



BOARDWALK Assembly Instructions TYPE 2



**Outdoor Structures
Australia**
outlasts and outperforms



NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

BOARDWALK CONSTRUCTION GUIDE TYPE 2 BOARDWALK

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1. TOOL AND SUNDRIES LIST

UP TO AND INCLUDING THE DECK

1	Paint brush 50mm (per worker)	1	Power plane
1	Paint brush 75mm (per worker)	1	Chain saw min. bar size 300mm
1	Laser (preferred) or dumpy level	1	Pneumatic drill with torque control (if working in wet areas)
2	String line (20m min.)	1	Drill 800 watt, 500 rpm min.
1	Claw hammer (per worker)	2	1/2" ratchet with 16,18 & 30mm sockets
1	Tape measure 8m (per worker)	3	Quick opening clamp 400mm
1	Acrow prop	Qty.	Lumber crayon (white)
2	Ring spanners to match above opening	Qty.	Carpenters pencils
1	Auger bit 22mm x 400 long*	Qty.	75mm gal. nails
1	Auger bit 13mm X 400 long*	1	Push trolley
1	Spade bit 25mm	1	Pair leather gloves (per worker)
1	Rafter Square	1	Pair rubber gauntlet gloves (per worker)
1	Spirit level 900mm min	Qty.	Barrier Cream
1	Countersinking or 12mm spade bit	2	12 countersink bits or
10	Single flute wood drill 5mm (13/64)	2	countersinking sinks and collars ⁶
5	Hex drive 5mm ⁴	1	Pair carpenters trestles
1	Hand or power saw 9 1/4"		

EXTRA FOR HANDRAILS

20	Temporary braces 50x25 @ 1.8m	1	Drill 8mm (5116)
1	Router with template follower	1	Handrail post template
1	rounding over bit 6mm	1	Auger bit 18mm*
1	Router bit 12mm (long series) ¹	1	Table edge bit ²
1	Auger bit 18mm*	1	Handrail drilling jig
1	Chisel 25mm	1	Safety glasses
1	Drill 11 mm	1	Dust mask

EXTRA FOR KERB

1	Router or electric planer	Qty.	65x3.15 gal. bullet head nails
1	Rounding over bit 6mm ³	4	Drill bit 3mm
1	Auger bit 11mm ⁵		

- * Suggested the use of Stanley eyed augers with the eye removed.
These are less likely to break in the hardwood than High Speed Steel auger bits
- 1 Suggested bit Carbatec CT X 1416
2 Suggested bit Carbatec CTN.-01
3 Suggested bit Carbatec CT 508B
4 Suggested bit Buildex 1-991-1085-8 or 1-991-1086-6
5 If not available remove the sides from a 12mm bit
6 Suggested Carbatec C102 countersink and 11900500 stop collar (fits 13/64")

1 INTRODUCTION

These instructions give information on how to assemble the superstructure of a Outdoor Structures Australia (OSA) **Design 2** boardwalk once the piles have been installed. While care has been taken to ensure coverage of the construction principals for boardwalks, the versatility and adaptability of this form of construction is only touched on here and so the information must be regarded as incomplete. Outdoor Structures Australia will take no liability for errors or omissions contained therein.

2 GETTING STARTED

2.1 General

At least until the deck planks are in position, all power tools should be pneumatic, hand or petrol operated to prevent the danger of electrocution in the wet environment. Pneumatic is preferred as they are lighter and do not burn out if stalled in the tough hardwood.

When installing any fastening, ensure that it is in a position to allow re-tightening in a year's time.

2.2 Preparing Bolts

Non Marine Environment

Before starting, all galvanised bolts should be painted with Amercoat 385. This can be done by either dipping the item in the Amercoat 385 or by applying two coats with a **50mm paint brush**. Ensure all washers are also painted. **NOTE.** Ensure that the bolts are degreased first if necessary. The last 25mm approx. of thread should remain unpainted. On installation the nut and exposed thread should then be painted with Amercoat 385.

Marine Environment

OSA recommends the use of 304 stainless fasteners in a marine environment. For ease and speed of supply threaded rod is normally used.

NOTE: Galvanized components used in either environment and are to be set in concrete should also be coated with Amercoat 385.

Refer to the attached Technical Data Sheet for safety instructions.

2.3 Preparing Head Stocks and Joists

All the Head stocks and joists should be coated with CN Oil for maximum life. Prior to oiling, the timber should be graded using the following procedure

1. Top/outside surface. Our timber, though of high quality, will not be free of natural feature/defect. Any natural feature/defect on the edge should go down to avoid moisture settling in these and hastening decay. Natural feature/defect on the side of the joists should be placed towards the inside of the boardwalk to shelter it from the weather. If there is no defect, place the hog in the timber up. During pre delivery Inspection at OSA's premises, timber may have been sprayed with a stencil indicating Down or Inside. Further grading should be done on site using **Lumber Crayon Mark Top or Inside** on any other piece that should be placed with care. Figure 1 shows incorrect placement.



Figure 1 How not to do it!

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

2. Length. Stack separately those lengths which are considerably longer than the nominal length. These may be needed if the post spacing is inaccurate and may avoid the necessity to purchase longer timber.

Prior to on site oiling the edges may be arrised with a plane. **A hand or jack plane** is preferred as it makes a smaller arris than a **power planer**. This will make brushing and handling easier.

Apply the oil with a **75mm paintbrush**. A roller can be used but the oil tends to splash off the roller onto the worker. The oil is more easily applied prior to assembling the structure. The following procedure is recommended. Set a number of joists on carpenters trestles and paint the joist all round. Lay 75mm high timber dunnage level on the ground at approx. 600-900mm spacings and place the oiled joists side by side on the dunnage with a gap of say 25mm between the edges. Place 25x25mm strips of timber on the top of this row of joists at about 600mm centres and repeat the process. This allows the oil to soak in before further handling. Coverage is 6 litres per M2 approx.

The joists and head stocks can be oiled after the superstructure has been built if the job dictates this method alternatively the timber can be ordered pre-oiled from OSA.

Refer to the attached Technical Data Sheet for Safety Instructions for CN Oil.

2.4 Preparing Handrail Posts

Apply a coat of Tanacoat to each of the posts with a 75mm paintbrush or spray with a knapsack or garden sprayer and stack. The posts do not need to be placed on strips to dry like the oiled members. Refer to the Technical Data Sheet for safety instructions.

3 HEADSTOCKS AND SLEEVES

3.1 Determining Headstock Levels

Do not assume the piles are driven to the correct level. *This must be checked.*

Mark one side of each post at the underside of the head stock level using a **laser level** or a **Dumpy Level**. The post should extend approximately 230mm above this point. There must not be less than 20mm clear between the top of the post and the underside of the decking to allow for shrinkage. Trim any excess and pick up offcut. Alternatively one post could be marked with the laser level and the other marked using a spirit level on a straight length of timber.

3.2 Installing Sleeve (For Marine and Brackish Environments)

The sleeve is necessary to stop attack by marine borers. As the borer only makes its home in the timber and does not swallow treated timber as it makes its hole, it is not poisoned by the chemical treatment.



Figure 2 Correctly fitting sleeves through posts cut too short

The sleeve is easiest installed by the pile driver and normally the sleeve goes to the top of the pile. It can be sandwiched between headstock. If installing by hand slip the sleeve over the pile until the top is approximately 20mm below the level of the headstock. The sleeve should be at least 600mm into the mud. If it will not push down by hand it may be eased into position with a jet of water and a spade. Some light taps of a **hammer** driving onto a piece of pine may also be used sparingly. Do not hammer directly on the sleeve. Fill the void with fine dry sand.

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

3.3 Fitting Headstocks Over Two Piles

At the position of the bottom of the head stock, drive in a galvanized 75mm bullet head nail 50mm into the pile. Measure the distance outside to outside of each set of piles and number the set and record.

Actual pile positions will vary from the designated positions due to piling operations, some may well be wider than the distance specified and may affect both the headstock and joist length. There is no structural problem if this is within the limits shown on the plans. For pier sets involving 3 piers or more, misalignment can cause problems, See 3.4 below. Using the numbers allocated to the sets of piles select the headstock length appropriate. When these have been supplied to a nominal length they may be up to 300mm longer. Cut the head stock to length, beveling back the cut by 25mm and arris if not already done.



Figure 3 When cut like this, the handrail cannot be braced

NOTE A variation of the standard headstock with handrails is to have one headstock overhang on one side and the other overhang on the other side. This will allow a diagonal brace to be retrofitted to the handrail if needed. This is an important design consideration in areas that are prone to vandalism. The decision to trim the headstocks level as in Figure 3 should only be done after considering the risk of intentional damage.

Place the headstocks on the nails ensuring

1. The best edge is up; taking note of any pre grading, See 2.3
2. That the hog is up if there is no defect and
3. That the heart is inwards figure 5.

Clamp the headstocks into place using **clamps** at least 400mm long. Using a **spirit level** adjust the top of the second head stock until it is level with the head stock that is sitting on the nail that has been accurately positioned. This will accommodate any variance in the depth of the members. OSA's standard headstock bolt is a single M20 hexagonal head at each pile. Drill a 22 mm diameter hole all the way through the posts. (A bit we have found suitable is a Stanley **eyed auger** with the head removed so it will fit in an ordinary chuck. The high speed steel bits can be easily broken.) Dip the head and shank of the 20mm hex head bolt in CN emulsion and insert the bolt with an engineering (square) washer under its head as well as under the nut. Keep the thread clean. If galvanised bolts are being used degrease the exposed thread and nut and coat with Amercoat 385. In Figure 3 we see a job where the builder did not complete the task of coating the bolts, complete coating is very important in a corrosive environment.

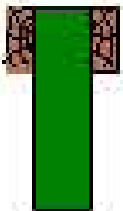


Figure 5
Growth
ring
alignment



Figure 4
Braced handrail post

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

3.4 Fitting Headstocks over 3 or More Piles



Figure 6 Fitting Headstock

Our designs make every effort to avoid sets of three piles as driven piles are difficult to place accurately. Three pile sets are normally avoided by the use of two heavier piles and/or heavier headstocks. Where they cannot be avoided, their installation is much the same as 3.3 above except problems may occur if the piles are out of alignment. If the misalignment is not more than 30mm the headstock will pull the pile into alignment. If the misalignment is greater, consult a supervisor. Do not apply undue force as the piles can break, especially at the knot clusters.



Figure 7 Joists low to ground

When the headstocks are very close to the ground, care must be taken to ensure that they will not become buried over time. Small retaining walls may be appropriate

4 JOISTS

4.1 Selecting and Preparing Members

Determine the distance between each set of piles measuring from centre to centre of each set of headstocks and number them. Measure both sides as these will vary depending on the curvature of the alignment. If the length is less than 3.5 metres a 150x75 member should be used and if longer use a 175x75 or 200x75 member as directed. Any deviation of the posts from vertical can be adjusted by 20mm or so by using an **Acrow prop** to push or pull the piles until the joists are fastened. Alternatively, drive a spacer block along between the joists to spread then to the required distance. Keep any system in place until the joists are fixed. If undue pressure is applied the posts may break. Select the joists that will have the minimum waste.

4.2 Outer Joists

The outer joists can be cut to length and arrised. Ensure that each end is not cut square but at a slight backwards angle as shown in Figure 8 This will ensure that the tops of the joists are hard up against each other to provide fixings for the decking. As well moisture will not be retained.

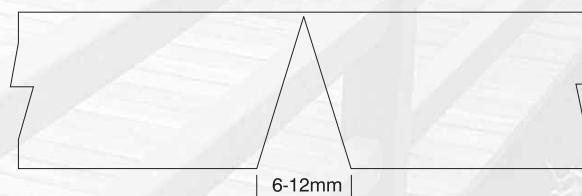


Figure 8 - Butting External Joists

Note: This can only be done after grading for best surface. Arris, if not already done, and carry all joists to site. Choose joists of the same depth or gauge them over the headstocks. Lay the precut outer joists on the headstocks against the outside of the pile.

4.2.2 Intermediate Joists

The intermediate joists are lapped and extend to the farthest of the headstock pair. Normally these joists are 3.6m lengths. Lapping gives a stronger structure and ensures that the decking is not fastened close to the end of the joist. It also means that it is not necessary to cut the joists to length. Sometimes double bolting is necessary and sufficient deckers are in place to keep the joists in position 70x35 decking cannot be pre-drilled with this decking layout but wider boards can. It is important that the decking layout be as shown in *Figure 9* for the whole length of the structure for pre-drilled decking to work.

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

Where some 200x75 members are needed the ends of the joists are reduced to 150mm. The timber removed must be backed off at a 1 in 3 angle, not cut square.

4.3 general

Ensure the shortest lengths are used first. If any trimming is done, pick up the offcuts. Counter-sink for the head of the cup head bolt to a depth of 6mm using a 25mm spade bit. Drill through the joists and headstocks with a 13mm bit. Remove the joists and apply a liberal coating of CN emulsion to the top and ends of the head stocks. Refer to the attached Technical Data Sheet for safety procedures.

Replace the joists and after dipping the 12x350mm cup head bolts in CN Emulsion, install them with an engineering washer under the nut. Keep the last 25mm clean and coat the exposed ends of galvanized bolts with Amercoat 385 after tightening. Apply extra CN emulsion to the counter-sunk section.

Lay a strip of 110mm malthoid on top of the joist to weatherproof the joist. Apply a liberal coat of CN Emulsion prior to laying decking. Note the use of a template to assist with the laying of the decking.

5 HANDRAIL STANDARDS

The handrail posts are bolted both ways which results in a very strong hand rail. Generally the fastenings are with M16 hex bolts. See figure 15 Look for any labels fastened to the post relating to grading. Natural feature should be placed to the back.

Ensure your end clearances on the bolts are structural. As a rule of thumb the depth of the beam is the end clearance e.g. a 150mm headstock requires 150mm end clearance.

When the handrail is installed at a join in the joists a structural join can be achieved in a number of ways including

- a U bolt
- a plate 300x75 over the join
- a threaded rod going right through to the post.



Figure 10 Malthoid with CN Emulsion

Refer to your plans as to what method is used in your instance

The U bolt has square washers under the nuts that bear against the joists. The joining plate is secured by 3 only 75mm stainless batten screws at each end. A round washer can be used under the nut. Refer to your plans for details when a threaded rod through to the post is used. The use of a nut both side of the handrail post and the foundation post is critical.

The handrail posts are frequently made of treated pine. Pine has a tendency to split longitudinally. This splitting can be controlled by cutting a groove along its length to about 1/3 of the depth. This is then placed at the back of the handrail.

Drive a galvanized nail into the standards at the level corresponding to the top of the headstocks and drop the post between the members and hard up against the outside joist. Clamp the stand-

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ards in position using **clamps** and temporarily nail in position with a **50x25 brace**. OSA's normal handrail bolt size is 16mm. Using an **18mm auger bit**, drill through the headstock and post and fit the 16mm hex head bolt after coating the shank with CN emulsion. Keep the last 25mm of thread clean. Ensure that an engineering washer is fitted under the head as well as under the nut. Coat the exposed thread of galvanised bolts with Amercoat 385 after tightening.

Fasten the post to the girder using the method specified which will generally involve M16 coach bolts, drill with an **18mm auger bit**. Where galvanised bolts, the shanks of these also should be coated with **CN Emulsion** leaving the last 25mm clean. Fit an engineering washer under the nut and Amercoat 385 the exposed thread. Give special attention to the drilling position to allow re-tightening.

NOTE. Pile offcuts can be used for handrail standards. Simply trim to the required length, bolt into place and around the top of the post with a router fitted with a table edging bit.

6 APPLYING PRESERVATIVES

If the head stocks and joists have not already been oiled and the posts coated with Tanacoat, the procedure with the posts secured and the frame of the boardwalk accessible is as follows.

1. Apply a coat of Tanacoat to the handrail posts and handrail
2. Apply a coat of CN oil to the sides and bottom of the headstocks
3. Apply a coat of CN oil to the sides bottom and top of the joists
4. Apply a liberal coat of CN emulsion to the interface between the head stock and joist
5. Apply a liberal coat of CN Emulsion to the top of the Malthoid and ends of the joists
6. Apply a liberal coat of CN emulsion to the top of the piles

Be careful not to slip. Do not walk on freshly coated timber. Wear appropriate protective coverings (gloves, overalls) for the application of preservatives. Refer to the safety data sheets for preservatives and oils.

7 DECKING

7.1 Selecting and Preparing Decking

The decking is branded *Deckwood* and normally has a finished size of 120x35 (70x35 is preferred for more rural areas). The decking has a patented profile. There are also a series of reeds on the bottom face. The profiled face must go on the underside. Any 70x35 material that is fully rough sawn is intended for bracing, not decking. When the decking is not supplied pre-docked cut the *Deckwood* to the nominal length of the boardwalk width ensuring one end is square. Defect dock the material, removing as much as is possible of any split ends.

NOTES

- 1 The grading is much easier if a template is cut to the correct length. This will allow the builder to determine where the best say 2.1 m lies in that piece of timber. If a table saw is used mark the length required on the infeed table.
- 2 Decking of different lengths is used on the boardwalk in areas such as widenings, and viewing platforms. Ensure that this material is retained for use in these areas only. Always cut so as to have the minimum waste and leave the long lengths till last.

7.2 Laying and Fastening Decking

120mm decking is normally laid without gap and 70x35 decking with up to a 6mm gap. Refer to plans for the target gap after seasoning. The timber will shrink about 6% giving a gap of 7mm on 120mm boards. The overall gap when seasoned should not exceed 13mm to meet disability access

requirements. It is sometimes easier to cut both sides after fastening. Using a **rafter square** mark out the position of the first board ensuring it is square to the joists. Simply run two **string lines** and push/pull the decker till the best portion lies within the string lines. Lay the boards to the line keeping the gap constant between the ends of the boards and the string line. Place a 6mm spacer at two points between each board. Batten screws are a suitable spacer. Cut in the deckers neatly around the posts. Check with the rafter square at least two points down each panel that the deckers are remaining square to the joists. Correct if necessary.

NOTES

1. There is no need to ensure that the deckers end at the end of the joist. They may be placed as if no join exists. The screws at the end of the outer joists should be inserted at an angle into the decking so that its point is furthest from the joist end so it develops sufficient pull out strength.
2. Take care not to stand on the ends of decking before they are fastened as they may tip up
3. Once a quantity has been laid and fastened a **push trolley** can make material handling easier. Care must be taken to avoid splitting the joist. As this is something which normally happens some time after the job is completed the value of this procedure is often not given the priority it deserves. The procedure is as follows

1. Predrilling the joist as outlined below
2. Ensuring the screws are not in a straight line but staggered, say 8-10mm, either side of the center line of the girder. This will reduce splitting the joist.

NOTE Countersink the decking for the screw head to a depth of 2mm under the surface with a **countersink** bit and then drill to the full depth of the screw through the decker with a **5mm (13/64) Single flute drill**. This is best done with the countersinking bit and stop collar that is integral with the bit.

Dip the stainless steel screw into CN emulsion and then screw home with a **5mm hexagon driver**. **SCREWS MUST BE PREDRILLED EVEN WHEN USING TYPE 17 SCREWS WHICH ARE CLASSED AS SELF DRILLING SCREWS**. If the screws are inserted too deep, water can settle in the depression and promote decay. These will need to be filled, hot pitch troweled into the hole has proven very effective.



Figure 12 Screws are too deep

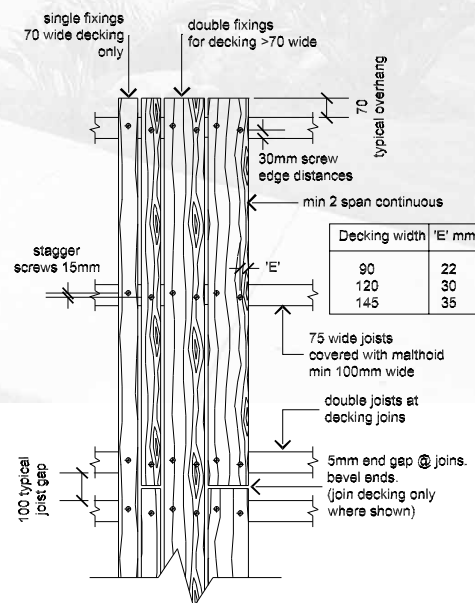


Figure 11 Deckwood fixing details

Mark with a **chalk line** the side of the boardwalk with the un-docked ends and saw to that mark. In a very sensitive area, sawdust can be collected into a bucket held a safe distance under the saw or dropsheet placed on the ground. Pick up all offcuts.

7.3 Changing Direction

7.3.1 Changes up to 13" (each panel)

Standard tapered Deckwood segments are available. Their length is at least 50mm longer than the nominal width of the Boardwalk. For each 10" change of direction the following number of segments are needed:

SEGMENTS PER 10°			
Nom. width	segments required	Nom. width	segments required
1.2	8 approx.	2.1	13 approx.
1.5	9 approx.	2.4	15 approx.
1.8	11 approx.		

Working from the centre of the angle, place deckers equally each side of the centre. The large end is cut square, place these in such a manner that a neat radius is formed. Compensate for differential shrinkage by laying with a 3mm gap at the small end. Fix as in 7.2 and trim the narrow end. It may be necessary to adjust the rate of the change in direction by inserting some parallel sided deckers

NOTE: Tapered segments are available up to 3.6 metres long. Unfortunately the lengths over 2.4 metres tend to bow during the tapering process but may be pushed back into alignment during fastening.



Figure 13 Mitered joint



Figure 14 Mitered joint with trimmer

7.3.2 Changes over 13' (each panel)

These will require that a joist trimmer be installed and the standard planks will be mitred over the trimmer. See the working drawings for details. Ensure a liberal coat of CN Emulsion is applied to the top of the trimmer. For the best effect the pile group needs to be correctly driven at $\frac{1}{2}$ the deflection angle. The need to match up (mirror) the mitres on the planks can be avoided if a mitre plank used as in *Figure 15*. Unfortunately the screw position will be closer to the end than is recommended and some splitting may result.

The drawing to the left shows the layout at the mitred intersection. A layer

of Malthoid is laid on the headstock and trimmers are fitted in-between the joists, fastened with 100mm stainless batten screws, so the end of the decking can be fastened. A trimmer is installed at the centre of the mitre so it is not necessary to match up one piece of decking against another at the mitre – very difficult thing to do if the piles are not central. The joists can not be lapped at this junction.

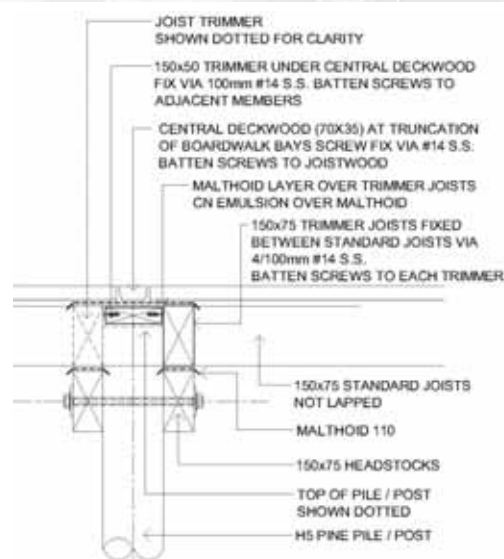


Figure 15 Detail of Trimmer Joists

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

7.4 Rest Stations/Widenings

At these areas the boardwalk tapers to a wider section. Ensure the decking continues to remain square to the main line of the boardwalk and does not follow square to the tapered sides of the widening

8 HANDRAIL

8.1 handrail posts Selection and Preparation

The handrail posts are bolted both ways which results in a very strong hand rail. Generally the fastenings are with M16 hex bolts. See figure 15 Look for any labels fastened to the post relating to grading. Natural feature should be placed to the back.

Ensure your end clearances on the bolts are structural.

As a rule of thumb the depth of the beam is the end clearance e.g. a 150mm headstock requires 150mm end clearance.

When the handrail is installed at a join in the joists a structural join can be achieved in a number of ways including

- a U bolt
- a plate 300x75 over the join
- a threaded rod going right through to the post.

Refer to your plans as to what method is used in your instance

The U bolt has square washers under the nuts that bear against the joists. The joining plate is secured by 3 only 75mm stainless batten screws at each end. A round washer can be used under the nut. Refer to your plans for details when a threaded rod through to the post is used. The use of a nut both side of the handrail post and the foundation post is critical.

8.2 Handrail Selection and Preparation

Measure the lengths required for each handrail section and select the pieces ensuring that minimum waste is achieved and the longest lengths used last. The timber will have already been pregraded for compliance to grade. During this grading Outdoor Structures Australia may have marked some with DOWN or OUTSIDE on one face. Follow this grading when installing. In the absence of any grading Install any hog uppermost. All rough sawn handrails should have a 6mm radius formed on all four edges. Handrail can be ordered from Outdoor Structures Australia with the edges prepared but is usually done by the customer. This is done with a router fitted with a 6mm Rounding over bit. It is easier to coat with Tanacoat prior to installing. Sand prior to applying any finish, as the surface "



Figure 16 Alignment of decking at rest station

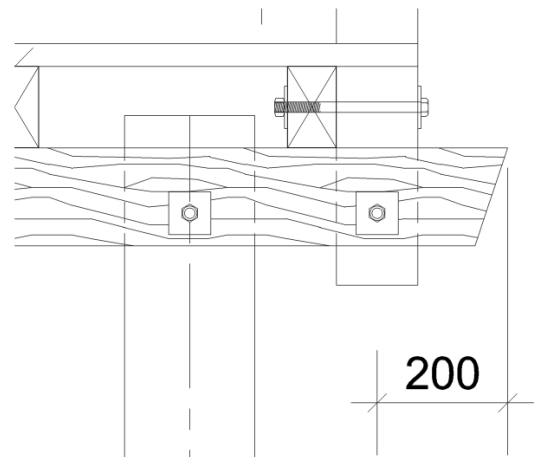


Figure 17 Handrail alignment



Figure 18 Handrail alignment

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

8.3 Fitting Bottom Rail

For our normal handrail system, the top of the lowest handrail is 250mm above the deck and is only set into the post 25mm. The post can be prepared by scarfing out the check with a series of saw cuts finished with a **plane or chisel**. Alternatively a jig can be used as in 8.3. Apply a liberal coat of CN emulsion to the cut, trim the handrail to suit taking care to defect dock and coat the sawn ends with or CN emulsion. Pick up the off cuts. Clamp in position.

Secure the handrails with two 100 mm stainless batten screws drilled through the face. Do not fasten from the top. Drill 35mm from the end. Dip the screws in CN emulsion and fasten.

8.4. Fitting Top and Middle Rail.

Check the plans for the placement of the rails as this varies at times. The handrail faces of our standard system are set 10mm behind the face of the post to disguise misalignment to some degree. To fit the handrails, each side of the post will have to be housed to take the rail. This is best done by using an adjustable aluminium or timber jig which clamps to the post. This jig is normally made on site from plywood. A router with a **long 12mm Bit** and a **template follower** can then cut the shape in the post. A template will be needed for both the 100x100 rail and the 100x75 rail. The radiused corners of the rail will then fit exactly into the hole formed with the 12mm bit.



Figure 19 Using a template



Figure 20 Timber jig

Clamp the jig to the post with the template facing square to the previous post and in correct alignment as to the depth of cut in the post. Using the router make the handrail housing. The ends will then be cut square, not at angles. Fasten as in 8.2 above Figures 20 - 21 shows a timber jig made by a client

For straight runs, the posts can be purchased pre routed. We recommend the use of safety glasses and dust masks when using the router on treated timber.



Figure 21

9 KERB

The 75x75 kerb is graded primarily so that the best face is up and any defect is down. Follow any pregrading of **DOWN** marked on the timber. Ideally the bow should go up but as the kerb is bolted in the centre this is not overly important.

We recommend that the corners of the kerb be radiused with a **6mm rounding over bit** fitted to a **router** as this finish is far neater than removing the corner with a plane.

Coat the top and bottom of the pre cut blocks with CN Emulsion. Drill through the kerb and block using an **11 mm auger bit** and insert a 10x180 gal cup head after coating the shaft with CN Emulsion (keep the first 25mm clean). Fit a round washer and tighten. If using galvanised bolts coat the exposed bolt with Amercoat 385. Stainless applications use a 12mm Man of War nut and threaded rod.

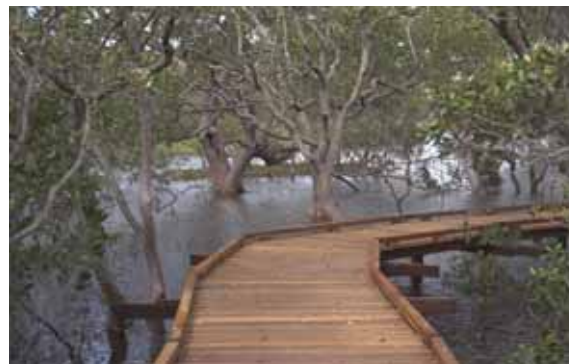


Figure 23 Boardwalk with kerbt

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

NOTE. As the timber seasons this block will become loose and may twist into the walkway and prove an obstacle. To avoid this, skew nail a 50x2.8 galvanized bullet head nail through the spacer into the deck. Do not join two kerbs on the one spacer.

10 TERMINATIONS

10.1 Timber terminations

Those members in contact with the soil at the end of the boardwalk can be expected to rot. To minimize damage to the boardwalk a sacrificial sleeper of 200x100 durability 1 hardwood is placed at the ends of the boardwalk. The method of installing this is as follows.

Trim the boardwalk joists 175mm shorter than the position at which the boardwalk is to terminate. Connect the end of the joists with a trimmer of 150x75 Joistwood, cut to the length of the decking. Secure the trimmer to the endgrain of the joists with two countersunk 10x150 gal coach-screws per joist. The sacrificial sleeper is cut to the same length as the 150x75 trimmer. Attach a 200x100 sleeper in a similar method to the back of the trimmer. Extend the decking over the sacrificial piece.

When an approach path is built on fill there is a likelihood that the path will sink leaving a trip hazard. We recommend that piles be installed beyond the boardwalk to support the end of the path

10.2 Concrete Abutments

These should be designed especially for each project and the engineers drawings should be followed. As a guide there should be a back and side wall to ensure that dirt does not encroach upon the structure. As well the joists should be raised 25-50mm above the abutment and there should be a forward slope on the abutment base to drain water away from the timber.

11 FINISHING

Coat the handrails with Tanacoat and if possible give the deck another coat of CN oil. The oil should be applied at least two weeks before the opening of the boardwalk.

NOTE: The treated offcuts should be taken to a landfill dump and buried. Take definite steps to ensure it does not end up as barbecue wood.

Help us to help others by informing us of limitations, errors or ambiguities in this instruction. Digital Images illustrating various steps would also be very helpful. Forward any correspondence to P.O. Box 517 Gatton Q 4343 AUSTRALIA or ted@outdoorstructures.com.au

12. TYPICAL CONSTRUCTION DETAILS

12.1 HEADSTOCK PILE CONNECTION

12.2 JOISTWOOD BOLTING DETAILS TYPICAL

12.3 STRAIGHTENING JOISTS

12.4 SCREWING DETAIL 70X35 DECKWOOD

12.5 KERB BOLTING DETAIL



Figure 22 Kerb alignment



Figure 24 Twisted kerb block

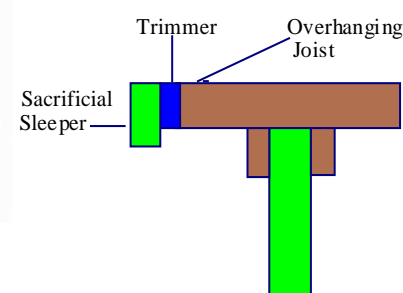
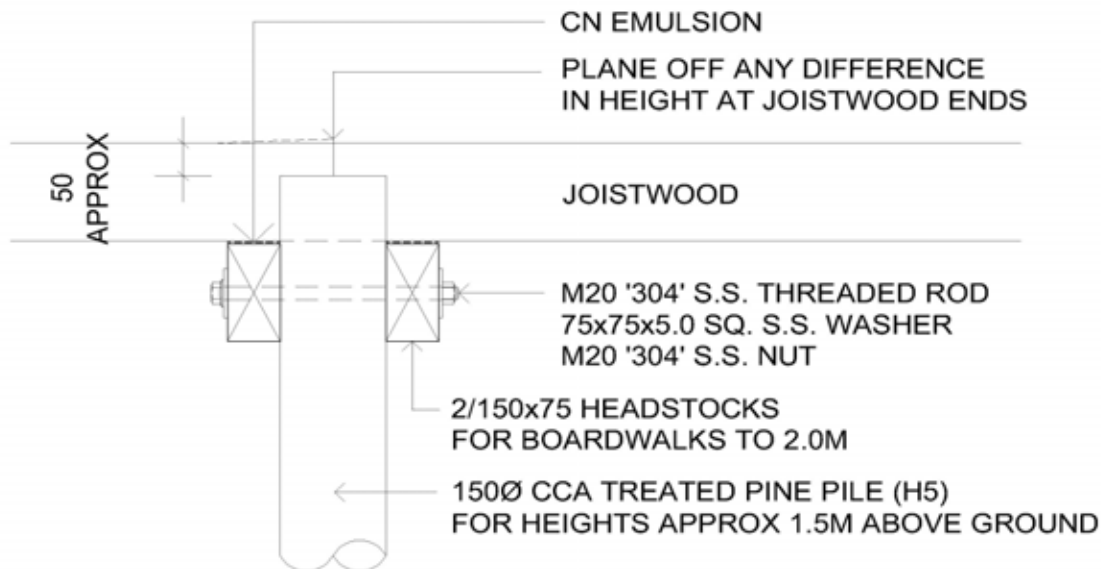
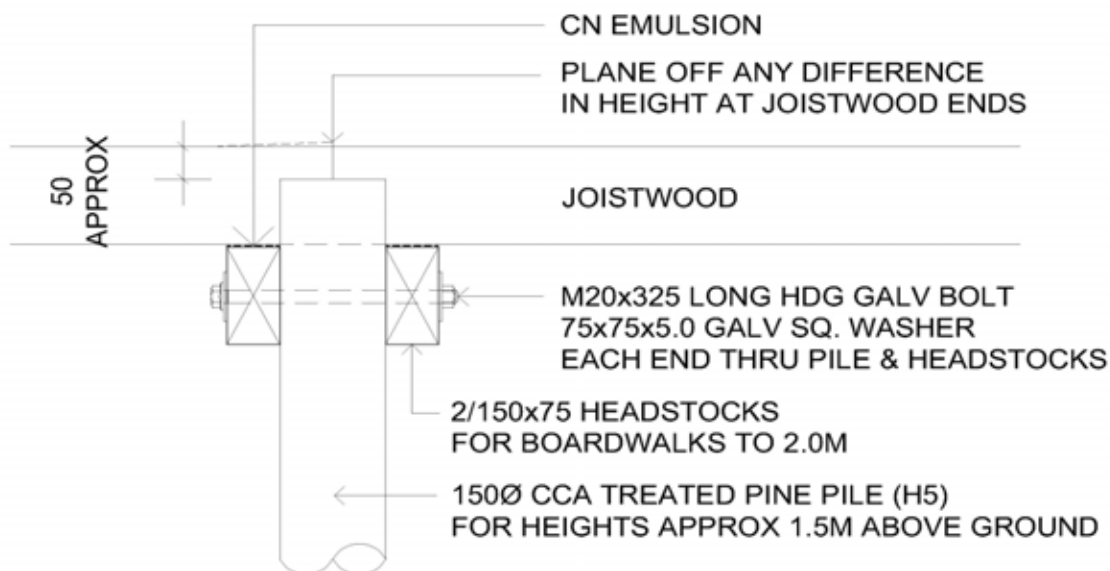


Figure 23 Termination detail

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

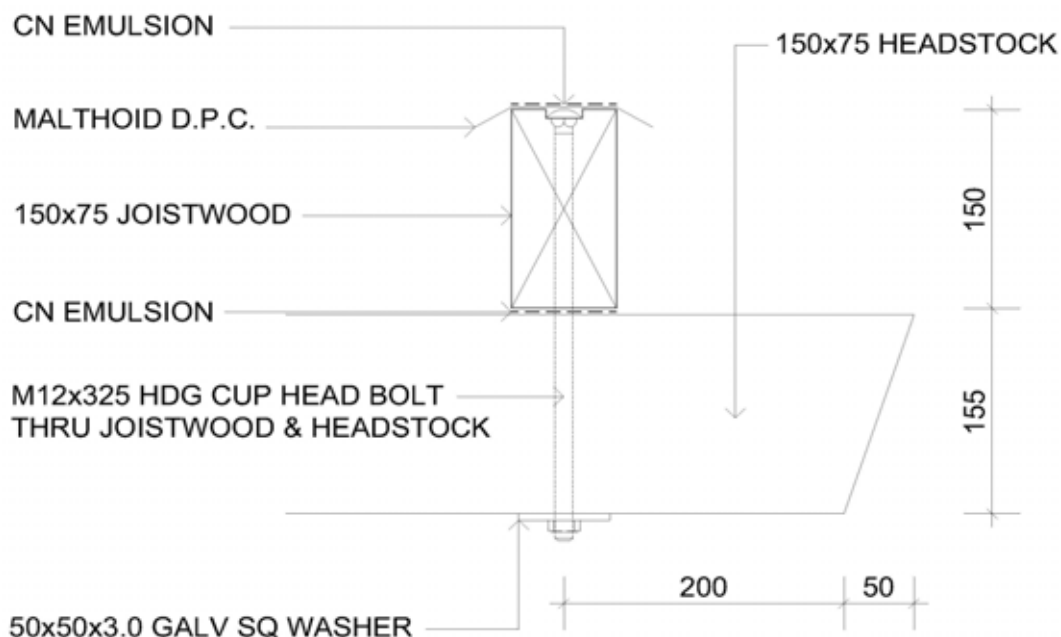


HEADSTOCK / PILE CONNECTION (STAINLESS STEEL)



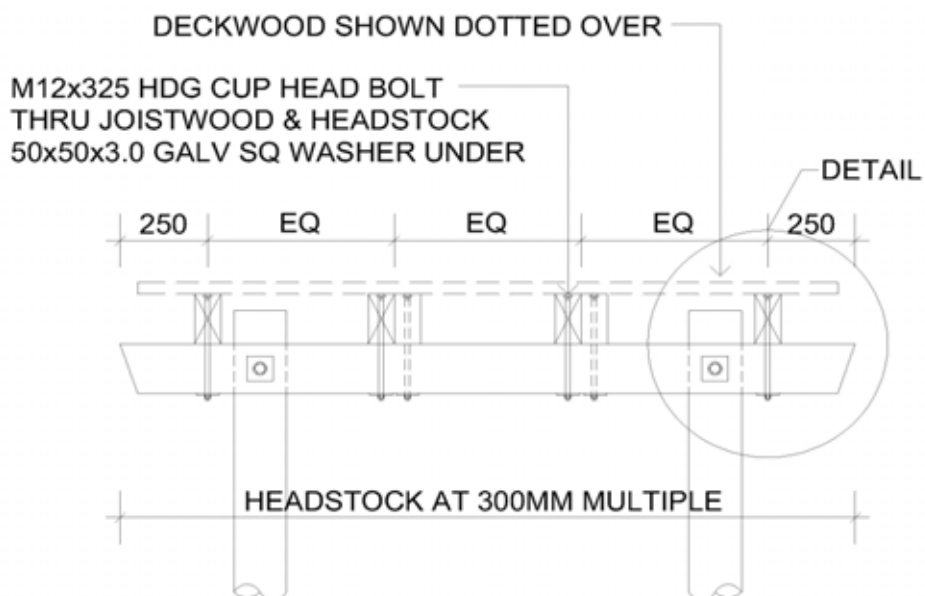
HEADSTOCK / PILE CONNECTION (GALVANISED)

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



OVERHANG DIMENSION IS FOR BOARDWALK WITH KERB ONLY

JOISTWOOD BOLTING DETAIL 1:5



OVERHANG DIMENSION IS FOR BOARDWALK WITH KERB ONLY

JOISTWOOD BOLTING DETAIL

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

PLACE TEMPORARY SPREADERS
(NOT SUPPLIED) BETWEEN JOISTS
WHILE SCREWING DOWN DECKING

150Ø CCA PINE PILE

HEADSTOCKS

EXTERNAL JOIST

INTERNAL JOIST

INTERNAL JOIST

EXTERNAL JOIST

PLACE BOWS IN JOISTWOOD
FACING UPWARDS AS SHOWN
SIMILAR BOWS POSITIONED
TOGETHER IN SAME BAY



BOLTING PATTERN FOR JOISTWOOD

BOWS IN JOISTWOOD

PLANE OFF ANY DIFFERENCE
IN HEIGHT AT JOISTWOOD ENDS

JOISTWOOD

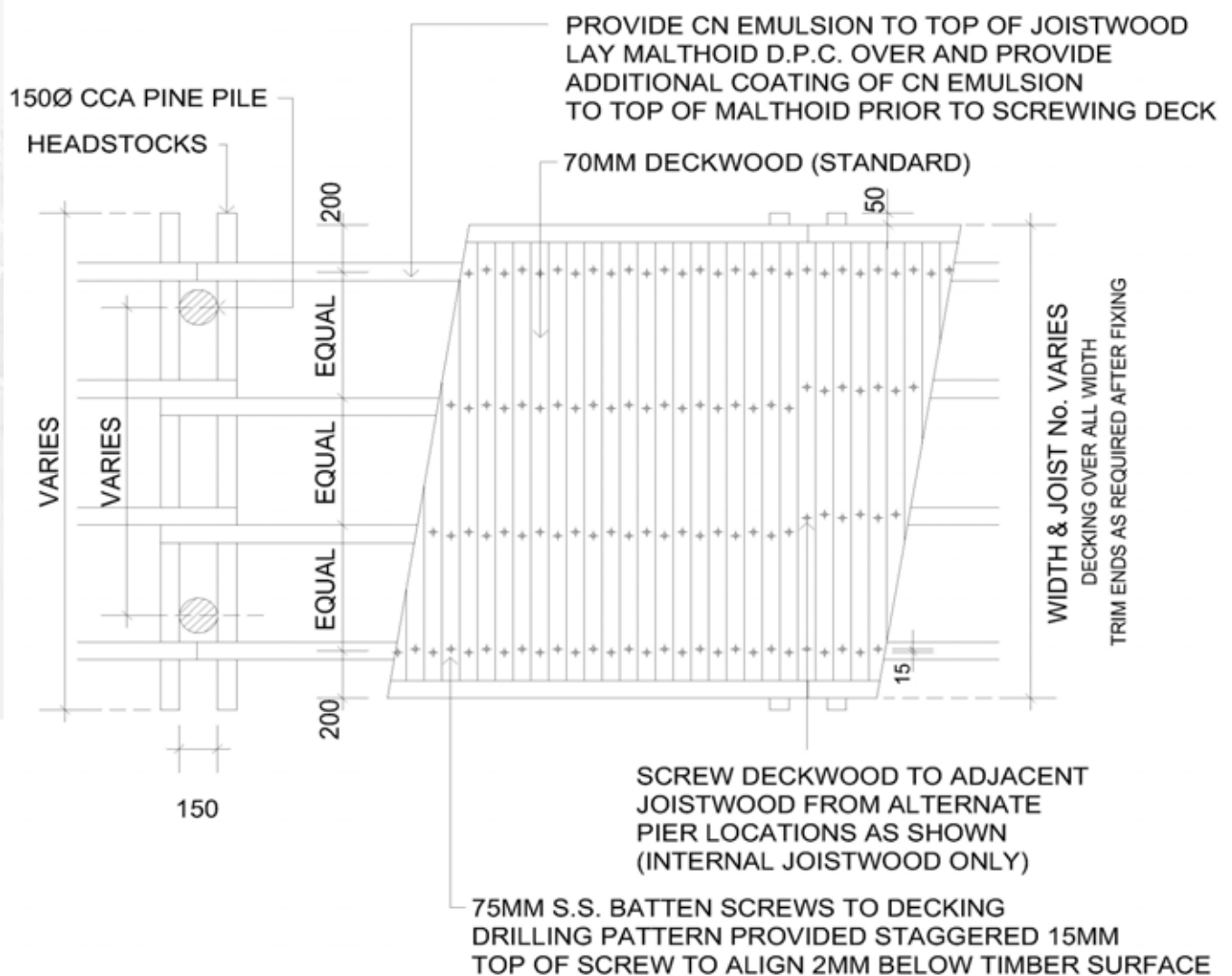


PLACE BOWS IN JOISTWOOD
FACING UPWARDS AS SHOWN
SIMILAR BOWS POSITIONED
TOGETHER IN SAME BAY

75MM NAIL IN PILE
TO LOCATE HEIGHT
OF HEADSTOCKS

BOWS IN JOISTWOOD

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



DECK SCREWING DETAIL

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

THRU SPACER TO UNDER SIDE
OF DECKWOOD
S.S. WASHER UNDER
M12 S.S. MAN-O-WAR NUT
TO TOP OF KERB

75x75 KERB
PENCIL ROUND TO TOP

75x200 SIZED KERB SPACER
AT MID SPAN OF KERB &
AT EACH END AS SHOWN

KERB BOLTING DETAIL (STAINLESS STEEL)

M10x180 HDG CUP HEAD BOLT
THRU SPACER TO UNDER SIDE
OF DECKWOOD
HDG WASHER UNDER

75x75 KERB
PENCIL ROUND TO TOP

75x200 SIZED KERB SPACER
AT MID SPAN OF KERB &
AT EACH END AS SHOWN

KERB BOLTING DETAIL (GALVANISED)

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

Material Safety Data Sheet



**Outdoor Structures
Australia**
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NON-Hazardous Substance, NON-Dangerous Goods

1. MATERIAL AND SUPPLY COMPANY IDENTIFICATION

Product name: **Tanalith E Treated Timber**

Recommended use: Timber treated to H3, H4 or H5 as per the Australian Standard AS1604

Supplier: Outdoor Structures Australia Pty Ltd
ABN: 29 713 463 351
Street Address: Old College Road
Gatton Qld 4343
Australia
Telephone: (07) 5462-4255
Facsimile: (07) 5462-4077

Emergency telephone number: (07) 5462-4255 (Mon-Fri, 8.30am – 4.00pm: Queensland Std Time)

2. HAZARDS IDENTIFICATION

Based on available information, this material is not classified as hazardous according to criteria of NOHSC Australia.

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail.

Poisons Schedule (Aust): Not applicable

3. COMPOSITION INFORMATION

CHEMICAL ENTITY	CAS NO.	PROPORTION
Soft or hard wood timber	-	>99%
Preservative	-	<1%
		100%

4. FIRST AID MEASURES

If poisoning occurs, contact a doctor or Poisons Information Centre (Phone Australia 131 126, New Zealand 0800 764 766).

The following first aid measures are for exposure to dust generated when the product is worked in any manner that results in wood dust being generated.

Inhalation: Remove victim from exposure - avoid becoming a casualty. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

Skin contact: If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

Product name: Tanalith E Treated Timber

Substance Key: OSA0001

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

Material Safety Data Sheet



**Outdoor Structures
Australia**
outlasts and outperforms

Eye contact: If in eyes wash out immediately with water. In all cases of eye contamination it is a sensible precaution to seek medical advice.

Ingestion: Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water to drink. Never give anything by the mouth to an unconscious patient. If vomiting occurs give further water. Seek medical advice.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Specific hazards: Combustible material. In common with many organic chemicals, may form flammable dust clouds in air.

Fire fighting further advice: On burning may emit toxic fumes. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to vapour or products of combustion.

Hazchem Code: Not applicable.

Suitable extinguishing media: If material is involved in a fire use water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).

6. ACCIDENTAL RELEASE MEASURES

For dust. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and the inhalation of dust. Work up wind or increase ventilation. Cover with damp absorbent (inert material, sand or soil). Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. If contamination of sewers or waterways has occurred advise local emergency services.

Dangerous Goods – Initial Emergency Response Guide No: Not applicable.

7. HANDLING AND STORAGE

Handling: Avoid eye contact and repeated or prolonged skin contact.

Storage: Store away from incompatible materials described in Section 10. Store away from sources of heat or ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

National occupational exposure limits:

No value assigned for this specific material by the National Occupational Health and Safety Commission (NOHSC Australia).

However for:

Material Safety Data Sheet



	TWA		STEL		CARCINOGEN CATEGORY	NOTICES
	ppm	mg/m3	ppm	mg/m3		
Wood dust (certain hardwoods such as beech & oak)	-	1	-	-	-	Sen
Wood dust (soft wood)	-	5	-	10	-	Sen

As published by the National Occupational Health & Safety Commission (NOHSC Australia).

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

'Sen' notice - sensitiser. The substance can cause a specific immune response in some people. An affected individual may subsequently react to exposure to minute levels of that substance.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept too as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

If the directions for use on the product label are followed, exposure of individuals using the product should not exceed the above standard. The standard was created for workers who are routinely, potentially exposed during product manufacture.

Biological Limit Values: As per the "National Model Regulations for the Control of Workplace Hazardous Substances [NOHSC: 1005 (1994)]" the ingredients in this material do not have a Biological Limit Allocated.

Engineering measures: Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. Avoid generating and inhaling dusts. Use with local exhaust ventilation or while wearing dust mask.

Personal protection equipment: OVERALLS, SAFETY SHOES, SAFETY GLASSES, GLOVES, DUST MASK.

Wear overalls, safety glasses and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Available information suggests that gloves made from leather should be suitable for intermittent contact. However, due to variations in glove construction and local conditions, the user should make a final assessment. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form / Colour / Odour: After treatment timber will have a light golden colour and may have slight amine odour.

Solubility:	Insoluble in water
Specific Gravity (20 °C):	0.6 – 1.0 (depending on moisture content)
Relative Vapour Density (air=1):	N App
Vapour Pressure (20 °C):	N App
Flash Point (°C):	N Av
Flammability Limits (%):	N Av
Autoignition Temperature (°C):	N Av

Product name: Tanalith E Treated Timber

Substance Key: OSA0001

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.

Material Safety Data Sheet



**Outdoor Structures
Australia**
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Melting Point/Range (°C): N App
Boiling Point/Range (°C): N App
pH: N App

(Typical values only - consult specification sheet)
N Av = Not available N App = Not applicable

10. STABILITY AND REACTIVITY

Chemical stability: This material is thermally stable when stored and used as directed.

Conditions to avoid: Elevated temperatures and sources of ignition.

Incompatible Materials: Oxidising agents.

Hazardous decomposition products: Oxides of carbon and nitrogen, smoke and other toxic fumes.

Hazardous reactions: No known hazardous reactions.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

Acute Effects

Inhalation: Dust may be an irritant to mucous membranes and respiratory tract.

Skin contact: Contact with dust may result in irritation.

Eye contact: Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.

Ingestion: Swallowing can result in nausea, vomiting and irritation of the gastrointestinal tract.

Long Term Effects: Wood dust has been classified by the International Agency for Research on Cancer (IARC) as a Group 1 agent. Group 1 - The agent is carcinogenic to humans.

Acute toxicity / Chronic toxicity

No LD50 data available for the product.

12. ECOLOGICAL INFORMATION

Avoid contaminating waterways.

Ecotoxicity: No information available.

Persistence and degradability: No information available.

Mobility: No information available.

Product name: Tanalith E Treated Timber

Substance Key: OSA0001

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



13. DISPOSAL CONSIDERATIONS

Refer to State/Territory Land Waste Management Authority.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT

Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail.

MARINE TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

AIR TRANSPORT

Not classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

15. REGULATORY INFORMATION

Poisons Schedule (Aust): Not applicable

All the constituents of this material are listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Literary reference

This Material Safety Data Sheet has been prepared by Chemical Data Services Pty Ltd on behalf of its client.

Reason(s) For Issue: First Issue

Material Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This MSDS summarises at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since Outdoor Structures Australia Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this MSDS in the context of how the user intends to handle and use the product in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for product as sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

1. Identification of the Material and Supplier

Product

Product name	CN Timber Protective Emulsion
Other names	CN Emulsion
Product code	GLM-CNE-20, GLM-CNE-200
Proper shipping name	Not applicable
UN number	Not applicable
DG class for transport	Not applicable
Packaging group	Not applicable
Hazchem code	1T
Poison schedule	S5
Uses	Remedial preservative to protect timber against fungal and insect attack. Used particularly for the ground line protection of wood utility poles.

Company Details

Company	Arch Wood Protection (Aust) Pty Ltd
Address	Station Street Trentham VICTORIA 3458
Telephone Number	07 3385 4804

Emergency Telephone Number: 1800 7WOOD7 (1800 796637)

2. Hazard Identification

Hazard Classifications

Classified as hazardous to the criteria of NOHSC. Poison Schedule Number: S5

Other Classifications

There are no other Classifications that are known to apply.

Risk and Safety Phrases

Risk

- Irritating to eyes and skin.
- May cause sensitization by inhalation and skin contact.
- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety

- Keep out of the reach of children.
- Avoid contact with the skin.
- Avoid contact with eyes.
- Do not breathe fumes or vapour.
- Take off immediately all contaminated clothing.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- Avoid exposure -- obtain special instructions before use.
- Wear suitable gloves and eye/face protection.

3. Composition / Information on Ingredients

Component	CAS/ Identification	Conc (%)
Copper naphthenate	1338-02-9	10-30%
Mineral oil hydrocarbons	8012-95-1	30-60%
Casein	9000-71-9	<1%
Ammonia	7664-41-7	<1%
Water	7732-18-5	10-30%

This is a commercial product whose exact ratio of components may vary. Trace quantities of impurities are also likely.

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

4. First Aid Measures

General Information

Arch Wood Protection (Aust) Pty Ltd has an Emergency Contact Phone Number: 1800 7WOOD7 (1800 796637).

Recommended first aid facilities Ready access to running water is required. Accessible eyewash is recommended. Emergency shower, hand wash, soap. CPR training, oxygen mask. First aid facilities should include Ipecac syrup.

Exposure

Swallowed Do NOT induce vomiting. Give a glass of water to drink. Contact a doctor.
Eye contact If product gets in eyes, wash material from them with running water for several minutes. If symptoms persist, seek medical advice.
Skin contact Flush immediately with large amounts of water. Remove all contaminated clothing. Contact a doctor.
Inhaled Generally, inhalation of fumes is unlikely to result in adverse health effects. However, it is a possible sensitizer and so if coughing, dizziness or shortness of breath is experienced, remove the patient to fresh air immediately. If patient is unconscious, place in the recovery position (on the side) for transport and contact a doctor.

Advice to Doctor

Treat symptomatically.

Additional Information

Not applicable

5. Firefighting Measures

Fire and explosion hazards There are no specific risks for fire/explosion for this chemical. It is non-flammable.
Suitable extinguishing substances Carbon dioxide, extinguishing powder, foam, fog sprays, water jets.
Unsuitable extinguishing substances Unknown.
Products of combustion Carbon dioxide, carbon monoxide, nitrogen, oxides of nitrogen, copper fumes.
Protective equipment No special measures are required.
Hazchem code 1T

6. Accidental Release Measures

Emergency procedures In the event of spillage alert the fire brigade to location and give brief description of hazard.
Shut off all possible sources of ignition.
Wear protective equipment to prevent skin, eye and respiratory exposure.
Clear area of any unprotected personnel.
Contain using sand, earth or vermiculite. Do not use sawdust on concentrate.
Prevent by whatever means possible any spillage from entering drains, sewers, or water courses. (If this occurs contact your relevant authority immediately.)
Clean-up method Use absorbent (soil, sand or other inert material). Collect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred, advise local emergency services.
Disposal Mop up and collect recoverable material into labelled containers for recycling or salvage. Recycle containers wherever possible. This material may be suitable for approved landfill. Dispose of only in accord with all regulations.
Precautions Wear protective equipment to prevent skin and eye contamination and the inhalation of vapours. Work up wind or increase ventilation.

7. Storage & Handling

Storage Avoid storage of harmful substances with food. Containers should be kept closed in order to minimise contamination. Keep from extreme heat and open flames. Avoid contact with incompatible substances as listed in Section 10.
Handling **Keep out of reach of children.** Keep exposure to a minimum, and minimise the quantities kept in work areas. See section 8 with regard to personal protective equipment requirements.

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

8. Exposure Controls / Personal Protective Equipment

Workplace Exposure Standards

An Exposure Standard (ES) has not been established. There is a general limit of 10mg/m³ for dusts and mists when limits have not otherwise been established.

NOHSC (NOHSC:1003)	Ingredient	ES-TWA	ES-STEL
	Copper naphthenate	Copper dust or mist: 1mg/m ³	Data unavailable
	Mineral oil hydrocarbons	5mg/m ³	Data unavailable
	Casein	Data unavailable	Data unavailable
	Ammonia	Data unavailable	Data unavailable
	Water	Data unavailable	Data unavailable

Engineering Controls

In industrial situations, concentration values below the ES value must be maintained. Exposure can be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If you believe airborne concentrations of mists, dusts or vapours are high, you are advised to modify processes or increase ventilation.

Personal Protective Equipment

Eyes



Avoid contact with eyes. Use safety glasses and/or chemical splash goggles if splashes are possible.

Skin



Gloves should be considered. If you suffer from dermatitis type skin conditions, use gloves.

Respiratory

A respirator when airborne concentrations approach the ES (section 8). If using a respirator, ensure that the cartridges are correct for the potential air contamination and are in good working order.

ES Additional Information

Not applicable

9. Physical & Chemical Properties

Appearance	Light green paste/gel
Odour	Slight ammonia and oily odour
pH	~8
Vapour pressure	Low
Vapour density	Not applicable
Boiling point	~100°C
Volatile materials	Not applicable
Freezing / melting point	Not applicable
Solubility	Water soluble
Specific gravity / density	~0.95 g/mL at 20°C
Flash point	180°C (closed cup)
Danger of explosion	Not explosive
Auto-ignition temperature	Not flammable
Upper and lower flammable limits	Non flammable
Corrosiveness	Non corrosive

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

10. Stability & Reactivity

Stability	Stable under normal use and storage conditions.
Conditions to be avoided	Containers should be kept closed in order to avoid contamination. Keep from extreme heat and open flames.
Incompatible materials	Stable under normal use and storage conditions. There are no specific incompatibilities for this chemical.
Hazardous decomposition products	CO and CO ₂ and copper fumes.
Hazardous reactions	No specific hazards.

11. Toxicological Information

Summary

No specific data is available for this product. Where available, toxicological data has been researched and data for the mixture calculated. The results of these calculations are presented below. The product is considered to have the following toxicity:

Supporting Data

Acute	Oral	No data for mixture is available. Using LD ₅₀ 's for ingredients, the calculated LD ₅₀ (oral, rat) for the mixture is >5,000 mg/kg. Data considered includes: Copper naphthenate 6400 mg/kg, mineral oil hydrocarbons 3700 mg/kg, Casein >5000 mg/kg, Ammonia 1000mg/kg.
	Dermal	No data for mixture is available. Using LD ₅₀ 's for ingredients, the calculated LD ₅₀ (dermal, rat) for the mixture is >2,000 mg/kg. Data considered includes: Copper naphthenate >2000 mg/kg, Mineral oil hydrocarbons >2500 mg/kg, Casein >2000 mg/kg, Ammonia (data unavailable).
	Inhaled	No data for mixture is available. Using LC ₅₀ 's for ingredients, the calculated LC ₅₀ (inhalation, rat) for the mixture is >5,000 ppm. Data considered includes: Copper naphthenate (data unavailable), Mineral oil hydrocarbons 0.1 mg/L/4h, Casein 820 mg/m ³ , Ammonia (data unavailable).
	Eye	The mixture is considered to be an eye irritant, because some of the ingredients present are considered eye irritants in more concentrated form.
	Skin	The mixture is considered to be a skin irritant, because some of the ingredients present are considered skin irritants in more concentrated form.
Chronic	Sensitisation	The mixture is considered to be a contact and respiratory sensitizer, because at least one of the ingredients present in greater than 0.1% is known to be a contact and respiratory sensitizer.
	Mutagenicity	No data for mixture is available. No ingredient present at concentrations > 0.1% is considered a mutagen.
	Carcinogenicity	No data for mixture is available. No ingredient present at concentrations > 0.1% is considered a carcinogen.
	Reproductive / Developmental	No data for mixture is available. No ingredient present at concentrations > 0.1% is considered a reproductive or developmental toxicant or have any effects on or via lactation.
	Systemic	No data for mixture is available. No ingredient present at concentrations > 1% is considered a target organ toxicant.
	Aggravation of existing conditions	None known.

NB: If instructions in this manual conflict with working drawings, please consult with your Engineers.



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

12. Ecological Information

Summary

No specific data is available for this product. Where available, ecotoxicological data has been researched and data for the mixture calculated. The results of these calculations are presented below. The product is considered to have the following ecotoxicity groups:

Ecotoxicity

Aquatic	No data for mixture is available. Using EC ₅₀ 's for ingredients, the estimatedcalculated EC ₅₀ for the mixture is < 1 mg/L. Data considered includes: Copper naphthenate (data unavailable), Mineral oil hydrocarbons (data unavailable), Casein (data unavailable), Ammonia (data unavailable).
Terrestrial vertebrate	Using LC ₅₀ (diet) for ingredients, the estimated LC ₅₀ (diet) for the mixture is > 2000mg/kg bw.
Terrestrial invertebrate	No data for the mixture. The mixture is not considered ecotoxic to terrestrial invertebrates. The estimated invertebrate ecotoxicity value for the mixture is > 25 µg/bee.

Supporting Data

Bioaccumulation	No data for mixture is available. No evidence of bioaccumulation.
Degradability	No data for mixture is available. No evidence of persistence in the environment.
Soil	No data available for the mixture. The soil toxicity value for the mixture is ≥ 100 mg/kg.
Mobility	Not applicable
Biocidal	Not applicable

13. Disposal Considerations

Restrictions	There are no product-specific restrictions, however, state and local disposal regulations may apply. Note that state and local disposal regulations may differ from federal disposal regulations.
Disposal method	Consult Arch Wood Protection for recycling options. Disposal of this product must comply with the requirements of state and local disposal regulations. The substance must be handled as hazardous waste and disposed of in an approved facility.
Contaminated packaging	Dispose of empty containers safely. Do not re-use containers for any other purpose. Clean drums by washing 3 times with clean water. Washings should be recycled into the treatment system. Empty drums should be returned to Arch Wood Protection.
Special considerations for landfill and incineration	Not applicable

14. Transport Information

UN number	Not applicable	Proper shipping name	Not applicable
Class(es)	Not applicable	Packing group	Not applicable
Precautions	Ecotoxic	Hazchem code	1T

Additional Information

None.

15. Regulatory Information

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP)	S5
Applicable prohibitions and notifications/licensing requirements	Not applicable
Agricultural and Veterinary Chemicals Act	30699
Listing in the Australian Inventory of Chemical Substances (AICS)	Not applicable
Additional information	Not applicable



Arch Timber Protective Emulsion CN

Material Safety Data Sheet

16. Other Information

Abbreviations

CAS Number	Unique Chemical Abstracts Service Registry Number
EC₅₀	Ecotoxic Concentration 50% – concentration in water which is fatal to 50% of a test population (e.g. daphnia, fish species).
ES	Workplace Exposure Standard
HAZCHEM Code	Emergency action code of numbers and letters that provide information to emergency services, especially fire fighters.
IARC	International Agency for Research on Cancer
LD₅₀	Lethal Dose 50% – dose which is fatal to 50% of a test population (usually rats).
LC₅₀	Lethal Concentration 50% – concentration in air which is fatal to 50% of a test population (usually rats).
MSDS	Material Safety Data Sheet (or Safety Data Sheet)
NICNAS	Australian National Industrial Chemicals Notification and Assessment Scheme
NTP	National Toxicology Program (USA)
SUSDP	Australian Standard for the Uniform Scheduling of Drugs & Poisons
UN Number	United Nations Number

References

Data	Unless otherwise stated comes from IUCLID datasheet for the specific chemical.
NOHSC: 1003	National Occupational Health and Safety Commission 1995, <i>Exposure Standards for Atmospheric Contaminants in the Occupational Environment</i> , Australian Government Publishing Service, Canberra, ACT

Other References

Not applicable

Disclaimer

This MSDS was prepared by Datachem LTD with final review and editing by Arch Wood Protection (Aust) Pty Ltd. The information included is based on our current state of knowledge, including information obtained from suppliers. The MSDS is given in good faith and constitutes a guideline (not a guarantee of safety). The level of risk each substance poses is relevant to its properties (as summarised in the MSDS) AND HOW THE SUBSTANCE IS USED. While guidelines are given for personal protective equipment, such precautions must be relevant to the use.

This MSDS is prepared in accordance with the ASCC document "National Code of Practice for the Preparation of Material Safety Data Sheets" 2nd Edition [NOHSC:2011(2003)]

To contact Arch Wood Protection (Aust) PtyLtd phone 1800 796637. For further technical information regarding the MSDS, contact the MSDS writer, email Datachem via info@datachem.co.nz or phone: +64-9-940 3080





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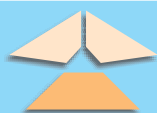
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The information and recommendations contained in this Guide have been prepared with due care. They are offered for the purpose of providing useful information to assist professionals designing decks.

Whilst every effort has been made to ensure that this Guide is in accordance with current practice, it is not intended as an exhaustive statement of all relevant information. As successful design and construction depends upon numerous factors outside the scope of this Guide, Outdoor Structures Australia and James Pierce & Associates accepts no responsibility for errors in, or omissions from the Guide, nor on designs or work done, or omitted to be done, in reliance on the Guide.

As successful design and construction depends upon numerous factors outside the scope of this Guide, Gatton Sawmilling and James



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