

Decks Close to Ground and Poor ventilation Data Sheet

This topic is the No. 1. Issue for construction of Decks in Australia.

Decks close to ground refer to any deck when it is no more than 1 metre off ground. With these decks the deck framing bearers may be close to the ground or raised above it with footings. Decks Close to ground means: Any deck under 1m off ground and / or Blocked in from the sides.

As member of the Australian Timber Flooring Association (ATFA) We are seen as the technical experts and feel it is our responsibility to provide this education so your investment is secure and most importantly you can see a clear understanding of the issues to carefully consider before starting your project.

Even Timber yards and in particular hardware stores seem to miss out on providing the education on this topic with a single focus of getting a sales and no concern for the finished installed product.

Decking material is Hygroscopic - this simply means that the raw material including the frame and the decking absorbs and dispels moisture which can also be effected by hot and cold weather changes. Your deck is actually always moving a little.

When decks are located close to ground conditions can often become very wet for extended periods of time and if not attended to at the design / planning stage there are going to be issues. It is therefore necessary to give consideration to all aspects of drainage and ventilation.

This process starts with, a step by step process to evaluate all issues.

Deck materials including decking and sub frame all have to be selected carefully - joists and bearers should be minimum H3 treated timber.

The damage that can be caused by poor drainage can be traumatic and very expensive. The real risk of actually replacing a decking after 2 to 5 years is REAL and does happen a lot more that you may think.

The decisions you make in your product selection and design all combine to create a poor investment due to trying to build as cheap as you can VERSUS spend a few more dollars and make good educated choices.

Choose quality decking material, choose secret fixing by Deck-Max that has proven to be the single strongest and highest quality fixing on the market.

The Mission Statement

Provide the best technical information and education, so your large investment is protected for the long life you should expect from this project.

Deck-Max believes that the formula to longevity is quality product to start with, then the education and understanding for the use and installation of our products.

With a combined building industry knowledge of over 60 years and having had the opportunity to speak to thousands of customers, contractors and Architects, Deck-Max has drawn from this experience to create this data sheet to assist in avoiding the pitfalls of building decks.

This has also driven us to be a one stop shop where we can provide many varieties of hardwood and Composite decking. Sourcing direct from Logs to finished product and the actual manufacturing OEM composite to the latest technology.

Knowledge is Key... Be informed before you spend your valuable money.

Deck-Max makes no warranties or assurances with respect to this document. It is the responsibility of the persons installing and build of the deck.

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A. Site review

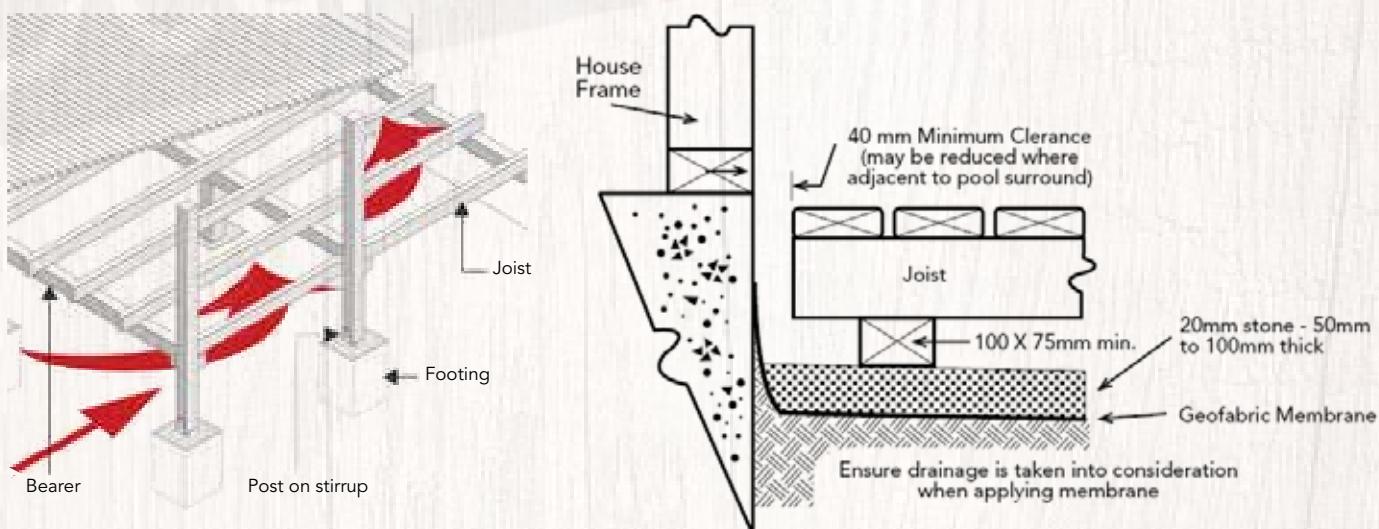
Questions to ask your self:

- Is the deck going over Concrete or Tiles?
 - What height do you need to finished height off the concrete?
 - Does the concrete or tile have fall away from the house so water can escape?
 - Is the decking going over a combination of both concrete and natural ground?
 - Is the deck built over natural ground?
 - What type of soil is the natural Ground?
 - Where the deck is going? - discover, do you have fall away from the house?
 - What is the finished height of ground to top of deck?
 - Is it under cover or exposed?
 - Is is part cover and part full weather?
 - Is it near a pool?
 - Can you get access for a small digger or mini excavator ?
- The answers to these questions starts to provide some do and do not's.

B. Design

Considerations:

- To determine if the deck is close to ground consider the following...
- If it is beside the water?
- In the design can you create ventilation to flow from under the deck and through the gaps on the deck surface



- Remember that all decking requires a set gap from 3mm up to say 6mm. (check with your local authority for any specific setting they stipulate)
- If no specific gap them we will discuss what suits best - (it is not always the look) but more so what material have you chosen - Hardwood or Composite.



- Colour is very important for you however you will not have the same selection that is offered for internal flooring.
 - This is due to the fact that timber as a material is processed differently and most importantly, internal flooring is dried to a lower moisture level (approx. 8%) and timber decking is dried to an ambient moisture of approx. 14% depending where your location is in Australia.
 - Composite decking is also manufactured to a set moisture level.
 - Both composite and hardwood are Hydroscopic (meaning: that the material expands and contracts) based on Hot - Cold / Wet Dry.
 - Finished heights are critical especially as the decking materials all vary in thickness from Min 19mm up to approx. 25mm.
 - DO NOT build the frame until you have chosen the decking material.
 - Best design is to create a seamless transition from inside house to deck - eliminate steps or small set down.

C. Decks over concrete or tiles:

- Be sure that the existing surface allows for water to run away from the house (simple test - run a hose over it and make note of where the water escapes)
- Determine what heights you have to work with.

Best Practice Tips

- ✓ If concrete - seal the surface before construction (concrete expels moisture when unpainted or waterproofed) by sealing it it minimises any of the moisture rising into the frame and the deck material.
- ✓ This minimises the cave type design that will be created if you design / build poorly.
- ✓ Be sure that all battens are not in contact with the floor (concrete or tile). this eliminates the moisture soaking into the baton and creating rot.
- ✓ This also provides a path for water to run under the battens and does provide some air flow to get under the material and dry out.
- ✓ Eliminate closing in the riser or face of the deck - this provides the only air flow to get under the deck and maintain air to dry this floor.
- ✓ If there is a drain in the slab then be sure to build an access panel over the drain to unblock any obstructions.



D. Materials Options to suit design:

- Three material choices
 1. Hardwood
 2. Composite
 3. Dasso Bamboo
- Decks Close to Ground almost dictate the most suitable selection of materials - therefore the closer to ground the deck is your choice is more limited due to the fact that hardwood close to ground can become very volatile as it is Hygroscopic and will not be happy if put in a wet damp environment to the underside.

1. Hardwood

When can I use Hardwood close to ground:

- Can use over concrete that has been sealed
- Can use when the sub frame is not in contact with the concrete
- Can use under roof and is protected from the weather - driving rain and part sun.

When do I not use hardwood:

- Do not use if you have poor drainage
- Do not use in a pit design with a perimeter beam blocking any air flow - (unless you install mechanical ventilation)
- Do not use if you cannot create ventilation air flow under the deck from the sides

2. Composite

- When you discover that Hardwood is not suitable as listed above then this is a clear option to select Composite decking from Deck-Max selecting their ZHU Composite range.
- Zhu Composite is what is called a capped composite which means it has a protective cover like a golf ball all the way around the core including the groove. This eliminates moisture having any Hygroscopic effect on the performance of the decking.
- All composite decking has a different reaction to climate - it moves a little tangentially (length ways) and not width wise. As long as you follow the manufacturers butt joint gap setting of 3.5mm this will facilitate any tangential expansion.
- Customers say to me (as a question) would I use composite - ? Sure !! especially if the deck I was building was close to ground and or had poor ventilation.
- Composite is also most suitable when butting up to a pool area - no chemicals will effect it nor will the extra water that will be splashed on it.

3. Bamboo by Dasso

- Dasso bamboo is the largest manufacturer of fused bamboo in the world.
- This material has proven itself all over the world in major projects.
- Fused Bamboo is the in-between material of choice when hardwood may not be suitable and Composite is not to your liking or cannot match a colour to your choice.
- Dasso fused Bamboo is 100% stable in all environments along with complimentary materials in Architectural sizes for feature walls, cladding etc.



E. Colour

- The ultimate challenge after steps A, B & C is to choose a colour of the decking.
- Guidelines:
 - If you are selecting internal timber floors and wish to create a seamless look to match inside to outside then be careful.
 - Your choice of colours inside is very large however decking is very limited due to the processing of timber.
- Internal timber flooring is processed to a lower moisture content whereas External timber are higher as they will be exposed to getting wet and the high heat and cool of different locations.
- In saying that Hardwoods come in colour tones of:
 - Forest Light - light tan to cream
 - Forest Reds - pink to deep red some brown tones
 - Spotted Gum - a variety of colour tines from pink to dark brown - very specific colour to be aware of as it is not a solid colour tone.
 - Iron Bark - a little like spotted gum - varies in tones from pinks to greys.
- Composite Decking offers a different range of colours:
 - ZHU decking - Charcoal
 - ZHU decking - Silver Grey
 - ZHU decking - Teak
 - ZHU decking - Mahogany
- Can always consider this - if you cannot match the colours keep them quite different as a contrasting look.

Tips

Always check your local Authorities for

- ✓ Deck approvals Guidelines
- ✓ How long to process applications
- ✓ Gap settings
- ✓ Bal / Fire categories
- ✓ Set backs off boundaries
- ✓ Pest spraying and pest access for future requirements

Select certified Builder / contractor

- ✓ Be sure they provide proof of license
- ✓ Proof of insurance
- ✓ Discuss all materials they have specified in the job
- ✓ The most important issue is site consideration - Air flow, drainage.
- ✓ Be sure you understand what they include and ask them to provide a full detailed specification - called a bill of quantities.



F. Decks over natural Ground:

- When laying your outdoor deck the drainage in your project is the single most important thing to consider at the planning stage. Across Australia especially in recent times is one thing that you can count on is - you may get an average monthly rainfall in one single night.
- Remember even sandy soils retain moisture and can stay very wet hence protection on all sub soil is required.
- The Damage that can be caused by poor drainage can be traumatic and very expensive.
- Best Practice Planning keeps any drainage issue to a very low cost verse the damage that can be caused because you either tried to save some money or the builder said do not worry or you had not read our data sheet before starting your decking project.



- The ground beneath the deck should be graded away from the building so that the water does not pond under the deck. This was also noted for decks over concrete.
- In some cases agricultural drainage pipes should be dug into the ground to ensure water escapes across the surface plus some soakage is moved away to minimise wet ground. Note - keep in mind where the underground services are located.
- NOTE: Hygroscopic effects are created by Rising moisture that is absorbed into the decking creates an imbalance where the top of the board is dry and the underside is wet - this then creates the natural movement - twisting, cupping to occur.
- Timber will do exactly what you tell it to do - so if you lay it over wet ground it will cup, twist, expand and contract
- Once the ground is graded and drainage is complete you then proceed to install the footings. If putting concrete footing's in - Be sure to create a dome on the top so water is not retained on the top which maybe around either timber embedded into concrete and or metal strips are used. Stops the rot.
- ** lay geofabric over the ground then lay over 50 to 200mm of 20mm blue stone / heavy gravel - this minimises the moisture in the ground from rising into the under side of the decking boards and frame.
- When setting your structure of the deck you must leave adequate ventilation between the deck and the ground, this is essential for long term stability and performance of the decking materials.
- Proper air ventilation allows air to flow in from outside the deck area, under the joists and up through the gaps between the decking boards. Carefully plan your deck structure to eliminate possible future services that may be already under your deck or may be fitted later. Wider gap setting is mandatory for decks close to ground and by not blocking in the sides - this increases air flow just the same as a fire will draw air to burn better.

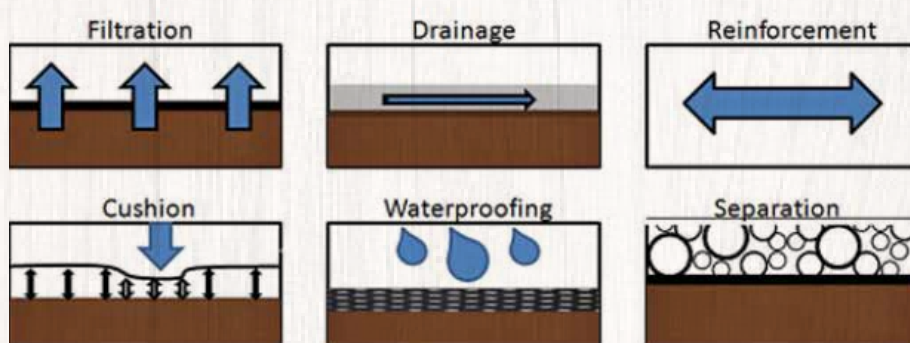
Geofabric:

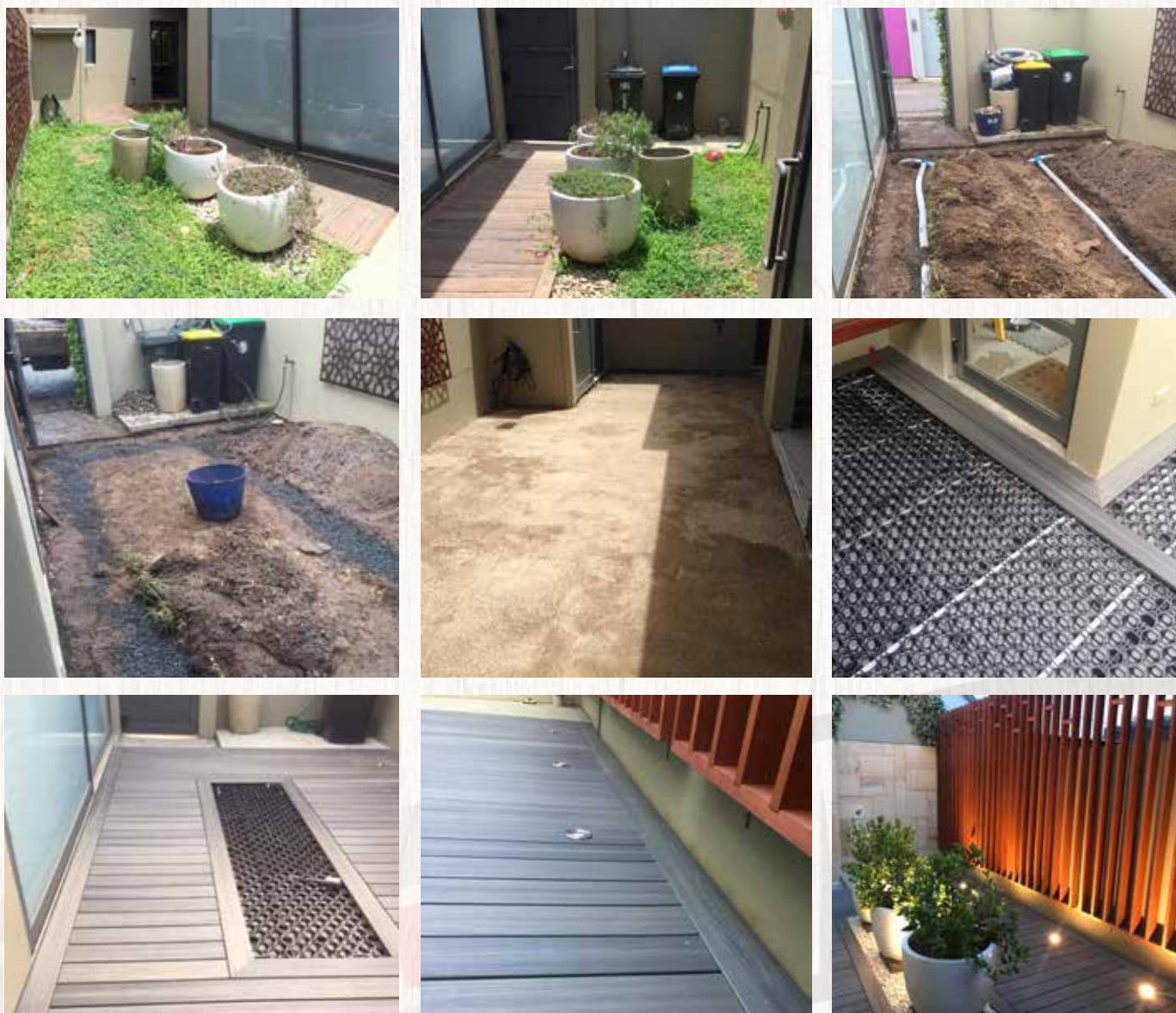
This material is sometimes called Filterwrap, this is a woven geotextile designed to provide effective and economic solutions for laying over natural ground when building decks This combined with the 20mm aggregate / stone will minimise rising moisture from the ground. Also used in trenches when laying agricultural drainage pipes.

Filtration - To restrict the migration of fine soil particles from a soil mass while remaining permeable to water movement at a rate at least equivalent to the permeability of the retained soil.

Separation - To separate and prevent two distinct soils or different materials from intermixing, thereby maintain the performance of the individual materials as in this case the sub soil from the 20mm stone.

Specification: Full roll size is 2m wide.





Sub framing option for decks on ground or under 100mm.:

- When heights are very restrictive and timber or even metal are not usable - for say decks that only have approx under 100mm then a product we use is called Deck Cell.
- As you can see in the project photo's as shown above where a deck is laid over natural ground we create a solution in the following steps.
 1. Excavate site to remove all old debris and materials down to a height enough to build back up by say 80mm
 2. Dig in trenches to install agricultural drainage that is then connected to storm water pipes.
 3. Lay up geotextile into the trench > put at least 50mm of 20mm blue stone > lay in the 100mm drainage pipe then cover with more 20mm stone then lay over the geotextile so prevent any additional soil or sand to fill in the stone and block up the agi pipe.
 4. Then screed off bedding sand to perfectly flat allow for compaction after screeding.
 5. Cover this entire area with geofabric allow at least a 200mm overlay on all joins then >>
 6. Fit the deck cell to cover the area to be decked.
 7. The only decking material option for this type of design is to use Capped composite -



G. Summary:

- As you have read there are many issues for consideration when building a deck and I hope this has allowed you to make a well informed project plan to provide the best possible outcome.
- Remember we here at Deck-Max are your one stop shop including design and technical advisor, along with having different decking materials to suit your project and location.
- When issuing documents for builders to tender note this document for all parties to be covered and ignorance is no longer an excuse - let alone cause major problems after install.
- Specify Deck-Max as the expert and supplier for materials nominated for decking and cladding for outdoor spaces.
- Ask us for our technical data sheets.
- We also do consult on major work projects based on all these topics.

If there is a drain in the slab or Over services then be sure to build an access panel over the drain to unblock any obstructions.



Commercial construction tips:

- ✗ Do not build a concrete plinth as a perimeter boundary and then lay in a deck that has no air flow,
- ✗ Do not build a pit that has poor drainage
- ✓ Consider that ZHU Composite may be a more suitable material to use in some commercial areas due to its stability near moisture or poor ventilation.
- ✓ Seal all concrete surfaces prior to laying a deck over concrete sub floor.
- ✓ Consider that composite decking will outperform timber for most commercial deck design and construction.
- ✓ Be sure to consult with the decking experts Deck-Max during the planning and specification stage.

