FactSheet
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Meyer TIMBER

DETAILING FOR DURABILITY

When detailing for durability, we first need to understand what durability is. From many common dictionaries, durability is the ability of a component to withstand wear and damage. This is a very loose definition and from an Australian Standards point of view it does allow a lot of room for interpretation. If there is a mark or water stain, does that mean the item is not durable? For the rest of this factsheet I will narrow this down (while still leaving room for interpretation). Durability can be taken as the ability of a piece of timber to perform the same structural function to a similar extent following a period of time.

All timber species have a natural durability, some more than others. A lot of the less durable species are more cost effective and easier to produce sustainably in the long term, so chemical companies have developed preservative treatments to increase the durability and make the species less susceptible to decay and damage. The Wood Solutions Timber Service Life Design Guide (Technical Guide #5) gives detailed information on the approximate life of different timbers in different applications around Australia.

In terms of timber, the two main items that generally affect the durability are insects and moisture. Insect attack relates to borers and termites, which is well documented and has solutions available through preservative treatment and basic preventative measures. This leaves moisture as the main area to consider when designing and detailing. If softwood is kept at moisture contents of over around 20% for long periods of time this is the environment that promotes fungal decay and rot. Note that preservative treatment (to H3 for example) will slow down this process but will not stop it. So how do we keep the moisture content down in the wood? Either prevent the moisture from entering in the first place (stop it from getting wet), or allow the moisture to escape in a reasonable time (have the timber well ventilated).

If you are trying to minimise moisture entering timber the main areas to protect are the top face as water can sit here and the end grain as water is drawn in a lot quicker through end grain (softwood cell structure is like a bunch of straws). Ways to do this include:

- Paint to prevent water entry (this is hard to maintain long term as timber movement can compromise the envelope coating and moisture can become trapped inside).
- Capping to stop water pooling on top. This could be malthoid capping on top of joists/bearers or metal capping over pergola or carport beams. The side of the beams is not as critical as water can run off easily, unless a ledger plate is nailed to the side of the beam, creating another moisture trap.
- Minimise moisture coming into end grain through end capping or splayed end cuts to keep the end away from the weather.

In allowing the moisture to readily escape the timber needs to be well ventilated. Problems areas here are contact faces (in nail laminations) and connections. Care should be taken to ensure if a connection is subject to moisture that the moisture can escape. For example, if securing a waling plate for a deck to the existing house, use some timber washers in the connections to put a 5mm gap between the plate and the house. This gap allows water to run off and also provides ventilation.

There are many timber buildings in different climates around the world that have withstood the rigour of time, including 10th century Russian churches, 15th century English manors, and even early Australian wharf structures. If you determine how likely there is to be insects and/or moisture ingress you can then put into place details appropriate to that level of hazard exposure. There are many common details that can be employed but every situation is different. Matching the correct detail to the situation is how the most cost effective buildings are constructed.

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