

External Cladding

Introduction

Timber cladding provides an envelope that protects and beautifies a building. This guide covers design and construction advantages, popular cladding systems, detailing requirements, and regulatory issues.



Acknowledgments

- Timber Manual, National Association of Forest Industries Ltd., Canberra.
- Cypress and Hardwood Claddings, Timber Research and Development Advisory Council, Brisbane.

External Cladding

Advantages of Timber

Structural Advantages

- can be used on a wide variety of foundation conditions because of its flexibility
- light weight requires smaller footings

- clad walls can be supported by posts, columns or piers, and therefore continuous sub-floor wall support is unnecessary – thus reducing costs

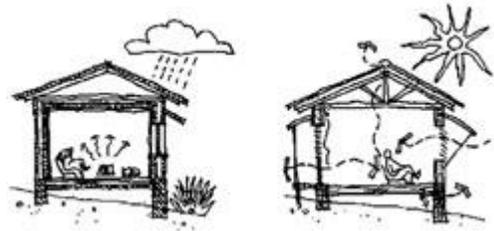
Aesthetic Advantages

- creates a lighter and smoother appearance compared to traditional brick masonry
- range of profiles, textures and coatings suitable for most contexts
- can be constructed to suit non-rectangular shapes with relative ease
- blends well with natural surroundings

Energy Efficiency Advantages

- can be designed and detailed to meet regulatory requirements in a variety of climates
- clad buildings are less reliant on thermal mass and are therefore less sensitive to building orientation and solar access, thus providing siting flexibility
- reacts quickly to both heating and cooling, taking little time to warm a cool room, or to cool a hot one. Insulation will also add to this by helping to reduce life-cycle energy consumption and green house gas emissions

The snug and breeze house



Construction Advantages

- rapid construction
- reduced material handling and scaffolding - especially on steep sites
- no wet trades involved

Good Design Practice

Good design practices help to ensure the best performance from timber cladding. For example, wide eaves and verandas help to provide protection.

Flashings at corners, doors, windows and wall intersections must be detailed to hold a head of water in harsh weather environments.

Cladding should finish at least 150mm above finished ground/paving level to avoid moisture up-take as shown in Figure 3. In conjunction with this, the bottom edge should be cut to slope upwards and inwards (i.e. at an angle of 15 degrees) to prevent water

tracking back into the building – as shown in Figure 4.

Figure 3: Ground clearance

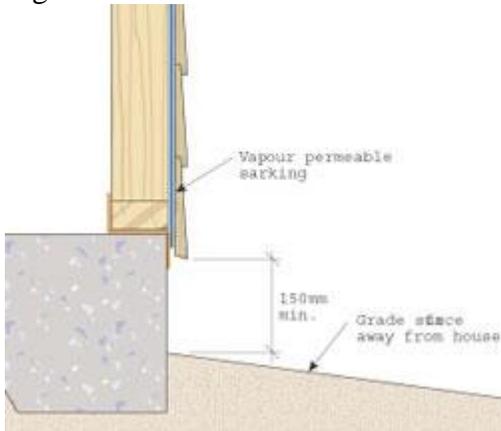
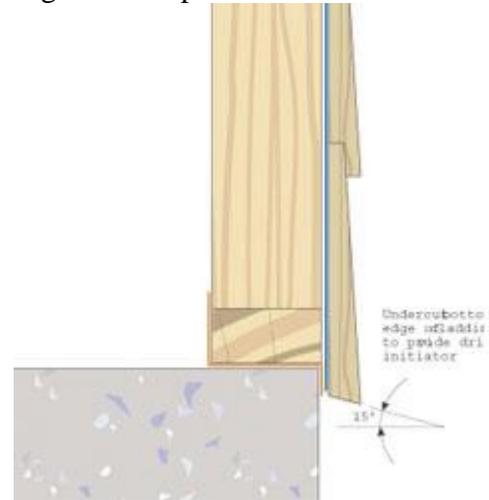


Figure 4: Drip initiator



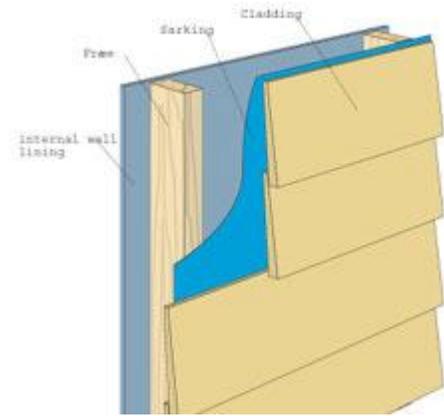
Sarking

Sarking is used to direct water that may have penetrated the cladding back to the outside. It also provides a barrier to prevent drafts, wind driven rain and dust from entering the wall cavity.

Sarking must be weather proof but vapour permeable, and is often made from aluminium foil or bitumen bonded insulation. This is fixed directly behind the timber cladding – as shown in Figure 5. Additional detailing may also be necessary where condensation is a concern. This occurs where there is a large temperature difference between the indoor and outdoor environments – as in very cold climates.

Cavity insulation can help by reducing cold outer air from meeting warm inner air. In extreme conditions a devoted vapour barrier on the warm side of the insulation may also be necessary.

Figure 5: Sarking and vapour barrier



Cladding Board Selection

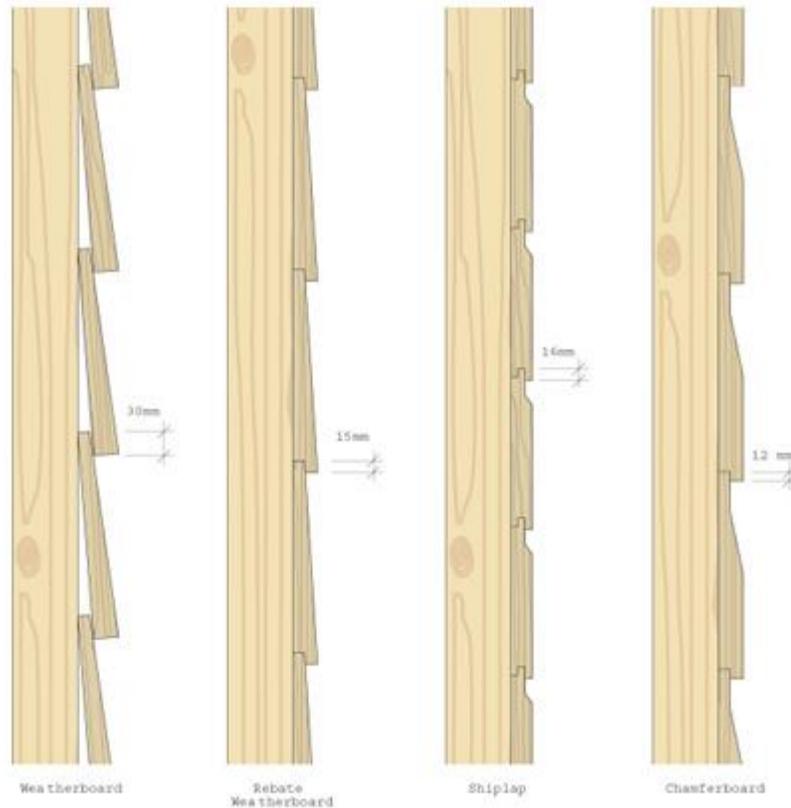
Solid timber cladding boards are available in either seasoned or unseasoned materials. Seasoned boards are characterised by being dressed, having a machined moulded face, and interlocking tongue and groove (or rebated) joint. Unseasoned boards are more likely to be rough sawn, have an unmachined face, and the absence of any tongue and groove joint. Cypress can often be supplied unseasoned, with a machined face and a tongue and groove joint designed to accommodate the expected shrinkage. This allows for shrinkage movement in-situ. The most common options are shown in Figure 6.

Species used for cladding include: Blackbutt, Cypress, Tallowwood, Spotted Gum, and a mixture of species generally termed mixed hardwoods. Each can be purchased in specific grades defining natural features of the cladding. (Refer to Table 1). For example, 'Select' grade contains few knots and gum veins, while 'Medium' and 'High Feature' grades contain higher proportions of these natural features. Ranking for Cypress follows a similar theme. Specific details for each can be found in AS2796.2 (see note 1) and AS1810 (see note 2) respectively.

Table 1: Grade descriptions

Species	Grades
Cypress	Grade 1
	Grade 2
Hardwood	Select Grade
	Medium Feature Grade
	High Feature Grade

Figure 6: Typical solid timber cladding profiles



Moisture Content

Moisture content in cladding boards influences overlap requirements. Seasoned boards should have a moisture content between 10-18% for hardwood and 10-15% for Cypress which ensures relatively little movement once the boards are fitted –thus allowing a small rebate or overlap.

In contrast, unseasoned boards have in excess of 18% content and are prone to considerable shrinkage movement – thus creating the need for larger rebates or overlaps.

Given this, the following applies (see note 3):

- For seasoned boards less than 150mm in width, a 13mm (min.) rebate or overlap is required. For boards greater than 150mm, a 20mm (min.) rebate or overlap is required.
- For unseasoned boards a 30mm (min.) overlap is required.

Nailing

Nailing requirements also vary according to seasoned or unseasoned states. For instance, unseasoned boards must be able to shrink independently of each other. Therefore nailing through overlaps must be avoided but must still provide restraint to the inner board – as shown in Figure 7.

Seasoned boards also should be nailed well away from edges to avoid splitting of thinner sections, or where tongue and groove or rebated overlaps occur. In addition, all board ends should pre-drilled to prevent splitting and flat head nails should be used to prevent pull-out.

Nails also need to be chosen to suit durability requirements and hot-dip galvanised nails are often adequate. Table 2 provides further details on specific nail sizes for different board thicknesses.

Figure 7: Nailing distances

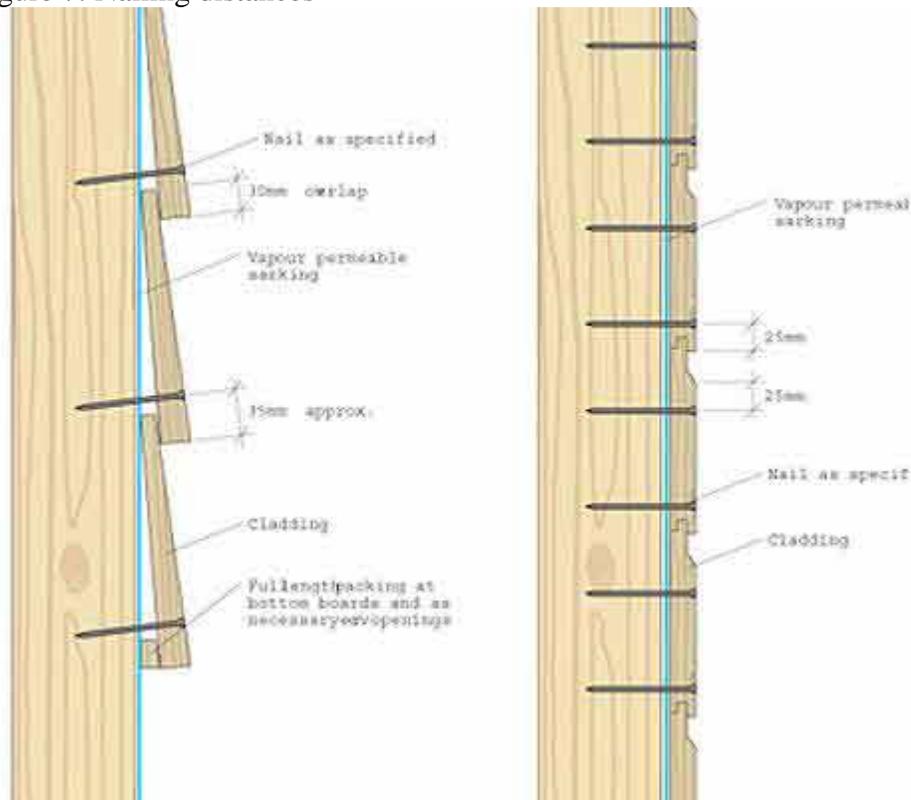


Table 2: Recommended minimum nail sizes

Cladding Thickness	Nail Size (mm)	
	Cypress & Hardwood Framing	Softwood other than Cypress Framing
15 to 22mm profiled	50 x 2.8mm plain	60 x 2.8mm twisted or annular threaded
Sawn weatherboards	60 x 2.8mm plain	65 x 2.8mm twisted or annular threaded

* Details are taken from AS2796.1 which applies to hardwoods. No overlap or rebate requirements are given for Cypress.

Installation Practices

Installation practices must be undertaken with weather resistance in mind.

- Boards with grooves must be fixed with the groove facing downwards.
- Sealants such as mastics should be avoided.
- Butt joints between boards should be minimised to limit moisture ingress e.g. single or long lengths should be used on walls exposed to prevailing weather conditions, short lengths could be used between windows or on sheltered parts of the wall, such as under eaves and verandas.
- Butt joints should be achieved by slightly over cutting board lengths then snapping the bowed board into position. For durability, boards should be end sealed prior to installation (e.g. with paint or oil based stain).

Notes

1. AS2796.2 - timber hardwood - sawn and milled products, Standards Australia.
2. AS1810 - timber - seasoned Cypress - milled products, Standards Australia.
3. Details are taken from AS2796.1 which applies to hardwoods. No overlap or rebate requirements are given for Cypress.

Hardboard Products

Hardboard products represent a special part of the cladding market. Different design and installation practices are required compared to solid timber cladding.

These products are made of a composition of fine hardwood fibres held together with natural lignin in the wood - applied under heat and pressure. Additives are included during manufacturing to boost moisture resistant properties. The end product typically finishes 9.5mm thick and has a factory applied primer coating to further reduce moisture penetration and minimise site painting.



Hardboard products must be fixed using special fasteners that allow flexibility and board movement due to ambient moisture variations.

Options in hardboard claddings include: boards, shingles or architectural panels (replicating board patterns). In each instance the face finish can be either smooth or textured. Due to the many variations of profile, size and texture, enquiries about detailed requirements should be made direct to the manufacturer.



BCA Requirements

The Building Code of Australia (BCA) influences the ability to use timber cladding. For instance, there are ten classes of building each requiring 'A', 'B' or 'C' type fire construction (depending on the rise of the building in storeys). 'A' and 'B' require non-combustible materials thus preventing the use of timber cladding. A large number of other applications are still possible where 'C' construction or less is required. Further details on this issue should be sought by referring to



the list of publications detailed at the end of this guide.

