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PROJECT

# Timber Cladding

## Specification Guidance for Social Housing



# SPECIFICATION GUIDANCE

This document provides information for specifiers and procurement specialists working on social housing projects. It is designed to help with the strategic selection of timber cladding as an external rainscreen in a social housing context. It provides performance criteria for specifying timber cladding and indicates what needs to be considered to achieve these in practice. The document highlights performance benefits across a range of intended design outcomes and is designed to help ensure that timber cladding is used appropriately. Timber cladding should not be viewed in isolation and should be considered very early on in the design process when specifying details and deciding on what build system to use.

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# WHY SPECIFY TIMBER CLADDING?

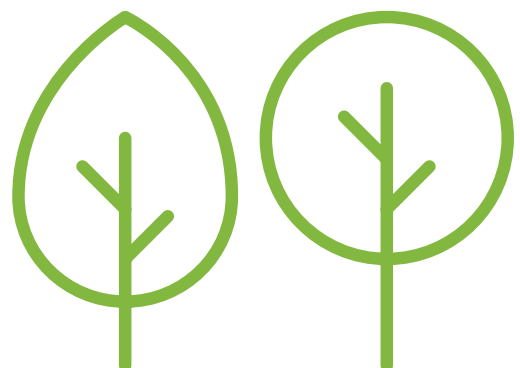
**Cladding is used to provide thermal insulation and weather resistance to buildings as well as improving their appearance. Timber cladding is used as a rainscreen as well as for aesthetics of a building and has good thermal and sound insulation properties.**

Timber cladding has become increasingly popular, mainly for its sustainability credentials and low environmental impact: It has a low carbon footprint as it requires less energy to produce than any other construction material and helps lock carbon into the building fabric. It is made from renewable material - wood - and can be reused, recycled or used as fuel at the end of its service life.

Timber cladding is widely available from sustainably managed forests and can be sourced locally. With correct detailing, proper installation and appropriate materials, timber cladding will provide a long lasting decorative and functional façade to any type of development, new build or existing stock.

## Specific benefits

- **Material interaction:** When building structure and cladding are both made from timber differential movement can be reduced. Substituting masonry cladding with timber also reduces the risk of condensation build-up within the wall.
- **Cost reductions:** Dry installation means the external envelope is quicker to install. Elimination of heavy masonry outer walls reduces size and cost of foundations.
- **Offsite compatible:** Timber cladding is relatively thin and light making it well suited to off-site prefabrication of buildings. Cladding panels may be factory pre-fabricated complete with insulation and breather membrane.
- **Ease of repair**



# HOW TO SPECIFY TIMBER CLADDING

Timber cladding can be specified for a number of reasons including a desire to use a local material, aesthetics, cost, method of construction etc. Cladding should be considered early in the design process along with all other elements of your design. The chosen build system, construction process, manufacturer and site can all influence material selection.

We've listed a number of criteria to help you decide if timber cladding is the right choice of material for a particular project, build type, site location and planned maintenance regime you're working on.



# PERFORMANCE CRITERIA AND INDICATORS

What does good look like and how could you achieve this in your project? Timber cladding relies on good design and material specification to provide reliable performance. The principal standard for cladding specification is BS8605:2014 External Timber Cladding Part 1 - Method of Specifying. Here are some criteria and indicators to make sure quality requirements for your project are met.

## Visual quality

We recommend you request representative samples from chosen suppliers to check the visual quality of the timber cladding. BS 1186:3 1990 (Timber for and workmanship in joinery) defines four appearance classes:

- **Class CSH** – knot diameter limited to 6mm on visible faces
- **Class 1** – knot diameter limited to 22.5mm on visible faces
- **Class 2** – knot diameter limited to 35mm on visible faces
- **Class 3** – knot diameter limited to 50mm or no more than 35% of board width

Exterior timber cladding is typically specified to Class 2 and 3 for natural cladding left to weather or when coated with translucent finishes. Class 1 and CSH grade are mostly used for hardwoods. For all classes, sapwood on exposed surfaces requires pre-treatment prior to installation as it can be subject to decay and insect attack. Alternatively, specify cladding to exclude sapwood.

The standard cites permissible limits and commentary for a list of other features such as:

- Splits, shakes & checks
- Resin pockets
- Sapwood
- Rate of Growth
- Slope of grain
- Decay & insect attack
- Edge jointing
- Finger jointing

## Certification

The Timber Decking and Cladding Association (tdca) recommends procuring products that are CladMark certified, a quality scheme operated by the tdca. However, most local sawmills in Wales will not be certified. If you are unsure about the suitability of available timber cladding, we recommend consulting a local cladding expert. Contact [Woodknowledge Wales](#) for details.

# PROFILES & AESTHETICS

Timber façades provide architectural character and can convey perceptions of value, security and longevity. Species selection, edge-profiles, weathering characteristics, orientation and surface texture need to be taken into account to achieve a desired outcome. Good detailing is essential for performance and durability of the cladding. Its importance cannot be stressed enough.

## Profile options

A variety of profiles can be chosen for aesthetics as well as performance. The infographic below gives an overview of typical profile options. For best performance of your timber cladding make sure to choose the right combination of profile, orientation and timber thickness as indicated in the table below.



Profile	Cladding Joint	Recommended orientation			Thickness (mm)
		Horizontal	Diagonal	Vertical	
Tongue and Groove (T&G)	Closed	✓	✓	✓	20mm (minimum)
Rectangular	Closed (board on board)	✗	✗	✓	16-25mm (thicker boards acceptable)
Feather edge	Closed	✓	✗	✗	Thin end 9mm (minimum) Thick end 16-25mm
Shiplap	Closed	✓	✗	✓	18mm (minimum)
Parallelogram	Open	✓	✗	✗	16-25mm (up to 50mm is acceptable)

## Aesthetic appearance

Before choosing a cladding type, be clear about the aesthetic appearance you want to achieve. Timber is a natural product and its appearance may change over time.

### Natural

For a natural look that is allowed to weather make sure to specify naturally durable species such as Western Red Cedar, European Oak, Sweet Chestnut and Douglas Fir. Alternatively, choose products treated with an appropriate preservative or modified wood.

For enhanced protection surface coatings can be applied. These work best on dimensionally stable cladding materials like modified woods or when used in combination with preservative treated wood.

### Stains and paints

Stains allow for a natural appearance of the selected cladding but with added colour, while paints will hide the grain of the timber. When specifying such products, make sure to use moisture permeable coatings. These are resistant to cracking, flaking and peeling as they don't risk trapping water under their surface.

More information on cladding finishes [here](#).

## SERVICE LIFE

How long should the cladding last? To get the right product for your housing project, the desired service life needs to be specified in accordance with BS 8417: Timber Preservation - Code of Practice which cites 3 service life categories of 15, 30 and 60 years. The durability class of a timber species relates to its heartwood only. The sapwood of all timber species is classed as "not durable". For naturally durable heartwood, check the durability class of the species selected. For pressure treated timber cladding the industry default standard is 30 years.

Service life categories are not guarantees of performance. They are durability performance benchmarks based on the following assumptions: good design detailing, installation practice and normal conditions of use. Other factors, such as exposure to the elements, mechanical damage, vandalism or failure of other building elements, may limit the service life of any construction. More information on timber preservation [here](#).

## Importance of detailing

Careful detailing to prevent moisture retention and to minimise the effects of moisture movement (expansion and contraction) is essential in all designs. Good detailing can reduce reliance on natural durability of timber species or preservative treatment. Detailing for durability should always be the first line of defence against decay:

- Prevent wetting of timber wherever possible
- Ensure effective drainage and good ventilation in situations where it is impossible to avoid wetting
- Use naturally durable or preservative treated timber in situations where wetting will be persistent.





- Remind your architect/designer of the four D's – DEFLECTION, DRAINAGE, DRYING and DURABILITY. These provide a useful framework when considering detailing of external timber cladding.

More information on detailing can be found [here](#).

## Maintenance schedules

Timber is a natural material and requires some maintenance during its lifetime. Be clear what maintenance schedules are acceptable for your housing project. How easy is it to access the cladding for maintenance or repair? What health and safety measures are required to do so, e.g. scaffolding? How much disruption will it cause? How do these factors impact on costs? If maintenance, repair and replacement are likely to be difficult and costly then the highest durability of cladding permitted by the budget should be chosen.

The service life of untreated timber cladding relies on its natural durability. Coatings increase the service life. However, all coated timber cladding will require recoating at some point. This will depend on site location and exposure. Here are some average indications:

- Clear coatings: annual. These are not recommended for exterior use because of their low UV resistance.

- Paints and stains: 2-3 years for softwoods and 3-5 years for hardwoods
- Modified timbers and coatings: >9 years<sup>1</sup>

The tdca recommends timber cladding with factory applied coatings. Some coating manufacturers claim lifetimes to first maintenance of up to 10 years for some factory-applied coating systems.

In a trial reported and authenticated by BMTRADA the use of acetylated wood as a material for finished cladding has shown that its use can extend the typical lifetime to first maintenance of medium-build transparent exterior wood stains by at least a factor of 3 meaning that its estimated lifetime to first maintenance in a natural exposure environment would be up to 9 or more years.

## Site location

Exposure to weather impact can differ from site to site and will determine service life and maintenance schedules for your cladding. A useful guide to assessing the exposure of different façades is BS EN 927-1 Paints and varnishes – Coating materials and coating systems for exterior wood. The standard categorises exposure by macroclimate (defined by compass direction) and microclimate (defined by the degree of shelter and inclination) and classifies exposure levels by numerical scores as shown below.

### Determination of Relative Exposure Based on Climatic Factors

Factor	Score			Total Score (sum)	Relative Exposure Condition
	1	2	3		
Orientation	NW - NE (moderate)	NE - SE; WNW - NW (hard)	SE - NW (extreme)	3	Mild
Degree of shelter	Sheltered	Partly sheltered	Unsheltered	4-6	Medium
Inclination	Vertical	~45°	Horizontal	7- 9	Severe

1. Based on reports from independent authorities in Europe the available test data support the broad view that using "Accoya" in combination with more extensible water-based surface coatings results in at least a doubling of the anticipated lifetime to first maintenance compared to non-modified softwood.

Assessing exposure conditions will help you decide whether an open or closed jointed system of cladding should be used or whether cladding profiles and species which can be more susceptible to distortion (e.g. feather-edged weatherboards in wide widths) can be used in a specific site location.

## Resistance to damage and vandalism

Ground level application of timber cladding is not recommended for social housing. However, should you choose to specify cladding at low levels, make sure to opt for hard wearing species such as oak. Species with a low density are more susceptible to impact and surface damage. They should not be used at low levels where there is the potential for abrasion, scraping or vandalism.

## Fire

Check if fire retardant treatment is required for your housing development. If this is the case, ensure that the cladding species and profile size correspond with the requirements of the chosen treatment.

Further information on service life can be found [here](#).

# COST & SPECIES SELECTION

Price can vary significantly. Naturally durable species from which all sapwood is excluded tend to cost more than less durable softwoods protected with wood preservative. Main factors impacting costs are availability of a species, quality, performance and level of processing involved.

## Specific requirements

Hardwoods and Western Red Cedar can be several times more expensive than most softwood cladding species. Less expensive timbers can be perfectly suitable for many applications. However, the different species have individual properties and may not necessarily provide suitable alternatives. Detailing and profile type suited for one species may not necessarily be appropriate without changing details of the wall build up. This would incur additional costs for redesign.

## Impact on procurement

When working with contractors it is important to convey the potential consequences for substituting a particular product with a cheaper one and the associated cost.

More information on species and durability can be found [here](#).

# USING HOME-GROWN TIMBER

Home-grown timber offers the best solution to support your local economy and secure employment options in your community. When specifying local timber, the following considerations should be made:

- What species are available?
- Are they suitable for the desired type of cladding (aesthetics, service life, maintenance, etc.)?
- Can local suppliers provide required sizes, profiles, treatment and quantities?
- What does this mean for detailing?



Suitable home-grown timber species are:

### Western Red Cedar

- silky texture and strong aromatic odour
- very light with high stability and extreme resistance to decay
- can be left untreated to last for decades
- ideal for painting and staining due to stability and lack of resin
- British cedar cladding is more knotty and cheaper than imported cedar



### Douglas Fir

- strongest homegrown softwood, used where impact damage may occur
- naturally durable, resistant against fungal and insect infestation
- medium weight with good stability
- Left untreated fades to a silver grey colour



### Oak

- high density, strength and durability
- golden yellow fading to natural silver over time if left untreated
- rustic appearance: contains many small pin knots; can further contain small knot clusters, medium-sized knots up to 25mm and larger knots, tight heart splits and small fissures
- most suited to feather-edge and waney-edge.



## INSTALLATION

As with all building elements correct installation is important. We recommend choosing installers that have previous experience of working with wood or can provide evidence of appropriate training and supervision. Discuss and specify suitable fixings with your installer prior to installation. Some species require specific types of fixing material to prevent staining.

## BUILDING TYPES

Not all types of building are suitable for use of timber cladding. It is not an appropriate choice for the following types:

- Flats over a certain height (see building standards)
- Buildings housing vulnerable residents (see building standards)
- Buildings where maintenance of coatings would be difficult or costly

# RIBA WORK STAGES

PRE DESIGN	<b>RIBA 0</b> Strategic Definition	
	<b>RIBA 1</b> Preparation & Briefing	<ul style="list-style-type: none"> <li>Define objectives of cladding: aesthetics, weather protection, other</li> <li>Check suitability of cladding against type of building</li> <li>Define whole-life cost / budget</li> <li>Define service life</li> <li>Derive maintenance objectives</li> </ul>
DESIGN	<b>RIBA 2</b> Concept Design	<ul style="list-style-type: none"> <li>Define aesthetic requirements</li> <li>Define type/level of weather protection</li> <li>Define performance criteria in context of service life and acceptable maintenance requirements (see 'plan for use')</li> <li>Consider detailing requirements in the context of chosen build system and type of cladding</li> <li>Consider site location &amp; exposure</li> <li>Consider impact on whole-life cost/budget</li> <li>Review against sustainability outcomes</li> </ul>
	<b>RIBA 3</b> Spatial Coordination	<ul style="list-style-type: none"> <li>Review as required in context of spatial coordination</li> </ul>
	<b>RIBA 4</b> Technical Design	<ul style="list-style-type: none"> <li>Define profiles</li> <li>Define type &amp; species of timber cladding</li> <li>Define type of treatment</li> <li>Focus on correct detailing (4 D's)</li> </ul>
CONSTRUCTION	<b>RIBA 5</b> Manufacturing & Construction	
HANDOVER	<b>RIBA 6</b> Handover	
IN USE	<b>RIBA 7</b> Use	

Will the timber cladding have a **surface coating** to control appearance or be **unfinished** and allowed to weather?

**Surface coating to control appearance**



**Maintenance Interval to surface coating**

Every 1 year

Clear oil (No varnish)

Every 5 years

Coloured paints or stains

No maintenance

No wood-based options

**Uncoated to weather**  
Consider possible uneven weathering and discolouration risk



**Anticipated service life of cladding**

15 years

30 years

60 years

**DURABILITY CLASS 4 TIMBERS**  
Slightly durable  
e.g Scots Pine

15 years

30 years

60 years



**Anticipated service life of cladding**

**DURABILITY CLASS 3 TIMBERS**  
Moderately durable  
e.g Larch, Douglas Fir, treated Scots Pine

**DURABILITY CLASS 2 TIMBERS**  
Durable  
e.g Western Red Cedar, Oak, Sweet Chestnut, thermally modified timbers

Discuss options based on cost & sustainability with cladding expert

# TECHNICAL INFORMATION

**External Timber Cladding: Design Installation and Performance.** Ivor Davies and John Wood

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**BS 8605-1:2014. External timber cladding.**

Part 1: Method of specifying. London: BSI

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**BS 8605-2 (in prep.). External timber cladding.**

Part 2: Code of practice for design and installation. London: BSI

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**Timber Cladding in Scotland**

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**External Cladding.**

Specification checklist by tdca

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**External Timber Cladding** 3rd Edition by P Hislop, P Kaczmar and L Taylor.

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**BM TRADA Wood Information Sheets:**

- [Finishes for external timber](#)
- [Modified wood products](#)
- [Durability by design](#)
- [Timbers, their properties and uses](#)

# EXAMPLES

Find examples for use of timber cladding in social housing across Wales [here](#).

# GUIDANCE FOR SOCIAL HOUSING

Check out our range of guidance documents for specifiers and developers in Social Housing [here](#).

