

5.5 Fixings

5.5.1 Softwood

Softwood boards are normally nailed to treated softwood battens. Standard wire nails can be used but annular ring-shank nails are preferred for their improved holding power. Small head, or siding nails are suitable for most softwoods, but larger heads are recommended for western red cedar because small heads can tend to pull through this soft wood. Some pneumatically-driven nails have D-shaped heads rather than round heads which affects the appearance of the fixing and may not be acceptable visually. Pneumatically-driven virtually headless pins are not recommended for fixing cladding boards.

Nail penetration into the batten should normally be 2 times the thickness of the board being fixed with annular ring-shank nails (2.5 times when round wire nails are used). Nails should be driven marginally below the surface to compensate for possible shrinkage of the wood which may otherwise cause the nail heads to stand proud of the surface. Nail fixings should be at least 20 mm from the end of the boards and 15 mm from the edges.

Secret nailing with single nails is not recommended for conventional tongued and grooved boards because of the risk of the tongue splitting. If a rebated tongue and groove board is used, nails can be driven through the shoulder and will be concealed by the overlap of the board above.

Overlapping boards above 100 mm width should be double nailed. Nails should preferably be located at the quarter points in the board width, but it is important that where boards are overlapped, or in a board-on-board pattern, that the nails fixing the outer boards do not penetrate the inner boards, as moisture movement will be in opposing directions and can lead to splitting of these boards.

For all boards to be left unfinished austenitic stainless steel nails should be used in order to avoid long term rust stains on the wood. This is especially important on woods with a high tannin content, where the reaction between the tannin and any ferrous metal will produce purple-black staining which cannot be removed. Stainless steel will weather to a matt grey colour similar to that of bleached wood, reducing the visibility of the nails in the long term.

Even if the cladding is to have a surface coating, stainless steel nails are preferred, rather than plated steel, because galvanising or other plating can be damaged when the nails are driven home manually or pneumatically, leading to possible corrosion. The typical low-build stain coatings applied to cladding also may not provide much long term protection to fixings.

6.2 Installation

The moisture content of boards should be checked and recorded immediately before installation as the moisture content may have changed since delivery. The actual moisture content of the wood at this stage should be within the range specified.

Where symmetrically profiled boards are to be used, and the growth rings are visible across the cross section of the board, the ‘heartside’ of the board should be to the outer face. The only exception is the inner layer of boards in a ‘board-on-board’ pattern, when the ‘heartside’ of the board should be to the inside (see *Section 5.2* and *Figure 5.4*). This takes into account the likely distortion of the wood due to any variation in moisture content. Occasionally, stresses built up in kiln dried wood which is later resawn, can result in the natural tendency to change shape being reversed, and some distortion may have occurred in the opposite direction even before the boards are installed. If this occurs, it may be necessary to reconsider which way round the boards should be fixed to the building.

With all interlocking boards, whether overlapping or tongue and groove, a minimum 2 mm clearance should be left for possible expansion between parts of a board ie the tongue and groove, or any rebated sections (*Figures 5.15, 5.17*). This is for a maximum board width of about 150 mm; if the board is wider a larger clearance should be provided.

If the wood is to be used ‘green’, shrinkage rather than expansion of the board is more likely, and less clearance need be provided. However, because of this shrinkage, joints will open and sufficient overlap should be provided between boards to accommodate this. (Tongue and groove joints are not suitable for use with ‘green’ wood.) In an open-joint application the boards should be fixed so that the specified joint width is achieved after the initial drying shrinkage has taken place. It may be necessary to determine the gap to be provided at installation by checking the actual moisture content of the timber, and calculating the amount of drying shrinkage to be expected.

Where board lengths are to be butt jointed, it is recommended to provide at least a 5 mm gap for ventilation and drainage on unfinished wood, but this may not be sufficient to allow insertion of a brush to re-coat the ends of the boards when maintenance is required. If visually acceptable, an 8 mm gap is the usual minimum space for this.

Boards must always be butt jointed over battens, whether vertical or horizontal. But single battens are not usually wide enough to allow both board ends to be fixed. If the boarding is ‘panellised’ and the boards are all of the same length, double battens can be used. Where boards are random lengths they must still be in multiples of the batten spacing, but short lengths of the standard size battens can be nailed to the side or top of the main battens to provide additional space for fixing the end of one of the boards. The length of this additional piece of batten should be at least three times the face width of the boards (*Figure 5.6*).

An alternative on thicker boards or narrow profiled sections, is to form a lap joint by rebating the ends of the section to allow an overlap which can be fixed together to the standard support batten

with a single nail or screw. However, this requires considerable precise preparation and should be limited to hardwood cladding profiles.

The finished widths of boards will be less than the nominal, or basic, size ie the finished size of a nominal 150 mm board will be about 144 mm due to cutting and planing. If the overall layout of the cladding is dimensioned on the basis of multiples of the nominal size, it will be necessary to adjust the gap between boards to allow for the reduction in the finished size of the board during fixing. This is to ensure that the boarding conforms with the overall dimensions required, and also coincides with such features as window openings (horizontally or vertically).

If boards are to be left unfinished, nails or screws (unless they are designed to be recessed) should be driven to lie as flush as possible with the surface of the wood after initial drying has taken place.

If a surface coating system is to be applied, the nails or screws should be slightly recessed to allow for a slight build up of the coating over the head.

If surface coating systems are to be added on site, at least the first coat should be applied to all faces of the boards before they are installed. In particular coatings should be applied thickly to any exposed end grain. Pre-coating will even out moisture absorption on all faces, reducing the risk of distortion across the section. It also avoids the risk of uncoated surfaces appearing on the face of the cladding due to shrinkage which can occur if all coats are only applied after installation (*Figure 3.3*).

Removing sharp arrises by sanding or chamfering will extend the life of surface coatings, particularly on horizontal boards. This is because liquid coatings will tend to pull away from sharp edges due to surface tension, resulting in a reduced film thickness at the most critical points, where any erosion from water run-off will be most severe.