

Recommended Practice / February 2004

Issued by: Timber Queensland Limited

### Introduction

This data sheet describes the installation of tongue and groove strip flooring over new and existing residential concrete slabs (fixed to battens or a plywood sub-floor).

This data sheet should be read in conjunction with Technical Data Sheet 11 "Tongue and Groove Timber Flooring".

The fixing of strip flooring, parquet and non structural floating floors directly onto concrete without battens or plywood sub-floors is not covered in this data sheet. These products should be installed in accordance with manufacturers recommendations.

### Concrete Slab Conditions

Top surface to be flat and even. Where undulations exceed 3 mm in 1500 mm, a concrete topping or levelling filler should be applied.

Slabs on ground should be constructed with a continuous underslab vapour barrier (e.g. 0.2 mm thick polyethylene).

Timber floors should not be installed until concrete slabs have moisture content less than 5½% (generally achieved after slabs have cured for approximately 4-6 months).

In old slabs moisture contents should be below this level and if towards the upper limit, care should be exercised.

A simple test to determine the approximate moisture content of the slab is to tape a 300 x 300 mm (minimum) sheet of polyethylene film (or glass) to the top of slab, sealed at all edges. If after 24 hours, moisture appears on the underside of the film (or glass), the slab is too wet and unsuitable for fixing a timber floor.

Before laying a timber floor the moisture content of the slab should be checked with a moisture meter or hygrometer.

### T & G Strip Flooring

Strip flooring is available in a variety of species, profiles, widths and thicknesses. (Refer Technical Data Sheet 11 "Tongue and Groove Timber flooring").

For fixing over a plywood sub-floor, any flooring over 10 mm thick may be used. For fixing to battens, boards should be minimum 19 mm thick.

### Sub-floor Plywood and Battens

Plywood sub-floor material and battens need to be at a moisture content within a few percent of the flooring at the time of installation.

### Moisture Content and Movement

At the time of installation the moisture content of strip flooring used along coastal Queensland should be between 10% and 15%. The average should preferably be between 11% and 13%. In drier inland areas and in air conditioned applications, flooring moisture content should be between 7% and 12% with an average of 9%.

Timber either absorbs moisture or dries out in response to seasonal changes of humidity and temperature in the surrounding atmosphere, with subsequent swelling or shrinkage.

Gapping can be expected between floor boards as they shrink during extended dry periods or if they are exposed to heat sources such as fire places or sunlight through large doors and windows. To ensure a relatively even distribution of gaps between boards, floor finishes that are likely to bond the edges of boards together should not be used.

Floors will tighten during periods of prolonged wet weather and therefore expansion gaps are required in wide floors (refer to Technical Data Sheet 11).

### Delivery, Storage and Handling

Timber should be provided by the supplier with plastic wrapping (to top, sides and ends) in good condition in order to maintain the flooring at the appropriate moisture content. It is the floor installers responsibility to ensure that the timber is at the appropriate moisture content at the time of installation and therefore flooring products must be protected from weather exposure and other sources of dampness on.

Ideally, flooring should not be delivered to site until it can be immediately stored under permanent cover. If this is not achievable other precautions that are equally effective, to prevent moisture uptake and excessive sun exposure, will be needed.

Plastic wrapping is easily damaged and should not be relied upon to keep the flooring dry. If moisture penetrates the plastic or timber is stored over a moist surface, subsequent moisture uptake can result in significant swelling of some boards. Flooring should not be laid in this condition, as wide gaps at board edges may result as boards redry. Wrapped packs should also be protected from excessive sun exposure as this too can have a detrimental effect.

## Installation

Installation of flooring should not occur until other construction activities, particularly wet trades are complete.

The building should be roofed and enclosed with the temperature and humidity as close as possible to the expected in-service conditions.

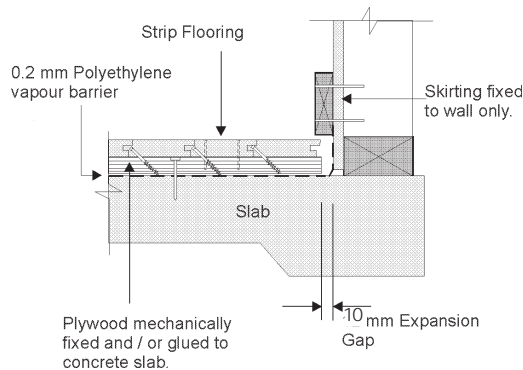
For secret nailing, uni-nail (secret nail) profile boards should be used (maximum cover width of 85 mm) with one nail per board at each fixing.

For face nailing, standard profile or uni-nail (secret nail) profile boards may be used. Boards exceeding 65 mm cover width require two nails per board at each fixing.

10 mm expansion gaps should be provided at all walls and other fixed obstructions parallel to the run of floor boards. Intermediate expansion joints should also be provided in larger floors (width at right angles to boards exceeding 6 metres), to give an equivalent gap of 10 mm every 6 metres (approx. 1.5 mm every metre or 1mm every 600mm).

As an added protection against moisture from the slab (from edge effects, beam thickening etc) or minor building leaks a 0.2mm polyethelene membrane over the slab is recommended. The polyethelene should be lapped by 200mm, taped at joints and brought up walls (or fixed columns etc) above the top of the flooring. The polyethelene is then covered by the skirting. Note that fixing of the plywood sub-floor or battens through the polyethelene is not considered an issue.

### Fixing to Plywood Sub-floor



Underlays to be minimum 15 mm thick type A bond, structural grade, plywood. Sheets should be installed in a brick pattern or at 45° to the direction of the strip flooring with a 6 mm gap between sheets and at walls or fixed obstructions. Plywood sheets shall be fixed to the concrete slabs by one of the following methods:-

#### (a) Nailed Only:

- Seal the slab using 'Selleys Bondcrete' solution or equivalent (4 water : 1 Bondcrete for first 2 coats, 2 water : 1 Bondcrete - third coat)
- Instal 0.2 mm polyethylene vapour barrier.
- Fix with galvanised diamond point nail 2.9 mm diameter or equivalent at 550 centres along grain, 500 centres across grain, 100 mm in from edges.

#### (b) Glued and Nailed:

- Seal the slabs as per the nailed only case above.
- Glue with a construction adhesive suitable for the purpose with 10 mm bead at 450 mm centres.
- Fix with galvanised diamond point nail 2.9 mm diameter or equivalent 300 mm in from edges on a 600 x 600 mm grid.

#### (c) Glued Only:\*

- Seal the plywood underside and edges with 2 coats (3 hours apart) of 'HydrEpoxy 256' or equivalent diluted with 10 to 15% water. Spread at approximately 6 m<sup>2</sup>/litre.
- Glue with 'HydrEpoxy 501' or equivalent, two component water based epoxy adhesive, mixed and applied in accordance with manufacturers recommendations. Spread with notched trowel approx. 2 m<sup>2</sup>/litre.

#### \*NOTE:

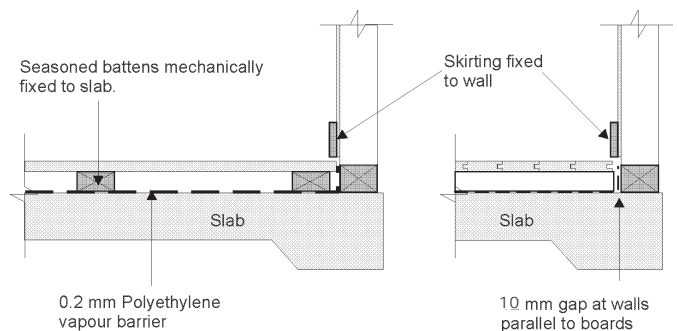
Vertical downward pressure must be applied to the plywood surface during curing in accordance with glue manufacturers recommendations.

T & G strip flooring should be fixed to the plywood sub-floor with either:-

- 38 x 15 gauge staples  
or 40 x 2.5 mm nails at 300 mm spacing
- 32 x 15 gauge staples  
or 30 x 2.5 mm nails at 200 mm spacing

To provide a cushion between the two floors and reduce possible squeaking a continuous bead of urethane flooring adhesive should be provided at 90° to the board length, midway between fixings.

### Fixing to Battens



A timber batten fixing system may be used where a minimum of 19 mm thick T & G flooring is used.

Battens to be seasoned hardwood or softwood and mechanically fixed to slabs with either 75 mm gun nails at 600 mm maximum spacing or M6 masonry anchors at 1200 mm maximum spacing.

The recommended fixing of flooring to battens is as follows:-

Batten Size	Recommended Spacing	Recommended Fixings
35 x 70 mm hardwood or softwood	<ul style="list-style-type: none"> <li>• 450 mm for softwood, cypress and end-matched hardwood flooring -</li> <li>• 600 mm for butt jointed hardwood flooring)</li> </ul>	50 x 15 gauge staples or 50 x 2.5 mm (min) nails (plain shank for hardwood battens, deformed shank for softwood battens)
19 x 63 mm hardwood only	300 mm**	38 x 15 gauge staples or 40 x 2.5 mm nails

\*\*Because of the closer spacing of fixings, secret fixing (using 85 mm maximum width boards) may be preferable.

#### NOTE:

Refer Technical Data Sheet 11 for maximum allowable batten (joist) spacings.

## Finishing

The finishing of feature floors should be carried out by a professional floor sander and finishing contractor.

Some finishes have the potential to bond board edges together at the tongue and groove joint. With seasonal moisture changes in the floor, this bonding or 'gluing effect' may produce a pattern across the floor where there are four or five tight boards followed by a large gap. In some instances the bonded joint may be of sufficient strength that boards may split. It is therefore recommended that finishes and finish systems are used that do not promote gluing. Modified urethane and oil based finishes or finish systems containing a bond breaking sealer followed by polyurethane top coats are considered appropriate. Advice should be sought from finish manufacturers.

## Safe Working

Working with timber produces dust particles. Protection of the eyes, nose and mouth when sanding, sawing and planing is highly recommended. Refer to tool manufacturers for safe working recommendations for particular items of equipment.

## Disposal of Offcuts and Waste

For any treated timber, do not burn offcuts or sawdust. Preservative treated offcuts and sawdust should be disposed of by approved local authority methods.



---

### Timber Queensland Limited

ACN 092 686 756 • ABN 50 092 686 756  
500 Brunswick Street, Fortitude Valley  
Brisbane Queensland 4006  
PO Box 2014, Fortitude Valley BC Qld 4006

Phone: (07) 3254 1989

Fax: (07) 3254 1964

Website: [www.timberqueensland.com.au](http://www.timberqueensland.com.au)

Email: [admin@timberqueensland.com.au](mailto:admin@timberqueensland.com.au)

---

Whilst every effort is made to ensure the accuracy of advice given, Timber Queensland Limited cannot accept liability for loss or damage arising from the use of the information supplied.