



Design Guide

1.1 Non-specific design

The following design information covers the use of SuperPine® when used for buildings detailed by 1.1.2(e) of NZS 3604 which is an acceptable solution of the New Zealand Building Code for buildings not requiring specific design.

1.1.1 Joist selection

Ranges of joists are now available, in solid timber, engineered timber (“I joists / LVL”), PoziStrut and steel. Each has its particular advantages and preferences.

The use of solid timber or “I” joists, with a moisture content of less than 15%, is strongly recommended and will provide the following benefits:

- o Post construction shrinkage and distortion will be minimised, limiting fastener noise and nail popping.
- o Deflection will be limited as dry timber is stronger and stiffer.
- o In all cases joists are lighter and easier to handle – particularly with “I” joists.

In some cases it is hard to avoid the use of “wet” timber due to the treatment requirements of NZS 3602. If this is the case, care should be taken to select straight and undistorted material or consideration given to post laying of panels.

1.1.2 Domestic buildings

In domestic housing applications, joist support centres up to 600mm are acceptable for all SuperPine® products, in line with the floor loads described in Table 1.2 - “Imposed floor live load reference values” of NZS 3604.

- a) If a more rigid floor is required, reduce support centres to 450mm or less.
- b) For large floors, over 15m long, consider post laying or allow for expansion. Refer C1.1.2b.
- c) Ensure that adequate ventilation is provided in sub-floor areas.
- d) When clear finish/coating is required, use only SuperPine® Square Edge.
- e) Additional panel support will be required for high point loads such as pianos, billiard tables etc.

C1.1.2a Refer to SuperPine® Technical Manual Section 7 – 7.4 Large floors.

C1.1.2b This is to ensure that timber nogs are used to support edges – if Tongue and Groove product is used, cracking of surface coatings may eventuate due to slight differential movement.

1.1.3 All other buildings

In all non-domestic building applications (i.e. residential, institutional, educational and other buildings) joist spacings for SuperPine® shall not exceed 600mm.

The floor loads, from Table 1.2 of NZS 3604, shall not be exceeded without specific design.

Special attention shall be given at the design stage to the effects of concentrated loadings, such as high density foot traffic, storage racks, hand trolley point loads etc.

Adequate cross flow ventilation shall be provided in all sub-floor areas for ground floor timber framed floors.

Where large areas of SuperPine® are laid e.g. gymnasiums, community halls, institutional type dwellings, farm buildings etc., it is important to ensure that careful consideration is given to the cross flow effect of sub-floor ventilation and that allowance is made for panel expansion.

Post laying is always the better option for large floors, particularly where clear finishing.

1.1.4 Structural diaphragms

SuperPine® Square Edge can be used for structural diaphragms. Design requirements for diaphragms to resist wind or seismic loads are given in NZS 3604.

- o SuperPine® Square Edge complies if fixed in accordance with the SuperPine® Technical Manual.
- o SuperPine® Tongue & Groove complies if fixed in accordance with the SuperPine® Technical Manual and joist centres do not exceed 450mm.

For floor diaphragms complying with NZS 4229 – Concrete Masonry Buildings Not Requiring Specific Engineering Design – SuperPine® Square Edge shall be used. Details shall be in accordance with NZS 4229.

C1.1.3 Residential, institutional, educational and other buildings as described in NZS 3604: clause 1.1.2 (e), (ii) - (v).

C1.1.4 Refer to SuperPine® Technical Manual Section 7 – Installation – for specific fixing details.

1.2 Specific design, commercial and industrial use

SuperPine® flooring panels are suitable for residential and commercial flooring applications with a maximum frame spacing of 600mm centres for a maximum live load of 1.8 kN.

Flooring platforms where the live loads exceed 1.8 kN / 2kPa, they must be specifically designed by either:

- SuperPine® Flooring - Using the properties in Table 3.3 of the SuperPine® Technical Manual or;
- SuperPine® is to be replaced with Strandfloor®, which is to be installed using Tables 5.1 and 5.2 of the Strandfloor® Technical Manual.

1.3 Sub-floor ventilation

Sub-floor ventilation must be provided to all platform floors suspended above the ground to ensure the ongoing moisture content of the SuperPine® should not exceed 15%.

The following information shall be regarded as the minimum ventilation levels required. Failure to control moisture in the particleboard could result in a non-performance which Laminex New Zealand™ will not be responsible for.

1.3.1 Opening requirement

This requirement shall be met by the provision of evenly distributed openings in the foundation wall, at a rate of no less than 3500mm² for every m² of floor area. The openings shall be as near as possible to the underside of the plates and bearers and be positioned to allow effective cross flow.

Either one, or a combination of the following methods, may be used to construct ventilation openings:

- o Continuous gaps, at least 20mm wide between baseboards, around the building perimeter.
- o Perimeter wall ventilators with sufficient net open area spaced regularly, commencing 750mm from the wall corner and at intervals of no greater than 1.8m.
- o A 50mm gap between the wall plates and a boundary joist at the ends of cantilevered floor joists and the wall plate and joist, where the bearer is cantilevered.
- o Other regularly spaced openings that will provide adequate ventilation.

It is important to ensure that party walls, internal foundations, attached terraces, or any other impediment, do not obstruct the subfloor ventilation airflow, and that:

- o No point of the ground is more than 7.5m from a ventilation opening, or;
- o The subfloor ventilation rate is greater than ten air changes per hour for wet sites, or five air changes per hour for dry sites.

C1.3.1 All requirements in accordance with NZBC – E2/AS1 and NZS 3604.

1.3.2 Vapour barriers

Where a sub-floor space cannot be adequately ventilated, the ground under a suspended floor shall be covered with a vapour barrier having a vapour flow resistance of no less than 50MN s/g, and a thickness of no less than 0.25mm.

Even with a vapour barrier, ventilation openings shall still be provided, but the net open area may be reduced to no less than 700mm² for every m² of floor area and be located to provide air cross flow in the subfloor space.

The vapour barrier shall be installed in a way that ensures:

- o It covers the total ground area.
- o Adjacent sheets are lapped no less than 75mm and laps are intermittently taped.
- o The ground is shaped to prevent water accumulation on the vapour barrier.
- o Water drains to the exterior.
- o It is securely held in place by bricks, large stones, pegs or similar method.

Where floor area designs still do not meet the above criteria, consideration should be given to the use of mechanical draft ventilation systems that create a subfloor ventilation rate greater than ten air changes per hour for wet sites, or five air changes per hour for dry sites.

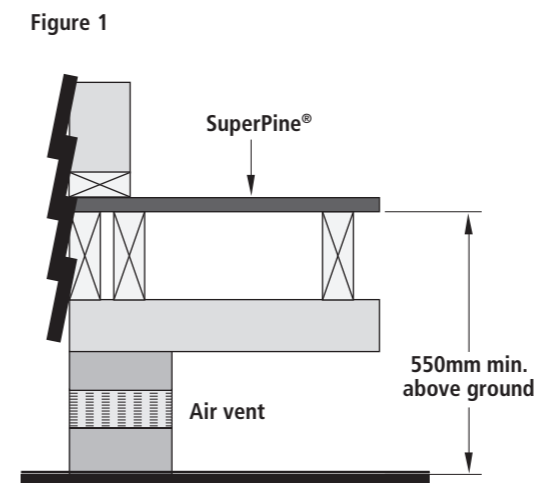
It is essential that all ventilation openings remain unrestricted and that vegetation is not allowed to cause obstructions over the life of the building.

1.4 Ground clearance

A minimum clearance of 550mm between the surface of the ground beneath the building and the underside of the flooring panels shall be provided in order to give adequate sub-floor air capacity and to provide access for inspection of the sub-floor structure.

The clearance of 550mm may not be reduced, even when vapour barriers are installed. Vapour barriers only allow the reduction in the ventilation requirement not the clearance dimension.

For ground clearance detail, see Figure 1.



C1.3.2 It is strongly recommended that vapour barriers be installed regardless of the situation. Great advantages can be gained in the reduction of sub-floor moisture content for very little cost.

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