

Residential LVL Substitutions -

Acceptable Solutions:

For use in Residential Timber framed Buildings in accordance with NZS3604 NelsonPine LVL may be used as a direct substitute in place of No. 1 Framing, SG6, SG8 and SG10 provided that the LVL is of the same finished size as the member to be substituted and has no less than the strength and stiffness properties of the grade to be substituted as per NZS3604: Timber Framed Buildings, Clause 2.3.9¹ (refer to Table 1 below: Timbers to be Substituted).

NelsonPine LVL meets the durability requirements of the NZ Building Code B2, when specified in accordance with NZS3602: Timber and wood-based products for use in building. H1.2 glueline and face treatment is the preferred treatment for LVL and is the only Acceptable Solution treatment for LVL in NZS3640: Chemical Preservation of Round and Sawn Timber (A5) and is included in NZBC B2/AS1.

Building (Minor Variations) Regulations 2009:

A minor variation is defined as: “a minor modification, addition, or variation to a building consent that does not deviate significantly from the plans and specifications” in Regulation 3 of the Building (Minor Variations) Regulations 2009.

A Building Consent Authority (BCA) needs to be made aware of the substitution and the BCA will require the application (by the owner or agent) to demonstrate that the substitution will meet the Building Code. This substitution note submitted to the BCA will provide confidence to the BCA of the nature of the minor variation when assessing its suitability. Minor variations can be approved on site or at the BCA office.

Laminated Veneer Lumber (LVL) supplied by different manufacturers can be substituted within a residential new build or renovation in accordance with MBIE guidance “A Quick Guide to Product Substitution” as per section 175 of the Building Act 2004 as a minor variation, provided that:

- The MoE grade is the same or higher.
- The dimensions are the same.
- The LVL is manufactured to AS/NZS4357 from Radiata Pine Species.
- The LVL meets the durability requirements of the application.

Examples of what is not a minor substitution and needs specific design input:

- LVL as a primary member in a commercial building.
- LVL being substituted for pre-cambered Glulam beams
- If in doubt please call Nelson Pine Industries Ltd.

¹ The 16kN limits on reactions are imposed to avoid overloading the rest of the structure (BRANZ Engineering Basis of NZS3603)

Table 1: Timbers to be Substituted

| NelsonPine LVL | TIMBERS TO BE SUBSTITUTED | | | | | | | |
|----------------|---------------------------|------|-----------------------|------|-----------------|------|------------------|--------|
| | Sawn Timber | | Glulam ^(a) | | LVL | | | |
| | SG8 | SG10 | GL8 | GL12 | J-Frame LVL8 | Hy90 | HyChord | HySpan |
| LVL8 | ✓ | | ✓ | | ✓ | | | |
| LVL11 | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ ^(b) | |
| LVL13 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Note (a) LVL may only be substituted for straight Glulam (non-cambered).

Note (b) For use in trusses use proprietary truss software as nail plate capacities may vary.

References:

- New Zealand Building Code Clause B2 Durability (Amendment 8).
- MBIE Quick Guide to Product Substitution.
- <https://www.building.govt.nz/projects-and-consents>.
- NZ Wood Design Guides: Consenting Timber Buildings.
- NZS3604: Timber Framed Buildings.
- NZS3603: Timber Structures Standard.
- NZS3602: Timber and wood-based products for use in building.
- NZS3640: Chemical Preservation of Round and Sawn Timber.
- NelsonPine LVL Specific Engineering Design Guide.
- NelsonPine LVL Product Technical Statement.
- J Frame Product Assurance Supplier Statement.



4/50 Meadowbank Rd, Meadowbank, Auckland 1072, NZ
T: +649 952 0001 F: +649 528 4906 M: 6421 259 1903
www.lignumstructural.co.nz

4 October 2018

Our ref 2588

New Zealand Wood Products Ltd
149 Kerrs Road
Wiri
Auckland

Comparison of Carter Holt Harvey Hyspan and Nelson Pine LVL13

| Table 1: Structural Properties | | | | | | |
|--------------------------------|----------------------------|--------------------------|----------------------------------|--------------------------------------|-------------------------------------------|--------------------------------|
| | Bending strength fb MPa | Shear strength fb MPa | Tension parallel to grain ft MPa | Compression parallel to grain fc MPa | Compression perpendicular to grain fp MPa | Modulus of elasticity E GPa |
| Hyspan | 50 | 4.6 | 30 | 42 | 12 | 13.2 |
| NP LVL13 | 48 | 5.3 | 33 | 38 | 12 | 13.2 |

Table 1 compares the structural properties of Carter Holt Harvey Hyspan and Nelson Pine LVL13. I have highlighted the three properties usually used for designing timber beams; these are the bending strength, shear strength and modulus of elasticity (stiffness). These properties are nearly identical.

The size factors and material strength factors vary between Hyspan and LVL13 a little, but they tend to cancel each other out, so in practice there is little difference in designing in either material.

The other thing to bear in mind is that for most domestic light timber framed construction, the deflection of the beam is critical. This means that the critical property is the modulus of elasticity. Because this figure is identical, a correctly selected Hyspan beam can usually be substituted with a Nelson Pine LVL13 beam.

David Reid, STRUCTURAL ENGINEER, Engineering NZ Member ID 121639.

Structural Timber Engineering

David V Reid, Structural Engineer, BE, Dip Bus, CMEngNZ, CPEng