

futurebuild[®]



designIT[®]

COMMERCIAL FLOORS

designIT[®] FOR COMMERCIAL FLOORS INSTALLATION GUIDE

SEPTEMBER 2019

Information contained within is specific to the Futurebuild[®] LVL range of products and must not be used with any other LVL products no matter how similar they may appear.

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Contents

1.0	Introduction.....	3
2.0	Installation.....	3
2.1	Basic Installation Requirements.....	4
2.2	Joist Placement.....	4
2.3	Fixing to Supports	4
2.4	Supports.....	4
2.5	Blocking & Bearing at Supports for Support of Gravity Loads.....	4
2.6	Lateral Restraint.....	5
2.7	Intermediate Restraint (Between Supports).....	5
2.8	Notching/Cut Backs/Holes with hyJOIST [®]	6
2.9	Holes in Solid LVL.....	7
2.10	Product Faults.....	7
2.11	Health & Safety	7
2.12	Storage & Handling	7
3.0	Installation Details Requiring Design & Specification.....	8
3.1	Framing Around Floor Openings	8
3.2	Design for Acoustics & Fire.....	8





1.0 INTRODUCTION

Manufactured in New Zealand, Futurebuild® LVL offers a comprehensive range of Laminated Veneer Lumber (LVL) solutions suitable for almost any commercial project. Futurebuild LVL is an engineered wood product with high structural reliability, performance and consistent dimensional accuracy. Architects and designers can specify Futurebuild LVL with confidence and it is readily available in a range of thicknesses, depths and lengths.

designIT® for Commercial Floors is a software tool for all building practitioners designing with the Futurebuild LVL range and other selected materials. It enables a wide range of commercial and industrial floor solutions to be developed in a simple and powerful application.

2.0 INSTALLATION

There are some aspects of installation that can be regarded by designers and builders as 'basic requirements' to be adopted for installation in the absence of additional requirements specified in the design documentation. Requirements that fit into this 'requirements category' are defined and detailed under 'Basic Installation Requirements'.

Other aspects are categorised as 'Installation details requiring design and specification', because they need selection and individual specification in the design documentation to ensure the design intent is communicated to the builder.

This guide provides a variety of details specific to the use of Futurebuild LVL floor systems for commercial, industrial and other heavily loaded floors. Details contained in this publication have been appropriately designed and/or tested by an engineer to determine their suitability. We do however, caution against any assumption that details published for other I-Joist products are suitable or sufficiently complete for use with hyJOIST®.

In all cases it is assumed that installation will be carried out in accordance with a joist layout drawing showing the location, size (section code) and maximum spacings of joists together with reference to any special requirements not included in this guide as 'basic requirements'.

The information contained in this guide is current as of September 2019 and is based on data available to Carter Holt Harvey (CHH) LVL Ltd trading as Futurebuild® LVL at the time of going to print. Futurebuild LVL reserves the right to change the information contained in this literature without prior notice.

It is important that you call 0800 808 131 to confirm that you have the most up to date information available or refer to www.futurebuild.co.nz.

Futurebuild LVL has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. This information does not replace professional advice and we recommend that professional advice should be obtained specific to your circumstances. To the extent permitted by law, Futurebuild LVL will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

2.1 BASIC INSTALLATION REQUIREMENTS

Installation requirements specified in this section should be assumed to apply as minimum requirements in the absence of additional or other requirements specified in the design documentation.

2.2 JOIST PLACEMENT

Joists should be accurately placed at not more than the nominated maximum centre to centre spacing so as to provide the support required for flooring and load bearing walls or posts.

2.3 FIXING TO SUPPORTS

Joists are to be fixed accurately in position at supports using nails or screws as per Detail F5.

2.4 SUPPORTS

Supports shall be level, dry and have at least the rigidity implied by good framing practice and/or the design criteria specified for supporting components as per designIT® for commercial floors or specific engineering design. (A moisture barrier is

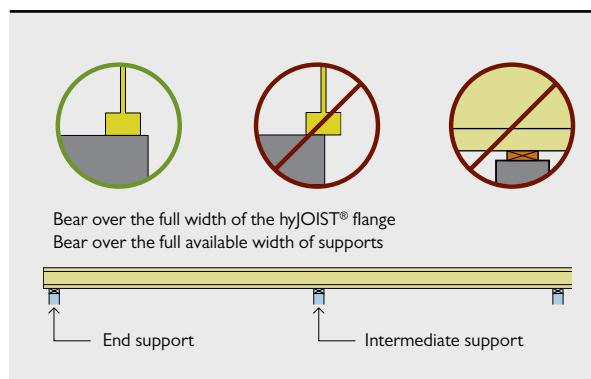
recommended where support is directly fixed to masonry or brickwork). Brackets available for use with Futurebuild® LVL solutions should be specified as part of the design information.

2.5 BLOCKING & BEARING AT SUPPORTS FOR SUPPORT OF GRAVITY LOADS

General

- Bearing should be provided to the full width of the LVL hyJOIST® bottom flange.
- It is good practice to bear over the maximum available width of supports.
- Use of web stiffeners can reduce the required bearing in hyJOIST, however, this needs to be specified in the design documentation.
- Continuous blocking provides support for load bearing walls directly aligned above supports. At end supports, a 'rimboard' or boundary joists can be used as an alternative to continuous blocking to support a load bearing wall.

Figure 1



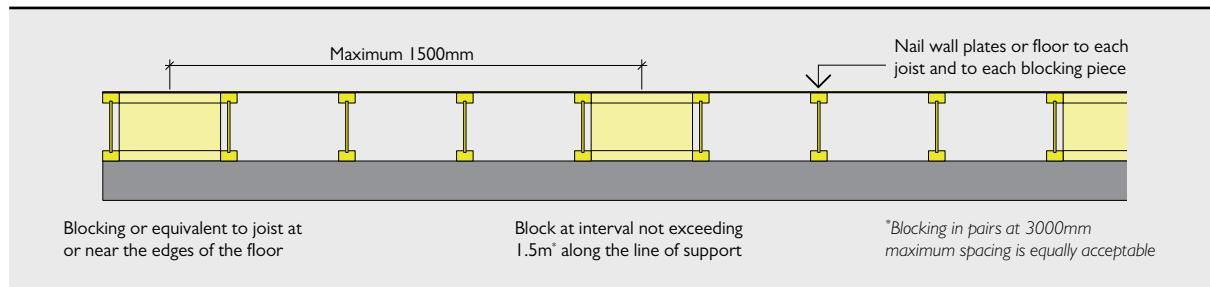
2.6 LATERAL RESTRAINT

Intermittent Blocking (or Equivalent) at Supports

All hyJOIST® joists, and solid LVL joists with D/B greater than 4 (i.e. deeper than 130, 170 and 240 for 35, 45 and 63mm thicknesses respectively), should be blocked or restrained against rollover at supports.

The fundamental requirement is to install joists plumb and hold them upright at supports. The simplest and most effective way of achieving this is to install square cut blocking. Alternative methods such as the use of 'rimboard', boundary joists, metal strap/brace or plywood closures are acceptable.

Figure 3



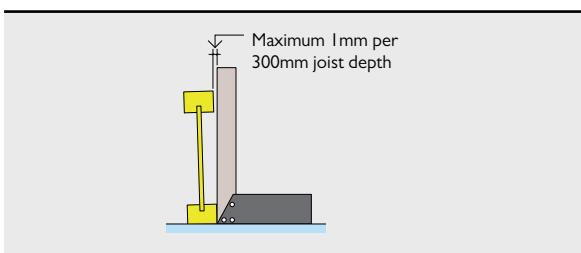
2.7 INTERMEDIATE RESTRAINT (BETWEEN SUPPORTS)

For best performance, the top flange of hyJOIST (or the top of Futurebuild® LVL joists) should be held straight between supports – (no more than 1mm per metre of span deviation from straight).

Before loading joists and attachment of flooring:

- Install blocking (or equivalent) at supports as described above, and between supports, install temporary battens braced back

Figure 2



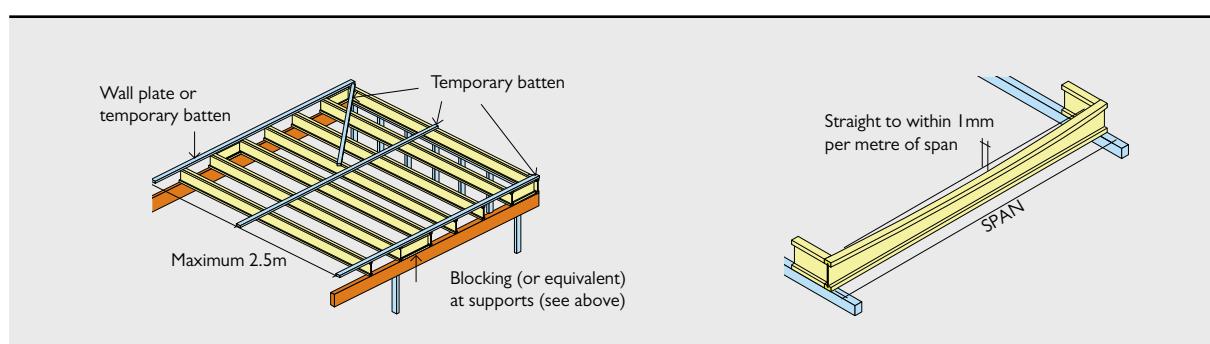
For installation of blocking, 'rimboard', boundary joist, metal strap/brace or plywood enclosures refer to Details F1, F2, F3 and F17.

to a point of rigidity (no more than 2.5 metres apart) to hold the top flange of each joist straight between supports.

- For installation of flooring, progressively work across the floor removing battens as required.

Note: Intermediate blocking is not required in Futurebuild LVL hyJOIST floor systems and if installed, can be a source of annoying nail creaks in the finished structure.

Figure 4



Fixing of Flooring

Flooring may be nailed to joists and to blocking using either 2.8mm diameter nails, hand driven or 2.5mm diameter nails, machine driven. Alternatively, for sheet flooring self-drilling Type 17 screws may be used. Fastener lengths should not exceed the lengths given in Table I. Nail or screw spacing should be at centres recommended for the particular flooring type. Where nail centres are less than 50mm it is good practice to stagger their location so as to avoid the possibility of splitting.

It is strongly recommended that flooring adhesive is used in conjunction with nailing.

Plywood flooring should be installed in accordance with the manufacturers literature.

Table I

Flooring Thickness	15-21mm	25mm
Maximum Nail/Screw Lengths	50mm	57mm

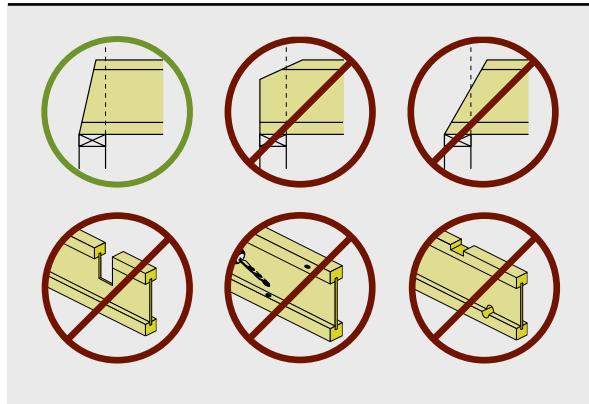
2.8 NOTCHING/CUT BACKS/HOLES WITH hyJOIST®

Notches or Holes in Flanges

Flanges may not be notched, planed or bored except as noted below:

1. At end supports only, one or both flanges may be notched to a maximum depth of 12mm (per flange) as shown in Detail F7.
2. At end supports flanges may be chamfer cut but not beyond the line of the support.
3. Do not bore holes through flanges. Holes up to 6mm for installation of nails or screws at supports allowed.

Figure 5



Notches or Holes in Webs with hyJOIST®

1. At end supports webs may be notched to accommodate the flange of a steel supporting beam within the limitations specified in Detail F8.
2. Holes may be cut through the web of hyJOIST® for the installation of service pipes and ducts but there are limitations on the placement, size and shape of holes. In general, larger holes must be located closer to midspan. Guidance on the positioning of web holes is given in designIT® for Commercial Floors. Alternative locations may be specified in the design documentation for specific load and support cases.

Figure 6

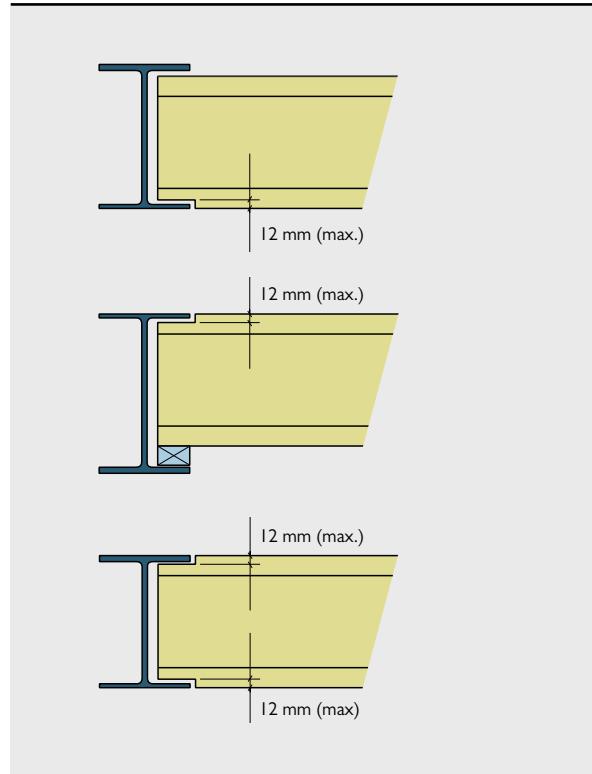


Figure 7

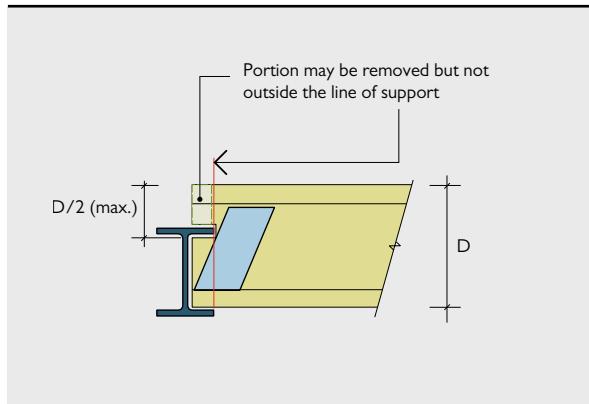
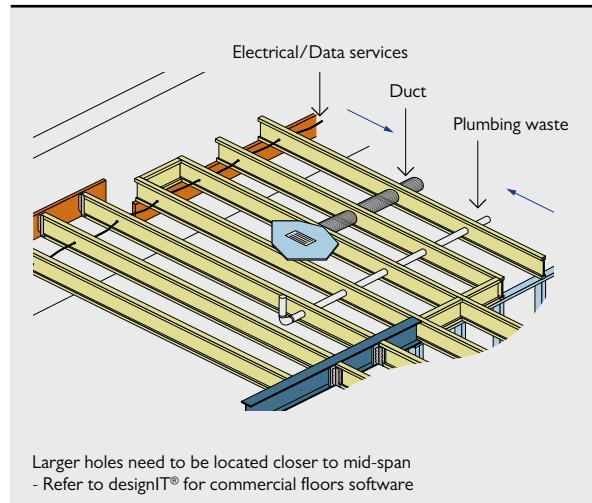


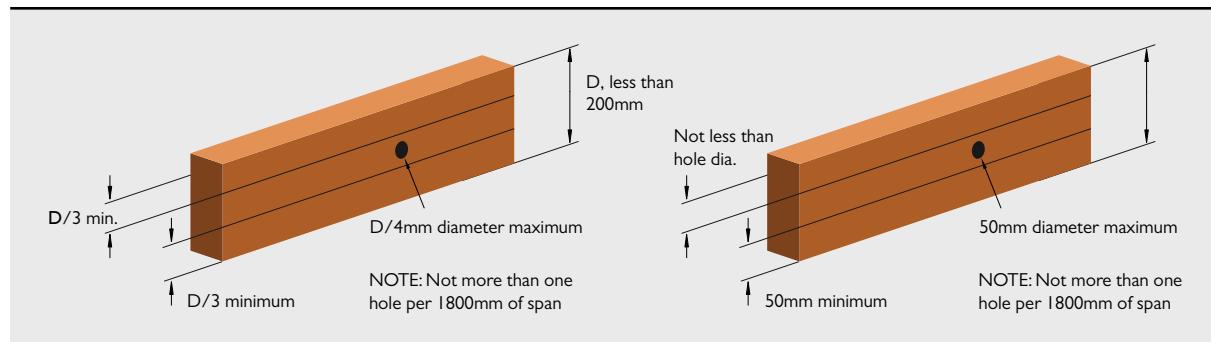
Figure 8



2.9 HOLES IN SOLID LVL

Holes may be drilled in Futurebuild® solid LVL floor joists where the live loading does not exceed 3.0kPa/2.7kN in accordance with Figure 9. Consult the Futurebuild Technical Team for advice relating to loads in excess of 3.0kPa/2.7kN.

Figure 9



2.10 PRODUCT FAULTS

Faults in manufacture do sometimes occur and faulty product may from time to time reach the market despite even the most stringent controls of the manufacturing process and quality.

Please let us know if you receive any product that you have concerns with – call 0800 808 131 even if you have solved the problem and a claim 'is not worth the hassle'. We want to know so that we can do better.

2.11 HEALTH & SAFETY

Futurebuild LVL should be handled in accordance with the Safety Data Sheets (SDS) for untreated and HI.2 treated LVL. Always wear safety glasses or non-fogging goggles when machining Futurebuild LVL.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc.) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn. Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling Futurebuild LVL.

2.12 STORAGE & HANDLING

Futurebuild LVL requires care in storage and handling. The following suggestions will help keep the Futurebuild LVL in good condition before use and after installation:

- The storage area should be protected from sun, rain and wind that can bring about rapid changes in temperature and humidity.
- Supports for Futurebuild LVL should be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in the joist).

- Prior to installation Futurebuild LVL should be stacked vertically on level bearers, at least 150mm clear of the ground.
- Futurebuild LVL should be kept clear of any ponding on the floor and placed so that it is not exposed to mechanical damage, and is kept as dry as practicable.
- Futurebuild LVL should be kept covered where possible.

3.0 INSTALLATION DETAILS REQUIRING DESIGN & SPECIFICATION

The following items need design and specification in the design documentation to communicate the requirements for installation:

- Joist sizes, product types and spacing for span, loading and flooring.
- Method of framing around openings in floors (e.g. stair voids).
- Bearing and support requirements differing from that specified under basic requirements for installation.
- Specification of web holes and permitted locations.

3.1 FRAMING AROUND FLOOR OPENINGS

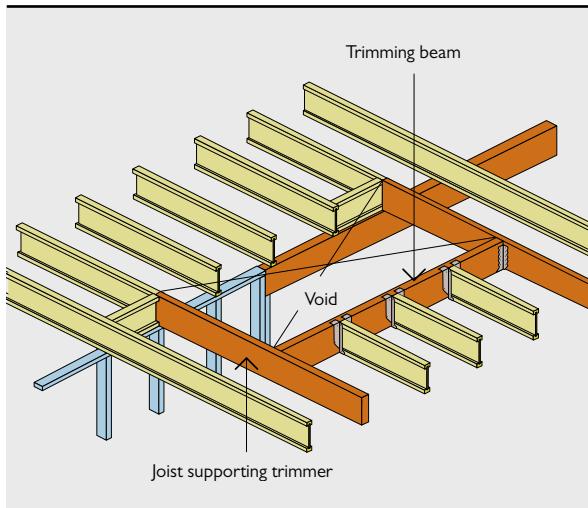
The size of members needed to frame around floor openings needs to be determined in design and specified in the design documentation for installation.

For convenience the depth of the trimmers and trimming joists are usually chosen to be the same as the depth of the floor joists. The ease of connecting and the greater strength and stiffness of solid Futurebuild® LVL sections relative to depth in comparison with hyJOIST® makes solid Futurebuild LVL sections the ideal material for framing both the trimmers and the trimming joists.

Trimmers and the supporting trimming joists may in some cases be hyJOIST, where structurally adequate. These can be connected using top mount hangers.

See detail F10 and refer to designIT® for commercial floors software for specification/design.

Figure 10



3.2 DESIGN FOR ACOUSTICS & FIRE

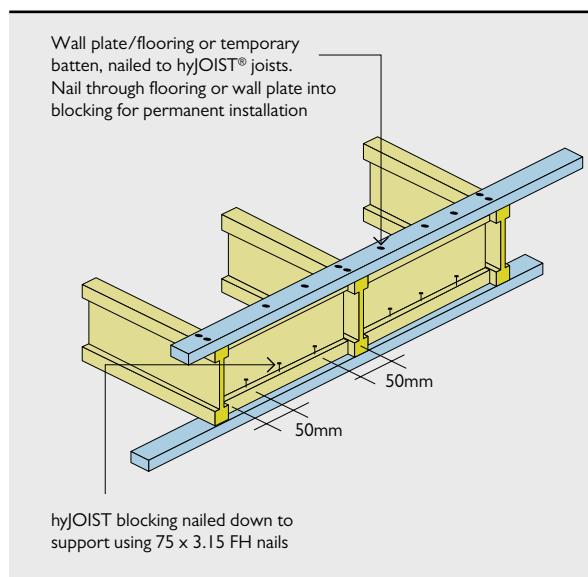
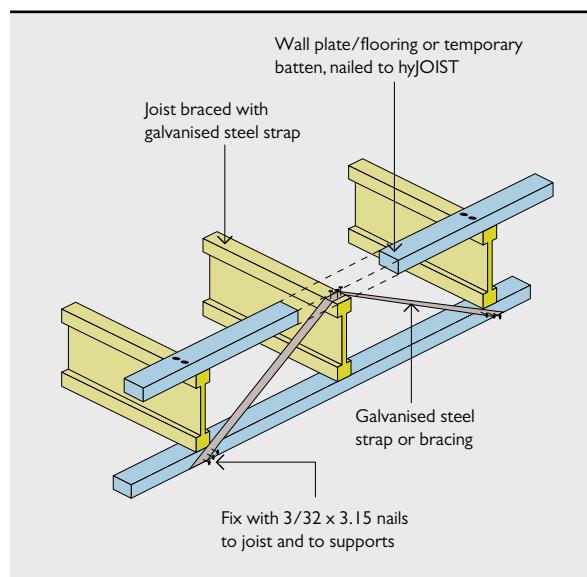
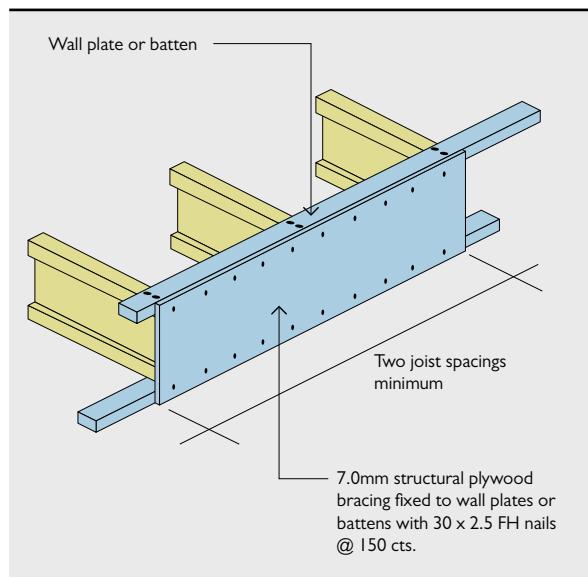
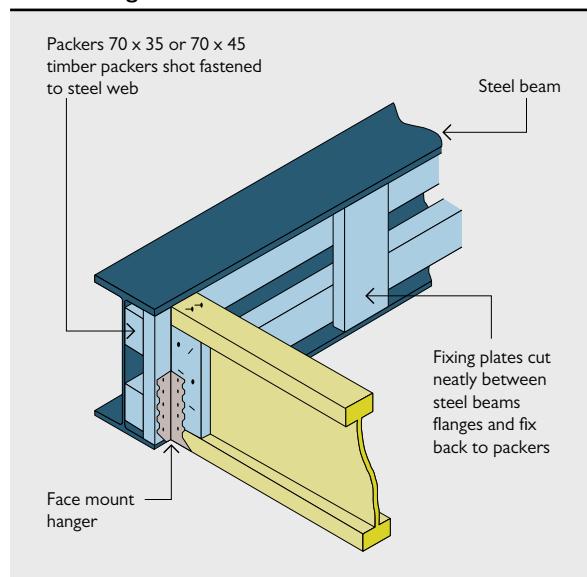
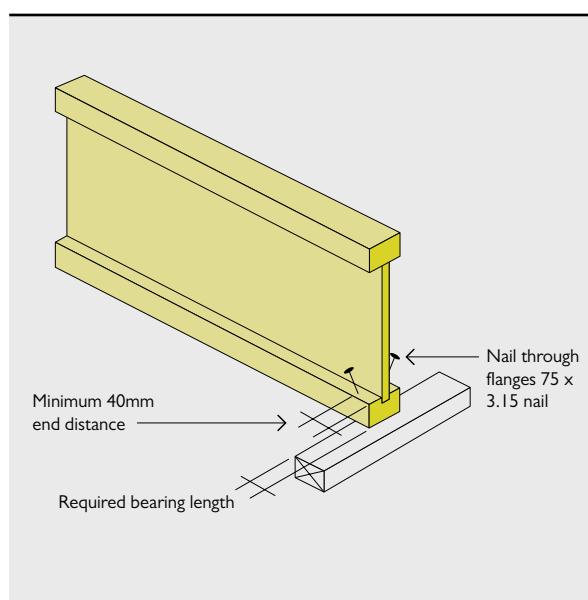
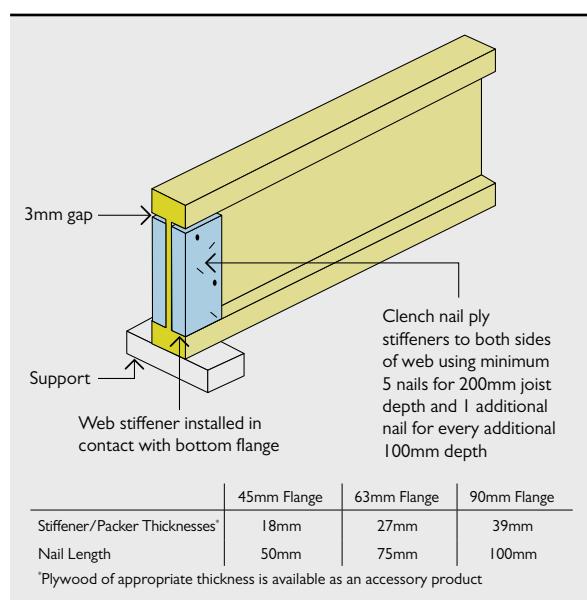
Light weight timber floor systems constructed with engineered wood products like hyJOIST and hySPAN® can provide ideal structural and dynamic performance; however, the lightweight nature of the products means that additional fire and/or acoustic solutions may be required to meet specific performance levels.

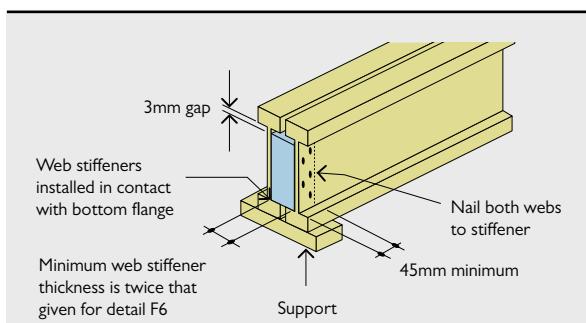
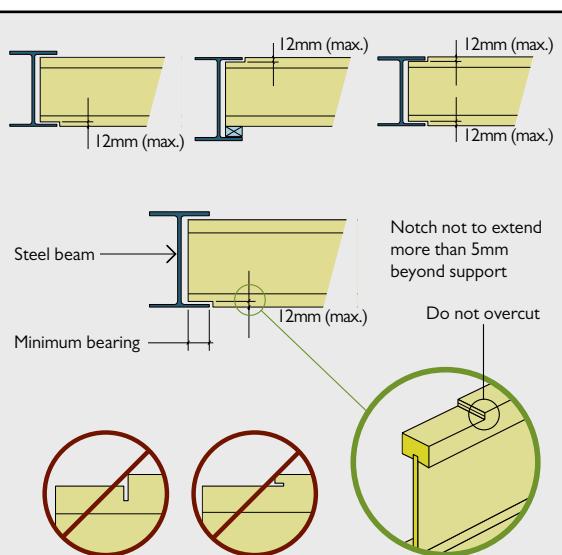
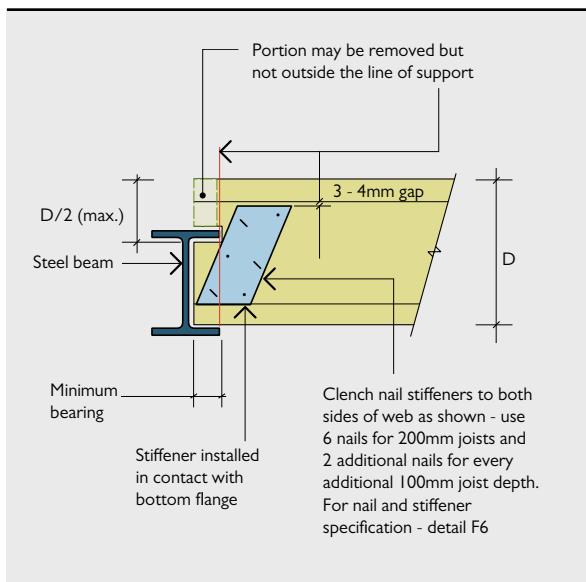
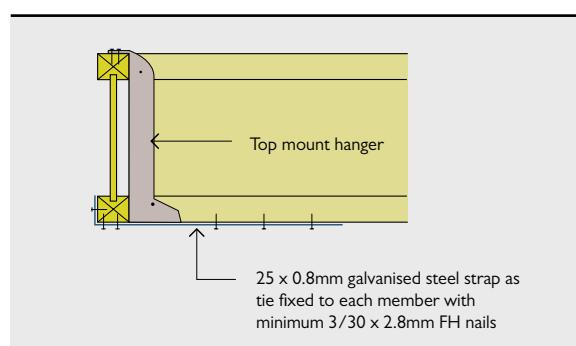
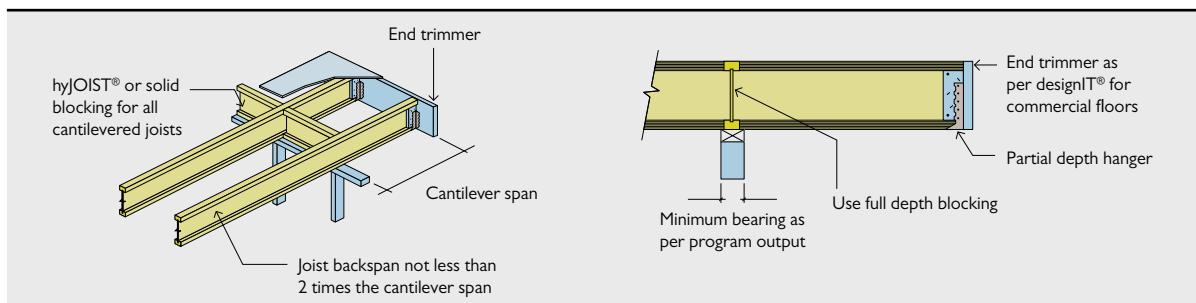
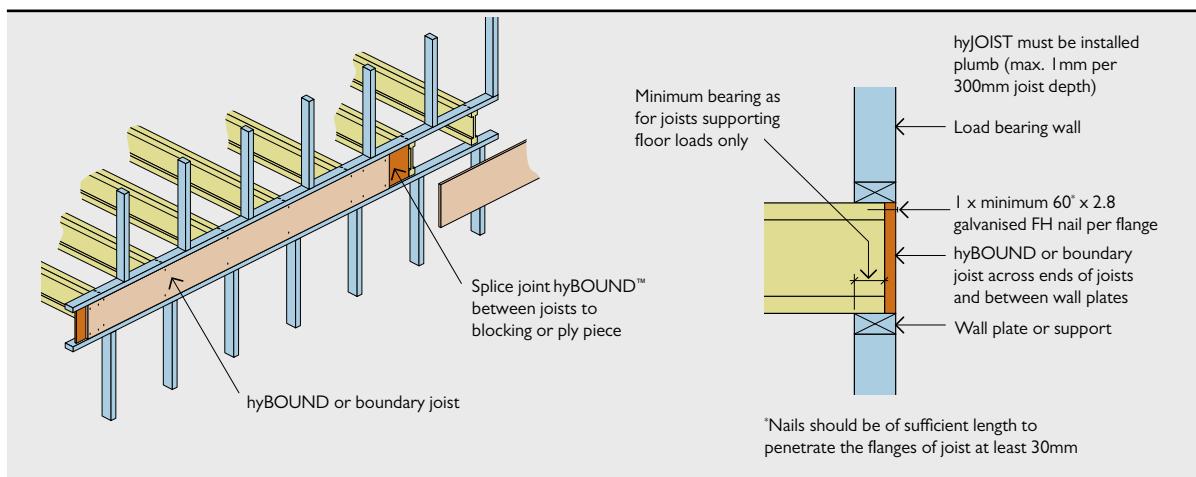
Additional fire resistance can be added to an LVL based solution using proprietary fire checking products like plaster/gypsum board installed in accordance with manufacturers literature. Any fire rated system should include Fire Resistance Ratings (FRR) taking into account the influence of fire on Stability, Integrity and Insulation.

Acoustic performance levels of lightweight floors are also heavily influenced by applying suitable treatments and proper acoustic detailing. Design and detailing of acoustic solutions should take into account both airborne sound insulation and impact sound insulation; both of which can be improved by providing

separation or resilience between the floor joists and the ceiling lining or the inclusion of acoustic underlays or sound absorbing material within the floor cavity.

Specific design solutions for acoustics and fire are beyond the scope of this publication. Futurebuild LVL also provide solutions for the design of Timber Concrete Composite (TCC) floors within the computelIT® for beams software package. TCC floors have shown to provide structurally fit composite solutions with in built fire and acoustic resistance; in many cases without the inclusion of additional materials/systems. To learn more about TCC floor systems contact Futurebuild LVL.

Detail F1 End Restraint – Blocking with hyJOIST®

Detail F2 End Restraint – Using Steel Strap or Bracing

Detail F3 End Restraint – Using Plywood

Detail F4 Fixing hyJOIST to Steel Beams – Using Face Mount Hangers

Detail F5 Nailing Down to Supports

Detail F6 Installation of Web Stiffeners


Detail F6A Web Stiffeners for Double Joists**Detail F7 Notching of Flanges at End Supports****Detail F8 Notching of Webs for Steel Beam Flange****Detail F10 hyJOIST®/hyJOIST Connection****Detail F13A hyJOIST Cantilever for Internal Balcony Applications****Detail F17 End Restraint – Using hyBOUND™ or Boundary Joist**





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