

Engineered Wood Products

IBUILT MULTISTRUT INSTALLATION GUIDE

June 2021

IBuilt MultiStrut joists provide increased spanning capabilities and access over standard framing while being lightweight, end trimmable and efficient to install.

They are ideal for domestic construction as both joists and rafters.





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Purpose

This guide will help correctly design, specify and install IBuilt™ Multistrut floor joists.

Important documents

This document must be read in conjunction with the following publications and documentation:

- The Architectural Building Consent documents.
- The Engineers Building Consent documents.
- NZS3604: Timber Framed Buildings
- The IBuilt layout plan supplied with the project.

The information and construction details contained in this document have been developed primarily for domestic/ residential applications in accordance with the principles and intent of NZS3604:2011 'Timber Framed Buildings'; NZS3603:1993 'Timber Structures Standard'; AS1720.1:2010 'Timber Structures – Design Methods'. Loading data is taken from AS/NZS1170:2002 'Structural Design Actions' to satisfy the requirements of Section B1 of the New Zealand Building Code.

New Zealand Wood Products (NZWOOD) Ltd accepts no liability or responsibility if the information contained in this document is incorrectly interpreted, inappropriately applied, or used in a manner other than explicitly set out in this design guide.

The information in this guide has been checked and verified, however, it should only be used by designers who are suitably qualified. For the most up to date information please refer to the online guide found on the **IBuilt Engineered Wood Products website** - www.ibuilt.co.nz.

Note: Other manufacturers' products may have different properties and therefore cannot be substituted or designed using information contained in this document.

Skills required

The use of this guide is intended for suitably qualified licenced building practitioners that are licensed to the relevant class.

Design assistance

For additional technical or engineering assistance please call 0800 022 352 or email the technical team at enquiries@nzwoodproducts.co.nz



For our warranty

Refer to www.ibuilt.co.nz



Compliance, Warranty and Quality Assurance

Compliance with the New Zealand Building Code (NZBC)

This guide offers information for designing and installing IBuilt's MultiStrut floor joist system in residential construction.

Additional design guidance can also be requested by contacting the IBuilt technical team on 0800 022 352.



When correctly designed, specified and installed IBuilt's MultiStrut floor joists meet the provisions of the NZBC:

Refer to the IBuilt MultiStrut Product Assurance Supplier Statement (PASS)



Scope and limitations of use

For scope and limitations.

Quality assurance

Nelson Pine LVL11

Nelson Pine Industries Ltd has stringent quality systems covering the management systems, the LVL production process and LVL product properties. Nelson Pine Industries is independently third party audited by the Engineered Wood Products Association of Australasia (EWPPAA) and by Telarc.

The EWPPAA Product Certification Scheme provides the framework for the NelsonPine LVL certification to AS/NZS 4357 Structural Laminated Veneer Lumber. Conformance with AS/NZS 4357 makes NelsonPine LVL suitable for NZS 3603 and NZS 3604 structural applications. Nelson Pine Industries Ltd is accredited by Telarc with ISO 9001 Quality Management Systems Certification.

Multinail Componentry

Nail plates and metal webs from Multinail are manufactured using grade G300 steel which is manufactured to AS1397 Steel sheet and strip—Hot-dip zincoated or aluminium/zinc-coated

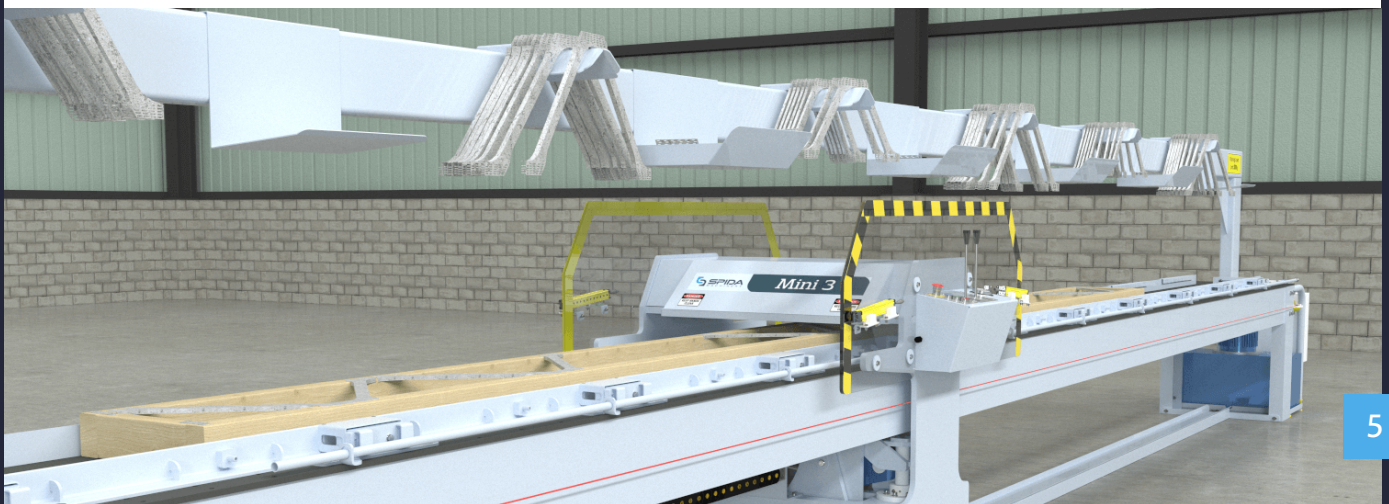
IBuilt Manufacturing

IBuilt's Auckland based manufacturing facility include pneumatic table presses for the assembly of floor trusses.

Location of chords, webs and plates are laid out on the assembly in accordance with the engineering drawing for the joist. The components are positively clamped to ensure timber members have good bearing at all contact points before being pressed together.

IBuilt's floor truss manufacturing team follow a quality assurance schedule to ensure compliance with **AS4446** Manufacture of nailplate-joined timber products is met. It includes checks such as:

- Timber condition and damage.
- Squareness of cuts.
- Nail plate locations.
- Nail plate teeth embedment.
- Joints free of defects.
- Tolerances checks for joist depth, length and straightness.





Multinail Australia Pty Ltd
ABN 79 003 999 586

Producer Statement PS1- Design

Author name :- Matthew Smith

Author company :- Multinail

To be supplied to :- Building Consent Authorities in New Zealand

Product :- MultiStrut Standard Floor Joist designs

Site :- Various Location in New Zealand

Date :- May 2021

Multinail has provided engineering design services in respect of the requirements of Clause B1 of the NZ Building Code for

☐ All ☒ Part only as specified – Standard MultiStrut floor joist designs of the proposed work.

The selection spans within this brochure have been prepared in accordance with Compliance Documents and Verification Method B1/VM1 of the NZ Building Code and in accordance with sound and widely accepted engineering principles.

On behalf of Multinail New Zealand, and subject to:

1. The verification of the design assumptions within the brochure
2. All proprietary products meeting their performance specification requirements.

I believe on reasonable grounds that the use of MultiStrut Trusses in the proposed building, if constructed in accordance with the drawings, specifications and other documents provided, will comply with the relevant provisions of the Building Code.

Multinail holds a current policy of Professional Indemnity Insurance of not less than \$500,000.

On behalf of Multinail

Matthew Smith, CMEngNZ 1007138
National Engineering Systems Manager

IBuilt MultiStrut Joists

IBuilt™ MultiStrut joist

IBuilt's MultiStrut floor joists are an open webbed parallel chord truss joist utilising steel web brackets and LVL11 top and bottom chords, and vertical webs.

IBuilt MultiStrut joists provide increased spanning capabilities over standard framing while also being lightweight and efficient to install. They are ideal for domestic construction as both joists and rafters.

The open web joist design enables building services such as plumbing, electrical and service ducting to run between the chords without the need for drilling, notching or cutting.

Large open floor plans are a common requirement in modern residential homes. With larger span capabilities the need for internal walls can be reduced.

Typical spans of up to 6m are achievable for residential floors which allows for larger open spaces or fewer structural beams.

Practical benefits

- Open web system gives almost uninterrupted access for the passage of services.
- 90mm wide flanges provide a large area for the fixing of flooring and ceiling material.
- Depth compatible with other engineered timber products.
- Supplied in 300mm increments with a trimmable end.
- Lightweight construction.
- Fast installation. Erected in approximately 50% of the time required for conventional joists.

Components of IBuilt MultiStrut joists

LVL11 Top and Bottom Chords

NZ made laminated veneer lumber (LVL) supplied by Nelson Pine, 90x35mm LVL11 chords have a higher strength:stiffness ratio and more predictable performance over sawn timber.

Nelson Pine LVL H1.2 framing is glue line treated plus surface coating with Azotek, which gives it a complete cross section treatment. LVL is an Acceptable Solution as per NZS 3640 for treatment and NZS 3604 Clause 2.3.9 for timber framing.

MultiStrut Steel Webs

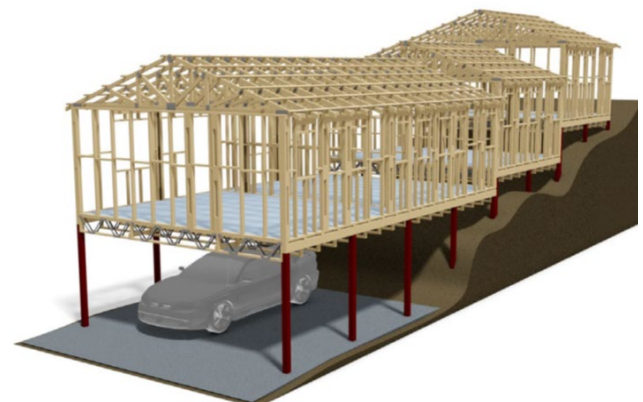
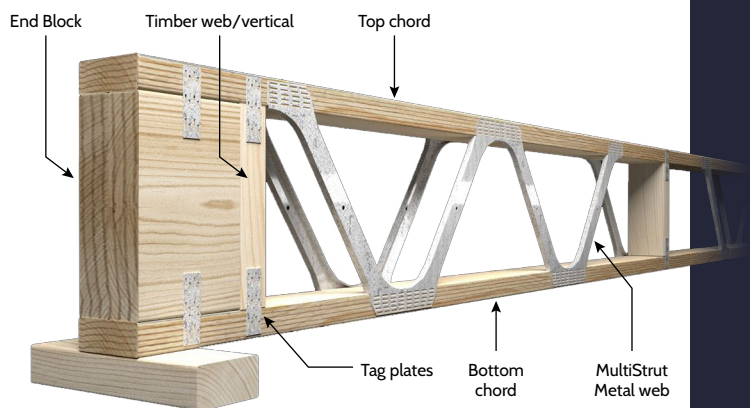
Multinail's steel webs are pre-pressed and formed for the fast and reliable manufacture of parallel chord timber floor joists and rafters. Steel webs are made from galvanised Z275 grade G300 steel to meet the requirements of NZS 3604:2011 Section 4 – Durability Table 4.2 (Galvanising of steel components).

IBuilt MultiStrut joists can be used in both midfloor and subfloor applications providing moisture levels, ventilation requirements and ground clearances for enclosed subfloors are met.

Multinail – Industry leaders since 1979

With over 40 years of history, Multinail are at the forefront of providing innovative solutions to the connector, design software and frame and truss machinery industry worldwide.

With a dedicated engineering team providing product development and support, IBuilt's new "MultiStrut" floor joists have been designed with pre fabrication in mind while also providing the need for adjustability during installation on site.



Span Tables

Design loadings

As per AS/NZS 1170

300 x 90 MAXIMUM JOIST SPAN (M)			
Floor type	MultiStrut Size	300crs	400crs
Standard floor	MSJ300	6.0	5.7
Heavy Floor	MSJ300	5.7	5.4

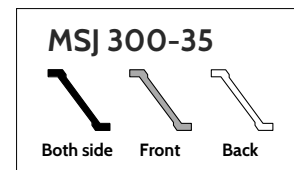
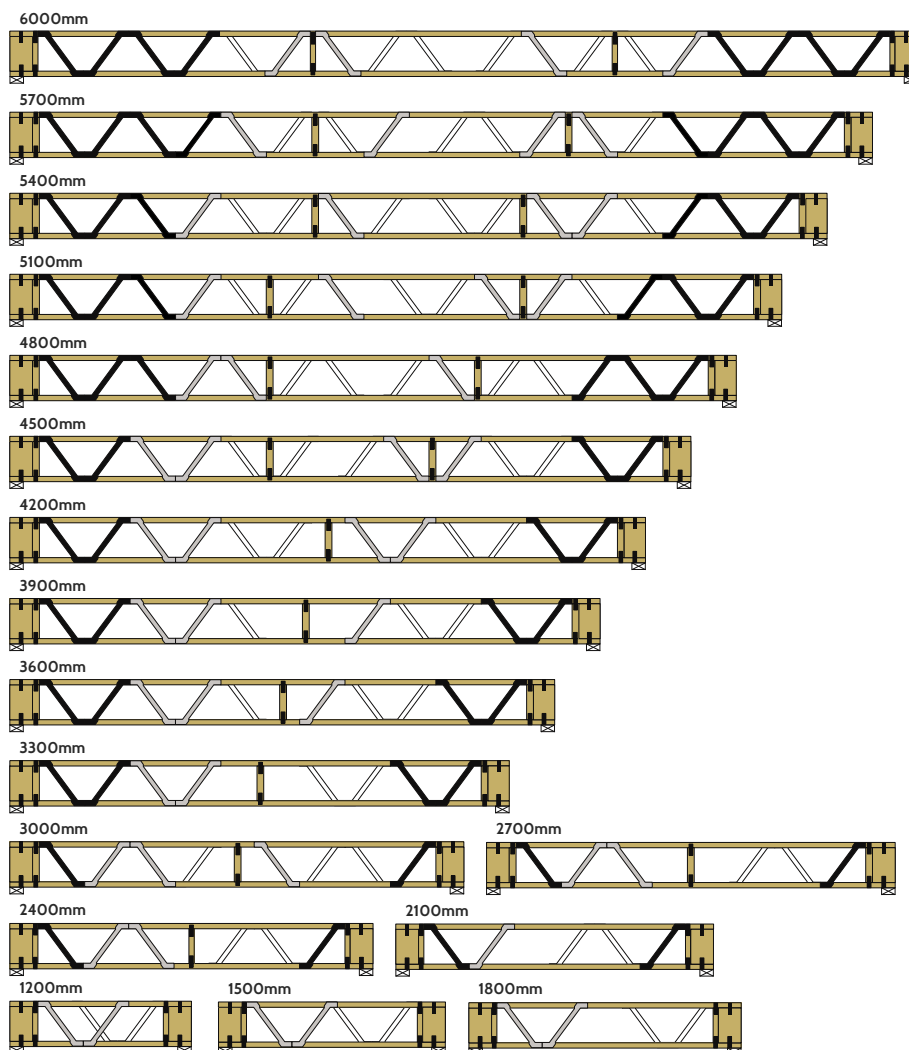
MultiStrut available in 300x90mm only.



Joist design data

- Live Load – 1.5kPa .
- Concentrated Load – 1.8kN.
- Flooring – 19-21mm plywood.
- Ceiling – 10-13mm plasterboard.
- Standard floor – 40kg/m2.
- Heavy floor – 65kg/m2 (includes standard floor + typical tile loads).
- Continuous span joists are required to be specifically detailed. (Maximum length allowable 9.6m).
- Joists supporting load bearing walls must be specific engineer designed.
- Large baths or other fixed loads may require additional support.
- Contact IBuilt (0800 022 352) for spans using alternative or heavier floor loadings.

Standard joist lengths

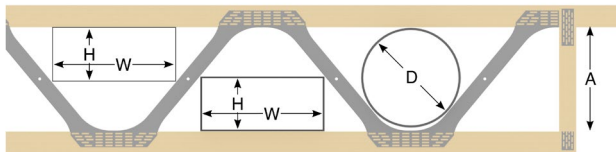
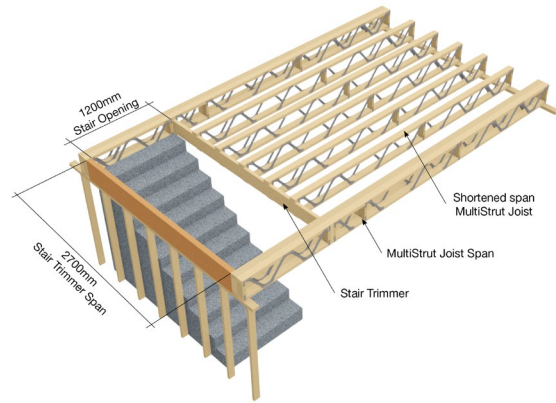


General Floor Design

Designing for openings and voids

IBuilt MultiStrut joists can be utilized as trimming members for stairwell voids and also shower openings to allow for level entry showers.

LVL or Glulam timber can also be used when the trimming member is also supporting additional loads such as load bearing walls or balustrade loads.



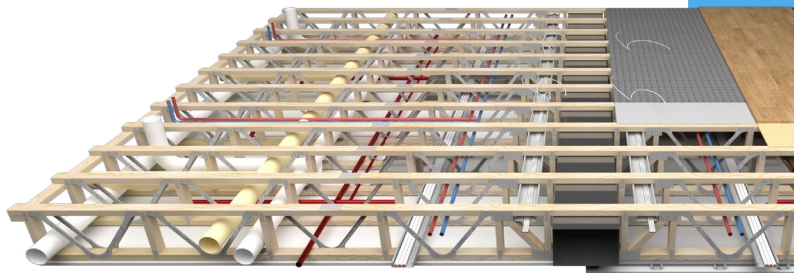
10mm min clearance required between all service lines and joist components.

Service penetrations

IBuilt MultiStrut joists are designed to allow the easy accommodation of electrical, plumbing, waste water and ducting with no cutting on site. Maximum clearances between the webs is as shown

Note: If larger opening sizes are required please contact the IBuilt technical team.

MSJ30035	
A (mm)	230
D (mm)	215
H (mm)	W (mm)
50	350
100	280
150	200
200	130



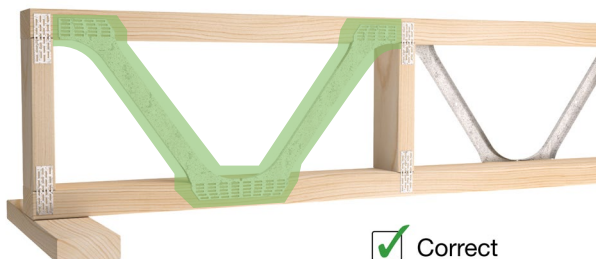
Orientation of IBuilt MultiStrut joists

Care must always be taken to ensure IBuilt MultiStrut joists are placed the correct way up to ensure their structural integrity is maintained.

Joists are always designed and manufactured so that the metal web starts at the top chord at each bearing point. During manufacture the joists are marked showing the correct orientation.

Note: If joists are installed incorrectly please contact IBuilt for remedial advice on 0800 022 352.

Bracket to start at top support

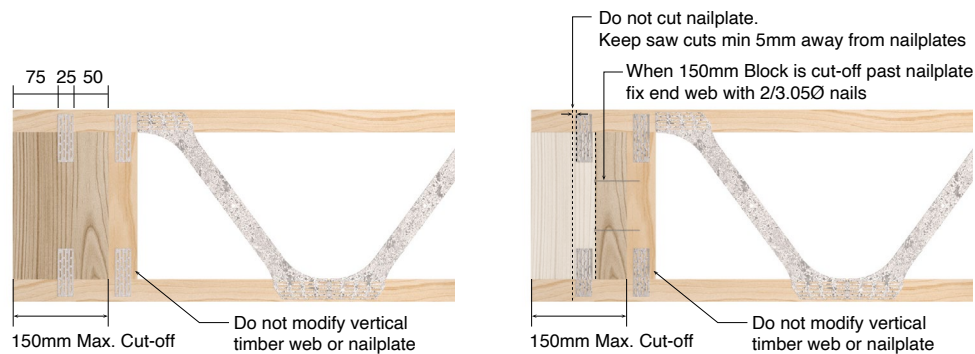


End trimming allowance

IBuilt MultiStrut joists have been engineered to allow a trimmable end to allow for on site framing variations.

Joists are supplied to site as a set length (increments of 300mm) so that end trimming can be carried out on site as needed.

Note: 90x35 Timber web must not be removed, notched or cut.



Note: If remaining block is less than 25mm the block piece is not required.

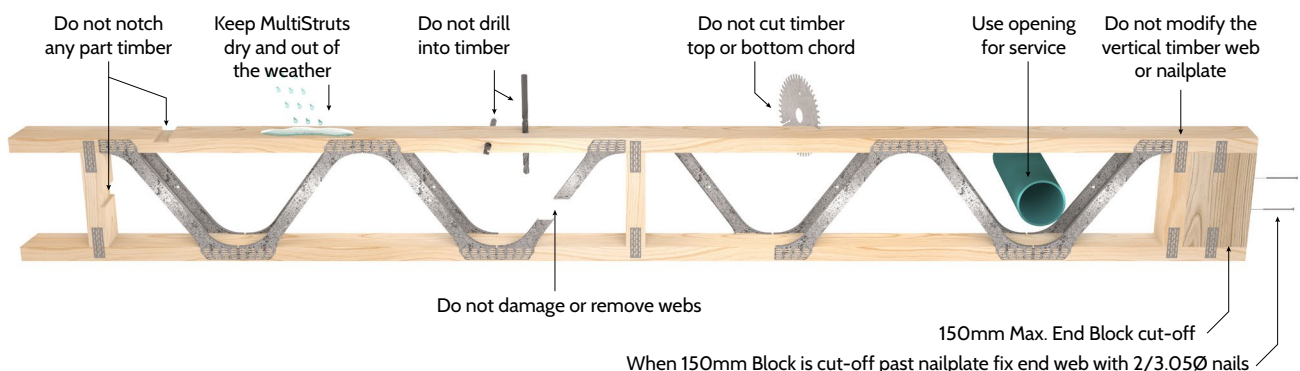
Alterations to webs or chords

Modifications to IBuilt MultiStrut joists are not permitted as it can affect the structural integrity of the joist.

Types of modifications not permitted:

- Cutting or bending of metal webs.
- Removal of any metal webs or nail plates.
- Holes in top or bottom chords from wastes pipes.
- Notches of any kind in top or bottom chords.
- Cutting of any timber component.

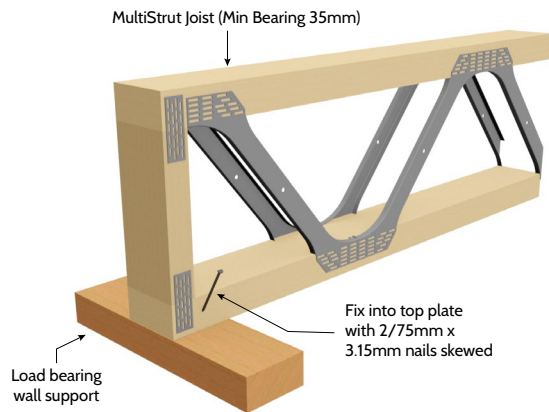
Joists should be positioned to avoid waste pipes from upper fixtures such as showers & WC etc.



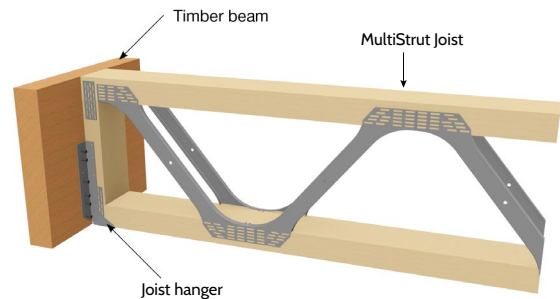
Should the MultiStrut get damaged in any way please contact IBuilt on [0800 022 352](tel:0800 022 352) for a remedial solution.

Typical Installation Details

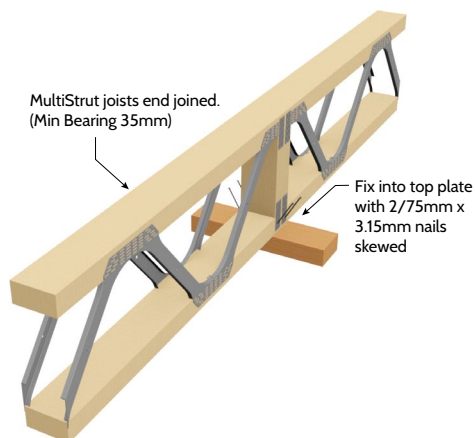
Fixing to wall top plate



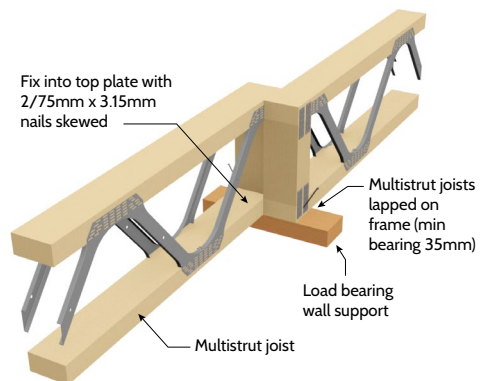
Joist hanger



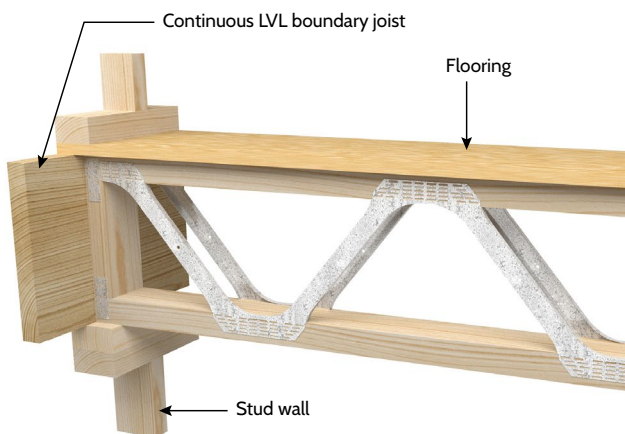
Fixing to internal walls (butt join)



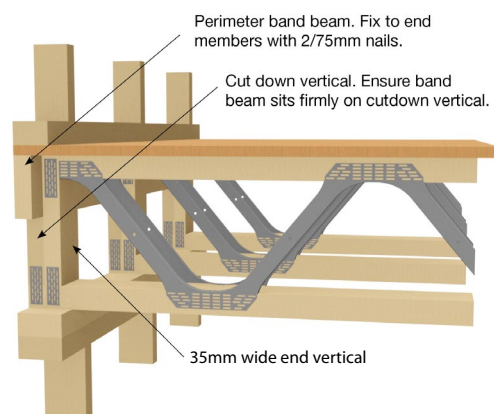
Fixing to internal walls (lap join)



Fixing to exterior wall frame - A (continuous boundary joist)



Fixing to exterior wall frame - B (continuous band beam)

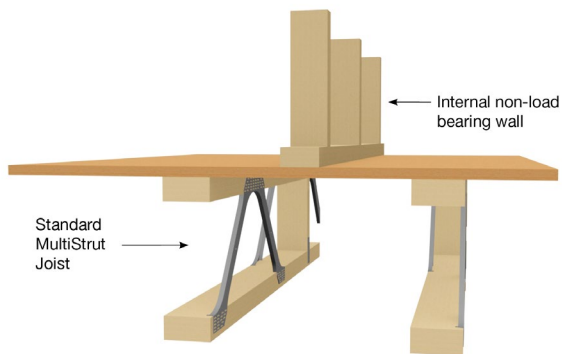


Typical Installation Details

Walls parallel to joists

Internal non-load bearing walls spaced between IBuilt MultiStrut joists do not require additional support.

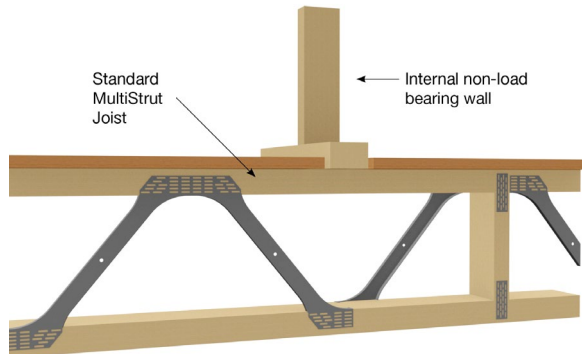
Note: 90x45 SG8 nogging on flat is acceptable if required. Fix with min 2/70mm x 3.15mm nails skewed into top chord.



Walls perpendicular to joists

Internal non-load bearing walls spaced between joists do not require additional support.

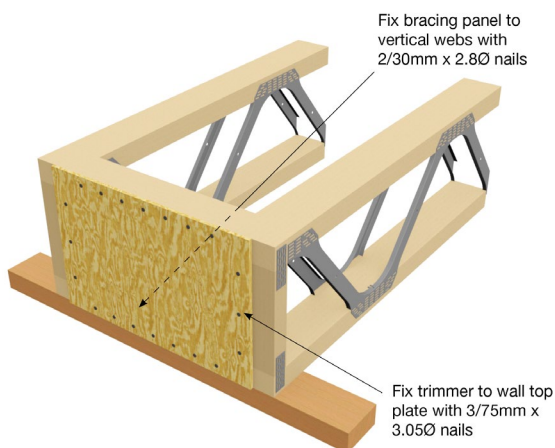
Note: Fix bottom plate of wall to joist with min 2/70mm x 3.15mm nails.



Blocking

Bracing panel or solid LVL nog skew nailed top and bottom between joists.

Note: Midspan solid blocking is not required for joists.



Strongback Support

What is a strongback?

Strongbacks are timber members installed within the IBuilt MultiStrut joists at right angles. Those structural elements are used to dampen the vibrations by increasing the stiffness of the floor system and reducing the deflection via load sharing.

Proper installation of strongbacks together with flooring material at a later stage will provide adequate lateral bracing and support for floor diaphragm.

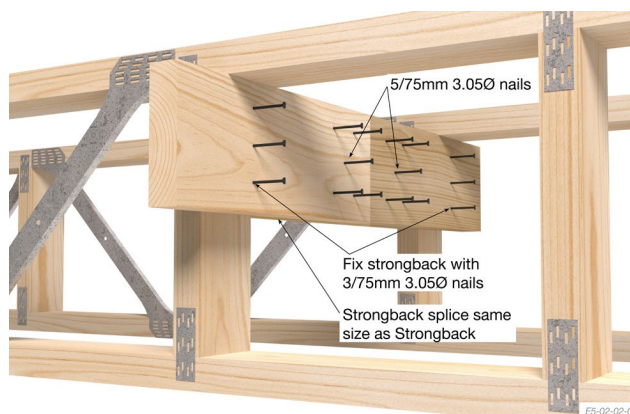


Recommended strongback size

Recommended strongback size is minimum 140x45mm SG8

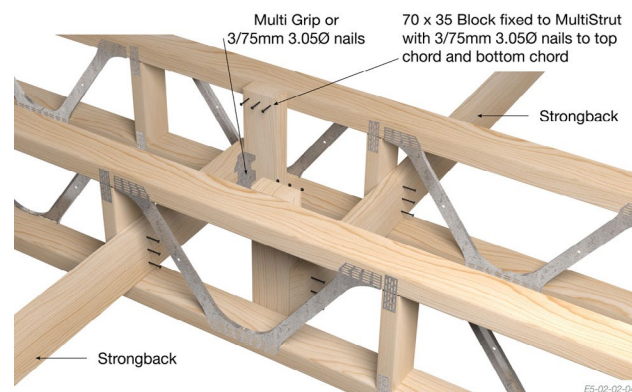
Fixing & splicing

Strongback must be fixed to the vertical webs at maximum 2400mm centres in each MultiStrut with 3/75mm x Ø3.05 nails or 2/65mm Multinail Green Tip #12 Screws. Follow Figure 1 or 2 for splicing details. Strongback can be located on underside of top chord as an alternative.



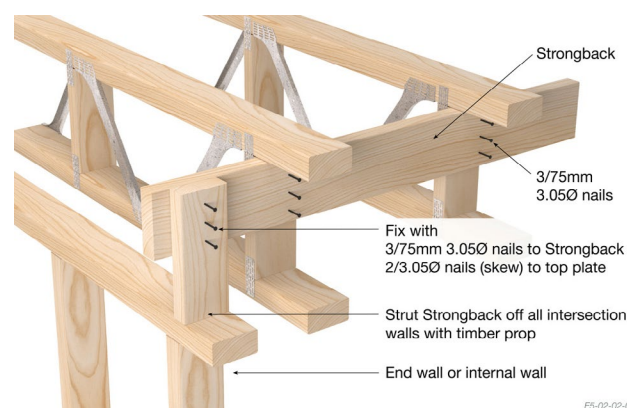
Strongbacks connection when change of span

When Strongbacks at the location where change of span happens due to different webbing configuration of MultiStrut, follow Figure below to ensure the continuity of Strongbacks.



Strongbacks strutting

It is recommended to have Strongbacks strutted at end walls and any internal walls run perpendicular to them.



Handling and Storage

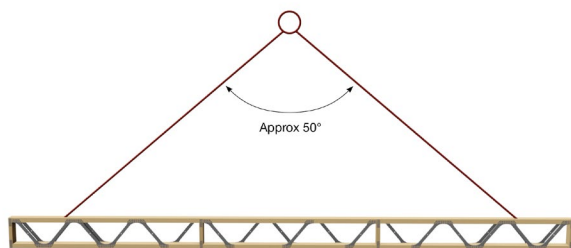
Lifting and transport

IBuilt Multistrut joist may be lifted in a single unit or in packs but care should be taken to avoid twisting, bending, dropping or knocking against adjacent structure.

Slings should always be attached to the timber chords where a panel point occurs.

If using a forklift to move packs of joists do not place tynes through joists as it may damage the steel webs.

Slings must not be attached to steel webs.

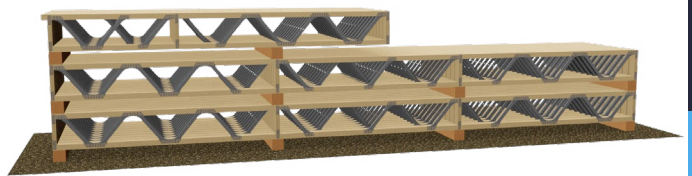


Storage on site

IBuilt MultiStrut joist should be strapped with steel or plastic bands.

Joists may be stacked vertically or horizontally but in both cases the chords should be clear of the ground and supported on bearer which are to be located directly under the web points.

Prior to installation joists should not be left exposed to the weather for extended periods without protection. This protection must ensure adequate air circulation.

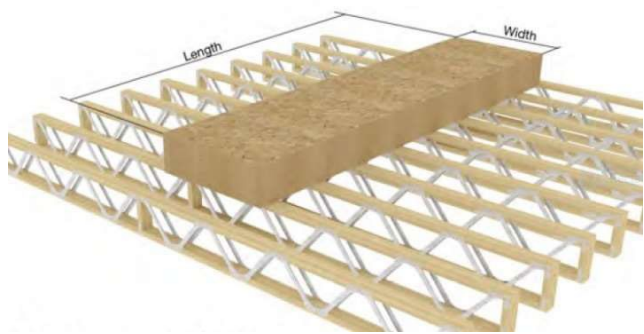
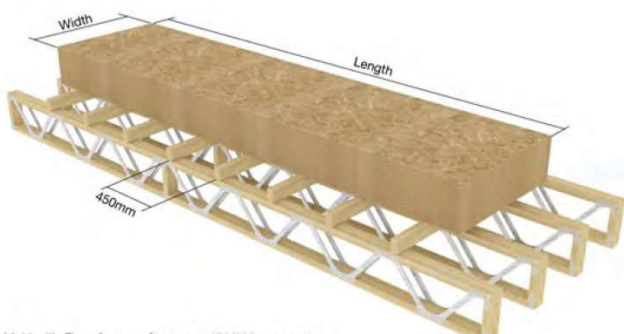


Storage of construction materials

Storage of materials on floor trusses during constructions is to be a maximum of 150kg/m², which is based on 1.5kPa typical floor live loads.

Ideally stacks of material must be placed directly over load bearing walls.

Where this is not possible material is to be supported on min 90x45 SG6 grade bearers at 450mm crs over a maximum of 4 floor trusses, or when perpendicular the material can load directly on the joists.



MAXIMUM LOAD FOR PRODUCT TYPE

Sheeting	Standard size
19mm Particleboard Flooring	12 sheets
22mm Particleboard Flooring	10 sheets
25mm Particleboard Flooring	7 sheets
10mm Plasterboard	20 sheets
13mm Plasterboard	17 sheets

Safety:

- Never walk on wrapped or unwrapped bundles.
- Do not walk on the joists until they are full installed or correctly braced, joists are unstable until braced laterally.
- During installation, a minimum of 90x45mm temporary bracing at 2.4m crs max is required.
- Only remove the bracing as the sheathing is being attached.
- Never overload joists with loads that exceed design limits.
- Stack building materials over walls or main beams only.
- Do not use joists as ramps, planks or walkways.
- Brace each joist as it is erected.
- All hangers, rimboards and blocking at the end supports of the joists must be installed and nailed properly.

The above are general recommendations and in some cases additional precautions may be required

On site:

Joists should be inspected on arrival at site to ensure no damage has occurred in transit and unloading. Any damaged joists should be reported immediately.

MultiStrut joists can withstand normal levels of wetting during construction, however should not be exposed for extended periods of time as this will increase the potential for nail-plate withdrawal due to wet/dry weather cycles. If any metal connectors are showing signs of withdrawal please contact IBuilt in the first instance for rectification advice.

DO NOT LOAD any joists where nail-plates are exhibiting withdrawal (i.e. more than 1mm gap between nail-plate and timber surface).

DO NOT re-hammer nail-plates on site without prior approval.

DO NOT use joists that are showing signs of damage to either timber chords or metal webs.



NZWOOD

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