futurebuild® LVL

OPTIMISING THE USE OF designIT® FOR HOUSES

FUTUREBUILD® PRODUCTS

FUTUREBUILD® SOFTWARE

FUTUREBUILD® SERVICES

OPTIMISING THE USE OF designIT® FOR HOUSES

A GUIDE FOR DESIGNERS

designIT® for Houses was developed to provide designers a quick and easy way to determine the size and grade of the Futurebuild® Laminated Veneer Lumber (LVL) range of products for members in houses, including floor joists, rafters, lintels and roof beams. The intent was to provide a software based solution, certified by Carter Holt Harvey (CHH) LVL Ltd, that allowed designers to use familiar terminology from NZS 3604, Timber Framed Buildings, to design structural members without the need for specific engineering judgement.

Since the release of designIT in 1999 there has been continual development and increased scope of solutions, including the introduction of floor joist and bearer calculators to enhance the design options, whilst continuing to use terminology familiar to NZS 3604 users.

DESIGN PHILOSOPHY

designIT® uses engineering design methodologies in accordance with Verification Method B1/VM1, 6.1 NZS 3603 Timber Structures to determine deflection, strength and reaction information for isolated members such as a floor joists, rafters, lintels and other common timber framing elements in houses. designIT typically considers only vertical loads in consideration of member design, where interaction with other framing elements provide lateral and torsional support. Members sized using designIT for houses, will provide "a system to resist vertical loads" as per NZS 3604 Clause 8.1.1.

Similar to NZS 3604, the overall structural stability of the building, including resistance to horizontal loads such as lateral and longitudinal wind and earthquake loading, is transferred through the wall framing, sills, wall plate, etc. together with the associated diaphragms and bracing.

Information provided should only be considered a general guide and is specific to the Futurebuild® LVL range of LVL products and cannot be used with any other LVL products no matter how similar they may appear.

For further information contact our technical team on 0800 585 244 or visit www.chhsoftware.co.nz.

SEP 2019

SPECIFICATION

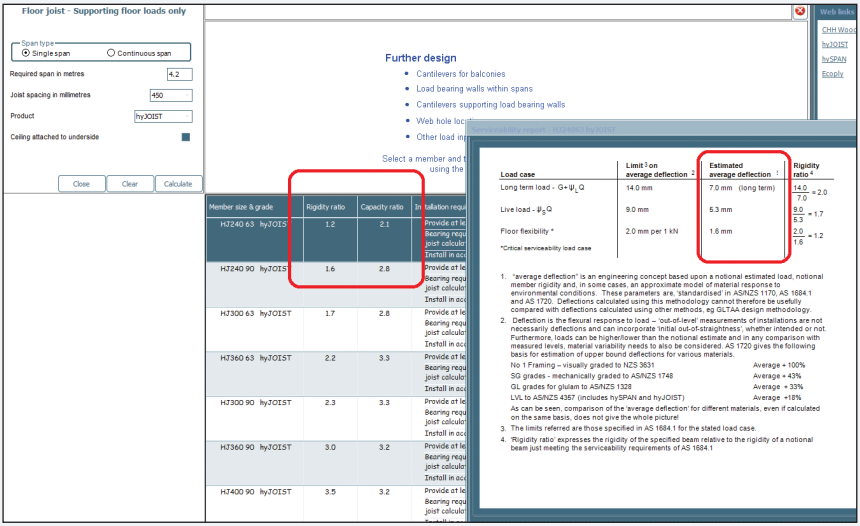
designIT for Houses uses the concept of rigidity and capacity ratio's together with readily available serviceability data to allow designers to make informed decisions around product selection, refer Figure 1.

designIT will not allow users to select section sizes that do not meet the minimum strength requirements.

Using limits on average deflection based on Australian Standard AS 1720.3 (Timber structures - Design criteria for timber-framed residential buildings) designers are presented with solutions that will meet or exceed these requirements. These limits have been developed over, and applied for, decades within house framing in Australasia. Designers are presented with calculated estimated average deflections to select member sizes based on customer requirements.

The design methodology applied in designIT uses the most up to date information available from Australian/ New Zealand standards to ensure designIT solutions correspond with performance levels of design solutions given in NZS 3604:2011.

Figure 1: Rigidity and Capacity Ratio's and Estimated Average Deflection



TIE-DOWN AND SUPPORT

designIT for Houses determines minimum bearing requirements and calculates the reactions relative to their respective load cases, it also provides specific tie-down and support details for hyJOIST. As a composite plywood/LVL member, hyJOIST has differing support and tie-down requirements to suit the nature of the beam. These details form part of the Installation Details section in designIT and are specific to the calculated capacity, refer Figure 2.

Solid sections including hySPAN, hyONE and hy90, can be considered similar to SG sections (Futurebuild LVL can be considered Joint Group J5 as a minimum) where reactions are provided and designers can select tie-downs from NZS 3604 Table 10.1 relative to fixing capacity (i.e. Type E = 4.7 kN, and Type F = 7.0 kN) or alternatively Table 2.2 – Fixing and capacity reference guide as applicable. These fixing capacities can then be compared to the reaction provided by designIT for uplift (0.9G+Wu), refer Figure 3, where positive (+) values represent uplift. Minimum bearing is also provided for all members as applicable.

Manufacturers of timber connectors like Mitek and Pryda may also have alternative solutions for tie-downs of rafters, lintels, wall plates or similar. These solutions can be specified in accordance with proprietary details based on required uplift provided by designIT.

Where manufacturers of timber connectors provide Characteristic values for their bracketry, the capacity of the connector should be determined in accordance with NZS 3604 Clause 2.4.7 Connector capacity and durability. The Reaction Report in designIT provides the duration of load factor noted as k_1.

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Figure 2: hyJOIST Support and Tie-Down

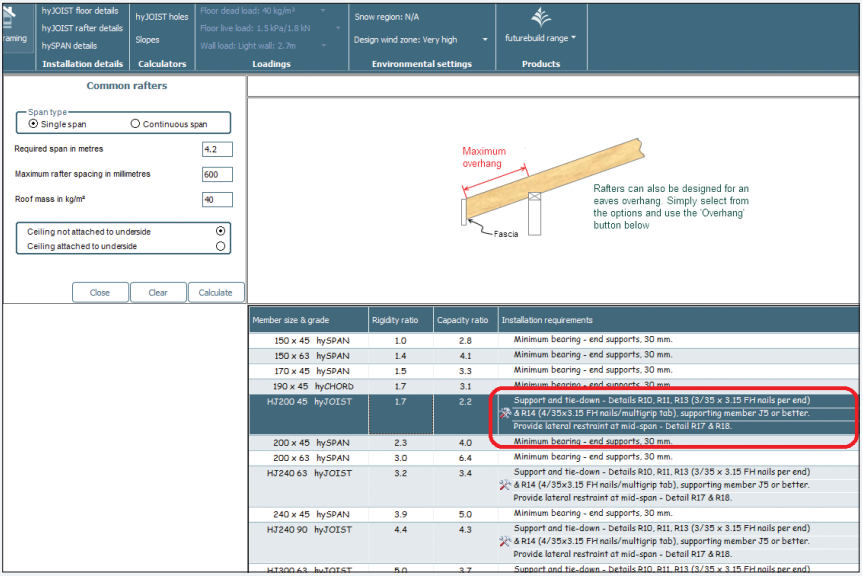
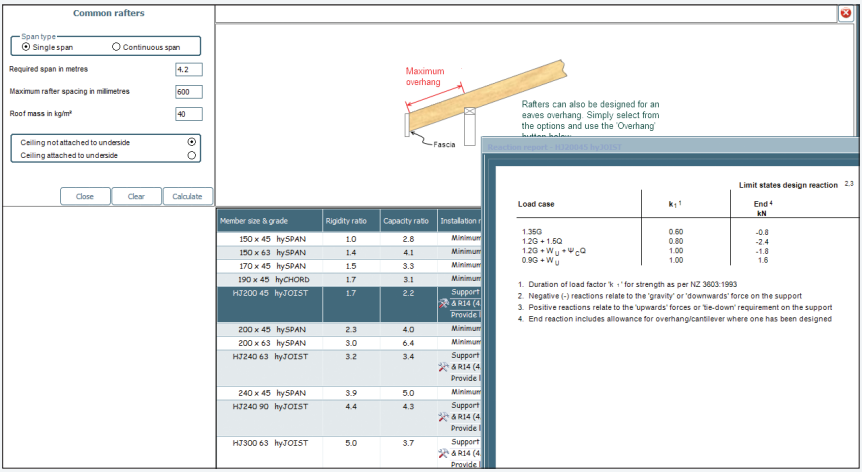


Figure 3: Reaction Report



DURABILITY REQUIREMENTS

Futurebuild LVL and SG8 components, when used and treated to the required treatment levels prescribed in NZS 3602 Timber and Wood-based Products for Use in Building (NZS 3602) and NZS 3604, will form part of an Acceptable Solution and comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

The following guidance is provided for LVL in relation to NZS 3602:

- Futurebuild LVL can be applied untreated in situations where it is protected from weather (with no risk of moisture penetration conducive to decay) i.e. mid floors, sub floors, etc. This is identified in Sections C and E of Table 1 of NZS 3602.
- With regard to treated LVL, citing of NZS 3604:2011 Clause B2/AS1 dictates that if LVL is not specifically referred to in NZS 3602 the LVL shall be preservative treated to the same level as that required in Clause B2/AS1 of the New Zealand Building Code for kiln dried Radiata Pine. Clause B2/AS1 allows for treatment to be to a H1.2 level in most cases. This includes situations covered by B2/AS1 Table 1A Section D, "Members protected from the weather but with a risk of moisture penetration conducive to decay," where H1.2 is specified for Radiata Pine. This would include, for example, enclosed external framing situations including lintels, studs, boundary joists, etc.

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DESIGN CERTIFICATE & PRODUCER STATEMENT

designIT for Houses provides a Design Certificate for job specific application of the software by a designer having knowledge of common building practice and terminology applied in NZS 3604. designIT also includes a site specific Producer Statement certifying the software itself. These documents may be used to assist in meeting the requirements of the New Zealand Building Code.

The Design Certificate and Producer Statement are provided as separate documents to reflect the roles and responsibilities of member design using designIT. Whilst CHH LVL Ltd certify the output of the program, the software is reliant on the user to input the appropriate design parameters. designIT, based on the inputted parameters, then calculates and provides design solutions together with any relevant installation requirements that are not covered by NZS 3604 and good building practice. Using the design information provided by designIT, including rigidity and capacity ratio, a user can make an informed decision about the appropriate size for specification.

designIT®
FOR HOUSES

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ON-SITE SUPPORT

Futurebuild® LVL provides designers, architects and engineers with software and solutions to aid in the development of cost-effective, fit for purpose structural solutions.

The Futurebuild LVL offer includes on-site support through literature in the form of the Futurebuild LVL Residential Design Guide, as well as the free designIT site app. The app provides designers and builders with access to details, a web hole location calculator and joist, bearer and lintel sizing options (refer Figures 4, 5 and 6). Download the designIT Site app from the Apple App store and Google Play store.

Our in-house Architectural Designers, Engineers and ex. Builders are also available to provide design and installation support - call 0800 585 244 or contact us via our website.

designIT® Site App

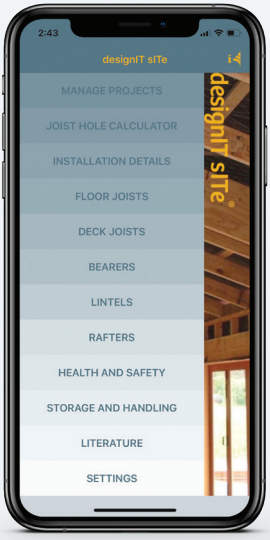

Figure 4

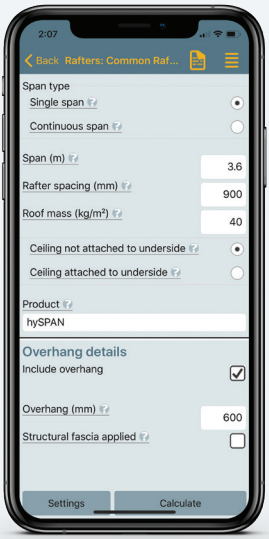

Figure 5

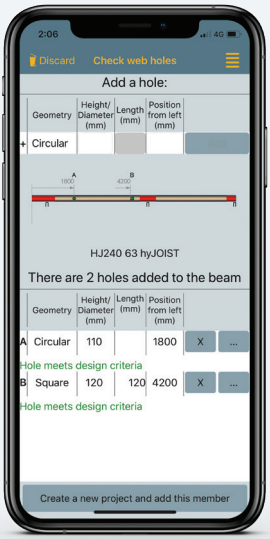

Figure 6

SOFTWARE

Our Futurebuild® LVL Software Solutions include specification software for both residential and non-residential structural systems. This software enables designers and engineers, even those unfamiliar with the specifics of timber engineering, to produce high quality and reliable specifications using engineered wood products. Futurebuild LVL software solutions include:

Residential Software

designIT® HOUSES

designIT® for Houses is a software tool for all building practitioners for designing with Futurebuild LVL range of engineered wood products and other selected materials for houses and similar structures. designIT for Houses enables a wide range of applications to be considered, including floor joists, bearers, lintels, etc without the need for the exercise of professional engineering judgment.

designIT® HOUSES-SITE APP

A handy tool for tradesmen using Futurebuild LVL products. Use the App to access installation details, a floor joist and hole calculator and more; on-site, anytime, anywhere.

Non Residential Software

designIT® COMMERCIAL FLOORS

designIT® for Commercial Floors is a software tool for all building practitioners for designing with the Futurebuild LVL range of engineered wood products and other selected materials in commercial, industrial and other heavily loaded floors.

computeIT®

The computeIT® software suite is designed to aid in the specification of heavy structural members in non-residential structural systems. It includes two software packages; computeIT for beams and computeIT toolkIT.

computeIT® BEAMS

computeIT® for Beams is an all-purpose beam analysis package that enables engineers to develop design solutions for a range of engineered wood products.

computeIT® TOOLKIT

computeIT® toolkIT is a series of design tools allowing quick and easy design of beams, columns, rigid moment connections, purlins and girts.

slabIT® SITE APP

slabIT® site is an app for the design of truFORM and gripFORM members for use as joists and bearers for forming slab soffits.

futurebuild® LVL

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HOUSES