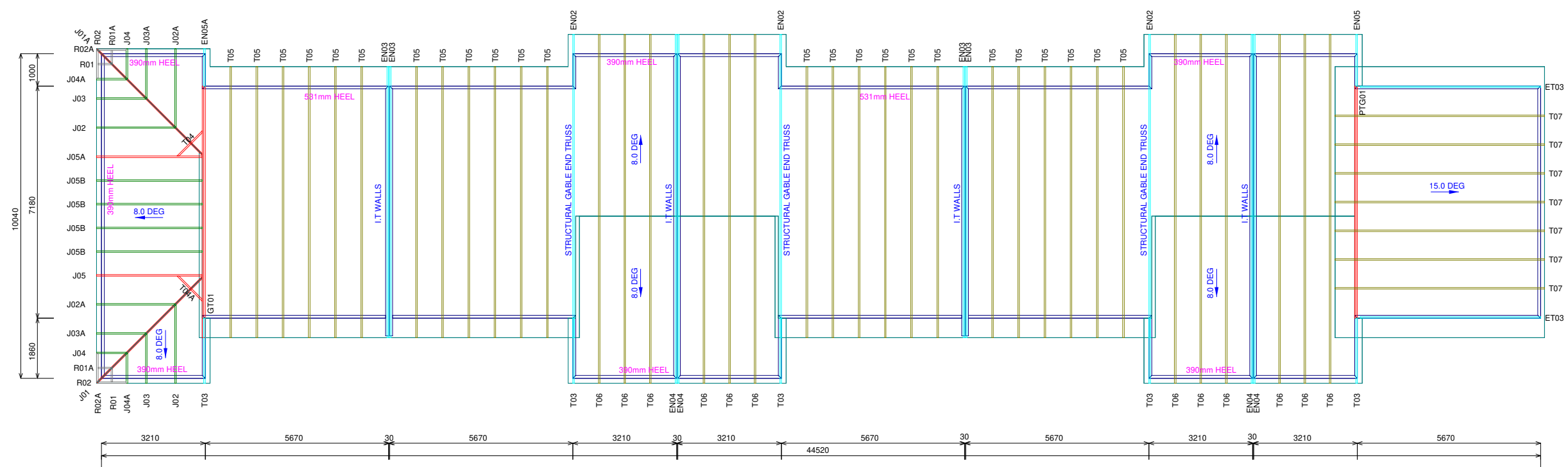


Three detailed cross-sections of the building facade are shown, illustrating the structural elements and dimensions. The sections are labeled ET01, T01B, T01, T02, and ET02A. The dimensions are 3320, 1460, 1860, 4300, 5380, and 1080. The annotations include 'FLOOR BEAM/JOIST', '240mm HEEL', '8.0 DEG', and 'L.T. WALLS'.

## LOWER ROOF



## I.T WALLS = INTERTENANCY WALLS



Site Address :  
GT Homes - Townhouse  
Development  
76 Pererika Street  
Victoria, Rotorua

Sheet Title :  
**For Building Consent  
Buildable Truss Layout**

Date : 14 Apr,2021	Drawn : Hoang Duong
Scale : 1: 150	System : MiTek 20/20

Job Details:	
Roof Pitch	: 8.0 & 15.0 Deg
Roof Material	: Longrun Iron .55mm
Ceiling Material	: Gib Board 13mm
Wind Zone	: Low
Roof Snow Load	: 0.000 kPa

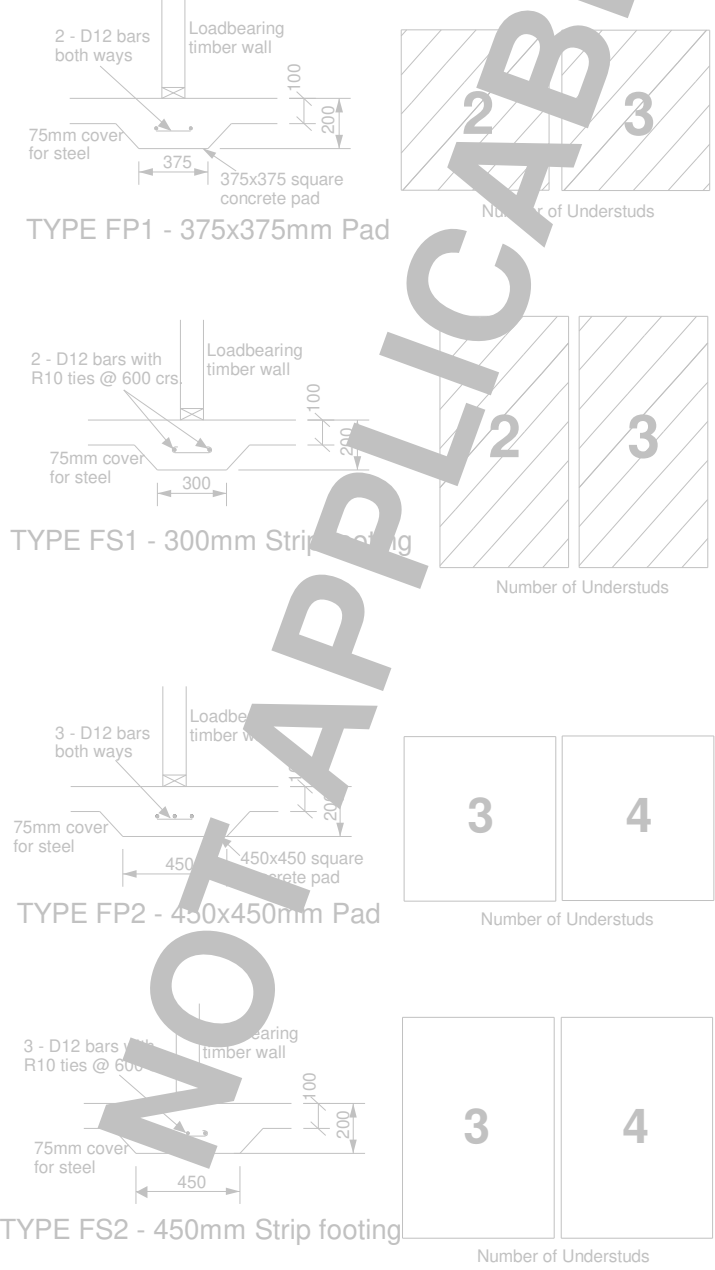
Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 32.0 m/s



Job Title :	BL204251
Sheet :	1
Revision Number :	

# Slab Thickening Details

Layout is null and void if trusses not supplied by PlaceMakers

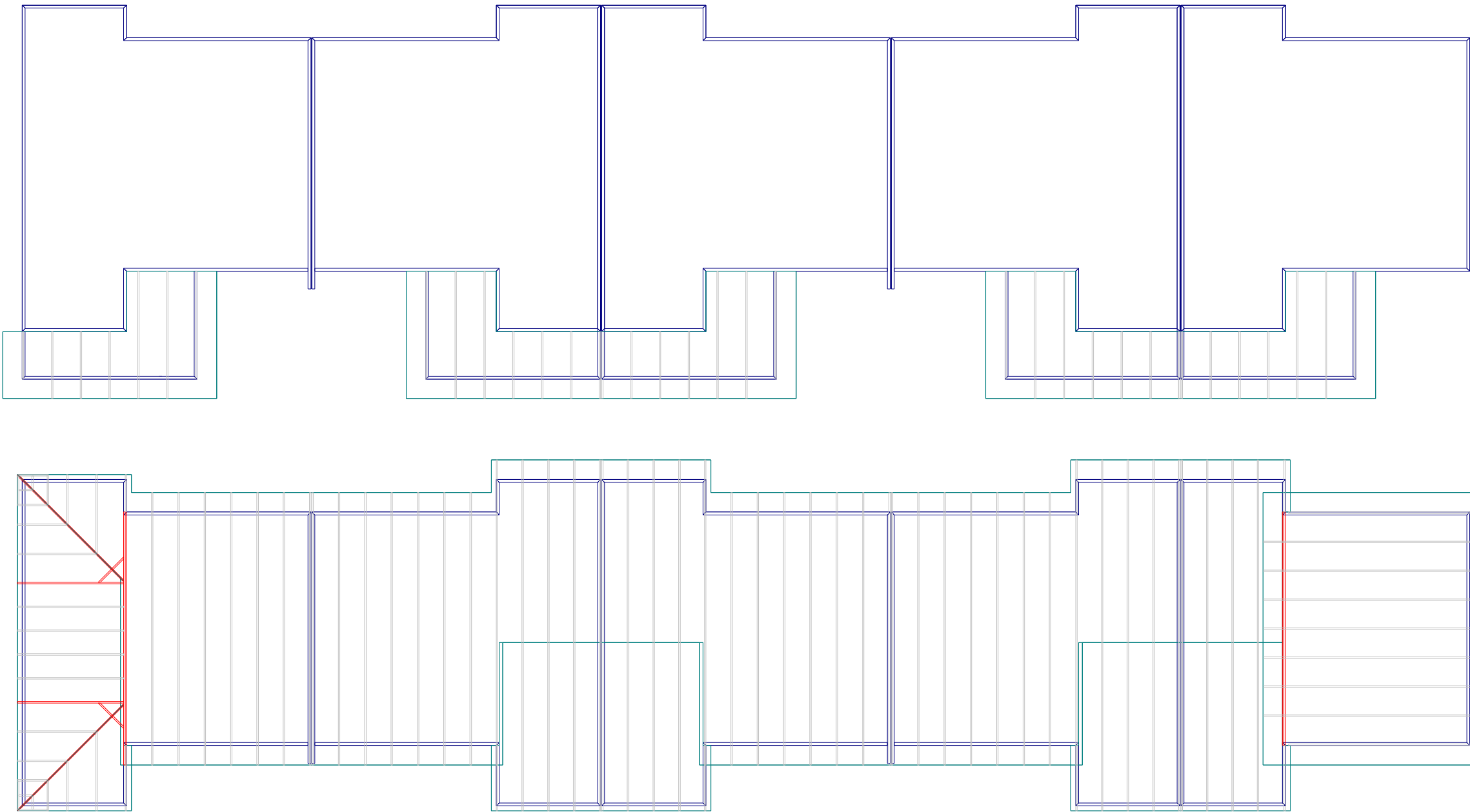


**NOTES:**

All point loads exceeding 8.0kN are indicated.

All walls shown to be considered load bearing.

Refer to Rib-raft floor design for slab thickening.



**APPROVED BUILDING CONSENT**  
**BC82325**  
**Date: 27/10/2021**  
**Page: 2 of 28**  
**Rotorua Lakes Council**



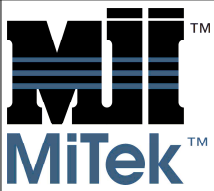
Site Address :  
GT Homes - Townhouse  
Development  
76 Pererika Street  
Victoria, Rotorua

Sheet Title :  
**For Building Consent  
Slab Thickening**

Date : 14 Apr,2021	Drawn : Hoang Duong
Scale : 1: 150	System : MiTek 20/20

Job Details:  
Roof Pitch : 8.0 & 15.0 Deg  
Roof Material : Longrun Iron .55mm  
Ceiling Material : Gib Board 13mm  
Wind Zone : Low  
Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 32.0 m/s



Job Title :  
**BL204251**

Sheet : <b>2</b>
Revision Number :

PrimeCad v4.7.346

# Lintel Fixing Details

TYPE E  
1.4kN

TYPE F  
4.0kN

TYPE G  
7.5kN

TYPE H  
13.5kN

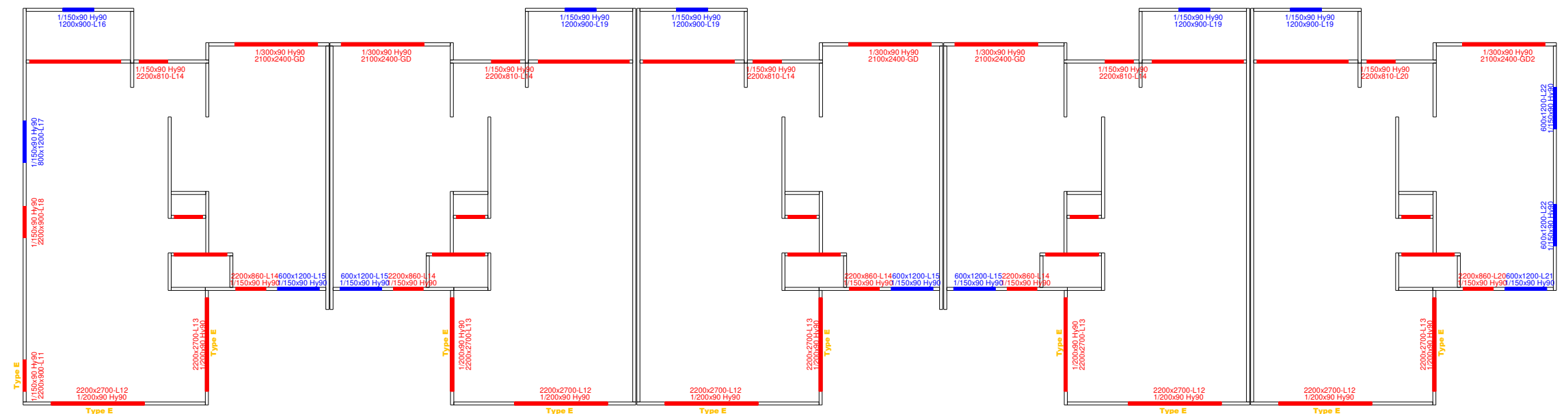
**APPROVED BUILDING CONSENT**  
**BC82325**  
**Date: 27/10/2021**  
**Page: 3 of 28**  
**Rotorua Lakes Council**

**NOTES:**

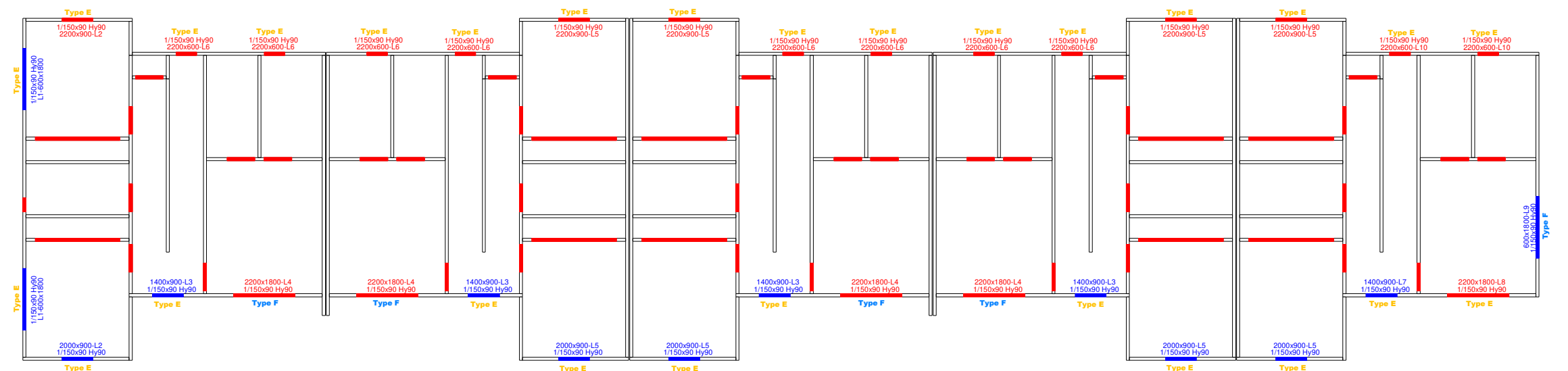
Refer to:  
 Lintel Fixing Schedule 01/2018  
 pages 73 & 74, Structural Fixings  
 On-site Guide for Building Code  
 Compliance 2018 Edition

(Alternative to NZS 3604:2011  
Table 8.14 & Figure 8.12)

Layout is null and void if trusses not supplied by PlaceMakers



## GROUND FLOOR



## FIRST FLOOR



Site Address :  
GT Homes - Townhouse  
Development  
76 Pererika Street  
Victoria, Rotorua

Sheet Title :  
**For Building Consent  
Lintel Fixing**

Date : 14 Apr,2021	Drawn : Hoang Duong
Scale : 1: 150	System : MiTek 20/20

Job Details:
--------------

Roof Pitch	: 8.0 & 15.0 Deg
Roof Material	: Longrun Iron .55mm
Ceiling Material	: Gib Board 13mm
Wind Zone	: Low
Roof Snow Load	: 0.000 kPa

Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 32.0 m/s



PrimeCad v4.7.346

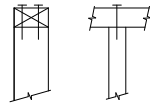
Job Title :  
**BL204251**  
Sheet :  
**3**  
Revision Number :

# Stud to top plate fixing details

Type A is minimum fixing required  
unless specified otherwise

**FIXING TYPE A**  
0.7kN

2/90x3.33 plain steel wire  
nails driven vertically into  
stud.

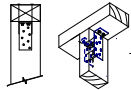


**FIXING TYPE B**  
4.7kN

2 x 90mm x 3.15 dia. plain steel wire nails driven  
vertically into stud.

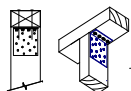
AND

Plus 2x LUMBERLOK  
CPC40



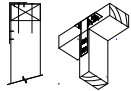
OR

Plus LUMBERLOK  
6 kN Stud Anchor  
(CPC80)

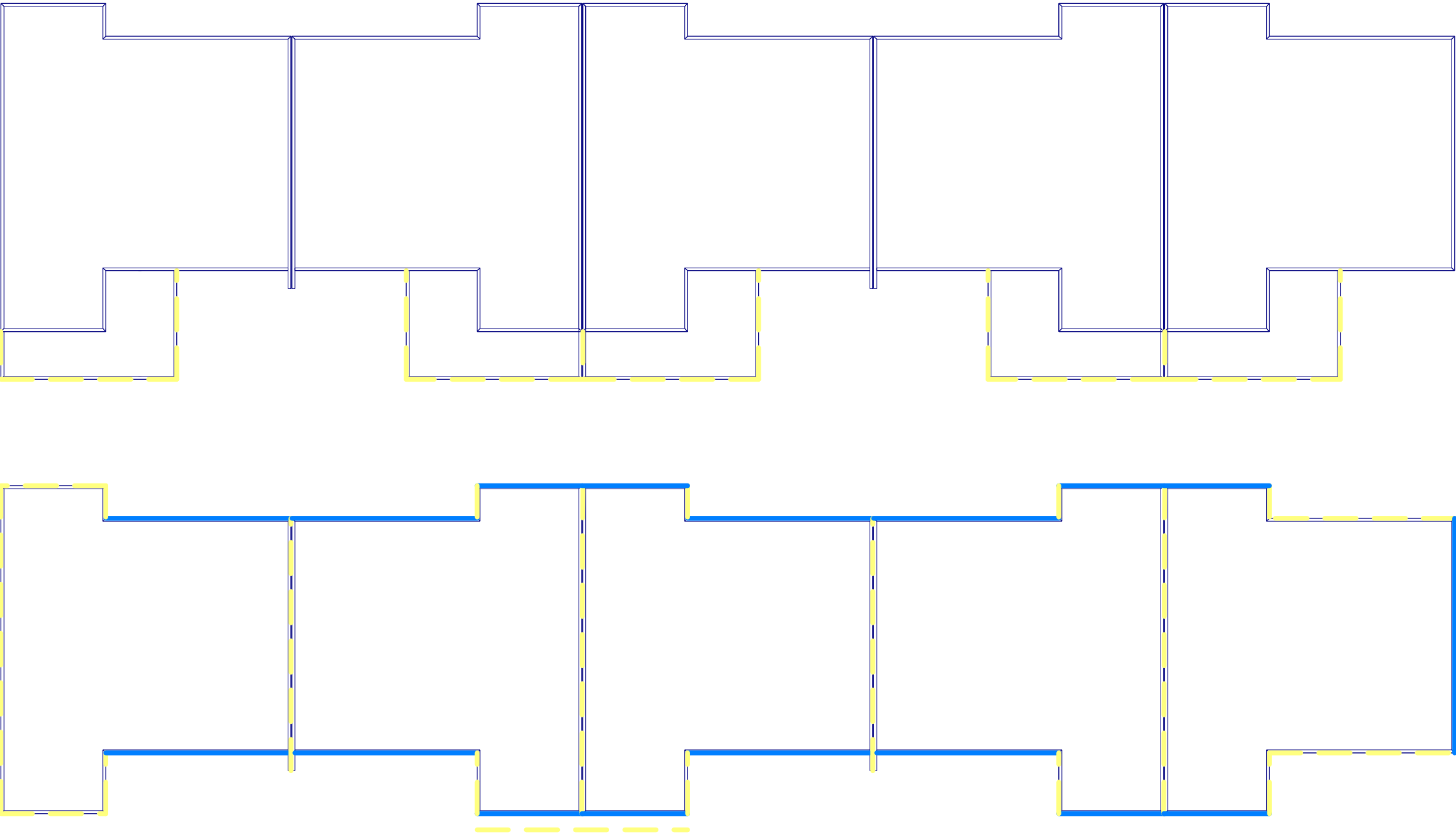


OR

Plus LUMBERLOK  
Stud Strap  
(One face only)



Recommended for  
internal wall  
options to  
avoid lining issues.



Layout is null and void if trusses not supplied by PlaceMakers

**APPROVED BUILDING CONSENT**  
**BC82325**  
**Date: 27/10/2021**  
**Page: 4 of 28**  
**Rotorua Lakes Council**

## NOTES:

Refer to:  
LUMBERLOK Wall Fixing Chart - Stud to Top Plate  
Fixing Schedule 09/2011

(Alternative to NZS3604:2011 Table 8.18)

**PlaceMakers**  
Know how. Can do.

Site Address :  
GT Homes - Townhouse  
Development  
76 Pererika Street  
Victoria, Rotorua

Sheet Title :  
**For Building Consent  
Stud To Top Plate Fixing**

Date : 14 Apr,2021 Drawn : Hoang Duong  
Scale : 1: 150 System : MiTek 20/20

Job Details:  
Roof Pitch : 8.0 & 15.0 Deg  
Roof Material : Longrun Iron .55mm  
Ceiling Material : Gib Board 13mm  
Wind Zone : Low  
Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 32.0 m/s

**MiTek**  
MiTek

PrimeCad v4.7.346

Job Title :  
**BL204251**  
Sheet :  
**4**  
Revision Number :

# Truss Fixings



X - LUMBERLOK JH47x90 Joist Hanger



Z - LUMBERLOK JH47x120 Joist Hanger



P - LUMBERLOK JH47x190 Joist Hanger



E - LUMBERLOK JH95x165 Joist Hanger



O - Pair of LUMBERLOK CT200 Ceiling Ties



H - LUMBERLOK CT400 Cyclone Tie



B - LUMBERLOK CT600 Cyclone Tie



M - Pair of LUMBERLOK Multi Grips



NP - LUMBERLOK Nailon Plate



N - LUMBERLOK N21 Diagonal Cleat



W - Pair of LUMBERLOK CPC40 Cleats

K - LUMBERLOK TTP 16kN Truss to Top Plate set

G - LUMBERLOK TTP 9kN Truss to Top Plate set

Layout is null and void if trusses not supplied by PlaceMakers

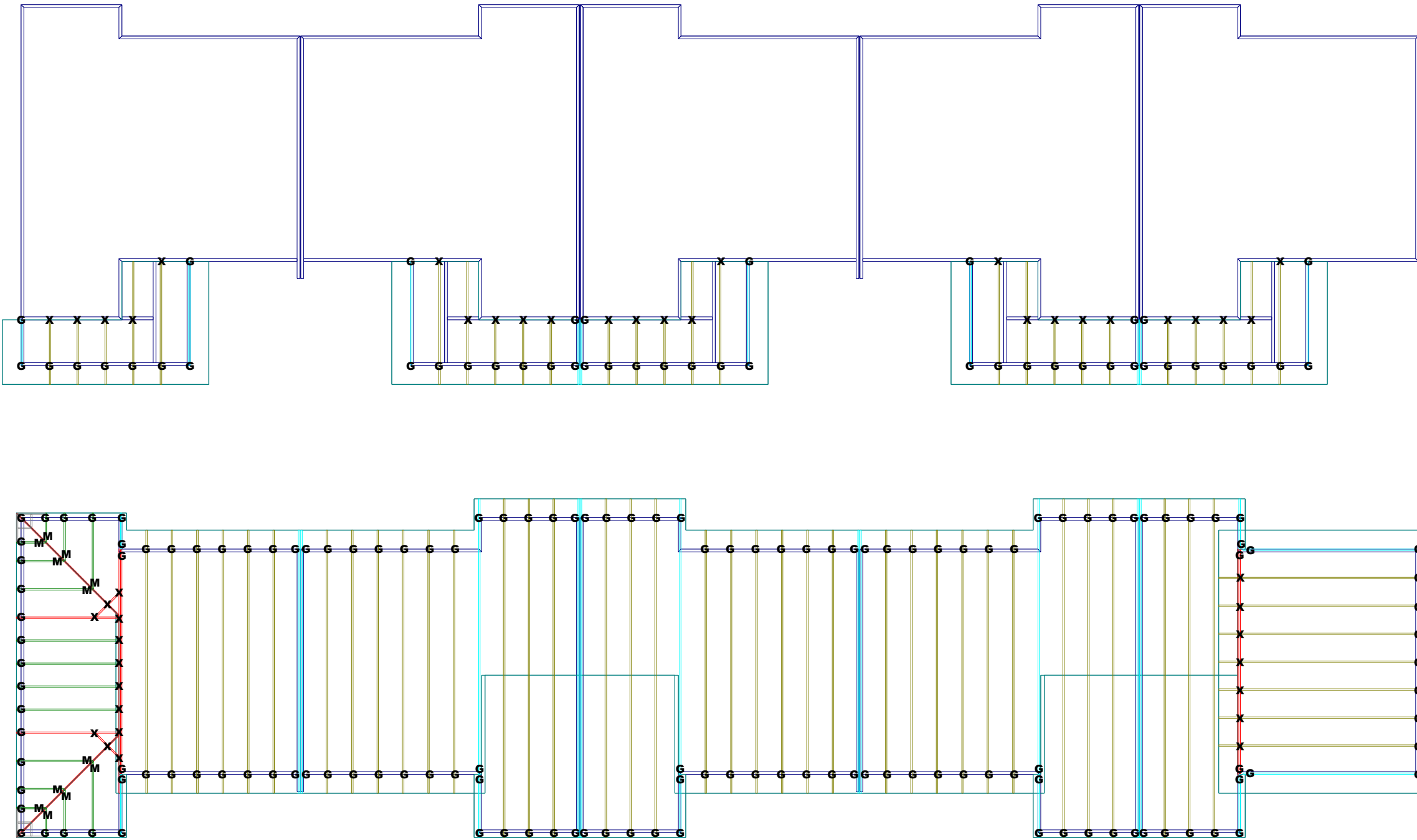
APPROVED BUILDING CONSENT

BC82325

Date: 27/10/2021

Page: 5 of 28

Rotorua Lakes Council



## NOTES:

All other areas must have at the minimum  
2/ 90x3.15mm skew nails + 2 wire dogs (4.7kN)  
for truss to top plate connections.

Refer to:  
LUMBERLOK Timber Connectors Characteristic  
Loadings Data brochure 03/4



Site Address :  
GT Homes - Townhouse  
Development  
76 Pererika Street  
Victoria, Rotorua

Sheet Title :  
**For Building Consent  
Truss Fixings**

Date : 14 Apr,2021 Drawn : Hoang Duong  
Scale : 1: 150 System : MiTek 20/20

Job Details:  
Roof Pitch : 8.0 & 15.0 Deg  
Roof Material : Longrun Iron .55mm  
Ceiling Material : Gib Board 13mm  
Wind Zone : Low  
Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
Roof Live Load : 0.250kPa  
Floor Live Load : kPa  
Wind Speed : 32.0 m/s



Job Title :  
BL204251  
Sheet :  
**5**  
Revision Number :

PrimeCad v4.7.346

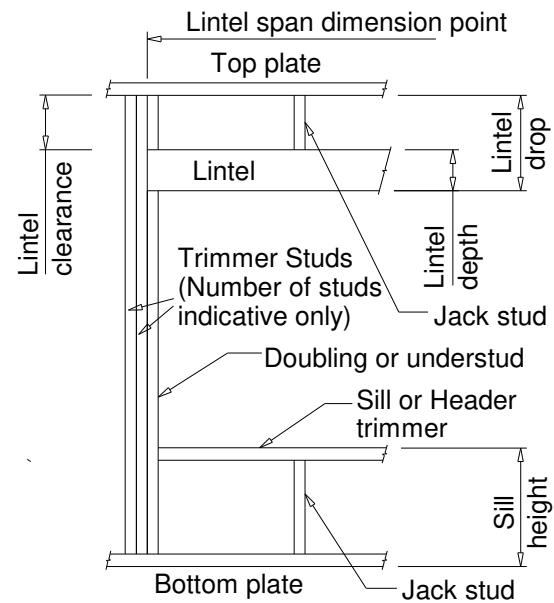


## LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

### NOTE:

- ★ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist horizontal loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011

### DEFINITIONS



### Lintel Supporting Girder Trusses:

Roof Tributary Area	Light Roof Wind Zone			Heavy Roof Wind Zone		
	L, M, H	VH	EH	L, M, H	VH	EH
8.6 m²	G	G	H	G	G	H
11.6 m²	G	H	H	G	G	H
12.1 m²	G	H	H	G	H	H
15.3 m²	H	H	-	G	H	H
19.1 m²	H	-	-	G	H	-
20.9 m²	H	-	-	H	H	-
21.8 m²	H	-	-	H	-	-
34.3 m²	-	-	-	H	-	-

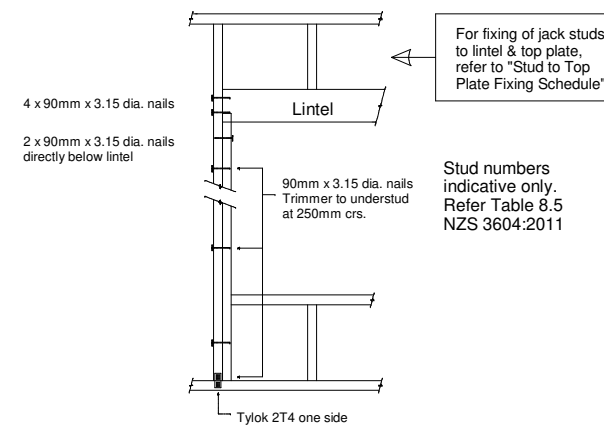
### Notes:

- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by Lintel)
- 2) Assumed girder truss is at mid-span or middle third span of lintel
- 3) Use similar fixings for both ends of lintel
- 4) All other cases require specific engineering design.

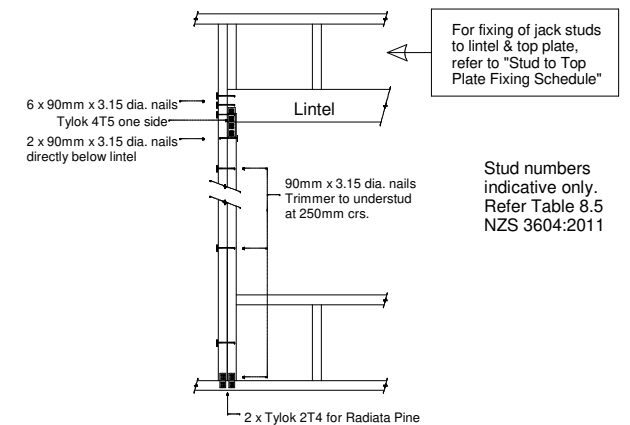
### SELECTION CHART FOR LINTEL FIXING

Lintel Span	Loaded Dimension (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	F	F	G	G	H	E	E	F	G	G
1.5	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	F	F	G	G	H	E	E	F	G	G
	6.0	F	F	G	G	H	E	E	F	G	H
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	F	F	G	G	E	E	F	F	G
	4.0	F	F	G	G	H	E	E	F	G	G
	5.0	F	F	G	G	H	E	E	F	G	H
	6.0	F	G	G	H	H	E	F	G	H	H
2.4	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	G	G
	4.0	F	F	G	G	H	E	E	F	G	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	G	H	H	E	F	G	H	H
3.0	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	G	H
	4.0	F	G	G	H	H	E	F	G	H	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	G	H	-	E	F	G	H	-
3.6	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	F	G	G	H	E	F	G	G	H
	4.0	F	G	H	H	-	E	F	G	H	H
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	H	-	-
4.2	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	G	G	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	H	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.5	2.0	F	F	G	G	H	E	E	F	G	H
	3.0	F	G	G	H	H	E	F	G	H	H
	3.4	F	G	G	H	H	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
4.8	2.0	F	F	G	G	H	E	E	F	G	H
	3.0	F	G	G	H	H	E	F	G	H	H
	3.2	F	G	G	H	H	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	G	H	E	F	G	G	H
	3.0	F	G	G	H	H	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	G	H	E	F	G	G	H
	2.8	F	G	G	H	H	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
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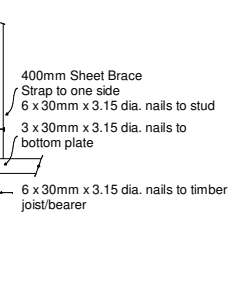
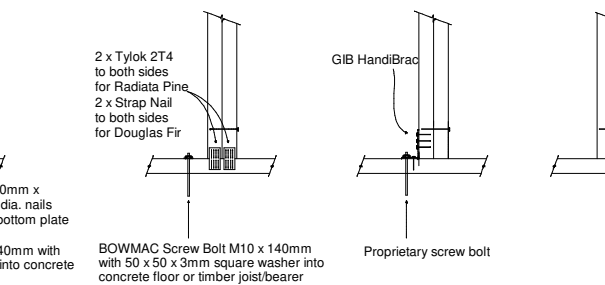
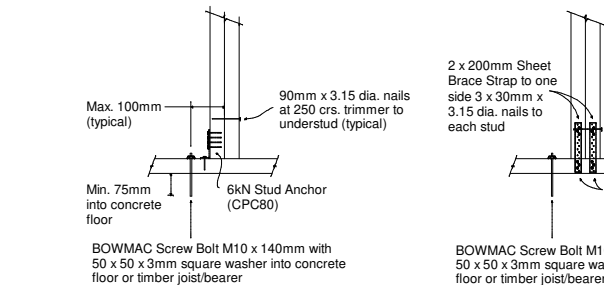
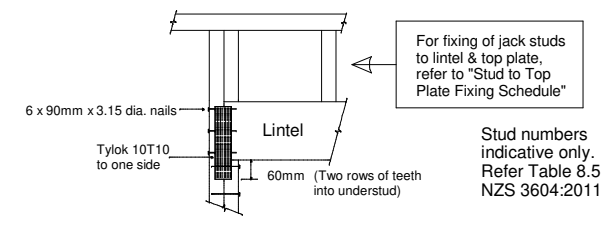
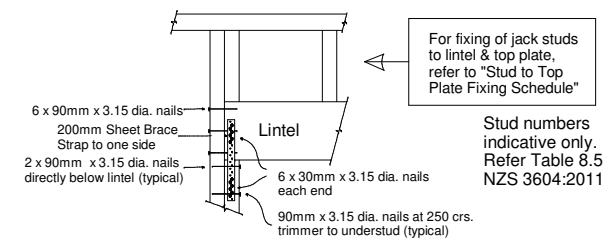
#### TYPE E 1.4kN



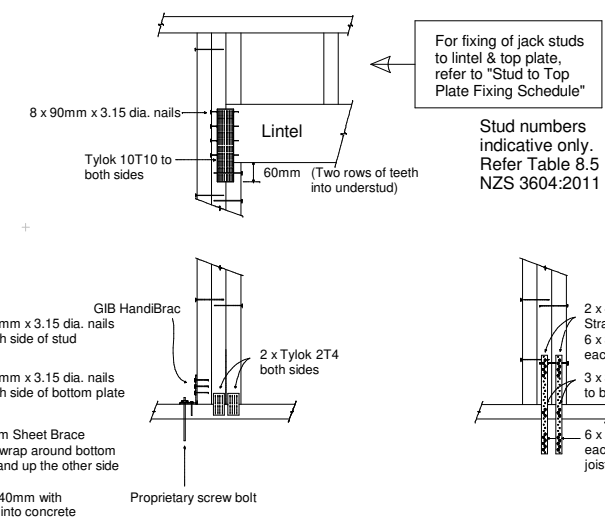
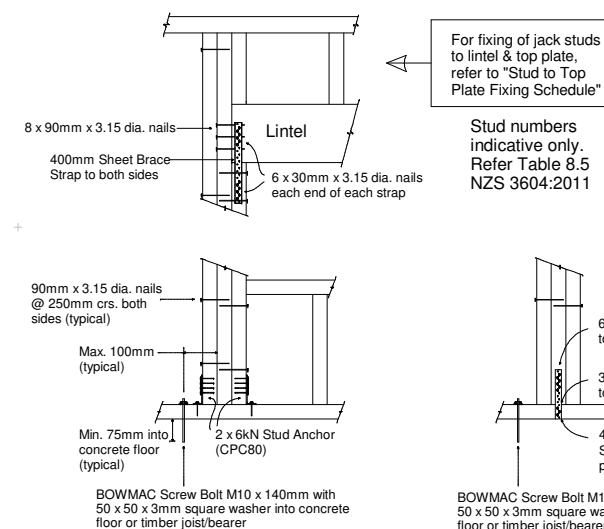
#### TYPE F 4.0kN



#### TYPE G 7.5kN



#### TYPE H 13.5kN





# MiTek New Zealand Limited

Correspondence from : **AUCKLAND**  
40 Neales Road, East Tamaki 2013  
PO Box 58-014, Botany 2163  
**Phone: 09 274 7109**  
**Fax: 09 274 7100**

**CHRISTCHURCH**  
14 Pilkington Way, Wigram 8042  
PO Box 8387, Riccarton 8440  
**Phone: 03 348 8691**  
**Fax: 03 348 0314**

MiTek 20/20 Engineering 4.7.346.0

www.mitek.nz.co.nz  
Printed: 17:00:30 14 Apr 2021

## PRODUCER STATEMENT for MiTek 20/20<sup>®</sup> TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **Placemakers National Estimating Unit (NEU)**

IN RESPECT OF: **MiTek<sup>®</sup> Truss Designs**

This producer statement covers the MiTek 20/20<sup>®</sup> truss design and the structural performance of the GANG-NAIL<sup>®</sup> connector plate for the job reference **BL204251** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20<sup>®</sup> truss design program has been developed by MiTek New Zealand Limited for the design of MiTek<sup>®</sup> timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20<sup>®</sup> are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clause B1 of the New Zealand Building Code.

**On behalf of MiTek New Zealand Limited,** and subject to:

- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
- v) The design being undertaken by the accredited fabricator under the terms of the software licence
- vi) Timber is graded to the requirements of NZS 3603:1993
- vii) Minimum timber treatment for these MiTek<sup>®</sup> trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003

**I believe on reasonable grounds** that the trusses, if constructed in accordance with the MiTek 20/20<sup>®</sup> truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than \$500,000.

**On behalf of MiTek New Zealand Limited,** **Date: Wednesday, 14 April, 2021**

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)  
**TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited**

**APPROVED BUILDING CONSENT**  
**BC82325**  
**Date: 27/10/2021**  
**Page: 7 of 28**  
**Rotorua Lakes Council**

Job: BL204251

Client: Oswald Construction Limited

Site: GT Homes - Townhouse

Description:  
Building Consent No.:  
MITek 20/20 Engineering 4.7.346.0

Phone:

Development  
76 Pererika Street  
Victoria, Rotorua

Phone:

MITek New Zealand Limited

Printed: 17:00:30 14 Apr 2021

**MITEK FABRICATOR DESIGN STATEMENT**

This statement is issued by MiTek accredited fabricator **Placemakers National Estimating Unit (NEU)**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

**MiTek 20/20® TRUSS DESIGN DATA**

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

**Job Details**

Importance Level : 2

Design Working Life : 50 years

**Roof Truss**

Timber Group: NEU-H1.2

Pitch: 8.0 &amp; 15.0 deg

Nominal Overhang: 150/600 mm

**Roof**

Material: Longrun Iron .55mm

**Ceiling**

Material: Gib Board 13mm

**Wind**

Area: Low (32.0 m/s )

Dead Load: 0.210 kPa

Dead Load: 0.200 kPa

Pressure Coeff: Cpe = varies; Cpi = -0.30, 0.20

Restraints: 900 mm centres

Restraints: 600 mm centres

Live Load: Q<sub>ur</sub> = 0.250 kPaLive Load: Q<sub>c</sub> = 1.400 kNQ<sub>c</sub> = 1.100 kN

The minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003. The timber for these MiTek® trusses shall be graded to the requirements of NZS 3603:1993. Proprietary fixings and timber connectors shall be selected in accordance with NZS3604:2011 Section 4 - Durability.

**MiTek® Truss List**


Legend: \* = detail only, ? = input only, ✕ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required  
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
EN01	4	1460	8.000	900	J03	2	1378	8.000	900	T03	5	1860	8.000	900
EN02	3	8180	8.000	900	J03A	2	1378	8.000	900	T05	24	7180	8.000	900
EN03	4	7180	8.000	900	J04	2	778	8.000	900	T06	12	10040	8.000	900
EN04	4	10040	8.000	900	J04A	2	778	8.000	900	T07	7	5670	15.000	900
EN05	1	1000	8.000	900	J05B	4	3120	8.000	900	J01	1	3867	5.675	900
EN05A	1	1000	8.000	900	*R01	2	418	8.000	900	J01A	1	3867	5.675	900
ET01	1	1460	8.000	900	*R01A	2	418	8.000	900	PTG01	1D	7180	0.000	900
ET02	4	3320	8.000	900	*R02	2	883	0.000	900	T04	1	1109	0.000	900
ET02A	1	3320	8.000	900	*R02A	2	883	0.000	900	T04A	1	1109	0.000	900
ET03	2	5580	15.000	900	T01	5	1460	8.000	900	J05	1	3120	8.000	900
J02	2	2278	8.000	900	T01B	15	1460	8.000	900	J05A	1	3120	8.000	900
J02A	2	2278	8.000	900	T02	5	3320	8.000	900	GT01	1D	7180	8.000	900

Total quantity : 130

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The computer design input has been carried out by:

Signed: 

Date: ...Wednesday, 14 April, 2021....

Name of Detailer: Hoang Duong

Qualifications and Title:

On behalf of:

Placemakers National Estimating Unit (NEU)  
25 Vickery St, Te Rapa, Hamilton,  
Phone:



## DESIGN CERTIFICATE

Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey LVL Limited (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code (NZBC), provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

Futurebuild LVL and SG8 components, when used and treated to the required treatment levels prescribed in NZS 3602 and NZS 3604, as modified by Acceptable Solution B2/AS1, will comply with the requirements of the NZBC (Acceptable Solution B2/AS1, 3.2).

### References:

1. NZS 3603:1993 Timber Structures Standard.
2. NZS 3604:2011 Timber-framed buildings.
3. AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
4. AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
5. AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.
6. AS 1720.1:2010 Timber structures. Part 1: Design methods.
7. AS 1720.3:2016 Timber structures. Part 3: Design criteria for timber-framed residential buildings.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 3 February 2021

For further information or advice contact:

Carter Holt Harvey LVL Limited,  
173 Captain Springs Road, Onehunga. Auckland  
Telephone: 0800 808 131  
Email: [designit@futurebuild.co.nz](mailto:designit@futurebuild.co.nz)  
Web: <https://futurebuild.co.nz/>

### Specifier details:

<b>Specifier:</b>	Hoang Duong
<b>Business name:</b>	PlaceMakers
<b>Email:</b>	<a href="mailto:neuadmin@placemakers.co.nz">neuadmin@placemakers.co.nz</a>

### Project & site details:

<b>Project:</b>	21-00204251
<b>Site address:</b>	76 Pererika Street, Victoria Rotorua
<b>Design wind zone</b>	Low
<b>Snow loading</b>	Design snow zone: N0

## MEMBER DESIGN DETAILS

### Member 1

- 1) Member code and description** L1 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 14 April 2021
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016

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#### 4) Design inputs

Span	1.8 m
Roof load width 'RLW'	1.8 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	6.0 mm	0.9 mm (long term)	6.5
Live load - $\Psi_S Q$	7.2 mm	0.3 mm	27.5
Wind load - $W_s$	9.0 mm	0.4 mm	21.6

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-1.4
1.2G + 1.5Q	0.80	-2.1
1.2G + $W_u$ + $\Psi_c Q$	1.00	-2.1
0.9G + $W_u$	1.00	0.5

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 2

#### 1) Member code and description

L2 - Lintels - In single or upper storey load bearing walls

#### 2) Date prepared

14 April 2021

#### 3) Serviceability criteria

AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span	0.9 m
Roof load width 'RLW'	1.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
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Long term load - $G + \Psi_L Q^*$	3.0 mm	0.1 mm (long term)	37.1
Live load - $\Psi_S Q$	3.6 mm	0.0 mm	152.6
Wind load - $W_s$	4.5 mm	0.0 mm	119.5

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-0.7
1.2G + 1.5Q	0.80	-1.0
1.2G + $W_u$ + $\Psi_c Q$	1.00	-1.1
0.9G + $W_u$	1.00	0.3

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 3

1) Member code and description L3 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	0.9 m
Roof load width 'RLW'	4.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

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## 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - $G + \Psi_L Q^*$	3.0 mm	0.3 mm (long term)	11.8
Live load - $\Psi_S Q$	3.6 mm	0.1 mm	46.1
Wind load - $W_s$	4.5 mm	0.1 mm	36.1

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-2.1
1.2G + 1.5Q	0.80	-3.4
1.2G + $W_u$ + $\Psi_c Q$	1.00	-3.4
0.9G + $W_u$	1.00	1.0

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 4

1) Member code and description L4 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

### 4) Design inputs

Span	1.8 m
Roof load width 'RLW'	4.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

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### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	6.0 mm	2.1 mm (long term)	2.9
Live load - $\Psi_S Q$	7.2 mm	0.6 mm	11.5
Wind load - $W_S$	9.0 mm	1.0 mm	9.0

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

		Limit States Design Reaction <sup>2,3</sup>
Load case	$k_1^1$	End kN <sup>4</sup>
1.35G	0.60	-3.1
1.2G + 1.5Q	0.80	-4.9
1.2G + $W_u$ + $\Psi_c Q$	1.00	-4.9
0.9G + $W_u$	1.00	1.4

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 5

1) Member code and description L5 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

### 4) Design inputs

Span	0.9 m
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Roof load width 'RLW'	5.7 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	3.0 mm	0.3 mm (long term)	8.9
Live load - $\Psi_S Q$	3.6 mm	0.1 mm	34.8
Wind load - $W_s$	4.5 mm	0.2 mm	27.2

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-2.8
1.2G + 1.5Q	0.80	-4.4
1.2G + $W_u$ + $\Psi_c Q$	1.00	-4.5
0.9G + $W_u$	1.00	1.3

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 6

1) Member code and description L6 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span	0.6 m
Roof load width 'RLW'	4.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	2.0 mm	0.1 mm (long term)	26.6
Live load - $\Psi_S Q$	2.4 mm	0.0 mm	103.8

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Wind load - $W_s$	3.0 mm	0.0 mm	81.3
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\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-1.8
1.2G + 1.5Q	0.80	-2.8
1.2G + $W_u$ + $\Psi_c Q$	1.00	-2.8
0.9G + $W_u$	1.00	0.8

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 7

1) Member code and description L7 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	0.9 m
Roof load width 'RLW'	1.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

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## 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - $G + \Psi_L Q^*$	3.0 mm	0.1 mm (long term)	47.3
Live load - $\Psi_s Q$	3.6 mm	0.0 mm	198.3
Wind load - $W_s$	4.5 mm	0.0 mm	155.3

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-0.5
1.2G + 1.5Q	0.80	-0.8
1.2G + $W_u$ + $\Psi_c Q$	1.00	-0.8
0.9G + $W_u$	1.00	0.2

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports



## Member 8

- 1) **Member code and description** L8 - Lintels - In single or upper storey load bearing walls
- 2) **Date prepared** 14 April 2021
- 3) **Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) **Design inputs**
- |                        |   |
|------------------------|---|
| Span                   | 1.8 m   |
| Roof load width 'RLW'  | 1.0 m   |
| Roof type and mass     | Light roof and ceiling - 40 kg/m <sup>2</sup> |
| Nominal wall thickness | 90 mm   |
- 5) **Member specification**
- |                            |   |
|----------------------------|---|
| Size, stress grade/product | Use 150 x 90 hy90                                 |
| Material type              | Structural Laminated Veneer Lumber to AS/NZS 4357 |

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### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	6.0 mm	0.6 mm (long term)	10.9
Live load - $\Psi_S Q$	7.2 mm	0.1 mm	49.6
Wind load - $W_s$	9.0 mm	0.2 mm	38.8

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-0.8
1.2G + 1.5Q	0.80	-1.2
1.2G + $W_u$ + $\Psi_c Q$	1.00	-1.2
0.9G + $W_u$	1.00	0.3

### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 9

- 1) **Member code and description** L9 - Lintels - In single or upper storey load bearing walls
- 2) **Date prepared** 14 April 2021
- 3) **Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) **Design inputs**
- |                       |   |
|-----------------------|---|
| Span                  | 1.8 m   |
| Roof load width 'RLW' | 3.1 m   |
| Roof type and mass    | Light roof and ceiling - 40 kg/m <sup>2</sup> |

Nominal wall thickness 90 mm

#### 5) Member specification

Size, stress grade/product Use 150 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	6.0 mm	1.5 mm (long term)	3.9
Live load - $\Psi_S Q$	7.2 mm	0.5 mm	16.0
Wind load - $W_s$	9.0 mm	0.7 mm	12.5

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-2.3
1.2G + 1.5Q	0.80	-3.5
1.2G + $W_u$ + $\Psi_c Q$	1.00	-3.6
0.9G + $W_u$	1.00	1.0

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 10

1) Member code and description L10 - Lintels - In single or upper storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span 0.6 m  
Roof load width 'RLW' 1.0 m  
Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>  
Nominal wall thickness 90 mm

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#### 5) Member specification

Size, stress grade/product Use 150 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	2.0 mm	0.0 mm (long term)	109.4
Live load - $\Psi_S Q$	2.4 mm	0.0 mm	446.3
Wind load - $W_s$	3.0 mm	0.0 mm	349.4

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-0.4
1.2G + 1.5Q	0.80	-0.7
1.2G + $W_u$ + $\Psi_c Q$	1.00	-0.7
0.9G + $W_u$	1.00	0.2

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 11

## 1) Member code and description

L11 - Lintels - In single or upper storey load bearing walls

## 2) Date prepared

14 April 2021

## 3) Serviceability criteria

AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	0.9 m
Roof load width 'RLW'	1.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>
Nominal wall thickness	90 mm

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## 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - $G + \Psi_L Q^*$	3.0 mm	0.1 mm (long term)	47.3
Live load - $\Psi_s Q$	3.6 mm	0.0 mm	198.3
Wind load - $W_s$	4.5 mm	0.0 mm	155.3

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-0.5
1.2G + 1.5Q	0.80	-0.8
1.2G + $W_u$ + $\Psi_c Q$	1.00	-0.8
0.9G + $W_u$	1.00	0.2

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 12

- 1) Member code and description** L12 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 14 April 2021
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- |                        |   |
|------------------------|---|
| Span                   | 2.7 m   |
| Roof load width 'RLW'  | 1.4 m   |
| Roof type and mass     | Light roof and ceiling - 40 kg/m <sup>2</sup> |
| Nominal wall thickness | 90 mm   |
- 5) Member specification**
- |                            |   |
|----------------------------|---|
| Size, stress grade/product | Use 200 x 90 hy90                                 |
| Material type              | Structural Laminated Veneer Lumber to AS/NZS 4357 |

### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ <sup>*</sup>	9.0 mm	1.5 mm (long term)	5.9
Live load - $\Psi$ sQ	10.8 mm	0.4 mm	27.0
Wind load - Ws	13.5 mm	0.6 mm	21.1

<sup>\*</sup>Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-1.4
1.2G + 1.5Q	0.80	-2.1
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-2.1
0.9G + W <sub>u</sub>	1.00	0.4

### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 13

- 1) Member code and description** L13 - Lintels - In single or upper storey load bearing walls
- 2) Date prepared** 14 April 2021
- 3) Serviceability criteria** AS 1720.1: 2010 and AS 1720.3: 2016
- 4) Design inputs**
- |                        |   |
|------------------------|---|
| Span                   | 2.7 m   |
| Roof load width 'RLW'  | 1.0 m   |
| Roof type and mass     | Light roof and ceiling - 40 kg/m <sup>2</sup> |
| Nominal wall thickness | 90 mm   |
- 5) Member specification**

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Size, stress grade/product Use 200 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	9.0 mm	1.2 mm (long term)	7.7
Live load - $\Psi_s Q$	10.8 mm	0.3 mm	37.8
Wind load - $W_s$	13.5 mm	0.5 mm	29.6

\*Critical serviceability load case  
See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-1.1
1.2G + 1.5Q	0.80	-1.5
1.2G + $W_u$ + $\Psi_c Q$	1.00	-1.6
0.9G + $W_u$	1.00	0.3

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 14

1) Member code and description L14 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span 0.9 m  
Floor load width 'FLW' 1.0 m  
Floor dead load 40 kg/m<sup>2</sup>  
Floor live load 1.5 kPa/1.8 kN  
Wall type and height Medium wall: 2.4 m  
Nominal wall thickness 90 mm  
Roof load width 'RLW' 4.3 m  
Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>

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## 5) Member specification

Size, stress grade/product Use 150 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	3.0 mm	0.3 mm (long term)	9.0
Live load - $\Psi_s Q$	2.5 mm	0.1 mm	49.0

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-3.0
1.2G + 1.5Q	0.80	-3.6
1.2G + $W_u$ + $\Psi_c Q$	1.00	-3.3
0.9G + $W_u$	1.00	-0.7

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 15

1) Member code and description L15 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	1.2 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	4.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

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## 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - $G + \Psi_L Q^*$	4.0 mm	1.1 mm (long term)	3.8
Live load - $\Psi_S Q$	3.3 mm	0.2 mm	20.7

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-4.0
1.2G + 1.5Q	0.80	-4.9
1.2G + $W_u$ + $\Psi_c Q$	1.00	-4.4
0.9G + $W_u$	1.00	-0.9

## 8) Installation requirements



- Provide at least 30 mm bearing at end supports

## Member 16

1) Member code and description L16 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

### 4) Design inputs

Span	0.9 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

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### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ <sup>*</sup>	3.0 mm	0.3 mm (long term)	12.0
Live load - $\Psi$ sQ	2.5 mm	0.1 mm	49.0

<sup>\*</sup>Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-2.2
1.2G + 1.5Q	0.80	-3.0
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-2.2
0.9G + W <sub>u</sub>	1.00	-1.1

### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 17

1) Member code and description L17 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span	1.2 m
Floor load width 'FLW'	2.1 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.8 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ*	4.0 mm	1.1 mm (long term)	3.7
Live load - $\Psi$ sQ	3.3 mm	0.3 mm	9.8

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-4.0
1.2G + 1.5Q	0.80	-6.4
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-3.9
0.9G + W <sub>u</sub>	1.00	-1.9

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 18

#### 1) Member code and description

L18 - Lintels in lower storey load bearing walls

#### 2) Date prepared

14 April 2021

#### 3) Serviceability criteria

AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span	0.9 m
Floor load width 'FLW'	2.1 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.8 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

#### 5) Member specification

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Size, stress grade/product Use 150 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ <sup>*</sup>	3.0 mm	0.3 mm (long term)	8.9
Live load - $\Psi$ sQ	2.5 mm	0.1 mm	23.3

<sup>\*</sup>Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-3.0
1.2G + 1.5Q	0.80	-4.8
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-3.0
0.9G + W <sub>u</sub>	1.00	-1.5

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 19

1) Member code and description L19 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span 0.9 m  
Floor load width 'FLW' 1.0 m  
Floor dead load 40 kg/m<sup>2</sup>  
Floor live load 1.5 kPa/1.8 kN  
Wall type and height Medium wall: 2.4 m  
Nominal wall thickness 90 mm  
Roof load width 'RLW' 5.7 m  
Roof type and mass Light roof and ceiling - 40 kg/m<sup>2</sup>

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## 5) Member specification

Size, stress grade/product Use 150 x 90 hy90  
Material type Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ <sup>*</sup>	3.0 mm	0.4 mm (long term)	8.1
Live load - $\Psi$ sQ	2.5 mm	0.1 mm	49.0

<sup>\*</sup>Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-3.3
1.2G + 1.5Q	0.80	-4.0
1.2G + $W_u$ + $\Psi_c Q$	1.00	-3.8
0.9G + $W_u$	1.00	-0.5

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 20

1) Member code and description L20 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	0.9 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

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## 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	3.0 mm	0.2 mm (long term)	12.4
Live load - $\Psi_s Q$	2.5 mm	0.1 mm	49.0

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-2.2
1.2G + 1.5Q	0.80	-2.9
1.2G + $W_u$ + $\Psi_c Q$	1.00	-2.1
0.9G + $W_u$	1.00	-1.1

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 21

1) Member code and description L21 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

### 4) Design inputs

Span	1.2 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

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### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi$ LQ*	4.0 mm	0.8 mm (long term)	5.2
Live load - $\Psi$ sQ	3.3 mm	0.2 mm	20.7

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

### 7) Reactions

Load case	k <sub>1</sub> <sup>1</sup>	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-2.9
1.2G + 1.5Q	0.80	-3.9
1.2G + W <sub>u</sub> + $\Psi$ cQ	1.00	-2.8
0.9G + W <sub>u</sub>	1.00	-1.5

### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 22

1) Member code and description L22 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

### 4) Design inputs

Span	1.2 m
Floor load width 'FLW'	2.3 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	3.1 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

#### 5) Member specification

Size, stress grade/product	Use 150 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

#### 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	4.0 mm	1.2 mm (long term)	3.3
Live load - $\Psi_S Q$	3.3 mm	0.4 mm	9.0

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

#### 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-4.6
1.2G + 1.5Q	0.80	-7.2
1.2G + $W_u$ + $\Psi_c Q$	1.00	-4.7
0.9G + $W_u$	1.00	-1.8

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

## Member 23

1) Member code and description GD - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

#### 4) Design inputs

Span	2.4 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	4.3 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

#### 5) Member specification

Size, stress grade/product	Use 300 x 90 hy90
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Material type Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	8.0 mm	2.3 mm (long term)	3.5
Live load - $\Psi_S Q$	6.7 mm	0.3 mm	19.5

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup> End kN <sup>4</sup>
1.35G	0.60	-8.0
1.2G + 1.5Q	0.80	-9.8
1.2G + $W_u$ + $\Psi_c Q$	1.00	-8.9
0.9G + $W_u$	1.00	-1.9

## 8) Installation requirements

- Provide at least 30 mm bearing at end supports

# Member 24

1) Member code and description GD2 - Lintels in lower storey load bearing walls

2) Date prepared 14 April 2021

3) Serviceability criteria AS 1720.1: 2010 and AS 1720.3: 2016

## 4) Design inputs

Span	2.4 m
Floor load width 'FLW'	1.0 m
Floor dead load	40 kg/m <sup>2</sup>
Floor live load	1.5 kPa/1.8 kN
Wall type and height	Medium wall: 2.4 m
Nominal wall thickness	90 mm
Roof load width 'RLW'	1.0 m
Roof type and mass	Light roof and ceiling - 40 kg/m <sup>2</sup>

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## 5) Member specification

Size, stress grade/product	Use 240 x 90 hy90
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

## 6) Serviceability

Load case	Limit <sup>3</sup> on average deflection <sup>2</sup>	Estimated average deflection <sup>2</sup>	Rigidity ratio <sup>4</sup>
Long term load - G + $\Psi_L Q^*$	8.0 mm	3.2 mm (long term)	2.5
Live load - $\Psi_S Q$	6.7 mm	0.7 mm	10.1

\*Critical serviceability load case

See 'Notes for interpretation of serviceability data' at the end of this report

## 7) Reactions

Load case	$k_1^1$	Limit States Design Reaction <sup>2,3</sup>
		End kN <sup>4</sup>
1.35G	0.60	-5.9
1.2G + 1.5Q	0.80	-7.9
1.2G + $W_u$ + $\Psi_c Q$	1.00	-5.6
0.9G + $W_u$	1.00	-3.1

#### 8) Installation requirements

- Provide at least 30 mm bearing at end supports

#### Notes for interpretation of serviceability data

1. 'average deflection' is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS 1170 and AS 1720.
2. Deflection is the flexural response to load 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, material variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.
 

No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!

3. The limits referred are those specified in AS 1720.3 for the stated load case.
4. 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements detailed.

#### Notes for interpretation of reaction data

1. Duration of load factor ' $k_1$ ' for strength as per NZS 3603:1993
2. Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
4. End reaction includes allowance for overhang/cantilever where one has been designed

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