

The Benefits of Mid-Rise Construction In Timber

For The Construction Clients' Group

PRESENTED BY SEAN GARDINER

calibre

Contents

1. What Is Possible
2. Benefits of Timber Construction
3. Timber vs Steel braced frame
4. Challenges
5. How
6. Code Compliance
7. What’s next
8. Conclusion/Questions?


WESBROOK


Moody
FOR
LEASE
FOR
LEASE


HEATHERBRAE


SOLD OUT


E King Edward

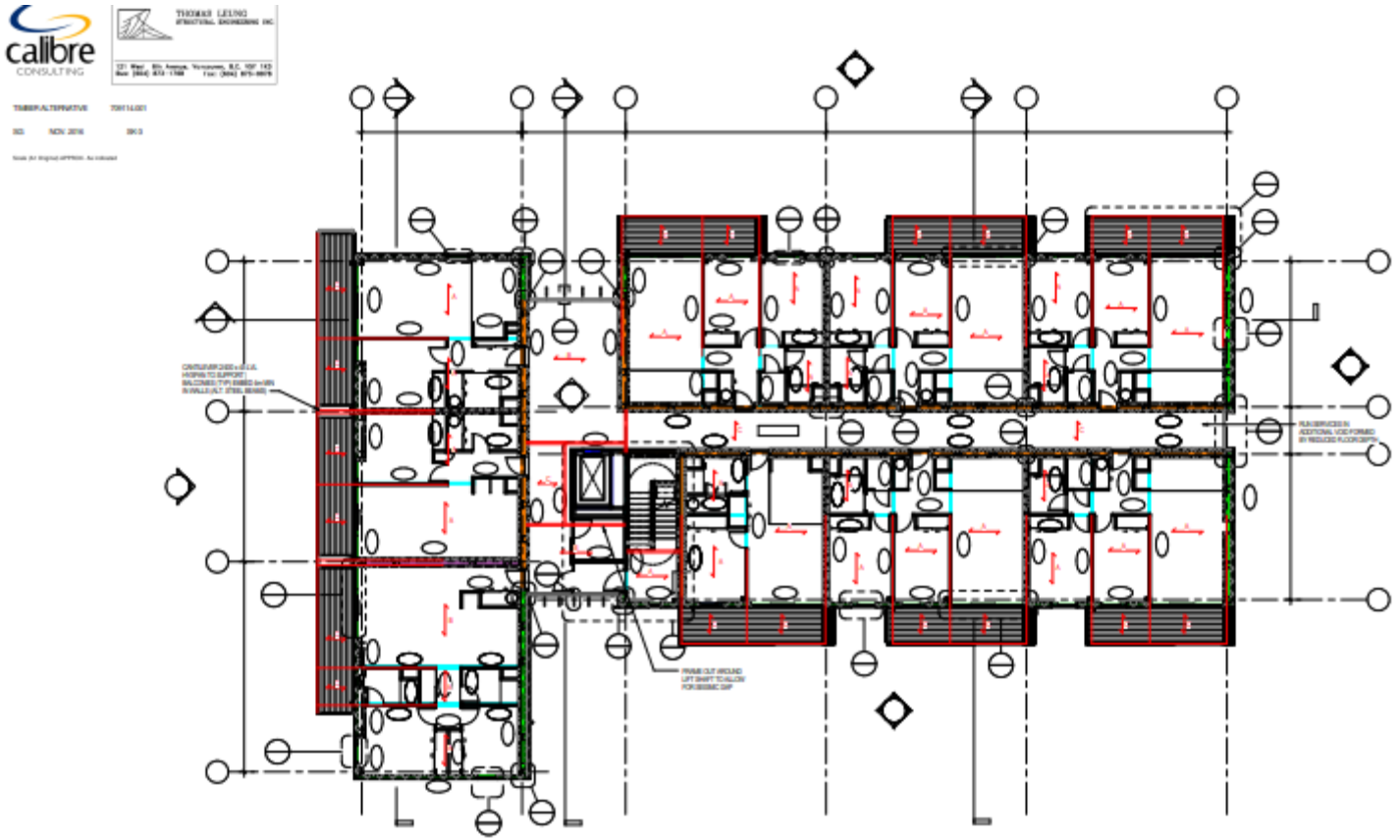
Benefits of timber construction

- Cost savings (e.g. light timber-framed construction)
- Reduced building weight
  - Reduced foundations (particularly for poor geotech)
  - Reduced lateral structure (light and flexible)
  - Opportunities for extension of building height
- Sustainable, low-carbon
- Broader pool of builders & Easily modified on site
- *Potential* programme savings
- Aesthetic- natural attraction of timber, "improved health and wellbeing"


Lendlease, Australia

Timber compared to Steel Braced

Atlas Quarter



Timber compared to Steel Braced

Atlas Quarter

- NZ Timber Concept vs Steel Braced Frame
- Christchurch
- 10% saving on super-structure
- 30% ($300k) saving in piles

Challenges

New Zealand Market

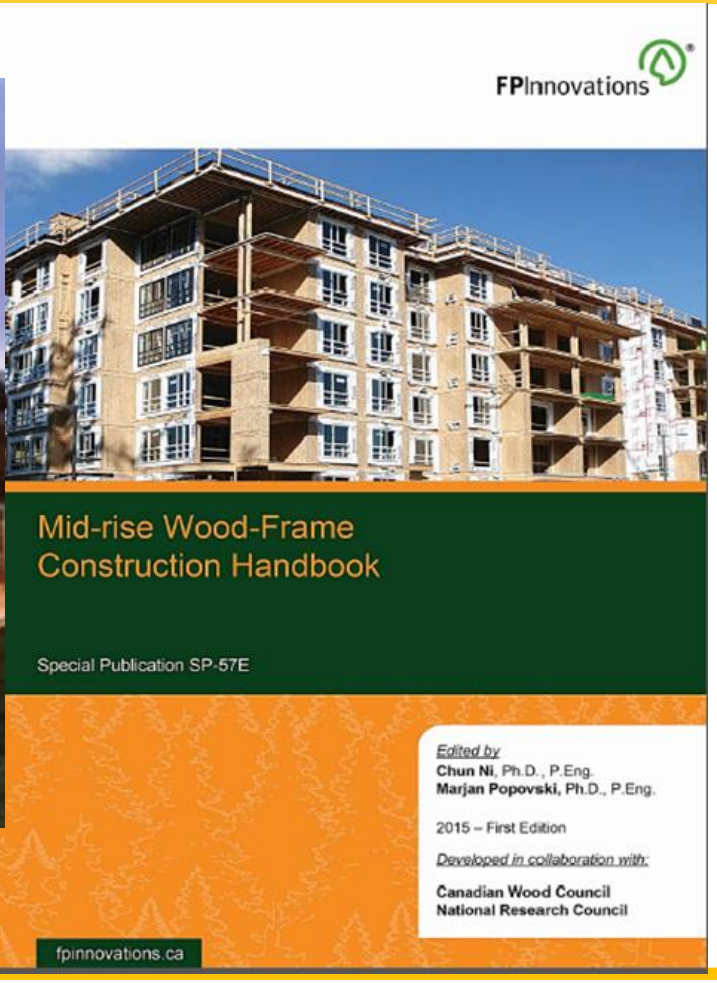
- Timber Shrinkage and differential movement
- Noise Control
- Floor Vibration
- Fire Safety
- Cladding and Facades
- Market perception?

What Challenges

UK and North America for decades

NZ Wood Design Guides

Mid-rise construction handbook



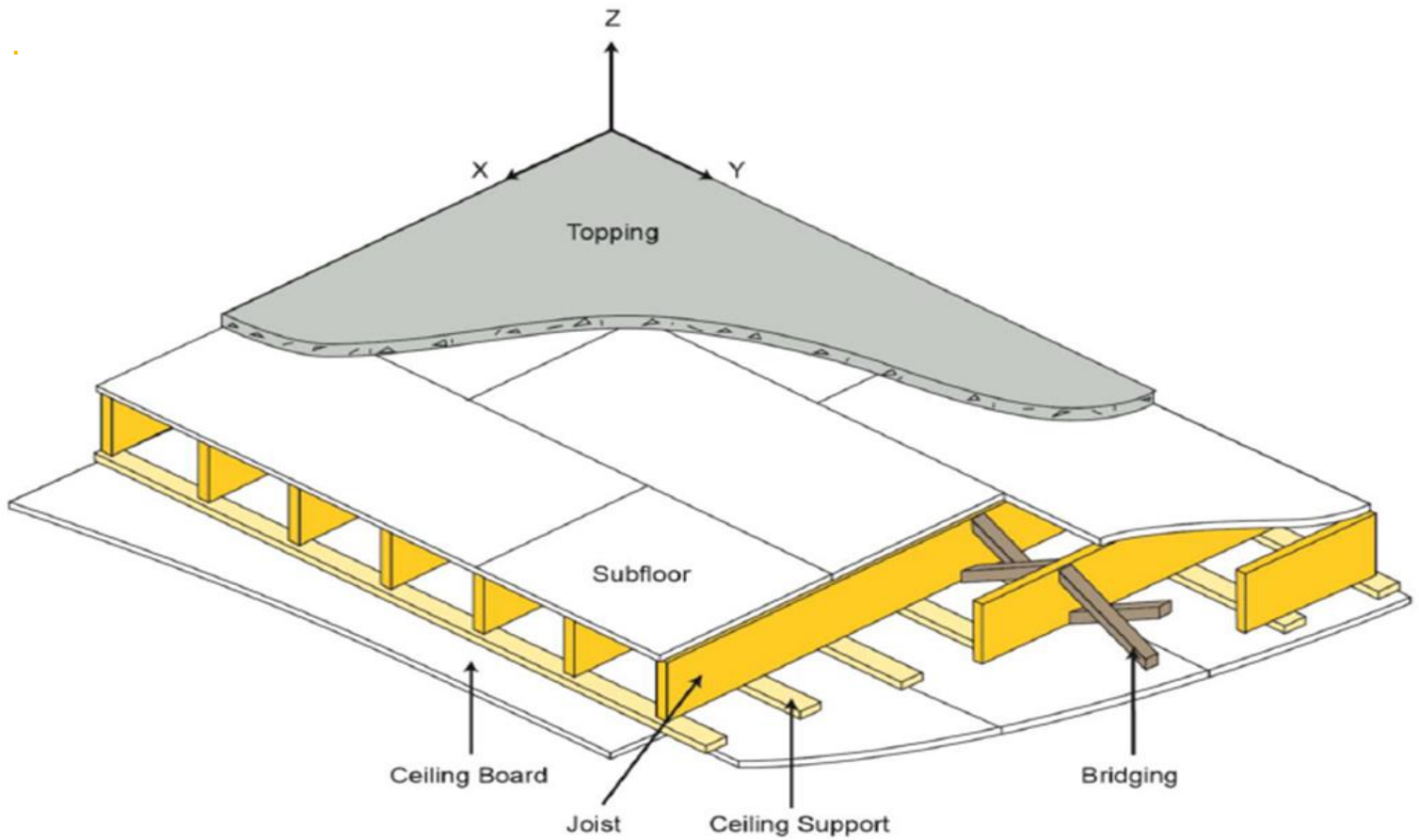
How? Light timber framing or CLT

Mid-rise (4-6 storey) apartments

- Concrete Podium
- Lightweight Timber Tower over
- Continuous Plywood Shearwalls
- Simplified Structural Design
- Wall Construction
    - Double Stud Party walls
    - Staggered Stud Corridor walls
    - Single Stud Internal and External LB walls
- LVL

How?

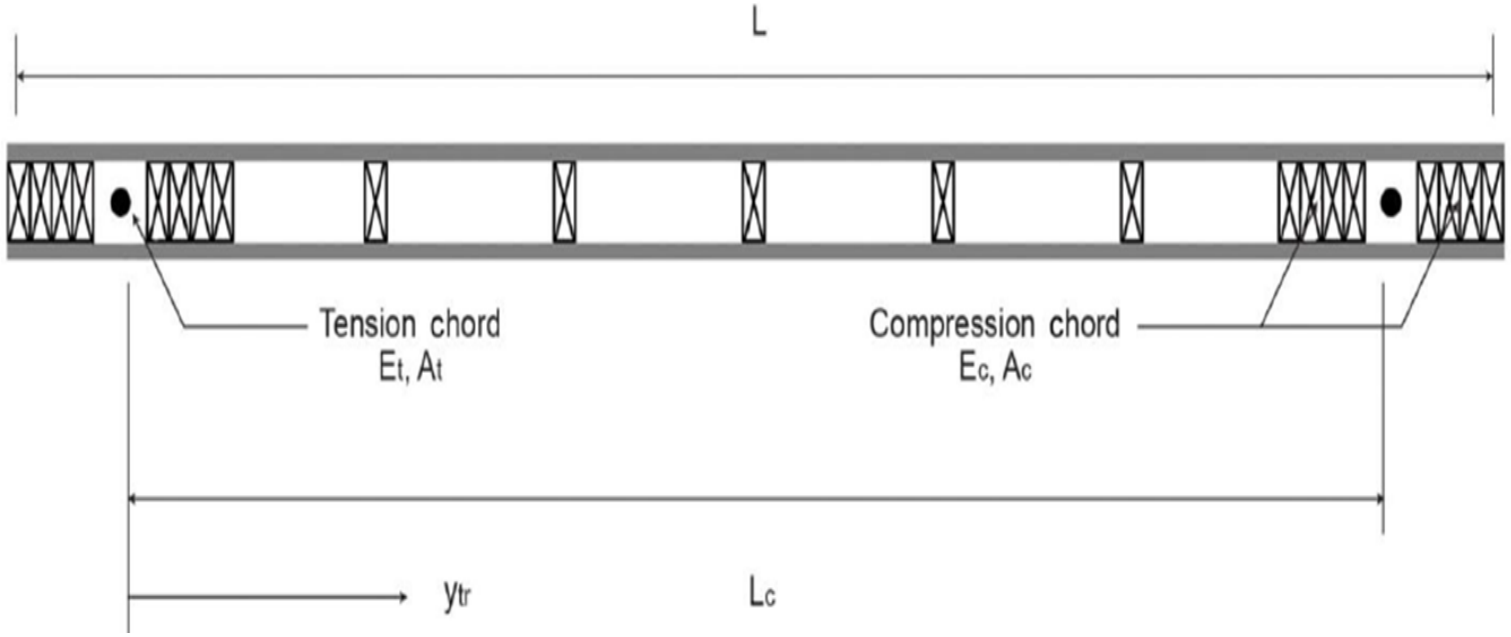
Typical Floor Construction

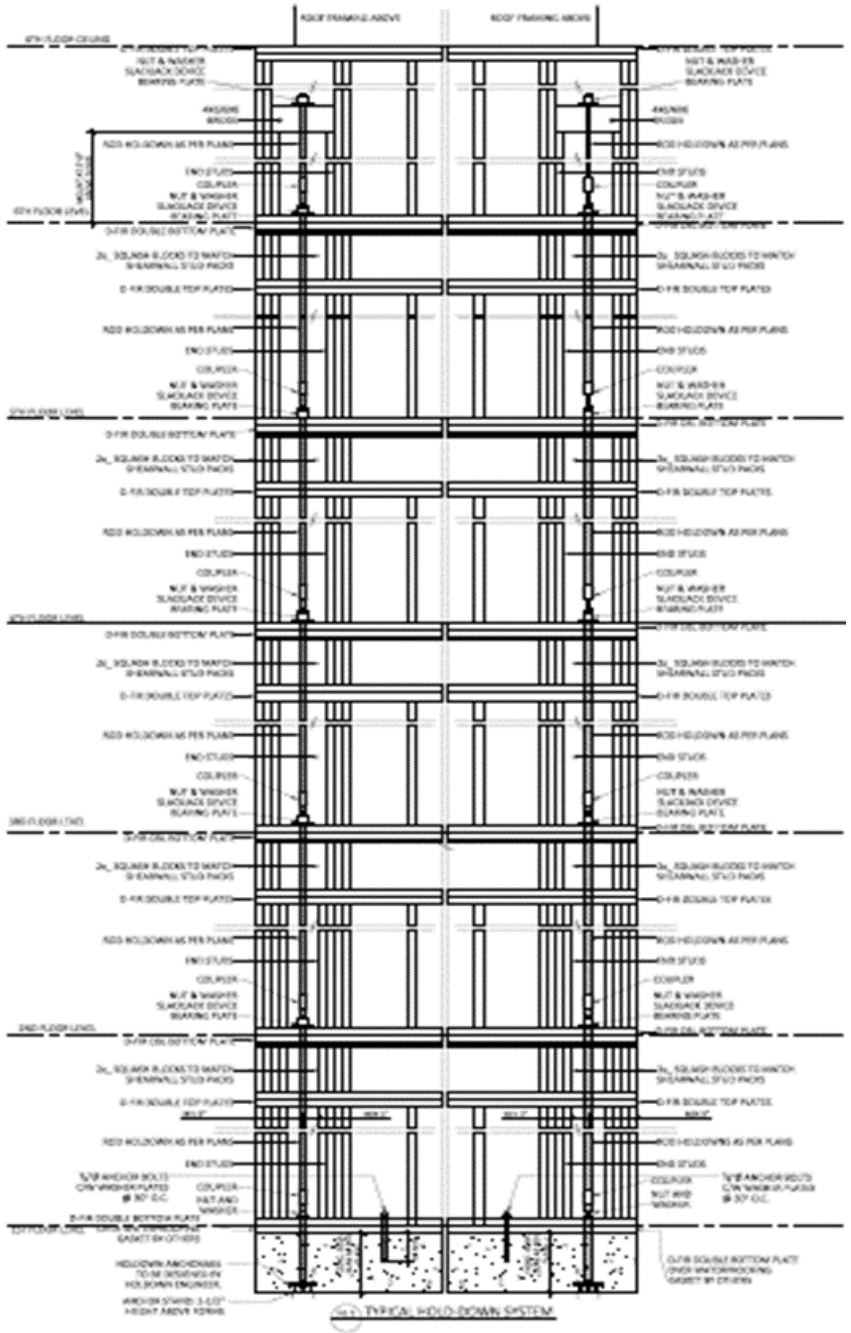


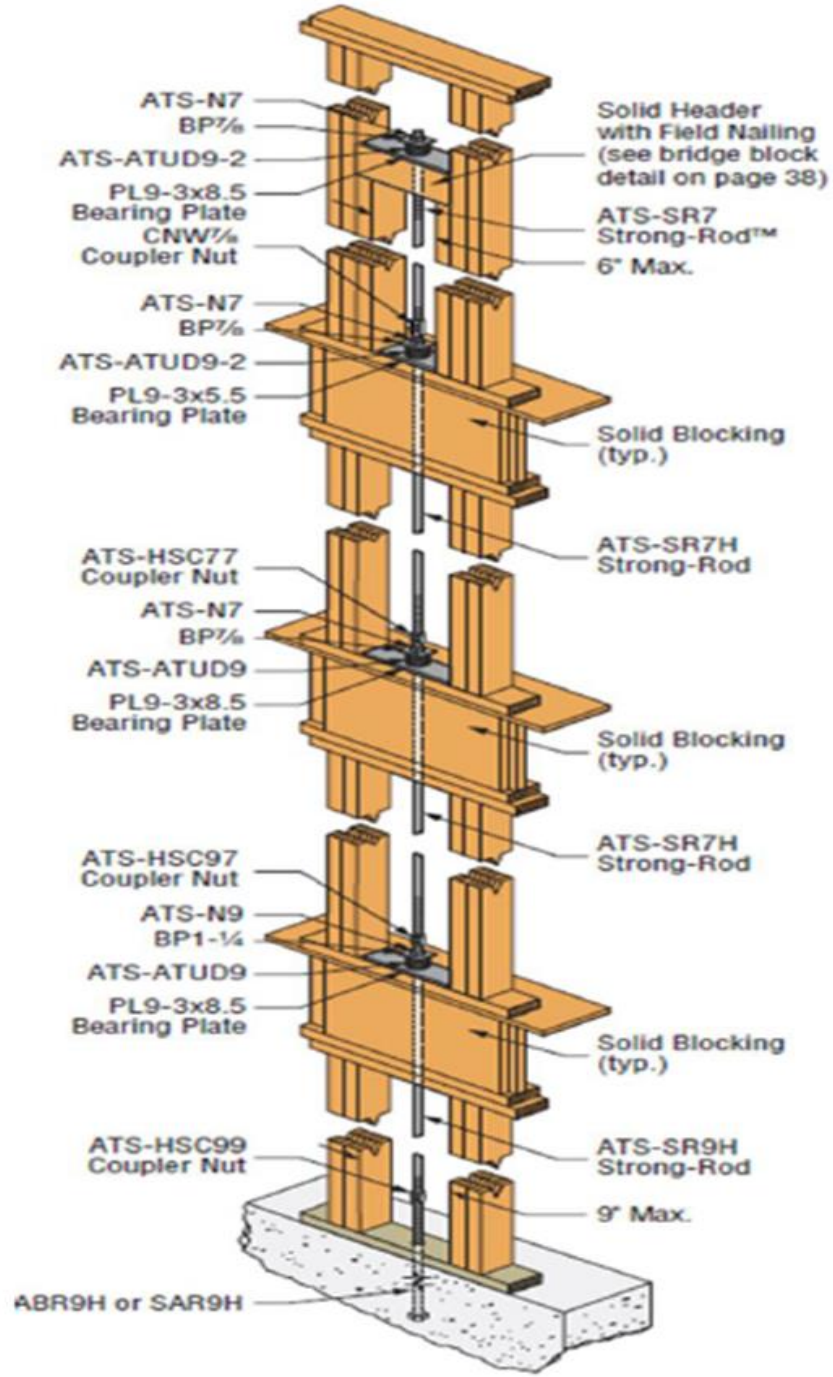
How?

Shear Wall Construction

- Seismic Performance (nail slip)
- Take-Up Devices
- Flexible and Ductile (reduced seismic loads)






ATS-N7
BP7/8
ATS-ATUD9-2
PL9-3x8.5
Bearing Plate
CNW7/8
Coupler Nut
Solid Header
with Field Nailing
(see bridge block
detail on page 38)
ATS-SR7
Strong-Rod™
6" Max.
ATS-N7
BP7/8
ATS-ATUD9-2
PL9-3x5.5
Bearing Plate
Solid Blocking
(typ.)
ATS-HSC77
Coupler Nut
ATS-SR7H
Strong-Rod
ATS-N7
BP7/8
ATS-ATUD9
PL9-3x8.5
Bearing Plate
Solid Blocking
(typ.)
ATS-HSC97
Coupler Nut
ATS-SR7H
Strong-Rod
ATS-N9
BP1-¼
ATS-ATUD9
PL9-3x8.5
Bearing Plate
Solid Blocking
(typ.)
ATS-HSC99
Coupler Nut
ATS-SR9H
Strong-Rod
9" Max.
ABR9H or SAR9H

How?

- Services Integration
- Corridors
- Balconies
- Lift Shafts
- Time Efficiencies
- Pre-fabrication
- Modularisation

Code Compliance?

- B1/VM1
- NZS1170.5 (Loadings)
- NZS3603 (Timber structures standard)
- Covered under current verification method
- Alternative solution and peer review may be required for low-damage systems, such as rocking shear walls

What Is Next?

- Cross-Laminated Timber (CLT)
- Portal Frames
  - Glulam
  - Laminated Veneer Lumber (LVL)
- PRESSS-LAM
- Rocking Structures
- RSFJ-Tectonus

Cross- Laminated Timber (CLT)

Available from:

Xlam- Nelson, New Zealand (also available in Australia)

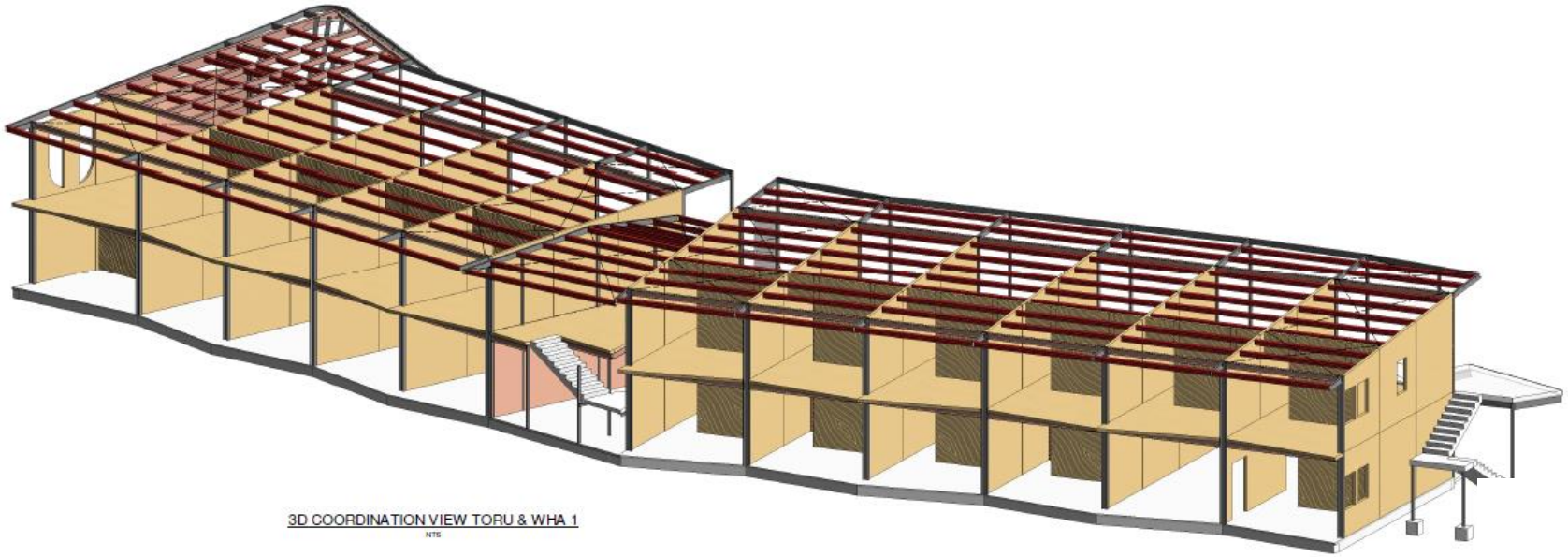
https://www.xlam.co.nz/

Streamlined Building Solutions (ex Australia, imported from Europe)

http://www.streamlinedbuilding.com/

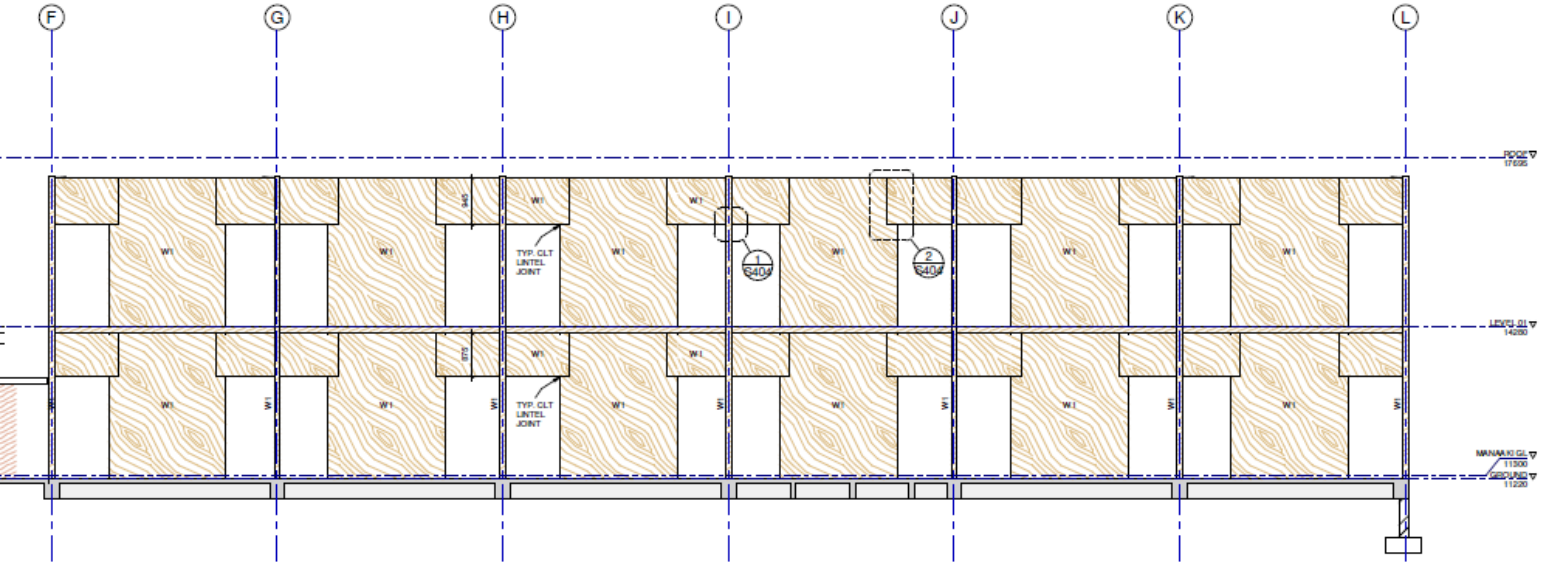
CLT- Mahitahi example

- Approx. $11M residential development
- Used “3-layers” CLT (5 layers expensive due to glue)
- CLT3/115 walls
- CLT3/135 floors
- Ductility μ =1.25-2.0

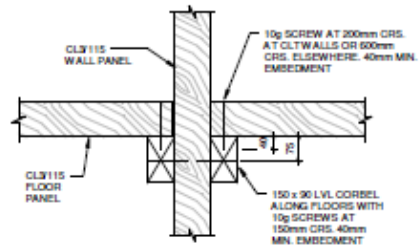


3D COORDINATION VIEW TORU & WHA 1

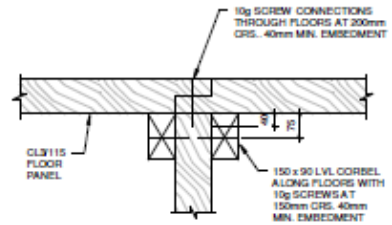
NTS



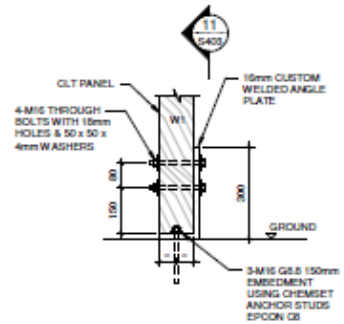
ELEVATION RUA ALONG CLT WALL GRID 1.4 — 1 / S102 — 1 : 50 @ A1



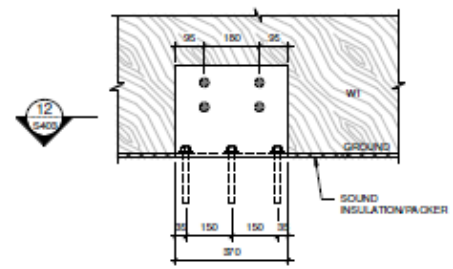
DETAIL 8 — 1 : 10 @ A1 — S121



DETAIL 9 — 1 : 10 @ A1 — S121



DETAIL 10 — 1 : 10 @ A1 — S111



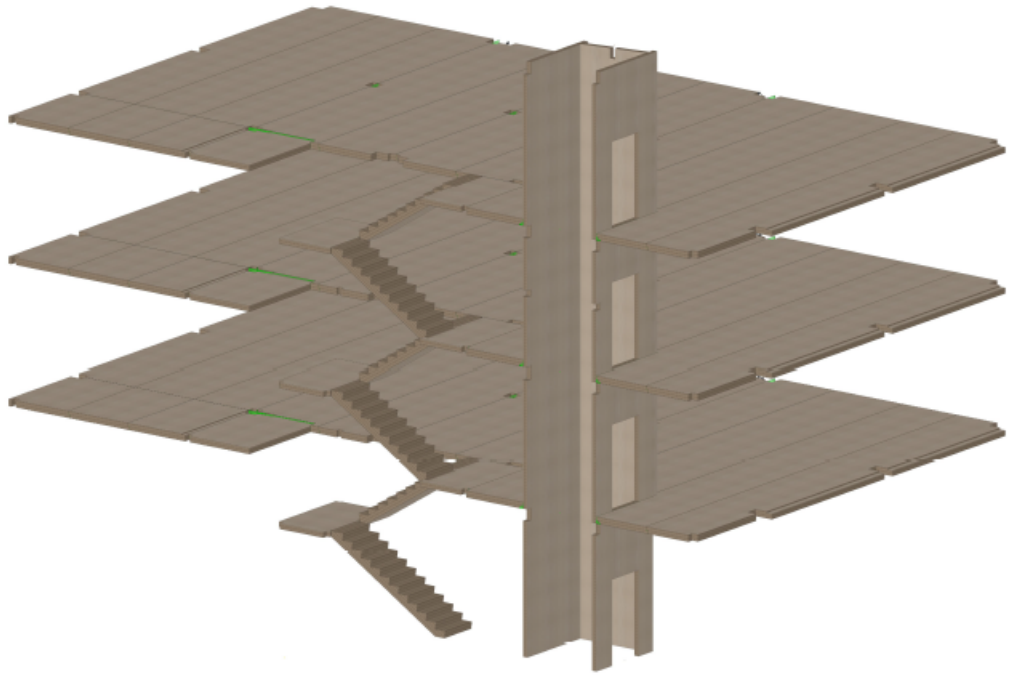
DETAIL 11 — 1 : 10 @ A1 — S211

XLam Shop Drawings

49-51 The Strand

ILINE CONSTRUCTION

Required Date: TBC
Customer: ILINE CONSTRUCTION
Architect: Wingate Farquhar
Engineer: Maximo Muller - 07 578 0896
Builder: ILINE CONSTRUCTION
Site Contact:
Site Address: 49-51 The Strand
Tauranga



PANELS SPECIFICATIONS

LOCATION / NAME	LAY-UP	AREA (m^2)	APPEARANCE		TREATMENT		
			TOP / FRONT	BOTTOM / BACK	TOP / FRONT	MIDDLE	BOTTOM / BACK
Lift shaft	CL5/130	107m^2	NVF	NVF	H1.2	H1.2	H1.2
Floor	CL5/175	712.5m^2	NVF	NVF	H1.2	H1.2	H1.2
Stair landings	CL3/135	22.5m^2	NVF	NVF	H1.2	H1.2	H1.2
Wet area	CL5/145	16m^2	NVF	NVF	H3.2	H3.2	H3.2
Wet area	CL5/175	46m^2	NVF	NVF	H3.2	H3.2	H3.2
AirStairs	AS9/315	24.2m^2	RGF	NVF	H1.2	H1.2	H1.2

CLT FIXINGS

The above are minimum requirements only, see engineers drawings/specs for details.
Fixings have been shown for information and are interpreted from structural design information
The structural engineer is to confirm completeness of the information shown
Supply of fixings is by the client. We note early ordering for lead-times should be allowed

TYPE	BRAND	ø	CENTRES	LOCATION	QUANTITY
	100mm Coach screws	M10	na	UA steel taps to lift shaft (D23 XL403)	100
	Spax 6x80 DS W/H	6mm	300	UB & PFC TO XLam floor panels (XL405)	2800
	Spax 6x160 DS W/H	6mm	300	CL5/175 Lap joints	1200
	Spax 6x120 DS W/H	6mm	300	CL5/145 Lap joint & UB/packer to XLam connection as shown on detail D27 XL405	100
	Spax 8x120 DS CS	8mm	TBC	Top of stair lap joint (D24 XL404)	TBC
	Spax 8X260 DS CS	8mm	TBC	Stair to landing connection (D24 XL404)	TBC
	Spax 8X220 DS CS	8mm	TBC	Lift shaft panel connections (D30 XL405)	TBC

Rev	Date	Modification
A	18/10/2017	Fixings added

FSC www.fsc.org 100% wood from well-managed forests FSC® C133133

XLam

XLam NZ Ltd
57 Beatty St
Tahunanui
Nelson NZ 7011
03 538 0930
info@xlam.co.nz

Project: 49-51 The Strand
Client: ILINE CONSTRUCTION

COVER SHEET

Final Approval, sign_____date___/___/2017

nts	Drawn by: BC	job no: N1708	date: 18/10/2017	sheet no: XL 000	rev. A

Conclusion/Questions?

CONTACT US

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