

# COST EFFICIENCIES AND FUNDING CONSIDERATIONS FOR TIMBER BUILDINGS



Gardiner  
Architects

*[Paul@gardinerarchitects.com.au](mailto:Paul@gardinerarchitects.com.au)*

*7/252 St Georges Rd, Fitzroy North, VIC, 3068*



# Perceived issues in mid-rise construction

- SKILLS REQUIRED
- CONTRACTORS EXPERIENCE
- LACK OF EXAMPLES
- COSTING AND PROGRAM
- ACOUSTIC SOLUTIONS
- COMPLEXITY OF DESIGN



**WITH  
CONCRETE  
IT'S  
EASIER**

# Our message is: “Change your mindsets”

- SKILLS REQUIRED
- CONTRACTORS F
- LACK OF EXAMPLE
- COSTING AND P
- ACOUSTIC SOLUTION
- COMPLEXITY OF DESIGN

**INNOVATORS  
DO ALREADY  
GET BENEFITS**



# OUTLINE

## Assessing feasibility

- **STANDARD COSTS**
- **FINANCIAL APPROACHES**
- **HIGH STREET, THORNBURY**
- **CONCLUSIONS**



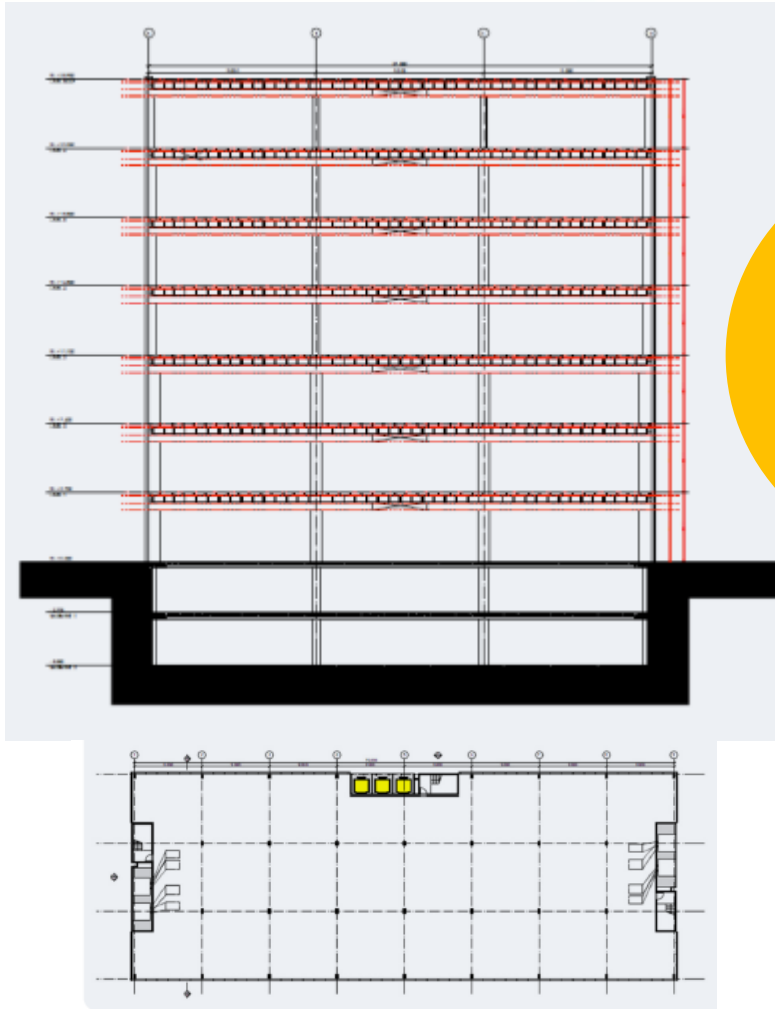


# STANDARD COSTS



# TDG #26 - OFFICE

Initial design (2015), updated



**TIMBER:  
-16%  
AND  
2 MONTHS  
QUICKER**

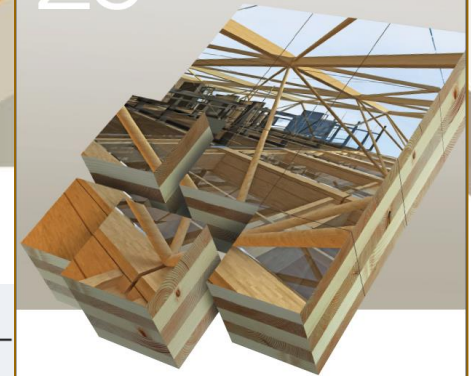


# TDG #26 - OFFICE

Initial design (2015), updated

26

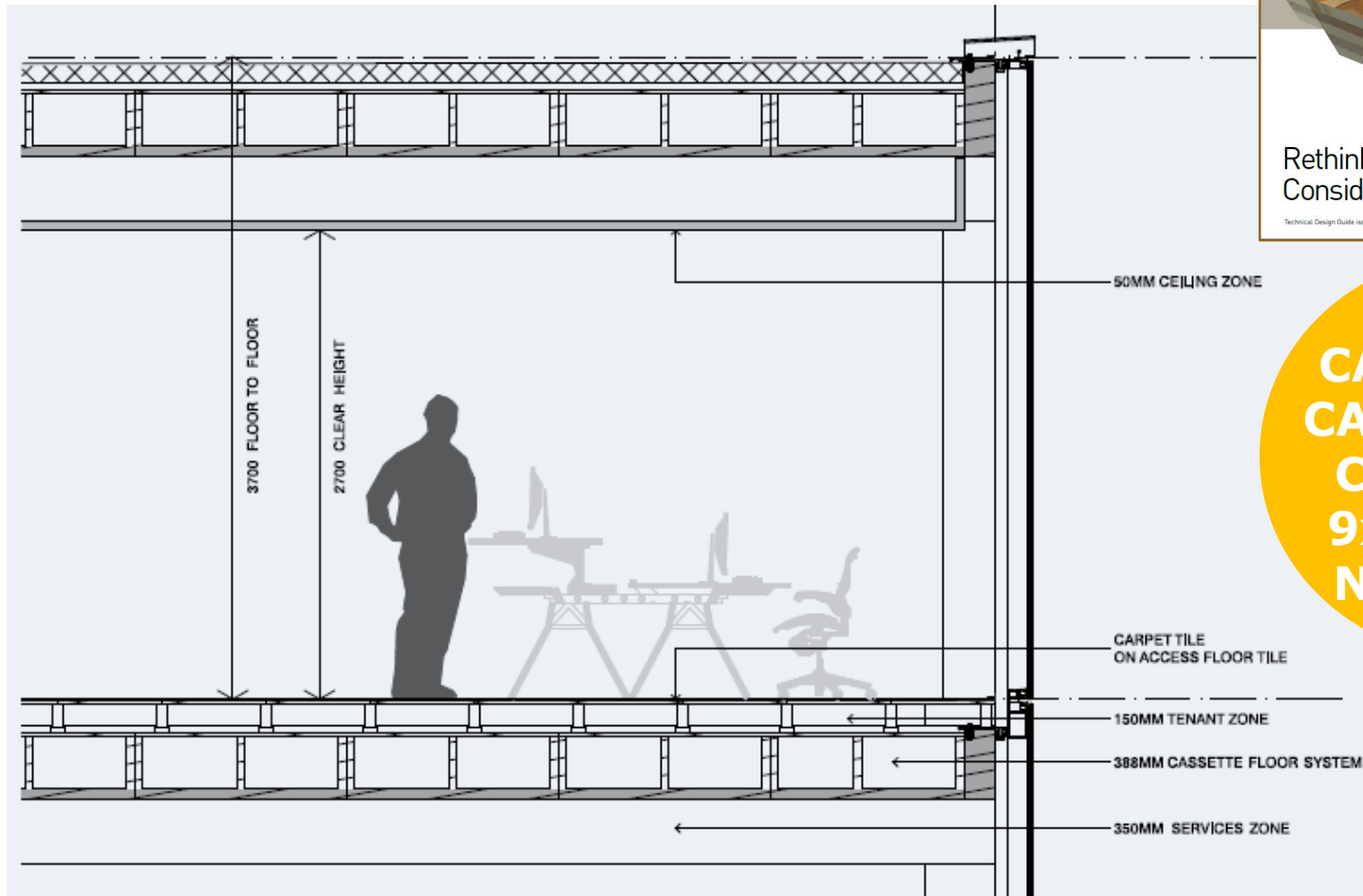
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design and build  
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Rethinking Office Construction -  
Consider Timber

Technical Design Guide issued by Forest and Wood Products Australia

**LVL  
CASSETTE +  
CANTL. BEAM  
CLT CORES  
9x9m GRID  
NCC SPECS**



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# OFFICES & COMMERCIAL

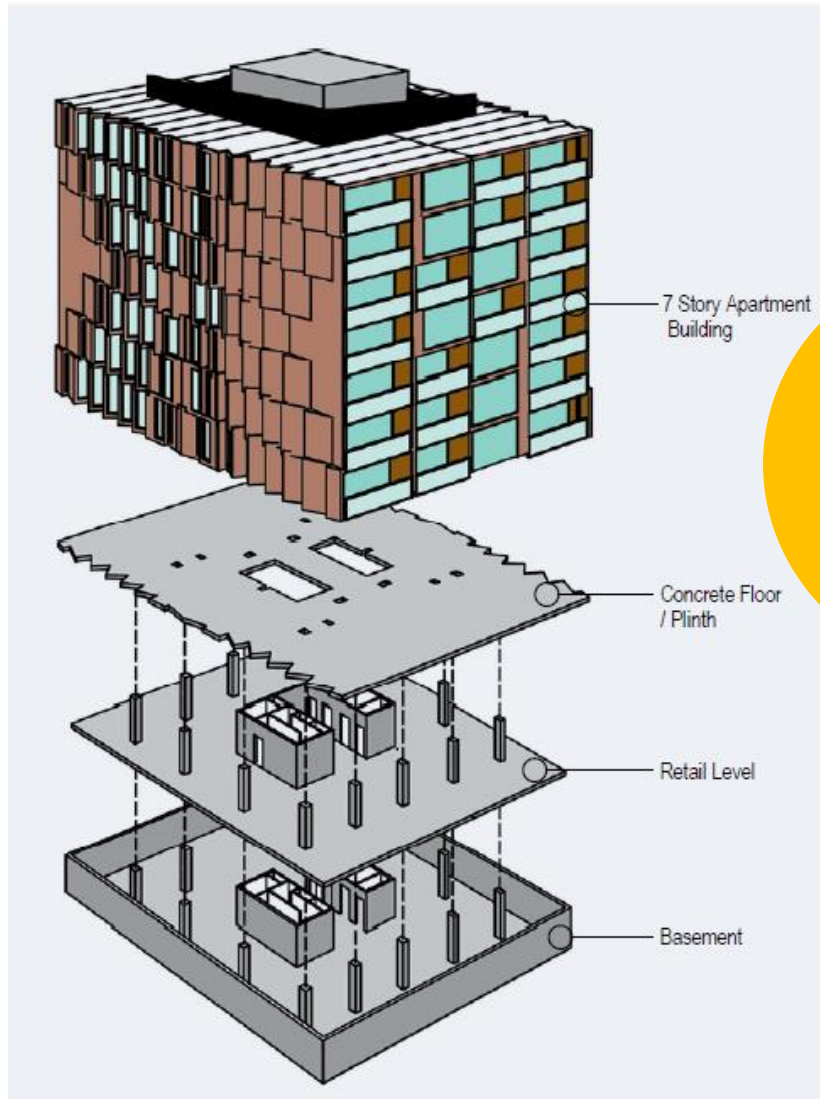
## Setting higher standards...



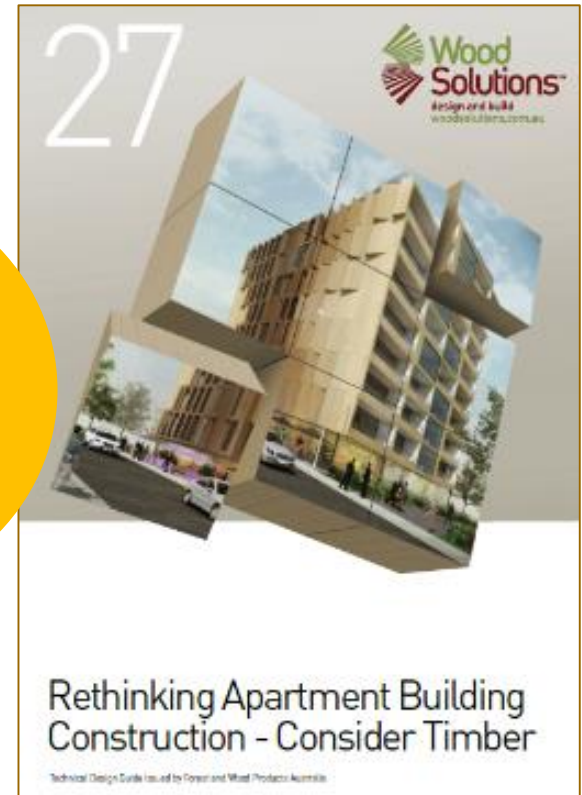


# TDG #27 – APARTMENTS

Initial design (2015), updated



**CLT -6.5%  
TF -13.8%  
AND  
3 MONTHS  
QUICKER**



# TDG #27 – APARTMENTS

Initial design (2015), updated



27

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Rethinking Apartment Building  
Construction - Consider Timber

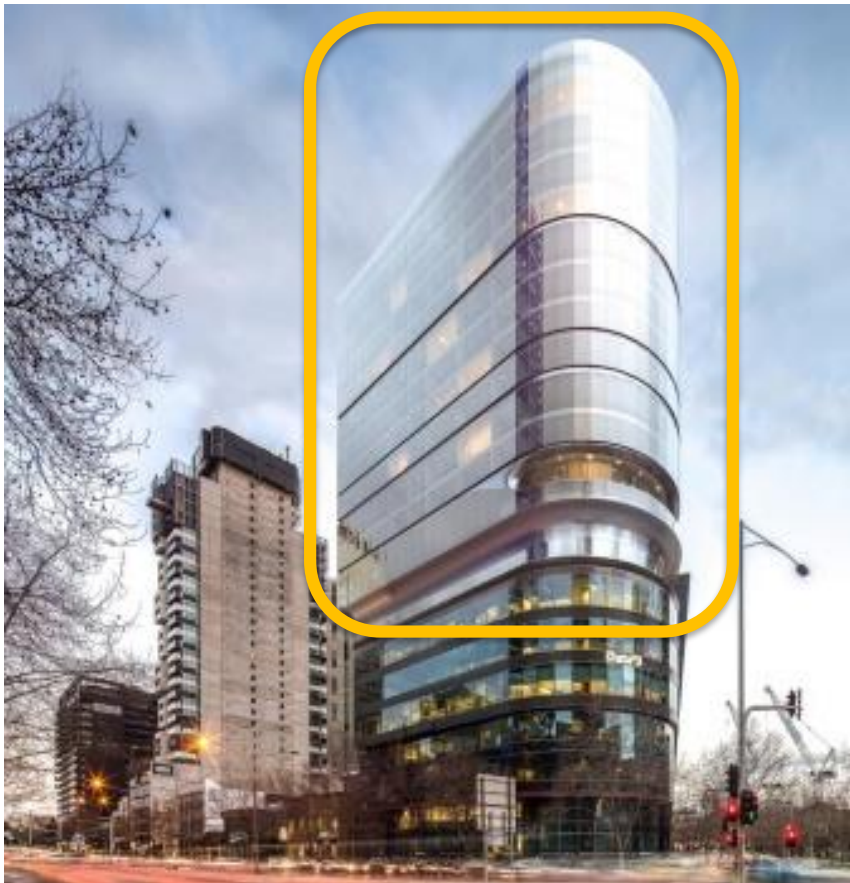
Technical Design Guide issued by Forest and Wood Products Australia

**PLATFORM  
OR BALCON  
NCC DTS SPECS  
SPRINKLERS**

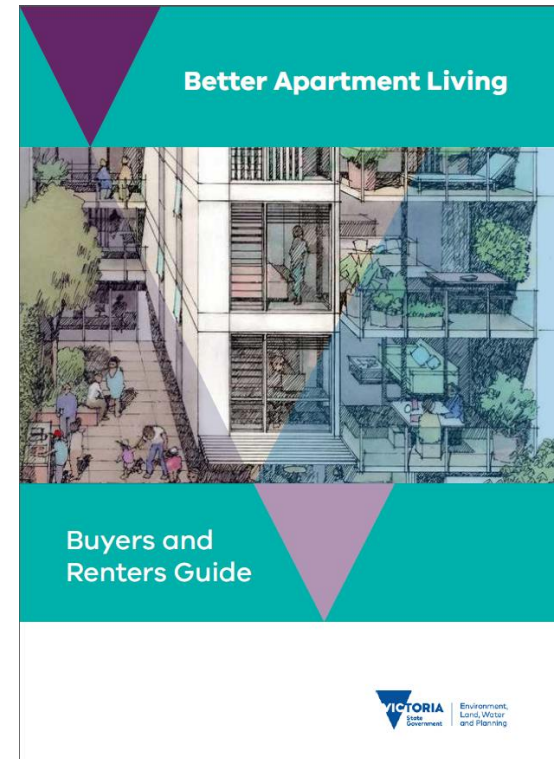
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# APARTMENTS

Ready to be better...



HUME PARTNERS  
PROPERTY



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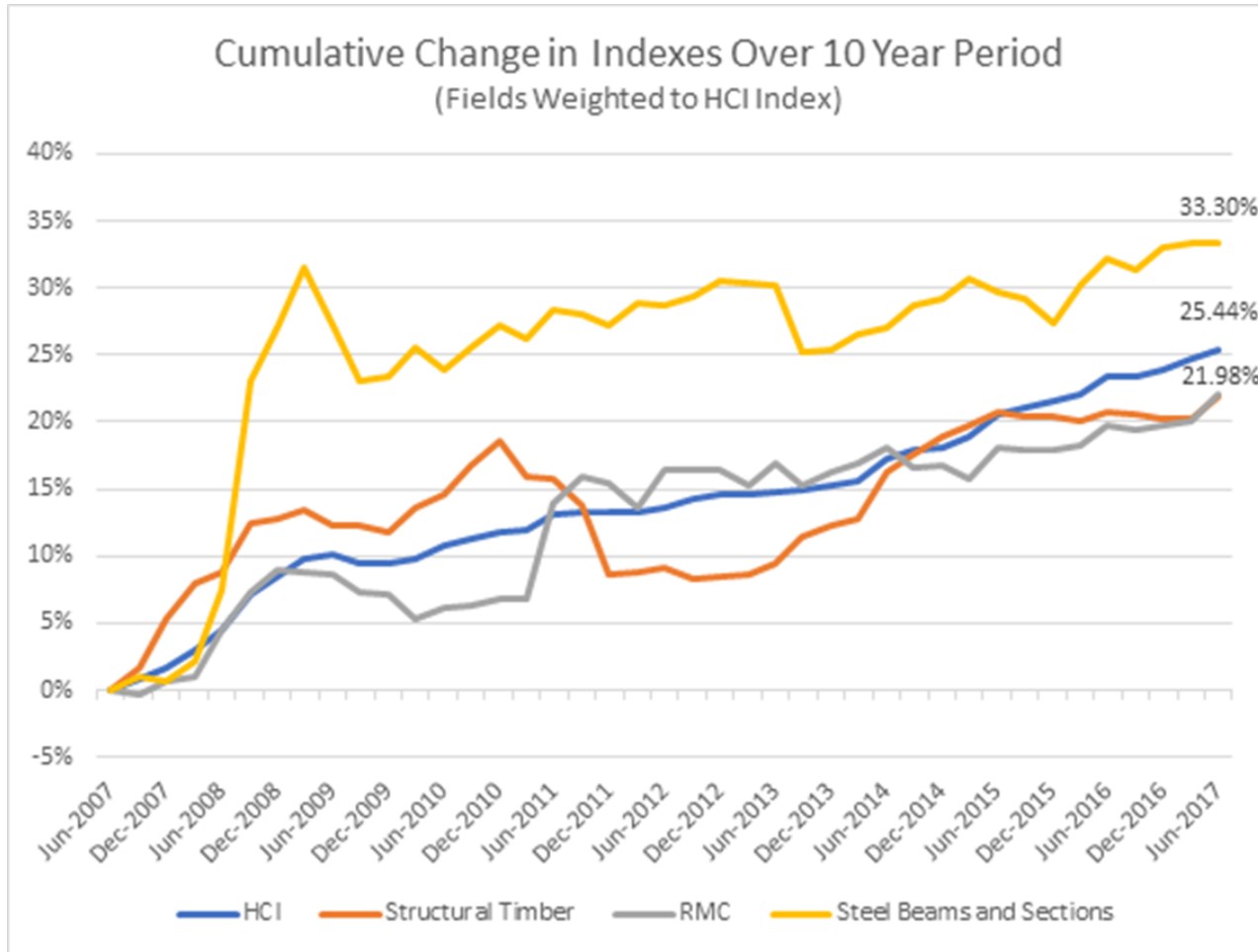


# FINANCIAL APPROACHES



# TIMBER PRICES ARE STABLE

## ABS Producer Price Indexes

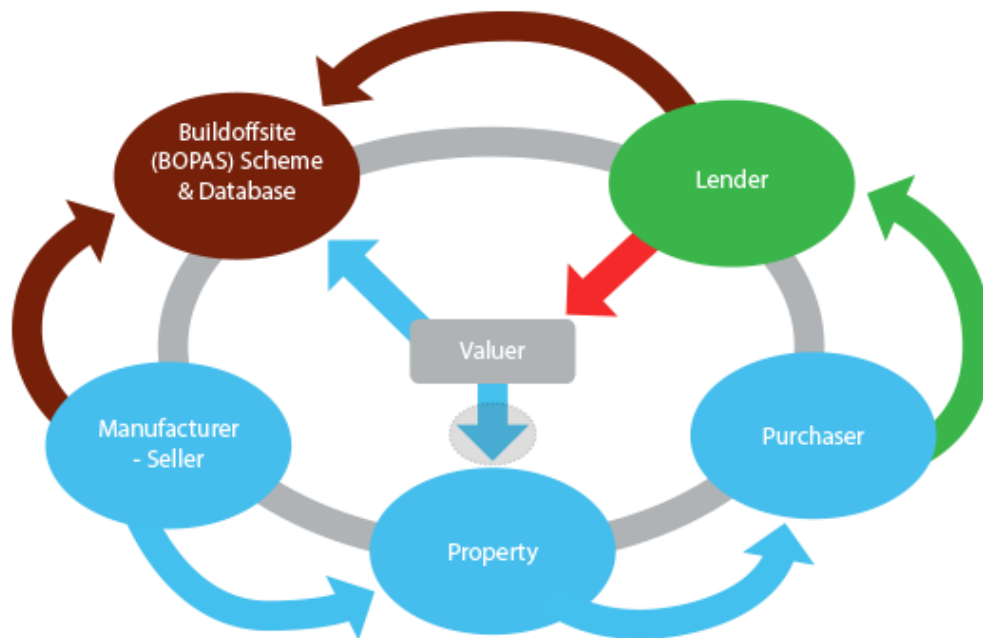


# FINANCING PURCHASERS

and, indirectly, supply and construction



<http://www.bopas.org/>



in consultation with



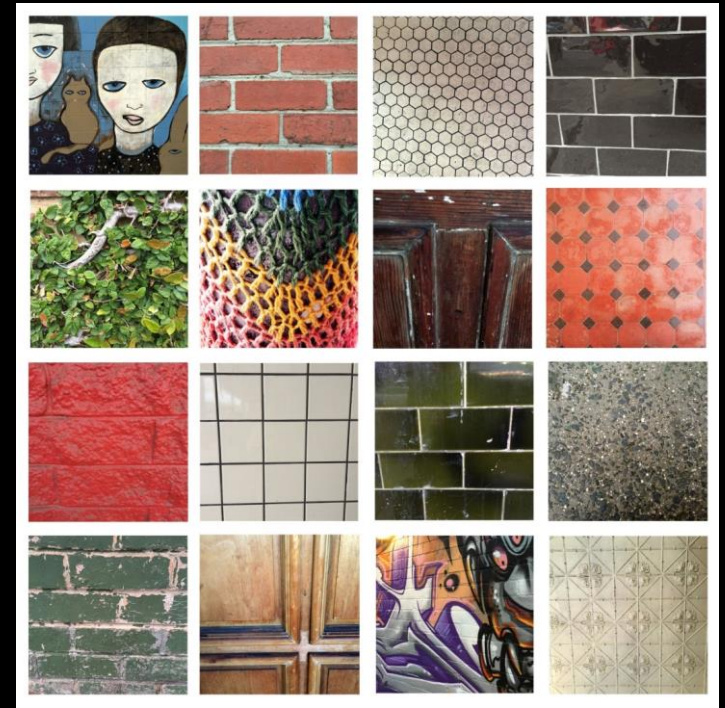
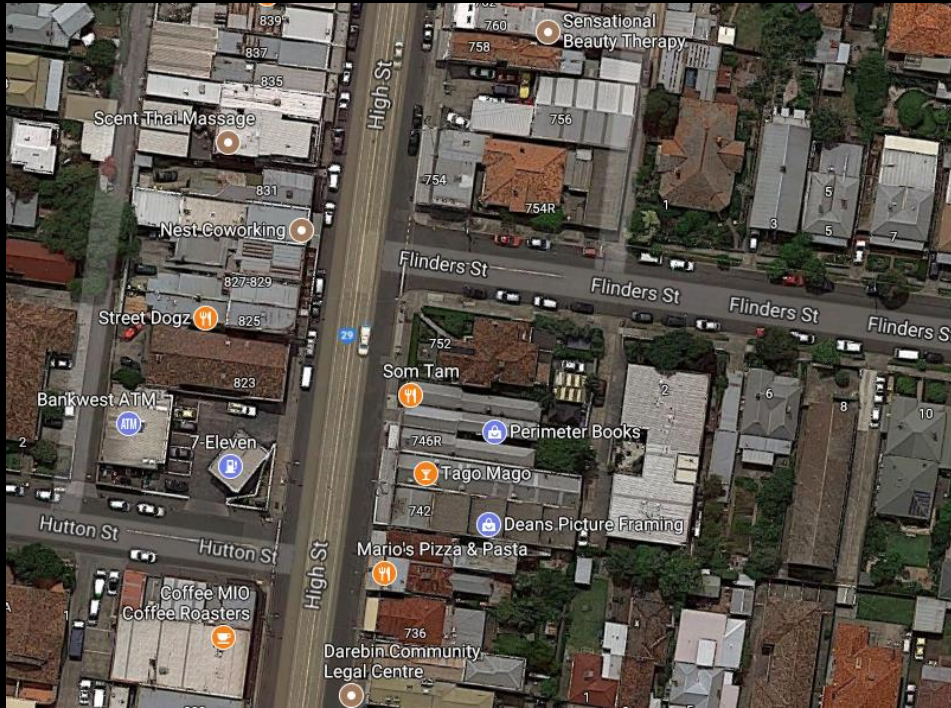




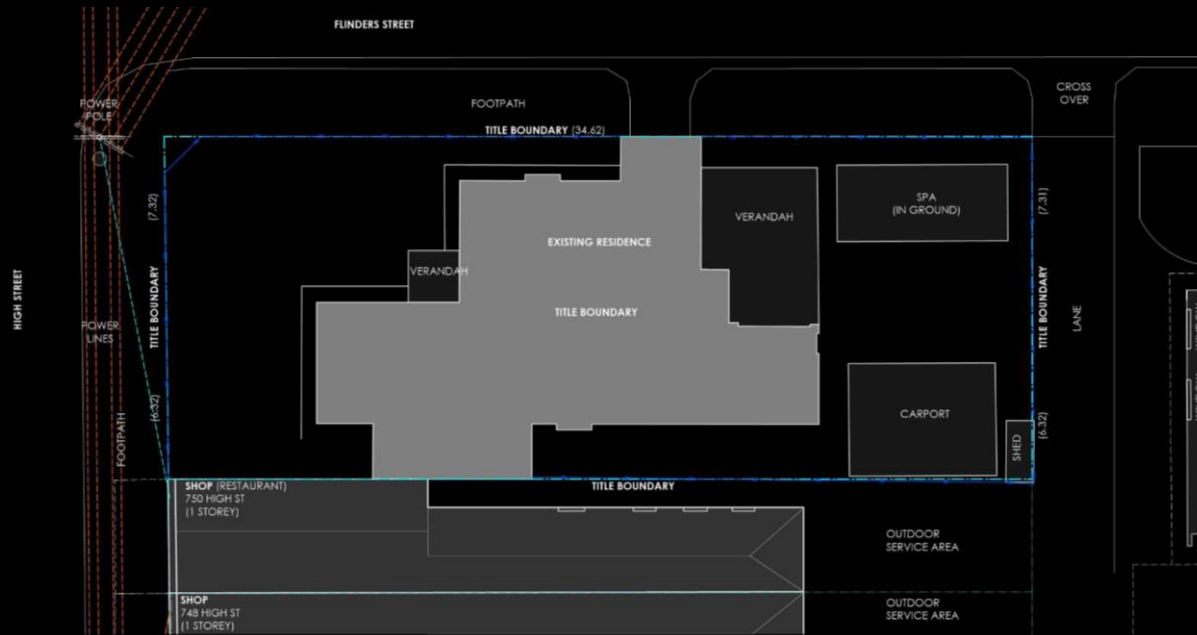
# HIGH STREET, THORNBURY



## Case Study: High St, Thornbury



Context    Location



- Contaminated Site
- Adjacent Powerlines
- Corner site
- Good access
- North facing side street

## Context Site Constraints + Opportunities

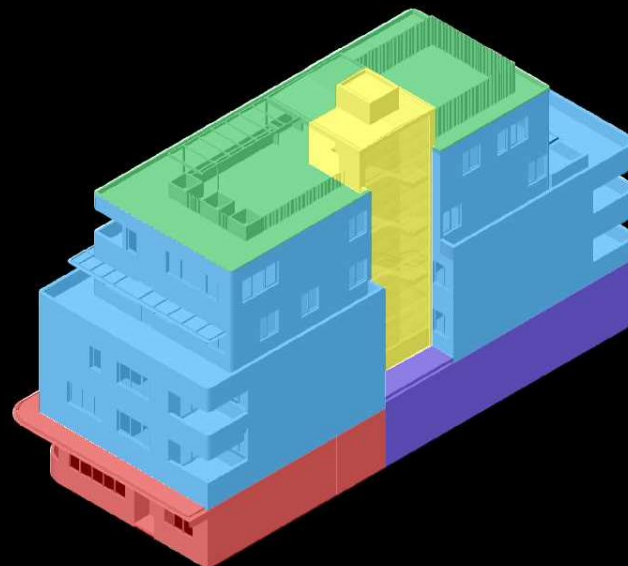
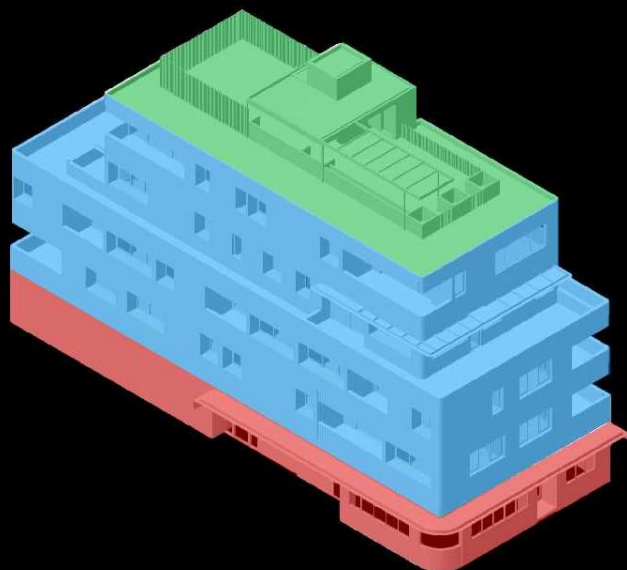






## Project Scope

- Retail and carstacker at ground level
- 13 residential apartments (1,2 + 3 beds)
- Communal rooftop deck and garden
- Developer to hold majority of apartments



Context   **Brief**



-  - Retail + car stacker at ground level
-  - Apartments over 4 levels
-  - Communal rooftop deck
-  - Single central stair + lift

Context   **Program**

- Planning permit received, committed to brick cladding
- Investigated structural systems
- Wood Solutions helped educate about mass timber industry
- Client willing to balance innovation and risk
- Engineered timber needs to be cost effective
- Interested in short + long term advantages of timber

Objectives

**Client Budget + Commitment**



- Fire control
- Acoustic control
- Cladding system
- Exposing timber structure
- Procurement systems
- Timber Supply
- Environmental considerations
- Zero setbacks

Objectives

**Timber Design Challenges**



Brick slip cladding

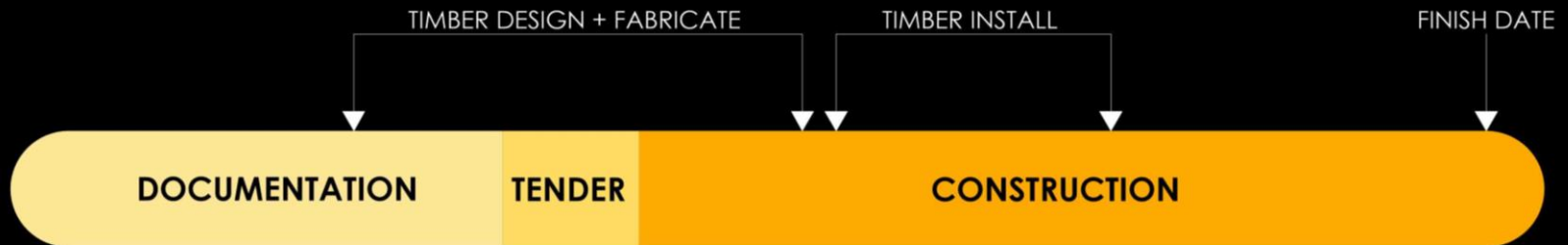


Exposed timber ceilings and services

Objectives

Finishes

- Advantages of a shorter construction period
- Procurement process: engaging timber contractor early
- More office hours spent during design development + documentation
- Less variations and site corrections expected



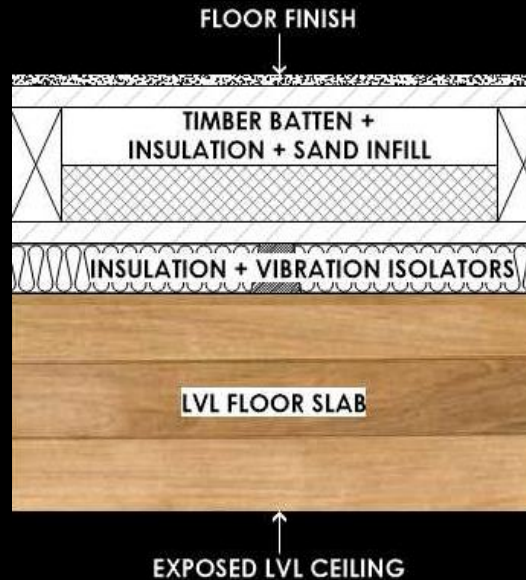
Objectives

**Timeframe (2-3 months quicker)**



## Fire

- Sprinkler system throughout, allowing more flexibility
- Fire engineering was preferred to DTS for exposing timber



## Acoustics

- Achieve a higher performance than BCA
- A combined solution with regard to traffic noise, between apartments

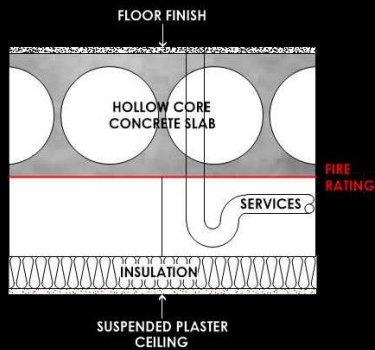
## Objectives

## Fire + Acoustic Performance

- Use of renewable material supported by Council policy
- Reduce overall carbon footprint
- Increase thermal performance
- Higher star rating **8.2 average**
- Economically sustainable investment

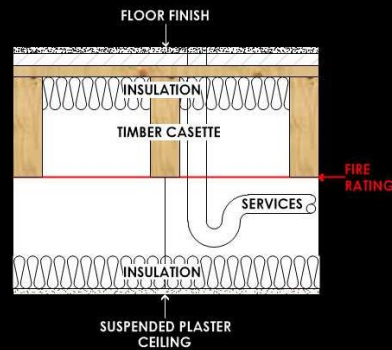
Objectives

**Sustainability**



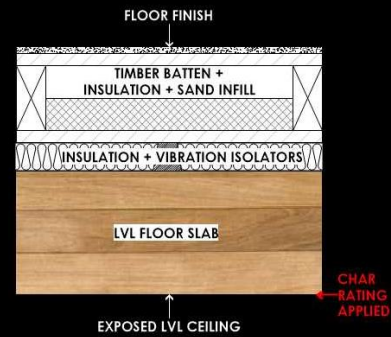
## Sketch Design

53Rw + Ctr  
50Lnw  
\$333/m2



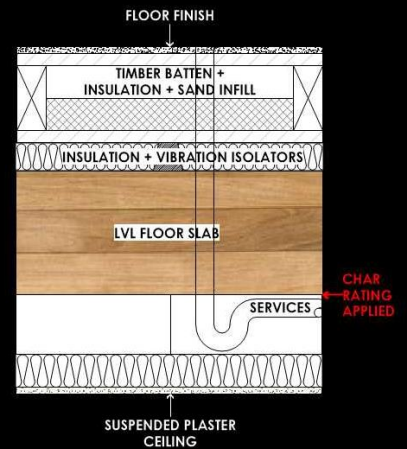
## Design Development

>50Rw+Ctr  
<51Lnw  
\$350/m2



## Documentation

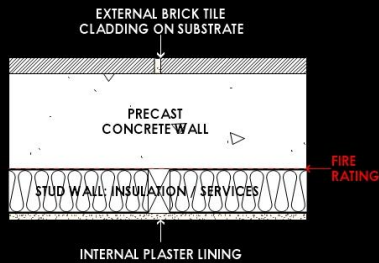
>53Rw+Ctr  
<50Lnw  
~\$310/m2



>55Rw+Ctr  
**<47Lnw**  
~\$370/m2

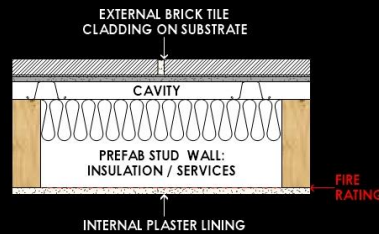
# Solutions Construction Options - Floors





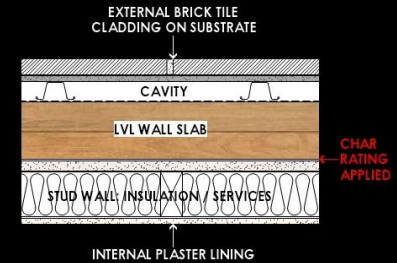
Sketch Design

53Rw + Ctr  
\$480/m2



Design Development

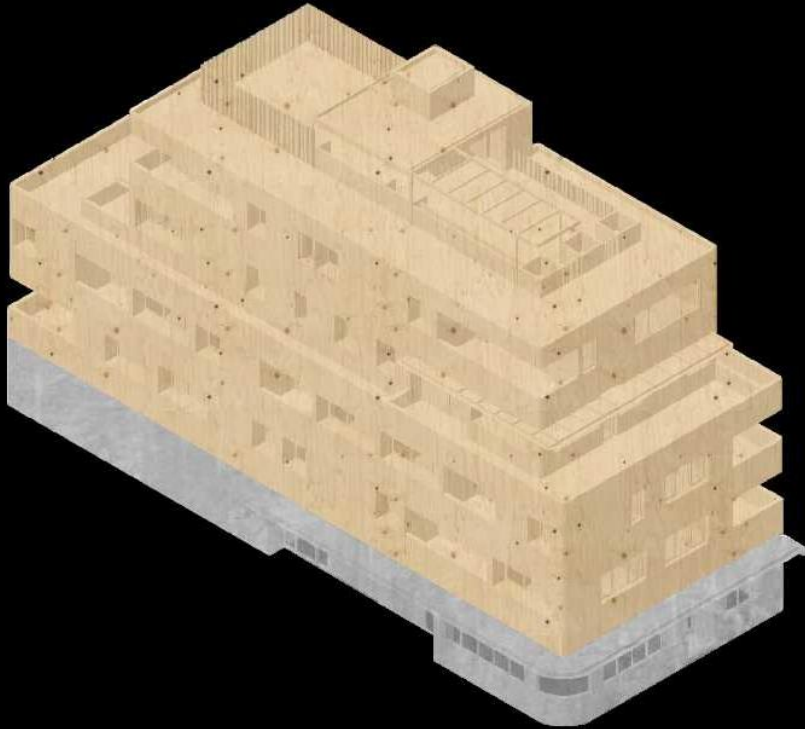
49Rw + Ctr – Timber Stud  
\$260/m2 – Timber Stud



Documentation

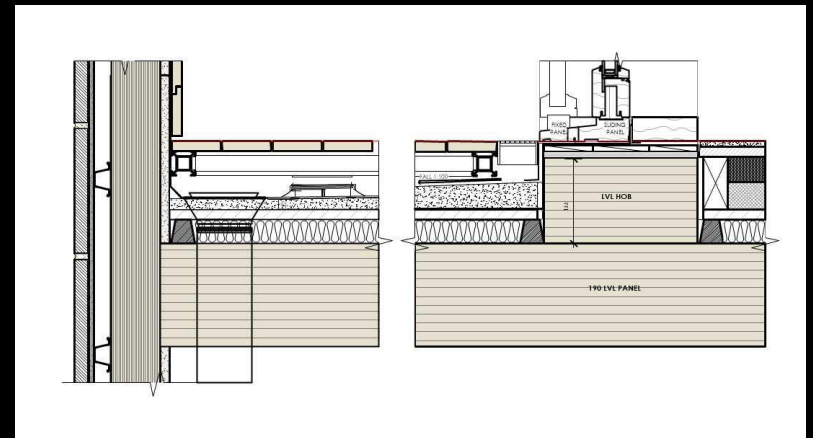
53Rw + Ctr  
**\$340/m2**

## Solutions Construction Options - Walls

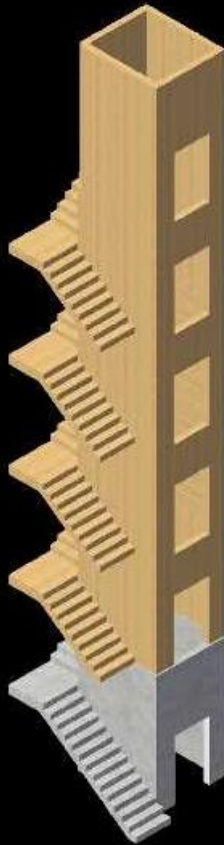


Concrete Ground Level  
Timber upper levels

**Solutions** **Construction**



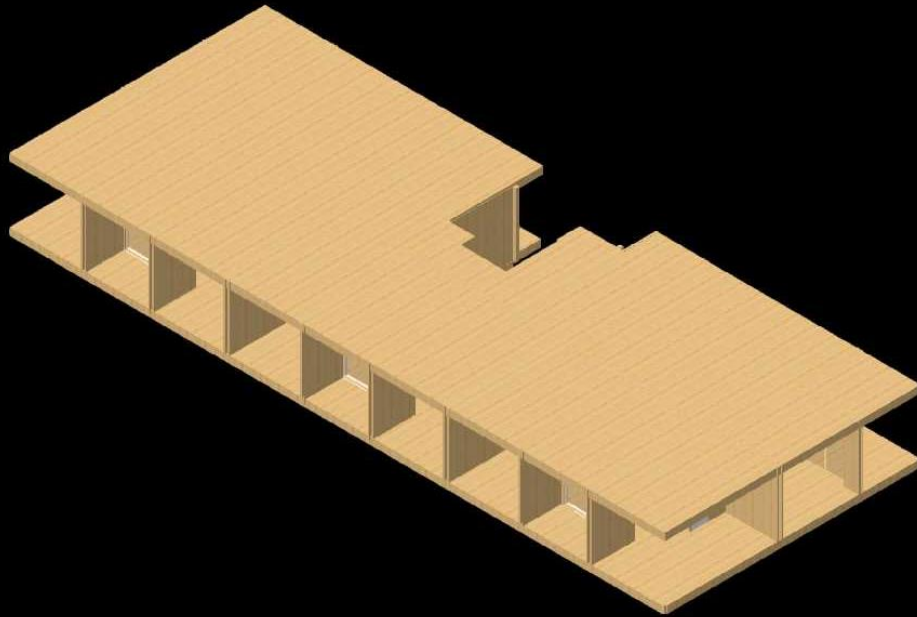
Balcony Threshold



- Concrete stair + lift shaft to ground level
- LVL timber lift shaft + stair to upper levels
- Single open stair around lift well

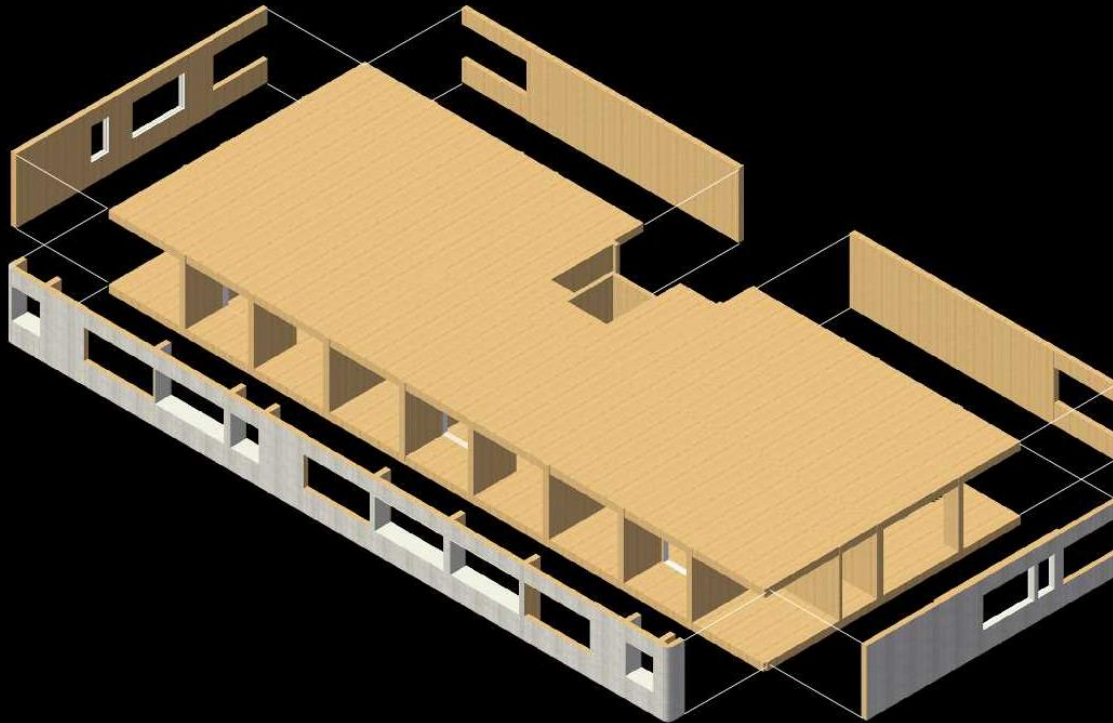
Solutions **Construction**





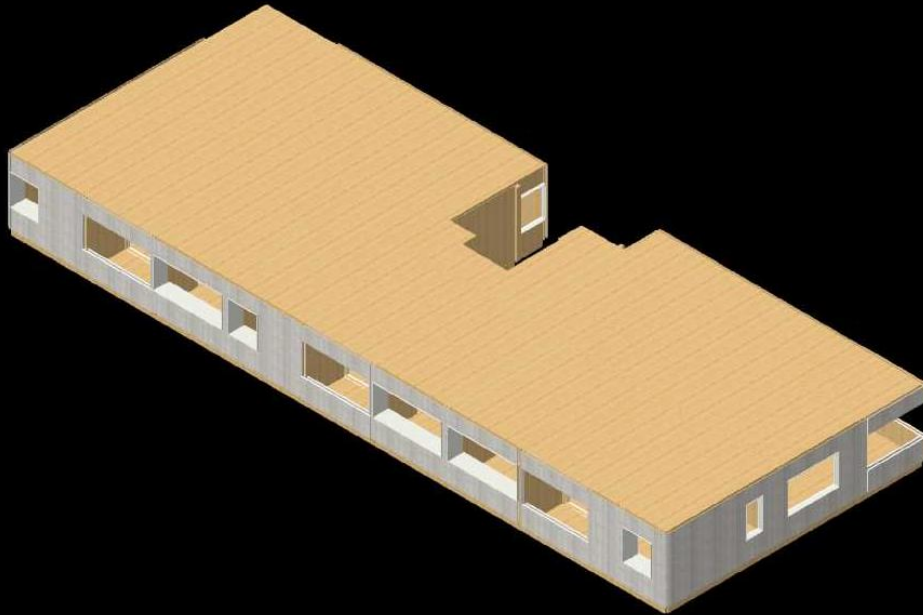
- LVL walls + floor plates

**Solutions** Prefabrication Process



- Pre-fabricated wall panels with cladding
- Pre-fabricated window boxes

**Solutions** Prefabrication Process



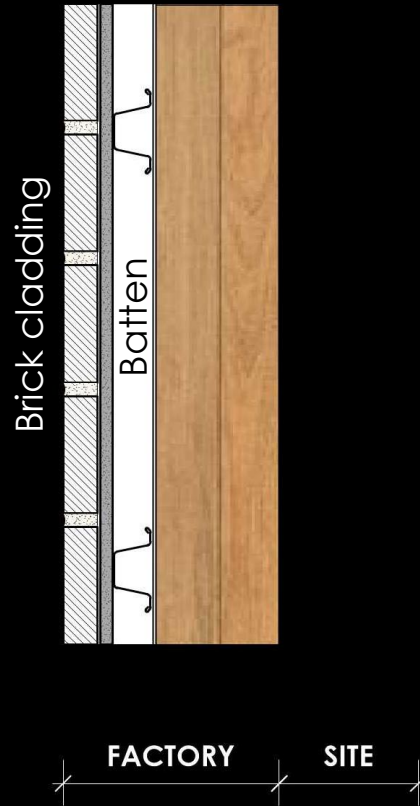
- Installed + connected to LVL floor plates on site

**Solutions** Prefabrication Process

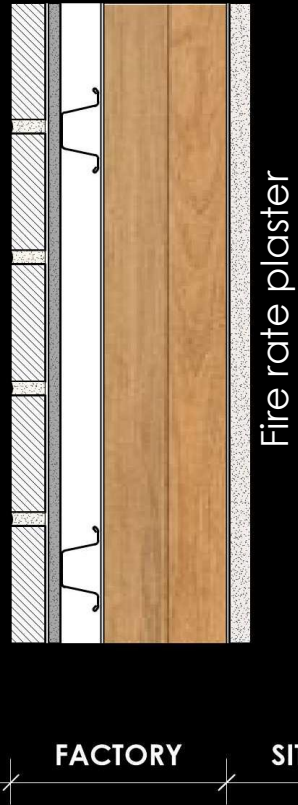




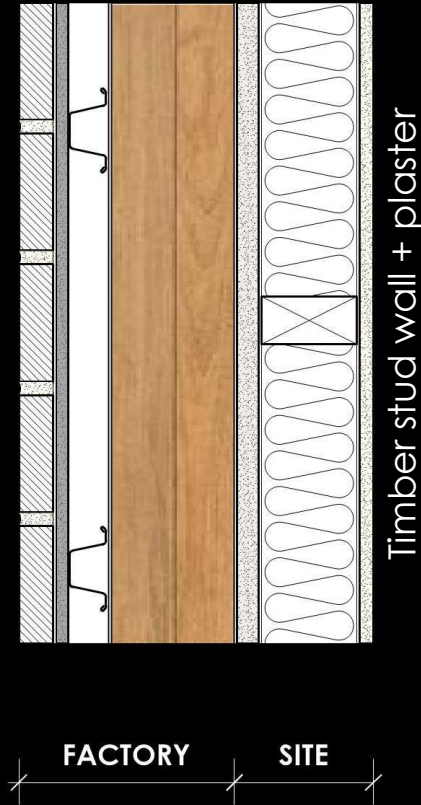
## Solutions Prefabrication Process



## Solutions Prefabrication Process

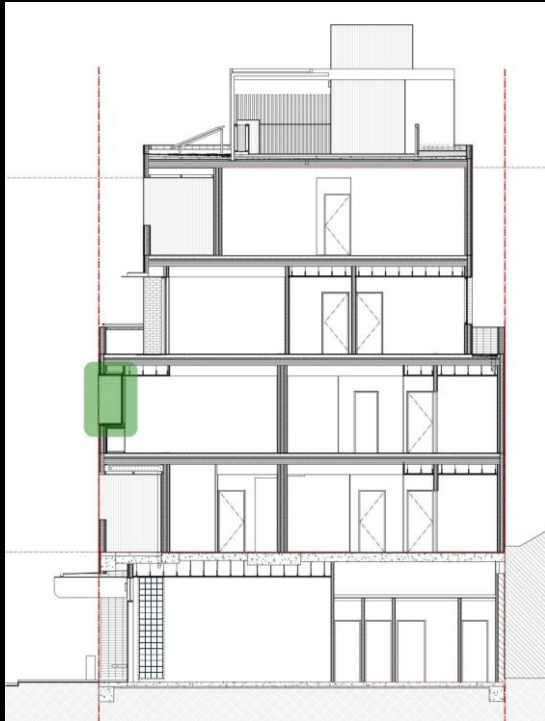


## Solutions Prefabrication Process



## Solutions Prefabrication Process





Recessed Window Boxes

**Solutions** Prefabrication Process



Sketch Design

Design Development

Documentation



Fixed



Mobile



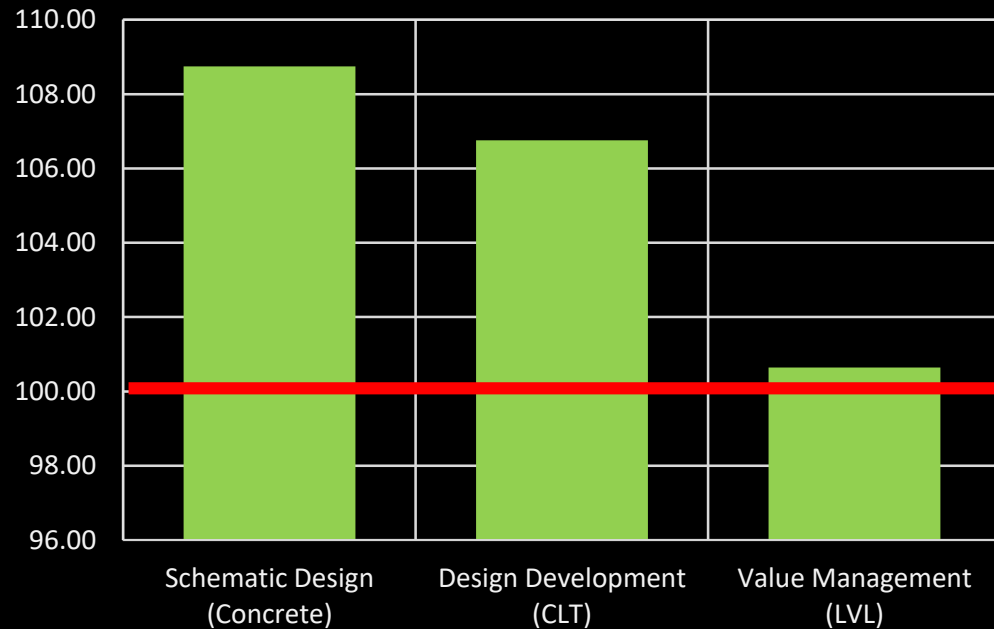
Self-erecting

Solutions **Cranage**

## Cost Plan Summary

	Schematic Design (Concrete)	Design Development (CLT)	Value Management (LVL)
Trades	61.0%	66.8%	66.3%
Services	17.9%	17.8%	18.3%
Prelims & Margin	11.8%	11.0%	11.0%
Allowances	9.3%	4.4%	4.4%
<b>Project Total (Indexed)</b>	<b>108.75</b>	<b>106.75</b>	<b>100.64</b>

## Indexed Total Project Costs



Solutions Cost Analysis





Generally cheaper than concrete

Cumulative effect on timing + other systems

Clients , architects, builders, consultants have a closer working relationship, and an open mind

At tender at the moment, time will tell!

Summary



# CONCLUSIONS



# **Demonstrated** Efficiencies & Cost Benefits



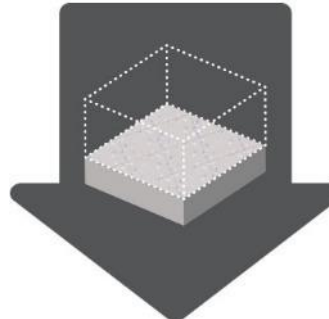
**Direct  
savings**



**Reduced  
infrastructures**



**Improved  
safety of  
worksites**



**Reduced  
foundations**



**Faster  
delivery**



**Lower  
environmental  
impact**