

FIELDERS FACT FILE

FILE REFERENCE NUMBER: F.7.5 /// JAN 2017

COSTING CASE STUDY — FIELDERS SLIMFLOR® VS POST TENSIONED SLABS

This fact file provides a costing case study comparing Fielders SlimFlor® and ply formed post tensioned slabs in Multi Story Construction.

ADVANTAGES OF FIELDERS SLIMFLOR®

- Reduced construction time (saving in labour, early tenancy and associated works, approximately 20% quicker floor-to-floor construction time).
- Minimal temporary propping allows for fit out of lower floors while upper floors are being constructed.
- Shallow floor depths, reduced overall building height offers savings in façade costs and building height restrictions.
- Reduced trades onsite (OH&S savings).
- Light weight structure, reducing sizes of substructure and footings.
- Ease of service integration, with potential to accommodate the services within the slab depth.
- Inherent fire resistance. A fire resistance of 60 minutes can be achieved without fire protection.

SlimFlor® utilises Fielders CF210 flooring profile in conjunction with Asymmetric Steel Beam Sections (ASB) to provide a floor system with a reduced construction zone. It does this by combining the floor slab and supporting structure in the same plane, providing a lightweight, versatile, long spanning floor system.

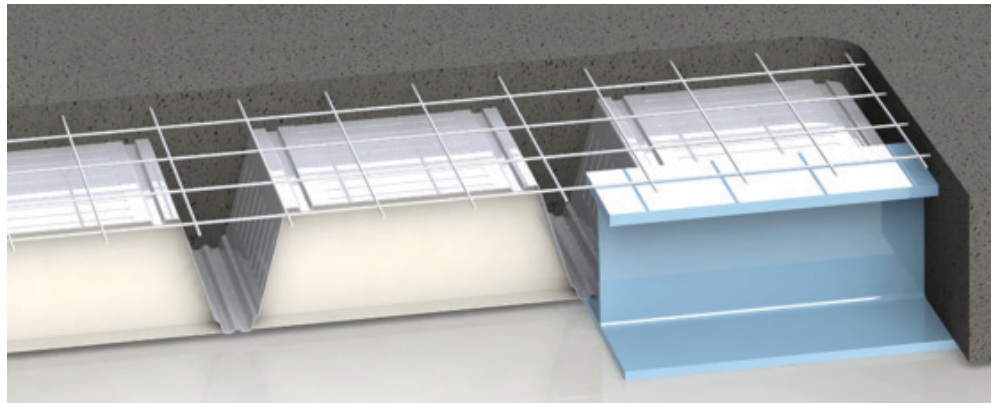


Figure F.7.5.1 Fielders SlimFlor®

DESIGN

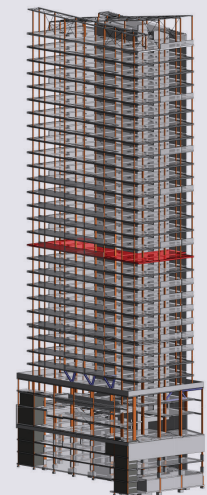
The project used in this cost comparison is a 30 story 'as built' apartment building. The floor footprint is approximately 564m². The following design criteria has been used for the purpose of the comparison;

- Live load 2.0kPa (residential loading)
- Super imposed dead load 1.5kPa
- FRL 90/90/90

Two (2) floor designs have been considered.

A. Design A - Fielders CF210 with a custom manufactured ASB.

B. Design B - a traditional post tensioned slab poured on traditional formwork.



DESIGN A:

FIELDERS CF210 WITH ASB'S

Design A consists of a SlimFlor slab design utilising Fielders CF210 profile with ASB beams (Figure F.7.5.2).

The slab is 290mm thick, which uses an equivalent volume of concrete as 120mm solid thick concrete slab.

The design allows for 12 kg/m² of conventional reinforcement.

The floor span is 7.5m.

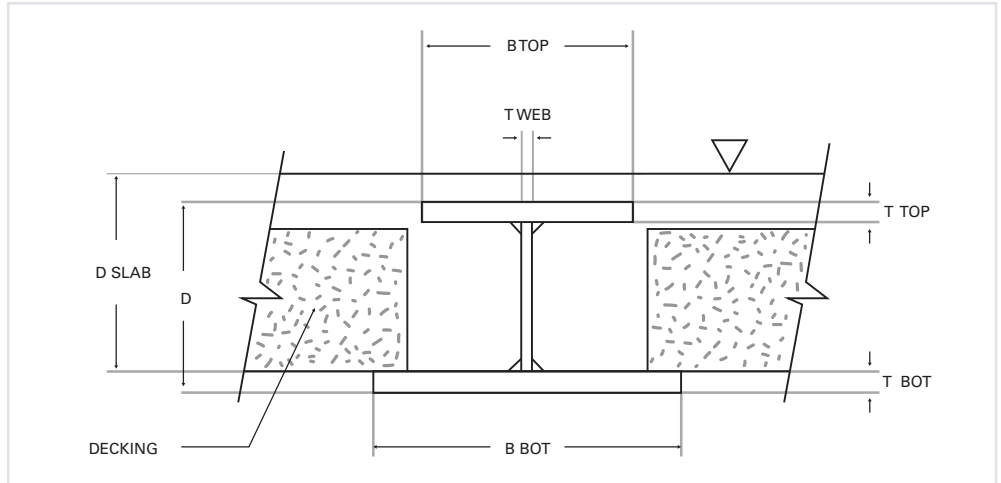


Figure F.7.5.2 ASB

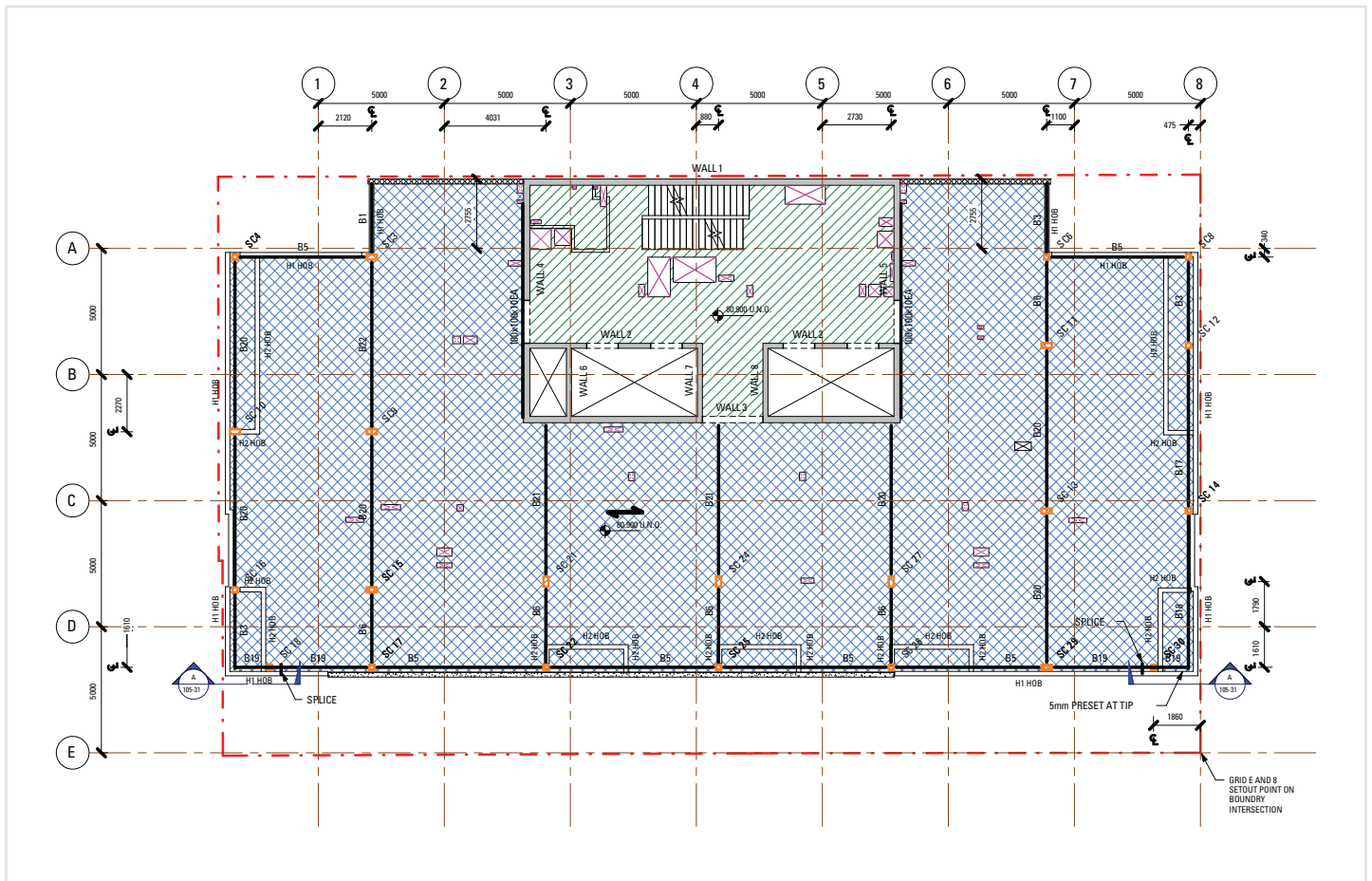


Figure F.7.5.3 SlimFlor® Floor Plan

DESIGN B: TRADITIONAL POST TENSIONED SLAB POURED ON TRADITIONAL FORMWORK

Design B consists of a traditional post tensioned slab cast on removable ply formwork.

The slab is 200mm thick.

The design allows for 5.5 kg/m² of post tensioning and 9.0 5.5 kg/m² conventional reinforcement.

The floor span is a 7.5m x 7.5m (Figure F.7.5.4).

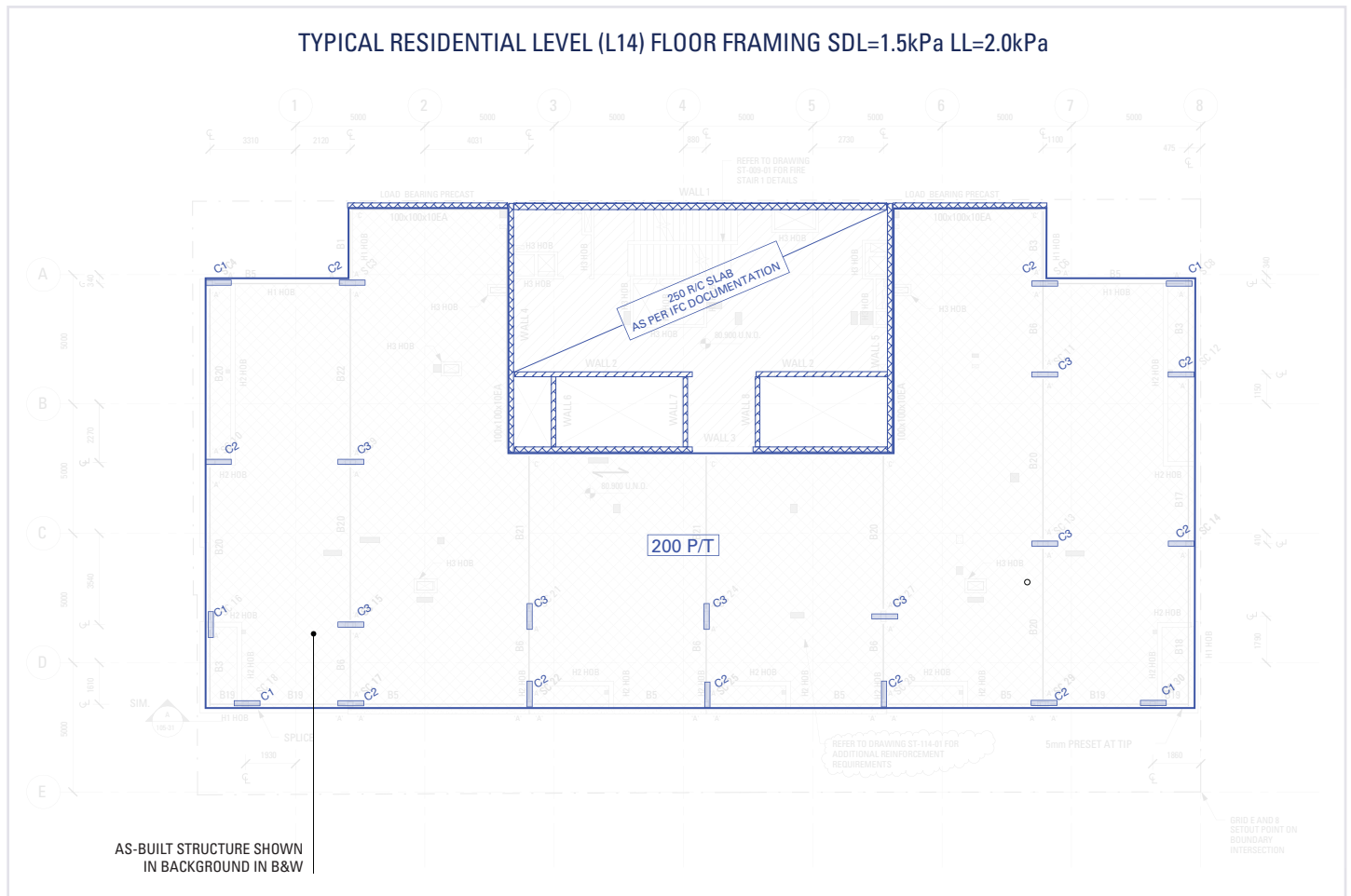


Figure F.7.5.4 Post Tensioned Floor Plan

NOTES:

Typical floorplate has been provided as an equivalent alternative to the as-built design, including strength, serviceability, fire and durability considerations.

The 250 thick R/C in-core slab is unchanged from the as-built design the column sizes and rates are indicative of a typical level in the middle of the building (level 14).

Structural sizes and rates:

FLOORPLATE

200mm P/T SLAB

5.5 kg/m² PT, 9.0 kg/m² Reinforcement

COLUMNS (f'c = 50MPa UNO):

C1: 900x225 mm BLADE COLUMN OR 550mm dia

140 kg/m³ Reinforcement

C2: 1000x250 mm BLADE COLUMN OR 550mm dia

140 kg/m³ Reinforcement

C3: 1400x350 mm BLADE COLUMN OR 700mm dia (f'c=80MPa)

160 kg/m³ Reinforcement

COSTING SUMMARY

Design A – FIELDERS SLIMFLOR					
Columns	Steel		\$29 206		
	Fire Protection		\$15 510		
Slabs	Concrete		\$26 516		
	CF210 Formwork/Propping		\$69 360		
	Reinforcing		\$15 640		
	Beams		\$39 729		
	Fire Protection		\$8 460		
Total Floor Cost			\$204 420.00	\$362.45/m²	
Note:					
1. There is approximately another \$15 510 of savings if the beams and columns can be concealed within fire rated ceilings and walls.					
Total Floor Cost¹			\$188 910.00	\$335.00/m²	
2.*Additional 10% saving in preliminary cost.					
Design B – POST TENSIONED SLAB					
Columns	Concrete		\$45 589		
	Reinforcement		\$7 314		
Slabs	Concrete		\$40 331		
	Formwork		\$81 660		
	Reinforcing	Rebar	\$11 730		
		PT	\$24 645		
Total Floor Cost			\$211 269.00	\$374.59/m²	

* The SlimFlor® CF210 system will be quicker to construct and therefore cheaper than the Post Tensioned Slab due to reduced Preliminaries and Overheads, this is likely to offer a cost saving of 10% of the associated preliminaries costs.

PLEASE CHECK WITH FIELDERS THAT YOU HAVE THE CURRENT FIELDERS FACT FILE FOR THIS TOPIC.

As this cost estimate is specific to this project, please discuss your project with Fielders to work out a suitable solution.

Costs are accurate as of July 2016.

Care has been taken to ensure that the design information herein is accurate, but Fielders Australia Pty Ltd and its agents do not accept responsibility for errors due to misinterpretation of the input data or of output information by the user. Design advice is provided as a recommendation only and is not a substitute for professional judgement. Damages for breach of any warranty conditions shall not extend to any consequential damages.

The information contained in this design advice remains the property of Fielders Australia and is submitted in strict confidence for the sole purpose of facilitating the exclusive specification and use of Fielders products. The information contained within this advice is based on testing conducted by and exclusive to Fielders profiles and cannot be assumed to apply to alternative products. Distribution of this and associated documents, is restricted to the following parties unless otherwise authorised by Fielders Australia.

The product information presented in this brochure is intended as a guide only. It is recommended that you obtain qualified expert advice when seeking confirmation of product application. More comprehensive information can be sourced from Specifying Fielders - KingFlor Manual and KingFlor Designer Suite Software.

REFERENCES

WT Partnership, Bluescope Works – Slab Systems Independent Costing Estimate No 2, 18 July 2016