



Flinder's Link Building

Adelaide

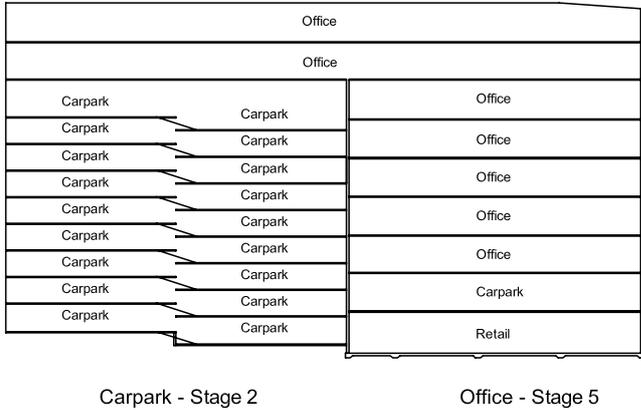


Figure 2: Cross-Section Elevation of Flinders Link Building

The Flinders Link project incorporates two adjoining buildings, currently known as Stage 2 and Stage 5. The Stage 2 building incorporates 9 storeys of carparks with 2 storeys of offices above, while the Stage 5 building incorporates a retail storey, a carpark storey and 7 storeys of offices above. The top two storeys of offices in each building are linked (see Figure 2).

The buildings have been constructed using a structural steel frame with composite floor slabs and composite action between the floor slabs and the steel beams.

The buildings are sprinkler-protected throughout. As they are both over 25 m in effective height, these sprinklers are required under DTS.

In the Stage 2 building, the carpark storeys at Levels 5 and below were protected in accordance with DTS, resulting in unprotected steel beams throughout and concrete-filled steel hollow section columns achieving an FRL of 60/-/-.

The structural fire protection at Level 6 has been approved as follows:

- all columns are protected to achieve an FRL of 60/-/-
- all beams in the floor above Level 6 which span directly into columns are protected to achieve an FRL of 60/-/-
- all other beams are unprotected.

In the Stage 5 building, the following protection has been used:

- all columns are concrete-filled steel hollow sections achieving an FRL of 120/-/-
- all beams which span directly into columns are protected to achieve an FRL of 60/-/-
- all other beams are unprotected.

The sprinkler system incorporates the following features:

- monitored valves at each storey;
- provision for end-of-line testing; and
- fast response heads.

In addition, a sprinkler management system was specified, incorporating:

- no two adjoining zones to be isolated at any one time;
- sprinkler zones to be isolated only for single days, reinstated a night;
- wood-equivalent fire loads per unit floor area to be reduced below 10 kg/m² if periods of extended isolation are unavoidable; and
- end-of-line testing to be performed after any isolation.

Approval for this solution was obtained on the basis that the benefits of the enhanced sprinkler system outweighed any additional hazard due to the reduction in FRL. Also discussed was the greater effectiveness of sprinklers in comparison with FRLs in satisfying the BCA objectives.

Test evidence was also presented from the Cardington fire tests^[1] and further work demonstrating the robustness of partially protected floor systems by Bailey^[2] was used.

References

1. Kirby, B et al, "The Behaviour of Multi-Storey Steel Framed Buildings in Fire", British Steel Corporation, 1999.
2. Bailey, C G and Toh, W S, "Experimental Behaviour of Concrete Floor Slabs at Ambient and Elevated Temperatures", Fourth International Workshop on Structures in Fire, Portugal, 2006.

DEVELOPER/BUILDER

PT Building Services,
Kambitsis Group and
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ARCHITECT

HASSELL

STRUCTURAL ENGINEER

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FLINDERS LINK BUILDING – FIRE RESISTANCE REQUIREMENTS SUMMARY		
BUILDING ELEMENT	ELEMENT REQUIREMENT	
	DTS	Alternative Solution
Office – beams	120/-/-	Beams framing directly into columns: Stage 2, Level 6: 60/-/- Stage 5: 120/-/- Other beams: unprotected
Office – columns	120/-/-	Stage 2, Level 6: 60/-/- Stage 5: 120/-/-
Retail – beams	180/-/-	Beams framing directly into columns: 120/-/- Other beams: unprotected
Retail – columns	180/-/-	120/-/-
Carpark – beams	60/-/- or 30 m ² /t	30 m ² /t
Carpark – columns	60/-/-	60/-/-
Sprinklers	Yes	Yes (with enhancements)

Table 3