



Fire &
Rescue NSW

Super High Rise and Podium Development





Podium Developments

- Podium developments have become common practice in today's built environment.
- Podiums are a cost effective way of building as fire services are shared over a number of buildings. Savings also follow on to the end user as maintenance and monitoring costs are reduced.





Podium Developments

- Podiums come in many different configurations:
 - Two buildings with one street address
 - Ten buildings with four street addresses
 - Some buildings may not have street access
- Podiums can impact on Fire Brigade operations:
 - Due to their complexity
 - Can be confusing to fire crews in the first instance
 - Can slow down response times
- Operationally, podiums require more consideration to ensure a timely emergency response.



Podium Developments

Defining What is a Podium

- A podium development is categorised as a United Building under clause A4.1 of the NCC:

A4.1 When Buildings are United

Two or more buildings adjoining each other form one united building if they –

- a) Are connected through openings in the walls dividing them: and*
- b) Together comply with all the requirements of the BCA as though they are a single building*

- For those involved in the business of building design we consider this definition as a DTS way of addressing Podium Developments.
- Effective Height is calculated based on all buildings spread over the podium.
- Podiums are considered **one** building.



Podium Developments

- Firefighters view podiums as separate buildings.
- Without prior knowledge how do you know that a number of buildings are interconnected by an underground carpark?
 - You must consider with all building developments that the responding fire crew has no prior knowledge regarding the site.
- There is an expectation that each building will have its own independent fire services.



Operational Considerations

Operational considerations when dealing with Podiums

- Occupants of podiums should receive the same Fire Brigade response as occupants in stand alone buildings.
- Responding to the source of the fire alarm
- The ASE should have multiple inputs indicating the building / tower that is in alarm
- Consider vehicle access to the site. One way streets / dead end roads.
- A red strobe should activate on the building that is in alarm.
- A FIP should be located in the designated building entry point.
 - Mimic
 - Repeater
 - Sub Indicator
- The master FIP should have full functionality so that alarms to all buildings including the EWIS system can be controlled from one central point.



Operational Considerations

- Wayfinding Signage is extremely important for Podium Developments
- Block Plans should clearly detail the locations of:
 - The Booster Assembly/s
 - Sprinkler Valve Room/s
 - Pump Rooms
 - Main FIP (Fire Control Centre / Room)
 - Electrical Cupboards / Rooms
- Recommend that plans are provided for all submissions showing all the above plus accessibility to the site (Street Names and Exit / Egress points)



Boosters on Podiums

- Boosters should be located so that they are easily identifiable and accessible for the fire appliance.
 - Rear one way laneways.
 - Valves should be orientated towards the hardstand or street.
 - Hose lay should not obstruct egress pathways or driveways.
 - In some instances a podium may require more than one booster.





Ring Mains

- The reliability of a fire hydrant system is increased with the installation of a ring main.
- Due to the increased amount of pipework and components required in a hydrant system for a podium development there is a greater chance of system failure.
- Where a building does not have a ring main and a failure occurs firefighters will be required to run lengths of hose from the fire appliance pump to the involved compartment.
- Consideration should be given to the building location on the podium and whether hose lay would be practical and achievable if hydrant failure was to occur.



Super High Rise

- The NCC considers that life risk associated with multilevel buildings can be effectively dealt with through the categorisation of buildings above and below an effective height of 25m
- A building with a height of 30m is considered to have a similar life risk to a building with effective height of 100m or even 300m.
- FRNSW believe that increasing building height incrementally increases the level of risk building occupants are exposed to.
- Operationally, increasing building height slows fire brigade intervention time and increases the complexity of FRNSW operations.



Super High Rise

- Vertical fire spread up the façade of a building is also not catered for in the current Australian Standards.
- Eg Under the provisions of AS 2118.1 an apartment building is required to be protected by a light hazard system capable of operating six heads at the required design flow irrespective of whether the façade offers the potential for vertical fire spread.





Super High Rise

NFPA 14 Standard of the installation of Standpipe and Hose Systems 2013.

For systems with two or more zones in which any portion of the higher zones cannot be supplied by means of fire department pumpers through a fire department connection, an auxiliary means of supply in the form of high-level water storage with additional pumping equipment or other means acceptable to the AHJ shall be provided.



Super High Rise



AS2419.1—2005 GENERAL FIXED ON-SITE PUMP REQUIREMENTS			
BCA Effective Height	Number of fixed on-site pumps	Number of fixed on-site relay pumps	Redundancy in design FRNSW pumping appliances
Less than 25 m	▶	None required	
More than 25 m less than 50 m	▶▶	None required	
More than 50 m less than 135 m	▶▶	▶	
More than 135 m	▶▶	▶	FRNSW pumping appliances no longer able to provide redundancy to the fire hydrant system design

*** Neither the BCA or AS2419.1 currently provides an alternative to the loss of redundancy, unlike NFPA 14**



Podiums and Effective Height

- FRNSW receive many proposals that compare the design with a horizontal slab separation to that of a DtS fire wall being constructed within the basement to "separate the buildings" under BCA Clause C2.7.
- The analysis then claims that the towers above can have their effective height measured to the horizontal separating slab.
- FRNSW consider that building separation in accordance with Clause C2.7 does not change the effective height of the United Building and therefore all requirements associated with the effective height greater than 25 m are applicable regardless of the separation.



Podiums and Effective Height

The following reasons are provided:

- A building is determined to be a United Building under Clause A4.1 where the buildings:
 - * Are connected through openings in the dividing wall
 - * Together comply with the requirements of the BCA as a single building
- Clause C2.7 allows a building to be treated as a separate building for the purposes of Parts C, D and E
- The effective height is determined based on the United Building under A1.1
- C2.7 does not remove the determination that the building is a United Building, and therefore does not allow for the effective height to change, since this is determined in Part A which is not included in the concessions of C2.7.



Podiums and Effective Height

- FRNSW also do not support comparisons to buildings that are standalone or do not have basements beneath them.
- International Fire Engineering Guidelines (2005)

1.2.9.1 Comparative or absolute approach

Both comparative and absolute approaches may be adopted in the analysis strategy. The methods chosen will be appropriate to the approach used.

Comparative approach

Typically, the fire safety provided by one element, or a sub-system, or the complete fire safety system, is compared to the level of fire safety that would be achieved in an identical building in which that element, sub-system or system is designed in compliance with the deemed-to-satisfy or prescriptive provisions identified in Section 1.2.8. If the analysis is carried out on such a comparative basis, it will involve the same assumptions, models, calculations and input data for the proposed trial design and the deemed-to-satisfy or prescriptive design.

A comparative approach aims to determine whether the alternative solution is equivalent to (or better than) the deemed-to-satisfy or prescriptive design. The comparative approach is often referred to as an “equivalence” approach.

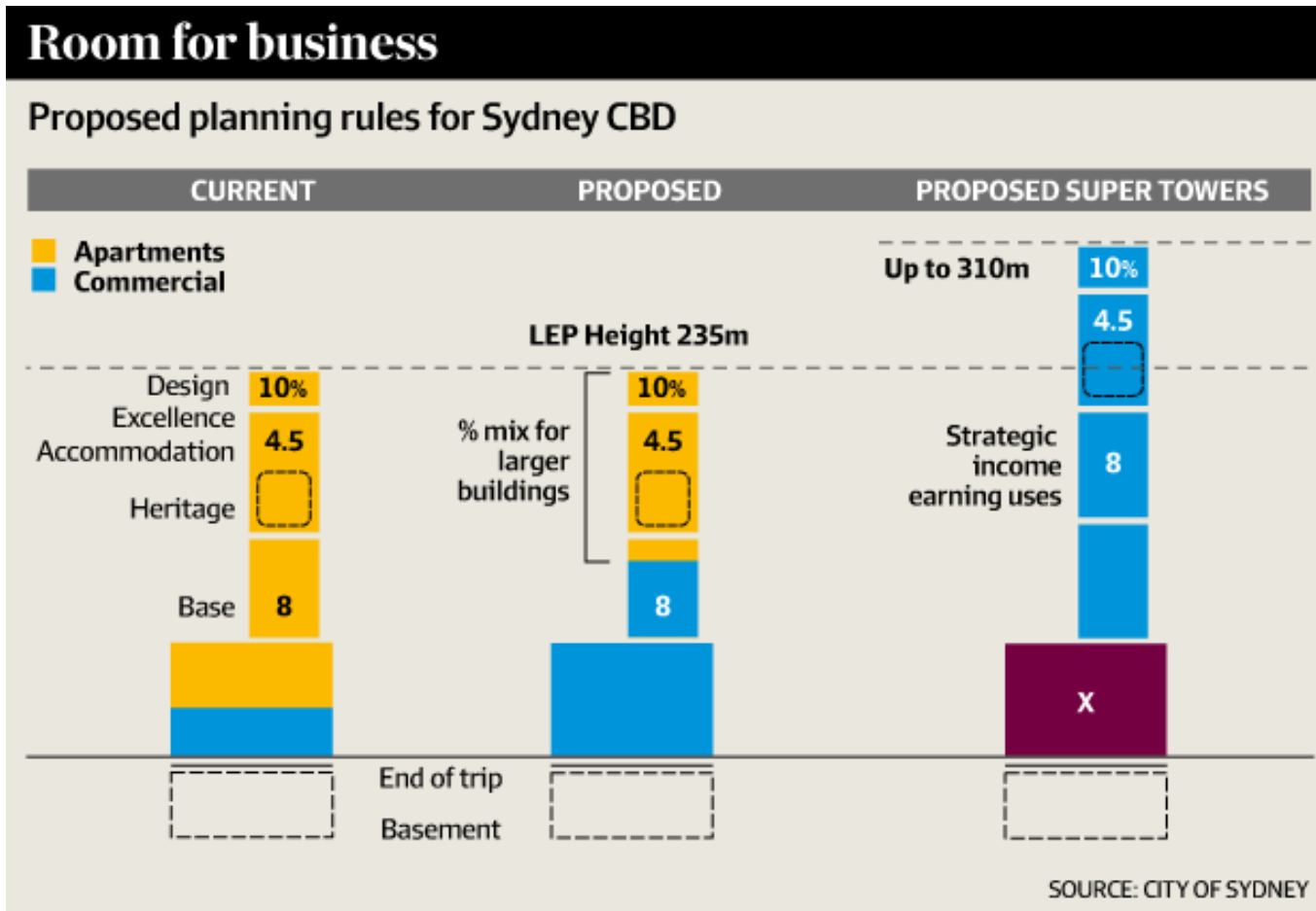
Performance Solutions for Podium Developments



- This does not mean FRNSW do not accept Performance Solutions for podium developments
- However, each identified departure and associated Performance Requirements would need to be adequately assessed
- Comparative assessments need to consider the previous slides
- Any Performance Solution should consider the complexities created by podium developments, including fire fighting considerations outlined previously



Super High Rise



Australian Financial Review – July 2016

<http://www.afr.com/real-estate/sydney-cbd-plan-to-curb-new-apartment-towers-20160713-gq4x4z>

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Super High Rise

- Hydrant design
- Reliability / redundancies in other fire safety systems required?
- Egress
 - Use of lifts – Studies by the Fire Safety Engineering Group at the University of Greenwich suggested that the actual use of lifts may not be as effective as the theory suggests
 - Refuge / waiting areas?
- Impacts of wind conditions?
- Are there other areas we need to consider as taller buildings are constructed?



Proposal for Change to NCC

- FRNSW are working on PFC submissions to ABCB for podium developments and super high rise buildings
 - Definitions
 - Technical requirements

Proposal for Change to NCC



Thank You