

Job no SY120272

20/07/2018

David Springford
Lendlease
Level 14, Tower Three, International Towers Sydney
Exchange Place, 300 Barangaroo Avenue, Sydney 2000

Dear David

One Sydney Harbour – Stage 1B Basement

Preliminary fire safety engineering review

This letter supports a State Significant Development Application (SSD 6960) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Amendment Act 2017 (EP&A Act). The Development Application (DA) seeks approval for construction of the Stage 1B Basement and associated works at Barangaroo South as described in the Overview of Proposed Development section of this report.

The Stage 1B Basement DA seeks approval for the construction of a four level basement to accommodate parking for the Stage 1B Residential Buildings (subject to separate SSD applications). The works include the construction of common plant and services, loading docks, waste rooms and storage areas, as well as structural cores and associated building services for the Stage 1B Residential Buildings. The proposed development also includes above ground elements such as roads, car park ramps and risers, and temporary public domain and landscaping works.

It is noted that site preparation works, including demolition, remediation and most of the required excavation, are covered under SSD 5897.

Exova Defire has undertaken a preliminary fire safety engineering review to determine whether the design can be demonstrated to achieve compliance with the performance requirements of the National Construction Code 2016 Amendment 1 Volume One – Building Code of Australia (BCA). The review was based on the drawings and information listed in Attachment 1.

The performance solutions identified to date are listed in Table 1.

No	Description of performance solutions	DTS provision	Performance requirements
1.	The basement is to be fire separated from the buildings above via a combination of vertical and horizontal elements – ie ground floor slab. The basement and individual buildings above are to be treated as separate buildings for the purposes of determining compliance with sections C, D and E of the BCA with the following exceptions: - All buildings are to be considered when demonstrating safe occupant evacuation by way of a precinct wide evacuation strategy. - Fire services are to be shared between all buildings as part of a precinct wide fire services strategy.	Clauses C2.7, C2.8 and C2.9	CP1, CP2, EP1.3, EP1.6 and EP2.2
2.	Reduction in fire ratings in storage areas on basement levels B2, B3 and B4 from 4 hours to 2 hours.	Clause C1.1 and specification C1.1	CP1 and CP2

No	Description of performance solutions	DTS provision	Performance requirements
3.	The residential garbage shafts are not enclosed at the bottom by fire rated construction.	Clause 2.7 of specification C1.1	CP2 and CP8
4.	The maximum travel distances within the basement carpark are generally proposed as follows: • 30m to a point of choice instead of 20m. • 70m to the nearest exit instead of 40m. • 100m between alternative exits instead of 60m.	Clauses D1.4 and D1.5	DP4 and EP2.2
5.	Basement level B5 comprises lift pits below R1, R2 and R3. Each space is served by a single exit.	Clause D1.2	DP4 and DP5
	The exits from basement level B5 do not provide a continuous means of travel to road or open space.	Clause D1.9	
6.	Doors from a number of rooms swing against the direction of egress.	Clause D2.20	DP2 and DP4
7.	The doorways to the private garages are proposed to be power operated panel lift type doors.	Clause D2.19	DP2 and DP4
8.	High pressure valves manufactured by Vatac not covered under AS 4118.1.6-1995 are to be utilised on the high pressure stage of the combined sprinkler / hydrant system.	Clause E1.5 and AS 2118.1:2017, AS 2118.6-2012 and AS 4118.1.6-1995	EP1.4
9.	A fire control room for each tower with an effective height of 50m or greater will be provided instead of providing a single fire control room which would be typically required for a united building greater than 50m in effective height. A fire control room will be provided within the basement which will have indication from the precinct fire control rooms above basement and be able to initiate evacuation of the respective building as selected by attending fire brigades. The basement fire control room is located within basement level B0 and involves a change in level to a road in excess of 300mm – approximately 3m.	Clause E1.8 and specification E1.8	EP1.6
10.	Due to the multiple entry points for each building the combined sprinkler / hydrant booster assembly is not technically within sight of the main building entry. The booster assembly is not provided with fire rated protection extending 2m each side of and 3m above the upper hose connections in accordance with AS 2419.1-2005.	Clause E1.3 and AS 2419.1-2005	EP1.3
11.	There are a number of rooms that will not be provided with fire hose reel coverage without passing through fire / smoke doors: • Basement level B0 – R1 and R2 water meters, R1 and R2 gas meters • Basement level B1 – R1, R2 and R3 garbage rooms, R1, R2 and R3 fuel cells, R1, R2 and R3 heat exchange rooms, R3 water meters, R1 and R2 bulk waste	Clause E1.4	EP1.1

No	Description of performance solutions	DTS provision	Performance requirements
12.	The fire brigade relay pump for the hydrant system is to be connected to the upper level of each cascade zone (diagram in AS 2118.6-2012) instead of directly into each pressure zone (AS 2419.1-2005).	Clause E1.3 and AS 2118.6-2012 and AS 2419.1-2005	EP1.3
13.	Proprietary FM approved class B monitoring switches are proposed to be used on isolation valves for the sprinkler system instead of class A switches retrofitted to the valve.	Clause E1.5 and AS 2118.6-2012 and AS 2118.1:2017	EP1.4
14.	The non-sprinklered exhaust plenums as permitted by AS 2118.1:2017 are not fire separated from the remainder of the sprinkler protected basement.	Clause E1.5 and specification E1.5	CP2 and EP1.4
15.	The stair pressurisation system for the basement carpark is to be designed with three doors open – ie doors from two carpark levels and the final discharge door.	Table E2.2a and AS/NZS 1668.1:2015	EP2.2

Table 1 Preliminary list of performance solutions

The areas of the design which impact upon fire brigade operations were discussed with Fire and Rescue NSW in a meeting held on 23/02/2016. This includes perimeter vehicular access, location of fire control centres, fire hydrant booster and pump locations. Fire and Rescue NSW were supportive of the design proposed.

It is Exova Defire's professional opinion that it is possible to develop performance solutions for the issues identified to demonstrate compliance with the relevant performance requirements of the BCA without major changes to the proposed design.

The details of the proposed performance solutions are subject to the outcome of the fire engineering brief and analysis which will be carried out in accordance with the International Fire Engineering Guidelines.

The performance solutions for the building will be developed as part of the ongoing design and development process and documented in a format suitable for submission to the relevant approval authorities. It is noted that additional performance solutions may be identified during the ongoing design development process in consultation with the design team.

Please contact me on 02 9211 4333 if you have any questions.

Yours sincerely



Victor Tung
Accredited fire safety engineer
Fire safety engineering
Exova Defire

Attachment 1 Drawings and information

Drawing title	Dwg no	Rev	Drawn
Basement plan level B0	BB2_PA2_A100	C	Lendlease
Basement plan level B1	BB2_PA2_A101	C	Lendlease
Basement plan level B2	BB2_PA2_A102	C	Lendlease
Basement plan level B3	BB2_PA2_A103	C	Lendlease
Basement plan level B4	BB2_PA2_A104	C	Lendlease
Basement plan level B5	BB2_PA2_A105	C	Lendlease
Section 01	BB2_PA2_A300	C	Lendlease
Section 02	BB2_PA2_A301	C	Lendlease
Section 03	BB2_PA2_A302	C	Lendlease
Section 04	BB2_PA2_A303	C	Lendlease
Building elements – ground floor	BB2_PA2_A400	C	Lendlease
Building elements – podium P1	BB2_PA2_A401	C	Lendlease
Building elements – podium P2	BB2_PA2_A402	C	Lendlease
Building elements – elevations	BB2_PA2_A501	C	Lendlease

Other information	Ref no	Date	Prepared by
Building Code of Australia report – One Sydney Harbour, Barangaroo, Stage 1B Basement	066819-06BCA	20/07/18	McKenzie Group Consulting