

Job no SY140017

09/08/2016

Dez Wong
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Exchange Place, 300 Barangaroo Avenue
Barangaroo NSW 2000

Dear Dez

One Sydney Harbour – Residential Building R4A

Preliminary fire safety engineering review

This letter supports a State Significant Development Application (SSD 6964) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Development Application (DA) seeks approval for construction of a residential flat building (known as Residential Building R4A) and associated works at Barangaroo South.

The Residential Building R4A DA seeks approval for the construction and use of a 72 storey residential flat building comprising 327 apartments, ground floor retail, the allocation of car parking, services, plant and storage within the Stage 1B Basement (subject of a separate concurrent DA), and the construction of ancillary landscaping and temporary public domain.

Approval for the construction of Residential Building R4A's core and associated plant and services within the basement is being sought as part of the concurrent Stage 1B Basement DA and do not form part of this DA.

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 Series 2014 Volume One – Building Code of Australia (BCA). The review was based on the drawings and information listed in Attachment 1.

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

Item	Description of alternative solution	DTS provision	Performance requirement
1.	Reduction of fire rating in ground floor retail to 2 hours instead of 3 hours. This includes the following: <ul style="list-style-type: none"> Fire separation between the retail and residential portions on the ground floor. Fire separation between the retail ground floor and the residential storeys above. 	Clauses C1.1, C2.7, C2.8 and C2.9 and specification C1.1	CP1 and CP2
2.	Separation between buildings R4A and R4B is proposed to be assessed on a performance basis. The buildings are considered as united buildings due to large colonnade / awning linking them at ground floor and the link bridge linking them at podium level 2.	Clauses C1.1, C2.7, C3.2 and C3.4	CP2 and CP8
3.	The required fire rated floors and walls bounding the sole occupancy units do not extend to the outer skin of the double skin façade.	Clause C1.1 and specification C1.1	CP2
4.	Reduction of structural adequacy to 60 minutes instead of 90 minutes for floor slabs in wet areas. This is due to a reduced slab thickness in these areas.	Clause C1.1 and specification C1.1	CP1 and CP2



Item	Description of alternative solution	DTS provision	Performance requirement
5.	The slab to the link bridge and supporting structure between R4A and R4B at podium level 2 is not proposed to be fire rated.	Clause C1.1 and specification C1.1	CP1 and CP2
6.	<p>Extended travel distances as follows:</p> <ul style="list-style-type: none"> • Travel distance to a point of choice of up to 30m instead of 20m in lift lobby and pool areas. • 50m to a point of choice instead of 20m from open deck podium 2 and 57m to an exit (maintenance access only). • 80m between exits instead of 45m from substation podium 1. • Travel distance to a point of choice of up to 30m instead of 20m in plant areas. • 66m to in exit instead of 20m at roof level. • 80m between exits instead of 60m from plant room level. 	Clauses D1.4 and D1.5	DP4 and EP2.2
7.	The exit doors from the retail tenancies on the ground floor are proposed to swing against the direction of egress.	Clause D2.20	DP2 and DP4
8.	The fire control room is located within basement level B0 and involves a change in level to a road or open space in excess of 300mm – approximately 3m.	Clause E1.8 and specification E1.8	EP1.6
9.	<p>The hydrant booster assembly facing Barangaroo Avenue is not within sight of the main building entry.</p> <p>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.</p> <p>The external fire hydrants are located less than 10m from the building and are not provided with fire rated protection extending 2m each side of the fire hydrant outlet and not less than 3m above the ground adjacent to the fire hydrant.</p>	Clause E1.3 and AS 2419.1-2005	EP1.3
10.	The sound systems and intercom systems for emergency purposes do not comply as the speech intelligibility (STI) requirement of ≥ 0.5 is not achieved in the bathrooms and balconies of the sole-occupancy units and the plant rooms.	Clause E4.9	EP4.3
11.	<p>The proposed sprinkler system will include the following:</p> <ul style="list-style-type: none"> • Proprietary FM approved type B monitoring switches are proposed to be used on isolation valves instead of type A switches retrofitted to the valve. • High pressure valves manufactured by Victaulic not covered under AS 4118.1.6-1995 are to be utilised on the high pressure stage of the combined sprinkler / hydrant system. • Use of 15mm (K-factor 8) sprinklers instead of 10mm (K-factor 5.6) sprinklers for residential common lobbies and concealed space protection. • Shower cubicles are not proposed to be provided with sprinkler coverage. • Sprinklers are not proposed to the underside of the link bridge positioned over the top of the common canopy linking buildings R4A and R4B. 	Clause E1.5 and AS 2118.1-1999, AS 2118.6-2012 and AS 4118.1.6-1995	EP1.4



Item	Description of alternative solution	DTS provision	Performance requirement
	<ul style="list-style-type: none">Sprinklers are not proposed to selected awnings – eg swimming pool.		

Table 1 Preliminary list of alternative solutions

The areas of the design which impact upon fire brigade operations will be discussed with Fire & Rescue NSW. This includes perimeter vehicular access, location of fire control centres, fire hydrant booster and pump locations.

It is Defire’s professional opinion that it is possible to develop alternative 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 alternative 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 alternative 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 alternative 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
Defire – Innovative fire safety



Attachment 1 Drawings and information

Drawing title	Dwg no	Drawn
Site Plan	BR4A_ASD_PA1_0002	Lend Lease / Renzo Piano Building Workshop
Plan Ground Floor Level 00	BR4A_ASD_PA1_2000	Lend Lease / Renzo Piano Building Workshop
Plan Podium Level P1	BR4A_ASD_PA1_2001	Lend Lease / Renzo Piano Building Workshop
Plan Podium Level P2	BR4A_ASD_PA1_2002	Lend Lease / Renzo Piano Building Workshop
Plan Lower Plate Level 01	BR4A_ASD_PA1_3001	Lend Lease / Renzo Piano Building Workshop
Plan Lower Plate Level 02-03	BR4A_ASD_PA1_3002	Lend Lease / Renzo Piano Building Workshop
Plan Lower Plate Level 04-19	BR4A_ASD_PA1_3004	Lend Lease / Renzo Piano Building Workshop
Plan Plant Level 20	BR4A_ASD_PA1_3020	Lend Lease / Renzo Piano Building Workshop
Plan Lower Plate Typical 21-32	BR4A_ASD_PA1_3021	Lend Lease / Renzo Piano Building Workshop
Plan Mid Plate Level 33-40	BR4A_ASD_PA1_3033	Lend Lease / Renzo Piano Building Workshop
Plan Mid Plate Level 41	BR4A_ASD_PA1_3041	Lend Lease / Renzo Piano Building Workshop
Plan Mid Plate Level 42-43	BR4A_ASD_PA1_3042	Lend Lease / Renzo Piano Building Workshop
Plan Mid Plate Level 44	BR4A_ASD_PA1_3044	Lend Lease / Renzo Piano Building Workshop
Plan Mid Plate Level 45-51	BR4A_ASD_PA1_3045	Lend Lease / Renzo Piano Building Workshop
Plan Plant Level 52	BR4A_ASD_PA1_3052	Lend Lease / Renzo Piano Building Workshop
Plan Upper Plate Level 53-60	BR4A_ASD_PA1_3053	Lend Lease / Renzo Piano Building Workshop
Plan Upper Plate Level 61-67	BR4A_ASD_PA1_3061	Lend Lease / Renzo Piano Building Workshop
Plan Penthouse Level 68	BR4A_ASD_PA1_3068	Lend Lease / Renzo Piano Building Workshop
Plan Penthouse Level 69	BR4A_ASD_PA1_3069	Lend Lease / Renzo Piano Building Workshop
Plan Roof Level 70	BR4A_ASD_PA1_3070	Lend Lease / Renzo Piano Building Workshop
Elevation North-East (Park)	BR4A_ASD_PA1_4001	Lend Lease / Renzo Piano Building Workshop
Elevation West (Barangaroo Ave)	BR4A_ASD_PA1_4002	Lend Lease / Renzo Piano Building Workshop
Elevation South-East (Lift Lobby)	BR4A_ASD_PA1_4003	Lend Lease / Renzo Piano Building Workshop
Elevation South (Watermans Quay)	BR4A_ASD_PA1_4004	Lend Lease / Renzo Piano Building Workshop
Overall Section AA	BR4A_ASD_PA1_5001	Lend Lease / Renzo Piano Building Workshop
Overall Section BB	BR4A_ASD_PA1_5002	Lend Lease / Renzo Piano Building Workshop

Other information	Ref no	Date	Prepared by
Building Code of Australia Report – One Sydney Harbour Residential Building R4A	068048-19BCA rev E	16/05/16	McKenzie Group Consulting