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SUITABILITY OF JBS REMEDIAL ACTION PLAN FOR CENTRAL BARANGAROO MP06_0162 (MOD 9)

Dear Ray Karslake,

Executive Summary

As supporting documentation in relation to the suitability of the Central Barangaroo JBS 2013 Remedial Action Plan (RAP) for the Concept Plan Modification (MOD 9) proposal, EDP Consultants Pty Ltd (EDP) have prepared this summary letter.

A comparison of the design assumptions in the RAP to the MOD 9 proposal identified that the majority of RAP construction assumptions are unchanged in the concept design. These design changes will be specifically addressed through the development and implementation of the RAP and other supporting documentation relating to contamination management. Further risk assessment will be included in each additional development application (DA) stage, including an updated human health risk assessment and incorporation of the Block 5 former declaration area into the Remedial Works Plan and future site audits.

EDP considers the JBS RAP suitable to be adopted for the MOD 9 submission, with consideration given to the requirements of the existing Site Audit Statement and Site Audit Report (SAS/SAR), which provides further management detail.

Acknowledgment of Country

We would like to acknowledge the Gadigal people who are the Traditional Custodians of this land. We would also like to pay respect to the Elders both past and present of the Eora Nation and extend that respect to all Aboriginal people.

Introduction

This summary has been provided in accordance with the Director-General's Requirements (DGR's) dated 15 April 2014, as supporting documentation for the Contamination Assessment. This summary is focused on assessing the suitability of the existing and approved Remedial Action Plan (RAP) by JBS, 2013. This summary document will be issued to the appointed NSW EPA Site Auditor (Ramboll) for review and who will subsequently provide a supporting statement to accompany the currently approved Concept Plan Modification (MOD 9) proposal.

The RAP outlines the nature and extent of contamination at Central Barangaroo and discusses the suitability of the proposed development from a human health and environmental risk perspective. Details are provided on the proposed landuse and basement design, however it should be noted that these details are based on a broad concept of the future development as known at the time, and the design assumptions used in Barangaroo South, not specific to the construction method proposed for Central Barangaroo.

It is noted that the Site Audit Report (SAR) and accompanying Section B Site Audit Statement (SAS) dated 31 July 2013 (GN439B-5) (the Central SAS/R) requires the preparation of additional plans for the management of remediation. These plans will apply the framework of the JBS RAP to the final design and construction program and will include a Remedial Works Plan (RWP), Validation Sampling and Analysis Quality Plan (VSAQP), Construction Quality Assurance Plan (CQAP), Construction Environmental Management Plan (CEMP) and Asbestos Management Plan (AMP). These additional plans will become the primary actionable plans during construction, designed to supplement the RAP with additional detail.

The JBS RAP is considered to be in general accordance with Managing Land Contamination, Planning Guidelines, SEPP 55 - Remediation of Land 1998 and Guidelines produced or approved under section 105 of the Contaminated Land Management Act 1997 in force at the time of writing. Consideration of the amended SEPP 55 (2020) does not present any additional considerations necessary to be addressed.

MOD 9 Proposed Barangaroo Concept Design

The proposed design for the MOD 9 Concept Plan comprises a series of mixed-use buildings overlying a common basement spanning Blocks 5, 6 and 7 in the east of the site, with public domain in the west. Up to four levels of basement are proposed, equivalent to 15 m below ground level, with retail in basement levels.

Discussion of RAP Assumptions

Table 1 presents and compares the design assumptions contained in Section 5.2 the RAP and Site Audit Statement/Report (SAS/SAR), with those proposed in the MOD 9 Concept Basement Design. The RAP only requires the basement design assumptions to be applied when considering the southern basement (when two separate basements were envisaged), due to Block 5 extending into the current Declaration Area, and the risk therein posed by the presence of tar contamination.

It is noted that the declaration has since been lifted in June 2020, with significant areas of the Block 5 portion of the declaration area remediated.

EDP have discussed each design assumption in relation to the concept basement design.

Table 1 – Comparison of RAP Assumptions and Concept Design

#	JBS RAP Assumption (Section 5.2)	MOD 9 Concept Design
1	A high-density residential building is proposed to be constructed on the eastern portion of the site and be underlain by two basements constructed to a depth of 10 m below the current ground levels. The southern basement is partially located within the Central Barangaroo Site and also extends into the Declaration Area.	A mixed-use commercial, residential and retail with multiple buildings, underlain by a single consolidated basement constructed to a nominal depth of RL -12.2m below the current ground levels. The southern end of the basement (Block 5) extends into a portion of the former Declaration Area that has been remediated and validated.
2	Design requirements for at least the southernmost basement to control potential exposures to infiltrating seepage water. This includes the incorporation of groundwater control walls into the basement structure.	The proposed basement is to be constructed below the standing water table, requiring design requirements to control infiltration seepage. The proposed design considers groundwater control via perimeter retention wall, slab specification and wall cavity/plenum design.
3	Two basement levels are proposed: upper and lower parking.	The concept plan proposes four (4) basement levels, extending the equivalent of five (5) basement depths, with basement levels 1 and 3 being mezzanine levels. The proposed mixed use of basements is to include parking, plant rooms, retail and precinct managers office. Proposed basement uses include: Level B1: Void over retail, loading dock, plant rooms

#	JBS RAP Assumption (Section 5.2)	MOD 9 Concept Design
		<p>Level B2: Retail mall – vaulted, plant rooms</p> <p>Level B3: Void over retail, plant rooms</p> <p>Level B4: Retail mall - vaulted, loading dock, plant rooms</p> <p>Level B5: Parking and plant rooms</p>
4	<p>The perimeter walls of the basement groundwater retention wall system will include:</p> <p>Diaphragm walls, extending to and keyed into bedrock and generally constructed around the southern, western and northern boundary; and</p> <p>A secant pile or equivalent walls, extending to and keyed into bedrock and generally constructed along the eastern boundary.</p> <p>Where basement excavations extend into bedrock, exposed bedrock surfaces will be covered with shotcrete.</p> <p>Perimeter walls (diaphragm / secant piles) will be constructed with a minimum thickness of 600 mm and will be keyed into the bedrock (irrespective of the depth of the basement that will be constructed within them)</p>	<p>The perimeter walls of the basement groundwater retention wall system will be consistent with the RAP assumptions, with the following amendments:</p> <p>Perimeter walls (diaphragm) will be constructed with a thickness of ~1,200 mm and will be keyed into the bedrock (irrespective of the depth of the basement that will be constructed within them). Secant piles will be adjacent the sandstone in the east and south east and typically 900 mm in thickness. This is considered an equally acceptable construction method.</p>
5	<p>In some areas a secondary reinforced concrete wall (treated with chemical additives for improved waterproofing) will be constructed within the perimeter walls as the internal car park basement wall.</p>	<p>Where excavation is into rock, following shotcrete, a secondary reinforced concrete wall will be constructed.</p> <p>Additional waterproofing will be considered only if required.</p>
6	<p>A sealed plenum will be constructed by a 200 mm thick block work wall (bagged to provide a relatively air tight zone) immediately inside the reinforced concrete car park basement wall. The sealed plenum will be configured to:</p> <p>Collect and drain seepage water that may permeate through the perimeter and basement car park walls. Seepage water (if any) will drain via a dish drain to a drainage sump located at the lowest basement level (away from the lift wells) from where it will be appropriately disposed of; and</p> <p>Vent vapours from seepage water that may permeate through the perimeter and basement car park walls. Vapour will be vented via a passive pipe riser to the height of the roof level of the above buildings</p> <p>A second plenum, referred to as a ventilation plenum, is proposed to be constructed adjacent to and inside the sealed plenum as part of the car park ventilation system.</p>	<p>Carparks have a minimum of 600 mm plenum void, formed with 140 mm blockwork. Retail space is proposed to have a minimum 300 mm cavity, formed with 190 mm blockwork. The plenum is not proposed to have any additional sealant applied.</p> <p>Drains will be in place to collect and drain seepage water (if any) to a drainage sump located in the lowest basement plant rooms (away from lift wells) where it will be appropriately disposed.</p> <p>No additional ventilation plenums are proposed, though pipe risers for passive venting are being considered along with the potential for mechanical ventilation. As seepage water is not to be captured or retained behind plenums, vapour risk is minimised.</p>
7	<p>The air exchange rate within the basement car park is maintained at least at 4 volume changes per hour.</p>	<p>Air exchanges in the proposed basement are expected to maintain a minimum of 4 volume changes per hour. Designed to meet or exceed Australian Standards.</p>

#	JBS RAP Assumption (Section 5.2)	MOD 9 Concept Design
8	Tar should be removed from the immediate vicinity of outer basement walls to the extent practicable, and basement designs and engineering controls should ensure that tar seepage into basements does not occur.	Regions of known tar in Block 5 have been remediated and validated by others, although it is expected that some minor localised tar deposits may still be present. Should additional investigation work during detailed design stages identify other areas of tar, these will be remediated in accordance with the JBS RAP and Remedial Works Plan currently in development.
9	Construction of compartments in the overall basement with each compartment adjacent to basement areas leaving a maximum of 2 exposed walls in contact with contaminated soil / groundwater.	Further design development will be undertaken post the Mod 9 application in relation to the detailing of all internal wall partitions. It is anticipated that large compartments will be created that may have up to 3 exposed external walls, though each will have plenums, and seepage drainage installed. These are anticipated to include compartments such as carparking levels, and retail floors. Each will have ventilation and/or air conditioning to ensure appropriate volume changes are achieved.
10	The basement groundwater retention walls system to comprise a secant pile wall, extending to and keyed into bedrock, with a reinforced concrete basement wall, constructed on the inside. A sealed plenum constructed immediately inside the reinforced concrete basement wall to include (a) passive ventilation to the atmosphere; and (b) dish drains that will drain any seepage.	Groundwater retention walls are to include a combination of diaphragm and secant walls. All walls will be keyed into bedrock. Reinforced concrete basement walls are only proposed where exposed bedrock forms the basement wall. Plenums are proposed for all external basement walls, and will include drains as a minimum, though passive ventilation is being considered as part of the design development.
11	Basement design plans to include engineering controls to ensure that contaminated groundwater does not accumulate in compartments which are ventilated to basement airspaces.	The perimeter drains proposed will be connected to a seepage collection network and a sump. The details of this system and the sump location are yet to be determined. Further detailed design will ensure no groundwater will accumulate in compartments that are ventilated to basement airspaces.
12	Basement levels should be maintained at lower pressure than occupied areas in accordance with AS1668.2 (Standards Australia 2002).	Further design development will be undertaken in relation to the basement pressure in accordance with the relevant Australian Standards. The mixed use for basement levels reduces the efficacy of this assumption as a management strategy, though positive pressure is expected from retail and office space due to air conditioning.
13	Sump rooms should be placed as far as possible from lift wells.	The location of sump rooms will be placed as far as possible from lift wells.
<p>General Note: The proposed basement design and construction will comply with all relevant Australian Standards.</p>		

Summary

The proposed MOD 9 basement concept design varies from the assumptions of the existing RAP. The major changes are the increased basement depth, mixed use within the basement levels, and enhanced wall construction details. The majority of RAP design assumptions are unchanged or improved upon in the concept design. These design changes will be specifically addressed through the development and implementation of the RAP, RWP, CEMP, CQAP, VSAQP and AMP. Further risk assessment will be included in each additional DA stage, including an updated human health risk assessment (HHRA) and incorporation of the Block 5 former Declaration Area into the RWP and future site audits.

EDP note that the additional remediation planning described above is required, particularly due to the change in proposed basement use and the basement depth extending below 10 m in the portion of Block 5 located within the former Declaration Area. Further documentation is required to fully meet the requirements of SEPP 55 for this area and will be prepared during the Stage 2 Development Application for the site to meet the requirements of SEPP 55.

EDP considers the JBS RAP suitable to be adopted for the MOD 9 submission, with consideration given to the requirements of the SAS/SAR, which provides further management detail.

Yours sincerely



Ryan Jacka
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EDP Consultants Pty Limited

References:

JBS RAP 2013, Remedial Action Plan, Barangaroo Central, Hickson Road, Sydney, NSW JBS 42021 – 51725 (Rev H)

SAS/SAR ENVIRON 2013, Site Audit Report and Site Audit Statement, Remedial Action Plan, Barangaroo Central, GN439B-5