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19 October 2011

Commercial-in-Confidence

Mark Burns
Environment Manager
Lend Lease Millers Point
30 The Bond
Hickson Road, Millers Point, NSW 2000

Dear Mark

Stage 1a Basement Design Change - Amended Remedial Action Plan, Other Remediation Works South Area, Hickson Road, Millers Point, NSW

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been engaged by Lend Lease (Millers Point) Pty Ltd (Lend Lease) to review changes to the Stage 1a basement design and provide advice on the implications (if any) of the basement changes to the Other Remediation Works South (ORWS) Amended Remedial Action Plan ('Amended RAP', [AECOM, 7 July 2011c]). For the purposes of this letter the term 'Site' refers to the ORWS area (also known as Stage 1a), located in Hickson Road, Millers Point, NSW (refer to **Figure 1**).

1.1 Background

The Amended RAP describes remediation requirements for the proposed development of the Site. The Amended RAP also presents contingency measures for a range of potential issues, including potential changes in basement design (refer Section 20.9 of the Amended RAP).

Lend Lease has changed the design of the proposed basement with the main change being the removal of the 'Deep Excavation' previously proposed adjacent to Hickson Road (previously proposed to be excavated to depth of -20 RL, refer to Section 3.2.3 of the Amended RAP). The proposed design changes do not include any alterations to the lateral extent of the basement, nor the related basement groundwater retention wall system as assumed by the ORWS Human Health and Ecological Risk Assessment Addendum (HHERA, [AECOM, 4 July 2011b]).

AECOM understands that Lend Lease is preparing a planning amendment application under Section 75W of the Environmental Planning and Assessment Act (the EP&A Act, 1979) in relation to the proposed change to the current approved basement design.

1.2 Objectives

This letter has been prepared to support the proposed planning amendment application by: (a) confirming whether the basement changes are consistent with the Amended RAP; and, (b) undertaking the actual contingency actions required by Section 20.9 of the Amended RAP.

As such, the objectives of this letter are to:

- Confirm whether the proposed basement modifications impact the validity of the Amended RAP and/or ORWS HHERA Addendum;
- Assess the implications of the proposed changes on the characterisation of materials to remain in-situ (in accordance with the Amended RAP);
- Assess the implications of the proposed changes to the basement design on the proposed extent of remediation (in accordance with the Amended RAP); and
- Advise whether (or not) additional sample analysis is required in accordance with the Amended RAP.

1.3 Scope of Work

To meet the above objectives AECOM undertook the following scope of work:

- Review of amended basement plans (as provided by Lend Lease on 17 October 2011);
- Review the Amended RAP to confirm whether the proposed changes are contemplated by and adequately addressed in the contingency measures outlined in Section 20.9 of the Amended RAP;

- Review the ORWS HHERA Addendum to confirm whether the proposed changes are consistent with the existing land use scenarios adopted by the HHERA; and
- Review of existing data and assessment of:
    - Confirmed Impacted Material (CIM, as defined in the Amended RAP) which may remain *in situ* based on the amended basement design;
    - The requirement for remediation of CIM (if any) that may remain *in situ* below the amended basement design; and
    - Whether the additional material to remain *in situ* in accordance with the amended basement design has been adequately characterised by the existing data set (for validation purposes).

2.0 Review of Basement Changes

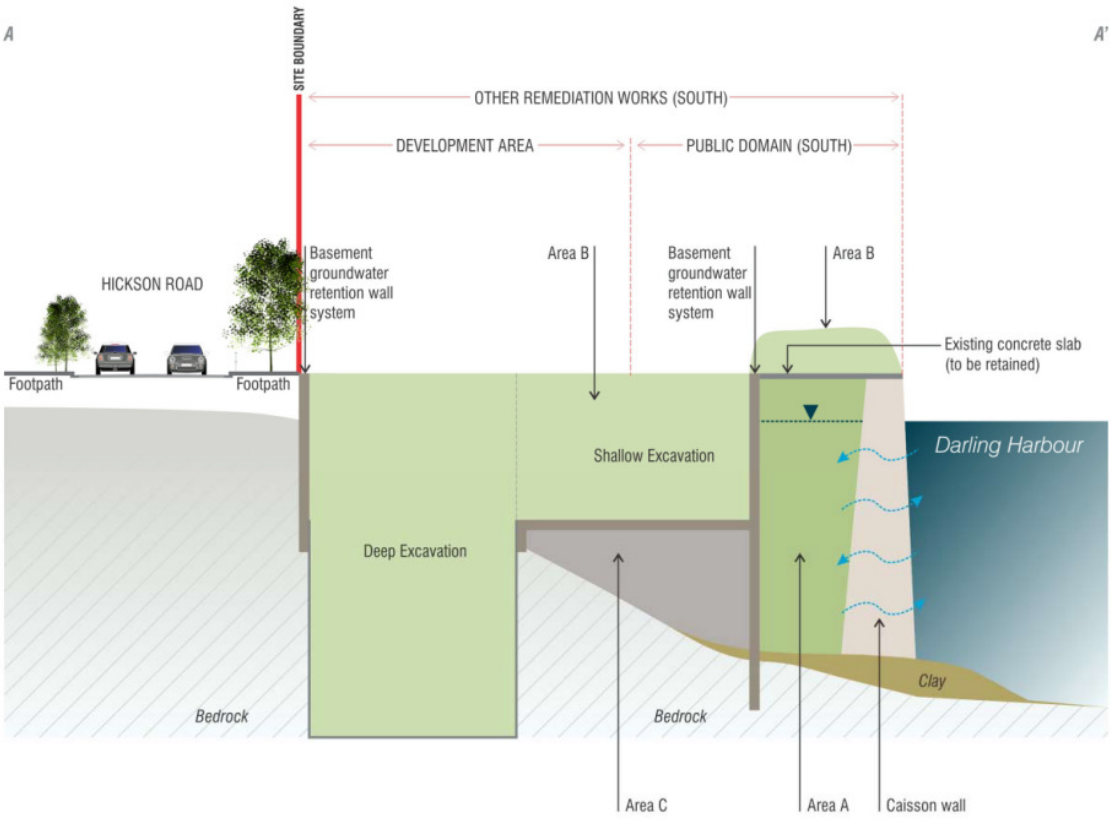
2.1 Current Basement Design

As detailed in Section 3.2.3 and Figure 5 of the Amended RAP, the basement excavation previously consisted of:

- a Deep Excavation, which was proposed to be excavated to Relative Level (RL) - 20 m Australian Height Datum (AHD, or 22.5 m bgs) along the eastern side of the Site, and
- a Shallow Excavation, which was proposed to be excavated to a typical depth of RL - 6 m AHD (8.5 m bgs).

The Shallow and Deep Excavation areas are diagrammatically illustrated in **Figure 1** below (which is a cross section taken from Section 1.3.1 of the Amended RAP). The alignment of this cross section is detailed in the attached **Figure F3**.

Figure 1 – Schematic Cross Section A-A' based on superseded Basement Design



2.2 Proposed Basement Changes

AECOM has reviewed the adjusted basement plans for the Stage 1a basement car park (refer to the plans titled 'Bulk Excavation and Basement Car Parking Section 75W-3 Application MP10_0023 [PA1-S75W-3]'). The new plans indicate that the Site will generally be excavated to RL - 5.3 m AHD (including the 0.8 m thickness of the basement base slab) (or 7.8 m bgs) with the exception of the following areas (refer to **Figure F1** [attached] and **Figure F3**):

- The plant room in the northeast corner of the Site (below level B3) to be excavated to RL -10.4 m AHD (12.9 m bgs);
- The plant room in the northwest portion of the Site to be excavated to RL -6.5 m AHD (9.0 m bgs);
- A transfer structure likely to be constructed at the southern end of the Site to a depth of approximately RL -8.5m AHD (11 m bgs);
- A grey water sump to be constructed in the north east corner of the site to a depth of approximately RL -8 m AHD (10.5 m bgs); and
- Basement 'commercial cores' to be constructed to a depth of approximately RL -12.5 m AHD and within the footprint of the future towers (which are the subject of separate planning applications).

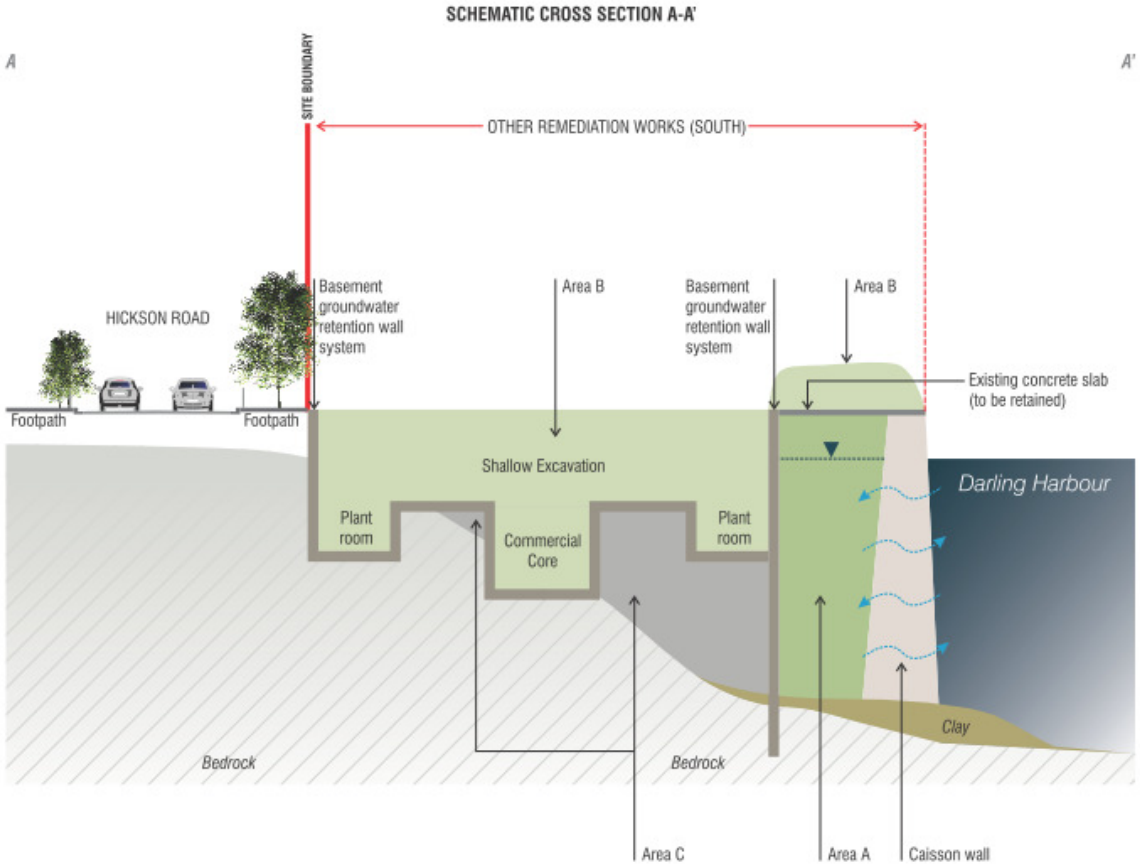
It is noted that the 'commercial cores' illustrated on **Figure F3** relate to the structural elements required for the C3 to C5 buildings and will include associated lifts, lift pits and fire stairs. The primary use for the commercial cores will be for lift overrun. Consequently, the commercial cores will not be occupied by full time workers or accessible to the public or users of the basement car park. The walls and floor of the commercial core will be the same thickness as that of the remainder of the basement.

The proposed amended excavation design, as described above, is based on the following assumptions:

- An additional 0.8 m excavation will be required below the surface slab level (SSL). That is, the base of the basement groundwater retention wall system is 0.8 m thick; and
- The average current surface elevation is RL 2.5 m AHD (as assumed in the Amended RAP).

The revised basement excavation, based on the proposed changes, is diagrammatically illustrated in **Figure 2** overpage. The alignment of this cross section is detailed in the attached **Figure F3**.

Figure 2 – Amended Schematic Cross Section A-A'



2.3 Implications of Proposed Changes

Based on AECOM's review of the changes to the Stage 1a basement design the following is noted:

- As the former Deep Excavation area is now planned to be excavated to depths ranging between RL -5.3 m AHD and RL -10.4 m AHD instead of RL -20 RL m AHD, a larger volume of fill and natural material will remain beneath the basement in the eastern portion of the Site (i.e. Area C on **Figure 2** above);
- The additional volume of fill material that will remain in situ below the basement is limited due to the depth of bedrock being generally shallower than the proposed depth of basement along the eastern side of the Site;
- The former Shallow Excavation area will be excavated an average of 0.5 m shallower than previously proposed (i.e. to RL -5.3 AHD, including the 0.8 m thickness of the basement base slab);
- The volume of materials to be removed as part of basement excavations (i.e. Area B on **Figure 2** above) will be reduced; and
- The lateral alignment of the basement groundwater retention wall system has not changed. Consequently, the proposed changes to the basement design will not change the existing data analysis presented in the Amended RAP for:
    - Area A - the area of the Site between Darling Harbour and the proposed basement groundwater retention wall system (refer to the attached **Figure F3**); and
    - Area D - the area of the Site in the southeast corner of the Site adjacent to Hickson Road and outside the basement groundwater retention wall system (refer to the attached **Figure F3**).

3.0 Review of ORWS HHERA Addendum

The ORWS HHERA Addendum derived remediation criteria for the protection of human health (Site Specific Target Criteria [SSTC]) and the environment (Site Specific Ecological Screening Criteria). The criteria were also compared to available Site data and conclusions provided with respect to potential for human health, odour or aesthetic risks following redevelopment of the Site.

As detailed in Section 5.2.2 of the Amended RAP, the ORWS HHERA Addendum considered land use scenarios for which applicable SSTCs for the Site were derived. In consideration of risk to human health, the following scenarios were considered in the Amended RAP:

- **Scenario 1:** Lower-most basement car park level (below water table) with some groundwater seepage through the basement walls and floor;
- **Scenario 2:** Upper-most basement car park level (above water table) with no groundwater seepage through the basement walls and floor (surfaces are dry in top 2 m);
- **Scenario 3:** Unpaved Recreation, Public Domain (South) with no concrete/hardstand paving;
- **Scenario 4:** Paved Recreation, Public Domain (South) with concrete/hardstand paving;
- **Scenario 5:** Typical commercial slab on ground construction;
- **Scenario 6**: Short term ground-intrusive maintenance;
- **Scenario 7**: High density residential (above a car park basement); and
- **Scenario 8**: Commercial slab on ground (with advection).

Based on a review of the ORWS HHERA Addendum, the proposed changes to the Stage 1a basement design do not change the proposed land use scenarios on which the ORWS HHERA Addendum is based and are considered consistent with the assumptions of the ORWS HHERA Addendum including, but not limited to:

- Above bedrock - the groundwater basement retention wall system will be least a 600mm thick and, in some areas, will include an additional 350mm reinforced concrete wall. It is noted that, to be conservative, the ORWS HHERA Addendum assumes that basement walls and floors will be 150 mm thick;
- Below bedrock - exposed bedrock surfaces will be shotcreted (100 mm thick) and a 350mm reinforced concrete wall will be constructed;
- A car park plenum and a ventilation plenum will be constructed in the basement car park areas;
- A minimum of four air exchanges per hour will be provided in the basement carpark areas; and
- The maximum carpark space will span no more than two perimeter walls, the other two will be internal walls that will not be adjacent to contaminated material.

4.0 Review of Amended RAP

4.1 RAP Assumptions

Section 20.9 of the Amended RAP states that if the design of the proposed basements is changed significantly such that the assumptions in the ORWS HHERA Addendum and the Amended RAP are affected, the documents would be revised, as required, and submitted to the NSW EPA Accredited Site Auditor and the NSW OEH for approval (unless advised otherwise).

Section 5.3.3 of the Amended RAP details the key assumptions with respect to the derivation of Remediation Criteria for Area A to D. As noted in **Section 2.3** above, the lateral alignment of the basement groundwater retention wall system has not changed and the changes will not affect Area A or D. Therefore, only the following assumptions relating to Area B and C are relevant to this letter:

- ***Area B**:*
    - *The soil SSESC for materials to be beneficially reused within the tidal prism has been adopted as part of the SSESC-B. This SSESC is based on the assumption that all material is located within the tidal prism and that application of the SSESC within tidal prism criteria is appropriate. This is a conservative assumption as at least half of the material reused within Area B (i.e. placed on top of the perforated concrete slab) will be upgradient of the tidal prism.*
    - *The existing public domain concrete slabs will be retained and perforated to allow free movement/infiltration of seepage waters from the beneficially reused material (Area B) into the underlying Area A fill materials. This assumption is consistent with that adopted in the ORWS HHERA Addendum.*
    - *As detailed in Section 5.3.2* (of the Amended RAP)*, the TTM approach described by ANZECC (2000) has been adopted for materials outside the retention wall system.*
- ***Area C**:*
    - *As detailed in Section 1.3.2* (of the Amended RAP)*, the basement groundwater retention wall system will be keyed into the underlying bedrock around the entire perimeter of the proposed Shallow and Deep Basement areas. This system will effectively isolate both the basement car park and any material remaining in situ under it (Area C material) from the surrounding ground conditions and Darling Harbour. Therefore, the application of the soil SSESCs for the Area C material is not warranted; and*
    - *As the basement excavations will be extended to below groundwater (i.e. within the saturated zone), contaminants dissolved in groundwater will also reflect soil impacts. Further, vapour concentrations would be equal to that in equilibrium with pore water (groundwater). Therefore, soil SSTCs are not applicable to the Area C material and only groundwater SSTCs are relevant.*

These assumptions are not impacted by the proposed changes to the Stage 1 basement design. In particular:

- the assumptions in relation to Area B concern the potential for beneficial reuse of material removed from Area B above the existing concrete pavement within the Public Domain (refer to Figure 2 above). This remains unchanged by the proposed basement design changes; and
- the assumptions in relation to Area C concern the design of the basement groundwater retention wall system which is unchanged by the proposed basement design changes.

4.2 Contingency Measures

Section 20.9 of the Amended RAP provides contingency measures for Areas A to D to address potential changes to the basement design that do not affect the assumptions of the ORWS HHERA Addendum and Amended RAP (refer to **Section 4.1** above).

Review of the Stage 1a basement design changes (**Section 2.0**) indicates that only Area B (material to be excavated) and Area C (material to remain *in situ* below the basements and within the groundwater retention walls) will be affected by the changes.

The contingency measures described by the Amended RAP in relation to Area B are:

1) *An increase/decrease in Area B fill material volumes as a result of any changes to the basement depth or retention wall system designs will not affect the proposed management strategy of beneficially reusing this material and the suitability of the Site for the proposed land uses; and*

2) *Increasing the elevation of the final Public Domain (South) and therefore increasing the capacity of the area for beneficial reuse will not impact on the remediation approach.*

The contingency measures described by the Amended RAP in relation to Area C are:

1) *CoPC concentrations in the proposed Area C fill materials are similar to that reported within the Area B fill materials and groundwater CoPC concentrations in Area C (following removal of the localised CIM in the MW08 area) will be significantly less than the groundwater Site-Specific Target Criteria (SSTC-C). Consequently, minor vertical changes to the lowest basement level in the Shallow Basement area (i.e. by less than 5 m) will not affect the proposed management strategy of retaining the Area C fill material in this Area and the suitability of the Area for the proposed landuse.*

2) *If the level of the lowest basement moves vertically by greater than 5 m, the Area C data set should be reassessed to confirm that it's sampling density suitably characterises the underlying, residual fill material. If this is not achieved, then additional sampling will be conducted in consultation with the NSW OEH Accredited Site Auditor.*

3) *If increased volumes of CIM are left below car park basements due to vertical changes in the level of the lowest basement, the extent and significance of these impacts, in the context of other material to remain below the car park basement, will be assessed to confirm whether they represent a significant risk to human health. This assessment will be conducted in consultation with the NSW OEH Accredited Site Auditor.*

With respect to Area B, the proposed changes to the basement design (refer to **Section 2.0**) will result in a reduction in the Area B fill material volumes and no change to the elevation of the final Public Domain (South). Therefore, there will be no impact on the proposed remediation approach.

With respect to Area C, the proposed changes to the basement design will result in: a change of less than 5 m in the vertical elevation of the lowest basement level in the former Shallow Basement area; and a change of greater than 5 m in the vertical elevation of the lowest basement level in the former Deep Basement area. Therefore, the contingency measures described at point (2) and (3) above for Area C may apply (refer to **Sections 5.0** and **6.0**, respectively).

5.0 Soil Characterisation

5.1.1 *In situ* Validation – former Shallow Excavation area

As the basement depth and associated volume of Area B material to be excavated in the former Shallow Excavation area (as defined in the Amended RAP) has not changed significantly, the soil sampling density of Area B and C has not changed and is considered to adequately characterise the material to remain *in situ*.

5.1.2 *In situ* Validation – former Deep Excavation area

As discussed in **Section 2.0**, the excavation depth has changed significantly within the former Deep Excavation area. Based on the change in excavation depth the following estimates of volumes and sampling density have been calculated for the portion of Area C likely to remain *in situ* below the former Deep Excavation area:

- The volume of material consisting of both fill and natural soil (excluding bedrock), that will remain beneath the basements in the former Deep Excavation area is approximately 42,000 m^3 of which approximately 10,000 m^3 is fill material and 32,000 m^3 is natural;
- 61 samples have been collected and analysed from Area C in the former Deep Excavation area, with 54 samples comprising natural material and seven consisting of fill material; and
- Based on the above the following sampling rates apply to Area C (material to remain *in* situ below the basement) in the former Deep Excavation area:
    - 1 sample per 688 m^3 in total;
    - 1 sample per 593 m^3 for natural material; and
    - 1 sample per 1,428 m^3 for fill material.

The sampling rate targeted by the *In situ* Soil and Fill Validation investigation AECOM (2011a) of Area C material was 1 borehole every 20 m x 20 m and soil samples collected/analysed at 1.5 m depth intervals (i.e. 1 sample analysed per 600 m^3). This sampling density has been broadly achieved (i.e. one sample analysed per 688 m^3) and is considered to be appropriate in assessing the suitability of materials to remain *in situ* in Area C based on consideration of:

- The horizontal and vertical distribution of analysed soil samples within the Area C materials;
- Previous investigations at the Site have detailed the history of landuse including land reclamation works using fill materials from similar sources. Consequently, the vertical and lateral distribution of CoPC concentrations in neighbouring Site Areas (i.e. Area B) is likely to be similar and can also be referred to for assessing the Area C materials; and
- The remediation criteria applicable to assessing the suitability of material to remain *in situ* within Area C (based on the SSTC derived by the ORWS HHERA Addendum) are based on groundwater quality and not soil quality.

Consequently, the soil sampling density achieved in Area C is considered to be acceptable for site assessment and remediation purposes.

6.0 Confirmed Impacted Material Assessment

As discussed in Section 6.3 and 7.5 of the Amended RAP, CIM was not identified to be present in Area C. However, as detailed in Section 6.3.4, naphthalene concentrations in groundwater exceeded the SSTC-C at one location (BH08/MW08) in Area C. This impact was not considered to represent CIM for the following reasons:

- *Naphthalene concentrations in the closest neighbouring monitoring well MW09 (located approximately 15 m to the south east of MW08) were reported below the LOR (refer to Table T13). With the exception of MW21 (1.4 µg/L) (located to the west of MW08), all naphthalene concentrations in groundwater across Area C (10 monitoring wells) were reported below the LOR. Consequently, the groundwater impacts in the MW08 area are considered to be localised and not indicative of broader impacts in Area C;*
- *Naphthalene concentrations in soil from BH08/MW08 (including other CoPCs typically associated with gas works contamination) (refer to Table T8), demonstrate that the soil impacts are limited vertically, likely due to the presence of the underlying sandstone bedrock (present at approximately 14.1 m bgl).*
- *The naphthalene concentrations in soil at neighbouring boreholes BH117 and BH307 (refer to Table T8), and lack of naphthalene impacts at surrounding boreholes, indicate that soil impacts are limited to an approximate 15 m radius to the north and south of MW08.*
- *The fill and natural material in the vicinity of MW08 (and the area to the east which includes BH117 and BH307) will be excavated as part of the Deep Basement works which will extend down to, and beyond, the depth of bedrock (present at approximately 14.1 m bgl). MW08 was installed to a depth of 14.1 m bgl and was screened from 10.5 to 14.1 m bgl. The Deep Basement will extend into bedrock to a depth of approximately 21.5 m bgl (20 RL m AHD). As such, significant source removal works will be included as part of the proposed development plans;*
- *The ORWS HHERA Addendum assumes that the SSTC groundwater concentration for naphthalene (900 µg/L) is present across the entire surface area of two basement walls with infiltration and groundwater seepage across 50% of the surface area of the two walls and floor (which is considered to be conservative). Given that the MW08 impact is localised (i.e. surrounding groundwater quality is below the groundwater SSTC-C) and that the bulk of the most impacted soils at the Site (with regards to naphthalene concentrations at the BH117 and BH307) will be removed as part of the proposed Deep Basement works, the localised elevated concentrations of naphthalene reported at MW08 are not considered to pose an unacceptable risk to human health.*

Based on the proposed changes to the Stage 1a basement design, the discussed naphthalene impacts in the BH08/MW08 area will now remain *in situ* below the base of the basement excavation. While the vertical and lateral extent of the naphthalene impacts in soil have been relatively well delineated in this area, only one well (MW09) is present within 15 m of MW08. Non-detectable naphthalene concentrations were reported at MW09. A possible estimate (based on the MW08 and MW09 impacts) is that an area measuring approximately 706 m^2

(based on a 15 m radius of impact around MW08) of the proposed Lower Basement floor would be impacted with naphthalene concentrations in groundwater which exceed the SSTC.

Consequently, it is concluded that the groundwater impact identified in the area of MW08 represents CIM and over excavation of fill and soil material to the depth of the underlying sandstone bedrock (at approximately 14.1 m bgs depth) will be required to remediate the area of BH08/MW08.

7.0 Conclusions

Based on the information provided above, AECOM concludes that the proposed changes to the Stage 1a basement designs at the Site:

- do not change the lateral alignment of the basement groundwater retention wall system as detailed in the Amended RAP;
- do not change the land use Scenarios detailed in the ORWS HHERA Addendum and Amended RAP;
- do not affect the assumptions adopted by the ORWS HHERA Addendum and Amended RAP;
- are anticipated by the Contingencies section of the Amended RAP (Section 20.9); and
- do not change the assessment of CIM potentially present in Area A, B and D (as detailed in Section 6.1, 6.2 and 6.4 of the Amended RAP);

Based on the above information, AECOM considers that the ORWS HHERA Addendum and Amended RAP do not require revision and are appropriate in managing the changed excavation works as a consequence of the changes to the Stage 1a basement designs.

The contingency measures required by Section 20.9 of the Amended ORWS RAP have been implemented (refer to **Sections 5.0** and **7.0**). Based on implementation of these contingencies it is concluded that:

- the assessment of CIM potentially present in Area C (as detailed in Section 6.3 of the Amended RAP) - reduction in the excavation depth in the former Deep Excavation area which will result in the naphthalene impacted soil and groundwater in the BH08/MW08 area remaining *in situ* beneath the now shallower basement area in the north east part of the Site. The groundwater impacts in this area are considered to represent CIM. Consequently, it is recommended that the impacted source material (soils) in the area of BH08/MW08 be remediated to the depth of bedrock in conjunction with the proposed bulk excavation works; and
- the existing sampling density for Area C material to remain *in situ* beneath the former Deep Excavation adequately characterises the material that will remain *in situ*. One sample per 688 m^3 has been analysed for the adjusted Area C analytical data set which broadly meets the goal of achieving a sampling density of 1 sample per 600 m^3. The horizontal and vertical distribution of analysed soil samples is also considered to be appropriate in characterising the Area C materials.

8.0 References

AECOM (2011a). *In situ* Soil and Fill Validation. Other Remediation Works (South) Area. 20 January 2011.

AECOM (2011b). ORWS Human Health and Ecological Risk Assessment Addendum, 4 July 2011.

AECOM (2011c). ORWS Amended Remedial Action Plan, 7 July 2011.

Lend Lease (2011). Bulk Excavation and Basement Car Parking Section 75W-3 Application MP10_0023 (PA1-S75W-3) including:

- BB1_PA1_S75W-3_A001 - Aerial Location Plan
- BB1_PA1_S75W-3_A002 - Site Analysis
- BB1_PA1_S75W-3_A003 - Survey Plan
- BB1_PA1_S75W-3_A004 - Demolition Plan
- BB1_PA1_S75W-3_A005 - Ground Plan
- BB1_PA1_S75W-3_A006 - Basement Plan Level B1
- BB1_PA1_S75W-3_A007 - Basement Plan Level B2
- BB1_PA1_S75W-3_A008 - Basement Plan Level B3
- BB1_PA1_S75W-3_A014 - Cross Section 1-1
- BB1_PA1_S75W-3_A015 - Longitudinal Section

9.0 Limitations

This document was prepared by AECOM Australia Pty Ltd (AECOM) for the sole use of Lend Lease (Millers Point) Pty Ltd, the only intended beneficiary of our work. Any advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole and are considered current to the date of this document. Any other party should satisfy themselves that the scope of work conducted and reported herein meets their specific needs before relying on this document. AECOM cannot be held liable for any third party reliance on this document, as AECOM is not aware of the specific needs of the third party. No other party should rely on the document without the prior written consent of AECOM, and AECOM undertakes no duty to, nor accepts any responsibility to, any third party who may rely upon this document.

This document was prepared for the specific purpose described in our emailed fee proposal dated 2 August 2011 and as agreed to by Lend Lease (Millers Point) Pty Ltd. From a technical perspective, the subsurface environment at any site may present substantial uncertainty. It is a heterogeneous, complex environment, in which small subsurface features or changes in geologic conditions can have substantial impacts on water and chemical movement. Uncertainties may also affect source characterisation assessment of chemical fate and transport in the environment, assessment of exposure risks and health effects, and remedial action performance.

AECOM's professional opinions are based upon its professional judgement, experience, and training. These opinions are also based upon data derived from the testing and analysis described in this document. It is possible that additional testing and analysis might produce different results and/or different opinions. AECOM has limited its investigation to the scope agreed upon with its client. AECOM believes that its opinions are reasonably supported by the testing and analysis that have been done, and that those opinions have been developed according to the professional standard of care for the environmental consulting profession in this area at the date of this document. That standard of care may change and new methods and practices of exploration, testing, analysis and remediation may develop in the future, which might produce different results. AECOM's professional opinions contained in this document are subject to modification if additional information is obtained, through further investigation, observations, or validation testing and analysis during remedial activities.

AECOM

Yours faithfully

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Enclosed:
Figure F1: Site Locality
Figure F2: Site Layout and Basement Groundwater Retention Wall System
Figure F3: Proposed Basement Plan

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information

PROJECT ID:	S4150090
CREATED BY:	TO
LAST MODIFIED:	TO 25 08 2011

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0 600m

Site Location

Lend Lease Development
ORWS Stage 1A Basement Adjustment
Barangaroo Other Remediation Works (South) Area
Hickson Road, Millers Point NSW

Figure
1

Map Document: G:\S4\S41500_S41599\S41500 Barangaroo\S4150090 ORWS Stage 1 A Basement Adjustment\S4150090 F1

A4 Size

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LEGEND

- DEVELOPMENT BLOCK BOUNDARY
- BASEMENT GROUNDWATER RETENTION WALL SYSTEM-ORWS SITE
- OTHER REMEDIATION WORKS (NORTH) AREA
- DECCW DECLARATION AREA
- OTHER REMEDIATION WORKS (SOUTH) AREA
- 1 PROPOSED DEVELOPMENT BLOCK NUMBER
- AREA A – LIMITED OR NO EXCAVATION (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- AREA B AND C – SHALLOW BASEMENT (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- AREA D – LIMITED OR NO EXCAVATION (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)

PROPOSED SOUTHERN COVE

PROPOSED PUBLIC DOMAIN

PROPOSED PUBLIC DOMAIN

Darling

Harbour

This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS				
01	SS			AKL
No.	BY	DATE	DESCRIPTION	APPD

SCALES: SCALE 1:750

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001-2000

DESIGNED	AR	CHECKED	
DRAWN	SS	CHECKED	JA
APPROVED		DATE	

DESIGNER: AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

ORWS STAGE 1A BASEMENT ADJUSTMENT

FIGURE F2:
SITE LAYOUT AND BASEMENT GROUNDWATER RETENTION WALL SYSTEM

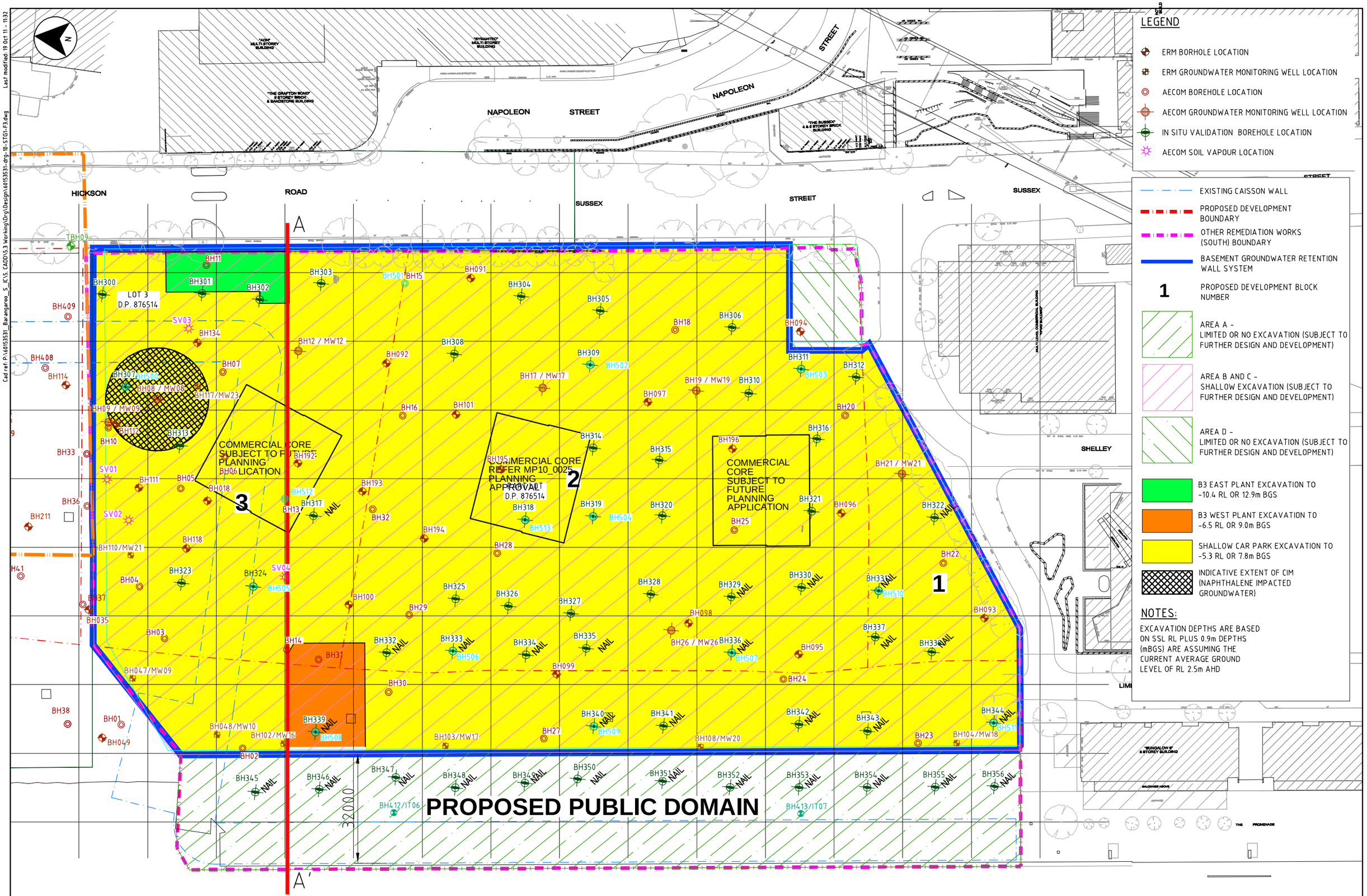
STATUS: DRAFT

DRAWING NO: 60153531-DRG-10-STG1-F2

REV: 01

Last modified: 19 Oct 11 - 11:32

Cad ref: P:\60153531_Barangaroo_S_ICS_CADD\S3 Working\Drg\Design\60153531-drg-10-STG1-F3.dwg



LEGEND

- ERM BORHOLE LOCATION
- ERM GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM GROUNDWATER MONITORING WELL LOCATION
- IN SITU VALIDATION BOREHOLE LOCATION
- AECOM SOIL VAPOUR LOCATION
- EXISTING CAISSON WALL
- PROPOSED DEVELOPMENT BOUNDARY
- OTHER REMEDIATION WORKS (SOUTH) BOUNDARY
- BASEMENT GROUNDWATER RETENTION WALL SYSTEM
- 1 PROPOSED DEVELOPMENT BLOCK NUMBER
- AREA A – LIMITED OR NO EXCAVATION (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- AREA B AND C – SHALLOW EXCAVATION (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- AREA D – LIMITED OR NO EXCAVATION (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- B3 EAST PLANT EXCAVATION TO -10.4 RL OR 12.9m BGS
- B3 WEST PLANT EXCAVATION TO -6.5 RL OR 9.0m BGS
- SHALLOW CAR PARK EXCAVATION TO -5.3 RL OR 7.8m BGS
- INDICATIVE EXTENT OF CIM (NAPHTHALENE IMPACTED GROUNDWATER)

NOTES:

EXCAVATION DEPTHS ARE BASED ON SSL RL PLUS 0.9m DEPTHS (mBGS) ARE ASSUMING THE CURRENT AVERAGE GROUND LEVEL OF RL 2.5m AHD

REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD
01	SS			AKL

SCALES: 5 0 5 10 15m — 1:500 FULL SIZE A1

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001-2000

DESIGNED	AR	CHECKED	
DRAWN	SS	CHECKED	JA
APPROVED		DATE	

DESIGNER: AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

ORWS STAGE 1A BASEMENT ADJUSTMENT

FIGURE F3:
PROPOSED BASEMENT PLAN

STATUS:	DRAWING NO:	REV:
DRAFT	60153531-DRG-10-STG1-F3	01