

CONSTRUCTION REMEDIATION STAGING PLAN

BARANGAROO SOUTH & CENTRAL – STAGE 1B PUBLIC
DOMAIN WORKS, SSD 7944

OCTOBER 2018



lendlease



Document History

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Issue	Addendum	Revision	Date
A		Issue for internal review – MB, CC, NO, WD	18 October 2018
B		Issue for Site Auditor review and endorsement	22 October 2018
C		Issue as final – site auditor's comments addressed	30 October 2018

Background

The construction and use of the Barangaroo Stage 1B Public Domain areas were approved by the Independent Planning Commission on the 11 September 2018 under Section 4.38 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposed public domain works were assessed under a State Significant Development application (SSD 7944) lodged by Lend Lease Millers Point to the Department of Planning and Environment.

The proposed public domain works include the development of Hickson Park, Watermans Quay, Barangaroo Avenue, Wulugul Walk, Watermans Cove and Public Pier (the public domain site) as described in the SSD 7944 documentation. **Figure 1** shows the public domain site boundaries.

As part of the public domain construction works, any required remediation and validation of the site will be undertaken in accordance with the following Remedial Action Plans (RAPs), which have been audited/endorsed by a NSW EPA accredited Site Auditor:

1. AECOM (2013). Remedial Action Plan, NSW EPA Declared Remediation Site 21122 and Block 4 (Stage 1b) Development Works, Barangaroo, Millers Point, NSW (the '**VMP/Block 4 RAP**')
2. AECOM (16 Feb 2017). VMP/Block 4 RAP Addendum – Part Stage 1B Public Domain (Watermans Quay), Hickson Road, Millers Point, Barangaroo South (the '**Watermans Quay RAP Addendum**')
3. AECOM (22 January 2016). Remedial Action Plan, Barangaroo South Stage 1B Waterfront Public Domain (the '**Stage 1B Waterfront Public Domain RAP**')
4. AECOM (7 July 2011). Amended RAP, Barangaroo (the '**ORWS RAP**')
5. AECOM (2012). Addendum to ORWS Amended RAP, Harbour Heat Rejection System Inlet Area, Barangaroo South (the '**HHR Inlet Area RAP Addendum**')
6. AECOM (2017). Addendum to the Stage 1B Waterfront RAP, Barangaroo South (the '**Addendum to the Waterfront RAP**')
7. AECOM (2015). Remedial Action Plan, Crown Hotel Development (Part of ORWN Area), Barangaroo South (the '**Crown RAP**')
8. AECOM (19 April 2017). Remedial Action Plan, Block 5 Public Domain, Barangaroo South (the '**Block 5 Public Domain RAP**')

This Construction Remediation Staging Plan has been prepared in response to condition of approval 6 (Part B) of SSD 7944 which states the following:

Prior to the issue of any Construction Certificate, a Construction Remediation Staging Plan which has been reviewed and endorsed by an EPA-accredited site auditor and submitted to the satisfaction of the Certifying Authority.

The Plan must outline how construction works will be managed/staged to ensure that where the site (or a part of the site) is contaminated in such a way that it requires remediation, the risk of construction/excavation (non-remediation) works inadvertently disturbing contaminated material is minimised as far as reasonably practicable.

It is noted that in addition to this document, a Validation Sampling and Management Plan (VSMP) will be prepared by the Lead Validation Consultant (LVC) for review and endorsement by a NSW EPA accredited Site Auditor. The VSMP will provide details of validation methods for the public domain site areas requiring remediation.

Remediation Works Staging and Management

Table 1 identifies the different public domain areas and applicable Remedial Action Plans (RAP) for each of these areas, the status of remediation requirements or validation sampling requirements in each area under the applicable RAP and provides details of proposed actions/management in order to minimise the risk of non-remedial works inadvertently disturbing contaminated material. Figure 1 shows the public domain site boundaries. **Figure 2** shows the applicable RAP areas. Drawings in **Appendix A** show preliminary construction staging plans.

Table 1: Public Domain Areas, remediation requirements and proposed management/staging of remediation related works

Item	Public Domain Area ¹	Applicable RAP	Related SSD or Planning Approval	Remediation works required to facilitate Public Domain Development?	Management/Staging
1	Barangaroo South – Block 4/Stage 1B Basement Area (ie. public Domain area above Block 4 basement, southern part of Hickson Park)	VMP/Block 4 RAP	SSD 5897 (remediation) & SSD 6960 (Stage 1B basement)	No (other than that being completed separately under SSD 5897). The public domain to be constructed within Block 4 will be constructed above the Stage 1B basement, after remediation of that area is completed and validated in accordance with the RAP and SSD 5897.	Any imported top soils for the public domain will be validated in accordance with the VMP/Block 4 RAP, which will be undertaken following excavation of Block 4 and subsequent basement structure construction
2	Barangaroo South - Watermans Quay	Watermans Quay RAP Addendum	SSD 5897	No (other than that being completed separately under SSD 5897) for the VMP Remediation Extent and areas beyond the VMP Remediation Extent. NB: The Watermans Quay RAP Addendum does not require remediation in the areas beyond the VMP Remediation Extent. Asbestos validation sampling in accordance with the Watermans Quay RAP Addendum was undertaken by ERM (March 2017) in this area. No asbestos fibres were detected and no suspected ACM was observed. ERM (March	Watermans Quay VMP Remediation Extent was remediated during 2018 as per GHD (27 July 2018) and Ramboll (11 September 2018) Any imported suitable fill and top soils will be validated in accordance with the Watermans Quay RAP Addendum following remediation of the VMP area and installation of services (as required). Excavation for the installation of services will be undertaken in accordance with an Unexpected Finds Protocol

CONSTRUCTION REMEDIATION STAGING PLAN



Item	Public Domain Area ¹	Applicable RAP	Related SSD or Planning Approval	Remediation works required to facilitate Public Domain Development?	Management/Staging
				2017) was endorsed by the site auditor in email dated 16 March 2017	
3	Barangaroo South - Watermans Cove and Wulugul Walk (Stage 1B Public Domain)	Stage 1B Waterfront Public Domain RAP	SSD 6960	Subject to additional validation sampling of the unsaturated soils as detailed in Section 16.4.1 of the Stage 1B Waterfront Public Domain RAP	<p>A Validation Sampling and Management Plan (VSMP) has been prepared for the Stage 1B Waterfront Public Domain (ERM, June 2016) which was endorsed by the Site Auditor (email dated 5 September 2016). Validation sampling of unsaturated soils commenced in mid 2018 and will be completed by end 2018.</p> <p>If remediation is required based on the above sampling, it would be undertaken prior to/during construction works in accordance with the Stage 1B Waterfront Public Domain RAP and the site's OHS plans.</p> <p>Any imported suitable fill and top soils will be validated in accordance with the Stage 1B Waterfront Public Domain RAP following any required remediation and installation of services (as required)</p> <p>Any excavation for installation of services will be undertaken in accordance with an Unexpected Finds Protocol</p>
4	Barangaroo South – Stage 1A (small portion of the Stage 1A area to the south of Watermans Cove)	ORWS RAP	MP10_0023 MOD 3 (remediation)	No. The Stage 1A area has been remediated and validated in accordance with the ORWS RAP as per Environ (June 2015) and Ramboll Environ (September 2015)	Any imported top soils for the Public Domain will be validated in accordance with the ORWS RAP during the Public Domain works
	Barangaroo South - Harbour Heat	HHR Inlet Area RAP Addendum	MP10_0023 MOD 5	No. The HHR Inlet area has been remediated and validated in accordance	This area will be raised and therefore will require the importation of



Item	Public Domain Area ¹	Applicable RAP	Related SSD or Planning Approval	Remediation works required to facilitate Public Domain Development?	Management/Staging
	Rejection (HHR) Inlet Area			with the HHR Inlet Area RAP Addendum as per Environ (June 2015)	<p>validated suitable fill. Since increasing the elevation of this area was not envisaged by the HHR Inlet Area Addendum RAP, the Addendum to the Waterfront RAP was prepared to clarify this approach.</p> <p>Imported suitable fill will be validated in accordance with the Stage 1B Waterfront Public Domain RAP during the HHR elevation works</p>
5	Barangaroo South - Barangaroo Avenue	Crown RAP Stage 1B Waterfront Public Domain RAP	SSD 6956	<p>No – Above Crown Basement: the majority of the proposed Barangaroo Avenue will be constructed above the Crown (Stage 1C) basement and therefore does not require remediation.</p> <p>Subject to additional validation sampling – outside Crown basement – as follows:</p> <p>A small portion of Barangaroo Avenue, at its southern end, is located outside the Crown Basement (and within the Crown RAP area). This area has been subject to additional sampling of the unsaturated soils as required under section 16.4.1 of the Crown RAP (AECOM, 2015). The results are reported in a Draft report by AECOM (2 Dec 2016), with all chemicals of potential concern analysed from samples collected in the Barangaroo Ave portion of the Crown site below the SSTC criteria. These results will be confirmed with the site auditor.</p>	<p>If remediation is required outside the Crown basement, it would be undertaken prior to/during construction works in accordance with the Crown RAP or the Stage 1B Waterfront Public Domain RAP as applicable and the site's OHS plans.</p> <p>Imported suitable fill will be validated in accordance with the Crown RAP during the Barangaroo public domain works.</p> <p>Any excavation for installation of services outside the Crown basement will be undertaken in accordance with an Unexpected Finds Protocol</p>



Item	Public Domain Area ¹	Applicable RAP	Related SSD or Planning Approval	Remediation works required to facilitate Public Domain Development?	Management/Staging
				A small remaining part of Barangaroo Avenue is located within the Stage 1B Waterfront Public Domain RAP area, which is part of the validation sampling noted under Item 3 above	
6	Barangaroo Central – the southern portion of Block 5 (Block 5 part of Hickson Park)	Block 5 Public Domain RAP	-	<p>No (other than that completed separately under SSD 5897 within the VMP remediation extent (eastern part of Hickson Park).</p> <p>Beyond VMP remediation extent - subject to additional validation sampling of the unsaturated soils as detailed in Section 7.3 of the Stage Block 5 Public Domain RAP</p>	<p>Validation sampling of unsaturated soils was undertaken in 2017. A review of the results will be undertaken in 2018 by the LVC. The results, and any need for additional sampling, will be reported to the site auditor.</p> <p>If remediation is required, it would be undertaken prior to/during the public domain construction works in accordance with the Block 5 Public Domain RAP and the site's OHS plans (all public domain works will be undertaken following completion of the VMP remediation).</p> <p>Any imported suitable fill and top soils will be validated in accordance with the Block 5 Public Domain RAP following any required remediation and installation of services (as required)</p> <p>Any excavation for installation of services will be undertaken in accordance with an Unexpected Finds Protocol</p>

1. Public Domain Areas as described in the AECOM (20 September 2017) letter titled 'Barangaroo South & Central – SEPP 55 Letter, Stage 1B Public Domain Development Works, DA SSD 7944, Hickson Road, Millers Point', prepared under the Stage 1B public domain works State Significant Development Application (SSD 7944)

Any required remediation activities will be validated and reported in accordance with the applicable RAP. Progress validation reporting is discussed below. An unexpected finds protocol, to be prepared under Condition 9 (Part B) of SSD 7944 and to be endorsed by an accredited site auditor, will be implemented during the works.

Progress Validation Reporting

Once specific remediation activities in the public domain are completed a Progress Validation Report (PVR) will be prepared by a validation consultant. The PVR will be a standalone report which demonstrates that the works comply and have been validated in accordance with the relevant RAP. The PVRs would be consistent with the requirements of the Office of Environment and Heritage (OEH) (2011) *Guidelines for Consultants Reporting on Contaminated Sites* and be suitable for review by the Site Auditor. The PVRs will include the following information, where applicable to the relevant PVR:

- Clear explanation of the remediation activity undertaken and methodology, including timing of the activity and validation requirements;
- A description of the validation methodology/procedures (inspections, sampling, spoil tracking, etc);
- Waste classification reports, waste tracking records and registers;
- Records of inspections and tabulated sampling and monitoring results;
- A discussion of the validation results and conclusions;
- Surveys of final excavation base and walls (if excavation is part of the remediation activity);
- Figures/drawings showing locations of validation inspections and sampling;
- Any other information needed to provide sufficient evidence that the validation requirements have been met;
- Constructed structures validation related-documentation (eg. any structure related to fundamental relevant HHERA assumptions);
- VENM certificates;
- Analytical results of non-VENM imported material (eg. top soils); and
- Imported materials tracking records and records of visual inspections of the material

PVRs will be submitted to the Site Auditor at completion of the required remedial works in the relevant public domain area for review and an Interim Audit Advice sought for that particular area. The PVR may be included and/or referenced in a final validation report for a specific Public Domain area being audited.

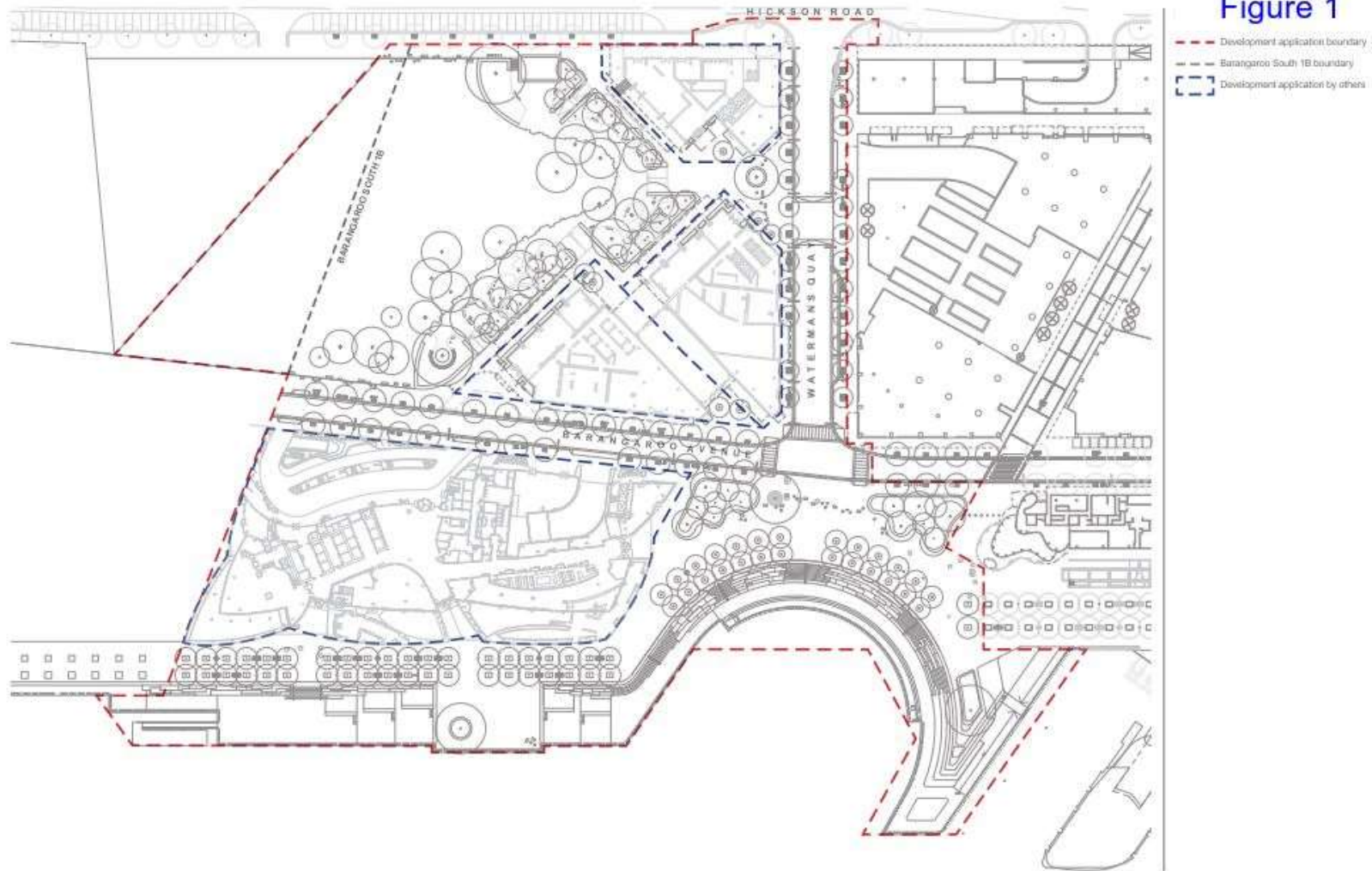
Closure

The above approach to construction remediation staging, progress validation and review by the Site Auditor will be undertaken to minimise the risk of inadvertently disturbing contaminated materials during non-remediation works as part of the Stage 1B Public Domain construction.

CONSTRUCTION REMEDIATION STAGING PLAN



Figure 1



Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
 Development Application Drawings

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Drawing Title
**STAGE 1B DEVELOPMENT
 APPLICATION BOUNDARY**

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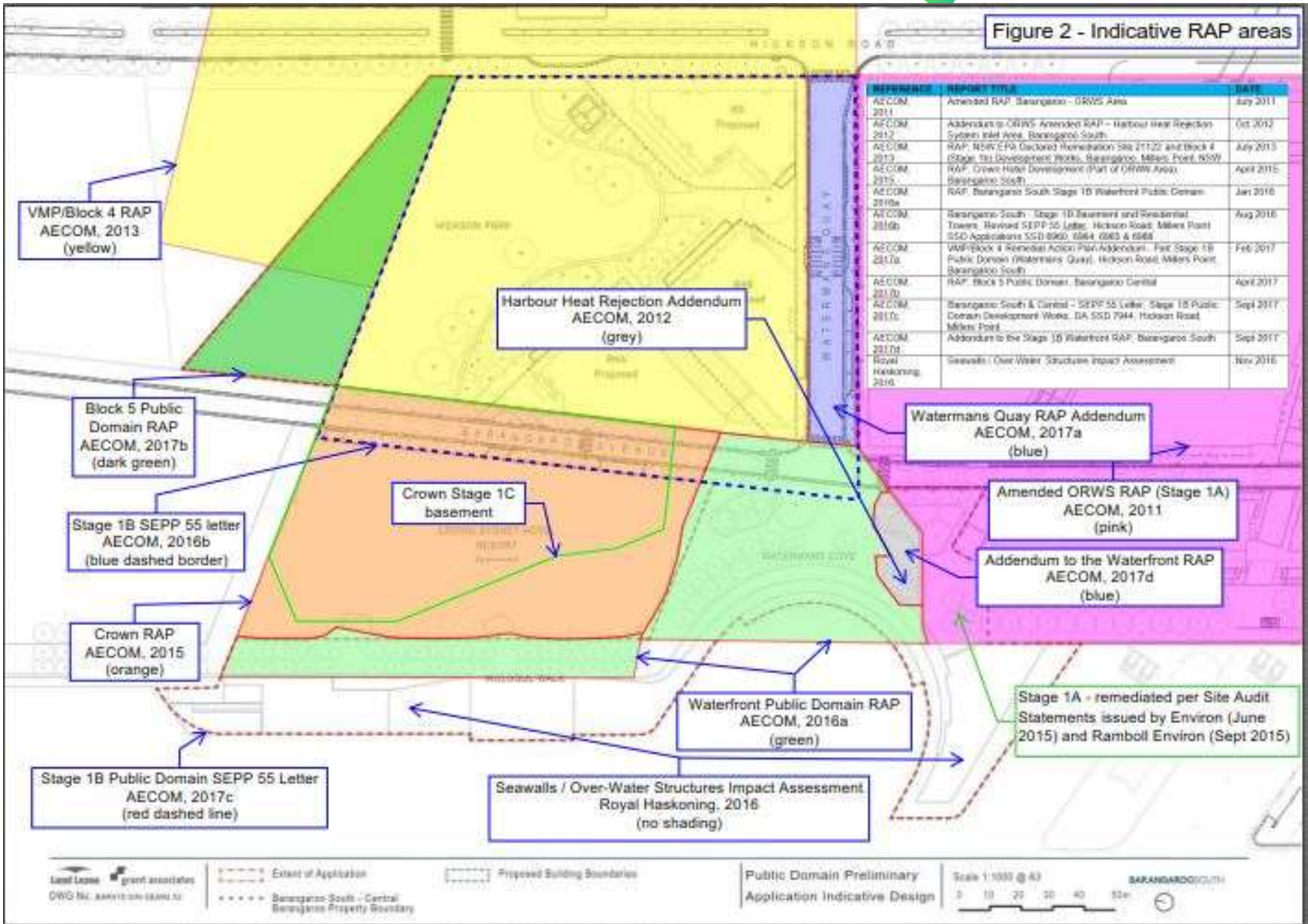
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Revision
 Rev A
 Rev B
 Rev C
 Rev D

Date
 18/11/2016
 20/01/2017
 15/03/2017
 08/09/2017

CONSTRUCTION REMEDIATION STAGING PLAN



References

RAPs applicable to the public domain are referenced above under subheading “Background” (in the order reported in **Table 1**).

Other documents referred to in **Table 1** include:

AECOM (2 December 2016). DRAFT Progress Validation Report 1 – Area A Validation, Barangaroo Stage 1C – Crown Sydney Hotel Resort Lead Validation Consultant

Environ Australia Pty Ltd (June 2015). Site Audit Report Area Validated for Tranche 1, Other Remediation Works (South), Barangaroo Audit Number GN 439C-1-1

ERM (June 2016). Validation Sampling and Management Plan Stage 1B Waterfront Public Domain

ERM (March 2017). Characterisation of Soil in Block 4 (Watermans Quay) for Potential Asbestos Containing Material Factual Report

GHD Pty Ltd (27 July 2018). Barangaroo, Sydney NSW, NSW EPA Declaration Area 21122 and Block 4 Remediation, Watermans Quay, Progress Validation Report 02

Graeme Nyland’s email dated 5 September 2016, re: Revised Stage 1B Public Domain VSMP

Graeme Nyland’s email dated 16 March 2017, re: Watermans Quay Asbestos Characterisation Report

Ramboll Environ Australia Pty Ltd (September 2015). Site Audit Report Area Validated for Tranche 2, Other Remediation Works (South), Barangaroo Audit Number GN 439C-1-2

Ramboll (11 September 2018). Re: Interim Audit Advice No. 3 – Review of Progress Validation Report 02, Watermans Quay, Barangaroo Declaration Area 21122 & Block 4 Remediation



Appendix A: Preliminary Construction Staging Plans

Stage 1) Site Establishment (Oct '18 to Nov '18)



LEGEND

- - - Development application boundary
- - - Barangaroo South 1B boundary

Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
Development Application Drawings

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Drawing Title
STAGE 1B MASTER PLAN

Drawing Number
BAR-418-DA-SP-GA05

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Revision
Rev A
Rev B
Rev C
Rev D
Rev E
Rev F
Rev G

Date
18/11/2016
20/01/2017
15/03/2017
28/04/2017
08/09/2017
03/11/2017

Site Accom:
- 3m high Single Stack

Stage 2a) Waterfront Cove Structures (Nov '18 to Dec '18)



LEGEND

- - - Development application boundary
- - - Barangaroo South 1B boundary

Revision	Date
Rev A	18/11/2016
Rev B	20/01/2017
Rev C	15/03/2017
Rev D	28/04/2017
Rev E	08/09/2017
Rev F	03/11/2017

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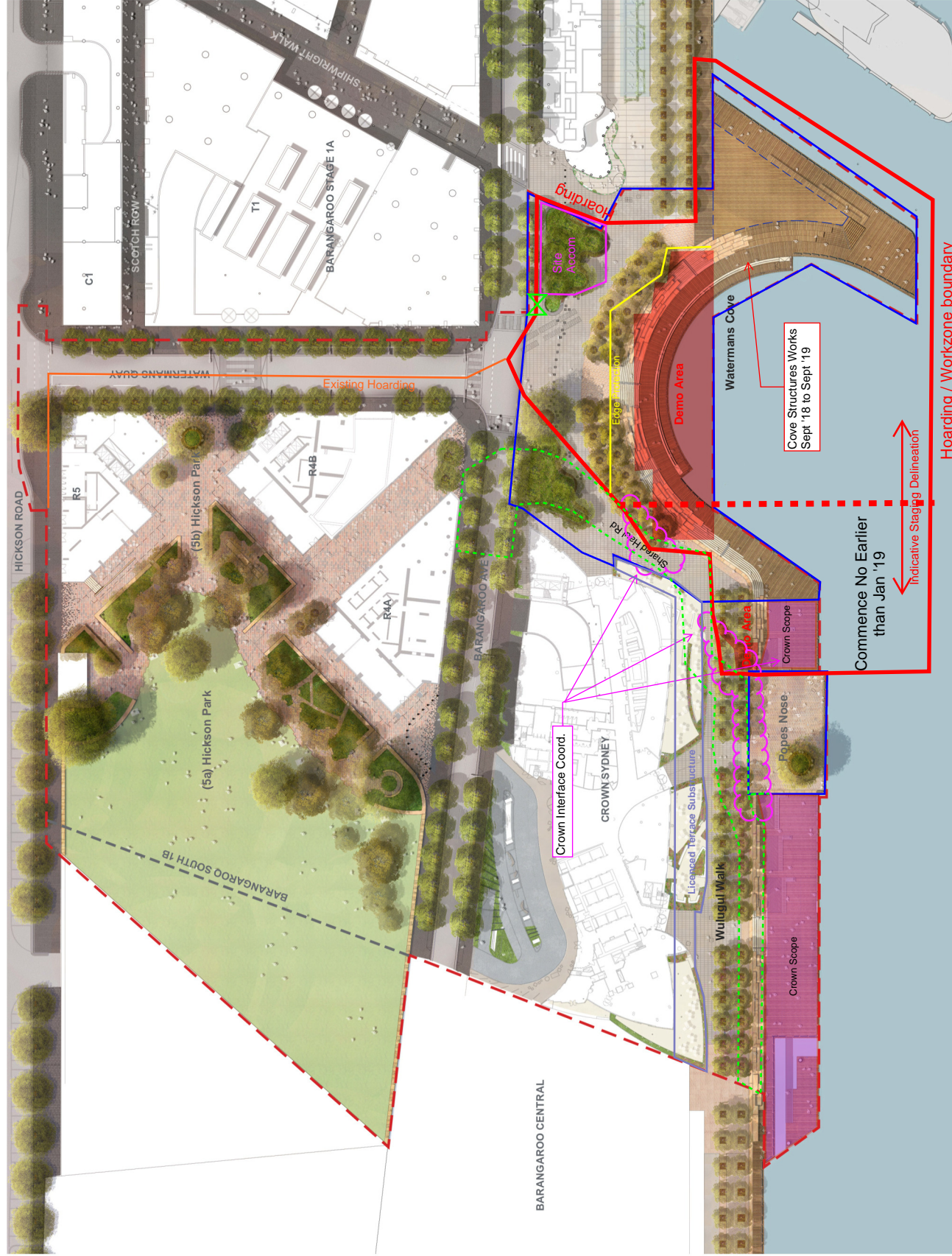
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Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
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No Earlier than Jan '19

Indicative Staging Delineation

Stage 2b) Waterfront Cove Structures (Jan '19 to Oct '19)



LEGEND

- - - Development application boundary
- - - Barangaroo South 1B boundary

Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
Development Application Drawings

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Drawing Title
STAGE 1B MASTER PLAN

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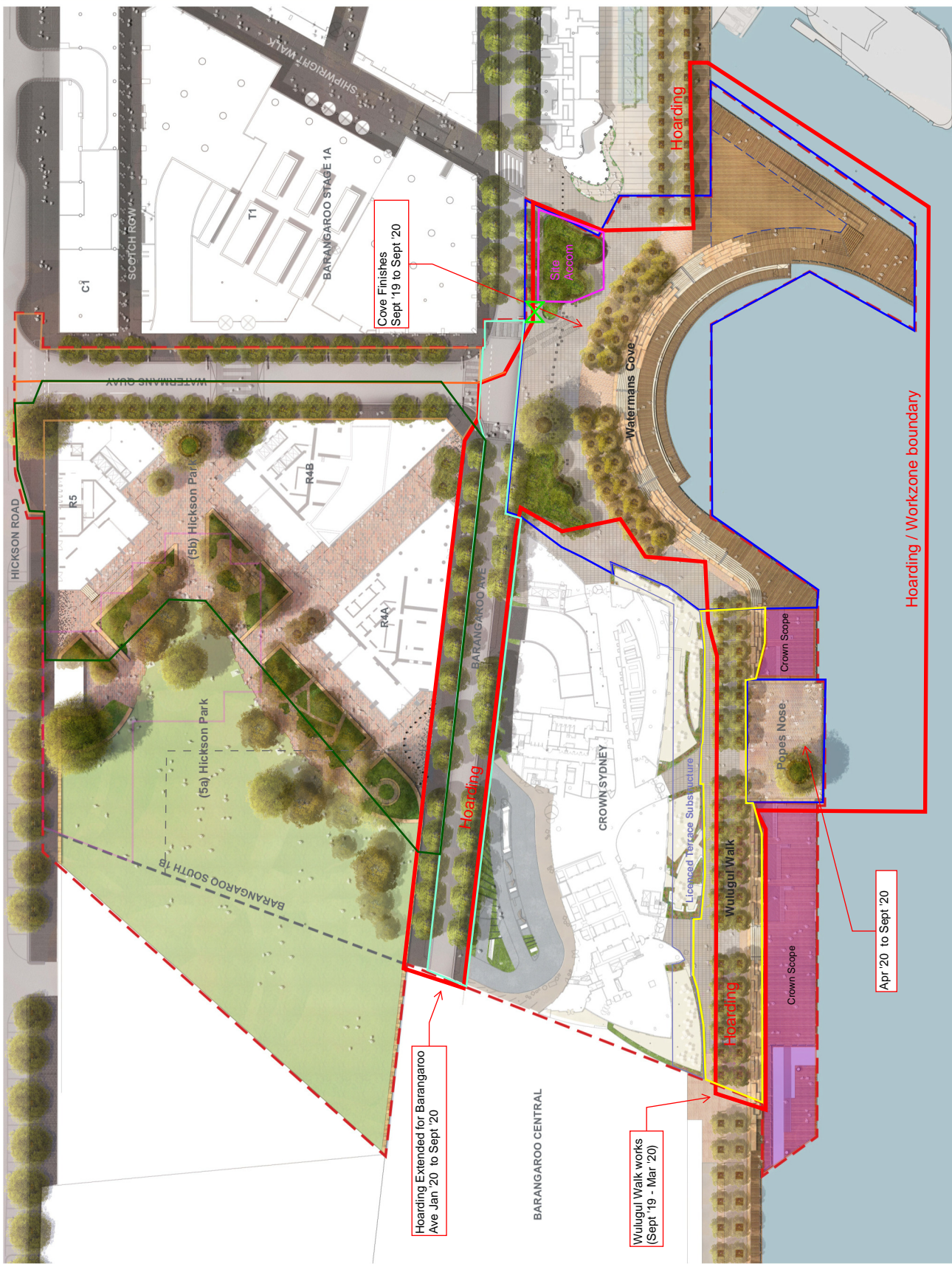
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Rev A
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Rev E
Rev F

Date
18/11/2016
20/01/2017
15/03/2017
28/04/2017
08/09/2017
03/11/2017

Stage 4) Cove, Wulugul Walk, Barangaroo Ave
(Jan '20 to May '20)



LEGEND

- - - Development application boundary
- - - Barangaroo South 1B boundary

Date	Revision
18/11/2016	Rev A
20/01/2017	Rev B
15/03/2017	Rev C
28/04/2017	Rev D
08/09/2017	Rev E
03/11/2017	Rev F

Drawing Number
BAR-418-DA-SP-GA05

Drawing Title
STAGE 1B MASTER PLAN

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Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
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Stage 5) Cove, Crown Perimeter Area, Hickson Park 5A (June '20 to Sept '20)

- LEGEND**
- - - Development application boundary
 - - - Barangaroo South 1B boundary



Project
BARANGAROO STAGE 1B
PUBLIC DOMAIN
 Development Application Drawings

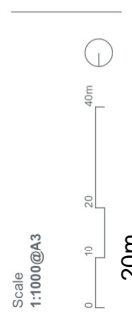
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Drawing Title
 STAGE 1B MASTER PLAN

Drawing Number
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Checked
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Drawn
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