

The background of the cover page is a composite image. It features a dark blue diagonal band across the middle. Behind this band, there is a grayscale image of a city skyline with several tall buildings. Overlaid on the entire background is a pattern of 3D rectangular blocks, some solid and some outlined, arranged in a grid-like fashion.

Review of Environmental Factors

Gap Park Tramway Footpath

Prepared for Woollahra Municipal Council

September 2020

REPORT REVISION HISTORY

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01	02/06/2020	Draft for internal review				
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Certification

This report has been authorised by City Plan Strategy & Development P/L, with input from a number of other expert consultants. To the best of our knowledge the accuracy of the information contained herein is neither false nor misleading. The comments have been based upon information and facts that were correct at the time of writing.

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TABLE OF CONTENTS

1. Declaration	5
2. Executive Summary	6
3. Site and Context	7
3.1. Site Identification	7
3.2. Ownership and Proponent	8
3.3. Site Description	8
3.4. Site Context and Surrounding Development.....	12
4. Description of the Development	15
4.1. Existing Development and Facilities	15
4.2. Background of Development.....	15
4.3. Proposed Works.....	17
4.3.1. Footpath.....	17
4.3.2. Stormwater Drainage Infrastructure Works	17
4.3.3. Outdoor Seating.....	17
4.3.4. Signage.....	17
4.3.5. Tree Removal	18
5. Consultation	19
5.1. Requirements of State Environmental Planning Policy (Infrastructure) 2007	19
5.2. Non-Statutory Consultation	20
6. Statutory Planning Framework	21
6.1. Overview	21
6.2. Part 5 Environmental Planning and Assessment Act 1979	21
6.2.1. Division 5.1 Definitions (cf previous s 110).....	21
6.2.2. Section 5.5 Duty to consider environmental impact (cf previous s 111)	22
6.3. Environmental Planning and Assessment Regulation 2000	22
6.4. State Environmental Planning Policy (Infrastructure) 2007	25
6.4.1. Overview	25
6.4.2. Consultation	25
6.4.3. Part 3 – Development Controls.....	25
6.5. Biodiversity Conservation Act 2016	26
6.6. Additional legislation	28
6.7. Additional state environmental planning policies	29
6.8. Woollahra Local Environmental Plan 2014	30
6.8.1. Zoning	30

6.8.2.	Objectives	30
6.8.3.	Clause 5.10 Heritage Conservation.....	31
6.8.4.	Clause 6.1 Acid Sulfate Soils.....	32
6.8.5.	Clause 6.3 Flood Planning.....	33
7.	Woollahra Biodiversity Conservation Strategy 2015-2025	34
8.	Environmental Impact Assessment	35
8.1.	Matters for Consideration.....	35
8.1.1.	Acoustic Impacts.....	35
8.1.2.	Visual Impact	35
8.1.3.	Safety and Security.....	35
8.1.4.	Heritage	36
8.1.5.	Aboriginal Archaeology.....	37
8.1.6.	Flora, Fauna and Ecology.....	37
8.1.7.	Water Management	38
8.1.8.	Transport, Traffic and Parking	38
8.1.9.	Construction Impacts	39
9.	Mitigation Measures.....	40
10.	Conclusion	43

FIGURES

Figure 1:	Cadastre map.....	7
Figure 2:	Aerial view of the site	8
Figure 3:	View of northern entrance of the unpaved pedestrian footpath	9
Figure 4:	View of the existing unpaved pedestrian footpath	9
Figure 5:	View of a portion of the unpaved pedestrian footpath.....	9
Figure 6:	View of the existing unpaved pedestrian footpath	9
Figure 7:	View of the existing unpaved pedestrian footpath	10
Figure 8:	View of southern entrance of unpaved pedestrian footpath	10
Figure 9:	View of the paved area adjacent the footpath's entrance	10
Figure 10:	View of southern entrance to Gap Park	10
Figure 11:	View of paved pedestrian pathway connecting to Gap Road.	11
Figure 12:	View of northern entrance to Gap Park.....	11
Figure 13:	View of the Gap Park coastal walk no. 1	11
Figure 14:	View of the Gap Park coastal walk no. 2	11
Figure 15:	Regional context.....	12

Figure 16: View of low-density residential development on Old South Head Road..... 13

Figure 17: View of low-density residential development on Gap Road..... 13

Figure 18: View of the ocean cliff referred to as 'The Gap' 13

Figure 19: View of Robertson Park from the east 13

Figure 20: View of Watsons Bay Boutique Hotel 14

Figure 21: View of Camp Cove from the south side..... 14

Figure 22: View of Watsons Bay commercial area 14

Figure 23: View of St Peters Church entrance and associated church buildings 14

Figure 24: Gap Park Masterplan 16

Figure 25: Biodiversity Values Land Map extract 27

Figure 26: WLEP 2014 Land Zoning Map extract 30

Figure 27: WLEP 2014 Heritage Map extract..... 31

Figure 28: WLEP 2014 Acid Sulfate Soils Map extract 32

TABLES

Table 1: Consideration of ISEPP Consultation requirements 19

Table 2: Compliance with Section 5.5 of the Act..... 22

Table 3: Clause 228 the Regulations compliance table 22

Table 4: Additional legislation..... 28

Table 5: Commonwealth legislation 28

Table 6: SEPPs 29

Table 7: Summary of potential heritage impacts 37

Table 8: Mitigation Measures 40

APPENDIX

Appendix	Document	Prepared By
1	Gap Park Masterplan Summary Report	Thompson Berrill Landscape Design P/L
2	Civil Plans and Design Summary Statement	Aspect Australia
3	Statement of Heritage Impact	Artefact Heritage
4	Due Diligence Aboriginal Heritage Assessment	Coast History and Heritage
5	Vegetation Survey	Woollahra Municipal Council

1. DECLARATION

This Review of Environmental Factors (REF) has been prepared for Woollahra Municipal Council and assesses the potential environmental impacts that could arise from the construction of a footpath in Gap Park.

This REF has been prepared in accordance with the relevant provisions contained within the following legislation:

- *Environmental Planning and Assessment Act 1979* (the Act);
- *Environmental Planning and Assessment Regulation 2000* (the Regulations); and
- *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).

Based on the information presented in this REF and with the implementation of the mitigation measures outlined, it is concluded there is unlikely to be any significant environmental impacts associated with the proposal.

Review

I have examined this Review of Environmental Factors in detail and submit it to Woollahra Municipal Council.



David Ryan

Executive Director

City Plan Strategy & Development P/L

Date: 16/09/2020

Authorisation

The proposal is satisfactory under Part 5 of the *Environmental Planning and Assessment Act 1979* and can proceed.

Woollahra Municipal Council

Date:

2. EXECUTIVE SUMMARY

This REF has been prepared on behalf of Woollahra Municipal Council and relates to the construction of a footpath that is to follow the alignment of the old tramway route through Gap Park, and associated works. A description of the site, its local context and surrounding development is provided at Section 3 of this report, while a detailed description of the proposed "activity" that is the subject of this REF is contained in Section 4.

The objectives of this REF are to:

- Satisfy the requirements of relevant environmental legislation and in particular those within the Act; and
- Identify and assess any environmental impacts that are likely to arise as a result of the activity and outline mitigation measures to be implemented during construction and/or operation to manage these impacts.

The activity constitutes "*development without consent*" under Clause 65 of the Infrastructure SEPP and therefore development consent is not required under Part 4 Development assessment and consent of the Act. Nonetheless, and pursuant to Part 5 Infrastructure and environmental impact assessment of the Act, Woollahra Municipal Council as the relevant determining authority for the activity to be carried out, must consider to the fullest extent possible the environmental impacts of the activity in deciding to proceed with the proposed works.

The matters that must be considered are prescribed in Section 5.5 of the Act and Section 228 of the Regulations. An assessment of the activity against these prescribed matters is provided at Section 6 of this REF.

The assessment conducted within this REF concludes that the activity is not likely to have an adverse impact on the environment and does not cause any unacceptable environmental risks to the site or surrounding locality. Therefore, the proposed works can be approved by Woollahra Municipal Council to proceed, subject to the implementation of the construction and operation mitigation measures outlined in Section 9. An Environmental Impact Statement (EIS) under Section 5.6 of the Act is not required for the activity in our opinion.

3. SITE AND CONTEXT

3.1. Site Identification

Gap Park (the site) is located off Old South Head Road, Watsons Bay and comprises 3 allotments, legally described as Lot 7084 in Deposited Plan (DP) 1069202, Lot 1 in DP 48230 and Lot 1698 in DP 752011. This REF only relates to the part of the site that comprises Lot 7084 in DP 1069202 as shown in (Figure 1).

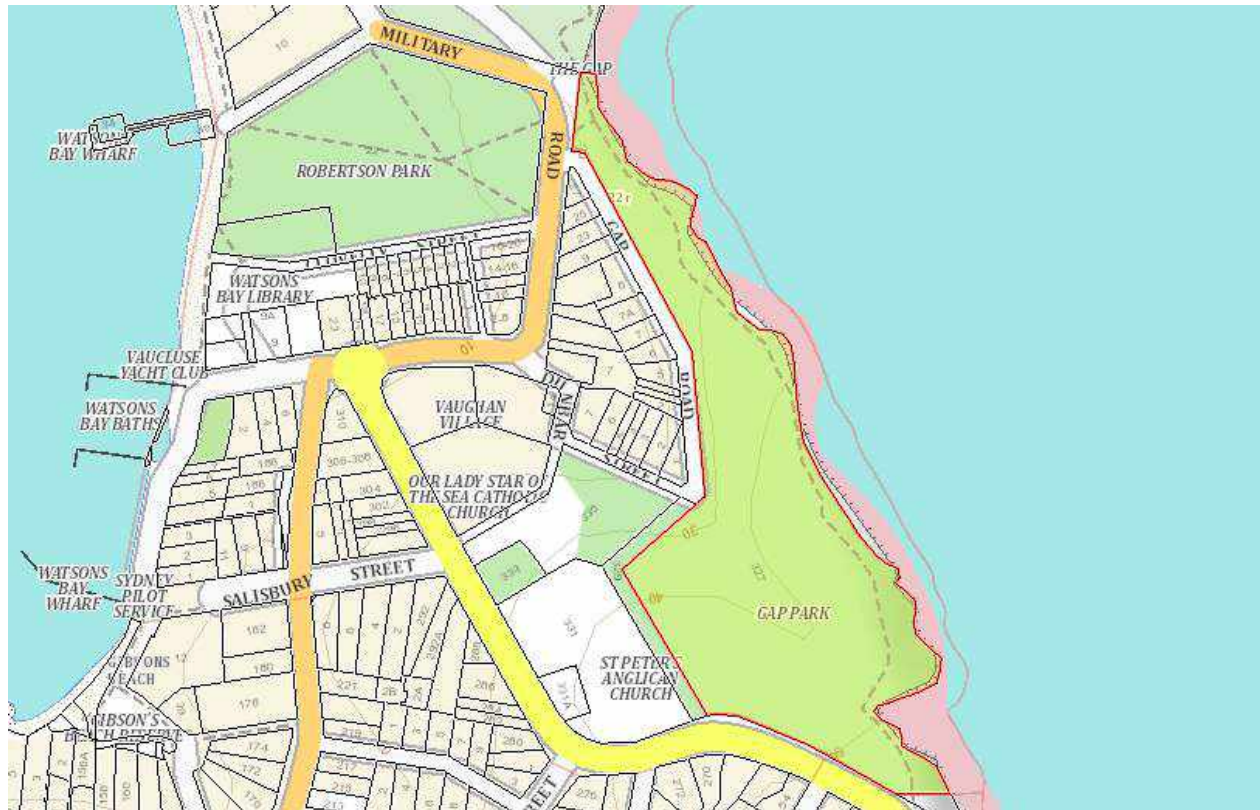


Figure 1: Cadastre map - Lot 7084 in DP 1069202 outlined red and shaded yellow (Source: Nearmap)

An aerial view of the site within the context of the surrounding development can be viewed at Figure 2 overleaf.



Figure 2: Aerial view of the site - site identified by orange marker (Source: Nearmap)

3.2. Ownership and Proponent

The landowner of the site and the proponent of the proposed works to be carried out is Woollahra Municipal Council.

3.3. Site Description

Gap Park is a public recreation area that covers a coastal escarpment area of approximately 4.7 hectares. Most of the site is vegetated with the exception of a small portion of open space located in the park's south. The coastal cliffs and escarpments along the eastern boundary of the site form the highest part of the site. The park falls towards Sydney Harbour and the western boundary forms the lowest part of the site. Jacobs Ladder is a low point that dissects the site and forms a valley that acts as the site's natural drainage flow path. It runs from the cliffs in the site's south-eastern corner to the intersection of Gap Road and Dunbar Street.

The summary report prepared for the Gap Park Masterplan includes a detailed history of the site (**Appendix 1**). This report states that Gap Park was formally designated a public reserve on 28 June 1887. From 1909

to 1960 a tramway ran through the site and remnants of this past use are still present on the site. Woollahra Municipal Council filled in the tramway cutting in 1964 with the intention of restoring the area. The filled tramway cutting currently comprises an unpaved footpath providing access through the site. The proposed works are set to occur within and around the old tramway cutting and follow its original alignment.

Further description of the existing development and facilities is provided at Section 4 and in the site photos.

Photos of the Site



Figure 3: View of northern entrance of the unpaved pedestrian footpath that follows the historic tramway route (Source: City Plan)



Figure 4: View of the existing unpaved pedestrian footpath, surrounded by rock faces and dense vegetation (Source: City Plan)



Figure 5: View of a portion of the unpaved pedestrian footpath with the attempts to fill the old tram route visible (Source: City Plan)



Figure 6: View of the existing unpaved pedestrian footpath, where it is surrounded by vegetation on either side (Source: City Plan)



Figure 7: View of the existing unpaved pedestrian footpath, with the old tram stop visible in the background (Source: City Plan)



Figure 8: View of southern entrance of unpaved pedestrian footpath that follows the historic tramway route (Source: City Plan)



Figure 9: View of the paved area adjacent the footpath's entrance where the original tram stop was located (Source: City Plan)



Figure 10: View of southern entrance to Gap Park (Source: City Plan)



Figure 11: View of paved pedestrian pathway connecting to Gap Road from the northern entrance of Gap Park (Source: City Plan).



Figure 12: View of northern entrance to Gap Park (Source: City Plan)



Figure 13: View of the Gap Park coastal walk no. 1 (Source: City Plan)



Figure 14: View of the Gap Park coastal walk no. 2 (Source: City Plan)

3.4. Site Context and Surrounding Development

The site is within the suburb of Watsons Bay in the Woollahra Municipal Council Local Government Area (LGA). It is located approximately 10.4 kilometres north-east of the Sydney Central Business District (CBD). Watsons Bay forms part of Sydney's Eastern Suburbs and mainly comprises low-density residential development, as well as various restaurants/ cafés, a hotel, shops, bushland, beaches and recreation areas.

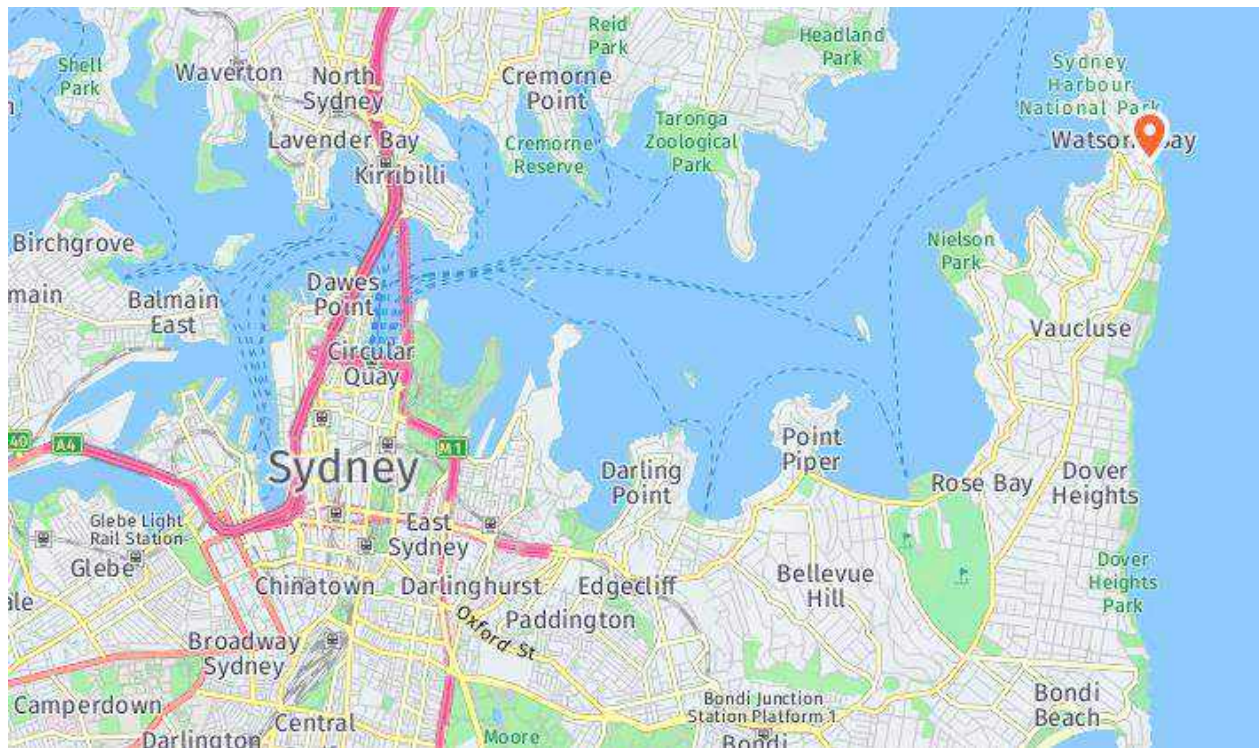


Figure 15: Regional context - site identified by orange marker (Source: Nearmap)

The following prominent built form and landscape features are located in close proximity to the site at Gap Park:

- Immediately south of the site past 'The Gap' ocean cliff is Sydney Harbour National Park - South Head. Located within South Head is the Royal Australian Navy training base known as HMAS Watson.
- Immediately west of the site and opposite The Gap is the large harbourside park known as Robertson Park.
- Approximately 250 metres west of the site is Watsons Bay Wharf and Watsons Bay Boutique Hotel. Immediately adjacent the hotel and fronting Camp Cove is the family-owned seafood restaurant, Doyles.

The site is generally bounded by National Parks and Wildlife Services land (i.e. South Head) to the north, the Tasman Sea to the east and St Peter's Anglican Church and associated buildings to the west. Further description of the surrounding development is provided by the photos that can be viewed in the figures overleaf.

Photos of Surrounding Development



Figure 16: View of low-density residential development on Old South Head Road opposite Gap Park in the south (Source: City Plan)



Figure 17: View of low-density residential development on Gap Road opposite the northern end of Gap Park (Source: City Plan)



Figure 18: View of the ocean cliff referred to as 'The Gap' with Sydney Harbour National Park in the distance (Source: City Plan)



Figure 19: View of Robertson Park from the east (Source: City Plan)



Figure 20: View of Watsons Bay Boutique Hotel (Source: City Plan)



Figure 21: View of Camp Cove from the south side (Source: City Plan)



Figure 22: View of Watsons Bay commercial area (Source: City Plan)



Figure 23: View of St Peters Church entrance and associated church buildings from Old South Head Road (Source: City Plan)

4. DESCRIPTION OF THE DEVELOPMENT

4.1. Existing Development and Facilities

Existing facilities at Gap Park include historic fortifications, park benches, a coastal walk and panoramic views. Due to the park's prominent location on a coastal escarpment on the South Head peninsula, it attracts various user groups such as local residents, independent visitors and international and national tour groups. Popular activities undertaken within the park include walking, harbour and ocean viewing, bird watching, whale watching and spectating major harbour events such as the annual Sydney to Hobart Yacht Race.

The activity relates specifically to the part of the park that comprises an unpaved pedestrian footpath. As detailed in the Gap Park Masterplan prepared by Thompson Berrill Landscape Design P/L included at **Appendix 1**, this footpath accesses the western portion of the site and follows the former tramway alignment. The access route was in the past evenly graded to facilitate the movement of the trams. However, the access path is now uneven and unsealed and is at times concealed by overgrown vegetation. The footpath is currently underutilised due to its poor condition and the absence of any wayfinding signage. The main users of the footpath are local residents that know the area well and want to avoid the popular coastal walk.

4.2. Background of Development

The Gap Park Masterplan was commissioned by Woollahra Municipal Council in 2007 and finalised in March 2008. The Masterplan prepared by Thompson Berrill Landscape Design P/L was commissioned to guide future improvements of the park and address a number of pre-existing social, environmental and recreation issues.

A comprehensive consultation process was undertaken in the preparation of the draft Masterplan, including:

- Consultation workshops with Council's Community Safety Committee;
- Self-Harm Minimisation Workshop with various representatives;
- Distribution of 600 questionnaires to surrounding residents seeking feedback;
- Interviewing of 97 park visitors on-site;
- Presentation of preliminary self-harm minimisation strategies to the Woollahra Community Safety Committee;
- Community Workshop held at Vaucluse Yacht Club, Watson's Bay; and
- Presentations to Councillors 29 October 2007.

Following this comprehensive consultation process the draft Masterplan was publicly advertised in October 2007.

One of the recommendations of the Masterplan was to celebrate and adaptively re-use the former tramway route/ cutting as a 2.5-metre-wide graded and all-ability shared pathway between north and south of Gap Park. The Masterplan further recommends that part of the proposed pathway comprise a habitat boardwalk.

An extract of the final Gap Park Masterplan prepared by Thompson Berrill Landscape Design P/L is at Figure 24.

The summary report prepared for the Gap Park Masterplan has been included at **Appendix 1** of this report.



Figure 24: Gap Park Masterplan - proposed footpath indicated by orange dashed line (Source: Thompson Berrill Landscape Design PL)

4.3. Proposed Works

This REF relates to a proposal for the construction of a new paved footpath within the Gap Park, including:

- Construction of a 2-metre-wide footpath following the alignment of the old tramway route through the park;
- Stormwater drainage infrastructure works;
- Landscape revegetation;
- Outdoor seating;
- Signage; and
- Tree removal.

As evident in the plans prepared by Aspect Australia Pty Ltd and included at **Appendix 2** of this report, the proposal will not include major building works and instead involves landscape improvements to Gap Park. A Design Summary Statement is also included at **Appendix 2** that further summarises the design features.

It should be noted that the proposed works only form a portion of the footpath that is identified in the Masterplan.

4.3.1. Footpath

The proposed footpath will replace the existing unpaved footpath that currently follows the alignment of the tramway, connecting the paved area of the old tram stop in the north to the littoral rainforest pathway in the south. It will be approximately 200 metres in length and a portion of it will comprise a 20-metre boardwalk. Most of the footpath will comprise sandstone paving in accordance with the details provided on the plans appended.

A rock lined and vegetated swale will run along most of the length of the footpath on its eastern side. The western side of the footpath will comprise landscape revegetation and maintained and/or extended safety fencing.

4.3.2. Stormwater Drainage Infrastructure Works

Stormwater drainage works are proposed to manage the run-off that will be generated from the new footpath. The swale to be located along the eastern side of the footpath will collect run-off from the footpath. The stormwater run-off will drain to two bioretention rain gardens and then be discharged via dissipation outlets.

4.3.3. Outdoor Seating

Two seats are proposed along the length of the footpath to provide for rest and passive recreation opportunities. These are to be supplied and installed in accordance with Standard Drawing No. SF1 in Woollahra Municipal Council's *Specifications for Roadworks, Drainage and Miscellaneous Works* (February 2012).

4.3.4. Signage

Three interpretation signs are proposed at various locations along the footpath as part of this proposal. The signs will provide information about the pre-European history of the area, flora and fauna and to celebrate the camera obscura that was previously located in the same approximate location between 1901 and 1914.

4.3.5. Tree Removal

The proposal requires the removal of some trees to facilitate construction of the footpath and associated works. Trees to be removed include those of the *leptospermum laevigatum*, *banksias integrifolia* and *kunzea* species. Many of the trees to be removed are in poor condition due to natural factors and are either dead or dying.

5. CONSULTATION

5.1. Requirements of State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP requires consultation with councils and public authorities under certain circumstances. Specifically, these requirements are set out by Clauses 13 to 17 within Part 2 Division 1. Consideration of these clauses in relation to the proposed development is provided in Table 1 below. The proposed development represents an activity that is to be undertaken by Woollahra Municipal Council, and therefore the Council is only bound to undertake the consultation requirements in clause 16 of the SEPP. Nonetheless, all the matters that might trigger consultation of the proposed development have been addressed.

Table 1: Consideration of ISEPP Consultation requirements

Matter to be addressed	Comment
<p><i>Clause 13</i> <i>Consultation with councils - development with impacts on council-related infrastructure or services</i></p>	<p>The proposed development will not impact Council infrastructure as follows:</p> <ul style="list-style-type: none"> ▪ No substantial impact on stormwater management is anticipated as a result of the stormwater drainage works proposed as part of the development; ▪ The paved footpath follows the route of an existing footpath and as such no additional traffic is expected to be generated by the proposed development that would strain the existing capacity of the local road network; ▪ No major disruption is likely to be caused to pedestrian or vehicular traffic in the area given the nature of the development and location of the work; and ▪ No excavation of, or in proximity to, a public road or footpath is required.
<p><i>Clause 14</i> <i>Consultation with councils - development with impacts on local heritage</i></p>	<p>Gap Park forms part of the Bicentennial Coastal Cliff Walk heritage item, pursuant to the <i>Woollahra Local Environmental Plan 2014 (WLEP 2014)</i>. The tramway cutting located within the park is also a separately listed item. Additionally, the site forms part of the Watsons Bay heritage conservation area.</p> <p>Given the nature of the site and rationale for the proposed development, there will be no effect on the heritage significance of these items or area.</p> <p>See further comments provided at Section 6.8.3 and Section 8.1.4 of this REF.</p>
<p><i>Clause 15</i> <i>Consultation with councils - development with impacts on flood liable land</i></p>	<p>The site is not identified as land within a flood planning area by the WLEP 2014.</p>
<p><i>Clause 15AA</i> <i>Consultation with State Emergency Service - development with impacts on flood liable land</i></p>	<p>The site is not identified as land within a flood planning area by the WLEP 2014.</p>

Matter to be addressed	Comment
<p><i>Clause 15A</i> <i>Consultation with councils - development with impacts on certain land within the coastal zone</i></p>	<p>The site is not identified as land with a coastal vulnerability area under the Infrastructure SEPP as per the meaning in the <i>Coastal Management Act 2016</i>.</p>
<p><i>Clause 16</i> <i>Consultation with public authorities other than councils</i></p>	<p>The proposed development is not specified development under this clause of the Infrastructure SEPP as it is not known to comprise any of the following:</p> <ul style="list-style-type: none"> ▪ Development adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> (NPW Act) or land to be acquired under Part 11 of that Act. ▪ Development on land in Zone E1 National Parks and Nature Reserves under the WLEP 2014 or in a land use zone that is equivalent to that zone. ▪ Development adjacent to an aquatic reserve or marine park that is declared under Clause 23 in Part 5 of the <i>Marine Estate Management Act 2014</i>. ▪ Development in the foreshore area within the meaning of the <i>Place Management NSW Act 1998</i> (cf <i>Sydney Harbour Foreshore Authority Act</i>). ▪ Development comprising a fixed or floating structure in or over navigable waters. ▪ Development that is for the purpose of a health service facility, correctional centre, or residential purposes, in an area of bush fire prone land. ▪ Development that may increase the amount of artificial light in the night sky and is on land within the dark sky region (i.e. within 200 kilometres of the Siding Spring Observatory) as identified on the dark sky region map. ▪ Development on defence communications facility buffer land near land near Morundah within the meaning of clause 5.15 of the Standard Instrument. ▪ Development on land in a mine subsidence district within the meaning of Clause 15 of the now repealed <i>Mine Subsidence Compensation Act 1961</i>. <p>Subsequently, consultation under Clause 16 (2) of the SEPP is not required.</p>
<p><i>Clause 17</i> <i>Exceptions</i></p>	<p>Not applicable as consultation under the Infrastructure SEPP is not required.</p>

5.2. Non-Statutory Consultation

No consultation of the proposed development was required pursuant to the Infrastructure SEPP. Nonetheless, extensive community consultation was undertaken to inform the final Gap Park Masterplan. Refer to the summary report prepared for the Gap Park Masterplan included at **Appendix 1** for further details.

6. STATUTORY PLANNING FRAMEWORK

6.1. Overview

The provisions of the Infrastructure SEPP enable this activity to be undertaken as “*development without consent*”.

While this removes the activity from the relevant provisions that are contained within Part 4 of the Act, it remains necessary for Woollahra Municipal Council as the relevant determining authority for this activity, to consider the environmental impact of the activity in accordance with the requirements of Part 5 of the Act. This requires consideration of the proposal against the relevant statutory planning provisions as undertaken below.

6.2. Part 5 Environmental Planning and Assessment Act 1979

6.2.1. Division 5.1 Definitions (cf previous s 110)

Subdivision 1 of Section 5.1 of the Act defines an “*activity*” for the purposes of Part 5 of the Act as meaning:

- (a) *the use of land, and*
 - (b) *the subdivision of land, and*
 - (c) *the erection of a building, and*
 - (d) *the carrying out of a work, and*
 - (e) *the demolition of a building or work, and*
 - (f) *any other act, matter or thing referred to in section 3.14 that is prescribed by the regulations for the purposes of this definition,*
- But does not include:*
- (g) *any act, matter or thing for which development consent under Part 4 is required or has been obtained, or*
 - (h) *any act matter or thing that is prohibited under an environmental planning instrument, or*
 - (i) *exempt development, or*
 - (j) *development carried out in compliance with a development control order, or*
 - (k) *any development of a class or description that is prescribed by the regulations for the purposes of this definition.*

The proposed works involve “*the carrying out of a work*” as per the Act’s definition of “*activity*” above, which does not require development consent under Part 4 of the Act in accordance with Clause 65 of the Infrastructure SEPP. Accordingly, the requirements of Part 5 of the Act are considered in this REF in relation to the proposed works.

This subdivision of the Act also provides a definition of “*determining authority*” for the purposes of Part 5, being:

“a Minister or public authority and, in relation to any activity, means the Minister or public authority by or on whose behalf the activity is or is to be carried out or any Minister or public authority whose approval is required in order to enable the activity to be carried out.”

Woollahra Municipal Council is a public authority and is the determining authority for the purpose of this REF.

6.2.2. Section 5.5 Duty to consider environmental impact (cf previous s 111)

Section 5.5 of the Act (previously Section 111) identifies the matters for consideration for the determining authority. An assessment of this activity against those matters identified in the Act is provided in Table 2 below.

Table 2: Compliance with Section 5.5 of the Act

Clause	Comment
<i>(1) For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.</i>	This REF examines and takes into account all possible matters affecting or likely to affect the environment by reason of the proposed development.
<i>(2) (Repealed)</i>	Not applicable.
<i>(3) Without limiting subsection (1), a determining authority shall consider the effect of an activity on any wilderness area (within the meaning of the Wilderness Act 1987) in the locality in which the activity is intended to be carried on.</i>	The site is not classified as a “wilderness area” under the <i>Wilderness Act 1987</i> or under the NPW Act.
<i>(4) (Repealed)</i>	Not applicable.

6.3. Environmental Planning and Assessment Regulation 2000

Clause 228 of the Regulations prescribes the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment for the purposes of Part 5 of the Act. The prescribed matters and an assessment of the proposed activity against those matters is outlined in the Table 3.

Table 3: Clause 228 the Regulations compliance table

Matter to be addressed	Comment
1. <i>For the purposes of Part 5 of the Act, the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment include –</i>	
<i>(a) For activities of a kind for which specific guidelines are in force under this clause, the factors referred to in those guidelines, or</i>	No specific guidelines are in force for the proposed activity.

Matter to be addressed	Comment
<p>(b) For any other kind of activity -</p> <p>(i) the factors referred to in the general guidelines in force under this clause, or</p> <p>(ii) if no such guidelines are in force, the factors referred to subclause (2).</p>	<p>An assessment of the activity under subclause 2 of Clause 228 of the Regulations is provided in this table.</p>
<p>2. The factors referred to in subclause (1)(b)(ii) are as follows –</p>	
<p>(a) Any environmental impact on a community</p>	<p>As described in Section 8 of this REF, subject to the implementation of the mitigation measures that are set out in Section 9, the proposed works will not result in any unacceptable environmental impacts on the community.</p>
<p>(b) Any transformation of a locality</p>	<p>The scale of the proposed works and its ongoing operation is such that it would not result in any transformational change to the Gap Park locality or surrounds.</p>
<p>(c) Any environmental impact on the ecosystems of the locality</p>	<p>As described in Section 8 of this REF, the proposed works have been designed and sited to minimise the extent of tree removal required. Nonetheless, some trees are required to be removed to facilitate the footpath and associated works, and these trees are generally dead or dying.</p> <p>A portion of the footpath will be in the form of a boardwalk to allow for the safe movement of ground dwelling fauna. The boardwalk will also bridge over exposed existing fig tree roots.</p> <p>A properly formed and drained path will reduce erosion and its associated impacts along the path.</p> <p>The proposed works are minor and will not result in any other environmental impacts that would prevent the proposed works being carried out by Woollahra Municipal Council as nominated by this REF.</p>
<p>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality</p>	<p>The proposal will improve the aesthetic quality of the locality by providing landscaping and fencing improvements and the removal of dead or dying trees.</p> <p>The recreational quality of the site will also be improved, by providing a paved footpath that will be more accessible than the existing unpaved footpath that it is to replace and additional outdoor seating. The provision of informative signage along the footpath will further improve the site's recreational quality.</p>

Matter to be addressed	Comment
<p>(e) <i>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations</i></p>	<p>The Gap Park is a listed heritage item under the WLEP 2014 as part of the Bicentennial Coastal Cliff Walk. The tramway cutting within Gap Park is a separately listed heritage item under the WLEP. Gap Park is also within a heritage conservation area.</p> <p>The proposal is minor and consistent with the ongoing use of the site for public recreational use. Its impacts on the aesthetic, archaeological, cultural, historical, scientific and social significance of the site will be largely positive, through the heritage interpretation inherent in the project design.</p> <p>Refer to Section 8.1.4 of this REF for further comments.</p>
<p>(f) <i>Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)</i></p>	<p>The proposed works are not known to impact on the habitat of protected fauna under the NPW Act. Rather, the proposal promotes that the safe movement of ground dwelling fauna within Gap Park.</p>
<p>(g) <i>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air</i></p>	<p>Some endangered flora and fauna species have been identified within the site and its surrounds. The proposed works will not result in any adverse impacts on these species as detailed in Section 8.1.6.</p>
<p>(h) <i>Any long-term effects on the environment</i></p>	<p>No long-term adverse effects on the environment are envisaged. The proposed works should reduce erosion and degradation along the path compared to current conditions, resulting in positive long-term environmental outcomes.</p>
<p>(i) <i>Any degradation of the quality of the environment</i></p>	<p>As above. The proposal involves landscape improvements, which will ensure the quality of the environment is maintained.</p>
<p>(j) <i>Any risk to the safety of the environment</i></p>	<p>Subject to the implementation of the mitigation measures set out in Section 9 of this REF, the proposed works will not result in any risk to the safety of the environment and its various user groups.</p>
<p>(k) <i>Any reduction in the range of beneficial uses of the environment</i></p>	<p>The proposal will increase the range of beneficial uses of the environment, by upgrading the public facilities within the site. Specifically, the proposal will increase the recreational offerings available within Gap Park.</p>
<p>(l) <i>Any pollution of the environment</i></p>	<p>Due to the proposal being small scale in terms of the extent of works and its ongoing operation, likely</p>

Matter to be addressed	Comment
	environmental pollution impacts will be minor. There may be impacts during the construction phase. However, these would be minor and can be mitigated through the implementation of the measures that are set out in Section 9 of this REF.
<i>(m) Any environmental problems associated with the disposal of waste</i>	The proposal's operation does not result in any waste. There may be waste associated with the construction phase of the proposed works. However, this can be managed through typical means. Further, bins are already provided within the park.
<i>(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply</i>	The proposal involves additional landscaping and building materials for construction purposes, but these are very minor given its scale.
<i>(o) Any cumulative environmental effect with other existing or likely future activities</i>	The proposal is small in scale and operation. In this case, any cumulative environmental impacts would be negligible and broadly positive.
<i>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions</i>	The site is located within the Sydney Harbour Catchment Area but is not located in a foreshore zone. Given this and the minor nature of the proposal, any potential impacts to coastal processes or coastal hazards are expected to be negligible.

6.4. State Environmental Planning Policy (Infrastructure) 2007

6.4.1. Overview

The Infrastructure SEPP simplifies the process for providing essential infrastructure and services such as hospitals, schools, railways, roads, power and water supplies and other necessary services across NSW by improving regulatory certainty and efficiency to provide a simplified process for providing the necessary infrastructure. This includes provisions that enable certain development to be approved by a public authority under Part 5 of the Act following an environmental assessment (known as "*development without consent*"). The relevant provisions of the Infrastructure SEPP in relation to the proposed works are considered below.

6.4.2. Consultation

Consultation (statutory and non-statutory) of the proposed development has been addressed in Section 5. While there is no statutory requirement for consultation of the proposed development in the Infrastructure SEPP, consultation was undertaken as part of the preparation of the Gap Park Masterplan finalised in 2008.

6.4.3. Part 3 – Development Controls

Division 12 in Part 3 of the Infrastructure SEPP provides for parks and other public reserves. Gap Park is defined as a "public reserve" pursuant to the definitions within Clause 64 of the Infrastructure SEPP. Clause 65 allows certain activities to be carried out as "*development permitted without consent*" as extracted below:

65 Development permitted without consent

- (i) roads, **pedestrian pathways**, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,
- (ii) recreation areas and recreation facilities (outdoor), but not including grandstands,
- (iii) visitor information centres, **information boards and other information facilities**,
- (iv) lighting, if light spill and artificial sky glow is minimised in accordance with the Lighting for Roads and Public Spaces Standard,
- (v) **landscaping**, including landscape structures or features (such as art work) and irrigation systems,
- (vi) amenities for people using the reserve, including toilets and change rooms,
- (vii) food preparation and related facilities for people using the reserve,
- (viii) maintenance depots,
- (ix) portable lifeguard towers,
- (b) environmental management works,
- (c) demolition of buildings (other than any building that is, or is part of, a State or local heritage item or is within a heritage conservation area). **Our emphasis**

6.5. Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 and applies to all NSW. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and in the future, consistent with the principles of ecologically sustainable development. In doing so it lists and protects threatened species, populations and ecological communities. Impacts to any threatened species and endangered ecological communities listed under the BC Act are required to be taken in account for determining a DA or an activity in accordance with section 7.3 of the BC Act. Applicants must also consider if their development will exceed any of the following biodiversity offset scheme (BOS) thresholds:

1. Exceeding the clearing threshold of an area of native vegetation;
2. Carrying out development on land included in the Biodiversity Values Land Map; or
3. Having a 'significant effect' on threatened species or ecological communities.

The site has an area of approximately 4.7 hectares and a clearing threshold of 0.5 hectares (or 5,000m²). The proposal is limited to a small area of Gap Park and has been designed to minimise tree removal. Accordingly, the proposal does not meet the BOS clearing threshold for native vegetation on the site.

The site is also not land included in the Biodiversity Values Land Map as demonstrated in the map extract at Figure 25.



Figure 25: Biodiversity Values Land Map extract - site of proposed works outlined in yellow (Source: NSW Government)

The Ecological Assessment prepared by Ecological Australia to inform the Gap Park Masterplan (**Appendix 1**) confirms that a number of vegetation communities have been identified within Gap Park. However, this assessment also confirmed that none of the identified communities were endangered ecological communities and therefore the proposed works will not have a significant impact on any such communities.

The threatened species *Acacia terminalis subsp. Terminalis* (Sunshine Wattle) is present within Gap Park. The nearest individual species has been identified to be located 8 metres from the construction footprint. Any impacts on this species are unlikely given the distance between the nearest tree and the proposed works. Nonetheless, mitigation measures will be implemented to protect this species as detailed in Section 9.

The humpback whale and grey-headed flying fox are threatened fauna species identified on or near the site. The site is located on the top of an escarpment away from the water and will not affect the humpback whale. Furthermore, minimal tree removal is proposed to ensure there are no adverse impacts on the flying fox.

Overall, the proposed development is not considered to exceed any of the BOS thresholds or result in any adverse impacts on threatened species, populations and ecological communities.

6.6. Additional legislation

The tables below list additional legislation that has been considered to determine whether or not it is applicable or otherwise relevant to the activity and to ensure the activity has no significant environmental impacts:

Table 4: Additional legislation

NSW Legislation	Comment
<i>Contaminated Land Management Act 1997</i>	Not applicable – The site has a long history of use as a public reserve and there is no known contamination.
<i>Heritage Act 1977</i>	Not applicable – whilst the site is a listed heritage item/ part of a heritage conservation area of local significance, it is not listed on the State Heritage Register.
<i>Rural Fires Act 1997</i>	Not applicable - the site is not bush fire prone land.
<i>Wilderness Act 1987</i>	Not applicable – This Act only applies to land identified as wilderness under the <i>Wilderness Act 1987</i> or declared as wilderness under the NPW Act. Such is not the case in the instance of this proposal.
<i>Protection of the Environment Operations Act 1997</i>	Not applicable – This Act aims to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development. The activity does not trigger the need for licensing under the Act.
<i>Roads Act 1993</i>	Not applicable - the proposal does not include road works.
<i>Water Management Act 2000</i>	Not applicable - the proposal is not located within 40 metres of the bed of riverbanks, lake shores or estuaries.
<i>Fisheries Management Act 1994</i>	Not applicable - the proposal does not involve aquaculture, dredging or reclamation work, relate to public water land or an aquaculture lease or works that would create an obstruction of a water body.
<i>Mine Subsidence Act 1997</i>	Not applicable - the site is not in a mine subsidence district.

Table 5: Commonwealth legislation

Commonwealth Legislation	Comment
<i>Environment Protection Biodiversity Conservation Act 1999</i>	This Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage

Commonwealth Legislation	Comment
	<p>places, which are defined in the Act as matters of national environmental significance (NES). The proposed activity has been assessed against this Act. The location of the site, relatively minor nature of the activity and the mitigation measures outlined in this report should avoid significant impact on the following:</p> <ul style="list-style-type: none"> ▪ a declared World Heritage Property; ▪ a National Heritage place; ▪ a declared Ramsar wetland; ▪ Commonwealth listed migratory species; ▪ Commonwealth listed threatened species or endangered community; ▪ Commonwealth marine areas; or ▪ Commonwealth land.

6.7. Additional state environmental planning policies

The following additional state environmental planning policies (SEPPs) have been considered as part of this REF:

Table 6: SEPPs

SEPP	Comment
<i>State Environmental Planning Policy No 19 - Bushland in Urban Areas</i>	The general aim of this policy is to protect and preserve bushland within the urban areas. The improvements to Gap Park as a result of the proposal, promote the objectives of this SEPP by protecting its aesthetic value and facilitating recreation.
<i>State Environmental Planning Policy No 55 - Remediation of Land</i>	This SEPP provides for a state-wide planning approach to the remediation of contaminated land. Its provisions relate to rezoning and development applications and planning proposals only. However, an evaluation of the potential for land contamination has nevertheless been undertaken. The site has a long history as a public reserve and there is no known contamination within Gap Park. Therefore, the likelihood of any contamination is low.
<i>State Environmental Planning Policy (Exempt and Complying Development Codes) 2008</i>	This SEPP aims to provide streamlined assessment processes for development that complies with specified development standards by providing exempt and complying development codes that have State-wide application. This

SEPP	Comment
	activity is not captured by the provisions of the SEPP.

6.8. Woollahra Local Environmental Plan 2014

The *Woollahra Local Environmental Plan 2014* (WLEP 2014) is the primary Environmental Planning Instrument (EPI) applying to the site and identifies the zoning and key development standards and considerations. A review of the WLEP 2014 provisions that are relevant to the site is provided in the below sections.

6.8.1. Zoning

The site is zoned RE1 Public Recreation in the Land Use Table for the WLEP 2014 as shown in Figure 26. 'Recreation areas' are permitted with consent within the RE1 Public Recreation zone pursuant to the WLEP 2014.

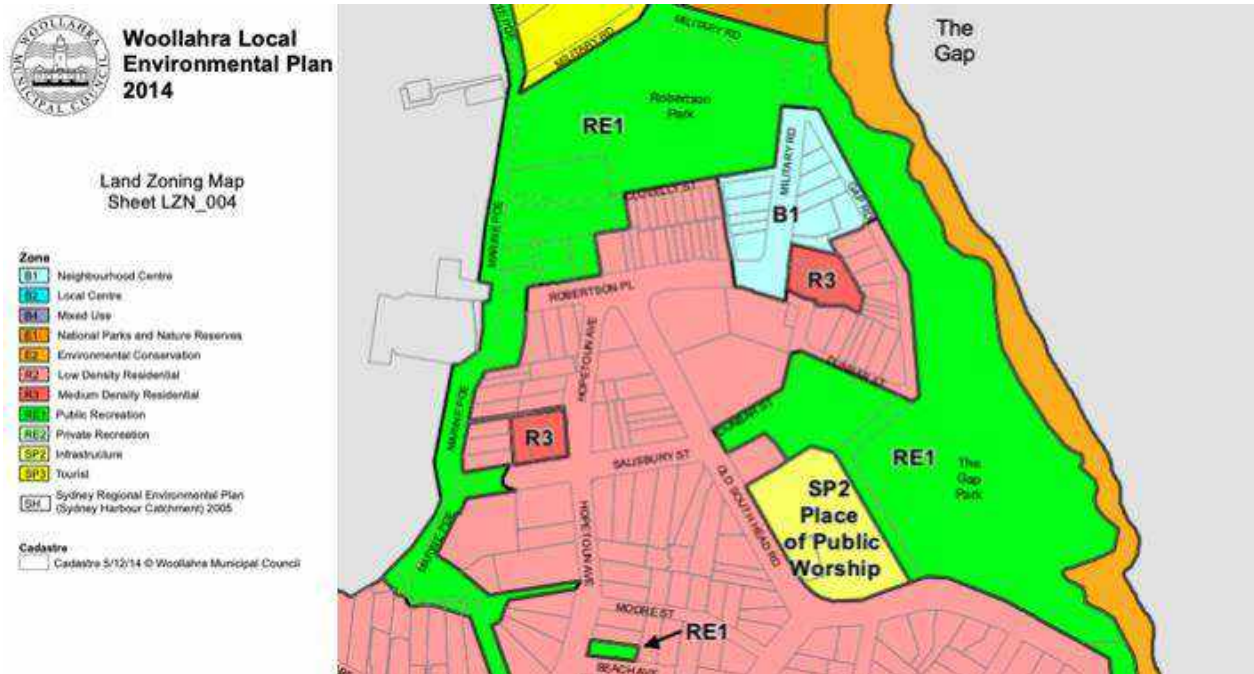


Figure 26: WLEP 2014 Land Zoning Map extract - site outlined in red (Source: NSW Legislation)

6.8.2. Objectives

The objectives of the RE1 Public Recreation Zone as identified within the WLEP 2014 Land Use Table are to:

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.

- To protect and enhance the natural environment for recreational purposes.

The proposal promotes the objectives of the RE1 Public Recreation zone by retaining and improving land available for recreational purposes and increasing the range of activities available for the local community. Noting the existing unpaved footpath is uneven and unsealed and overgrown by vegetation in some places, the proposed works involve the construction of a paved footpath that will make this part of the park more accessible. The provision of seating and educational signage will allow visitors to sit and enjoy their surrounds, while also being able to develop an understanding and establish an appreciation for the site's history. Furthermore, the boardwalk component facilitates recreation and the safe movement of fauna. The proposed footpath and associated works have also been designed to minimise the extent of tree removal, thereby protecting and enhancing the natural environment so that it can continue to be enjoyed by park users.

6.8.3. Clause 5.10 Heritage Conservation

Gap Park forms part of the Bicentennial Coastal Cliff Walk heritage item (no. 343) as shown in Figure 27. A tramway cutting located within the park is also a separately listed heritage item (no. 346) under the WLEP 2014. The site also forms part of the Watsons Bay heritage conservation area as shown in the figure below.

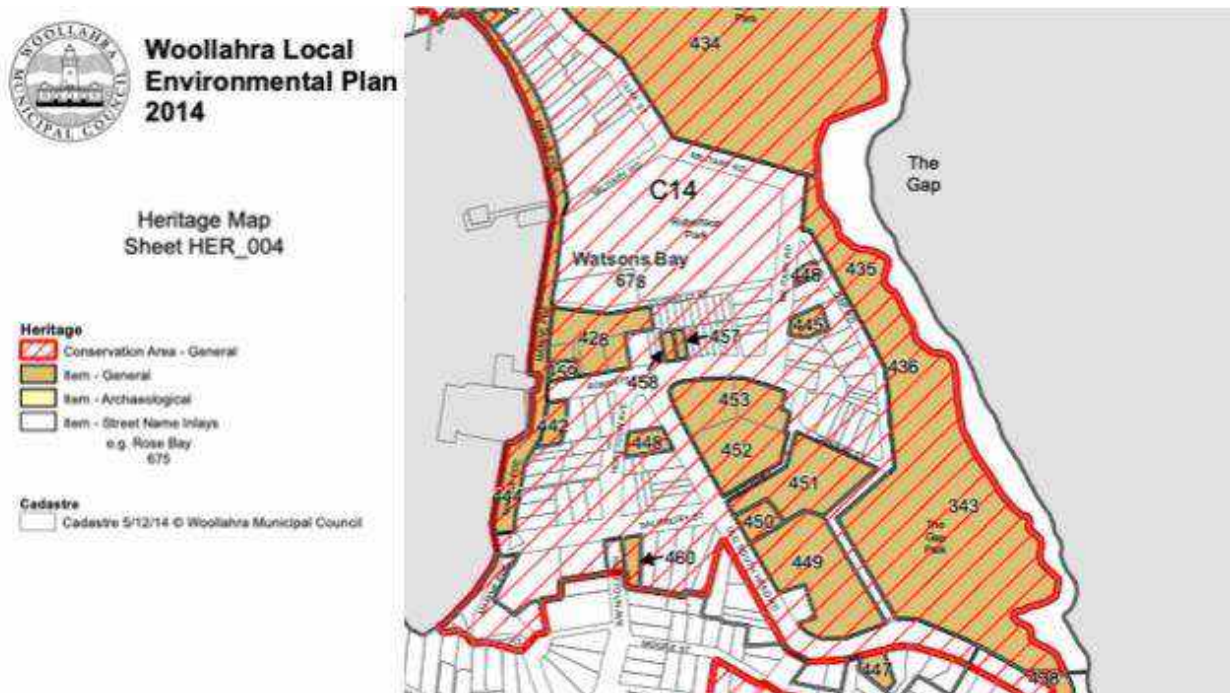


Figure 27: WLEP 2014 Heritage Map extract - site outlined in green (Source: NSW Legislation)

The proposed works are not considered to have major impacts on these heritage items or the conservation area. As detailed in the summary report for the Gap Park Masterplan that is included at **Appendix 1** of this REF, the purpose of the proposed works are to celebrate and adaptively re-use the tramway cutting by constructing a new paved footpath that will follow the alignment of the tramway route and is accessible to all. The proposal is considered to have a positive impact on the heritage significance of the site and locality.

A Statement of Heritage Impact (SoHI) has been prepared by Artefact Heritage and is included at **Appendix 3**. The SoHI concludes that provided all recommended mitigation measures are followed, the proposal will

result in nil to moderate impacts on the heritage items on or in the vicinity of the site. The moderate grading refers to actions involving the modification of a heritage item such as altering its setting/ landscape. However, the SoHI notes that impacts arising from such actions may be able to be partially mitigated, which is the case for the proposed works as demonstrated by the conclusions of the SoHI.

Refer to Section 6.8.3 of this REF for a detailed assessment of the potential heritage impacts of the proposal.

A Due Diligence Aboriginal Heritage Assessment has also been prepared by Coast History and Heritage (**Appendix 4**). Given the proposed footpath is to follow the existing unpaved footpath and former tramway route, the site of the proposed works is likely to be highly disturbed and the potential for Aboriginal relics is unlikely. Subject to the recommended management strategy identified in this report being implemented, the report concludes that no further archaeological investigations are required prior to construction commencing.

6.8.4. Clause 6.1 Acid Sulfate Soils

The site is identified as land affected by Class 5 acid sulfate soils on the WLEP 2014 Acid Sulfate Soils Map (Figure 28).

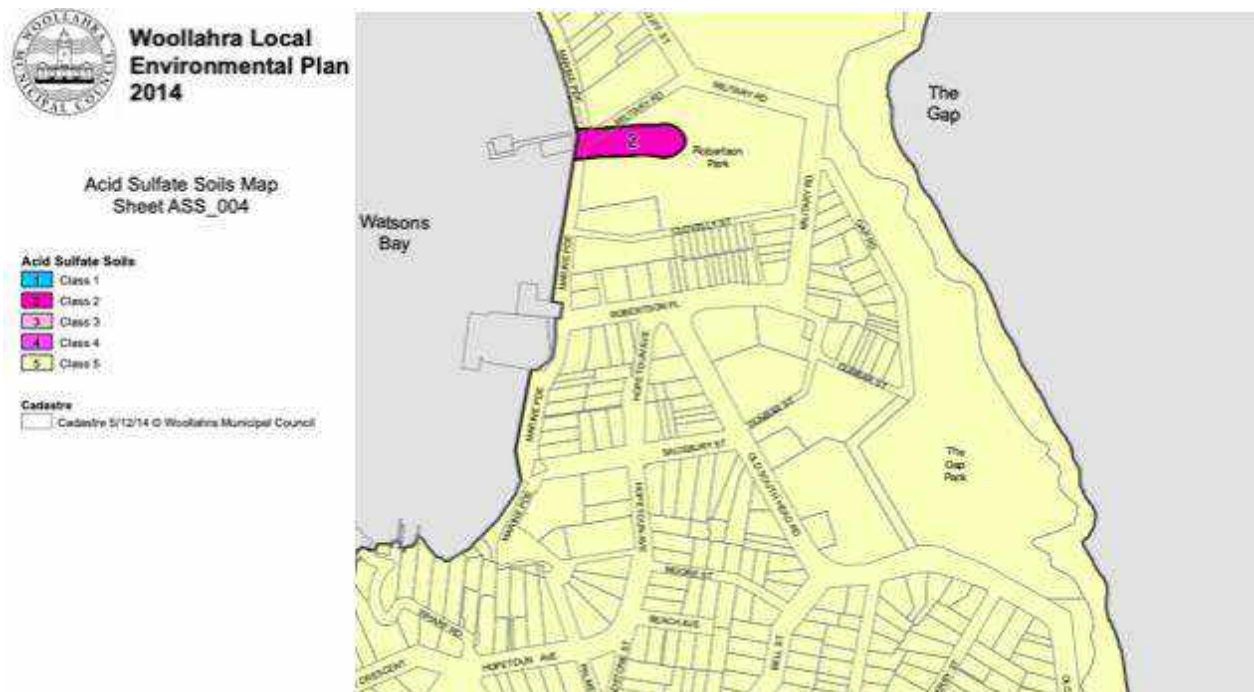


Figure 28: WLEP 2014 Acid Sulfate Soils Map extract - site outlined in red (Source: NSW Legislation)

The proposed development does not comprise works within 500 metres of Class 1, 2, 3 or 4 land below 5 metres Australian Height Datum (AHD) and by which the watertable is likely to be lowered below 1 metres AHD on adjacent Class 1, 2, 3 or 4 land and therefore an Acid Sulfate Soils Management Plan is not required.

The proposed development will not disturb, expose or drain acid sulfate soils and cause environmental damage due to site's location on the top of an escarpment and the minor nature of the development. Subsequently, the proposed development is consistent with the objective of this clause of the WLEP 2014.

This clause of WLEP 2014 seeks to ensure earthworks will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land. The proposal only comprises minor earthworks associated with the design and construction of the path, which are unlikely to have any detrimental impact on any of the environmental functions or existing built environments. Refer to Section 9 for identified mitigation measures in relation to minimise any potential impacts.

6.8.5. Clause 6.3 Flood Planning

The site is not land that is identified as "Flood planning area" on the Flood Planning Map for the WLEP 2014.

7. WOOLLAHRA BIODIVERSITY CONSERVATION STRATEGY 2015-2025

The *Woollahra Biodiversity Conservation Strategy 2015-2025* (the Strategy) was prepared by Woollahra Municipal Council staff and Ecological Australia and provides a vision, targets, objectives, on-ground actions and funding options for improving biodiversity management and practices across the Woollahra LGA. The LGA is estimated to have a total of 53.8 hectares of remnant vegetation and contains the following listed species:

- Sunshine Wattle;
- Nielson Park She-oak;
- Magenta Cherry;
- Sooty oystercatcher;
- Powerful Owl;
- Eastern Bentwing-bat;
- Southern Myotis;
- Grey-headed Flying Fox; and
- Seahorses, seadragons, pipehorses, ghostpipefish and seamoths.

There are also twenty-eight native animal species protected under the NPW Act that are recorded in Woollahra.

Gap Park and the site of the proposed works is identified as one of ten Key Habitat Areas within Woollahra. These areas support most of the LGA's natural vegetation and function as core foraging and breeding habitats.

The Sunshine Wattle is the only threatened flora species confirmed to be present within the Gap Park, while the Grey-headed Flying Fox is the only threatened fauna species to be confirmed to be present. These species will not be adversely affected by the proposed works as detailed in Section 6.5 and 8.1.6 of this REF.

The Strategy identifies various current and proposed biodiversity management practices for the LGA. Some practices such as Water Sensitive Urban Design (WSUD) have been included in the design of the proposal, while other practices where relevant have been included as mitigation measures within Section 9 of this REF.

8. ENVIRONMENTAL IMPACT ASSESSMENT

8.1. Matters for Consideration

This section gives consideration to other potential environmental impacts that are associated with the activity.

8.1.1. Acoustic Impacts

The ongoing usage of the park is not expected to increase significantly as a result of the proposed works, which essentially involve the upgrading of any existing unpaved footpath to make it more accessible. Furthermore, the proposed works are located towards the middle of Gap Park and this will also act as a buffer, noting the park is generally bounded by South Head to the north and Signal Hill Reserve to the south, with the Tasman Sea to the east and St Peter's Anglican Church and associated buildings to the west. Therefore, the proposed works are unlikely to result in any adverse acoustic impacts on the site or locality. Residential properties on Gap Road and Old South Head Road are located in proximity to the proposed works. However, the location and nature of the proposed works are such that they are unlikely to cause any significant increase in the noise levels experienced within these properties and no mitigation measures are required.

8.1.2. Visual Impact

Negligible adverse visual impact outcomes are anticipated as a result of the proposed works given the following:

- The use of the park will not be fundamentally altered;
- The scope of works is minor; and
- The works will not erode any private or public views.

The visual impact of the proposal will be generally positive and therefore no mitigation measures are required.

8.1.3. Safety and Security

Crime Prevention through Environmental Design (CPTED) is a recognised model that provides that if development is appropriately designed it can reduce the likelihood of crimes being committed. By introducing CPTED measures within the design of the development, it is anticipated that these will assist in minimising the incidence of crime and contribute to perceptions of increased public safety in the locality. The principles of CPTED include surveillance, access control, territorial reinforcement and space management. The proposal has been designed to take into consideration these principles of CPTED as follows:

Surveillance: Crime targets can be reduced by opportunities for effective surveillance, both natural and technical.

Gap Park as a whole includes different areas that provide various opportunities for natural surveillance. There are also opportunities for natural surveillance opportunities from Gap Road and nearby residential properties. Furthermore, there are various CCTV cameras located through the park to provide surveillance.

The proposal itself will also improve opportunities for surveillance through the widening and straightening of the existing unpaved footpath and potential increase in foot traffic as a result of the paving making it more accessible.

Access Control: Physical and symbolic barriers can be used to attract, channel or restrict the movement of people to minimise the opportunities that are available for crime and increase the effort required to commit crime.

Gap Park is a public reserve and therefore there are no restrictions in terms of people that can access the site. However, the proposed provision of a swale on the footpath's eastern side and fencing on its western sides will ensure that any users of the proposed paved footpath will remain on the footpath and not stray off course.

Territorial Reinforcement: Well-used places reduce opportunities for crime and increase the risk to criminals.

The proposal will improve the recreational use of the park and contribute to reducing opportunities for crime. The site is not known to have a recent history of antisocial behaviour and the proposal provides for minimal seating, which will limit opportunities along the length of the proposed footpath to linger or encourage gatherings.

Space Management: Appropriately utilised and well cared for spaces reduce the risk of crime and antisocial behaviour.

The proposed works will ensure that the western portion of Gap Park is appropriately utilised by upgrading the uneven and unsealed existing footpath that is at times overgrown by vegetation in some places. The introduction of a paved footpath will make the historic tramway alignment more easily identifiable and accessible. Woollahra Municipal Council will be responsible for the ongoing maintenance of the proposed works.

Considering that the above CPTED principles have been into account in the design of the proposal, the safety and security of the park is unlikely to change and is in fact more likely to be improved by the proposed works.

8.1.4. Heritage

The SoHI at **Appendix 3** identifies the site as being located within the curtilage of the following heritage items:

- Tramway Cutting - Item no. I436;
- Bicentennial Coastal Cliff Walk - Item no. I343;
- Watsons Bay Heritage Conservation Area - Item no. C14; and
- Dunbar Anchor - Item no. I435.

Based on the assessment of potential impacts on these heritage items undertaken in preparing the SOHI, the table below provides a summary of the potential impacts on heritage items and archaeological remains, noting conclusions on these potential impacts are subject to the recommended mitigation measures being followed.

Table 7: Summary of potential impacts (Source: Artefact Heritage)

Item	Direct (physical)	Indirect (visual/vibration)	Archaeological	Approvals
Tramway Cutting I436	Minor to moderate	Moderate (temporary) Negligible (permanent)	Minor to moderate	N/A
Bicentennial Coastal Cliff Walk I343	Negligible	Minor (temporary) Negligible (permanent)	N/A	N/A
Dunbar Anchor I435	Nil	Nil	N/A	N/A
Watsons Bay Heritage Conservation Area C14	Negligible	Negligible	Negligible	N/A

Most potential impacts on the identified heritage items resulting from the proposed works are nil, negligible or minor, meaning that they have (respectively) no heritage impact, result in very minor changes to the heritage items or result in the slight alteration of heritage buildings, archaeological resources or the setting of the historical item.

The highest of these potential impact ratings resulting from the proposed works relates to the tramway cutting. The proposed works are identified within the SoHI as being unlikely to result in direct impacts to the cutting itself. However, it is acknowledged that the proposed works have the potential to remove or impact on boundary stones, retaining walls and subsurface remains within the site associated with the former tramway route. With the implementation of the mitigations recommended in the SoHI the grading of impacts is reduced to minor.

In terms of potential impacts on archaeological remains, the SoHI concludes that the site has been assessed as having low potential to contain archaeological sleepers and rails and high potential to contain locally significant archaeological remains of boundary stones and retaining walls as they were observed on the site. The SoHI concluded that while the proposed works have the potential to impact on these archaeological remains, these impacts would be minor provided that all recommended mitigation measures are implemented.

The mitigation measures recommended to manage potential heritage impacts are included in Section 9 below.

8.1.5. Aboriginal Archaeology

The Aboriginal heritage assessment at **Appendix 3** notes that the potential for Aboriginal relics is unlikely, and while it is considered that no further archaeological investigations are required prior to construction measures, the management strategy recommended within the report is to be implemented during construction.

8.1.6. Flora, Fauna and Ecology

The existing physical condition of the pathway is such that it does not have any ecological attributes which, if lost, would significantly impact upon any threatened species, population, ecological community or habitat. The proposed works involve the upgrading of an existing unpaved footpath that has already disturbed the

environment. However, the proposal has been designed to minimise the extent of tree removal that is required.

An Ecological Assessment prepared by Ecological Australia is appended to the Masterplan's summary report. Some removal of *leptospermum laevigatum*, *banksias integrifolia* and *kunzea* tree species is proposed. The Ecological Assessment confirmed that while a number of vegetation communities were identified, none of these communities identified in Gap Park are considered to be endangered ecological communities.

A more recent Vegetation Survey has also been prepared by Woollahra Municipal Council to assess vegetation species structure and composition along the route of the proposed footpath within Gap Park. The *Acacia terminalis subsp. Terminalis* (Sunshine Wattle) is a threatened species that was identified on the site. The proposed works have been designed around this flora species and it is not proposed to be removed. A copy of this Vegetation Survey as prepared by Woollahra Municipal Council is included at **Appendix 5**.

Ecological Australia identified 3 threatened fauna species potentially occurring on Gap Park or in nearby waters:

4. *Sterna fuscata* (sooty tern);
5. *Megaptera novaeangliae* (humpback whale); and
6. *Pteropus poliocephalus* (grey-headed flying fox).

Ecological Australia were able to confirm the presence of the humpback whale and grey-headed flying fox. However, the Ecological Assessment identifies the further fragmentation of already highly fragmented habitat and barriers to the movement of small ground dwelling fauna as the key potential fauna impacts from pathways. The proposal, as mentioned above, upgrades an existing footpath that has already resulted in disturbance and comprises a boardwalk that will allow for the safe movement of small ground dwelling fauna. Therefore, the proposal is not expected to have any significant adverse impacts on the fauna within Gap Park.

Furthermore, the proposed landscaping is to be of a high quality and expected to be durable and therefore no adverse impacts are associated with removing any trees or the provision of the landscaping at the site. The design for the proposed works within the park is adequate and does not require any further mitigation measures.

8.1.7. Water Management

The proposal involve stormwaters drainage works to manage the stormwater run-off from the paved footpath. These works include a vegetated swale and bioretention rain gardens to integrate with the park landscape.

The proposed works are minor and therefore there are not expected to be any adverse water management impacts. Nonetheless, a Construction Management Plan (CMP) will be prepared prior to construction commencing to ensure there are no adverse construction related water management impacts from the proposal.

8.1.8. Transport, Traffic and Parking

Any increase in traffic and/or parking to the site and locality due to the proposal is expected to be very minor, as the main drawcard for local residents and visitors to Gap Park is the 'The Gap' and the coastal walk, with the existing footpath to be replaced by the paved footpath mainly used by local residents who walk to the site.

The site also enjoys excellent public transport connectivity and is located 250 metres from Watsons Bay Wharf. Direct ferry services between Watsons Bay and Circular Quay in the Sydney CBD operate from this wharf. Additional ferry services also operate between Watsons Bay and Pyrmont via Barangaroo and other stops. A bus stop is located on Military Road opposite 'The Gap' that is serviced by the following bus routes:

- 324 - Watsons Bay to Walsh Bay (via Old South Head Road);
- 352 - Watsons Bay to Walsh Bay (via Vaucluse Road); and
- 380 - Watsons Bay to Bondi Junction.

Adverse impacts to traffic and parking are considered to be unlikely given the nature of the proposal and its connectivity. Subsequently, no mitigation measures are required for the ongoing operation of the park. A CMP will be prepared to ensure there are no adverse traffic impacts during construction of the proposed works.

8.1.9. Construction Impacts

A range of impacts including dust, noise, erosion, waste material and traffic are associated with the construction of most developments. It is expected good construction practice will be adopted to minimise impacts in line with typical expectations. However, a CMP will be prepared by Woollahra Municipal Council to manage these impacts.

9. MITIGATION MEASURES

This REF has identified and assessed the key issues arising from the proposed development in accordance with the applicable legislation. On the basis of that assessment, it is concluded that the activity will not have a significant impact on the environment, subject to the mitigation measures outlined below.

The mitigation measures at Table 8 below were prepared having regard to the accompanying plans and reports. The activity is to be completed generally in accordance with these plans and documentation.

Table 8: Mitigation Measures

Issue	Recommended Mitigation Measure
Construction	A Construction Management Plan (CMP) will be prepared, and any construction work will be carried out in accordance with this CMP to mitigate any dust, noise, erosion, waste and traffic impacts to acceptable levels.
Acoustic (construction) (to form part of the CMP)	All reasonable practical steps are to be undertaken to reduce noise during the construction of the footpath.
Water Management (construction) (to form part of the CMP)	<p>All care and due diligence are to be taken to minimise or prevent material during construction from entering drain inlets or waterways, with erosion and sediment control measures to be implemented in accordance with Council's specifications, as required by the civil plans for the proposal.</p> <p>Stormwater management practices should be implemented during construction phase in accordance with the <i>'Managing Urban Stormwater: Soils and construction - Volume 1, 4th edition 'Blue Book'</i>.</p>
Water Management (operation)	The proposal should be designed and constructed in accordance with the civil plans by Aspect Australia, which include details of the stormwater works.
European Heritage	The proposed works should be carried in accordance with the mitigation measures recommended within Section 9.2 of the SoHI, including but not limited to the preparation of an Unexpected Finds Procedure to be provided to all contractors.
Aboriginal Archaeology	The proposal should be designed and constructed in accordance with the Due Diligence Aboriginal Heritage Assessment prepared by Coast History and Heritage and its recommended management strategy.

Issue	Recommended Mitigation Measure
<p>Flora, Fauna and Ecology</p>	<p>The proposal should be constructed in accordance with the civil plans prepared by Aspect Australia, including any identified tree protection measures, such as the establishment of tree protection zones (TPZs).</p> <p>Landscaping is to be implemented in accordance with the plans that have been prepared by Aspect Australia.</p> <p>Bush revegetation is to continue to occur in the Gap Park.</p> <p>Stormwater management practices should be implemented during construction phase in accordance with the 'Managing Urban Stormwater: Soils and construction - Volume 1, 4th edition 'Blue Book'.</p> <p>The proposal should be designed and constructed in accordance with the civil plans by Aspect Australia, which include details of the stormwater works.</p> <p>Specifically, in relation to mitigating impacts on the <i>Acacia terminalis subsp. Terminalis</i> (Sunshine Wattle):</p> <ul style="list-style-type: none"> ▪ Establish no-go and no-work areas around areas where the species occurs and clearly identify these areas on both plans and on the site. ▪ Establish a process that must be followed in the event that any work is to leave the current construction footprint, as permits may be required, ▪ Provide a briefing to workers regarding the location of the no-go zones on the site and promote awareness of vegetation on the site that is protected by legislation and to which fines can apply to individuals and companies if any damage to the protected vegetation occurs. ▪ The plans should be reviewed in light of above measures to ensure that the no-go zones are protected from indirect impacts such as stormwater run-off and dust etc. where relevant.

Issue	Recommended Mitigation Measure
Safety and Security	<p>The proposal should be developed in accordance with the civil plans that incorporate CPTED principles.</p> <p>Fencing to be provided in accordance with the civil plans.</p> <p>Woollahra Municipal Council will be responsible for the ongoing maintenance the proposed footpath and associated landscape improvements.</p>

10. CONCLUSION

This Review of Environmental Factors (REF) has been prepared to investigate possible environmental impacts associated with the construction of a paved footpath within Gap Park that follows the old tram route alignment.

In accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*, this REF has determined the activity is not likely to have any adverse effect on the environment and does not cause any unacceptable environmental risks to the land or surrounding area. Where potential impacts have been identified, appropriate mitigation measures have been recommended in Section 9 of this REF. Consequently, an Environmental Impact Statement (EIS) is not required and this REF is an adequate level of impact assessment.

Should Woollahra Municipal Council proceed with this activity, the development should be subject to the mitigation measures listed in Section 9 of this report.

APPENDIX 1

Summary Report for Gap Park Masterplan



SUMMARY REPORT

Gap Park Masterplan



Prepared for Woollahra Municipal Council by:

Thompson Berrill Landscape Design Pty Ltd

MARCH 2008

TABLE OF CONTENTS

	Page No.
Acknowledgments	1
1.0 INTRODUCTION	2
1.1 The Brief	2
1.2 Project Methodology	3
1.3 Consultation	4
2.0 BACKGROUND CONTEXT	5
2.1 Site Context	5
2.1.1 Site Location and Description	5
2.1.2 Regional Significance	5
2.2 Landscape Analysis	5
2.2.1 Landform	5
2.2.2 History	6
2.2.3 Geology	7
2.2.4 Visual Analysis	7
2.2.5 Historical Infrastructure	8
2.2.6 Vegetation Areas	9
2.2.7 Fauna	10
2.2.8 Visitor Patterns	10
2.3 Landscape Infrastructure	11
2.3.1 Entries/Lookouts	11
2.3.2 Access	12
2.3.3 Lighting	12
2.3.4 Signage	12
2.3.5 Park Infrastructure	13
3.0 MASTERPLAN RECOMMENDATIONS	14
3.1 Cultural	14
3.1.1 Gap Park Former Tramway	14
3.1.2 Adjacent Churches	14
3.1.3 The Gonyah	14
3.1.4 Additional Cultural Works	14
3.2 History	14
3.2.1 The Dunbar Anchor	14
3.2.2 Jacob's Ladder	14
3.2.3 Grieve Memorial	14
3.2.4 Former Gun Emplacements	14
3.2.5 Former 'Camera Obscura'	15

3.3	Visual	15
	3.3.1 Surrounding Views	15
	3.3.2 Pathway Site Lines	15
	3.3.3 Norfolk Island Pines	15
	3.3.4 Lookout Platforms	15
	3.3.5 Views to Adjacent Historic Buildings	15
3.4	Environment	15
	3.4.1 High Diversity Remnant Heathland	15
	3.4.2 High Diversity Revegetation Areas	15
	3.4.3 Lower Diversity Revegetation Areas	15
	3.4.4 Littoral Rainforest	15
	3.4.5 Entry Plantings	16
	3.4.6 Trees within Gap Park	16
	3.4.7 Habitat Boardwalks	16
3.5	Safety	16
	3.5.1 General	16
	3.5.2 Balustrades	16
	3.5.3 Cultural Programs	16
	3.5.4 Memorial Plantings	16
	3.5.5 Bicycle Refuge	17
3.6	Recreation	17
	3.6.1 Walking and Jogging	17
	3.6.2 Picnicking	17
	3.6.3 All Ability Access	17
	3.6.4 Bicycles	17
	3.6.5 Bird Watching	17
	3.6.6 Whale Watching	17
	3.6.7 Photography	17
3.7	Landscape Infrastructure	18
	3.7.1 Entries	18
	3.7.2 Access	19
	3.7.3 Lighting	20
	3.7.4 Signage	20
	3.7.5 Park Infrastructure	20
3.8	Self Harm Minimisation Strategies	20
	3.8.1 Lighting	20
	3.8.2 Safety Telephone	21
	3.8.3 Proposed Fencing at Key Locations	22
	3.8.4 Signage	22
	3.8.5 Closed Circuit Television	22
4.0	PRELIMINARY OPINION OF PROBABLE COST	23
5.0	BIBLIOGRAPHY	27

APPENDICES

APPENDIX A REPORT

Gap Park Masterplan: Aboriginal Archaeological Investigation (by others)

APPENDIX B REPORT

Gap Park Masterplan: Fauna Report (by others)

APPENDIX C SUMMARY

Gap Park Masterplan: Background Document Summary

APPENDIX D MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #1

APPENDIX E MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #2

APPENDIX F MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #3

APPENDIX G MEETING MINUTES

Gap Park Masterplan: Suicide Prevention Forum

APPENDIX H MEETING MINUTES

Gap Park Masterplan: Community Safety Committee Meeting

APPENDIX I MEETING MINUTES

Gap Park Masterplan: Community Workshop

APPENDIX J SUMMARY

Gap Park Masterplan: Site Visitor Survey Summary

APPENDIX K INDEX OF IMAGERY BOARDS

Gap Park Imagery: Flora and Fauna

Gap Park Imagery: Landscape Types

Gap Park Imagery: Park Visitors

Gap Park Imagery: The Dunbar

Gap Park Imagery: Trams

APPENDIX L INDEX OF DRAWINGS

GPMP-01 Gap Park Masterplan: Overall Masterplan March 2008

GPMP-02 Gap Park Masterplan: North and South Entries Plan March 2008

GPMP-03 Gap Park Masterplan: Self Harm Minimisation Plan March 2008

ACKNOWLEDGMENTS

The Gap Park Masterplan was commissioned by the Woollahra Municipal Council in early 2007. The project has been guided by a Project Working Group comprising of representatives from Woollahra Municipal Council. Other organisations were involved throughout the project, relative to each stage of the project. This group met throughout the project, and contributed to the development of the plan. The Group included the following members of staff:

Woollahra Municipal Council

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Isabelle Shapiro, Councillor, Woollahra Municipal Council

Prince of Wales Hospital

Marianne O'Donnell, Prince of Wales Hospital
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Lifeline

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National Parks and Wildlife Services of NSW

David Costello, National Parks and Wildlife Services of NSW

TBLD would like to thank the Project Working Group for their guidance and input to the development of this plan.

1.0 INTRODUCTION

1.1 THE BRIEF

Woollahra Municipal Council commissioned The Gap Park Masterplan in early 2007 to guide the future improvements to the park, and address a number of pre-existing social, environmental and recreational issues.

The impact of the high visitation numbers has seen the existing park infrastructure decline over the years since the last substantial landscape works were completed by council in 1982. Since that time works have focussed on bush regeneration, with small improvements made such as the viewing area near the Grieve Memorial at the southern end of the park, and the renewal of the coastal fence.

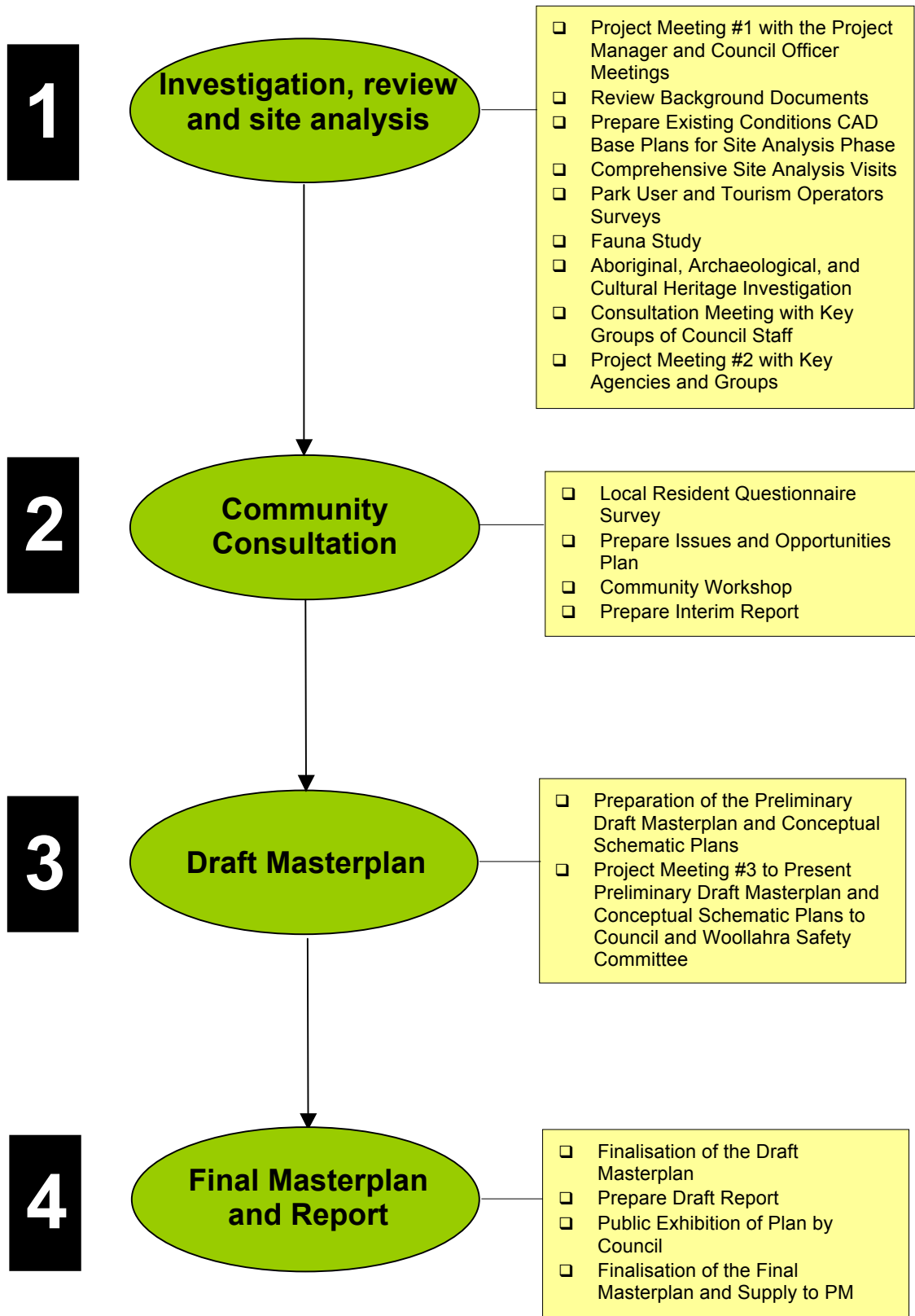
Development of the Masterplan involved thorough site analysis investigations, to understand the ecology, geology, user group patterns, and indigenous and European history within the park. The Masterplan was to be developed in consultation with community and stakeholder groups, with the outcomes of these consultations informing the resolution of the Masterplan.

The guidelines and principles of relevant documents and plans previously prepared for this municipality were reviewed in the preparation of the Masterplan. These documents include: Council's Woollahra Crime Prevention Plan 2007; the Woollahra Outdoor Recreation and Open Space Strategy 1992; Woollahra Recreational Needs Assessment and Strategy 2006; Council's Woollahra Bike Plan 2000, which notes utilisation of the former tramline route as a all-ability shared access path and the Watson's Bay Heritage Conservation Area DCP 2004, which discusses future tree plantings, views, and lighting of the park.

Council's project brief outlines development of a landscape Masterplan that will:

- Build on the existing character of the park
- Guide the ongoing development and maintenance of the park
- Improve passive recreational opportunities while protecting the natural and cultural values of the park
- Maintain the ecological integrity of the bushland environment that characterises the park
- Interpret the cultural and natural heritage of the park
- Provide improved access for mobility impaired visitors

1.2 PROJECT METHODOLOGY



1.3 CONSULTATION

The comprehensive consultation process undertaken in preparation of the draft Masterplan included:

- Consultation workshops with Council's Community Safety Committee (refer Annexure F).
- Self-Harm Minimisation Workshop with representatives including: Rose Bay Police; the Woollahra Community Safety Committee; Lifeline, National Parks and Wildlife Service of NSW; Southern Sydney Mental Health Unit; a resident who had lost a family member through self-harm at Gap Park; Councillor Shapiro (as chair of Council's Safety Committee); and Director Warwick Hatton and Woollahra Council staff to discuss the issue of self-harm and measures that could be investigated to reduce the incidence at Gap Park (refer Annexure E).
- Questionnaires distributed to 600 surrounding residents seeking feedback including issues residents would like addressed in the Masterplan. The questionnaire was also made available through Woollahra Libraries and online through Council's website. Eighty-six were returned (refer Annexure H).
- Ninety-seven on site interviews conducted with a range of park visitors (refer Annexure H).
- Community Workshop held at the Vaucluse Yacht Club, Watson's Bay (refer Annexure G).
- Presentation of the preliminary self-harm minimisation strategies to the Woollahra Community Safety Committee.
- Presentation to Councillors 29 October 2007.

2.0 BACKGROUND CONTEXT

2.1 SITE CONTEXT

2.1.1 Site Location and Description

Gap Park is located on the Sydney Harbour's South Head, and covers a coastal escarpment area of approximately 4.7 hectares. It is bounded on the north by National Parks and Wildlife Services land, on the east by the Tasman Sea, and on the west by a group of historic church buildings and Old South Head Road, Watson's Bay (refer Diagram 01). The site is characterised by areas of high diversity remnant bush regeneration areas, revegetation areas, some open space to the south and dramatic sandstone cliffs along the coastal route. The park offers spectacular 360 degree views across Sydney Harbour, out over the Tasman Sea, and across to North Head. Interesting significant heritage items such as The Dunbar shipwreck relics, gun emplacements and tramline remnants are also contained in this superb natural environment. Visitors currently access the site by car, bus, and ferry services.



Gap Park Location Diagram 01

2.1.2 Regional Significance

Gap Park is within the very eastern portion of Sydney Harbour's open space network, located to the south of South Head. Remnant vegetation areas to the centre of the site are recognised by council to be of importance to the local region. Gap Park is one of the premier tourist attractions of Sydney for local, regional, national, and international visitors, who come to admire the incredible beauty and views offered by the park. Unfortunately, the site is also known as a location of self harm.

2.2 LANDSCAPE ANALYSIS

2.2.1 Landform

The landform of Gap Park has been shaped by the forces of time, nature and geology. More recently, humans have had a significant impact on the park. This impact has been most obvious since European settlement in Australia. Before European occupation of Australia, the landscape of Gap Park was very different to what it is today. Early descriptions tell of a predominately open heathland, characterised by large exposed sandstone boulders and wind-pruned endemic heath species.

The earliest works in Gap Park were carried out in 1920, when Vauclose Council implemented a series of asphalt paths, with a safety light at the intersection of these paths and the tramline. In 1934 improvements to the park were undertaken including new fences, seats, toilets, and clearing some existing building and weed growth.

Evidence of the impact of early Europeans on the site can again be found at the south of the park. When the tramline was opened through the park in 1909, a path was carved

through the underlying sandstone so the tram could descend through the site on an even grade. Council records from 1964 note that after the tramline was decommissioned in 1960, council filled in the “old tramway cutting with the object of restoring the area”. In 1966 extensive work had been carried out here, to sculpt the landscape here into what it is today “including stone revetments, regrading, topdressing....”

In the 1980s council began a bush regeneration program at Gap Park. In 1981 Council's Landscape Architect, Noel Rutting, designed the planting of Queensland littoral rainforest species in the deepest part of the Jacob's Ladder Gully, that exist today.

The cliffs and escarpments along the eastern boundary form the highest part of the site, and are exposed to the coastal winds of the Tasman Sea. From here the park slopes towards Sydney harbour. A level change runs longitudinally through the park, steeper in some areas than others, and separates the western and eastern areas. The western boundary is the lowest part of the site, with greater protection from the elements.



Gap Park escarpment

Jacob's Ladder is a low point that dissects the site. It forms a valley that runs northwest, from the cliffs at southeast corner of the park, to the intersection of Gap Road and Dunbar Street. As a localised low point, water draining off the site also follows the path of this valley.

2.2.2 History

Aboriginal

An Aboriginal archaeological assessment was commissioned prior to the development of the Gap Park Masterplan (AHMS, 2007). This report noted that although coast dwelling Aboriginals undoubtedly inhabited this local area, no evidence or artefacts were found within the site. Acknowledgement of the Gadigal People as the traditional owners of the land will be included in interpretative signage.

European

Gap Park was formally designated as a public reserve on 28th June 1887. A tramline running from Sydney's CBD to Signal Hill Station was extended to Gap Park in 1909. In 1960 the trams ceased, and the tracks were removed. In 1964 council filled in the 'old tramway cutting with the object of restoring the area'.

At the turn of the 19th century Caesar Anthony Colonna engaged Lassetter & Co. to erect a “camera obscura”, housed in an octagonal red wood building, at Gap Park. In 1901 Vaucluse Council ordered the building removed. The building was locked up, until forcibly removed by the military authorities in 1914. Telescopes for hire were installed at the park in the 1930s.

The Grieve memorial was unveiled in December 1900. This was erected in memory of Gideon James Grieve who was killed at the battle of Paardeberg, South Africa, in February 1900.

The Dunbar was wrecked to the south of Jacob's Ladder in 1857, with a resulting 121 casualties, and only one survivor. Its Admiralty anchor was retrieved in 1910, and erected as a memorial in 1930.

The World War II gun emplacement was for a small calibre gun, which was never installed.



Historic elements

2.2.3 Geology

Sedimentary Hawkesbury sandstone is the underlying bedrock across the park, and is particularly visible along the cliffs and escarpments along the eastern boundary. These cliffs have been shaped by the forces of wind and water acting on them over thousands of years.



In some parts, the level change running longitudinally through the middle of the park is visible as an exposed sandstone drop-off. Deeper sandy loam soils occur in the low western boundary of the site.

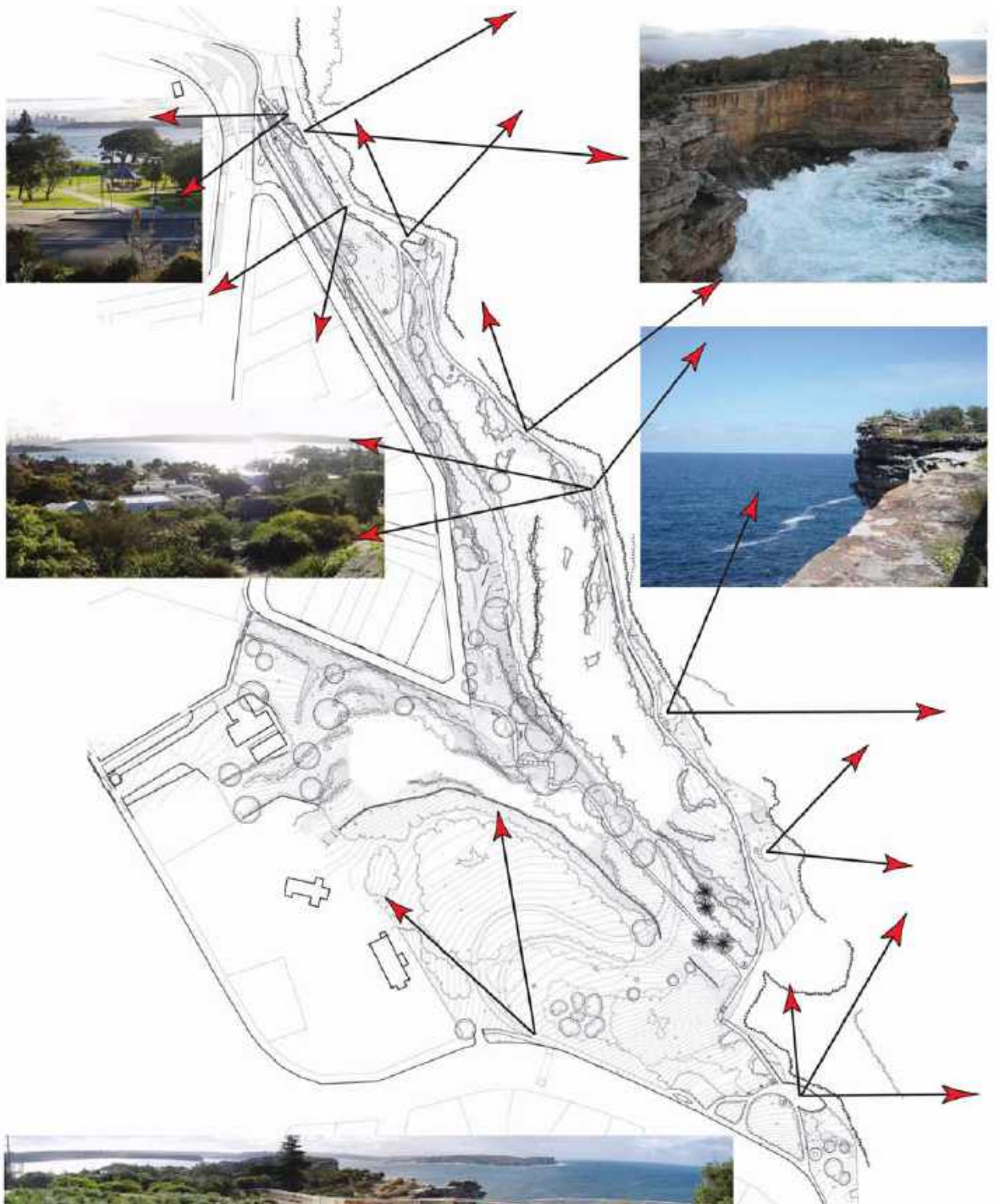
The valley of Jacob's Ladder is formed by geological dyke. Igneous material was deposited along this valley by volcanic lava thousands of years ago. This lava cooled and hardened into basalt, and the sedimentary Hawkesbury sandstone formed above this. Over time, the sandstone was eroded to expose the basalt. The basalt was more easily eroded than the sandstone, and thus formed the low valley along the site that we see today.

Sandstone cliffs and "Jacob's Ladder"

2.2.4 Visual Analysis

The highest part of the site is along the cliffs and escarpments of the eastern boundary. Along the coastal path of this boundary there are spectacular panoramic views of waves crashing into the sandstone cliffs, across the ocean, and towards Sydney harbour and the CBD. It is these 360° views that Gap Park is most famous for, and it is the main reason for such high visitation of the site (refer Diagram 02).

The southern end of the site also offers expansive views across Gap Park, the ocean, and Sydney harbour. The views from here have been significantly reduced since the 1980s bush regeneration plantings of non-endemic native species, which followed the 1960s landfilling of the area and the existing tramline cutting.



Gap Park view corridors Diagram 02

2.2.5 Historical Infrastructure

Historically, Gap Park had far more infrastructure than it does today. There was a tramline through the park, electrical connections, information signage, a public telephone, and some lighting. There is little of this infrastructure remaining in Gap Park today. The tramline (along with its electrical connections and power poles) was decommissioned in 1960. The information signage, public telephone and lighting were removed by council in the 1980s after repeated incidents of vandalism.

The pathways of Gap Park tell a story of their own, and are a unique part of the fabric of the park. Concrete with exposed aggregate is used throughout the park, and was selected because of its durable nature. The concrete of The Gap viewing area is particularly distinctive, and visually articulate the harsh natural conditions of the site. The remnant original concrete paving from the former “Gap Loop” tram station to The Gap viewing area also tells its own tale of the former access to the site. In other areas, such as the littoral rainforest part of Jacob’s Ladder, the concrete was textured to provide grip. Parts of the existing paving, such as is evident along the coastal path, are lifting and require attention.



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Before recent council fencing upgrades, the barrier fencing was a low timber fence with horizontal rails, and no infill. Evidence of this original fence exists in some locations.

Remnant concrete paving from the former tram station

2.2.6 Vegetation Areas

TBLD has developed descriptive titles for the existing vegetation areas that characterise the site, for the purpose of the Masterplan. These are based on character and dominant vegetation types, determining areas for corresponding recommendations (see GPMP-01). Typical characteristics of each area are as follows:

High Diversity Remnant Heathland Regeneration Areas

- Excellent diversity and quality of endemic species
- Provides fauna with habitat, and movement corridor
- Some hidden dangerous sandstone drop-offs within the area
- No signage informing users of diverse fauna of flora present
- Since 1988 area has been weeded but not ‘revegetated’ as in parts of Gap Park
- Provides a rare example of the pre-European remnant vegetation of this region

High Diversity Revegetation Areas

- Example of high quality bush regeneration
- In the 1980s a bush regeneration program was begun at Gap Park
- Inaccessible to the public

Lower Diversity Revegetation Areas

- In the 1980s a bush regeneration program was begun at Gap Park
- Lower quality bushland, with low species diversity
- Poor soil conditions from extensive previous land filling on site
- Plants originally planted here from Ku-ring-gai National Park seed stock
- Invasive weeds dominate the area
- Poor edge condition
- Areas continues to encroach on former pedestrian paths and open space areas and diminish these values
- Creates enclosed spaces and an informal path network
- Fauna habitat

Littoral Rainforest

- Unique vegetation community, dominated by Queensland species
- One of few rare areas of respite within Gap Park
- Dense shade
- Weed infestation of ground layer

Entry Plantings

At Jacob's Ladder there are lower height ground cover species, designed to maximize ocean views for users and nearby residents. These plantings provide a sense of arrival for visitors to Gap Park, but are sparse, and limited in their poor diversity.

Trees

From review of historical photos, it appears trees did not previously exist in the pre-European landscape of Gap Park. However, the cultural plantings are now an iconic part of the park, and native trees provide habitat.

2.2.7 Fauna

Gap Park forms an important fauna habitat link from South Head to the coastal regions to the south of the park. Ecological Australia was commissioned to provide a fauna report, to assist in the development of the Gap Park Masterplan. Nineteen species of bird and one mammal species were recorded during their site inspection of Gap Park. The majority of the bird species are native species, and one considered to be common in the Sydney area. Three bird species, the common starling, the house sparrow, and feral pigeon, are introduced species. The mammal species observed, the domestic dog, is also an introduced species (Ecology Australia 2007).

A variety of bird and aquatic animals have been recorded in and around the park. Refer Appendix B for further information, including a species list for Gap Park.

2.2.8 Visitor Patterns

Gap Park is highly used by local, regional, state-wide, national, and international user groups. Site surveys and questionnaires found it to be busiest on weekends and holiday periods, particularly by regional and state-wide users, but it is also frequently visited throughout the week by national and international tourists.

Most visitors come to Gap Park for the views and to enjoy the natural attributes of the park, but are largely unaware of the rich history of the site. Many visitors visit Gap Park in conjunction with other nearby activities, such as visiting Watson's Bay, or dining at Doyles restaurant.

Local users prefer to visit the site when there are less people there, such as mornings and afternoons during the week. These visitors often use the quieter tracks such as the former tram alignment.

International visitors were found to come from a broad range of countries, with the majority coming from within Asia. Many of the international visitors come to the site as part of a tour or school group, and these groups are found at the site throughout the week. Some tour groups visit the site at dawn, when the visitor's planes have just arrived, but their hotel rooms are not yet available. These visitors use the nearby Robertson Park toilet facilities, which has an impact on these local park facilities.

Very few people visit the site after dusk as there is no lighting on the site, and the overgrown vegetation also creates areas of isolation. The isolated nature of the coastal pathway is a public safety risk, due the distance from residential areas and lack of sight lines.

Refer to Appendix J for the Site Visitor Survey and Questionnaire findings.

2.3 LANDSCAPE INFRASTRUCTURE

2.3.1 Entries / Lookouts

The Gap Viewing Area

Currently, The Gap viewing area as it is known is in a deteriorated state from a combination of benign neglect and harsh site conditions. This area has been neglected since landscape works in the 1980s, and consequently there is no seating provided, almost no signage, no lighting, the arrival experience is weak, there is no all-ability access, and the railing is outdated and damaged in places.



The Gap viewing area

Gap Loop Entry

The historic tram stop was named Gap Loop. Some of the original fabric of this tram stop still exists on the site, such as the paving that formed the original arrival experience to The Gap viewing area. This current path is well graded, but damaged in places, and also overgrown. Moreover, visitors currently have no awareness of the historical significance of this arrival point.

Jacob's Ladder Lookout Area

Jacob's Ladder lookout area is currently in quite good condition, after recent council works here in 2003. Since their installation, the arrival planting density has been affected by pedestrian impacts, and natural dieback. The planting is now sparse, and only holds a low variety of species. Also, there is almost no signage here, and no lighting exists.

Side Steps

A flight of original sandstone steps enter Gap Park from the northern end of Gap Road. These steps are in good condition, and some original steel bracket fixings can also be found here. However, the original hand railing is in poor condition.

Church Entries

The boundary between Gap Park and the adjacent church buildings at the south of the park are currently open and informal. This maintains the surrounding views, and



Church grounds at south of Gap Park

extends the park-like feel at this section of the site.

The road entry to the Gunyah building is poorly defined. The original cultural plantings have been removed, so the plantings here make no reference to the building's era. Parts of the carpark are also used as storage facilities for bush regeneration works. The rear entry to the building has been overplanted with bush regeneration works, resulting in a lack of adequate firebreak to the building.

Rainforest Gully

The rainforest gully in the lower section of the Jacobs Ladder fault is the shadiest and sheltered part of Gap Park, as the deep soils and lower winds here allow large trees to grow. Weeds have infested the ground layer of vegetation. The concrete path through this area is in satisfactory condition, and has been textured for foot grip. The existing hand railing is in poor condition. There is one rest area along this route, but the seat and surrounding area is of low quality, and overgrown with vegetation.

2.3.2 Access

Coastal Pathway

The coastal pathway runs along the length of the eastern boundary of Gap Park, along the high natural coastal escarpment. Most users access the site along this route because of the stunning panoramic views. The path is exposed to high winds, has little shade, and is quite narrow and requiring localised repair at certain locations. As the path follows the natural contour of the ground along its route, there are steps and steep grades prohibiting all-ability access for the entire coastal pathway. A series of informal rest and viewing areas exist along this path, and these areas and their access points are steep and degraded in areas.



Gap Park user on coastal pathway

Pathway along Former Tram Alignment

An informal path accesses the western part of the site, along the former tram alignment. The access route was evenly graded, for the tram to evenly descend through the site. However, the path surface is uneven and unsealed, and the base material for the tram tracks is exposed in places. The path is currently not well used by visitors as it is unsigned and concealed by overgrown vegetation in places, and is in poor condition.

2.3.3 Lighting

Gap Park currently has no lighting. There is evidence of previous lighting of the main entries to the park that was removed after they were damaged in the 1980s. The lack of lighting to the park entries means that site users are limited to visiting during daylight hours.

2.3.4 Signage

Interpretative, information, and directional signage have historically been erected across the site through, but almost all of these are now gone. Woollahra Municipal Council

maintenance team reported that many of these signs were vandalised, and others have been found at the base of the cliffs. These were never replaced, and hence Gap Park currently has very few signs. The lack of signage makes Gap Park disorientating, particularly for first time visitors.

2.3.5 Park Infrastructure

Park infrastructure through Gap Park is currently minimal. There is very little viewing seating, and even less seating in shaded locations. The seating and surrounding pads that are currently found in the park are of low quality. There are also very few picnic tables in the park. These are found in the south of the site (where many more were historically located) and are also of low quality.

Council recently upgraded the coastal fencing with a high quality 1300mm high stainless steel mesh fencing, to help minimise incidents of self harm or accidental injury. Before this upgrade the fencing was a low timber fence with horizontal rails, and limited or no infill.

3.0 MASTERPLAN RECOMMENDATIONS

The following Masterplan recommendations are in accordance with the publicly advertised Masterplan dated October 2007.

3.1 CULTURAL

3.1.1 Gap Park Former Tramway

Celebrate, interpret, and adaptively re-use the former tramway route as a 2.5m wide sealed, graded, all-ability shared access link between north and south of Gap Park. Protect and enhance the former tram station and "The Glen", with interpretive signage included.

3.1.2 Adjacent Churches

Interface with adjacent church buildings and grounds to be maintained as open and informal.

3.1.3 The Gunyah

Rationalise The Gunyah buildings front carpark, with some cultural plantings reinstated. Create a firebreak zone, particularly at rear, where dense plantings occur very close to building.

3.1.4 Additional Cultural Works

Investigate installation of interpretive memorial sculpture to James Johnson (sole survivor of The Dunbar wreck) near this location, from which he was rescued.

3.2 HISTORY

3.2.1 The Dunbar Anchor

The story of The Dunbar wreck, and some of the people involved (as well as origins of State Emergency Service formed here), to be told through the landscape and interpretation.

Protect and conserve historic anchor suffering from severe rust deterioration. Implement recommendations of archaeological condition report, including electrolysis treatment (off site), specialist treatment as part of an ongoing protection regime, and investigate reinstalling anchor to more sheltered location of the site.

3.2.2 Jacob's Ladder

Jacob's Ladder geology to be interpreted and signage shall explain its former use as a naval way-finding device.

3.2.3 Grieve Memorial

Grieve memorial to include information about the life of Lieutenant Gideon Grieve, and to be restored or protected as required.

3.2.4 Former Gun Emplacements

Gun emplacements to be restored or protected as required. Information shall be provided regarding the history, function and role of these former military installations.

3.2.5 Former Camera Obscura

Former location of camera obscura is to be sculpturally interpreted, with information regarding the history and workings of this unique historical feature.

3.3 VISUAL

3.3.1 Surrounding Views

The Masterplan recommends ongoing maintenance of visual access to the cliffs, ocean, city CBD, harbour and the heads. In some instances these views (that historically existed) can be improved through the selective removal or trimming of encroaching vegetation.

3.3.2 Pathway Site Lines

Improve visual access along pathways by selective removal or trimming of encroaching vegetation. Consequently, this will increase safety by improving public surveillance in this area.

3.3.3 Norfolk Island Pines

The existing Norfolk Island Pines (*Araucaria heterophylla*) significantly increase the visual signature of the park, when viewed from the harbour or land. These trees are of high cultural value to the site, and are to be retained and protected. Replace and strengthen with succession planting of same species.

3.3.4 Lookout Platforms

Views to sandstone cliffs and rock platforms shall be improved through the installation of a new lookout point, and improving existing points. New durable balustrade at the viewing area with historic timber 'angled' top rail, curved inwards design and increased height to deter access. Fixed binoculars may also be provided in certain locations, subject to future investigations.

3.3.5 Views to Adjacent Historic Buildings

Maintain open views from Gap Park to adjacent historic buildings in the south, and retain low open fence. Retain cultural plantings where appropriate, to preserve historic landscape character.

3.4 ENVIRONMENT

3.4.1 High Diversity Remnant Heathland Regeneration Areas

Found east of the former tram alignment, between Jacob's Ladder and The Gap lookout areas. These areas are to remain undeveloped and undisturbed. Bush regeneration works to concentrate work on maintaining the ecological quality of this zone.

3.4.2 High Diversity Revegetation Areas

Found west of Jacob's Ladder valley, near The Gonyah. These areas are of high quality, and provide good fauna habitat. The vegetation within is to be retained and improved.

3.4.3 Lower Diversity Revegetation Areas

Found west of Jacob's Ladder valley, in the south of the park. These areas were planted after the removal of the tramline, and over landfill. Where possible, this vegetation is to be consolidated, retained and improved through planting with diverse endemic species.

3.4.4 Littoral rainforest

Found in lower portion of Jacob's Ladder valley. This area has valuable cultural plantings dominated by Qld species, and weed infestation. Cultural plantings are to be retained,

and character of area is to be retained and improved with long term weed control strategies.

3.4.5 Entry Plantings

Introduce a greater variety of low growing indigenous species at main entry planting, to create an educational and botanical feature for tourists and residents, with interpretive signage.

3.4.6 Trees within Gap Park

New trees are to not be planted on the elevated exposed sections of the park, as tall trees did not previously occur within this windswept coastal environment, maintaining the original visual character of the site.

Removal of recently planted *Banksia integrifolia* that will obscure surrounding views when they grow to maturity. This is in accordance with the recommendations regarding maintenance of views from the site, in the "Watson's Bay Heritage Conservation Area DCP 2004".

3.4.7 Habitat Boardwalks

The ecological report commissioned in conjunction with the Gap Park Masterplan identified small ground dwelling fauna in the park, and described the possible effect on their movement patterns through the installation of a sealed path along the former tram alignment. The proposed habitat boardwalks will allow for areas where fauna can pass safely underneath path, across an organic and permeable surface.

These boardwalks will also have bicycle speed calming devices included, as per RTA recommendations. In addition, they have been strategically located adjacent to large existing trees with aerial roots, to help minimise damage to these trees.

3.5 SAFETY

3.5.1 General

Gap Park is subjected to extreme conditions. The park is almost continuously exposed to high levels of salt spray and wind loading, as well as ongoing and vandalism to the existing infrastructure. Consequently, all proposed elements within the landscape Masterplan are designed to be durable, and securely installed.

3.5.2 Balustrades

New balustrades to be installed at the key lookout areas to the north and south (see Self Harm Minimisation Strategies 3.7.3).

3.5.3 Cultural Programs

A positive suggestion from the Council Community Safety Committee meeting was the concept of fostering community spirit within the local area, to increase public respect and use of the site. Council shall promote cultural programs, utilising Gap Park as much as possible, to help de-stigmatise the site as a known venue for self harm, and generally increase use of the site by improving community ownership.

3.5.4 Memorial Plantings

Some grieving friends and family currently leave wreaths (or other items of remembrance) for victims of self harm, adjacent to the coastal pathway and / or fence. In some circumstances these items are retained for many months. These items reinforce the negative perception of Gap Park as a known location for self-harm, and can unconsciously promote 'copycat' self-harm attempts. As part of the Masterplan, council will consider developing a memorial tree planting area for families and friends of victims of self harm in a discreet area of Gap Pak away from the main public areas. This area

would assist with the grief process, and would be sensitive to the park's character, while still creating a meaningful place of remembrance. This proposal would require further investigation and consultation, with potential opportunity to locate the area near The Gunyah.

3.5.5 Bicycle Refuge

A new bicycle refuge is to be provided near south entry, for access over road to shared path. The location of this refuge is subject to future investigations by council.

3.6 RECREATION

3.6.1 Walking and Jogging

Walking and jogging are popular activities on the site. New directional signage is to be included across the site, with distances and destinations clearly displayed. As required, the surfaces of retained existing paths will be repaired and / or improved.

3.6.2 Picnicking

Picnicking areas and tables that were previously provided to the south of Gap Park, adjacent to the proposed all-ability path, shall be reinstated to improve community ownership of the park.

3.6.3 All-Ability Access

All-ability access to the site is currently limited to the northern and southern lookouts within the site. A sealed, graded, all-ability shared path shall be included through the western part of the site, along the former tram alignment. New signage, habitat boardwalks, and bicycle speed calming chicanes will be integrated parts of this shared path (see Habitat Boardwalks Strategies 3.4.7).

3.6.4 Bicycles

The shared path provides off road pedestrian / bicycle pathway along the former tram alignment, in accordance with the recommendations of the 'Woollahra Bicycle Plan (2000)'. At key locations and intersections, bicycle speed calming chicanes will be integrated in this shared path.

The perception that cyclists and pedestrians cannot successfully mix does not match reality according to research conducted on shared paths (Pedestrian-Cyclist Conflict Minimisation on Shared Paths and Footpaths, Austroads Inc. 2006). In Sydney there are many successful shared pathways working well around Sydney, for example: the Bay Run, Canada Bay; Louise Savage Pathway, Sydney Olympic Park; Cooks River Cycleway. Research suggests that cyclists accommodate to the presence of others, by decreasing their speed, whereas walkers adopt a less erratic course, which results in their travelling along the path more quickly. Overall, most people's experience of paths and their encounters with others are peaceful, unobtrusive, co-operative and agreeable. Pedestrians may also benefit from increased safety, as the unpredictable presence of cyclists may be a deterrent to crime occurring.

3.6.5 Bird Watching

Bird watching will be enhanced through improving native vegetation habitat areas, as defined in the Masterplan. In addition, the inclusion a formal of path at the west of the site will allow bird watchers to access previously little used parts of Gap Park.

3.6.6 Whale Watching

Opportunities for whale watching are to be improved through the installation of a new lookout point, and improving the condition of existing lookouts. Information signage will also be provided at the lookout points.

3.6.7 Photography

Photography opportunities will be improved through the installation of a new lookout point, and improving existing lookouts. Selective removal or trimming of encroaching vegetation will help provide enhanced visual amenity of surrounding views.

3.7 LANDSCAPE INFRASTRUCTURE

3.7.1 Entries / Lookouts The Gap Viewing Area

The visitor arrival experience is to be significantly improved with new wide, comfortable and classical sandstone steps directly and symmetrically accessing the natural low point in The Gap promenade. The pedestrian crossing to Robertson Park will be realigned. The existing steps will be removed, and revegetated with indigenous species.

Gently curved sandstone entry and exit walls to both sides of steps will emphasize the sense of entry and arrival, and provide an informal seating and meeting place. 1m high stainless steel handrails and integrated low level lighting will be included within these walls.

All-ability access will be provided by retaining the existing lower sealed ramp, and creating a new ramp extension to access The Gap viewing area with integrated low level LED light. The existing ramps will be removed, and revegetated with indigenous species.

450mm high seat and integrated low level lighting will be provided to the back of The Gap promenade. Existing concrete wall will be re-fitted with timber seating (refer GPMP-02 detail 6).

Installation of interpretative signage regarding recreation activities e.g. bird and whale watching. Installation of directional signage at key locations.



The Gap main entry

Gap Loop Entry

The Gap Loop former tram station will function as a new sealed all-ability visitor arrival pathway from the new entry steps to The Gap lookout, utilising the existing gentle gradients. Visual amenity shall be improved by selective removal / trimming of tall vegetation, to increase safety by improving public surveillance in this area.

Install interpretative signage regarding Gap Park's unique tram history, fauna and flora.

Jacob's Ladder Lookout Area

The existing fence will be realigned, and new concrete pavement surface installed, to match the new landscape configuration, designed to maximise outward views.

450mm high seat and backrest, with integrated low level lighting will be provided to the back of the "Jacob's Ladder" viewing area. New concrete wall will be fitted with timber seating. New low level lighting bollards will also be provided to edge of arrival pathways.

Interpretive signage regarding geology of Jacob's Ladder and Dunbar wreck, as well as directional signage, will be installed.

Side Steps

The historic stair and wall relics will be protected. Repair existing balustrade, or provide new balustrades to stairway.

Potential for interpretive signage regarding relics (original 1920s items), and tram history.

Church Entries

Maintain open views from Gap Park to adjacent historic buildings in the south, and retain low open fence.

Rainforest Gully

Improve existing paving material and grading where possible, and provide new balustrades to paths. Provide new or improved rest area(s) with seating, along the pathway through the gully.

New rainforest interpretive signage will be installed to interpret the Queensland species in valley.

Investigate opportunities to reduce night disturbances in this area through increased visual penetration through selected thinning of vegetation to improve sightlines.

3.7.2 Access

Coastal pathway

Improve existing paving material and grading where possible, for improved access. Provide new seating along route, as identified through detailed design.

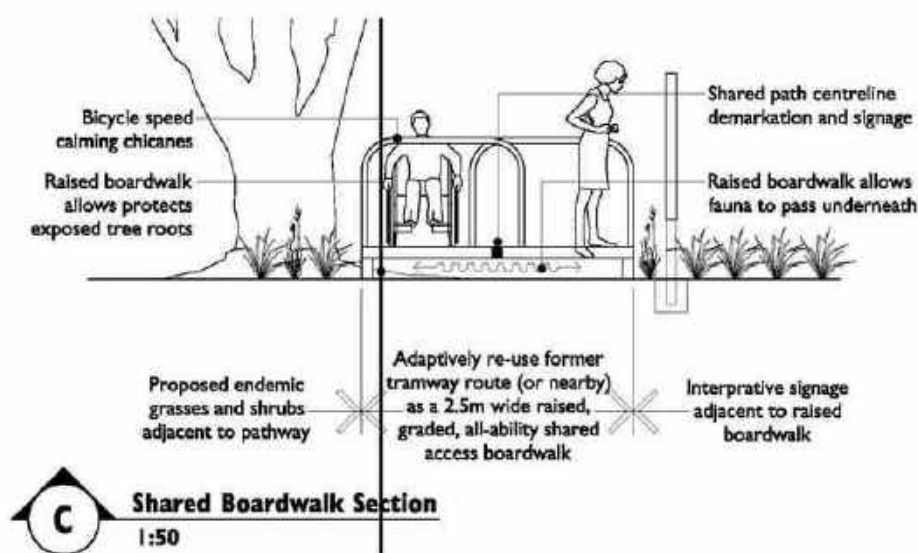
Retain and improve important views by selective removal or trimming of tall vegetation only where appropriate.

Install interpretive signage regarding local history, fauna and flora.

Pathway along Former Tram Alignment

Celebrate and adaptively re-use the former tramway route as a 2.5m wide graded, all-ability shared pathway between north and south of Gap Park. Provides shared pedestrian / bicycle access link in accordance with the 'Woollahra Bicycle Plan (2000)'. To be sealed with concrete surface and exposed aggregate finish. Line marking to centre of pathway, and shared use integrated signage.

Two 'habitat link' boardwalks along route allow fauna to pass safely underneath path, have integrated bicycle speed calming devices included as per RTA recommendations, and also protect large exposed tree roots from damage.



Interpretive signage to be installed, regarding the rich tram history (operated 1903 - 1960).

3.7.3 Lighting

Lighting is to be an integral part of the Masterplan, and the consultation process informed the decision to light the two main entries to the park. This will allow for improved public visitation and safety after dark. See 3.8.1 for details of lighting.

3.7.4 Signage

Interpretative and directional signage is also important elements of the Masterplan. Directional signage will clearly direct people through the site, with distances and routes to key destinations listed. Interpretative signage will inform people about the pertinent natural, cultural, and historic aspects of the site that they may be otherwise unclear about. This signage will require detailed design.

3.7.5 Park Infrastructure

New park seating will be included throughout Gap Park, particularly seating in shaded locations.

New picnic tables will also be provided, to encourage varied public interaction with the site, and consequently increase public ownership and usage of the Gap Park.

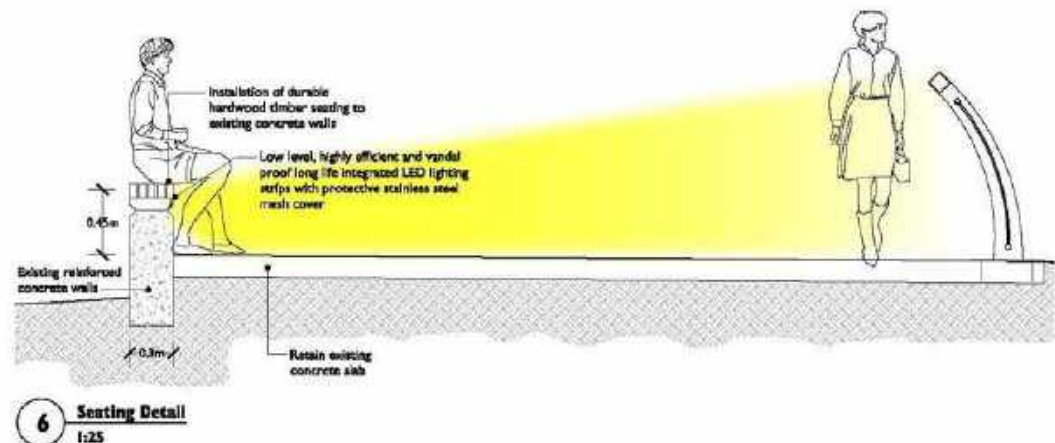
3.8 SELF HARM MINIMISATION STRATEGIES

During the process of developing the Masterplan, local police experienced with self-harm events at The Gap, were consulted. In addition, counsellors from "Lifeline" and medical psychologists from the Southern Sydney Mental Health Unit based at the Prince of Wales Hospital were consulted on the best contemporary methods to assist in the minimisation of self harm. Through the various consultations, it was generally acknowledged that it will not be possible to prevent people determined on self-harm. However, opportunities exist to dissuade people who are considering carrying out self-harm. This can be done through a range of traditional and contemporary measures (see Self Harm Minimisation Plan GPMP-03 details in Annexure J).

3.8.1 Lighting

The Masterplan proposes lighting the two main viewing areas with discreet LED lights in a vandal proof frame, fully integrated with the new seating here. This frame will be mounted above the existing concrete wall at the back of The Gap viewing area, and above the new concrete wall at the back of the Jacob's Ladder lookout. The lighting

illuminates the main viewing areas without the need for pole top light fixtures (as recommended in the “Watson’s Bay Heritage Conservation Area DCP 2004”), and also minimizes face glare. LED lights have a working life of over 25 years, are all-weather protection rated, and are one of the most energy efficient light sources available. Council commissioned lighting tests at The Gap viewing area in preparation of the Masterplan, and during the tests the LED lights were successful. In specific locations, higher intensity lighting will also permit facial recognition for Closed Circuit Television (CCTV). This detail requires future investigations by council.



3.8.2 Safety Telephone

Recommendations have been made by the Rose Bay Police, mental health counsellors and the Safety Committee for a safety telephone to be installed at the key entries to Gap Park. These cashless phones would allow people considering self-harm to contact a counselling service provider such as “Lifeline”, and also allow people witnessing incidents of potential self harm to contact a support organisation. The phones would be signposted, and positioned in a discreet, but easily accessed location.

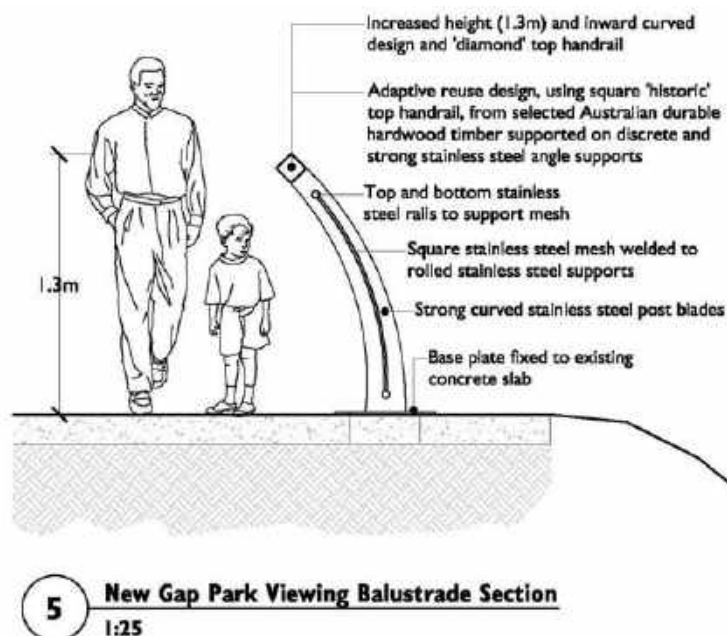
Some of the features of the safety telephones:



- Programmable send and receive numbers with no charge for call
- One to three push button(s) to programmed numbers (e.g. 000 or local police)
- Hands-free speaker, with built in microphone
- Internal battery with charging options (solar, mains)
- Digitally stored announcements
- Illuminated button option
- Vandal-resistant aluminum housing, with dual high security locks
- All weather protection rating

3.8.3 Proposed Fencing at Key Locations

Balustrades are to be installed at the key lookout areas to the north and south of the park, at the main viewing locations. The curved vertical blades reflect nautical symbolism, while allowing for maximum visual transparency. They are curved inwards to deter climbing, but if the fence is scaled, it is possible to climb back over from the sea-cliff side. The diagonal timber top handrail is in keeping with historical Australian coastal handrail theme. In addition, the fence will be in-filled with welded stainless steel square mesh, to further deter climbing.



3.8.4 Signage

Signage will be integral to the development of the Masterplan. There will be directional signage to assist in navigating through the park, with key locations and distances listed. There will also be directional signage to safety phones locations. Interpretive signage will occur throughout the park, and will describe the history, flora and fauna of Gap Park. All signage is subject to future design development.

3.8.5 Closed Circuit Television

Recommendations to install CCTV have been provided by the Rose Bay Police and the Community Safety Committee to:

- Assist emergency services to respond to potential self-harm incidents, and deter such events from occurring; and
- Aid search and identification of reported missing persons using archived image searches

The Masterplan proposes the installation of CCTV at the two main entry locations to the park. This allows a record to be made of all people entering and leaving the site. Police have indicated that this may in itself be a deterrent to people seeking to self-harm. Rose Bay Police have also indicated they will be able to install a monitor at Rose Bay Police Station, linked to the CCTV, to assist with surveillance. They would also be able to retrieve recorded footage to assist with missing person investigations. The monitoring and handling of CCTV footage requires extensive resources and training skills. Council does not have these resources; therefore, only with police participation will this aspect of the plan be able to proceed.

CCTV technology and optics has improved greatly in recent years and cameras may be discreet in size and location. The cameras will have vandal resistant housings, and all-weather protection rating. They can also be activated with motion and infrared sensors, therefore reducing non-active image data capture.

4.0 PRELIMINARY OPINION OF PROBABLE COST

Gap Park Masterplan November 2007

Prepared by TBLD on behalf of Wollahra Municipal Council
REFER TO DRAWING NOS. GPMP-01, GPMP-02 & GPMP-03

Please note:

1. This preliminary opinion of probable cost has been prepared for planning purposes.

No.	Description	Qty	Item	Rate	TOTAL
1.0	GENERAL				
	<i>North & south entries, and other works areas, as required.</i>				
1.1	Site establishment and preliminaries	3	Item	\$2,500	\$7,500
1.2	Installation of temporary chain link mesh fencing to perimeter of work areas for the period of contract works	3	Item	\$3,000	\$9,000
	Subtotal to General				\$16,500
2.0	THE GAP MAIN ENTRY AND VIEWING AREA				
	<i>Including all materials and labour, as required.</i>				
2.1	Earthworks including vegetation spray and removal off site, cut and fill (inc. rock-breaking) to achieve surface levels, as required	1	Item	\$5,000	\$5,000
2.2	Demolish existing steps and ramps to viewing area	1	Item	\$5,000	\$5,000
2.3	Max. 500mm high curved sandstone walls to street frontage, sides of new steps, and front of new 1:6 entry ramp (inc. footings and light housings)	66	lin.m	\$800	\$52,800
2.4	Sandstone steps inc. concrete base and tacticles, as required	1	Item	\$40,000	\$40,000
2.5	Stainless steel railing to sides of new steps (inc. all fixings)	23	lin.m	\$500	\$11,500
2.6	Drainage to back of walls, as required	1	Item	\$2,000	\$2,000
2.7	Wall mounted lighting to street frontage, sides of new steps, and front of new 1:6 entry ramp (inc. higher intensity lighting areas)	20	No.	\$500	\$10,000
2.8	2.5m wide concrete with exposed agg. finish to proposed 1:6 ramp, & all ability path along former tram alignment (up to former tram stop)	358	m2	\$100	\$35,800
2.9	Restoration and preservation of historic concrete paving from former tram stop to The Gap viewing area (inc. former tram stop)	1	Item	\$5,000	\$5,000
2.10	Paving to street edge to be included in streetscape upgrade				
2.11	Bench seating to The Gap viewing area	6	Item	\$2,500	\$15,000
2.12	Feature arrival planting (inc. tubestock at 6 per m2, mulch and timber edging as required)	200	m2	\$60	\$12,000
	Subtotal to The Gap Main Entry and Viewing Area				\$194,100
3.0	JACOB'S LADDER MAIN ENTRY AND LOOKOUT AREA				
	<i>Including all materials and labour, as required.</i>				
3.1	Earthworks including vegetation spray and removal off site, cut and fill to achieve surface levels, as required	1	Item	\$5,000	\$5,000
3.2	Max. 500mm high curved sandstone walls to back of lookout area (inc. footings and light housings)	20	lin.m	\$800	\$16,000
3.3	Drainage to back of walls, as required	1	Item	\$2,000	\$2,000
3.4	Coloured concrete paving to extension of lookout area	10	m2	\$100	\$1,000
3.5	Seating on new concrete wall incl. armrests, backrests, ss brackets, light housings and grill, cables, fixings and strip LED lighting (estimate only, subject to detailed design)	20	lin.m	\$1,500	\$30,000

No.	Description	Qty	Item	Rate	TOTAL
3.6	Realign former railing to edge of viewing area	10	lin.m	\$500	\$5,000
3.7	Feature arrival infill planting (inc. tubestock infill to existing plantings at 2 per m2, mulch and timber edging as required)	553	m2	\$30	\$16,590
3.8	Feature arrival planting (inc. tubestock at 6 per m2, mulch and timber edging as required)	300	m2	\$60	\$18,000
Subtotal to Jacob's Ladder Main Entry and Lookout Area					\$93,590

4.0 LITTORAL RAINFOREST GULLY LANDSCAPE WORKS					
<i>Including all materials, installation and labour, as required.</i>					
4.1	Upgrade existing access pathways within rainforest gully, inc. new rest areas, repaving, and balustrade, as required	1	Item	\$50,000	\$50,000
Subtotal to Littoral Rainforest Gully Landscape Works					\$50,000

5.0 GUNYAH LANDSCAPE WORKS					
<i>Including all materials, installation and labour, as required.</i>					
5.1	Upgrade of existing landscape adjacent to "Gunyah" building, inc. firebreak vegetation removal, turfing, and seating, as required	1	Item	\$10,000	\$10,000
5.2	Gunyah memorial tree planting area for community use	1	Item	\$500	\$500
Subtotal to Gunyah Landscape Works					\$10,500

6.0 DRAINAGE					
<i>Including all trenching, excavations, materials, fittings, fixings and labour as per the drawings.</i>					
6.1	Drainage pits, trenches, and ag-lines, as required	1	Item	\$5,000	\$5,000
Subtotal to Drainage					\$5,000

7.0 SHARED PATH					
<i>Including all materials, installation and labour, as required.</i>					
7.1	Earthworks including vegetation spray and removal off site, cut and fill to achieve surface levels, as required	1	Item	\$20,000	\$20,000
7.2	Drainage pits, trenches, and ag-lines, as required	1	Item	\$5,000	\$5,000
7.3	Shared pathway 2.5m wide concrete with exposed aggregate finish, \$100 per m2 rate	1,200	m2	\$100	\$120,000
7.4	Shared pathway 2.5m wide timber boardwalk	50	lin.m	\$1,500	\$75,000
7.5	Lane markings	480	lin.m	\$5	\$2,400
7.6	Speed calming chicanes	4	No.	\$1,500	\$6,000
7.7	Timber post & rail fencing for steep area adjacent to sandstone cutting	300	lin.m	\$200	\$60,000
Subtotal to Shared Path					\$288,400

8.0 COASTAL PATH					
<i>Including all materials, installation and labour, as required.</i>					
8.1	Improve coastal path condition (inc. levelling & repairs, as required)	1	Item	\$10,000	\$10,000
8.2	Seats : 2000 x 500 x 450mm high Class 1 hardwood seat bases and fixings	6	No.	\$2,000	\$12,000
Subtotal to Coastal Path					\$22,000

9.0 SIGNAGE					
<i>Including all materials, installation and labour, as required.</i>					
9.1	Directional signage to local destinations, and safety telephones (estimate only, subject to detailed design)	1	Item	\$5,000	\$5,000
9.2	Interpretive signage inc. research, graphic design and production (estimate only, subject to detailed design)	1	Item	\$50,000	\$50,000
Subtotal to Signage					\$55,000

No.	Description	Qty	Item	Rate	TOTAL
10.0	SCULPTURAL / MEMORIAL				
	<i>Including all materials, installation and labour, as required.</i>				
10.1	James Johnson memorial sculpture (subject to detailed design)	1	Item	\$100,000	\$100,000
10.2	Camera obscura interpretation (subject to detailed design)	1	Item	\$50,000	\$50,000
	Subtotal to Sculptural/Memorial				\$150,000
11.0	DUNBAR ANCHOR				
	<i>Including all materials, installation and labour, as required.</i>				
11.1	Removal off site, restoration, reinstallation, interpretation, and protection	1	Item	\$100,000	\$100,000
	Subtotal to Dunbar Anchor				\$100,000
12.0	HERITAGE PROTECTION				
	<i>Including all materials, installation and labour, as required.</i>				
12.1	Former gun emplacements protection and restoration	2	Item	\$40,000	\$80,000
12.2	Grieve memorial restoration (subject to detailed design)	1	Item	\$50,000	\$50,000
12.3	Protect heritage fabric and historic artefacts found on site (subject to detailed design)	1	Item		TBC
	Subtotal to Heritage Protection				\$130,000
13.0	FURNITURE				
	<i>Including all materials, installation and labour, as required.</i>				
13.1	Picnic tables : 1800 x 1500 x 750mm high Class 1 hardwood tabletop, 450mm high seat bases and fixings	6	No.	\$3,000	\$18,000
13.2	Seats : 2000 x 500 x 450mm high Class 1 hardwood seat bases and fixings	6	No.	\$2,000	\$12,000
13.3	Bins to be included in streetscape upgrade				
13.4	Bike parking racks to be included in streetscape upgrade				
	Subtotal to Furniture				\$30,000
14.0	VEGETATION				
	<i>Including all soil preparation, plant material and labour as per drawings.</i>				
14.1	Grassing incl. subgrade preparation, supply and spread site topsoil, hydro-seeding and minor weed control	2,500	m2	\$5.00	\$12,500
14.2	Indigenous planting (inc. tubestock at 6 per m2, mulch and timber edging as required. Works to be done by council)				
14.3	Selective vegetation trimming to paths, as required. Works to be done by council				
	Subtotal to Vegetation				\$12,500
15.0	SELF HARM MINIMISATION STRATEGIES				
	The Gap Main Entry and Viewing Area				
15.1	Lighting bollards and cabling to new 1:6 ramp and safety telephone	5	Item	\$1,500	\$7,500
15.2	Seating on existing concrete wall incl. armrests, backrests, ss brackets, light housings and grill, cables, fixings and strip LED lighting (estimate only, subject to detailed design)	82	lin.m	\$1,500	\$123,000
15.3	Railing to The Gap viewing area inc. ss blades, mountings, verticals, mesh, brackets, base plate, fixings, and timber handrail (estimate only, subject to detailed design)	86	lin.m	\$2,500	\$215,000
15.4	CCTV and safety telephone (inc. supply, installation, all connections, and testings, as required), as per 'Austcomms' quotation	1	Item	\$45,000	\$45,000
15.5	Underground ADSL and power supply, connections, pits, meter installation, and transformers, as required, to lighting CCTV and safety telephone	1	Item	\$20,000	\$20,000
15.6	CCTV monitoring by Rose Bay police station	1	Item		TBC

No.	Description	Qty	Item	Rate	TOTAL
	Jacob's Ladder Main Entry and Lookout Area				
15.7	Lighting bollards and cabling to new 1:6 ramp and safety telephone	8	Item	\$1,500	\$12,000
15.8	Railing to Jacob's Ladder lookout area inc. ss blades, mountings, verticals, mesh, brackets, base plate, fixings, and timber handrail (estimate only, subject to detailed design)	20	lin.m	\$2,500	\$50,000
15.9	CCTV and safety telephone (inc. supply, installation, meters, all connections, and testings, as required), as per 'Austcomms' quotation	1	Item	\$35,000	\$35,000
15.10	Underground ADSL and power supply, connections, pits, meter installation, and transformers, as required, to lighting CCTV and safety telephone	1	Item	\$30,000	\$30,000
15.11	CCTV monitoring by Rose Bay police station	1	Item		TBC
	Subtotal to Sef Harm Minimisation Strategies				\$537,500

	SUBTOTAL (EX GST)				\$1,695,090
	INVESTIGATION, DESIGN, AND DETAILED DOCUMENTATION 10%				\$169,509
	Contingencies 10% (construction works only)				\$169,509
	TOTAL PRELIM. OPINION OF PROBABLE COST INC. CONTINGENCIES (EX GST)				\$2,034,108

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Photo from State Library of NSW (September 2002) **'The Gap', South Head, Sydney, taken ca.1870s** retrieved July 10, 2007 from <http://libapp.sl.nsw.gov.au/cgi-bin/spydus/RECOPT/PM/BSEARCH/720/421199,46?http://image.sl.nsw.gov.au/spf/a089/a089967r.jpg>

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Photo from State Library of NSW (September 2002) **North Head, and the Gap south of South Head, Port Jackson or Sydney Harbour, taken 1877** retrieved July 10, 2007 from <http://libapp.sl.nsw.gov.au/cgi-bin/spydus/RECOPT/PM/BSEARCH/720/421012,52?http://image.sl.nsw.gov.au/spf/a089/a089900r.jpg>

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APPENDICES

APPENDIX A

REPORT

Gap Park Masterplan: Aboriginal Archaeological Investigation

By AHMS

**ARCHAEOLOGICAL & HERITAGE MANAGEMENT
SOLUTIONS PTY LTD**

ARCHAEOLOGISTS & HERITAGE CONSULTANTS

ACN 088 058 388

ABN 45 088 058 388



349 Annandale Street
Annandale NSW 2038
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10th August 2007

Thompson Berrill Landscape Design Pty Ltd
1/78 Addison Road,
MANLY, NSW 2095

Attn: Mr. Glenn Berrill (Director)

Re: The Gap, Watsons Bay, NSW – Preliminary Aboriginal Archaeological Investigation

Dear Mr Berrill,

This letter report presents results of a preliminary Aboriginal archaeological investigation of The Gap Park in Watson's Bay, NSW (refer to Figure 1 overleaf).

The investigation was commissioned on behalf of Woollahra Municipal Council as part of the Gap Park Masterplan and to provide advice for future development and management of the subject land. The archaeological investigation was designed to identify potential Aboriginal archaeological issues associated with the study area, and any requirements for detailed assessment, investigation and/or impact mitigation works. It is envisaged that this advice will assist in preparing the Masterplan and informing future management of the Park.

As such, this report is not a formal *Aboriginal Heritage Impact Assessment (AHIA)* in accordance with NSW Dept of Environment & Climate Change Guidelines and did not include full Aboriginal community consultation, as is required for an AHIA assessment. However, consultation with the La Perouse Local Aboriginal Land Council was undertaken to discuss the cultural heritage significance of the Gap Park. The advice of the La Perouse Local Aboriginal Land Council has been incorporated into this report, however should an AHIA be required in future, broader Aboriginal Community consultation will be required in accordance with the DECC Interim Community Consultation Guidelines 2004.

Aims

Specific aims of the study were as follows:

- a) Identify any known Aboriginal sites and/or objects within the subject area and assess the potential for Aboriginal sites and/or objects buried below ground surfaces;
- b) Consult with La Perouse Local Aboriginal Land Council regarding the cultural heritage significance of The Gap;

- c) Research, review and assess secondary historical sources and archaeological reports available for the local area to identify the potential for Aboriginal sites and/or objects to be present within the study area;
- d) Identify Aboriginal heritage constraints and opportunities with regard to the future development and management of The Gap and the level of any further Aboriginal heritage investigations required; and
- e) Provide Council with a practical assessment identifying what legislative and policy requirements would apply and how best to manage any Aboriginal heritage known or likely to be present in the study area. Recommendations for management of Aboriginal heritage would be made in accordance with the statutory requirements of the *National Parks & Wildlife Act 1974 (NPW Act, 1974)*.

Investigation Methodology

Archaeological Literature Review

Previous reports, surveys and studies in the locality were reviewed to determine the potential for archaeological sites within the study area as well regional patterns of Aboriginal use and occupation. The Dept of Environment & Climate Change (DECC) Aboriginal Heritage Information Management System (AHIMS) was consulted regarding known archaeological sites in the surrounding area, and to identify whether any Aboriginal sites or objects have been recorded within the study area.

Site Inspection

The study area was inspected on foot. The investigation assessed the degree of land disturbance and erosion in the study area to determine the likelihood of undisturbed Aboriginal sites and/or objects buried below ground surfaces.

Community Consultation with La Perouse Local Aboriginal Land Council

La Perouse Local Aboriginal Land Council was invited to participate in a short site inspection. They were consulted to ascertain whether or not the study area has cultural heritage significance to the local Aboriginal community. Land Council has prepared a brief letter report setting out the cultural values of the site, which is attached to this report. **A COPY OF THIS REPORT WILL BE FORWARDED TO THE LAND COUNCIL UPON APPROVAL OF THIS DRAFT BY THOMPSON BERRILL. LPLALC WILL REVIEW THE DRAFT REPORT AND PROVIDE A LETTER TO BE INCORPORATED INTO THE FINAL VERSION OF THE REPORT.**

Letter Report

This letter describes the results of the AHIMS Aboriginal sites database search, literature review, Aboriginal community consultation and site inspection. The report also identifies Aboriginal heritage constraints on development and management of The Gap. It provides recommendations about the level of further archaeological investigation that should be undertaken in advance of any future development works within the Park.



Figure 1 - Location Plan (study area is shaded red). *Source: Woollahra Municipal Council*

Aboriginal Historical Context

The traditional owners of the Vaucluse area were the *Gadigal*¹ People, a *Darug* language speaking 'clan' group. The *Darug* language group originally extended from the eastern suburbs of Sydney as far south as La Perouse, west beyond the Blue Mountains and north as far as the mouth of the Hawkesbury River². The *Gadigal* were a sub-group (often referred to as 'clans'), based upon religious and/or totemic associations to country. Ethnohistoric sources indicate the *Gadigal* occupied the south side of Sydney harbour from South Head to Cockle Bay³.

The traditional life of the Gadigal was broken through the course of the early 19th century. The impact of smallpox and influenza decimated the Aboriginal population, with individual epidemics killing large numbers of people. Early white settlement of traditional hunting lands deprived Aboriginal groups of sources of food and access to camping and ceremonial sites. This forced individuals to either relocate into the potentially hostile lands of neighbouring Aboriginal groups, partially integrate into colonial society as fringe dwellers or to resist. Resistance by Aboriginal groups was often met with retaliatory action by white settlers and the colonial administration. A combination of these factors led to the demise of traditional lifestyles and a decrease in the Aboriginal population.

By studying accounts of early settlers, we can reconstruct aspects of the Gadigal lifestyle. The subsistence and economy of Aboriginal groups depended largely on the environment in which they lived. While coastal groups exploited marine and estuarine resources, hinterland groups relied on freshwater and terrestrial animals and plants. A distinction between the two lifestyles is clearly made in early European accounts. During a trip along the Hawkesbury-Nepean during 1791, Watkin Tench wrote that:

'[hinterland people] depend but little on fish, as the river yields only mullets, and that their principal support is derived from small animals which they kill, and some roots (a species of wild yam chiefly) which they dig out of the earth'.

In contrast, Collins wrote that for coastal people such as the Gadigal:

'Fish is their chief support...the woods, exclusive of the animals which they occasionally find in their neighbourhood, afford them but little sustenance; a few berries, the yam and fern root, the flowers of the different Banksia, and at times some honey, make up the whole vegetable catalogue'

Tench also noted the importance of marine foods in the economy of coastal groups. According to Tench, the task of fishing was divided between husband and wife, the woman using a hook and line and the man using a fish gig (spear)⁴. Bark canoes were often used by both men and women for fishing and fires were commonly placed in the middle of these canoes. When fish were scarce or the weather was foul, coastal groups turned their attention to gathering shellfish, hunting reptiles and small animals, digging fern roots, or gathering berries⁵.

¹Attenbrow 2002: 23-25

²Eades, D.K. 1976; and see also Tindale's Tribal Boundaries Map:
(www.samuseum.sa.gov.au/tindale/HDMS/tindaletribes/daruk.htm)

³ibid

⁴Tench, W 1996: pp.258-260

⁵ibid

Although early observations have provided much useful information about Aboriginal society at contact, archaeological investigations have shown clear deficiencies. Archaeological excavations on the NSW coast have clearly shown that coastal people exploited a wide range of hinterland terrestrial resources, which sits in contradiction to early records that coastal people were almost exclusively 'fishers' and inland people were 'hunters'. The contradiction is probably accounted for by the visibility of fishing and gathering activities on and near the water as opposed to the relative invisibility of hunting and foraging activities in the hinterland.

From the historical record it is clear that quite large populations were supported along the coast. One such account comes from Tench and is worth quoting in full:

*"on the north west arm of Botany Bay stands a village which contains more than a dozen houses and perhaps five times that number of peopleGovernor Phillip, when on an excursion between the head of the harbour and that of Botany Bay, once fell in with a party which consisted of more than 300..."*⁶.

Aboriginal groups living in the Hawkesbury sandstone region made extensive use of the natural rock overhangs and caverns that are characteristic of the area. George Barrington observed that *"Those who build bark huts are very few compared to the whole. Generally speaking, they prefer the ready made habitations they find in the rocks"*.

Tench described how native huts were constructed by laying pieces of bark together in the form of an oven. The end result consisted of a low shelter, which was opened at one end and sufficient to accommodate one person lying down⁷. Tench⁸ goes on to conclude that "there is reason, however, to believe that they depend less on them (huts) for shelter than on the caverns with which the rocks abound".

Plant management practices that bear remarkable similarity to those reported in northern Australia were also conducted in the Sydney area. For instance, there is good evidence that the Darug practiced fire-stick farming in and around Sydney. When the first fleet arrived in Sydney, Captain John Hunter found an environment where:

"the trees stand very wide of one another, and have no underwood; in short the woods ... resemble a deer park, as much as if they had been intended for such a purpose" .

This is the classic result of Aboriginal firing of the landscape. Ethnographic evidence from Northern Australia suggests that the systematic burning of the landscape was carried out for a variety of reasons. 'Fire-stick farming' opened up access to land and created pockets of early succession vegetation that increased the amount of important plant foods. Early regrowth vegetation, particularly grasses, attracted animals, which in turn made them easier to hunt. Aboriginal firing of the landscape was an important tool in manipulating the environment to increase food sources.

Plant management was not just restricted to the manipulation of the environment though. Plant processing also figured prominently and enabled the *Gadigal* and other groups to broaden their

⁶ Tench, W. 1996: 58

⁷ Tench, W. 1996: .53

⁸ *ibid*

range of food sources. Hunter provides an interesting account of trying to eat a poisonous yam (probably *Dioscorea bulbifera*) and getting violently sick. Hunter had seen Aborigines digging this same yam and concluded, "*They no doubt have some way of preparing these roots, before they can eat them*".

According to George Washington Walker's journal of 1836, the Illawarra Aborigines processed Zamias. Walker recorded that the Aborigines:

*"either roast them, and pound them into a paste, steeping them in water to get rid of their acrid and hurtful properties, or get rid of these by longer period of steeping in water, so as to render them fit to be eaten in a raw state"*⁹.

Such plant management and processing practices were an important part of the economies of Aboriginal groups.

Archaeological Background

For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types and locations in any given area.

In terms of regional archaeology, the study area falls within the Sydney Basin. Aboriginal occupation in this region dates back well into the Pleistocene period (i.e. before 10,000 years ago). This evidence comes from radio carbon dates (C14) dates retrieved from excavated sites such as Cranebrook Terrace (41,700 years before present), Shaw's Creek K2 (14,700 years before present) and George & Charles St Parramatta (c.25,000-30,000 BP). The dating of Cranebrook Terrace is currently under review¹⁰, so at this time the Charles & George St site is considered as the oldest reliable date for Aboriginal occupation in the Sydney region. The oldest coastal site in the Sydney region is Prince of Wales Hospital (8,400 BP), closely followed by Curracurrang Rockshelter in Royal National Park (7,450 BP)¹¹.

The vast majority of dated sites in the Sydney region are less than 5,000 years old (35 out of a total of 48 dated sites). It has been argued that this is a result of increased populations and 'intensification', during this period. The prevalence of sites dating to the last 5000 years may also be a result of the last significant rise in sea level, approximately 6000 years ago. The sea level rise would have submerged many of the older sites along the coastal fringe.

The archaeology of the Sydney region has been well documented through a large number of academic, amateur and impact assessment investigations over the past 30 years. Approximately 4,300 sites have been recorded and registered with the NPWS Sites Register for Sydney, reflecting both the wealth of archaeology in the region and the number of archaeological investigations undertaken.

⁹ Quoted in Organ, M. 1990: 208

¹⁰ Attenbrow 2002:20-21

¹¹ As cited in Attenbrow 2002:18-19; Cranebrook Terrace [41 700 +3000/-2000 ANU-4016]; Shaw's Creek [14 700±250 Beta-12423]; Prince of Wales Hospital [8 400±800 lacks a lab no. from source] and Curracurrang 1 [7 450±180 Gak-482]

The dominant site types in the Sydney region (in the 15 - 20 % frequency range) are rock shelters with midden deposit, rock shelters with art, rock art engravings and open artefact scatters¹². Site types in the 5 - 15 % range, include rock shelters with artefacts, grinding grooves and open middens¹³. The distribution, density and size of site types is largely dependent on environmental context. For instance, middens are found in close proximity to marine, estuarine and less often, freshwater bodies. Rock shelters are only found in areas of exposed sandstone escarpment and grinding grooves are found in areas of exposed flat beds of sandstone, particularly along creek lines.

A study of the regional archaeology of the Cumberland Plain by Dr Jim Kohen made a number of findings about site location patterns in the Sydney area. The study demonstrated that proximity to water was an important factor in site patterning. Kohen showed that 65 % of open artefact scatter sites were located within 100 metres of permanent fresh water¹⁴. Only 8 % of sites were found more than 500 metres away from permanent fresh water. In short, open artefact scatters are larger, more complex and more densely clustered along permanent creek and river lines. Kohen's study also found that Silcrete (51 %) and Chert (34 %) are the most common raw materials used to manufacture stone artefacts¹⁵. Other raw materials include quartz, basalt, tuff and quartzite.

A consideration of sub-surface artefact scatters is also relevant because of the potential for areas with no surface evidence to contain buried sub-surface deposits. A 1997 study of the Cumberland Plain by McDonald¹⁶ found that:

- 17 out of 61 excavated sites had no surface artefacts prior to excavation;
- The ratio of recorded surface to excavated material was 1:25; and
- None of the excavated sites could be properly characterised on the basis of surface evidence. In short, surface evidence (or the absence of surface evidence) does not necessarily indicate the potential, nature or density of sub-surface material.

The results of McDonald's study clearly highlight the limitations of surface survey in identifying archaeological deposits. The study also shows the importance of test excavation in establishing the nature and density of archaeological material on the Cumberland Plain, within the Sydney region.

The east coast has been the subject of studies that examine settlement patterns, particularly in regard to the role of seasonality. Based on the results of coastal excavations (particularly in the Royal National Park) and site distribution patterns, Gretchen Poiner argued that seasonality was a major influence on settlement patterns and subsistence modes on that coast. Poiner claimed that large semi-sedentary summer camps gave way to dispersal of smaller groups into the hinterland during winter when marine resources diminished. Anne Ross challenged

¹² Attenbrow 2002: 49

¹³ *ibid*

¹⁴ Kohen 1986: 229-275

¹⁵ Kohen 1986: 280-281

¹⁶ McDonald 1997

Poiner's model, using ethnographic evidence to argue that inland winter migration was unlikely due to tribal boundaries¹⁷. Instead, Ross argued that smaller groups were spread more thinly along the coast during winter.

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied. A technological sequence for stone artefacts for the region was first described in the late 1940s by Fred McCarthy and has since been refined. Known as the 'Eastern Regional Sequence' it was based on direct dating of excavated sequences. Some debate about the precise nature and significance of the technological changes described still continues¹⁸, therefore the ERS should be regarded only as a general guide to technological change. The ERS phases are as follows:

- **Capertian** - is distinguished by large uniface pebble tools, core tools, horsehoof cores, scrapers and hammerstones. Backed artefacts occasionally present. Generally dates to before 5,000 years before present (BP).
- **Early Bondaian** - Aspects of the Capertian assemblage continue, but backed artefacts and ground-edged artefacts increase. Artefacts during this period were predominantly made from fine-grained silicious stone such as silcrete and tuff. Generally dated from 5,000 BP to 2,800 BP.
- **Middle Bondaian** - Characterised by backed artefacts, particularly Bondi Points and ground-edged artefacts. Artefacts made from silicious materials, however quartz becomes more frequent. Generally dated from 2,800 BP to 1,600 BP.
- **Late Bondaian** - characterised by bipolar technology, eloueras, ground-edged artefacts, and bone and shell artefacts. Bondi points are virtually absent and artefacts are predominantly made from Quartz. Generally dated from 1,600 BP to contact.

AHIMS Database Search

A search of the DEC AHIMS database found 61 site recordings within a 1.25 kilometre radius around the study area. These sites include rock engravings, middens, rockshelters with and without archaeological deposit and/or art, axe grinding grooves, an open archaeological deposit and a burial.

The majority of sites are rock engravings and rock shelters either with art or middens. Only one open archaeological deposit was identified (45-6-2797). No sites have been previously recorded within the study area (refer to Figure 2 for site locations).

The predominance of rock engravings and rock shelter site types reflects the local geology and access to resources. For examples, rock engravings, axe grinding grooves and rock shelters are found in areas of outcropping bedrock. Outcropping bedrock is common in The Gap study area.

¹⁷ Ross 1976

¹⁸ Hiscock & Attenbrow 2002; Hiscock & Attenbrow 1988; Hiscock & Attenbrow 2005

Sites in the AHIMS database search were recorded from a variety of sources from the late 19th century onwards¹⁹. Studies undertaken for academic, commercial and management purposes were prepared by Tia Negerevich, Jim Wheeler, Elizabeth Rich, Tessa Corkill and Val Attenbrow. The AHIMS sites tend to be focused in places investigated for these reports, therefore the site distribution is not a comprehensive record of sites across the landscape.



Figure 2 – Topographic map showing Aboriginal sites recorded on the AHIMS database near the study area (marked green). Source: Topoview - CMA 1:25,000 map sheets.

¹⁹ Recorded by Campbell in 1899, and Angas 1847 as cited by Negerevich 1978: 3,11

Predictive Modelling

The topography and distribution of natural resources near the study area generally indicates a potential for:

- Rock engravings and axe grinding grooves in areas of outcropping sandstone that contain flat sandstone platforms;
- Isolated finds anywhere across the landscape;
- Open artefact scatter sites and midden deposits across all landforms with intact topsoils;
- Rock shelters may also be found in areas of rock overhangs.

Previous land clearance for vegetation removal (refer to Figure 3) is likely to have disturbed original topsoil within the study area to varying degrees. Associated erosion from vegetation removal is likely to have further impacted the soils. However the retention of some original vegetation (seen in Figure 3) suggests there is potential for archaeological deposit within the study area. The integrity of stone artefact and/or midden deposits will depend on the degree of disturbance of topsoils. Open artefact scatters may be found buried below current ground surfaces in areas where intact A horizon soils remain. In areas where A horizon soils have been removed or substantially disturbed by erosion it is unlikely that sub-surface deposits remain. Isolated finds may be found anywhere across the landscape, and represent the random loss, deliberate discard or abandonment of artefacts, or the remains of dispersed artefact scatters.

There is no potential for scarred and/or carved trees because the study area does not contain remnant old growth trees of sufficient age to retain cultural scarring or marking.

There is a high potential for axe grinding grooves and rock engravings across the study area but particularly along the central and eastern sections which contain flat sandstone outcrops (platforms).

There is a potential for rockshelters and rock overhangs within the central part of the study area as this area contains some overhanging benches.

Results of the Site Inspection

A brief inspection of the study area was carried out on the 31st of July 2007 by archaeologist Felicity Barry Pty Ltd and Shane Ingrey of La Perouse Local Aboriginal Land Council. Coverage of the study area was designed to identify areas of potential archaeological sensitivity; it was not designed to be a comprehensive survey.

No Aboriginal sites were identified during the site inspection. The topography of the study area is dominated by the steep coastal cliff that occupies the eastern margin of The Gap Park. The cliff top comprises a series of outcropping sandstone platforms that drop steeply (up to 14 metres in places) to the western portion of the Park. No drainage lines are present in the study area, however water erosion channels observed along pathways beneath the cliffline appear to pool near the intersection of Dunbar Street and Gap Road (see Figure 4). This source is only likely to have been available in times of heavy rainfall. Other sources may have been small holes and voids in the sandstone platform that pooled water after rain. The closest permanent creekline appears to be located 2km southwest of the study area in the vicinity of Milk Beach.

The vegetation within the site included both native and non-native plantings, some of which were the result of recent re-vegetation (refer Figure 4). A 1943 aerial photograph of the site (Figure 3) indicates that some original vegetation is likely to have been retained. This may be supported by a Council Engineering report stating that Park improvement works in 1965 retained both 'the natural rock surfaces and the few remaining specimens of [coastal] tea tree (*Leptospermum laevigatum*)'²⁰. The area shown in the 1943 aerial photograph as retaining vegetation was steeply graded and contained several large fig trees (*Ficus rubiginosa*).

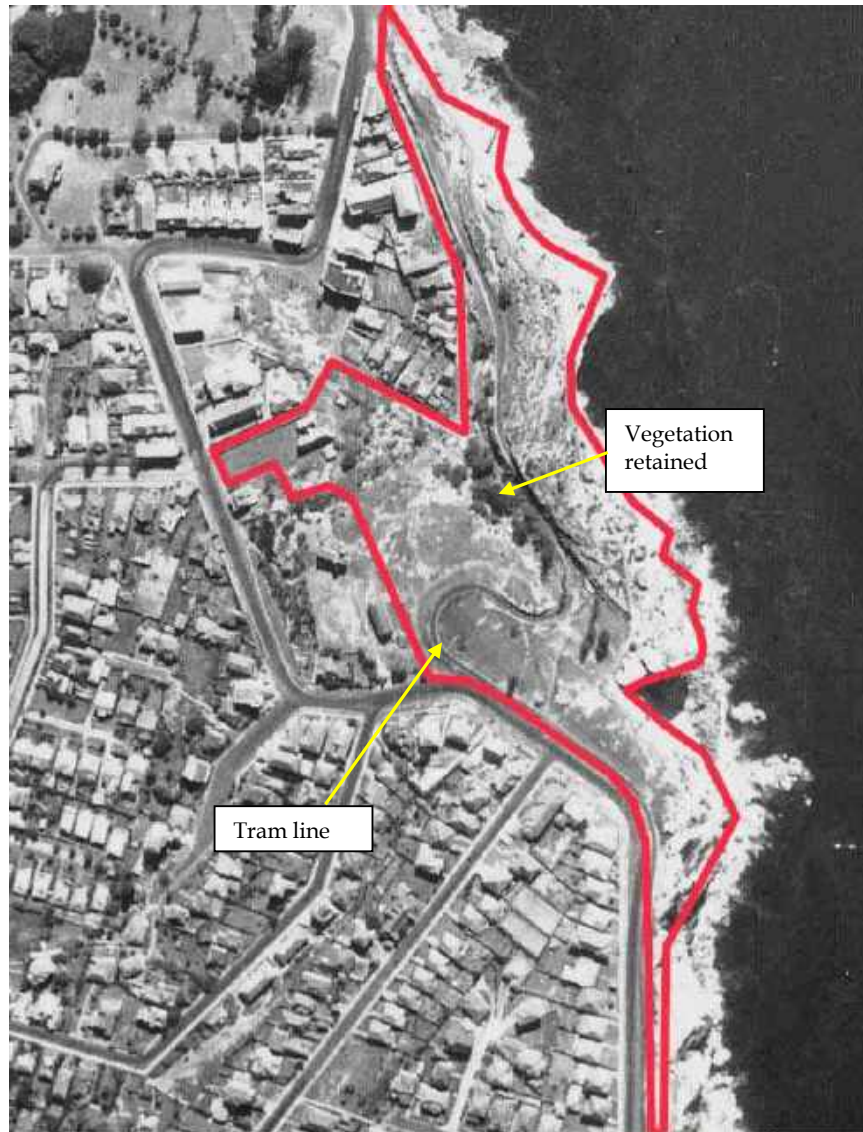


Figure 3 - 1943 Aerial Photograph of the Gap Park (outlined in red) showing vegetation removal in the Gap Park during World War II. Note also the position of the tram line. Source: Roads and Traffic Authority NSW.

²⁰ Woollahra Local History Centre, 2005: 2

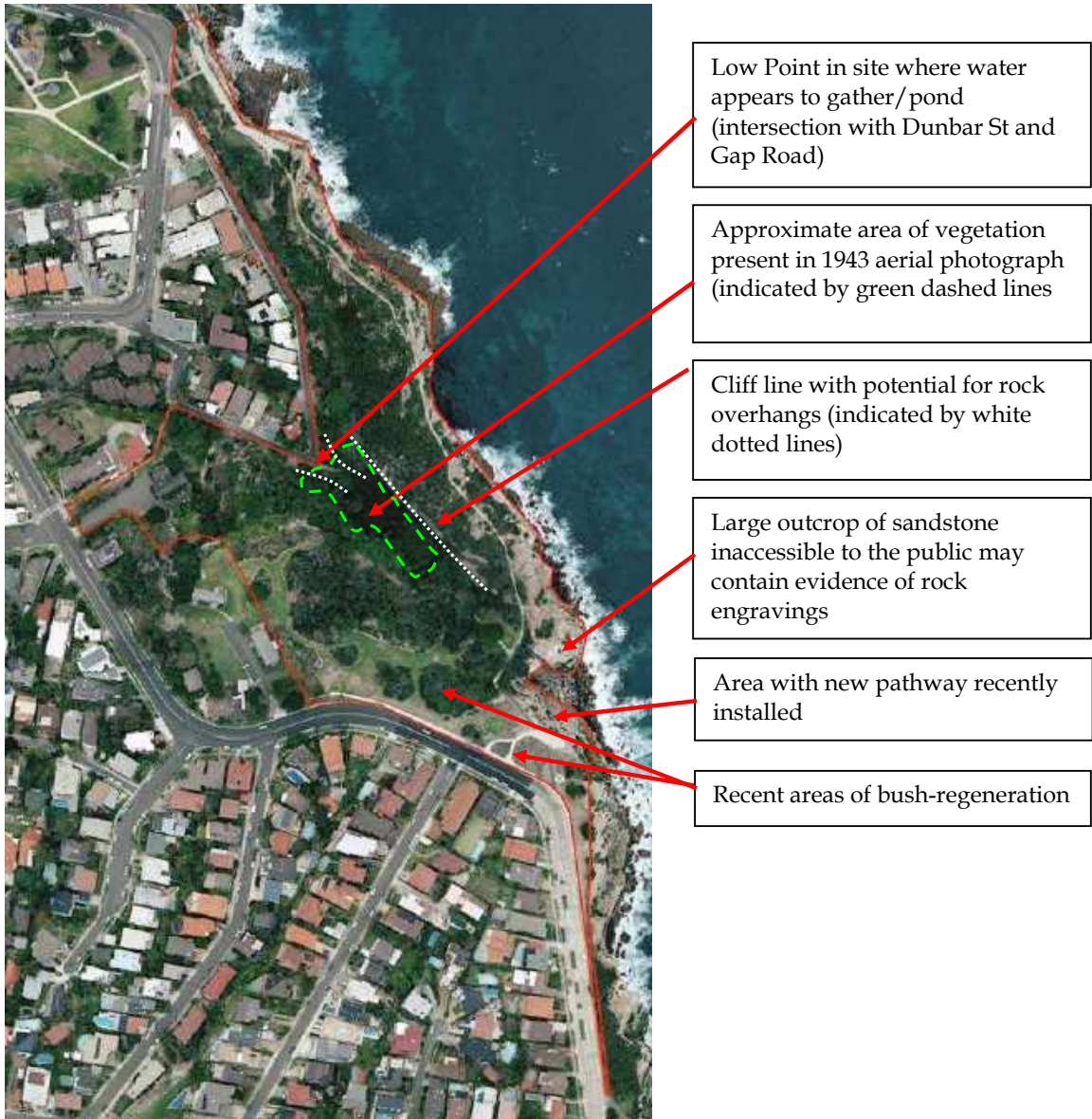


Figure 4 - Aerial photograph of the study area with natural and landscape features observed during survey. *Map Source: Woollahra Municipal Council*

Historical evidence indicates that changes to the park through construction of various structures, formation, regrading and topdressing of pathways from the 1920s, construction of revetments and revegetation have occurred at various times. Major changes included the introduction of the tramline and its later removal – evidence of this can be seen in a cutting running south-north through the central portion of the park. The tramway alignment is still visible as a gravel path running adjacent to the partially cut cliffline in the centre of the park (refer Figure 3).

Other impacts on the park have included construction of two concrete footings in the south-eastern part of the park for use during World War II. Three memorials are also present, two for the wreck of the Dunbar and one for the Lieutenant G. J. Grieve.

The ground visibility was mixed across the park but tended to be good along the cliff top and generally poor in other parts of the site. Although visibility was generally good on the cliff top rock platforms, lichen and low/shrubby ground cover obscured some of the rock surfaces on the western side of the pathway on the cliff-face. Poor ground surface visibility meant that effective detection of archaeological sites was low across most of the subject land.

The soils in the central and western parts of the site are sufficient to retain large to medium sized trees, indicating reasonable depth of soil in these areas. Soils on the cliff top sandstone platforms were very thin to non-existent. Therefore there is very low potential for archaeological deposits on the sandstone platforms and some potential for archaeological deposits in deeper intact soils across central and western portions of the park.

The presence of both exposed and obscured flat sandstone platforms in the study area may contain evidence of engraving. This is suggested by engravings located on similar platforms north of Gap Park²¹.

Some rock overhangs were present beneath the partly cut cliffline in the central part of the study area near the Dunbar Street/Gap Road gully. These have the potential to contain evidence of small rockshelters and associated midden / archaeological deposits.

During the site inspection, no old growth trees of sufficient age to retain cultural scars or markings were observed. Therefore scarred or carved trees are unlikely to be present.

Consultation with La Perouse Local Aboriginal Land Council

The La Perouse Local Aboriginal Land Council (LPLALC) was consulted to identify whether or not the study area has cultural heritage significance to the Local Aboriginal community.

LPLALC HAVE INDICATED THEY WILL PROVIDE INFORMATION REGARDING THE CULTURAL SIGNIFICANCE OF THE SOUTH HEAD AREA AND GAP PARK FOLLOWING RECEIPT OF THE CURRENT REPORT IN DRAFT FORMAT. ADVICE FROM THE LAND COUNCIL WILL THEN BE INCORPORATED INTO THE MAIN TEXT OF THE FINAL VERSION OF THE REPORT AND A COPY OF THEIR CORRESPONDENCE WILL BE INCLUDED AS AN ATTACHMENT.

²¹ Negerevich 1978

Aboriginal Archaeological Constraints

No Aboriginal sites were identified during the site inspection.

Our assessment of archaeological constraints presented below is based on conclusions about archaeological potential drawn from our understanding of local archaeological patterns and our assessment of landscape and prior land use disturbance. We have identified two areas within the Park that contain potential archaeological constraints that will need to be considered during preparation of a Masterplan. The two areas of constraint are shown on Figure 5 and described below.

1. Rock Engraving Zone (Shaded yellow on Figure 5)

The presence of flat sandstone platforms across the eastern side of the study area along the cliff top is consistent with similar landforms to the north which contain rock engravings. The eastern cliff top has potential to contain rock engravings and grinding grooves on flat sandstone outcrops. Some of these areas are currently exposed adjacent to pathways and the cliff edge, however similar areas may also be obscured by grass and low shrub coverage.

Due to the limited nature of this preliminary assessment, which did not include comprehensive survey, additional detailed survey work will be required if pathways or any form of ground disturbance works are proposed within the area marked yellow on Figure 5. The purpose of the detailed survey would be to determine whether or not any engravings/grinding grooves are present within the footprint of the proposed development works. This survey may require supplementary inspections in a variety of lighting conditions, including possibly night survey using oblique light.

Where the survey work identifies Aboriginal rock engravings/grinding grooves, they should be avoided through re-design. If this is not possible, a full *Aboriginal heritage impact assessment (AHIA)* and Aboriginal community consultation in accordance with *DEC Interim Community Consultation Requirements for Applicants (2005)* will be required to determine the cultural significance of the site(s). Please note under the provisions of the *National Parks and Wildlife Act, 1974* Section 90 consent from the Dept of Environment & Climate Change (DECC) would be required prior to any disturbance of an axe grinding groove/engraving site.

2. Rock Shelter and Potential Archaeological Deposit Zone (shaded Orange on Figure 5)

The orange shaded area has been identified as having potential to contain archaeological deposit and rock shelters/overhangs along cliff lines within the study area. This area is less likely to have been directly affected by erosion (because it contains remnant vegetation) and therefore is most likely to have undisturbed soils. This area may also contain rock shelter sites within rock overhangs that have not been affected by quarrying for the tram-alignment cutting.

Further investigation will be required if pathways and any form of ground disturbance works are proposed within the area marked orange on Figure 5. The detailed survey would be to determine whether or not any rock shelters (with archaeological deposit, midden or art) and/or areas of potential archaeological deposit are present within the footprint of the proposed development works.

Where the survey work identifies rock shelters/potential archaeological deposit, they should be avoided through redesign. If this is not possible, a full *Aboriginal heritage impact assessment (AHIA)* and Aboriginal community consultation in accordance with *DEC Interim Community Consultation Requirements for Applicants (2005)* will be required to determine the cultural significance of the site(s). Please note under the provisions of the *National Parks and Wildlife Act, 1974* Section 90 consent would be required from DECC prior to any disturbance of a rock shelter/archaeological deposit and potential archaeological deposit.



Figure 5 – Aerial photograph of the study area showing zones of archaeological potential (yellow and orange) and the old tram alignment (purple).

Map source: Woollahra Municipal Council

Proposed Masterplan

As part of this preliminary assessment we were asked to identify potential Aboriginal heritage constraints on development of The Gap to inform the site's Masterplan.

We understand the Masterplan is in an early stage of development and specific design details have not been determined. We also understand that our study and other environmental studies will assist in the design stage. To that end, if any new works (i.e. outside of existing formalised paths and garden beds etc) are proposed within archaeological potential zones 1 and 2, a detailed Aboriginal heritage impact assessment (AHIA) should be undertaken in advance of the works.

Recommendations

The following recommendations are based upon:

- the legal requirements of the *National Parks and Wildlife Act of 1974*; in conjunction with
- the results of the preliminary archaeological investigation documented in this letter; and
- preliminary consultation with the La Perouse Local Aboriginal Land Council.

It is recommended that:

1. If new works²² are proposed in zone 1 (shaded yellow in Figure 5), a detailed *Aboriginal Heritage Impact Assessment (AHIA)* focusing on identification of rock engravings/grinding grooves should be undertaken. The *AHIA* should include Aboriginal community consultation, undertaken in accordance with Dept of Environment and Climate Change (DECC) *Interim Community Consultation Requirements for Applicants (2005)*;
2. If new works are proposed in zone 2 (shaded orange in Figure 5), a detailed *Aboriginal Heritage Impact Assessment (AHIA)* focusing on identification of rock shelter sites and potential archaeological deposits, should be undertaken. The *AHIA* should include Aboriginal community consultation, undertaken in accordance with Dept of Environment and Climate Change (DECC) *Interim Community Consultation Requirements for Applicants (2005)*;
3. No further action is recommended within the remainder of the subject land, i.e. areas outside of zones 1 and 2 (unshaded areas on Figure 5);

²² New works are defined as any new paths (ie. on new alignments not currently used for paths), new landscaping works, new furniture, new recreational equipment or new planting/garden beds/bush re-generation.

4. **Please Note** : It is an offence under *Section 90* of the *National Parks & Wildlife Act 1974* to disturb, destroy or deface Aboriginal objects without the Consent of the *NSW Dept of Environment & Conservation* (DEC). If any Aboriginal sites or objects are found during the course of development or maintenance works within the Gap Park, excavation work in that area must cease immediately. If the Aboriginal object(s) cannot be avoided by development works (ie. through re-design), a *Section 90 Consent* from DEC will be required before work can recommence.

Please don't hesitate to contact me if you wish to discuss these matters further.

Yours sincerely,

A handwritten signature in cursive script that reads "Felicity Barry".

Felicity Barry
(Archaeologist).

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Attachment 1: Correspondence from La Perouse Local Aboriginal Land Council

APPENDIX B

REPORT

Gap Park Masterplan: Fauna Report

By Ecological Australia



ASSESSMENT | PLANNING | MANAGEMENT

Ecological Assessment

Fauna Report for the Gap Masterplan
(Project No. 069-053)

Report prepared for:
Thompson Berrill Landscape Design Pty Ltd

August 2007

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Contents

1. INTRODUCTION.....	1
1.1 STUDY AREA.....	1
2. METHODS.....	3
2.1 LITERATURE REVIEW	3
2.2 DATA AUDIT	3
2.3 AERIAL PHOTO INTERPRETATION.....	3
2.4 SITE INSPECTION.....	3
3. RESULTS.....	4
3.1 DATA AUDIT.....	4
3.2 VEGETATION AND FAUNA HABITAT.....	4
3.3 FAUNA OBSERVED.....	7
3.4 POTENTIAL IMPACTS OF INCREASED HUMAN USE OF GAP PARK ON FAUNA.....	7
3.4.1 <i>Vegetation loss</i>	7
3.4.2 <i>Increased lighting</i>	8
3.4.3 <i>Pathways</i>	8
3.4.4 <i>Human presence</i>	9
4. RECOMMENDATIONS.....	10
5. CONCLUSION	10
6. REFERENCES	11
APPENDIX 1 – LIST OF FAUNA PREVIOUSLY RECORDED IN GAP PARK.....	12

1. Introduction

A report detailing the local fauna species and their habitats in Gap Park, Watsons Bay, as well as the potential effects of increased usage of Gap Park on local fauna, is required by Thompson Berrill Landscape Design (TBLD) for their submission of a Masterplan for Gap Park to Woollahra Council.

This document reports the findings from a site inspection of Gap Park, provides information on fauna species previously recorded in the park, comments on the relative diversity, capacity, condition and connectivity of habitat for fauna in the park, and details some impacts of increased human use of the park on fauna and their habitats.

1.1 Study Area

Gap Park is located at approximately 151°17'E, 33°51'S in the Woollahra Local Government Area. The Park is just under 5 ha and is bounded by mostly residential development to its west and south, coastline to its east, and a small area of National Park (South Head) to its north which forms part of Sydney Harbour National Park (Figure 1).

Much of the vegetation in Gap Park is remnant vegetation and can be described as heath and low scrub (WMC 2004). Vegetation is approximately 2 – 5 m in height and typical species include Sydney coast wattle (*Acacia longifolia*), ccrub she-oak (*Allocasuarina distyla*), tick bush (*Kunzea ambigua*), heath banksia (*Banksia ericifolia*), coast rosemary (*Westringia fruticosa*), and Port Jackson mallee (*Eucalyptus obtusiflora*). Bush regeneration works have occurred in Gap Park since the 1980s (WLHC 2005) and approximately 74% of bushland in Gap Park was maintained at the end of 2004 (WMC 2004).

Soils in Gap Park are highly erodible, shallow and infertile quartz sands derived from Hawkesbury sandstones (WMC 2004). The topography is generally undulating and comprises low hills and rocky outcrops. No creeks traverse Gap Park, although a spring used to occur near Gap Bluff to the north of Gap Park that fed Glen Creek running west to Watsons Bay (WMC 2004).

The climate of the Park is typical of the Sydney region, which can generally be described as temperate. Climatic data for the study area in the 3 months leading up to the survey are shown in Table 1. Data were obtained from the Bureau of Meteorology website for the nearest weather recording station at Observatory Hill.



Figure 1: Location of Gap Park, Watsons Bay.

Table 1: Climate data leading up to the survey. Historical averages are shown in brackets

	Month / 2006	Average daily maximum temp (°C)	Average daily minimum temp (°C)	Monthly rainfall (mm)
Observatory Hill	May	22.4 (19.4)	13.7 (11.5)	9.8 (121.5)
	June	16.8 (16.9)	9.4 (9.3)	510.6 (130.6)
	July	17.1 (16.2)	8.5 (8.0)	67.2 (97.8)

Sources: http://www.bom.gov.au/climate/averages/tables/cw_066062.shtml (Observatory Hill historical averages); <http://www.bom.gov.au/climate/dwo/200704/html/IDCJDW2124.200704.shtml> (2007 averages).

2. Methods

2.1 Literature Review

Literature on effects of habitat loss, fragmentation and artificial lighting on fauna was reviewed to determine potential effects of increased use of Gap Park by humans.

2.2 Data Audit

A search of the Atlas of NSW Wildlife was performed for fauna within Sydney Harbour National Park on 9/07/07. While this search resulted in a list of fauna for the whole of Sydney Harbour National Park, which is comprised of many scattered areas around Sydney Harbour, the list was considerably smaller than that produced from a search of fauna within a 10 km radius of Gap Park (minimum area searched in the Atlas).

The fauna list for Sydney Harbour National Park was examined to determine species (including threatened species) likely to occur in Gap Park. In addition, flora and fauna lists for Gap Park (WMC 2003) and flora lists for the Woollahra Municipality (WMC 2004) were examined, with lists inspected to determine fauna species likely to occur and habitats likely to be present in the area.

2.3 Aerial Photo Interpretation

Aerial photographs of the site and surrounding area were provided by the client and were used to investigate the extent of vegetation cover, landscape features and land use in the area.

2.4 Site Inspection

Survey of Gap Park was conducted by Dr Enhua Lee of Eco Logical Australia on 2/08/07. Random traverses of the areas were undertaken to collect site-specific data pertaining to the vegetation communities and habitat values for fauna potentially occurring on site. Although targeted surveys were not undertaken, particular attention was paid to microhabitats and points of interest (eg. rock crevices, fallen logs) within the park.

Vegetation communities encountered were described and notes on habitat taken. All fauna observations were recorded. The site inspection took approximately 3 person hours to complete.

Weather conditions for the months preceding the inspection were recorded in Table 1, while daily information leading up to the inspection are recorded below (Table 2).

Table 2: Weather conditions leading up to (2 days) and during field work (1 day), recordings at Observatory Hill, Sydney NSW.

Date	Max Temp	Min Temp	Rain
31/07/07	18.6	6.3	0
1/08/07	24.2	8.2	0
2/08/07	21.9	16.4	0

Source: <http://www.bom.gov.au/climate/dwo/200707/html/IDCJDW2124.200707.shtml>

3. Results

3.1 Data audit

A total of 186 fauna species (mostly vertebrate species; 14 introduced), including 15 threatened fauna species have been recorded as occurring in or near (within nearby waters) Sydney Harbour National Park. Due to a lack of habitat diversity within Gap Park, most of the fauna species have a low likelihood of occurrence for Gap Park. Three species of threatened fauna recorded in Sydney Harbour National Park (listed as vulnerable under the *Threatened Species Conservation Act 1995* (TSC Act)) potentially occur on or in waters near Gap Park (sooty tern *Sterna fuscata*, humpback whale *Megaptera novaeangliae*, and grey-headed flying-fox *Pteropus poliocephalus*), and 2 of these (humpback whale and grey-headed flying-fox) have been confirmed to occur on or close to Gap Park (Appendix 1).

Eighty-four species of vertebrate fauna (12 introduced) have previously been recorded as occurring on or near Gap Park (Appendix 1). In addition to the humpback whale and grey-headed flying-fox, the barking owl (*Ninox connivens*) has also been recorded and is listed as vulnerable under the TSC Act.

3.2 Vegetation and fauna habitat

The vegetation communities in Gap Park were mostly coastal heath and low scrub communities (Figure 2), although there was also a small area of low forest in the east of the Park along Gap Road (Figure 3), which contained rainforest elements. Norfolk pine (*Araucaria heterophylla*) was present in Gap Park, which is likely to have provided habitat for fauna, but did not form a distinct vegetation community with the other native plant species. None of the vegetation communities occurring on Gap Park are considered to be endangered ecological communities.



Figure 2: Coastal heath community with exposed Hawkesbury sandstone, Gap Park.



Figure 3: Low forest community with rainforest elements, Gap Park.

Typical species in the heath and low scrub communities were Sydney coast wattle (*Acacia longifolia*), coast tea tree (*Leptospermum laevigatum*), swamp oak (*Casuarina glauca*), tick bush (*Kunzea ambigua*), coast banksia (*Banksia integrifolia*), old man banksia (*B. serrata*), coast rosemary (*Westringia fruticosa*), Port Jackson fig (*Ficus rubiginosa*), and sweet pittosporum (*Pittosporum undulatum*). Typical species in the low forest community included Moreton Bay fig (*Ficus macrophylla*), cabbage tree palm (*Livistona australis*), sweet pittosporum (*Pittosporum undulatum*), lilly pilly (*Acmena smithii*), smooth-barked apple (*Angophora costata*), black she-oak (*Allocasuarina littoralis*), and swamp oak. Ground cover in the low forest community contained many fern species, such as bracken (*Pteridium esculentum*).

Much of the vegetation in Gap Park was remnant and, as bush regeneration activities within the park are designed to encourage natural germination, there was a fair amount of regrowth in the vegetation communities. The vegetation communities were in relatively good condition, with high canopy cover and a high ratio of native to introduced plant species. Vegetation communities were also relatively continuous such that besides stretching across the park, communities were continuous with those to the north and south of the park, connecting communities on South Head in Sydney Harbour National Park with communities further down from South Head in Signal Hill Reserve. It is likely, therefore, that Gap Park represents an important corridor for wildlife movement on South Head.

There were a number of habitat elements present on Gap Park that may be used by fauna. In particular, fallen logs and branches were present in the vegetation communities. Fallen logs provide complexity to the vegetation communities and provide shelter for ground-dwelling mammals and reptiles, and foraging habitat for some birds. Litter was also present in the vegetation communities and this was particularly deep in the low forest community in Gap Park. Litter is used by many

ground-dwelling mammals, reptiles and birds for shelter and foraging. As well, there were many areas of exposed Hawkesbury sandstone in all vegetation communities. The sandstone varied from flat horizontal slabs (Figure 2) to boulders and steep cliff faces with caves (Figures 4 and 5). These provided areas for lizards to bask on, for ground-dwelling fauna to shelter and forage in, and for mammals such as bats to roost in. No hollow-bearing trees were observed on Gap Park.



Figure 4: Exposed Hawkesbury sandstone, Gap Park.



Figure 5: Exposed Hawkesbury sandstone with caves, Gap Park.

3.3 Fauna observed

Nineteen species of bird and one mammal species were recorded during the site inspection of Gap Park (Table 3). The majority of the bird species are native species and considered to be common in the Sydney area, while three bird species, the common starling (*Sternus vulgaris*), house sparrow (*Passer domesticus*) and feral pigeon (*Columba livia*), are introduced species. The mammal species observed, the domestic dog (*Canis familiaris*), is also an introduced species.

Table 3: Fauna recorded in Gap Park. * Denotes introduced species.

Scientific Name	Common Name
<i>Anthochaera carunculata</i>	Red Wattlebird
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Canis familiaris</i>	Domestic Dog
<i>Columba livia</i> *	Feral Pigeon
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Corvus coronoides</i>	Australian Raven
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Falco cenchroides</i>	Nankeen Kestrel
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Larus novaehollandiae</i>	Silver Gull
<i>Malurus cyaneus</i>	Superb Fairy-wren
<i>Manorina melanocephala</i>	Noisy Minor
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Passer domesticus</i> *	House Sparrow
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater
<i>Sericornis frontalis</i>	White-browed Scrubwren
<i>Sturnus vulgaris</i> *	Common Starling
<i>Strepera graculina</i>	Pied Currawong
<i>Streptopelia chinensis</i>	Spotted Turtle-dove
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet

3.4 Potential impacts of increased human use of Gap Park on fauna

3.4.1 Vegetation loss

The vegetation communities of Gap Park are remnant patches representing the original vegetation communities present prior to European settlement (WMC 2004). Any loss of vegetation from these communities will have a negative impact on local fauna. This is because fauna reliant on the habitats provided by existing vegetation of Gap Park will have less area in which to shelter, forage, and potentially reproduce and disperse. Removal of dead vegetation (fallen logs, litter) will also have a

negative impact on fauna due to some fauna using these elements as sheltering or foraging habitat.

The location where vegetation is removed may affect the extent of the impact of vegetation loss on fauna. For example, removal of vegetation from the edges of communities may have less impact on dependent fauna than removal of vegetation from core areas within communities. This is because edge and core areas of vegetation communities support different types of fauna (those adapted and less adapted to 'edge' environments exposed to disturbance) and removal of vegetation and fauna habitat from edge areas creates less disturbance to vegetation communities than removal from core areas (due to different levels of disturbance already experienced in the two areas). Nevertheless, vegetation loss will still result in a net loss of potential habitat for fauna and will thus impact local fauna.

3.4.2 Increased lighting

Studies on the effects of artificial lighting, which increases the amount of light that would be experienced naturally, have shown that artificial lighting influences fauna in both positive and negative ways (Outen 2002). Increased lighting can increase food density, with light attracting insects. This can benefit nocturnal insectivorous fauna, such as microchiropteran bats. In addition, increased lighting can prolong foraging periods for diurnal fauna, affording them more time to feed.

Negative effects of increased lighting on fauna include loss of protection provided by darkness (both nocturnal and diurnal fauna) that may expose fauna to greater predation risk, decreases in aestivation periods for diurnal fauna, and decreases in foraging habitat for light-sensitive nocturnal fauna.

Lighting may also increase the potential for fauna to be disturbed by humans and may decrease the area of available roosting habitat on site (associated with increased disturbance and light penetration).

Given that artificial lighting affects fauna, increased lighting in Gap Park will affect local fauna in the park. Whether the impacts will be positive or negative, however, will be dependent on the responses of fauna species to increased light. The majority of fauna recorded in the park are diurnal species (Appendix 1), so it is likely that increased lighting in the park will have negative rather than positive effects on local fauna overall. Moreover, nocturnal species recorded in Gap Park include tawny frogmouth (*Podargus strigoides*) and the threatened barking owl (*Ninox connivens*), species which are unlikely to be attracted to illuminated areas.

3.4.3 Pathways

The construction of more paths through Gap Park will likely further fragment an already highly fragmented habitat. This fragmentation of habitat will affect local fauna species as fauna preferring core-habitat areas will be forced into edge habitats, which will expose them to predators and less favourable microhabitats. Given the small size of Gap Park (just under 5 ha), there is already little remaining core habitat in the park.

In addition, the fragmentation of habitat may act as a barrier to movement for small ground dwelling fauna. Many pathways already traverse Gap Park, and while two paths border the park (along the coast and on the eastern side of the park), some cut through continuous vegetation at the core of the park, fragmenting existing habitat. At present, existing paths are unlikely to act as barriers to small fauna movement across them as paths are generally grassy or have natural surfaces. It is likely, though, that if paths are sealed with concrete as they are along the coast, or widened, paths will act as semi-permeable barriers to small fauna movement.

3.4.4 *Human presence*

During the site inspection, it was noted that many fauna species were habituated to human presence. It is, therefore, likely that increased human presence in the park will not negatively impact local diurnal fauna. However, nocturnal fauna may be affected by the presence of humans if humans are present during their foraging hours and humans decrease their foraging success. Increased human access along illuminated paths may also affect the suitability of areas for roosting.

4. Recommendations

The potential impact of lighting has been discussed in the previous section. However, lighting can take various forms, and some of these may impact fauna in different ways. For example, lighting mounted high up on poles will cast light further than low level lights (1m) illuminating a pathway. Low level lighting is less likely to affect roosting habitat beyond a pathway than lighting mounted well above a path.

It is therefore recommended that the following be considered:

- Low level lights (1 m high) be used for illumination in Gap Park
- Globes with a low wattage be used for illumination in Gap Park
- The Masterplan should seek to divert access away from key habitat areas. This can be achieved by the use of formed paths and careful location of other park facilities.
- Interpretive signage can also be used to educate the public of the different habitat types and of their importance. Signs can also identify common species occurring within the park.

5. Conclusion

Gap Park contains remnant heath and low scrub, and low forest communities, the latter of which contains rainforest elements. These vegetation communities are in good condition and connect vegetation communities on South Head to those further down the peninsula. Vegetation communities in Gap Park, therefore, act as a wildlife corridor for fauna movements along the southern peninsula of Sydney Harbour.

Many habitat elements are present in Gap Park for fauna. These habitats include:

- Forest
- Heath
- Grassland (turf)
- Litter
- Woody debris
- Coastlines
- Rock outcrops and surface rocks

These represent habitats for a diverse range of birds, mammals, reptiles and amphibians.

The development of Gap Park for increased use by humans, which may include the removal of vegetation, installation of artificial lighting, and construction or upgrading of paths will impact local fauna.

6. References

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Appendix 1 – List of fauna previously recorded in Gap Park

The following list of fauna is sourced from the 2002 – 2003 Flora and Fauna List for Gap Park (WMC 2003). * Denotes introduced species.

CLASS-AVES (BIRDS)

ORDER PROCELLARIIFORMES

Family Pelecanoididae

Pelecanoides urinatrix

Common Diving-Petrel

Family Diomedeidae

Diomedea exulans

Wandering Albatross

D. epomophora

Royal Albatross

Family Procellariidae

Puffinus tenuirostris

Short-tailed Shearwater

ORDER SPHENISCIFORMES

Family Spheniscidae

Eudyptula minor

Little Penguin

ORDER PELECANIFORMIS

Family Phalacrocoracidae

Phalacrocorax varius

Pied Cormorant

P. carbo

Great Cormorant

P. sulcirostris

Little Black Cormorant

P. melanoleucos

Little Pied Cormorant

Family Sulidae

Morus serrator

Australasian Gannet

ORDER CICONIIFORMES

Family Ardeidae

Ardea novaehollandiae

White-faced Heron

Egretta sacra (Syn *Ardea*)

Eastern Reef Egret

ORDER FALCONIFORMES

Family Falconidae

Falco cenchroides

Australian Kestrel

F. longipennis

Australian Hobby

ORDER CHARADRIIFORMES

Family Charadriidae

Vanellus miles

Masked Lapwings

Family Laridae

Larus novaehollandiae

Silver Gull

Sterna caspia
S. hirundo
S. bergii

Caspian Tern
 Common Tern
 Crested Tern

ORDER COLUMBIFORMES

Family Columbidae
Columba leucomela
 **Columba livia*
Streptopelia chinensis
Ocyphaps lophotes
Geopelia humeralis

White-headed Pigeon
 Feral Pigeon
 Spotted Turtle-Dove
 Crested Pigeon
 Bar-shouldered Dove

ORDER PSITTACIFORMES

Family Psittacidae
Cacatua galerita
C. roseicapillus
Trichoglossus haematodus
Melopsittacus undulatus
Barnardius zonarius
Platycercus elegans
P. eximius
Psephotus haematonotus

Sulphur-crested Cockatoo
 Galah
 Rainbow Lorikeet
 Budgerigar (escapees)
 Ringneck (escapees)
 Crimson Rosella
 White-cheeked Rosella
 Red-rumped Parrot (escapees)

ORDER CUCULIFORMES

Family Cuculidae
Eudynamys scolopacea

Common Koel

ORDER STRIGIFORMES

Family Strigidae
Ninox connivens

Barking Owl

Family Podargidae
Podargus strigoides

Tawny Frogmouth

ORDER CORACIIFORMES

Family Alcedinidae
Dacelo novaeguineae
Alcedo azurea

Laughing Kookaburra
 Azure Kingfisher (Gap Rd 95)

ORDER PASSERIFORMES

Family Hirundinidae
Hirundo neoxena

Welcome Swallow

Family Motacillidae
Anthus novaeseelandiae

Richard's Pipit

Family Campephagidae
Coracina novaehollandiae

Black-faced Cuckoo-shrike

Family Pycnonotidae <i>*Pycnonotus jocosus</i>	Red Whiskered Bulbul
Family Pachycephalidae <i>Eopsaltria australis</i> <i>Rhipidura rufifrons</i> <i>R. fuliginosa</i> <i>R. leucophrys</i>	Eastern Yellow Robin Rufous Fantail Grey Fantail Willie Wagtail
Family Maluridae <i>Malurus cyaneus</i>	Superb Fairy-wren
Family Acanthizidae <i>Sericornis frontalis</i>	White-browed Scrubwren
Family Meliphagidae <i>Anthochaera carunculata</i> <i>A. lunulata</i> <i>Manorina melanocephala</i> <i>Lichenostomus melanops</i> <i>L. penicillatus</i> <i>Phylidonyris novaehollandiae</i> <i>Acanthorhynchus tenuirostris</i>	Red Wattlebird Little Wattlebird Noisy Miner White-eared Honeyeater White-plumed Honeyeater New Holland Honeyeater Eastern Spinebill
Family Pardalotiae <i>Pardalotus punctatus</i>	Spotted Pardalote
Family Zosteropidae <i>Zosterops lateralis</i>	Silvereye
Family Ploceidae <i>*Passer domesticus</i>	House Sparrow
Family Sturnidae <i>*Sturnus vulgaris</i> <i>*Acridotheres tristis</i>	Common Starling Indian Mynah
Family Grallinidae <i>Grallina cyanoleuca</i>	Australian Magpie-lark
Family Cracticidae <i>Cracticus torquatus</i> <i>Gymnorhina tibicen</i> <i>Strepera graculina</i>	Grey Butcherbird Australian Magpie Pied Currawong
Family Corvidae <i>Corvus coronoides</i>	Australian Raven

CLASS-MAMMALIA**SUBCLASS-Eutheria**

ORDER- Chiroptera

SUBORDER- Megachiroptera

Family Pteropodidae

Pteropus poliocephalus

Grey-headed Flying Fox

ORDER- Rodentia

SUBORDER- Myomorpha

Family-Muridae

Subfamily- Murinae

*Rattus fuscipes***R. rattus***R. norvegicus***Mus musculus*Bush Rat
Black Rat
Brown Rat
House Mouse

ORDER- Pinnipedia

Family-Phocidae

Hydrurga leptonyx

Leopard Seal

ORDER-Lagomorpha

Family- Leporidae

**Oryctolagus cuniculus*

Rabbit

ORDER- Carnivora

Family- Canidae

**Canis sp.* (unleashed/vagrants)

Dog

Family-Felidae

**Felis catus*

Cat

ORDER-Artiodactyla

SUBORDER-Ruminantia

Family- Bovidae

**Capra hircus* (extinct)

Goat

ORDER- Cetaceans

SUBORDER- Mysticeti

Family- Balaenidae

Megaptera novaeangliae

Humpback Whale

SUBORDER- Odontoceti

Family- Delphinidae

*Delphinus delphis**Tursiops truncatus*Common Dolphin
Bottlenose Dolphin

SUBCLASS-Marsupialia

ORDER- Diprotodonta
 SUPERFAMILY- Phalangeroidea
 Family- PHALANGERIDAE
Trichosurus vulpecula

Common Brushtail Possum

CLASS-AMPHIBIA

ORDER- Salientia
 Family- Myobatrachidae
Limnodynastes peronii

Brown-striped Frog

ORDER- Squamata
 SUBORDER- Sauria
 Family- Gekkonidae
Oedura lesueurii
 Family- Scincidae
Tiliqua scincoides
Lampropholis guichenoti
Ctenotus taenioilatus

Lesueur’s Velvet Gecko

Blue Tongue Lizard
 Garden Skink
 Copper-tail Skink

SUBORDER- Serpentes
 Family- Elapidae
Pseudechis porphyriacus

Red Belly Black Snake

CLASS-INSECTA

ORDER- Odonata
 SUBORDER-Zygoptera
 SUBORDER- Anisoptera

Damselflies
 Dragonflies

ORDER- Blattodea
 Family- Blattidae
**Periplaneta americana*
 Family- Blattellidae
**Blatella germanica*

American Cockroach

German Cockroach

ORDER- Isoptera
 Family- Rhinotermitidae
**Coptotermes acinaciformis*
 Family- Termitidae
Nasutitermes walker

Coptotermes

Niggerhead

ORDER- Mantodea
 Family- Mantidae
Tenodera sp

Praying Mantis

ORDER- Orthoptera	
SUBORDER- Ensifera (Crickets)	
SUPERFAMILY- Grylloidea	
Family- Gryllidae	
<i>Teleogryllus sp</i>	Black-field Cricket
Family- Gryllotalpidae	
<i>Gryllotalpa sp</i>	Mole Cricket
SUPERFAMILY- Gryllacridoidea	
Family- Gryllacrididae	
<i>Nunkeria sp</i>	
SUBORDER- Troctomorpha	
Family- Liposcelidae	
<i>Liposcelis sp</i>	Booklouse
ORDER-Hemiptera	
SUBORDER- Sternorrhyncha	
Family- Aphididae	
Unknown species	
SUPERFAMILY- Coccoidea	
Family- Eriococcidae	
<i>Apiomorpha sp</i>	Galls
<i>Margarodidae</i>	
<i>Icerya purchasi</i>	Cottony Cushion Scale
<i>Monophlebulus pilosior</i>	Mealybug
SUBORDER- Auchenorrhyncha	
Family- Cicadidae	
Unidentified small black species	
Family- Flatidae	
<i>Siphanta sp</i>	Planthopper
SUBORDER- Heteroptera	
Family- Scutelleridae	
<i>Tectocoris diophthalmus</i>	Harlequin Bugs
ORDER- Coleoptera	
SUBORDER- Polyphaga	
Family- Scarabaeidae	
Unknown species seen var. locales Gap Park.	
Subfamily- Rutlinea	
<i>Anoplognathus sp</i>	Christmas Beetles
<i>Calloodes sp</i>	
Family- Curculionidae (Weevils)	
Unknown species seen var. locales Gap Park)	
ORDER- Diptera	
SUBORDER- Nematocera	
Family- Culicidae	
<i>Aedes sp</i>	Domestic Mosquito
SUBORDER-Bracycera	
Family- Dolichopodidae	
<i>Sciapus sp?</i>	Longlegged Fly

Family- Muscidae	
<i>Musca domestica</i>	House Fly
<i>M. vetustissima</i>	Bush Fly
ORDER- Lepidoptera – many unidentified as yet	
Superfamily-Papilionidae	
Family- Pieridae	
<i>Appias paulina ega</i>	Common Albatros
ORDER- Hymenoptera	
SUBORDER- Symphyta	
Family- Pergidae	
<i>Perga sp.</i>	Spitfire Grubs
(a) SUBORDER- Apocrita (Terebrant (Parasitica) Group	
Family- Ichneumonidae	
<i>Cissopimpla sp.</i>	Ichneumon Wasp
(b) SUBORDER- Apocrita Aculeate Group	
Superfamily- Vespoidea	
Family- Vespidae (Paperwasps, Potter Wasps)	
Unidentified species in some trees and shed windows.	
Family- Formicidae (Ants)	
Unidentified species	
Superfamily- Apoidea	
Family- Apidae	
* <i>Apis mellifera</i>	Honey Bee
<i>Trigona sp.</i>	Native Honey Bee
CLASS-ARACHNIDA	
ORDER- Araneae	
SUBORDER- Araneomorphae (Modern Spiders)	
Family- Heteropodidae	
<i>Holconia immanis</i>	Sydney Huntsman
Family- Pholcidae	
<i>Pholcus phalangoides</i>	Daddy Long-legs
Family- Theridiidae	
<i>Lactrodectus hasselti</i>	Red-back
Family- Araneidae	
<i>Nephila ornata</i>	Golden Orb-weaving

APPENDIX C

MEETING MINUTES

Gap Park Masterplan: Background Document Summary



Gap Park Masterplan

Background Document Summary

1. WATSONS BAY HERITAGE CONSERVATION AREA DEVELOPMENT CONTROL PLAN, FEBRUARY 2004

1.1 Abstract

- The DCP outlines in detail the development details and recommendations for Watson's Bay.

1.2 Part 3: Precincts

Upper Gap Park precinct

- Existing topography and vegetation should be maintained.
- New plantings should not obscure existing views and vistas.
- Additional cultural plantings not appropriate, but retain existing pines and figs.
- Public views to and from Watson's Bay, Sydney Harbour, and the waterfront, The Gap and within the park are to be retained.
- No new structures to be constructed.
- New structures limited to commemorative structures, public artworks, etc. to not 'clutter' the landscape.
- No additional fencing should be constructed. New fencing should be as low as possible.
- No additional parking.
- Existing public access (including disabled access) to be retained throughout park.
- New path colours and fences to be recessive

1.3 Part 5: Public domain principles

5.3.1 Parks

- Formal layout of parks to be retained, including built elements, paths and cultural plantings. To reflect their key development period.
- Significant views and vistas to be retained, through the careful location of plantings and structures
- New plantings and structures to enhance public views and vistas between The Gap and the beach.
- Structures located to protect and enhance views and vistas. Should be designed to enhance the character of the area, in terms of character, scale, massing, form, colour and materials.

5.3.3 Waterfront

- Public promenades to be retained along waterfront and from Marine Parade to The Gap, through Robertson Park.

5.3.4 Landscape elements

- Significant landscape elements such as cultural plantings (street trees and park vegetation), sandstone retaining walls, and steps should be conserved.
- Street trees only to be planted along street with verges.
- Street trees to be consistent with the period planting of the area.
- New retaining walls should be of similar design to traditional walls in the area in terms of their character, height and materials.
- The scale and proportion of new steps should be consistent with the existing built form, and should comply with Australian Standards.
- New steps and ramps should be designed and located to enhance amenity and opportunities for vistas.

5.3.5 Signs and advertising

- The style and colours of signs should complement the historic character of the area.
- Signs should be discreet.
- Signs should be provided for the interpretation of heritage items and sites, walks and parks. They should incorporate brief historical information.
- The cumulative visual impacts of signs should be assessed and the number of signs limited appropriately to avoid visual cluttering of the streetscape.

5.3.9 Public access

- Opportunities should be retained and created for pedestrian circulation through the Watson's Bay area.

5.3.10 Services

- Lighting standard should not extend above the adjacent tree line, or the line of the cliffs, when viewed from the harbour.

2. CONSERVATION PLAN FOR FORMER BIOLOGICAL STATION 31 PACIFIC STREET, WATSON'S BAY, DECEMBER 1986

2.1 Abstract

- This paper was written to present evidence of former biological station building as an item of heritage significance.

2.2 Section 1: Cultural Significance

1.2.5 European Settlement 1840-1877

- Permanent settlement brought denudation of indigenous flora, mainly by domestic goats. Landforms of native grasses and dominate sandstone outcrops.
- 1850s and 1860s military fort established at south head, as well as public ferry wharf, hotel, post office and pilot station at Watson's Bay.
- 1869 horse drawn 'bus' established from Circular Quay to Watson's Bay.

1.2.6 European Settlement 1878-1887

- Zoo station gazetted in 1879. Sited at Watsons Bay address for good view (on small hill in peninsular) and isolation. Completed in 1881.
- 1885-1886 site named 'biological station', and taken over by military.

1.2.7 European Settlement 1887-1927

- Watson's Bay area became residential in late 19th century.

1.3 Nicolai de Miklouho Maclau

- Worked as biologist in former biological station building 1881 – 1886.

1.7 Landscape Setting

1. Natural site pre-European with two major plant communities:
 - Diverse, adapted to nutrient starved sandstone ledges.
 - Adapted to deep, sandy, rich soils and high levels of water.
2. Cleared landscape with predominately exposed sandstone, grass, sand, and fresh water.
3. Cultural landscape with isolation, and biological station as only large building of area.
4. Cultural landscape as a garden setting to support military residences.

3. WOOLLAHRA OUTDOOR RECREATION AND OPEN SPACE STRATEGY, OCTOBER 1992

3.1 Abstract

- The outdoor recreation and open space strategy provides direction to local government authorities in the future provision of open space.

3.2 Section 3: Open Space Goals

3.1 Woollahra Council's Vision

- Facilitate the enhancement of quality of life of its community
- Conserve the natural and built environment of the municipality.
- Foster the individuality of local areas and the diverse range of lifestyles they offer, yet maintain an overall harmony within this diversity.

3.3 Section 5: The Community and Open Space Needs

5.2.2 Recent Studies in Woollahra

- Passive recreation activities were the most popular form of recreation activity among residents, reflected in their appeal to all age groups.
- Walking was the most popular passive recreation activity, with no marked shifts in seasonality.

5.2.3 Park Exit Surveys

- 9% of people surveyed desired more bins to be provided within Gap Park.
- 8% of people surveyed desired more seating to be provided within Gap Park.

5.2.4 Consultation with the Community

- Consultations revealed several key issues:
 - The views of Sydney Harbour from Woollahra are an important component if the heritage of Woollahra and are one of the main reasons for people visiting the municipality.
 - Bushland open space in Woollahra is insufficient. Bushland regeneration is recognised as worthwhile.
- The main unmet recreational needs, applying to Gap Park are:
 - More public viewing points of the natural beauty of Woollahra and the harbour.
 - Improve the accessibility of existing recreation facilities to enable less-abled people to readily use them.
 - Further barbeque and picnic facilities in the large open space areas.

5.3 Summary of Open Space Demand

- Walking is consistently recognised as the most popular activity, both within the Municipality and neighbouring Waverly. Access to foreshore areas and links between existing foreshore open areas and links between existing foreshore open spaces was considered important.

3.4 Section 6: Policies, Actions, and Resources

6.3 Community Needs

- Council to redistribute resources to allow additional resources to be allocated to the management, upgrading and maintenance of open space in the bushland setting. Priority areas include Gap Park.

- Specific maintenance problems include the presence of dog excrement and associated reduction in use of open space (particularly in Gap and Park) and use of public open spaces for private activities (such as dumping rubbish or storing material).

4. ROBERTSON PARK PLAN OF MANAGEMENT, NOVEMBER 2004

4.1 Abstract

- The Plan of Management seeks to balance open space and recreational values with conservation and the inherent physical and cultural heritage qualities of Robertson Park. It will also provide a basis for Woollahra Council's ongoing management, enhancement, and maintenance.

4.2 Section 4: Community and Crown Land Management Requirements Crown Land's Act 1989

- The Department of Lands land management philosophy directly relates to the principles of Crown land management that are listed in Section 11 of the Crown Lands Act 1989:
 - Environmental protection principles be observed in relation to the management and administration of crown land.
 - The natural resources of Crown Land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible.
 - Public use and enjoyment of appropriate Crown land to be encouraged.
 - Where appropriate, multiple use of Crown land be encouraged.
 - Where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity.
 -

4.3 Section 6.2: Heritage

6.2.1 Aboriginal Heritage

- The Watsons Bay open space lies with the lands of the Birrabirragal people.
- Their routine was dominated by fishing from canoes, made of tree bark. The women also gathered shellfish, and evidence can be found in shell middens within rock shelters across Watson's Bay and South Head.
- There are a number of rock art sites in the area also, but these are too fragile to sustain public exposure.

6.5.4 Cycle Access

- Plan recognises that no dedicated cycle paths currently exists in Watson's Bay, and that an on road provision is to be formalised by the Watson's Bay Cycle Plan.

6.5.5 Public Transport

Bus Services

- A bus stop is located on Military Road adjacent to "The Gap" The Watson's Bay bus service (324 and 325) runs seven days a week.

Ferry Services

- A public ferry wharf is located at the end of Military Road to the south east of Robertson Park. Four services per day on weekdays, and six per day on Saturday's, Sunday's and public holidays.

Water Taxi

- Water Taxi services disembark passengers at the public wharf and are popular with visitors to the local restaurants or local residents travelling to the CBD.

4.4 Section 8: Appendix Historical Overview of Robertson Park

- Extensive timeline and detailed description of Watson's Bay (more specifically Robertson Park area) historic events presented.

- Discussion about post-1980s tree plantings in Robertson Park, and their lack of regard for blocking the important view corridor between “The Gap” and Watson’s Bay.

Physical Attributes

- The topography of Robertson Park is determined by its underlying Hawkesbury Sandstone rock formation, which tilts down gently westward from the high cliffs of “The Gap” toward the harbour. It was once bisected by a small freshwater stream that flowed here.

5. PLAN OF MANAGEMENT, NATURAL AREA (FORESHORE), JUNE 1996

5.1 Abstract

- The Plan of Management identifies issues and strategies relating to the management of public foreshore areas under Council’s control.
- Outlines a program of preservation to ensure the proper maintenance and survival items historically or environmentally significant.
- Emphasis is placed on the preservation of coastal environments from the impacts of urban development, recreational and commercial activity. Proposes strategies for the protection and promotion of harbour views, cliff sites, beaches, vegetation and native wildlife.

5.2 Section 1: Introduction

1.3 Council’s Land Management Goals

- To ensure the preservation of open space as a community resource for public access and recreation.
- To develop a regional coordinated approach to the management of open space.
- To encourage community participation in the management of open space.
- To satisfy district and regional needs for sporting and recreation facilities.

5.3 Section 2: History

2.1 Arrival of Governor Phillip

- Strong connection of the site to the earliest European arrival in Australia.
- South Head as the site of first signals in Australia, communicating the existence of a newly formed colony to incoming ships.

2.2 Military History

- The Woollahra region has featured prominently in Australian military history.
- South Head fortifications were constructed in the area during 1871 – 1876, and most guns were removed in the 1960s.

2.3 Views of the Harbour – Famous Lookouts

- Thousands of tourists each year are captivated by the impressive views of Sydney Harbour from numerous public lookouts within the Woollahra Municipality.
- Gap Park offers two perspectives of Sydney Harbour – one of calm harbour waters, the other a contrasting vision of untamed sea beyond the heads.
- “The Gap”, as a unique natural area, has inspired a range of human emotions, from admiration to despair. The high- profile tourist venue also has a reputation of being a notorious suicide spot.
- Gap Park established in 1887. After the completion of Old South Head Road in 1811 and New South Head Road in 1840s, it became a popular attraction for admiring steep cliffs and crashing seas.

5.4 Section 5: Management Issues

5.1 Public Access

- Protect and promote existing public foreshore areas.
- Ensure that existing foreshore open space is readily accessible and adequately used by the community.

5.7.1 Views and Vistas

- Council allowances for tree lopping or removal contribute to the protection of existing views. These policies aim to maintain the aesthetic value of foreshore areas while providing direct lookouts onto the harbour.

5.7.4 Bushland Management

- Gap Park is one of two of the last remaining areas containing remnant vegetation in the Woollahra Municipality. Council aims to preserve these rare areas of natural resource by implementing appropriate bushland management strategies.
- Earlier attempts at bushland management in Gap Park proved largely unsuccessful. They were administered in an ad hoc manner with little consideration of long term results.

5.8 Heritage Significance

- Provides a list of heritage items/sites within Gap Park:
 - Remnant coastal heathland vegetation and significant cliff sites.
 - Remnant tram track.
 - Military artefacts including gun emplacements and Grieve memorial.
 - Location of "The Dunbar" memorial and anchor.

6. WOOLLAHRA BIKE PLAN, APRIL 2000

6.1 Abstract

- The aims of the plan are:
 - Assess community needs for safe and convenient bicycle use.
 - Ensure Woollahra's Bike Plan complements those of neighbouring councils.
 - Develop a clear and achievable implementation strategy.
 - Estimate the cost of implementing the options recommended in the Bike Plan.

6.2 Section 3: Principles of Planning for Bicycle Routes

3.1.1 Principles

- The bicycle network for Woollahra based in the following criteria:
 - Safety
 - Coherence
 - Directness
 - Attractiveness
 - Comfort

6.3 Appendix A: Recommended Engineering Works and Associated Costs

Sub-regional Routes

- Recommendation for bike path to commence opposite Derby St and to follow the old tram route down to Military Rd. At an estimated cost of \$40 000, for the approximate 0.5km route.

Appendix H: Principles and Operational Guidelines for Inner-Sydney Areas

H8 Road and Path Surfaces

- Smooth contact and maintenance of edges between differing surfaces.
- Desired vertical variation of 5mm, with 10mm as maximum recommended.
- Textured surfaces at the end of paths.
- Off-road paths should be designed so that water can drain quickly, without depositing debris.
- Regular maintenance to ensure surfaces clear and free of debris after seasonal variations, and weeds, glass, gravel, tree roots and plant overgrowth do not make the surface unusable.
- Ramps and dropped kerbs should be installed where required.

H9 Shared Pedestrian / Bicycle Paths

- Absolute minimum width of 2m, but should be wider (2.5m) where space permits.

7. WOOLLAHRA CRIMEPREVENTION PLAN, JANUARY 2007

7.1 Abstract

- The plan developed to reduce the public's fear of crime and actual crime from occurring in Woollahra. Provides a framework to implement strategies to prevent crime.

7.2 Section 1: Executive Summary

1.1 Aims of the Crime Prevention Plan

- Ensures that public places are safe, attractive, and well cared for so that fear of crime is reduced and spaces are well used by the community.

7.3 Section 2: Introduction

2.2 The Role of Council in Crime Prevention

"Design out" Crime

- By ensuring that public spaces are designed to maximise safety through removing objects or situations that may create the chance for crime to occur.

7.4 Section 3: Background to Crime Prevention Planning

3.2 Situational Crime Prevention

- Target hardening, target removal, or target reduction.
- Natural or casual surveillance.
- Formal surveillance.
- Access controls.

3.3 Social Crime Prevention

- A public place can become less safe when, out of fear, less people use it, as with reduced usage the levels of natural surveillance is reduced.

7.5 Section 4: Crime Profile

4.1 Crime Profiles in Woollahra

- Bureau of Crime Statistics table presents evidence that malicious damage is the highest form of crime in the Woollahra Municipality.

8. WATSON'S BAY HERITAGE CONSERVATION STUDY, MAY 1997

8.1 Abstract

- Provides a detailed landscape character description of the environmental value within the Woollahra Municipality. Gap Park narrative is listed separately.

9. WOOLLAHRA HERITAGE STUDY, APRIL 1997

9.1 Abstract

- Lists Gap Park as an area of state historic significance, and also provides a detailed account of the Grieve memorial as an item of significance.

10. ASSESSMENT OF HERITAGE SIGNIFICANCE, SEPTEMBER 2003

10.1 Abstract

- Detailed assessment of “The Dunbar” anchor and rock inscriptions as items worthy of state heritage listing.
- The August 20, 1957 wrecking of “The Dunbar” ranks as the worst peacetime tragedy to befall NSW.
- Lists these items as significant to the community’s sense of place, and components of the city’s cultural fabric.

11. ARCHAEOLOGICAL REPORT, MAY 1998

11.1 Abstract

- Provides a detailed description regarding the historic value of the gun emplacements within Signal Hill and Gap Park, originally installed in 1893.

12. SYDNEY HARBOUR FORTIFICATIONS ARCHIVAL STUDY, PART ONE, MARCH 1985

12.1 Abstract

- Provides a detailed description regarding the historic value of the 1893 gun emplacements within Signal Hill and Gap Park.

13. HERITAGE ITEM LISTING, DUNBAR ANCHOR, TRAMWAY CUTTING, JULY 2007

13.1 Abstract

- Detailed description into the history and condition of the heritage listed “Dunbar” anchor.

14. SYDNEY HARBOUR NATIONAL PARK, PLAN OF MANAGEMENT, OCTOBER 1998

14.1 Abstract

- Survey recognised 26% of visitors from country NSW, and 21% from overseas.
- The track and associated interpretation of “Gap Bluff” to be upgraded. Old areas of asphalt will be covered and planted with native species, and informational/directional signs installed.
- The track will be promoted as a loop walk from “The Gap” over “Gap Bluff” and back past the “Officer’s Mess”.
- A walking track linking “Gap Bluff” to inner South Head, via Cliff Street, will also be developed.
- The use of part of the “Officer’s Mess” and its surrounds for functions, lectures, community meetings and information and a shop for the NPWS will also be investigated.
- Walking track from the end of Cliff Street at Camp Cove, behind Lady Bay, and then looping around the Hornby lighthouse is to be defined, directional, have interpretive signage erected, and be revegetated with native species.

15. GAP PARK, WATSON’S BAY, SEPTEMBER 2005

15.1 Abstract

- Designated as a public reserve on 28th June, 1887.
- Tramline extended to Signal Station at Watson's Bay 1903, and then to Gap Park in 1909.
- 1909 the old Gap Tavern was demolished and replaced by a new Town Hall. Rivoli Picture Theatre operated from the upper floor of this building from 1910.
- Refreshment rooms such as the Gap Café, the Park Tearooms, and the Dunbar Tearooms all opened near the tram terminus in Military Rd, below "The Gap".

15.2 Tourist Ventures in Gap Park

- At the turn of the 19th century Caesar Anthony Colonna engaged "Lassetter & Co." to erect a "camera obscura", housed in an octagonal red wood building, at Gap Park. In 1901 Vacluse Council ordered the building removed. The building was locked up, until 'forcibly removed' by the military authorities in 1914.
- Telescopes for hire were lodged at the park in the 1930s.

15.3 Monuments and Memorials

- Grieve memorial unveiled in December 1900.
- Dunbar wrecked in 1857, anchor was retrieved in 1910, and memorial was unveiled in 1930.
- The World War II gun emplacement was for a small calibre gun, which was never installed.

15.4 Development of Gap Park

- In 1920 Vacluse Council implemented a series of asphalt paths, with a safety light at the intersection of these paths with the tramline.
- In 1934 a landscape architect drew up plans for proposed improvements to the park, including new fences, seats, toilets, and clearing some existing building and weed growth.
- In 1960 the trams ceased, and the tracks were removed.
- In 1964 council filled in the 'old tramway cutting with the object of restoring the area'.
- In 1965 it was reported that Gap Park had been restored to 'something like the original contours, with great care being taken at the time to preserve the natural rock surfaces and the few remaining specimens of tea tree'.
- In 1966 extensive work had been carried out 'including stone revetments, regarding, topdressing....'
- In the 1980s a bush regeneration program was begun at Gap Park.

16. STATE OF THE ENVIRONMENT REPORT, 2004-2005

16.1 Abstract

- State of the Environment reporting enables council to report on the progress of the environmental activities undertaken in their areas, and provides a mechanism for monitoring the progress of ecologically sustainable development.

16.2 Section 3: Water

3.2 Environmental Works Program

Gap Park Stabilisation and Track Works

- Gap Park improvement works included the stabilisation of a section of drainage channel in Gap Park to control park runoff and the construction of a footpath and viewing areas at the southern, elevated end of the park.

16.3 Section 4: Biodiversity

4.1 Bush Regeneration and Revegetation Status of Council Reserves

- Table 4 displays how a high percentage (76%) of Gap Park is regenerated and under maintenance.

APPENDIX D

MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #1

Friday June 8 2007 2:00 - 4:00pm Woollahra Council Offices



MEETING NOTES

Gap Park Masterplan 2007

Council Officer Workshop # 1

Meeting held on June 29 2007 from 1pm to 3.30pm, at the Woollahra Council office.
Minutes prepared by Thompson Berrill Landscape Design P/L

Attendance:

David Sheils (DS)	Manager - Public Open Space, Woollahra Municipal Council
Rod Ward (RW)	Project Manager - Public Open Space, Woollahra Municipal Council
Llewallyn Jones (LJ)	Parks Co-ordinator, Woollahra Municipal Council
Jeff Hill (JH)	Team Leader Bushland, Woollahra Municipal Council
Rudi Adlmayer (RA)	Bushland Officer, Woollahra Municipal Council
Phillip Julian (PJ)	Parks Technical Officer, Woollahra Municipal Council
Paul Fraser (PF)	Parks and Recreational Co-ordinator, Woollahra Municipal Council
Orla Burke (OB)	Community Services Officer, Woollahra Municipal Council
Glenn Berrill (GB)	Director, Thompson Berrill Landscape Design P/L
Andrew Zouroudis (AZ)	Landscape Architect, Thompson Berrill Landscape Design P/L

Apologies

Greg Stewart (GS)	Traffic Engineer, Woollahra Municipal Council
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WORKSHOP WITH COUNCIL MEMBERS

RW opened the meeting, introduced the consultants, and gave a brief project overview. GB explained the role of TBLD in the development of the Gap Park masterplan. He outlined the planned techniques for the site analysis, the key deadlines, and then invited all present staff to introduce themselves and briefly explain their roles within Woollahra Municipal Council. The tables below include the general discussions and corresponding actions, as well as workshop notes about the strengths and issues of the presently existing Gap Park as seen by the council members.

<i>Item</i>	<i>Issues / Information</i>	<i>Actions</i>
1.0	General Preliminary Comments	
1.1	<ul style="list-style-type: none"> • Council manages 30ha of bushland with the Woollahra Municipality. • (RA) Flora list prepared for Gap Park • (JH) Woollahra Bushland Trust established 2006. • (JH) Gap Park site is 4.8ha. 	

Item	Issues / Information	Actions
	<ul style="list-style-type: none"> • (JH) Regeneration of almost denuded Gap Park began in the early 1980s. • OB discussed need to consider 'safety by design', which may involve reducing access to cliffs and increased lighting to allow for safe police patrol of site. • DS requested internet advertising of resident questionnaire, so that mailing list does not limit accessibility to interested public parties. • DS explained that 'Tourism NSW' unlikely to contribute funds to the development of Gap Park masterplan, as the project will not significantly impact tourist visitation to the site. State government also unlikely to contribute, but federal government may. • DS discussed how the local community is affected by very high visitation rates and associated traffic congestion, but reap no benefits or increased services. Also, local shops have little tourism trading as visits are mostly brief and favour known venues. • (GB) Land zoned as a future "right of way" in the south of Gap Park to have allocation reviewed within the masterplan. • (GB) Consider surface treatment for possible shared (cycle/pedestrian) pathway along former tramline. Sealed or unsealed? • (JH) Promotion of bushcare programme as part of masterplan an opportunity for educational groups • (DS) 19th August, 2007 is 150th anniversary of "The Dunbar" wreck, to be held at Signal Hill Reserve. Great opportunity to display preliminary MP information and design opportunities for public interest 	<ul style="list-style-type: none"> • (RW) Requires consideration in MP, but should not drive MP decisions, as this issue is common to all Sydney cliff sites and not just Gap Park • RW to investigate this closer to required dates • Requires discussion in streetscape masterplan process re type of businesses, and perhaps changing their mix • Requires research and consideration in MP • Requires consideration in MP • TBLD to prepare material for RW to display on site
2.0	Historic Artefacts	
2.1	<ul style="list-style-type: none"> • (GB) Historic wall near Gap Park entry steps needs rail to top, but needs to preserve archaeological features (brackets, etc.) • "Dunbar" anchor is located at Gap Park entry, but wreck was near "Jacob's Ladder" probably because people visit here, tram previously stopped here, etc. 	<ul style="list-style-type: none"> • Requires consideration in MP • (DS) Review retention or removal of "The Dunbar" anchor from site due to marine archaeologist's concern of ongoing deterioration of anchor in exposed site

WORKSHOP NOTES from Mtg #2

3.0	Strengths of Gap Park
3.1	<ul style="list-style-type: none"> • Popularity (equal to Bondi) • Coach visitation (regardless of infrastructure) • Dramatic scenery / sea cliffs • Rich underlying heritage (trams, gun emplacements, “The Dunbar”) • Affordable • Access to facilities (toilets, shops) • Accessibility (car, bus and ferry) • Natural heritage • Historical views from the ‘tramway’ • Habitat corridor (birds, reptiles, migratory birds, whales) • Whale watching • Opportunities for ‘passive recreation’ (walks, jogging, dog walking) • Proximity to other attractions (all day visits, “Doyles”) • Important link to reserves (Signal Hill Rs, Lighthouse Rs, Christison Pk) • Multiple access points (north and south) • Regional perspective and integration (“Greenweb” corridor) • Explorative play for children (small paths, bushland) • Historic interest (fabric and cultural relics i.e. “The Dunbar” anchor, military gun emplacements, walls, tramline) • History of area generally (Camp Cove settlers, indigenous occupation, trams, military) • 360° panoramic views • National profile • Geology (“Jacobs Ladder” volcanic dyke, cliffs, sandstone platforms) • Wet gully rainforest environment and creekline • Positive aspect of its darkness at night (low anti-social activity at night) • Contrasting micro-climates (wet gully to dry heath) • Surrounding bldgs (“Gunya”, churches) and their connectivity to park • Uplifting environment • Sense of mortality • Informal small secluded trails (variable routes to get away from “The Gap” crowds) • Interactivity of climbing up and down rocks • Cliffs (height, experience, drama, texture) • Ocean (swell, contrast with sheltered harbour) • Sense of darkness (enclosure and exposure) within vegetation • Views (sunrise and sunset, to city, corridor to harbour) • Gateway to harbour • “Sydney to Hobart” yacht race, fireworks, ship watching • Social gatherings (picnics, family parties, wedding ceremonies) • Photography • Painting • “The Dunbar” wreck (tangible nature due to anchor) • Cultural heritage (memorials, indigenous history) • Military history (“The Dunbar” ballast, gun emplacements, relics) • Scuba diving • Informal nature and genuine nature of experience due to largely unmodified cultural fabric • Cultural plantings (way finding nature of these) • Topography dictating landscape fabric • Film destination • Cliffs (from sea and air, waterfalls during rain) • Way finding devices from sea (trees, lighthouses) • Connectivity of gun emplacements (regionally, nationally)
4.0	Issues of Gap Park

4.1

- Suicide:
 - Realistic limits of landscape masterplan to address what is a far wider community concern and issue
 - Suicide at Gap Park affects far fewer people than the positive aspects of visitation do
 - Important to consider *all* options in the MP process
 - Suicide is indicative of weaknesses and stresses in our society as a whole and all of government have a role to play in facilitating responses to the problem
 - Lighting, phone contacts, to disrupt “downward spiral” during event
 - Identify locations (day or night), what is specific to sites?
 - Retrieval of bodies and impact on site users and residents
 - Managing ‘voyeurism’ aspect
 - Tour guides may promote incorrect suicide stories (usually smaller groups), address through education to tour groups
 - Unfortunate notorious reputation of “The Gap”
- Tourists
 - Large number of users
 - Buses take up parking. Minimal current parking controls seem to work OK.
 - Tours leave bus engines running, but are changing behaviour
 - Dominate narrow residential paths
 - Encourage tour groups to walk coastal loop so not parking twice.
 - Impact on Robertson Park (toilets, bins, etc.)
- Neglected paths, steps, walls, etc.
- Threatened species
- Fire Management (“mosaic burning” technique considered)
- Infrastructure
 - Remaining fence replacement requirement at “The Gap”
 - Very little seating currently (traditional far more).
 - Constricted and continual loss of views from existing seating and pathways due to increased vegetation bulk and height.
 - Vegetation height (taller spp) is not appropriate in some infrastructure viewing areas; to be addressed in the MP
 - Poor condition of pathways and surfaces
 - Poor fencing at “The Gap” entry and at key sites
 - Review steps and ramp at “The Gap” entry in the MP
 - MP to consider and resolve an integrated design response at “The Gap” viewing area, including fencing, surfaces, seating and access
 - erosion problems along tramline creek above “The Gunya”
- “The Gunya” building
 - Popular for community use
 - Outdoor informal space that previously existed is required for community use
 - Current carpark mulch storage inappropriate
 - Outdoor great for informal children’s play
 - Cultural planting at front entrance appears to be in poor condition, review planting design and spp in MP
 - Carpark requires consideration and review of layout and efficiency in MP
- Cultural planting : maintain and replacement strategy
- Management of revegetation
 - Defining uses and areas
 - Balance habitat vs users requirements
 - Edge management : reduce edge effects
 - Safety
 - Encroachment on open space by default
 - Loss of views due to proximity, species, and height of revegetation.
 - Habitat importance (bird, reptiles)

	<ul style="list-style-type: none"> • Public awareness of cultural features • Illegal dumping at “The Gunya” and corner Gap Rd and Dunbar St
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ACTIONS from Mtg #2

- *RW to confirm supply of feature level survey to allow TBLD to commence site analysis.*
- *RW to supply current road proposals drawing (CAD format) to allow TBLD to commence collating masterplan base plans.*
- *TBLD to prepare bibliography of documents*
- *TBLD to prepare background review of documents*
- *TBLD to set suitable date for suicide prevention forum with RW*
- *TBLD to coordinate with RW procedure for posting resident questionnaire on internet*
- *RW to invite representatives of the following to attend suicide prevention forum:*
 - *Eastern Suburbs Mental Health (Peter Clout)*
 - *Suicide Prevention Australia*
 - *Lifeline*
 - *National Parks and Wildlife Services (David Costello)*
 - *Vaucluse Progress Association (Michael Rolph)*
 - *Community Safety Committee*
 - *Police Rescue Squad*
 - *Rose Bay Police*
 - *WMC engineer (Frank Rotta)*
- *RW to confirm mail out distribution area (500m radius), and organise mail merge and return envelopes to WMC offices*
- *RW to invite representatives from National Parks and Wildlife Services NSW to attend site visit with TBLD to discuss commonalities to site management and masterplanning at “The Gap”, and infrastructure (e.g. fencing and signage)*
- *TBLD to meet GS with RW and DS to discuss Watson’s Bay streetscape project in context of MP*
- *TBLD to meet the bushland crew on site during site analysis phase. RW to coordinate*
- *TBLD to prepare draft questionnaires for 1) Visitor Questionnaire and 2) resident questionnaire*

APPENDIX E

MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #2

Friday June 29 2007 1:00pm - 3:30pm Woollahra Council Offices



MEETING NOTES

Gap Park Masterplan 2007

Project Working Group Meeting # 2

Meeting held on June 29 2007 from 1pm to 3.30pm, at the Woollahra Council office.
Minutes prepared by Thompson Berrill Landscape Design P/L

Attendance:

David Sheils (DS)	Manager - Public Open Space, Woollahra Municipal Council
Rod Ward (RW)	Project Manager - Public Open Space, Woollahra Municipal Council
Luallen Jones (LJ)	Parks Co-ordinator, Woollahra Municipal Council
Jeff Hill (JH)	Team Leader Bushland, Woollahra Municipal Council
Rudi Adlmayer (RA)	Bushland Officer, Woollahra Municipal Council
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Apologies

Greg Stewart (GS)	Traffic Engineer, Woollahra Municipal Council
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WORKSHOP WITH COUNCIL MEMBERS

RW opened the meeting, introduced the consultants, and gave a brief project overview. GB explained the role of TBLD in the development of the Gap Park masterplan. He outlined the planned techniques for the site analysis, the key deadlines, and then invited all present staff to introduce themselves and briefly explain their roles within Woollahra Municipal Council. The tables below include the general discussions and corresponding actions, as well as workshop notes about the strengths and issues of the presently existing Gap Park as seen by the council members.

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WORKSHOP NOTES from Mtg #2

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4.0	Issues of Gap Park
4.1	<ul style="list-style-type: none"> • Suicide: <ul style="list-style-type: none"> ○ Realistic limits of landscape masterplan to solve a wider community concern and issue ○ Effects far fewer people than positive aspects do

	<ul style="list-style-type: none"> ○ Displacing behaviour ○ Important to consider <i>all</i> options in process ○ Caused due to underlying weaknesses of whole system (community and government) ○ Lighting, phone contacts, to disrupt “downward spiral” during event ○ Target locations (day or night?), what is specific to sites? ○ Retrieval of bodies and impact on site users and residents ○ Managing ‘voyeurism’ aspect ○ Tour guides now promote incorrect suicide stories (usually smaller groups) ○ Notorious reputation of “The Gap” • Tourists <ul style="list-style-type: none"> ○ Large number of users ○ Buses take up parking. Minimal current parking controls seem to work OK. ○ Tours leave bus engines running, but are changing behaviour ○ Dominate narrow residential paths ○ Encourage tour groups to walk coastal loop so not parking twice. ○ Impact on Robertson Park (toilets, bins, etc.) • Neglected paths, steps, walls, etc. • Threatened species • Fire Management (“mosaic burning” technique considered) • Infrastructure <ul style="list-style-type: none"> ○ Remaining fence replacement requirement at “The Gap” ○ Very little seating currently (traditional far more). ○ Constricted views from existing seating due to increased vegetation. Height not appropriate. ○ Poor condition of path ○ Poor fencing at “The Gap” entry ○ Review steps and ramp at “The Gap” entry ○ Drainage: MP to consider and resolve integrated design at “The Gap” viewing area, including fencing, surfaces, seating and access erosion problems along tramline creek at “The Gunya” • “The Gunya” building <ul style="list-style-type: none"> ○ Popular for community use ○ Outdoor informal space that previously existed is required for community use ○ Current carpark mulch storage inappropriate ○ Outdoor great for informal children’s play ○ Cultural planting at front entrance in poor condition ○ Carpark requires consideration and review of layout and efficiency • Cultural planting : maintain and replacement strategy • Management of revegetation <ul style="list-style-type: none"> ○ Defining uses and areas ○ Balance habitat vs users requirements ○ Edge management : reduce edge effects ○ Safety ○ Encroachment on open space by default ○ Loss of views due to proximity, species, and height of revegetation. ○ Habitat importance (bird, reptiles) • Public awareness of cultural features • Illegal dumping at “The Gunya” and corner Gap rd and Dunbar St
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ACTIONS from Mtg #2

- *RW to confirm supply of feature level survey to allow TBLD to commence site analysis.*

- *RW to supply current road proposals drawing (CAD format) to allow TBLD to commence collating masterplan base plans.*
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- *TBLD to prepare background review of documents*
- *TBLD to set suitable date for suicide prevention forum with RW*
- *TBLD to coordinate with RW procedure for posting resident questionnaire on internet*
- *RW to invite representatives of the following to attend suicide prevention forum:*
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 - *Suicide Prevention Australia*
 - *Lifeline*
 - *National Parks and Wildlife Services (David Costello)*
 - *Vaucluse Progress Association (Michael Rolph)*
 - *Community Safety Committee*
 - *Police Rescue Squad*
 - *Woollahra Local Police*
 - *Woollahra council traffic engineer (Frank Rotta)*
- *RW to confirm mail out distribution area (500m radius)*
- *RW to invite representatives from National Parks and Wildlife Services NSW to attend site visit to discuss commonalities to site management and masterplanning at "The Gap", and infrastructure (e.g. fencing and signage)*
- *TBLD to meet GS with RW and DS to discuss Watson's Bay streetscape project in context of MP*
- *TBLD to prepare draft questionnaire for site and residential distribution*

APPENDIX F

MEETING MINUTES

Gap Park Masterplan: Council Officer Working Group Meeting #3

Friday July 13 2007 11:00am - 3:30pm Gap Park



MEETING NOTES

Gap Park Masterplan 2007

Project Working Group Meeting # 3

Meeting held on July 13 2007 from 11am to 3.30pm, at Gap Park.

Minutes prepared by Thompson Berrill Landscape Design P/L

Attendance:

Rod Ward (RW)	Project Manager - Public Open Space, Woollahra Municipal Council
Rudi Adlmayer (RA)	Bushland Officer, Woollahra Municipal Council
Glenn Berrill (GB)	Director, Thompson Berrill Landscape Design P/L
Andrew Zouroudis (AZ)	Landscape Architect, Thompson Berrill Landscape Design P/L

WORKSHOP WITH COUNCIL MEMBERS

GB and AZ met on site with Woollahra Municipal Council representatives RW and RA to gather information and discuss historic and current bushland regeneration practices and goals within Gap Park. The table below includes the general discussions and corresponding actions.

<i>Item</i>	<i>Issues / Information</i>	<i>Actions</i>
1.0	General Comments	
1.1	<ul style="list-style-type: none"> • RA explained that division of spaces shown on the WMC bushland management plan for Gap Park is to divide working hours. • (RA) Bushland works began in 1988. • (RA) Bushland east of 'Jacob's Ladder' valley has naturally regenerated – no planting. • (RA) Bushland west of 'Jacob's Ladder' valley was landfilled, and has been revegetated with Ku-ring-gai seed stock. • RA knows of a "super 8" video from a tram passenger going through Gap Park, by Scott McGregor. • (RA) Small Quercus ilex (Holly Oak) exists near bend in former tram alignment. • (RA) Coral trees were previously prevalent 	<ul style="list-style-type: none"> • TBLD to explore whether this is obtainable

Item	Issues / Information	Actions
	<p>on site as cultural plantings, but removed by council as hazardous (branch dropping).</p> <ul style="list-style-type: none"> • (RA) Oleander sp. previously flanked the entry to “Gunya” building, but now removed. • (RA) Fence separating church land from Gap Park now removed, and Glochidion sp. planted here recently. • (RA) Vegetation on embankments along Old South Head Rd is good example of remnant vegetation. Now managed separately to council. • (RA) Luallen Jones was working within council bushland team when sandstone walls were established within Gap Park. • (RA) Verge on east of Gap Rd was previously turfed, and is now planted. • (RA) Council has performed experiments on growth of bushland, with varying percentages of solar access. • (RA) Revegetated bushland west of “Jacob’s Ladder” valley is not of high value. Low plant diversity, such as Leptospermum, Crowea, Angpohora, Myrtacea. Turkey rhubarb dominates. • (RA) Revegetated bushland east of “Jacob’s Ladder” valley is of high value, with high plant diversity. Species such as Darwinia, Micromyrtus ciliata, Allocasuarina distylla. • (RA) Main tourists observed are German, Italian, American and Asian (from six main countries). Asian groups often sing in existing gun turrets. • (RA) Few tourists use back paths, as unsure of safety, unwelcoming entries, and dense overstorey. Locals use these paths as quiet, away from tourists. • (RA) Big problem with vandalism on site. Unsecured lights, bins, signs, etc. are removed or damaged. Aluminium signs were previously installed informing visitors of tram history, etc. but these were vandalised. • (RA) Toilet previously hung off edge of “The Gap” lookout area (photo in “Watson’s Bay Leaf”). • (RA) Historic tunnel through the cliff, under “The Gap” lookout. Now blocked up. • (RA) Gun emplacements used in World War I, and perhaps in World War II. • (RA) Natural caves occur just north of gun emplacements. • (RW) Recess in new fence was planned on being a viewing deck, but now unused. • (RA) Tuckeroo sp. planted very close to historic near gun emplacement. • (RA) Queensland rainforest species planted along “Jacob’s Ladder” part of Noel 	<ul style="list-style-type: none"> • TBLD to meet with LJ on site to find out where material came from, etc. • Requires detailed consideration in MP • Requires consideration in MP • Requires consideration of removal in MP

Item	Issues / Information	Actions
	Rutting bushland plan. Now taken over by Cissus sp. and Morning Glory. <ul style="list-style-type: none"> • (RA) Legless lizard habitat adjacent to church buildings. • (RA) Allocasuarina portuensis planted near "Gunya" building. • (RA) Melaleuca sp. existing adjacent to "Gunya" building, as cultural plantings. 	<ul style="list-style-type: none"> • Requires consideration of protection in MP • Requires consideration of protection in MP

ACTIONS from Mtg #3

- *RW to supply current road proposals drawing (CAD format) to allow TBLD to commence collating masterplan base plans.*
- *TBLD to prepare background review of documents*
- *TBLD to set suitable date for suicide prevention forum with RW*
- *TBLD to coordinate with RW procedure for posting resident questionnaire on internet*
- *RW to invite representatives of the following to attend suicide prevention forum:*
 - *Eastern Suburbs Mental Health (Peter Clout)*
 - *Suicide Prevention Australia*
 - *Lifeline*
 - *National Parks and Wildlife Services (David Costello)*
 - *Vaucluse Progress Association (Michael Rolph)*
 - *Community Safety Committee*
 - *Police Rescue Squad*
 - *Woollahra Local Police*
 - *Woollahra council traffic engineer (Frank Rotta)*
- *RW to confirm mail out distribution area (500m radius)*
- *RW to invite representatives from National Parks and Wildlife Services NSW to attend site visit to discuss commonalities to site management and masterplanning at "The Gap", and infrastructure (e.g. fencing and signage)*
- *TBLD to meet GS with RW and DS to discuss Watson's Bay streetscape project in context of MP*
- *TBLD to meet LJ with RW to discuss history of site land-filling, and historic walls*
- *TBLD to prepare draft questionnaire for site and residential distribution*

APPENDIX G

MEETING MINUTES

Gap Park Masterplan: Suicide Prevention Forum

Friday August 24 2007 2:00m - 3:30pm Woollahra Council Offices



MEETING NOTES

Gap Park Masterplan 2007

Suicide Prevention Forum

Meeting held on August 24 2007 from 2pm to 3.30pm, at the Woollahra Council Office.
Minutes prepared by Thompson Berrill Landscape Design P/L

Attendance:

David Sheils (DS)	Manager - Public Open Space, Woollahra Municipal Council
Rod Ward (RW)	Project Manager - Public Open Space, Woollahra Municipal Council
Llewallyn Jones (LJ)	Parks Co-ordinator, Woollahra Municipal Council
Orla Burke (OB)	Community Services Officer, Woollahra Municipal Council
Warwick Hatton (WH)	Parks Technical Officer, Woollahra Municipal Council
Bruce Rann (BR)	Parks and Street Trees Officer, Woollahra Municipal Council
Peter Clout (PC)	Prince of Wales Hospital
Mary-Anne Bowyer (MB)	Prince of Wales Hospital
Graham James (GJ)	Lifeline
David Costello (DC)	National Parks and Wildlife Services
Allan Baines (AB)	Police Officer, Rose Bay Police Station
Greg Shrimpton (GS)	Police Constable, Rose Bay Police Station
Isabelle Shapiro (IS)	Representative, Community Safety Committee
Glenn Berrill (GB)	Director, Thompson Berrill Landscape Design P/L
Andrew Zouroudis (AZ)	Landscape Architect, Thompson Berrill Landscape Design P/L

WORKSHOP WITH COUNCIL & MENTAL HEALTH PROFESSIONALS

RW and DS opened the meeting, introduced the consultants, and gave a brief project overview. GB explained the role of TBLD in the development of the Gap Park masterplan. He outlined the site analysis process, the key milestones, and then invited the attendees to introduce themselves and briefly explain their roles. The Rose Bay Police then presented findings on incidents and patterns of self harm within the site. Then the group identified current key mental health issues and strategies (open discussion), the role of local government with regard to these issues, and possible responses for implementation and inclusion within the Gap Park Masterplan. The table below outlines comments from the meeting.

Comments

- AB and GS from Rose Bay Police Dept talked through presentation on incidents within site (self harm or possible self harm), between August 06 and July 07.
- GS Incidents extend across Gap Park, but are definitely concentrated around “The Gap”, “Gap Bluff”, and Jacob’s Ladder, but do occur across the whole site.
- GS Average 40 deaths per year.
- GS Men : Women incidents are 50 : 50.
- GS Males 18-25 are a high percentage of self harm victims.
- GS Most suicides by night, but more attempts occur during the day.
- GS Many incidents occur on Sundays (possibly due to non work day), and also Thursdays (no reasons offered).
- GS Victims get to the site mainly by taxis, buses, and cars.
- PC Self harm is not an illegal offence.
- AB/GS Police policy is to speak to potential victims of self harm, and have talked many out of possible situations. Police negotiators are called in if person does not respond, or is there for a long time and cannot be talked out of situation.
- PC All incidents, as obliged under the health act, are reported to the mental health system.
- PC Psychological assessments are conducted by the health system, for those brought to them by the police. Magistrate within health system decides if admitted, or released.
- PC Police discretion to decide if person exhibits ‘bona fide’ self harm characteristics or not.
- AB recognises “8ft (high) fence is not the solution to the problem, and will ruin the positive aspects of the site”. Police want discreet CCTV to assist in investigations (to understand patterns, times, and methods of entry, etc.), and identification of victims (often no witnesses, and bodies never retrieved).
- AB/GS Perhaps CCTV at entries only, and main suicide locations.
- GJ from ‘Lifeline’ described how there is no easy fix to this issue. He noted that feelings of isolation are the main reason for self harm.
- AB/GS Sundays, Christmas’s, etc. are more frequent periods for incidents, as victims can become aware of their situation of loneliness.
- AB/GS 4-5pm to 2am are most frequent times of calls.
- AB/GS Sometimes incidents are “one-offs” (ie. relationship breakdown, job loss, etc.), but others have repeat incidences.
- MB Men tend to choose more violent means of suicide.
- GJ noted that part of the victim wants to die, but if they have some form of support (e.g. call to friends/family member/lifeline), then part of them wants to live also.
- MB Difficult to determine if callers are asking for help, in process of suicide, or fulfilling part of a plan.
- General group suggestion of signage throughout site, noting location of distance to nearest phone, suggestion of telephone with direct connection to support service e.g. emergency department of hospitals or to ‘lifeline’.
- PC comments that the negative reputation of “The Gap” needs cultural and generational change. Discussed possibility of renaming of site (e.g. Gap Park).
- MB discussed drama of location. These sites exist world wide – they are easy to get to, have convenient parking, are low public use areas, and notorious for “copy-cat” behaviour.
- MB noted people who go to “The Gap” want to succeed as it has been done here before successfully by others.
- MB Memorials are not recommended or condoned on site, as can have a negative effect on potential victims of self harm. Important to have a discreet place for grieving relatives and friends – somewhere to go, not in public view. Perhaps tree planting area for those affected.
- MB The earlier victims are intercepted the better, so methods to assist near entries to site are important.
- DC suggested tour guide licensing as an option, as NPWS are doing. Operators to attend information sessions regarding suicides to obtain license. Fines or penalties for breaches of codes. Difficulties of policing discussed.

- General group suggestion of voluntary change through tourism industry bodies, to change policies/principles also discussed.
- General group comment that media does not report incidents, in line with an agreed code of conduct.

ACTIONS from Mtg

- *Distribution of meeting minutes*
- *RW to coordinate updating group for future involvement in the Gap Park Masterplan process, regarding implementation of suggestions discussed.*

APPENDIX H

MEETING MINUTES

Gap Park Masterplan: Community Safety Committee Meeting

Thursday August 30 2007 2:00pm - 3:30pm Woollahra Council Offices



MEETING NOTES

Gap Park Masterplan 2007

Community Safety Committee

Meeting held on August 30 2007 from 2pm to 3.30pm, at the Woollahra Council Office.
Minutes prepared by Thompson Berrill Landscape Design P/L

Attendance:

David Sheils (DS)	Manager - Public Open Space, Woollahra Municipal Council
Rod Ward (RW)	Project Manager - Public Open Space, Woollahra Municipal Council
Orla Burke (OB)	Community Services Officer, Woollahra Municipal Council
Sue Turner (ST)	Woollahra Municipal Council
Warwick Hatton (WH)	Parks Technical Officer, Woollahra Municipal Council
Greg Shrimpton (GS)	Police Constable, Rose Bay Police Station
Isabelle Shapiro (IS)	Representative, Community Safety Committee
Ross Clifton (RS)	Representative, Community Safety Committee
Dianne Gaddin (GD)	Representative, Community Safety Committee
Juliet Kirkpatrick (JK)	Representative, Community Safety Committee
Gina Grubb (GG)	Representative, Community Safety Committee
Charles Woden (CW)	Representative, Volunteer in Policing
Elizabeth Carpenter (EC)	Double Bay Neighbourhood Watch
Paula Storey (PS)	Double Bay Neighbourhood Watch
Michael Rolfe (MR)	President, Vaucluse Progress Association
Helena Rolfe (HR)	Representative, Vaucluse Progress Association
Kevin Berry (KB)	Representative, Vaucluse Progress Association
Glenn Berrill (GB)	Director, Thompson Berrill Landscape Design P/L
Andrew Zouroudis (AZ)	Landscape Architect, Thompson Berrill Landscape Design P/L

WORKSHOP WITH COMMUNITY SAFETY COMMITTEE

RW and DS opened the meeting, introduced the consultants, and gave a brief project overview. GB explained the role of TBLD in the development of the Gap Park masterplan. He outlined the site analysis process, the key milestones, and then invited the attendees to introduce themselves and briefly explain their roles. The table below outlines comments from the meeting.

Comments

- RC suggested water fountain to be installed within site, with recycled water. This was generally not supported by others in the meeting due to council's policy of water saving
- RC suggests native flowers to encourage birdlife.
- KB requested action, not just planning.
- DG read a personal statement of the importance of this issue to the community, and suggested CCTV, improved fencing in areas, police patrols, signs informing of police patrols, public phones, lighting, memorial tree planting.
- OB read information by Michael Gerondis (apology), noting difficulties of determining victim numbers due to jurisdictional differences between police and water police in retrievals.
- OB suggested importance of intercepting possible self harm victims, at entries to site.
- PS suggests more signage of mental health organisations. Also suggests informing bus company drivers, taxi drivers, local shops, etc. to inform police about potential self harm victims in the vicinity.
- PS also suggests lighting of rainforest lower area, as she (being a local resident) knows this is currently an area of noise and negative activity at night time.
- HR suggests a nearby public phone, as there are none adjacent to foreshore trail system. 'Telstra' refused requests to install a phone. Suggests signs leading to phones.
- GG suggests no fountain, tram cultural interpretation signage, clearing of rainforest gully weeds for walking.
- GS reported 9 suicides, and 119 self harm incidents in the past 18 months. Police suggest lighting the entire path (or at least entry areas), "covert" CCTV cameras, and public phones.
- EC suggests getting more people to frequent the site, during day and night time, to encourage community spirit and cultural perception change of site, and help deter incidents of self harm. I.e. through cultural activities, performances, and encouraging opportunities for picnicking in grassy open space areas. Suggests researching the artist John Beard.

ACTIONS from Mtg

- *Distribution of meeting minutes*
- *RW to coordinate updating group for future involvement in the Gap Park Masterplan process, regarding implementation of suggestions discussed.*

APPENDIX I

MEETING MINUTES

Gap Park Masterplan: Community Workshop

Thursday August 30 2007 6:00pm - 8:30pm Vaucluse Yacht Club



MEETING NOTES

Gap Park Masterplan

Community Meeting #1

Thursday August 30 2007, from 6.00pm to 8.30pm, Vaucluse Yacht Club

1.0 WELCOME

DS and RW opened the meeting, introduced the consultants and gave a brief project overview. GB explained the role of TBLD in the development of the Gap Park Masterplan, and outlined the site analysis completed to date and the intent of the workshop. GB then invited participants (25 persons) to introduce themselves and participate in identifying the strengths, issues and opportunities to be considered in the Masterplan development.

2.0 WORKSHOP

The next part of the meeting was run as an informal workshop facilitated by GB with comments and suggestions recorded on butchers paper.

2.1 Strengths

- Well serviced destination – ferry and bus
- Remnant vegetation
- Panoramic views in two directions
- Rock formations and features
- Fresh air
- Bird life
- Historic fabric
- Intact natural/open space/landscape
- Importance of how it was used – earliest site of European occupation in Australia
- Important part of our defence – tunnels, gun emplacements
- Great opportunity for community involvement
- Coastal walk to gully walk
- Sense of potentiality
- Incredibly beautiful
- Big occasion place – eclipse, QE II, boxing day, NYE
- Maritime theme of strength / maritime trade
- Historic tall ships – passage of the tall ships
- Aboriginal significance

- Location central to other parks (Christisson park, South Head, Robertson park), and Watson's Bay village
- South Head CMP – potential to realise the vision for a unified site
- Size
- Ocean / nature
- Sea and harbour views
- Climbing up rocks
- Transition of spaces
- Variety of experience
- Elevation
- Popularity (locally and internationally)
- Green space
- Journey across site
- Morning beauty and walks
- Will not be commercially developed
- Unmodified landscape
- Atmosphere of calm
- Appeals to large age groups
- Council owned coastal heath environment
- Birdlife
- Gully landscape
- Bush regeneration areas
- Church buildings at boundaries
- Sound of ocean
- Accessibility (close to public transport options and open to all)
- City views
- Robertson park playground
- Beauty of sandstone

2.2 Issues

- Lack of information – historical visitor information
- Lack of parking
- Poor infrastructure – pathways, seating, lighting, fencing
- Loss of the history of the tramway alignment
- Rubbish
- Dog excrement and dogs in site
- Old fence in gully, out of place
- Could the village live with CCTV
- Seen as the centre of self harm in Sydney
- Suicide is a reality
- Quality (low) of retail development at Watson's Bay for the amount of visitors
- Fragmented zone of land management, and seamless expectations of experience
- Lack of orientation signage – how to get around
- Need a new way of thinking about land tenure
- Encroachment of vegetation into view corridors – loss of views - needs to be addressed
- Submarine net across the harbour
- Cost and priority of historic 'fabric' protection
- Lack of disabled access to coast

- Trail management
- Over development – how to prevent and manage
- Websites romanticise incidents of self harm within the site
- Tour guides capitalise on incidents of self harm within the site
- Cohesiveness between masterplan and items as identified and resolved in former council DCP
- Competing user groups
- Too much concrete through site
- Tourists conflicting with residents
- Bus parking needs to be rationalised
- Lack of “sympathetic” signage
- Condition of gully footpath and balustrade
- Appearance and condition of ‘The Gap’ main entry and fencing
- Lack of interpretive signage throughout site regarding former uses of site, etc.
- No seating at ‘The Gap’
- Accessibility through site – narrow paths
- Lack of all-ability accessibility through site
- Path in poor condition in gully from fig roots
- No bike access through site, as outlined in Woollahra Municipal Council bike plan
- New fences too high – obstructing views
- Watson’s Bay beach litter
- No water drinking fountains through entire site, and surrounding area.
- Shrubs becoming too high on harbour side of coastal path near ‘The Gap’ – obstructing views
- Coastal path in poor condition
- Power lines are unaesthetic to south of site.
- Creative playgrounds needed
- No seats under shade on entire coastal path
- Trip hazard to edge of Robertson Park entry path
- Safety of gully area

2.3 Opportunities

- Synergy of information systems for orientation, heritage, cultural values, and media (pod casts)
- Tour guide accreditation – possibly limit number of tourists (tours), requires public sector and private sector ownership
- Integrated history of the region. Enormous amount of history – chance to integrate this currently fragmented history.
- Provide information about famous Russian marine biologist (Nicholas Maclay).
- Opportunity for themed walks
- How is it promoted (lure of the site for exercise)
- Importance of how the overall site fits together
- HMAS Watson is insignificant in the site
- Restricting access? Charging for access?
- Opportunity for whale watching – telescopes (great for tourists)
- Destination integration. How do you put into an integrated feel?
- Heritage precinct – maritime theme
- Pride in positioning the area – lead to other improvements
- Receptacles for litter
- Subliminal issues

- Ferry integration
- Resident use of ferries
- New infrastructure must be in keeping with heritage fabric
- Reopen the former tram alignment for commercial use of a historic tram, running from Gap Park up to the top of the hill (near lighthouse), so the buses terminate at Christissons Pak. Tram shunts up and down
- Purchase a tram and fit out for installation on site (interpretive)
- Tours to the lighthouses (five in whole area)
- Potential for viewing platform
- Disabled access to destinations
- Interpretative signage
- Relocation of The Dunbar anchor to a more protected location, and more connected to the original location (i.e. Jacob's Ladder)
- Interpretation of the former tramway route, and signage
- Cycle paths along the tramway route
- Potential for The Gap Inn site to be redeveloped as a museum site
- Tell human stories of 'The Gap' - James Johnson story, Lt Grieve story
- Rebuild the camera obscura
- Cycle parking at the entries to the park to encourage people to cycle rather than use car
- Use former trail alignment trail for walking and cycling – great exercise for locals and all-ability access
- Widened or separate cycling route parallel to the walking path
- Possibly use the old tramway route for the cycling route
- Few locations where a tram ran through natural parkland
- Information centre (and museum combined)
- Annual 'no car day'. A chance for the focus on health– like 'city to surf'
- Too much lighting can ruin the natural landscape - keep it low key and located at entries
- Ensure media and websites do not report incidents of self harm
- Educate shop owners to become aware of potential victims of self harm
- Changing design of fence to make more difficult to climb
- 'The Gap' site needs to be really well designed
- Install CCTV cameras and lifeline phone(s)
- Easy to dial phone number for locals reporting incidents of potential self harm
- Local residents can be better educated in what to do
- Training workshops for local residents to assist people
- Install water drinking fountains (similar to Bondi Junction fountains – robust design)
- Showers at new tap location at Camp Cove
- "Medi-alert" for medical assistance along pathways
- Correctly graded all-ability access path through entire site for elderly, wheelchairs, etc.
- Fence upgrade at 'The Gap' main entry
- All-ability access to 'The Gap'
- Low level down-lights along path at 'The Gap' lookout
- Robinson Park toilets upgrade and upsize
- Integrated clear signage and path networks
- Careful consideration of safety and self harming issues throughout all potential implementations
- Minimal fencing so people can see over them
- Bus parking should be moved within NPWS land

- Lighting to gully to increase visual safety, and to remedy current hooliganism in this area
- Repairing paths through gully to remove trip hazards and tree root damage
- New balustrade and pathways through gully
- Close gully area after sunset
- Strong design of integrated low level lighting and furniture
- Extend natural vegetation zone to the western edge of vegetation area (i.e. across tramway cutting)
- Upgrading of steps to Gap Road
- Rationalising human movement patterns throughout site. Intensifying at north and south ends, and controlling accessibility through site
- Maintain tram cuttings
- General tidying up of site
- Consideration of bus pickup and drop-off points. Possibly allow only one point
- Bus shelter to Watson's Bay Village
- Protect The Dunbar anchor
- More information about The Dunbar wreck
- Interpretive vandal-proof signage integrated within footpath (as done at west end of Camp Cove)
- More lighting at night will encourage more people into site (consider implications)
- Consider reasons behind designed alignment of existing paths and their connecting views, etc.
- Locking garbage bins
- Distress phones for potential self harm victims, and signs to these around the site
- Demolish hall adjacent to St Peter's church, and use space to extend parkland
- Retaining and building on cultural artefacts
- Replace The Dunbar anchor with sculpture, selected from public tender. Possibly only during restoration works to anchor
- Apply for federal / state funding for all-ability access path(s)
- Directional signage with information and accurate distances to destinations throughout site – round table format, with arrows (like used at west head)
- Information booklets about the site, that could be sold to the public at a small price
- Connectivity from The Gunyah building to the park
- Area of reflection, for family/friends of self harm victims. Quiet area with seating, small plaques and tree planting

3.0 NEXT STEPS IN THE PROJECT

- RW to coordinate with community for future involvement in the Gap Park Masterplan process, regarding implementation of devices discussed. TBLD to complete preparation of the existing conditions plan

APPENDIX J

SUMMARY

Gap Park Masterplan: Site Visitor Survey Summary

Gap Park Masterplan

Summary of On Site Visitor Surveys

Prepared by Thompson Berrill Landscape Design P/L for Woollahra Municipal Council, September 2007

1.0 INTRODUCTION

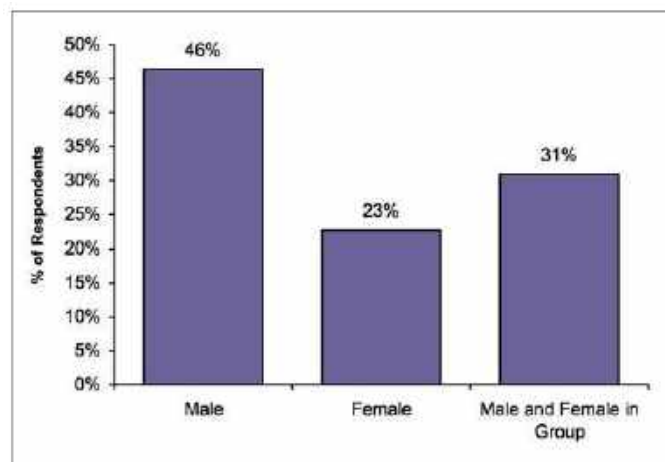
A visitor survey was prepared to seek feedback from the general public regarding Gap Park and their overall visitor experience. A total of 97 on site visitor surveys were completed with the assistance of two Thompson Berrill Landscape Design staff members who conducted the surveys either during the week or on the weekend. Each respondent was asked if they would like to participate in answering a series of questions in regards to such things as the frequency of their visits, lengths of stay and any suggested improvements with only 3 refusals due to other time constraints.

While some of the respondents were visiting Gap Park as part of a group, each survey form has been counted as one response for the purpose of calculating percentages. Each visitor survey was entered into an Access database and this paper includes a summary of these outcomes.

Please refer to Attachment A for a sample copy of the visitor survey form.

2.0 SUMMARY OF RESPONSES

2.1 Gender



The gender imbalance towards males may represent a male preference for visiting coastal sites or areas for contemplation or 'time out'.

2.2 Where they live

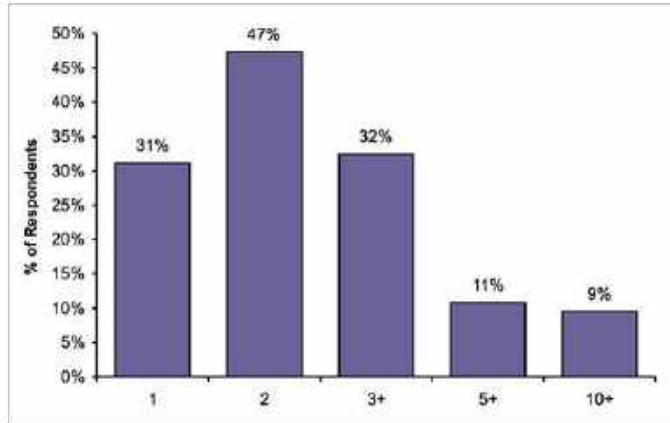
The predominant user group is from Sydney. Approximately 53% of visitors were from the Sydney area and included the suburbs of Bondi, Five Dock, Cronulla, Carlingford, Winston Hills, Watson Bay, Vacluse, Summer Hills, San Souci, Rosebay, Rhodes, Randwick, Point Piper, Parramatta, North Strathfield, Normonhurst, Neutral Bay, McMahn's Point, Liverpool, Kingsgrove, Kingsford, Harbord, Gosford, Georges Hall, Ermington, Eastlakes, Coogee, Chatswood, Castle Hill, Camperdown, Bronte, Blacktown, Bilgola, Beverly Hills, Bankstown, Auburn and Annandale.

Overseas visitors were the second most significant user group. Approximately 28% of visitors were from overseas and included the countries of the United States of America (6%), Korea (5%), United Kingdom (4%), New Zealand (3%), Netherlands (2%), China

(2%), South Africa (1%), Poland (1%), Italy (1%), Denmark (1%), Canada (1%) and Brazil (1%).

Approximately 17% of visitors were from interstate and included Queensland (6%), Victoria (5%), Western Australia (2%), South Australia (2%) and New South Wales (2%).

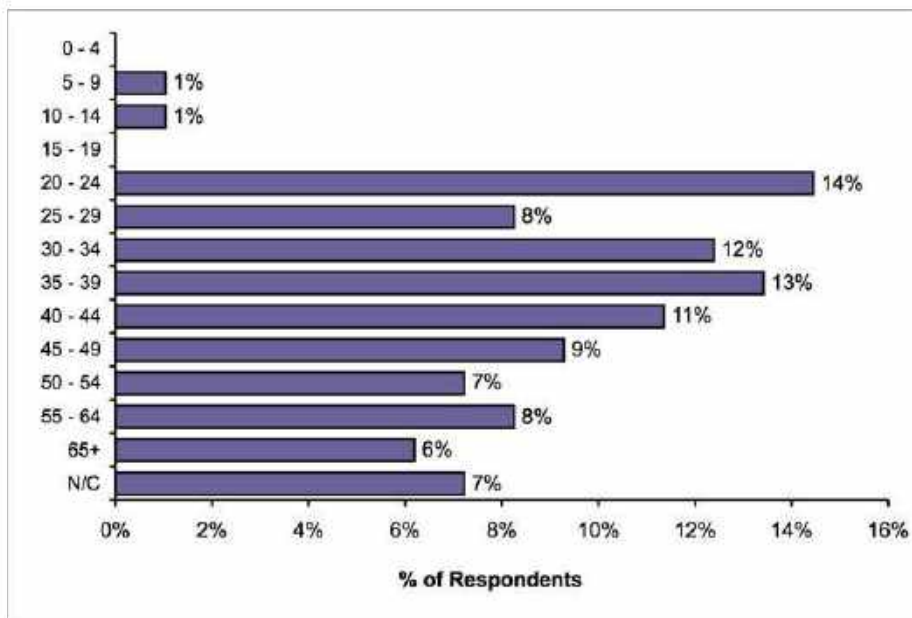
2.3 How many people were they visiting with



A large number of respondents indicated that they had visited Gap Park in groups of two or more people with 47% of respondents indicating they were visiting in a group of two people and another 32% of respondents were visiting in groups of three or more. This indicates the importance of social nature of visitation to Gap Park.

A total of 31% of respondents were visiting alone while around 20% indicated they were visiting with a group of 5 or more and some respondents indicated that they were part of a school or university excursion.

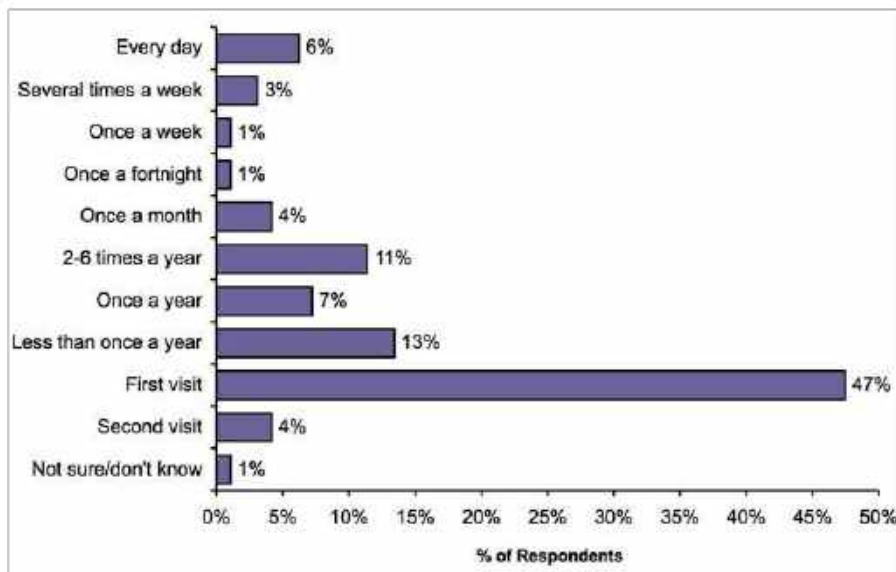
2.4 Age range



Results indicate that the 20-24 age group are regular visitors of Gap Park followed by the 35-39 age group with 13%, the 30-34 age group with 12% and the 40-44 age group with 11%.

This indicates a surprisingly high level of younger visitors, combined with an even spread of visitors throughout all age areas.

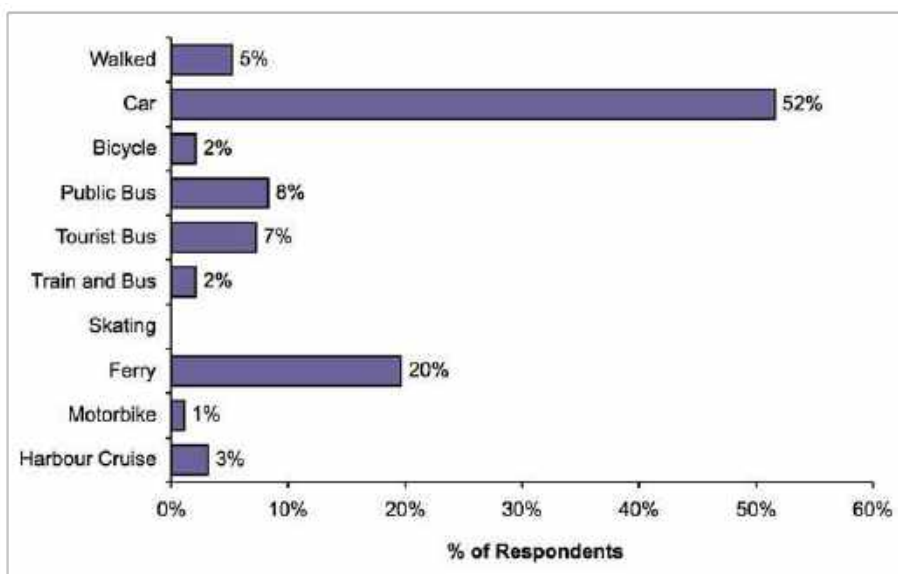
2.5 How often do they visit



An overwhelming number of visitors were visiting Gap Park for the first time with around 47% of the respondents surveyed indicating that they were first time visitors. Along with first time visitors, 13% of respondents visit less than once a year, 11% visit 2-6 times a year, 7% visit once a year and 6% visit every day.

This indicates that residents from the local Sydney area are visiting Gap Park for the first time followed by those who visit the site 1-6 times a year.

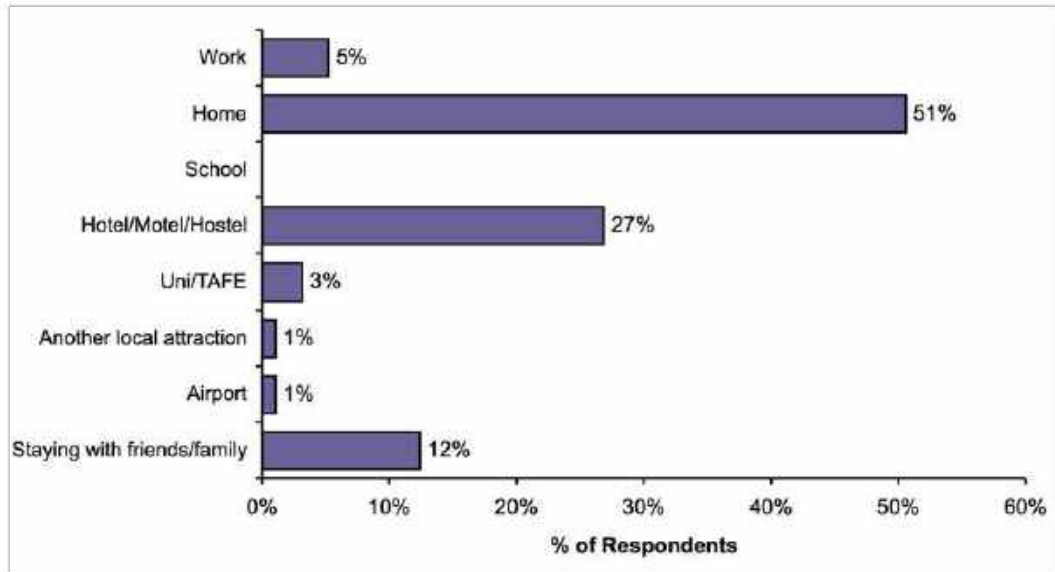
2.6 What was the main form of transport used to get to Gap Park



Over half of respondents had used a car as their main form of transport to the site (52%) followed by the ferry (20%), public bus (8%), tourist bus (7%) and walking (5%).

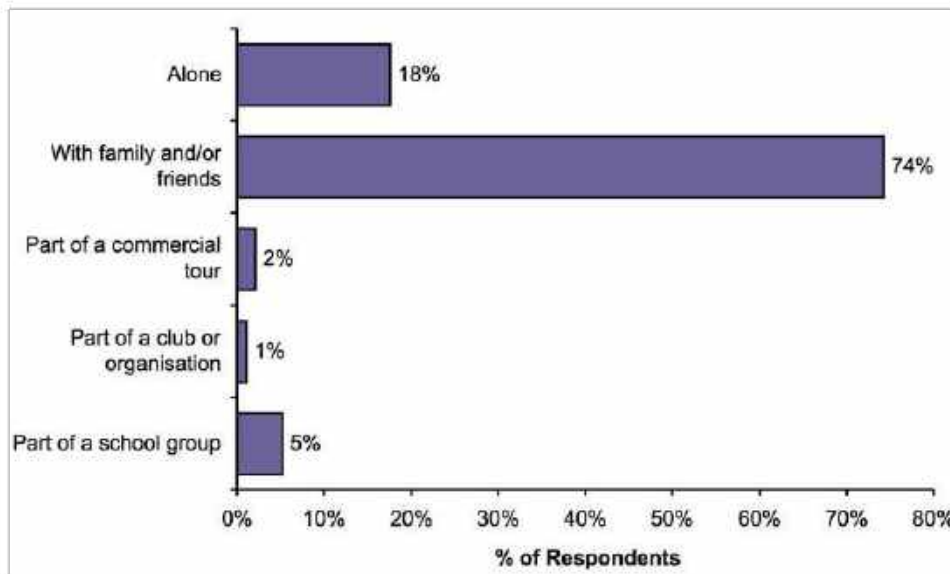
Results show that car use to visit Gap Park is the dominant form of transport indicating an opportunity to reduce vehicle impact by emerging transport forms. Ferry is surprisingly light and could be higher if promoted more. Bicycle use is very low indicating the low connectivity of paths up to the site.

2.7 Where did they travel from



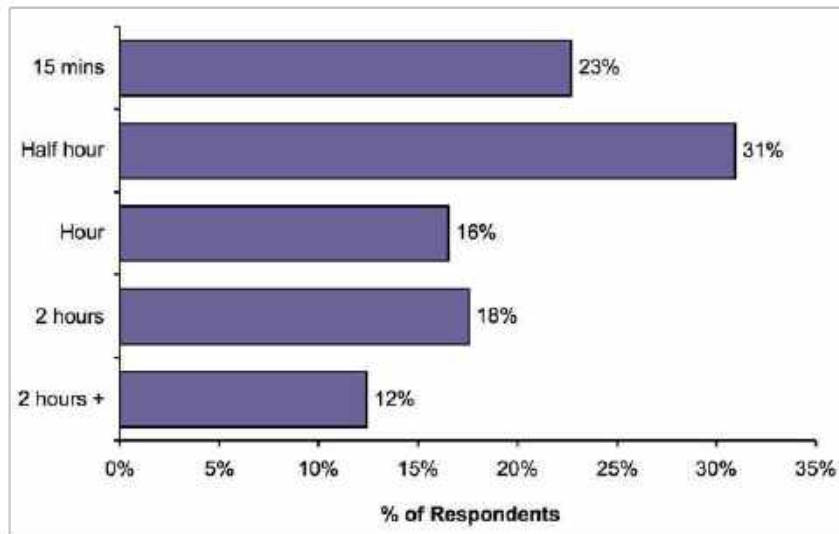
Approximately 51% of the visitors to Gap Park had traveled from home while 27% of respondents had traveled from their hotel/motel accommodation and 12% had traveled from a friends or relatives home.

2.8 What type of group were they with



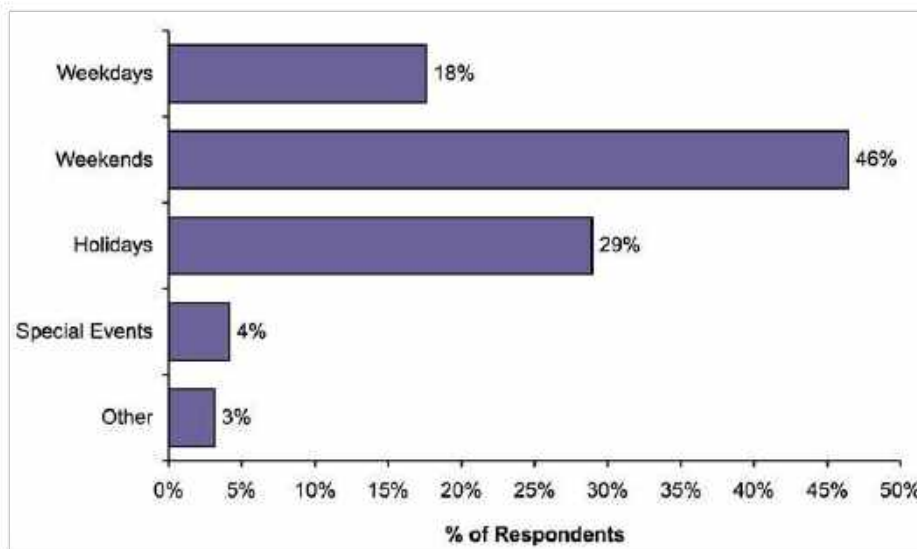
Results indicate that 74% of respondents were visiting Gap Park with other family members or friends.

2.9 Length of stay



Around 70% of respondents stayed at the park for no longer than an hour while around 30% of respondents stayed for 2 hours or more.

2.6 When do they visit Gap Park



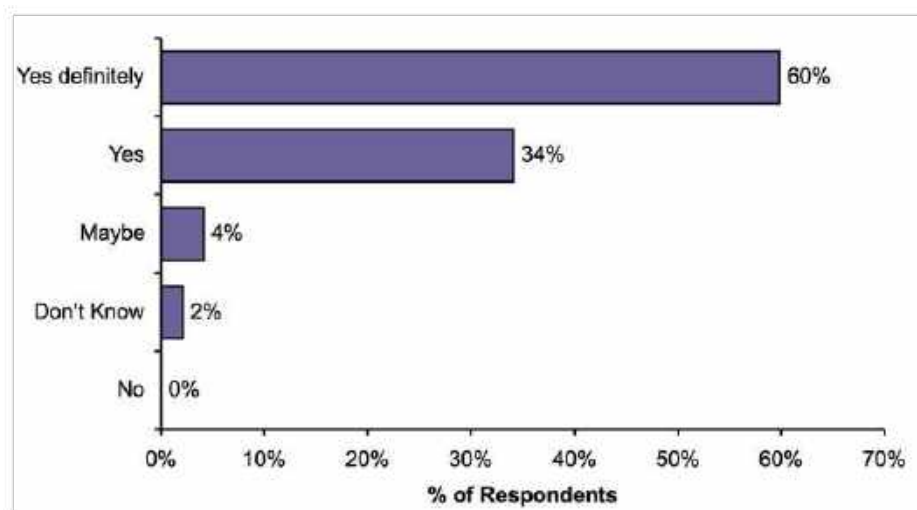
Approximately 46% of respondents indicated that they visit Gap Park on the weekends, 29% of respondents indicated that they were on holidays and 18% of respondents indicated they visit on weekdays. Several respondents explained that they visited the site specifically during the week due to high visitor numbers on the weekend.

2.7 What languages other than English are spoken at home

67%	English is the main language spoken at home
6%	Korean
3%	Chinese
2%	Portugese
2%	Mandarin
2%	German
2%	Dutch
2%	Danish

- 1% Vietnamese
- 1% Turkish
- 1% Thai
- 1% Russian
- 1% Polish
- 1% Nepalese
- 1% Italian
- 1% Indonesian
- 1% Hungarian
- 1% Fiji Hindi
- 1% Cantonese
- 1% Bunjabi
- 1% Africaans

2.8 Would they come back to Gap Park



Approximately 94% of respondents indicated that they would definitely come back and visit Gap Park.

3.0 REASONS FOR VISITING GAP PARK

The most popular value of Gap Park was its views with 52% of respondents selecting this as their reason for visiting.

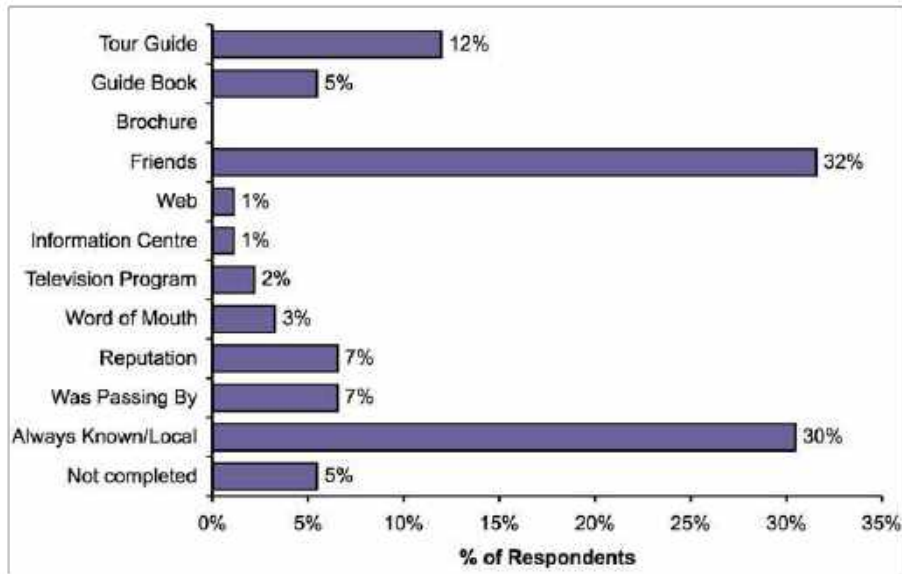
- %
- 52% Views
- 20% Walking
- 18% Site seeing
- 10% Fresh Air
- 8% To show friends or family
- 8% Lunch at Doyles
- 5% Tourist attraction
- 5% Cliffs
- 5% Restful tranquility
- 4% On the way
- 4% Photography
- 3% Stumbled across it
- 3% Historical
- 3% For the food e.g. fish and chips
- 3% Walking the dog
- 2% See what it is all about
- 2% Scenery
- 2% Proximity to Watsons Bay

2%	It is a stop on the harbour cruise
2%	Have breakfast or lunch or dinner
2%	Day trip
1%	Visit the park
1%	To whale watch
1%	Sydney icon
1%	Something to do
1%	Part of school excursion
1%	Old architectural buildings
1%	Looks dangerous
1%	Information centre suggested to visit
1%	Fun
1%	Friends or family suggested to visit
1%	Experience the eastern suburbs
1%	Dunbar story
1%	Bus tour stops at the Gap
1%	Brings back memories
1%	Bushland

4.0 WHAT THEY VALUE ABOUT GAP PARK

70%	Views
18%	Fresh Air
16%	Cliffs
14%	The ocean
11%	Walking
10%	Restful tranquility
8%	Natural Place
8%	Bushland
5%	It's history
4%	Sound of the ocean against the rocks
3%	Views of the ships
3%	Rock shapes and colours
3%	Photography
2%	The park
2%	It's natural landscape character
2%	Birdlife
1%	Unique geographical location
1%	The stories
1%	The sky
1%	Stroller friendly
1%	Sense of democracy
1%	Seeing and visiting new places
1%	Restaurants and pubs are nearby
1%	Playground at the park
1%	Plaques
1%	Ocean meets the harbour
1%	Fish and chips at Doyles
1%	Exercising
1%	Close to everything
1%	Clean and tidy
1%	City views
1%	Walking the dog
1%	Not Completed

5.0 HOW DID THEY HEAR ABOUT GAP PARK



It appears that respondents had heard about Gap Park from a variety of different sources with 32% had heard about the site from friends or family, 30% had always known it was there as they resided in the local area and 12% had been told to visit by a tour guide.

6.0 ISSUES TO BE ADDRESSED

53%	None provided
10%	Poor fence
10%	Poor Parking
9%	No Bins
6%	Lack of seating
3%	Rubbish
2%	Poor Paths
2%	Too many people
2%	Height factor
2%	Negative history and stories
2%	No drinking fountains
2%	Toilets in the park
1%	No Lighting
1%	Aboriginal history
1%	Dog poo
1%	During first visit to the park, witnessed a suicide
1%	Having to walk all the way around to the other side
1%	Inappropriate behaviour e.g. drugs
1%	Lack of directional signage
1%	Lack of information on location
1%	Narrow paths
1%	Needs a telescope
1%	No good vantage points
1%	No suitable access for prams, had to carry pram up the stairs
1%	No tour guide on site
1%	The rails
1%	Too commercial
1%	Unable to look right over the cliffs

7.0 SUGGESTED IMPROVEMENTS

15%	Retain natural character, do not overdevelop
15%	None suggested
14%	More benches or seats required
10%	No improvements required
9%	Upgrade fencing
7%	Rubbish bins required
7%	More signage required including maps
7%	Additional parking required
4%	Provide tourist information
4%	Needs a telescope
3%	Upgrade paths
3%	Toilets in the park require regular maintenance
3%	Provide bins for cigarette butts
3%	Provide better vantage points
3%	More maintenance required e.g. paint the fences
3%	More information about historical events and development including photos
2%	Plaque with information for gun emplacements
2%	On site tour guide required
2%	More native vegetation required
2%	Bush regeneration required
1%	Provide ramp for prams for better access
1%	Weed control required
1%	Watson's Bay to Manly ferry
1%	Tidy up the steps
1%	Stop driving past crossing at the Gap
1%	Skate park required
1%	Signs for Asian visitors e.g. directional signage
1%	Shelters required
1%	Seats to be located in the shade
1%	Seafood shop required
1%	Retain bushland setting
1%	Reopen tram line
1%	Reopen gun emplacements
1%	Provide a place for children to play
1%	Preserve the coastline
1%	Preserve ecosystem
1%	Plant trees in front of NP buildings harbour side
1%	Picnic tables required
1%	Ongoing maintenance required
1%	No cafés required
1%	New fence required at the Gap site
1%	Move sandstone boulders at cliff base
1%	More signage informing people that path ends at the top
1%	More restaurants required
1%	More public transport required
1%	More play equipment required
1%	More information about the tram line
1%	More information about native vegetation
1%	More information about local wildlife including birdlife
1%	More advertising required
1%	Glass fencing required
1%	Get rid of the rails
1%	Get rid of the fences
1%	Ferries to be more regular
1%	Fences are too low for children
1%	Directional signage to Watsons Bay required
1%	Cafes required
1%	Bicycle tours around the peninsula
1%	Area is too windy
1%	Allow dogs

ATTACHMENT A

Copy of Site Survey

Gap Park Masterplan Questionnaire



Woollahra Municipal Council

1. Male Female Postcode Age Range 15-19 20-24 25-29 30-34 35-39
 40-44 45-49 50-54 55-64 65+

2. How often do you visit The Gap (Gap Park)?

Every day Several times a week About once a week Once a fortnight Once a month
 About 2-6 times a year About once a year Less than once a year First Visit Irregular

3. What is the main form of transport you use to get to The Gap (Gap Park)?

Walked Car Bicycle Public Bus Tourist Bus
 Train and bus Skating (inline/board) Motor bike Ferry Other_____

4. How long do you usually stay at The Gap (Gap Park)?

15 mins half hour 1 hour 2 hours 2 hours +

5. When do you mainly visit The Gap (Gap Park)?

Weekdays Weekends Holidays Special Events Other

6. What do you like or value most about The Gap (Gap Park)?

Ocean Views Harbour Views Walking for exercise Walking the dog Coastal Walking Trail
 Fresh Air Restful Tranquility Native Birdlife Bushland Natural Place
 Historical Features Spectacular Cliffs Place for Photography Place to meet Friends Jogging
 Other _____
 Other _____

8. What issues would you like addressed in the plan?

1. _____
2. _____
3. _____
4. _____
5. _____

APPENDIX K

INDEX OF IMAGERY BOARDS

Gap Park Imagery: Flora and Fauna

Gap Park Imagery: Landscape Types

Gap Park Imagery: Park Visitors

Gap Park Imagery: The Dunbar

Gap Park Imagery: Trams

APPENDIX L

INDEX OF DRAWINGS

GPMP-01 Gap Park Masterplan: Overall Masterplan March 2008

GPMP-02 Gap Park Masterplan: North and South Entries Plan March 2008

GPMP-03 Gap Park Masterplan: Self Harm Minimisation Plan March 2008



- ### Self Harm Minimisation Strategies
- Lighting**
 - Low level LED lighting fully integrated with new seating, on two main entry locations, as shown
 - Increased intensity lighting at specific entry zones for CCTV surveillance
 - Vandal-resistant design
 - All weather protection rating
 - Safety Telephone**
 - Programmable send and receive numbers with no charge for call
 - Close to three path sections to programmed numbers (e.g. 000 or local police)
 - Audible and visual feedback on button press
 - Hands-free speaker, with built-in microphone
 - Internal battery with charging option (recharge, reuse)
 - Digitally stored announcements
 - Buried location options
 - Vandal detection, with automatic dial-in reporting
 - Unique ID for location information
 - Vandal-resistant aluminium housing, with dual high security locks
 - All weather protection rating
 - Signage**
 - Directional signs to safety phones
 - Directional signs to key locations, with distance listed
 - Proposed Fencing at Key Locations**
 - Curved vertical blades with noxious symbols, allowing for maximum visual transparency and curved inward to deter climbing
 - Diagonal timber top handrail, in keeping with historical coastal handrail theme
 - Welded stainless steel square mesh fill to deter climbing
 - Closed Circuit Television (CCTV)**
 - Position of CCTV surveillance for visitors viewing site through main entries
 - Remote monitoring available, e.g. at local police station
 - Vandal resistant camera housing
 - All weather protection rating

- ### Key Principles and Recommendations
- Cultural**
 - Gap Park has diverse cultural values which are not well respected for the general public. Cultural values are to be protected and interpreted.
 - Corridor, interpret, and adaptively re-use the former tramway route as a 2.5m wide graded, all-ability shared access link between north and south of Gap Park.
 - Former tram station and 'The Glen' to be protected and enhanced, with interpretive signage installed.
 - Interface with adjacent church buildings and grounds to be maintained as open and informal.
 - Railcorridor: The Dunbar Ladder (front carpark), with some cultural plantings retained, and a firebreak zone created close to the building.
 - History**
 - Gap Park has a rich heritage fabric to be protected and interpreted. Information regarding the history of the site shall be provided through a series of interpretive signage panels through the park.
 - The story of The Dunbar wreck, and some of the people involved (as well as origins of SES services), to be told through the landscape and interpretation.
 - Protect and conserve historic anchor suffering from severe rot deterioration. Implement recommendations of condition report, including electrolysis treatment (off site), specialist treatment as part of an ongoing protection regime, and investigate retaining anchor to show sheltered location of the site.
 - Jacob's Ladder footpath to be interpreted, and explain its former use as a novel way-finding device.
 - Develop memorial to include information about the life and tributes of Lieutenant Gordon Grievess, and to be retained or protected as required. Information shall be provided regarding the history, function and role of these former military installations.
 - Former location of camera obscura to be sculpturally interpreted, with information regarding the history and workings of this unique historical feature.
 - Visual**
 - The visual amenity of Gap Park is of vital importance to its identity and meaning to the community. The site's views define its character, and make it a unique and highly visited location.
 - Maintenance of the visual access to the cliffs, ocean, city CBD, harbour and the forests. In some instances these views (that historically existed) can be improved through the selective removal or thinning of encroaching vegetation.
 - Improve visual access along pathways by selective removal or thinning of encroaching vegetation (increasing safety by improving public surveillance in this area).
 - The Norfolk Island Pines are of high cultural value to the site, and are to be retained and protected.
 - Develop memorial to include information about the life and tributes of Lieutenant Gordon Grievess, and to be retained or protected as required.
 - Views to sandstone cliffs and rock platforms shall be improved through the installation of a new lookout point, and improved through planting with diverse endemic species.
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 - Views to sandstone cliffs and rock platforms shall be improved through the installation of a new lookout point, and improved through planting with diverse endemic species.
 - Environment**
 - Gap Park has significant environmental, ecological, and habitat values.
 - The ecology of the site is rich and diverse in some areas, and of lower quality and diversity in other areas. Areas of high diversity and ecological importance are not to be developed, disturbed or accessed by the public.
 - High diversity remnant woodland areas (east of the former tram alignment, between Jacob's Ladder and The Gap) and the Gap Lookout area are to remain undisturbed and unimproved. Bush regeneration works to concentrate work on maintaining the ecological quality of this area.
 - High diversity remnant woodland areas (west of Jacob's Ladder valley, near The Gynyah) are of high quality, and provide good fauna habitat. This vegetation is to be retained and improved.
 - Lower diversity remnant woodland areas (east of Jacob's Ladder valley) were planted after the removal of the tramline, and over time the vegetation is to be consolidated, retained and improved through planting with diverse endemic species.
 - Littoral rainforest on lower portion of Jacob's Ladder valley, now valuable cultural plantings dominated by Old species, and weed infestation. Character of area is to be retained and improved with long term weed control strategies.
 - Introduce a greater variety of low growing indigenous species at main entry planting, to create an educational and botanical feature for tourists and residents, with interpretive signage.
 - New trees are to not be planted on the site, as tall trees did not previously occur within this windward coastal environment, maintaining the original visual character of the site.
 - Habitat boardwalk allow for fauna movement across shared path environment.
 - Safety**
 - The Gap Park masterplan aims to increase general safety for the users of the site, and also seek to deter people considering self-harm. Generally, site safety shall be increased through a range of measures.
 - New boardwalks to be installed at the key lookout areas to the north and south.
 - All proposed elements within the landscape are to be durable, stable, and securely installed, to reduce vandalism.
 - People considering self-harm shall be deterred through increased lighting of the two key entries, CCTV, safety telephones, and improved directional signage to telephones (see self-harm minimisation notes).
 - Cultural programs are to be promoted to help de-stigmatised the site as a known venue for self-harm, and generally increase use of the site, improving community ownership.
 - Discrete areas for families and friends of victims of self-harm, with ceremonial tree planting, to be provided near 'The Dunbar'.
 - New bicycle refuge to be provided near south entry, for access over road to shared path (decision subject to future investigations).
 - Recreation**
 - Recreation to be improved within Gap Park wherever possible to increase public use of the site for public health, assist in Kaboring community spirit, and improve public surveillance.
 - Walking and jogging are popular activities on the site. New directional signage is to be installed across the site, with distances and destinations clearly displayed.
 - Park-benching areas and tables that were previously provided to the east of Gap Park shall be reinstated to improve community ownership of the park.
 - All-ability access to the site is currently limited to the northern and southern lookouts within the site. A shared, graded, all-ability shared path shall be installed through the western part of the site, along the former tram alignment.
 - Shared path provides off-road pedestrian / bicycle pathway in accordance with the 'Woodlands Bicycle Plan (2000)'.
- Bird watching to be improved through improving native vegetation areas, as defined in the masterplan, and providing signage with bird species information.
- Opportunities for wildlife watching to be improved through the installation of new lookout point, and improved viewing lookouts.
- Photography opportunities improved through the installation of new lookout point, improved existing lookouts, and through selective removal or thinning of encroaching vegetation.

- ### DRAWING KEY
- Existing trees to be retained
 - Existing Norfolk Island pine to be retained
 - Proposed shrub plantings
 - Proposed native grass plantings
 - Littoral rainforest area
 - Low diversity remnant area
 - High diversity remnant area
 - Existing entry planting
 - Proposed turf areas
 - Former tramline to be converted into all-ability graded shared path, 1.5m wide, hand railing and permeable surface
 - Habitat boardwalk and bicycle dike
 - Control walk and seated amenity path along former tramline alignment
 - Minor pedestrian path connections
 - Existing walls to be retained
 - Significant view lines
 - Directional signage
 - Interpretive signage
 - Self-harm minimisation infrastructure (CCTV and safety telephones)



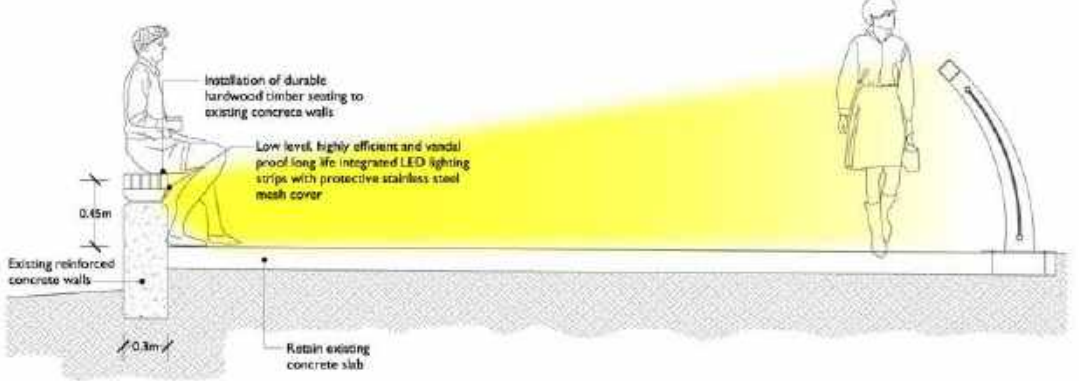
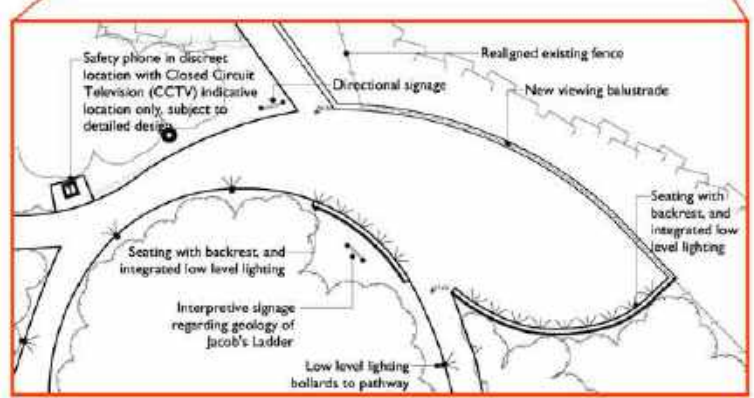
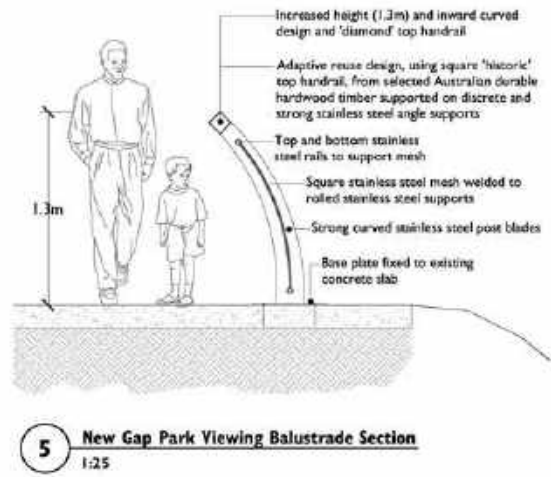
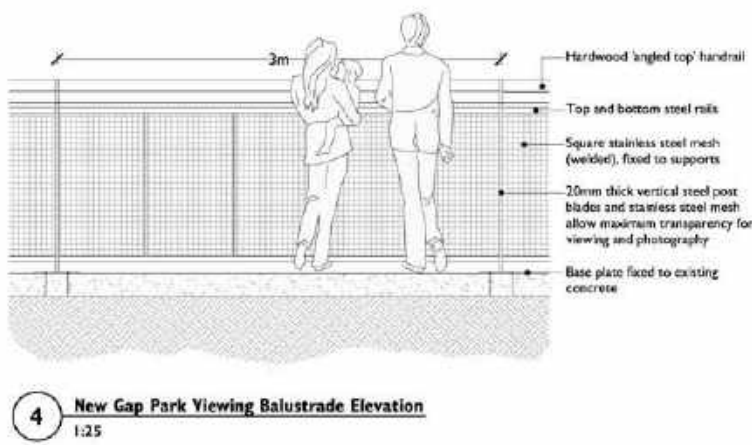
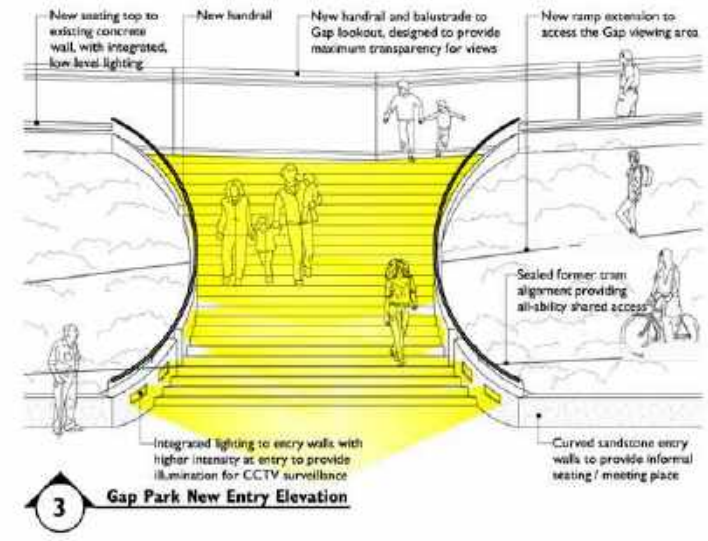
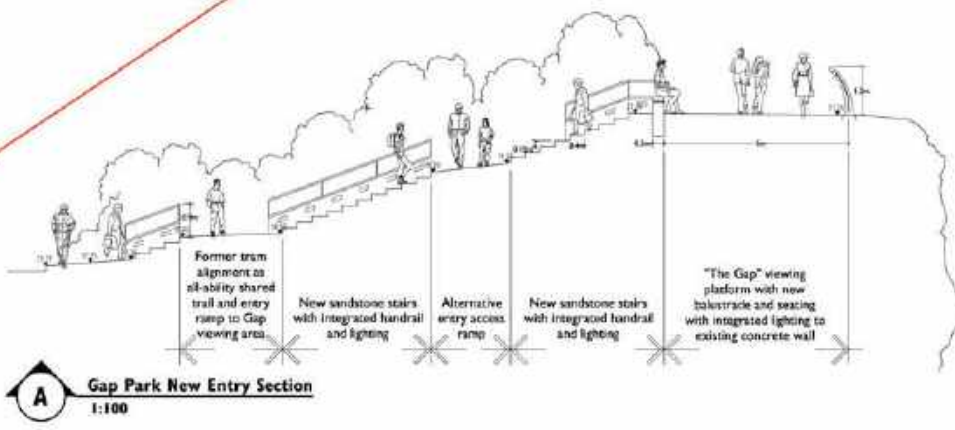
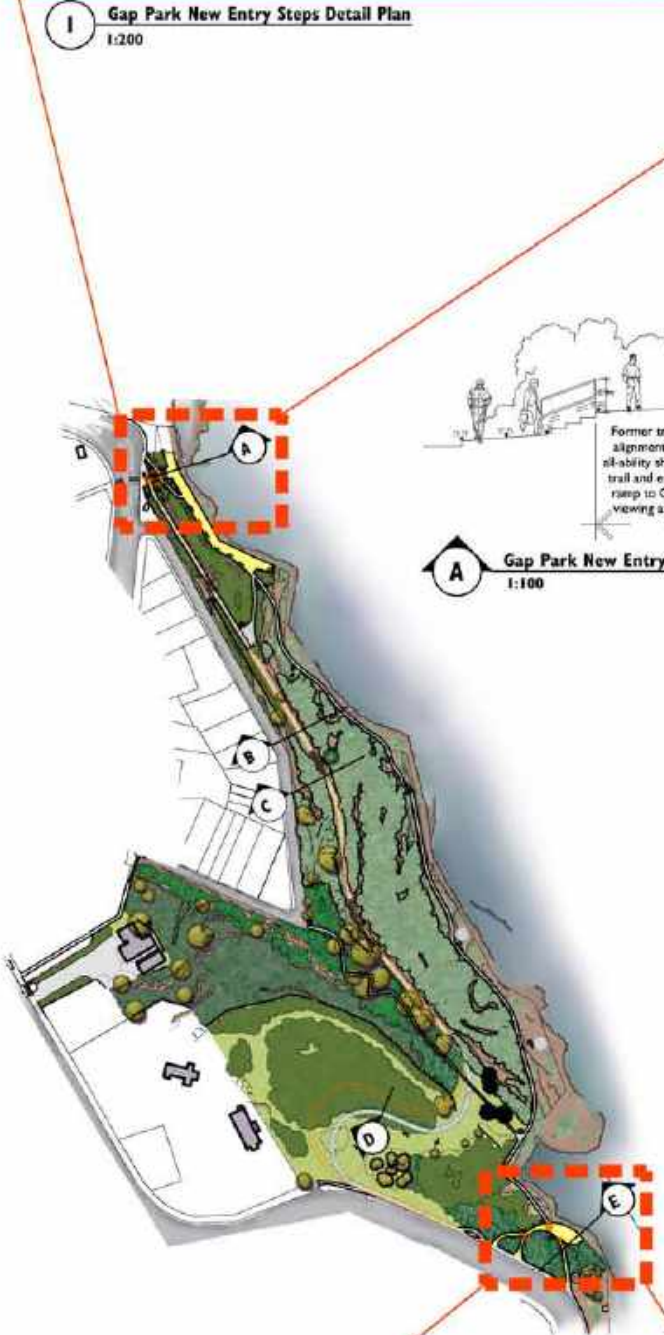
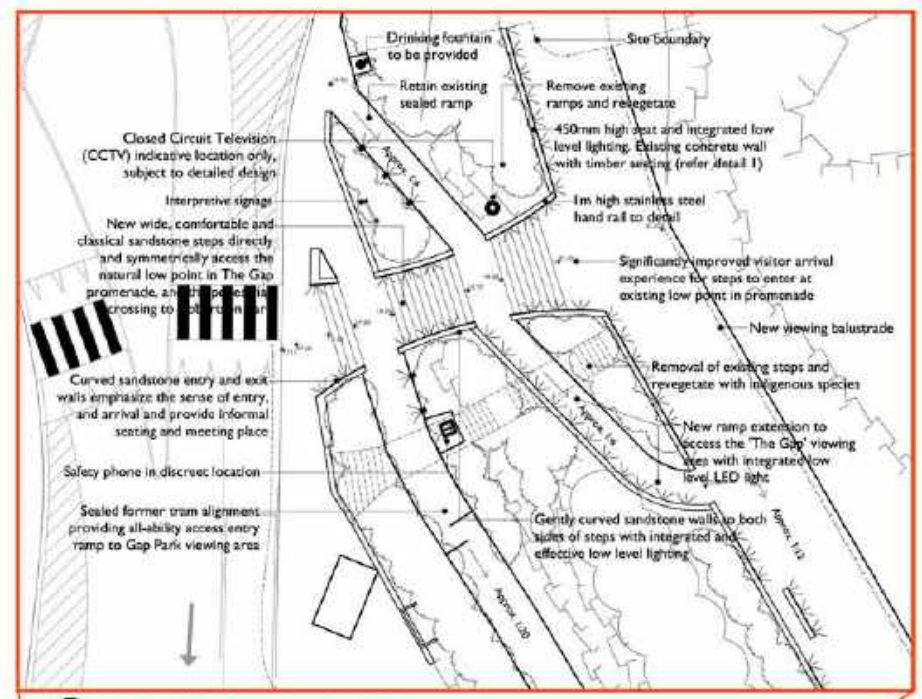
THOMPSON BERRILL LANDSCAPE DESIGN P/L
 PO BOX 665 MANLY NSW 2095 T: 612 9977 6444 E: info@tbl.com.au

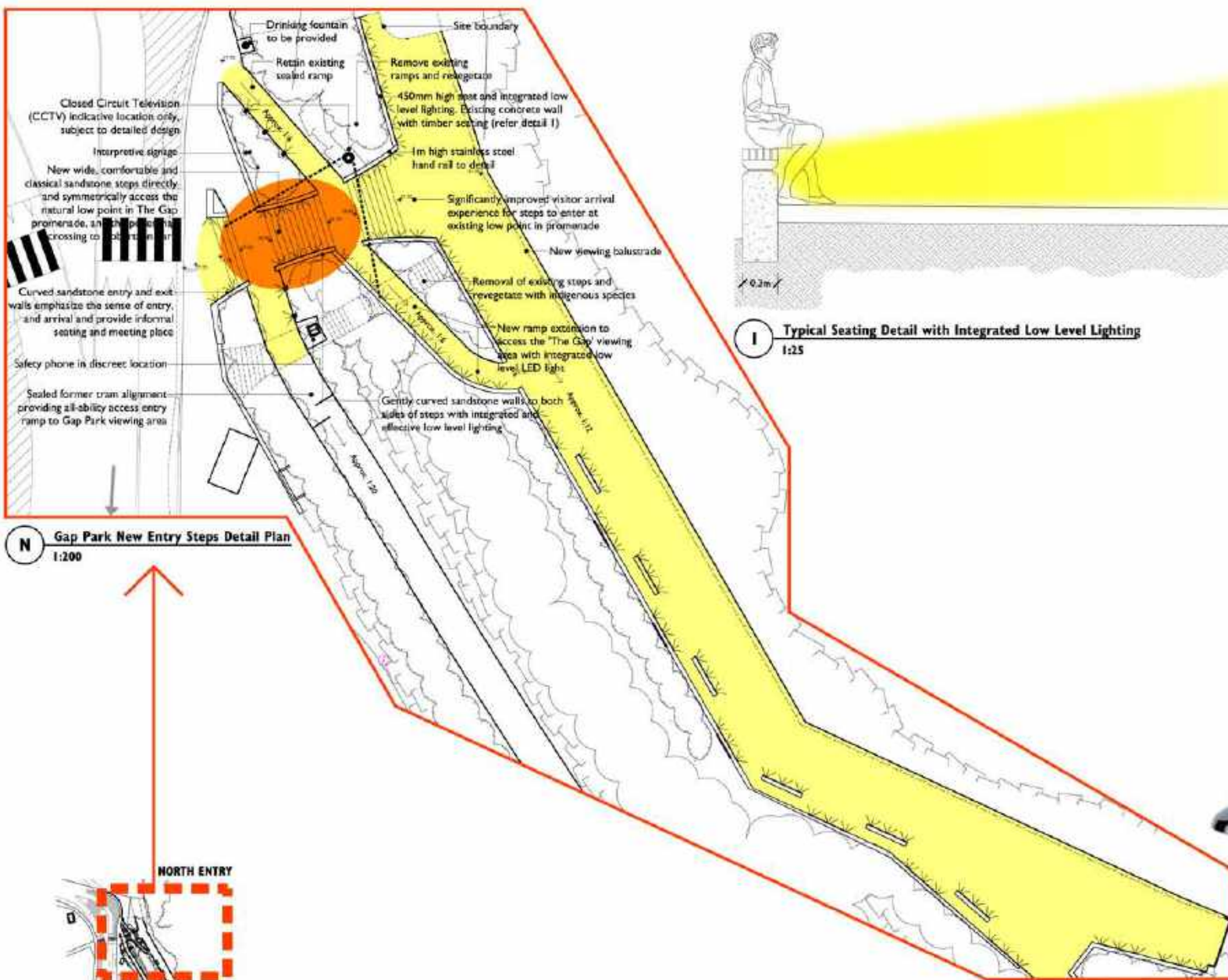


NORTH AND SOUTH ENTRIES PLAN

GAP PARK MASTERPLAN

MARCH 2008
 GPMP-02
 SHEET 2 OF 2
 SCALE 1:2000 @ A1

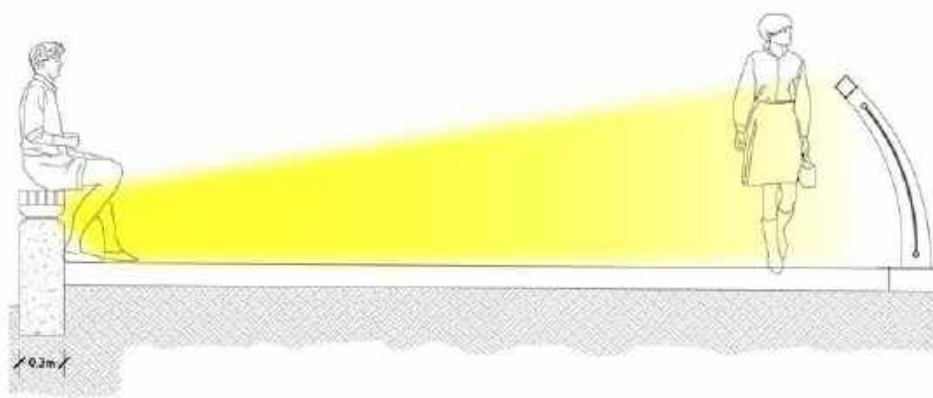




1 Gap Park New Entry Steps Detail Plan
1:200

- Drinking fountain to be provided
- Retain existing sealed ramp
- Remove existing ramps and revegetate
- 450mm high seat and integrated low level lighting. Existing concrete wall with timber seating (refer detail 1)
- 1m high stainless steel hand rail to detail
- Significantly improved visitor arrival experience for steps to enter at existing low point in promenade
- New viewing balustrade
- Removal of existing steps and revegetate with indigenous species
- New ramp extension to access the 'The Gap' viewing area with integrated low level LED lights
- Gently curved sandstone walls to both sides of steps with integrated and reflective low level lighting
- Site boundary
- Closed Circuit Television (CCTV) indicative location only, subject to detailed design
- Interpretive signage
- New wide, comfortable and classical sandstone steps directly and symmetrically across the natural low point in The Gap promenade, and the location of the crossing to adjacent promenade
- Curved sandstone entry and exit walls emphasize the sense of entry and arrival and provide informal seating and meeting place
- Safety phone in discreet location
- Sealed former tram alignment providing all-ability access entry ramp to Gap Park viewing area

1 Typical Seating Detail with Integrated Low Level Lighting
1:25



- 1.0 Lighting**
- Low level LED lighting, fully integrated with new seating, to two main entries locations, as shown
 - Increased intensity lighting at specific entry zones, for CCTV surveillance
 - Vandal-resistant design
 - All weather protection rating

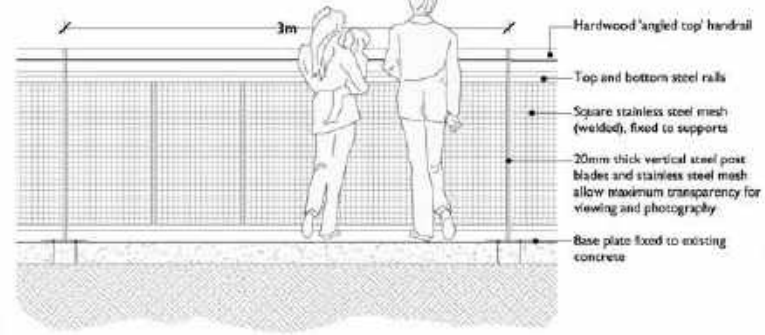
- 2.0 Safety Telephone**
- Programmable send and receive numbers
 - One to three push button(s)
 - Audible and visual feedback on button press
 - Handsfree speaker, with built in microphone
 - Accessible locally or remotely
 - Internal battery with charging options (solar, mains)
 - Digitally stored announcements
 - Illuminated button option
 - Vandal detection, with automatic dial-up reporting
 - Unique ID for location information
 - Vandal-resistant aluminium housing, with dual high security locks
 - All weather protection rating



2 Safety Telephone Example

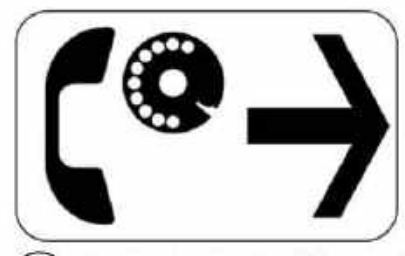


- 3 New Gap Park Viewing Balustrade Elevation**
1:25
- Increased height (1.3m) and inward curved design and 'diamond' top handrail
 - Adaptive reuse design, using square 'historic' top handrail, from selected Australian durable hardwood timber supported on concrete and strong stainless steel angle supports
 - Top and bottom stainless steel rails to support mesh
 - Square stainless steel mesh welded to rolled stainless steel supports
 - Strong curved stainless steel post blades
 - Base plate fixed to existing concrete slab



- 3.0 Proposed Fencing at Key Locations**
- Curved vertical blades with nautical symbolism, also allowing for maximum frontal transparency
 - Diagonal top handrail, in keeping with coastal theme
 - Welded, stainless steel square mesh
 - Curved inwards to deter climbing

- 4.0 Signage**
- Directional signage to safety phones
 - Directional signage to key locations, with distances listed

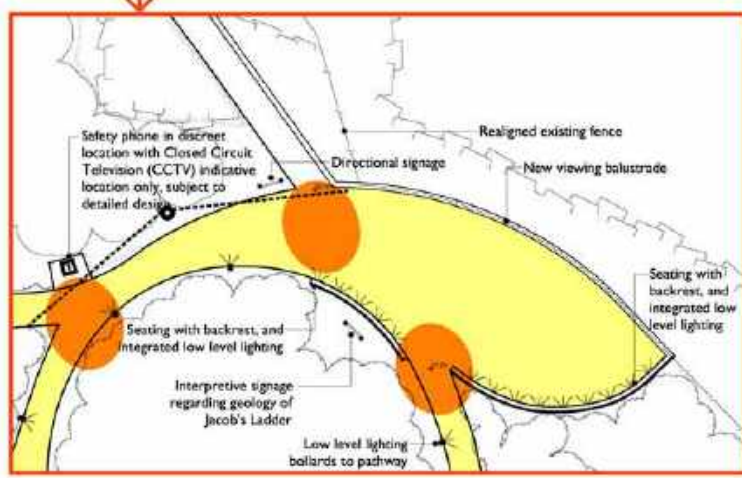


4 Safety Telephone Directional Sign Example

- 5.0 Closed Circuit Television (CCTV)**
- Provides CCTV surveillance for visitors accessing site through main entries
 - Accessible locally or remotely
 - Vandal resistant camera housing
 - All weather protection rating



5 CCTV Example



5 Jacobs Ladder Lookout Area Detail Plan
1:200

- DRAWING KEY**
- Increased intensity lighting at specific entry zones, for CCTV surveillance
 - Low level LED lighting to main entries, for improved public amenity and safety
 - Directional signage to safety telephones
 - CCTV indicative location
 - Safety telephone indicative location
 - Approximate monitoring area of CCTV
 - New balustrade to edge of main entries

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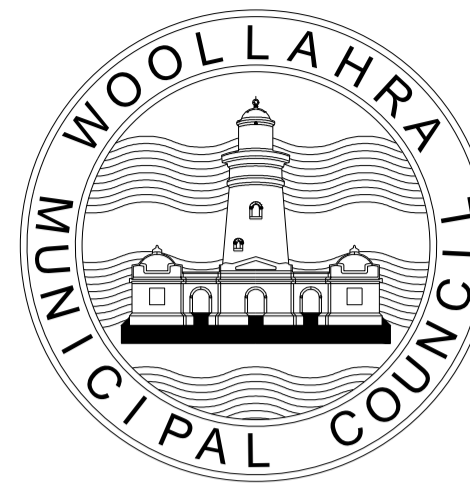
SELF HARM MINIMISATION PLAN GAP PARK MASTERPLAN

MARCH 2008
GPMP-03
SCALE 1:2000 @ A1



APPENDIX 2

Civil Plans

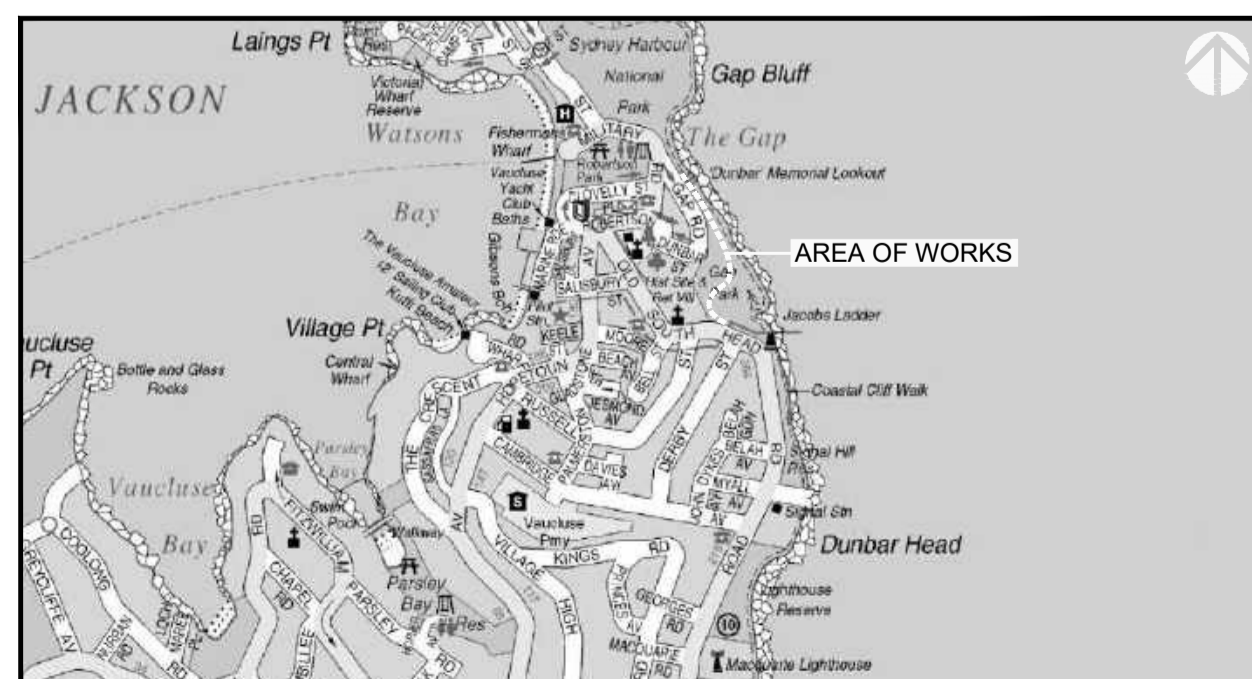


WOOLLAHRA MUNICIPAL COUNCIL

GAP PARK - WATSONS BAY PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY ROUTE WITH INFRASTRUCTURE IMPROVEMENTS

CIVIL INFRASTRUCTURE WORKS FOOTPATH, STORMWATER AND LANDSCAPE WORKS PROJECT No: 15320

LOCALITY PLAN





ASPECT AUSTRALIA
ASPECT AUSTRALIA PTY LTD | ABN 40 080 381 979
CIVIL INFRASTRUCTURE DESIGN CONSULTANTS
PO BOX 1097 CRONULLA NSW 2230 T 0419 271 877
email: admin@aspectaustralia.com.au
web: www.aspectaustralia.com.au



**Local Government
PROCUREMENT**
APPROVED CONTRACTOR

DRAWING SCHEDULE | PRELIMINARY ISSUE

DWG No	DRAWING TITLE	REV	DATE
15320-00	COVER SHEET	A	27.05.20
15320-01	CONSTRUCTION NOTES AND DETAILS (1)	A	27.05.20
15320-02	CONSTRUCTION NOTES AND DETAILS (2)	A	27.05.20
15320-03	GENERAL ARRANGEMENT PLAN	A	27.05.20
15320-04	LAYOUT PLAN AND DETAILS (1)	A	27.05.20
15320-05	LAYOUT PLAN AND DETAILS (2)	A	27.05.20
15320-06	WAYFINDING AND INTERPRETIVE SIGNAGE PLAN	A	27.05.20

GENERAL NOTES

- G1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH WOOLLAHRA COUNCIL'S STANDARD DRAWINGS AND SPECIFICATIONS AND ANY ALL OTHER TECHNICAL DOCUMENTATION AND SPECIFICATIONS RELATING TO THE PROJECT.
- G2. ALL SERVICES SHOWN ON THIS PLAN ARE APPROXIMATE ONLY AND HAVE BEEN LOCATED FROM SITE INVESTIGATION AND LOCAL AUTHORITIES PLANS. ALL SERVICES ARE TO BE VERIFIED PRIOR TO CONSTRUCTION.
- G3. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER EXISTING SERVICES. ALLOW FOR PROTECTION TO OVERHEAD POWER LINES IN ACCORDANCE WITH ELECTRICAL AUTHORITY REGULATIONS & WORK COVER.
- G4. THE CONTRACTOR SHALL CHECK AND BE RESPONSIBLE FOR THE CORRECTNESS OF ALL DIMENSIONS.
- G5. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.
- G6. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF "DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT" AND COUNCIL'S SPECIFICATIONS. CONTRACTOR TO PROVIDE COUNCIL WITH AN EROSION AND SEDIMENTATION CONTROL PLAN FOR APPROVAL PRIOR TO COMMENCEMENT OF WORK.
- G7. WHERE EXCAVATION IS CLOSE TO UTILITY POLES, PROVIDE TEMPORARY PROPS TO ALL UTILITY POLES TO THE RELEVANT AUTHORITIES REQUIREMENTS.
- G8. ALL EXPOSED CONCRETE SURFACES MUST BE FINISHED WITH A MEDIUM BROOM FINISH GENERALLY PERPENDICULAR TO THE DIRECTION OF TRAVEL. ALL CONCRETE SLABS MUST HAVE AN EXPANSION JOINT INSTALLED ALONG THE BUILDING LINE, KERB LINE AND ADJOINING HARDSTAND PAVEMENTS. MASTIC JOINTS TO BE EXCLUDED ADJACENT SANDSTONE WALLS.
- G9. TELSTRA PITS ARE TO BE ADJUSTED AT COUNCIL'S EXPENSE. CONTRACTOR TO CO-ORDINATE WITH TELSTRA'S ACCREDITED SUB-CONTRACTORS IN RELATION TO THE ADJUSTMENT WORKS IN CONSULTATION WITH THE SUPERINTENDENT.
- G10. ASPECT AUSTRALIA IS TO PROVIDE CONSTRUCTION SETOUT SERVICES FOR THE SETOUT OF THE PATHWAYS AND RETAINING WALLS ON BEHALF OF COUNCIL IN CONSULTATION WITH THE CIVIL CONTRACTOR AND COUNCIL'S PROJECT MANAGER.



EARTHWORK NOTES

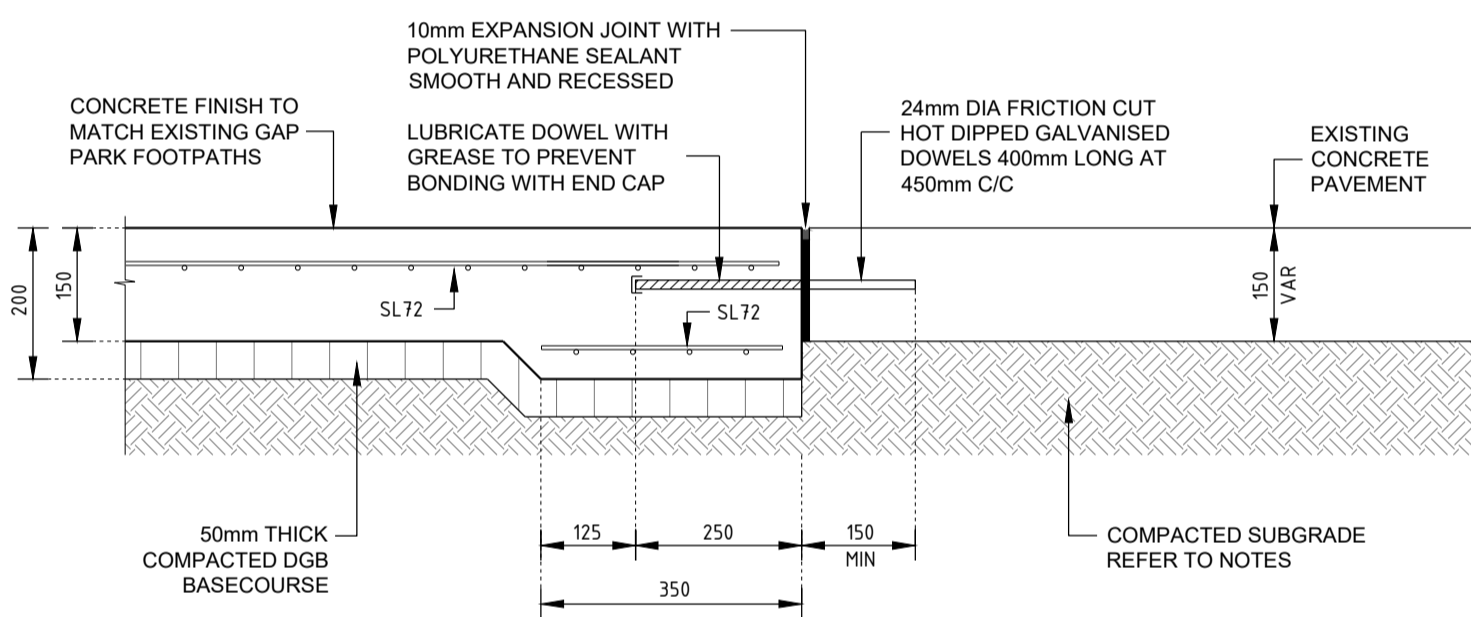
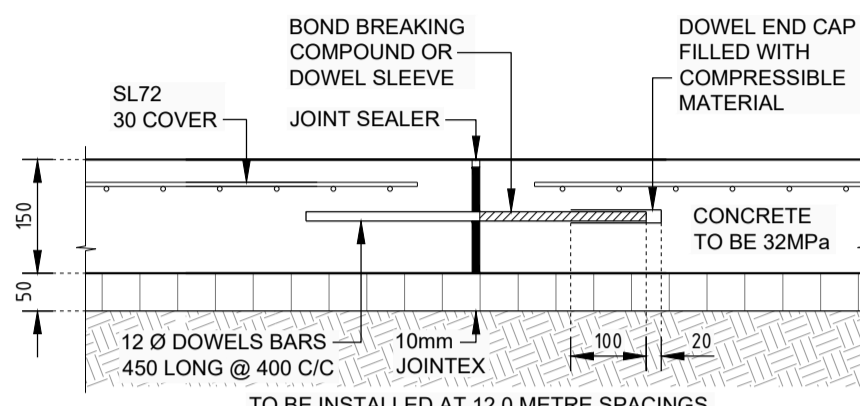
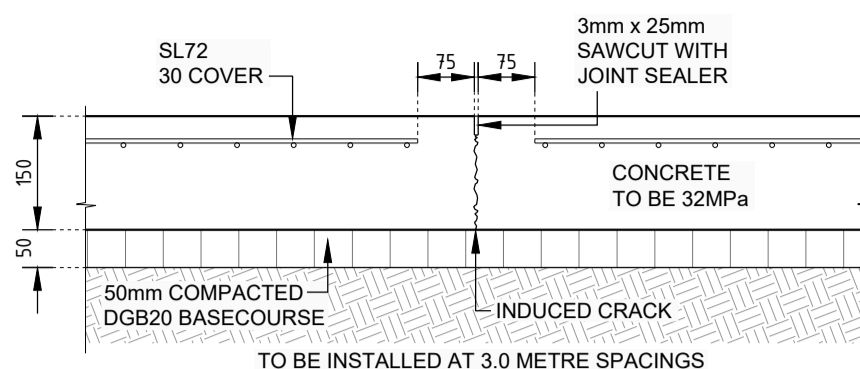
- E1. THE TOP LAYER OF GRASS / VEGETATION TO BE STRIPPED TO A NOMINAL DEPTH OF 50 - 100mm AS DIRECTED BY THE PROJECT MANAGER. ALL STRIPPED MATERIAL TO BE REMOVED FROM SITE AND TAKEN TO AN APPROVED DISPOSAL FACILITY.
- E2. SELECTED TOPSOIL BELOW THE STRIPPED SURFACE IN PROPOSED EXCAVATION AREAS IS TO BE STOCKPILED FOR RE-USE AS DIRECTED BY COUNCIL'S PROJECT MANAGER.
- E3. SELECTED IMPORTED FILL IS TO BE APPROVED BY THE PROJECT MANAGER AND ANY NON CONFORMING MATERIAL DISPOSED OFF SITE.
- E4. THE SLOPE OF THE DESIGN SUB GRADE LEVEL SHALL BE CONTINUOUS WITH NO DEPRESSIONS OR RIDGES. BEFORE PLACING FILL PROOF ROLL EXPOSED SUBGRADE AND REMOVE SOFT SPOTS. THE SUBGRADE SHALL BE COMPACTED TO NO LESS THAN THE FOLLOWING UNLESS NOTED OTHERWISE:
 - 1. FOOTINGS / PATHS: 98% SDD AND +/-2% OMC
 - 2. LANDSCAPE / TURF: 95% SDD AND +/-2% OMC
- E5. FOLLOWING ESTABLISHMENT OF DESIGN SUB GRADE LEVELS, TOPSOIL SHALL BE SPREAD AND PLACED TO A NOMINAL DEPTH OF 100mm OVER PROPOSED GRASS AND LANDSCAPE AREAS.
- E6. THE PROPOSED CONSTRUCTION TOLERANCE FOR DESIGN LEVELS OVER SOFT AREAS OF GRASS AND LANDSCAPE IS +/- (0-50mm) UNLESS SPECIFIED OTHERWISE BY COUNCIL'S PROJECT MANAGER

LANDSCAPE NOTES

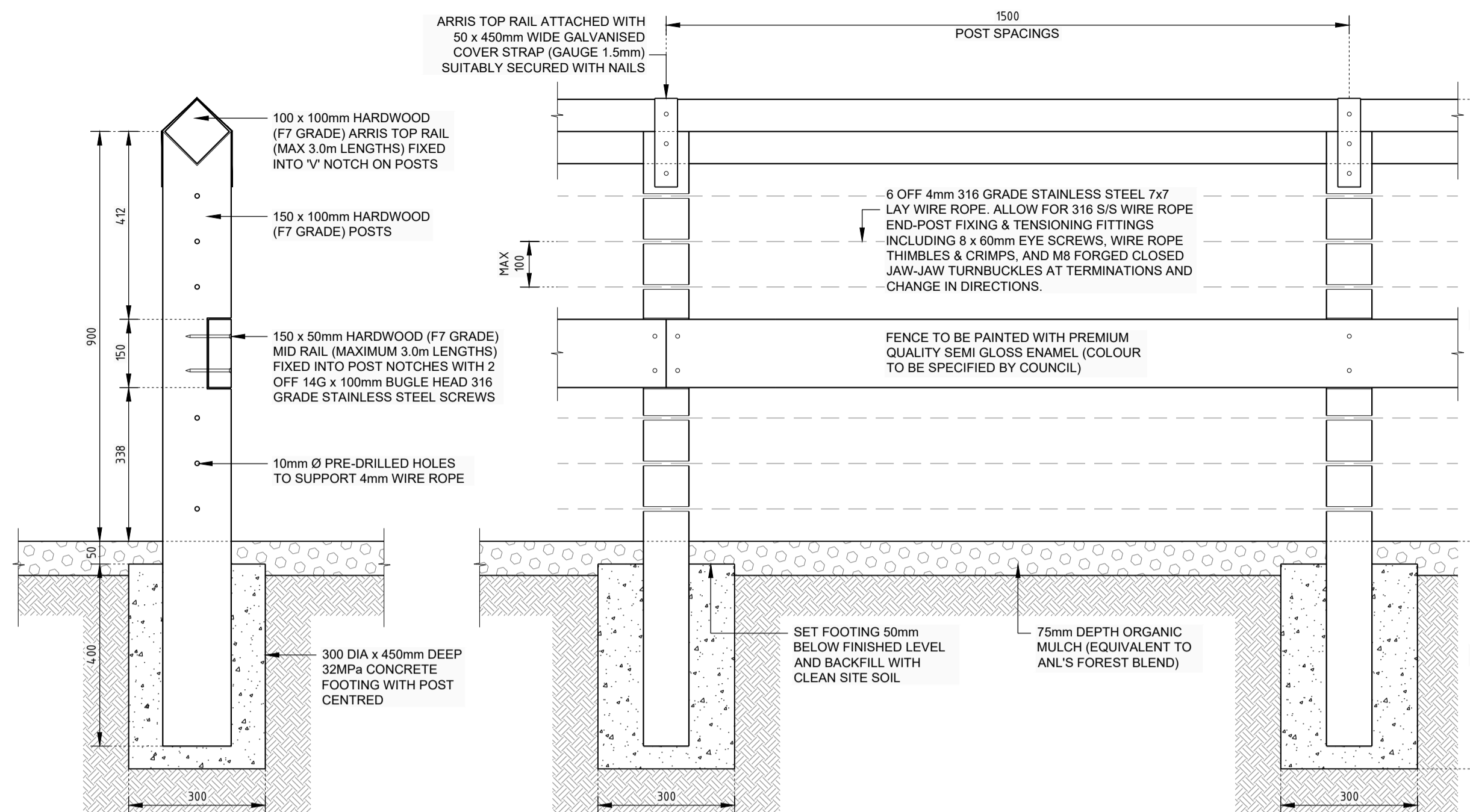
- L1. **SOIL PREPARATION** - EXISTING TOPSOIL IS TO BE STRIPPED AND REUSED WHERE POSSIBLE. ANY IMPORTED TOPSOIL TO MEET REQUIRED VOLUME AND/OR TO IMPROVE GROWING CONDITIONS SHALL BE IN ACCORDANCE WITH AS4454 AND BE FREE OF WEEDS, RUBBLE, ROCK, ETC. SUBGRADE IS TO BE CULTIVATED TO A DEPTH OF 150mm EXCEPT IN AREAS OF EXISTING TREES WHERE ROOT SYSTEMS MUST BE PROTECTED AT ALL TIMES.
- L2. **ORGANIC MULCH** - SHALL BE PROVIDED TO A DEPTH OF 75mm IN ACCORDANCE WITH AS4454 (EQUIVALENT TO ANL'S FOREST BLEND) TO ALL PLANTED AND MULCHED AREAS. MULCH SHALL BE KEPT CLEAR OF PLANT STEMS TO AVOID COLLAR ROT.
- L3. **PLANT PROCUREMENT** - ALL PLANT STOCK SHALL BE GROWN BY A CERTIFIED NURSERY TO NATSPEC STANDARDS. PLANT STOCK SHALL BE SUPPLIED WITH FIBROUS, HEALTHY ROOT SYSTEM WITHOUT ANY SIGN OF ROOT GIRDLING. PLANTS SHALL BE HARDENED OFF BY THE NURSERY AND FREE FROM WEEDS, DISEASE, PESTS.
- L4. **PLANTING** - SHALL BE CARRIED OUT BY A QUALIFIED LANDSCAPE CONTRACTOR IN ACCORDANCE WITH THE PLAN & PLANT SCHEDULES. PLANT STOCK AND PLANTING SOIL SHALL BE THOROUGHLY SOAKED PRIOR TO PLANTING. HOLES SHALL BE TWICE THE SIZE OF THE ROOTBALL AND BACKFILLED WITH SUITABLE SITE SOIL (OR IMPROVED IF NECESSARY). A SLOW RELEASE FERTILISER TABLET SHALL BE PROVIDED AT THE BASE OF EVERY HOLE COVERED WITH A LIGHT LAYER OF SOIL (TO AVOID ROOT BURN). ALL PLANTS TO BE THOROUGHLY WATERED AFTER PLANTING.
- L5. **PLANT ESTABLISHMENT** - THERE SHALL BE A 13 WEEK ESTABLISHMENT PERIOD FOLLOWING PRACTICAL COMPLETION. DURING THIS TIME THE LANDSCAPE CONTRACTOR SHALL MAKE GOOD ALL DEFECTS. MAINTENANCE AND ESTABLISHMENT IS TO BE CONDUCTED IN ACCORDANCE WITH ACCEPTED HORTICULTURAL PRACTICES INCLUDING BUT NOT LIMITED TO WATERING, FERTILISING, WEEDING, PRUNING, PEST / DISEASE CONTROL, RE-STAKING, AND REPLACEMENT OF ANY PLANTS THAT FAIL.

TREE PROTECTION NOTES

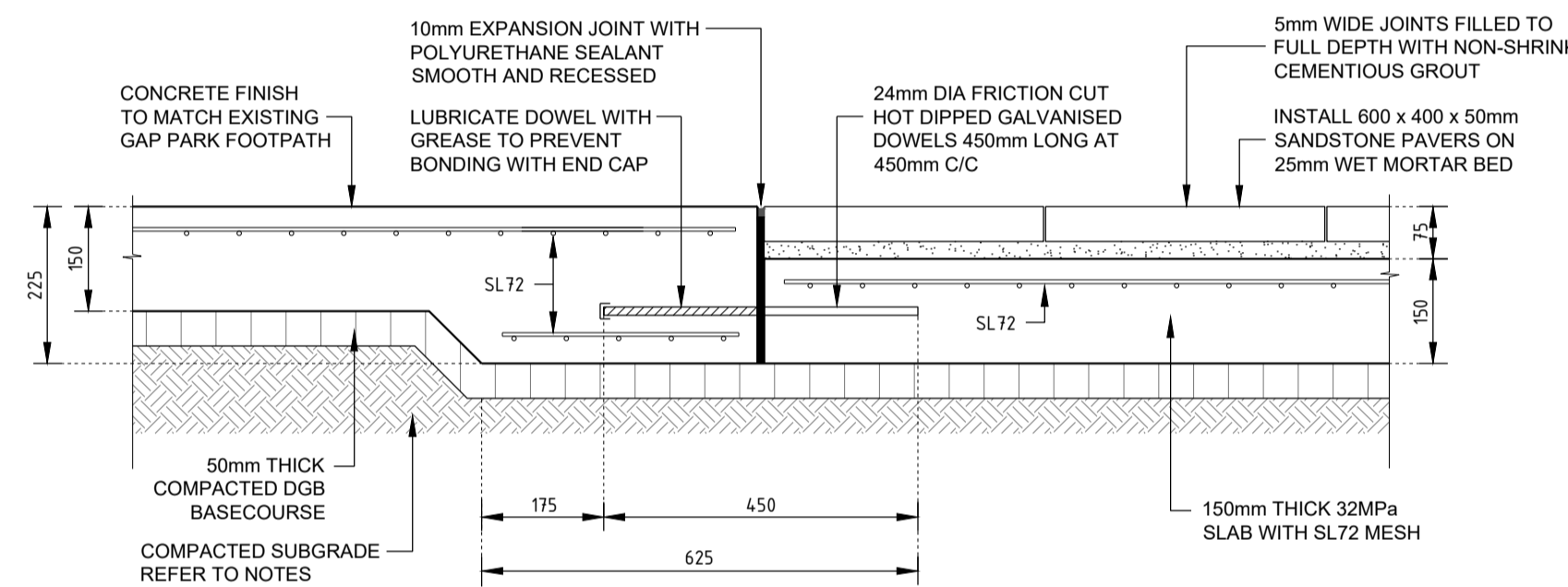
- T1. ALL TREES AND THEIR ROOT SYSTEMS ARE TO BE RETAINED AND PROTECTED AT ALL TIMES. IF A TREE ROOT IS ENCOUNTERED THAT REQUIRES TRIMMING OR REMOVAL THE CONTRACTOR IS TO CONTACT COUNCIL'S PROJECT MANAGER IMMEDIATELY SO AN INSPECTION CAN BE CARRIED OUT BY COUNCIL'S TREE OFFICER. ANY PROPOSED PROTECTION MEASURES OR ADJUSTMENTS TO DESIGN LEVELS ARE TO BE MADE IN CONSULTATION WITH DESIGN OFFICE.
- T2. ALL EXCAVATION WITHIN TREE PROTECTION ZONES (TPZ) MUST BE CARRIED OUT CAREFULLY USING SPADES, FORKS AND TROWELS, TAKING CARE NOT TO DAMAGE THE BARK AND WOOD OF ANY ROOTS. SPECIALIST TOOLS FOR REMOVING SOIL AROUND ROOTS USING COMPRESSED AIR MAY BE AN APPROPRIATE ALTERNATIVE TO HAND DIGGING, IF AVAILABLE TO CONTRACTOR.
- T3. PRIOR TO USING ANY MACHINERY FOR EXCAVATION, POT-HOLING MUST BE CARRIED OUT BY HAND TO DETERMINE IF ANY TREE ROOTS ARE PRESENT. IF TREE ROOTS PRESENT, EXCAVATION IS TO BE CARRIED OUT BY HAND.
- T4. ALL SOIL REMOVAL MUST BE UNDERTAKEN WITH CARE TO MINIMISE THE DISTURBANCE OF ROOTS BEYOND THE IMMEDIATE AREA OF EXCAVATION. SMALLER FIBROUS ROOTS SHOULD BE RETAINED WHERE POSSIBLE.
- T5. IF DIGGING BY HAND, A FORK SHOULD BE USED TO LOOSEN THE SOIL AND HELP LOCATE ANY SUBSTANTIAL ROOTS. ONCE ROOTS HAVE BEEN LOCATED, THE TROWEL SHOULD BE USED TO CLEAR THE SOIL AWAY FROM THEM WITHOUT DAMAGING THE BARK.
- T6. ROOTS TEMPORARILY EXPOSED MUST BE PROTECTED FROM DIRECT SUNLIGHT, DRYING OUT AND EXTREMES OF TEMPERATURE BY APPROPRIATE COVERING.
- T7. NO VEHICULAR OR REPEATED PEDESTRIAN ACCESS IS ALLOWED OVER AREAS WHERE ROOTS HAVE BEEN TEMPORARILY EXPOSED WITHIN THE CONSTRUCTION SITE.
- T8. WHEN EXCAVATING OUTSIDE THE TREE PROTECTION ZONES (TPZ) TREE ROOTS GREATER THAN 50mm IN DIAMETER SHOULD BE RETAINED WHERE POSSIBLE. ROOTS GREATER THAN 50mm IN DIAMETER SHOULD ONLY BE CUT IN EXCEPTIONAL CIRCUMSTANCES AFTER CONSULTATION WITH COUNCIL'S TREE OFFICER. THE CONTRACTOR SHALL ENGAGE AN ARBORIST (AUSTRALIAN QUALIFIED FRAMEWORK CERTIFIED LEVEL 5) TO UNDERTAKE ANY TREE ROOT OR BRANCH PRUNING IN ACCORDANCE WITH AS4373-2007 PRUNING OF AMENITY TREES.
- T9. IF APPROVAL IS GRANTED BY COUNCIL'S TREE OFFICER TO REMOVE OR TRIM ANY TREE ROOTS THEY SHALL BE CUT CLEANLY WITH A SHARP SAW OR SECATEURS 10 - 20cm CLEAR OF THE PROPOSED EXCAVATION.



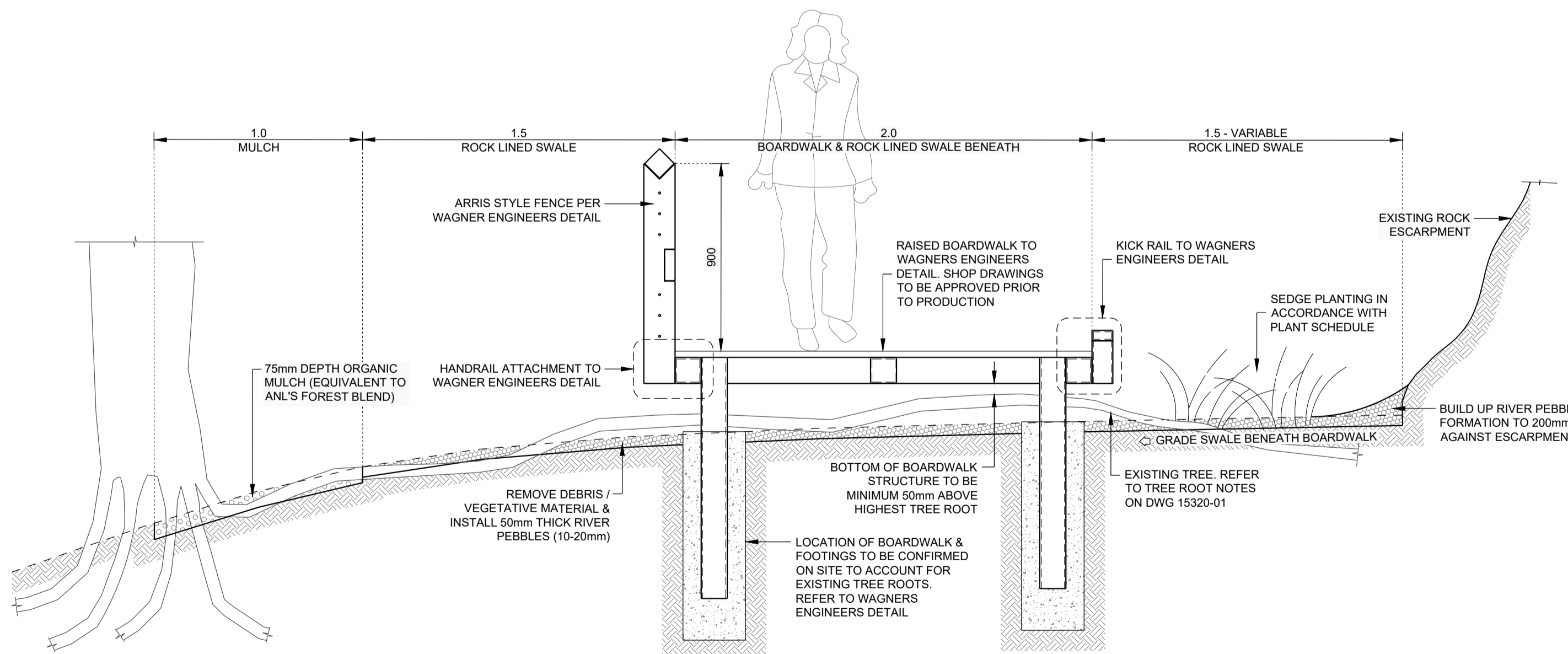
NEW TO EXISTING EXPANSION JOINT (DEJ-3)
SCALE 1:10



ARRIS RAIL FENCE
SCALE 1:10

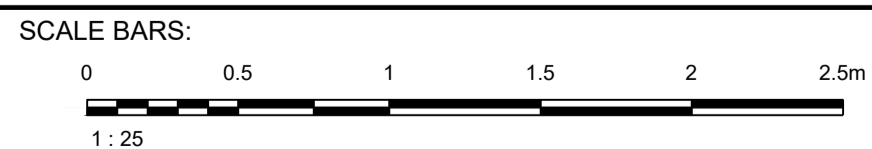


225mm THICK CONCRETE EXPANSION JOINT (DEJ-2) CONCRETE PAVEMENT TO SANDSTONE PAVING
SCALE 1:10



BOARDWALK - TYPICAL SECTION
SCALE 1:20

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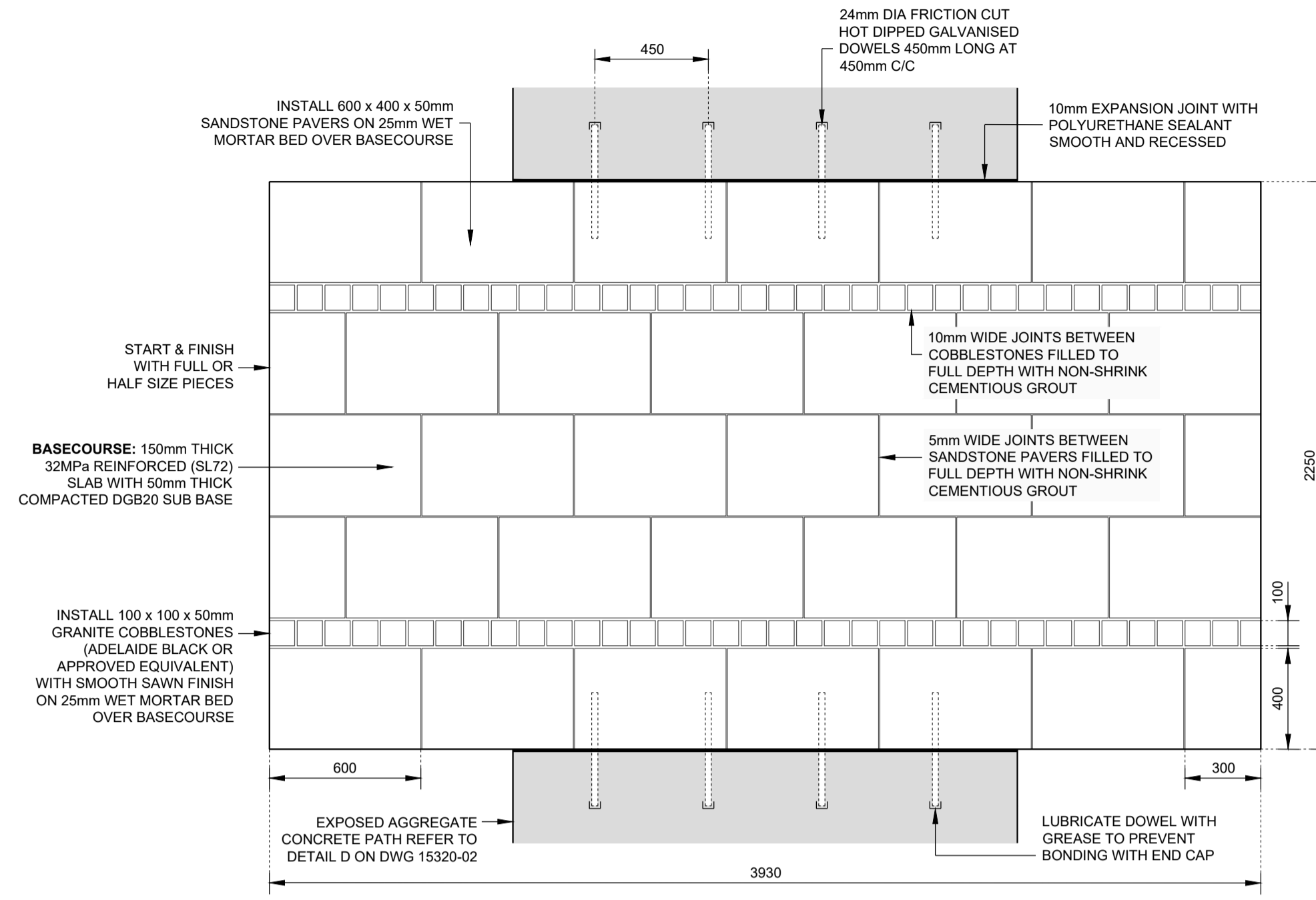
CLIENT:
WOOLLAHRA MUNICIPAL COUNCIL
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DATUM:	AHD
GRID:	MGA
JOB REF:	15320
APPROVED:	R.WARD

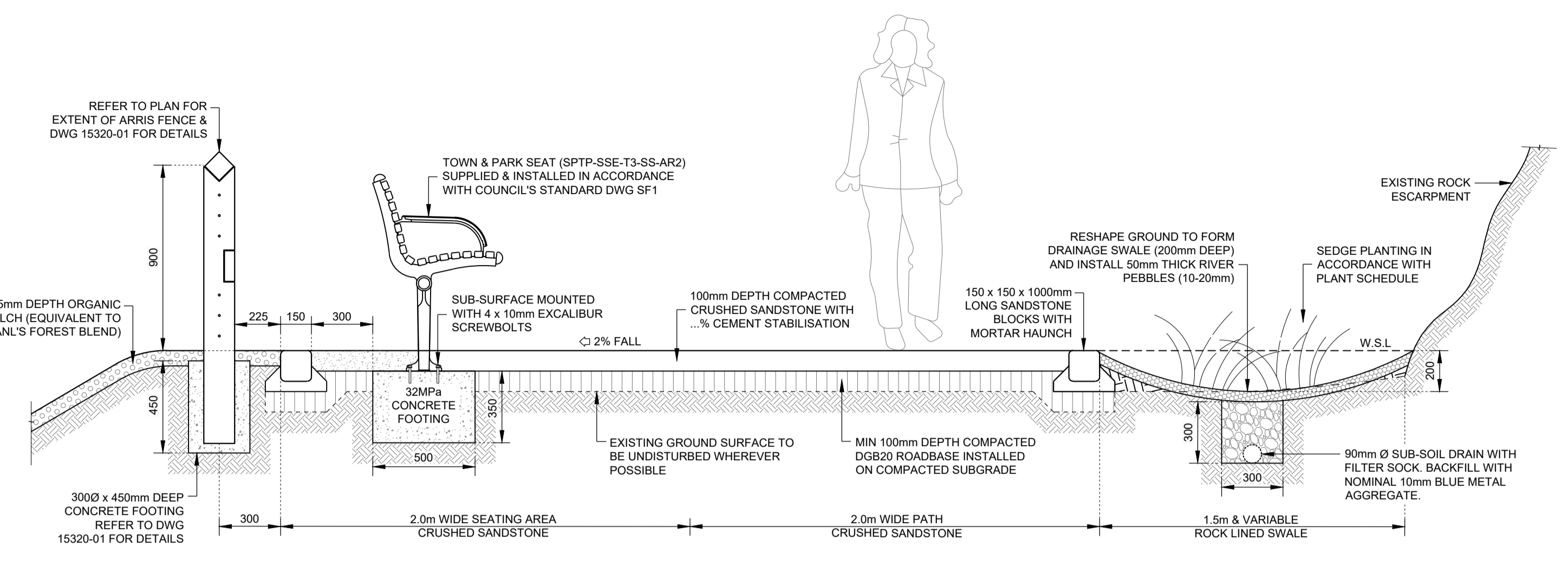
PROJECT:
GAP PARK, WATSON BAY PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY ROUTE WITH INFRASTRUCTURE IMPROVEMENTS

DRAWING
CONSTRUCTION NOTES AND DETAILS (1)

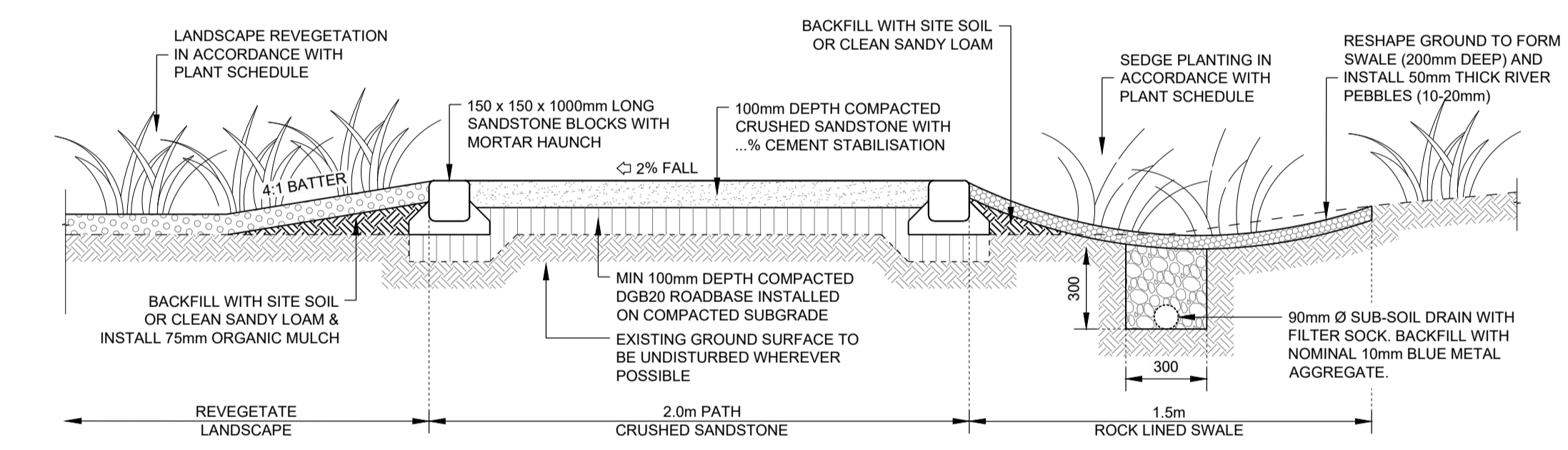
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ISSUED FOR:	PRELIMINARY		



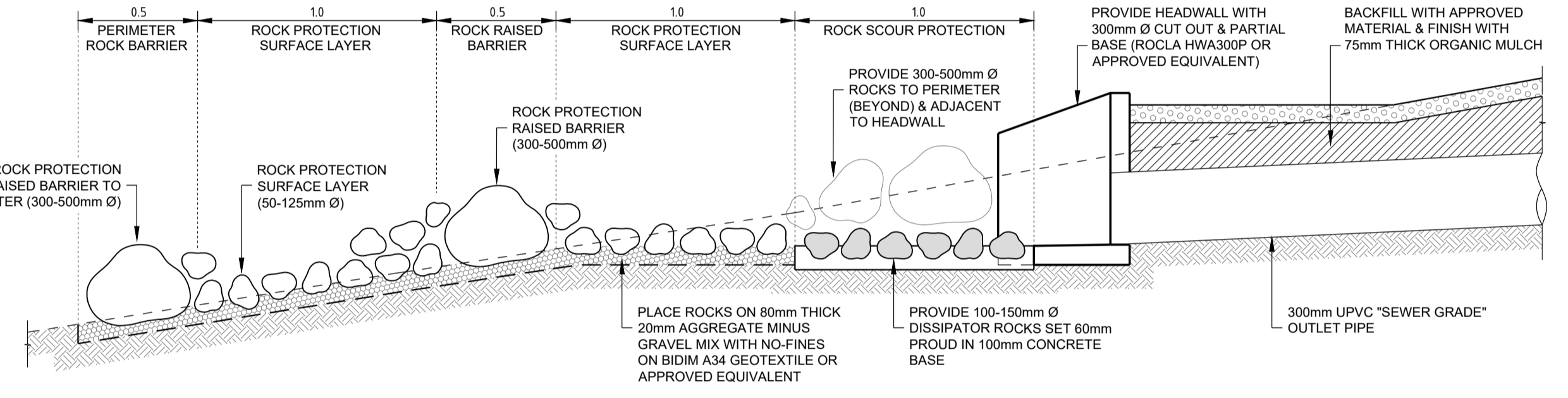
SANDSTONE PAVING DETAIL (B)
SCALE 1:20



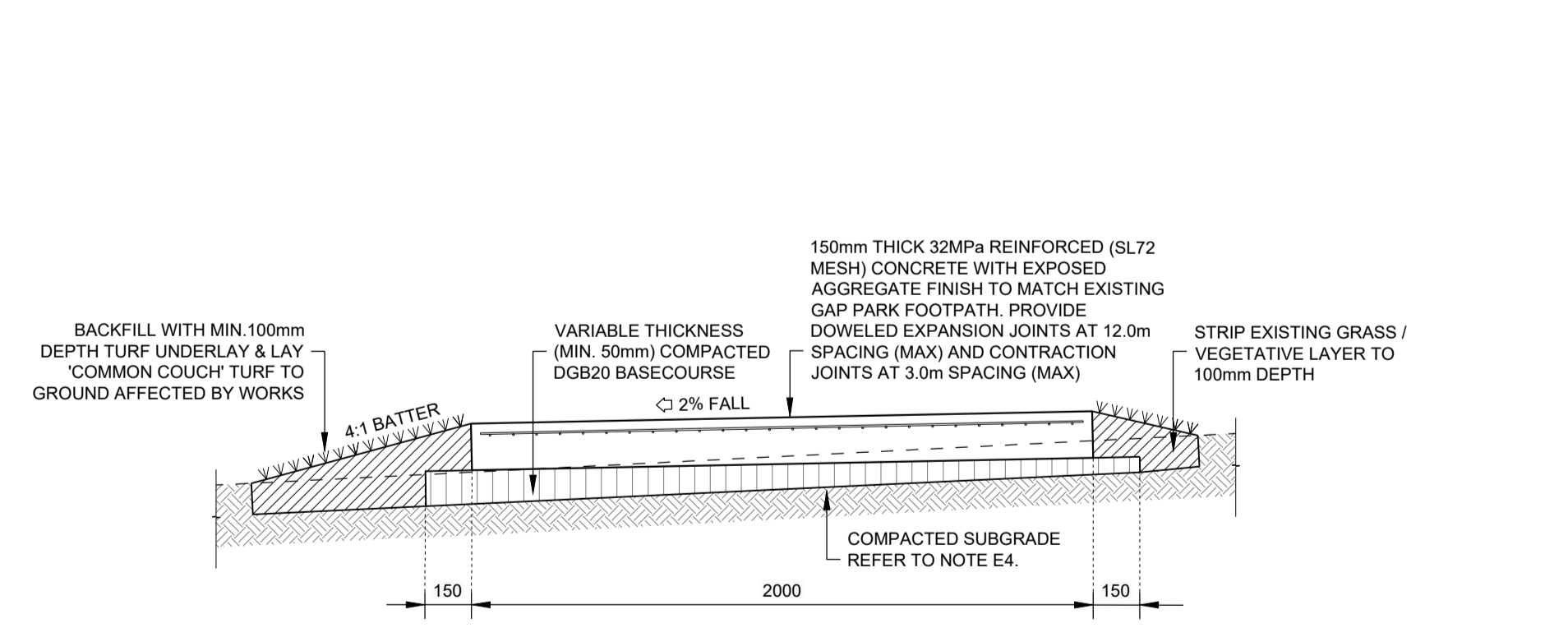
FENCE, SEATING AREA & PATH - SECTION (E)
SCALE 1:20



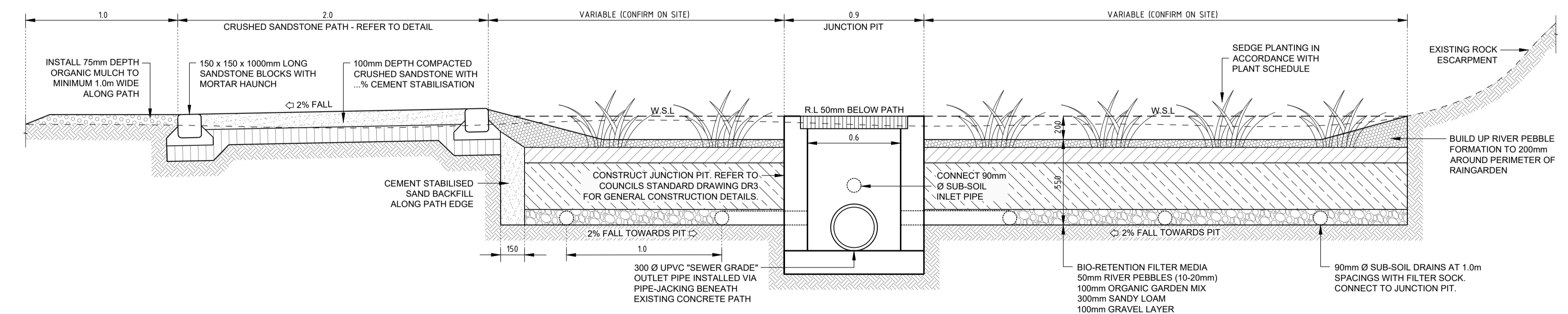
CRUSHED SANDSTONE PATH (C)
SCALE 1:20



STORMWATER DISSIPATION OUTLET (F)
SCALE 1:20



CONCRETE PATH (D)
SCALE 1:20



BIORETENTION RAIN GARDEN (G)
SCALE 1:20

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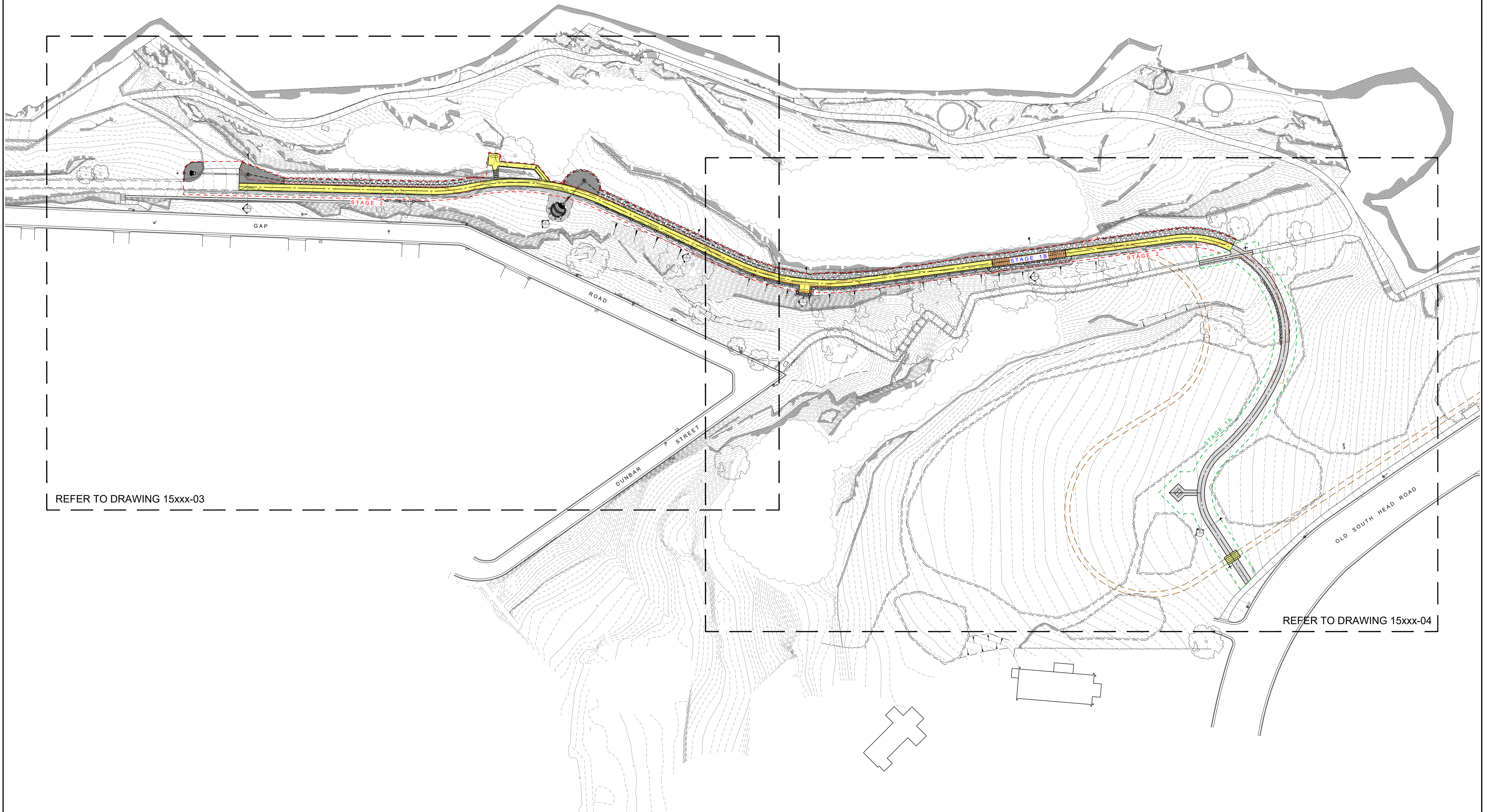
CLIENT:
WOOLLAHRA MUNICIPAL COUNCIL
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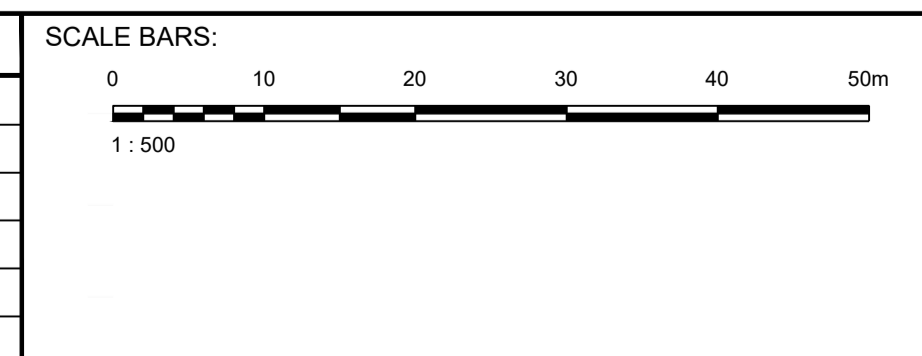
PROJECT:
GAP PARK, WATSON BAY
PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
ROUTE WITH INFRASTRUCTURE IMPROVEMENTS

DRAWING:
CONSTRUCTION NOTES AND DETAILS (2)

DRAWING No	15320-02	REVISION	A
SHEET 2 OF 6 SHEETS			A1
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A	27.05.20	PRELIMINARY ISSUE FOR REVIEW OF ENVIRONMENTAL FACTORS



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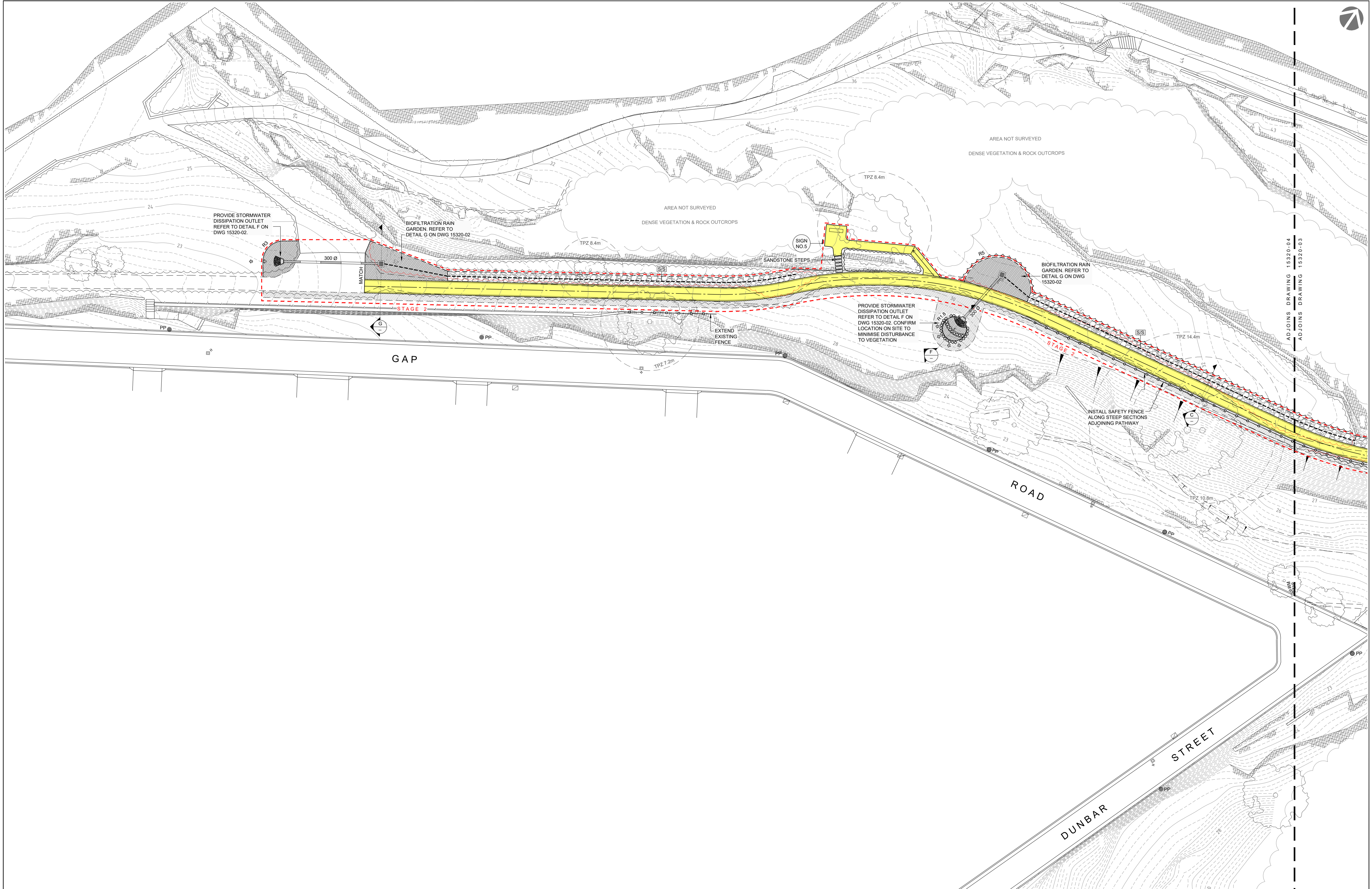
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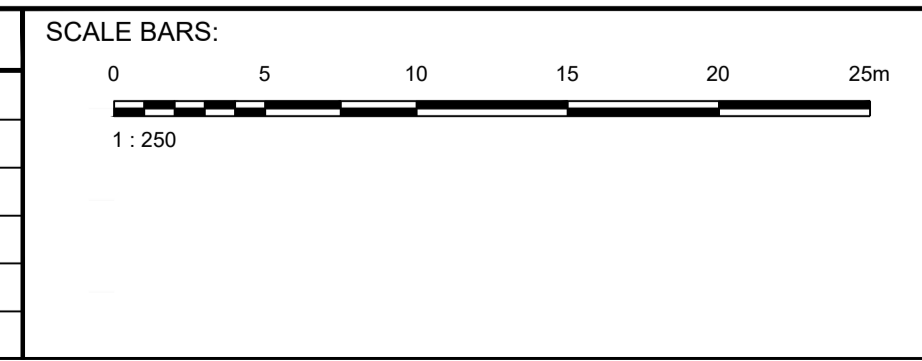
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**GAP PARK, WATSON BAY
 PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
 ROUTE WITH INFRASTRUCTURE IMPROVEMENTS**

DRAWING
GENERAL ARRANGEMENT PLAN

DRAWING No	REVISION
15320-03	A
SHEET 3 OF 6 SHEETS	A1
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No	DATE	REVISION DETAILS
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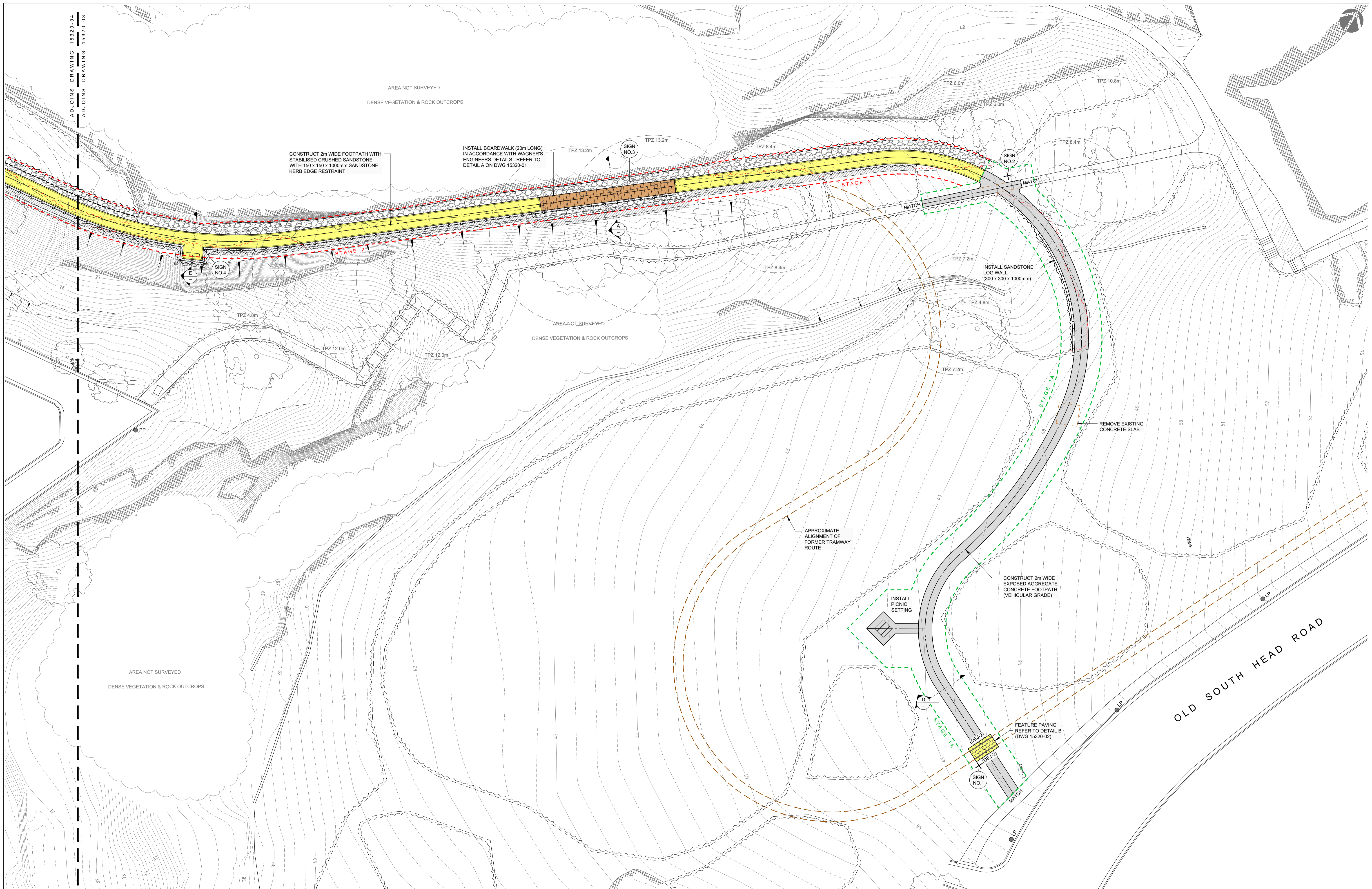
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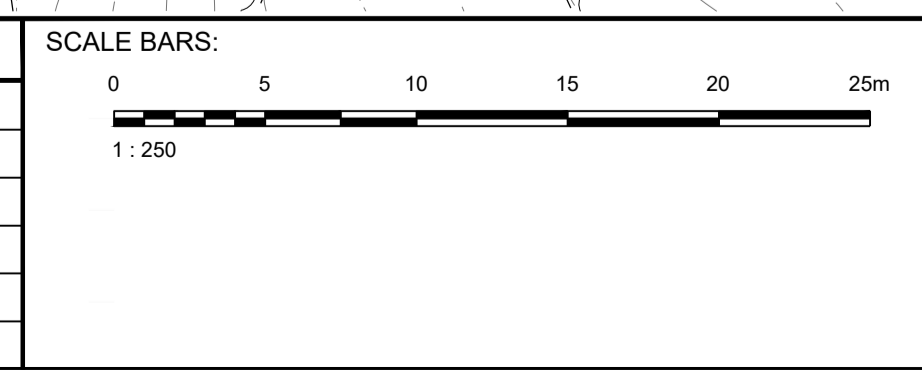
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DRAWING No	REVISION
15320-04	A
SHEET 4 OF 6 SHEETS	A1
ISSUED FOR: PRELIMINARY	

ADJOINS DRAWING 15320-04
 ADJOINS DRAWING 15320-03



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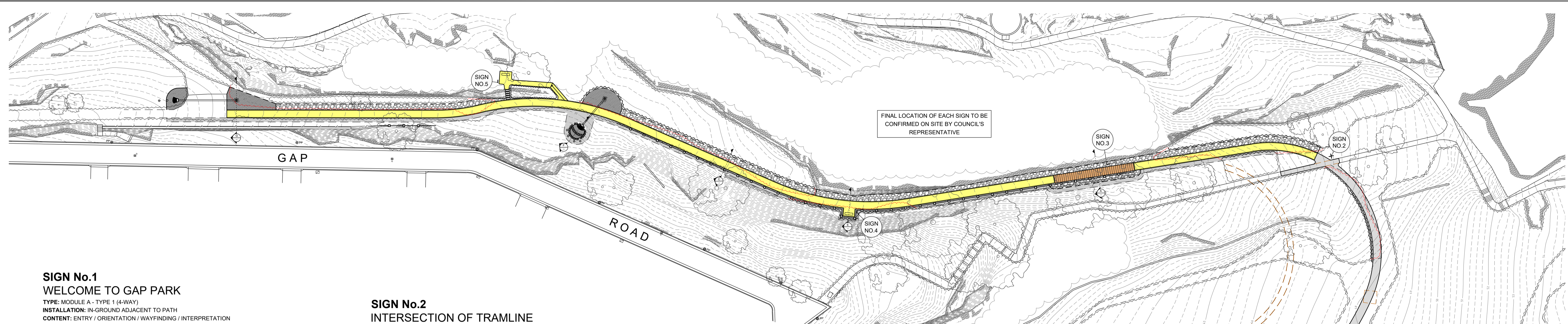
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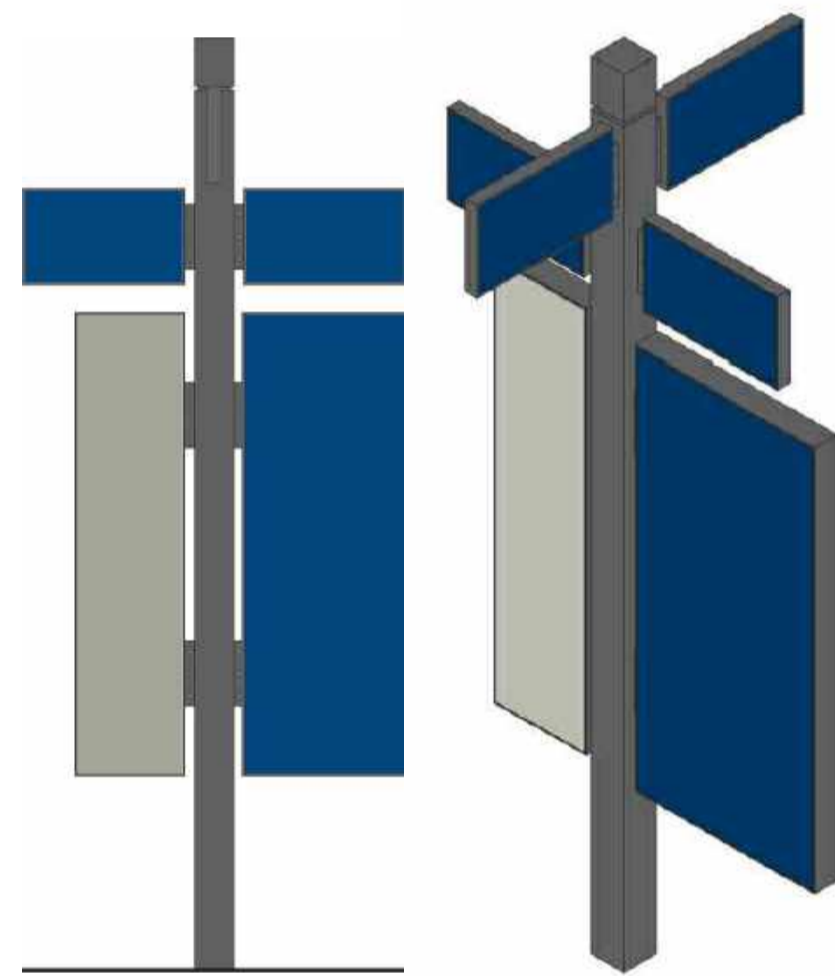
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DRAWING No	REVISION
15320-05	A
SHEET 5 OF 6 SHEETS	A1
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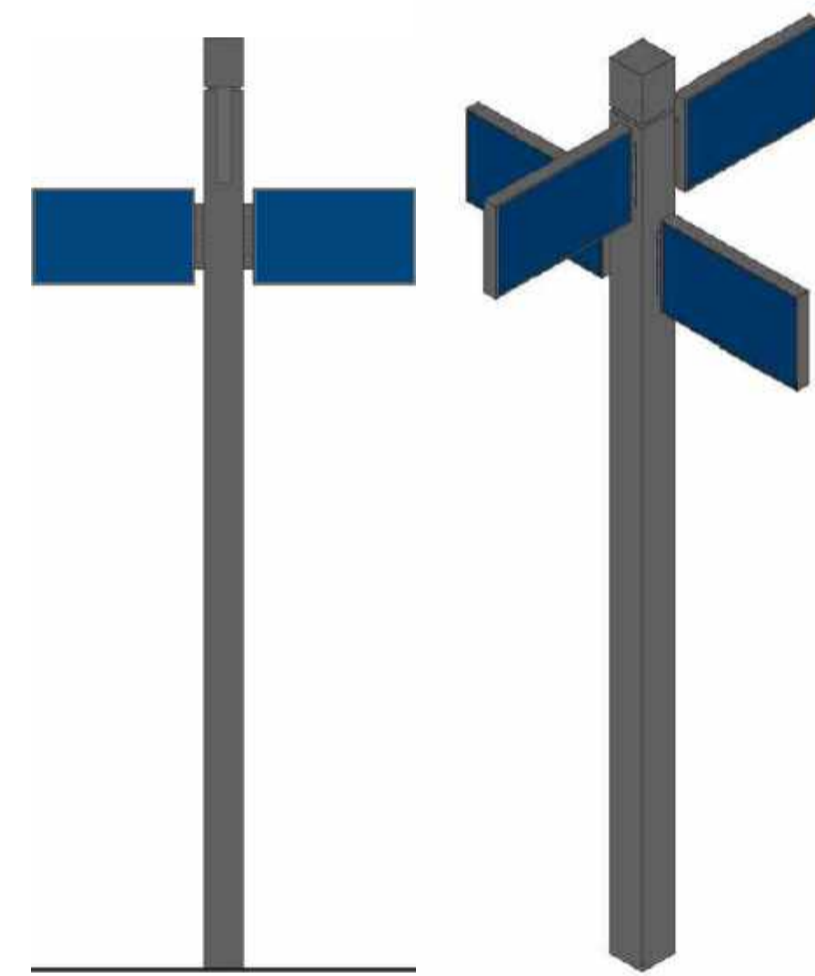
SIGN No.1
WELCOME TO GAP PARK

TYPE: MODULE A - TYPE 1 (4-WAY)
INSTALLATION: IN-GROUND ADJACENT TO PATH
CONTENT: ENTRY / ORIENTATION / WAYFINDING / INTERPRETATION
INTERPRETATION FEATURE: HISTORIC TRAMLINE ROUTE
DESCRIPTION: THIS SIGNPOST MARKS THE START OF THE HISTORIC TRAMWAY ROUTE AND THE ENTRY INTO THE PARK FROM THE SOUTH-WEST. FEATURE SANDSTONE PAVING WITH GRANITE COBBLESTONES MARK INTERPRET THE APPROXIMATE LOCATION OF THE TRAMLINE. SIGN CONTENTS SHOULD INCLUDE HISTORY OF THE PARK AND WATSONS BAY TRAM, MAP SHOWING HISTORIC TRAM ROUTE AND NEW PATH, AS WELL AS DIRECTION AND DURATION TO AT LEAST THE FOLLOWING LANDMARKS: JACOBS LADDER, DUNBAR ANCHOR, GAP BLUFF CENTRE, HMAS WATSON, AND CAMP COVE. CONTENT TO BE SUPPLIED BY COUNCIL'S REPRESENTATIVE.
TYPICAL SIGN GRAPHICS:



SIGN No.2
INTERSECTION OF TRAMLINE & JACOBS LADDER PATH

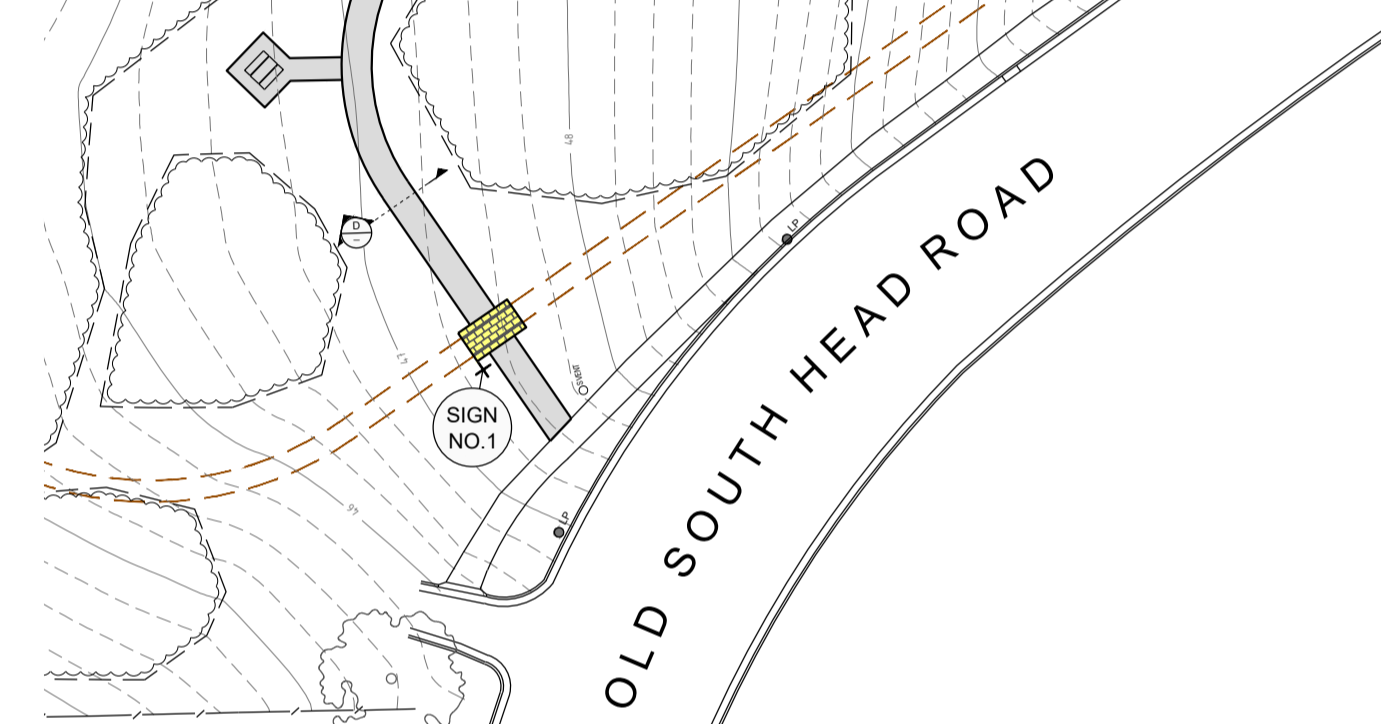
TYPE: MODULE A - TYPE 3 (4-WAY)
INSTALLATION: IN-GROUND ADJACENT TO PATH
CONTENT: SECONDARY WAYFINDING / DIRECTIONAL
DESCRIPTION: THIS IS A NODE WHERE THE NEW PATH CROSSES THE EXISTING PATH BETWEEN THE LITTORAL RAINFOREST WALK (WEST) AND JACOBS LADDER (EAST). SIGN TO PROVIDE DIRECTION AND DURATION TO AT LEAST THE FOLLOWING LANDMARKS: JACOBS LADDER, DUNBAR ANCHOR, OLD SOUTH HEAD ROAD, C AND CAMP COVE.
TYPICAL SIGN GRAPHICS:



THESE SIGNAGE IMAGES ARE FROM GAP PARK SIGNAGE PROJECT (2010) PREPARED BY DEUCE DESIGN. REFER TO SIGNAGE PACKAGE FOR FURTHER DETAILS

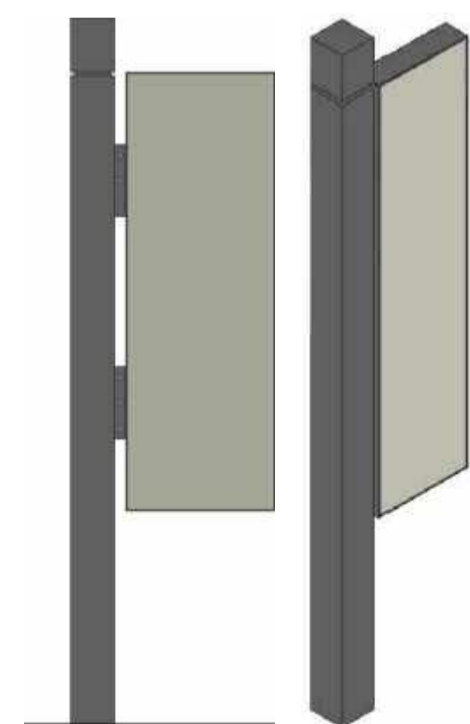
TYPICAL SIGN GRAPHICS

GRAPHICS FOR EACH SIGNPOST ARE TO BE PREPARED IN ACCORDANCE WITH DEUCE DESIGN'S GAP PARK SIGNAGE PROJECT (2010) IN COLLABORATION WITH COUNCIL'S HERITAGE OFFICERS, AND LA PEROUSE LOCAL ABORIGINAL LAND COUNCIL REPRESENTATIVE'S



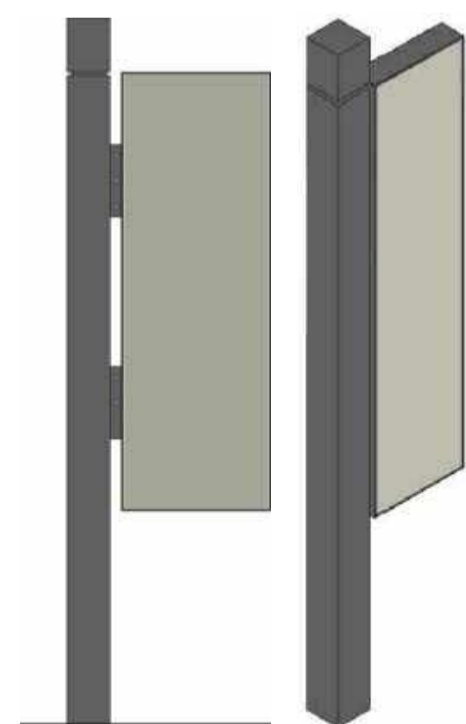
SIGN No.3
BOARDWALK - ABORIGINAL HERITAGE

TYPE: MODULE A - TYPE 6
INSTALLATION: IN-GROUND ADJACENT TO PATH
CONTENT: INTERPRETATION
INTERPRETATION FEATURE: ABORIGINAL HERITAGE
DESCRIPTION: THIS SIGN IS TO BE LOCATED ADJACENT TO THE BOARDWALK AND IS TO PROVIDE INFORMATION ABOUT THE PRE-EUROPEAN HISTORY OF THE AREA INCLUDING THE USE OF THIS LAND BY THE GADIGAL PEOPLE. IT IS TO PROVIDE INFORMATION ABOUT POTENTIAL ROCK ENGRAVINGS, ROCK SHELTER AND ARCHAEOLOGICAL DEPOSITS. INFORMATION IS TO BE PREPARED IN COORDINATION WITH THE LA PEROUSE LOCAL LAND ABORIGINAL COUNCIL REPRESENTATIVE.
TYPICAL SIGN GRAPHICS:



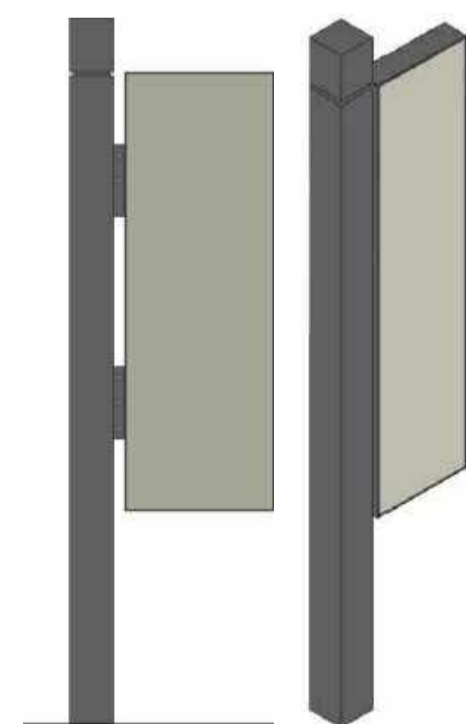
SIGN No.4
SEATING AREA - FLORA & FAUNA

TYPE: MODULE A - TYPE 6
INSTALLATION: IN-GROUND ADJACENT TO PATH
CONTENT: INTERPRETATION
INTERPRETATION FEATURE: FLORA AND FAUNA
DESCRIPTION: LOCATED WITHIN A VEGETATED AREA, THIS SIGN IS TO PROVIDE INFORMATION ABOUT THE PRE-EUROPEAN FLORA AND FAUNA COMMUNITIES THAT WERE INDIGENOUS TO THIS SITE - INCLUDING THE REMNANT HEATHLAND VEGETATION, LITTORAL RAINFOREST FEATURING MANY QUEENSLAND SPECIES, AND THE BUSH REGENERATION WORKS THAT ARE UNDERTAKEN BY COUNCIL.
TYPICAL SIGN GRAPHICS:

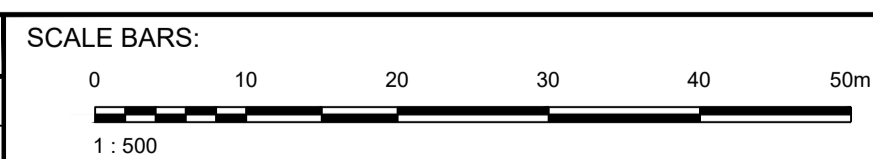


SIGN No.5
CAMERA OBSCURA

TYPE: MODULE A - TYPE 6
INSTALLATION: IN-GROUND ADJACENT TO PATH
CONTENT: INTERPRETATION
INTERPRETATION FEATURE: CAMERA OBSCURA
DESCRIPTION: LOCATED ADJACENT TO A SMALL SEATING AREA ELEVATED OFF THE MAIN PATH, THIS SIGN IS TO CELEBRATE THE CAMERA OBSCURA WHICH WAS LOCATED IN THIS APPROXIMATE LOCATION OPERATING BETWEEN 1901-1914. THIS LOCATION HAS THE POTENTIAL FOR AN ADDITIONAL INTERPRETIVE SCULPTURE ELEMENT.
TYPICAL SIGN GRAPHICS:



No	DATE	REVISION DETAILS
A	27.05.20	PRELIMINARY ISSUE FOR REVIEW OF ENVIRONMENTAL FACTORS



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SCALES:	AS SHOWN
DATUM:	AHD
GRID:	MGA
JOB REF:	15320
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PROJECT:
**GAP PARK, WATSON BAY
 PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
 ROUTE WITH INFRASTRUCTURE IMPROVEMENTS**

DRAWING
WAYFINDING & INTERPRETIVE SIGNAGE PLAN

DRAWING No	REVISION
15320-06	A
SHEET 6 OF 6 SHEETS	A1
ISSUED FOR: PRELIMINARY	

DESIGN SUMMARY STATEMENT

GAP PARK, WATSONS BAY

PROPOSED NEW PATHWAY ALONG HISTORIC TRAMWAY ROUTE

DOCUMENT REVISION RECORD

Date:	4 December 2019
Revision:	V1
Issue for:	Draft Review
Prepared by:	Scott Champion (Landscape Architect)
Review by:	Shaun Nolan (Director Infrastructure Design)

TABLE OF CONTENTS	1
DESIGN SUMMARY STATEMENT	
Project Description and Status Update	2
Gap Park Masterplan 2008	2
Path Accessibility	3
Heritage Items	3
Interpretative and Wayfinding Signage	5
Vegetation	6
Planning and Development Controls	7
Next Steps Forward	8
ATTACHMENTS	
Appendix A - Tramway Path Community Consultation Plan 17 June 2019	9
Appendix B - Preliminary Aboriginal Archaeological Investigation 10 August 2007	11
Appendix C - Heritage Listing Dunbar Anchor & Tramway Cutting	32
Appendix D - Heritage Listing Dunbar Group	36
Appendix E - Heritage Listing Monument to Lieutenant G.J. Grieve	44
Appendix F - Site Photographs 28 November 2019	48

PROJECT DESCRIPTION AND STATUS UPDATE

Woollahra Municipal Council (WMC) engaged Aspect Australia Pty Ltd (AA) in March 2019 to prepare civil engineering and landscape design drawings for the proposed tramway path to be generally in accordance with the route included in the 2008 Gap Park Masterplan. The conceptual drawings have been completed and were used by Council to facilitate stakeholder consultation to seek community feedback regarding the project.

The community consultation period has now ended, and an internal report outlining the feedback received was prepared by WMC.

This design statement is intended to provide a status update, background to the project, and summary of design features, relationship to the Gap Park Masterplan 2008, proposed materials and finishes, impacts on existing vegetation, proposed bush regeneration, identification of relevant development and or planning controls, and discussion of the various heritage items located within Gap Park. It is to be read in conjunction with the Community Consultation Plan attached as Appendix A to this document.

The project involves the proposed extension of a pathway celebrating the former alignment of the Watsons Bay tram which was decommissioned in 1960. The path will connect the Military Road end of the park in the north to Old South Head Road in the south. The path is approximately 385 metres long and will extend from the current “Gap Loop” tram stop and largely follows the historic tram route, past the existing path to Jacobs Ladder, and continuing through the grassed clearing towards Old South Head Road.

The path will be 2 metres wide, constructed from decomposed granite with sandstone edges and include rest and or seating areas, habitat boardwalk, sandstone log wall, and interpretive and or wayfinding signage. Other associated works include a drainage swale to control stormwater runoff and safety fence along sections of the path with steep embankments. Council will also continue to implement its bush regeneration works throughout the park which will include new indigenous plantings at opportunities around the pathway and rest areas.

GAP PARK MASTERPLAN 2008

The proposed path was included as an element of the Masterplan that was developed for Gap Park in 2008. Works from the Masterplan have been gradually implemented over several years including the coastal path upgrade, entry from Military Road, CCTV network and emergency phone booths, and new fencing.

The proposed path is generally in accordance with the route described on the Masterplan. There is a small change to the alignment of the route towards the Old South Head Road end. After consideration of existing site levels and vegetation, it was agreed with Council that an alternative route provided less disturbance to existing vegetation, was more suited to provide a satisfactory path gradient, and better represented the desire lines currently evident in the usage of the park. This section of path that differs from the masterplan was already altered from the original tram way route. The original route utilised a cutting through this section of the park which was filled and revegetated in the 1970's by Council. Using the original route would require substantial vegetation removal and was not considered viable.

The Masterplan recommended the path to be concrete with an exposed aggregate finish, however, Council advised that asphalt would be nominated in the Community Consultation Plan as they believed it was a better fit within the bushland setting. Subsequent feedback was received from the community requesting that the scale and material choice be limited to retain the natural character of the existing bushland track. Aspect Australia provided a summary of the advantages and or disadvantages of three material choices (asphalt,

decomposed granite, and exposed aggregate concrete) and Council selected decomposed granite with a sandstone edge to be used.

PATH ACCESSIBILITY

The Australian Human Rights Commission (AHRC) states that: *“While a footpath necessarily follows the natural topography of the area, in the best possible circumstances a continuous accessible path of travel along a footpath should:*

- *Have a gradient of no steeper than 1 in 20*
- *Have a cross fall of no steeper than 1 in 40*
- *Have kerb cuts with appropriate kerb ramps*
- *Incorporate appropriate Tactile Ground Surface Indicators where necessary to ensure adequate safety and orientation at street crossings*
- *Have a pedestrian zone with a minimum clear width of 1.8 metres at the narrowest point and a minimum clear height of 2 metres with nothing encroaching into that envelope*
- *Be as smooth as possible without raised or cracked paving or tree root damage*
- *Have a slip resistant surface during dry and wet conditions*

“The Commission notes, however, that topographical issues, historical practices and local conditions will affect the capacity of local government authorities to achieve this level of good practice in all circumstances.”

The Commission also acknowledges that *“...individual authorities must make their own decisions on how to proceed based on the needs of local communities, local conditions, historical practice and any unique heritage or environmental issues.”*

Following advice from Council, the proposed path was designed at 2 metres wide without the intention for it to be used as a shared cycleway. The proposed design aims to provide a path that is accessible wherever feasible within the constraints of the site. However, there are certain sections where the existing topography and vegetation prohibit achieving the desired gradient without extensive earthworks and removal of a significant amount of vegetation. In these locations, the design will seek to achieve a satisfactory balance between minimising the gradients as much as possible while limiting impacts from changes to existing ground levels.

The proposed path material is compacted decomposed granite with a cement additive to improve the stability of the surface and ability to cope with normal wear and tear. This material has been preferred by Council, over concrete for example, due to its more appropriate compatibility and permeability within a natural bushland setting.

HERITAGE ITEMS

TRAMWAY CUTTING (NO. 436)

The ‘Tramway Cutting’ is listed as a locally significant heritage item in WMC’s Local Environment Plan 2014 (heritage item no. 436). The LEP does not provide any additional information about the heritage item.

The Office of Environment and Heritage (OEH) groups the Tramway Cutting in the same listing as the Dunbar Anchor (Refer to Appendix C). The item is listed as an archaeological-terrestrial type of heritage item and as having historical significance at a Regional level. However, it is worth noting that, with the exception of two photographs, the historical notes describe the Dunbar Anchor without referring to the Tramway Cutting.

Given the limited information available about the Tramway Cutting heritage item, an assumption has been made that the item relates to the existing cutting itself. This cutting through the sandstone will remain and is featured along the route of the proposed tramway path that is intended to celebrate the history of the Watsons Bay tram.

DUNBAR ANCHOR (NO. 435)

This heritage item is in a separate part of Gap Park and is not considered to be impacted by the proposed work.

DUNBAR ROCK INSCRIPTION (NO. 437)

This heritage item is in a separate part of Gap Park and is not considered to be impacted by the proposed work.

MONUMENT TO LIEUTENANT G.J. GRIEVE (NO. 438)

This heritage item is in a separate part of Gap Park and is not considered to be impacted by the proposed work.

ABORIGINAL ARCHAEOLOGICAL INVESTIGATION

As part of the Gap Park Masterplan prepared in 2008, a Preliminary Aboriginal Archaeological Investigation of Gap Park was undertaken by Archaeological & Heritage Management Solutions Pty Ltd (AHMS). Refer to Appendix B. The site inspection that was undertaken by AHMS during this investigation was not designated to be a comprehensive survey, however, no Aboriginal sites were identified.

The Report noted that the exposed and obscured flat sandstone platforms may contain evidence of engraving. In addition, some of the rock overhangs beneath the partly cut cliff-line have the potential to contain evidence of small rock-shelters and associated midden and or archaeological deposits.

The Report identified two areas within the park that contained these potential archaeological constraints. They are:

1. *Rock Engraving Zone (shaded yellow)*

This area is located outside the area affected by the proposed tramway path.

2. *Rock Shelter and Potential Archaeological Deposit Zone (shaded orange)*

The proposed path runs through this zone. It is identified as having potential to contain archaeological deposit and rock shelters / overhangs along cliff-lines.

The Report states that "further investigation will be required if pathways and any form of ground disturbance works are proposed within the area marked orange. The detailed survey to be undertaken would be to determine whether or not any rock shelters (with archaeological deposit, midden or art) and / or areas of potential archaeological deposit are present within the footprint of the proposed development works."

The Report's second recommendation also relates to the proposed work and advises that:

"If new works are proposed in zone 2 (shaded orange), a detailed Aboriginal Heritage Impact Assessment (AHIA) focusing on identification of rock shelter sites and potential archaeological deposits, should be undertaken. The AHIA should include Aboriginal community consultation, undertaken in accordance with Department of Environment and Climate Change (DECC) Interim Community Consultation Requirements for Applicants (2005)."



*Aerial photograph showing zones of archaeological potential
(Source: AHMS Preliminary Archaeological Investigation, August 2007)*

INTERPRETATIVE AND WAYFINDING SIGNAGE

Locations for interpretive and wayfinding signs have been selected to provide information and celebrate the former tram route, location of the former “camera obscura” which operated from the end of the 19th century until 1914, as well as pre-European cultural and environmental features of Gap Park.

The proposed signage will be consistent in design style and material as the existing signs within Gap Park which have been manufactured in accordance with the Deuce Design 2010 Interpretation & Wayfinding Construction Package.

SIGNAGE LOCATION NO.1 - WAYFINDING AND INTERPRETIVE

Location: Start of new path from existing footpath along Old South Head Road.

Description: Sandstone paving demonstrating where the proposed path crosses the historic alignment of the tram route and signage that includes information and photographs about the historic route. Wayfinding signage will also be included to demonstrate direction and distances to other items such as The Gap, Jacobs Ladder, and Dunbar’s anchor.

SIGNAGE LOCATION NO.2 - WAYFINDING

Location: Node where proposed path crosses the existing footpath between the Littoral Rainforest Walk (west) and Jacobs Ladder (east).

Description: Direction and distances to be provided to other places such as The Gap, Jacobs Ladder, Dunbar's anchor, and Old South Head Road.

SIGNAGE LOCATION NO.3 - INTERPRETIVE

Location: Within the Littoral Rainforest near the proposed habitat boardwalk

Description: This interpretive location has been selected to celebrate the pre-European history of the site including Aboriginal heritage, native fauna and flora.

SIGNAGE LOCATION NO.4 - INTERPRETIVE

Location: Site of the historic 'Camera Obscura'

Description: This interpretive sign is intended to at the approximate location of the former 'Camera Obscura' which operated from late 19th century until 1914. This location has the potential for an interactive element if desired by Council.

VEGETATION

Aspect Australia completed a site walk on 4 April 2019 with Council's Bush Regeneration Officers and Project Manager to review the intended route and discuss potential impacts to the existing vegetation, among other matters.

Council's revegetation officers provided advice throughout the length of the walk identifying trees that were worthy of retention and those that were senescent or of low value that could be removed in order to allow the construction of the path in the desired location.

Throughout the next stage of detail design, these trees to be retained and or removed as part of the proposed work will be identified in a survey to allow potential impacts to be assessed by Council's Tree Management Officers.

Council advised that prior to commencing works on the path, some of the existing vegetation could be extracted by Council's bush regeneration officers and re-planted elsewhere within the park.

Council also advised that revegetation and or bush regeneration works are carried out regularly in the park and that no specific treatment to other areas is required as part of this project. New planting works would only be required near select locations along the path where necessary and around the new seating areas identified. This would be undertaken in consultation with the bush regeneration officers and existing planting schemes.

PLANNING AND DEVELOPMENT CONTROLS

WMC's Project Manager supplied information and or advice following internal discussion with WMC's Heritage Planners. This advice suggested that the proposed work could be undertaken as Exempt Development under the Infrastructure SEPP if it meets the requirements of exempt development in Division 12, including:

INFRASTRUCTURE SEPP 2007

- *Clause 66.3 (a) – “complies with clause 20”*

The items that are related to the proposed work are (e) and (g).

Item (e) relates to a requirement that the work must involve no more than a minimal impact on the heritage significance of a heritage item. Council must be satisfied that the proposed work involves no more than a minimal impact on the Tramway Cutting.

Item (g) requires no removal or pruning of any vegetation unless it is undertaken in accordance with a permit or development consent. Council's Project Manager advised that any tree removal or pruning required will be assessed by Council's Arborist / Bush Regeneration Officers with subsequent approvals provided.

- *Clause 66.3 (b) – “involves no greater disturbance of native vegetation than necessary”*

As discussed earlier in this report, minimising the amount of vegetation requiring removal is a key design consideration in all phases of this project.

- *Clause 66.3 (c) – “does not result in an increase in stormwater run-off or erosion”*

There are erosion issues on the existing bush track that is currently acting as a channel for the flow of stormwater run-off coming off the above escarpment. This project intends to improve the management of this stormwater run-off by utilising a vegetated, rock-lined swale next to the path that is intended to capture the run-off, control its movement, and then provide areas where it can be dissipated into the natural ground.

WATSONS BAY HERITAGE CONSERVATION AREA (C3.4.15 PRECINCT P: UPPER GAP PARK)

The Watsons Bay HCA provides precinct guidelines (G1 – G9) for the area known as Upper Gap Park where the proposed path is located. The project is considered to be in keeping with the intended character and guidelines provided for this precinct.

NEXT STEPS FORWARD

We recommend Woollahra Council complete an internal review of the project using this document as the starting point for discussions. We request Council to advise if any of the following items are required before commencing the next phase of design documentation:

- Identify any approvals and or permits that are required prior to any construction taking place.
- Confirm if additional reports required by other consultants (Aboriginal Heritage Impact Assessment)
- Advise if any other matters are to be considered when preparing detail design documentation

Subject to resolution of the above items, we anticipate the following design items (but not limited to) will be required as part of the design process leading to the tendering and successful construction of the project:

- Undertake additional topographical survey (using GPS) to supplement the existing survey completed by others in 2017. The updated survey is to include the location and size of existing trees and roots, existing walking paths, ground levels and other key features identified along the proposed path route.
- Undertake minor path alignment adjustments identified at our recent site meeting with Councils Project Manager. Incorporate water sensitive design measures (WSUD) to control overland flow path at the downstream end of the project adjoining the existing concrete (former 'Gap Loop' Tramway Stop).
- Undertake stormwater calculations to determine the appropriate measures required to protect the proposed path from future scouring and erosion.
- Undertake setout of proposed footpath alignment with the placement of survey pegs to assist Council's arborist and or bush regeneration officers to review and procure necessary approvals for any vegetation removal as required.
- Complete underground services location search (DBYD) and engage Accredited Plant Locator (APL) to identify and mark-up the location and depths of existing CCTV and or Telstra cables that have been installed under the existing and or proposed footpath alignment.
- Identified mature trees adjoining the proposed footpath alignment will be documented and their structural root zones (SRZ) and tree protection zones (TPZ) defined on the design drawings. Councils tree protection officer will be required to review and approve any works within these zones and advise of any notes or specifications that are required to be added to our drawings to ensure their protection during construction.
- Prepare detail design documentation of path including habitat boardwalk (level of detail to be agreed upon in consultation with Councils Project Manager) to facilitate tendering and the successful construction of the project.

Appendix A

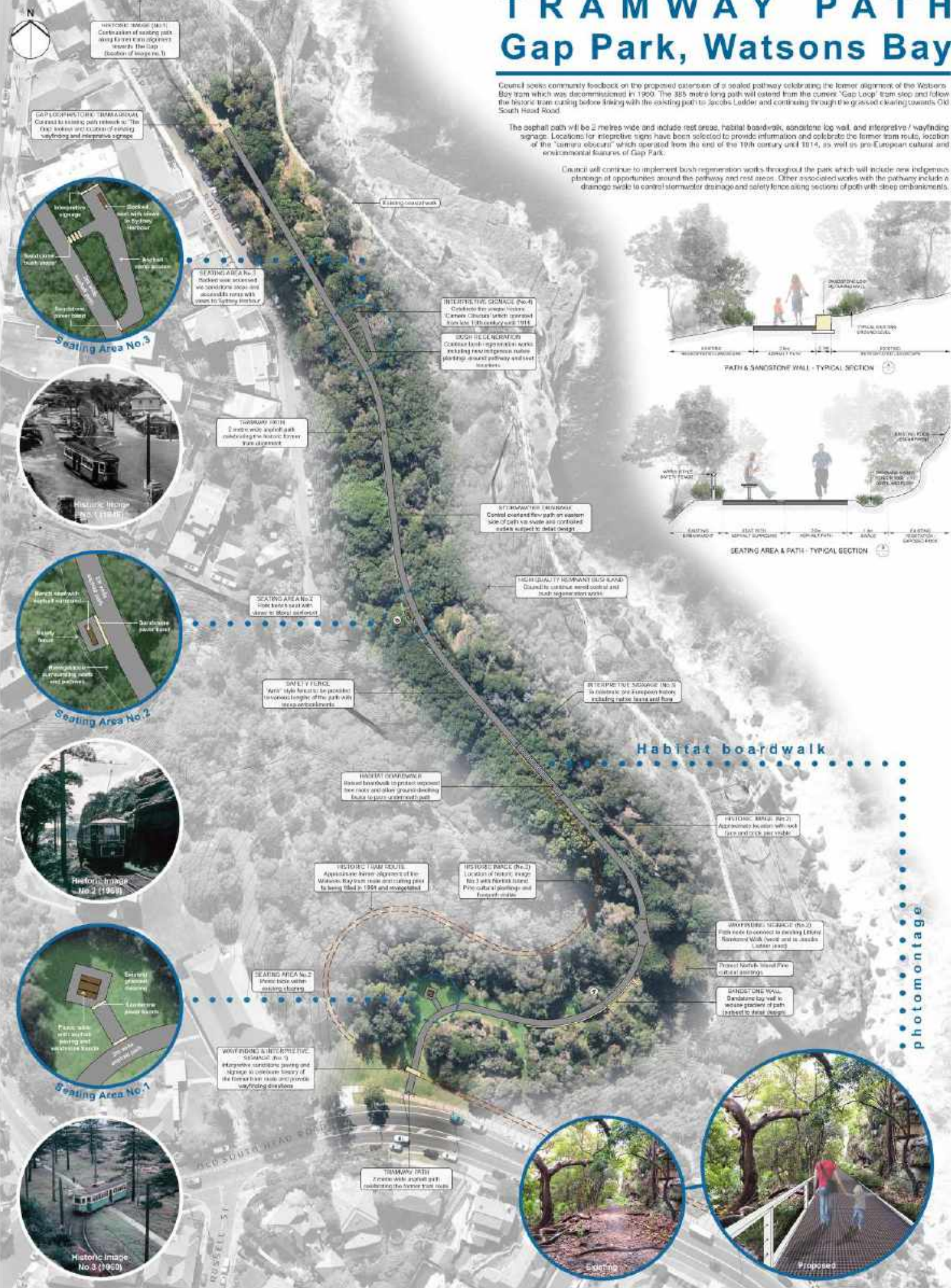
COMMUNITY CONSULTATION PLAN | 17 JUNE 2019
PREPARED BY ASPECT AUSTRALIA

TRAMWAY PATH Gap Park, Watsons Bay

Council seeks community feedback on the proposed extension of a sealed pathway celebrating the former alignment of the Watsons Bay tram which was decommissioned in 1960. The 385 metre long path will extend from the current 'Gap Loop' tram stop and follow the historic tram cutting below linking with the existing path to Jacobs Ladder and continuing through the grassed clearing towards Old South Head Road.

The asphalt path will be 2 metres wide and include rest areas, habitat boardwalk, sandstone bog wall, and interpretive / wayfinding signage. Locations for interpretive signs have been selected to provide information and celebrate the former tram route, location of the 'camina obscura' which operated from the end of the 19th century until 1914, as well as pre-European culture and environmental features of Gap Park.

Council will continue to implement bush regeneration works throughout the park which will include new indigenous plantings at opportunities around the pathway and rest areas. Other associated works with the pathway include a drainage swale to control stormwater drainage and safety fence along sections of path with steep embankments.



Photomontage



SCALE 1:500 (A1) 1:1000 (A3)

COMMUNITY CONSULTATION PLAN

Appendix B

PRELIMINARY ABORIGINAL ARCHAEOLOGICAL INVESTIGATION | 10 AUGUST 2007
PREPARED BY ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS (AHMS)

**ARCHAEOLOGICAL & HERITAGE MANAGEMENT
SOLUTIONS PTY LTD**

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10th August 2007

Thompson Berrill Landscape Design Pty Ltd
1/78 Addison Road,
MANLY, NSW 2095

Attn: Mr. Glenn Berrill (Director)

Re: The Gap, Watsons Bay, NSW – Preliminary Aboriginal Archaeological Investigation

Dear Mr Berrill,

This letter report presents results of a preliminary Aboriginal archaeological investigation of The Gap Park in Watson's Bay, NSW (refer to Figure 1 overleaf).

The investigation was commissioned on behalf of Woollahra Municipal Council as part of the Gap Park Masterplan and to provide advice for future development and management of the subject land. The archaeological investigation was designed to identify potential Aboriginal archaeological issues associated with the study area, and any requirements for detailed assessment, investigation and/or impact mitigation works. It is envisaged that this advice will assist in preparing the Masterplan and informing future management of the Park.

As such, this report is not a formal *Aboriginal Heritage Impact Assessment (AHIA)* in accordance with NSW Dept of Environment & Climate Change Guidelines and did not include full Aboriginal community consultation, as is required for an AHIA assessment. However, consultation with the La Perouse Local Aboriginal Land Council was undertaken to discuss the cultural heritage significance of the Gap Park. The advice of the La Perouse Local Aboriginal Land Council has been incorporated into this report, however should an AHIA be required in future, broader Aboriginal Community consultation will be required in accordance with the DECC Interim Community Consultation Guidelines 2004.

Aims

Specific aims of the study were as follows:

- a) Identify any known Aboriginal sites and/or objects within the subject area and assess the potential for Aboriginal sites and/or objects buried below ground surfaces;
- b) Consult with La Perouse Local Aboriginal Land Council regarding the cultural heritage significance of The Gap;

- c) Research, review and assess secondary historical sources and archaeological reports available for the local area to identify the potential for Aboriginal sites and/or objects to be present within the study area;
- d) Identify Aboriginal heritage constraints and opportunities with regard to the future development and management of The Gap and the level of any further Aboriginal heritage investigations required; and
- e) Provide Council with a practical assessment identifying what legislative and policy requirements would apply and how best to manage any Aboriginal heritage known or likely to be present in the study area. Recommendations for management of Aboriginal heritage would be made in accordance with the statutory requirements of the *National Parks & Wildlife Act 1974 (NPW Act, 1974)*.

Investigation Methodology

Archaeological Literature Review

Previous reports, surveys and studies in the locality were reviewed to determine the potential for archaeological sites within the study area as well regional patterns of Aboriginal use and occupation. The Dept of Environment & Climate Change (DECC) Aboriginal Heritage Information Management System (AHIMS) was consulted regarding known archaeological sites in the surrounding area, and to identify whether any Aboriginal sites or objects have been recorded within the study area.

Site Inspection

The study area was inspected on foot. The investigation assessed the degree of land disturbance and erosion in the study area to determine the likelihood of undisturbed Aboriginal sites and/or objects buried below ground surfaces.

Community Consultation with La Perouse Local Aboriginal Land Council

La Perouse Local Aboriginal Land Council was invited to participate in a short site inspection. They were consulted to ascertain whether or not the study area has cultural heritage significance to the local Aboriginal community. Land Council has prepared a brief letter report setting out the cultural values of the site, which is attached to this report. **A COPY OF THIS REPORT WILL BE FORWARDED TO THE LAND COUNCIL UPON APPROVAL OF THIS DRAFT BY THOMPSON BERRILL. LPLALC WILL REVIEW THE DRAFT REPORT AND PROVIDE A LETTER TO BE INCORPORATED INTO THE FINAL VERSION OF THE REPORT.**

Letter Report

This letter describes the results of the AHIMS Aboriginal sites database search, literature review, Aboriginal community consultation and site inspection. The report also identifies Aboriginal heritage constraints on development and management of The Gap. It provides recommendations about the level of further archaeological investigation that should be undertaken in advance of any future development works within the Park.



Figure 1 - Location Plan (study area is shaded red). *Source: Woollahra Municipal Council*

Aboriginal Historical Context

The traditional owners of the Vaucluse area were the *Gadigal*¹ People, a *Darug* language speaking 'clan' group. The *Darug* language group originally extended from the eastern suburbs of Sydney as far south as La Perouse, west beyond the Blue Mountains and north as far as the mouth of the Hawkesbury River². The *Gadigal* were a sub-group (often referred to as 'clans'), based upon religious and/or totemic associations to country. Ethnohistoric sources indicate the *Gadigal* occupied the south side of Sydney harbour from South Head to Cockle Bay³.

The traditional life of the Gadigal was broken through the course of the early 19th century. The impact of smallpox and influenza decimated the Aboriginal population, with individual epidemics killing large numbers of people. Early white settlement of traditional hunting lands deprived Aboriginal groups of sources of food and access to camping and ceremonial sites. This forced individuals to either relocate into the potentially hostile lands of neighbouring Aboriginal groups, partially integrate into colonial society as fringe dwellers or to resist. Resistance by Aboriginal groups was often met with retaliatory action by white settlers and the colonial administration. A combination of these factors led to the demise of traditional lifestyles and a decrease in the Aboriginal population.

By studying accounts of early settlers, we can reconstruct aspects of the Gadigal lifestyle. The subsistence and economy of Aboriginal groups depended largely on the environment in which they lived. While coastal groups exploited marine and estuarine resources, hinterland groups relied on freshwater and terrestrial animals and plants. A distinction between the two lifestyles is clearly made in early European accounts. During a trip along the Hawkesbury-Nepean during 1791, Watkin Tench wrote that:

'[hinterland people] depend but little on fish, as the river yields only mullets, and that their principal support is derived from small animals which they kill, and some roots (a species of wild yam chiefly) which they dig out of the earth'.

In contrast, Collins wrote that for coastal people such as the Gadigal:

'Fish is their chief support...the woods, exclusive of the animals which they occasionally find in their neighbourhood, afford them but little sustenance; a few berries, the yam and fern root, the flowers of the different Banksia, and at times some honey, make up the whole vegetable catalogue'

Tench also noted the importance of marine foods in the economy of coastal groups. According to Tench, the task of fishing was divided between husband and wife, the woman using a hook and line and the man using a fish gig (spear)⁴. Bark canoes were often used by both men and women for fishing and fires were commonly placed in the middle of these canoes. When fish were scarce or the weather was foul, coastal groups turned their attention to gathering shellfish, hunting reptiles and small animals, digging fern roots, or gathering berries⁵.

¹Attenbrow 2002: 23-25

²Eades, D.K. 1976; and see also Tindale's Tribal Boundaries Map:
(www.samuseum.sa.gov.au/tindale/HDMS/tindaletribes/daruk.htm)

³ibid

⁴Tench, W 1996: pp.258-260

⁵ibid

Although early observations have provided much useful information about Aboriginal society at contact, archaeological investigations have shown clear deficiencies. Archaeological excavations on the NSW coast have clearly shown that coastal people exploited a wide range of hinterland terrestrial resources, which sits in contradiction to early records that coastal people were almost exclusively 'fishers' and inland people were 'hunters'. The contradiction is probably accounted for by the visibility of fishing and gathering activities on and near the water as opposed to the relative invisibility of hunting and foraging activities in the hinterland.

From the historical record it is clear that quite large populations were supported along the coast. One such account comes from Tench and is worth quoting in full:

"on the north west arm of Botany Bay stands a village which contains more than a dozen houses and perhaps five times that number of peopleGovernor Phillip, when on an excursion between the head of the harbour and that of Botany Bay, once fell in with a party which consisted of more than 300..."⁶.

Aboriginal groups living in the Hawkesbury sandstone region made extensive use of the natural rock overhangs and caverns that are characteristic of the area. George Barrington observed that *"Those who build bark huts are very few compared to the whole. Generally speaking, they prefer the ready made habitations they find in the rocks"*.

Tench described how native huts were constructed by laying pieces of bark together in the form of an oven. The end result consisted of a low shelter, which was opened at one end and sufficient to accommodate one person lying down⁷. Tench⁸ goes on to conclude that "there is reason, however, to believe that they depend less on them (huts) for shelter than on the caverns with which the rocks abound".

Plant management practices that bear remarkable similarity to those reported in northern Australia were also conducted in the Sydney area. For instance, there is good evidence that the Darug practiced fire-stick farming in and around Sydney. When the first fleet arrived in Sydney, Captain John Hunter found an environment where:

"the trees stand very wide of one another, and have no underwood; in short the woods ... resemble a deer park, as much as if they had been intended for such a purpose" .

This is the classic result of Aboriginal firing of the landscape. Ethnographic evidence from Northern Australia suggests that the systematic burning of the landscape was carried out for a variety of reasons. 'Fire-stick farming' opened up access to land and created pockets of early succession vegetation that increased the amount of important plant foods. Early regrowth vegetation, particularly grasses, attracted animals, which in turn made them easier to hunt. Aboriginal firing of the landscape was an important tool in manipulating the environment to increase food sources.

Plant management was not just restricted to the manipulation of the environment though. Plant processing also figured prominently and enabled the *Gadigal* and other groups to broaden their

⁶ Tench, W. 1996: 58

⁷ Tench, W. 1996: .53

⁸ *ibid*

range of food sources. Hunter provides an interesting account of trying to eat a poisonous yam (probably *Dioscorea bulbifera*) and getting violently sick. Hunter had seen Aborigines digging this same yam and concluded, "*They no doubt have some way of preparing these roots, before they can eat them*".

According to George Washington Walker's journal of 1836, the Illawarra Aborigines processed Zamias. Walker recorded that the Aborigines:

*"either roast them, and pound them into a paste, steeping them in water to get rid of their acrid and hurtful properties, or get rid of these by longer period of steeping in water, so as to render them fit to be eaten in a raw state"*⁹.

Such plant management and processing practices were an important part of the economies of Aboriginal groups.

Archaeological Background

For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types and locations in any given area.

In terms of regional archaeology, the study area falls within the Sydney Basin. Aboriginal occupation in this region dates back well into the Pleistocene period (i.e. before 10,000 years ago). This evidence comes from radio carbon dates (C14) dates retrieved from excavated sites such as Cranebrook Terrace (41,700 years before present), Shaw's Creek K2 (14,700 years before present) and George & Charles St Parramatta (c.25,000-30,000 BP). The dating of Cranebrook Terrace is currently under review¹⁰, so at this time the Charles & George St site is considered as the oldest reliable date for Aboriginal occupation in the Sydney region. The oldest coastal site in the Sydney region is Prince of Wales Hospital (8,400 BP), closely followed by Curracurrang Rockshelter in Royal National Park (7,450 BP)¹¹.

The vast majority of dated sites in the Sydney region are less than 5,000 years old (35 out of a total of 48 dated sites). It has been argued that this is a result of increased populations and 'intensification', during this period. The prevalence of sites dating to the last 5000 years may also be a result of the last significant rise in sea level, approximately 6000 years ago. The sea level rise would have submerged many of the older sites along the coastal fringe.

The archaeology of the Sydney region has been well documented through a large number of academic, amateur and impact assessment investigations over the past 30 years. Approximately 4,300 sites have been recorded and registered with the NPWS Sites Register for Sydney, reflecting both the wealth of archaeology in the region and the number of archaeological investigations undertaken.

⁹ Quoted in Organ, M. 1990: 208

¹⁰ Attenbrow 2002:20-21

¹¹ As cited in Attenbrow 2002:18-19; Cranebrook Terrace [41 700 +3000/-2000 ANU-4016]; Shaw's Creek [14 700±250 Beta-12423]; Prince of Wales Hospital [8 400±800 lacks a lab no. from source] and Curracurrang 1 [7 450±180 Gak-482]

The dominant site types in the Sydney region (in the 15 - 20 % frequency range) are rock shelters with midden deposit, rock shelters with art, rock art engravings and open artefact scatters¹². Site types in the 5 - 15 % range, include rock shelters with artefacts, grinding grooves and open middens¹³. The distribution, density and size of site types is largely dependent on environmental context. For instance, middens are found in close proximity to marine, estuarine and less often, freshwater bodies. Rock shelters are only found in areas of exposed sandstone escarpment and grinding grooves are found in areas of exposed flat beds of sandstone, particularly along creek lines.

A study of the regional archaeology of the Cumberland Plain by Dr Jim Kohen made a number of findings about site location patterns in the Sydney area. The study demonstrated that proximity to water was an important factor in site patterning. Kohen showed that 65 % of open artefact scatter sites were located within 100 metres of permanent fresh water¹⁴. Only 8 % of sites were found more than 500 metres away from permanent fresh water. In short, open artefact scatters are larger, more complex and more densely clustered along permanent creek and river lines. Kohen's study also found that Silcrete (51 %) and Chert (34 %) are the most common raw materials used to manufacture stone artefacts¹⁵. Other raw materials include quartz, basalt, tuff and quartzite.

A consideration of sub-surface artefact scatters is also relevant because of the potential for areas with no surface evidence to contain buried sub-surface deposits. A 1997 study of the Cumberland Plain by McDonald¹⁶ found that:

- 17 out of 61 excavated sites had no surface artefacts prior to excavation;
- The ratio of recorded surface to excavated material was 1:25; and
- None of the excavated sites could be properly characterised on the basis of surface evidence. In short, surface evidence (or the absence of surface evidence) does not necessarily indicate the potential, nature or density of sub-surface material.

The results of McDonald's study clearly highlight the limitations of surface survey in identifying archaeological deposits. The study also shows the importance of test excavation in establishing the nature and density of archaeological material on the Cumberland Plain, within the Sydney region.

The east coast has been the subject of studies that examine settlement patterns, particularly in regard to the role of seasonality. Based on the results of coastal excavations (particularly in the Royal National Park) and site distribution patterns, Gretchen Poiner argued that seasonality was a major influence on settlement patterns and subsistence modes on that coast. Poiner claimed that large semi-sedentary summer camps gave way to dispersal of smaller groups into the hinterland during winter when marine resources diminished. Anne Ross challenged

¹² Attenbrow 2002: 49

¹³ *ibid*

¹⁴ Kohen 1986: 229-275

¹⁵ Kohen 1986: 280-281

¹⁶ McDonald 1997

Poiner's model, using ethnographic evidence to argue that inland winter migration was unlikely due to tribal boundaries¹⁷. Instead, Ross argued that smaller groups were spread more thinly along the coast during winter.

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied. A technological sequence for stone artefacts for the region was first described in the late 1940s by Fred McCarthy and has since been refined. Known as the 'Eastern Regional Sequence' it was based on direct dating of excavated sequences. Some debate about the precise nature and significance of the technological changes described still continues¹⁸, therefore the ERS should be regarded only as a general guide to technological change. The ERS phases are as follows:

- **Capertian** - is distinguished by large uniface pebble tools, core tools, horsehoof cores, scrapers and hammerstones. Backed artefacts occasionally present. Generally dates to before 5,000 years before present (BP).
- **Early Bondaian** - Aspects of the Capertian assemblage continue, but backed artefacts and ground-edged artefacts increase. Artefacts during this period were predominantly made from fine-grained silicious stone such as silcrete and tuff. Generally dated from 5,000 BP to 2,800 BP.
- **Middle Bondaian** - Characterised by backed artefacts, particularly Bondi Points and ground-edged artefacts. Artefacts made from silicious materials, however quartz becomes more frequent. Generally dated from 2,800 BP to 1,600 BP.
- **Late Bondaian** - characterised by bipolar technology, eloueras, ground-edged artefacts, and bone and shell artefacts. Bondi points are virtually absent and artefacts are predominantly made from Quartz. Generally dated from 1,600 BP to contact.

AHIMS Database Search

A search of the DEC AHIMS database found 61 site recordings within a 1.25 kilometre radius around the study area. These sites include rock engravings, middens, rockshelters with and without archaeological deposit and/or art, axe grinding grooves, an open archaeological deposit and a burial.

The majority of sites are rock engravings and rock shelters either with art or middens. Only one open archaeological deposit was identified (45-6-2797). No sites have been previously recorded within the study area (refer to Figure 2 for site locations).

The predominance of rock engravings and rock shelter site types reflects the local geology and access to resources. For examples, rock engravings, axe grinding grooves and rock shelters are found in areas of outcropping bedrock. Outcropping bedrock is common in The Gap study area.

¹⁷ Ross 1976

¹⁸ Hiscock & Attenbrow 2002; Hiscock & Attenbrow 1988; Hiscock & Attenbrow 2005

Sites in the AHIMS database search were recorded from a variety of sources from the late 19th century onwards¹⁹. Studies undertaken for academic, commercial and management purposes were prepared by Tia Negerevich, Jim Wheeler, Elizabeth Rich, Tessa Corkill and Val Attenbrow. The AHIMS sites tend to be focused in places investigated for these reports, therefore the site distribution is not a comprehensive record of sites across the landscape.



Figure 2 – Topographic map showing Aboriginal sites recorded on the AHIMS database near the study area (marked green). Source: Topoview - CMA 1:25,000 map sheets.

¹⁹ Recorded by Campbell in 1899, and Angas 1847 as cited by Negerevich 1978: 3,11

Predictive Modelling

The topography and distribution of natural resources near the study area generally indicates a potential for:

- Rock engravings and axe grinding grooves in areas of outcropping sandstone that contain flat sandstone platforms;
- Isolated finds anywhere across the landscape;
- Open artefact scatter sites and midden deposits across all landforms with intact topsoils;
- Rock shelters may also be found in areas of rock overhangs.

Previous land clearance for vegetation removal (refer to Figure 3) is likely to have disturbed original topsoil within the study area to varying degrees. Associated erosion from vegetation removal is likely to have further impacted the soils. However the retention of some original vegetation (seen in Figure 3) suggests there is potential for archaeological deposit within the study area. The integrity of stone artefact and/or midden deposits will depend on the degree of disturbance of topsoils. Open artefact scatters may be found buried below current ground surfaces in areas where intact A horizon soils remain. In areas where A horizon soils have been removed or substantially disturbed by erosion it is unlikely that sub-surface deposits remain. Isolated finds may be found anywhere across the landscape, and represent the random loss, deliberate discard or abandonment of artefacts, or the remains of dispersed artefact scatters.

There is no potential for scarred and/or carved trees because the study area does not contain remnant old growth trees of sufficient age to retain cultural scarring or marking.

There is a high potential for axe grinding grooves and rock engravings across the study area but particularly along the central and eastern sections which contain flat sandstone outcrops (platforms).

There is a potential for rockshelters and rock overhangs within the central part of the study area as this area contains some overhanging benches.

Results of the Site Inspection

A brief inspection of the study area was carried out on the 31st of July 2007 by archaeologist Felicity Barry Pty Ltd and Shane Ingrey of La Perouse Local Aboriginal Land Council. Coverage of the study area was designed to identify areas of potential archaeological sensitivity; it was not designed to be a comprehensive survey.

No Aboriginal sites were identified during the site inspection. The topography of the study area is dominated by the steep coastal cliff that occupies the eastern margin of The Gap Park. The cliff top comprises a series of outcropping sandstone platforms that drop steeply (up to 14 metres in places) to the western portion of the Park. No drainage lines are present in the study area, however water erosion channels observed along pathways beneath the cliffline appear to pool near the intersection of Dunbar Street and Gap Road (see Figure 4). This source is only likely to have been available in times of heavy rainfall. Other sources may have been small holes and voids in the sandstone platform that pooled water after rain. The closest permanent creekline appears to be located 2km southwest of the study area in the vicinity of Milk Beach.

The vegetation within the site included both native and non-native plantings, some of which were the result of recent re-vegetation (refer Figure 4). A 1943 aerial photograph of the site (Figure 3) indicates that some original vegetation is likely to have been retained. This may be supported by a Council Engineering report stating that Park improvement works in 1965 retained both 'the natural rock surfaces and the few remaining specimens of [coastal] tea tree (*Leptospermum laevigatum*)'²⁰. The area shown in the 1943 aerial photograph as retaining vegetation was steeply graded and contained several large fig trees (*Ficus rubiginosa*).

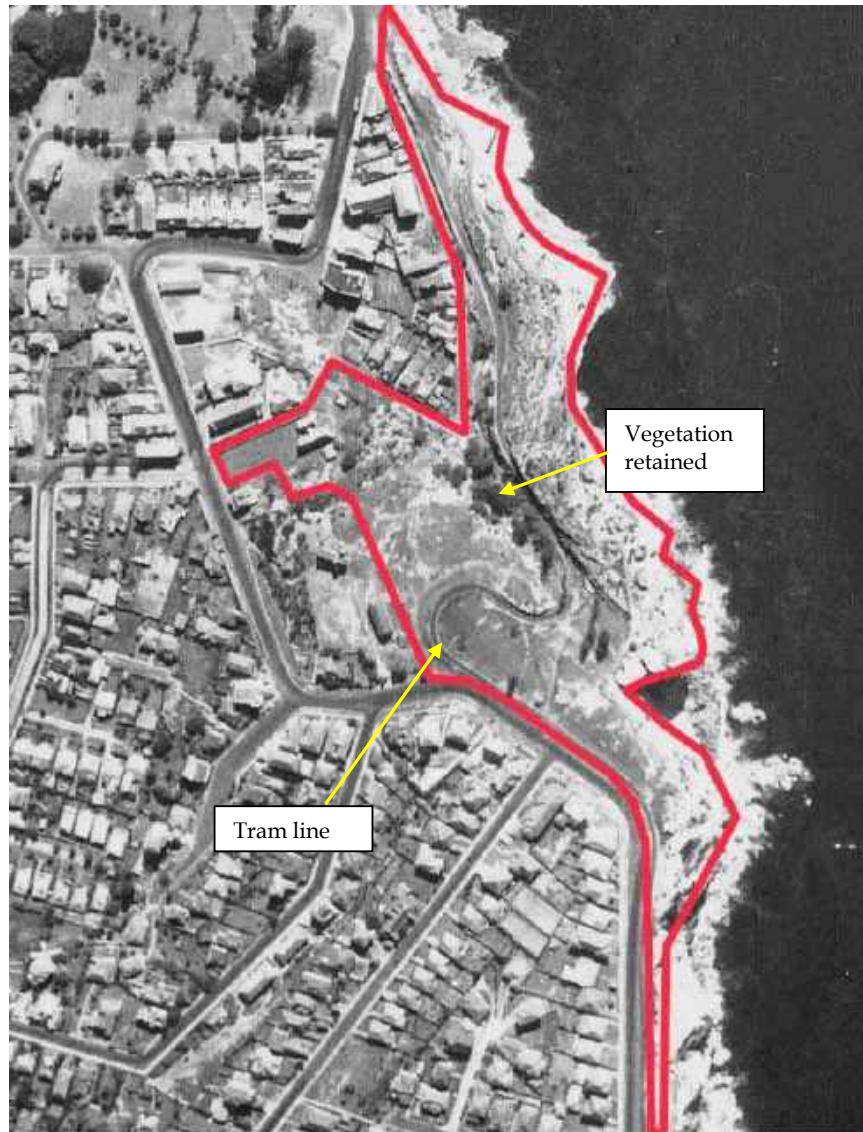


Figure 3 - 1943 Aerial Photograph of the Gap Park (outlined in red) showing vegetation removal in the Gap Park during World War II. Note also the position of the tram line. Source: Roads and Traffic Authority NSW.

²⁰ Woollahra Local History Centre, 2005: 2

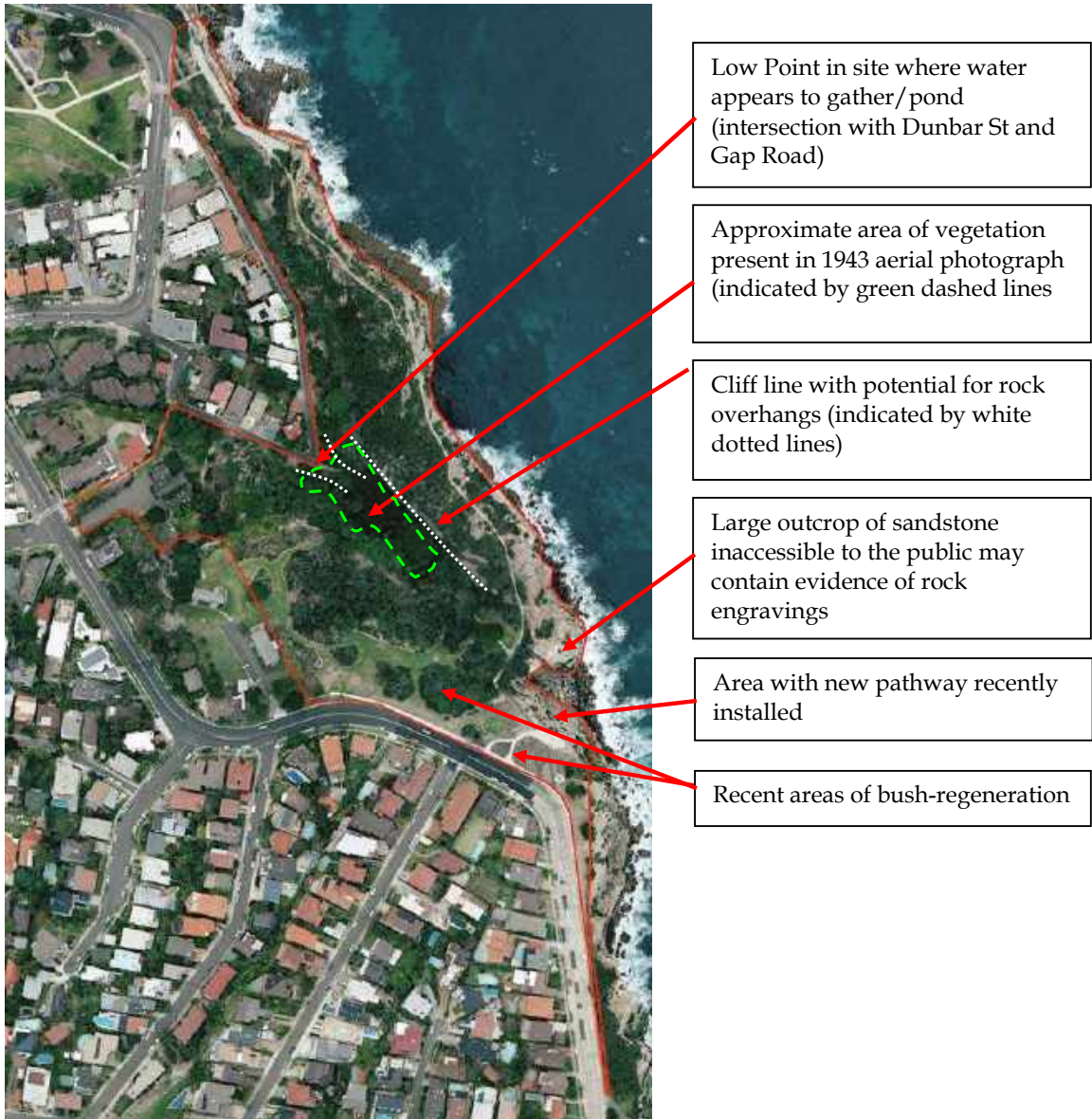


Figure 4 - Aerial photograph of the study area with natural and landscape features observed during survey. *Map Source: Woollahra Municipal Council*

Historical evidence indicates that changes to the park through construction of various structures, formation, regrading and topdressing of pathways from the 1920s, construction of revetments and revegetation have occurred at various times. Major changes included the introduction of the tramline and its later removal – evidence of this can be seen in a cutting running south-north through the central portion of the park. The tramway alignment is still visible as a gravel path running adjacent to the partially cut cliffline in the centre of the park (refer Figure 3).

Other impacts on the park have included construction of two concrete footings in the south-eastern part of the park for use during World War II. Three memorials are also present, two for the wreck of the Dunbar and one for the Lieutenant G. J. Grieve.

The ground visibility was mixed across the park but tended to be good along the cliff top and generally poor in other parts of the site. Although visibility was generally good on the cliff top rock platforms, lichen and low/shrubby ground cover obscured some of the rock surfaces on the western side of the pathway on the cliff-face. Poor ground surface visibility meant that effective detection of archaeological sites was low across most of the subject land.

The soils in the central and western parts of the site are sufficient to retain large to medium sized trees, indicating reasonable depth of soil in these areas. Soils on the cliff top sandstone platforms were very thin to non-existent. Therefore there is very low potential for archaeological deposits on the sandstone platforms and some potential for archaeological deposits in deeper intact soils across central and western portions of the park.

The presence of both exposed and obscured flat sandstone platforms in the study area may contain evidence of engraving. This is suggested by engravings located on similar platforms north of Gap Park²¹.

Some rock overhangs were present beneath the partly cut cliffline in the central part of the study area near the Dunbar Street/Gap Road gully. These have the potential to contain evidence of small rockshelters and associated midden / archaeological deposits.

During the site inspection, no old growth trees of sufficient age to retain cultural scars or markings were observed. Therefore scarred or carved trees are unlikely to be present.

Consultation with La Perouse Local Aboriginal Land Council

The La Perouse Local Aboriginal Land Council (LPLALC) was consulted to identify whether or not the study area has cultural heritage significance to the Local Aboriginal community.

LPLALC HAVE INDICATED THEY WILL PROVIDE INFORMATION REGARDING THE CULTURAL SIGNIFICANCE OF THE SOUTH HEAD AREA AND GAP PARK FOLLOWING RECEIPT OF THE CURRENT REPORT IN DRAFT FORMAT. ADVICE FROM THE LAND COUNCIL WILL THEN BE INCORPORATED INTO THE MAIN TEXT OF THE FINAL VERSION OF THE REPORT AND A COPY OF THEIR CORRESPONDENCE WILL BE INCLUDED AS AN ATTACHMENT.

²¹ Negerevich 1978

Aboriginal Archaeological Constraints

No Aboriginal sites were identified during the site inspection.

Our assessment of archaeological constraints presented below is based on conclusions about archaeological potential drawn from our understanding of local archaeological patterns and our assessment of landscape and prior land use disturbance. We have identified two areas within the Park that contain potential archaeological constraints that will need to be considered during preparation of a Masterplan. The two areas of constraint are shown on Figure 5 and described below.

1. Rock Engraving Zone (Shaded yellow on Figure 5)

The presence of flat sandstone platforms across the eastern side of the study area along the cliff top is consistent with similar landforms to the north which contain rock engravings. The eastern cliff top has potential to contain rock engravings and grinding grooves on flat sandstone outcrops. Some of these areas are currently exposed adjacent to pathways and the cliff edge, however similar areas may also be obscured by grass and low shrub coverage.

Due to the limited nature of this preliminary assessment, which did not include comprehensive survey, additional detailed survey work will be required if pathways or any form of ground disturbance works are proposed within the area marked yellow on Figure 5. The purpose of the detailed survey would be to determine whether or not any engravings/grinding grooves are present within the footprint of the proposed development works. This survey may require supplementary inspections in a variety of lighting conditions, including possibly night survey using oblique light.

Where the survey work identifies Aboriginal rock engravings/grinding grooves, they should be avoided through re-design. If this is not possible, a full *Aboriginal heritage impact assessment (AHIA)* and Aboriginal community consultation in accordance with *DEC Interim Community Consultation Requirements for Applicants (2005)* will be required to determine the cultural significance of the site(s). Please note under the provisions of the *National Parks and Wildlife Act, 1974* Section 90 consent from the Dept of Environment & Climate Change (DECC) would be required prior to any disturbance of an axe grinding groove/engraving site.

2. Rock Shelter and Potential Archaeological Deposit Zone (shaded Orange on Figure 5)

The orange shaded area has been identified as having potential to contain archaeological deposit and rock shelters/overhangs along cliff lines within the study area. This area is less likely to have been directly affected by erosion (because it contains remnant vegetation) and therefore is most likely to have undisturbed soils. This area may also contain rock shelter sites within rock overhangs that have not been affected by quarrying for the tram-alignment cutting.

Further investigation will be required if pathways and any form of ground disturbance works are proposed within the area marked orange on Figure 5. The detailed survey would be to determine whether or not any rock shelters (with archaeological deposit, midden or art) and/or areas of potential archaeological deposit are present within the footprint of the proposed development works.

Where the survey work identifies rock shelters/potential archaeological deposit, they should be avoided through redesign. If this is not possible, a full *Aboriginal heritage impact assessment (AHIA)* and Aboriginal community consultation in accordance with *DEC Interim Community Consultation Requirements for Applicants (2005)* will be required to determine the cultural significance of the site(s). Please note under the provisions of the *National Parks and Wildlife Act, 1974* Section 90 consent would be required from DECC prior to any disturbance of a rock shelter/archaeological deposit and potential archaeological deposit.



Figure 5 – Aerial photograph of the study area showing zones of archaeological potential (yellow and orange) and the old tram alignment (purple).

Map source: Woollahra Municipal Council

Proposed Masterplan

As part of this preliminary assessment we were asked to identify potential Aboriginal heritage constraints on development of The Gap to inform the site's Masterplan.

We understand the Masterplan is in an early stage of development and specific design details have not been determined. We also understand that our study and other environmental studies will assist in the design stage. To that end, if any new works (i.e. outside of existing formalised paths and garden beds etc) are proposed within archaeological potential zones 1 and 2, a detailed Aboriginal heritage impact assessment (AHIA) should be undertaken in advance of the works.

Recommendations

The following recommendations are based upon:

- the legal requirements of the *National Parks and Wildlife Act of 1974*; in conjunction with
- the results of the preliminary archaeological investigation documented in this letter; and
- preliminary consultation with the La Perouse Local Aboriginal Land Council.

It is recommended that:

1. If new works²² are proposed in zone 1 (shaded yellow in Figure 5), a detailed *Aboriginal Heritage Impact Assessment (AHIA)* focusing on identification of rock engravings/grinding grooves should be undertaken. The *AHIA* should include Aboriginal community consultation, undertaken in accordance with Dept of Environment and Climate Change (DECC) *Interim Community Consultation Requirements for Applicants (2005)*;
2. If new works are proposed in zone 2 (shaded orange in Figure 5), a detailed *Aboriginal Heritage Impact Assessment (AHIA)* focusing on identification of rock shelter sites and potential archaeological deposits, should be undertaken. The *AHIA* should include Aboriginal community consultation, undertaken in accordance with Dept of Environment and Climate Change (DECC) *Interim Community Consultation Requirements for Applicants (2005)*;
3. No further action is recommended within the remainder of the subject land, i.e. areas outside of zones 1 and 2 (unshaded areas on Figure 5);

²² New works are defined as any new paths (ie. on new alignments not currently used for paths), new landscaping works, new furniture, new recreational equipment or new planting/garden beds/bush re-generation.

4. **Please Note** : It is an offence under *Section 90* of the *National Parks & Wildlife Act 1974* to disturb, destroy or deface Aboriginal objects without the Consent of the *NSW Dept of Environment & Conservation* (DEC). If any Aboriginal sites or objects are found during the course of development or maintenance works within the Gap Park, excavation work in that area must cease immediately. If the Aboriginal object(s) cannot be avoided by development works (ie. through re-design), a *Section 90 Consent* from DEC will be required before work can recommence.

Please don't hesitate to contact me if you wish to discuss these matters further.

Yours sincerely,

A handwritten signature in cursive script that reads "Felicity Barry".

Felicity Barry
(Archaeologist).

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Attachment 1: Correspondence from La Perouse Local Aboriginal Land Council

Appendix C

HERITAGE LISTING | DUNBAR ANCHOR & TRAMWAY CUTTING
NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

Dunbar anchor, tramway cutting

Item details

Name of item:	Dunbar anchor, tramway cutting
Type of item:	Archaeological-Terrestrial
Primary address:	Gap Park, Watsons Bay, NSW 2030
Local govt. area:	Woollahra

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
Gap Park	Watsons Bay	Woollahra			Primary Address

Statement of significance:

The Dunbar Anchor, Gap Park Watsons Bay is significant as a remnant of the worst maritime disaster in the shipwreck of the Dunbar. The shipwreck, which occurred in 1857 caused the death of all but one of the 122 persons aboard and the anchor, which was recovered from the wreck in c1907 is set as a memorial to the death of these people. The anchor and plaque have historic and social significance for their association with the worst sea disaster to occur in the vicinity of Sydney Harbour in the nineteenth century. It also has significance for its association with many 'old colonists' who were amongst the 63 passengers to die. The shipwreck was responsible for the construction of lights on both North Head and Hornby Light on the tip of South Head and the memorial is significant as part of the historic remnants and structures which make up the features Gap Park and surrounds.

Note: The State Heritage Inventory provides information about heritage items listed by local and State government agencies. The State Heritage Inventory is continually being updated by local and State agencies as new information becomes available. Read the [OEH copyright and disclaimer](#).

Description

Designer/Maker:	Dunbar Anchor
Builder/Maker:	Erected by Alderman C. B. Coombes
Construction years:	1907-
Physical description:	The Dunbar Anchor is located at the northern end of Gap Park on the rocky outcrop just back from the impressive high sandstone cliffs of The Gap. Anchor monument and plaque to Dunbar Wreck. two engravings also made in the sandstone relating to the wreck. External Materials: Recovered cast iron anchor and chain set in monument.
Modifications and dates:	General condition is good, some parts are badly deteriorated.
Further information:	Dunbar Anchor and rock inscription in Old South head Road are part of the Dunbar Shipwreck Group SHR listing - Refer to SHR for significance statement etc

History

Historical notes: The Dunbar Anchor and chain are remnants from the British built merchant ship the Dunbar, commanded by Captain James Green and owned by the Scottish shipowner Duncan Dunbar and built in Sunderland in 1853 at James Laing's ship-yards. The Dunbar was a wooden frigate, three masted all square-rigged and similar to the Sydney cruise ship Bounty. The ship was wrecked approximately 500 yards south of 'The Gap' on the night of August 20 1857 with the loss of all but one of the 122 persons aboard. The sole survivor was able seaman James Johnson who was rescued from the base of the cliff at the Gap about 36 hours later. The Dunbar was on its second voyage from England to the colony when it was wrecked and amongst those to perish were many old colonists returning to Sydney. Following the disaster a light was erected on North Head as well as Hornby Light on South Head.

Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
8. Culture-Developing cultural institutions and ways of life	Leisure-Activities associated with recreation and relaxation	Leisure-
8. Culture-Developing cultural institutions and ways of life	Social institutions-Activities and organisational arrangements for the provision of social activities	Cultural and social life-


Assessment of significance

SHR Criteria a) Historically representative at a Regional level.
[Historical significance]

SHR Criteria c) Aesthetically representative at a Local level.
[Aesthetic significance]

SHR Criteria d) Socially representative at a Regional level.
[Social significance]

SHR Criteria g) Socially representative at a Regional level. Aesthetically representative at a Local level.
[Representativeness] Historically representative at a Regional level.

Assessment criteria: Items are assessed against the  **State Heritage Register (SHR) Criteria** to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommended management:

The Dunbar Anchor should be maintained and retained as a memorial to the deaths of the 121 persons who perished in the wreck. The Anchor and its surrounds should be restored and retained in good condition.

Listings

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Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Local Environmental Plan	Woollahra	LEP 1995	10 Mar 95	28	
Local Environmental Plan	Woollahra LEP 2014	435	23 May 15		
Within a conservation area on an LEP	Watsons Bay HCA	LEP 1995 Am 5	22 Jan 99	10	
Heritage study	Woollahra				

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
Woollahra Heritage Study 1997	1997	F80	Graham Brooks and Associates Pty Ltd	GBA	N o

References, internet links & images

None

Note: internet links may be to web pages, documents or images.



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Appendix D

HERITAGE LISTING | DUNBAR GROUP

NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

Dunbar Group

Item details

Name of item:	Dunbar Group
Type of item:	Archaeological-Maritime
Group/Collection:	Transport - Water
Category:	Shipwreck
Location:	Lat: -33.8502550593 Long: 151.2881156400
Primary address:	, Watsons Bay, NSW 2030
Local govt. area:	Woollahra

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
	Watsons Bay	Woollahra			Primary Address
	Various	Multiple LGAs			Alternate Address

Owner/s

Organisation Name	Owner Category	Date Ownership Updated
Land and Property Management Authority (LPMA)	State Government	
Woollahra Municipal Council	Local Government	

Statement of significance:

The Dunbar Group comprises:

- a) the shipwreck remains;
- b) the Gillies artefact collection owned and managed by the Australian National Maritime Museum;
- c) The Anchor memorial at The Gap; and
- d) the historic rock cutting on the cliffs above the wreck site.

The Dunbar wreck site and its associated relics are a significant component of Australia's maritime heritage by virtue of the shipwreck's impact in 1857 on the developing colony of New South Wales, its influence on the improvement of navigational aids in Port Jackson (construction of Hornby Lighthouse) and its potential for interpretation through public education programs. The disaster ranks as New South Wales' worst peace time merchant shipping tragedy. The loss of 121 passengers and crew with sole survivor James Johnson, rocked Sydney and the nation. The event is still remembered today through annual ceremonies at St Stephens Anglican Church, Camperdown (Newtown) - site of the government mass burial plot, and individual gravestones.

The Dunbar Anchor memorial and Dunbar rock inscription are a significant component of the Dunbar historic shipwreck story, and linked directly to the Historic Shipwreck remains, and to contemporary and modern community interest in the 1857 tragedy.

The Dunbar anchor memorial at 'The Gap' and the nearby rock inscription provide alternate public venues for community appreciation of the tragedy and impact on the inhabitants of Sydney.

Date significance updated: 27 Oct 03

Note: The State Heritage Inventory provides information about heritage items listed by local and State government agencies. The State Heritage Inventory is continually being updated by local and State agencies as new information becomes available. Read the [OEH copyright and disclaimer](#).

Description

Designer/Maker: Ship: James Laing

Builder/Maker: Ship: James Laing & Sons, Sunderland

Construction years: 1852-1853

Physical description: A timber full-rigged ship built from British Oak and East India Teak. Three masts, square rigged. Registered tonnage was 1321 tons. Copper fastened throughout, iron knees. Length of vessel: 201.9 feet; Breadth: 35 feet; depth: 22.7 feet. Copper sheathed. Rampant lion figurehead carved by James Brooker of Maryport.

The Dunbar Anchor Memorial comprises a large (approximately 4metre) iron Admiralty pattern anchor, attached to the natural sandstone rock cliff face above the southern end of The Gap. The rock face has been worked to a vertical surface to accept the anchor which is fastened to it, with a remnant shackle attached. The memorial includes a stone plinth bonded to the wall detailing the date and purpose of the monument. A timber safety rail fence surrounds the memorial precinct.

The second item, a rock cut inscription, was inscribed on the flat (horizontal) sandstone cliff top above the actual wreck site location. The inscription reads :DUNBAR C.P. 25th AUG 1857 RECUT BY E.S.S. 20 AUG 1906". It is unknown which tools were used to make the inscription, which have subsequently been picked out by dark pigment (paint?).

Physical condition and/or Archaeological potential: The shipwreck site has been greatly reduced due to the exposed nature of its setting at the foot of the South Head cliffs and its shallow depth (~7-8 metres of water). The archaeological remains have been severely reduced due to the actions of salvage divers at the site since its re-discovery in the early 1950's. Without heritage legislation in force and a lack of understanding of conservation science and heritage protection, the Dunbar and other notable wreck sites, were severely damaged at this time. Uncontrolled looting at the site lasted until the 1970's, the use of explosives known from the earlier period of this activity. Today, the main elements consist of one Admiralty and one Porters iron anchor, concreted anchor chain, pig iron ballast blocks scattered through the sandstone rock gullies, and many fragmentary remains of cargo items, ships fittings and fastenings.

The Dunbar anchor has been in outdoor exhibition since 1930 and was the focus of an intensive materials conservation seminar in 1991, held by Woollahra Council with the NSW Heritage Office. The anchor underwent conservation treatment at that time. Ongoing corrosion problems suggest that the anchor is in need of reassessment in terms of the conservation technique used.

The rock inscription appears to have been hand carved and is still sharp and distinct. There appears to have been little physical weathering at the site.

Date condition updated: 15 Jul 03

Modifications and dates:

While recovered in 1910, the anchor was not established at the site until 1930.

The rock inscription was carved by an onlooker at the scene of the shipwreck event on 25 August 1857, five days after the event, and apparently recut by another individual on 20 August 1906, 49 years to the day of the disaster.

Further information:

The Dunbar disaster ranks as one of Australia's worst maritime disasters. The nature of the event is still retained in the social history of Sydney and NSW. The name Dunbar is widely known in today's society, and the wreck event gave rise to the naming of the cliff face where the vessel struck, as "Dunbar Head".

The Dunbar anchor used in The Gap memorial appears to have been one of two anchors reported to have been removed from the actual wreck site in 1910 by a local syndicate interested in preserving the memory of Dunbar. The group relocated the wreck site in 1907.

Current use:

Shipwreck: Recreational. Anchor memorial, Gillies, etc: Recreational, education

Former use:

Trade, transport, military services

History

Historical notes:

The Dunbar was built as a first class passenger and cargo carrier. Ship rigged and well fitted out throughout, the vessel was, at the time of launching, the largest timber vessel constructed in Sunderland. This was partly in response to the demand for ships to carry passengers to the Australian goldfields. The Dunbar however was initially deployed as a troop ship in the Crimean War and did not become involved in the Australian trade until 1856. During the night of the 20th August 1857, the ship was approaching the entrance to Port Jackson on its second trip. There were 59 crew and 63 passengers on board under command of Captain Green. Approaching the Heads in a violent storm, the crew burnt a blue light to attract a pilot. The ship was driven against the cliffs of South Head and rapidly broke apart. Only one out of 122 survived, Able Seaman James Johnson, who managed to cling to the cliff face until rescued some 1-2 days later. Bodies and wreckage filled the harbour. A funeral was held in Sydney for the dead which included several prominent residents and business people. There were seven hearses, 4 mourning coaches and a long procession of carriages. The city closed down for the ceremony and the streets lined with mourners while all flags flew at half mast across the city and harbour. The ceremony was held at St Stephens Cemetery in Newtown, the bodies of some victims being placed in a mass grave funded by the Government. A later enquiry blamed the disaster on insufficient navigational aids in the Harbour. As a result of this loss and that of the ship Catherine Adamson at North Head some 9 weeks later, the Government built the Hornby Light at the tip of South Head. James Johnson was eventually employed in Newcastle as the lighthouse keeper and on 12 July 1866, helped rescue the sole survivor from the Cawarra disaster at Newcastle. Memorial services for the victims of the Dunbar are still held annually at St Stephens Church.

Anchor memorial and cutting

The Dunbar Historic Shipwreck is located beneath the South Head cliffs near to the Signal Station. The site appears to have been relocated several times since the 1857 loss. The anchor that forms the memorial was recovered from the wreck, identified as Dunbar, in 1910. There is no reason to suggest that this was not the Dunbar wreck, being the only reported site in the immediate vicinity of the cliffs. A very similar anchor is retained on the identified Dunbar wreck site today and may be the other 'bower' or main anchor used by the Ship. The rock inscription situated above the wreck location appears to have been cut by an onlooker to the tragedy unfolding below, and later recut on an anniversary of the wreck. Its historical associations are not questioned.

Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
3. Economy- Developing local, regional and national economies	Events-Activities and processes that mark the consequences of natural and cultural occurrences	(none)-
3. Economy- Developing local, regional and national economies	Transport-Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	(none)-

Assessment of significance

SHR Criteria a)

[Historical significance]

Significant in the evolution of sea safety. The loss of the fine passenger ship with that of the Catherine Adamson 9 weeks later on North Head, created enormous pressure for the locating of a lighthouse closer to South Head to mark the actual harbour entrance (Hornby Light). A site representative of the dangers associated with immigrant travel during the period of the 1850s gold rushes. The events that followed the wrecking, the search, recovery and burial of victims, had a considerable impact on the rapidly expanding colony, possessing in its population a large proportion of people who had travelled by sea and were able to relate to its hardships and fears.

SHR Criteria b)

[Associative significance]

The Dunbar anchor memorial was established by the local government as a permanent memorial of the horrendous loss of the Dunbar ship, its passengers and crew, in 1857. The 'Dunbar Disaster', as commonly referred, shocked the inhabitants of Sydney and Australia generally. The fine Ship built to high standards in Scotland by a notable shipbuilder, was destroyed in a matter of minutes by extreme storm conditions. The tragic loss of 121 lives, many women and children, had a devastating effect on the community and ranks as the worst peacetime merchant maritime tragedy to befall NSW.

The outpouring of public emotion included a phase of intensive visitation to the scene of the wreck site. Crowds made their way to the South Head cliff tops above the wreck and witnessed its final destruction and the significant loss of life and cargo. The rock inscription was cut five days after the tragedy by C.P. (identity unknown), probably by one such visitor to the site. It was re-cut 49 years to the day of the actual loss in 1906 by another unknown individual.

SHR Criteria c)

[Aesthetic significance]

The vessel, wrecked at the foot of the sheer cliffs below the Signal Station at South Head, has a dramatic aspect and the place a melancholy atmosphere. A rock inscription overlooking the site records the loss, and is a tangible reminder of the tragedy which occurred below. It is linked by the headland walking track to "The Gap" where one of the Dunbar's anchors is displayed. The site is accessible to the general public, retaining potential for further significant interpretative programs.

The physical cliff face became known as Dunbar Head due to the impact site and is formally recognised as such today as a significant coastal landmark.

The wreck event formed the focus of contemporary artists who captured the terrifying scene through notable artworks, several within the State Library of NSW collection. Artists include G.F. Gregory, Samuel Thomas Gill.

SHR Criteria d)

[Social significance]

A site significant for the impact that the loss had on the colonial population and which is retained in the social fabric of Sydney to this day. Representing the most significant shipwreck loss in NSW, the appalling nature of the disaster and the extreme loss of life and property are remembered in annual memorial services at the victim's graves located within St Stephens Cemetery, Newtown.

The Dunbar Anchor Memorial acts as a public focal point for the interpretation of the

tragedy. Situated prominently at 'The Gap', scene of chaos at the time of the tragedy, visitors are invited to learn of the Dunbar history through interpretative plaques.

Significant local interest was generated in relocating the wreck of the Dunbar and relics from the site. Attempts are known at the time of the tragedy in 1857, in 1861, and in 1907 when two anchors were first reported underwater and a syndicate formed to recover them in 1910. One of those anchors appears to have formed the memorial established at The Gap in 1930. These events constitute concerted attempts to establish a public memorial to the tragedy and to mark, through time, the significant nature of the wreck event.

'The Gap' and the South Head coastal cliff top walk retain significance of place, as an area that witnessed the break-up of the Dunbar wreck site, slightly to the south. The anchor memorial serves to focus public appreciation of the loss for the contemporary colonial population.

SHR Criteria e)

[Research potential]

The material remaining on the Dunbar site is of low significance in terms of its technical attributes. Material that has been removed from the site, eg) spectacles, telescopes, coins, cutlery, anchors, cannon, etc, is likely to be of moderate significance. One collection of artefacts recovered from the site and registered with the Commonwealth Historic Shipwrecks Amnesty in 1993-5, The Gillies Collection, retains significance for the scale of its objects, as a record of early shipwreck salvage activities and the impact that uncontrolled access to these fragile sites can generate. The collection, now owned and managed by the Australian National Maritime Museum, is representative of the types of materials imported to Australia during the 1850's. It holds potential for research into conservation standards and applications.

SHR Criteria f)

[Rarity]

The Dunbar shipwreck is significant, particularly in relation to its interpretative potential, as a rare example of a shipwreck associated with a significant loss of life in close proximity to a major port and centre of population.

Recovered from the wreck site in 1910 and established as a public memorial in 1930, the resulting anchor monument is unique in New South Wales for its scale and visual setting. As an easily accessible monument to a significant shipping tragedy at the entrance to Sydney, the memorial and associated rock cutting, demonstrate the contemporary community's reaction to the impact of the Dunbar disaster to their world. The monument continues to form a component of the city's cultural fabric, as a rare example of a public venue established to keep the memory of those lost, current.

The Dunbar Admiralty-pattern anchor is characteristic of the type of large iron anchors employed by international sailing vessels during the mid nineteenth century. It comprises one of the 'bower' or main anchors from the vessel, another example of which is retained on the wreck site underwater.

Comparable government memorials to shipwrecks in NSW include the Walter Hood 1870 memorial near Bendalong; and the Ly-ee-Moon Cemetery (1890) at Greencape.

SHR Criteria g)

[Representativeness]

Representative, particularly in relation to its historical attributes, of the dangers associated with immigrant travel in the mid 1850s.

The Dunbar anchor memorial and the cliff-top cutting are unique items in NSW in terms of land-based memorials to historic shipwreck events. Such was the impact of the 1857 disaster that the contemporary population wished it to be retained in living memory.

Comparable government memorials to shipwrecks in NSW include the Walter Hood 1870 memorial near Bendalong; and the Ly-ee-Moon Cemetery (1890) at Greencape.

Integrity/Intactness:

Due to extensive salvage by SCUBA divers in the 1950s and 1960s, the site's integrity has been severely eroded. Portions of intact archaeological deposits are retained on-site which might retain a moderate level of potential for future scientific examination.

Assessment

Items are assessed against the  **State Heritage Register (SHR) Criteria** to

criteria: determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommended management:

Monitoring of site to assess extent and effect of wave and surge activity. Continued research into the vessel and its victims. Cataloguing of remaining private collections of Dunbar relics held in the community.

Procedures /Exemptions

Section of act	Description	Title	Comments	Action date
57(2)	Exemption to allow work	Standard Exemptions	<p>SCHEDULE OF STANDARD EXEMPTIONS</p> <p>HERITAGE ACT 1977</p> <p>Notice of Order Under Section 57 (2) of the Heritage Act 1977</p> <p>I, the Minister for Planning, pursuant to subsection 57(2) of the Heritage Act 1977, on the recommendation of the Heritage Council of New South Wales, do by this Order:</p> <p>1. revoke the Schedule of Exemptions to subsection 57(1) of the Heritage Act made under subsection 57(2) and published in the Government Gazette on 22 February 2008; and</p> <p>2. grant standard exemptions from subsection 57(1) of the Heritage Act 1977, described in the Schedule attached.</p> <p>FRANK SARTOR</p> <p>Minister for Planning</p> <p>Sydney, 11 July 2008</p> <p>To view the schedule click on the Standard Exemptions for Works Requiring Heritage Council Approval link below.</p>	Sep 5 2008

 **Standard exemptions** for works requiring Heritage Council approval

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Heritage Act - State Heritage Register		01675	17 Oct 03	167	10126
National Historic Shipwreck Register and database					

References, internet links & images

Type	Author	Year	Title	Internet Links
Tourism		2007	Dunbar Shipwreck Group	View details
Tourism	Attraction Homepage	2007	Dunbar Shipwreck Group	View details

Note: internet links may be to web pages, documents or images.



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Appendix E

HERITAGE LISTING | MONUMENT TO LIEUTENANT G.J. GRIEVE
NSW DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

Monument to Lieutenant G.J. Grieve

Item details

Name of item:	Monument to Lieutenant G.J. Grieve
Type of item:	Landscape
Group/Collection:	Parks, Gardens and Trees
Category:	Monuments
Primary address:	Old South Head Road, within Gap Park, Watsons Bay, NSW 2030
Local govt. area:	Woollahra

All addresses

Street Address	Suburb/town	LGA	Parish	County	Type
Old South Head Road, within Gap Park	Watsons Bay	Woollahra			Primary Address

Statement of significance:

The memorial to Lieutenant G. J. Grieve, a marble and sandstone structure standing at the southern end of Gap Park, close to the cliff face, has historic and social significance as a remembrance to Lieutenant Grieve, a Special Service Officer who was killed in February 1900 at the battle of Paardeberg during the Boer War. It has social significance for commemorating both the dead from the Boer War as well as a particular local identity.

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Description

Designer/Maker:	Andrews Brothers
Construction years:	1900-
Physical description:	A sandstone and marble memorial. No longer in its original state. The memorial was originally a drinking fountain made basically of sandstone, but with a marble back. Present memorial has sandstone base, with marble blocks to each side of the base. A marble plaque has the following inscription. "To the Memory of (old English script) the late Lieutenant C. J. Grieve who fell fighting at the battle of Paardeberg South Africa 18th February 1900, aged 36." The letters are uppercase (except were marked) and engraved. A recent reconstituted sandstone block with unusual drinking bottle motif has central position in the memorial. Original sandstone appears to have a sandstone coating, which is flaking in some areas. Concrete patching to base and structure. Cracking to northern side. Style: N/A External Materials: Sandstone and marble. Internal Materials: N/A
Modifications and dates:	The drinking fountain has been removed, and in its place is a reconstituted sandstone block with a drinking bottle motive on the front. Original sandstone surface is generally in reasonable condition, some surface flacking is occurring. Northern marble block has minor

cracking. The memorial was vandalised in 1907 and 1926. Some edge reconstruction and other minor patching has been undertaken with concrete.

Current use: Monument within park

Former use: Monument within park

History

Historical notes: The memorial to Lieutenant Gideon James Grieve was unveiled on Dec. 22nd 1900 by Alderman John Dykes, Mayor of the Vacluse Municipal Council. Lieutenant Grieve, a Special Service Officer, was killed in February 1900 at the battle of Paardeberg during the Boer War. Grieve was also a member of the New South Wales Permanent Staff. Born and educated in Edinburgh in 1864, Grieve arrived in NSW in 1885. Initially working as stationer, he joined The Scottish Rifles, and so began a distinguished military career. The memorial, originally a drinking fountain, is no longer in its original state. It was designed by Andrews Brothers and erected by the residents of Watson's Bay. Other memorials for Lieutenant Grieve are located in South Africa near to where he fell, and outside the Scots Church in Sydney. Responsibility for the Watson's Bay memorial, which lies at the southern end of Gap Park near Old South Head Road, now lies with the Woollahra Municipal Council. The memorial was vandalised in 1907 and again in 1926.

Historic themes

Australian theme (abbrev)	New South Wales theme	Local theme
8. Culture-Developing cultural institutions and ways of life	Domestic life-Activities associated with creating, maintaining, living in and working around houses and institutions.	A place to live-
8. Culture-Developing cultural institutions and ways of life	Social institutions-Activities and organisational arrangements for the provision of social activities	Cultural and social life-


Assessment of significance

SHR Criteria a) Historically representative at a Local level.
[Historical significance]

SHR Criteria c) Aesthetically representative at a Local level.
[Aesthetic significance]

SHR Criteria d) Socially representative at a Local level.
[Social significance]

SHR Criteria g) Socially representative at a Local level. Aesthetically representative at a Local level.
[Representativeness] Historically representative at a Local level.

Assessment criteria: Items are assessed against the  **State Heritage Register (SHR) Criteria** to determine the level of significance. Refer to the Listings below for the level of statutory protection.

Recommended management:

Restoration and repair of sandstone elements. Removal of central reconstituted sandstone block and reinstatement of drinking fountain equipment is suggested.

Listings

Heritage Listing	Listing Title	Listing Number	Gazette Date	Gazette Number	Gazette Page
Local Environmental Plan	Woollahra	LEP 1995	10 Mar 95	28	
Local Environmental Plan	Woollahra LEP 2014	438	23 May 15		
Within a conservation area on an LEP	Watsons Bay HCA	LEP 1995	10 Mar 95	28	
Heritage study	Woollahra				

Study details

Title	Year	Number	Author	Inspected by	Guidelines used
Woollahra Heritage Study 1997	1997	F81	Graham Brooks and Associates Pty Ltd	GBA	N o

References, internet links & images

None

Note: internet links may be to web pages, documents or images.

Data source

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Appendix F

SITE PHOTOGRAPHS | 28 NOVEMBER 2019
PROVIDED BY ASPECT AUSTRALIA



Example of piers constructed to provide support to natural rock shelves



Existing track along the proposed route of path with visible signs of sandstone cutting



Location of habitat boardwalk to traverse existing Fig tree roots



Site of the 'Gap Loop' tram stop and start of the proposed path



Example of sandstone edge located along some portions of existing track



Typical conditions of existing bushland track



Existing path along tram route from 'Gap Loop' towards Military Road



Existing pedestrian desire line to be utilised near Old South Head Road

APPENDIX 3

Statement of Heritage Impact

Gap Park, Watsons Bay Tramway Path Upgrade project

Statement of Heritage Impact

Report to Woollahra Council

July 2020



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EXECUTIVE SUMMARY

Woollahra Municipal Council are proposing to construct a new pathway through Gap Park, Watsons Bay (the project). The new pathway will follow an original tram route through the park and take pedestrians past what is known as the Tramway Cutting, a heritage listed modified sandstone rock face (Woollahra Local Environment Plan 2014 no. I436).

Artefact Heritage has been engaged by Woollahra Municipal Council to provide a non-Aboriginal (historic) Statement of Heritage Impact (SoHI) for the project. The aim of this SoHI is to identify heritage items and archaeological remains which may be impacted by the project, assess potential impacts to those items, recommend mitigation measures to reduce the level of heritage impacts and identify other management or statutory obligations for the project. The tramway cutting and original tram route encompass the study area for this report.

The establishment of the proposed pathway through Gap Park will include the following works:

- Construction of concrete, paved and crushed sandstone paths
- Construction of a 20-metre-long raised boardwalk along the Gap Park Tramway Cutting
- Subsurface excavations of approximately 300mm in width and 450mm in length for boardwalk posts
- Establishment of safety fences
- Subsurface excavations of approximately 300mm in width and 450mm in length for fence posts
- Clearing of vegetation and soils along the project route to an estimated depth of 50-100mm
- Establishment of cross path swales at 20 metre intervals to assist in stormwater management
- Installation of signage
- Installation of a sandstone log wall
- Revegetation activities

Summary of conclusions

The study area is located within the curtilage of four items listed on the Woollahra Local Environment Plan (LEP) 2014:

- Tramway Cutting – Item no. I436
- Bicentennial Coastal Cliff Walk – Item no. I343
- Watsons Bay Heritage Conservation Area – Item no. C14
- Dunbar Anchor – Item no. I435

Potential impacts to heritage listed items

- Provided all mitigation measures are followed, the project would result in:
 - **Minor to moderate** direct (physical) and **negligible** (permanent) indirect (visual) impacts to the Woollahra LEP 2014 listed Tramway Cutting (I436)
 - **Negligible** direct (physical) and **negligible** (permanent) indirect (visual and vibration) impacts to the Woollahra LEP 2014 listed Bicentennial Coastal Cliff Walk (I343) and Watsons Bay Heritage Conservation Area (C14)
 - **Nil** direct and indirect impacts to the Woollahra LEP 2014 listed Dunbar Anchor (I435)

Potential impacts to archaeological remains

The study area has been assessed as having **low** potential to contain archaeological evidence of sleepers and rails and **high** potential to contain locally significant archaeological remains of boundary stones and retaining walls. Boundary stones and retaining walls were both observed during the site inspection immediately west of the Tramway Cutting and along the former tramway alignment to the north of the cutting. Additional evidence of the former tramline may survive in the study area.

The proposal has potential to impact these remains, however, provided all mitigation measures are followed, impacts to these remains would be minor.

Mitigation measures and recommendations

The following mitigation measures and recommendations would be enacted to minimise heritage impacts during the construction program:

- Although there is **low** potential for evidence of sleepers and rails and **high** potential for evidence of boundary stones and retaining walls to be impacted by the proposed works, these items do not meet the definition of a 'relic' under the *Heritage Act*. Therefore, no archaeological excavation permits are required for the project. However, in order to adequately manage impacts to locally significant remains associated with the former tramway, it is recommended that an Unexpected Finds Procedure be put in place for the duration of the works and all evidence of former boundary stones and retaining walls are retained, protected or reused for the project.
- The presence and historical context of known and potential archaeological remains associated with the former Watsons Bay Tram such as boundary stones, retaining walls, historic graffiti, sleepers and rails, would be included in any interpretative signage prepared for the project
- In order to manage potential future heritage impacts associated with the project, it is recommended advice is sought from a suitable heritage specialist if project redesign resulting in new ground disturbance, impacts to the natural landscape of impacts to fabric associated with the tramway cutting is proposed
- In order to reduce impacts to the heritage significance of the Woollahra LEP 2014 listed Tramway Cutting it is recommended that:
 - No direct impacts occur to the cutting, with the exception of vegetation removal
 - All evidence of chisel marks, drill marks and graffiti are retained

- All sandstone boundary stones lining the existing tramway path are retained and/or reused where possible
- All retaining walls along the tramway route are retained and protected during and after works
- If any surviving infrastructure associated with the tramway is uncovered during the construction program, all works would cease and the Unexpected Finds Procedure for the project would be followed
- The design of footpaths, footbridges, retaining walls, fences and signage would aim to be sympathetic to the existing nature of the Woollahra LEP 2014 listed Tramway Cutting (I436), Bicentennial Coastal Cliff Walk (I343) and Watsons Bay Heritage Conservation Area (C14) and designed to minimise physical and visual impacts towards these items
- The project would be designed to satisfy and consider all Precinct Guidelines outlined in the Watsons Bay Heritage Conservation Area chapter of the Woollahra DCP 2015. This includes minimising vegetation removal, providing disability access and ensuring the proposed paths, boardwalk, fences, signage and sandstone log retaining walls do not obstruct exiting views within Gap Park and are sympathetic to the existing character of the area. This includes using construction materials, colours and forms that complement the landscape, climate and topography.
- Prior to the commencement of works a heritage induction would be prepared for all contractors to complete. The induction would address significant fabric associated with the former tramway cutting (shown in Figure 5-13 - Figure 5-28) or potential archaeological remains that may be uncovered during vegetation clearance or subsurface excavations. The induction would also specify that in the event significant fabric is impacted or archaeological remains are encountered, works must cease immediately, and the advice of a qualified archaeologist and/or heritage consultant must be sought
- Areas containing significant fabric (shown in Figure 5-13 - Figure 5-28) would be identified to all site workers, recorded on site plans and physically delineated with hi-visibility flagging and bollards where suitable. Any excavation work, storage of equipment, or vehicle parking would not occur within these zones
- An Unexpected Finds Procedure would be prepared and provided to all contractors for the duration of the project. This procedure would consist of the following controls should unexpected archaeological finds (such as sleepers, rails or structural fabric) be identified during works:
 - All work must immediately cease in the area
 - The contractor supervisor must notify the environmental manager for the project, and a qualified archaeologist or heritage consultant must be notified
 - Should the unexpected find constitute a significant archaeological 'relic', work cannot continue in the area of location of the find until a *S.146 Notification of the Discovery of a 'Relic'* has been submitted to the NSW Heritage, DPC. Further approvals may be required before works in this area can proceed.

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
1	23 July 2020	Dr Sandra Wallace (Artefact Heritage)	Dr Sandra Wallace (Artefact Heritage)	23 July 2020	Internal review
2	27 July 2020	Rod Ward (Woollahra Municipal Council)	Rod Ward (Woollahra Municipal Council)	31 July 2020	Client review

Author:	Adele Zubrzycka
Project manager:	Dr Sandra Wallace
Project number:	20108 Gap Park, Watsons Bay Tramway Path Upgrade project
Name of organisation:	Artefact Heritage
Document version:	Final

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TABLE OF CONTENTS

1.0	Introduction.....	11
1.1	Project background.....	11
1.2	Study area	11
1.3	Limitations.....	12
1.4	Authorship.....	12
2.0	Methodology	14
2.1	Heritage impact assessments	14
2.1	Significance assessments	14
2.2	Archaeological potential	15
2.2.1	Terminology	16
3.0	Legislative Context.....	17
3.1	Introduction	17
3.2	Commonwealth legislation.....	17
3.2.1	Environment Protection and Biodiversity Conservation Act 1999	17
3.2.2	Commonwealth Heritage List	17
3.2.3	National Heritage List	18
3.3	State Legislation	18
3.3.1	Heritage Act 1977	18
3.3.2	The State Heritage Register	19
3.3.3	Section 170 Heritage Registers.....	19
3.4	Environmental Planning and Assessment Act 1979	20
3.4.1	Woollahra Local Environment Plan 2014	20
3.5	Non-statutory registers	20
3.5.1	Register of the National Estate.....	20
3.6	Summary of heritage listings	21
4.0	Historical Context	23
4.1	Early settlement in Watsons Bay.....	23
4.1.1	Aboriginal land use	23
4.1.2	Early European occupation	23
4.1.3	Gap Park.....	24
4.2	Watsons Bay Tram (c1908 -1960)	24
4.3	Gap Park (1960-present).....	31
5.0	Physical Context.....	32
5.1	Introduction	32
5.1.1	The study area.....	32
5.1.2	Summary of findings	33
6.0	Significance Assessment.....	38
6.1	Introduction	38
6.2	Listed heritage items within the study area	38
6.2.1	Tramway Cutting – I436	38
6.2.2	Dunbar Anchor – I435	39

6.2.3	Bicentennial Coastal Cliff Walk - I343	40
6.2.4	Watsons Bay Heritage Conservation Area – C14	41
7.0	Archaeological Assessment	42
7.1	Archaeological potential assessment	42
7.1.1	Land use summary	42
7.1.2	Previous impacts	43
7.1.3	Assessment of archaeological potential	43
7.1.4	Assessment of archaeological significance	43
8.0	Heritage Impact Assessment	47
8.1	Proposed works	47
8.1.1	Justification	47
8.2	Assessment of heritage impact to items within the study area	47
8.2.1	Tramway Cutting (I436)	47
8.2.2	Bicentennial Coastal Cliff Walk (I343)	48
8.2.3	Dunbar Anchor (I435)	48
8.2.4	Watsons Bay Heritage Conservation Area (C14)	49
8.2.5	Watsons Bay Heritage Conservation Area - DCP 2015 Management Policies	49
8.3	Summary of heritage impacts	51
8.4	Statement of Heritage Impact	52
9.0	Conclusions and Recommendations	53
9.1	Summary of conclusions	53
9.1.1	Potential impacts to heritage listed items	53
9.1.2	Potential impacts to archaeological remains	53
9.2	Mitigation measures and recommendations	53
10.0	References	56
Appendix A	57
10.1	Heritage significance assessments	57
10.1.1	Significance assessment for Tramway Cutting (I436)	57
10.1.2	Significance assessment for Bicentennial Coastal Cliff Walk (I343)	58
10.1.1	Significance assessment for Dunbar Anchor (I435)	58
10.1.1	Significance assessment for Watsons Bay Heritage Conservation Area (C14)	59
Appendix B	61
10.2	Proposed works	61

FIGURES

- Figure 1-1. Location of Gap Park, the study area and former tramline. 13
- Figure 3-1. Overview of heritage listed items within the study area..... 22
- Figure 4-1. Sketch of the Sydney tram network in 1909 showing the newly extended Watsons Bay line. The study area, referred to as Gap Loop, is circled. Source. Keenan, 1999, p. 33. 25
- Figure 4-2. 1960 Watsons Bay tram entering the cutting between Gap Park and Gap Loop, in an area now occupied by the Don Richie Grove. Photo by the late John Alfred. Source. Lindsay Bridge, Flickr. 25
- Figure 4-3. Tram stopped at the Military Road terminus at Watsons Bay (right), near The Gap (left) in 1949. Source. Keenan, D. R c/o WikiCommons. 26
- Figure 4-4. Tram ascending from the Military Road terminus at Watsons Bay towards Old South Head Road. Photo taken by Peter Sage. Source. Flickr, Lindsay Bridge..... 26
- Figure 4-5. 1943 aerial photograph showing the original alignment of the Watsons Bay tram line (indicated by the dashed yellow line) running through Gap Park from Old South Head Road to the tram stop at Military Road. Source. Six Maps. 27
- Figure 4-6. Interior of the Watsons Bay Tram, n.d. Source. Woollahra Municipal Council Library..... 28
- Figure 4-7. Watsons Bay tram approaching Watsons Bay terminus along the tramway cutting (the study area). Boundary stones (indicated by the yellow arrow) can be seen to the left of the tram and tram line. Source. Facebook - Vaucluse Public School. 29
- Figure 4-8. Still from a 1950's film showing Sydney Trams in Watsons Bay, Kings Cross and the City. This image shows the Watsons Bay tram passing through the tramway cutting (the study area). Source. Gezza1967, YouTube. 30
- Figure 4-9. A tram at Watsons Bay in 1960. Source. Lindsay Bridge Collection, c/o The Guardian. .. 30
- Figure 4-10. Farewell notices on a tram at the Watsons Bay terminus on the last day of operations on that line, 10 July 1960. Source. Lindsay Bridge Collection, c/o The Guardian. 31
- Figure 5-1. Existing Gap Park signage and vegetation at the Old South Head Road end of the study area..... 33
- Figure 5-2. Example of the existing landscape within the southern portion of Gap Park. 33
- Figure 5-3. View east towards the Don Ritchie Grove path from the former tramway route. 33
- Figure 5-4. View north towards an existing bitumen path leading towards the former tramway cutting in Don Richie Grove. 33
- Figure 5-5. View north within the study area showing an existing gravelled footpath to the west of the former tramway cutting. 34
- Figure 5-6. View south within the study area showing an existing gravelled footpath to the west of the former tramway cutting. 34
- Figure 5-7. View north along the former tramway route showing the tramway cutting (left) and overall nature of the study area..... 34
- Figure 5-8. View east towards the tramway cutting and associated escarpment from the Jacobs Ladder Gully. 34
- Figure 5-9. View south along the former tramway route showing the tramway cutting (right) and overall nature of the study area. 34

Figure 5-10. View north along the former tramway route showing overall nature of the study area....	34
Figure 5-11. View north along the former tramway route. Gap Road and its associated residential development can be seen to the left.	35
Figure 5-12. View south towards the former tram stop and tramway route.	35
Figure 5-13. Example of remnant chisel marks along the former tramway cutting.	35
Figure 5-14. Example of remnant chisel marks along the former tramway cutting.	35
Figure 5-15. Example of remnant drill marks along the former tramway cutting.....	35
Figure 5-16. Example of remnant drill marks along the former tramway cutting.....	35
Figure 5-17. Example of what may represent remnant infrastructure along the former tramway cutting.	36
Figure 5-18. Brick pylon supporting a rock overhang at the entrance to the former tramway cutting..	36
Figure 5-19. Example of graffiti (L.U and B.G) engraved and painted onto the northern end of the tramway cutting.	36
Figure 5-20. Example of graffiti (A.T '41) engraved and painted onto the northern end of the tramway cutting.	36
Figure 5-21. Example of a partially eroded bitumen footpath within the study area.	36
Figure 5-22. View north along the former tramway route showing existing path and sandstone boundary stones (indicated by arrow).	36
Figure 5-23. Detail of sandstone boundary stone partially covered in modern bitumen.	37
Figure 5-24. Detail of sandstone boundary stone partially covered in decayed leaf matter.	37
Figure 5-25. Example of sandstone boundary.	37
Figure 5-26. Detail of loose sandstone boundary stone.....	37
Figure 5-27. View west looking down slope from the former tramway showing a concrete and stone retaining wall.....	37
Figure 5-28. View east towards to tramway route from Gap Road showing examples of concrete and sandstone retaining walls along the northern end of the former tramway route.	37

TABLES

Table 2-1. NSW heritage assessment criteria.....	15
Table 2-2. Definition of assessed archaeological potential.....	15
Table 2-3. Artefact Heritage terminology for heritage impact types.....	16
Table 2-4. Terminology for assessing the magnitude of heritage impact,	16
Table 3-1. Summary of listings for the heritage items in and near the study area.....	21
Table 6-1. Statement of Significance for Tramway Cutting.....	38
Table 6-2. Statement of significance for the Dunbar Anchor	39
Table 6-3. Statement of Significance for Bicentennial Coastal Cliff Walk.....	40
Table 6-4. Statement of Significance for Watsons Bay Heritage Conservation Area.....	41
Table 7-1. Historical land use within the study area.....	42
Table 7-2. Consideration of archaeological significance against the NSW heritage assessment criteria.....	44
Table 8-1. Precinct Guidelines and assessment of impacts – Upper Gap Park	50
Table 8-2. Summary of impacts to heritage items as a result of the project.....	51
Table 8-3. Statement of heritage impact for the project.....	52

1.0 INTRODUCTION

1.1 Project background

Woollahra Municipal Council are proposing to construct a new pathway through Gap Park, Watsons Bay (the project). The new pathway will follow an original tram route through the park and will take pedestrians past what is known as the Tramway Cutting, a heritage listed modified sandstone rock face (Woollahra Local Environment Plan [LEP] no. 1436).

Artefact Heritage has been engaged by Woollahra Municipal Council to provide a non-Aboriginal (historic) Statement of Heritage Impact (SoHI) for the project. The aim of this SoHI is to identify heritage items and archaeological remains which may be impacted by the project, determine the level of heritage significance of each item, assess the potential impacts to those items, recommend mitigation measures to reduce the level of heritage impact and identify other management or statutory obligations.

The establishment of the proposed pathway through Gap Park will include the following works:

- Construction of concrete, paved and crushed sandstone paths
- Construction of a 20-metre-long raised boardwalk along the Gap Park Tramway Cutting
- Subsurface excavations of approximately 300mm in width and 450mm in length for boardwalk posts
- Establishment of safety fences
- Subsurface excavations of approximately 300mm in width and 450mm in length for fence posts
- Clearing of vegetation and soils along the project route to an estimated depth of 50-100mm
- Establishment of cross path swales at 20 metre intervals to assist in stormwater management
- Installation of a signage
- Installation of a sandstone log wall
- Revegetation activities

1.2 Study area

The study area is located within the Woollahra Local Government Areas (LGA), in the parish of Alexandria and county of Cumberland. It is encompassed by the former Watsons Bay tramway route which is situated within Gap Park in the Sydney suburb of Watsons Bay. Gap Park is bounded to the northeast by The Gap (a high coastal escarpment on Sydney Harbour's South Head), to the northwest by Dunbar Road and Gap Road, and to the south by Old South Head Road.

The former tramway route is situated in the north-west portion of Gap Park and commences at Old South Head Road, before turning east towards The Gap Park and a gully (Jacob's Ladder) that sits to its immediate west. The Tramway Cutting is accessed to the south by an existing concrete path that leads through the Don Ritchie Grove Path from the coastal walk. It is accessed from the north via Gap Road and formal concrete paths associated with the coastal walk.

The location of Gap Park, the study area and the former tramway route alignment are shown in Figure 1-1.

1.3 Limitations

The findings outlined in this document are based on historical research and field inspections. No physical archaeological investigation was undertaken during the preparation of this report. An Aboriginal cultural heritage assessment is beyond the scope of this report.

1.4 Authorship

This report was prepared by Adele Zubrzycka (Senior Heritage Consultant) with input and review provided by Dr Sandra Wallace (Director). Gareth Holes (Heritage Consultant) was responsible for map preparation.

Figure 1-1. Location of Gap Park, the study area and former tramline.



Document Path: D:\GIS\GIS_Mapping\20108 Gap Park\MXD\20108_Gap_Park_Tramline_v1_200721.mxd

2.0 METHODOLOGY

2.1 Heritage impact assessments

The objective of this SoHI report is to evaluate whether the project will affect the heritage value of a site, heritage item and/or place. A SoHI should also address how the heritage value of the site, item or place can be conserved or maintained, or preferably enhanced by the proposed works.

This SoHI has been prepared in accordance with the following guidelines:

- *Statements of Heritage Impact 2002, NSW Heritage Manual 2002* (NSW Heritage Office)
- *Historical Archaeology Code of Practice 2006* (Heritage Office, Department of Planning)
- *Historical Archaeology Code of Practice 2006* (Heritage Office, Department of Planning)
- *Assessing Significance for Historical Archaeological Sites and Relics 2009* (Heritage Branch, Dept. of Planning)
- *Burra Charter 2013* (Australia ICOMOS).

2.1 Significance assessments

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the Heritage Act and implemented through the *NSW Heritage Manual*, the *Archaeological Assessment Guidelines*¹ and the *2009 Assessing Significance for Historical Archaeological Sites and Relics*.²

If an item meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have heritage significance (see Table 2-1). The significance of an item or potential archaeological site can then be assessed as being of local or state significance. If a potential archaeological resource does not reach the local or state significance threshold, then it is not classified as a relic under the Heritage Act.

'*State heritage significance*', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'*Local heritage significance*', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.³

¹ NSW Heritage Office 1996; 25-27

² NSW Heritage Branch, 2009.

³ This section is an extract based on the Heritage Office *Assessing Significance for Historical Archaeological Sites and Relics* 2009:6.

Table 2-1. NSW heritage assessment criteria.

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of the local area’s cultural or natural history.
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area’s cultural or natural history.
C – Aesthetic or Technical Significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of the local area’s cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area’s cultural or natural history.
G - Representativeness	An item is important in demonstrating the principal characteristics of a class of NSW’s cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

2.2 Archaeological potential

The identified levels of archaeological potential referred to in this SoHI are based on the definitions outlined in Table 2-2.

Table 2-2. Definition of assessed archaeological potential.

Grading	Definition
High Potential	Where there is evidence of multiple phases of historic development and structures, with minimal or localised twentieth-century development impacts, and where it is likely that archaeological resources would remain intact.
Moderate Potential	Where analysis has demonstrated known historical development with some previous impacts, but where it is likely that archaeological remains would survive with localised truncation and disturbance.
Low Potential	Where research has indicated little historical development, or where there have been substantial previous impacts which may not have removed deeper subsurface remains entirely.
Nil to Low Potential	Where there has only been low intensity historical activity, such as land clearance or informal land use, with little to no archaeological ‘signature’ expected; or where previous impacts were extensive, such as large-scale bulk excavation which would leave isolated and highly fragmented deposits.
Nil Potential	Where there is no evidence of historical development or use, or where previous impacts such as deep basement structures would have removed all archaeological potential.

2.2.1 Terminology

A detailed assessment is provided for direct, potential direct, indirect and archaeological impacts. Each type of impact is described in Table 2-3 below.

Table 2-3. Artefact Heritage terminology for heritage impact types

Impact	Definition
Direct	Impacts resulting from works located within the curtilage boundaries of the heritage item.
Potential direct	Impacts resulting from increased noise, vibrations and construction works located outside the curtilage boundaries of the heritage item.
Indirect	Impact to views, vistas and setting of the heritage item resulting from proposed works outside the curtilage boundaries of the heritage item.
Archaeological	Impacts to potential archaeological remains located within the curtilage boundaries of the heritage item.

In order to consistently identify the magnitude of potential impact of the proposed works, the terminology contained in Table 2-4 has been referenced throughout this document. Terminology and definitions are based on those contained in guidelines prepared by the International Council on Monuments and Sites (ICOMOS).

Table 2-4. Terminology for assessing the magnitude of heritage impact,

Grading	Definition
Major	<p>Actions that would have a long-term and substantial impact on the significance of a heritage item. Actions that would remove key historic building elements, key historic landscape features, or significant archaeological materials, thereby resulting in a change of historic character, or altering of a historical resource.</p> <p>These actions cannot be fully mitigated.</p>
Moderate	<p>Actions involving the modification of a heritage item, including altering the setting of a heritage item or landscape, partially removing archaeological resources, or the alteration of significant elements of fabric from historic structures.</p> <p>The impacts arising from such actions may be able to be partially mitigated.</p>
Minor	<p>Actions that would result in the slight alteration of heritage buildings, archaeological resources, or the setting of an historical item.</p> <p>The impacts arising from such actions can usually be mitigated.</p>
Negligible	Actions that would result in very minor changes to heritage items.
Nil	Actions that would have no heritage impact.

3.0 LEGISLATIVE CONTEXT

3.1 Introduction

There are several items of State and Commonwealth legislation that are relevant to the current study. A summary of these Acts and the potential legislative implications follow.

Heritage listed items within and directly adjacent to the study area were identified through a search of the relevant state and federal statutory heritage registers discussed below including:

- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- State Heritage Register (SHR)
- Woollahra LEP 2014
- Section 170 Heritage and Conservation Registers
- NSW State Heritage Inventory database.

Items listed on these registers have been previously assessed against the NSW Heritage Assessment guidelines (as outlined in Section 2.1). Statements of heritage significance, based on the NSW Heritage Assessment guidelines, as they appear in relevant heritage inventory sheets and documents, are provided in this assessment.

3.2 Commonwealth legislation

3.2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inscription on the WHL, NHL or the CHL.

The EPBC Act stipulates that a person who has proposed an action that will or is likely to have; a significant impact on a World, National or Commonwealth Heritage site must refer the action to the Minister for the Environment (hereafter the Minister). The Minister would then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment.

There are no items in or near the study area that are registered on the WHL, CHL or NHL. As such, the heritage provisions of this act do not apply, and works for the project would not require referral to the Minister.

3.2.2 Commonwealth Heritage List

The CHL was established by the EPBC Act to protect Indigenous, historic, and natural heritage places owned or controlled by the Australian Government. The CHL and EPBC Act contain provisions for the management and protection of listed places under Commonwealth ownership or control.

There are no items on the CHL within the study area.

3.2.3 National Heritage List

The NHL was established by the EPBC Act to protect places of significant natural or cultural heritage value at a National level. The EPBC Act requires NHL places to be managed in accordance with the National Heritage Management Principles. Under sections 15B and 15C of the EPBC Act, a referral must be made to the Department of the Environment and Energy for actions that are likely to have a significant impact on National Heritage listed properties.

There are no items on the NHL within the study area.

3.3 State Legislation

3.3.1 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides protection for items of 'environmental heritage' in NSW. 'Environmental heritage' includes places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items considered to be significant to the State are listed on the SHR and cannot be demolished, altered, moved or damaged, or their significance altered without approval from the Heritage Council of NSW.

3.3.1.1 The 2009 'Relics provisions'

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. According to Section 139 (Division 9: Section 139, 140-146):

- (1) A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance is carried out in accordance with an excavation permit.
- (2) A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.
- (3) This section does not apply to a relic that is subject to an interim heritage order made by the Minister or a listing on the State Heritage Register.
- (4) The Heritage Council may by order published in the Gazette create exceptions to this section, either unconditionally or subject to conditions, in respect of any of the following:
 - a. Any relic of a specified kind or description,
 - b. Any disturbance or excavation of a specified kind or description,
 - c. Any disturbance or excavation of land in a specified location or having specified features or attributes,
 - d. Any disturbance or excavation of land in respect of which an archaeological assessment approved by the Heritage Council indicates that there is little likelihood of there being any relics in the land.

Section 4 (1) of the Heritage Act (as amended in 2009) defines a relic as:

...any deposit, artefact, object or material evidence that:

relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance

A relic has been further defined as:

Relevant case law and the general principles of statutory interpretation strongly indicate that a 'relic' is properly regarded as an object or chattel. A relic can, in some circumstances, become part of the land be regarded as a fixture (a chattel that becomes permanently affixed to land).⁴

Excavation permits are issued by the Heritage Council of NSW, or its Delegate, under Section 140 of the Heritage Act for relics not within an SHR curtilage or under Section 60 for significant archaeological remains within an SHR curtilage.

An application for an excavation permit must be supported by an Archaeological Research Design and Archaeological Assessment prepared in accordance with the NSW Department of Premier and Cabinet (NSW Heritage, DPC) (formerly the NSW Heritage Division) archaeological guidelines. Minor works that will have a minimal impact on archaeological relics may be granted an exception under Section 139 (4) or an exemption under Section 57 (2) of the Heritage Act.

3.3.2 The State Heritage Register

The SHR was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by the NSW Heritage Division of the Department of Planning, Industry and Environment (DPIE) and includes a diverse range of over 1,500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

To carry out activities within the curtilage of an item listed on the SHR, approval must be gained from the Heritage Council by securing a Section 60 permit. In some circumstances, under Section 57(2) of the Heritage Act, a Section 60 permit may not be required if works are undertaken in accordance with the NSW Heritage branch document *Standard Exemptions for Works Requiring Heritage Council Approval*⁵ or in accordance with agency specific exemptions. This includes works that are only minor in nature and will have minimal impact on the heritage significance of the place.

There are no items listed on the SHR within the study area.

3.3.3 Section 170 Heritage Registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 (s170) requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

There are no items listed on the s170 register within the study area.

⁴ *Assessing Significance for Archaeological Sites and 'Relics'*, Heritage Branch, Department of Planning, 2009:7.

⁵ Heritage Council of New South Wales, 2009. *Standard Exemptions for Works Requiring Heritage Council Approval*.

3.4 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

The EP&A Act also requires that Local Governments prepare planning instruments (such as LEPs and Development Control Plans [DCPs]) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required. The current study area falls within the boundaries of the Woollahra Municipal Council local government area (LGA).

3.4.1 Woollahra Local Environment Plan 2014

The study area is located within the Woollahra LGA. The Woollahra LEP 2014 aims to conserve the heritage significance of heritage items and heritage conservation area, including associated fabric, settings and views; and to protect archaeological sites. The LEP stipulates development controls in relation to development proposed on or near heritage listed properties, archaeological sites, or Aboriginal places of heritage significance. The relevant DCP for the study area remains the Woollahra DCP 2015. Potential impacts as a result of the project have been assessed against the DCP in Table 8-1.

The study area is within the heritage curtilage of the following items listed on the Woollahra LEP 2014:

- 'Tramway Cutting – Woollahra LEP 2014 no. I436
- Bicentennial Coastal Cliff Walk – Woollahra LEP 2014 no. I343
- Dunbar Anchor – Woollahra LEP 2014 no. I435
- Watsons Bay Heritage Conservation Area – Woollahra LEP 2014 no. C14

3.5 Non-statutory registers

3.5.1 Register of the National Estate

The Register of the National Estate (RNE) is a list of natural, Aboriginal and historic heritage places throughout Australia. It was originally established under the *Australian Heritage Commission Act 1975*. Under that Act, the Australian Heritage Commission entered more than 13,000 places in the register. Following amendments to the *Australian Heritage Council Act 2003*, the RNE was frozen on 19 February 2007 and ceased to be a statutory register in February 2012. The RNE is now maintained on a non-statutory basis as a publicly available archive and educational resource.

There are no items on the RNE within the study area.

3.6 Summary of heritage listings

Table 3-1 provides a summary of heritage listed items within the study area. The location of these items are illustrated in Figure 3-1.

Table 3-1. Summary of listings for the heritage items in and near the study area.

Heritage item	Register listings	Address	Proximity to the study area	Significance
Tramway Cutting	Woollahra LEP 2014 Item no. I436	Gap Park, Watsons Bay	Within	Local
Bicentennial Coastal Cliff Walk	Woollahra LEP 2014 Item no. I343	Coastal Cliff, within Christison Park, Macquarie Lightstation, Lighthouse Reserve, Signal Station, Signal Hill Reserve and Gap Park, Vaucluse and Watsons Bay	Within	Local
Dunbar Anchor	Woollahra LEP 2014 Item no. I435	Gap Park, Watsons Bay	Within	Local
Watsons Bay Heritage Conservation Area	Woollahra LEP 2014 Item no. C14	Watsons Bay	Within	Local

Figure 3-1. Overview of heritage listed items within the study area.



4.0 HISTORICAL CONTEXT

4.1 Early settlement in Watsons Bay

4.1.1 Aboriginal land use

Prior to, and after, the arrival of Europeans in 1788, land in and around Watsons Bay was occupied by the Cadigal (or Gadigal) people.⁶ The Cadigal took advantage of the area's natural marine resources and referred to the land as *Kutti*.⁷ As Paul Irish notes in his work on Aboriginal settlement in Sydney following colonisation, Watsons Bay continued to act as a campground for Aboriginal people throughout the nineteenth and early twentieth century.⁸ These camp sites were located at the Vaucluse Estate, around Camp Cove and in an area now occupied by the Watson's Bay Library. Land within Gap Park and study area was occupied by open scrubland and exposed sandstone boulders.⁹

Today, Watsons Bay sits within the boundaries of the La Perouse Local Aboriginal Land Council.

4.1.2 Early European occupation

Following European settlement in 1788, Watsons Bay was used as a fishing village and pilot station managed by a man named Barton.¹⁰ Piloting duties were also carried out by Robert Watson, the former quartermaster for the *Sirius*.¹¹ The first land grant in Watsons Bay was given to Edward Laing in 1793, although he never occupied or improved his property. Laing's grant was located approximately 600 metres north of the study area, near Camp Cove.

Formal subdivisions and residential development commenced in c1830 and generally comprised of fisherman's cottages which were located close to the harbour. Several large gentlemen's estates were also developed in the area during this period. The earliest access road to Watsons Bay comprised of a rough track cleared in 1803. This was replaced by South Head Road (now Old South Head Road) in 1811 and extended from the main township of Sydney to South Head.

South Head Road proved to be unsuitable and difficult to maintain and was replaced by New South Head Road in 1830. A regular ferry service to Watsons Bay commenced in 1854, allowing residents and recreational visitors to easily access the suburb.¹²

Watsons Bay underwent significant development from the 1850s onwards to cater for the influx of visitors through these new means of transport. Development included the Marine Hotel and zoo, the Gap Hotel and Doyle's Restaurant. The arrival of the tram in 1903 opened Watsons Bay to more visitors throughout the twentieth century.

⁶ Woollahra Municipal Council, n.d. 'A brief history of Woollahra.' *Woollahra Municipal Council*. Accessed online 5/12/2019 at: https://www.woollahra.nsw.gov.au/library/local_history/a_brief_history_of_woollahra

⁷ Attenbrow, V. 2002. *Sydney's Aboriginal Past*, University of New South Wales Press, Sydney, p 12.

⁸ Irish, P. & Ingre, M, 2011. *Aboriginal Connections to Vaucluse House and Elizabeth Bay House*. Research Report (Report to Historic Houses Trust of NSW); Irish, P. 2017. *Hidden In Plain View: The Aboriginal People of Coastal Sydney* (Sydney: New South Publishing).

⁹ Woollahra Municipal Council, 2008. Summary Report, Gap Park Masterplan, p. 5.

¹⁰ Collins, D. 1975. *An account of the English Colony in New South Wales*, Reed in association with the Royal Historical Society, Sydney and J Jervis in V Kelly (ed), n. d. *The History of Woollahra*, Sydney, Woollahra Municipal Council, p 4.

¹¹ Ibid.

¹² Derricourt, Robin, 2008. *Watsons Bay*, Dictionary of Sydney, <http://dictionaryofsydney.org/entry/watsonsbay>, viewed 14 Jul 2020

4.1.3 Gap Park

As outlined in the Gap Park Masterplan, Gap Park was designated as a Public Reserve in June 1887.¹³ The park was popular tourist destination throughout the nineteenth century, as it continues to be today. Early tourist attractions within the park included the coastal walk, a camera obscura commissioned by Sydney businessman Caesar Anthony Colonna and two memorials. Colonna's camera obscura was removed by the Woollahra Municipal Council in 1914 due to fears it would be used by foreign spies to study fortifications at South Head.¹⁴

4.2 Watsons Bay Tram (c1908 -1960)

The Watsons Bay tramline was first established between King Street in the city and Ocean Street in Woollahra in 1894. The line was originally powered by cable traction.¹⁵ It was gradually extended north between 1898 and 1909 starting at Rose Bay Wharf.¹⁶ Works to extend the line to Watsons Bay began in late-1902/early 1903, at which time there were numerous concerns from the public regarding the ability of the existing tramline to accommodate the increase in traffic.¹⁷ The first section of the Watsons Bay extension was completed on 4 May 1903 and went as far as the Macquarie Lighthouse, approximately 400 metres south of the study area.¹⁸

In 1909, the portion of the Watsons Bay line encompassed by the study area was extended from the Macquarie Lighthouse terminus to Military Road, near The Gap (as shown in Figure 4-1 - Figure 4-5).¹⁹ The extension comprised of a fully electrified 65-chain single line which was surveyed in mid-1907.²⁰ Works to extend the track commenced in early 1908 and involved excavation into sandstone outcrops to form a reverse curve and cutting, both of which are encompassed by the current study area and tramway cutting. Details regarding these works are unclear, yet surviving physical evidence suggests they were carried out using drills and hand chisels (see Figure 5-13 - Figure 5-16).

Duplication works to the line took place between 1903 and 1934, although the tram route within the study area continued to operate as a single track. Navigation during busy periods was assisted by passing loops. At its peak, the Watsons Bay line was Australia's busiest single line tram route, transporting an estimated 50,000 passengers daily.²¹

An aerial photograph taken in 1943 shows the general nature of the study area and Gap Park during this period (Figure 4-5). The landscape surrounding the tram route is also shown in Figure 4-4, Figure 4-7 and Figure 4-8. These images indicate that the area was relatively free from vegetation and sandstone outcrops were exposed. They also provide evidence for infrastructure associated with the line, such as boundary stones along the track and overhead wiring (most visible in Figure 4-7).

In the mid-1950s, bus routes began replacing tram services to Watsons Bay, and by the late-1950s patronage of the once busy Watsons Bay tram route had decreased dramatically.²² In June 1960, the NSW Minister for Transport announced that the Queen's Square-Watsons Bay line would cease operations and be replaced by bus services.²³

¹³ Woollahra Municipal Council, 2008. Summary Report, Gap Park Masterplan, p. 6.

¹⁴ Woollahra Municipal Council, 2005. Gap Park, Watsons Bay

¹⁵ Trolley Wire, August 2007, p. 3. Accessed online at:

https://www.sydneytramwaymuseum.com.au/members.old/Trolley_Wire/310%20-%20Trolley%20Wire%20-%20Aug%202007.pdf on 21/07/2020.

¹⁶ Trolley Wire, August 2007, p. 3.

¹⁷ The Daily Telegraph, Mon 9 Feb 1903, NEW AND IMPROVED TRAMWAYS, p. 4.

¹⁸ The Daily Telegraph 5 May 1903, TRAMWAY EXTENSIONS, p. 4.

¹⁹ Royal Australian Historical Society, 1955. Sydney's Tramways, p. 120

²⁰ Keenan, p. 33.

²¹ Keenan, p. 3.

²² Trolley Wire, August 2007, p. 19.

²³ Trolley Wire, August 2007, p. 20.

Figure 4-1. Sketch of the Sydney tram network in 1909 showing the newly extended Watsons Bay line. The study area, referred to as Gap Loop, is circled. Source. Keenan, 1999, p. 33.

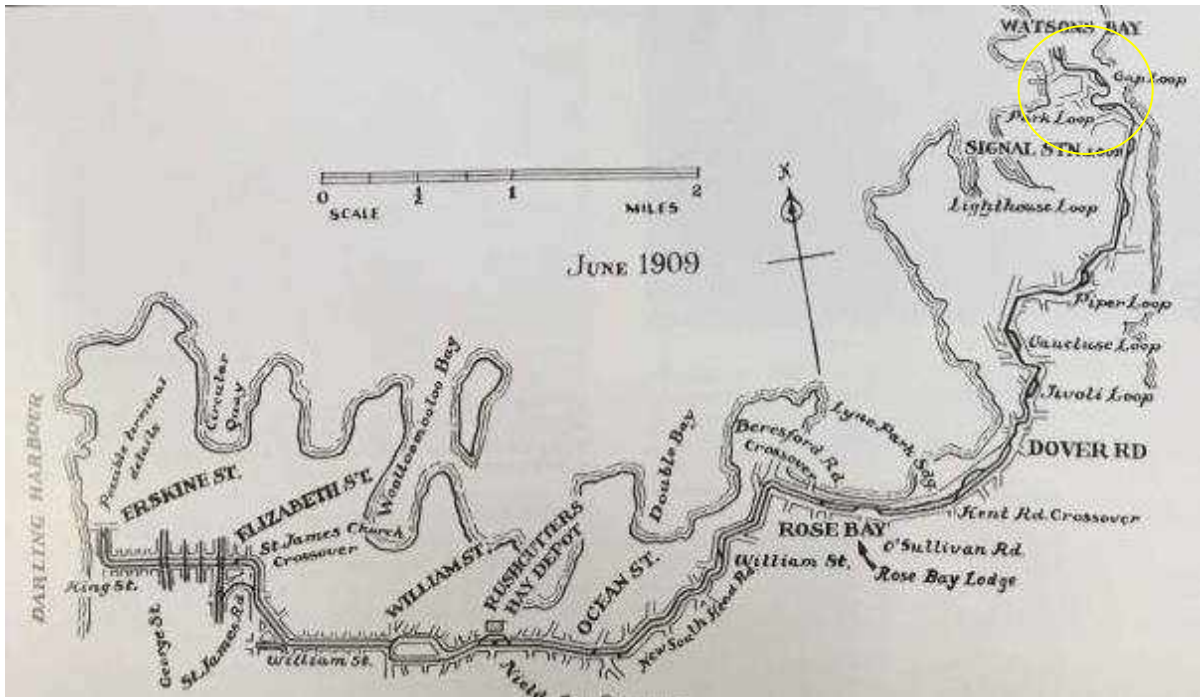


Figure 4-2. 1960 Watsons Bay tram entering the cutting between Gap Park and Gap Loop, in an area now occupied by the Don Richie Grove. Photo by the late John Alfred. Source. Lindsay Bridge, Flickr.



Figure 4-3. Tram stopped at the Military Road terminus at Watsons Bay (right), near The Gap (left) in 1949. Source. Keenan, D. R c/o WikiCommons.



Figure 4-4. Tram ascending from the Military Road terminus at Watsons Bay towards Old South Head Road. Photo taken by Peter Sage. Source. Flickr, Lindsay Bridge.



Figure 4-5. 1943 aerial photograph showing the original alignment of the Watsons Bay tram line (indicated by the dashed yellow line) running through Gap Park from Old South Head Road to the tram stop at Military Road. Source. Six Maps.



Figure 4-6. Interior of the Watsons Bay Tram, n.d. Source. Woollahra Municipal Council Library.



Figure 4-7. Watsons Bay tram approaching Watsons Bay terminus along the tramway cutting (the study area). Boundary stones (indicated by the yellow arrow) can be seen to the left of the tram and tram line. Source. Facebook - Vaucluse Public School.



Figure 4-8. Still from a 1950's film showing Sydney Trams in Watsons Bay, Kings Cross and the City. This image shows the Watsons Bay tram passing through the tramway cutting (the study area). Source. Gezza1967, YouTube.



Figure 4-9. A tram at Watsons Bay in 1960. Source. Lindsay Bridge Collection, c/o The Guardian.



4.3 Gap Park (1960-present)

Following its termination, land once occupied by the Watsons Bay tramway were filled in by Woollahra Municipal Council in 1964 and plans made to restore the area.²⁴ Restoration works included removing defunct rail infrastructure such as power poles, electrical connections, rails and sleepers along the tram corridor in Gap Park.²⁵

Gap Park and the Jacob's Ladder Gully underwent extensive revegetation works in the 1980s. Today these areas are regularly visited by local residents and members of the general public.

Figure 4-10. Farewell notices on a tram at the Watsons Bay terminus on the last day of operations on that line, 10 July 1960. Source. Lindsay Bridge Collection, c/o The Guardian.



²⁴ Woollahra Municipal Council 2008, p. 6.

²⁵ Woollahra Municipal Council 2008, p. 6-7.

5.0 PHYSICAL CONTEXT

5.1 Introduction

An inspection of the study area was undertaken by Adele Zubrzycka (Senior Heritage Consultant, Artefact Heritage) on Thursday 14 July 2020. The inspection was carried out on foot and a photographic record was made. The aim of the inspection was to assess the existing nature of the study area and any potential direct and indirect impacts to listed heritage items as a result of the project. The presence of potential archaeological remains within the study area was also investigated.

5.1.1 The study area

The study area is encompassed by the former Watsons Bay tramway route and its associated cuttings. It is presently located within Gap Park, a recreational area used by residents and visitors to access the South Head coastal walk, suburb of Watsons Bay, walk through the formalised Don Ritchie Grove and Jacob's Ladder Gully or informal Tramway Cutting path. Land associated with the Jacob's Ladder Gully and informal Tramway Cutting path comprises of a vegetated gully characterised by sandstone overhangs and rockfaces that slope abruptly and gently to the west from the South Head escarpment and coastal walk. An example of this landscape is shown in Figure 5-5 - Figure 5-10. The southern end of Gap Park is relatively flat and landscaped, with areas of cleared grassed paths and vehicle access tracks weaving around patches of native bush and trees as shown in Figure 5-1 - Figure 5-3.

The former tramway route runs through the formalised southern end of Gap Park (shown in Figure 5-2 and Figure 5-4), north towards Military Road past the Jacobs Ladder Gully (shown in Figure 5-5 - Figure 5-11). It occupies land characterised by gradual and steep slopes down to the west from the coastal walk escarpment.

The existing path associated with the tramway route has been formalised through a combination of cleared ground in the southern end (see Figure 5-3), and loose gravel or bitumen paths in the northern portion of the route (see Figure 5-21 - Figure 5-26). Sections of the existing path are narrow and being encroached upon by vegetation and sediment runoff from the eastern rock overhangs as shown in Figure 5-5 - Figure 5-11.

A total of seven features associated with the former tramline and activities related to the formation of the tramway cutting were observed during the site inspection. These comprised of chisel marks (Figure 5-13 and Figure 5-14), drill marks (Figure 5-15 and Figure 5-16), iron infrastructure bolted or cut into the rockface (Figure 5-17), brick pylons used to support rock overhangs (Figure 5-18), evidence of initials which had been painted or engraved onto the face of the rock cutting (Figure 5-19 and Figure 5-20), sandstone boundary stones running on either side of the tramway route (Figure 5-21 - Figure 5-26) and retaining walls along the downward slope to the west of the former tramway and cutting (Figure 5-27 and Figure 5-28). The latter can be seen from Jacobs Ladder Gully, Gap Road and Don Richie Grove.

With the exception of sandstone boundary stones and retaining walls along the former tramway route, no additional evidence of potential archaeological remains in the form of sleepers or tracks were identified during the site inspection.

5.1.2 Summary of findings

Numerous features associated with the formation and ongoing use of the Watsons Bay tramway were identified during the site inspection:

- Chisel marks, drill marks, iron infrastructure and graffiti bolted, cut painted or engraved into the rockface cutting – shown in Figure 5-13 - Figure 5-17, Figure 5-19 and Figure 5-20
- Brick pylons used to support rock overhangs – shown in Figure 5-18
- Sandstone boundary stones running on either side of the tramway route – shown in Figure 5-21 - Figure 5-26
- Retaining walls along the downward slope to the west of the former tramway and cutting – shown in Figure 5-27 and Figure 5-28



Figure 5-1. Existing Gap Park signage and vegetation at the Old South Head Road end of the study area.



Figure 5-2. Example of the existing landscape within the southern portion of Gap Park.



Figure 5-3. View east towards the Don Ritchie Grove path from the former tramway route.



Figure 5-4. View north towards an existing bitumen path leading towards the former tramway cutting in Don Ritchie Grove.



Figure 5-5. View north within the study area showing an existing gravelled footpath to the west of the former tramway cutting.



Figure 5-6. View south within the study area showing an existing gravelled footpath to the west of the former tramway cutting.



Figure 5-7. View north along the former tramway route showing the tramway cutting (left) and overall nature of the study area.



Figure 5-8. View east towards the tramway cutting and associated escarpment from the Jacobs Ladder Gully.



Figure 5-9. View south along the former tramway route showing the tramway cutting (right) and overall nature of the study area.



Figure 5-10. View north along the former tramway route showing overall nature of the study area.



Figure 5-11. View north along the former tramway route. Gap Road and its associated residential development can be seen to the left.



Figure 5-12. View south towards the former tram stop and tramway route.



Figure 5-13. Example of remnant chisel marks along the former tramway cutting.



Figure 5-14. Example of remnant chisel marks along the former tramway cutting.



Figure 5-15. Example of remnant drill marks along the former tramway cutting.



Figure 5-16. Example of remnant drill marks along the former tramway cutting.



Figure 5-17. Example of what may represent remnant infrastructure along the former tramway cutting.



Figure 5-18. Brick pylon supporting a rock overhang at the entrance to the former tramway cutting.



Figure 5-19. Example of graffiti (L.U and B.G) engraved and painted onto the northern end of the tramway cutting.



Figure 5-20. Example of graffiti (A.T '41) engraved and painted onto the northern end of the tramway cutting.



Figure 5-21. Example of a partially eroded bitumen footpath within the study area.



Figure 5-22. View north along the former tramway route showing existing path and sandstone boundary stones (indicated by arrow).



Figure 5-23. Detail of sandstone boundary stone partially covered in modern bitumen.



Figure 5-24. Detail of sandstone boundary stone partially covered in decayed leaf matter.



Figure 5-25. Example of sandstone boundary.



Figure 5-26. Detail of loose sandstone boundary stone.



Figure 5-27. View west looking down slope from the former tramway showing a concrete and stone retaining wall.



Figure 5-28. View east towards to tramway route from Gap Road showing examples of concrete and sandstone retaining walls along the northern end of the former tramway route.

6.0 SIGNIFICANCE ASSESSMENT

6.1 Introduction

The following section provides an overview description and statement of significance for heritage items within the study area.

Information for each item has been extracted from their respective State Heritage Inventory database listings or any other relevant heritage resources. Where these descriptions are incomplete, descriptions and assessments of significance for these items have been prepared by Artefact Heritage.

In-depth significance assessments for each item are provided in Appendix A and assessed against the criteria outlined in the *NSW Heritage Manual: Assessing heritage significance* (NSW Heritage Office 2001), shown in Table 2-1.

6.2 Listed heritage items within the study area

6.2.1 Tramway Cutting – I436

The Tramway Cutting is listed on the Woollahra LEP 2014 (Item no. I436) as an item of local heritage significance and is a key landscape component of the current study area.

Table 6-1. Statement of Significance for Tramway Cutting

Tramway Cutting ²⁶	
Significance	Local
Description	The tramway cutting located within Gap Park comprises of a 20-metre-long section of the former Watsons Bay tram route which is encompassed by sandstone outcrops modified to accommodate the Watsons Bay tramway in 1908. Although details regarding modification activities are not known, physical evidence surviving on the face of the cutting suggests modification was carried out using hand chisels and mechanical drills. Some sections of the cutting have retained aspects of their original formations such as rock shelters. One rock shelter overhang is being supported by a brick pylon made from modern machine pressed brick bonded with hard cement mortar.
Statement of significance	The Tramway Cutting has historical, associative, social and aesthetic significance at a local level. The cutting is directly associated with the Watsons Bay tram, one of Sydney's busiest and most popular tram routes in the early to mid-twentieth century. The extension of the Watsons Bay line in 1909 allowed an increasing number of visitors into the suburb to explore its natural and historical heritage. The cutting's social significance amongst the local community is evidenced by the many books, websites and archival material available for the tramway which reflect its ongoing importance amongst members of the public who used the line or have a connection and interest with tram history. The item has aesthetic significance as a prominent example of landscape modifications associated with Sydney's transport system. Its aesthetic significance is further complimented by its setting within Gap Park.

²⁶ Heritage NSW, SHI inventory listing for Tramway Cutting. Accessed online at 14/07/2020.at: <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>

6.2.2 Dunbar Anchor – I435

The Dunbar Anchor is listed on the Woollahra LEP 2014 (item no. (435) as having local significance. The study area is located within its heritage curtilage.

Table 6-2. Statement of significance for the Dunbar Anchor

Dunbar Anchor ²⁷	
Significance	State
Description	<p><i>The Dunbar Anchor is located at the northern end of Gap Park on the rocky outcrop just back from the impressive high sandstone cliffs of The Gap. Anchor monument and plaque to Dunbar Wreck. two engravings also made in the sandstone relating to the wreck.</i></p> <p><i>External Materials: Recovered cast iron anchor and chain set in monument.</i></p>
History	<p><i>The Dunbar Anchor and chain are remnants from the British built merchant ship the Dunbar, commanded by Captain James Green and owned by the Scottish shipowner Duncan Dunbar and built in Sunderland in 1853 at James Laing's shipyards. The Dunbar was a wooden frigate, three masted all square-rigged and similar to the Sydney cruise ship Bounty.</i></p> <p><i>The ship was wrecked approximately 500 yards south of 'The Gap' on the night of August 20 1857 with the loss of all but one of the 122 persons aboard. The sole survivor was able seaman James Johnson who was rescued from the base of the cliff at the Gap about 36 hours later. The Dunbar was on its second voyage from England to the colony when it was wrecked and amongst those to perish were many old colonists returning to Sydney. Following the disaster a light was erected on North Head as well as Hornby Light on South Head.</i></p>
Modifications and condition	<i>General condition is good, some parts are badly deteriorated.</i>
Additional information	<i>Dunbar Anchor and rock inscription in Old South head Road are part of the Dunbar Shipwreck Group SHR listing</i>
Recommended management	<i>The Dunbar Anchor should be maintained and retained as a memorial to the deaths of the 121 persons who perished in the wreck. The Anchor and its surrounds should be restored and retained in good condition.</i>
Statement of Significance	<p><i>The Dunbar Anchor, Gap Park Watsons Bay is significant as a remnant of the worst maritime disaster in the shipwreck of the Dunbar. The shipwreck, which occurred in 1857 caused the death of all but one of the 122 persons aboard and the anchor, which was recovered from the wreck in c1907 is set as a memorial to the death of these people.</i></p> <p><i>The anchor and plaque have historic and social significance for their association with the worst sea disaster to occur in the vicinity of Sydney Harbour in the nineteenth century. It also has significance for its association with many 'old colonists' who were amongst the 63 passengers to die. The shipwreck was responsible for the construction of lights on both North Head and Hornby Light on the tip of South Head and the memorial is significant as part of the historic remnants and structures which make up the features Gap Park and surrounds.</i></p>

²⁷ Heritage NSW, SHI inventory listing for the Dunbar Anchor. Accessed online at 14/07/2020.at: <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>

6.2.3 Bicentennial Coastal Cliff Walk - I343

The Bicentennial Coastal Cliff Walk is listed on the Woollahra LEP 2014 (item no. I343) as a locally significant item. The study area is located within its heritage curtilage.

Table 6-3. Statement of Significance for Bicentennial Coastal Cliff Walk.

Bicentennial Coastal Cliff Walk ²⁸	
Significance	Local
Description	<p><i>The Bi-Centennial Coastal Cliff Walk is located along the cliff face overlooking the ocean between Watson's Bay and Vaucluse. The walk consists of a pathway that meanders along the top of the cliff from Gap Park to Christison Park, and features old WW2 concrete gun emplacements and bunkers as well as the stone Signal Station designed by Mortimer Lewis and built by convict labour about 1840, and the Macquarie Lighthouse designed and constructed by Francis Greenway and located towards the southern end of the walk.</i></p> <p><i>A bronze plaque dated 1992 commemorating the opening of the "Bicentennial Coastal Cliff Walk" is set on a rock overlooking the ocean. Elements in the walk include a timber fence along the cliff edge and steel frame and timber benches, a bitumen path with hardwood edges, and viewing platforms with sandstone paving. The Walk is part of the proposed 20km. walking trail from South Head to Bumbora Point at La Perouse.</i></p> <p><i>External Materials: Natural vegetation and rock formations, steel and timber benches, bitumen paths and concrete WW2 relics, timber fencing</i></p>
History	<p><i>The Bi-Centennial Coastal Cliff Walk is located at the top of the cliff overlooking the ocean between Watson's Bay and Vaucluse. 'The earliest known European use of the site was made by a small detachment of men maintaining a lookout on the heights above Watson's Bay. A flagstaff had been constructed in January 1790 in order to signal the settlement at Sydney Cove of the approach of shipping... Between July and August 1790 a column 30 feet high was constructed in brick and stone adjacent to the flagstaff. The column was to function as a beacon for ships approaching Port Jackson since there was no other indication that this was the location of the settlement.</i></p> <p><i>A guardhouse was erected in 1801, and soon after Governor Macquarie took office in 1810 he ordered the mounting of signal guns. "The next major work to take place in the region was the construction of Macquarie Lightstation... completed in 1818' and Macquarie appointed the local landholder, Robert Watson, as lighthouse superintendent. A quarry located at the south eastern corner of the existing lightstation compound can be dated to the 1816-1818 period. 'In 1838 a Signal Station was constructed between the signal station and the lighthouse.' The remnants of two gun emplacements, one dating from 1893 and the second dating from 1938. A concrete bunker dating from the World War 2 period is still in place.</i></p>
Modifications and condition	<i>Good condition and maintenance.</i>
Recommended management	<i>It is strongly recommended that there be no alterations or modifications to the equipment, relics, natural vegetation and rock formations, or structures included in the area of the Bi-Centennial Coastal Cliff Walk. Maintenance should be restricted to replacing safety fencing and making safe any items included in this area.</i>
Statement of significance	<i>The site of this Walk has strong historical links to the earliest days of the European Settlement of Australia, and as such has high social and historic significance. The building remnants such as the bunkers and gun emplacements have high social and historic significance as part of the defence systems initiated in the late nineteenth century and at the beginning of the 2nd. World War. The natural vegetation and rock formations have high social and historical significance as part of the history of European development of the Colony of New South Wales. The Signal Station and the Macquarie Lighthouse have aesthetic significance as part of the historic development of the area.</i>

²⁸ Heritage NSW, SHI inventory listing for the Bicentennial Coastal Cliff Walk. Accessed online at 14/07/2020 at: <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>

6.2.4 Watsons Bay Heritage Conservation Area – C14

The Watsons Bay Heritage Conservation Area is listed on the Woollahra LEP 2014 (item no. C14) as having local significance. The study area is located within its heritage curtilage.

Table 6-4. Statement of Significance for Watsons Bay Heritage Conservation Area.

Watsons Bay Heritage Conservation Area ²⁹	
Significance	Local
Description	<p><i>Watsons Bay is dominated by a rugged coastal landscape that defines the east side of a narrow peninsula at the entrance to Sydney Harbour. Its natural topography includes exposed ridges and cliff faces to the Tasman Sea, which contrast with the protected bays and sheltered beaches on Sydney Harbour. A subdivision and development pattern has evolved since settlement on the gently sloping western side of the peninsula.</i></p> <p><i>The pattern is clearly influenced by the landform, topography and drainage patterns. The built form retains the character of a low-scaled early 19th and 20th century maritime village, enhanced by natural vegetation and parklands, including the continuous park along the ridge line and cliff tops. The area offers important views and vistas to the heads, Sydney Harbour, the Sydney CBD and the Tasman Sea. Landmarks within the area, such as church spires and the lighthouse, can be viewed from the Sydney CBD Maritime linkages are visually reinforced by the many maritime structures including wharves, jetties, boat sheds and promenades that remain.</i></p>
History	<p><i>The natural landscape of Watsons Bay has been dominated by the sea and harbour, influencing its occupation by the original landowners, the Birrabirragal People, and later European settlers. Watsons Bay was the site of the first landing within Sydney Harbour. Permanently occupied from 1790, it is one of the earliest European settlements in Australia. Its rich maritime history is evident in a variety of built and landscape elements that reflect its role in navigation, defence and recreation.</i></p>
Recommended management	Recommended management for the Watsons Bay Heritage Conservation Area is outlined in the Woollahra DCP 2014
Statement of significance	<p><i>Watsons Bay is a place of great natural and scenic beauty. It is a rare combination of a dramatic and varied coastal landscape and a village that evolved from the first landing point in Sydney Harbour in 1788, the third permanent settlement in New South Wales from 1790 and a pilot station established in 1792.</i></p> <p><i>It conveys a strong sense of its maritime heritage in its built and landscape features that evidence four key historic themes:</i></p> <ul style="list-style-type: none"> <i>• The growth of a village: Evident in the subdivision and development pattern that occurred during the 19th century and continued throughout a number of phases. These phases are demonstrated in the range of building types still present in the area, from moderately scaled fisherman's cottages, more substantial houses and marine villas to Inter-war period housing and community buildings.</i> <i>• Navigation: Evidenced by the key role South Head has played in piloting ships into Sydney. A number of navigation structures, such as the lighthouse, wharves and jetties, have important historic and aesthetic significance.</i> <i>• The defence of Sydney at The Heads: Reflected in the 19th century South Head batteries and artillery establishment, complex of fortifications, HMAS Watson and the extent of the untouched landscape typical of defence occupation of the foreshores.</i> <i>• Recreation and tourism: Dating from as early as 1803, there has been a strong emphasis on water related tourism facilities, such as hotels, beach promenades and parks. Tourism was further enhanced as a result of the area's association with shipwrecks and by association with important cultural figures such as Christina Stead and Zane Grey. The extensive and varied landscape and village character also contributes to the appeal of Watsons Bay to tourists.</i>

²⁹ Woollahra Municipal Council, 2015. Part C: Heritage Conservation Areas - Watsons Bay Heritage Conservation Area. Accessed online on 14/07/2020 at: https://www.woollahra.nsw.gov.au/__data/assets/pdf_file/0016/150532/Chapter_C3_Watsons_Bay_HCA.pdf

7.0 ARCHAEOLOGICAL ASSESSMENT

7.1 Archaeological potential assessment

This section discusses the study area's potential to contain historical archaeological resources. The potential for the survival of archaeological remains is significantly affected by activities which may have caused ground disturbance. This assessment is therefore based on consideration of current ground conditions, and analysis of the historical development of the study area.

'Archaeological potential' refers to the likelihood that an area contains physical remains associated with an earlier phase of occupation, activity or development of that area. This is distinct from 'archaeological significance' and 'archaeological research potential'. These designations refer to the cultural value of potential archaeological remains and are the primary basis of the recommended management actions included in this document. Identified levels of archaeological potential referred to in this section are based on the definitions outlined in Table 2-2.

7.1.1 Land use summary

The European occupation of the study area has been divided into three general phases of historical activity, which are outlined in Table 7-1 below.

Table 7-1. Historical land use within the study area.

Phase	Discussion	Potential remains
Phase 1 Early European land grants and occupation (1788-c1908)	<p>Prior to the establishment of the tramway and tramway cutting, land within the study area was undeveloped and characterised by a natural gully occupied by native vegetation.</p> <p>With the exception of informal footpaths used by members of the public to traverse the area, no structures or landscapes modifications are known to have been established during this period of occupation.</p>	Ephemeral evidence of paths and vegetation clearance
Phase 2 Tramway (c1908-1960)	<p>Land within the study area underwent significant modifications to accommodate the extension of the Watsons Bay line to Military Road This included localised grading and vegetation clearance and chiselling and drilling activities along sandstone overhangs to form various cuttings through the tram alignment.</p> <p>In order to establish the tramline itself, ballast, sleepers, rails, boundary stones, retaining walls, and fences were installed along the route.</p>	Rails, sleepers, sandstone boundary stones, ephemeral evidence of former fence lines, ballast.
Phase 3 Tramway (1960-present)	<p>After the Watsons Bay line was decommissioned in 1960, tram infrastructure such as rails, ballast and sleepers were removed throughout the study area and landscape modifications commenced.</p> <p>These modifications included sculpting the landscape through filling activities as well as restoring the area through revegetation and the establishment of formal and informal paths.³⁰</p>	Evidence of redeposited fills

³⁰ Woollahra Municipal Council, 2008. Summary Report, Gap Park Masterplan, p. 6.

7.1.2 Previous impacts

7.1.2.1 Establishment of the Watsons Bay tramway and cutting (Phase 2)

Construction activities associated with the Watsons Bay tramway and cutting required significant landscape modifications that would have removed, truncated or disturbed any evidence of pre-1909 land use or occupation throughout the study area.

7.1.2.2 Decommissioning of the Watsons Bay line (Phase 3)

Following decommissioning of the Watsons Bay line, all tram tracks and sleepers were removed along the route.³¹ Therefore, evidence of former infrastructure are no longer likely to exist within the study area. However, evidence associated with the tramway in the form of boundary stones and intact retaining walls were observed during the site inspection (as shown in Figure 5-21 - Figure 5-26, Figure 5-27 - Figure 5-28).

7.1.3 Assessment of archaeological potential

Based on findings from the site inspection (described in Section 5.0), known land use and previous disturbance activities (described in Section 7.1.1), the study area has been assessed as containing the following non-Aboriginal archaeological potential:

- **Phase 1 – Nil** potential to contain surviving archaeological evidence of pre-tramway land use such as informal paths and landscape modifications
- **Phase 2:**
 - **High** potential to contain above and below ground evidence of tramline infrastructure such as boundary stones and retaining walls.
 - **Low** potential to contain evidence of tramline infrastructure such as sleepers, rails and former fence lines
- **Phase 3 – High** potential to contain evidence of land filling activities. However, evidence of landscape modifications from this period would not be considered archaeological in nature due to their modern deposition date.

7.1.4 Assessment of archaeological significance

Archaeological significance refers to the heritage significance of known or potential archaeological remains. As with other types of heritage items, archaeological remains should be managed in accordance with their significance. In situations where development is proposed, this can influence the degree of impact that may be acceptable or the level of investigation and recording that may be required.

While archaeological remains often form an integral component of the overall significance of a heritage place, it is necessary to assess them independently from above ground and other historic elements. Assessing the heritage value of archaeological remains is made more difficult by the fact that their extent and nature is often unknown. It becomes necessary for judgement to be made on the basis of expected or potential attributes. The Heritage NSW, DPC (formerly the NSW Heritage Branch) document *Assessing Significance for Historical Archaeological sites and 'Relics'* provides the framework for the following significance assessment. It has been prepared according to criteria outlined in Table 2-1.

³¹ Woollahra Municipal Council, 2008. Summary Report, Gap Park Masterplan, p. 6.

Table 7-2. Consideration of archaeological significance against the NSW heritage assessment criteria.

Criteria	Description
<p>A – Historical Significance An item is important in the course or pattern of the local area’s cultural or natural history.</p>	<p>The study area is historically significant due to its associations with the Watsons Bay tramline and tramway cutting (Phase 2). At its peak, the Watsons Bay tram was the busiest single line tram route in Australia and transported thousands of tourists and residents to Watsons Bay daily. This influx of visitors played a significant role in the establishment of commercial businesses in the area and aesthetic character of Watsons Bay today.</p> <p>Land use in the study area prior to the establishment of the Watsons Bay tramline was associated with recreational activities which may have involved the establishment of informal paths and vegetation removal (Phase 1). Evidence of these activities is likely to have been removed or distributed during construction works for the tram corridor.</p> <p>If found to be intact and legible, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) may reach the threshold for significance at a local level. However, these remains are likely to be considered ‘works’ (archaeological remains that do not fall under the definition of relics in the <i>Heritage Act</i>) and would not be protected under the <i>Heritage Act</i>.</p> <p>Archaeological remains associated with pre-tram occupation (Phase 1) are unlikely to reach the threshold of local or state significance under this criterion as they would highly ephemeral and difficult to distinguish within the landscape.</p>
<p>B – Associative Significance An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area’s cultural or natural history.</p>	<p>The former tram line, tramway cutting and associated archaeological remains (Phase 2) have strong associations with Sydney’s tram network and ongoing residential and recreational development in Watsons Bay. It is therefore important to the cultural and natural heritage of Watsons Bay.</p> <p>There is no evidence to suggest that Phase 1 paths or landscape modifications have strong or special associations with Watsons Bay or members of the local community.</p> <p>If found to be intact and legible, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) may reach the threshold for significance at a local level. However, these remains are likely to be considered ‘works’ (archaeological remains that do not fall under the definition of relics in the <i>Heritage Act</i>) and would not be protected under the <i>Heritage Act</i>.</p> <p>Archaeological remains associated with pre-tram occupation (Phase 1) do not reach the threshold of local or state significance under this criterion.</p>
<p>C – Aesthetic or Technical Significance An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.</p>	<p>The potential archaeological remains within the study area have little potential for aesthetic significance. Although it is recognised that exposed <i>in situ</i> archaeological remains may have distinctive/attractive visual qualities and have visual characteristics with potential to connect communities and individuals to the past in a tangible way, the potential archaeological remains at the study area are likely to be ephemeral.</p> <p>The potential archaeological remains associated with Phase 1 and 2 occupation do not meet the threshold for local or state significance under this criterion.</p>

Criteria	Description
<p>D – Social Significance An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.</p>	<p>The Watsons Bay tram line and its associated cutting continue to have strong associations with members of the local community today. These include past and present residents of Watsons Bay and Vaucluse, as well as individuals with an interest in Sydney's historical tram network. This is evidenced by various publications that include details about the line, Facebook groups, websites and films uploaded to YouTube which discuss the line and its route through Gap Park.</p> <p>There is no evidence to suggest potential archaeological remains associated with Phase 1 paths would hold strong or special associations amongst the local community as they would be highly ephemeral and difficult to distinguish within the landscape.</p> <p>If found to be intact and legible, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) may reach the threshold for significance at a local level. However, these remains are likely to be considered 'works' (archaeological remains that do not fall under the definition of relics in the <i>Heritage Act</i>) and would not be protected under the <i>Heritage Act</i>.</p> <p>Archaeological remains associated with pre-tram occupation (Phase 1) are unlikely to reach the threshold of local or state significance under this criterion.</p>
<p>E – Research Potential An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.</p>	<p>It is unlikely that potential archaeological remains associated with Phase 1 or 2 occupation would yield information that will contribute to an understanding of the local area's cultural history. Information regarding the construction and use of Sydney's early twentieth century tram network is well understood and there is extensive documentary evidence available to answer questions regarding construction methods and modifications made to and associated with the Watsons Bay tram corridor. Evidence of Phase 1 paths would not contribute further information into the use of Gap Park prior to the establishment of the tramway.</p> <p>Therefore, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) and early land use (Phase 1) would not reach the threshold for local or state significance under this criterion.</p>
<p>F – Rarity An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.</p>	<p>There is no evidence to suggest that potential or known archaeological remains associated with former Watsons Bay tramline or earlier land use would possess uncommon, rare or endangered aspects of the local area's cultural history. Sydney's tram system was extensive, and evidence of former infrastructure would represent later and common methods of construction techniques and materials. Phase 1 footpaths of landscape modifications would also be represented by common methods of construction and materials.</p> <p>Therefore, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) and early land use (Phase 1) would not reach the reach the threshold for local or state significance under this criterion.</p>

Criteria	Description
<p>G – Representativeness An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).</p>	<p>If found to be intact and legible, potential archaeological remains of the Phase 2 tramway cutting and alignment may demonstrate principle characteristics of construction methods and techniques associated with Sydney's tram network.</p> <p>Potential archaeological remains associated with Phase 1 paths are unlikely to demonstrate evidence of NSW's cultural and natural history as they were truncated and disturbed by Phase 2 development activities and are likely to be highly ephemeral.</p> <p>If found to be intact and legible, potential archaeological remains associated with the Watsons Bay tramline (Phase 2) may reach the threshold for significance at a local level. However, these remains are likely to be considered 'works' (archaeological remains that do not fall under the definition of relics in the <i>Heritage Act</i>) and would not be protected under the <i>Heritage Act</i>.</p> <p>Archaeological remains associated with pre-tram occupation (Phase 1) are unlikely to reach the threshold of local or state significance under this criterion as they would highly ephemeral and difficult to distinguish within the landscape.</p>

7.1.4.1 Statement of archaeological significance

As discussed in Section 7.0 and based on findings from the site inspection (Section 5.0), land within the study area has high potential to contain archaeological evidence of boundary stones and retaining walls associated with the Watsons Bay tramline (Phase 2). It also contains low potential for evidence of sleepers, rails and ballast associated with the former tram alignment.

The Watsons Bay tram played an important role in the local area's recreational and social history and was Australia's busiest single line tram route. Therefore, potential archaeological remains associated with the tramline have historical, associative, social and representative significance at a local level. They would be directly associated with the Watsons Bay tram, Australia's busiest single line tram routes in the early to mid-twentieth century. The former tramline continues to contain significance amongst members of the local community.

Despite their significance, archaeological remains associated with the former tramline are likely to be considered 'works' (archaeological remains that do not fall under the definition of relics in the *Heritage Act*) and would not be protected under the *Heritage Act*. They should however be preserved or managed appropriately.

8.0 HERITAGE IMPACT ASSESSMENT

This section will assess potential impacts to listed heritage items, heritage conservation areas and potential archaeological remains within the study area may occur as a result of the project. The methodology and terminology used to evaluate and describe these impacts is discussed in Section 2.1.

8.1 Proposed works

The establishment of the proposed pathway through Gap Park will include the following works:

- Construction of concrete, paved and crushed sandstone paths
- Construction of a 20-metre-long raised boardwalk along the Gap Park Tramway Cutting
- Subsurface excavations of approximately 300mm in width and 450mm in length for boardwalk posts
- Establishment of safety fences
- Subsurface excavations of approximately 300mm in width and 450mm in length for fence posts
- Clearing of vegetation and soils along the project route to an estimated depth of 50-100mm
- Establishment of cross path swales at 20 metre intervals to assist in stormwater management
- Installation of signage
- Installation of a sandstone log wall
- Revegetation activities

The location and nature of works required for the project are illustrated in Appendix B.

8.1.1 Justification

The last major landscaping work to occur in Gap Park was completed in 1982. Bush regeneration and the renewal of a coastal walk fence have also been carried out over the last decade. However, due to ongoing high visitation numbers in Gap Park, the condition of existing park infrastructure has declined. Therefore, upgrades to the existing tramway cutting path are required to ensure the landscape is maintained and continues to be accessible to residents and visitors in the area.

8.2 Assessment of heritage impact to items within the study area

8.2.1 Tramway Cutting (I436)

8.2.1.1 Direct Impacts

Direct impacts to the tramway cutting will include vegetation clearance from the face of the cutting, localised excavations, sediment clearing and the establishment of a boardwalk, footpaths, fencing, signage and sandstone log wall construction along the former tramway route.

These works are unlikely to result in direct impacts to the cutting itself. However, localised excavations, sediment clearing activities and the construction of a boardwalk, paths, fences and signage along the former tramway route have the potential to remove or impact boundary stones, retaining walls and subsurface remains associated with the former tramway.

If these works were to permanently damage or remove archaeological evidence of the former tramline, it would be considered a **moderate** impact to the overall significance of the item.

However, if mitigation measures outlined in Section 9.2 below are followed, the project would result in a **minor** impacts to the overall significance of the item.

8.2.1.2 Indirect Impacts

The proposed works would require modifications to the item's immediate landscape through vegetation removal, soil and sediment clearance and the addition of fencing, signage, sandstone log walls, a boardwalk and footpaths. These activities would alter the existing character of item and its immediate landscape.

Although this has potential to negatively impact the heritage significance of the item by modifying its current setting, the project will improve the character and appearance of the item by formalising the landscape, removing weeds, exposing its original width and alignment and drawing attention the cutting and its historical context.

Therefore, the proposed works result in **negligible** indirect impacts to the heritage significance of the item.

8.2.2 Bicentennial Coastal Cliff Walk (I343)

8.2.2.1 Direct Impacts

Direct impacts to the Bicentennial Coastal Cliff Walk will include vegetation clearance and localised excavations, sediment clearing and the addition of fencing, signage, sandstone log walls, a boardwalk and footpaths along a small portion of the item's heritage listed curtilage.

These works are minor when considering the overall size and character of the Bicentennial Coastal Cliff Walk and are unlikely to significantly impact fabric directly associated with its significance.

Therefore, the project will result in **negligible** direct impacts to the heritage significance of the item

8.2.2.2 Indirect Impacts

The proposed works would require minor modifications to the item's overall landscape through vegetation removal, soil and sediment clearance and the addition of fencing, signage, sandstone log walls, boardwalks and footpaths. They would also involve temporary visual impacts associated with the construction program such as safety fencing and the presence of construction vehicles in the area.

These works are minor when considering the overall size and character of the Bicentennial Coastal Cliff Walk. In addition, they would likely improve the character and appearance of the item by formalising the landscape, removing weeds and exposing the original width and alignment of the former tramway route and cutting.

Therefore, the project would result in **minor** (temporary) and **negligible** (permanent) indirect impacts to the heritage significance of the item.

8.2.3 Dunbar Anchor (I435)

8.2.3.1 Direct Impacts

No direct impact to the Dunbar Anchor would occur for the project. Although the curtilage of the item includes the study area, the item itself is located approximately 11 metres northeast of the study area boundary itself.

Therefore, provided no works for the project extend to the item (such as site compounds), the project would result in **nil** direct impacts to the heritage significance of the item.

8.2.3.2 Indirect Impacts

Views to and from the study area from the Dunbar Anchor are obstructed by vegetation and the natural form of the landscape. Therefore, the project will not modify or change the items existing setting or overall character.

Therefore, provided no works for the project extend to the item (such as site compounds), the project would result in **nil** indirect impacts to the heritage significance of the item.

8.2.4 Watsons Bay Heritage Conservation Area (C14)

8.2.4.1 Direct Impacts

Direct impacts to the Watsons Bay Conservation Area would be limited to land within the study area, which occupies a small portion of the item's overall curtilage. These impacts would include vegetation clearance, grading and the establishment of paths, a boardwalk, fences, signage and sandstone log walls.

These works are unlikely to significantly alter or remove fabric and vegetation associated with the conservation area. Further, no contributing elements to the conservation area would be impacted by the works. Therefore, the project would result in **negligible** direct impacts to the heritage significance of the item.

8.2.4.2 Indirect Impacts

The project would involve minor modifications to land within the Watsons Bay Conservation Area and has potential to alter components of Gap Park's existing setting and character. This would occur through the establishment of paths, a boardwalk and signage, as well as the localised removal or some vegetation. However, the study area encompasses a small component of the Watsons Bay Conservation Area and the project would likely improve views and vistas within Gap Park by exposing the tramway cutting and its original alignment.

Therefore, the project would result in **negligible** indirect impacts to the heritage significance of the item.

8.2.5 Watsons Bay Heritage Conservation Area - DCP 2015 Management Policies

In order to conserve the cultural and natural heritage values of the Watsons Bay Heritage Conservation Area, Part C of the Woollahra Municipal Council's 2015 DCP includes a separate chapter (Chapter 3) which outlines management policies and controls for proposed developments within the heritage conservation area.

Chapter 3 identifies the study area as being with Precinct P – Upper Gap Park. Development in Precinct P is guided by Precinct Guidelines which are outlined in Chapter 4.15 of the document. These are designed to supplement general controls for all development in the Watsons Bay Heritage Conservation Area. These Precinct Guidelines and their relevance to the project are outlined in Table 8-1 below.

Table 8-1. Precinct Guidelines and assessment of impacts – Upper Gap Park³²

Precinct Guidelines	Project impacts against Precinct Guideline
<p><i>G1) The existing topography and vegetation should be maintained. New plantings should be typical Hawkesbury sandstone heath community plants of the same scale and species to those existing. New plantings should not obscure existing views and vistas. Additional plantings of Norfolk Island Pines and Fig trees are not appropriate in Upper Gap Park. Existing pines and fig trees should be retained as cultural plantings.</i></p>	<p>The project will require some minor vegetation clearance along the former tramway alignment. Although these works are not explicitly in keeping with this Precinct Guideline, they would be limited to overgrown vegetation and informal plantings. No established trees or significant vegetation would be impacted by the project.</p> <p>Therefore, these works are in keeping with this guideline.</p>
<p><i>G2) The existing extensive public views to and from Watsons Bay, Sydney Harbour and the waterfront, The Gap and within the park should be retained.</i></p>	<p>The project involves minor works that predominantly comprise of new landscape features such as a boardwalk, footpaths, sandstone log retaining walls, signage and fences. These proposed landscape features will follow the existing tramway path alignment within Gap Park.</p> <p>The nature of these works will not significantly modify current public views to and from Watsons Bay, Sydney Harbour, the waterfront or The Gap. They are therefore in keeping with this guideline.</p>
<p><i>G3) To retain the open landscape setting and ruggedness of the topography, no new structures should be constructed within the park.</i></p>	<p>No new structures are included in the project design, with the exception of landscape features such as a boardwalk, footpaths, sandstone log retaining walls, signage and fences.</p> <p>The form, colour and location of these new landscape features will not modify Gap Park’s open landscape setting or ruggedness of the topography. The project is therefore in keeping with this guideline.</p>
<p><i>G4) Existing monuments should be maintained as contributory items. New structures should be limited to commemorative structures, public artworks, interpretive signage and the like, the number of which should be carefully controlled so as not to result in a visual ‘cluttering’ of the landscape.</i></p>	<p>The project will not involve the removal or modification of any existing monuments of contributory items within the Watsons Bay Conservation Area or Gap Park.</p> <p>The location and density of proposed signs, seating and fences for the project are considered to be adequately distributed across the study area and will not result in a visual ‘cluttering’ of the landscape.</p> <p>The project is therefore in keeping with this guideline.</p>
<p><i>G5) No additional fencing should be constructed. New safety fencing should be constructed as low as possible whilst still serving its purpose. It should be constructed of materials that withstand tough marine and coastal conditions, are appropriate in terms of the character of the landscape and do not obstruct views and vistas.</i></p>	<p>The project will involve the construction of safety fencing along the former tramway cutting.</p> <p>The proposed fence will be low lying and constructed from timber and steel. These materials and designs are in keeping with the existing character of the Gap Park landscape.</p> <p>Proposed materials have been designed to withstand the harsh marine and coastal conditions in the area and complement existing safety fencing within Gap Park. Therefore, proposed fences would be in keeping with this guideline.</p>

³² Woollahra Municipal Council 2015, pp. 114-115.

Precinct Guidelines	Project impacts against Precinct Guideline
<i>G7 The existing public access (including disabled access) throughout the park should be retained. Public access within the park to The Gap should be retained.</i>	<p>When complete, the proposed project design will not block or modify existing public access (including disabled access) to Gap Park or the tramway cutting path.</p> <p>Further, it will provide disability access to the path - something that is not currently available to members of the public.</p>
<i>G8 Any new paths throughout the precinct should be constructed using recessive colours and finishes.</i>	<p>The project will involve the construction of footpaths and a boardwalk along the former tramway cutting.</p> <p>The proposed footpaths and boardwalk will be constructed using grated steel, concrete and timber. These materials and designs are in keeping with the existing character of the landscape. They have been designed to withstand the harsh marine and coastal conditions in the area and complement existing paths in Gap Park. Therefore, these works are in keeping with this guideline.</p>

8.3 Summary of heritage impacts

An assessment of the potential impact of the proposed works on the heritage significance of heritage listed items within the study area is included in Table 8-2.

Table 8-2. Summary of impacts to heritage items as a result of the project.

Item	Direct (physical)	Indirect (visual/vibration)	Archaeological	Approvals
Tramway Cutting I436	Minor to moderate	Moderate (temporary) Negligible (permanent)	Minor to moderate	N/A
Bicentennial Coastal Cliff Walk I343	Negligible	Minor (temporary) Negligible (permanent)	N/A	N/A
Dunbar Anchor I435	Nil	Nil	N/A	N/A
Watsons Bay Heritage Conservation Area C14	Negligible	Negligible	Negligible	N/A

8.4 Statement of Heritage Impact

The SoHI summarised in Table 8-3 has been developed from the Heritage Division's guidelines for *Statements of Heritage Impact* (2002).

Table 8-3. Statement of heritage impact for the project.

Heritage Consideration	Discussion
<p>What aspects of the project respect or enhance the heritage significance of the study area and nearby heritage items?</p>	<p>The project will respect and enhance the heritage significance of the study area and its associated heritage listed items by exposing the former alignment of the Watsons Bay tram alignment and cuttings. It will also invite visitors and residents to walk along the cutting through the installation of formalised paths and boardwalks. The addition of signage will encourage visitors to appreciate the natural and modified landscape and draw the public's attention to the history and significance of the area.</p> <p>Because the project will involve minimal changes to the existing landscape, it will respect the heritage significance of the study area and its natural landscape.</p>
<p>What aspects of the project could have a detrimental impact on the heritage significance of the study area and nearby heritage items?</p>	<p>Aspects of the project that may have a detrimental effect on the study area and its associated heritage items include the removal of existing vegetation and the addition of paths and boardwalks into an landscape. At present, the study area is characterised by an informal track. The addition of new infrastructure and removal of vegetation will modify views and vistas towards and within the existing tram alignment.</p> <p>The project may also have a detrimental impact on the heritage significance of the study area by replacing a relatively private and inconspicuous pathway with a formalised and easily recognisable track.</p>
<p>How is the impact of the new development on the heritage significance of the item or area to be minimised?</p>	<p>Impacts to the heritage significance of the study area and its associated heritage items will be minimised through the limited works that will be required to formalise the landscape. For example, the location of boardwalk posts will be designed to avoid existing tree roots and the existing ground surface will be undisturbed where possible.</p> <p>Fences, paths and boardwalks have all been designed to be sympathetic to the existing natural and modified landscape.</p>
<p>Why is the new development required to be adjacent to, or within, a heritage item?</p>	<p>The project is required to be next to a heritage listed item (Tramway Cutting) as the aim of the path upgrade is to formalise the original Watsons Bay tram alignment path which has fallen into disrepair over time.</p>

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Summary of conclusions

The study area is located within the curtilage of four heritage listed items:

- Tramway Cutting – Woollahra LEP 2014 no. I436
- Bicentennial Coastal Cliff Walk – Woollahra LEP 2014 no. I343
- Watsons Bay Heritage Conservation Area – Woollahra LEP 2014 no. C14
- Dunbar Anchor – Woollahra LEP 2014 no. I435

9.1.1 Potential impacts to heritage listed items

- Provided all mitigation measures are followed, the project would result in:
 - **Minor to moderate** direct (physical) and **negligible** (permanent) indirect (visual) impacts to the Woollahra LEP 2014 listed Tramway Cutting (I436)
 - **Negligible** direct (physical) and **negligible** (permanent) indirect (visual and vibration) impacts to the Woollahra LEP 2014 listed Bicentennial Coastal Cliff Walk (I343) and Watsons Bay Heritage Conservation Area (C14)
 - **Nil** direct and indirect impacts to the Woollahra LEP 2014 listed Dunbar Anchor (I435)

9.1.2 Potential impacts to archaeological remains

The study area has been assessed as having **low** potential to contain archaeological evidence of sleepers and rails and **high** potential to contain locally significant archaeological remains of boundary stones and retaining walls. Boundary stones and retaining walls were both observed during the site inspection immediately west of the Tramway Cutting and along the former tramway alignment to the north of the cutting. Additional evidence of the former tramline may survive in the study area.

The proposal has potential to impact these remains, however, provided all mitigation measures are followed, impacts to these remains would be minor.

9.2 Mitigation measures and recommendations

The following mitigation measures and recommendations would be enacted to minimise heritage impacts during the construction program:

- Although there is **low** potential for evidence of sleepers and rails and **high** potential for evidence of boundary stones and retaining walls to be impacted by the proposed works, these items do not meet the definition of a 'relic' under the *Heritage Act*. Therefore, no archaeological excavation permits are required for the project. However, in order to adequately manage impacts to locally significant remains associated with the former tramway, it is recommended that an Unexpected Finds Procedure be put in place for the duration of the works and all evidence of former boundary stones and retaining walls are retained, protected or reused for the project.
- The presence and historical context of known and potential archaeological remains associated with the former Watsons Bay Tram such as boundary stones, retaining walls, historic graffiti, sleepers and rails, would be included in any interpretative signage prepared for the project

- In order to manage potential future heritage impacts associated with the project, it is recommended advice is sought from a suitable heritage specialist if project redesign resulting in new ground disturbance, impacts to the natural landscape or impacts to fabric associated with the tramway cutting is proposed
- In order to reduce impacts to the heritage significance of the Woollahra LEP 2014 listed Tramway Cutting it is recommended that:
 - No direct impacts occur to the cutting, with the exception of vegetation removal
 - All evidence of chisel marks, drill marks and graffiti are retained
 - All sandstone boundary stones lining the existing tramway path are retained and/or reused where possible
 - All retaining walls along the tramway route are retained and protected during and after works
 - If any surviving infrastructure associated with the tramway is uncovered during the construction program, all works would cease and the Unexpected Finds Procedure for the project would be followed
- The design of footpaths, footbridges, retaining walls, fences and signage would aim to be sympathetic to the existing nature of the Woollahra LEP 2014 listed Tramway Cutting (I436), Bicentennial Coastal Cliff Walk (I343) and Watsons Bay Heritage Conservation Area (C14) and designed to minimise physical and visual impacts towards these items
- The project would be designed to satisfy and consider all Precinct Guidelines outlined in the Watsons Bay Heritage Conservation Area chapter of the Woollahra DCP 2015. This includes minimising vegetation removal, providing disability access and ensuring the proposed paths, boardwalk, fences, signage and sandstone log retaining walls do not obstruct exiting views within Gap Park and are sympathetic to the existing character of the area. This includes using construction materials, colours and forms that complement the landscape, climate and topography.
- Prior to the commencement of works a heritage induction would be prepared for all contractors to complete. The induction would address significant fabric associated with the former tramway cutting (shown in Figure 5-13 - Figure 5-28) or potential archaeological remains that may be uncovered during vegetation clearance or subsurface excavations. The induction would also specify that in the event significant fabric is impacted or archaeological remains are encountered, works must cease immediately, and the advice of a qualified archaeologist and/or heritage consultant must be sought
- Areas containing significant fabric (shown in Figure 5-13 - Figure 5-28) would be identified to all site workers, recorded on site plans and physically delineated with hi-visibility flagging and bollards where suitable. Any excavation work, storage of equipment, or vehicle parking would not occur within these zones
- An Unexpected Finds Procedure would be prepared and provided to all contractors for the duration of the project. This procedure would consist of the following controls should unexpected archaeological finds (such as sleepers, rails or structural fabric) be identified during works:
 - All work must immediately cease in the area

- The contractor supervisor must notify the environmental manager for the project, and a qualified archaeologist or heritage consultant must be notified
- Should the unexpected find constitute a significant archaeological 'relic', work cannot continue in the area of location of the find until a *S.146 Notification of the Discovery of a 'Relic'* has been submitted to the NSW Heritage, DPC. Further approvals may be required before works in this area can proceed.

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APPENDIX A

10.1 Heritage significance assessments

10.1.1 Significance assessment for Tramway Cutting (1436)

Criteria	Description
A – Historical Significance An item is important in the course or pattern of the local area's cultural or natural history.	The Tramway Cutting is historically significant at a local level due to its associations with the Watsons Bay tramline. The Watsons Bay tram was Australia's busiest single line tram route and transported thousands of tourists and residents to Watsons Bay daily. This influx of visitors played a significant role in the establishment of commercial businesses in the area and aesthetic character of Watsons Bay today.
B – Associative Significance An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.	The Tramway Cutting has strong associations with Sydney's tram network and ongoing residential and recreational development in Watsons Bay. It is therefore important to the cultural and natural heritage of Watsons Bay and meets the threshold for associative significance at a local level.
C – Aesthetic or Technical Significance An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.	The Tramway Cutting demonstrates important characteristics associated with landscape modifications essential for rail infrastructure in the early twentieth century. Although a high degree of technical achievement was not required to produce the cutting, it forms a key component of Gap Park's landscape today. Its setting within the gully further compliments the cutting and former tram route. Therefore, the item is considered to contain aesthetic significance at a local level.
D – Social Significance An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.	<p>The Tramway Cutting has strong associations with members of the local community today. These include former and present residents of Watsons Bay and Vaucluse, as well as individuals with an interest in Sydney's historical tram network. This is evidenced by various publications that include details about the line, Facebook groups, websites and films uploaded to YouTube which discuss the line and its route through Gap Park.</p> <p>The cutting is also likely to be significant to members of the Watsons Bay community who use Gap Park for recreational purposes and are aware of its history or appreciate its aesthetic values. The item meets the threshold for social significance at a local level.</p>
E – Research Potential An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.	<p>It is unlikely that the Tramway Cutting would yield information that will contribute to an understanding of the local area's cultural history. Information regarding the construction and use of Sydney's early twentieth century tram network is well understood and there is extensive documentary evidence available to answer questions regarding construction methods and modifications made to and associated with the tram corridor.</p> <p>Therefore, the tramway cutting does not meet the threshold for significance under this criterion.</p>

Criteria	Description
F – Rarity An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.	There is no evidence to suggest that the Tramway Cutting possesses uncommon, rare or endangered aspects of the local area's cultural history. Sydney's tram system was extensive, and evidence of former infrastructure would represent later and common methods of construction techniques and materials. Therefore, the tramway cutting does not meet the threshold for significance under this criterion.
G – Representativeness An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).	The Tramway Cutting demonstrates principle characteristics associated with the Sydney tram network's construction methods in the early twentieth century. It is well preserved and its original setting remains relatively intact and discernible. Therefore, the item is considered to contain representative significance at a local level.

10.1.2 Significance assessment for Bicentennial Coastal Cliff Walk (I343)³³

Bicentennial Coastal Cliff Walk (I343)

A – Historical Significance	<i>The site of this Walk has strong historical links to the earliest days of the European Settlement of Australia, and as such has high social and historic significance. The building remnants such as the bunkers and gun emplacements have high social and historic significance as part of the defence systems initiated in the late nineteenth century and at the beginning of the 2nd. World War. The natural vegetation and rock formations have high social and historical significance as part of the history of European development of the Colony of New South Wales.</i>
C - Aesthetic Significance	<i>The Signal Station and the Macquarie Lighthouse have aesthetic significance as part of the historic development of the area.</i>
D – Social Significance	<i>The site of this Walk has strong historical links to the earliest days of the European Settlement of Australia, and as such has high social and historic significance. The building remnants such as the bunkers and gun emplacements have high social and historic significance as part of the defence systems initiated in the late nineteenth century and at the beginning of the 2nd. World War. The natural vegetation and rock formations have high social and historical significance as part of the history of European development of the Colony of New South Wales.</i>

10.1.1 Significance assessment for Dunbar Anchor (I435)³⁴

Dunbar Anchor (I435)

A – Historical Significance	<i>The Dunbar Anchor, Gap Park Watsons Bay is significant as a remnant of the worst maritime disaster in the shipwreck of the Dunbar. The shipwreck, which occurred in 1857 caused the death of all but one of the 122 persons aboard and the anchor, which was recovered from the wreck in c1907 is set as a memorial to the death of these people. It is historically significant at a Regional level.</i>
------------------------------------	--

³³ This significance assessment has been adapted from information published in the Heritage NSW, SHI inventory listing for the Bicentennial Coastal Cliff Walk. Accessed online at 14/07/2020.at: <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>

³⁴ This significance assessment has been adapted from information published in the Heritage NSW, SHI inventory listing for the Dunbar Anchor. Accessed online at 14/07/2020.at: <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>

Dunbar Anchor (I435)

B – Associative Significance	<i>It also has significance for its association with many 'old colonists' who were amongst the 63 passengers to die. The shipwreck was responsible for the construction of lights on both North Head and Hornby Light on the tip of South Head and the memorial is significant as part of the historic remnants and structures which make up the features Gap Park and surrounds.</i>
D – Social Significance	The anchor and plaque have historic and social significance for their association with the worst sea disaster to occur in the vicinity of Sydney Harbour in the nineteenth century. It is socially significant at a Regional level.

10.1.1 Significance assessment for Watsons Bay Heritage Conservation Area (C14)³⁵

Watsons Bay Heritage Conservation Area (C14)

A – Historical Significance	<i>A true Gateway to Sydney: reflected in the area's modest start as a fishing village and maritime heritage. Role in navigation: pilot station, lighthouses, wharf, jetties and navigational markers. Role in defence: HMAS Watson, coastal defence structures and relics, Water Police, Constable's Cottage, gun emplacements, underwater mine control tunnels and winch house for anti-torpedo and midget submarine boom net at Green (Laings) Point. Evidence of early fishing village and more substantial houses built for master mariners, pilots, lighthouse keepers and city merchants. A later wave of Inter-War housing and associated public buildings and community infrastructure (development/subdivision). Importance as a historical tourist destination and recreation venue: ferry wharf, hotels, tea room, waterfront promenade, cliff walk, parks, The Gap, yacht club and game fishing club. Strong sense of history represented in historic road alignments, built character and monuments such as South Head Road obelisk, Philip Memorial. Site of an early, if not the first, marine biological research station in Australia which reflects the diversity of the aquatic environment. □ Educational role: Former School of Artillery, Submarine Warfare Systems Centre, former Watsons Bay State School (now scout hall), former site of Catholic Parish School and Convent School. Historic</i>
B – Associative Significance	<i>Reflected in Watsons Bay place names is the area's association with maritime figures and events such as Lt William Bradley, Robert Watson, Henry Gibson and historic shipwreck, Dunbar. The area has been the inspiration for books and other literature and is associated with authors Christina Stead and Zane Grey. Watsons Bay is associated with leading figures in Sydney's history. Examples include 'Clovelly' residents Hannibal Macarthur and Sir John Robertson, merchant pilot and lighthouse keeper Richard Siddons and Colonial Architect Mortimer Lewis</i>
C - Aesthetic Significance	<i>Scenic beauty. Dramatic and varied landscape: topography, exposed cliffs, protected bays; sheltered beaches, tranquil ambience; and pedestrian quality/amenity. Low scale-built form, subservient to landscape. Collection of small-scale cottages, including important weatherboard groupings. Views and vistas from elevated landform and parks; across Robertson Park from promenade; in from harbour; water glimpses from streets; and glimpses of landmarks/churches/significant trees. Number of landmark buildings, including Dunbar House and the St Peters Church. Backdrop of vegetation that dominates buildings. Rock shelves and beaches. Natural edges, including coastal vegetation in Sydney Harbour National Park, juxtaposed with built edges. Cultural plantings such as the Moreton Bay figs in Robertson Park as well as the coral trees in Cliff Street.</i>

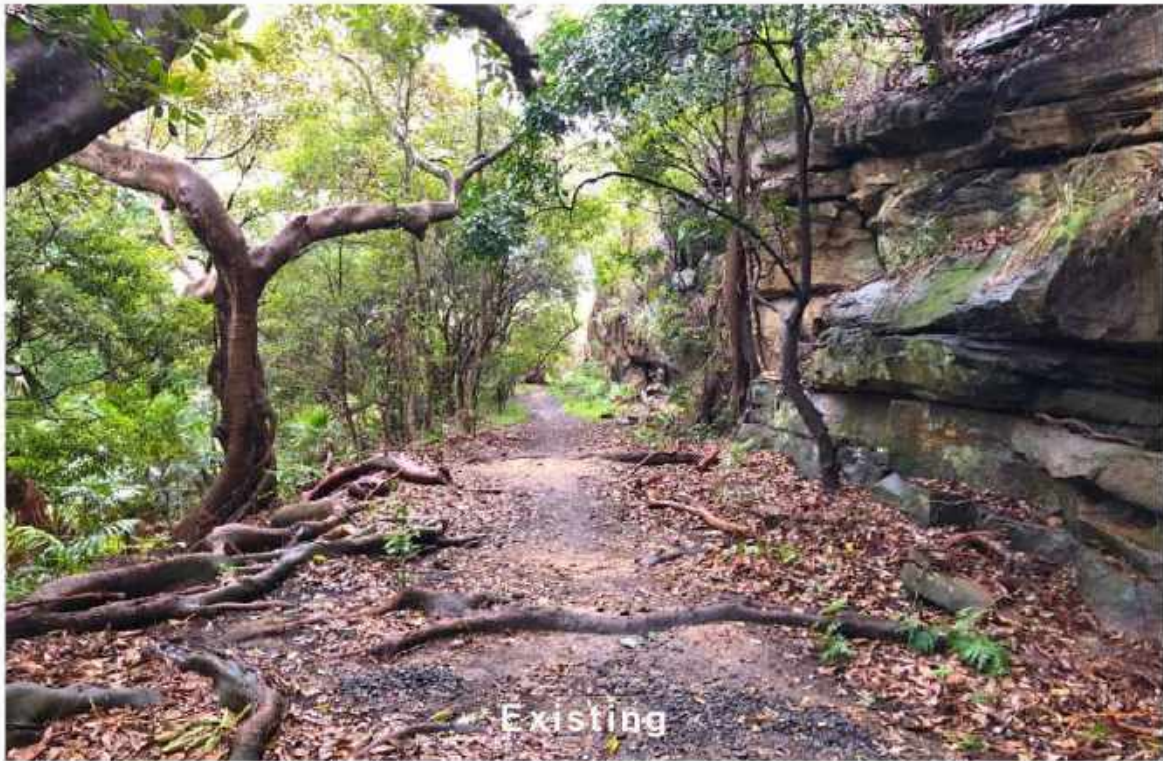
³⁵ This significance assessment has been adapted from information published in Woollahra Municipal Council, 2015. Part C: Heritage Conservation Areas - Watsons Bay Heritage Conservation Area

D – Social Significance *Scenic beauty and low-scale village character valued by the local community and visitors. Importance to Sydneysiders as a tourism and recreational destination. Attention as a place where Sydney residents bring visitors from interstate and overseas to enjoy its character, ambience and sense of history. Availability as a place to view Sydney Harbour, the Tasman Sea and the coast as well as enjoy maritime events such as yacht races, fireworks and arriving ships). Maritime sports clubs, including Vaucluse Yacht Club and Sydney Game Fishing Club. Gathering place for families and friends. Venues such as the Naval Chapel, St Peters, Star of the Sea, The Gap Bluff Centre and Dunbar House are within walking distance between venues (Naval Chapel, St Peters, Star of the Sea, The Gap Bluff Centre, Dunbar House).*

E – Research Potential *Role in defence: anti-torpedo and midget submarine boom net at Green (Laings) Point. Marine life: biological research, sea grasses. Potential to contain archaeological evidence of its early development. Gap Bluff, site of early radar development by navy.*

APPENDIX B

10.2 Proposed works



Habitat boardwalk (photomontage)

TRAMWAY PATH - GAP PARK, WATSONS BAY



Woollahra
Municipal
Council



Typical sections

TRAMWAY PATH - GAP PARK, WATSONS BAY



Woollahra
Municipal
Council



WOOLLAHRA MUNICIPAL COUNCIL

**GAP PARK - WATSONS BAY
PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
ROUTE WITH INFRASTRUCTURE IMPROVEMENTS**

**CIVIL INFRASTRUCTURE WORKS
FOOTPATH, STORMWATER AND LANDSCAPE WORKS
PROJECT No: 15320**

LOCALITY PLAN



DRAWING SCHEDULE | PRELIMINARY ISSUE

DWG NO.	ISSUE TITLE	REV.	DATE
15320-01	COVER SHEET	A	27/05/20
15320-02	CONNECTIONS PLAN AND DETAILS (D)	A	27/05/20
15320-03	CONNECTIONS PLAN AND DETAILS (E)	A	27/05/20
15320-04	GENERAL ARRANGEMENT PLAN	A	27/05/20
15320-05	LAYOUT PLAN AND DETAILS (D)	A	27/05/20
15320-06	LAYOUT PLAN AND DETAILS (E)	A	27/05/20
15320-07	SMYTHONGARIE INTERPRETIVE SIGNAGE PLAN	A	27/05/20

GENERAL NOTES

- BE ADVISED AND TO BE FULLY AWARE THAT ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
- ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
- USE OF THIS DRAWING IS LIMITED TO THE PROJECT AND SITE SPECIFIC PURPOSES ONLY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES WITHOUT THE WRITTEN PERMISSION OF THE CONSULTANT.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR THE WORK AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
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TREE PROTECTION NOTES

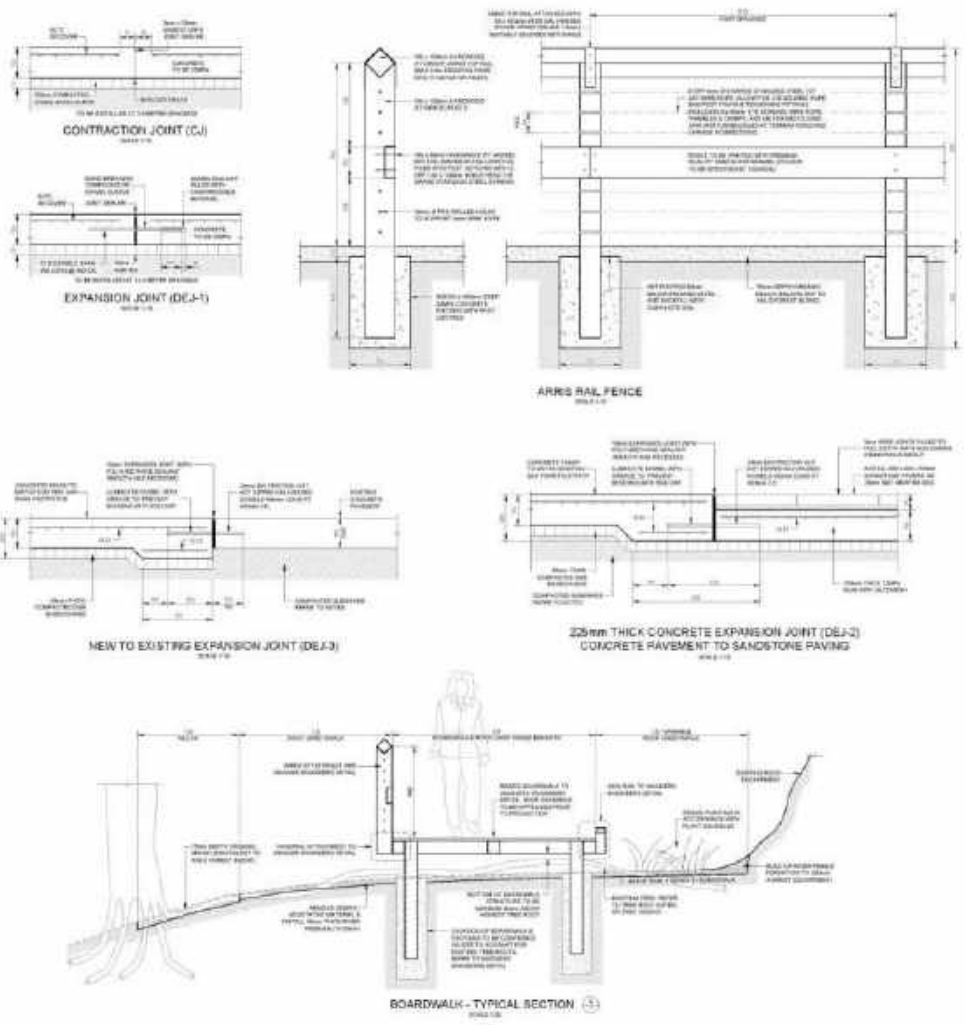
- ALL TREES TO BE PROTECTED SHALL BE IDENTIFIED AND MARKED WITH RED PAINT AND BOUND BY A RED POLYETHYLENE SHEET.
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EARTHWORK NOTES

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LANDSCAPE NOTES

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NO.	DATE	REVISION DETAILS
1	23.03.23	PRELIMINARY ISSUE FOR REVIEW OF DEVELOPMENT APPLICATION



ASPECT AUSTRALIA
 APPROVED CONTRACTOR
 LOCAL GOVERNMENT
 APPROVED CONTRACTOR

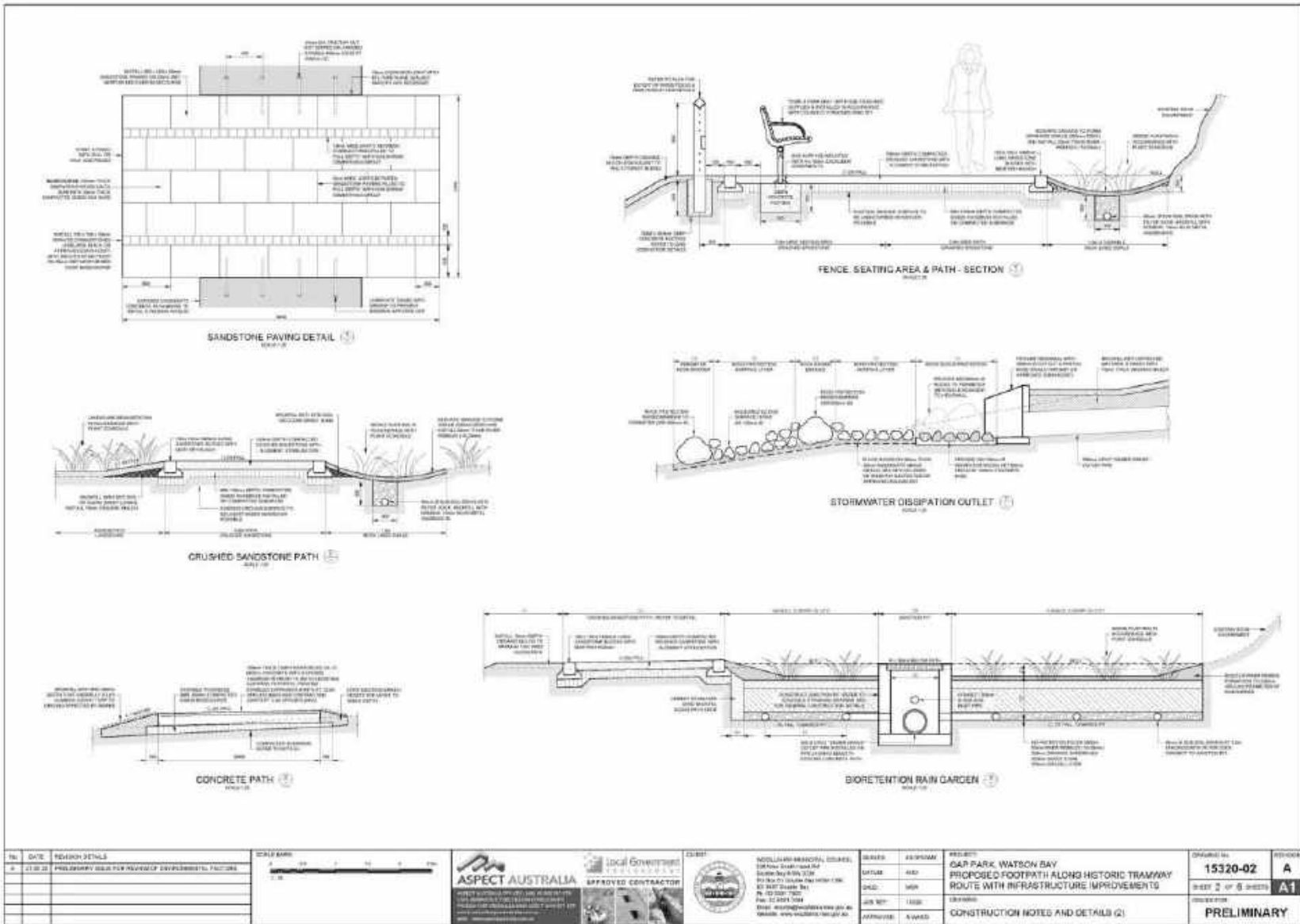


NOTES:
 1. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
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 3. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.

PROJECT:
 G&P PARK WATSON BAY
 PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
 ROUTE WITH INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION NOTES AND DETAILS (1)

DRAWING NO:	15320-01	REVISION:	A
SHEET:	1 OF 8 SHEETS	SCALE:	A1
DATE:	23.03.23	PROJECT:	G&P PARK WATSON BAY



NO.	DATE	REVISION DETAILS
1	23.02.23	PRELIMINARY ISSUE FOR REVIEW OF ENVIRONMENTAL FACTORS



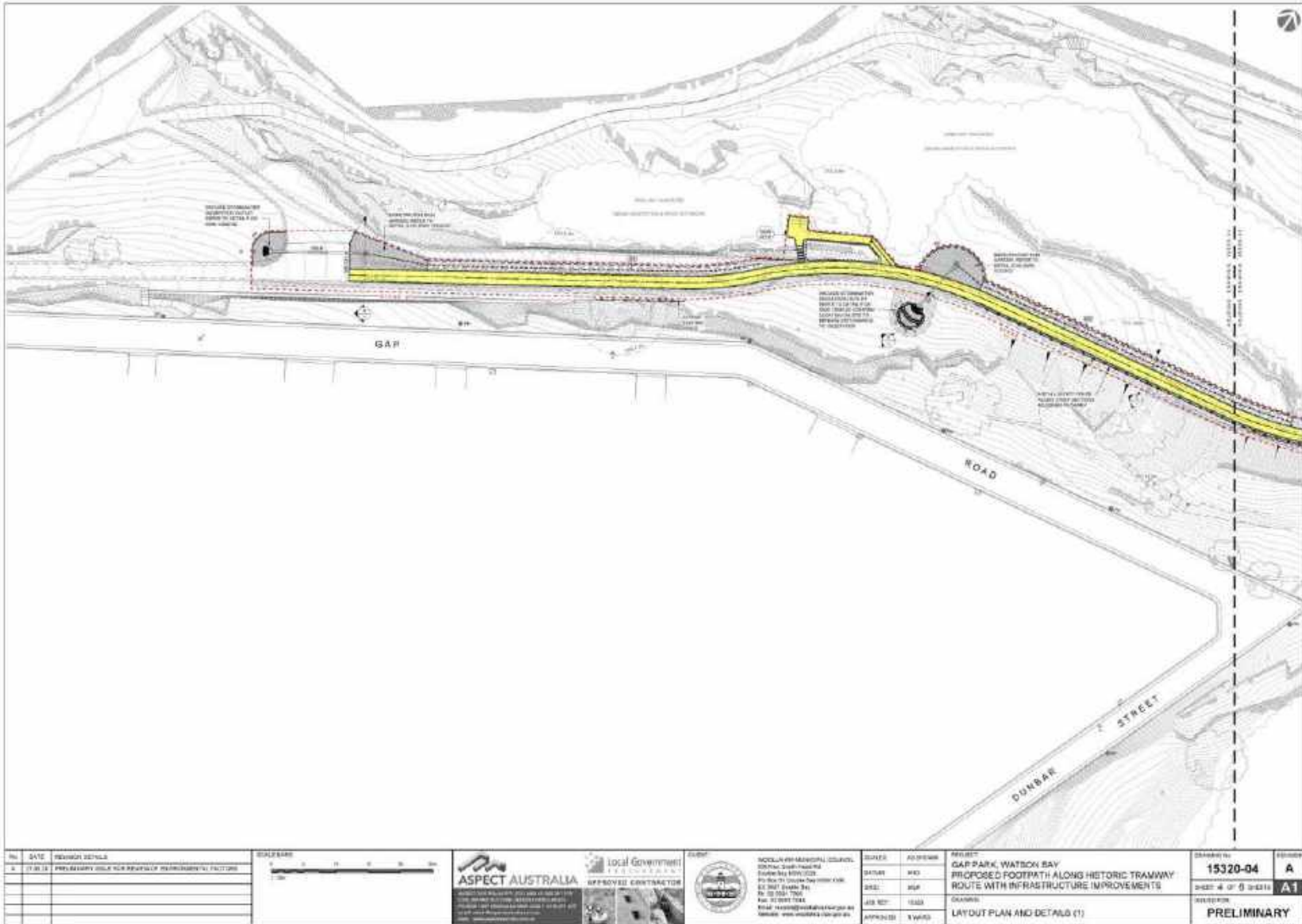
ASPECT AUSTRALIA
 APPROVED CONTRACTOR
 LOCAL GOVERNMENT
 APPROVED CONTRACTOR

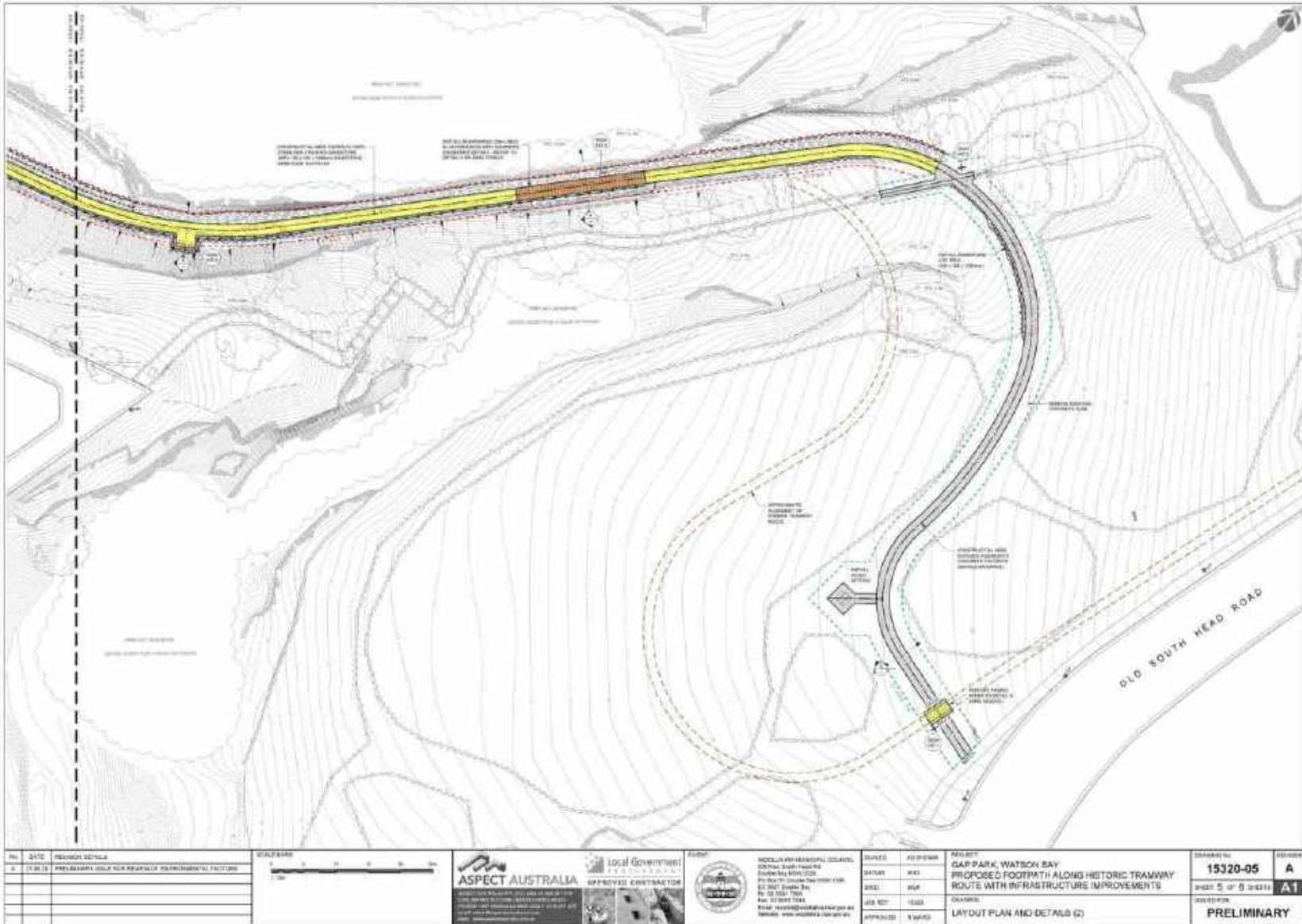
CONSULTANTS
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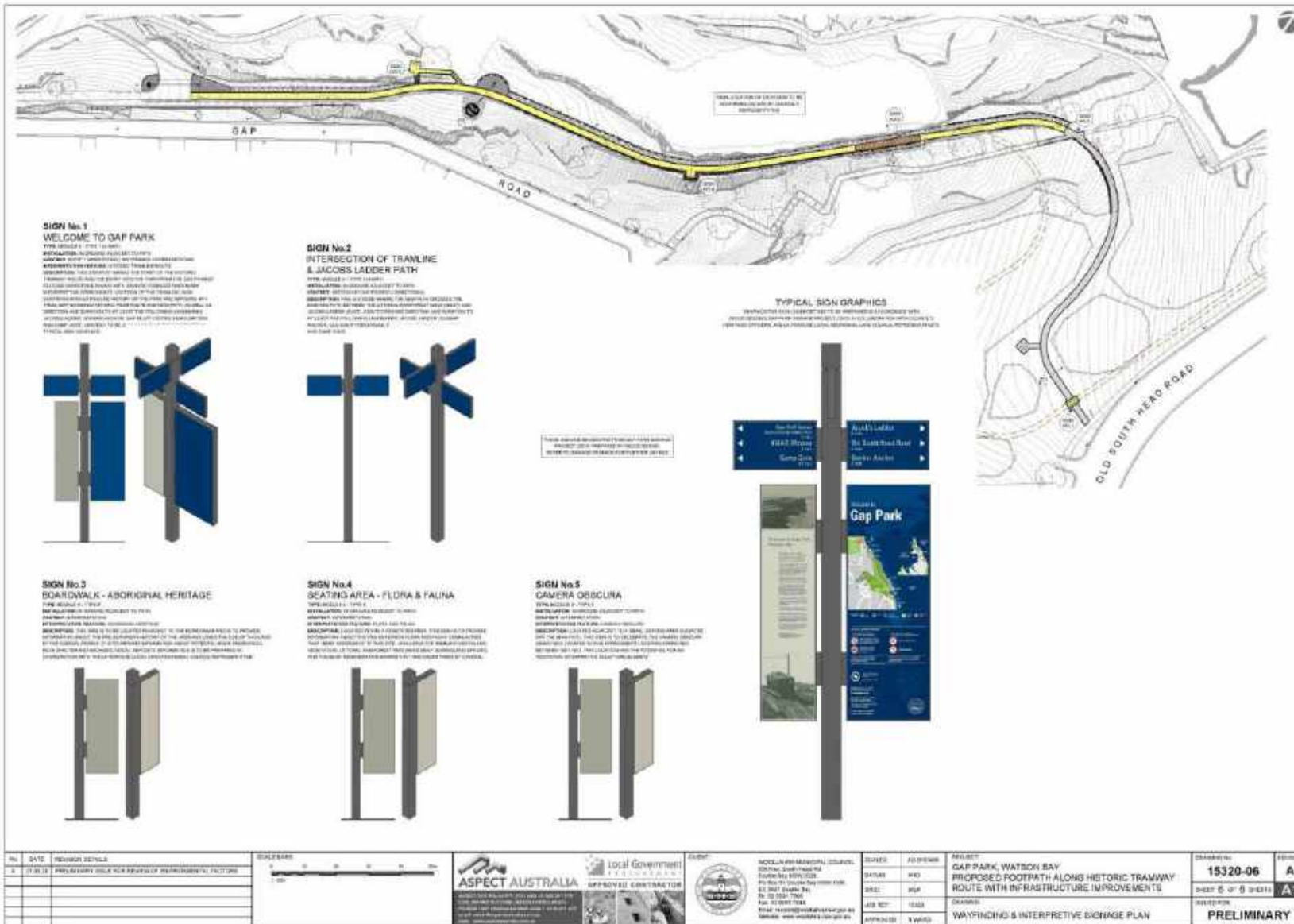
DESIGNER	ASPECT/A
DRAWN	AKP
CHECKED	MBP
DATE	1/2023
PROJECT NO.	155320-02

PROJECT: GAR PARK WATSON BAY PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY ROUTE WITH INFRASTRUCTURE IMPROVEMENTS
 SHEET 2 OF 8 SHEETS
 CONSTRUCTION NOTES AND DETAILS (2)

PROJECT NO.	155320-02
REVISION	A
DATE	1/2023
STATUS	PRELIMINARY







No.	DATE	REVISION DETAILS
1	17.03.15	PROVISIONAL ONLY FOR REVIEW OF INSTRUMENTATION FACTORS



ASPECT AUSTRALIA
 Local Government
TECHNOLOGY
 APPROVED CONTRACTOR

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 DUNDAS WA 6125
 PO Box 711 Dundas New South Wales
 61 08 9324 7100
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 Website: www.nickollariver.nsw.gov.au

OWNER	ADVISOR	PROJECT
SHIRAZ	MKS	GAP PARK, WATKINS BAY
DATE:	2014	PROPOSED FOOTPATH ALONG HISTORIC TRAMWAY
SCALE:	ASAP	ROUTE WITH INFRASTRUCTURE IMPROVEMENTS
JOB NO.:	1543	DRAWN:
APPROVED:	X 1/10/15	DESCRIPTION

DRAWING NO.	REVISION
15320-06	A
SHEET 6 OF 8 SHEETS	A1
DESCRIPTION	PRELIMINARY



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APPENDIX 4

Due Diligence Aboriginal Assessment

6 April 2020

Rod Ward
Project Manager – Capital Projects
Woollahra Municipal Council
536 New South Head Road
Double Bay NSW 2028

Dear Rod,

**RE : Due Diligence Aboriginal Heritage Assessment
Gap Park Tramway Path, Watsons Bay**

This Due Diligence Aboriginal Heritage Assessment report has been prepared by Coast History & Heritage [Coast] to inform the environmental assessment of the installation of proposed new tramway path within Gap Park at Watsons Bay. Its purpose is to determine whether any further Aboriginal heritage investigations may be needed in relation to the proposal. Woollahra Council requested the assessment because a previous 2007 Aboriginal heritage assessment identified areas of Aboriginal archaeological potential and recommended that and proposed impacts in these areas be subject to detailed Aboriginal heritage assessment.¹

Since the completion of the 2007 study there have been substantial changes to the laws and processes governing Aboriginal heritage assessment and management in NSW. The most appropriate type of assessment for the current proposal is a Due Diligence Aboriginal Heritage Assessment which will determine if any further and more detailed assessment is required and which meets the reporting requirements of the Department of Planning, Industry and Environment (DPIE).² This Due diligence Aboriginal heritage assessment report was written by Dr Paul Irish (Director) and Rebecca Bryant (Archaeologist).

1 What we are assessing

The property and proposal

The study area is within a public reserve known as Gap Park at Watsons Bay, which comprises ocean clifftop and adjacent lands at Watsons Bay, about seven kilometres to the east of the Sydney CBD and five kilometres north of Bondi Beach (see **Figure 1** and **Figure 2**). Gap Park is about 4.6 hectares in size, and is bounded on the east by a sheer cliff bordering the Pacific Ocean and on the west by Gap Road and Old South Head Road. The study area comprises a linear corridor within Gap Park (see **Figure 2** and **Figure 3**). It is within the Woollahra Local Government Area, in the Parish of Alexandria, County of Cumberland, within the boundaries of the La Perouse Local Aboriginal Land Council, and within the Department of Planning, Industry & Environment Metropolitan Sydney Region.

¹ AHMS Pty Ltd 2007. *Re: The Gap, Watsons Bay, NSW – Preliminary Aboriginal Archaeological Investigation* (Report to Thompson Berrill Landscape Design Pty Ltd).

² DECCW 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*

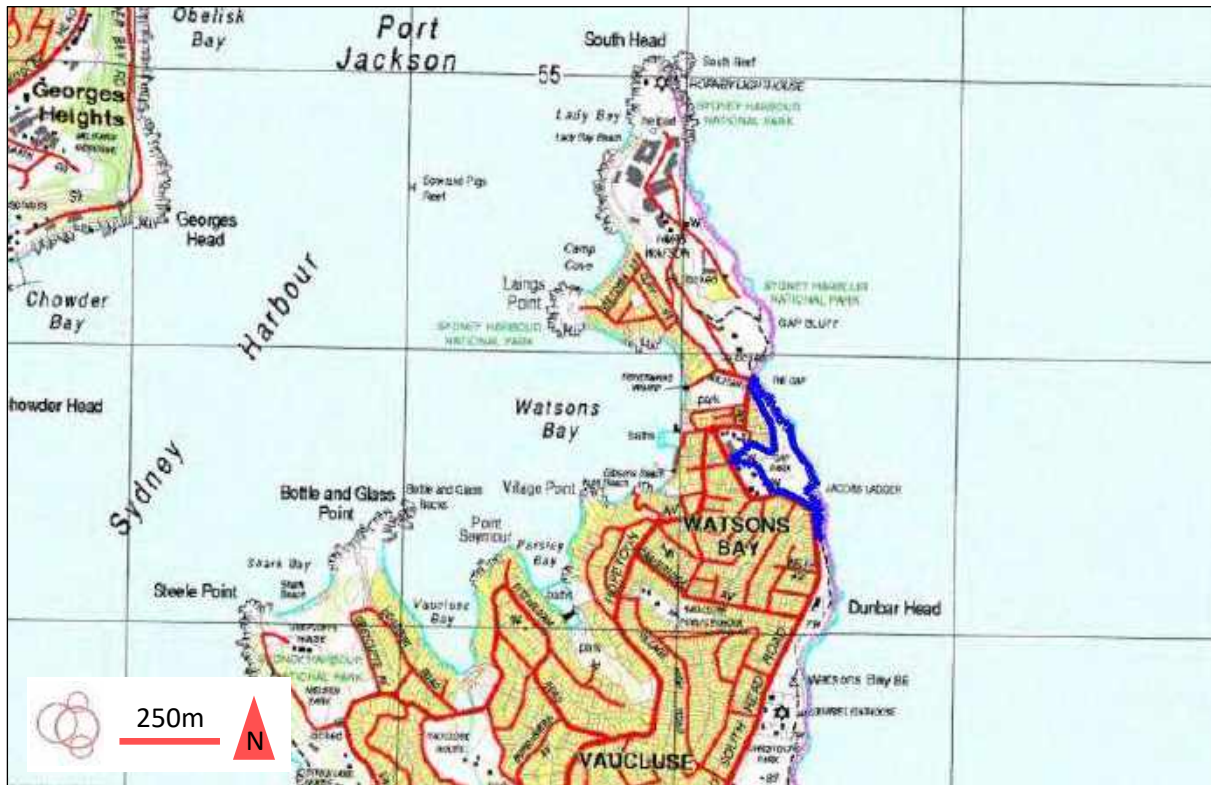


Figure 1. Gap Park (blue outline) and local topography.



Figure 2. The local context of Gap Park (red outline) and the proposed new walkway (yellow line).

The 385m long walkway will largely follow the alignment of a former tramline and areas filled in the 1970s in the southern end of the park, with several small sections outside these area (**Figure 3**). The path is proposed to be 2m in width and consist of crushed sandstone or granite with sandstone edging. It will largely rest on top of existing surfaces. Potential subsurface impacts include the following:

- localised impact of existing areas of path through construction of the new walkway;
- a small section where the path bends north at its south-eastern corner will involve removal of trees and construction of a new path;
- several small areas adjacent to the walkway for interpretive signs and seats, the largest of which is a separate platform towards the northern end of the walkway; and
- removal of some trees along the pathway alignment.

The new pathway alignment passes through areas identified in the 2007 Aboriginal heritage assessment as having the potential to contain either Aboriginal rockshelters, as discussed further below.

2 Who we have spoken with

Aboriginal community consultation

As part of this Due Diligence Aboriginal Heritage Assessment we spoke with the La Perouse Local Aboriginal Land Council (LPLALC) to provide an Aboriginal community perspective on the assessment, and to identify any particular Aboriginal cultural or historical associations that might need to be considered in relation to the proposal. Under the *Aboriginal Land Rights Act 1983* the LPLALC has a responsibility 'to promote the protection of Aboriginal culture and the heritage of Aboriginal persons'³ within its boundaries, which includes the study area. It also represents families with cultural and historical ties to coastal Sydney.

The project was discussed with the LPLALC, and Site Officer David Ingrey participated in the site inspection on Tuesday 21 January 2020. During and after the inspection, we discuss what we had seen and the possible implications of the proposed development for Aboriginal heritage. We then provided the LPLALC with a draft copy of this report and asked them to let us know of any Aboriginal cultural or historical connections or information that they thought should be considered in this assessment. We also asked them to consider its recommendations. Their comments are attached in **Appendix 1** and support the recommendations of this report.

³ *Aboriginal Land Rights Act 1983*, s52(1)(m).

3 Information we have considered

Environmental, archaeological and historical context

3.1 Environmental context

If we want to understand how Aboriginal people may have used the local area in the past, and what traces of that use might still physically remain on and below the ground surface, we need to understand the local environment and how it has changed over time.

The study area is situated above the southern side of Sydney Harbour, on a peninsula of land which extends north to the southern headland at the harbour's entrance. It sits immediately to the west and downslope of a large sandstone outcrop extending about 50m back from the ocean clifftop, before sloping gently to steeply downwards across the alignment of the majority of the walkway alignment. The southern/south-western portion of the walkway is situated on made ground consisting of fill deposited in the 1970s.⁴

Soils in the study area are formed from the weathering of the sandstone and are known as the Hawkesbury soil landscape.⁵ Such soils are highly susceptible to erosion, especially in sloping areas like the current study area. This is important in working out what physical traces may remain of the past Aboriginal use of the area. Flat exposed boulders or outcrops of sandstone can contain rock engravings or grooves from the sharpening of stone axes. In sloping areas like this, Aboriginal people most likely camped in sandstone overhangs, which may still contain evidence of their use both as artefacts buried within the sandy floors of these shelters, or as painted artworks on the rear wall or roof. The physical evidence within sandstone overhangs is often better protected over time due to its sheltered location, but rain erodes soil from shelter floors, and this will get washed downslope.

Fresh water may have been available in erosion channels during heavy rains in the western portion of Gap Park.⁶ The natural vegetation in the area is likely to have included heath, scrub and trees including bottle brushes, acacias and eucalypts, which would have provided habitat for animals, and useful plants.⁷ Fish and shellfish would have been available in Watsons Bay. As the number of Aboriginal sites in the area show, this was a resource-rich and well-used area for Aboriginal people.

Contrary to popular belief, Aboriginal people did not disappear from areas like Watsons Bay soon after Europeans arrived in Sydney in 1788. One of the authors of this report has researched these ongoing Aboriginal connections across coastal Sydney, and in particular to the Vaucluse and Watson's Bay areas.⁸ Aboriginal people continued to live within local properties such as the Vaucluse Estate through the nineteenth century, and were still visiting and camping on the estate in the early twentieth century. There were also large Aboriginal settlements at nearby Camp Cove in the 1830s

⁴ Aspect Australia 2019. *Design Summary Statement. Gap Park, Watsons Bay. Proposed New Pathway Along Historic Tramway Route* (Report to Woollahra Municipal Council): 2.

⁵ Chapman, G. & Murphy, C. 1989. *Soil Landscapes of the Sydney 1:100 000 Sheet* (Soil Conservation Service of NSW).

⁶ AHMS 2007:10.

⁷ Benson, D. 2011. 'Native plants of Sydney Harbour National Park: historical records and species lists, and their value for conservation monitoring', *Cunninghamia*12(1): 61-84.

⁸ Irish, P. & Ingre, M, 2011. *Aboriginal Connections to Vaucluse House and Elizabeth Bay House*. Research Report (Report to Historic Houses Trust of NSW); Irish, P. 2017. *Hidden In Plain View: The Aboriginal People of Coastal Sydney* (Sydney: New South Publishing).

and 1840s, and just a few hundred metres west of the study area at Watsons Bay (near the Greenwich Pier Hotel – now Watsons Bay Library) in the 1890s.⁹ By the end of the nineteenth century most Aboriginal people in coastal Sydney had come to live at the La Perouse Aboriginal fishing village on Botany Bay,¹⁰ though it is likely that they continued to visit the Watsons Bay area well into the twentieth century.

It is unlikely within the study area that traces of the historical Aboriginal use of the area will have survived. Instead, it is more likely that traces of pre-European Aboriginal use may be present. These will most likely be closely associated with outcropping sandstone, where it has survived historical impacts. Gap Park was made a public reserve in 1887 and in the northern end of the study area, a building was constructed to house a camera obscura around the turn of the century, which proved a popular tourist attraction until it was removed in 1914.¹¹ The majority of the study area was impacted by the construction of the tramline in 1909, which operated until 1960. A 1943 aerial photograph shows the park during the operation of the tramline and the extent of vegetation clearing evident at that time (**Figure 4**). Most of the current vegetation in the vicinity of the study area dates to after the closure of the tramline. After the tramline closed, the southern portion of Gap Park was landscaped and filled. These activities are likely to have impacted to some degree any archaeological evidence of past Aboriginal use that may have survived within the current study area.



Figure 4. Gap Park in 1943 showing the tramline.

⁹ Irish 2017: 32-33, 36-38, 126-7.

¹⁰ Irish 2017: Chapter 7.

¹¹ Woollahra Local History Centre 2005. *Gap Park, Watsons Bay*: 1.

3.2 Archaeological recordings and research

For this assessment we checked the main Aboriginal heritage database for New South Wales, the Department of Planning, Industry & Environment ('DPIE') Aboriginal Heritage Information Management System ('the AHIMS Register'). We searched the AHIMS Register over a 4km x 4km area centred on the study area (see **Appendix 2**).¹² While no Aboriginal sites are registered within the study area, there are 67 sites within the search area, which covers the Vaucluse/Watsons Bay peninsula.¹³ The distribution of sites largely reflects the focus of Aboriginal life around the coastline, and their occupation of rockshelter sites and creation of rock engravings where suitable sandstone outcrops (**Table 1**). Specifically, almost all of the registered sites are clustered around the shore of Watsons Bay/South Head and the Vaucluse Peninsula.

Table 1. Summary of AHIMS Register search results.

Site Type	Number	Percentage
Rock Engraving	22	33%
Rockshelter with Midden and/or Stone Artefacts	15	22.5%
Open Midden	12	18%
Rockshelter with Art	8	12%
Rockshelter with Potential Archaeological Deposit (PAD)	3	4%
Rockshelter with Art and Midden	1	1.5%
Historical Aboriginal Place	1	1.5%
Burial	1	1.5%
Restricted Site	1	1.5%
Open Midden and Engraving	1	1.5%
Axe Grinding Groove and Engraving	1	1.5%
Open area of Potential Archaeological Deposit (PAD)	1	1.5%
	67	100%

Only five of the 67 sites are located within 500m of the study area (**Figure 5**), however some of these have been incorrectly registered. Rock engraving sites #45-6-0711, #45-6-0712 and #45-6-0717 were recorded in the 1890s by surveyor W.D. Campbell as part of a study he conducted on rock engravings in the Sydney area.¹⁴ The original detailed plans and sketches made by Campbell are held in the NSW State Library and contain more specific information about site locations.¹⁵ Between these maps and Campbell's published descriptions, it is clear that these three engravings are located several hundred metres further west, in association with areas behind Gibson Beach (where

¹² AHIMS Search ID 480587, on 30/1/2020 within co-ordinates E339370-E343370, N6251600-N6255600 (GDA94 / MGA Zone 56).

¹³ The search contained 68 sites, but #45-6-2971 is listed as a duplicate of #45-6-1518.

¹⁴ Campbell, W.D. 1899. *Aboriginal Carvings of Port Jackson and Broken Bay* (Memoirs of the Geological Survey of NSW).

¹⁵ Thank you to Dr Shane Ingrey of the La Perouse Aboriginal community for making us aware of these records.

rockshelter #45-6-2084) is located. The final of the five registered sites shown in **Figure 5** is an engraving located within the national park, about 200m to the north of northern end of the current study area.



Figure 5. Registered Aboriginal sites close to the study area with approximate corrected locations indicated with red arrows.

Gap Park was the subject of a preliminary Aboriginal archaeological study in 2007 to inform future planning for the park.¹⁶ The study included background archaeological and historical research and a brief field inspection. The inspection did not locate any Aboriginal sites, but observations from this and background materials, allowed the identification of areas of potential archaeological sensitivity, as shown in **Figure 6**. These included an area associated with outcropping sandstone along the ocean coast which could potentially contain rock engravings or axe grinding grooves on their exposed upper surface. The other is an area west of this and covering some of the current study area, in which there is considered to be some potential for rockshelters with archaeological evidence to be present.

¹⁶ AHMS 2007.



Figure 6. Approximate extent of areas of potential archaeological sensitivity as determined in the AHMS 2007 study, in relation to the current study area (blue line).

As well as the AHIMS Register, we also searched some other heritage registers to see if any other sites or places of Aboriginal cultural or historical significance had been recorded. The NSW State Heritage Inventory (incorporating the NSW State Heritage Register) was searched on 30/1/2020 for the suburb of Watsons Bay. No items in within close proximity to the study area are listed for their Aboriginal heritage values. The tramway cutting is seemingly listed on the local heritage inventory (item #436) as part of a combined entry with the Dunbar shipwreck anchor (at the north end of Gap Park), but the listing only mentioned the anchor.

Although no sites are listed on the heritage registers, this doesn't mean that there are no Aboriginal sites or areas of Aboriginal heritage significance within the study area. The AHIMS Register records only where things have been found, usually because of Aboriginal heritage assessments undertaken

for previous development proposals. So, if nothing specific has been proposed over the last 30-40 years in or near the study area, it is likely that this area has never been subject to detailed archaeological survey (beyond the brief inspection in 2007). Based on what we know from the surrounding area, the most likely traces of past Aboriginal life which might survive within the property will be associated with outcropping sandstone, either as rock engravings or as sandstone overhangs with traces of past Aboriginal use (such as stone artefacts or art).

4 What we have observed

Site inspection

On Tuesday 21 February 2020, the study area was inspected by Paul Irish (Coast) and David Ingrey (La Perouse LALC), accompanied by Rod Ward (Woollahra Municipal Council). Although the study area has been considerably disturbed through historical activities, the observations we made, together with the other information about the area reviewed above, were enough to determine the likelihood for Aboriginal archaeological remains to be present within the study area. Observations were made along the route from south to north.

The southern 70m of the walk from Old South Head Road traverses an area filled in the 1970s and currently cleared and grassed (**Figure 7**). The next 60-70m includes grassed areas and existing tracks but includes a roughly 10m section through regrowth bush at its northern end, before meeting the original alignment of the tramway (**Figure 8**). This is also where the path meets the western edge of a sandstone outcrop, at the base of which is a low (ca. 0.5m high) overhang. Immediately to the north of this is a small shelter about 1m high and 1.5m deep and 3m long, with a brick pylon at its entrance, probably erected in association with the adjacent tramline (**Figure 9**). The floor deposit is partly disturbed loose grey sand. No artefacts, faunal remains or charcoal were observed, nor was any art observed on the roof or rear wall. The overhang is small and unlikely to have been used by Aboriginal people in the past, however this cannot be definitely discounted.

The next 100m of the route follows an existing path along the original tramline alignment. The path is strewn in sections with broken bitumen from a previous attempt to create a hard surface along the track. Some of this is loose and could easily be removed without damaging the soil below, but other pieces appear stuck to the underlying deposit. The tramline appears to have been constructed by cutting through the steeply sloping edge of the sandstone outcrop to the east and using the spoil to level a 2-3m wide corridor above the continuing moderate to steep slope below (west) (**Figure 10**). Mature fig trees are growing in this slope immediately west of the path.

The northern 150m of the proposed walkway follows the existing track immediately east of a steep slope down to houses on Gap Road, while outcropping sandstone is lower and generally 10-20m further east of the path. About 50m from the end is a small clearing to the east of the track which is proposed to be used as an interpretation/seating area discussing the camera obscura tourist attraction that was located there in the 1890s and 1900s. This has a low sandstone outcrop to the east, which was inspected for engravings (**Figure 12**). Sandstone is also immediately below the clearing and is exposed in several places, suggesting the soil in this area is shallow and that the sandstone outcrop below may once have been exposed (**Figure 12**). The area contains expansive views west along the harbour and it is possible that rock engravings are present on the sandstone under the clearing.



Figure 7. View west over filled area at the southern end of the proposed path.



Figure 8. View south from low rockshelter to area where new path required to be cut through existing bush.



Figure 9. View north-east into small rockshelter with supporting brick pylon at its entrance (10cm gradations on scale).



Figure 10. View south along former tramline showing cut sandstone outcrop to the east (left) , levelled tramline corridor and continuing slope to the west (right).



Figure 11. Sandstone outcrop on eastern edge of interpretation/seating area and ground below which consists of shallow vegetation and soil over sandstone.



Figure 12. Sandstone outcrop immediately below the surface in the area proposed for interpretation and seating.

5 Our conclusions

In this assessment we have considered the environmental setting and historical context of the study area, what is currently known about past Aboriginal use of the surrounding area, and have conducted a field inspection. Based on all of these things, we have been able to determine whether the current proposal is likely to impact any items of Aboriginal heritage, and whether it may have other impacts to Aboriginal heritage values. In doing so, we have also addressed the Due Diligence assessment requirements of the DPIE.¹⁷

There are no previously recorded Aboriginal archaeological sites within the study area, and none were identified as a result of the research or site inspection for the current assessment. No mature trees were present within or in close proximity to the study area which may contain scars of Aboriginal cultural origin. One possible rockshelter and one possible engraving site were noted and the implications of these are discussed below.

The majority of the proposed walkway route follows an existing path along the former tramway route and is likely to be highly disturbed. The remainder at the southern end is largely situated in an area historically filled after the closure of the tramline. No excavation is proposed for the installation of the pathway. Materials are to be deposited on the existing surface, including concrete footings for the proposed boardwalk section of the walk (see **Figure 3**). As such, it is considered highly unlikely that the construction of the path will directly impact any known or potential Aboriginal archaeological remains. There is some potential for indirect impacts to the low rockshelter at the south-eastern end of the study area from dust or entry to the shelter, and this has been addressed in the management strategy below. Similarly, the possible presence of engravings in the interpretation/seating area towards the northern end of the path will require consideration.

Providing that the management strategy outlined below (and with reference to **Figure 13**) is implemented, there are considered to be no further archaeological requirements in relation to the current proposal, and no further archaeological investigations are considered warranted prior to the commencement of construction.

It is recommended that the following be implemented during design and construction:

- Where possible avoid, or else minimise any subsurface impacts, for example by ensuring any footings are broad and either sit on the current surface or involve very shallow excavation; by grinding the stumps of any trees to be removed rather than removing them, and by leaving embedded bitumen fragments in the existing path.
- The location of the small shelter as shown in **Figure 13** should be protected through the erection of temporary protective fencing during construction to prevent people or dust from entering the shelter.
- The design of the interpretation/seating area shown in **Figure 13** should seek to minimise subsurface impacts, as there is potential for rock engravings to be located immediately under

¹⁷ As outlined in the DECCW 2010 *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*.

the current ground surface. This could be achieved by raking over the existing top matter and building on top of this, rather than excavating for footings.

- Where subsurface impacts cannot be avoided, they should be subject to archaeological monitoring to ensure that any Aboriginal archaeological remains that may be exposed can be appropriately managed.
- With the implementation of these measures, it is considered unlikely that Aboriginal archaeological remains will be impacted by the proposal, but it should be noted that any unexpected Aboriginal objects remain protected by the provisions of the *National Parks and Wildlife Act 1974*. Our recommendations therefore include measures to ensure that any such objects are identified and appropriately managed during the course of the works.

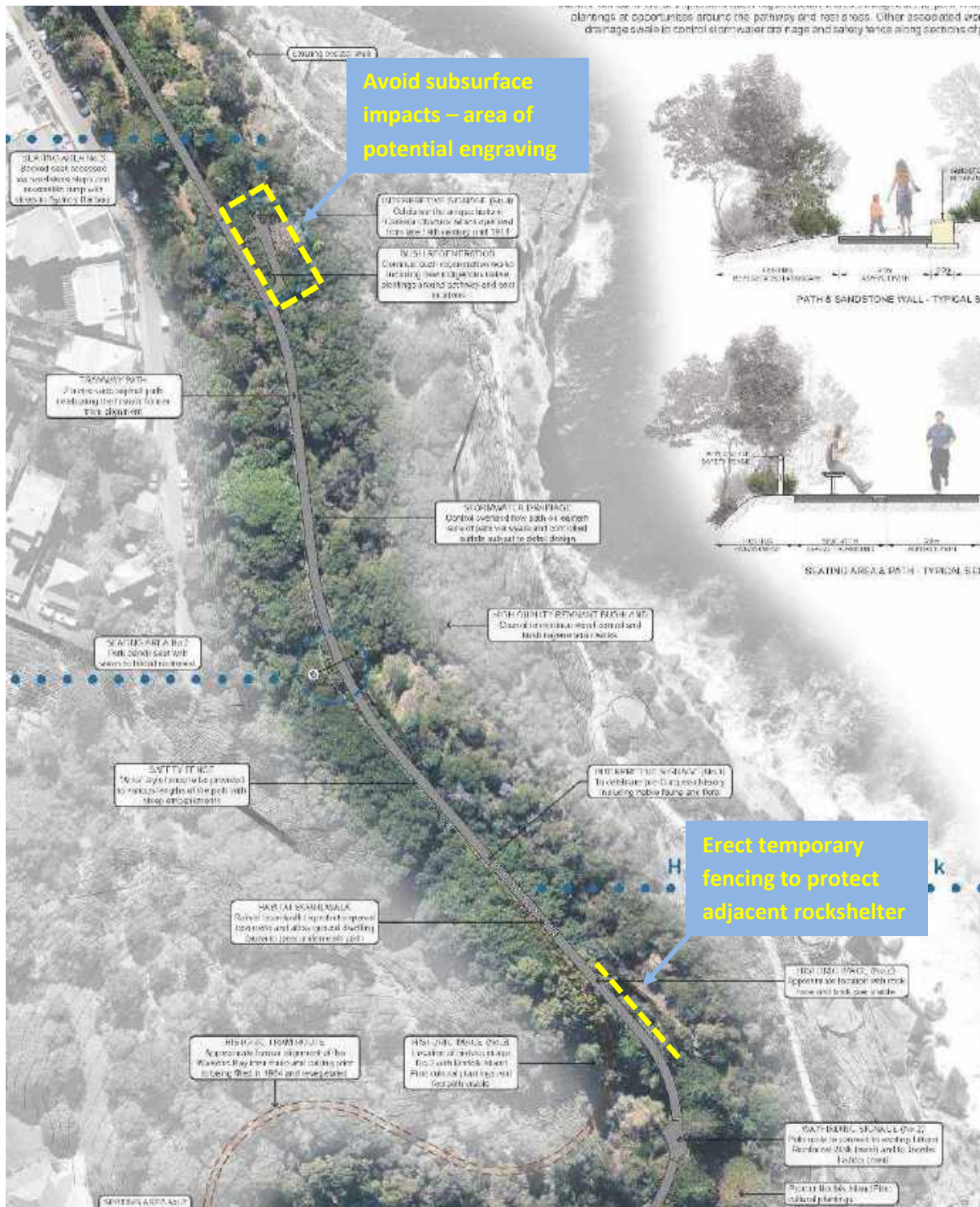


Figure 13. Extract of tramway path plan showing areas requiring management during construction.

6 Our recommendations

We have based our recommendations on:

- the research and conclusions of our assessment as outlined in this report;
- the views expressed during our consultation with the La Perouse Local Aboriginal Land Council, including during the field inspection and as outlined in their report attached in **Appendix 1**;
- the legal protections provided to Aboriginal 'objects' and 'places' under s.86 of the *National Parks and Wildlife Act 1974*;
- current policy and regulatory requirements relating to the assessment of Aboriginal heritage, and in particular the DECCW (2010) *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*;

We recommend that:

1. No further Aboriginal heritage investigations are required in relation to planning of the current tramway path proposal within Gap Park, Watsons Bay.
2. Subsurface impacts should be avoided or minimised in accordance with the strategy outlined in this report.
3. Any proposed subsurface impacts should be subject to archaeological monitoring by a representative of the La Perouse Local Aboriginal Land Council (and a suitably qualified archaeologist if required).
4. The location of the small shelter as shown in **Figure 13** should be protected through the erection of temporary protective fencing during construction to prevent people or dust from entering the shelter.
5. The design of the interpretation/seating area shown in **Figure 13** should seek to minimise subsurface impacts, as there is potential for rock engravings to be located immediately under the current ground surface. This could be achieved by raking over the existing top matter and building on top of this, rather than excavating for footings.
6. If any Aboriginal objects or bones suspected of being human are identified during construction, site workers must:
 - a. Not further disturb or move these remains.
 - b. Immediately cease all work at the location.
 - c. In the case of suspected human remains only, notify NSW Police. In the case of Aboriginal objects, notify The Department of Planning, Industry & Environment (DPIE) Environment Line on 131 555 as soon as practicable and provide available details of the objects or remains and their location. If not already present, the La Perouse Local

Aboriginal Land Council should also be notified to assist in the determination of appropriate management for the objects or remains.

- d. Not recommence any work at the location unless authorised in writing by the Department of Planning, Industry & Environment.
7. One copy of this report should be forwarded to the La Perouse Local Aboriginal Land Council.
8. A copy of this report should be forwarded to:

The Registrar
Aboriginal Heritage Information Management System
NSW Department of Planning, Industry & Environment
Locked Bag 5020
Parramatta NSW 2220

If you require any further information, please do not hesitate to contact us.

Yours sincerely,



Dr Paul Irish

Director

E: paul@coasthistory.com.au

W: www.coasthistory.com.au

Appendix 1

Correspondence with the La Perouse LALC

6 April 2020

Dr Paul Irish
P.O. Box A74
ARNCLIFFE NSW 2205

Email: admin@coasthistory.com.au

Dear Dr Irish

Due Diligence Aboriginal Heritage Assessment - Tramway Path, Gap Park, Watsons Bay NSW

I write in regards to the above mentioned assessment dated February 2020. I have reviewed the draft report and provide the following information and recommendations on behalf of the La Perouse Local Aboriginal Land Council (**La Perouse LALC**).

As you may be aware, the La Perouse LALC was established and operates within the provisions of the *Aboriginal Land Rights Act 1983* (NSW) (**ALRA**) and currently represents a membership of approximately 470 Aboriginal persons who reside within or have an association with the La Perouse LALC area. In accordance with Section 52 of the ALRA the La Perouse LALC has a statutory function to "take action to protect the culture and heritage of Aboriginal persons in the Council's area".

The Watsons Bay area holds heritage significance to the La Perouse Aboriginal community due to the occupation of the area by our direct ancestors until 1883. The La Perouse LALC can provide further significance information on request.

Following the review of the plan, I can provide the following recommendations:

Recommendation 1:

The La Perouse LALC agrees with recommendations set out on pages 16 and 17 of the report.

Recommendation 2:

The La Perouse LALC advises that if any Aboriginal objects (such as human or animal bone, shell material or stone artifacts) are impacted or unearthed during any activity on the property, the activity must cease and the NSW Office of Environment and Heritage and La Perouse LALC be contacted immediately.

If you would like to discuss this issue further please don't hesitate to contact the La Perouse LALC office on 9311 4282 during business hours.

Yours sincerely,



Chris Ingrey
Chief Executive Officer

LA PEROUSE



LOCAL ABORIGINAL LAND COUNCIL

PO Box 365, Matraville
New South Wales, 2036

T: (02) 9311 4282

E: admin@laperouse.org.au

ABN: 89 136 607 167

Appendix 2

AHIMS Register Search

[The search is of a 4km x 4km area centred on the study area. To help protect the listed Aboriginal sites we have provided only the basic search results without site coordinates. If the extensive search results showing site names and coordinates are required, please contact Coast History & Heritage].

Coast History & Heritage

Date: 30 January 2020

PO BOX A74 7 Mitchell Street
Arncliffe New South Wales 2205

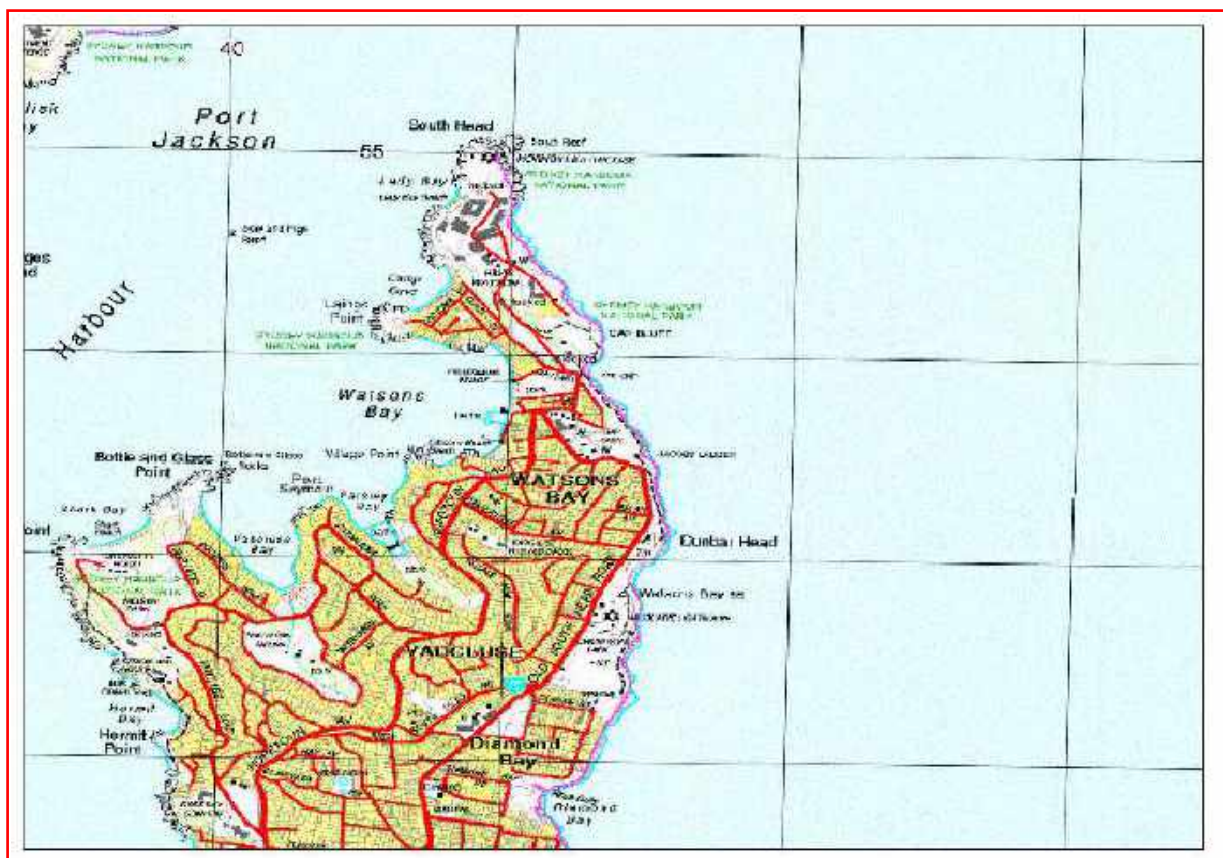
Attention: Rebecca Bryant

Email: rebecca@coasthistory.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 339370 - 343370, Northings : 6251600 - 6255600 with a Buffer of 0 meters. Additional Info : Due diligence, conducted by Rebecca Bryant on 30 January 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

68	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(http://www.nsw.gov.au/gazette\)](http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

APPENDIX 5

Vegetation Survey

Vegetation Survey of species structure and composition in Gap Park Tramway Watsons Bay Sydney for ecological restoration and future vegetation monitoring.

Rudi Adlmayer
Bushcare Liaison Officer
Woollahra Council

Abstract

Monitoring of an area within Gap Park is to be undertaken to aid in its restoration and protection due to a two by 150 metre wide path going alongside remnant vegetation. This paper reports on what vegetation is there currently.

A 80m line transect with five 5m X 5m quadrats, an 80m overstorey transect, 10 random stick points, and 5 random .25m² quadrats were used to assess species composition, frequency and ground cover. Key results showed number of species, number of introduced species, and the major threatened species. The area was found to be resilient with numerous remnant vegetation, and a very low proportion of environmental weeds.

Issues raised were implications for restoration at this site that will have meet the guidelines in the Plan of Management Gap Park, the Woollahra Biodiversity Conservation Strategy 2015-2025, Biodiversity Conservation Act and any REFs and to connect with Parsley Bay, Johnsons Lookout, Vaucluse House and Sydney Harbour National Park bushland areas.

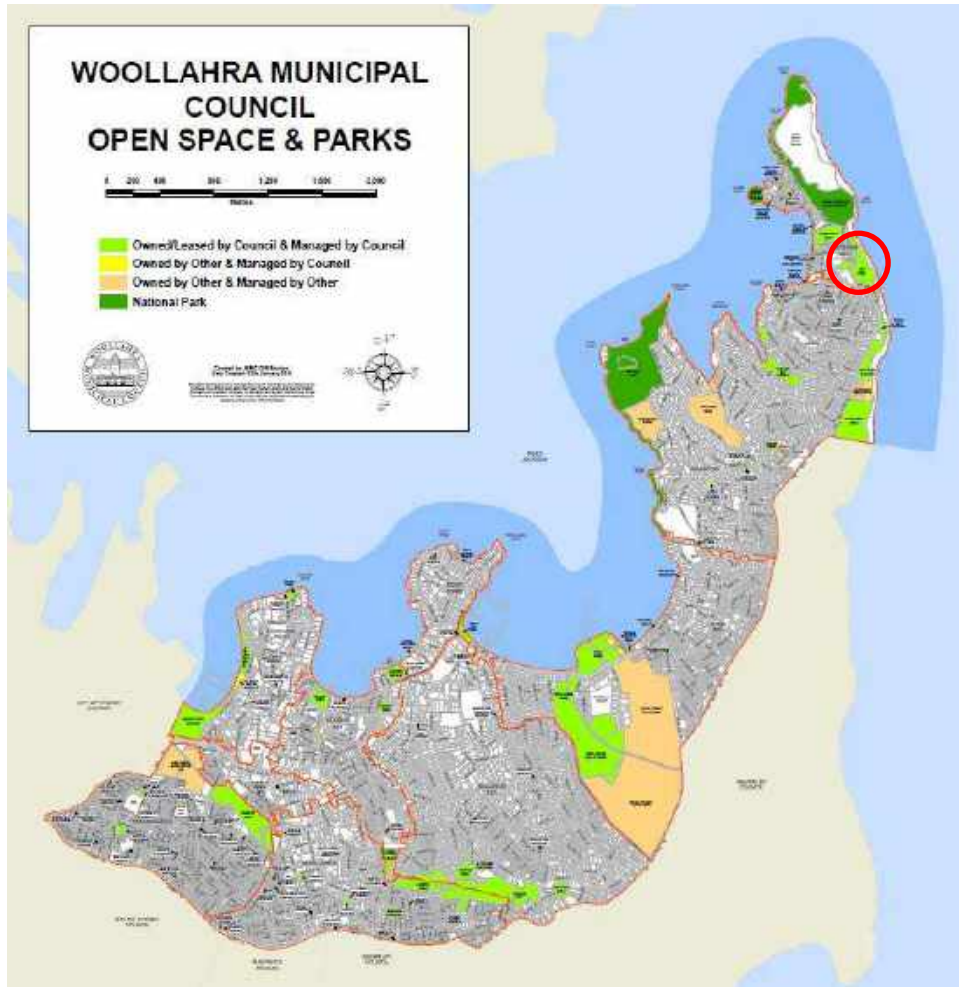
Introduction

The study site for this report is in Gap Park Watsons Bay NSW. See Map 1 and 2. The area is 500m² and runs above and parallel with the length of Gap Rd in the suburb of Watsons Bay.

It is on a disturbed edge of remnant vegetation that was once part of the Watsons Bay Tramline in Gap Park.

It is part of Gap Park that is 4ha in size. The Park is recognised as a major wildlife corridor and a site that contains The Sunshine Wattle *Acacia terminalis subsp terminalis* (Biodiversity Conservation Plan). The park is currently managed by Woollahra Council.

This report documents the structure and species of the vegetation of the selected site to enable the old tramway to be developed into a public pathway with interpretation, to protect existing remnant vegetation and to assist with ecological restoration including translocation at the site and provide Woollahra Council with ongoing scientific data of what vegetation exists on the site.



Map 1 Gap Park regional context



Map 2 Gap Park local context.



Photos 1, 2, 3, and 4 Clockwise Sunshine Wattle (*Acacia terminalis* subsp. *terminalis*), Woolly xanthosia, (*Xanthosia pilosa*), Sweet sarsaparilla (*Smilax glycyphylla*), and Orchid species Gap Park.

Aims and Objectives

The aims of this report are to achieve what vegetation structure and species exist on this site to allow the site to be ecologically restored and be monitored in the future by Council staff and volunteers.

The objectives of the reports are to measure and assess the vegetation of the site using sound scientific vegetation assessment methods including:

Five 5m X 5m quadrats with the following surveys within each 5m X 5m quadrat:

- Parallel line search for species composition
- 5 0.25m² quadrats (groundcover)
- 10 stick point surveys
- Species Cover Transect down middle of site N-S 80 m.
- 80m Native overstorey assessment

Methods and Materials

To gain an assessment of the area a series of rapid assessments were conducted on the 3rd June 2020 by Council staff.

A random walk was conducted to assess work health and safety (WHS) issues and obtain an overview of the vegetation. The site appeared to consist of herbaceous indigenous groundcovers interspaced with some remnant trees.

For monitoring purposes, 5 5m X 5m permanent quadrats were placed in representative areas and a single 80m long transect placed down the centre of the site (Bayley & Brouwer 2004).

Species composition within the quadrats were recorded using a parallel line search, the use 0.25m² quadrats within each 5m X 5 m quadrats and a species %cover using 10 stick points within each 5m x 5m quadrat..

Foliage cover of plants aligned with trees in the upper canopy were estimated at 5 points along the transect using a vertical 10mm diameter pvc pipe (Bayley & Brouwer 2004).

Equipment and Tools

Equipment required for the survey included a Council utility, stakes, 100m tapes, stick points, tape, GPS, compass, camera, 0.25 m² quadrats, first aid kit, sunscreen, PVC pipes, clip board and survey sheets as per ACT region Vegwatch manual.

Work Place Health and Safety (WHS)

EVENT STEPS	POTENTIAL HAZARDS	HAZARD CONTROL MEASURES	RATING
1 Transport of equipment	Injuries from loading & unloading equipment (manual handling)	<ul style="list-style-type: none"> One Council vehicle used to transport Council equipment and food One Council officer available to carry equipment to vehicle, with assistance of one or two volunteers Two to three people to lift any one item and load the equipment onto the vehicle (depending on weight) Council Equipment includes: 	High
	Injuries from car accident (vehicles, mobile equipment, propelled objects)	The Council driver must have a current C class drivers licence First aid kit in vehicle	Extreme
2 Setting up the site	Injuries from lifting equipment (manual handling)	Council vehicle to park as close as possible to set up area to unload equipment Three staff to unload equipment	High
	Injuries from falls (falls of people)	Check site prior to operation for <ul style="list-style-type: none"> - Glass - Holes - Water leak – slippery areas - Have vehicle on site at all times in case of emergency Induct volunteers before work begins regarding safe work practices.	Medium
	Dehydration	Water available First aid officer on site	Low
	Sun Stroke (radiation hazards)	Sunscreen provided; Volunteers are requested to always wear a hat, no hat no work. <u>Site has plenty of shade.</u>	Low
	Food poisoning	Wash hands prior to handling food Make sure food and drink is cooked and fresh. First aid officer on site Have vehicle on site at all times in case of emergency.	High
3 Operation	Sun burn	Make sure participants wear sun cream and hats. - Request in media advertisements.	High
	Dehydration	Participants are asked to bring water.	High
	Insect bites	Insect repellent provided	Low
4 Packing up	Injuries from lifting equipment (manual handling)	Two people to lift Council equipment or what person is comfortable with. Packing up commences at 3pm. Most of the public have left by this time	High
	Equipment damage	Ensure all equipment is handled with care when it is being moved Ensure equipment is secured into the vehicle to reduce equipment moving	Low
	Injuries to public from left over equipment (falls of people)	Ensure area is checked for left over equipment Have vehicle on site at all times in case of emergency.	High

Results

Five 5m X 5m Quadrats

1. Stick point, 0.25m² quadrats and step points

10 random stick points, 5 x 0.25m² quadrats, and 10 point stick surveys were done within each quadrat the results showed that there was high species frequency of the Native groundcover *Microlaena stipoides*.

2. Quadrat #1, #2, #3, #4 and #5

A parallel line search was completed in each quadrat in a zig zag pattern to assess plant species. There were trees over 2 metres the highest being a Port Jackson Fig (*Ficus rubiginosa*), a Cheese tree (*Glochidion ferdinandi*) and numerous Tick Bush (*Kunzea ambigua*). The vegetation is a scrubland to heathland on Sydney sandstone. (Fairley, A, 2010; NSW DPI 2014). See figure 1.

The 5 quadrats overall had 24 indigenous species and 13 introduced species. The highest percentage canopy cover was *Kunzea abigua* and Coastal Ti Tree (*Leptospermum laevigatum*). The highest percentage groundcover was *Microlaena stipoides*. See figure 2.

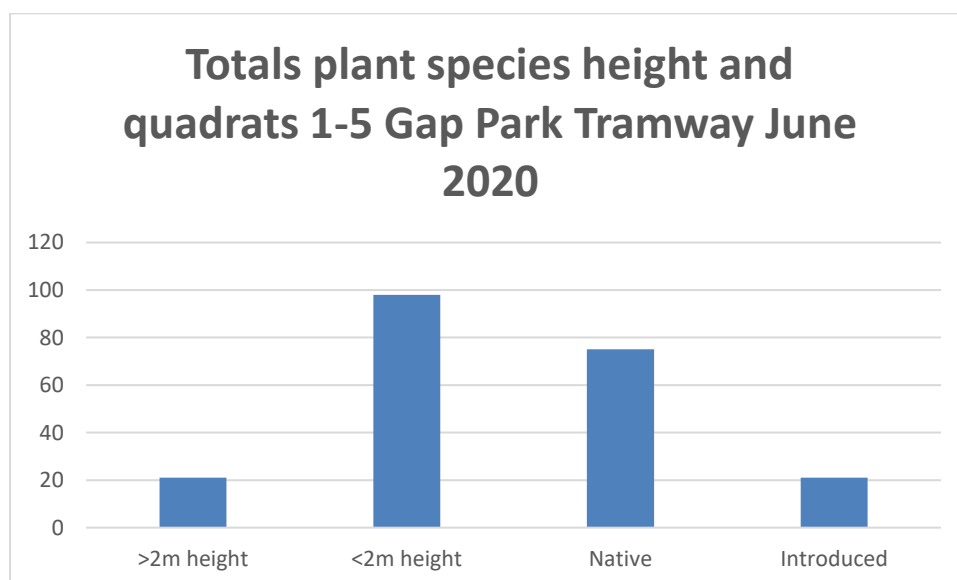


Figure 1 Total number of plant height species in all 5 quadrats Gap Park Tramway site

Plant Species List Gap Park Tramway				
	Common Name	Scientific	Native	Introduced
1	Tick Bush	<i>Kunzea ambigua</i>	1	
2	Naïve Fuchsia	<i>Epacris longifolia</i>	1	
3	Weeping Grass	<i>Microlaena stipoides</i>	1	
4	Panic Grass	<i>Entolasia stricta</i>	1	
5	Wooly Xanthosia	<i>Xanthosia pilosa</i>	1	
6	Cheese Tree	<i>Glochidion ferdinandi.</i>	1	
7	Tuckerroo	<i>Cupianopsis anacardioides</i>	1	
8	Mat Rush	<i>Lomandra longifolia</i>	1	1
9	Eragrostis	<i>Eragrostis pilosa</i>		1
10	Port Jackson Fig	<i>Ficus rubinosa</i>	1	
11	Centella	<i>Centella asiatica</i>	1	
12	Sydney Golden Wattle	<i>Acacia longifolia</i>	1	
13	Sunshine Wattle	<i>Acaia terminalis sub sp terminalis</i>	1	
14	False Sasparella	<i>Smilax glycyphylla</i>	1	
15	Common Couch	<i>Cynoden dactylon</i>		1
16	QLD Blue Couch	<i>Digitaria didactyla</i>		1
17	Breynia	<i>Beynia oblongifolia</i>	1	
18	Dianella	<i>Dianella caerulea</i>	1	
19	Parramatta Grass	<i>Sporobolus africanus</i>		1
20	Birdnest fern	<i>Asplenium australasicum</i>	1	
21	Velt Grass	<i>Eharta erecta</i>		1
22	Balckberry nightshade	<i>Solanum nigrum</i>		1
23	Commalina	<i>Commalina cyanea</i>	1	
24	Chinese Hackberry	<i>Celtis sinensis</i>		1
25	Cotula	<i>Cotula australis</i>	1	
26	Ti Tree	<i>Leptospermum laevigatum</i>	1	
27	Yellow Myrtle	<i>Acacia suaveolens</i>	1	
28	Four-leaf Allseed	<i>Polycarpon tetraphyllum</i>		1
29	Apple dumplings	<i>Billardiera scandens</i>	1	
30	Mickey Mouse Plant	<i>Ochna serrulata</i>		1
31	Canphor Laurel	<i>Cinnamomum camphora</i>		1
32	Pomax	<i>Pomax umbellata</i>	1	
33	Hop Bush	<i>Dodonaea triquetra</i>	1	
34	Norfolk Island hibiscus	<i>Lagunaria patersoni</i>		1
35	Brown pine	<i>Podocarpus elatus</i>	1	1
			24	13

Figure 2 Species list in all 5 quadrats Gap Park Tramway site

3 Overstorey cover percentage

The over story average percentage over 5 points was 60%. Using guide depicting percentage cover of canopy. (NSW DPI 2014 pg. 27)

The overstorey consisted mainly of Tick Bush (*Kunzea ambigua*) and Coastal Ti Tree (*Leptospermum laevigatum*). See figure 3.

The groundcover consisted of 100% native groundcovers with the most dominate being Micolaena (*Micolaena stipoides*) and Bordered Panic Grass (*Entolasia stricta*). However Velt Grass (*Erharta erecta*) and Parramatta Grass (*Sporobolus africanus*) was numerous at the site as well

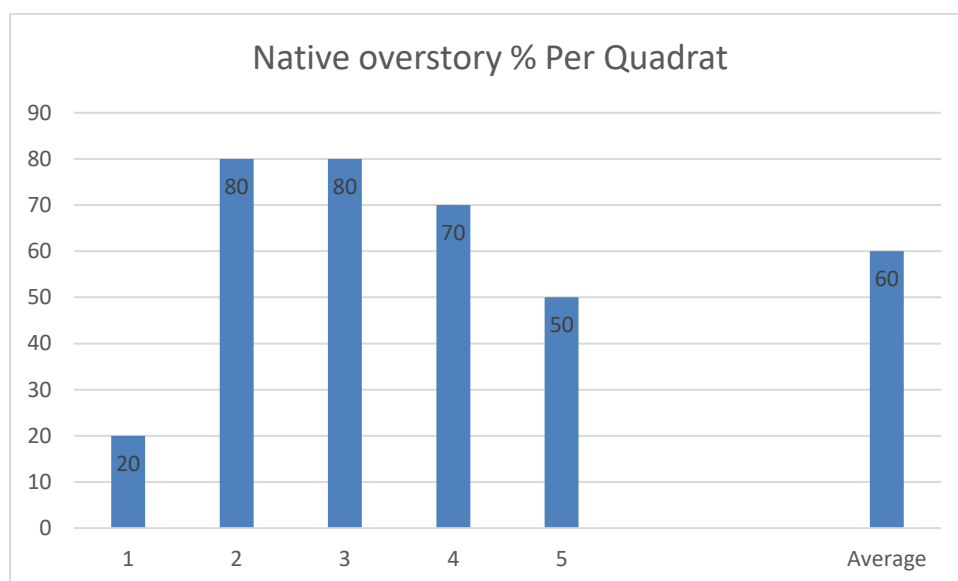


Figure 3 Native overstorey % Per Quadrat in all 5 quadrats Gap Park Tramway site

Discussion and Results

Results found in the 5 x 5 surveys that the site assessed is degraded along its edge from impacts from urbanisation including cut and fill and ballast from a tramway. However most of the site consists of remnant plants.

Any path laid should be done along existed degraded area and not near remnant plants.

From the vegetation survey completed at this site it can be concluded that this site can protect previous ecologically restored vegetation due to the large amount of remnant species on the site and the small amounts of introduced species.

Construction around threatened species and rarer plants such as orchids, sarsaparilla and xanthosia should be avoided.

Removal of larger senescent species should be removed to allow solar access and flame weeding to assist with natural regeneration.

Site should be monitored in the exact same way again within 3 years after restoration has begun to document differences and improvements to the site.

References

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Appendices

Appendice 1

Raw Data from 3 quadrats for stick points, step points and .25m2 quadrats

Comparisons	Stick Points	Step Points	.25m2 quadrats	
Quadrat 1				
"Species"	Stick point (% cover)	Step point (% cover)	.25m2 quadrats (% cover)	.25m2 quadrats (% frequency)
Trad	80	73	82	90
Balloon	47	27	3	30
Madeira	23	7	1.5	20
Nasturtium	57	17	32	70
Buffalo	30	7	2	20
Kykuyu	7		3	30
Quadrat 2				
"Species"	Stick point (% cover)	Step point (% cover)	.25m2 quadrats (% cover)	.25m2 quadrats (% frequency)
Trad	67	73	84	90
Balloon	13	23	13	30
Madeira	13	7	3	20
Nasturtium	73	37	39	70
Buffalo	10	13	5	20
Kykuyu	23	17	1	30
Quadrat 3				
"Species"	Stick point (% cover)	Step point (% cover)	.25m2 quadrats (% cover)	.25m2 quadrats (% frequency)
Trad	30	30	38	90
Balloon	20	17	3	30
Madeira	13	7	1	20
Nasturtium	33	23	21	70
Buffalo	7	3	0	20
Kykuyu	23	40	4	30

Appendice 2

Plant Species List

Plant Species List Cooper Park Vegetation Assessment in 3 10m x 10m Quadrats				
	Common Name	Scientific	Native	Introduced
1	Bangalay	<i>Eucalyptus botryoides</i>	✓	
2	Lemon Scented Gum	<i>E. citriodora</i>	✓	
3	Black Butt	<i>E. pilularis</i>	✓	
4	Tea Tree	<i>Leptospermum flavescens</i>		✓
5	Kauri Tree	<i>Agathis robusta</i>		✓
6	Madeira Vine	<i>Anredera cordifolia</i>		✓
7	Coastal banksia	<i>Banksia integrifolia</i>	✓	
8	Trad	<i>Tradescantia fluminensis</i>		✓
9	Nasturtium	<i>Tropaeolum majus</i>		✓
10	Balloon vine	<i>Cardiospermum grandiflorum</i>		✓
11	Buffalo grass	<i>Stenotaphrum secundatum</i>		✓
12	Kykuyu grass	<i>Pennisetum clandestinum</i>		✓
13	Sweet pittosporum	<i>Pittosporum undulatum</i>	✓	
14	Chinese Hackberry	<i>Celtis sinensis</i>		✓
15	Illawarra Flame Tree	<i>Brachychiton acerfolium</i>		✓
16	Large Privet	<i>Ligustrum lucidum</i>		✓
17	Australian Teak	<i>Flindersia australis</i>		✓
18	Lilly	<i>Lily species</i>		✓
19	Camphor Laural	<i>Cinnamomum camphora</i>		✓
20	Bannana	<i>Musa sp</i>		✓

Appendice 4

Native overstorey %

Native Overstorey 20m Transect											
Date: 12/4/16			Location: Cooper Park Kendall St. 20m Transect 33.8878505° S Lat 151.255963°E Lon								
Surveyor: Rudi Adlmayer			Recorder : Rudi Adlmayer								
	1	2	3	4	5	6	7	8	9	10	Average
Native overstorey %	40	50	40	30	40	50	40	40	40	40	41

