Prepared for
City of Sydney
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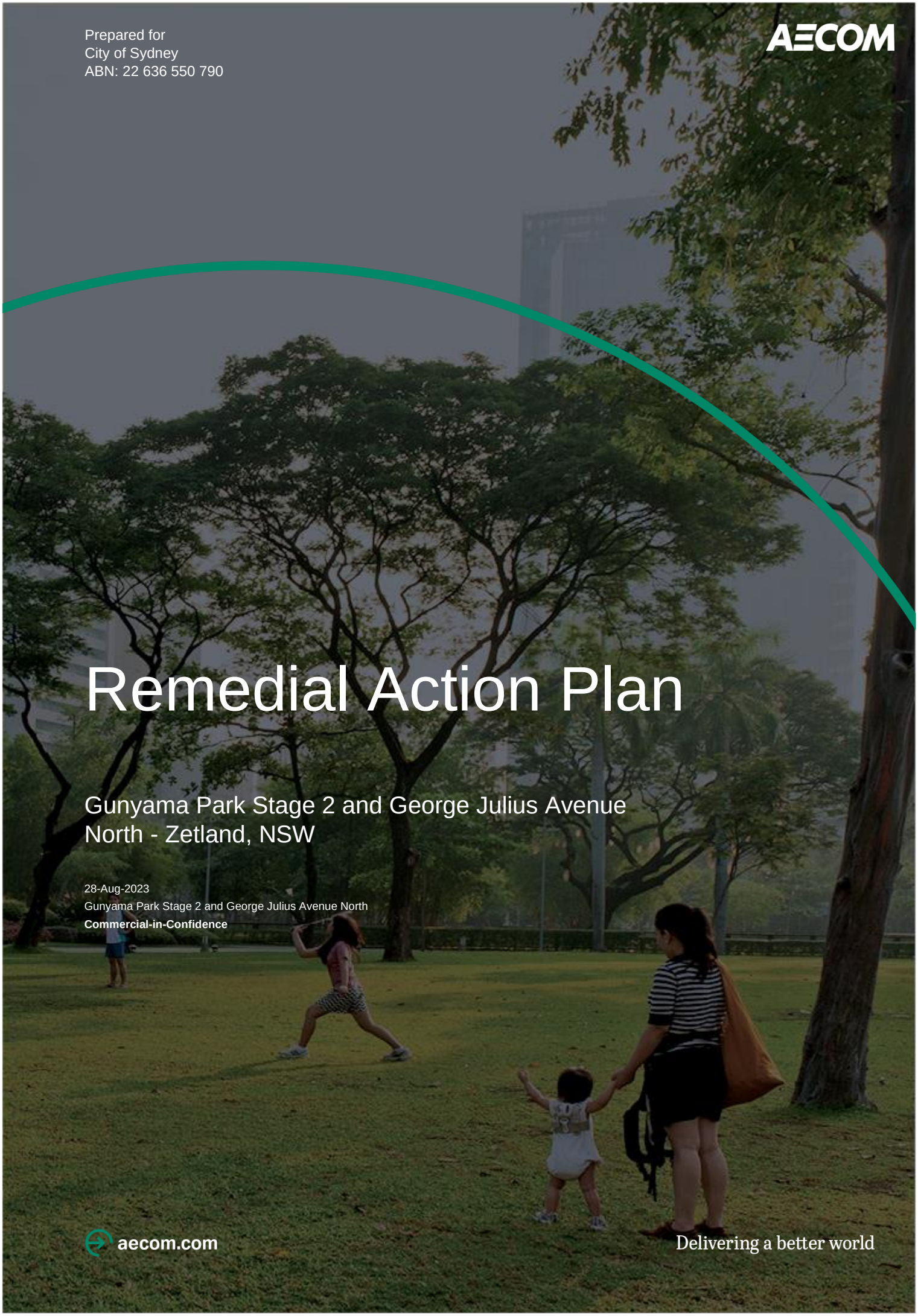

Remedial Action Plan

Gunyama Park Stage 2 and George Julius Avenue North - Zetland, NSW

28-Aug-2023
Gunyama Park Stage 2 and George Julius Avenue North
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Client: City of Sydney

ABN: 22 636 550 790

Prepared by

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28-Aug-2023

Job No.: 60477507

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document	Remedial Action Plan
Ref	60477507
Date	28-Aug-2023
Originator	Jack Rawsthorne
Checker/s	Kate McGrath
Verifier/s	Jonathan Ho

Revision History

Rev	Revision Date	Details	Approved	
			Name/Position	Signature
0	23-Jun-2023	Final	Dane Mallinson Principal Environmental Scientist	
1	21-Aug-2023	Final	Dane Mallinson Principal Environmental Scientist	
2	28-Aug-2023	Final	Dane Mallinson Principal Environmental Scientist	

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1.0 Introduction

1.1 Background

AECOM Australia Pty Ltd (AECOM) was commissioned by the City of Sydney (CoS) to prepare this Remedial Action Plan (RAP) for the proposed extension of Gunyama Park and adjacent George Julius Avenue North roadway to be developed as part of Stage 2 construction of the Gunyama Park Aquatic and Recreation Centre (GPARC) located at 17 Zetland Avenue, Zetland, NSW. The GPARC development forms part of the larger Green Square Precinct transformation project. The un-remediated development area of Stage 2 is referred to as 'the Site' with boundaries defined in **Figures 1 and 2, Appendix A**.

The Site is divided into two lots, with the southern portion owned by the City of Sydney and the northern portion owned by Lincon Development Pty Ltd (Lincon Development) (the land will be transferred to the CoS in late 2023). The Stage 2 construction works follow on from the Stage 1 development works which comprised construction of the Aquatic Centre (refer to **Figure 2** in **Appendix A**).

Remediation and validation works were completed within all of the Stage 1 development area and some parts of Stage 2, including a small portion of the Site where underground storage tanks (USTs) were removed. The remediated areas within Stage 2 are shown on **Figure 2** in **Appendix A**. Construction works within this part of the Stage 2 area will be undertaken in accordance with the applicable procedures in the *Gunyama Park Aquatic and Recreation Centre Long Term Environmental Management Plan* (JBS&G, 2020a) and is not subject to this RAP.

The Stage 2 development works will include the following:

- Landscaped setback areas across the Site. Gunyama Park will include a small amenities building, pathways, trees, growing media, lawn, playground, a skate bowl and some services (refer to **Appendix B**). The final details are subject to further design and development and;
- Construction of George Julius Avenue North on the eastern portion of the Site.

Based on the above development works, the proposed land uses at the Site will comprise:

- Recreational open space
- Commercial/industrial (construction of George Julius Avenue North roadway).

The Council development plans are provided in **Appendix B**.

1.2 Objectives

The objectives of this RAP are to:

- Summarise the findings of the previous stages of environment site investigations conducted at the Site (refer to **Section 1.4**);
- Present a plan of the anticipated remediation that will allow the planned development of the Site to proceed in a manner that protects human health and the environment, and to make the Site suitable for the proposed land uses (recreation); and
- Develop a plan to where possible, retain all excavated material onsite as part of the proposed development, consistent with the Stage 1 RAP (AECOM, 2016).

1.3 Regulatory Framework

This RAP has been developed with reference to the following guideline documents:

- The National Environment (Assessment of Site Contamination) Amendment Measure (NEPM, 1999 as amended 2013): provided the soil assessment criteria and were used to apply the NSW Environment Protection Authority (EPA) decision processes for assessing redevelopment of urban Sites and throughout preparation of this RAP;
- Guidelines for the Assessment and Management of Groundwater Contamination (NSW Department of Energy and Climate Change [DECC], 2007): followed throughout the site investigations and during preparation of this RAP;
- Australian and New Zealand Environment Guidelines for Fresh and Marine Water Quality (ANZG, 2018): considered for the assessment of groundwater conditions;
- Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2020): followed for preparation of this RAP;
- Sampling Design Guidelines (NSW EPA, 2022): considered during design of the validation sampling plan and determination of the Data Quality Objectives (DQOs);
- Waste Classification Guidelines (NSW EPA, 2014): used for characterising soil for disposal to an appropriately licensed landfill facility;
- Managing Land Contamination: Planning Guidelines, State Environmental Planning Policy (SEPP) 55 - Remediation of Land (Department of Urban Affairs [DUAP] and EPA, 1998): considered for the preparation of this RAP; and
- City of Sydney Contaminated Land Development Control Plan 2012: City of Sydney Council (14 December 2012).

The scope of remediation works and methodology presented herein is based on AECOM's current understanding of the nature and extent of contamination present at the Site and the provided Council development plans.

1.4 Previous Reports

The following reports were previously prepared for parts of the Site:

- Douglas Partners Pty Ltd (DP) (DP, 1995). Preliminary Contamination Assessment (summarised in WSP reports)
- Douglas Partners (DP, 2009). Phase 1 Contamination Assessment (summarised in WSP reports)
- WSP Environment & Energy Pty Ltd (WSP) (WSP, 2011a). Phase 1 Contamination Assessment, 106-116 Epsom Road, Zetland NSW. Prepared for Lincon Development Pty Ltd. May 2011;
- WSP (WSP, 2011b). Limited Phase 2 Contamination and Geotechnical Assessment, 106-116 Epsom Road, Zetland NSW. Prepared for Lincon Development Pty Ltd. October 2011;
- AECOM (AECOM, 2016). GPARC Remedial Action Plan, Rev 0 15 June 2016;
- AECOM (AECOM, 2017a) Additional Remedial Action Plan Investigations – Gunyama Park Aquatic and Recreation Centre, Rev C, 28 February 2017;
- EI Australia Pty Ltd (EI Australia) (EI Australia, 2020a). Additional Site Investigation - 106-116 Epsom Road, Zetland NSW, 22 July 2020;
- JBS&G Pty Ltd (JBS&G) (JBS&G, 2020a) Gunyama Park Aquatic and Recreation Centre Validation Report, 17 Zetland Avenue, Zetland, 9 December 2020 (Rev 2);
- JBS&G Pty Ltd (JBS&G) (JBS&G, 2020b) Gunyama Park Aquatic and Recreation Centre Long Term Environmental Management Plan, 132 Joynton Avenue, Zetland, NSW 11 November 2020.

The following geotechnical reports have also been prepared for the Site:

- Coffey Geotechnics (NSW) Pty Ltd (Coffey) (Coffey 2015) Additional Geotechnical Investigation Report, 106-116 Epsom Road, Zetland, NSW, 13 April 2015;
- Douglas Partners (DP, 2016). Report on Geotechnical Investigation, Gunyama Park Aquatic and Recreation Centre, Joynton Avenue, Zetland, 11 April 2016; and
- EI Australia (EI Australia, 2020b) Additional Geotechnical Investigation, 106-116 Epsom Road, Zetland, 15 July 2020.

The following reports were completed for adjoining land to the south of the Site:

- ADE (ADE, 2018) Phase II Detailed Site Investigation 94-104 Epsom Road - MER-08-14531/DSI/v1d – 15 October 2018
- ADE (ADE, 2021a) Site Remediation & Validation Report - Southern Basement, Landscaping Setbacks & Road Footprints - 94-104 Epsom Road 21.0234.VAL2.v3f – 28 October 2021
- ADE (ADE, 2021b) Site Remediation & Validation Report Northern Basement - 94-104 Epsom Road - MER-08-18948 VAL1.v2f – 28 October 2021

2.0 Site Description

2.1 Site Identification

The current layout of the Site is presented on **Figure 2** in **Appendix A**. Currently, the Site consists of a vacant lot, and is temporarily being used as a stockpile area for a neighbouring construction site. The Site was historically occupied as a racetrack, stables and paddocks with a tyre and rubber factory located on the same property but to the south.

The Site identification details are presented in the following table:

Table 1 Site Identification Details

Item	Description	
Site Owners	City of Sydney (Lot 11 DP 1271716) Lincon Development (Lot 1 DP 1265902)	
Site Address	13 George Julius Avenue, Zetland	Lot 1 DP 1265902
	17 Zetland Avenue, Zetland	Part Lot 11 DP 1271716
Site Survey	Refer to **Appendix B**	
County and Parish	County of Cumberland, Parish of Alexandria	
Local Government Authority	City of Sydney	
Current Zoning	SP2 Community Facility	
Proposed Land Use	Recreation mixed use, public open space (Gunyama Park), and roadway (George Julius Avenue North)	
Geographical Coordinates (Australian Map Grid)	N 6246516, E 334305	
Site Elevation (m AHD)	Approximately 20 m AHD	
Stage 2 Area	0.87 hectares (ha)	
Site Area	0.7 ha	
Site Location	**Figure 1**	
Site Layout and Former BH Locations	**Figure 2**	

2.2 Surrounding Land Uses

The Site is currently surrounded by the following land uses:

- North: Zetland Ausgrid Depot (recently sold to be redeveloped into high density residential apartments), followed by high density residential apartments and open space.
- East: Former car dealerships and service centres (vacant), followed by Link Road and Southern Cross Drive.
- South: A Meriton residential construction site followed by Epsom Road.
- West: Gunyama Park Sports Field (synthetic sports field) and then Gunyama Park Aquatic Centre

2.3 Topography and Drainage

The Site is located in an area which is relatively flat and elevated approximately 20 m AHD. The surrounding land in the vicinity of the Site displays a gentle slope (down) to the west towards Alexandra Canal (located approximately 1.4 km to the south west of the Site). There are no natural drainage features at the Site and any stormwater generated at the Site is expected to drain into the Council stormwater drainage system present along the recently constructed portion of George Julius Avenue as well as Zetland Avenue and Joynton Avenue.

2.4 Geology

The regional geology is composed of Quaternary medium to fine grained “marine” sand with podsols (Sydney 1: 100 000 Geological Series Sheet 9130 1st Edition 1983).

The Site is located in the northern portion of the Botany Basin. The Botany Basin is considered a superimposed structural basin within the larger Cumberland Basin (DMR, 1980). The geology of the Site and surrounding area is characterised by Quaternary aged interbedded marine sands, peaty sands, peat and mud (Botany Sands), underlain by the Triassic Hawkesbury Sandstone. The Botany Sands are expected to be greater than 10 metres thick in the site area and thicken to up to 80 metres in the central portion of the Botany Basin, south of the Site.

Reference to the Sydney 1:100,000 Soil Landscape Series Sheet 9130 indicates that the Site is located in an area mapped as being “disturbed terrain”. Disturbance is defined as removal or burial of soil, or landfill with soil, rock, building and waste materials. The area is originally low lying swampland (Waterloo Swamp), which was historically filled to raise surface levels.

2.5 Acid sulfate soils

The Botany Bay 1.25 000 scale acid sulfate map of the area indicated that no known occurrence of acid sulfate soils is identified for the Site. The Site is also mapped as Class 5 acid sulfate risk in the Sydney Local Environmental Plan (LEP) 2012 acid sulfate soil risk maps. Class 5 mapped land requires an acid sulfate soil management plan (ASSMP) where ‘*works are within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land*’. The works will not cause the watertable to be lowered below 1 metre AHD on adjacent mapped Class 1, 2, 3 or 4 land.

It was however found that potential acid sulfate soils (PASS) were present in the western portion of the Stage 1 construction during previous investigations (AECOM, 2016). Acid sulfate soils were confirmed and managed under an ASSMP during construction works during Stage 1 (JBS&G, 2020a). PASS were present as organic clays and sandy clay in the western portion of the Stage 1 construction site and were not identified elsewhere. Natural soils beneath the fill at the Site (non-PASS) were found to comprise sand to the maximum extent of boreholes (4.5 to 6.45 m below ground level [bgl]) in previous investigations (refer to Section 2.9).

Field acid sulfate soil screening tests were undertaken by Douglas Partners (2023) at six boreholes at the Site (refer to Table 3 in Section 2.9). The results indicated PASS was likely present at two boreholes (BH205 and BH206) within the clayey sand fill near the centre of the Site at a depth of 2.4-2.5 m bgl. As excavation will not be undertaken in that part of the Site, and the maximum depth of excavation at the Site is expected to be 1 m bgl no further investigation is considered required. An acid sulfate soil management plan (ASSMP) will be prepared to detail procedures should fill be encountered during excavation that displays signs of acid sulfate soils.

2.6 Hydrogeology

Groundwater within the Site is present within the Botany Sands aquifer and sometimes within shallow fill, depending on the depth of fill and local groundwater levels (DP, 2016 and AECOM, 2016). Groundwater levels within the unconfined Botany Sands aquifer are variable but typically shallow (within five metres of ground surface) when not influenced by localised pumping. The water table depth and direction of flow in the region is influenced by local factors such as distance from recharge and discharge areas, local development and pumping.

Recharge to the Botany Sands aquifer is via direct rainfall, locally enhanced by rainfall runoff and via a series of ponds in Moore Park and Centennial Park (located approximately 1 km to the north east of the Site). Locally groundwater flows from the Botany Sands and discharges to Alexandra Canal and Botany Bay. Natural groundwater fluctuations can cause the water table to rise by up to 0.5 metres following high rainfall events and can also be influenced by tidal fluctuations and seasonal variations. In 2014, groundwater levels were relatively high across eastern Sydney within the Botany Sands aquifer particularly when compared to levels during the recent drought.

Groundwater quality within the unconfined Botany Sands aquifer is of variable quality but is typically of low salinity and moderately acidic. The shallow water table is susceptible to contamination because of its location in an urban and industrial environment with no confining layer. Variations in the native groundwater quality are attributed to a number of factors including the presence of peaty sediments, industrial development, leakage from sewer systems and landfills.

The Site and surrounds is within the Botany Groundwater Management Zone 2, which bans domestic use of groundwater due to contamination (http://www.water.nsw.gov.au/water-management/water-quality/groundwater/Botany-Sand-Beds-aquifer).

Groundwater levels recorded during AECOM (2016) (refer to **Appendix C**) were only observed at one monitoring well (MW205) as the other in the Site was dry at the time. This is likely due to temporary dewatering works occurring at the time to the west and northwest of the Site on the Green Square Town Centre construction site (on the opposite side of Joynton Avenue) and possibly related to the Mirvac basement excavation/construction works to the south of the Site. The inferred groundwater flow is towards the west.

2.7 Site History

The site history was detailed in the AECOM (2016) RAP and is summarised in this section. The Site was formerly part of a natural wetland that was drained and filled for development of a racecourse in the 1930s. The Site was briefly used as part of an ordinance unit and military camp during WWII and then purchased by Nuffield (Australia)Pty Limited (car manufacturers) in the 1950s. The northern part of the Site was then further filled in the 1960s and used as open space and a car park. The northern part of the Site was then used as stockpiling area for a neighbouring construction site in 2022.

The southern part of the Site was part of a property operating as a printing business during the 1970s to 1990s until it became part of the City of Sydney Council in 1998 and used for a works depot until demolished in around 2018. A stormwater detention basin was then excavated and constructed within the southern part of the Site and a UST was removed during these works (refer to **Section 0**).

The land surrounding all sides of the site was also subject to historical filling and used for a variety of commercial and industrial land uses. These included car manufacturing (British Motor Corporation [BMC] plant), Defence Navy Supply Centre, the Royal South Sydney Hospital, Ingot Mills Pty Ltd factory (textile manufacturing) and the Olympic Tyre and Rubber Company.

2.8 Areas of Contaminants of Concern

The areas and contaminants of concern based on the historical information and former and current surrounding land uses are summarised in **Table 2** below.

Table 2 Areas and Contaminants of Concern

Area	Activity	Contaminants
All of the Site	Uncontrolled spoil disposal (potentially liquid and solid) in the 1900s and between 1950s and 1970.	Asbestos, metals, PAHs, total recoverable hydrocarbons (TRH), benzene toluene ethylbenzene xylene (BTEX), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and industrial solvents (semi volatile organic compounds [SVOCs] and volatile organic compounds VOCs)
	Racecourse construction and operation, the use of ash on the racecourse surface	Metals, PAHs, OCPs and OPPs
	Ordnance storage or use during WWII	There is no Unexploded Ordnance (UXO) reported on the Department of Defence website: www.defence.gov.au/uxo/where_is_uxo
Southern portion of the Site	Unknown fuel storage and dispensing (known fuel storage and dispensing on southern boundary of the Site [shown on **Figure 2**, **Appendix A**]. UST was removed and validated, although impacts not fully delineated).	Lead, TRH, BTEX and PAHs
	Industrial manufacturing (rubber), printing and depot use	Metals, TRH, BTEX, PAHs, industrial solvents (SVOCs and VOCs),

Area	Activity	Contaminants
Up-gradient off-site sources	Industrial manufacturing, electrical substations, car servicing centres/mechanics and filled land from up-gradient off-site sources	Metals, TRH, BTEX, PAHs, cyanide, industrial solvents (SVOCs and VOCs), PCBs and per- and poly-fluoroalkyl substances (PFAS).

2.9 Previous Site Investigations

The AECOM (2016) RAP summarised the findings of previous investigations and included an additional investigation undertaken by AECOM. An Additional Site Investigation by EI Australia was also prepared for the property at 106-116 Epsom Road (EI Australia, 2020). It is noted that the EI Australia report did not include the collection and analysis of any samples within the Site but reviewed the previous data and included investigation of adjoining block to the south-east of the Site.

The results of these previous investigations in the context of the Site are summarised in **Table 3** below and tabulated in **Table C1** to **C7** in **Appendix C.** The historical borehole and groundwater monitoring well locations completed within the Site are shown on **Figure 2** in **Appendix A**. Results of the investigations indicated that metals, polycyclic aromatic hydrocarbon (PAH) and asbestos impacts were identified in fill across the Site. The fill appears to extend off-Site to the south west based on the findings of EI Australia (2020) report.

Table 3 Previous Site Investigations

Report	Investigation Summary
DP, 1995	Five test pits (sample locations unknown) were sampled to 2.8 m bgs across the part of the Site which now comprises Lot 1 DP 1265902 in the Site. The property was described as a grassed flat area used for the storage of scaffolding and similar light construction materials at the time of the sampling. The following results were reported: • Fill logged as loose grey and black sand with steel cables, brick, plastic, concrete, car tyres and other anthropogenic materials. • Fill was underlain by sands. • Samples were analysed for metals, total petroleum hydrocarbons (TPH) and BTEX and were less than the relevant criteria at the time – ANZECC (1992). • There was no information on groundwater.
DP, 2009	Five boreholes (DP-BH1 to DP-BH5) were drilled and sampled across Lot 1 DP 1265902 of the Site (refer to **Figure 2** in **Appendix A**). The boreholes were sampled to 3 m bgl and reported following results: • Fill described as per DP 1995 report. • Benzo(a)pyrene (B[a]P) concentrations up to 6.6 mg/kg and total PAH concentrations up to 46.1 mg/kg. • Zinc concentrations up to 280 mg/kg and copper concentrations up to 220 mg/kg. • All other results were less than the adopted criteria. • There was no information on groundwater.

Report	Investigation Summary
WSP , 2011b	Three boreholes (BH05, BH12 and BH09) were sampled using a solid stem auger within Lot 1 DP 1265902 of the Site (**Figure 2** in **Appendix A**). It is noted that an additional nine boreholes were completed within the remainder of property (Lot 1 DP 830870) to the south of the Site. The following results were reported for the three boreholes within the Site: • Fill with silty sand with bricks, tyre, steel cables, plastic, glass and concrete to depths of 4.2 m bgs (BH05), 4.0 m (BH09) and 2.7 m (BH12). • All PID VOC readings were less than 1 part per million (ppm). • Analysed selected soil samples for metals, TPH, BTEX, PAHs, volatile organic compounds (VOCs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs). All results were less than the adopted assessment criteria at the time (NEPM [1999] Health Investigation Level (HIL) E – recreational/open space, NSW EPA (1994) Threshold concentrations for sensitive land use and NEPM (1999) provisional phytotoxicity based investigation levels (PBILs). One groundwater well was installed to 6 m bgl and screened across fill and sand (GW04). It is noted that three wells were installed to the south of the Site (GW01 to GW03). GW04 was sampled and analysed for dissolved metals, TPH and VOCs and the results reported included: • The standing water level (SWL) was 3.16 m below top of casing (bTOC) and the Relative Level (RL) was 16.973 m AHD. • Measured groundwater parameters: pH of 4.68, Redox 85.6 mV and conductivity 0.289 mS/cm. • Dissolved copper (3 µg/L) and zinc (10 µg/L) concentrations exceeded the ANZECC 95% trigger values for marine ecosystems of 1.4 µg/L and 8 µg/L respectively. • Bis (2-ethylhexyl) phthalate (42 µg/L) was detected above the limit of reporting (LOR).
AECOM, 2016	AECOM completed an additional investigation of the overall GPARC to fill data gaps for the purposes of informing the RAP. The investigation included a Phase 1 desktop assessment of what was known as the Lincon Development site (Lot 1 DP 1265902) and a Phase 2 soil and groundwater data gap investigation of the overall GPARC, including the Site. The additional investigation was reported in the AECOM (2016) RAP and the scope and results specific to the Site are summarised below: • The investigation locations within the Site included drilling of eight boreholes (BH214 to BH221) and installation and sampling of two groundwater monitoring wells MW204 and MW205 (in BH216 and BH219 respectively). • Fill and natural underlaying sands were consistent with previous investigations, with fill encountered to depths ranging from 2.4 to 3.3 m bgl • Field PID VOC screening results were all less than 10 ppm and no odours were noted in soils • MW204 was dry (installation depth 6 m below top of casing [toc]) and the standing groundwater level (SWL) in MW205 was 4.32 m bgl • Selected soil samples were analysed for heavy metals, TRH/BTEXN, PAHs and asbestos and the groundwater sample was analysed for heavy metals, TRH/BTEXN, PAHs and VOCs • The soil and groundwater results are summarised below: - Soil analytical results which exceeded the adopted NEPC 2013 human health-based (HIL-C) criteria were: ▪ Lead in BH214_2.0-2.1 and BH216_1.5-1.6 at concentrations of 965 and 729 mg/kg respectively (criteria 600 mg/kg) ▪ Benzo(a)pyrene TEQ in BH214_2.0-2.1 and BH216_1.5-1.6 at concentrations of 4.9 and 11.1 mg/kg respectively (criteria 3 mg/kg)

Report	Investigation Summary
	- Soil analytical results which exceeded the NEPC 2013 ecological based (EIL and ESLs for open space) criteria were: ▪ Copper in BH214_2.0-2.1 and BH216_1.5-1.6 at concentrations of 701 and 364 mg/kg respectively (criteria 60 mg/kg) ▪ Nickel in BH214_2.0-2.1 at concentration of 105 mg/kg (criteria of 30 mg/kg) ▪ Zinc concentrations in BH214_2.0-2.1 (629 mg/kg), BH216_0.5-0.6 (99 mg/kg), BH216_1.5-1.6 (646 mg/kg), BH218_2.0-2.1 (91 mg/kg), BH219_0-0.1 (73 mg/kg), BH219_1.5-1.6 (78 mg/kg) and BH221_1.0-1.1 (83 mg/kg) (criteria 70 mg/kg) ▪ Benzo(a) pyrene concentrations in BH214_1.0-1.1 (1.1 mg/kg), BH214_2.0-2.1 (3.3 mg/kg) and BH216_1.5-1.6 (7.5 mg/kg) (criteria 0.7 mg/kg) ▪ TRH_C16-C34 concentrations in BH214_2.0-2.1 (630 mg/kg) and BH216_1.5-1.6 (530 mg/kg) (criteria 300 mg/kg). - Friable asbestos fibres were detected in one soil sample (BH214_2.0-2.1) - All groundwater results were less than the adopted assessment criteria. The findings aligned with those from previous investigations, noting that fill material across the site was impacted with metals, PAHs and asbestos. Furthermore, it stated that management measures like the placement of an appropriate growing medium over the fill would need to be implemented.
Coffey, 2016	Coffey undertook an additional geotechnical investigation of the overall GPARC. The scope included three boreholes (BH118w, BH122w and BH130) and seven cone penetration tests (CPTs) (CPT117, CPT118, CTP121 to 124 and CPT126) within the Site. Two of the boreholes were converted to groundwater monitoring wells (BH118W, BH122W). The following observations of fill were recorded in each borehole: • BH118w – fill to 2.5 m bgl comprising crushed sandstone to 0.4 and then dark brown silty sand with basaltic gravel, • BH122w – fill to 4 m bgl comprising fine to coarse sand and gravel to 0.5 m and then silty sand with trace gravel. • BH130 – fill to 2.5 m bgl with fine to coarse sand and gravel sandy clay with sandstone gravel to 1.4 m bgl and then coarse sand with some sandstone gravel. Depth to groundwater was reported as: • BH118w: 4.3 m / 16 m AHD • BH122w: 4.1 m /15.8 m AHD.
EI, 2020	EI Australia undertook an Additional Site Investigation which included part of the Site (Lot 1 DP 1265902) and another parcel of adjoining land at 106-116 Epsom Road, Zetland (Lot 21 to 24 in DP 1265903)(southeast of the Site, refer to **Figure 4** in **Appendix A**). The objective of the investigation was to close out data gaps to further characterise the site soils prior to remediation and bulk excavation. The scope of works within the Site included a review of previous investigations (WSP, 2012 and DP, 2009). A total of 15 boreholes were drilled and sampled within the land at 106-116 Epsom Road and were not located within the Site. The soil samples were analysed for heavy metals, TRH, BTEXN, PAHs, OCP, OPP, PCB and asbestos. The results from the 15 boreholes were: • Fill with inclusions of demolition waste was encountered across the site with an average depth of 1.4 m bgl and a maximum depth of 3.6 m bgl • CoPC exceeding the adopted soil investigation criteria in two samples, one for OCPs (Heptachlor) and another for total PAHs.
DP, 2023	DP undertook an additional geotechnical investigation at the Site in 2023. The investigation included collection of a total 20 acid sulfate soils for field acid sulfate soil screening tests from eight boreholes, including six boreholes within the Site (BH201 to BH206, shown on **Figure F2** in **Appendix A**). One sample had a strong positive result for PASS (BH205 at 2.4-2.5 m bgl) and one had a less positive result for PASS

Report	Investigation Summary
	(BH206 at 2.4-2.5 m bgl). The two samples were of fill comprising dark grey sand and clayey sand with organic and sulfuric odours noted. Laboratory analysis (Suspension Peroxide Oxidation Combined Acidity and Sulfur [SPOCAS] or Chromium Reducible Sulfur [CRS]) was not undertaken on the samples.

2.10 Previous Site Remediation and Validation Works

Additional site investigations and validation works were undertaken as part of the Stage 1 construction and remediation works and were documented in the Stage 1 Validation Report (JBS&G, 2020a). The remediation works included the removal and validation of two USTs within the Site. The two USTs were identified during the construction of the stormwater detention basin to the east of the Stage 1 boundary. The USTs were designated as unexpected finds (designated identification number UF02) and were investigated and validated as part of the Stage 1 works due to being located on the boundary of the Stage 1 construction site. The location of the former USTs within the Site is shown on **Figure 2** in **Appendix A**.

The Stage 1 validation report (JBS&G, 2020a) stated that the two USTs were found to contain around 11,000 L of liquid (product and hydrocarbon wash water) and found to be in poor condition. The liquid was removed from the tanks and disposed to a licensed liquid waste facility and the tanks disposed to an appropriately licensed facility. Following removal of the USTs the excavation was advanced to a 9 m x 6.7 m x 2.5 m deep excavation. The excavated material was noted to be stained and had a strong hydrocarbon odour. The excavated material was classified as General Solid Waste (GSW) and disposed to a licensed landfill.

Validation samples were collected from the walls and base of the excavation respectively. The excavation was extended to the west to the extent practicable and further validation samples collected. The resultant excavation was 13 m x 7.5 m x 3.1 m. The validation samples are shown on **Figure 3** in **Appendix A**.

To further delineate the impacts, three boreholes (BHA1, BHA2 and BHA3) were advanced and eight primary samples were analysed. Borehole BHA1 was located within the Site and the other two were off-Site to the west. Strong hydrocarbon odours were observed in BHA1 within natural sands at depths of 1.5 to 4 m bgl with PID VOC readings ranging from 2.9 to 6.3 ppm.

The soil validation samples were analysed for TRH, lead, VOCs, BTEX, phenols and PAHs. Analytical results exceeded the validation criteria in some samples from the western and southern walls for TRH and PAHs and in borehole BHA1 for TRH. The soil results are presented in **Table C8** in **Appendix C** and criteria exceedances are listed in **Table 4**.

The excavation could not be extended further south due to a retaining wall and therefore the soil impacts in the southern excavation wall remain within the Stage 2 area/ the Site. The Site Audit Report for Stage 1 (Senversa, 2020) confirmed that the UST from UF02 was removed and that this area was not delineated in full.

Table 4 JBS&G (2020a) Stage 1 Soil Validation Criteria Exceedances for UF02

CoPC	Samples	Concentration (mg/kg)	Criteria (mg/kg)
Excavation validation samples of UF02			
Carcinogenic PAH TEQ	UST2-32S (0.3)	3.851	3 (NEPC 2013, HIL-C)
TRH >C10-C16 fractions	UST2-3W(2.2)A, UST2_6W(2.4)A, UST2-7S(0.4), UST2-9S(2.3), UST2-12S(2.2) and UST2-34S(2.2)*	2,600 to 11,000	1,000 (NEPC 2013, Recreational Management Limit)
TRH >C16-C34 fractions	UST2-9S and UST2-12S	5,400 and 3,400	2,500 (NEPC 2013, Recreational Management Limit)
Additional delineation of UF02			
TRH >C10-C16 fractions	A1_2.0	4,500	1,000 (NEPC 2013, Recreational Management Limit)

2.11 Previous Off-site Remediation and Validation Works

Remediation and validation works were completed on the parcels of land directly adjacent to and up to the southern boundary of the Site (now SP105223 and Lot 11, 14 and 15 in DP1277812) as part of the Meriton redevelopment works which included the construction of apartments with a basement and the southern part of George Julius Avenue which adjoins the Site. The following validation reports were prepared:

- ADE (2021a) Site Remediation and Validation Report – Southern Basement, Landscaping Setbacks and Road Footprints. 28 October 2021 (prepared for Karimbla Construction Services Pty Ltd)
- ADE (2021b) Site Remediation and Validation Report – Northern Basement, 94-104 Epsom Road Zetland, NSW (prepared for Karimbla Construction Services Pty Ltd)

Remediation and validation works were undertaken by ADE (2021a) immediately south of the UST excavation described in **Section 2.8** within George Julius Avenue. The remediation works were the excavation and validation of a benzo(a)pyrene hotspot at a sampling location designated TP3. TRH was not detected in the soil samples from the excavation (3 m x 3 m x 1 m excavation dimension). Another borehole (BH03) was undertaken 15 m south of the Site boundary and TRH impacts were not detected within the borehole. Validation works undertaken within the footprint of the apartment basement of SP105223 by ADE (2021b) did not identify TRH impacts in groundwater or soil. The boundary of the ADE validation works (ADE, 2021a and 2021b) are shown on **Figure 4** in **Appendix A** and the summary of results are included in **Table C8** in **Appendix A**.

Based on the above information TRH impacts that remained on the southern wall of the UST excavation at UF02 within the Site are unlikely to have extended off-Site.

3.0 Nature and Extent of Contamination

3.1 Subsurface Conditions

The previous site investigations (refer to **Section 1.4**) reported that deeper fill material is present on the Site. The investigation conducted by AECOM (2016) provided the following lithological summary:

- Road base gravels underlying pavements followed by fill consisting of sand, gravel and clay with demolition type waste (brick and concrete) to 1 - 2 m bgl. The demolition type fill was underlain fill similar to the fill in the Stage 1 area, but with lower proportions of slag, ash and metals. No obvious odours were observed during sampling of the fill.
- The fill was underlain by poorly graded fine to medium sand and no clays were encountered to the depth of the boreholes.

3.2 Summary of Identified Contamination

3.2.1 Fill/Soil

Based on the findings of the site investigations (AECOM, 2016), field observations and the analytical data, it appears that there have been two generations of filling at the Site:

- Fill Generation 1 - prior to 1910 and contains waste with slag, ash and metal. The material filled the former Waterloo swamp and dam that was located within and surrounding the Site. The fill was deepest in the west near Joynton Avenue and shallowest in the south east of the Site. The highest concentrations of carcinogenic PAHs and lead were in the western part of the Site and highest towards Joynton Avenue. The depth of fill adjacent to Joynton Avenue is generally 3-3.5 m depth; and
- Fill Generation 2 – From the mid-1950s, Lot 1 DP 1265902 was filled with a mound of material that sits above the Generation 1 fill. The Generation 2 Fill consists of soil mixed with demolition and tyre waste. A conceptual cross section illustrating the stratigraphy at the Site is provided as **Figure 5** (**Appendix A**).

The fill is impacted mainly with lead, copper, nickel, zinc, PAHs, asbestos and more isolated areas of TRH. Exceedances of the adopted HILs for carcinogenic PAHs and lead occurred in some areas of the Site. As reported by AECOM (2016), lead and PAH concentrations were significantly lower in the Generation 2 fill present on Lot 1 DP 1265902 and validates the concept that different generations of filling have occurred at the Site. This distribution has implications of how material can be excavated and separated for potential reuse at the Site.

The previous investigations summarised in **Section 2.9** identified lead and benzo(a)pyrene concentrations exceeding the HIL C criteria. Copper, nickel, zinc, benzo(a)pyrene and TRH C_{10}-C_{34} fractions were also found to exceed the adopted ecological assessment criteria in fill. TRH C_{10}-C_{34} fractions also exceeded the adopted ecological assessment criteria and management limits in natural soils in the southern most portion of the Site (JBS&G, 2020a). Although asbestos was only detected in one sample during investigations by AECOM in 2015 within the Site (BH2014) (AECOM, 2016), ACM was detected in four samples during investigations in the adjoining Stage 1 area and found to be widespread during construction. Due to Stage 1 having the same type of fill as the Site and due to the limitations associated with detecting asbestos in boreholes (test pit excavations better at identifying asbestos in soil) it is concluded that asbestos is present throughout the fill in numerous parts of the Site.

There was no Australian Standard Leaching Procedure (ASLP) or Toxicity Characteristic Leaching Procedure (TCLP) data for the boreholes sampled within the Site to directly access the leachability of CoPC within the Site fill. No further leaching testing is however considered required to inform the remediation methodology given the following reasons:

- The deeper fill (~1.5 to 3 m bgl) within the Site is consistent with fill within the Stage 1 area which had a similar composition (including containing ash and slag) and concentrations of CoPC in a similar range and magnitude of order (see **Figure 4** in **Appendix A** for the cross-section showing fill layers of the Site and Stage 1);

- An assessment of the leachability and potential negative impacts on groundwater quality and receptors by retaining fill in-situ under the capping in Stage 1 was undertaken by JBS&G (2020) and found that:
    - the highest concentrations of CoPC in groundwater were in the western area of Stage 1 where fill has been historically at or partly submerged by groundwater;
    - although the ASLP results exceeded the adopted ecological criteria, the ASLP tests present worst-case scenario for leachate generation given the intensive aggressive agitation when compared to a compacted fill profile with minimal infiltration. The criteria are very conservative being direct contact with aquatic ecosystems and doesn't consider dilution effects between the Site and the discharge point; and
    - the 'cap and contain' remedial strategy was considered appropriate in reducing surface water infiltration and no further remediation method was considered required to reduce leachability of CoPC.
- As stated in the Site Audit Statement for the Stage 1 remediation and validation (Senversa, 2020), the fill has been in place for an extensive period (>100 years) and has resulted in relatively low concentrations of PAHs and heavy metals in groundwater
- The groundwater beneath the Site is likely below the depth of the fill across the most of the Site and the capping and marker layer will further reduce surface water infiltration into the fill.

It is noted that limited soil samples were analysed for OCPs historically within the Site and the results for all three samples were less than the LOR. Based on the results of investigations on the surrounding sites including Gunyama Park Aquatic and Recreation Centre (AECOM, 2016) and on 106-116 Epsom Road to the south (EI, 2020), OCP contamination in fill above the LOR was only identified in one sample and was not located near the Site boundary. There is no evidence of a concrete slab across the Site in historical aerials with the exception of the southern portion of the Site. Shallow soils within the southern portion of the Site were excavated and removed from the Site as part of construction of a temporary detention basin. As such no further assessment of OCPs within fill at the site is considered necessary unless an unexpected find such as buried waste (drums or containers with residue) are discovered during excavations.

It is noted that the HIL C criteria is based on direct dermal (i.e. absorption of contaminants through the skin), inhalation of dust and incidental ingestion of soil and dust particles. Design specifications indicate that a minimum of 500 mm cap comprising validated suitable clean fill (as defined in **Section 4.2**) underlain by a marker material will be implemented. This cap layer will mitigate contact with the underlying fill materials. Therefore, it is considered that the limited exceedances of the HIL C do not preclude the soils from being suitable for reuse as long as appropriate long term management actions are implemented to maintain the integrity of the capping layer.

As an appropriate growing medium will be created by the importation of a minimum of 500 mm validated suitable clean topsoil and imported fill (and deeper where trees are planted) the contaminated fill would no longer be considered a risk to the ecological receptors in the redeveloped park.

As described in Section 2.9, two USTs were removed and validated within the southern portion of Lot 11 DP 1271716 in the Site during the Stage 1 remediation works by JBS&G (2020a). Not all the hydrocarbon impacted soils on the southern wall of the excavation could be removed due to excavation restrictions caused by the retaining wall on the Site boundary. As such a narrow strip (approximately 1.5 m wide) of hydrocarbon contaminated soil (TRH C_{10}- C_{34} fractions) remains on the southernmost boundary of the Site. Based on the validation data reported in JBS&G (2020a) the contamination is at depths of between 1.5 and 4 m bgl in natural sands (strong hydrocarbon odours) and comprises TRH C_{10}-C_{16} at concentrations ranging between 3,400 to 5,400 mg/kg and TRH C_{16}-C_{34} at concentrations ranging between 2,600 to 11,000 mg/kg (exceeding NEPC 2013 management limits and ESL). As described in Section 2.10, remediation and validation works undertaken within the off-Site development to the south did not identify hydrocarbon impacts in soil.

The TRH concentrations did not exceed the adopted vapour intrusion criteria for commercial/industrial land use or for intrusive maintenance workers. As such the TRH contamination does not pose a vapour risk to the use of the future amenities building or underground services and associated pits.

As the contamination is semi-volatile (low vapour intrusion risk), isolated on-site and previous investigations did not identify down-gradient hydrocarbon impacts in groundwater, it would be appropriate to be capped and maintained on site.

3.2.2 Groundwater

All reported concentrations of the CoPC the Site were reported to be less than the adopted human health and ecological criteria, and less that the laboratory LOR. It should be noted only two monitoring wells were installed in the Site (MW204, MW205) and MW204 was dry at the time of sampling.

As noted in the 2016 Stage 1 RAP (AECOM, 2016), based on the reported soil contaminant and groundwater concentrations on this part of the Site, adverse impacts to groundwater in the Site are not likely. Therefore, it was stated that further investigation or management of groundwater at the Site was not considered to be warranted. There are potential semi-volatile hydrocarbon groundwater impacts that have since been identified in the southern portion of the Site where the former USTs were removed. This hydrocarbon contamination is localised within the Site to an approximately 1.5 m wide strip on-Site. As described in **Section 2.11**, remediation and validation works were undertaken within the off-Site development up to and immediately adjacent to the southern property boundary. As the validation works did not identify hydrocarbon impacts, they are not considered to extend off-site to the south.

3.2.3 Data Gaps

It is noted that due to changes in the development boundary (extending further east than originally planned) there is a spatial data gap in the Site within Lot 1 DP 1220949 and southeast most portion of Lot 1 DP 1239679 where no previous soil sampling has been completed. This area of the Site will be constructed as a road (George Julius Avenue North) with around 3 m of fill placed above the existing level. As stated above in **Section 3.2.1** there are potential hydrocarbon impacts in soil and groundwater localised at the southernmost extent of the Site. No down-gradient hydrocarbon impacts were identified in groundwater by JBS&G (2020b) to the west. The area south of the Site has since been constructed as George Julius Avenue and a residential apartment with a basement. No further delineation is required as:

- the impacted soil will be located at depths greater to or equal to 3 m bgl and below the depth of the service trenches
- the source of the contamination (UST02) was removed to the extent practicable on-Site
- the soil results didn’t exceed the vapour intrusion criteria
- there were no down-gradient hydrocarbon impacts in groundwater identified
- construction, including remediation and validation of George Julius Avenue to the south has been completed with no hydrocarbon impacts identified.

As stated in **Section 3.2.1**, there is no existing TCLP data for the Site and as such further sampling and analysis for waste classification purposes will be required during remediation when excavated spoil is required to be disposed off-site.

3.3 Conceptual Site Model

The purpose of a Conceptual Site Model (CSM) is to assess risks potentially present at the Site by identifying and describing contaminant sources, transport mechanisms, exposure pathways and sensitive receptors associated with the Site. The CSM is based on AECOM’s review of the previous reports and results from the investigation conducted by AECOM in 2015 (AECOM, 2016), validation works completed by JBS&G (2020a) and reports prepared for the adjacent development site to the south of the Site (ADE, 2021a and 2021b). The CSM developed for the Site is summarised in **Table 5** below.

Table 5 Conceptual Site Model

Consideration	Details
Site Setting	The Site is located in a former commercial/industrial area. The future land-use is to change to recreational and open space with a playground and parkland areas and a roadway.
Contaminants and Areas of Concern	The main contaminants of concern in soil are metals (mainly lead, nickel and zinc), PAHs, TRH and asbestos. The source of contamination is related predominantly to historical uncontrolled placement of impacted fill across the Site, rather than historical operations.
Sources of contamination	The following contamination activities are known or suspected to have occurred: • Deposition of uncontrolled contaminated fill, including ash, slag and demolition waste from unconfirmed sources. • Leaks from two former USTs • Off-site sources of groundwater contamination from surrounding industrial and filled sites (including the discussed Defence site to the north).
Groundwater Depth and Flow Direction	Groundwater conditions on the Site are summarised below: • Shallow groundwater was encountered at a depth of 4.3 m AHD and within sand at MW205, with the other monitoring well (MW204) being dry at the time of sampling, likely due to local dewatering occurring to the west-northwest of the Site in 2015. • The flow direction was inferred to be towards the west.
Extent of Groundwater Impacts	• No sheens LNAPL or DNAPL were encountered in the well monitored. • All concentrations of TRH and BTEXN were less than the human health based groundwater assessment criteria (GAC). • All concentrations of CoPC were less than the ecological based GAC. • There may be localised semi-volatile TRH contamination in groundwater at the southernmost extent of the Site
Extent of soil impacts	• Some concentrations of lead and benzo(a)pyrene TEQ (LOR) in fill exceeded the HIL for open space (AECOM, 2016). • Asbestos was detected in one sample and is concluded to be present randomly in fill on Site (AECOM, 2016). • Concentrations of BTEXN and TRH were below the adopted HSLs. • Concentrations of zinc, nickel, copper, benzo(a)pyrene and TRH C16-C34 exceeded the ecological based criteria (DP, 2009; WSP, 2011b; AECOM 2015). • Localised semi-volatile TRH contamination exceeding the ecological based criteria and management limits remains in the southernmost portion (~1.5 m wide strip) of the Site and could extend off-Site to the south.
Potential Transport Mechanisms and Exposure Pathways for Contaminants	• dermal contact or ingestion of contaminants in soil during construction or post development. • Dispersion of dust in the wind from unsealed surfaces during construction • Uptake of contaminants by plants and ecological receptors in soil post development. • Off-site groundwater migration.
Potential Receptors of Contamination	The potential human receptors of contamination include: • Construction workers, contractors and visitors on the Site during redevelopment works. • Future receptors are recreational users of Gunyama Park and intrusive maintenance workers. Potential environmental receptor of impacts are: • Off-site groundwater which flows towards the Alexandra Canal.

Consideration	Details
Identified Complete Future Pathways	• Direct dermal contact or ingestion of contaminants in soil: complete pathways exist for future site users due to the contamination of lead and carcinogenic PAHs exceeding the HIL if an appropriate barrier is not in place. The placement of appropriate barriers between the source and receptor will appropriately mitigate this pathway. Barrier controls include a capping layer and implementation of a long term site management plan to ensure maintenance and longevity of control measure. Physical disturbance of asbestos (plant and vehicles running over material) and dispersion of asbestos fibres via wind: friable asbestos have been detected in fill. A complete pathway may exist where impacted soils are not capped and protected by a long-term management plan or where appropriate Asbestos Management Plan is not implemented during construction works. Workers could also be exposed during construction and redevelopment if appropriate controls are not implemented. • Groundwater migration to ecological receptors: there is potential for groundwater to migrate off-site and to impact surrounding groundwater quality. Therefore this pathway is considered complete. It is noted that down-gradient groundwater quality is already affected by similar sources of contamination and the Site would be further contributing to poor groundwater quality. Due to the distance between the Site and the nearest surface water body being over 1.2 km and the concrete lined nature of Alexandra Canal (considered a degraded ecosystem), the pathway between the Site source and the nearest surface water body is incomplete.

4.0 Validation Criteria

4.1 Soil Validation Criteria

The soil validation criteria for the Site have been considered from the following NSW EPA endorsed guidance documents:

- NSW DEC, 2017. *Guidelines for the NSW Site Auditor Scheme (3rd Edition);*
- National Environment Protection Council (NEPC), 1999. *National Environment Protection (Assessment of Site Contamination) Measure (NEPM), as amended* 2013
- Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report No.10 - *CRC CARE Health Screening Levels for petroleum hydrocarbons in soil and groundwater.* September 2011. (Friebel, E.and Nadebaum, P., 2011); and
- WA Department of Health (DoH), 2021. *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.*

Given the proposed land use for the Site, a range of criteria sourced from the guidance documents listed above are required to be applied. Soil validation criteria to be applied are based on the applicable human health and ecological investigation levels published in NEPC (2013). Specifically, validation criteria will be derived for each contaminant as relevant based on:

- Health Investigation and Screening Levels for:
  - Recreational C for the Gunyama Park public open space - Table 1A(1) (NEPC, 2013)
  - Commercial/Industrial D for George Julius Avenue North - Table 1A(3) (NEPC, 2013)
- Environmental Investigation Levels for the public open space (Gunyama Park) and commercial/industrial (George Julius Avenue North) - Table 1B(1) to 1B(5), NEPC (2013)
- Environmental Screening Levels for the public open space (Gunyama Park) and commercial/industrial (George Julius Avenue North) - Table 1B(6), NEPC (2013)
- Management Limits for Total Petroleum Hydrocarbons (TPH) fractions in Soil for the public open space (Gunyama Park) and George Julius Avenue North (George Julius Avenue North) – Table 1B(7) NEPC (2013); and
- The definition of asbestos contaminated soil as provided in Safe Work Australia (SWA) 2011/NSW WorkCover 2011.

4.2 Imported Materials

In accordance with current NSW EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. As referenced in the Stage 1 AECOM RAP (2016), imported materials will only be accepted to the Site if they meet the definition of:

- Virgin Excavated Natural Material (VENM) as defined in the Protection of the Environment Operations Act (1997) Schedule 1; or
- Excavated Natural Material (ENM) as defined in DECC (2012); or
- any other suitable material which has been appropriately validated and meets the soil validation criteria.

All material imported to the Site will be required to be accompanied by appropriate documentation that has been verified by the appointed Validation Consultant.

4.3 Waste Classification

Materials which do not meet the soil validation criteria and/or are deemed not suitable for reuse at the Site (refer to **Section 4.1**) will be assessed for off-site disposal in accordance with the NSW EPA (2014) Waste Classification Guidelines.

5.0 Assessment of Remediation Requirements – Stage 2 Construction Works

Based on the current soil and groundwater data set (2008-2020) and in conjunction with the elements of the proposed development, it is AECOM's opinion that:

The PAH, lead and asbestos impacted fill materials in the Site do not warrant further remediation (other than capping) – the future risk of contaminated soil coming into contact with human or ecological receptors is considered low and does would not warrant remediation for the following reasons:

- The impacts would not present an unacceptable risk to future site occupants or intrusive maintenance workers (following completion of the proposed development works) due to HIL C exceedances only being observed at sample depths greater than 0.5 m bgl based on the data from the site investigation conducted by AECOM (2016).
- The lithology encountered at boreholes within this area generally consisted of fill from 1 – 2 m bgl.
- The area will be capped with a minimum of 500 mm of validated suitable clean fill ((as defined in **Section 4.2**) below finished site levels in areas of shallow planting and other open spaces; and a minimum of 1.5 m below finished site levels in areas of tree planting, with environmentally suitable materials placed in construction garden beds/planter boxes to the final finished site levels; and the capping material will be underlain by a marker material.
- Analytical results from groundwater well MW205 for metals, PAH, BTEX, TRH and VHCs all reported concentrations below the laboratory limit of reporting.
- The area of TRH contamination in the southernmost portion of the Site is limited in extent on-Site and will be below the depth of services as 3 m of fill and capping will be placed for the construction of George Julius Avenue North.

The 'cap and contain' strategy will prevent PAH, lead and asbestos impacted material from coming into contact with receptors. Remediation works may be required when unexpected finds are encountered.

6.0 Regulatory Framework

6.1 Council

Remedial works at the Site shall be carried out in accordance with the requirements of the *Contaminated Land Management Act* 1997, the State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP 2021), City of Sydney *Contaminated Land Development Control Plan* 2012 (DCP 2012) and the NSW Protection of the Environment Operations Act, 1997.

SEPP 2021 specifies when remediation work will require Development Consent from the planning authority (Category 1 remediation work). Any remediation works that do not require Development Consent are Category 2.

Based on review of Clause 9 of SEPP 2021 and the DCP 2012, the proposed remediation works are considered to be Category 2, as summarised below:

Table 6 Review of SEPP 55 Requirements

Category 1 Remediation Work	Site Evaluation
SEPP 55	
Designated Development	No
Land declared to be critical habitat	No
Likely to have significant effect on a critical habitat or a threatened species, population or ecological community	No
Development for which another State environmental policy or regional environmental plan requires development consent	No
Carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:	
• Coastal protection	No
• Conservation or heritage conservation	No
• Habitat area, habitat protection area, habitat or wildlife corridor	No
• Environment protection	No
• Escarpment, escarpment protection or escarpment preservation	No
• Floodway	No
• Littoral rainforest	No
• Nature reserve	No
• Scenic area, or scenic protection	No
• Wetland	No
Carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated	No
DCP 2012 (where different to above)	
Remediation works involving on-Site treatment of groundwater	No
Remediation works involving on-Site treatment of contaminated soil	No
Remediation work that does not comply with the management provisions of Section 5 of the DCP 2004	No [1]

Notes:

[1] Review of DCP 2012, indicates that:

- Council requires 30 days notice prior to the commencement of Category 2 remediation works;
- Council requires a copy of ESA report(s) and the RAP at least 14 days prior to the commencement of Category 2 remediation works;
- Contact details for the Principal Contractor and/or party responsible for ensuring compliance of remediation work with all relevant regulatory requirements; and
- After completion of the remediation program, Council must be notified within 30 days.

AECOM assumes that the above notification(s) will be provided by the Remediation Contractor.

6.2 CLM Act (1997)

The CLM Act (1997) is the primary Act under which contaminated land is regulated by the NSW EPA. Relevant legislation relating to the CLM Act (1997) includes the Contaminated Land Management Regulation (2008), which commenced on 1 September 2008.

This section addresses the following aspects of the Act:

- Determination and suitability of a contaminated site for a proposed use including the generation of remediation criteria;
- Existing orders and regulatory instruments applicable to the Site; and
- Voluntary remediation proposals and agreements.

The Guidelines for the NSW Site Auditor's Scheme (The Auditor Guidelines) (DEC, 2017) were prepared by the Department of Environment and Conservation (DEC, now known as the NSW EPA) under the CLM Act (1997). The Auditor Guidelines (DEC, 2017) describe a decision process for assessing urban redevelopment sites that should be followed by contaminated land consultants. The Auditor Guidelines (DEC, 2017) prescribe soil investigation levels (SILs), which are the concentrations of particular contaminants above which further investigation and evaluation (such as through completion of a quantitative risk assessment) are required.

The CLM Act (1997) sets out requirements for site audits. It is understood that a Site Audit Statement will be prepared by a NSW EPA Accredited Site Auditor for the Site. The SAS will confirm whether the Site has been remediated to a standard suitable for the proposed development land uses.

6.3 WorkCover

6.3.1 Asbestos

As discussed in **Section 3.2.1**, asbestos in soil is expected to be encountered in the fill randomly across the Site. WorkCover requires at least 7 days notification prior to any excavation works associated with bonded and friable asbestos.

6.3.2 Underground Storage Tanks

If any USTs are encountered during the excavation works, based on review of the DECC (2009) *Guidelines for the Implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008*, removal of the UST should be undertaken in accordance with:

- Australian Standard AS4976-2008, *The Removal and Disposal of Underground Petroleum Storage Tanks*; and
- Australian Standard AS1940-2004, *The Storage and Handling of Flammable and Combustible Liquids*.

WorkCover must be notified of any UST removal works within 7 days using the prescribed approval form.

7.0 Remediation

7.1 Objective

As discussed in **Section 1.2**, the remediation objective is to manage the excavation and fill/soil disposal reuse works so that the Site is suitable for development of the future Gunyama Park and George Julius Avenue (recreational open space and commercial/industrial). Where possible, all excavated material will be retained onsite as part of the development works. The Site works will consist of asphalt being removed from the Site and the underlying fill material being capped with a layer of clean material. Furthermore, it is expected that existing height levels will change in this area. All geotechnically suitable materials excavated that are demonstrated to be aesthetically appropriate and chemically stable/immobile where contaminants have been identified above the validation criteria will be reused below the capping layer where possible.

7.2 Preferred Remediation Strategy

The overarching remedial strategy for the Site will be the implementation of a capping layer of clean material (as defined in Section 4.2) over the contaminated fill present in the area.

A long term Environmental Management Plan (EMP) will be developed to manage residual fill contamination (including PAHs, lead, TRH and asbestos) and the integrity and longevity of the capping layer at the Site (refer to **Section 9.5**).

The preferred strategy to achieve the remediation objectives is as follows:

- Site establishment and preparatory works;
- The existing concrete slabs will be retained where possible. Where sections of the slab are removed, a suitably qualified Validation Consultant will inspect the removed slabs for asbestos and the underlying soils to assess for potentially contaminated soils (based on visual and olfactory observations and field screening of soil samples using a photoionisation detector [PID]);
- Excavation and separation of any other potentially contaminated fill materials (based on visual and olfactory observations) considered to be Unexpected Find Material for separate stockpiling and validation testing to confirm if it is suitable for reuse within Gunyama Park Stage 2 and George Julius Avenue North works or will require offsite disposal (refer to **Section 9.2.2**);
- Importation of suitable/validated imported fill to the Site to achieve the Gunyama Park, related open space final levels and George Julius Avenue North (if required) and as required for the capping material (refer to **Section 7.3.3**);
- Once the required levels (minus the capping layer) have been achieved in the Gunyama Park, related open space areas and George Julius Avenue North, a survey of the top of fill levels will be undertaken during a detailed survey and site inspection will be conducted to confirm that the marker material meets the requirements of **Section 7.3.2**; and
- A final survey of the final finished level will be conducted to confirm that the marker and capping requirements in the Gunyama Park area and George Julius Avenue North (as detailed in **Section 7.3.2** and **7.3.3**) are achieved.

The above approach is considered to be appropriate as there will be no complete exposure pathway to the underlying fill materials for future occupants of the Gunyama Park open space area and George Julius Avenue North due to the proposed capping works.

7.3 Remediation Methodology

7.3.1 Management of Unexpected Finds

Excavated material which is deemed to be Unexpected Finds Material will be stockpiled separately and sampled in accordance with the requirements of **Section 9.2**. Based on the results of these validation works, the material will be either reused within the Gunyama Park below the capping material (refer to **Section 7.3.2** and **7.3.3** below) or tested for offsite disposal (refer to **Section 8.7**).

The following unexpected events have been identified as having the potential to occur during the excavation works:

- Variation of contaminant characteristics or identification of unanticipated contaminants and materials. This may include the following materials:
  - Soil that appears to be contaminated based on visual and olfactory (odour) observations;
  - Soil that contains significant VOC concentrations (i.e. greater than 50 ppm as measured during the field screening of bagged soils samples using a PID);
  - Groundwater that appears to be contaminated based on visual and olfactory (odour) observations (including potential hydrocarbon sheens on the water surface);
  - Drums or underground storage tanks with unknown contents (i.e. either contained or potentially leaked into the surrounding soils).

In the event that additional trade waste lines or other in-ground features are identified and are considered to represent potential contamination sources (e.g. tanks, drums, unusual wastes etc), the following protocol will be adopted:

- All excavation works will cease, the Validation Consultant will be contacted and the area of concern will be appropriately barricaded;
- If required, appropriate sampling and analysis will be undertaken by the Validation Consultant;
- The requirement for any additional remediation works will be assessed by the Validation Consultant and undertaken following liaison with the Site Auditor; and
- The above works will be documented in the Validation Report.

Occupational Health & Safety (OH&S) and environmental protection requirements may need to be reviewed, depending on the type of unexpected finds encountered.

7.3.2 Marker Material Installation

As discussed in **Section 7.2** the proposed Gunyama Park will be capped as follows:

- The capping material will be underlain by a marker material. Consistent with the Green Square Town Centre project, the marker material shall consist of a bright coloured HDPE geotextile fabric constructed to a density greater than 300 grams per square metre (or equivalent).

Disturbance of the underlying fill material in the above open space areas will be managed as per the requirements of the Long-term EMP.

Regular inspections will be undertaken by the Validation Consultant to verify the appropriate installation of the marker material beneath the proposed Gunyama Park at the appropriate depth below the Final Finished Levels including the minimum 500 mm of crushed rock and/or validated suitable imported fill (as defined in **Section 9.2.3**, as appropriate). Photographic records will be maintained from the inspection(s) for inclusion in the Validation Report in addition to provision by the Principal Contractor of a survey showing the level(s) and lateral extent of the marker material.

7.3.3 Capping Material Installation

Inspection will be undertaken to verify the installation of the capping profile during placement of the suitable imported fill (as defined in **Section 9.2.3**) over the marker material. The following capping works will be undertaken:

- Gunyama Park beneath other open space areas - a minimum of 500 mm of validated suitable clean fill (as defined in **Section 4.2**). The capping material will be underlain by a marker material;
- Gunyama Park shallow landscaping and mass planting - minimum 500 mm capping depth;
- George Julius Avenue North – minimum 550 mm capping depth;
- Underground service corridors – minimum 850 mm capping depth. The services will be placed within imported fill and above the marker layer. If services are installed at greater depths, the depth of the imported fill and marker layer will be extended appropriately; and
- Planted tree areas – minimum 1.5 m depth capping depth.

The above capping material requirements are broadly in line with that being undertaken within the Green Square Town Centre infrastructure corridors. The typical cross-sections of the capping and marker layers are shown in **Appendix D**. The extent of the capping layer to be installed as part of the Stage 2 works is shown on **Figure 6** in **Appendix A**.

Capping would not be required in areas of the Site where the material is natural and uncontaminated or if there is a minimum of 2 m of validated clean material (as defined in **Section 4.2**).

In capping areas directly adjacent to the Site boundary, such works will be completed with use of a retention wall. The thickness of the capping material may be increased locally to provide suitable batter slopes for certain areas.

Photographic records will be retained from the inspection(s) for inclusion in the Validation Report in addition to provision by the Principal Contractor of a survey showing the final finished level(s) and lateral extent of the capping. The Validation Consultant will inspect the imported fill as it is brought to the Site.

8.0 Construction Management Procedures

This section identifies the broad environmental construction management measures that will be required to be implemented, specifically in relation to contamination on the Site, during the proposed development works. These measures are proposed to be incorporated into a Remediation Environmental Management Plan (REMP) to be prepared by the Principal Contractor (refer to **Section 8.1**).

8.1 Construction Environmental Documents

During construction the following Management Plans and Work Procedures will be prepared for the proposed development works at the Site:

Table 7 Construction Environmental Documentation

Project Plan	To be prepared by	To be approved by:
Remedial Action Plan (RAP) (this document)	AECOM	CoS/Site Auditor
Construction Environmental Management Plan	AECOM	CoS
Occupational Health and Safety Plan (OHSP)	Principal Contractor	CoS
Remediation Environmental Management Plan (REMP) including: • *Remediation schedule,* • *Hours of operation* • *Names and phone number for contact personnel* • *Traffic and Pedestrian Management Plan;* • *Noise and Vibration Management Plan;* • *Waste Management Plan;* • *Stormwater and Erosion Management Plan;* • *Air Management Plan; and* • *Flora and Fauna Assessment*	Principal Contractor	CoS
Asbestos Management Plan	Principal Contractor	CoS/Site Auditor
Acid Sulfate Soils Management Plan (ASSMP)	Principal Contractor	CoS/Site Auditor
Material Tracking Plan	Principal Contractor	CoS/Site Auditor
Quality Management Plan	Principal Contractor	CoS
Validation Report	Principal Contractor's Validation Consultant	CoS/Site Auditor
Long Term EMP	Principal Contractor's Validation Consultant	CoS/Site Auditor

8.2 Material Tracking Plan

All materials handled during the construction works will be tracked in accordance with the Material Tracking Plan (MTP) in order to allow verification of the correct movement and handling. The system will track materials from cradle-to-grave, and will provide detailed information on the location and quantity of all material movements both on and off-Site, so that the material being handled can be identified and accounted for. The tracking system shall include accurate tracking of stockpiles throughout the entire material handling stage and will included confirmation of stockpile locations and volumes. This is to reduce the risk of cross-contamination between stockpiles/spoil movement.

As part of this process, accurate records shall be kept to ensure that backfilling of excavations (where required) and potential reuse of material only occurs following the appropriate testing of the subject materials. Plans will be made with respect to the extent of each excavation. A register of all analytical results for stockpiles and excavations will be maintained throughout the soil testing works.

Standard forms shall be prepared as part of the MTP. The forms and their function shall include, but not be limited to:

- Off-Site Transport/Disposal Form: providing a record of materials removed from the Site and including the material type, quantity, origin, shipping destination, time/date removed from the Site, time/date placed at the offsite location and an approval by the nominated environmental consultant that the material meets the disposal requirements;
- Imported Fill Form: providing a record of materials imported to the Site including the date, material type, quantity, point of origin, intended use and the suitability of the material for use as backfill at the Site;
- Material Excavation Form: providing a record of excavated materials for each piling area or excavation on the Site including the date, material type, excavated quantity, origin and intended destination;
- Material Stockpiling Form: provides a record of all materials placed in stockpiles. The form will include the date, material type, stockpiled quantity, origin and intended end use; and
- Material Placement Form: this form provides a record of any materials backfilled on the Site and includes the date, material type, quantity backfilled and origin.

Each form shall be completed on a daily basis by the Remediation Contractor's representative and collated into a cumulative log (tracking register) for each process on a weekly basis. The template for the tracking register will be included in the MTP. Roles and responsibilities for materials tracking will be specified in the MTP.

8.3 Erosion and Sedimentation Control

This section outlines the broad environmental construction management measures that will be required for erosion and sediment control during the proposed works. Further detail will be provided in the *REMP* to be prepared by the Remediation Contractor.

To prevent erosion of surfaces and sedimentation of surface water during the construction works, appropriate measures should be implemented to manage:

- Excavations;
- Material stockpiling;
- Surface water flows; and
- Dust and odour generation.

These four aspects are addressed in the following sections, and supplement the *REMP* to be prepared for the construction works.

8.3.1 Management of Excavations

To minimise the amount of erosion and sedimentation during the proposed excavation works, as far as practicable, works should minimise the area of exposed, unsealed surfaces or extent of trenches at any one time, through sequencing of works and progressive excavation and restoration. Surface waters will need to be appropriately controlled during the excavation works.

When excavations are planned, diversion channels/drains should be constructed to divert clean water away from future open excavation areas (e.g. piling locations), exposed surfaces (e.g. stockpile areas) and areas of disturbed soils (e.g. unsealed roadways). Similarly, erosion and sediment control measures should be installed around and downslope of planned excavation areas and around stormwater drains, pits and outflows prior to the start of excavation to prevent silt laden water from migrating off-site.

To anticipate and plan for potential erosion and sedimentation incidents, erosive works should be deferred or re-scheduled after periods of heavy rainfall and during high wind periods.

Restoration of previously exposed surfaces, excavations and stockpiles may involve permanent solutions including asphalting/concreting or revegetating the area, or temporary measures such as seeding and/or covering. Restoration of a disturbed area is to be undertaken as soon as practicable. Trenches and excavations are to be covered as soon as feasibly possible through backfilling and sealing, to reduce the potential exposure of stormwater to sediment and/or contaminants.

8.3.2 Stockpiling of Materials

8.3.2.1 Stockpile Locations

Materials generated by the piling or excavation works will be stockpiled within a designated stockpile area. If the excavated material is considered to be significantly different to that encountered during the previous site investigations (i.e. Unexpected Finds Material), the stockpiled soil will then be tested for either potential reuse on the Site or to classify the material prior to being transported directly offsite to a licensed landfill facility. The soil testing works related to these works are detailed in **Section 9.2.2**. The volume of stockpiles formed from the discussed piling and excavation works will be confirmed as part of the MTP.

8.3.2.2 Stockpile Area Preparation

In the event that contaminated spoil material is temporarily stored on-site prior to being transported off-site, the following management measures will be implemented (further detail will be provided in the *REMP* to be prepared by the Remediation Contractor):

- A designated temporary spoil stockpile containment area is to be established on the Site on a concrete/asphalt surface or other relatively impervious layer such as or HDPE plastic where no hardstand is available;
- Stockpiles of excavated fill material or contaminated natural soils should be covered with plastic covers/tarps to mitigate risks associated with wind and water erosion;
- In addition to the sediment source controls, sediment filters (e.g. geotextile ‘sausages’, gravel / sandbags or similar) are to be installed around the Site’s active stockpiling areas. Sediment filters are to be installed at on-site stormwater inlets, grates and entry points of preferential drainage lines (if any) to reduce potential sedimentation;
- Signs will be erected at the entrance to the stockpile area and at locations around the stockpile specifying individual stockpile numbers and the type of materials stored; and
- Buffer zones will be established around each stockpile area to enable access to the stockpiles and minimise impacts of the stockpile area on the surrounding facilities. The location of the truck access to the stockpiles and stockpile area is not to impede the function of the diversion drains, bunding and erosion and sedimentation control measures outlined previously.
- Where stockpiles are placed on an unsealed ground surface (no plastic liner or pavement), validation sampling of the stockpile footprint will be undertaken as described in **Section 9.2.4**.
- Where stockpiles of imported validated material are placed on a unsealed (no plastic liner or hardstand) and unvalidated ground surface (on fill or potentially contaminated soil), the bottom, 0.1 m of the stockpile is to be treated and handled as potentially contaminated soil or fill and not used as fill above the marker layer. A visual inspection of the minimum 0.1 m base of stockpile will be inspected by the Validation Consultant to visually confirm that the stockpiled material handled hasn’t mixed with underlaying contaminated soils.

8.3.2.3 Stockpile Construction and Maintenance

The drainage, sediment and erosion control measures installed within stockpiling areas at the commencement of the construction works will be maintained, repaired and replaced where necessary for the duration of the stockpiling activities (in accordance with the REMP).

Stockpiles of excavated material are to be kept onsite for the shortest time period possible. All stockpiles are to be maintained in a tidy and safe condition with stable batter slopes (if required). Stockpiles of excavated Site fill/soils are to be kept in a separate area to any stockpiles of imported materials.

As discussed, while it is considered unlikely that stockpiles would be held onsite for the longer term, if required, such stockpiles should be covered with high density polyethylene (HDPE) plastic or stabilised with spray grass seeding to reduce dust generation and erosion.

Measures will be taken to reduce the generation of dust from stockpiles through the use of wetting and covers (refer to **Section 8.8**). Run-off will be managed by the use of surface bunding, silt fences and drainage diversions collected and prevented from moving onto other areas of the Site, off-site and/or into stormwater drains or waterways.

8.4 Water Management

Works are not to pollute waters, in accordance with the requirements of section 120 of the *Protection of Environment Operations Act* (*POEO Act*, 1997).

8.4.1 Surface Water Management

During construction works, stormwater entering the Site is to be minimised wherever possible by directing surface stormwater away from the Site. This can be accomplished using bunds, diversion drains and stormwater control measures constructed to divert clean water away and in particular around exposed areas, disturbed soils (e.g. piling works) and stockpiling areas.

Sediment control devices are to be installed around all stormwater drains, gutters and pits, and in depressions downstream of the Site, prior to the start of works, to prevent sediment-laden water from entering the stormwater system. Stormwater inlet / grate openings within the vicinity of works that have the potential to receive contaminated waters are to be blocked through the use of barriers surrounding the inlet.

Areas where on-site stormwater could come into contact with spoil / waste material, contaminated material, excavated areas (trench locations, prior to backfilling), open stockpiles, this stormwater is to be contained through the use of bunds (or similar), to allow stormwater collection, categorisation, appropriate water quality treatment and reuse, or, off-site disposal. No untreated sediment-laden surface water collected in these areas is to enter the stormwater system or is to be sprayed on other areas of the Site/vegetation without prior testing and treatment (if required).

If a wheel wash is installed, dirty water is to be pumped out and treated (e.g. with flocculent in a sealed skip bin) and reused onsite (if suitable) or disposed offsite at a licensed facility.

Before any on-site collected water is discharged to stormwater drains, sewers or other outlets, approval, permits and/or licences from relevant authorities will need to be secured. Water that fails to meet the criteria of the applicable permits and/or licences is to be pumped into waste storage containers for off-site disposal. The approximate amounts of stormwater either released or containerised for off-site disposal will be recorded, along with the results of laboratory testing, on a Stormwater Monitoring and Disposal Record Form. These disposal documents are to be retained by the Principal Contractor and reported, as required, with monthly waste generation reports prepared in accordance with the requirements of the *REMP*.

In addition, any chemical and fuel spills that occur will be cleaned up to prevent contamination of run-off (a more detailed description of spill management will be detailed in the *REMP*).

Stormwater control devices are to be inspected daily. Inspections of control devices during rain / storm events is to be undertaken at a higher frequency (to be determined based on the magnitude of the event), and on completion of the storm event to monitor the effectiveness of mitigation techniques. If warranted, the inspections should involve cleaning and/or replacement of devices if deemed that they are compromised.

8.5 Management of Asbestos Containing Materials

Based on the results of the site investigations and validation works conducted within the Stage 1 development area, ACM will be encountered in the Site's fill material. As such, an Asbestos Management Plan will be prepared prior to commencement of the construction works and will be implemented during the excavation works.

Identified ACM which requires removal under an Asbestos Management Plan will be collected and disposed of by a licensed Asbestos Removal Contractor (ARC) in accordance with the requirements of the following:

- NSW Work Health and Safety Act (2011);
- NSW Work Health and Safety Regulation (2017);
- Code of Practice: How to Safely Remove Asbestos, Safe Work Australia (2019); and
- Code of Practice: How to manage and control asbestos in the workplace, Safe Work Australia (2019).

The ACM removal works, where required by the Asbestos Management Plan, would be undertaken as follows:

- The Principal Contractor would establish appropriate barriers and signage around the area where ACM has been identified;
- The ACM will be suitably removed from the Site by an Asbestos Removal Contractor (ARC);
- Airborne asbestos fibre monitoring will be undertaken around the working area during the works to confirm that the ACM is being removed in an appropriately controlled manner (refer to **Section 8.9**);
- Validation soil samples will be collected at 10 m lineal intervals along the walls and base of any identified ACM impacted excavation areas and analysed for asbestos. Should the soils beneath the ACM be impacted with asbestos fibres, the impacted soils will be excavated for appropriate off-site disposal; and
- An ARC will conduct a visual inspection of the affected area to confirm that it is free of all visible ACM fragments. A clearance certificate will be prepared to document these works.

If ACM is encountered and removed during the excavation works, for the purposes of appropriately protecting the construction worker, residual soils must not contain asbestos (bonded or otherwise) as determined by the following:

- A visual inspection of the remediated area to confirm the removal of all visible ACM fragments; and
- No detection of asbestos in samples collected from the residual soils and submitted for analysis.

The additional works (including over-excavation if required) for management of ACM identified in residual soils for the protection of construction workers will be determined by the Asbestos Management Plan.

Asbestos air monitoring to be conducted during the remediation works is discussed in **Section 8.9**.

8.6 Classification for On-Site Reuse

As discussed in **Section 8.3.2.1**, stockpiled Unexpected Finds Material from the excavation works will be assessed for its suitability for reuse on-site, where required, by collection of representative samples and chemical analysis for the relevant CoPC (refer to **Section 3.2.1**). The analytical results will be assessed against the soil validation criteria as detailed in **Section 3.3**.

8.7 Waste Classification for Off-Site Disposal

Materials deemed not suitable for reuse at the Site or which require excavation to accommodate the redevelopment works will be assessed for off-site disposal in accordance with the NSW EPA (2014) Waste Classification Guidelines - Part 1: Classifying Waste.

Stockpile sampling would be undertaken at a frequency of one sample analysed per 100 m3 on the basis that the sampled materials are inspected by a qualified environmental scientist and are observed to be relatively homogenous. If the material is considered to be heterogeneous comprising different fill types, then a greater sampling density will be required.

Waste classification samples will be analysed for the following suite of analytes:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, mercury and zinc);
- TPH and BTEX;
- PAHs;
- Asbestos; and
- TCLP testing for heavy metals and PAHs, as required based on the primary results.

Based on the analytical data presented in **Section 2.9** and **0**, it is considered unlikely that onsite treatment works will be required as part of the offsite disposal works (i.e. the materials are likely to be classified as either General or Restricted Solid Waste which do not require treatment/stabilisation).

8.7.1 Off-Site Transportation of Materials

Classified waste is to be taken to an appropriate waste disposal facility licensed to receive such waste. Approval may need to be obtained from the respective landfill facility prior to transport. An application for such an approval would require an assessment of the DECCW Guidelines and an estimate of the likely volume of waste to be disposed.

The following material handling requirements will be implemented for trucks transporting materials off-Site:

- A licensed transporter is to be used to transport material to an appropriately licensed NSW EPA waste facility;
- All truck loads are to be filled to the correct level, no over-filling;
- Trucks carrying waste materials will be covered prior to exiting the Site and will remain covered until authorised to unload at the destination (NSW EPA licensed waste facility);
- Trucks will be fitted with seals to ensure that the movement of potentially saturated materials is undertaken appropriately. The integrity of the seals will be inspected and tested prior to commencement of each day's haulage works;
- Excess dust or load material is to be removed from vehicles prior to departure from Site, and as such may require the use of an onsite wheel wash or spray wash or similar. In the event that materials are tracked offsite, it is to be immediately cleaned up in a way that prevents contamination of land, the stormwater or waterways;
- Trucks will not wait in the streets surrounding the Site or within the Site area; and
- Trucks will exit the Site through predetermined exit points and will follow a predetermined transport route to the destination (landfill) via an approved route in accordance with the Principal Contractor *Traffic Management Plan* (yet to be prepared).

8.8 Air Quality Management

This section outlines a number of measures that are to be implemented on Site to reduce potential dust and odour issues that may be associated with the works, from a contamination perspective. These measures are to be adopted in accordance an Air Management Plan and Stormwater and Erosion Management Plan to be prepared as part of the REMP (refer to **Section 7.3.3**).

8.8.1 Odours

Based on the findings of the previous investigations, it is considered unlikely that significantly odorous materials would be generated during the construction works. If odorous materials are encountered, the following environmental control measures listed below are implemented.

An odour management system will be developed as part of the REMP to incorporate the use of various management options as deemed appropriate.

If required, the management of odours during the excavation and stockpiling works will include the following options:

- Investigation as to the source of odours including odour monitoring;
- Minimisation of the quantity or surface area of exposed odorous materials;
- Implementation of odour management response procedures (required to be specified in the REMP);
- Implementation of progressive contingency measures (required to be specified in the REMP);
- Covering of exposed odorous materials progressively or at the completion of each work period;
- Minimising exposed/excavation areas;
- Apply odour suppressant sprays or foams to excavation surfaces; and
- Undertake activities during favourable weather conditions.

Selection of the appropriate management and mitigation measures, including those summarised above, will be based on consideration of:

- The quantity of odorous materials that require remediation;
- The duration of the required remediation works and associated management of odorous materials;
- The proximity of the proposed remediation works to sensitive receptors;
- The prevailing and forecast weather conditions; and/or
- Other activities being undertaken at the Site in parallel with the remediation work.

8.8.2 Dust

To prevent unacceptable levels of dust being generated during the construction works, a number of appropriate measures should be implemented. These measures may include the following:

- Use of a water cart or water sprays to suppress dust in open areas and along unsealed internal roadways;
- Watering and installation of temporary sheeting to cover localised exposed areas and stockpiles;
- Hosing down spoil as it is excavated during excavation activities;
- Covering stockpiles of potential contaminated soil which will remain on the Site for more than 48 hours
- Alteration of the works program to minimise the extent of disturbed open areas;
- Consolidation of material stockpiles, where appropriate;
- Use of chemical dust-suppressants provided the chemicals do not pose a contamination or OHS hazard;
- Use of alternative coverings such as hydromulch to stabilise the surface of open disturbed areas and long-term stockpiles;
- Use of additional dust suppression features on items of dust generating plant and equipment;
- Installation and use of a wheel wash at the Site exit to remove material from Site vehicles;
- Securely covering all loads entering or exiting the Site; and
- Use of alternate work practices such as modified equipment to minimise dust generation.

8.9 Asbestos Air Monitoring

ACM in the form of bonded and friable asbestos is expected to be encountered randomly within the fill at the Site. Consequently, asbestos fibre air monitoring must be carried out during times when excavation of fill materials is conducted in accordance with the *Guidance Note on The Membrane Filter Method For Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC:3003(2005)].

The air monitoring must be carried out by a Licenced Asbestos Assessor to NATA Standards and in accordance with the Safework Australia *Code of Practice How to Remove Asbestos Safely*. If friable asbestos is discovered during the works, an independent licensed asbestos assessor will be required [independent of the Principal Contractor/Licenced Class A (friable) or Class B (non-friable) asbestos removalist].

The asbestos assessor will select the number and location of asbestos monitoring locations based on the daily site works and conditions. Typically the monitoring locations will be around the active excavation area (fill material), stockpile areas and site sheds/amenities on each day of remediation work.

Air monitoring samples are only to be analysed at a NATA accredited laboratory accredited to ISO17025 for asbestos counting.

The airborne asbestos monitoring results will be communicated to the site workers daily during pre-start/toolbox meetings at the commencement of the next work shift and a copy posted in the site office.

The following asbestos fibre control limits and actions applicable to the work will include:

Table 8 Asbestos Air Monitoring Action Levels

Level	Control Limit	Action
Acceptable limit	<0.01 fibre/mL	Equal to background and detectable limits. Level to achieve for air clearances.
Alert level	>0.01 fibres/mL	Review control measures, investigate the cause and implement controls to eliminate or minimise exposure.
Action level	>0.02 fibres/mL	Review control measures investigate the cause and implement controls to eliminate or minimise exposure. The licensed asbestos removalist (Remediation Contractor) must notify the regulator (WorkCover NSW) by phone followed by email, fax or written statement that work has ceased and the results of the air monitoring. Work may only recommence following receipt of air clearance monitoring results of <0.01 fibres/mL).

The air monitoring will continue until the final excavation surface has been inspected as clear of visible asbestos. Following the receipt of the final air clearance monitoring results of <0.01 fibres/mL, the asbestos work exclusion area may be entered without the need for asbestos exposure prevention PPE.

8.10 Noise and Vibration Management

The following measures are recommended to minimise potential noise and vibration impacts from excavation and compaction works on the Site, and are to be applied in conjunction with any conditions of development approval gained for the works:

- Unless contrary to the conditions of development approval, all reasonable and feasible measures are to be used to meet the construction noise management levels outlined in The City of Sydney Code of Practise for Construction Hours/Noise within the Central Business District (1992) and the NSW EPA Industrial Noise Policy (1999);
- Efficient silencers and low noise mufflers should be used on all plant and machinery where possible;
- Regularly maintain plant and machinery to minimise noise emissions;
- Face exhausts of plant and machinery away from receivers, where possible;

- Vibration monitoring may need to be undertaken during vibration generating activities (e.g. jackhammering, ground compaction) to determine compliance with NSW EPA guidelines at the nearest receivers; and
- The potential cumulative impacts of the proposed works in conjunction with other planned construction works in the area (i.e. on the Green Square Town Centre site) should be considered and appropriate mitigation measures adopted if required.

8.11 Site Access

The primary access route to the Site will be in accordance with the Review of Environmental Factors (REF) and approved Construction Site Management Plan. The main gate will control access to and around the Site during the development works.

Entry to any designated excavation works areas will be controlled through the use of a sign-on/sign-off log system at the main gate. Only authorised personnel will be allowed into the excavation works area.

Personnel will gain access to excavation areas only after they have:

- Attended and completed a Site safety induction briefing (applicable to all Site workers and visitors);
- Are wearing all applicable personal protective equipment (PPE) as detailed in the OHSP; and
- Been inducted into the OHSP.

All construction vehicles and delivery vehicles will enter the Site through the nominated entry point.

8.12 Work Health and Safety Signage

Work Health and Safety (WHS) signage will be installed at the Site entrance detailing the location of the Site offices, construction/excavation works, first aid facilities and parking. Traffic restrictions will be installed to limit access further into the Site and ensure the safety of Site visitors.

Signage at the main gate will include after-hours contact details. Additional signage will be erected along Exclusion Zone boundaries to restrict access to these areas to authorised personnel only.

8.13 Hours of Operation

Hours of operation must be in accordance with the REF and the City of Sydney Code of Practice for Construction Hours/Noise 1992.

9.0 Validation Plan

This section provides a description of the validation methodology to be adopted by the Validation Consultant during the remediation works.

The information presented herein is of a summary nature only. If required, specific details could be documented in a *Sampling, Analysis and Quality Plan* (SAQP).

9.1 Project Team

The Project Team must include a suitably qualified Validation Consultant with experience working on contaminated sites and trained in the requirements of this RAP. Decisions related to validation will be made in accordance with relevant guidelines endorsed by the NSW EPA.

9.2 Soil Validation Plan

9.2.1 Unexpected Finds Material

The validation of Unexpected Finds Material will be conducted to assess whether it can be reused onsite as follows:

- All Unexpected Finds Material proposed to be reused as fill materials below the capping layer and down to a depth of 2 m below the Final Finished Level in the Gunyama Park area shall be sampled at a frequency of one sample per 70 m^3 (consistent with the Green Square Town Centre project);
- Samples shall be analysed for the CoPC listed in **Section 3.2.1**(i.e. lead, TPH, BTEX, PAHs and asbestos) in combination with consideration of the source location and material inspection. A detailed and systematic inspection will be completed of the material to assess the potential presence of visible ACM prior to final placement. This will comprise supervision of excavation of the Unexpected Finds Material and inspection during stockpiling of the material. The material will be visually assessed and field screened using a photoionisation detector;
- The validation samples will also be tested to assess the leachability of lead and benzo(a)pyrene concentrations under a neutral leaching conditions (using the ASLP). This testing will confirm that potentially lead and benzo(a)pyrene impacted materials are suitability immobile. The lead and benzo(a)pyrene ASLP results in the materials is required to be less than the adopted ANZG (2018) trigger values for marine aquatic ecosystems to enable onsite reuse; and
- Fill materials shall be inspected for consistency by the Validation Consultant. Material which is found to be aesthetically dissimilar to the fill materials exposed in general at the Site shall be assessed as per the protocols for unexpected finds. Malodorous materials shall be analysed for TPH and VOCs (in addition to the CoPCs discussed above).
- Should fill or soils with indicators typical of acid sulfate soils (black colouration and rotten egg odour) and more than 1 tonne of the material require excavation from the Site in total, the procedures in the ASSMP will be implemented.

The following rules will apply to the soil testing data when assessing against the soil validation criteria (refer to **Section 4.0**) by statistical analysis:

- No single analyte concentration shall exceed 250% of the soil validation criteria for each CoPC; and
- The standard deviation of the results must be less than 50% of the allowable maximum specified for each CoPC.

If the above validation testing of the Unexpected Finds Material indicates that the material is suitable for reuse beneath the Gunyama Park capping layer, the material will also be inspected as it is placed in this area to ensure it is similar to the materials that were tested and analysed during the above validation sampling.

9.2.2 Underground Storage Tanks

If any USTs and related infrastructure are encountered during the excavation works, soil characterisation / validation sampling of the resulting excavation will be completed in accordance with NSW EPA (2014) *Technical Note: Investigation of Service Station Sites*, as follows:

9.2.2.1 Validation of Excavations

The validation of UST excavations will be undertaken as follows:

- **Tank Pit Excavation - Walls**: a minimum of two samples will be collected and analysed per tank, with a sample taken from each tank wall. Samples will be selected for analysis based on results of both field observations and field screening results (refer **Section 9.2.2.3**). Samples will also be distributed across soil types (i.e. multiple wall samples may be collected and analysed);
- **Tank Pit Excavation - Floor**: at least one sample will be collected and analysed from beneath each removed UST and / or every 10 m^2 thereafter;
- **Fuel Dispensing Pumps - Base**: one sample will be collected and analysed beneath each dispensing pump backfill and one per natural soil (if considered required);
- **Fuel Feed Lines to Dispensing Pumps** - one sample will be collected and analysed per 5 m of trenching from excavated fuel lines; and
- **Remote Fill Points** - one sample will be collected and analysed per fill point.

Samples will be collected by the following method:

- Directly from the bulk samples within excavator bucket using a trowel and gloved hand; and
- Hand auger safely in accessible areas.

9.2.2.2 Stockpile Characterisation Sampling

Soil removed during UST excavation works will be sampled at a minimum rate of one sample per 25 m^3, or one sample per stockpile for stockpiles smaller than 25 m^3. Samples will be collected directly from the stockpiles using a trowel and gloved hand.

9.2.2.3 Field Screening

Each soil sample will be split in the field to provide a sub sample for screening for Volatile Organic Compound (VOCs) using a Photo-Ionisation Detector (PID). The result of the PID screening will be used to help identify which samples to send for laboratory assessment, along with other field observations. Field screening of soil samples by organic vapour analysers will follow the headspace method to minimise the loss of volatiles (as per Section 7.4.3 in Schedule B2 of the NEPM (2013 *as amended*).

The PID will be supplier calibrated prior to delivery and additionally calibrated using fresh air and gas standard (isobutylene or similar) in the field at the beginning of each sampling day. Calibrations certificates from the supplier and daily field calibrations will be maintained on the project file.

9.2.3 Imported Fill

Any material imported to the Site will be required to meet the environmental and geotechnical requirements specified for the particular end use.

It is expected that materials imported to the Site for the capping works or for use as growing media will meet the validation criteria detailed in **Section 4.0**.

The frequency of soil sampling will be dependent on the source of the fill material. If the material is brought onto the Site from a quarry, and the material is homogeneous, soil testing will consist of:

- a certificate warranting that the material is VENM or demonstrating the physical and chemical quality of the fill, including supporting test data; and
- visual confirmation that the material is free from contamination as it is imported to the Site.

If the imported material (including landscaping materials such as mulch) cannot be certified as VENM or clean quarry material by the supplier, the following works will be undertaken by the Validation Consultant:

- Site inspection of the source site and the reporting of these findings in the relevant reports; and
- One sample per 70m^3 will be collected and analysed or a minimum of 10 samples per source (consistent with the Green Square Town Centre project). This sampling density may be decreased depending on the quantity of material to be imported from a given source and the initial laboratory analytical results. Any change in sampling density will be determined in consultation with the NSW EPA Accredited Site Auditor; and
- Visual confirmation that the material is free from contamination as it is imported to the Site.

Samples will be collected and analysed from the source location and the suitability of the material assessed by the Validation Consultant, prior to import of the material to the Site.

All soil samples will be analysed for the following suite of potential contaminants:

- Metals (As, Cd, Cr, Cu, Ni, Pb, Zn and Hg);
- PAHs and phenols;
- TPH/BTEX;
- OPPs and OCPs;
- PCBs; and
- Asbestos.

The analytical results will also be assessed to ensure they are representative of background concentrations – that is, metals concentrations are very low and organics non-detect.

The above testing regime will also be undertaken for recycled concrete, crushed rock (non-quarry), topsoil or any other imported product prior to importation to the Site.

9.2.4 Stockpile Footprint Validation

Where stockpiles of excavated fill or potentially contaminated soil are placed on the unsealed ground surface (no plastic liner or pavement and not on fill), validation samples are to be collected at a rate of 1 per one sample per 25 m^2 (on a 5 m grid).The validation samples will be analysed for CoPC and visual asbestos clearance of the surface undertaken by a licensed asbestos assessor (LAA).

9.3 Quality Assurance / Quality Control

The Validation Consultant should adopt the Data Quality Objectives (DQO) process, which have been developed based on the iterative DQO process developed by the USEPA (2000) *Guidance for the Data Quality Objectives Process - EPA QA/G-4* and adopted by NSW DEC (2006).

The guidelines incorporate field quality control and laboratory analysis, methods and information on laboratory quality control data and will be used to validate the field and analytical data for the validation works. Assessment of the achievement of the DQOs must be undertaken through reference to the Data Quality Indicators (DQIs) of completeness, comparability, representativeness, precision and accuracy.

Components of the field and laboratory programs (including quality assurance) are briefly presented in the following sections.

9.3.1 Sampling Methodology

Field procedures will be undertaken with reference to:

- National Environmental Protection (Assessment of Site Contamination) Amendment Measure (NEPC, 1999 as amended) *Schedule B2, Guideline on Site Characterisation*; and
- ANZECC (2000) - Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council (ANZECC/NHMRC), "*Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*", January 1992.

The general soil sampling strategy would be as follows:

- All soil samples will be collected into laboratory prepared and supplied glass jars with Teflon lined lids. The sampling locations will be accurately recorded (by survey wherever possible). Sample depths (where appropriate) will be recorded by tape measure. To assist surveying, labelled sample location markers (e.g. survey pegs or similar) will be used;
- Screening of the vapour headspace of soil samples for volatile organic compounds (VOCs) will be undertaken in the field using a PID. Observations for odours, staining and other unusual conditions will also be made. Sample collection will be biased towards detecting contamination;
- All samples will be collected using decontaminated equipment and a new pair of nitrile gloves;
- Samples for analysis for organic compounds will be placed on ice; and
- All samples will be forwarded to an analytical laboratory for analysis under chain-of-custody protocols.

9.3.2 Field and Laboratory QA/QC

Collection of field quality control samples will include:

- Blind duplicate soil samples (intra-laboratory) will be analysed at a rate of 1 per 20 primary samples;
- Split duplicate samples (inter-laboratory) will be analysed at a rate of 1 per 20 primary samples; and
- Where required, rinsate or equipment blank samples will be collected and analysed at a rate of 1 sample per day of sampling activities.

Additionally, the PID will be calibrated prior to the start of field activities and daily during field activities. Calibration records will be provided in the Validation Report.

Laboratory QA/QC procedures will comprise the following at a minimum:

- Laboratory Duplicate Samples: at least one per batch (where the batch exceeds five samples);
- Matrix Spiked Samples: at a rate of approximately 5% of all analyses. At least one per batch will be reported;
- Laboratory Blanks: at least one per batch and one per analyte;
- Laboratory Control Samples: analysed at a rate of at least one per process batch, and typically at a rate of 5% of analyses; and
- Surrogates: at least one per sample.

9.3.3 Laboratory Analyses

All laboratory analyses will be conducted by laboratories using methods accredited by the National Association of Testing Authorities, that adhere to the international standard methods referred in the ANZECC (1996) guidelines and Schedule B(3) of the NEPC (2013).

9.3.4 Decision Rules

To evaluate the sample analysis data, the following decision rules will be applied:

- Sampling locations are to be recorded by survey;
- Comparison of the sample analysis results to the soil validation criteria;
- Qualitative assessment of potential risk associated with any ‘elevated’ result(s);
- If required, assessment of data through checking that each individual sample concentration does not exceed the soil validation criteria by more than 250%;
- Calculation of the Upper Confidence Limit (UCL) on the average concentrations (of the relevant contaminant(s)) at a confidence level of 95 % (95 % $UCL_{average}$). This would include excavation and stockpile samples;

- If required, calculation of the standard deviation of the data. The standard deviation should be less than 50% of the validation criteria;
- Assessment of the sampling results for any soil/waste to be disposed off-site in accordance with NSW EPA (2014) *Waste Classification Guidelines*; and
- Assessment of the reliability of both the field and laboratory programs by reference to DQIs.

Where data indicates that unacceptable concentrations of chemical contaminants remain, the excavation and stockpiling process will be required at the relevant location(s).

9.4 Validation Reporting

A Validation Report will be prepared by the Validation Consultant on completion of remediation works. The report will contain an overview of the remediation activities conducted and details of the following:

- A survey plan of the site boundary;
- Volumes of excavated material and location of excavations/stockpiles;
- Field observation of the piling and excavation works, and observations of any Unexpected Finds Material;
- Tracking of materials disposed off-site or reused on other parts of the Site;
- Validation field methods;
- Plan of validation sampling locations;
- Site photographs;
- Analytical results of validation and characterisation soil samples and related QA/QC results;
- Confirmation that the required capping layer extends across all proposed public open space areas; and
- A conclusion regarding the completeness of remediation and the suitability of the Site for the proposed land uses.

Supporting factual evidence will be included in the report. This will include a Stockpile Register for the project, landfill disposal certificates, VENM certificates (if required), NATA ‘stamped’ laboratory analysis certificates, interpretative summary tables and an overview of the works carried out during the remediation process. The report will include an assessment of all results and evaluation of the suitability of the Site for the proposed land use.

The Validation report will be prepared in accordance with the relevant NSW EPA endorsed guideline documents.

9.5 Long-Term Environmental Management Plan

Part of the Site validation process includes the preparation of a long-term EMP by the Validation Consultant in accordance with NSW EPA (2020) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land* and endorsement of the EMP by the Site Auditor. The existing Gunyama Park Aquatic and Recreation Centre Long Term EMP (JBS&G, 2020b) will be updated to include the Site.

The EMP includes the following:

- roles and responsibilities for implementing the EMP on an ongoing basis at the Site (including site inductions;
- the surveyed location of capped areas (confirmation via as-built construction plans);
- a summary of the CoPC and the areas of potential concern if the cap is proposed to be penetrated/excavated;
- requirement to maintain the integrity of the capping layer (refer to **Section 7.3.3**);

- ongoing environmental monitoring required (if any);
- management measures for potential future intrusive works within the proposed public open space areas (Gunyama Park); and
- requirement for the EMP to be included in the Site's Environmental Management System.

10.0 Conclusion

This RAP has generally been prepared to meet the requirements of the DUAP and EPA (1998) Managing *Land Contamination: Planning Guidelines, State Environmental Planning Policy (SEPP) 55 - Remediation of Land* considered for the preparation of this RAP and relevant NSW EPA endorsed guidelines including the NSW EPA (2020) *Contaminated Land Guidelines: Consultants Reporting on Contaminated Land*.

It is concluded that upon successful implementation of the selected remediation strategy described by this RAP (and any associated EMP) and in conjunction with the proposed Stage 2 development works, the Site will have been made suitable for the proposed Gunyama Park (recreational open space) and George Julius Avenue North roadway.

11.0 References

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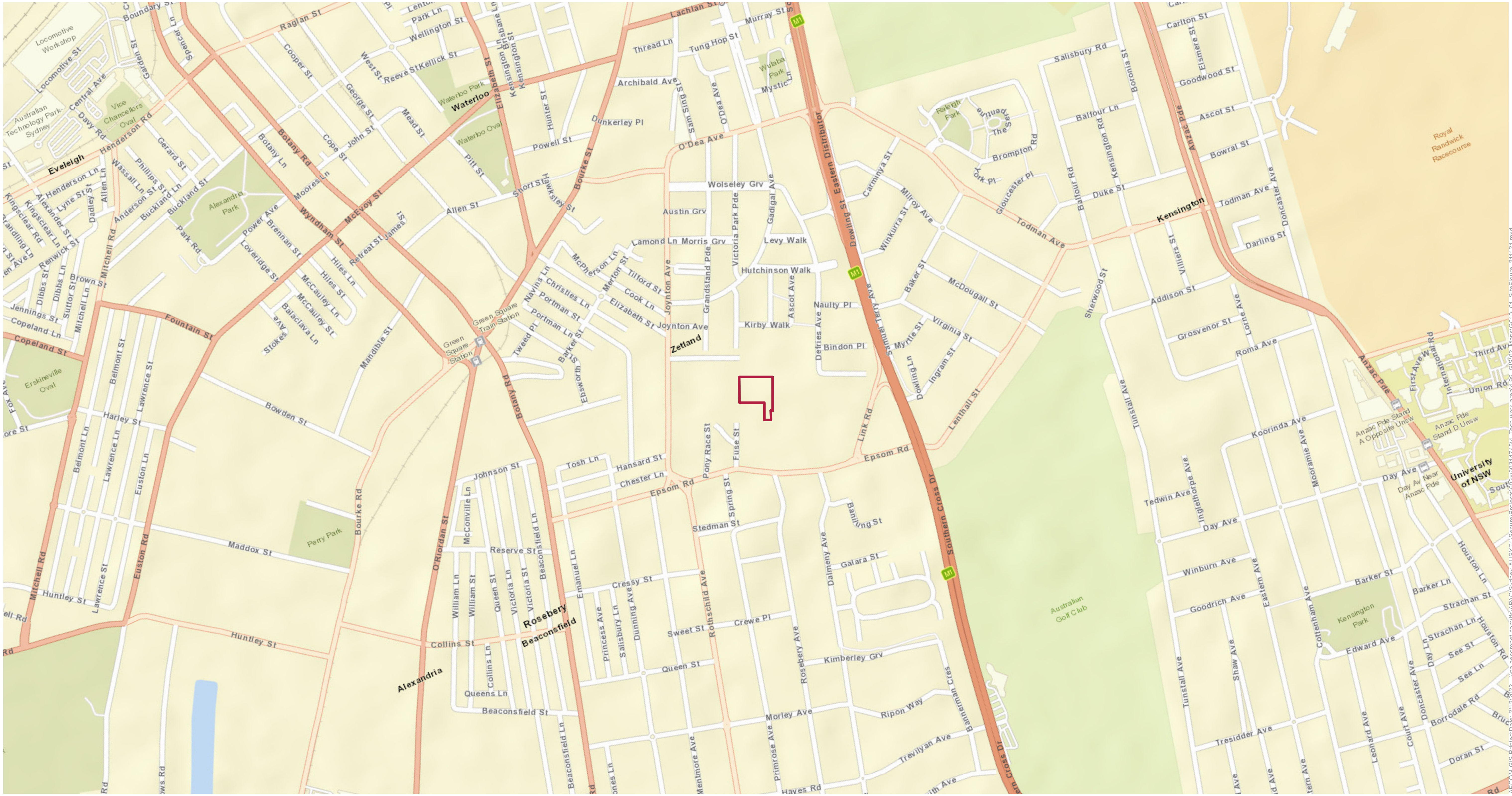
Appendix A

Figures



KEY

Site Boundary

0 120 m

Disclaimer Spatial data used under licence from Land and Property Management Authority, NSW © 2015.

AECOM makes no representations or warranties of any kind, about the accuracy, reliability, completeness, suitability or fitness for purpose in relation to the map content.

SCALE 1:10,000 SIZE A3

SHEET 1 of 1 COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 1 - Gunyama Park and George Julius Avenue North Site Location

PROJECT GREEN SQUARE TOWN CENTRE

CLIENT CITY OF SYDNEY

DRAWN		DATE		MAP #	REV	Project
	SC		2/12/2022			
CHECK		DATE		G002	05	60477507

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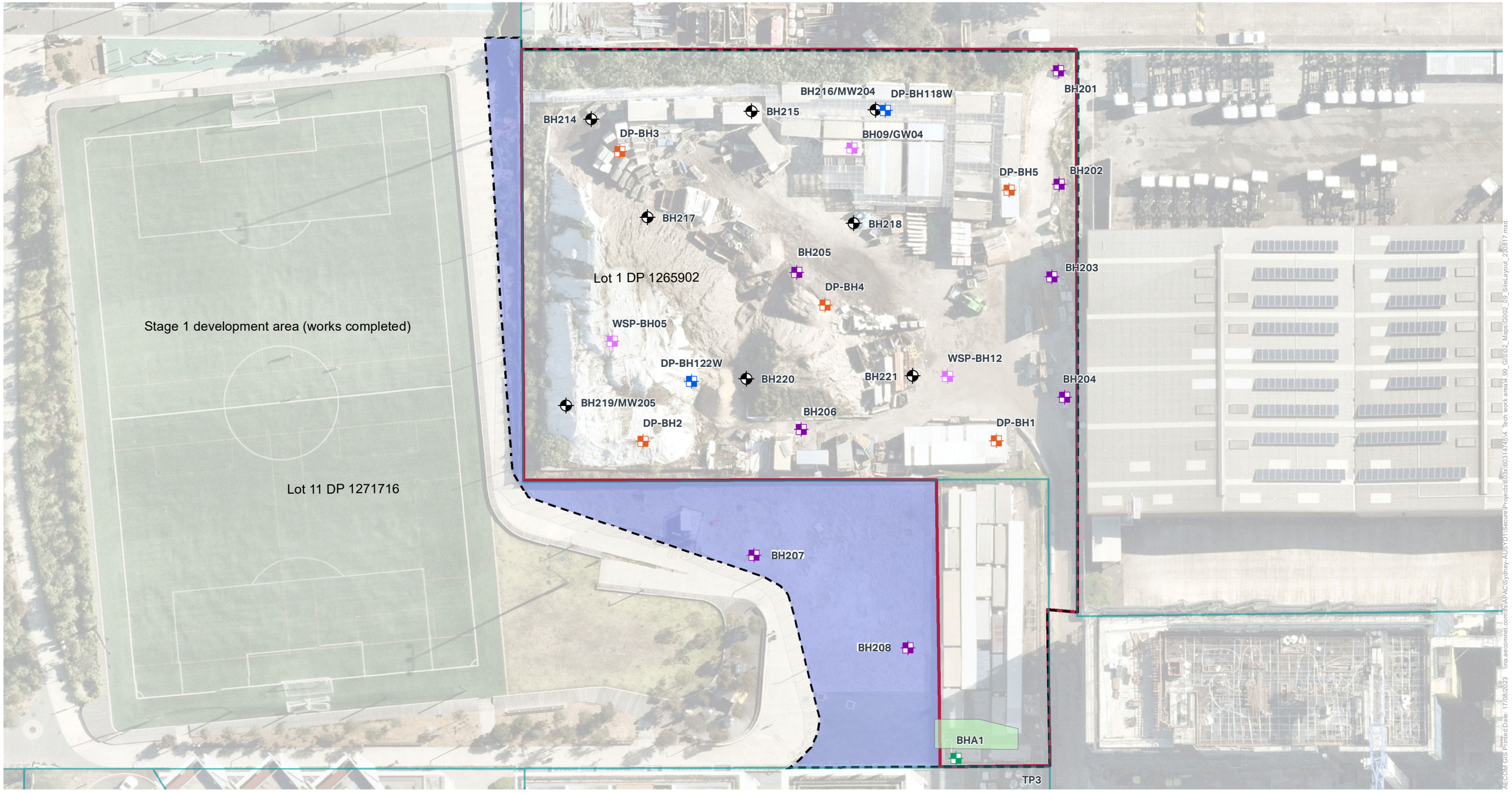

KEY

- Site Boundary
- Stage 2 boundary
- Cadastral boundary
- UST excavation (removed and validated during Stage 1 (JBS&G 2020)
- Remediated and validated during Stage 1 (JBS&G 2020)
- AECOM (2015) borehole locations
- Previous borehole location (DP, 2009)
- Previous borehole/well location (WSP, 2012)
- Previous borehole location (DP, 2016)
- Previous borehole location (JBS&G 2020)
- Previous borehole location (DP, 2023)

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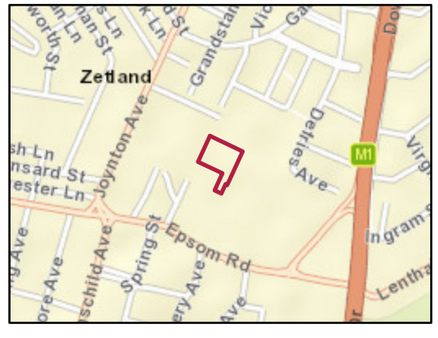

SCALE 1:600 | SIZE A3

SHEET 1 of 1 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 2 - Gunyama Park and George Julius Avenue North Soil Borehole and Monitoring Well Locations

PROJECT GREEN SQUARE TOWN CENTRE

CLIENT CITY OF SYDNEY

	DATE	MAP #	REV	Project
DRAWN	17/08/2023	G002	07	60477507
CHECK	DATE			

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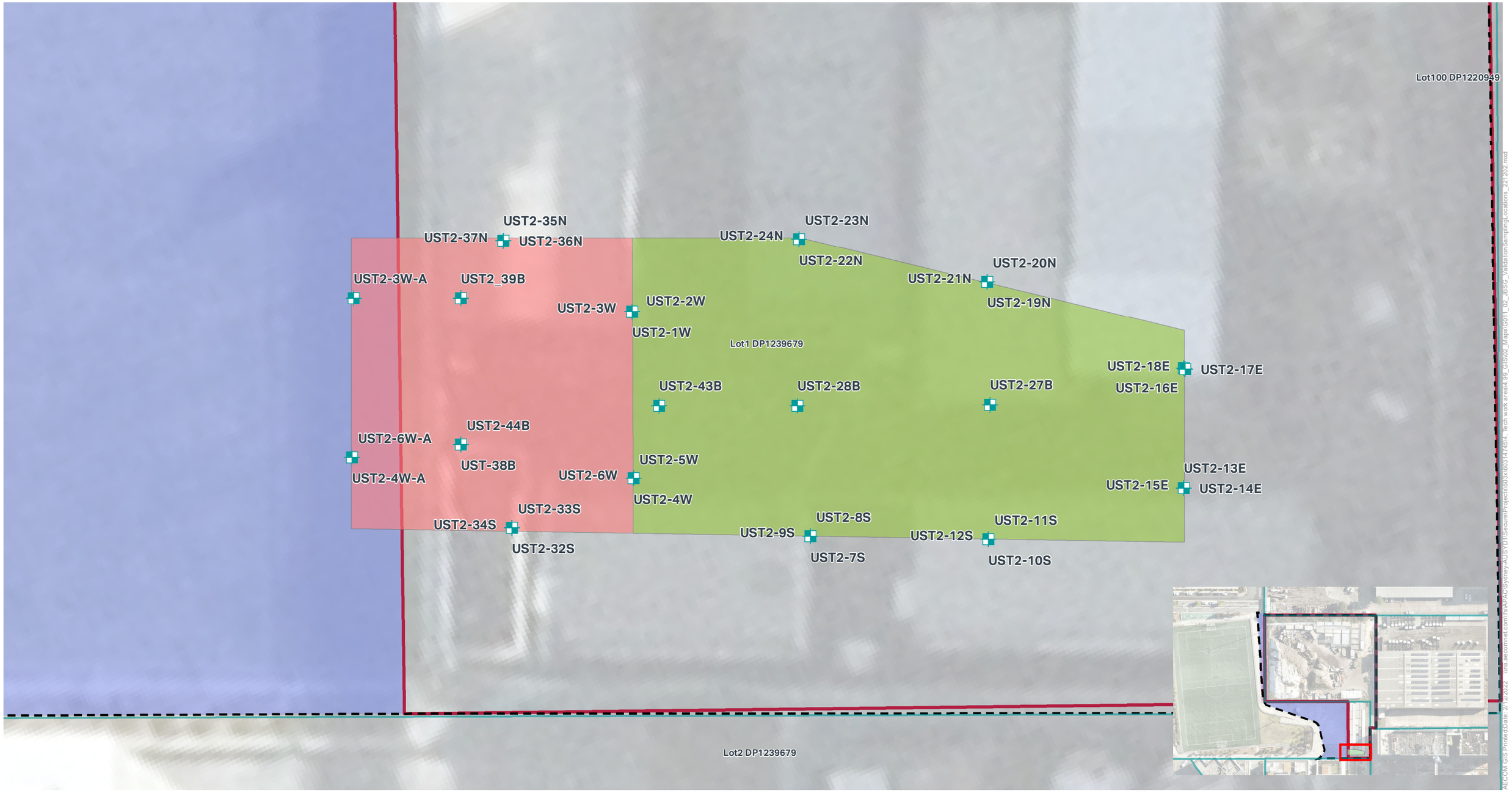

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- Stage 2 boundary
- Cadastral boundary
- UF02
- UF02-Extension
- Remediated and validated during Stage 1 (JBS&G 2020)
- JBSG_ValidationSamplingLocations_01pt_221202

0 1 2 m

SCALE 1:60 | SIZE A3

SHEET **1 of 1** | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

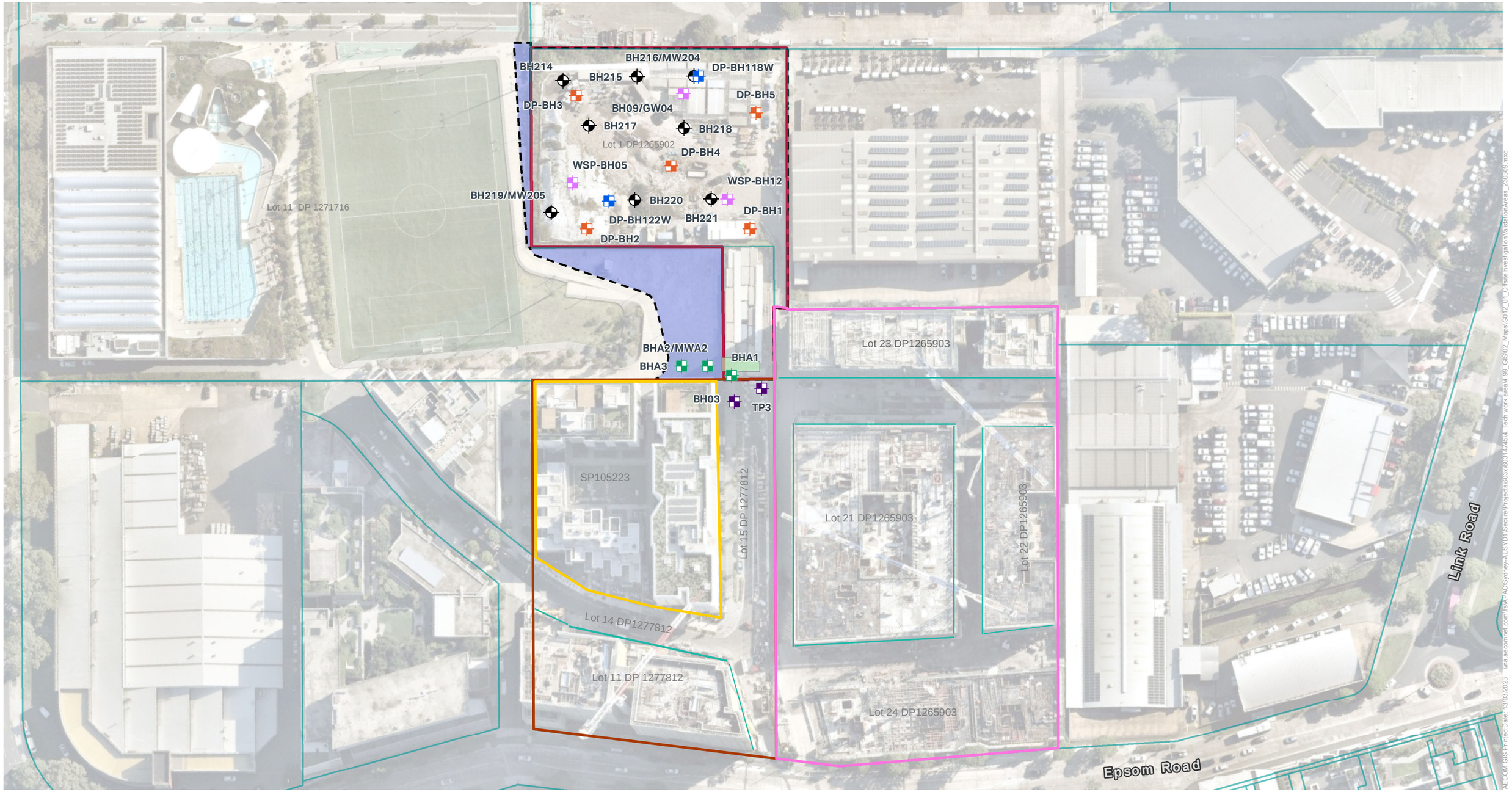
FIGURE 3 - Gunyama Park and George Julius Avenue North Validation Sampling Locations

PROJECT GREEN SQUARE TOWN CENTRE

CLIENT CITY OF SYDNEY

DRAWN	DATE 2/12/2022	MAP #	REV	Project
CHECK	DATE	G002	07	60477507

JJ



KEY

- Site Boundary
- Stage 2 boundary
- Cadastral boundary
- ADE (2021a) validation boundary
- ADE (2021b) basement validation boundary
- EI (2020) investigation boundary
- UST excavation (removed and validated during Stage 1 (JBS&G 2020)
- Remediated and validated during Stage 1 (JBS&G 2020)
- AECOM (2015) borehole location
- Previous borehole location (DP, 2009)
- Previous borehole/well location (WSP, 2012)
- Previous borehole location (DP, 2016)
- Previous borehole location (JBS&G 2020)
- Remediation excavation (ADE, 2021a)

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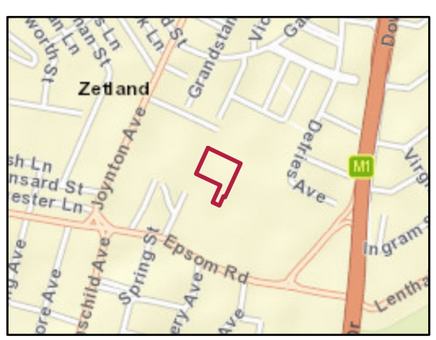


SCALE 1:1,300
SIZE A3
SHEET 1 of 1
COORDINATE SYSTEM GDA 1994 MGA Zone 56
TITLE

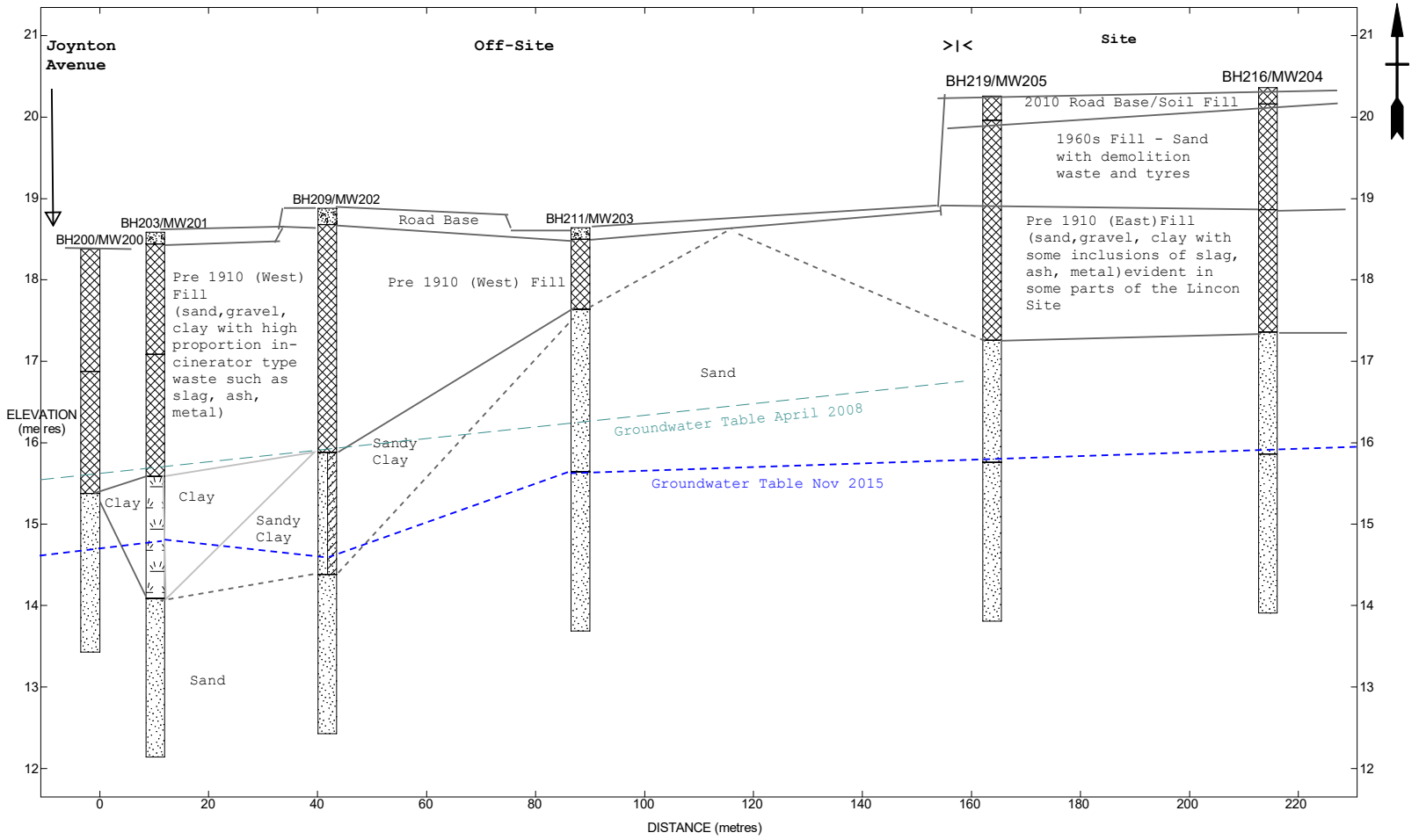
FIGURE 4 - Gunyama Park and George Julius Avenue North Off-Site Investigation and Validation Areas

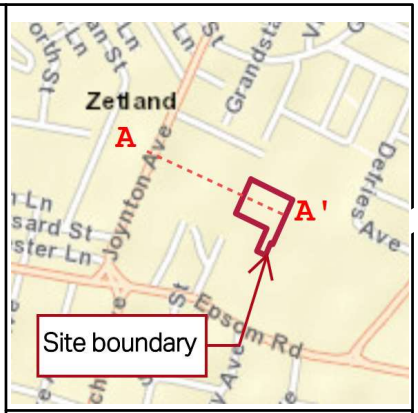
PROJECT GREEN SQUARE TOWN CENTRE
CLIENT CITY OF SYDNEY

DRAWN	DATE	MAP #	REV	Project
JJ	13/03/2023			
CHECK	DATE	G012	08	60477507

Figure D4 A-A'
Cross Section

North West ◄ — ► South East





Site Map Scale 1:3,175

Explanation:

BH200/MW200 — Borehole Number

Borehole Lithology — Well Construction

Encountered Water Level

Stabilised Water Level

Horizontal Scale (metres)

Vertical Exaggeration: 15x

Lithology Graphics

- Fill (made ground)
- USCS Poorly-graded Sand
- Concrete
- USCS Peat
- USCS Poorly-graded Sand with Clay

Well Graphics

0 17

AECOM

AECOM Australia Pty Ltd

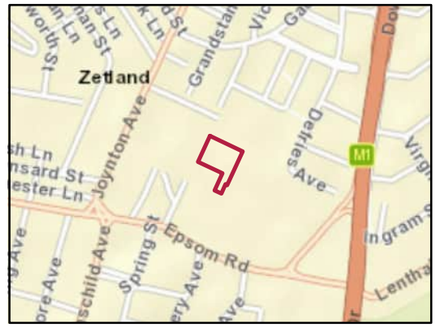
FIGURE NUMBER	
F5	Gunyama Park -
JOB NUMBER	
60477507	

BORELOGS_NOV2015 60477076.GPJ 16/12/15

KEY

- Site Boundary
- Stage 2 boundary
- Cadastral boundary
- UST excavation (removed and validated during Stage 1 (JBS&G 2020)
- Remediated and validated during Stage 1 (JBS&G 2020)
- Extent of capping within the park
- Extent of capping within the road reserve
- AECOM (2015) borehole locations
- Previous borehole location (DP, 2009)
- Previous borehole/well location (WSP, 2012)
- Previous borehole location (DP, 2016)
- Previous borehole location (JBS&G 2020)

0 10 20 m



SCALE 1:600 | SIZE A3

SHEET 1 of 1 | COORDINATE SYSTEM GDA 1994 MGA Zone 56

TITLE

FIGURE 6 - Gunyama Park and George Julius Avenue North Capping Extent

PROJECT GREEN SQUARE TOWN CENTRE

CLIENT CITY OF SYDNEY

DRAWN	DATE	MAP #	REV	Project
JJ	29/05/2023	G002	07	60477507
CHECK	DATE			

Appendix B

Development plans

place design group.

SYDNEY
Unit 3B
830/832 Elizabeth Street
Waterloo NSW 2017
T + 61 2 9290 3300

PROJECT

GUNYAMA PARK
STAGE 2

CLIENT

CITY OF SYDNEY

NOTES

ALL DRAWINGS TO BE PRINTED IN COLOUR.

ALL SIZES AND DIMENSIONS ARE INDICATIVE + FOR COSTING PURPOSED ONLY.

CONTRACTOR IS TO PROVIDE SHOP DRAWINGS FOR APPROVAL AND ALL DIMENSIONS ARE TO BE CHECKED AND VERIFIED ON SITE PRIOR TO COMMENCEMENT OF WORKS.

SIZES OF AND DIMENSIONS TO ANY SERVICE ELEMENTS ARE INDICATIVE ONLY. ACTUAL SIZES/DIMENSIONS TO BE CONFIRMED ON SITE.

MARIST COLLEGE TO PROVIDE SURVEY FOR SUPPLEMENTARY CONSTRUCTION DOCUMENTATION + SETOUT DRAWINGS

DRAFT

ISSUE	CODE	ISSUE DESCRIPTION	BY	CHK	DATE
01	PRE	ISSUE FOR INFORMATION	RH	LI	20.06.2023

PRE - Preliminary | CA - Council Approval | T - Tender | CON - Construction

DRAWING TITLE

SITE PLAN

DESIGN : BP
DOCUMENT : RH
PROJECT : 2522146

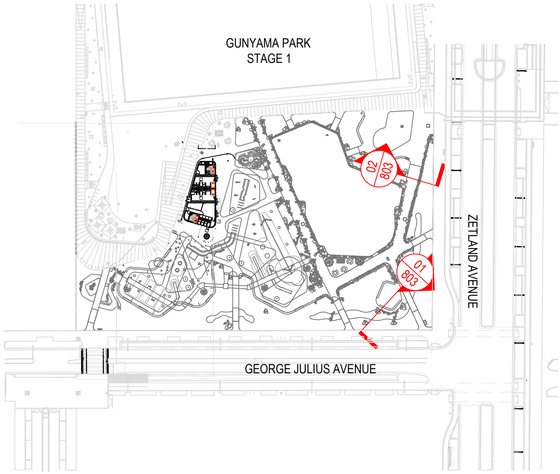
NORTH

2 0 2 4 6 8 10 12 metres

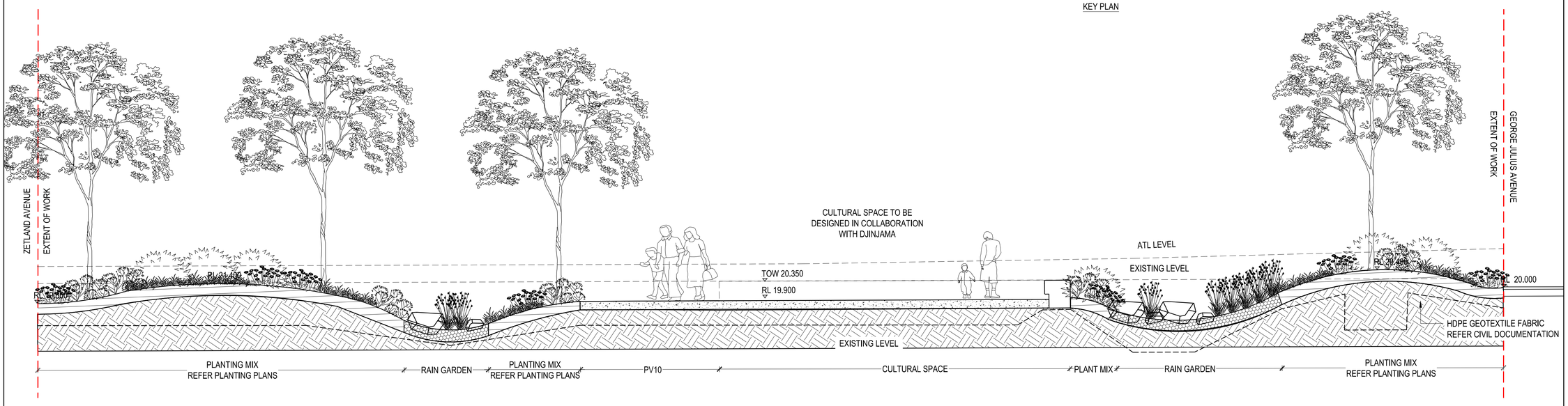
SCALE 1:250 @ A1 1:500 @ A3

DRAWING NUMBER GP_2522146-001

REVISION 01



KEY PLAN



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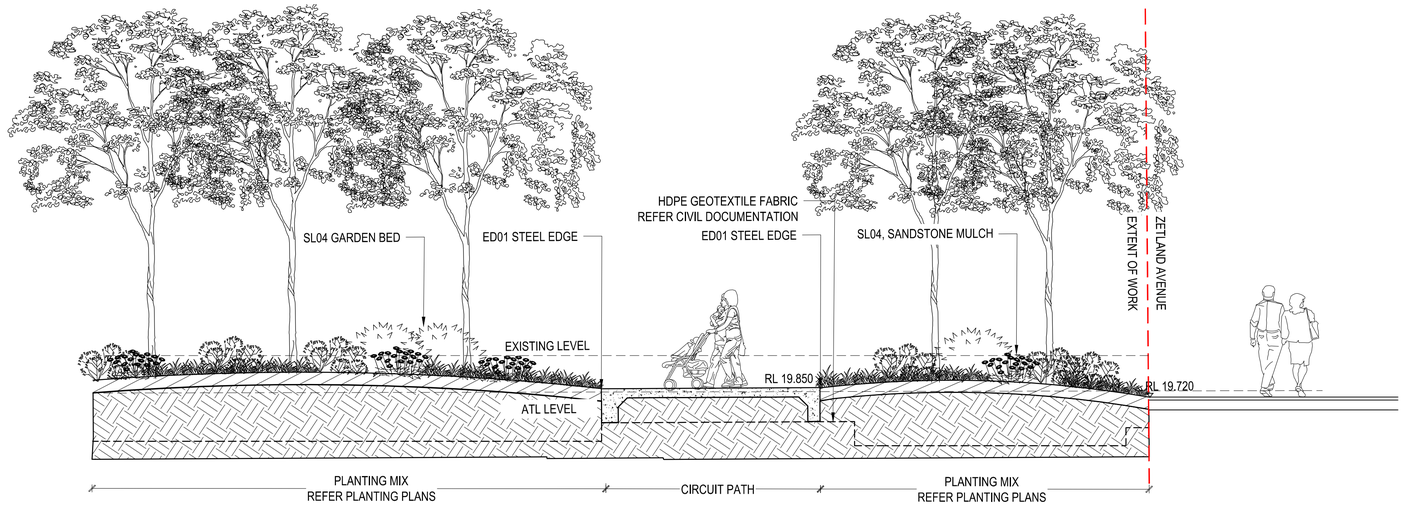
SCALE 1:50



02 803 SECTION - VEHICLE ACCESS AND CIRCUIT PATH
SCALE 1:50

place design group.

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T + 61 2 9290 3300

PROJECT

GUNYAMA PARK
STAGE 2

CLIENT

CITY OF SYDNEY

NOTES

ALL DRAWINGS TO BE PRINTED IN COLOUR.

ALL SIZES AND DIMENSIONS ARE INDICATIVE + FOR COSTING PURPOSED ONLY.

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MARIST COLLEGE TO PROVIDE SURVEY FOR SUPPLEMENTARY CONSTRUCTION DOCUMENTATION + SETOUT DRAWINGS

DRAFT

ISSUE	CODE	ISSUE DESCRIPTION	BY	CHK	DATE
01	PRE	ISSUE FOR INFORMATION	RH	LI	20.06.2023

PRE - Preliminary | CA - Council Approval | T - Tender | CON - Construction

DRAWING TITLE

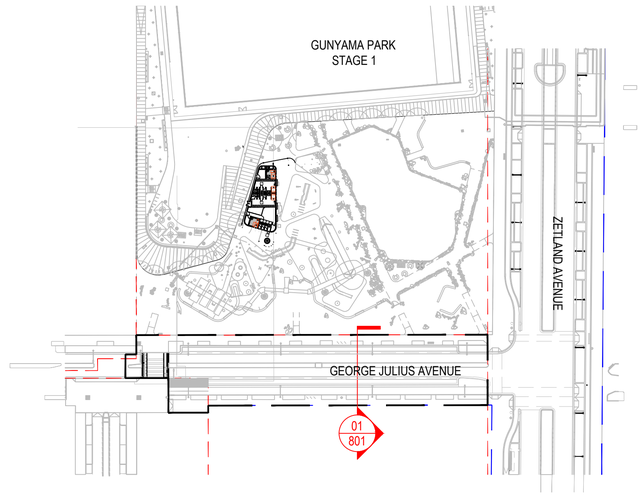
SECTIONS

DESIGN : BP
DOCUMENT : RH
PROJECT : 2522146

NORTH

SCALE AS SHOWN @ A1

DRAWING NUMBER	REVISION
GP_2522146-803	01



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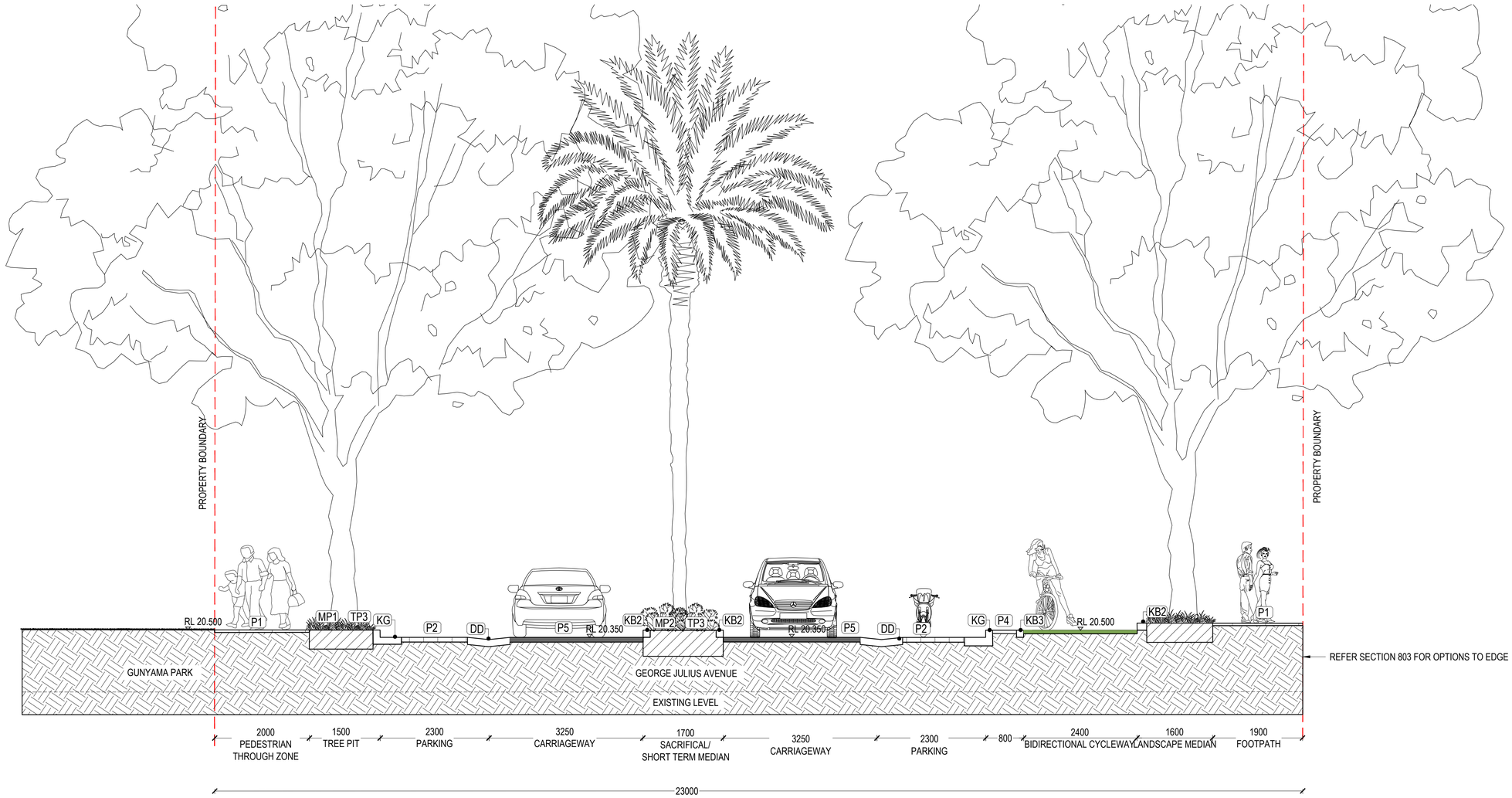

01
801
SECTION - GEORGE JULIUS AVENUE
SCALE 1:50

place design group.

SYDNEY
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Waterloo NSW 2017
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PROJECT

GUNYAMA PARK
STAGE 2

CLIENT

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DESIGN : BP
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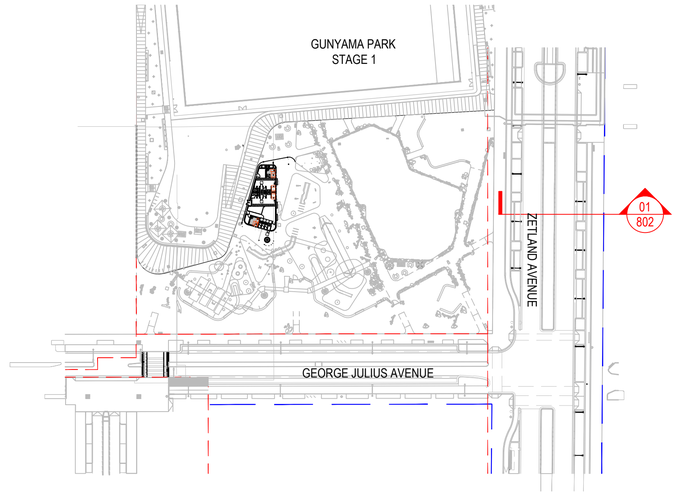

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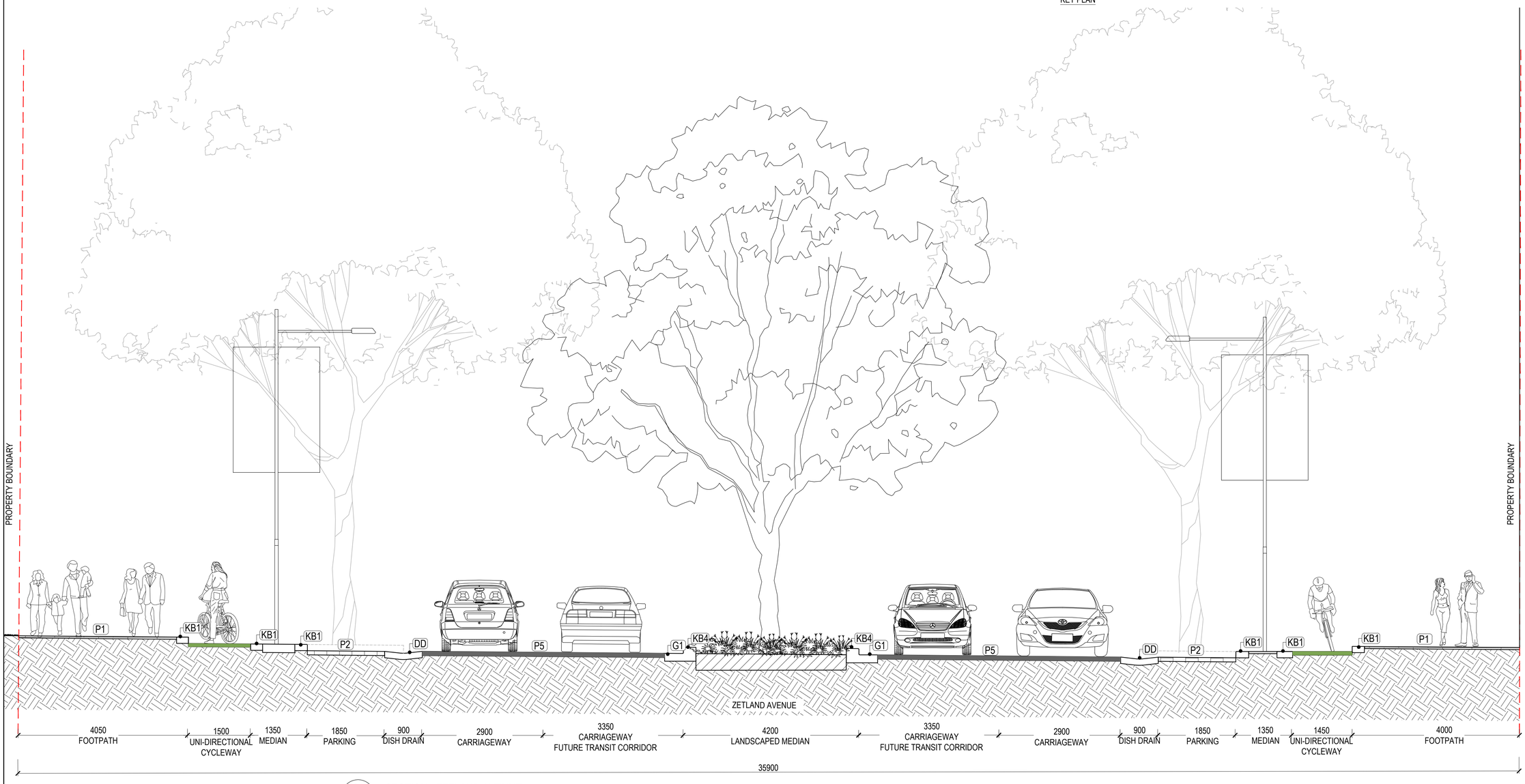

01/802 SECTION - ZETLAND AVENUE
SCALE 1:50

place design group.

SYDNEY
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PROJECT

GUNYAMA PARK
STAGE 2

CLIENT

CITY OF SYDNEY

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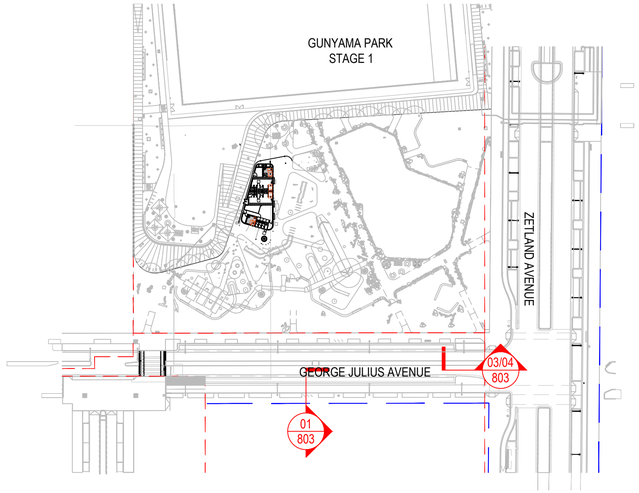

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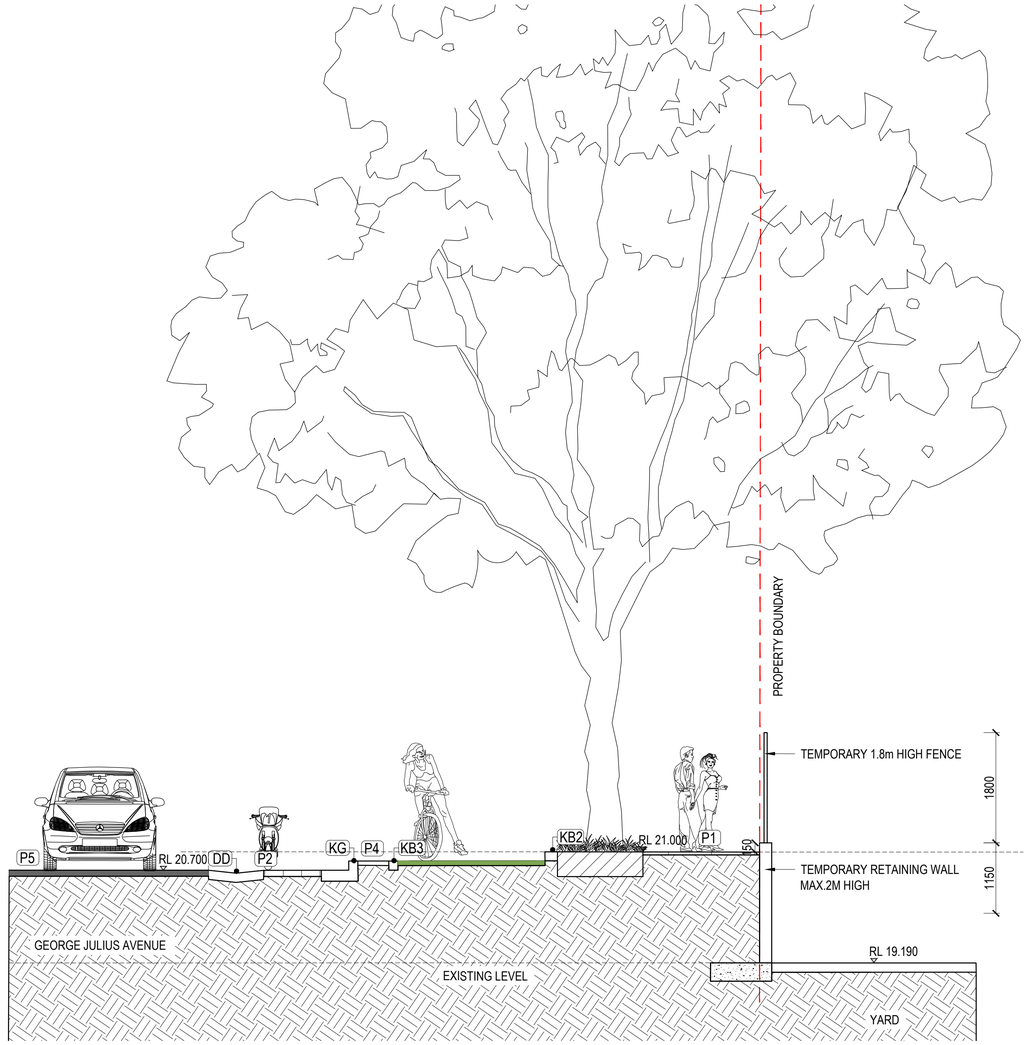
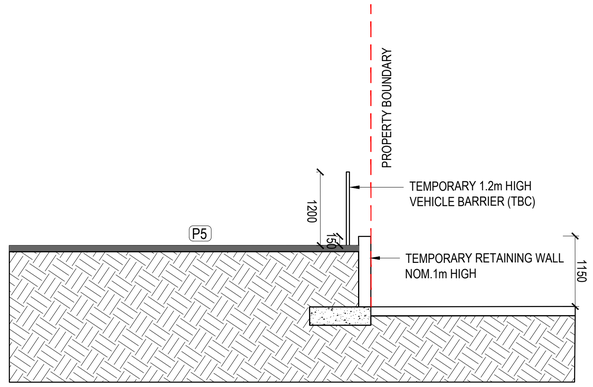
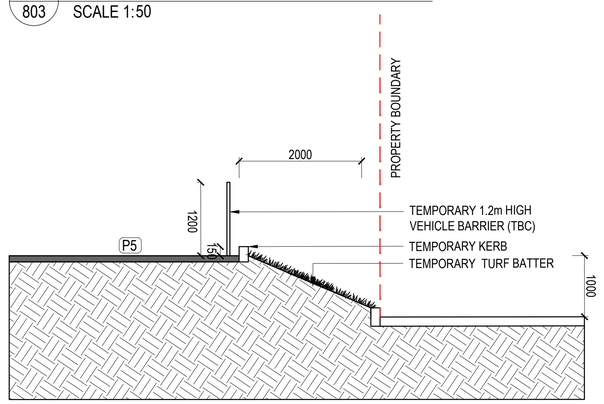


01 / 803 SECTION - GEORGE JULIUS AVENUE AND YARD
SCALE 1:50



2 / 803 OPTION 1 - GEORGE JULIUS AVENUE
SCALE 1:50



03 / 803 OPTION 2 - GEORGE JULIUS AVENUE
SCALE 1:50

place design group.

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PROJECT

GUNYAMA PARK
STAGE 2

CLIENT

CITY OF SYDNEY

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SCALE AS SHOWN @ A1

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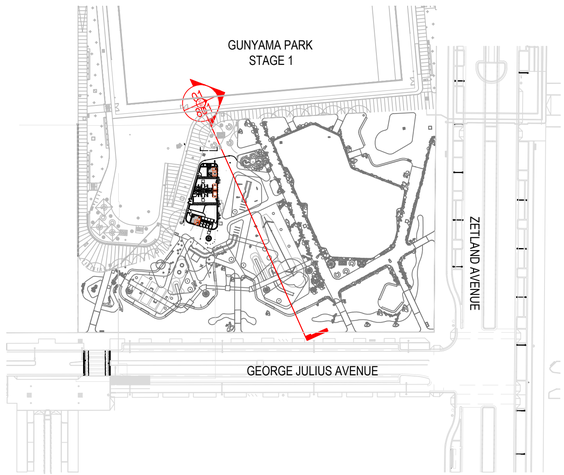

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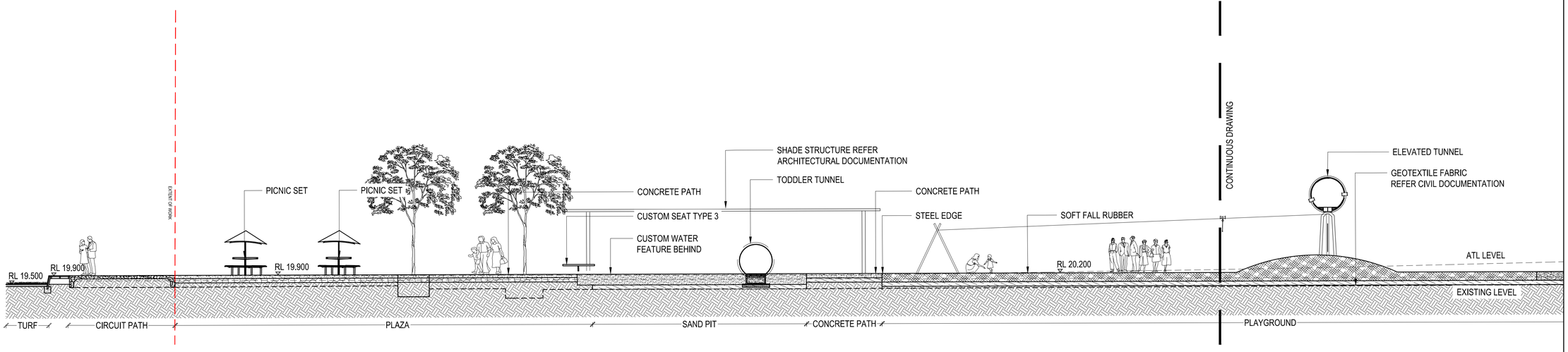

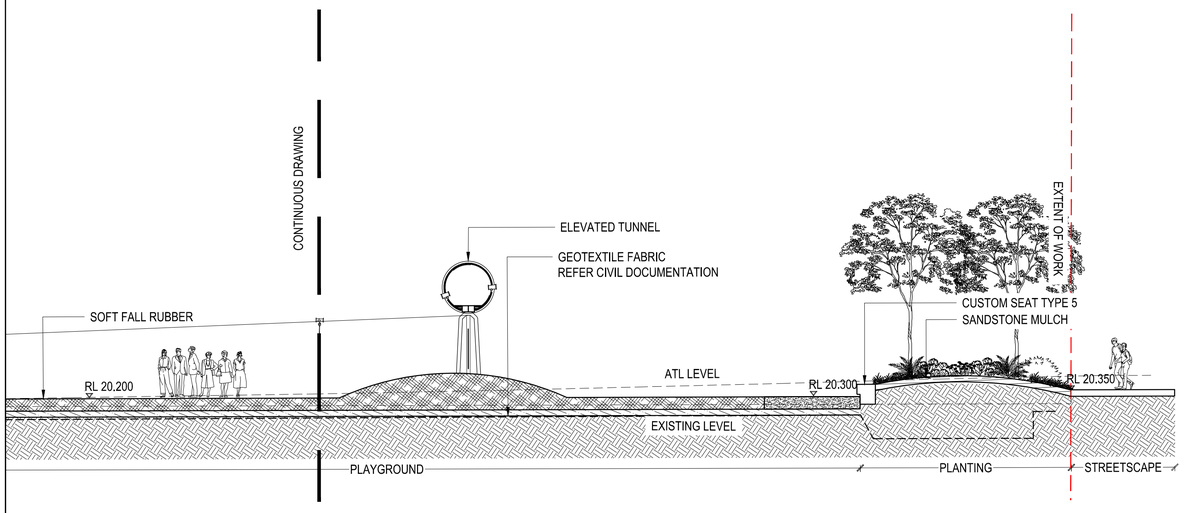

01 / 801 SECTION - PLAYGROUND
SCALE 1:100

place design group.

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PROJECT

GUNYAMA PARK
STAGE 2

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DESIGN : BP
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SCALE AS SHOWN @ A1

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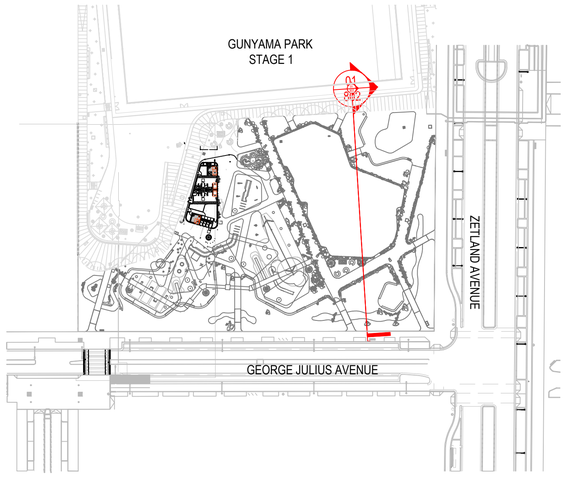

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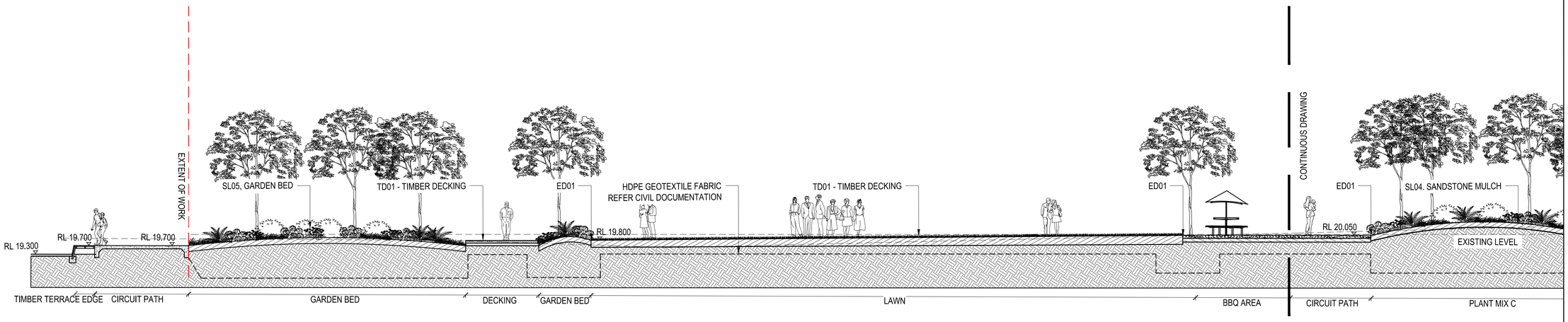

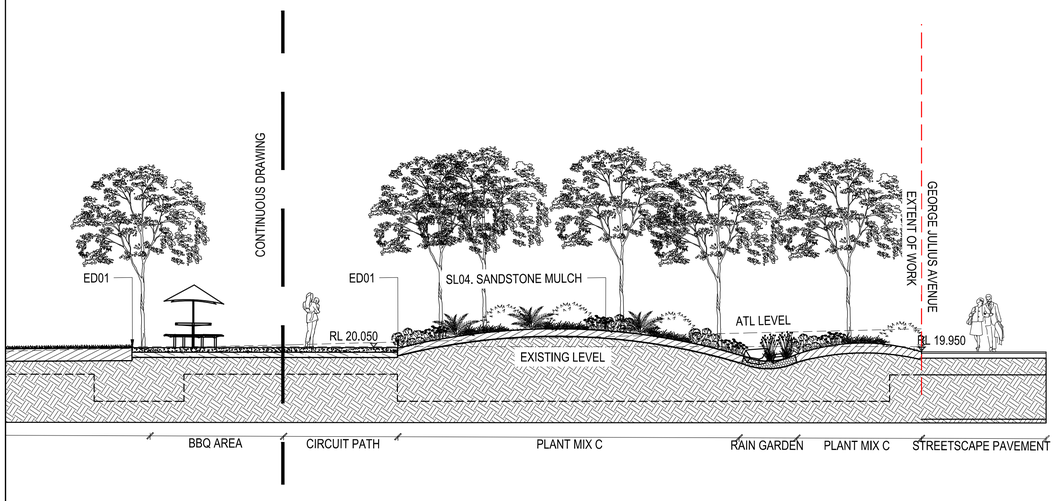

01
802
SECTION - BBQ AND LAWN
SCALE 1:100

place design group.

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DRAWING NUMBER	REVISION
GP_2522146-802	01

94-104 EPSOM ROAD, ZETLAND

CIVIL WORKS PACKAGE

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

DRAWING LIST

□□□□□□□C□□□	COVER SHEET AND LOCALITY PLAN
□□□□□□□C□□□	NOTES AND LEGENDS
□□□□□□□C□□□	CITY OF SYDNEY STANDARD DETAILS
□□□□□□□C□□□	TYPICAL SECTIONS SHEET □
□□□□□□□C□□□	TYPICAL SECTIONS SHEET □
□□□□□□□C□□□	BULK EARTHWORKS CUT□FILL PLAN
□□□□□□□C□□□	SITEWORKS AND STORMWATER DRAINAGE PLAN
□□□□□□□C□□□	RETAINING WALL RW□□ PLAN AND ELEVATION
□□□□□□□C□□□	STORMWATER DRAINAGE LONGITUDINAL SECTIONS
□□□□□□□C□□□	GEORGE JULIUS AVENUE CONTROL LINE MC□□ LONGITUDINAL SECTIONS SHEET □
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□□□□□□□C□□□	PAVEMENT PLAN
□□□□□□□C□□□	SIGNAGE AND LINEMARKING PLAN
□□□□□□□C□□□	SERVICES AND UTILITIES CO-ORDINATION PLAN
□□□□□□□C□□□	INTERNAL STORMWATER DRAINAGE CATCHMENT PLAN
□□□□□□□C□□□	EXTERNAL STORMWATER DRAINAGE CATCHMENT PLAN
□□□□□□□C□□□	SITEWORKS DETAILS
□□□□□□□C□□□	STORMWATER DRAINAGE DETAILS SHEET □
□□□□□□□C□□□	STORMWATER DRAINAGE DETAILS SHEET □
□□□□□□□C□□□	EROSION AND SEDIMENTATION CONTROL PLAN
□□□□□□□C□□□	EROSION AND SEDIMENTATION CONTROL DETAILS
□□□□□□□C□□□	PUBLIC DOMAIN P□ □□ BOUNDARY LONGITUDINAL SECTION SHEET □
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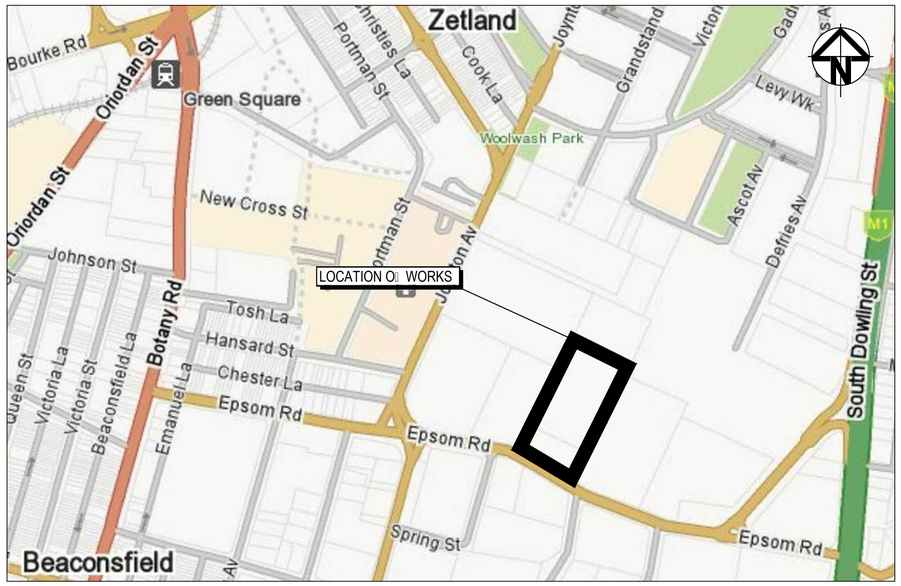

LOCALITY PLAN
N□T□S

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

100mm on Original

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Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	NTS	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
COVER SHEET
AND LOCALITY PLAN

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION
A1

Project - Drawing No.
18-557-C101
Issue
A

SITEWORKS NOTES

1. ORIGIN OF LEVELS:- REFER SURVEY NOTES.
2. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO AT & L.
3. MAKE SMOOTH CONNECTION WITH EXISTING WORKS.
4. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
5. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)
6. PROVIDE 10mm WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS.
7. ASPHALTIC CONCRETE SHALL CONFORM TO RMS. SPECIFICATION R116.
8. ALL BASECOURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051 (UNBOUND), RMS. FORM 3052 (BOUND) COMPACTED TO MINIMUM 98% MODIFIED DENSITY IN ACCORDANCE WITH AS 1289 5.2.1
   FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m^3 OF BASECOURSE MATERIAL PLACED.
9. ALL SUB-BASE COURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051, 3051.1 AND COMPACTED TO MINIMUM 95% MODIFIED DENSITY IN ACCORDANCE WITH A.S 1289 5.2.1
   FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m^3 OF SUB-BASE COURSE MATERIAL PLACED.
10. AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL IN (9) A CERTIFIED RECYCLED CONCRETE MATERIAL COMPLYING WITH RMS. FORM 3051 AND 3051.1 WILL BE CONSIDERED. SUBJECT TO MATERIAL SAMPLES AND APPROPRIATE CERTIFICATIONS BEING PROVIDED TO THE SATISFACTION OF AT & L.
11. SHOULD THE CONTRACTOR WISH TO USE A RECYCLED PRODUCT THIS SHALL BE CLEARLY INDICATED IN THEIR TENDER AND THE PRICE DIFFERENCE BETWEEN AN IGNEOUS PRODUCT AND A RECYCLED PRODUCT SHALL BE CLEARLY INDICATED.
12. WHERE NOTED ON THE DRAWINGS THAT WORKS ARE TO BE CARRIED BY OTHERS, (eg. ADJUSTMENT OF SERVICES), THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CO-ORDINATION OF THESE WORKS.

STORMWATER DRAINAGE NOTES

1. STORMWATER DESIGN CRITERIA:
   (A) AVERAGE RECURRENCE INTERVAL:
   1:100 YEARS ROOFED AREAS TO SURCHARGE PIT
   1:20 YEARS EXTERNAL PAVEMENTS
   (B) RAINFALL INTENSITIES:
   TIME OF CONCENTRATION: 5 MINUTES
   1:100 YEARS= 269.5 mm/hr
   1:20 YEARS= 210.7 mm/hr
   (C) RUNOFF COEFFICIENTS:
   ROOF AREAS: C_{100} =1.0
   EXTERNAL PAVEMENTS: C_{10} =1.0
2. PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '4' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
3. PIPES UP TO 300 DIA SHALL BE SEWER GRADE uPVC WITH SOLVENT WELDED JOINTS.
4. EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED.
5. ALL STORMWATER DRAINAGE LINES UNDER PROPOSED BUILDING SLABS TO BE uPVC PRESSURE PIPE GRADE 6. ENSURE ALL VERTICALS AND DOWNPIPES ARE uPVC PRESSURE PIPE, GRADE 6 FOR A MIN OF 3.0m IN HEIGHT.
6. PIPES TO BE INSTALLED TO TYPE HS3 (ROAD) HS2 (LOTS) SUPPORT IN ACCORDANCE WITH AS 3725 (1989) IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)
7. ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3500 3.1 (1998) AND AS/NZS 3500 3.2 (1998).
8. PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY AT & L.
9. ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED FITTINGS WHERE PIPES ARE LESS THAN 300 DIA.
10. WHERE SUBSOIL DRAINS PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS, UNSLOTTED uPVC SEWER GRADE PIPE IS TO BE USED.
11. CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
12. GRATES AND COVERS SHALL CONFORM TO AS 3996.
13. ALL INTERNAL PIT DIMENSIONS TO CONFORM TO AS3500.3 TABLE 8.2.
14. AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
15. ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.

SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY JBW SURVEYORS PTY LTD., BEING REGISTERED SURVEYORS. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. AT & L DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.

SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT AT & L.

THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM THE ORIGINAL SURVEY DOCUMENTS.

GENERAL NOTES

CAD DIGITAL DATA : JBW SURVEYORS PTY LTD

THE INFORMATION SUPPLIED IN THIS DATA FILE IS SUPPLIED ON THE CONDITION THAT THESE GENERAL NOTES ARE ALWAYS STORED WITH THE SUPPLIED CAD DRAWING, & IF THE DATA IS PROVIDED TO ANY PARTY ON ANY FORM OF HARD COPY OR COMPUTER MEDIA THEN THESE GENERAL NOTES WILL ALSO BE A PART OF THAT HARD MEDIA COPY OR COMPUTER MEDIA DATA;

ORIGIN OF LEVELS (SCIMS-DATED 20/09/18)
SSM 49315 RL 21.502 A;H;D VIDE SCIMS

THE GRID SYSTEM SHOWN RELATES TO THE MAPPING GRID OF AUSTRALIA (MGA), THE ORIGIN OF WHICH IS:
PM 59536 E=334 192.382 N=6246303.045 CLASS B ORDER 2 (ADOPTED FOR POSITION AND ORIENTATION)
SSM 49315 E=334416.792 N=6246223.743 CLASS B ORDER 2 (ADOPTED FOR ORIENTATION)
AS SUPPLIED BY SCIMS DATED 20/09/2018

THE SUBJECT PROPERTY BOUNDARIES HAVE NOT BEEN SURVEYED

THE BOUNDARIES SHOULD BE SURVEYED AND MARKED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORK

IMPROVEMENTS AND FEATURES SHOWN ON OR NEAR THE BOUNDARIES ARE INDICATIVE ONLY

THE POSITION OF IMPROVEMENTS AND FEATURES HAVE BEEN LOCATED FOR PLOTTING PURPOSES ONLY

VISIBLE SERVICES THAT HAVE BEEN SURVEYED ARE DENOTED BY ABBREVIATIONS THAT ARE REFERENCED IN THE SYMBOLS TABLE

SERVICES THAT ARE DENOTED "DBYD" HAVE BEEN PLOTTED FROM INFORMATION PROVIDED FROM 'DIAL BEFORE YOU DIG' AND HAVE NOT BEEN SURVEYED

UNDERGROUND SERVICES THAT ARE OF A CRITICAL NATURE SHOULD BE EXPOSED AND THEIR POSITION SURVEYED

CONTOURS HAVE BEEN INTERPOLATED FROM SPOT HEIGHTS
CONTOURS ARE AT 0.1 METRE INTERVALS

(W) DENOTES EASEMENT FOR DRAINAGE (G2934.96)

SYMBOLS

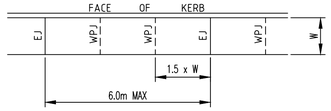
BH DENOTES BORE HOLE
BIT DENOTES BITUMEN
CBW DENOTES CONCRETE BLOCK WALL
CWSF DENOTES CYCLONE WIRE SECURITY FENCE
EK DENOTES EMBANKMENT
EM DENOTES ELECTRICAL MAIN
EP DENOTES ELECTRICITY POWER POLE
GM DENOTES GAS MAIN
HY DENOTES HYDRANT
INV DENOTES INVERT OF KERB
LIP DENOTES LIP OF KERB
LMK DENOTES LANE MARKING
LP DENOTES LIGHT POLE
LRW DENOTES LOW RETAINING WALL
LCH DENOTES LOW CONCRETE HOB
MH DENOTES MANHOLE
MPF DENOTES METAL PANEL FENCE
MW DENOTES MONITORING WELL
OHC DENOTES OVERHEAD CABLES
PT DENOTES PIT
PU DENOTES PIT UNKNOWN
SI DENOTES SIGN
SMH DENTOES SEWER MANHOLE
SV DENOTES STOP VALVE
TC & TP DENOTES TELECOMMUNICATIONS PIT
TK DENOTES TOP OF KERB
WM DENOTES WATER MAIN

DENOTES THE APPROXIMATE SPREAD & TRUNK LOCATION OF A TREE

JOINTING NOTES

PEDESTRIAN PAVEMENT JOINTS

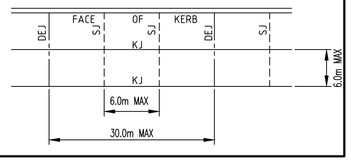
1. ALL PEDESTRIAN PAVEMENTS ARE TO BE JOINTED AS FOLLOWS. (U.N.O)
2. EXPANSION JOINTS ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX. 6.0m CENTRES.
3. WEAKENED PLANE JOINTS ARE TO BE LOCATED AT A MAX. SPACING OF 1.5 x WIDTH OF THE PAVEMENT.
4. WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND OR ADJACENT PAVEMENT JOINTS.
5. PEDESTRIAN PAVEMENT JOINT DETAIL.



NB: CHECK RELEVANT COUNCIL REQUIREMENTS IF IN PUBLIC ROAD. REFER TO LANDSCAPE ARCHITECT DRAWINGS FOR STANDARD DETAILS

VEHICULAR PAVEMENT JOINTS

6. ALL VEHICULAR PAVEMENTS TO BE JOINTED AS FOLLOWS. (U.N.O)
6. ALL VEHICULAR PAVEMENTS TO BE JOINTED AS SHOWN ON DRAWINGS.
7. KEYED CONSTRUCTION JOINTS SHOULD GENERALLY BE LOCATED AT A
8. SAWN JOINTS SHOULD GENERALLY BE LOCATED AT A MAX OF 6.0m CENTRES WITH DOWELED EXPANSION JOINTS AT MAX 30.0m CENTRES
9. VEHICULAR PAVEMENT JOINT DETAIL.
   MAX OF 6.0m CENTRES



BULK EARTHWORKS NOTES

1. ORIGIN OF LEVELS: REFER SURVEY NOTES
2. STRIP ALL TOPSOIL/ORGANIC MATERIAL FROM CONSTRUCTION AREA AND REMOVE FROM SITE OR STOCK PILE AS DIRECTED BY SUPERINTENDENT.
3. EXCAVATED MATERIAL TO BE USED AS STRUCTURAL FILL PROVIDED THE PLACEMENT MOISTURE CONTENT OF THE MATERIAL IS +/- 2% OF THE OPTIMUM MOISTURE CONTENT.
4. COMPACT FILL AREAS AND SUBGRADE TO NOT LESS THAN:

LOCATION	STANDARD DRY DENSITY (AS 1289 E 5.1.1.)
UNDER BUILDING SLABS ON GROUND	98%
UNDER ROADS AND CARPARKS	98%
LANDSCAPED AREAS UNLESS NOTED OTHERWISE	98%

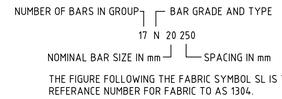
5. FOR NON COHESIVE MATERIAL, COMPACT TO 75% DENSITY INDEX.
6. BEFORE PLACING FILL, PROOF ROLL EXPOSED SUBGRADE WITH AN 8 TONNE (MIN) DEADWEIGHT SMOOTH DRUM VIBRATORY ROLLER TO DETECT THEN REMOVE SOFT SPOTS (AREAS WITH MORE THAN 2mm MOVEMENT UNDER ROLLER).
7. FREQUENCY OF COMPACTION TESTING SHALL BE NOT LESS THAN :-
   (A) 1 TEST PER 200m^2 OF FILL PLACED PER 300 LAYER OF FILL.
   (B) 3 TESTS PER VISIT
   (C) 1 TEST PER 1000m^2 OF EXPOSED SUBGRADE
   TESTING SHALL BE "LEVEL 1" TESTING IN ACCORDANCE WITH AS 3798 (1996).
8. FILLING TO BE PLACED AND COMPACTED IN MAXIMUM 150mm LAYERS
9. NO FILLING SHALL TAKE PLACE TO EXPOSE SUBGRADE UNTIL THE AREA HAS BEEN PROOF ROLLED IN THE PRESENCE OF AT & L AND APPROVAL GIVEN IN WRITING THAT FILLING CAN PROCEED.

CONCRETE NOTES

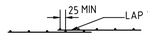
1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
2. CONCRETE QUALITY
   ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

ELEMENT	AS 3600 F'c MPa AT 28 DAYS	SPECIFIED SLUMP	NOMINAL AGG. SIZE
VEHICULAR BASE	32	60	20
KERBS, (PATHS, AND PITS) @32 MPa	25	80	20

   - CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL
   - PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379.
3. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY AT & L.
4. CLEAR CONCRETE COVER TO ALL REINFORCEMENT FOR DURABILITY SHALL BE 40mm TOP AND 70mm FOR EXTERNAL EDGES UNLESS NOTED OTHERWISE.
5. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
6. THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED AND CURED IN ACCORDANCE WITH R.T.A. SPECIFICATION R83.
7. REINFORCEMENT SYMBOLS:
   N DENOTES GRADE 450 N BARS TO AS 1302 GRADE N
   R DENOTES 230 R HOT ROLLED PLAIN BARS TO AS 1302
   SL DENOTES HARD-DRAWN WIRE REINFORCING FABRIC TO AS 1304



   THE FIGURE FOLLOWING THE FABRIC SYMBOL SL IS THE REFERANCE NUMBER FOR FABRIC TO AS 1304.
8. FABRIC SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING DETAIL:



DETAILS AND SPECIFICATIONS

1. ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH CITY OF SYDNEY TECHNICAL SPECIFICATIONS
2. WHERE CONFLICT EXISTS BETWEEN AT&L DETAILS AND COUNCIL. THE CITY OF SYDNEY STANDARD DRAWINGS TAKE PRECEDENCE.

EXISTING UNDERGROUND SERVICES NOTES

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN IN THIS SET OF DRAWINGS HAVE BEEN PLOTTED FROM SURVEY INFORMATION AND SERVICE AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE.
AT & L CAN NOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN FROM ANY CAUSE WHATSOEVER.

CONTRACTORS SHALL TAKE DUE CARE WHEN EXCAVATING ONSITE INCLUDING HAND EXCAVATION WHERE NECESSARY.

CONTRACTORS ARE TO CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF EXCAVATION WORKS.

CONTRACTORS ARE TO UNDERTAKE A SERVICES SEARCH, PRIOR TO COMMENCEMENT OF WORKS ON SITE. SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.

LEGEND

EXISTING

- EXISTING BOUNDARY
- EXISTING BOUNDARY TO BE REMOVED
- +213.00 SURFACE LEVEL
- 213.0 CONTOUR
- FENCE
- EXISTING TREE
- G GAS
- T TELSTRA
- OP OPTIC FIBRE
- E ELECTRICITY (U'GROUND)
- W WATER
- SW STORMWATER
- S SEWER

PROPOSED

- PROPOSED BOUNDARY
- 20.0 PROPOSED CONTOUR
- ● F213.00 PROPOSED SURFACE LEVEL
- K&G KERB AND GUTTER
- KO KERB ONLY
- FK FLUSH KERB
- IKO INTEGRAL KERB ONLY
- STORMWATER PIT WITH GRATE AND LINE
- KERB INLET PIT
- JUNCTION PIT WITH INFILL
- SURFACE INLET PIT
- SUBSOIL DRAINAGE LINE
- FP FLUSHING POINT
- IR INTERMEDIATE RISER
- RETAINING WALL

KERBING NOTES

1. ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25 MPa U.N.O IN REINFORCED CONCRETE NOTES.
2. ALL KERBS, GUTTERS, DISH DRAINS AND CROSSINGS TO BE CONSTRUCTED ON 100mm GRANULAR BASECOURSE COMPACTED TO MINIMUM 95% MODIFIED DRY DENSITY (AS 1289 5.2.1).
3. EXPANSION JOINTS (E.J) TO BE FORMED FROM 10mm COMPRESSIBLE CORK FILLER BOARD FOR THE FULL DEPTH OF THE SECTION AND CUT TO PROFILE. EXPANSION JOINTS TO BE LOCATED AT DRAINAGE PITS, ON TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLABS.
4. WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLABS.
5. BROOMED FINISH TO ALL RAMPED AND VEHICULAR CROSSINGS. ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
6. IN THE REPLACEMENT OF KERB AND GUTTER :-
   EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm U.N.O FROM THE LIP OF GUTTER. UPON COMPLETION OF THE NEW KERB AND GUTTER NEW BASECOURSE AND SURFACE TO BE LAID 600mm WIDE U.N.O.

   EXISTING ALLOTMENT DRAINAGE PIPES ARE TO BE BUILT INTO THE NEW KERB AND GUTTER WITH 100mm DIA HOLE.

   EXISTING KERB AND GUTTER IS TO BE COMPLETELY REMOVED WHERE NEW KERB AND GUTTER IS SHOWN.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

1. THE SITE SUPERINTENDENT/ENGINEER WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED.
2. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH
   a. LOCAL AUTHORITY REQUIREMENTS
   b. EPA REQUIREMENTS
   c. NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
3. MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
4. WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
5. CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.

LAND DISTURBANCE

6. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   (A) INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN. REFER DETAIL.
   (B) CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
   (C) INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.
   (D) UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. WHERE POSSIBLE, PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL

7. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
8. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

SEDIMENT CONTROL

9. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
10. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
11. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
12. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS

13. ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
14. ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
   (A) PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
   (B) ENSURING THAT NOTHING IS NAILED TO THEM
   (C) PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
   (I) ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER
   (II) A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH
   (III) CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

DIAL 1100 BEFORE YOU DIG

CONTRACTOR SHALL CALL;
DIAL BEFORE YOU DIG 1100
PRIOR TO COMMENCEMENT OF WORK TO OBTAIN ALL CURRENT SERVICE AUTHORITY PLANS

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info□ design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	NTS
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
□ETLAND

Title
NOTES AND LEGENDS

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info□ atl.net.au

Status: FOR APPROVAL
NOT FOR CONSTRUCTION

A1

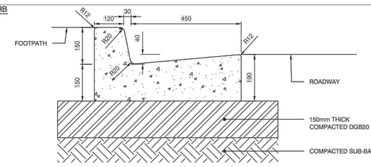
Project - Drawing No.: 18-557-C102

Issue: A

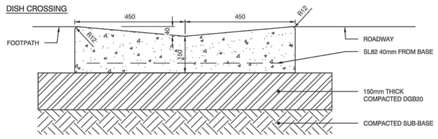
100mm on Original

Date Plotted: 14 Aug 2020 - 05:01PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C102.dwg

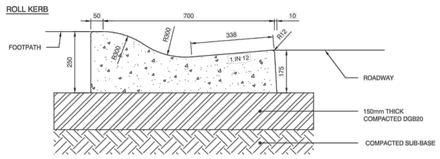
BARRIER KERB



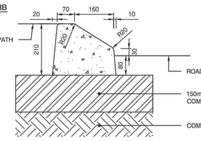
DISH CROSSING



ROLL KERB



MOUNTABLE KERB



NOTES:

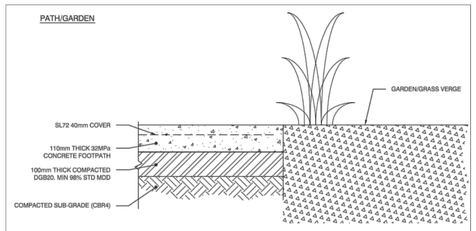
1. ALL KERBS TO BE MIN 25MPa CONCRETE UNLESS NOTED OTHERWISE.
2. ALL KERBS TO BE STEEL TROWEL FINISHED.
3. ALL EDGES SHALL BE TOOL FINISHED WITH 10mm RAD 50mm WIDE EDGING TOOL.
4. EXPANSION JOINTS SHALL BE PLACED AT 6m INTERVALS.

SCALE 1:10

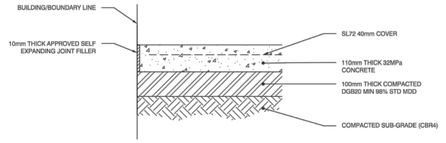
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	KERB & GUTTER CAST IN-SITU KERB AND GUTTER DETAILS	Rev B Date 22.03.13 Approved P S	K&G Dwg No. 1.1.2

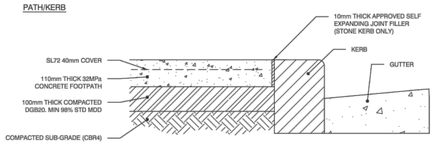
PATH/GARDEN



PATH/BUILDING LINE



PATH/KERB

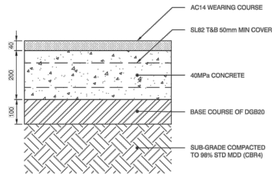


SECTION 1:10

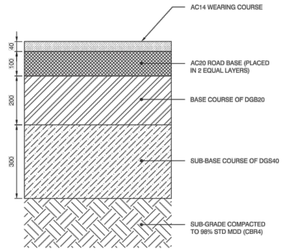
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	CONCRETE PAVING JUNCTIONS	Rev C Date 21.11.13 Approved P S	FOOTWAYS Dwg No. 2.6.3

RIGID ROAD PAVEMENT



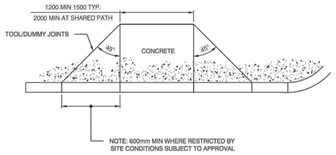
FLEXIBLE ROAD PAVEMENT



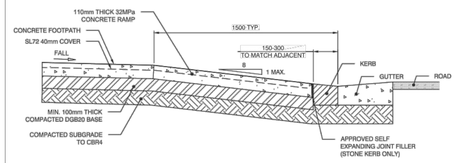
SECTION 1:10

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	ROAD PAVEMENTS TYPICAL PAVEMENT DETAILS	Rev B Date 22.03.13 Approved P S	ROADWAYS Dwg No. 3.1.1



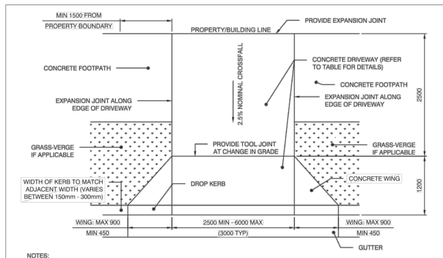
PLAN 1:50



SECTION 1:20

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

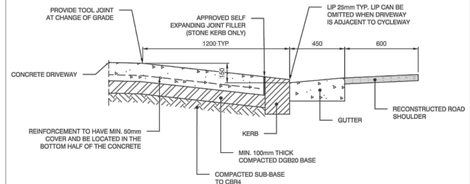
CITY OF SYDNEY	CONCRETE PAVING PEDESTRIAN RAMP	Rev C Date 21.11.13 Approved P S	FOOTWAYS Dwg No. 2.6.5



NOTES:

1. DRIVEWAY TO BE GENERALLY PERPENDICULAR TO KERB LINE, UNLESS APPROVED OTHERWISE.
2. FOR NARROW FOOTPATHS LENGTH OF RAMP TO BE AS SHORT AS POSSIBLE, OR LAYBACK ONLY TO BE USED IN APPROVED APPLICATIONS.
3. FOR DRIVEWAYS WIDER THAN 6.0m A TOOL JOINT SHALL BE PROVIDED ALONG THE CENTRE OF THE DRIVEWAY.
4. DRIVEWAY CONCRETE SHALL BE WOOD FLOAT FINISHED.

PLAN 1:50

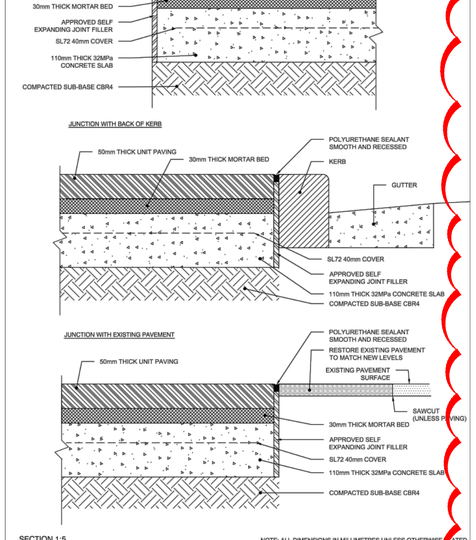


DRIVEWAY SPECIFICATIONS			
DRIVEWAY USE	CONCRETE STRENGTH	THICKNESS	REINFORCEMENT
SINGLE RESIDENTIAL	32MPa	150mm	SL82
MULTI RESIDENTIAL	32MPa	200mm	SL82
COMMERCIAL/ INDUSTRIAL	32MPa	250mm	TWO LAYERS SL82

SECTION 1:20

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	CONCRETE PAVING VEHICULAR CROSSING	Rev C Date 21.11.13 Approved P S	FOOTWAYS Dwg No. 2.6.8

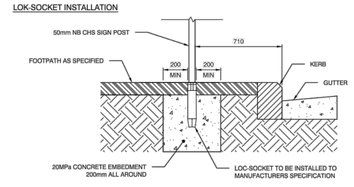


SECTION 1:5

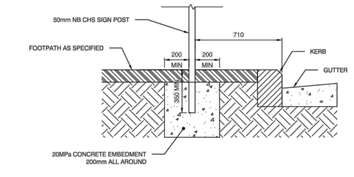
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	CONCRETE UNIT PAVING JUNCTIONS	Rev D Date 01.12.19 Approved P S	FOOTWAYS Dwg No. 2.3.4

LOK-SOCKET INSTALLATION



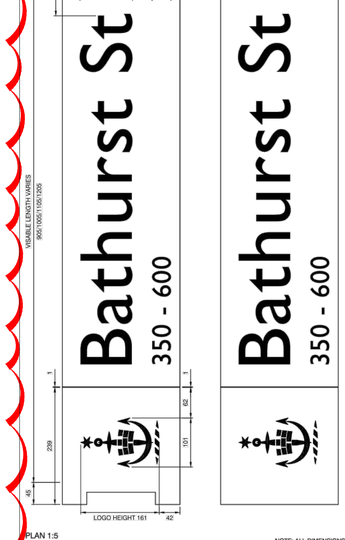
DIRECT CONCRETE EMBEDMENT



SECTION 1:20

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

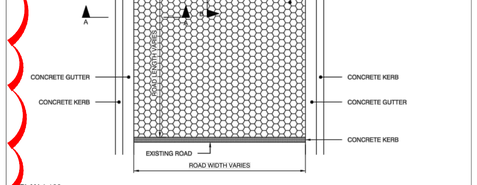
CITY OF SYDNEY	SIGNAGE SIGN POST INSTALLATION	Rev D Date 01.12.19 Approved P S	SIGNAGE Dwg No. 6.2.2



PLAN 1:5

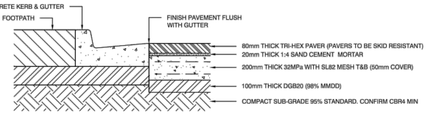
NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	SIGNAGE STANDARD STREET NAME BLADES	Rev D Date 01.12.19 Approved P S	SIGNAGE Dwg No. 6.2.1

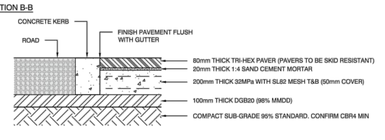


PLAN 1:100

SECTION A-A



SECTION B-B



SECTION 1:20

NOTE: ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CITY OF SYDNEY	ROAD PAVEMENTS CONCRETE UNIT PAVEMENT	Rev D Date 01.12.19 Approved P S	ROADWAYS Dwg No. 3.1.10

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
C	ADDED DETAIL	22-06-21
B	ADDED DETAIL	24-05-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	AS SHOWN	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
CITY OF SYDNEY
STANDARD
DETAILS

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

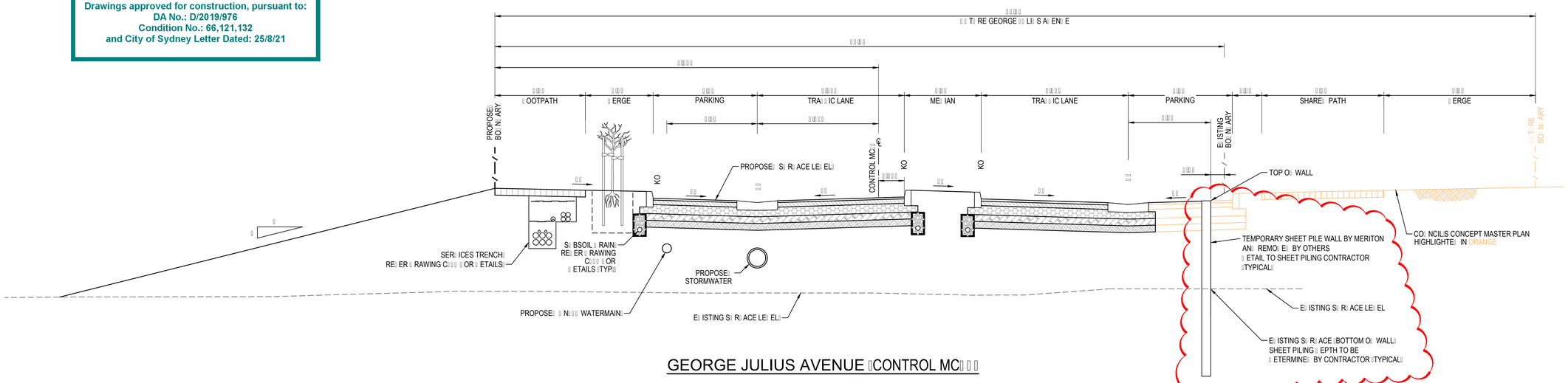
Status		
FOR APPROVAL NOT FOR CONSTRUCTION	A1	
Project - Drawing No. 18-557-C103	Issue C	

Date Plotted: 23 Jun 2021 - 04:12PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C103.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

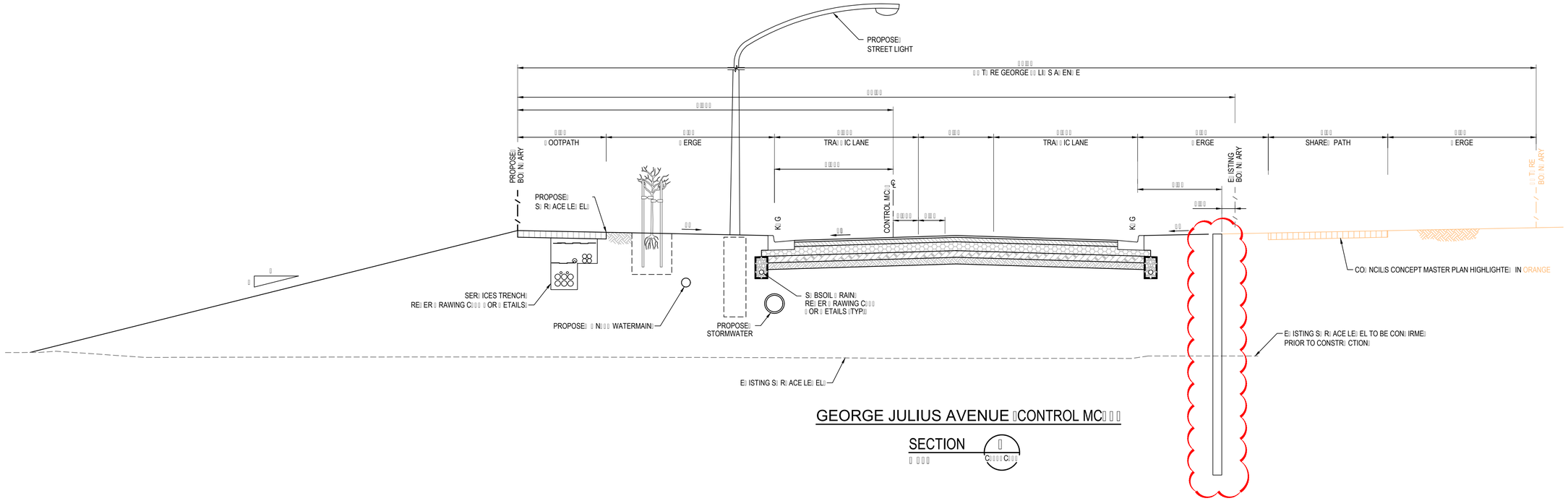
NOTES:

1. ALL ROA WORKS TO BE CONSTR CTE IN ACCOR ANCE WITH CITY O SY NEY P BLIC OMAIN TECHNICAL SPECI ICATION
2. OR TR NK STORMWATER RAINAGE ETAILS RE ER TO RAWINGS BY G ALLIANCE OR ETAILS



GEORGE JULIUS AVENUE CONTROL MC

SECTION
C C



GEORGE JULIUS AVENUE CONTROL MC

SECTION
C C

Issue	Description	Date
B	REVISED TEMPORARY RETAINING WALL	18-12-20
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A A

Client

KARIMBLA
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PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales		Drawn	ADC
	AS SHOWN	Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
TYPICAL SECTIONS
SHEET 1

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status: FOR APPROVAL
NOT FOR CONSTRUCTION

A1

Project - Drawing No.: 18-557-C105

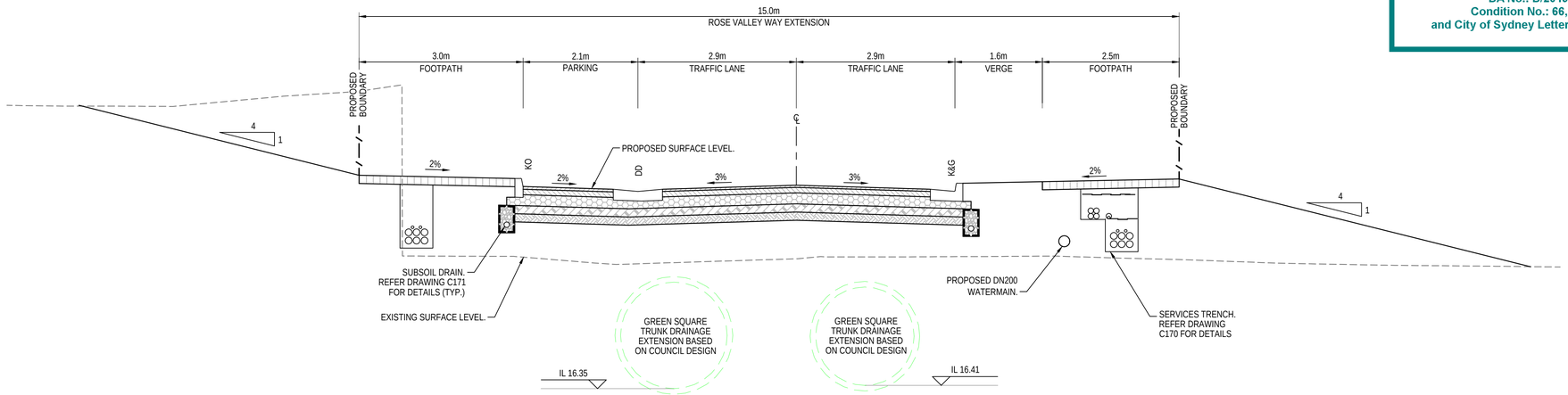
Issue: B

Date Plotted: 18 Dec 2020 - 10:57AM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C105.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

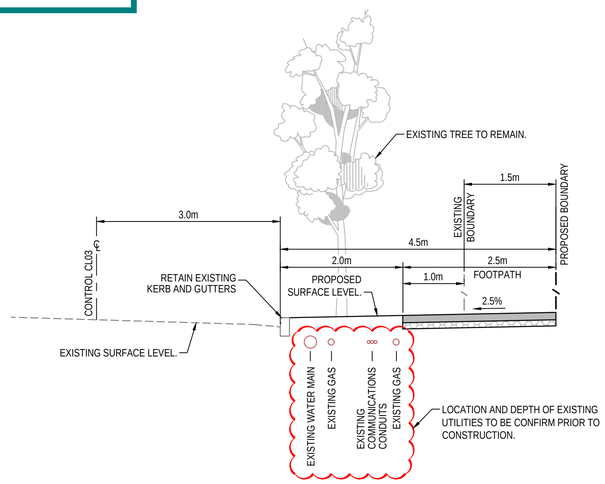
NOTES:

1. ALL ROADWORKS TO BE CONSTRUCTED IN ACCORDANCE WITH CITY OF SYDNEY PUBLIC DOMAIN TECHNICAL SPECIFICATION.
2. FOR TRUNK STORMWATER DRAINAGE DETAILS REFER TO DRAWINGS BY DG ALLIANCE FOR DETAILS.



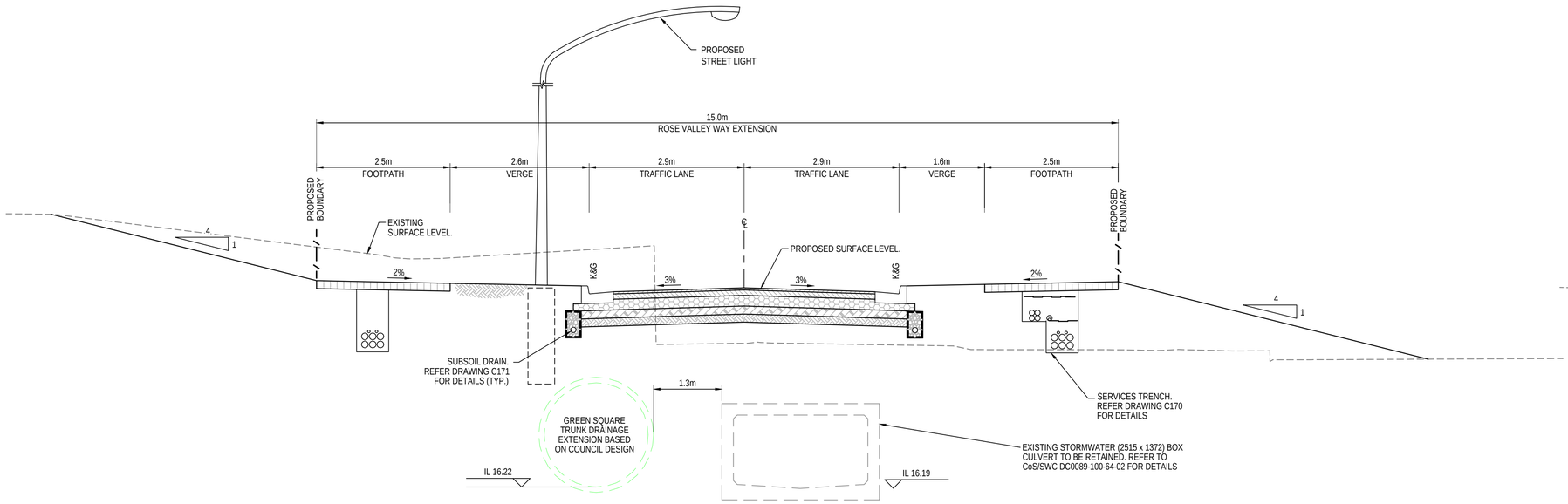
ROSE VALLEY WAY (CONTROL MC02)

SECTION 3 (C110, C150)
1 : 50



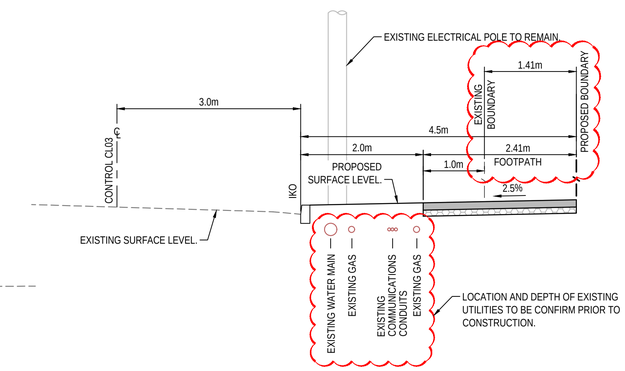
EPSOM ROAD (CONTROL MC03)

SECTION 5 (C110)
1 : 50



ROSE VALLEY WAY (CONTROL MC02)

SECTION 4 (C110, C150)
1 : 50



EPSOM ROAD (CONTROL MC03)

SECTION 6 (C110)
1 : 50

Issue	Description	Date
B	ISSUED FOR APPROVAL	19-07-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

0 1 2 3 4 5m

1 : 50 @ A1 1 : 100 @ A3

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales		Drawn	ADC
	AS SHOWN	Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
TYPICAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

Project - Drawing No.
18-557-C106

Issue
B

100mm on Original

Date Plotted: 19 Jul 2021 - 12:15PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C106.dwg

C T ILL EPTH RANGE LEGEN
L r C r

TOTAL EARTHWORKS VOLUMES

	CUT (m^3)	FILL (m^3)	BALANCE (m^3)
TOTAL	-697	3,967	3,270 (IMPORT)

NOTES
1. EARTHWORKS CALCULATED BETWEEN EXISTING SURFACE LEVEL FROM SURVEY AND PROPOSED EARTHWORKS SURFACE LEVEL. REFER DRAWINGS C145 FOR PAVEMENT DETAILS.
2. THE VOLUMES DO NOT TAKE INTO ACCOUNT THE FOLLOWING :-
- EXISTING TOPSOIL STRIPPING AND BLENDING
- BULKING FACTORS OF REMOVED CUT
- REMOVAL OF EXISTING BUILDING SLABS AND PAVEMENTS
- REMOVAL AND/OR REMEDIATION OF ANY EXISTING UNCONTROLLED FILL
- PROPOSED LANDSCAPING
- STORMWATER AND UTILITY TRENCHING
- EXCAVATION FOR RETAINING WALL BACKFILL MATERIAL

FUSE STREET
FUSE STREET
WAY
ALLEY
ROSE
EPSOM ROA
PROPOSE LOT
PROPOSE LOT
G NYAMA PARK
T RE GEORGE LI S A EN E
SP 95242
SP 95242
DP 1

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales
A A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales: 1 : 250 A1
Grid: MGA
Height Datum: AHD
Drawn: ADC
Designed: GJ
Checked: GJ
Approved:

Project
94-104 EPSOM ROAD
ETLAND

Title
BULK EARTHWORKS
CUT/FILL PLAN

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status: FOR APPROVAL
NOT FOR CONSTRUCTION
A1
Project - Drawing No.: 18-557-C108
Issue: A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:01PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C108.dwg

LEGEND

- GREEN SQUARE TRUNK DRAINAGE EXTENSION BASED ON COUNCIL DESIGN
- EXISTING STORMWATER CULVERT
- K&G — PROPOSED KERB AND GUTTER
- KO — PROPOSED KERB ONLY
- DD — PROPOSED DISH DRAIN
- IKO — PROPOSED INTEGRAL KERB ONLY
- PR — PROPOSED PRAM RAMP
- PROPOSED KERB INLET PIT
- PROPOSED SURFACE INLET PIT
- PROPOSED JUNCTION PIT
- SUBSOIL DRAINAGE LINE
- FP — FLUSHING POINT
- IR — INTERMEDIATE RISER
- ø375 — PROPOSED STORMWATER PIPE, PIPE SIZE AND TYPE
- 20.5 — PROPOSED CONTOUR
- RAIN GARDEN MEDIA DEPTHS AND SPECIFICATION REFER DWG. C172 AND CITY OF SYDNEY STANDARD DRAWING 7.2.2 PLANTS AND VEGETATION REFER TO LANDSCAPE PLANS AND WSUD SPECIFICATIONS
- GREEN SQUARE TRUNK DRAINAGE
- EXISTING CULVERT

FUSE STREET

ALL VEHICLE ACCESS VIA FUSE STREET UNTIL GEORGE JULIUS AVENUE IS COMPLETED (BY OTHERS)

LIMIT OF WORKS

EXTEND LAYBACK TO ALLOW FOR SERVICE VEHICLE MANOEUVRE

MAKE SMOOTH CONNECTION WITH EXISTING WORKS.

CONSTRUCT KERB INLET PIT OVER EXISTING STORMWATER CULVERT AND MAKE SMOOTH CONNECTION.

RAIN GARDEN 3

PROVIDE CAPPING TO STORMWATER PIPE FOR FUTURE CONNECTION

OSD TANK 1

NOTE: REFER TO AT&L DRAWING SERIES 18-557-C200 FOR ON-LOT STORMWATER DETAILS

CONSTRUCT KERB INLET PIT OVER GREEN SQUARE TRUNK DRAINAGE AND MAKE SMOOTH CONNECTION.

PROPOSED DRIVEWAY (SUBJECT TO BUILDING DESIGN)

REMOVE EXISTING VEHICULAR CROSSING TO BE DEMOLISHED AND DISPOSED OF FROM SITE. CONSTRUCT INTEGRAL KERB ONLY AND EXTEND 1m BEYOND EXISTING VEHICULAR CROSSING EXTENT.

EXISTING ELECTRICAL POLE TO REMAIN.

REMOVE EXISTING VEHICULAR CROSSING TO BE DEMOLISHED AND DISPOSED OF FROM SITE. CONSTRUCT INTEGRAL KERB ONLY AND EXTEND 1m BEYOND EXISTING VEHICULAR CROSSING EXTENT.

EPSOM ROAD

EXISTING PEDESTRIAN RAMP TO BE DEMOLISH AND UPGRADE TO COUNCILS SPECIFICATION AND REQUIREMENTS

EXISTING TREE TO REMAIN (TYP.)

REMOVE EXISTING VEHICULAR CROSSING TO BE DEMOLISHED AND DISPOSED OF FROM SITE. CONSTRUCT INTEGRAL KERB ONLY AND EXTEND 1m BEYOND EXISTING VEHICULAR CROSSING EXTENT.

LOCATION AND DEPTH OF EXISTING UTILITIES TO BE CONFIRM PRIOR TO CONSTRUCTION

PROPOSED LOT 1

CONSTRUCT KERB INLET PIT. GREEN SQUARE TRUNK DRAINAGE TO BE PROTECTED DURING CONSTRUCTION.

TOP OF TEMPORARY BATTER.

GREEN SQUARE TRUNK DRAINAGE TO BE COMPLETED BY OTHERS

3.00m FOOTPATH

2.50m FOOTPATH

ROSE VALLEY WAY

RAIN GARDEN 1

RAIN GARDEN 2

RAIN GARDEN 4

PROPOSED BOLLARD (TYP.)

CONTROL MC01

CONTROL MC02

CONTROL MC03

EXISTING 2515 (W) x 1372 (H) CULVERT @ 0.7%

PROVIDE CAPPING TO STORMWATER PIPE FOR FUTURE CONNECTION

OSD LOT 2

NOTE: REFER TO AT&L DRAWING SERIES 18-557-C200 FOR ON-LOT STORMWATER DETAILS

TOE OF TEMPORARY BATTER

CONSTRUCT KERB INLET PIT. GREEN SQUARE TRUNK DRAINAGE TO BE PROTECTED DURING CONSTRUCTION.

PROPOSED LOT 2

MAKE SMOOTH CONNECTION INTO GREEN SQUARE TRUNK DRAINAGE TO BE COMPLETED BY OTHERS. INVERT LEVEL TO BE CONFIRMED.

TOE OF TEMPORARY BATTER

STORMWATER DRAINAGE DESIGN TO BE CONFIRMED WITH ADJACENT LOT DEVELOPMENTS.

LIMIT OF WORKS

FUTURE GEORGE JULIUS AVENUE

EXISTING EASTERN BOUNDARY SURFACE LEVELS TO BE CONFIRMED PRIOR TO CONSTRUCTION.

COUNCIL'S CONCEPT MASTER PLAN HIGHLIGHTED IN ORANGE

RETAINING WALL RW01. REFER DRAWING 18-557-C115 FOR DETAILS.

GUNYAMA PARK

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
C	ISSUED FOR APPROVAL	19-07-21
B	ISSUED FOR APPROVAL	22-06-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

0 5 10 15 20 25m

1 : 250 @ A1 1 : 500 @ A3

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 250 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
SITEWORKS AND STORMWATER DRAINAGE PLAN

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

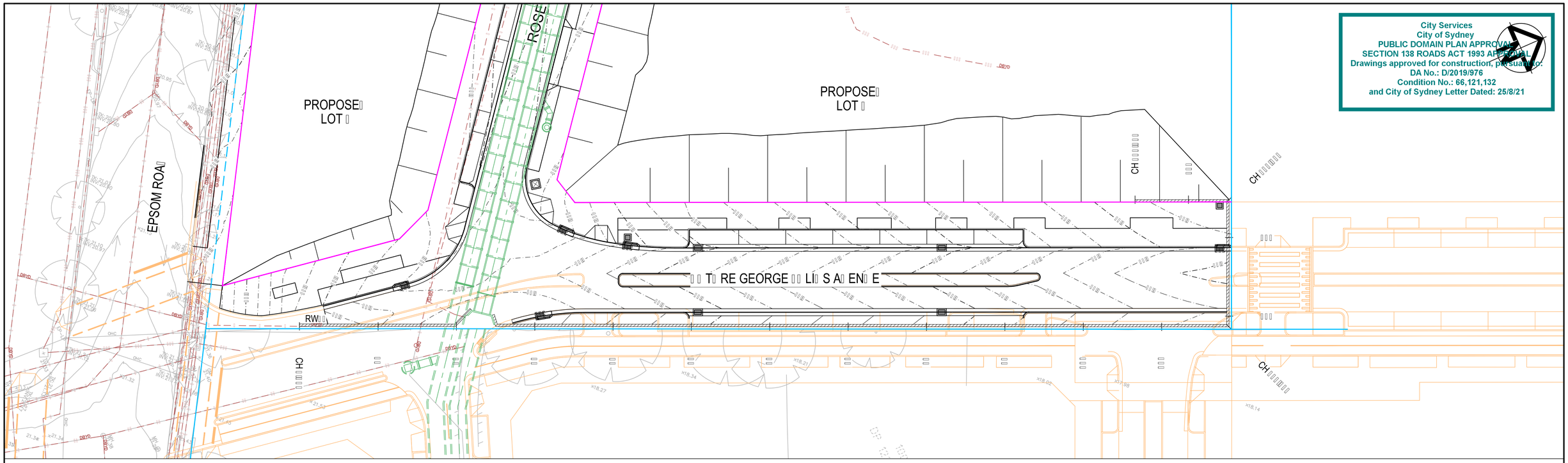
A1

Project - Drawing No.
18-557-C110

Issue
C

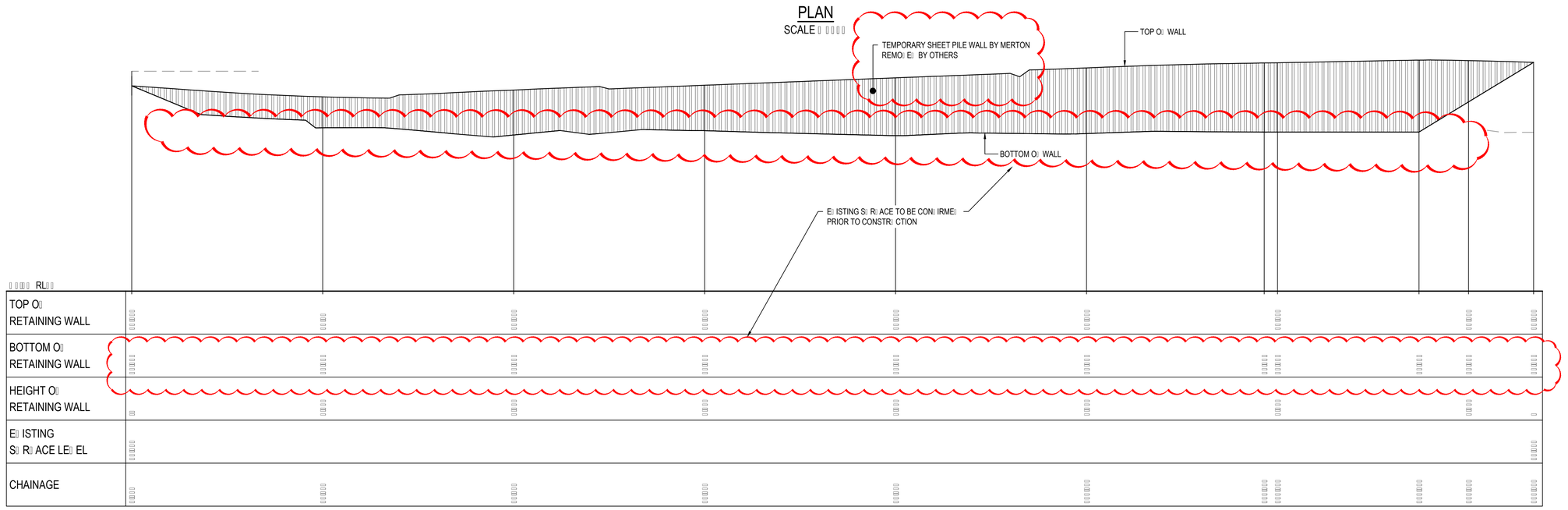
100mm on Original

Date Plotted: 19 Jul 2021 - 12:15PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C110.dwg



City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

PLAN
SCALE



RETAINING WALL RW PROFILE

SCALE HORIZ
VERT

Issue	Description	Date
B	REVISED TEMPORARY RETAINING WALL	18-12-20
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
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Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	AS SHOWN
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
RETAINING WALL RW01
PLAN AND ELEVATION

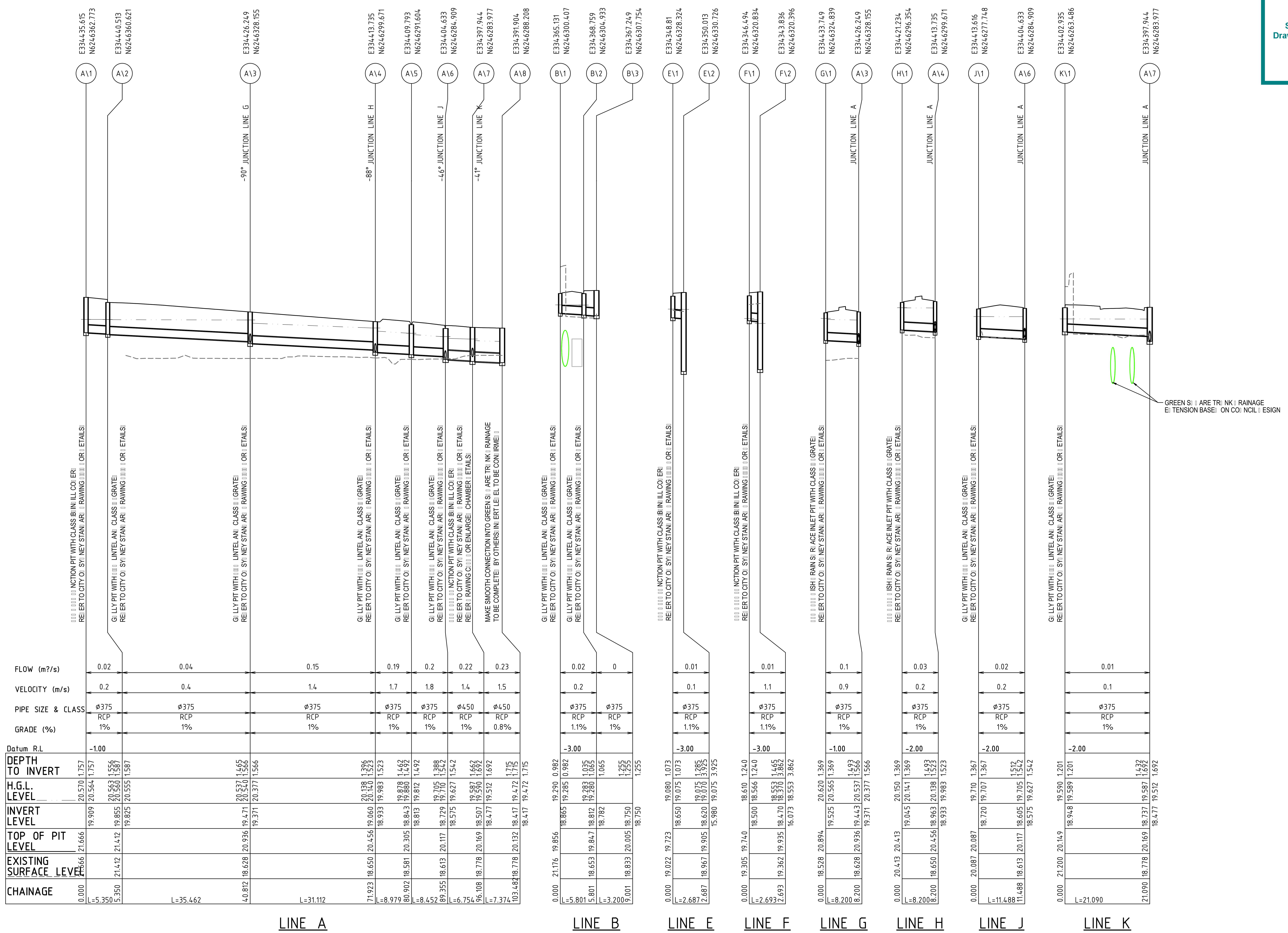
Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C115	B

100mm on Original

Date Plotted: 18 Dec 2020 - 10:45AM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C115.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW) PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales: 1 : 100 (V) @ A1, 1 : 500 (H) @ A1
Grid: MGA
Height Datum: AHD
Drawn: ADC
Designed: GJ
Checked: GJ
Approved:

Project: 94-104 EPSOM ROAD ZETLAND

Title: STORMWATER DRAINAGE LONGITUDINAL SECTIONS

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
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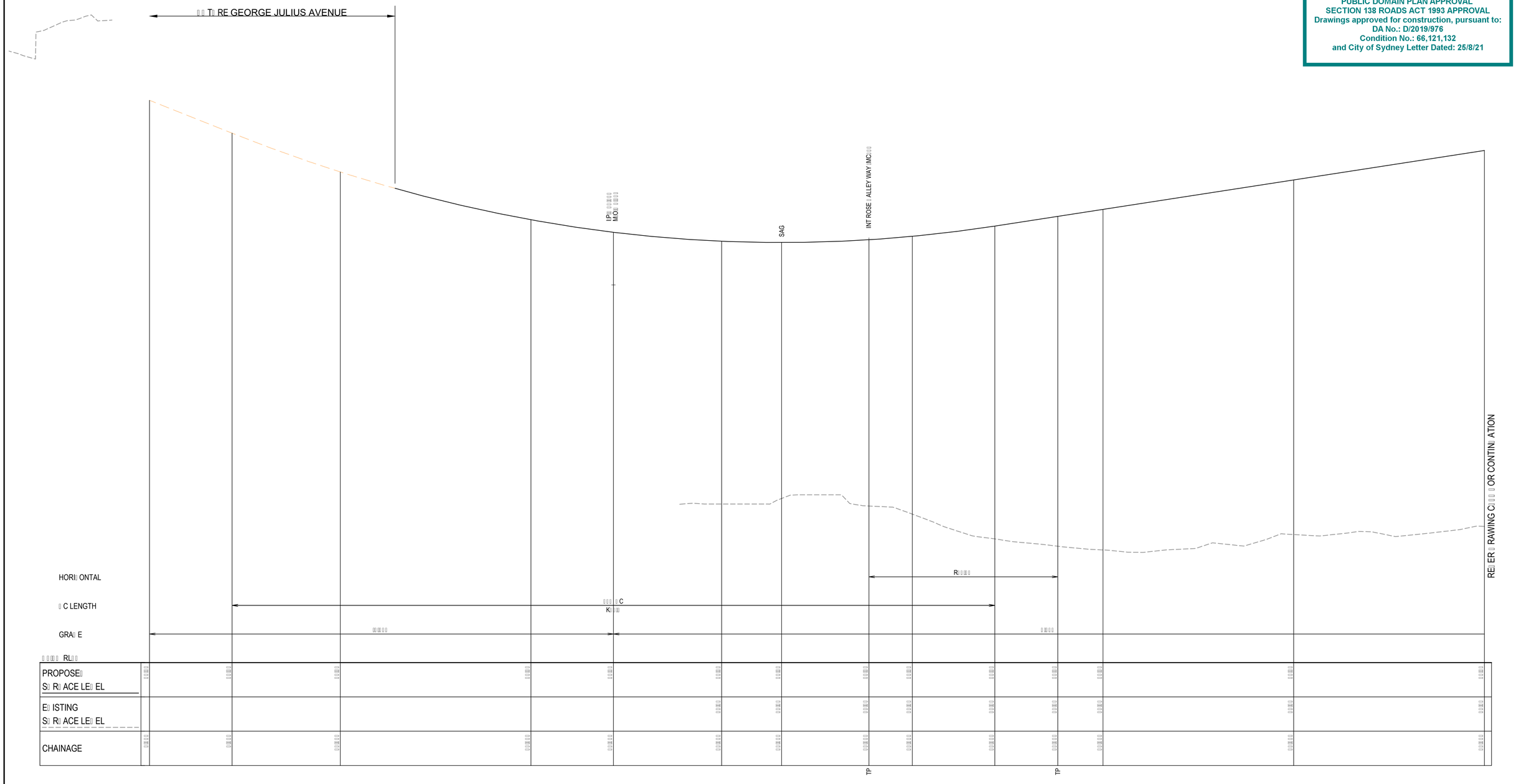
Status: FOR APPROVAL NOT FOR CONSTRUCTION — A1

Project - Drawing No.: 18-557-C117
Issue: A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:02PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C117.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION GEORGE LI S A EN E CONTROL MC

SCALE HORI
ERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

100mm on Original

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
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Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
GEORGE JULIUS AVENUE
CONTROL LINE MC01
LONGITUDINAL SECTIONS
SHEET 1

Civil Engineers and Project Managers
at&l
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North Sydney NSW 2065
ABN 96 130 882 405
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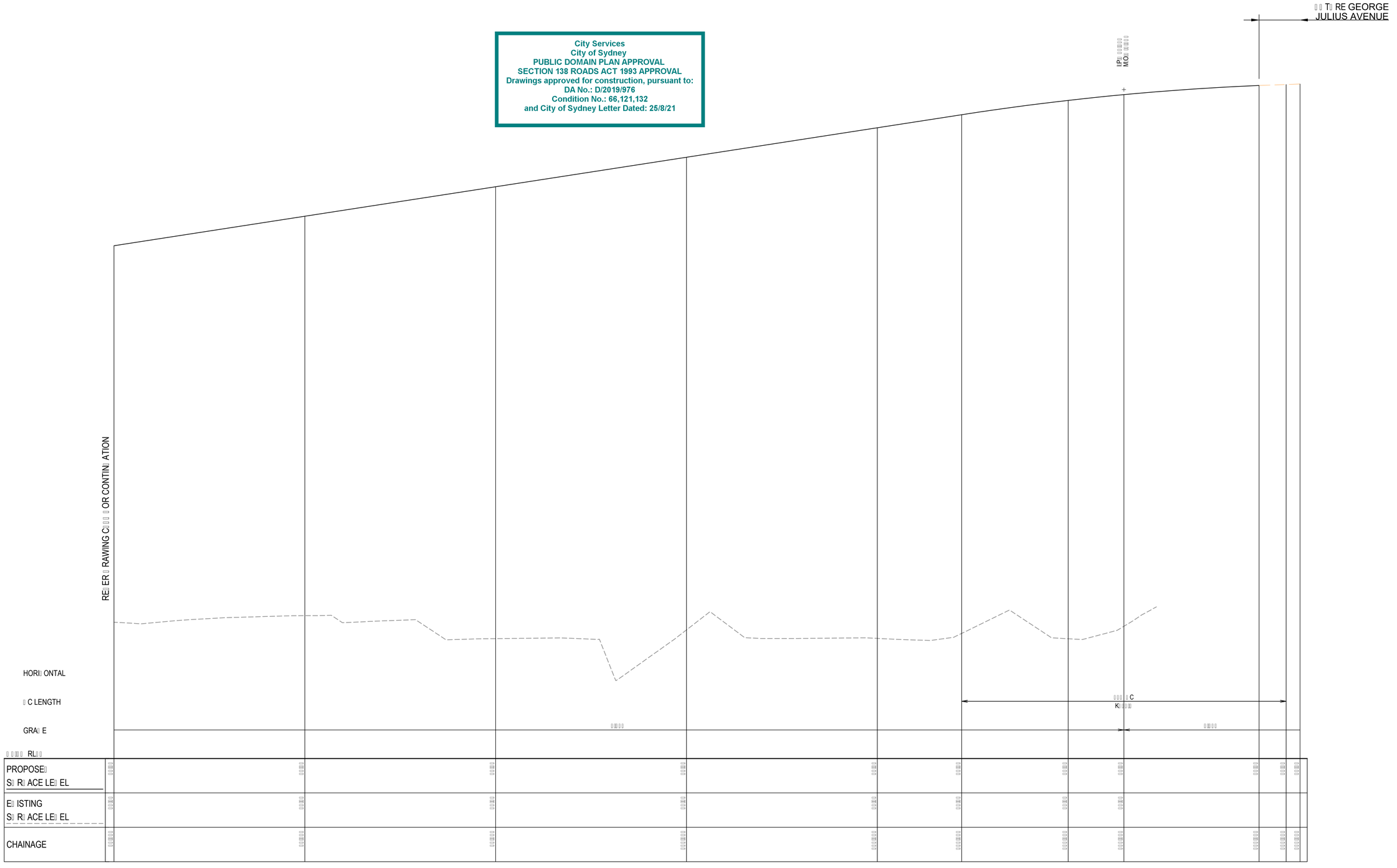
info atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C120	A

Date Plotted: 14 Aug 2020 - 05:02PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C120.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION GEORGE LI S A EN E CONTROL MC
SCALE HORI
ERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales
A A
A A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
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Tel: (02) 9287 2888 Fax: (02) 9287 2777
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Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
GEORGE JULIUS AVENUE
CONTROL LINE MC01
LONGITUDINAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
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www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

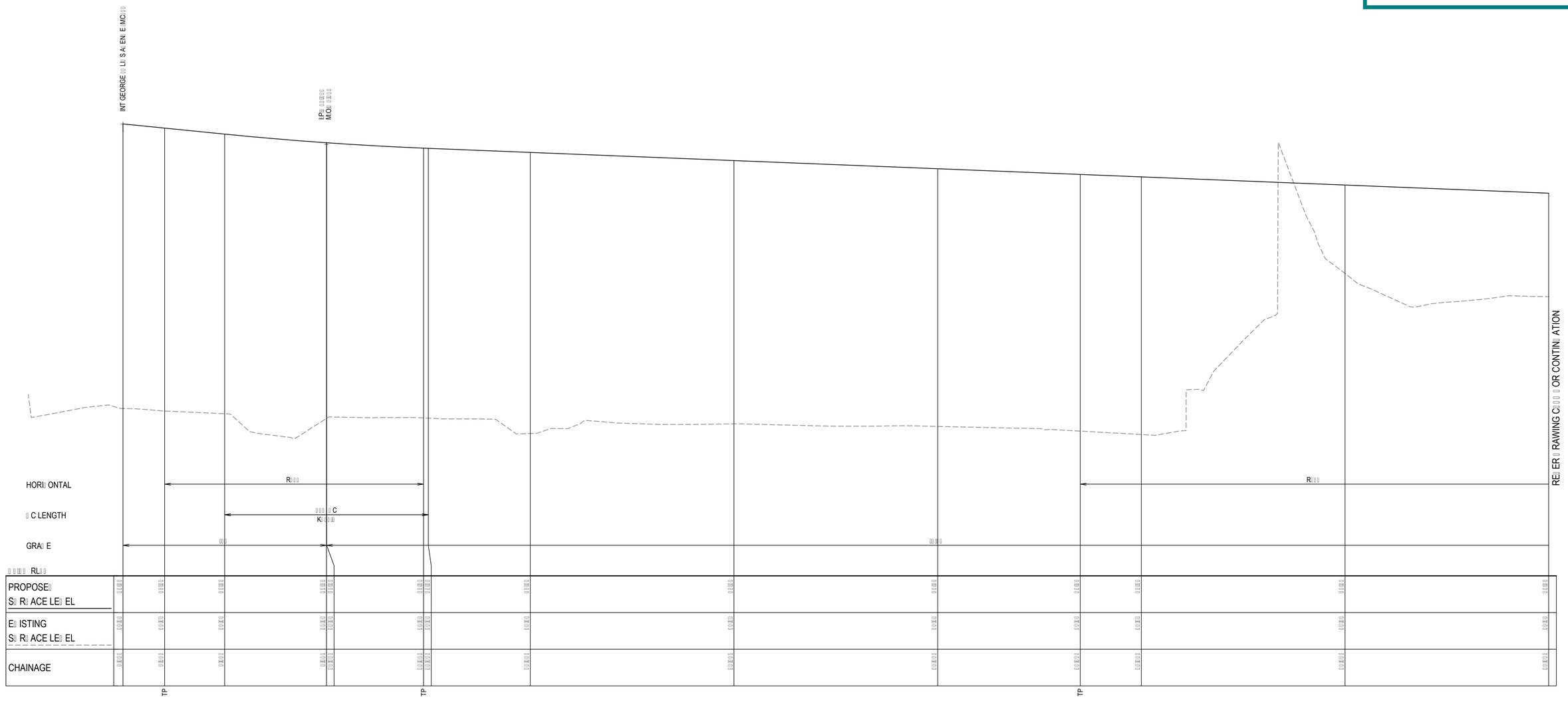
Project - Drawing No.
18-557-C121

Issue
A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:02PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C121.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION ROSE ALLEY WAY CONTROL MC
SCALE HORI
ERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

100mm on Original

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
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Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL LINE MC02
LONGITUDINAL SECTIONS
SHEET 1

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
North Sydney NSW 2065
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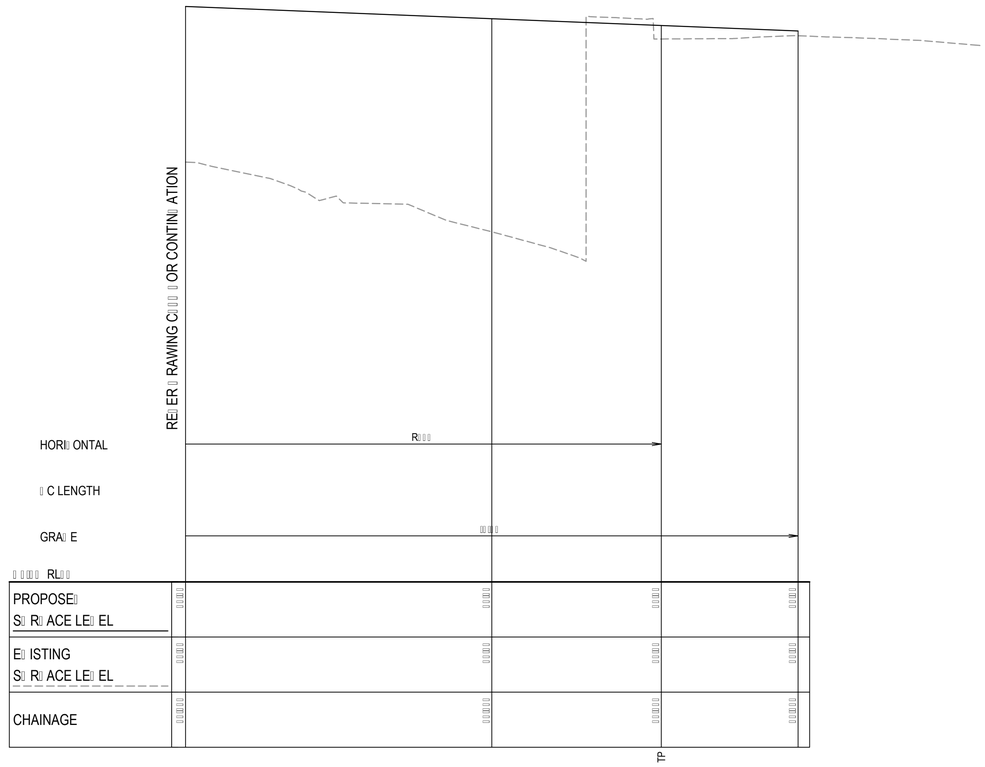
Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C122	A

Date Plotted: 14 Aug 2020 - 05:02PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C122.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION ROSE ALLEY WAY CONTROL MC

SCALE HORI
ERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
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Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL LINE MC02
LONGITUDINAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
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Status: FOR APPROVAL
NOT FOR CONSTRUCTION

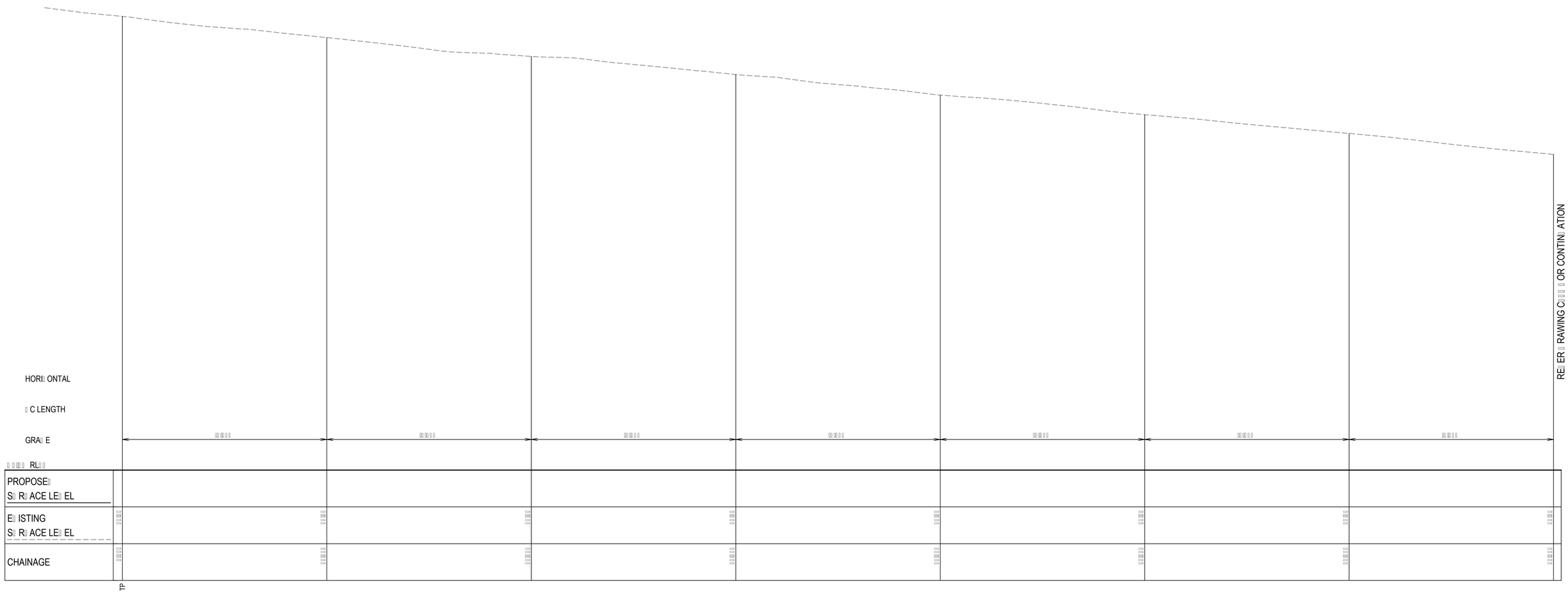
Issue: A1

Project - Drawing No.: 18-557-C123

Issue: A

Date Plotted: 14 Aug 2020 - 05:02PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C123.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION EPSOM ROA CONTROL MC

SCALE HORI
ERT

A	ISSUED FOR APPROVAL	14-08-20
Issue	Description	Date

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
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Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
EPSOM ROAD
CONTROL LINE MC03
LONGITUDINAL SECTIONS
SHEET 1

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
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ABN 96 130 882 405
Tel: 02 9439 1777
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info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

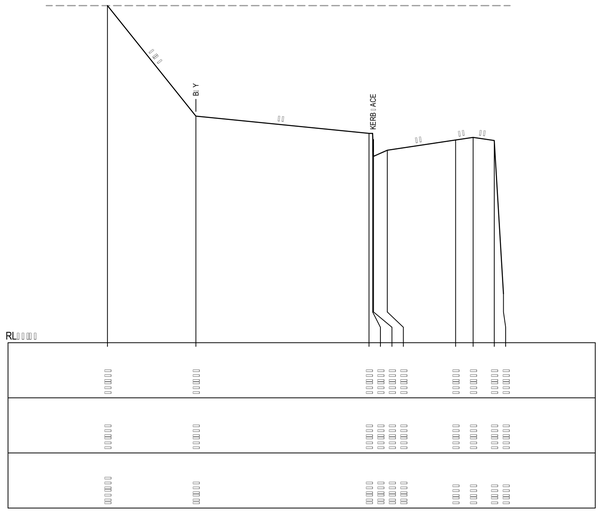
A1

Project - Drawing No.
18-557-C124

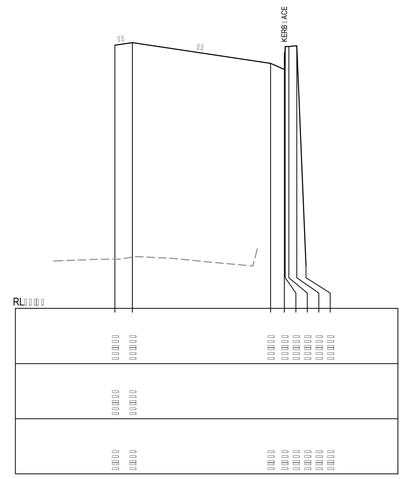
Issue
A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C124.dwg



CH



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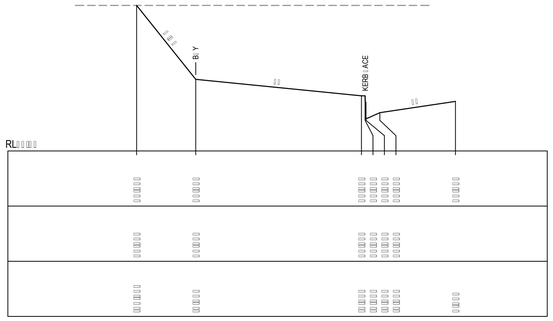

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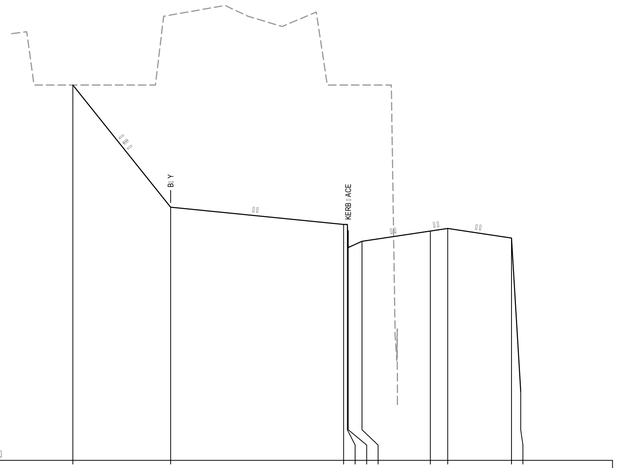

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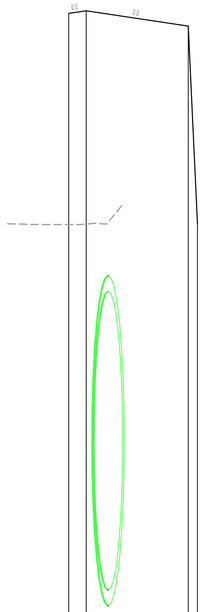

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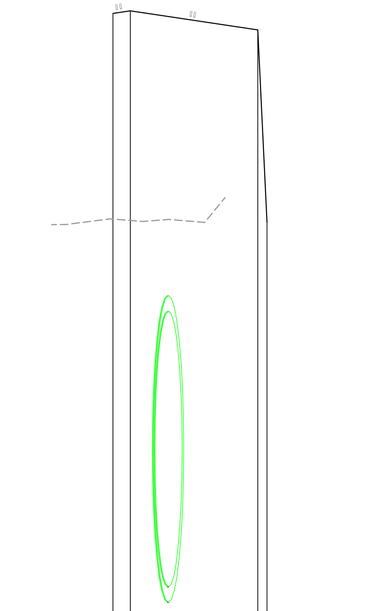

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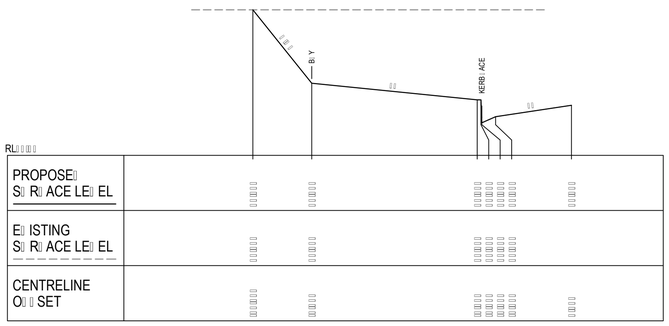


CH

CH

CH

CH

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A

A

A

A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

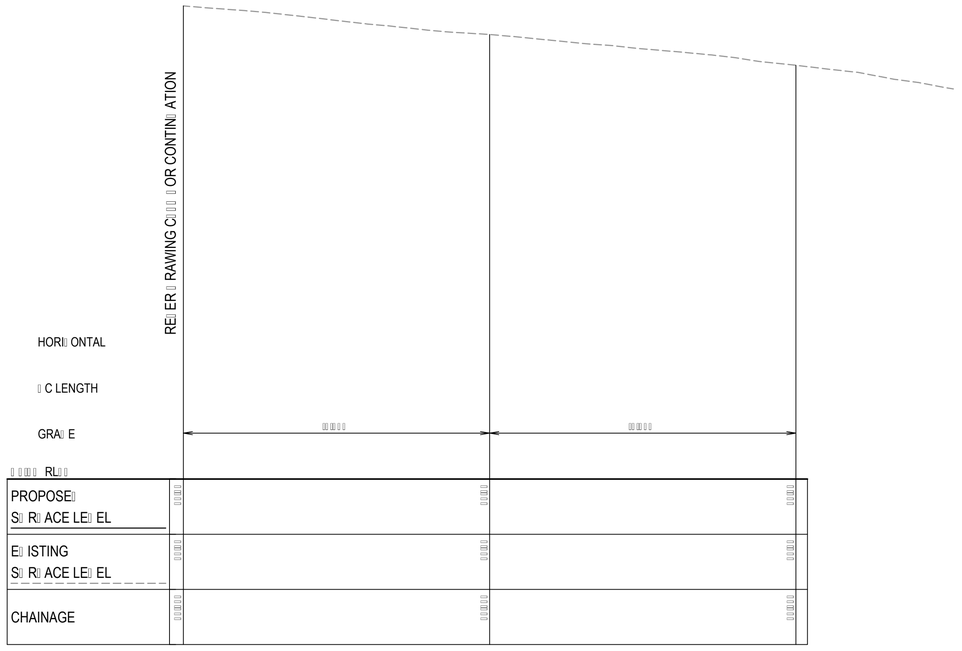
Title
GEORGE JULIUS AVENUE
CONTROL MC01
CROSS SECTIONS
SHEET 1

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No. 18-557-C130	A

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C130.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



LONGIT INAL SECTION EPSOM ROA CONTROL MC
SCALE HORI
ERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales
A A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
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Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
EPSOM ROAD
CONTROL LINE MC03
LONGITUDINAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
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Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

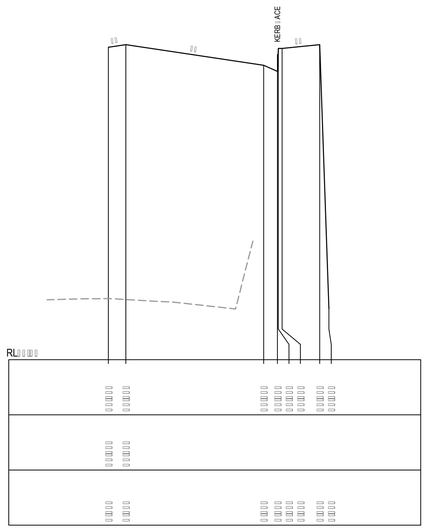
Project - Drawing No.
18-557-C125

Issue
A

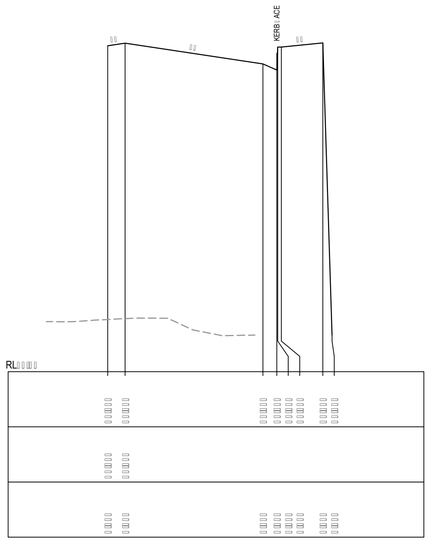
100mm on Original

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C125.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



CH



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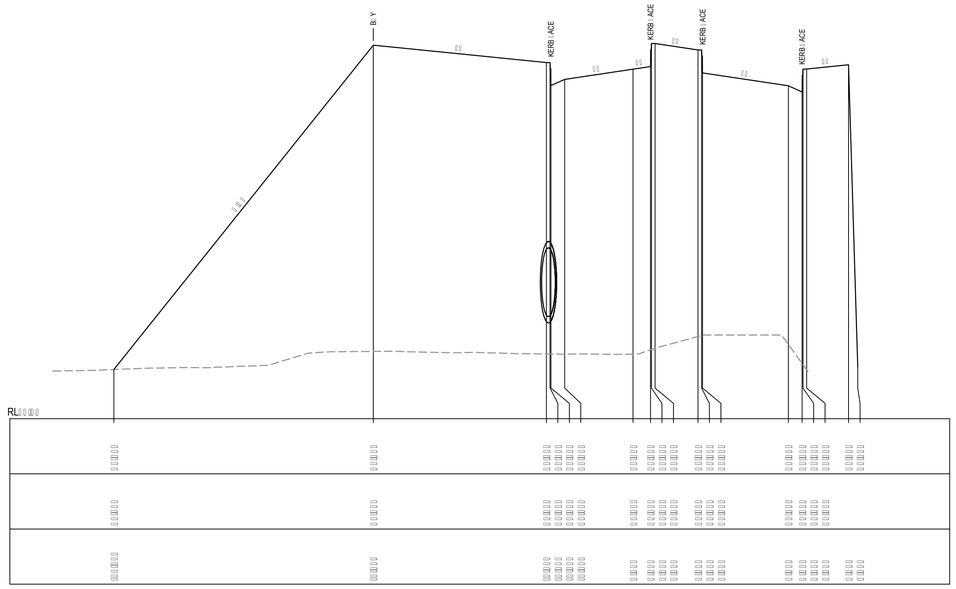

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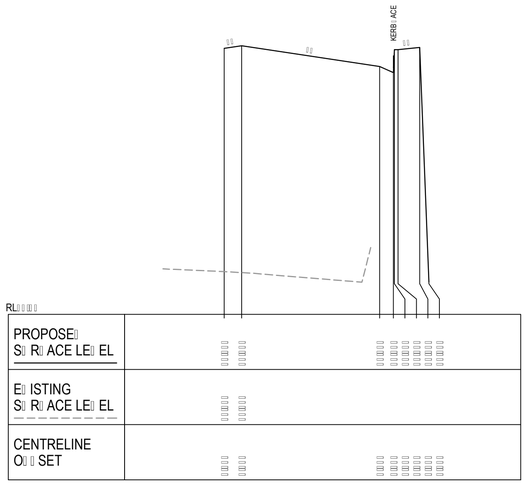

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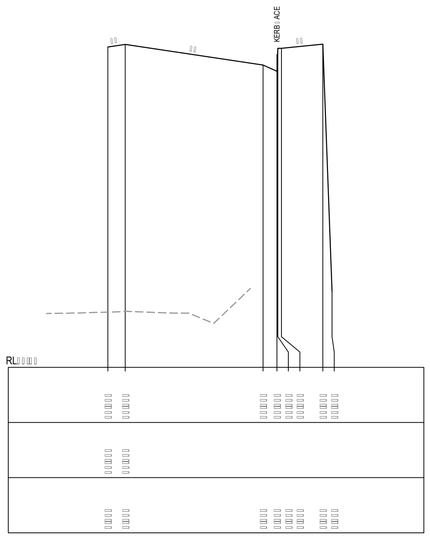

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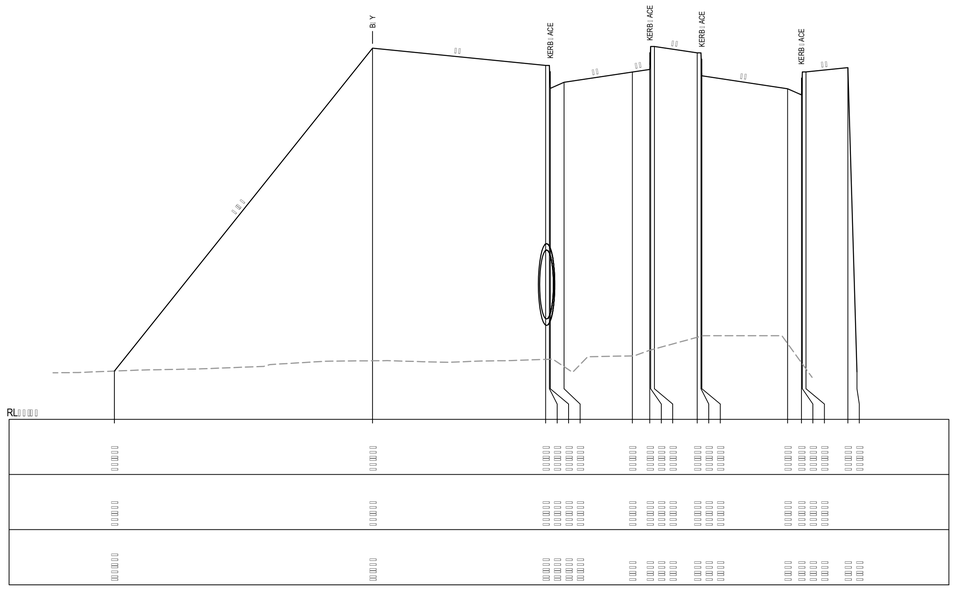

CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A1 A1

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
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Scales	1 : 20 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
GEORGE JULIUS AVENUE
CONTROL MC01
CROSS SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
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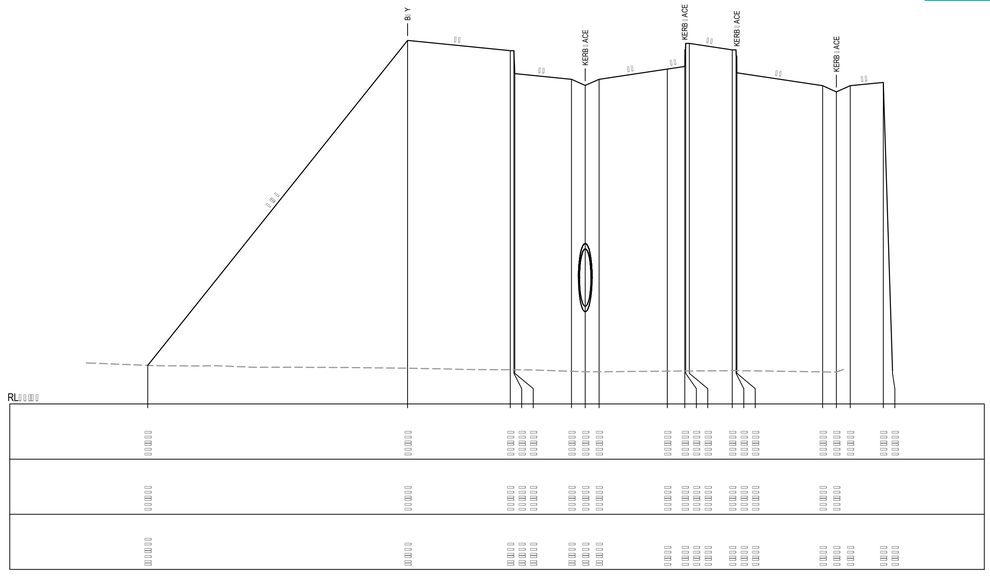
Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No. 18-557-C131	A

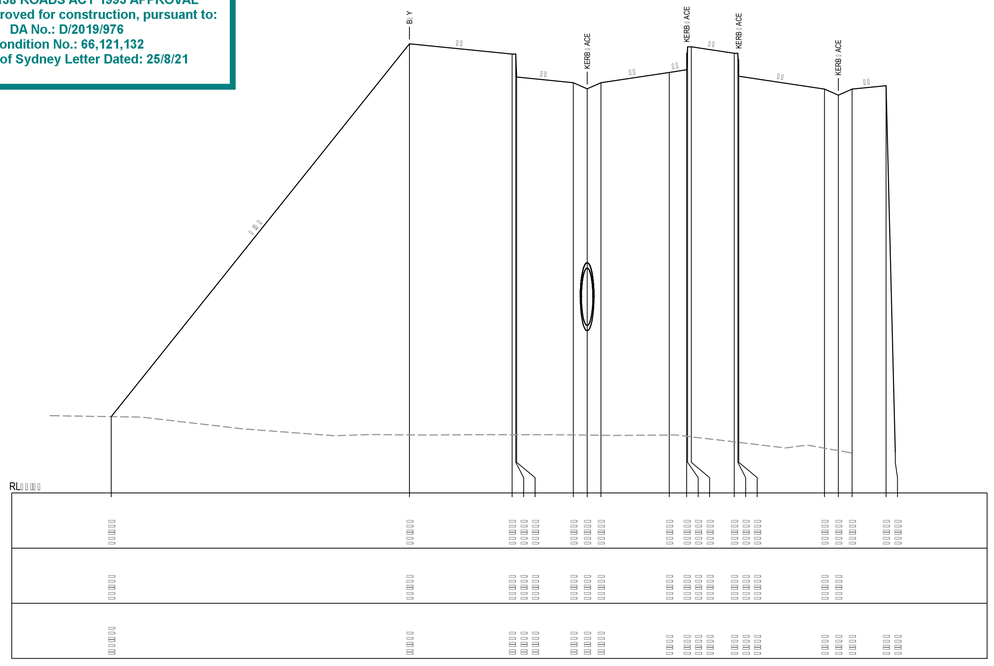
100mm on Original

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C131.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



CH



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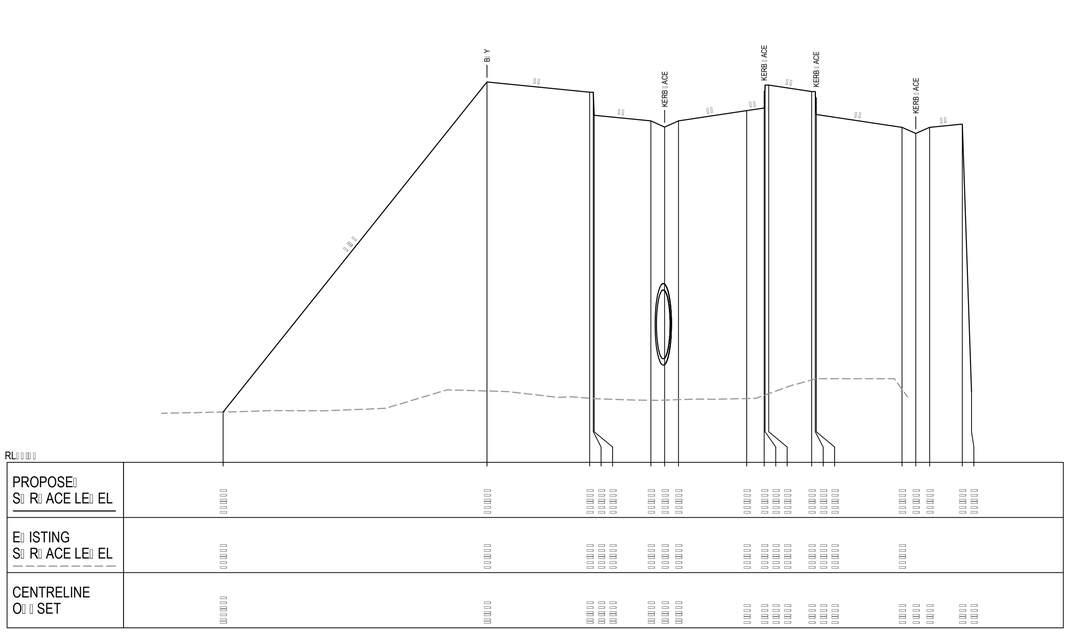

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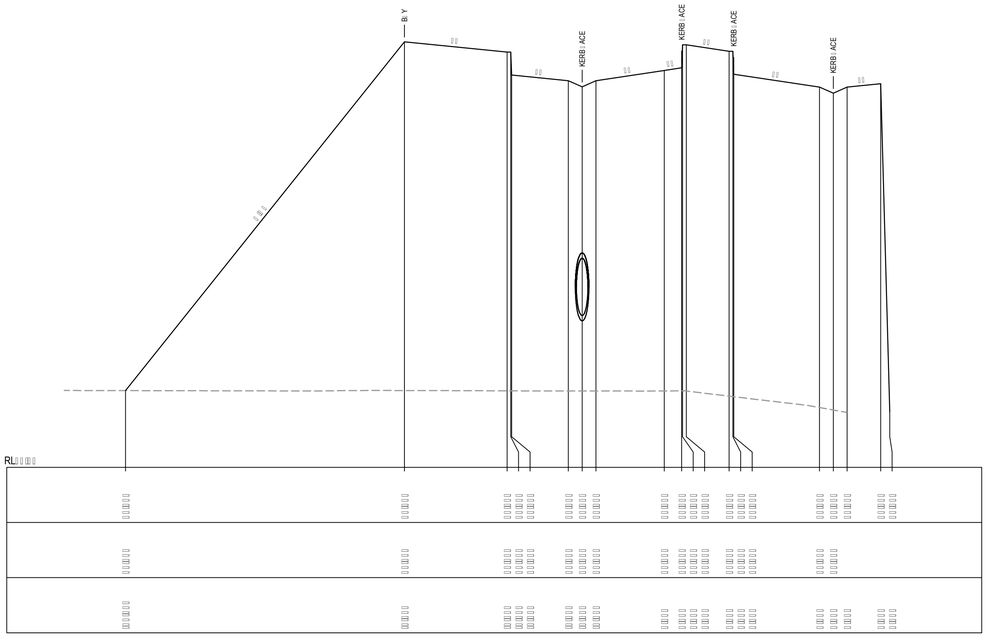
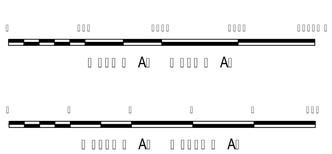


CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales



100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

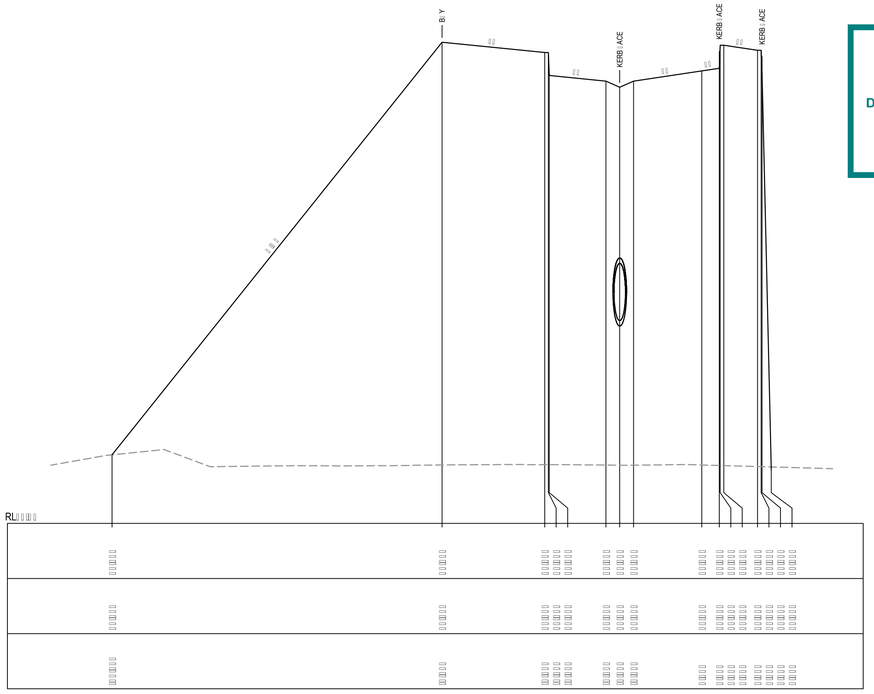
Scales	1 : 20 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
GEORGE JULIUS AVENUE
CONTROL MC01
CROSS SECTIONS
SHEET 3

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C132	A



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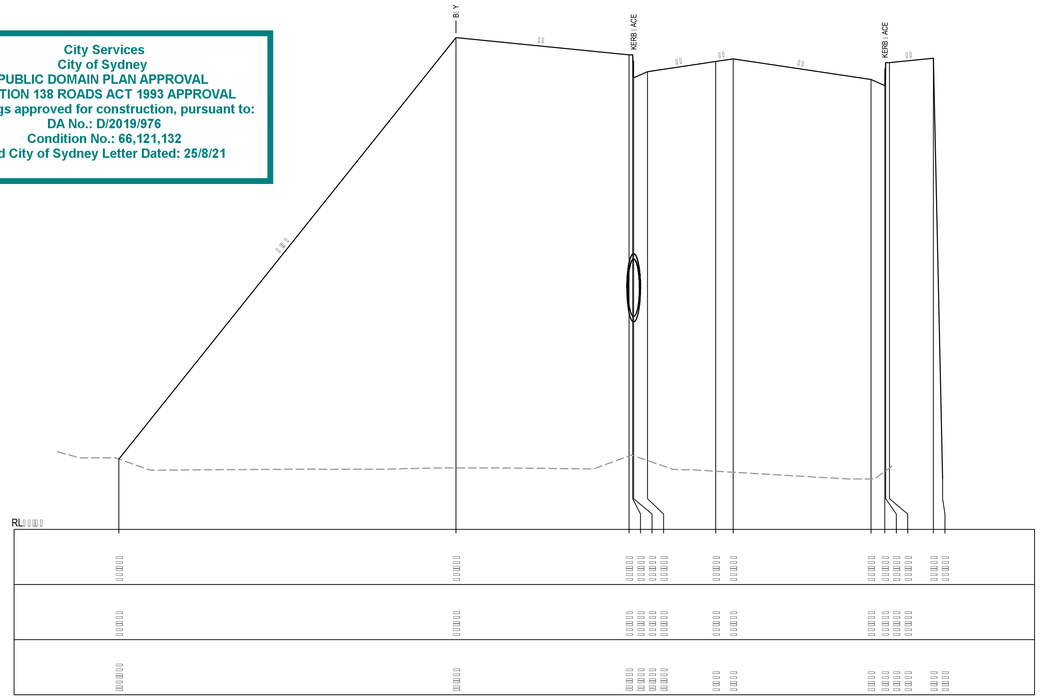

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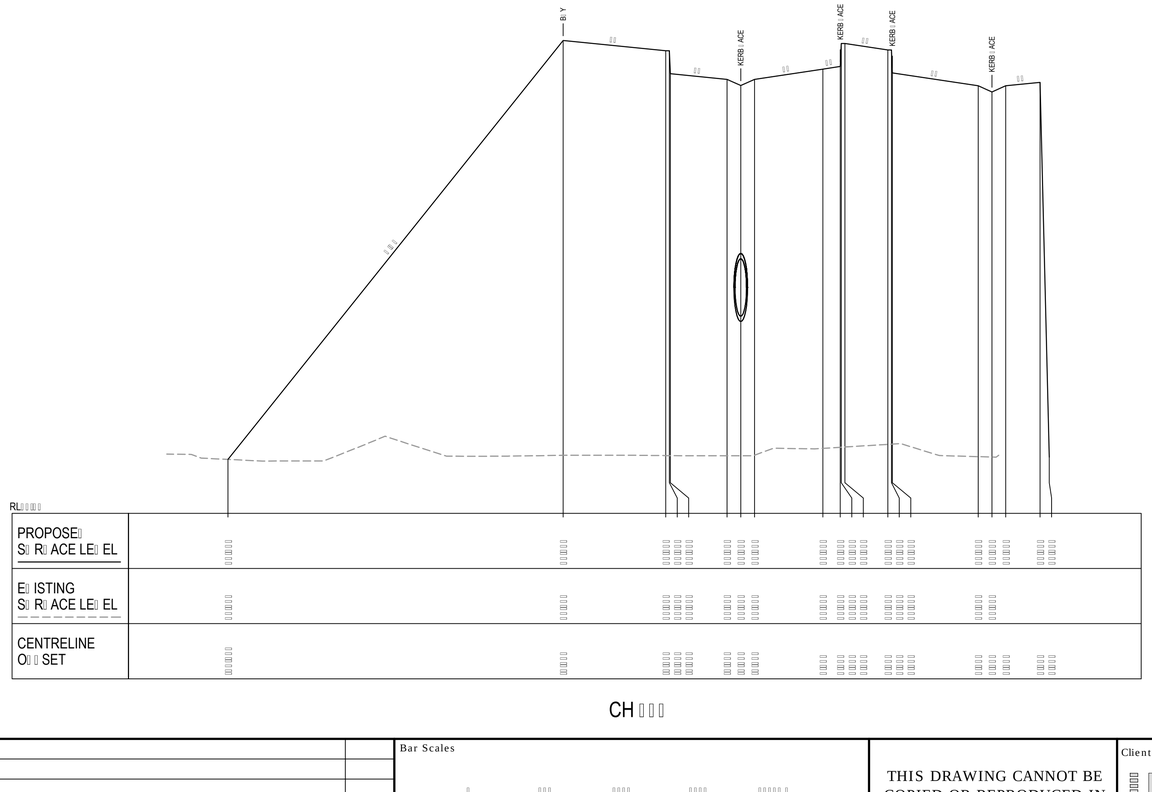

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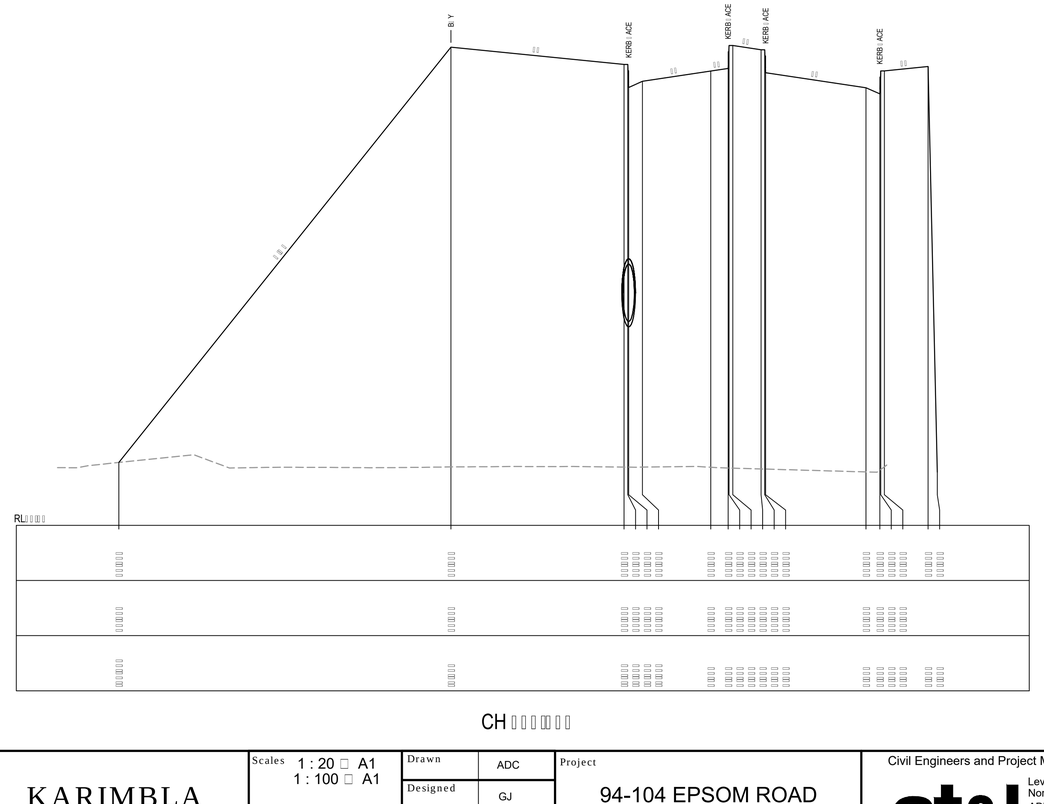

CH

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A

A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales 1 : 20 A1
1 : 100 A1

Grid MGA

Height Datum AHD

Drawn ADC
Designed GJ
Checked GJ
Approved

Project
94-104 EPSOM ROAD
ETLAND

Title
GEORGE JULIUS AVENUE
CONTROL MC01
CROSS SECTIONS
SHEET 4

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
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info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

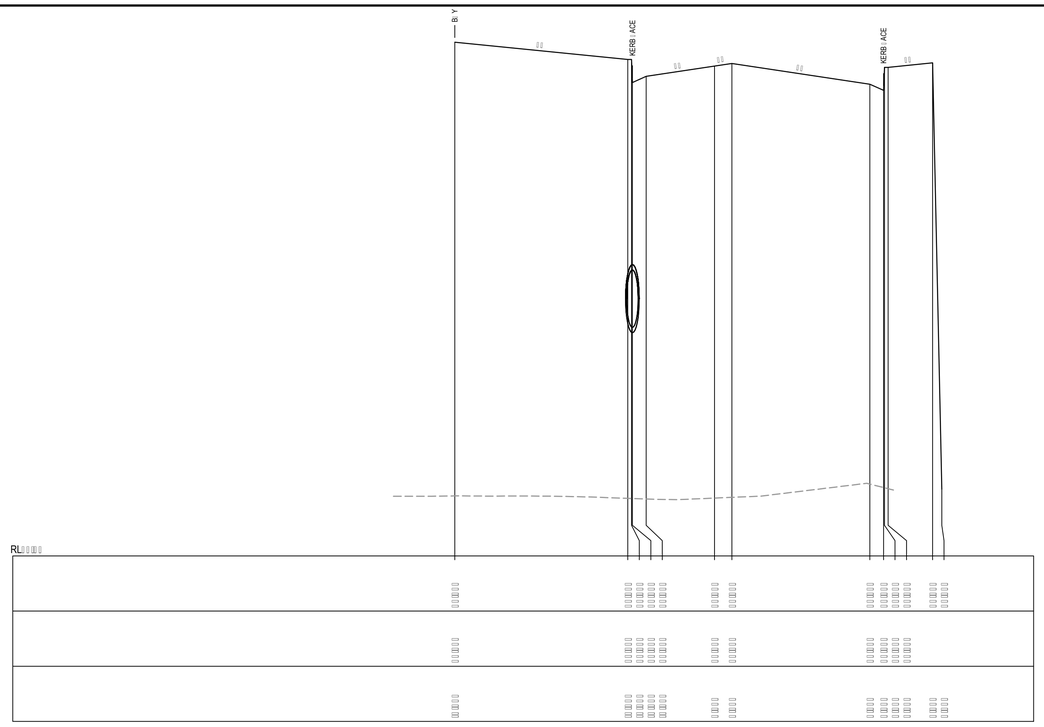
A1

Project - Drawing No.
18-557-C133

Issue
A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C133.dwg



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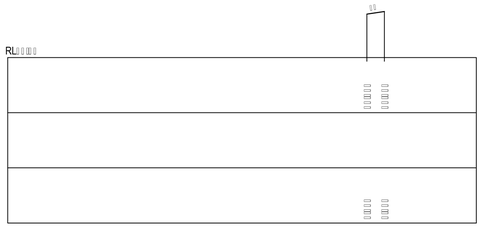

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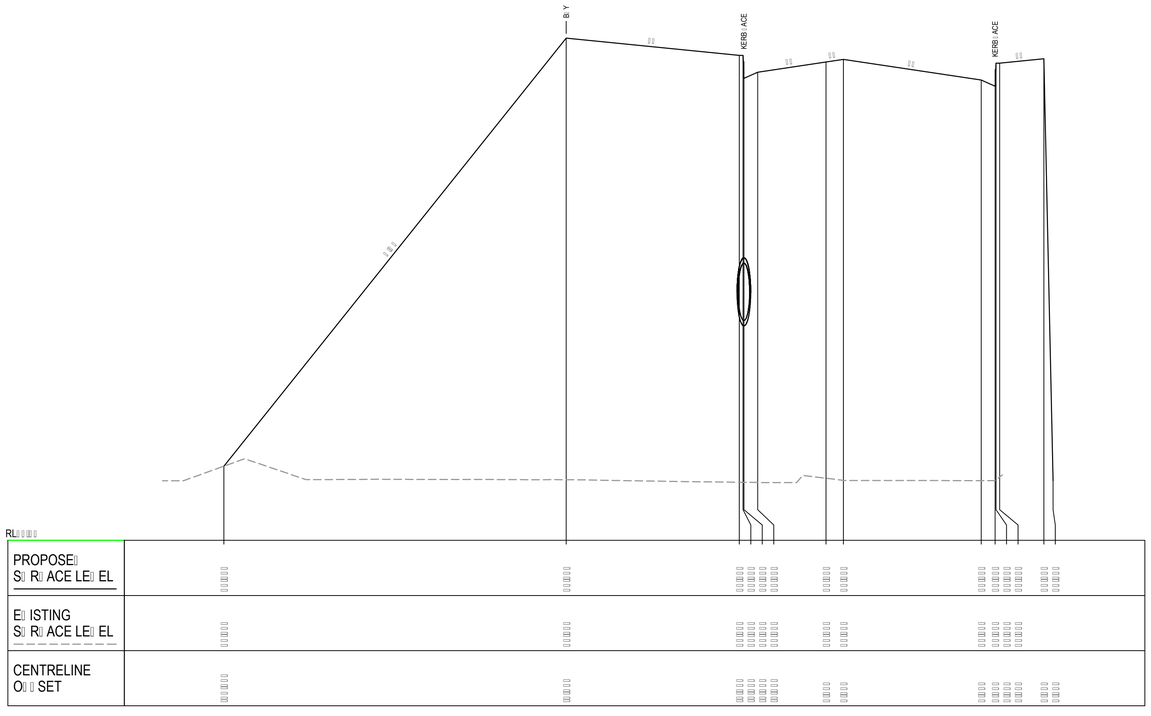

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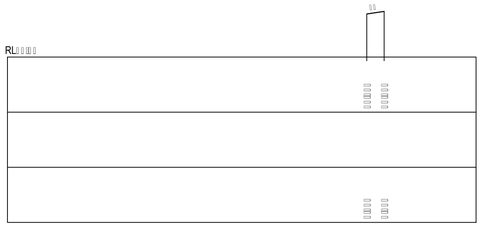

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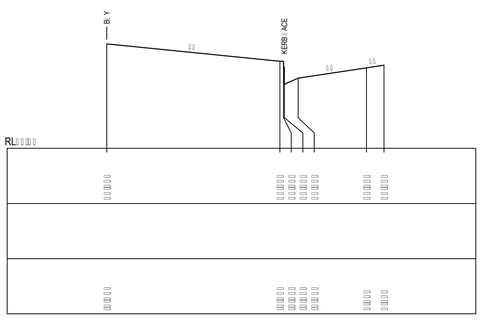


CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A1 A1

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project

94-104 EPSOM ROAD
ETLAND

Title

GEORGE JULIUS AVENUE
CONTROL MC01
CROSS SECTIONS
SHEET 5

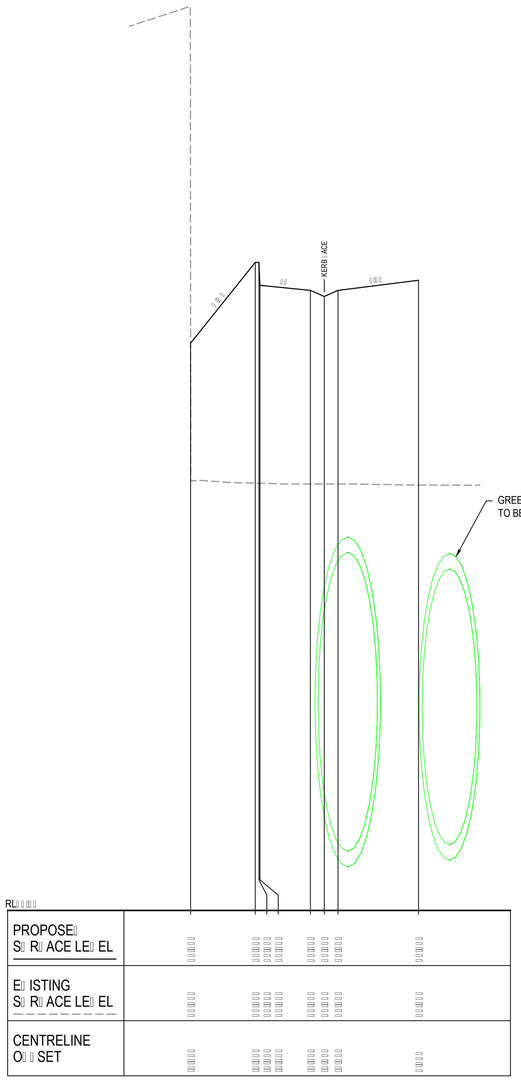
Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C134	A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C134.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



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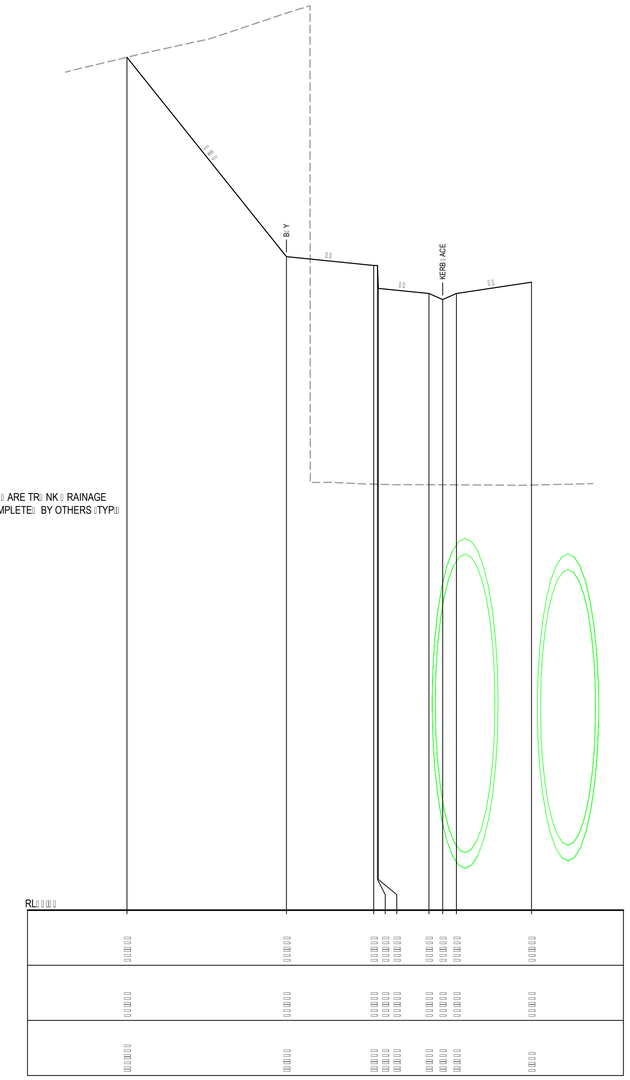

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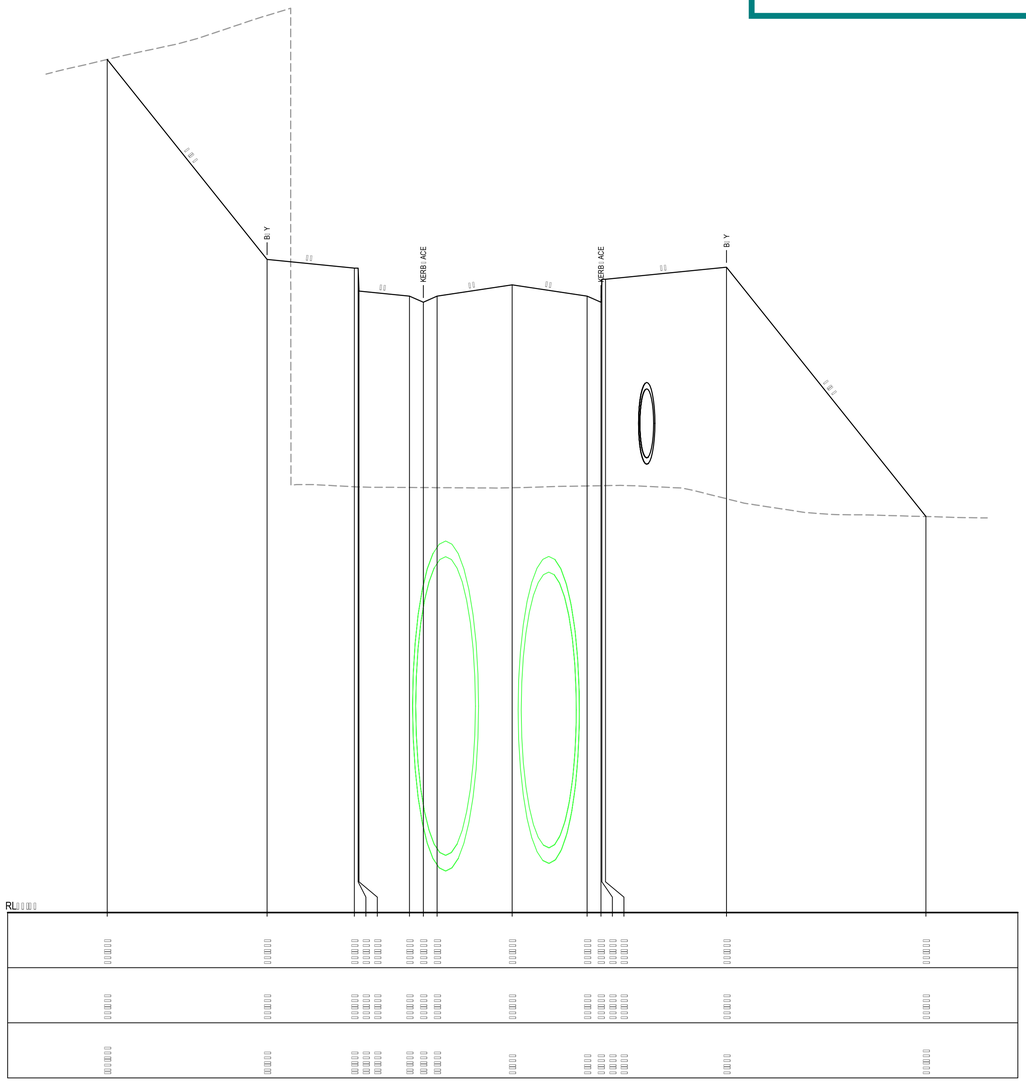

CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 1

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

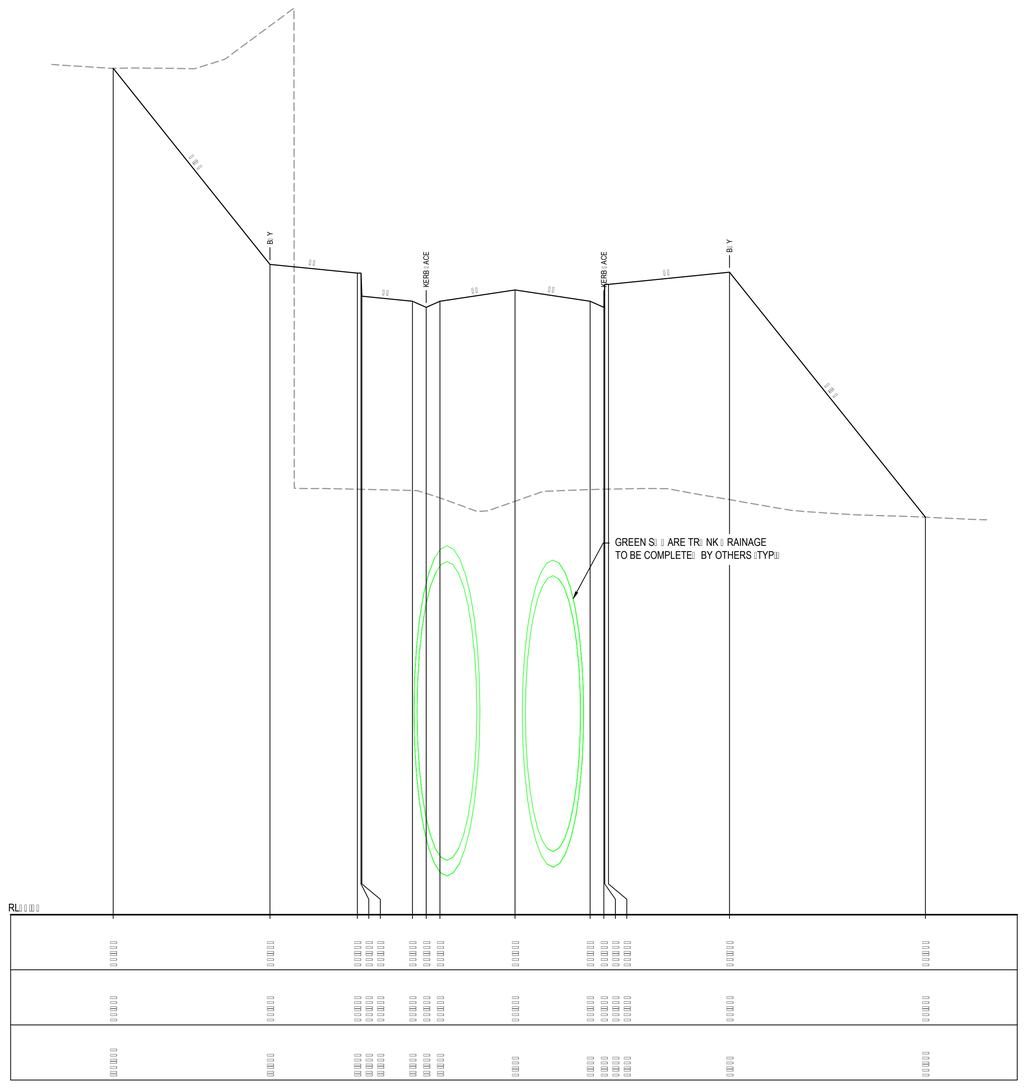
A1

Project - Drawing No.
18-557-C135

Issue
A

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C135.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



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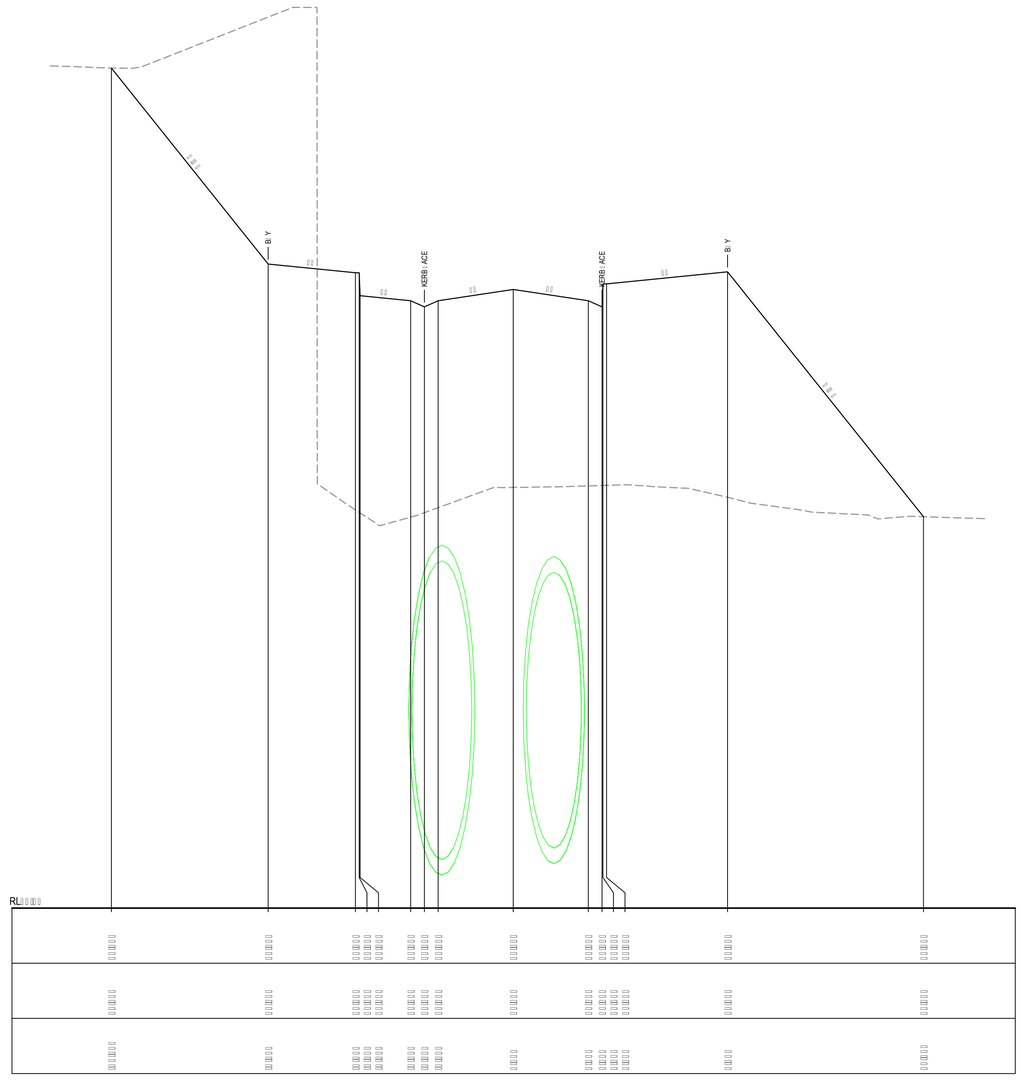

CH . .

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

. . . . A. . . . . A.

. . . . . A. . . . . A.

100mm on Original

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info. design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 . A1 1 : 100 . A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
.ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 2

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
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www.atl.net.au
info. atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

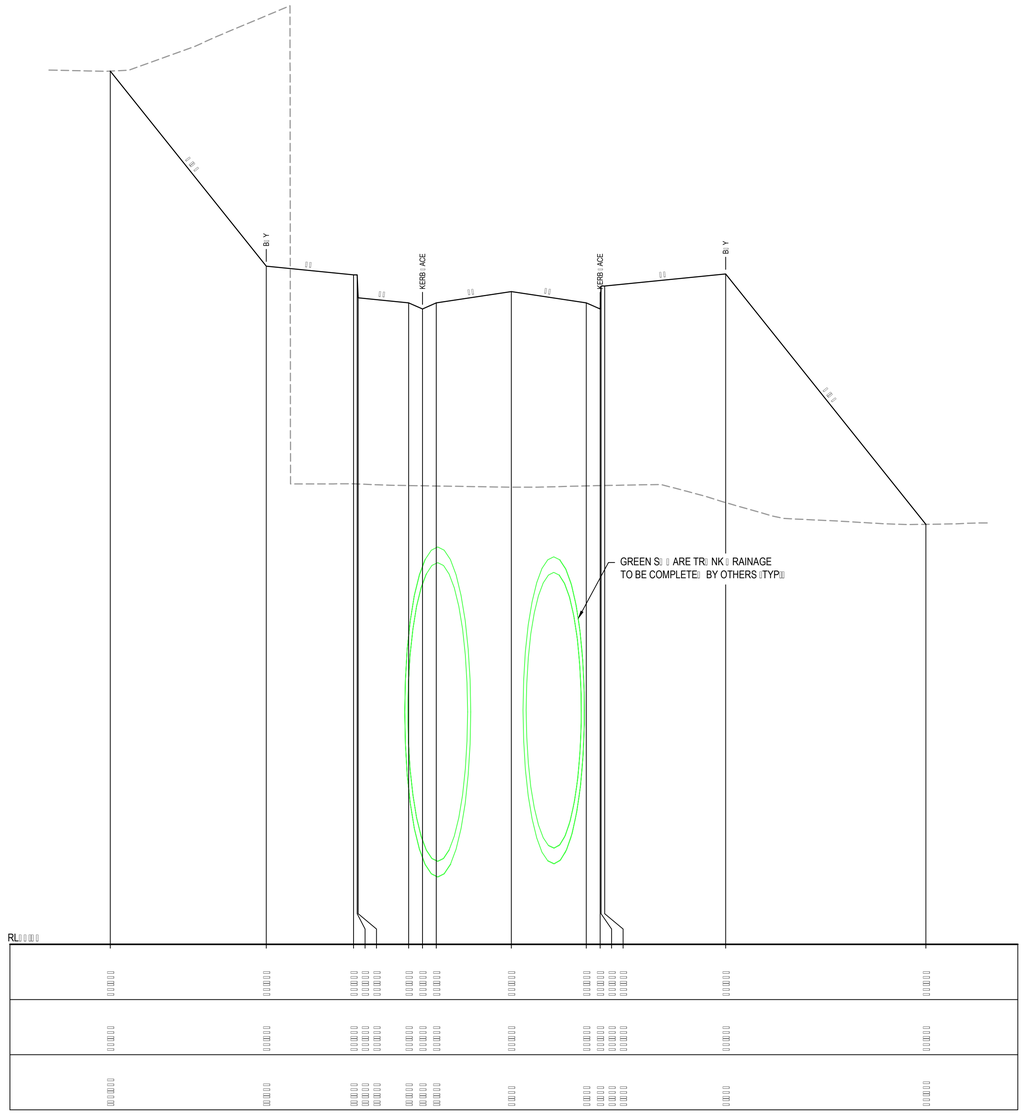
A1

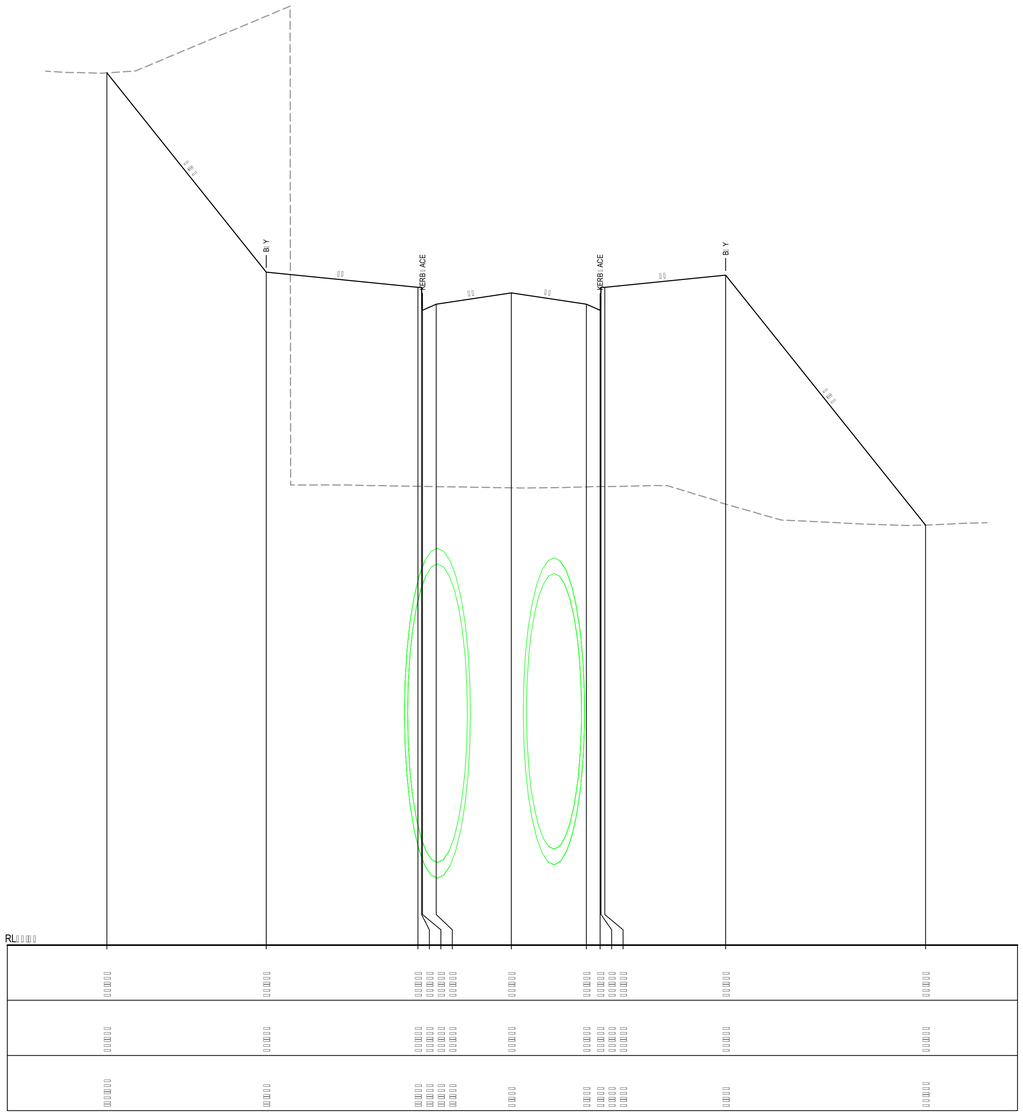
Project - Drawing No.
18-557-C136

Issue
A

Date Plotted: 14 Aug 2020 - 05:03PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C136.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21





Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

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Tel: (02) 9287 2888 Fax: (02) 9287 2777
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Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 3

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North Sydney NSW 2065
ABN 96 130 882 405
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info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

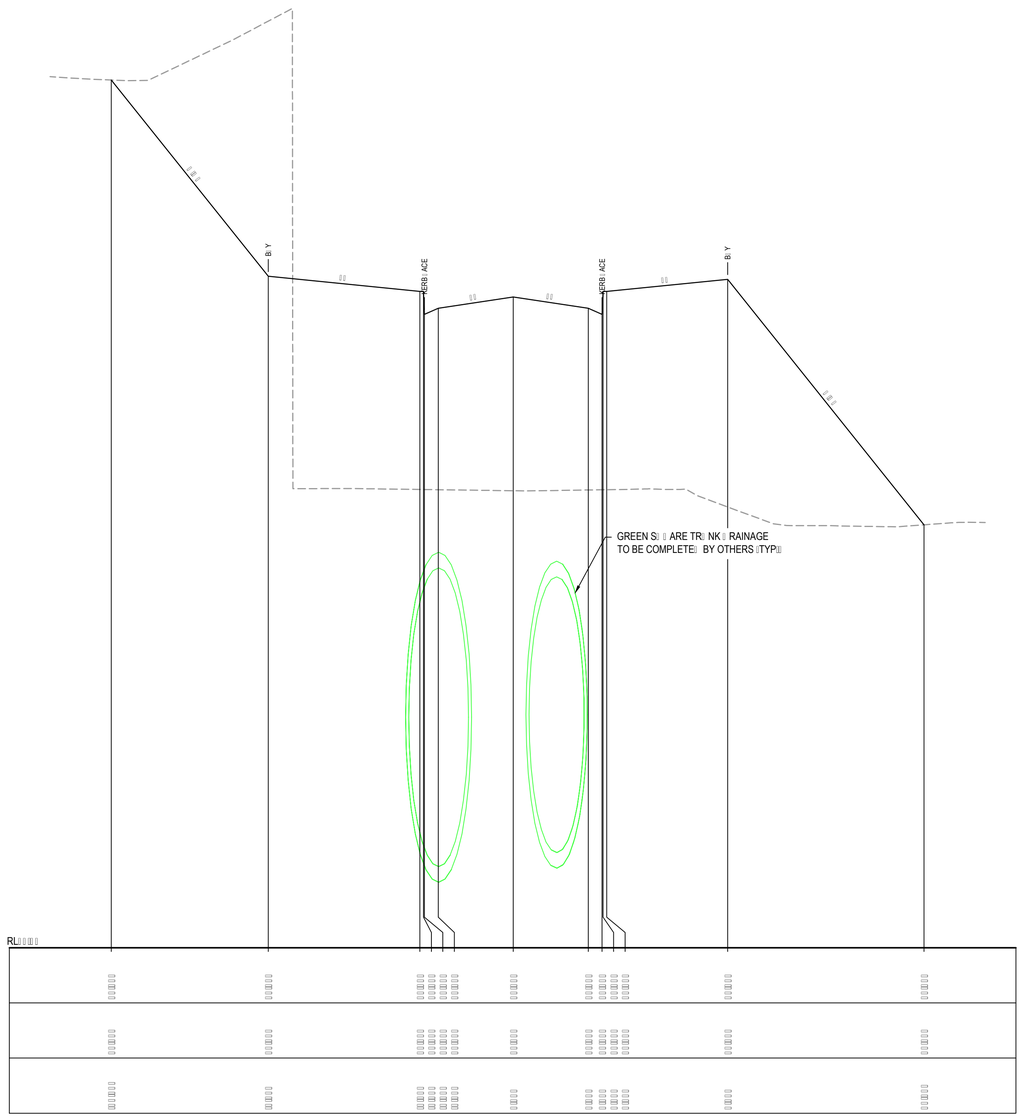
A1

Project - Drawing No.
18-557-C137

Issue
A

Date Plotted: 14 Aug 2020 - 05:04PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C137.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



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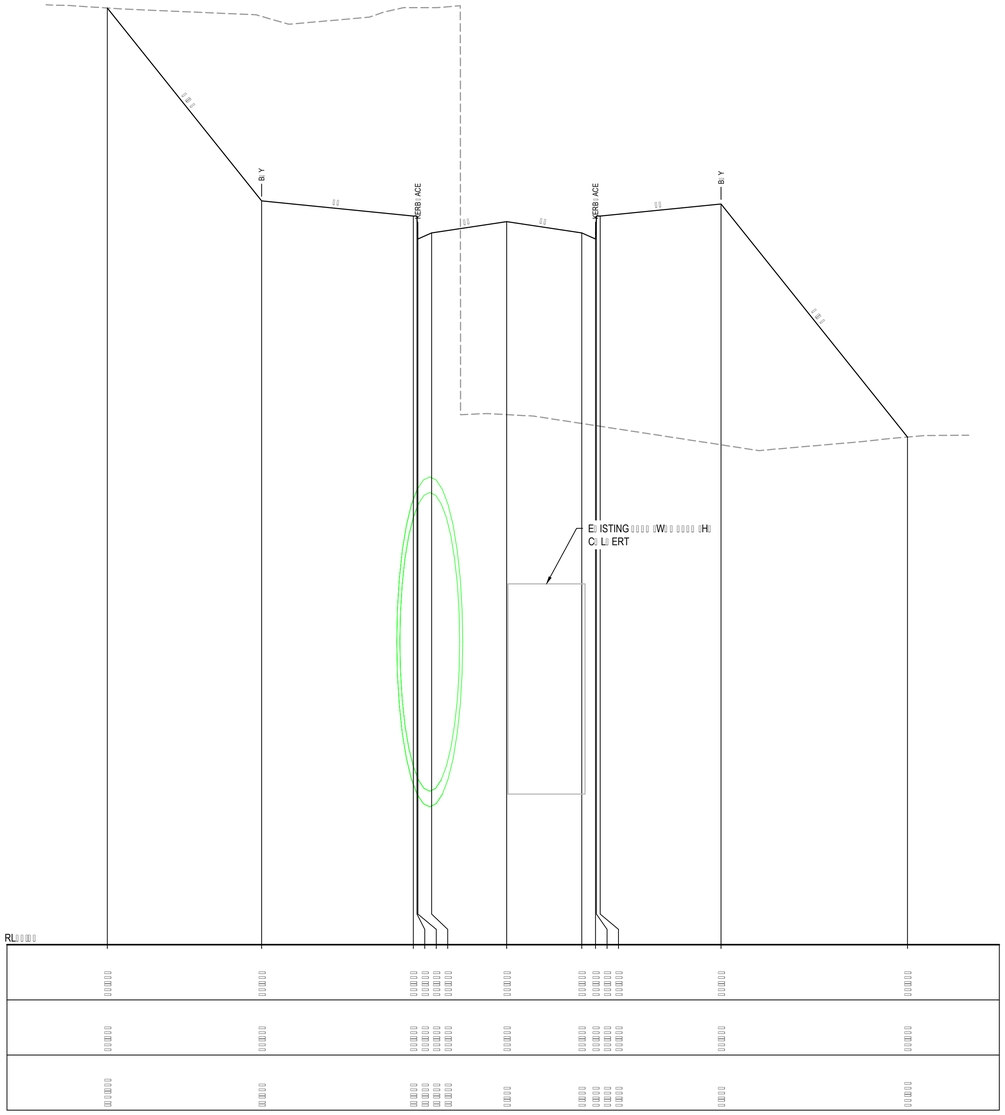

CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD

Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 4

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
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www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

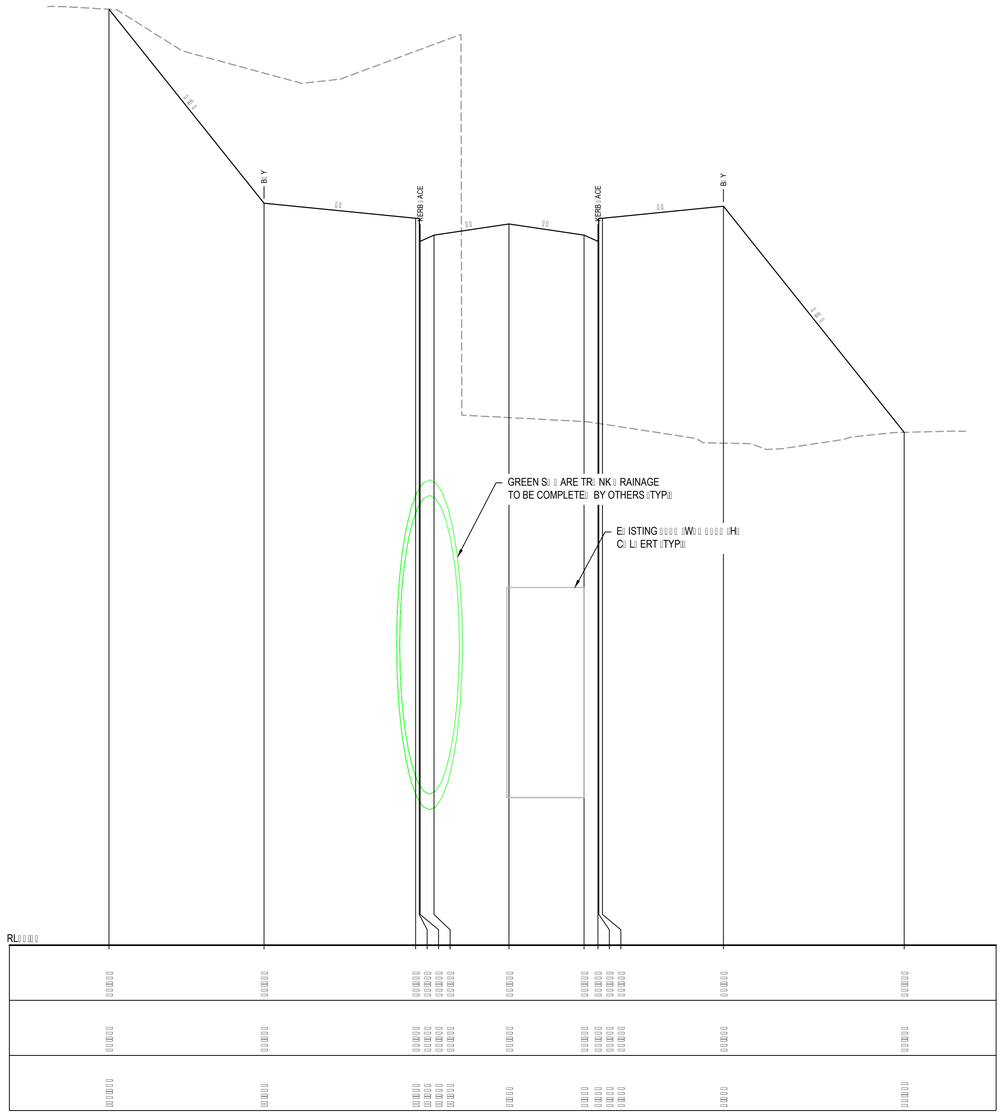
A1

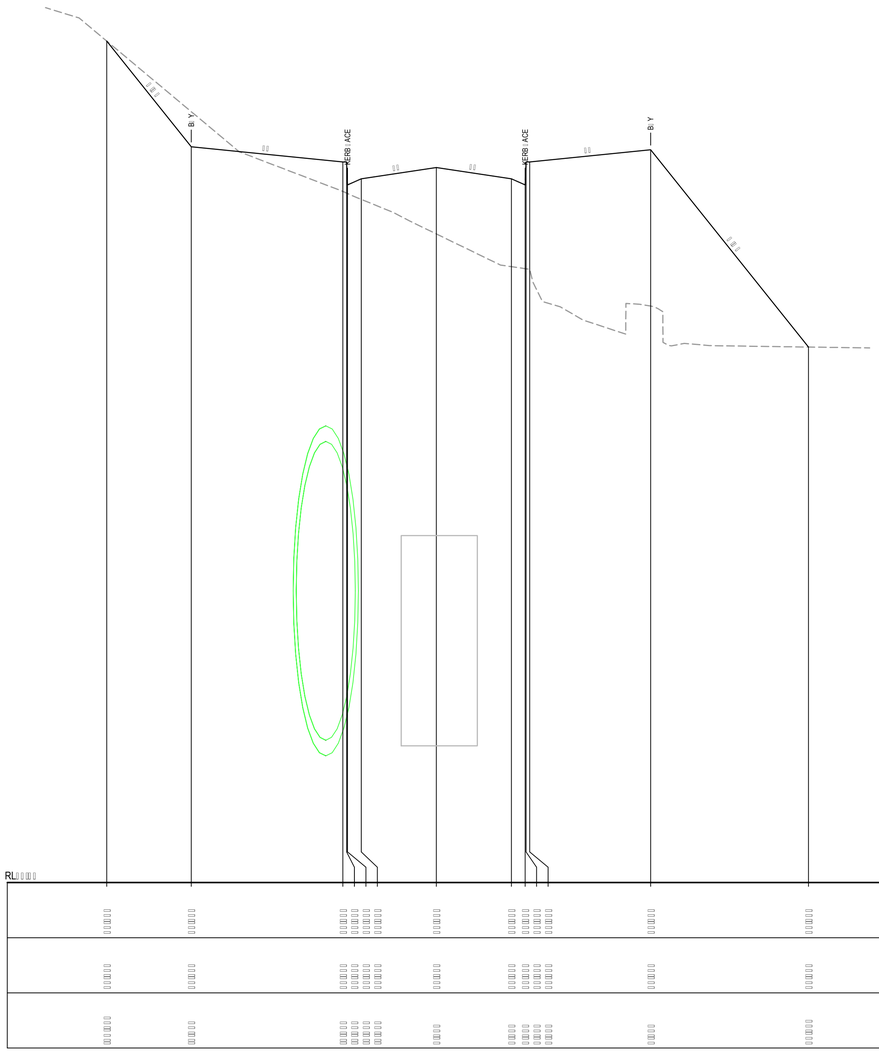
Project - Drawing No.
18-557-C138

Issue
A

Date Plotted: 14 Aug 2020 - 05:04PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C138.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21





Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 5

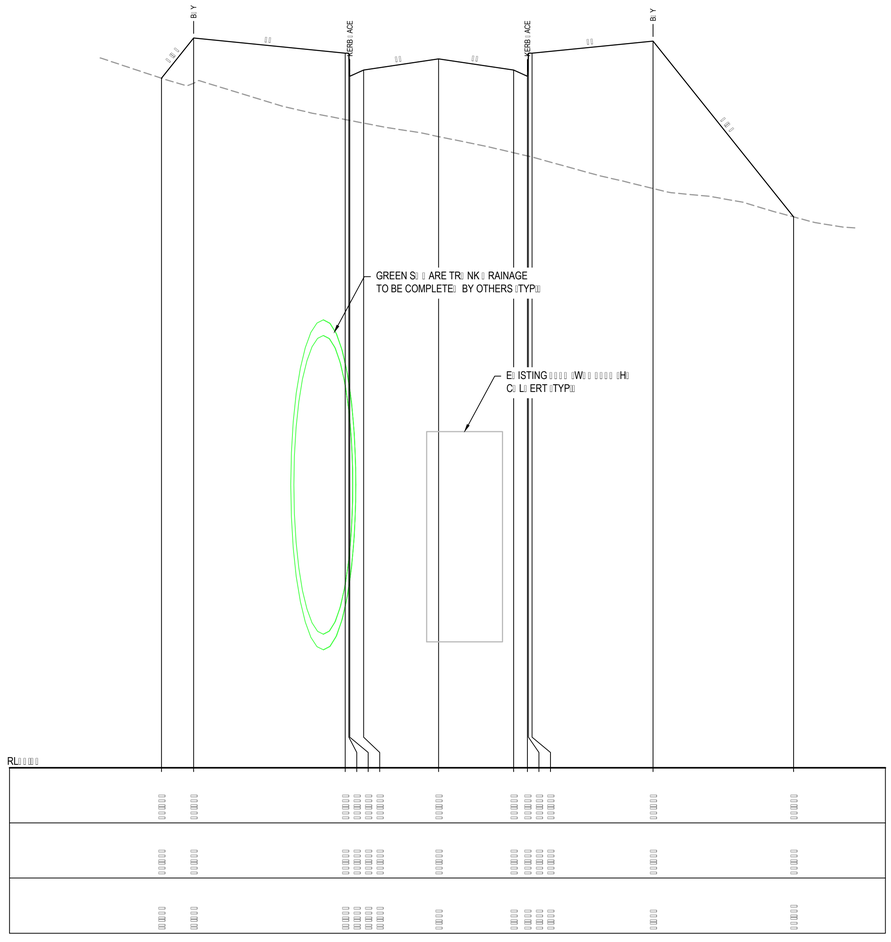
Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

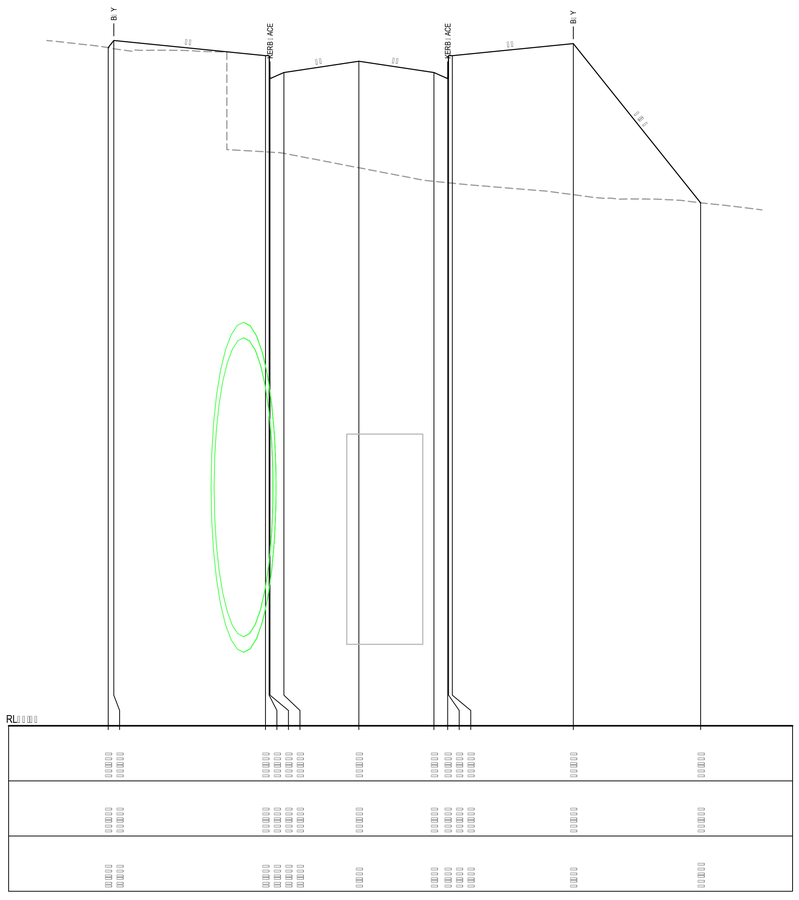
Status	FOR APPROVAL NOT FOR CONSTRUCTION
Project - Drawing No.	18-557-C139
Issue	A
	A1

100mm on Original

Date Plotted: 14 Aug 2020 - 05:04PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C139.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21





Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

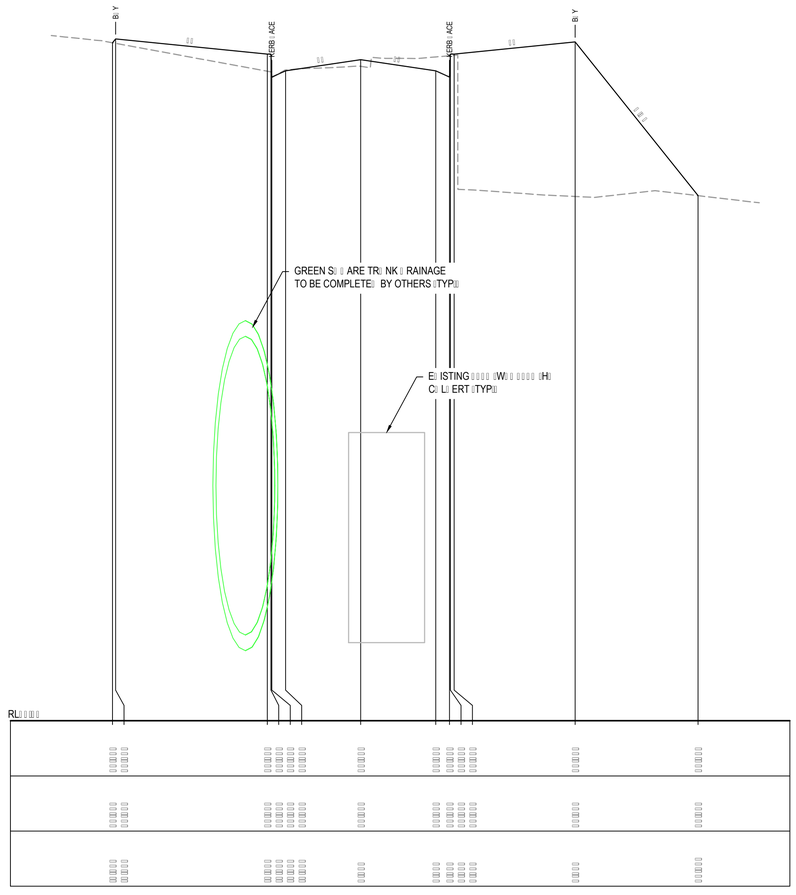
Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 6

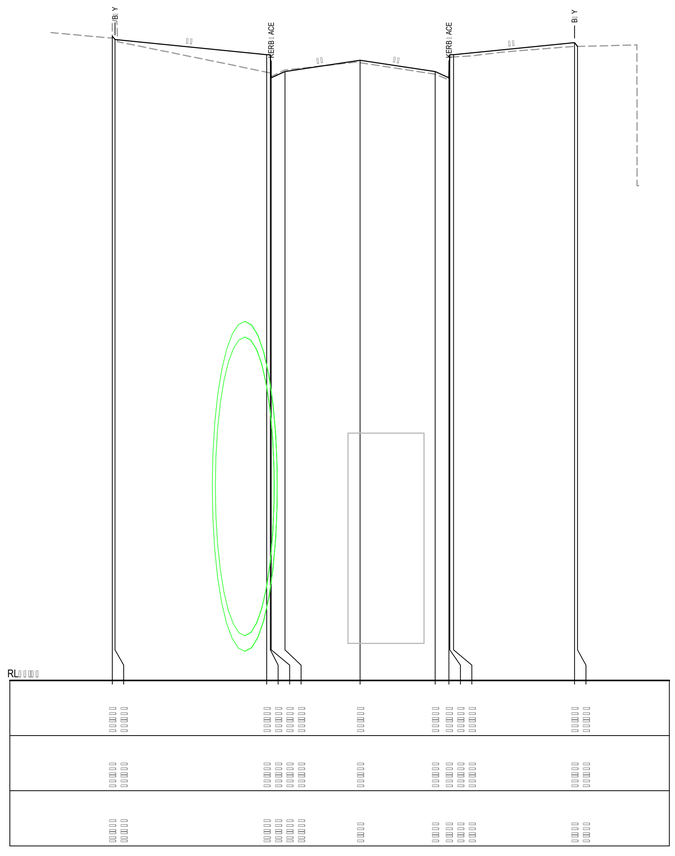
Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C140	A

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



CH



CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 20 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
ROSE VALLEY WAY
CONTROL MC02
CROSS SECTIONS
SHEET 7

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

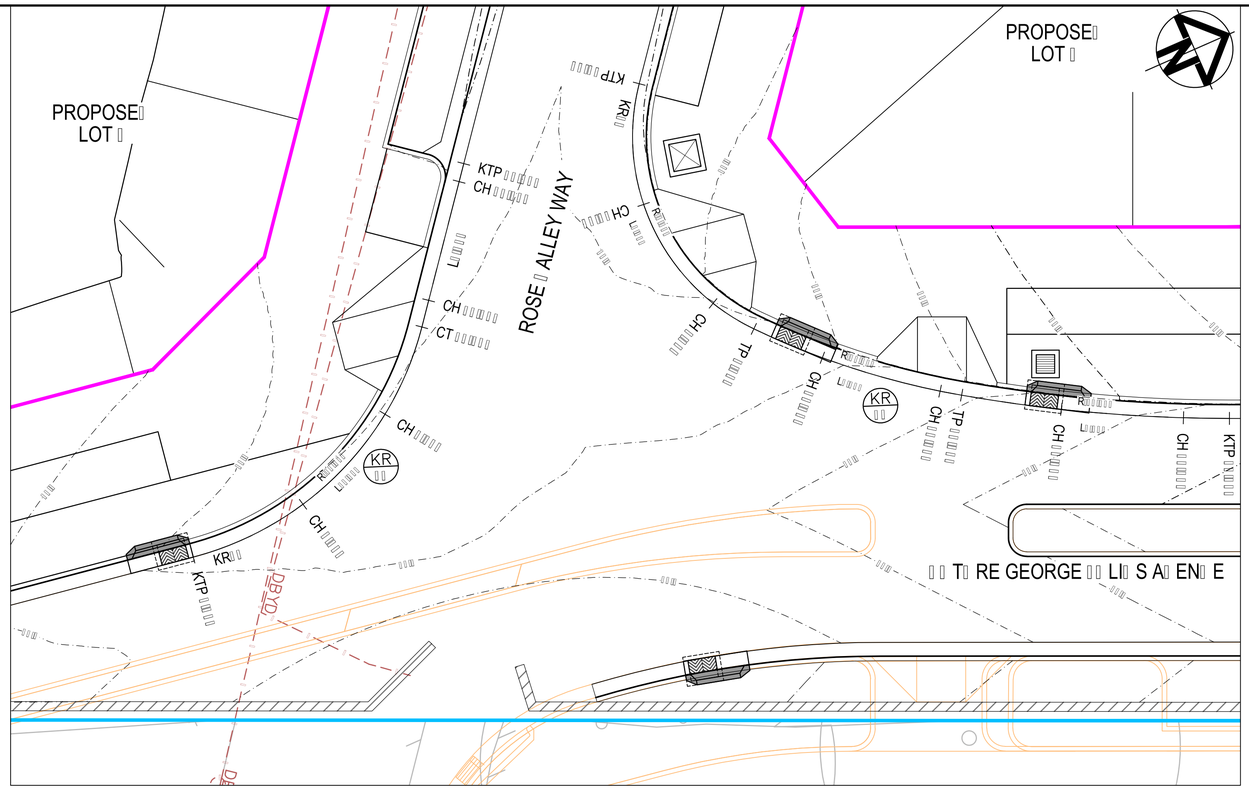
A1

Project - Drawing No.
18-557-C141

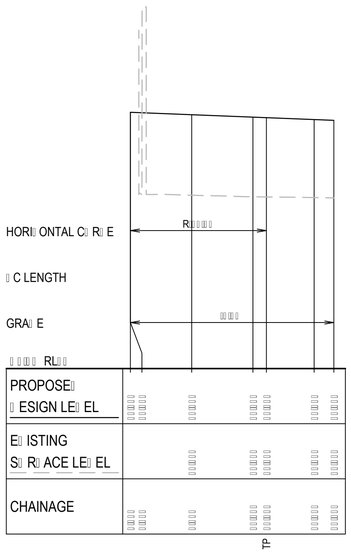
Issue
A

100mm on Original

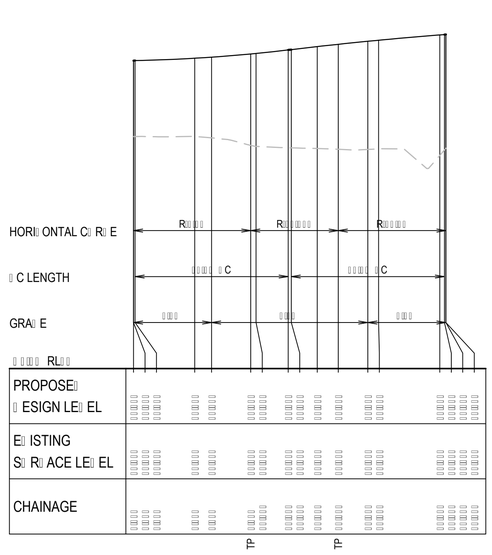
Date Plotted: 14 Aug 2020 - 05:04PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C141.dwg



PLAN
SCALE



KERB RET RN PRO ILE KR
SCALE HORI
1:50 VERT.



KERB RET RN PRO ILE KR
SCALE HORI
1:50 VERT.

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

A A

A A

100mm on Original

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	AS SHOWN
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
KERB RETURN PROFILES

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

Project - Drawing No.
18-557-C143

Issue
A

Date Plotted: 14 Aug 2020 - 05:04PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C143.dwg

PAVEMENT JOINTS LEGEND

—··—EJ—··— EXPANSION JOINT

—··—CJ—··— CONSTRUCTION/CONTRACTION JOINT

NOTES:
1. CONSTRUCTION AND EXPANSION JOINTS WITHIN FOOTPATH PAVEMENT REFER TO CITY OF SYDNEY STANDARD DRAWINGS 2.6.2, 2.6.3 AND 2.6.4
2. CONTRACTION AND EXPANSION JOINTS WITHIN ROAD PAVEMENT REFER TO CITY OF SYDNEY STANDARD DRAWINGS 3.1.2 AND 3.1.3
3. PROVIDE 150mm WIDE FLUSH KERB WHERE TO ALL PAVER TYPE PAVEMENT EDGING, DEPTH OF KERB TO MATCH BASE OF CONCRETE SLAB REFER TO CITY OF SYDNEY STANDARD DRAWINGS 3.1.11

PAVEMENT LEGEND

PAVEMENT TYPE 1- FLEXIBLE ROAD PAVEMENT (3.1.1)

40mm ASPHALTIC CONCRETE (AC14) ON
100mm ASPHALTIC CONCRETE (AC20) IN TWO LAYERS ON
200mm BASECOURSE (DGB20, RMS3051) ON
200mm SUB BASECOURSE (DGS40, RMS3051) ON
COMPACTED SUBGRADE TO 98% MDD (CBR = 10%)
TRAFFIC - ESA 1 x 10^6 ESA

PAVEMENT TYPE 2 - VEHICULAR CROSSING (2.6.8)

200mm THICK CONCRETE (32MPa) WITH SL82 T&B (50mm COVER) ON
150mm BASECOURSE (DGB20, RMS3051, 98% MMDD) ON
200mm SUB BASECOURSE (DGS40, RMS3051) ON
COMPACTED SUBGRADE TO 98% MDD (CBR = 4%)
(PAVEMENT FINISH TO MATCH TYPE 6)

PAVEMENT TYPE 3 - FOOTPATH (REFER TO COS DETAIL 1.2.6.3)

110mm THICK CONCRETE (32MPa) WITH SL72 (TOP 40mm COVER) ON
100mm BASECOURSE (DGB20, RMS3051, 98% MMDD) ON
COMPACTED SUBGRADE TO 98% MDD (CBR = 4%)
JOINT SPACINGS REFER TO CITY OF SYDNEY STANDARD DRAWING 2.6.2 FOR DETAILS
(PAVEMENT FINISH TO LANDSCAPE ARCHITECT'S DETAIL)

PAVEMENT TYPE 4 - UNIT PAVING FOOTPATH (REFER TO COS DETAIL 2.3.9)

50mm THICK PAVER (CoS STD DWG 2.3.9) ON
30mm THICK MORTAR BEDDING ON
110mm THICK CONCRETE (f'c=32MPa) WITH
SL72 MESH (40mm TOP COVER) ON
100mm THICK COMPACTED BASECOURSE (DBG 20) ON COMPACTED SUBGRADE.
(PAVEMENT FINISH TO LANDSCAPE ARCHITECT'S DETAIL)

PAVEMENT TYPE 5 - PERMEABLE PAVING (PV4 - ECOTRIHEX HONED SILVER)

80mm THICKNESS PERMEABLE PAVERS (ECOTRIHEX LAID IN ACCORDANCE WITH CMAA MA56) COLOUR TO LANDSCAPE ARCHITECTS DETAILS. ON
20mm THICKNESS BEDDING MATERIAL (2-5mm AGGREGATE 'BLUE METAIL') ON
150mm THICKNESS DRAINAGE MEDIUM (5-10mm AGGREGATE 'BLUE METAL') ON
GEOTEXTILE FILTER FABRIC (BIDM A29) ON
300mm THICKNESS BASECOURSE (OPEN GRADED BASECOURSE TABLE 3 CMAA MA56) ON
COMPACTED SUBGRADE TO 98% MDD (CBR = 4%)
(100mm DIA. SUBSOIL DRAINAGE DRAINING INTO NEAREST PIT)

PAVEMENT TYPE 6 - PERMEABLE PAVING (PV5 - ECOTRIHEX STANDARD CHARCOAL)

80mm THICKNESS PERMEABLE PAVERS (ECOTRIHEX LAID IN ACCORDANCE WITH CMAA MA56) COLOUR TO LANDSCAPE ARCHITECTS DETAILS. ON
20mm THICKNESS BEDDING MATERIAL (2-5mm AGGREGATE 'BLUE METAIL') ON
150mm THICKNESS DRAINAGE MEDIUM (5-10mm AGGREGATE 'BLUE METAL') ON
GEOTEXTILE FILTER FABRIC (BIDM A29) ON
300mm THICKNESS BASECOURSE (OPEN GRADED BASECOURSE TABLE 3 CMAA MA56) ON
COMPACTED SUBGRADE TO 98% MDD (CBR = 4%)
(100mm DIA. SUBSOIL DRAINAGE DRAINING INTO NEAREST PIT)

LANDSCAPING

REFER TO LANDSCAPE ARCHITECT'S DETAILS
(INCLUDE STRUCTURAL SOILS WITHIN THE LANDSCAPED AREAS WHERE TREE PLANTING IS REQUIRED

RAIN GARDENS

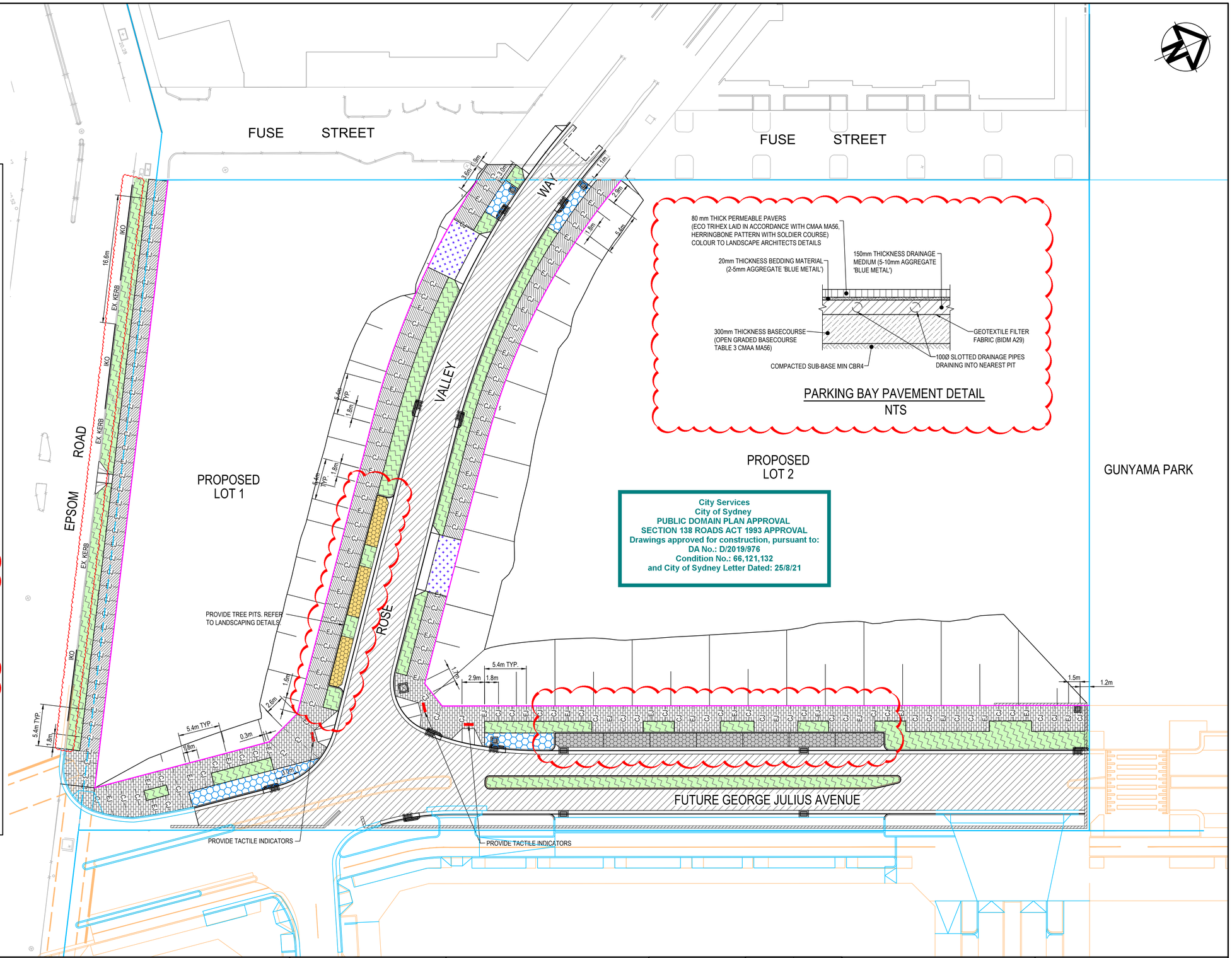
RAIN GARDEN MEDIA DEPTHS AND SPECIFICATION REFER DWG. C172 AND CITY OF SYDNEY STANDARD DRAWING 7.2.2
PLANTS AND VEGETATION REFER TO LANDSCAPE PLANS AND WSUD SPECIFICATIONS

NOTE:
PAVEMENT FINISH AND ROAD FURNITURE REFER TO LANDSCAPE ARCHITECT'S DETAILS
PAVEMENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH CITY OF SYDNEY COUNCIL.

KERB LEGEND

IKO — PROPOSED INTEGRAL KERB ONLY (REFER TO DETAIL ON DRAWING C170)

EX. KERB — EXISTING KERB



PARKING BAY PAVEMENT DETAIL
NTS

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
F	ISSUED FOR APPROVAL	10-08-21
E	ISSUED FOR APPROVAL	19-07-21
D	ADDED PARKING BAY PAVEMENT DETAIL	22-06-21
C	REVISED PARKING PAVEMENT	24-05-21
B	ISSUED FOR APPROVAL	12-04-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales
0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3

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Scales 1 : 250 @ A1
Grid MGA
Height Datum AHD

Drawn ADC
Designed GJ
Checked GJ
Approved

Project
94-104 EPSOM ROAD
ZETLAND

Title
PAVEMENT PLAN

Civil Engineers and Project Managers
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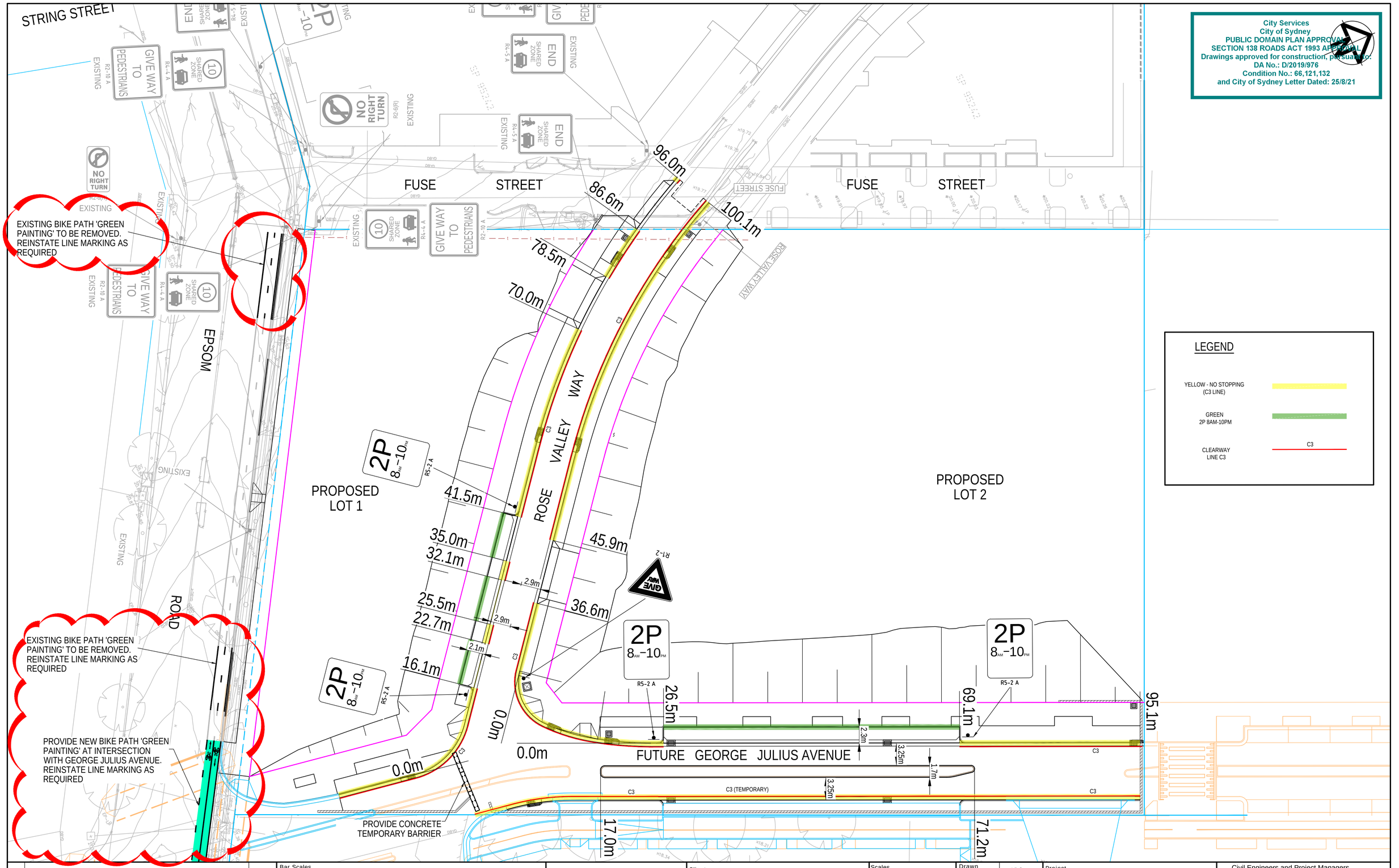
Status FOR APPROVAL
NOT FOR CONSTRUCTION
A1
Project - Drawing No. 18-557-C145
Issue F

100mm on Original

Date Plotted: 11 Aug 2021 - 08:13AM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C145.dwg



City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
F	ISSUED FOR APPROVAL	19-07-21
E	ISSUED FOR APPROVAL	22-02-21
D	ISSUED FOR APPROVAL	19-02-21
C	ISSUED FOR APPROVAL	18-02-21
B	ADDED STOP SIGNAGE	13-01-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales
0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3

Client
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Scales 1 : 250 @ A1
Grid MGA
Height Datum AHD
Drawn ADC
Designed GJ
Checked GJ
Approved

Project
94-104 EPSOM ROAD
ZETLAND

Title
SIGNAGE AND LINEMARKING PLAN

Civil Engineers and Project Managers
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Status FOR APPROVAL
NOT FOR CONSTRUCTION
A1
Project - Drawing No. 18-557-C146
Issue F

100mm on Original

Date Plotted: 19 Jul 2021 - 12:14PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C146.dwg

SER ICES LEGEN

PROPOSE SER ICES

- E — ELECTRICITY
- S — SEWER SER ICE
- W — WATER MAIN
- T — TELECOMM NICATIONS
- G — GAS SER ICE
- LIGHT POLE
- LE LIGHT
- TELSTRA PIT
- WATER HY RANT
- WATER STOP ALVE
- SEWER MANHOLE

E ISTING SER ICES

- G — E ISTING GAS
- T — E ISTING TELSTRA
- E — E ISTING O ERHEA ELECTRICAL
- W — E ISTING WATER
- S — E ISTING SEWER
- SW — E ISTING STORMWATER
- E ISTING SER ICE TO BE REMO E
- E ISTING EASEMENTS
- E ISTING STORMWATER C L ERT
- E ISTING EASEMENT TO BE ISSOL E

NOTES

1. REPLACE ALL SER ICE LI S TO S IT A ACENT PA EMENT MATERIAL AN LE ELS.
2. RE ER TO RELE ANT APPRO E SER ICE A THORITY RAWINGS OR CONSTR CTION.

FUSE STREET

FUSE STREET

E ISTING GAS SER ICE TO BE REMO E

E ISTING NBN SER ICE TO BE REMO E

PROPOSED 225Ø SEWER MAIN

PROPOSED 225Ø SEWER MAIN

WAY

VALLEY

ROSE

EPSOM ROA

PROPOSE LOT

PROPOSE LOT

PROPOSE WATER MAIN

E ISTING NBN SER ICE TO BE REMO E

E ISTING GRATE PITS TO BE EMOLISHE TYP

PROPOSE TR NK RAINAGE BY OTHERS

LOCATION AN EPTH O E ISTING TILITIES TO BE CON IRM PRIOR TO CONSTR CTION.

E ISTING TELSTRA SER ICE TO BE REMO E

E ISTING NBN SER ICE TO BE REMO E

PROPOSE WATER MAIN

FUTURE GEORGE JULIUS AVENUE

G NYAMA PARK

6 C106 · 4 C106 · 5 C106 · 3 C106 · 1 C105 · 2 C105

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

Client

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Scales	1 : 250 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project

94-104 EPSOM ROAD
ETLAND

Title

SERVICES AND UTILITIES CO-ORDINATION PLAN

Civil Engineers and Project Managers
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ABN 96 130 882 405
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info atl.net.au

Status: FOR APPROVAL
NOT FOR CONSTRUCTION

A1

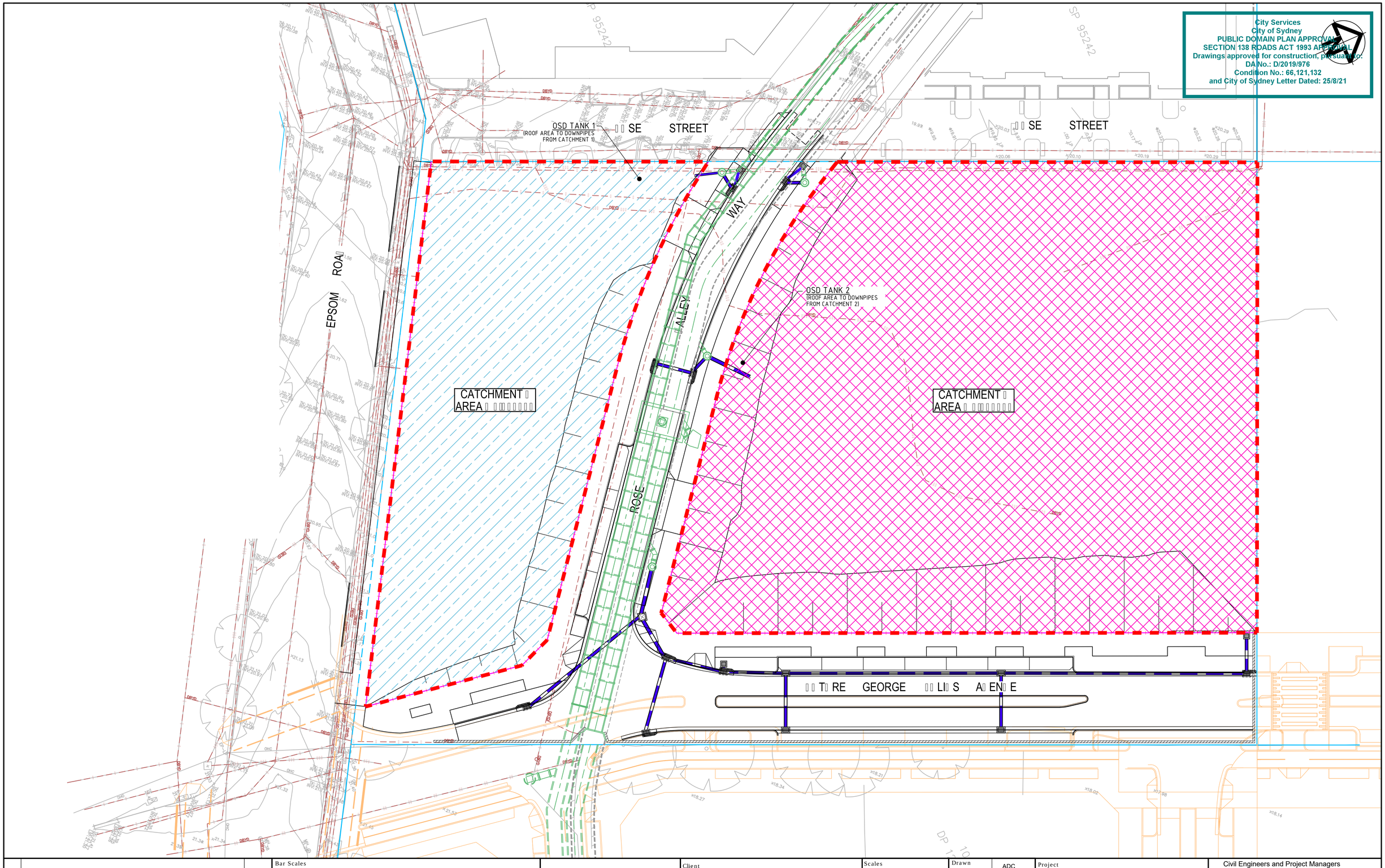
Project - Drawing No.: 18-557-C150

Issue: A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:05PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C150.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

THIS DRAWING CANNOT BE COPIED OR REPRODUCED IN ANY FORM OR USED FOR ANY OTHER PURPOSE OTHER THAN THAT ORIGINALLY INTENDED WITHOUT THE WRITTEN PERMISSION OF AT&L

Client

KARIMBLA CONSTRUCTION SERVICES (NSW) PTY LIMITED
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Scales		Drawn	ADC
1 : 250 @ A1		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
WETLAND

Title
INTERNAL STORMWATER DRAINAGE CATCHMENT PLAN

Civil Engineers and Project Managers
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ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No. 18-557-C160	A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:05PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C160.dwg

LEGEN

CATCHMENT BO N ARY

SE STREET

SE STREET

SP 95242

SP 95242

CATCHMENT
AREA

WAY

CATCHMENT E
AREA

ALLEY

PROPOSE
LOT

PROPOSE
LOT

CATCHMENT B
AREA

ROSE

CATCHMENT B
AREA

CATCHMENT A
AREA

CATCHMENT A
AREA

CATCHMENT A
AREA

CATCHMENT A
AREA

CATCHMENT K
AREA

T RE GEORGE LI S A EN E

CATCHMENT
AREA

CATCHMENT H
AREA

CATCHMENT G
AREA

ROA

EPSOM

DP 1

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

Client

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Scales	1 : 250 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project

94-104 EPSOM ROAD
ETLAND

Title

EXTERNAL
STORMWATER DRAINAGE
CATCHMENT PLAN

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

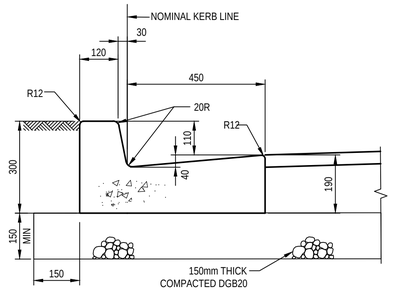
Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1

Project - Drawing No.: 18-557-C161

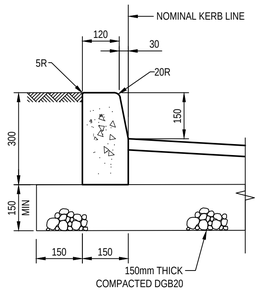
Issue: A

100mm on Original

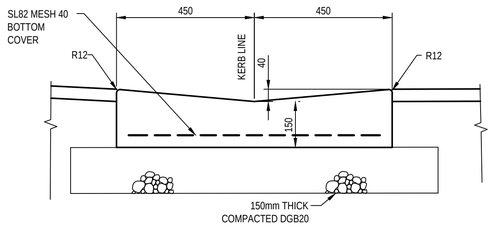
Date Plotted: 14 Aug 2020 - 05:05PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C161.dwg



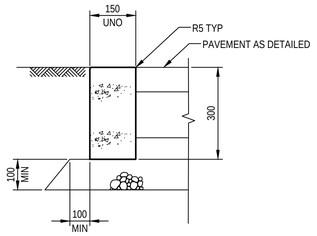
BARRIER KERB (K&G - DWG.1.1.2)
SCALE 1:10



KERB ONLY (KO)
SCALE 1:10

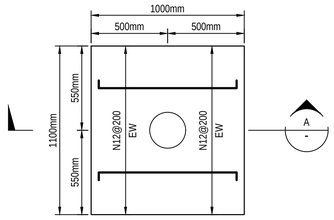


DISH CROSSING (DD - DWG.1.1.2)
SCALE 1:10

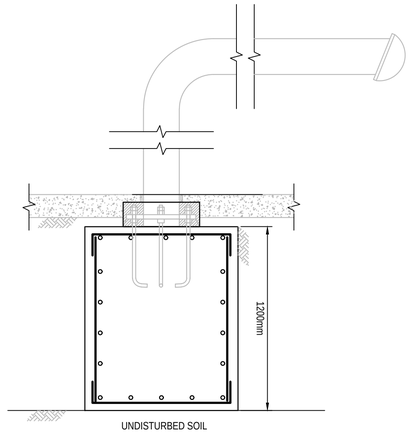


FLUSH KERB (FK)
SCALE 1:10

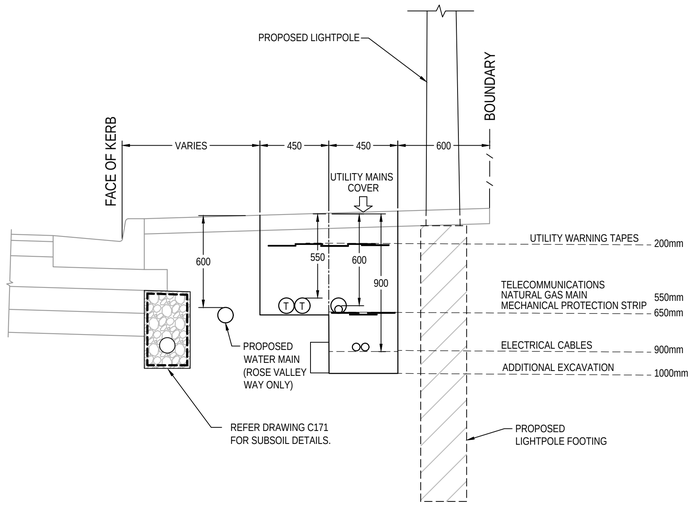
NOTE:
1. 40MPA CONCRETE.
2. FOOTING SHALL SIT ON UNDISTURBED SOIL OR WELL COMPACT.
3. THE SOIL AROUND THE FOOTING SHALL BE COMPACTED AFTER FOOTING IS CONSTRUCTED.
4. COVER: 50mm



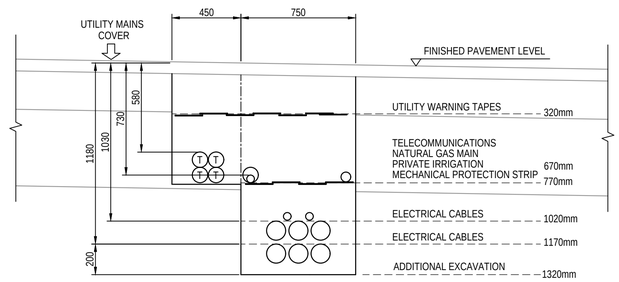
STREET LIGHT FOOTING ZETLAND
SCALE 1:20



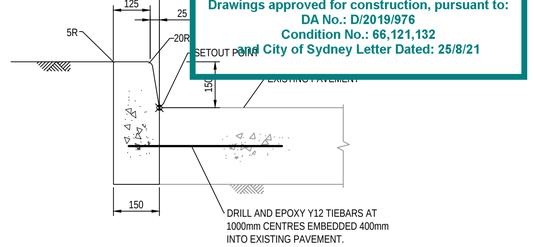
STREET LIGHT SECTION A
SCALE 1:20



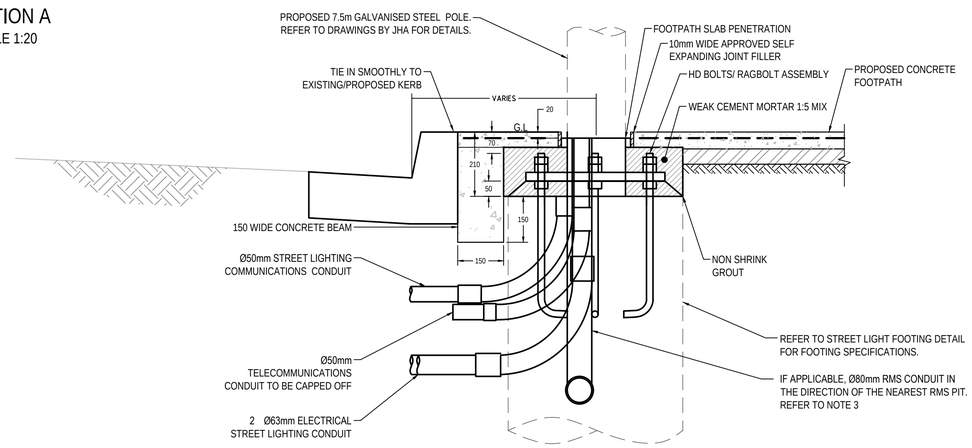
TYPICAL SERVICES TRENCH DETAIL
SCALE 1:20



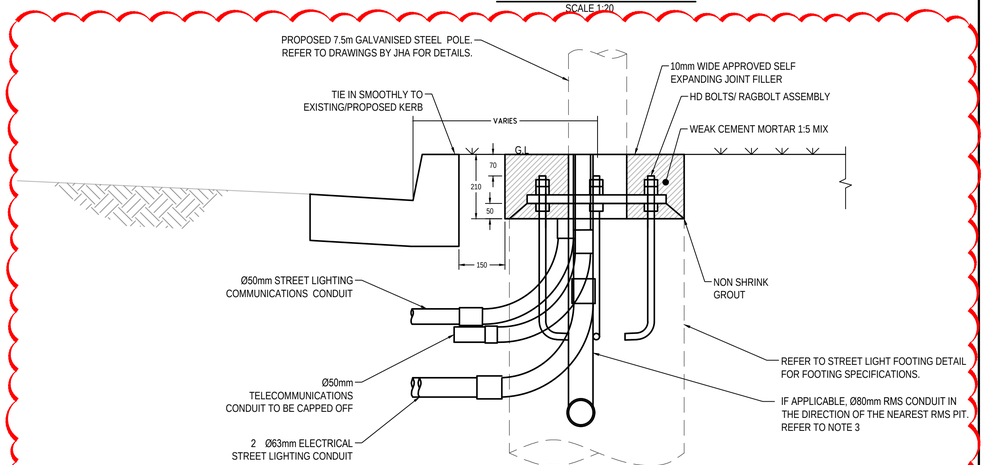
TYPICAL ROAD CROSSING SERVICES TRENCH DETAIL
SCALE 1:20



INTEGRAL KERB ONLY (IKO)
1 : 10



CONDUITS ARRANGEMENT AT POLE BASE CONCRETE FOOTPATH
SCALE 1:20



CONDUITS ARRANGEMENT AT PLANTING BED
SCALE 1:20

Issue	Description	Date
D	ADDED DETAIL	22-06-21
C	ADDED DETAIL	23-03-21
B	ADDED DETAIL	15-03-21
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

0 100 200 400 600 800 1000mm
1 : 10 @ A1 1 : 20 @ A3

0 500 1000 1500 2000mm
1 : 20 @ A1 1 : 40 @ A3

100mm on Original

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Scales	1 : 250 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
SITEWORKS DETAILS

Civil Engineers and Project Managers
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ABN 96 130 882 405
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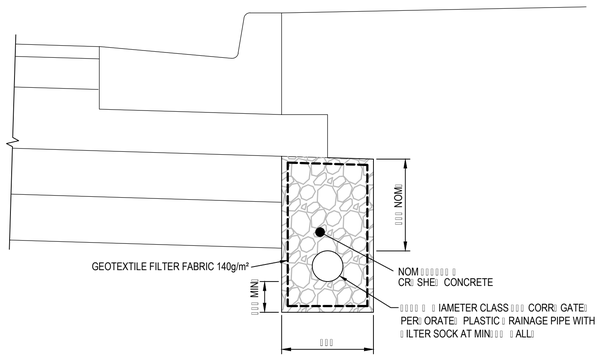
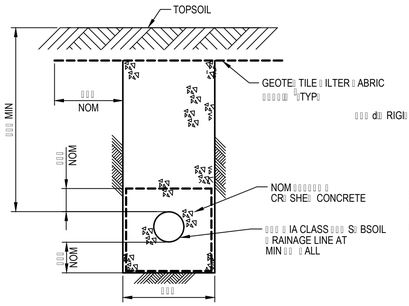
www.atl.net.au
info@atl.net.au

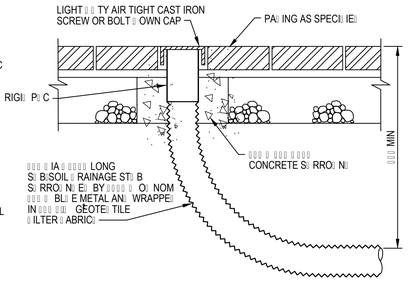
Status	FOR APPROVAL NOT FOR CONSTRUCTION
Project - Drawing No.	18-557-C170
	A1
Issue	D



S BSOIL BEHIN KERB
SCALE

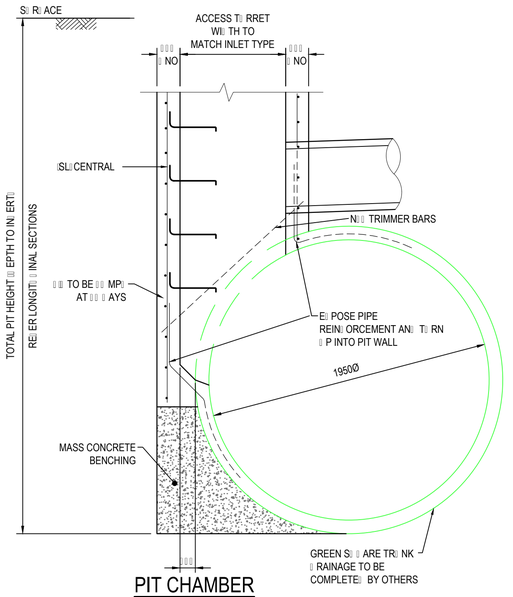


S BSOIL IN LAN SCAPE AREAS
SCALE



L SHING POINT IN PA ING
SCALE

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



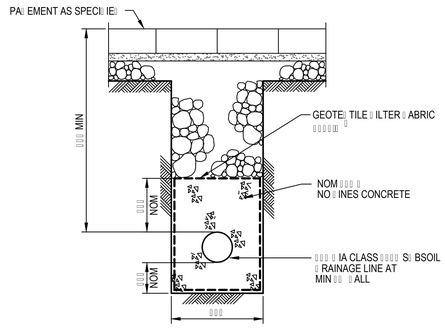
PIT CHAMBER
STAN AR SA LE TYPE G LLY PIT
SCALE

CHAMBER EPTH E CEE ING IN HEIGHT WILL BE
ESIGNE AN APPRO E BY STR CT RAL ENGINEER

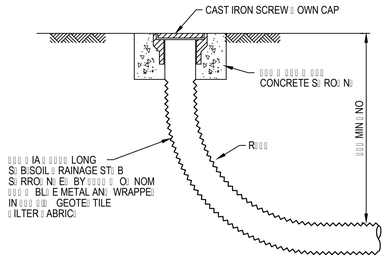
NOTES:
1. WALL THICKNESS IN CHIMNEY TO BE A STE TO S IT TYPE O PIT LI
2. SADDLE PIT TO BE CONSTRUCTED ON PIPES OF Ø1050mm OR GREATER.
3. ALL IMENSIONS SHOWN ARE IN MILLIMETERS.

EPTH TO IN ERT	WALL THICKNESS	ABRIC CO SL
		N AT
		N AT
		N AT

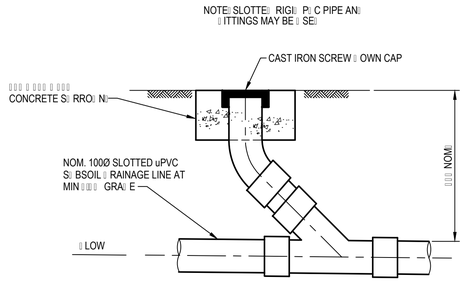
CHAMBER EPTH E CEE ING IN HEIGHT WILL BE ESIGNE AN APPRO E BY STR CT RAL ENGINEER



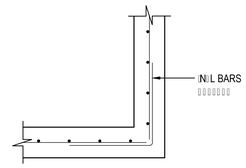
S BSOIL N ER PA ERS
SCALE



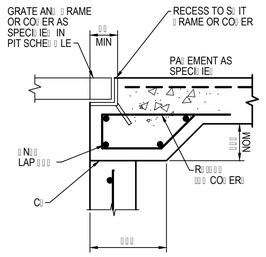
L SHING POINT
SCALE
NOTE SLOTTE RIGI P C PIPE AN
ITTINGS MAY BE SE



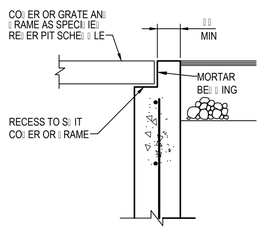
INTERME IATE RISER
SCALE



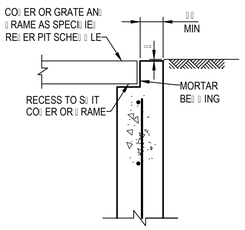
TYPICAL CORNER DETAIL
SCALE



ETAIL "C"
SCALE



ETAIL " "
SCALE



ETAIL "E"
SCALE

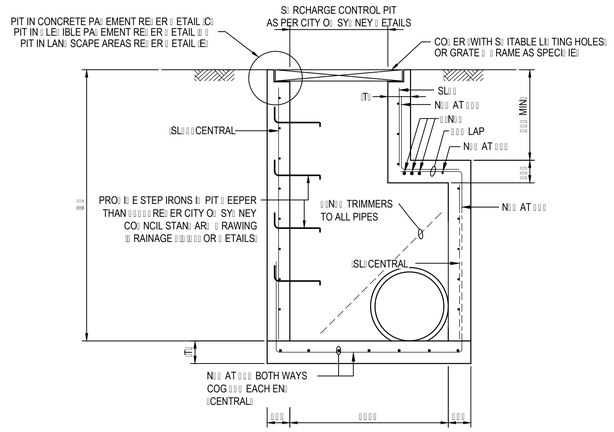
NOTE

1. OR PIT SI E RE ER TO TABLE MIN LONG
2. REIN ORCING MESH IS TO BE BENT TO LAP ARO N ALL CORNERS. ERTICAL BARS ARE NOT TO BE C T ALTERNATELY PRO E "L" BARS AT ERTICAL CTS.
3. COMPRESSI E STRENGTH OR CAST IN SIT CONCRETE SHALL BE A MINIM M MP AT AYS.
4. TOP O BENCHING SHALL BE O O TLET PIPE IAMETER.
5. S BSOIL RAINAGE PIPE LONG WRAPPE IN ABRIC SOCK TO BE PRO I E A ACENT TO INLET PIPES.
6. ALL PITS SHALL BE PRO I E WITH A LOCKING CLIP.
7. PIT GRATE TO BE AS PER LONGSECTION.
8. PRO I E STEP IRONS AS IN ICATE OR PITS EEPER THAN
9. N AT CENTRAL MAY BE SE IN LE O MESH LAP AT CORNERS

CONCRETE STRENGTH NLESS NOTE OTHERWISE

ELEMENT	MP AYS	SL MP	MA AGG SI E	CEMENT TYPE
PITS				GP

CO ER NLESS NOTE OTHERWISE



S RCHARGE PIT
ENLARGE CHAMBER
SCALE

NOTE

1. OR INLET SI E RE ER TO STORMWATER LONGIT INAL SECTIONS ON RAWING C
2. REIN ORCING MESH IS TO BE BENT TO LAP ARO N ALL CORNERS. ERTICAL BARS ARE NOT TO BE C T ALTERNATELY PRO I E N "L" BARS AT ERTICAL CTS.
3. COMPRESSI E STRENGTH OR CAST IN SIT CONCRETE SHALL BE A MINIM M MP AT AYS.
4. TOP O BENCHING SHALL BE O O TLET PIPE IAMETER.
5. S BSOIL RAINAGE PIPE LONG WRAPPE IN ABRIC SOCK TO BE PRO I E A ACENT TO INLET PIPES.
6. ALL PITS SHALL BE PRO I E WITH A LOCKING CLIP.
7. PIT GRATE TO BE WEL LOK G LLY GRATE GG OR APPRO E E ALENT.
8. RING INSTALLATION O GRATE AN RAME CONTRACTOR IS TO ENS RE CLEARANCE BETWEEN LINTEL AN OPENE GRATE RE ER TO INSTALLATION TOLERANCE.
9. PRO I E STEP IRONS AS IN ICATE OR PITS EEPER THAN
10. N AT CENTRALLY PLACE MAY BE SE IN LIE O MESH LAP AT CORNERS
11. MINIM M REIN ORCEMENT CO ER TO BE NLESS NOTE OTHERWISE
12. CHAMBER EPTH E CEE ING IN HEIGHT WILL BE ESIGNE AN APPRO E BY STR CT RAL ENGINEER
13. CONCRETE STRENGTH NLESS NOTE OTHERWISE

ELEMENT	MP AYS	SL MP	MA AGG SI E	CEMENT TYPE
PITS				GP

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A A

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales		Drawn	ADC
	AS SHOWN	Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
STORMWATER DRAINAGE DETAILS
SHEET 1

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status: FOR APPROVAL
NOT FOR CONSTRUCTION

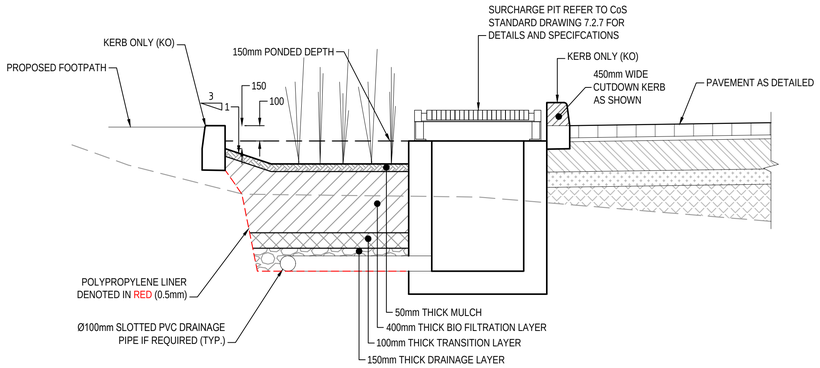
A1

Project - Drawing No.: 18-557-C171

Issue: A

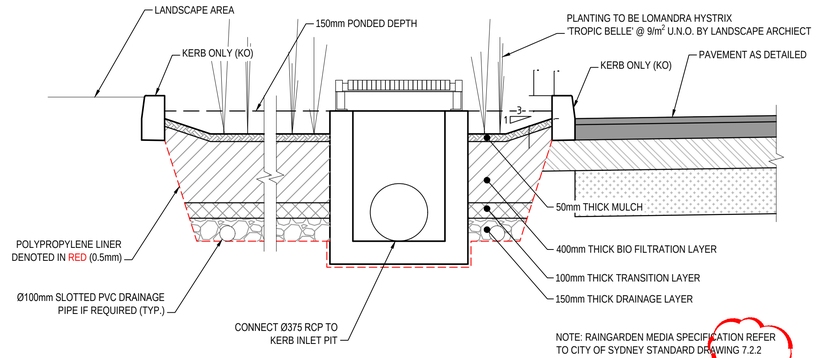
Date Plotted: 14 Aug 2020 - 05:05PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C171.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



TYPICAL RAIN GARDEN INLET DETAIL
SCALE 1:20

NOTE: RAINGARDEN MEDIA SPECIFICATION REFER TO CITY OF SYDNEY STANDARD DRAWING 7.2.2



NOTE: RAINGARDEN MEDIA SPECIFICATION REFER TO CITY OF SYDNEY STANDARD DRAWING 7.2.2

TYPICAL RAIN GARDEN OUTLET DETAIL
SCALE 1:20

Issue	Description	Date
B	ISSUED FOR APPROVAL	22-06-21
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales
0 500 1000 1500 2000mm
1 : 20 @ A1 1 : 40 @ A3

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
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Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	AS SHOWN
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ZETLAND

Title
STORMWATER DRAINAGE DETAILS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

Project - Drawing No.
18-557-C172

Issue
B

Date Plotted: 23 Jun 2021 - 04:12PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C172.dwg

LEGEN

SE IMENT ENCE (S)

CATCH RAIN

BARRIER ENCE

STRAW BALE ILTER (S)

MESH AN GRA EL INLET ILTER (S)

GEOTE TILE INLET (S)

STABILISE SITE ACCESS AN TR CK WASH OWN AREA (S)

PROPOSE SITE ACCESS GATE

FUSE STREET

FUSE STREET

EPSOM ROA

ROAD

VALLEY WAY

ROSE

PROPOSE LOT

PROPOSE LOT

G NYAMA PARK

FUTURE GEORGE JULIUS AVENUE

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A A

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales		Drawn	ADC
	1 : 250 A1	Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
EROSION AND SEDIMENTATION CONTROL PLAN

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

A1

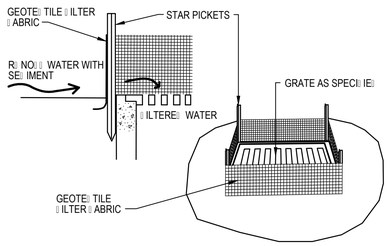
Project - Drawing No.
18-557-C180

Issue
A

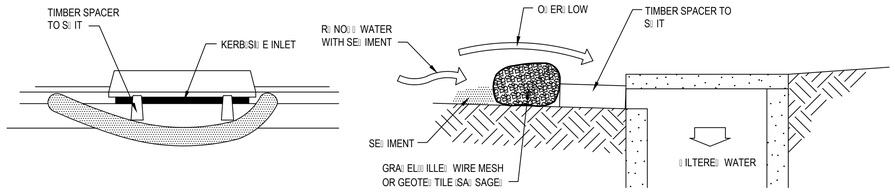
100mm on Original

Date Plotted: 14 Aug 2020 - 05:06PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C180.dwg

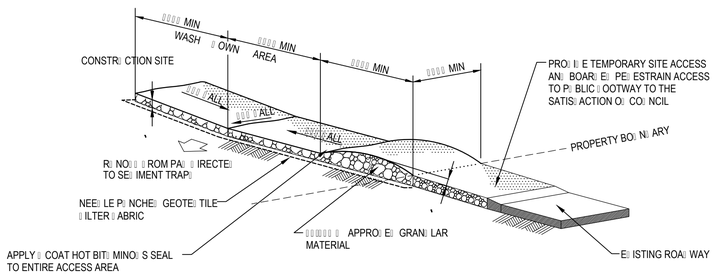
City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



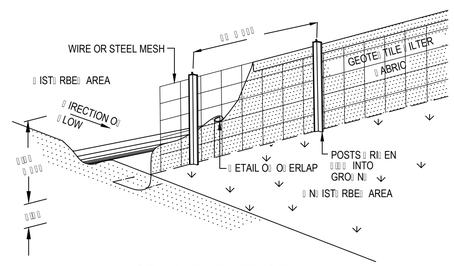
GEOTE TILE ILTER PIT S RRO N
NTS



MESH AN GRA EL INLET ILTER
NTS



STABILISE SITE ACCESS AN TR CK WASH OWN AREA
NTS



SE IMENT ENCE
NTS

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales		Drawn	ADC
AS SHOWN		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
EROSION AND SEDIMENTATION CONTROL DETAILS

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

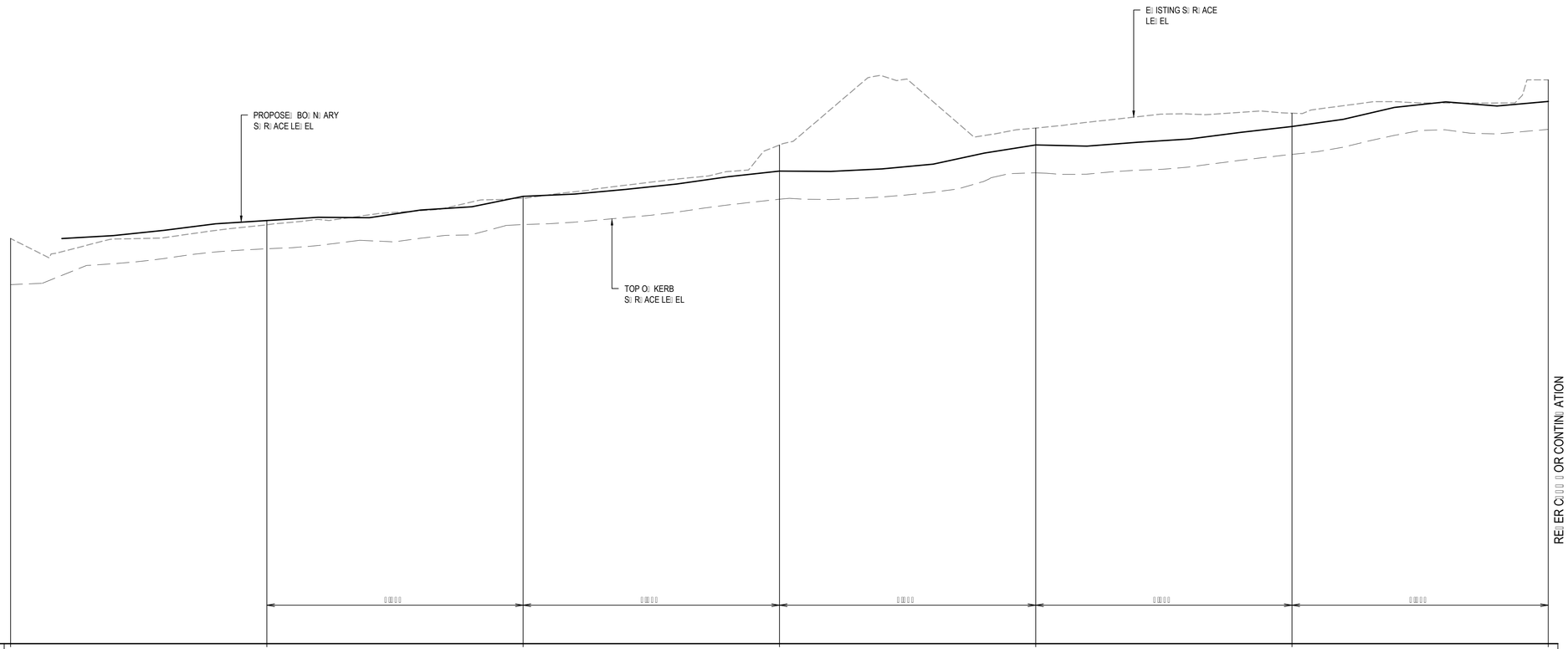
Status: FOR APPROVAL
NOT FOR CONSTRUCTION
A1

Project - Drawing No.: 18-557-C181
Issue: A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:06PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C181.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



PD01 LONGITUDINAL SECTION

SCALE 1:100 HORIZ
1:100 VERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

0 1 2 3 4 5m
At 1:10 At 1:100

0 10 20 30 40 50 60m
At 1:100 At 1:1000

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@karimbla.com.au
Internet: http://www.karimbla.com.au

Scales	1 : 10 @ A1 1 : 100 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
WETLAND

Title
PUBLIC DOMAIN
PD01 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 1

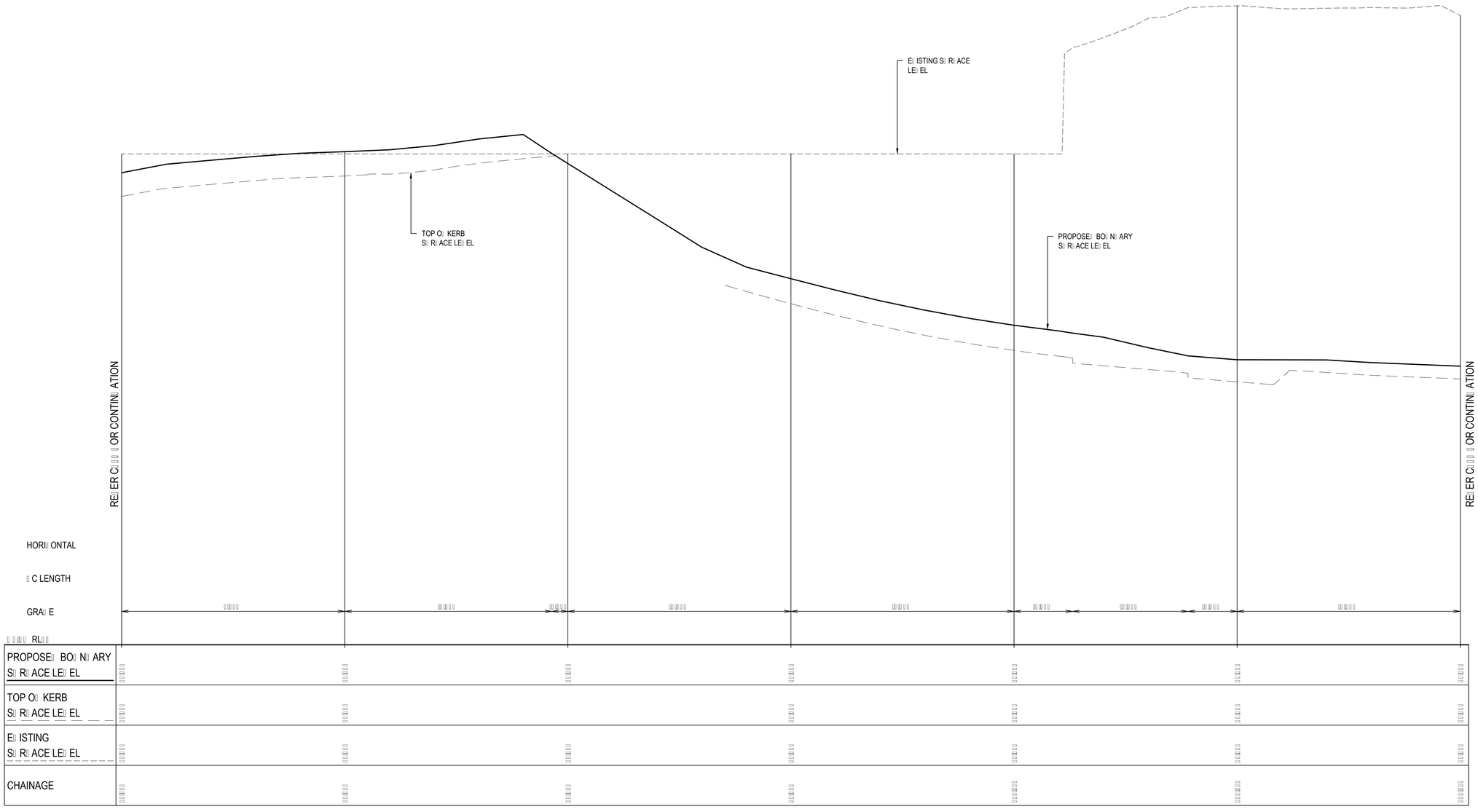
Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C184	A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:06PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C184.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



PLAN LONGITUDINAL SECTION

SCALE HORIZONTAL
VERTICAL

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A1 A1

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
PUBLIC DOMAIN
PD01 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
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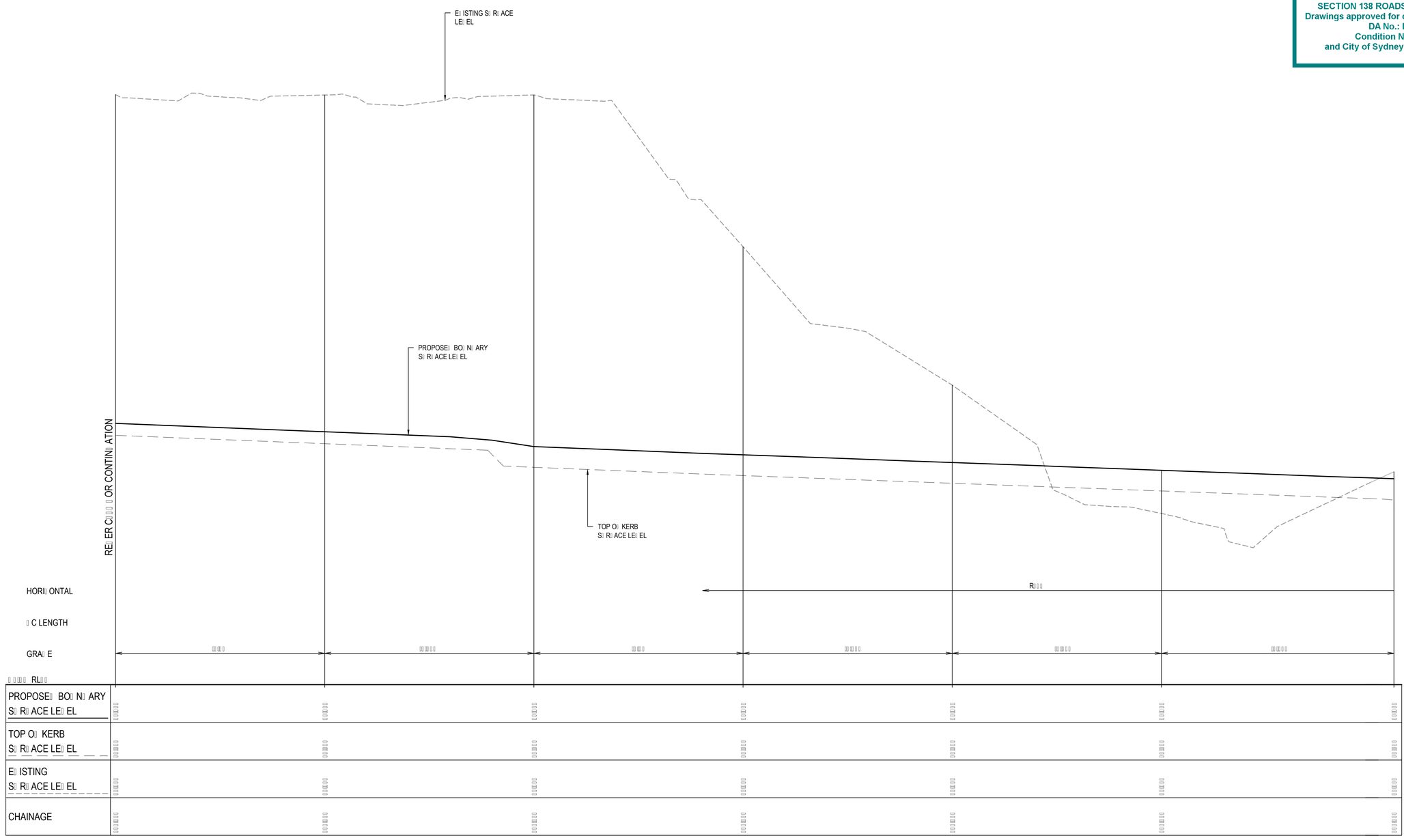
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status		
FOR APPROVAL NOT FOR CONSTRUCTION		A1
Project - Drawing No.		Issue
18-557-C185		A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:06PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C185.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



PD01 LONGITUDINAL SECTION

SCALE 1:100 HORIZONTAL
1:100 VERTICAL

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

1:100 @ A1 1:200 @ A3

1:50 @ A1 1:100 @ A3

100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
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Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 @ A1 1 : 100 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
WETLAND

Title
PUBLIC DOMAIN
PD01 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 3

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status
FOR APPROVAL
NOT FOR CONSTRUCTION

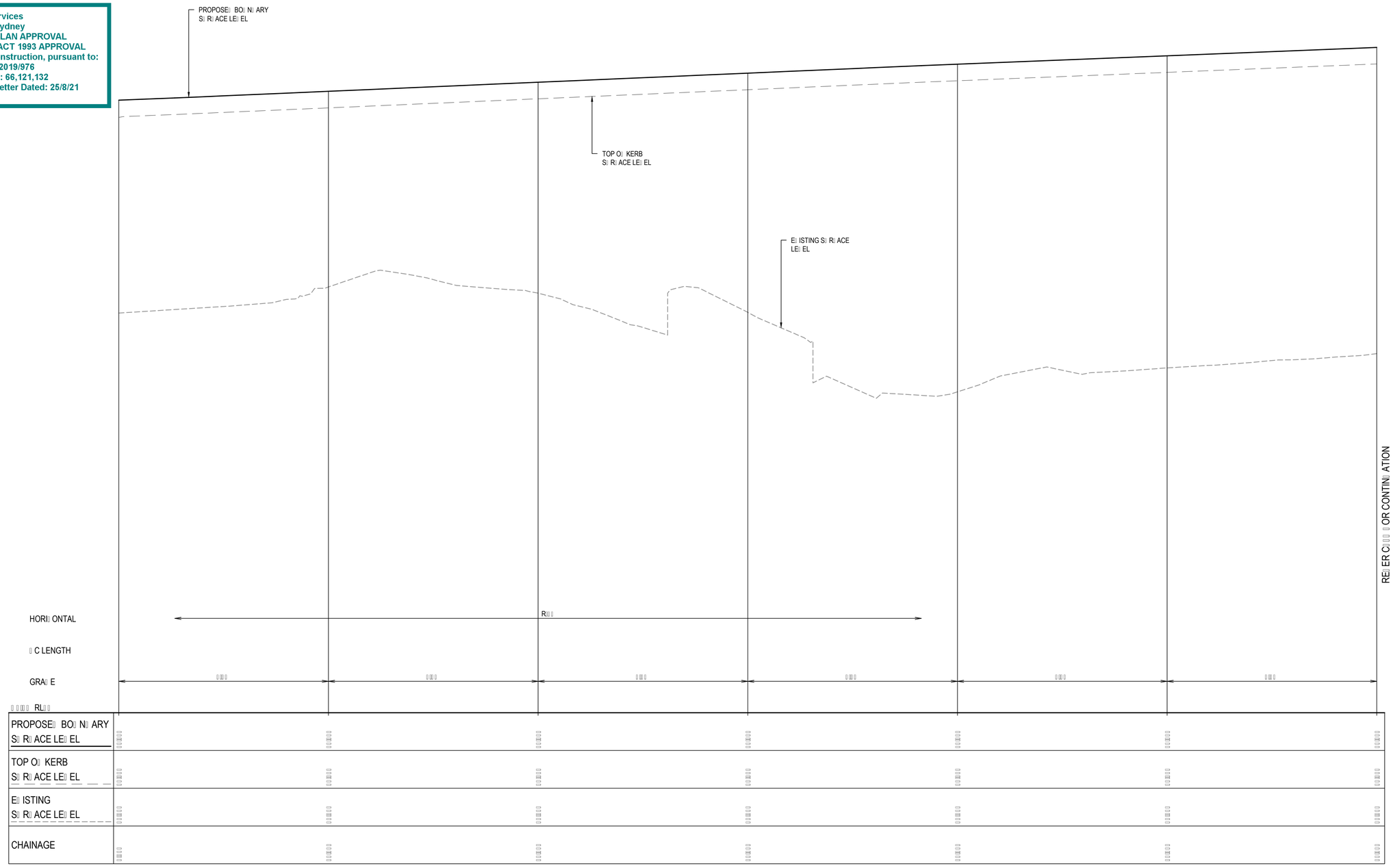
A1

Project - Drawing No.
18-557-C186

Issue
A

Date Plotted: 14 Aug 2020 - 05:06PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C186.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



PD02 LONGITUDINAL SECTION

SCALE 1:100 HORIZ
1:100 VERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

0 5 10 15 20 25mm
25mm @ A1 50mm @ A0

0 100 200 300 400 500 600mm
600mm @ A1 1200mm @ A0

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 @ A1 1 : 100 @ A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
WETLAND

Title
PUBLIC DOMAIN
PD02 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 1

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
North Sydney NSW 2065
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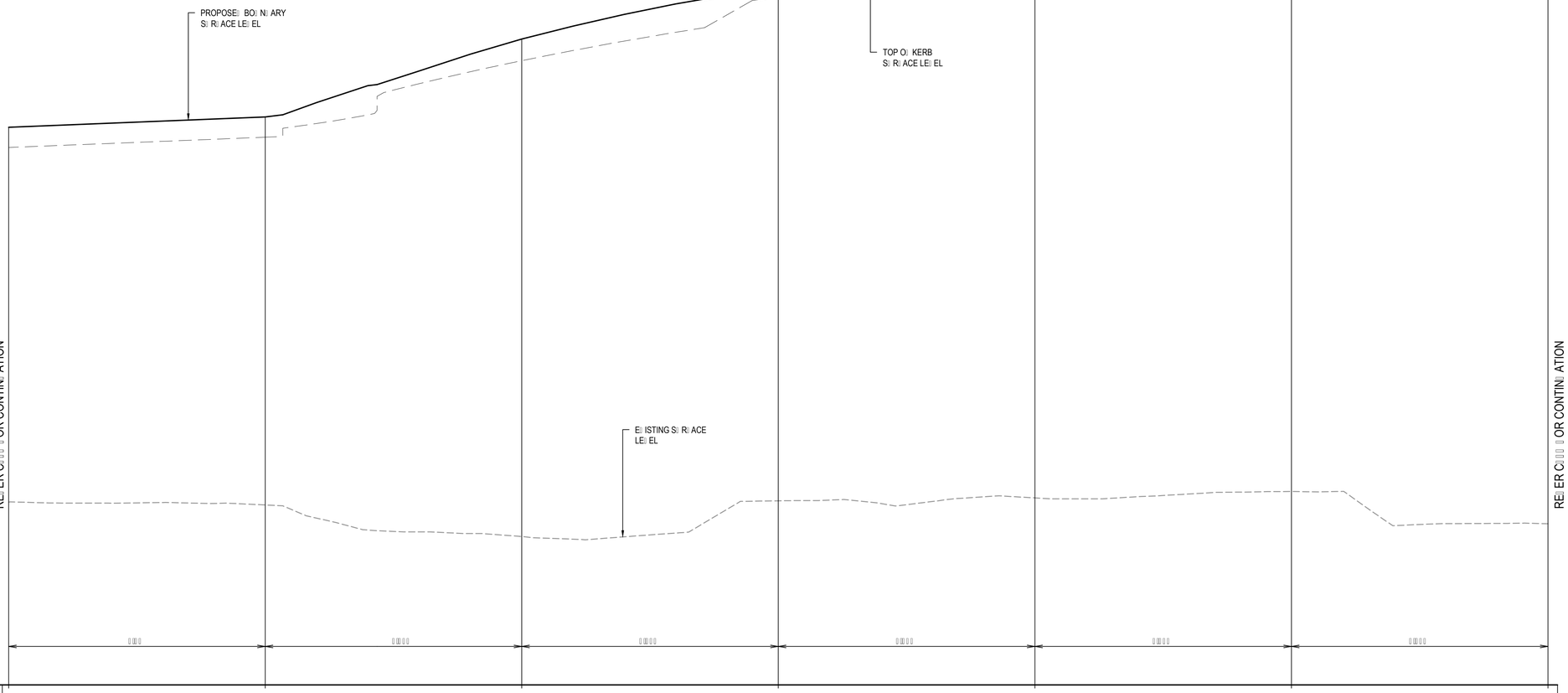
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C187	A

100mm on Original

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



PLAN LONGITUDINAL SECTION

SCALE HORIZ
VERT

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A1 A1

A1 A1

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
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Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

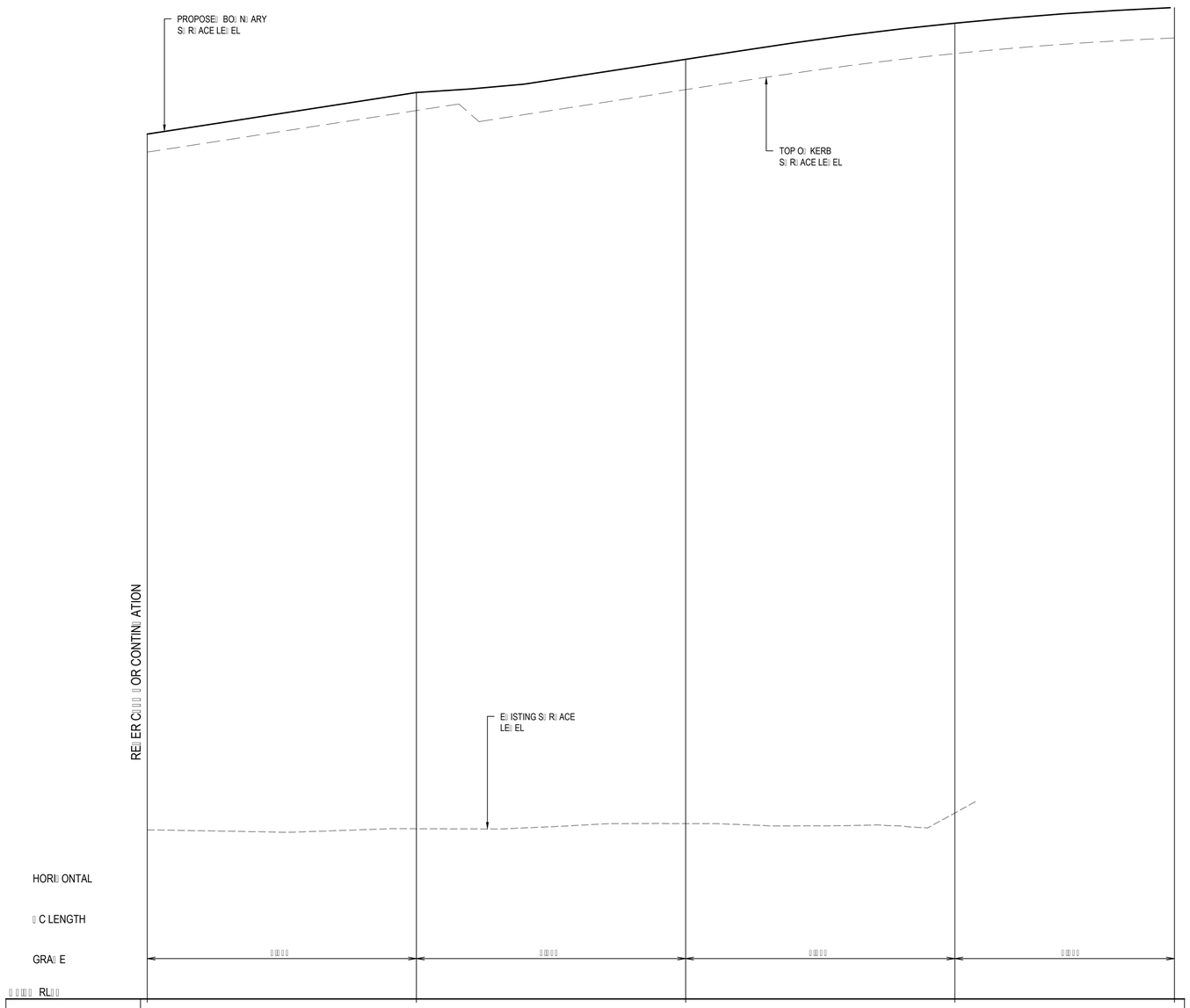
Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
PUBLIC DOMAIN
PD02 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C188	A



PD02 LONGITUDINAL SECTION

SCALE 1:100 HORIZONTAL
1:100 VERTICAL

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

100mm on A1 200mm on A1
50mm on A1 100mm on A1

Client
KARIMBLA CONSTRUCTION SERVICES (NSW) PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 @ A1 1 : 100 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

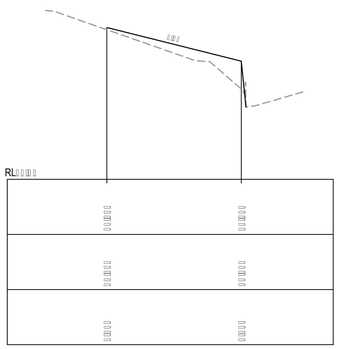
Project
94-104 EPSOM ROAD
GREENWICH

Title
PUBLIC DOMAIN
PD02 BOUNDARY
LONGITUDINAL SECTIONS
SHEET 3

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status	FOR APPROVAL NOT FOR CONSTRUCTION
Project - Drawing No.	18-557-C189
Issue	A1 A

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



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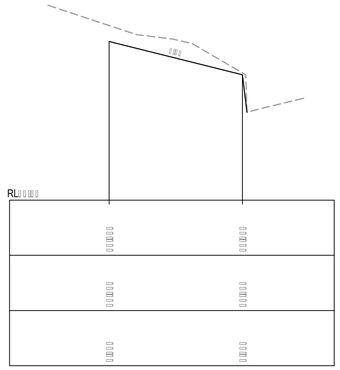

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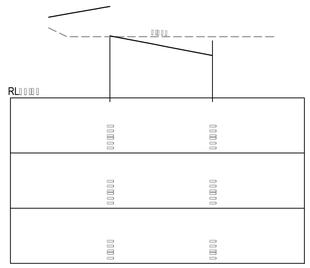

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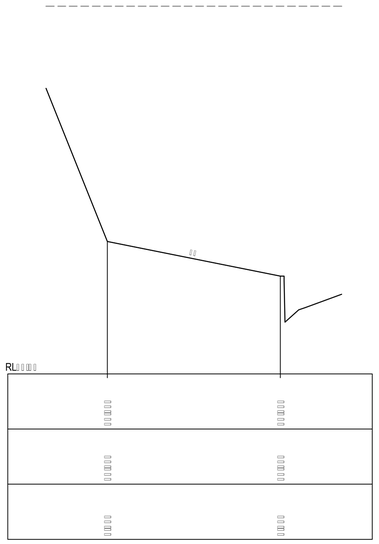

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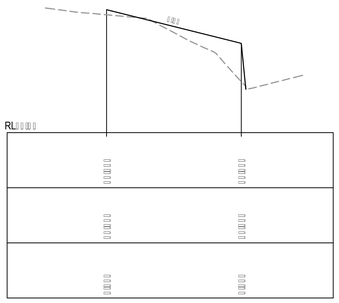

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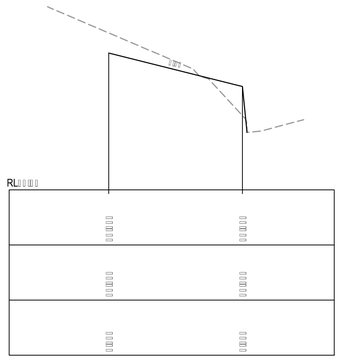

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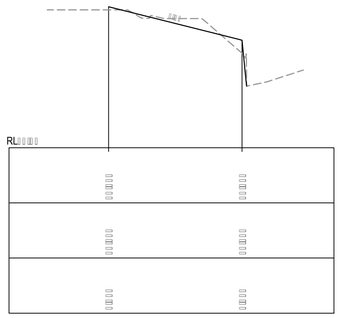
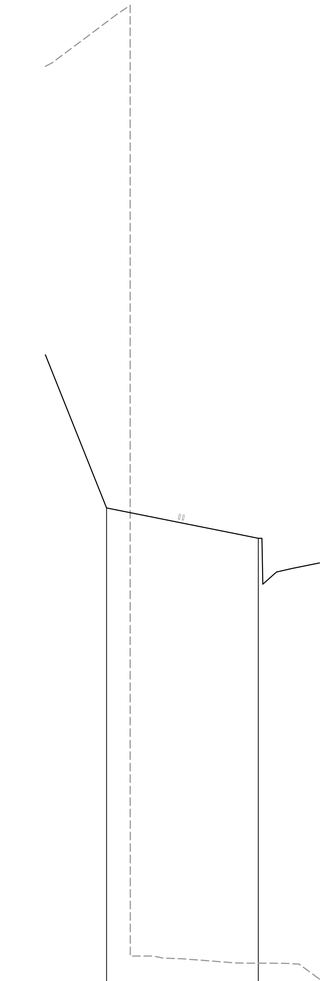


CH

CH



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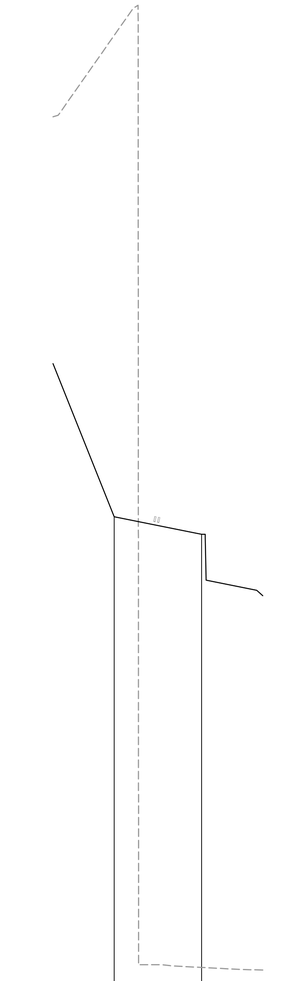

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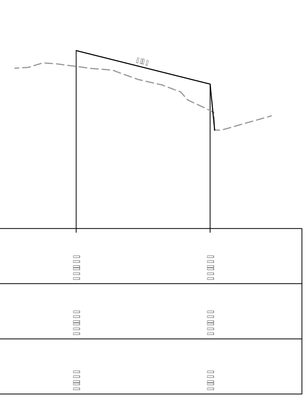

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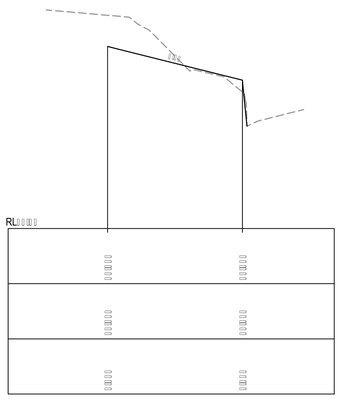

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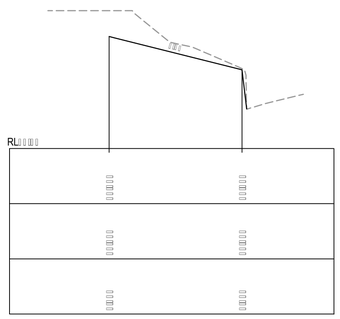

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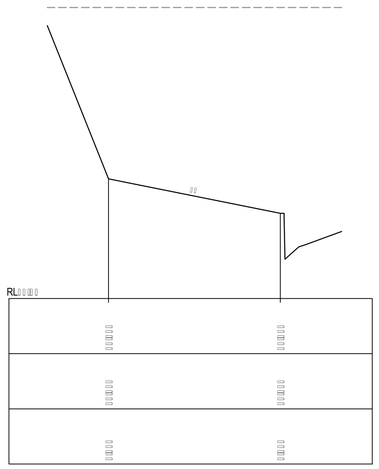

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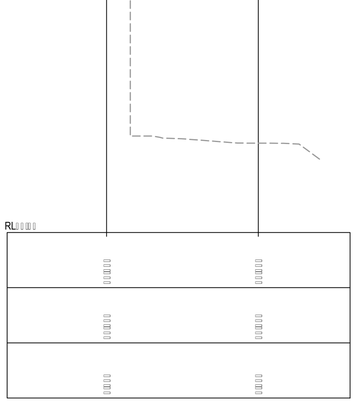

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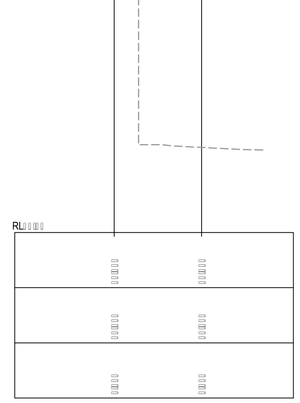

CH

Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

100mm on Original

Bar Scales

A1 A1

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED

Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project

94-104 EPSOM ROAD
ETLAND

Title

PUBLIC DOMAIN
PD01 BOUNDARY
CROSS SECTIONS
SHEET 1

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
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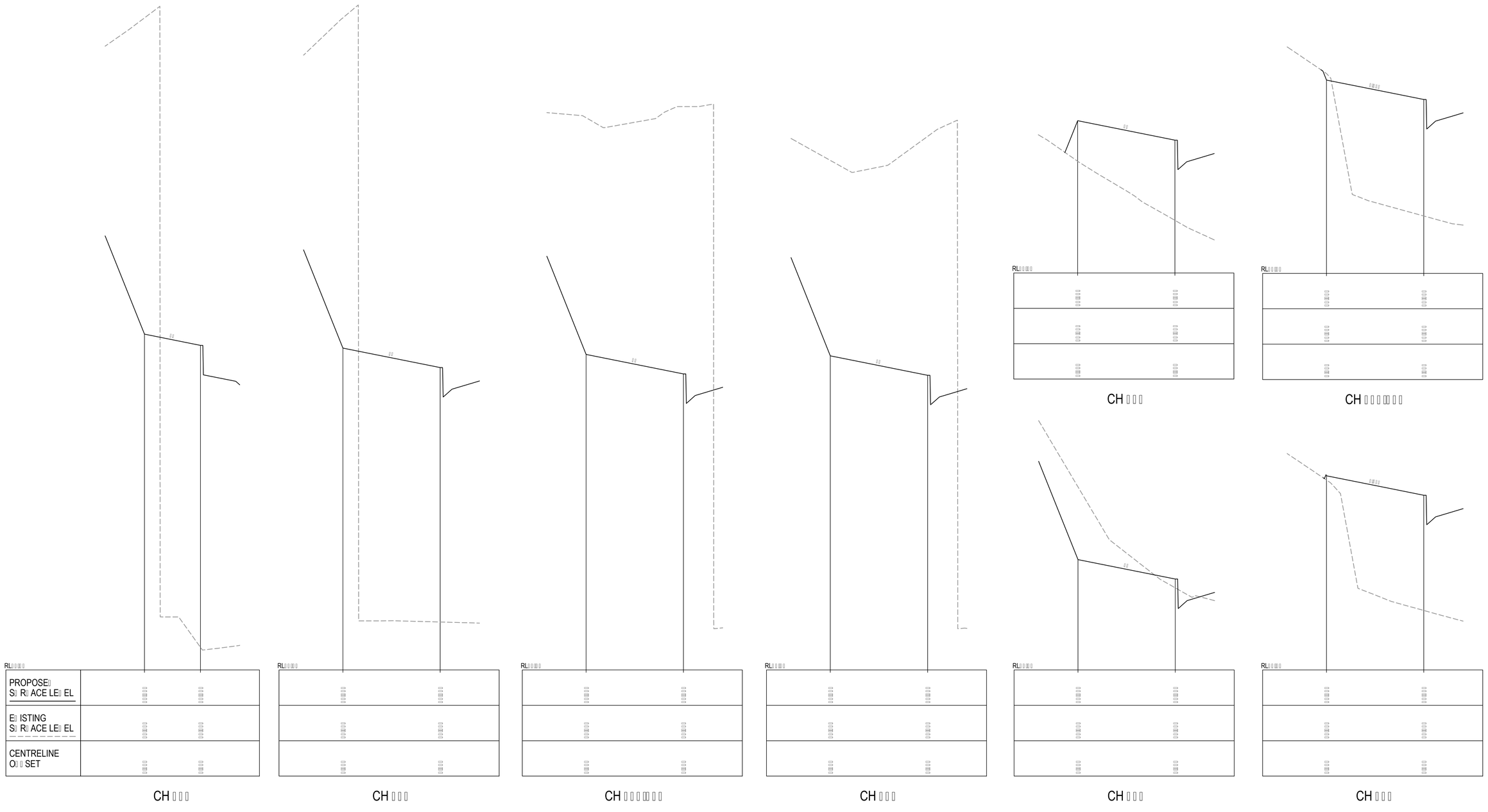
www.atl.net.au
info atl.net.au

Status	
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C190	A

Date Plotted: 14 Aug 2020 - 05:07PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C190.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A1 A1

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
PUBLIC DOMAIN
PD01 BOUNDARY
CROSS SECTIONS
SHEET 2

Civil Engineers and Project Managers
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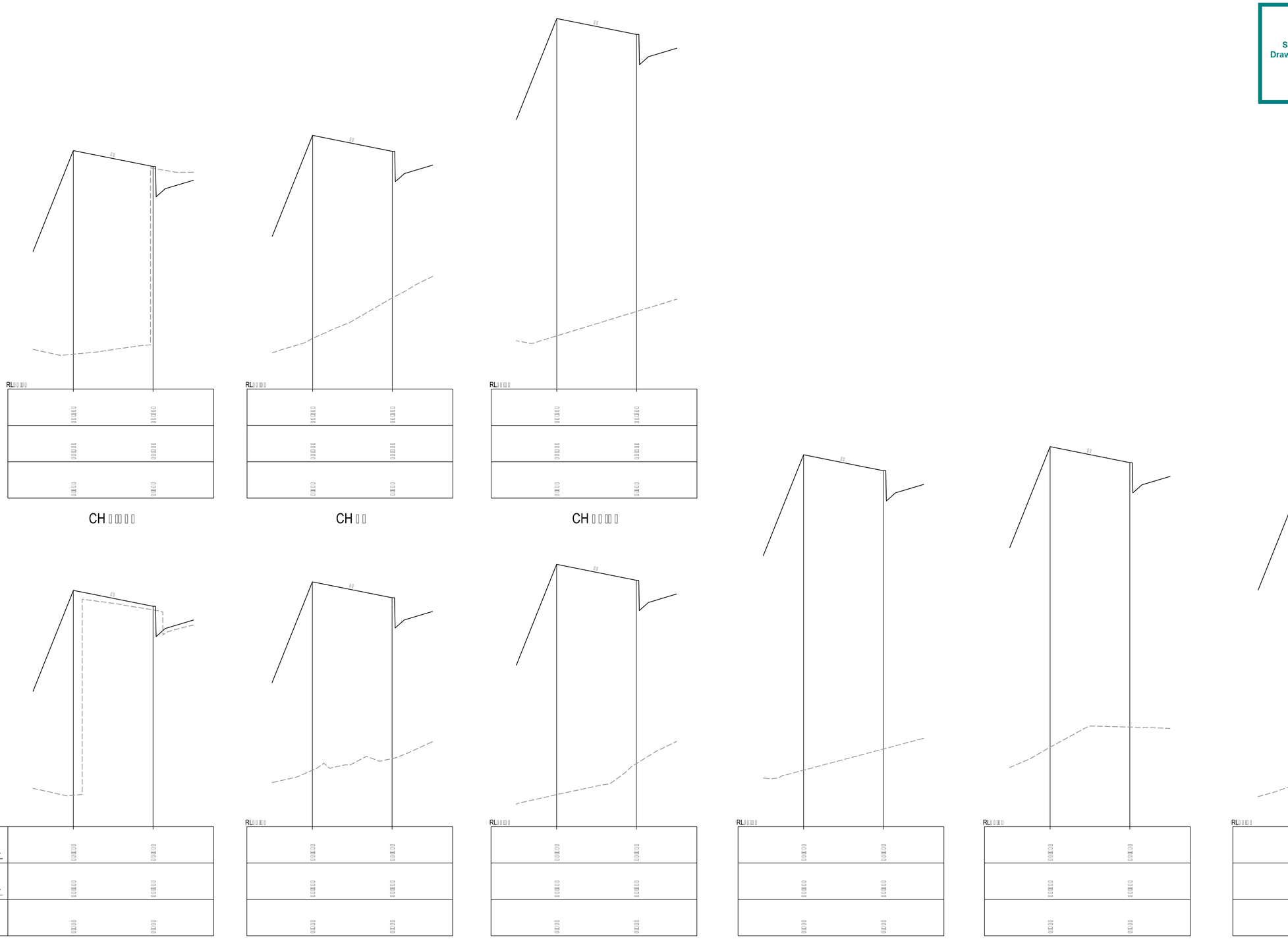
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No.	Issue
18-557-C191	A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:07PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C191.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

100mm on Original

Client
KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info@design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 @ A1 1 : 100 @ A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

Project
94-104 EPSOM ROAD
RETLAND

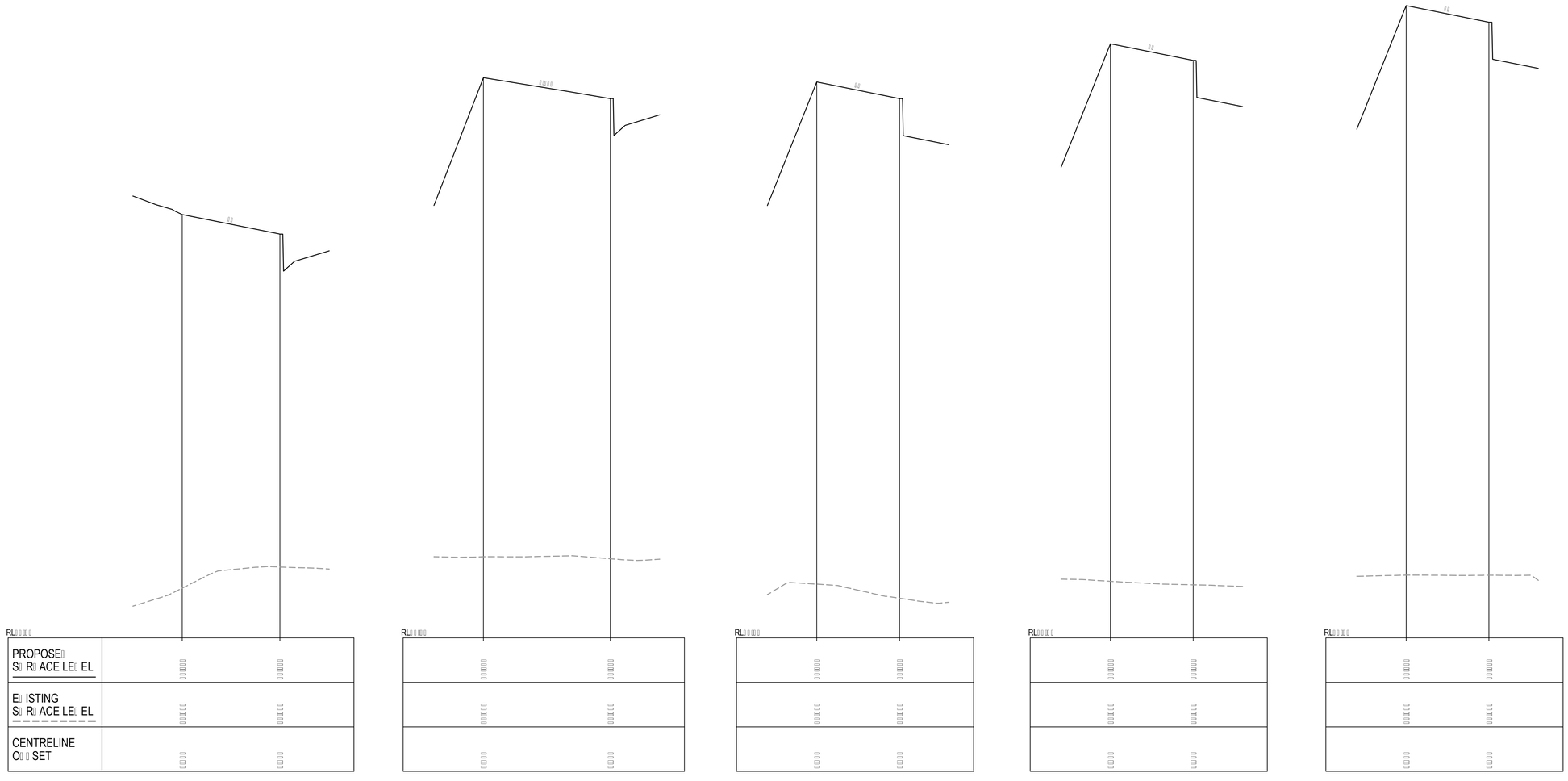
Title
PUBLIC DOMAIN
PD01 BOUNDARY
CROSS SECTIONS
SHEET 3

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No. 18-557-C192	A

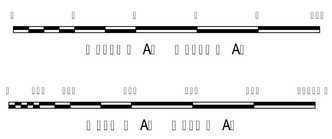
Date Plotted: 14 Aug 2020 - 05:07PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C192.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales



Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1	Drawn	ADC
		Designed	GJ
Grid	MGA	Checked	GJ
Height Datum	AHD	Approved	

Project
94-104 EPSOM ROAD
ETLAND

Title
PUBLIC DOMAIN
PD02 BOUNDARY
CROSS SECTIONS
SHEET 1

Civil Engineers and Project Managers
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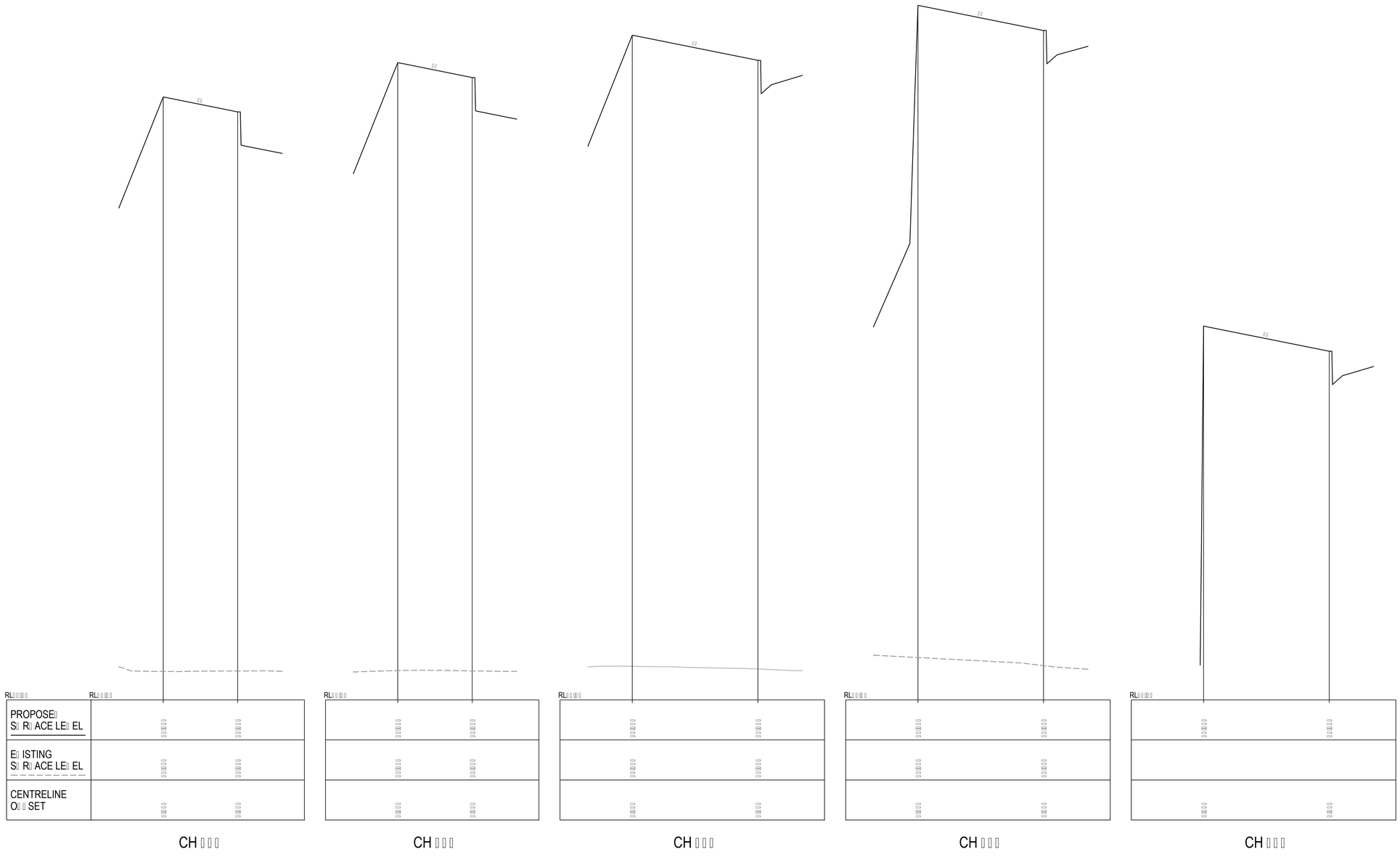
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	Issue
FOR APPROVAL NOT FOR CONSTRUCTION	A1
Project - Drawing No. 18-557-C193	A

100mm on Original

Date Plotted: 14 Aug 2020 - 05:07PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C193.dwg

City Services
City of Sydney
PUBLIC DOMAIN PLAN APPROVAL
SECTION 138 ROADS ACT 1993 APPROVAL
Drawings approved for construction, pursuant to:
DA No.: D/2019/976
Condition No.: 66,121,132
and City of Sydney Letter Dated: 25/8/21



Issue	Description	Date
A	ISSUED FOR APPROVAL	14-08-20

Bar Scales

A1 A1

A1 A1

100mm on Original

Client

KARIMBLA
CONSTRUCTION SERVICES (NSW)
PTY LIMITED
Level 11, 528 Kent Street, Sydney NSW 2000
Tel: (02) 9287 2888 Fax: (02) 9287 2777
Email: info design.meriton.com.au
Internet: http://www.meriton.com.au

Scales	1 : 10 A1 1 : 100 A1
Grid	MGA
Height Datum	AHD
Drawn	ADC
Designed	GJ
Checked	GJ
Approved	

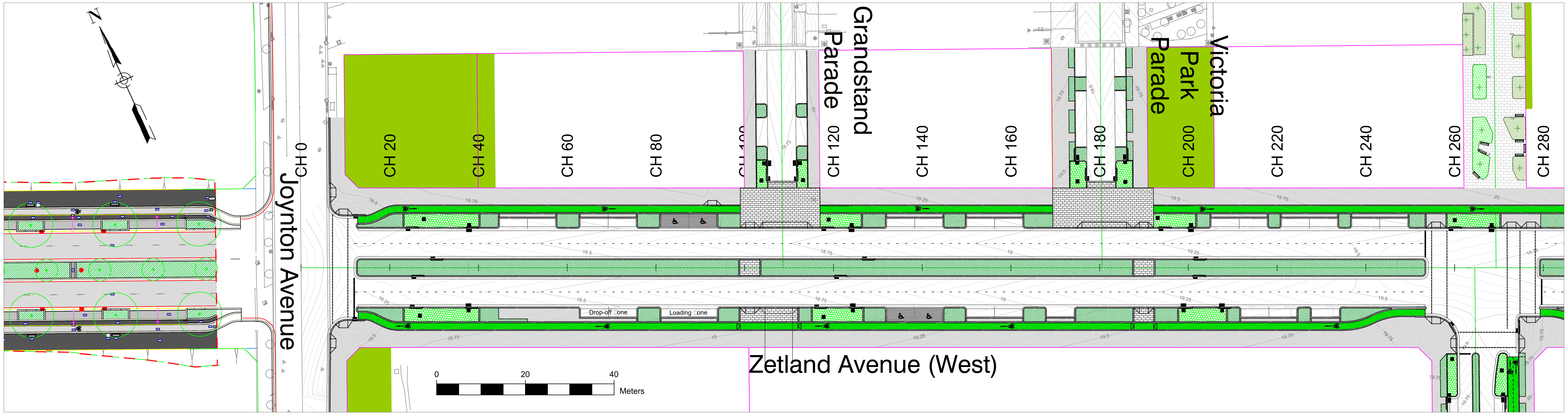
Project
94-104 EPSOM ROAD
ETLAND

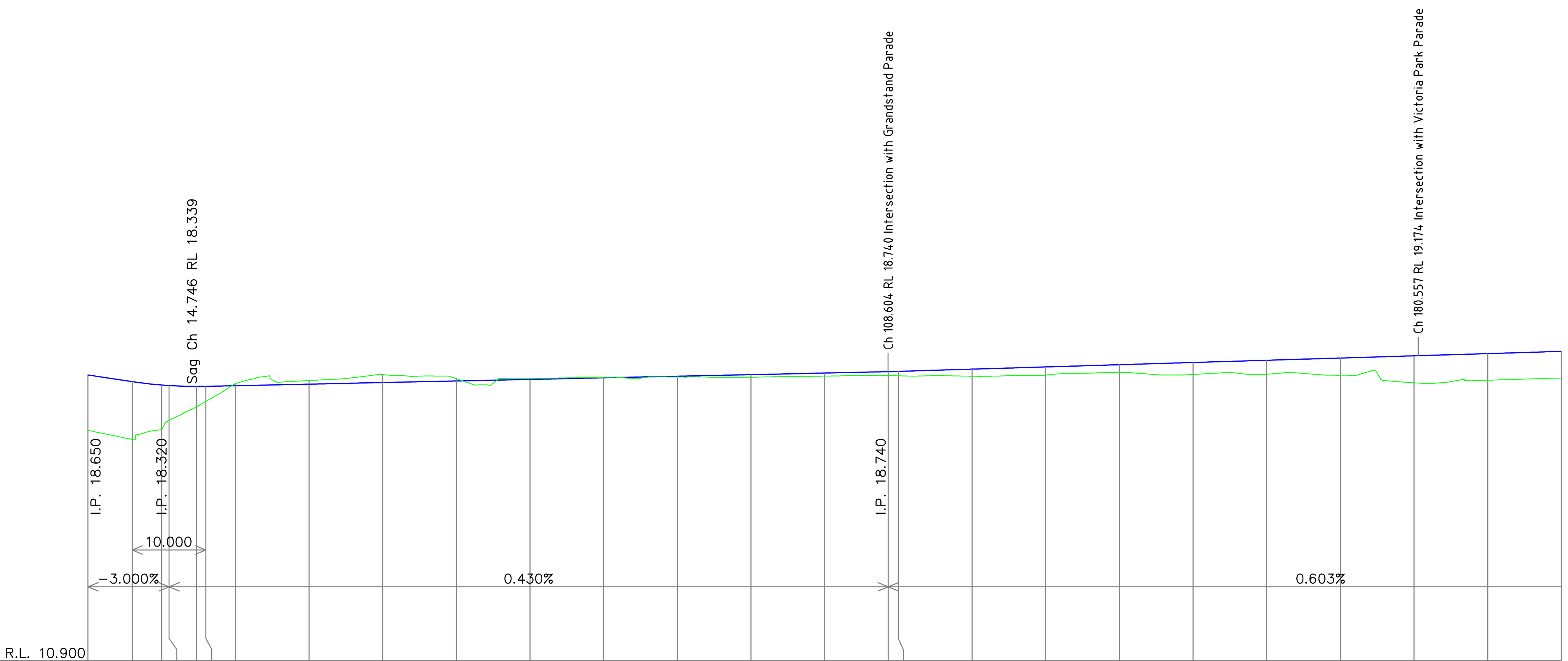
Title
PUBLIC DOMAIN
PD02 BOUNDARY
CROSS SECTIONS
SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info atl.net.au

Status	FOR APPROVAL NOT FOR CONSTRUCTION
Issue	A1
Project - Drawing No.	18-557-C194
Issue	A

Date Plotted: 14 Aug 2020 - 05:07PM File Name: F:\18-557 94 Epsom Road\Drgs\Civil\Final\100 SERIES - External Road\18-557-C194.dwg





Horizontal Geometry: L=399.359, B=114°17'10"

CHAINAGE	Cut / Fill	DESIGN SURFACE	EXISTING SURFACE
0.000	−1.504	18.650	17.15
6.000	−1.569	18.470	16.90
10.000	−1.208	18.377	17.17
11.000	−0.943	18.363	17.42
14.746	−0.552	18.339	17.79
16.000	−0.410	18.342	17.93
20.000	+0.055	18.359	18.41
30.000	+0.097	18.402	18.50
40.000	+0.215	18.445	18.66
50.000	+0.062	18.488	18.55
60.000	+0.029	18.531	18.56
70.000	+0.014	18.574	18.59
80.000	−0.023	18.617	18.59
90.000	−0.069	18.660	18.59
100.000	−0.084	18.703	18.62
108.627	−0.108	18.740	18.63
110.000	−0.119	18.748	18.63
120.000	−0.192	18.809	18.62
130.000	−0.222	18.869	18.65
140.000	−0.206	18.929	18.72
150.000	−0.324	18.989	18.67
160.000	−0.381	19.050	18.67
170.000	−0.466	19.110	18.64
180.000	−0.732	19.170	18.44
190.000	−0.723	19.231	18.51
200.000	−0.725	19.291	18.57

LONGITUDINAL SECTION
Zetland Avenue (West) Ch 0.000 to Ch 200.000
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

Date	No.	By	Amendments	Chckd
	5			
	4			
	3			
21-09-2015	2	MS	100% Design	PS
23-12-2014	1	MS	80% Design	PS

ZETLAND AVENUE (WEST) LONGSECTIONS CH 0 - 200

EPSOM PARK PRECINCT
INFRASTRUCTURE CONCEPT DESIGN

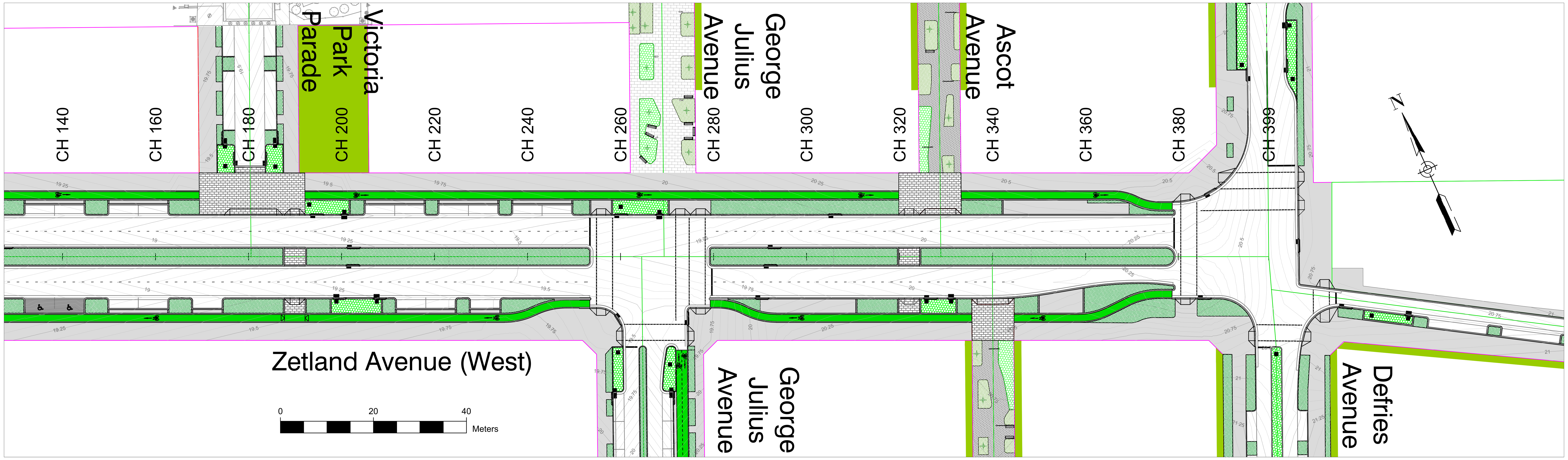
Designed: MS | Checked: PS | Drawn: MS | Approved: PS

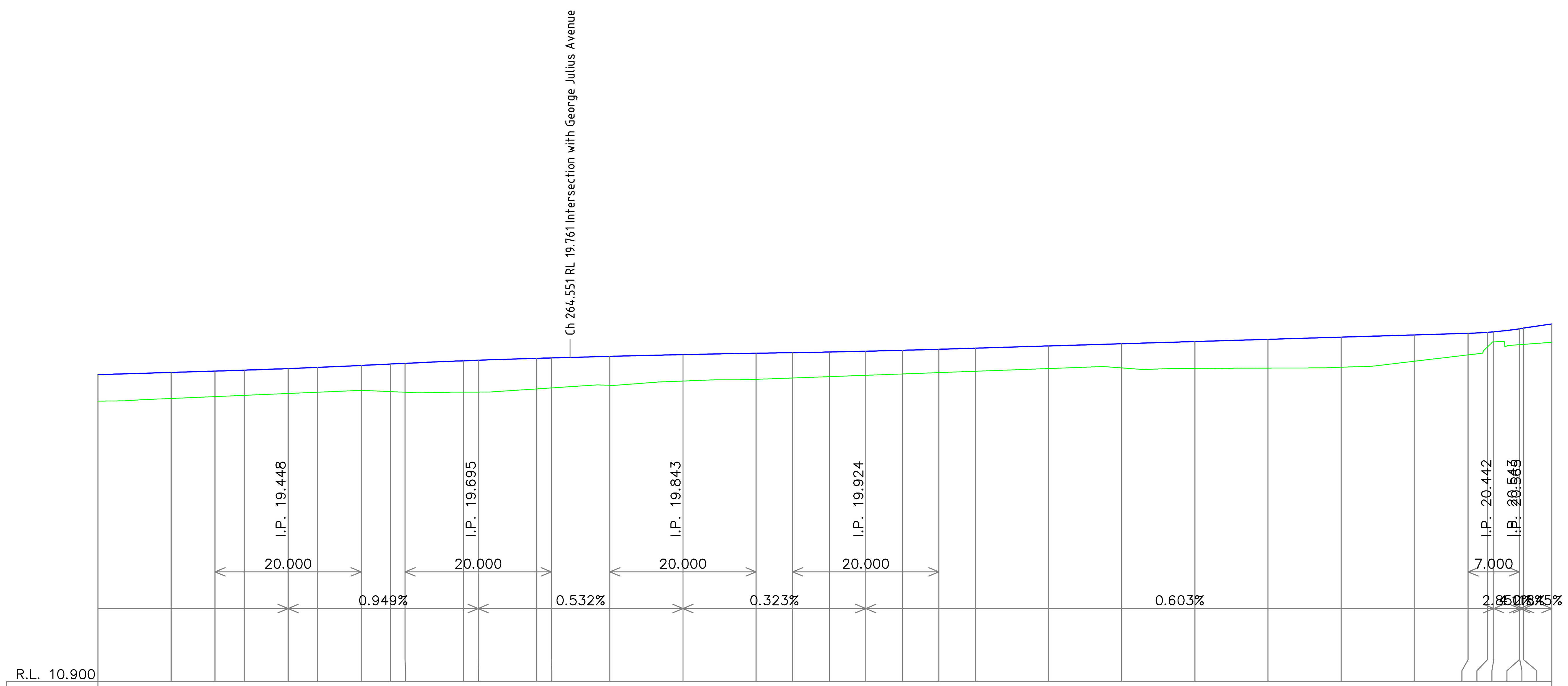
SCALE: H = 1:500, V = 1:100
PAPER: A1

CITY OF SYDNEY 2030

PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Issue: 2
Drawing No.: E3-13/1164 - 701
Sheet No.: 1 OF 2





Horizontal Geometry: L=399.359, B=114°17'10"

CHAINAGE	EXISTING SURFACE	DESIGN SURFACE	Cut Fill
200.000	18.57	19.291	-0.725
210.000	18.64	19.351	-0.712
216.000	18.69	19.387	-0.696
220.000	18.72	19.413	-0.688
226.000	18.78	19.456	-0.680
230.000	18.81	19.489	-0.679
236.000	18.86	19.543	-0.682
240.000	18.83	19.581	-0.754
242.000	18.81	19.600	-0.790
250.000	18.81	19.669	-0.857
252.000	18.81	19.684	-0.870
260.000	18.90	19.737	-0.836
262.000	18.93	19.748	-0.821
270.000	19.00	19.790	-0.790
280.000	19.12	19.838	-0.722
290.000	19.16	19.876	-0.714
295.000	19.20	19.892	-0.693
300.000	19.24	19.910	-0.674
305.000	19.27	19.931	-0.658
310.000	19.31	19.956	-0.646
315.000	19.35	19.984	-0.637
320.000	19.38	20.015	-0.632
330.000	19.46	20.075	-0.618
340.000	19.47	20.135	-0.660
350.000	19.46	20.195	-0.733
360.000	19.47	20.256	-0.786
370.000	19.49	20.316	-0.823
380.000	19.66	20.376	-0.719
387.367	19.83	20.421	-0.590
390.000	20.05	20.448	-0.402
390.867	20.19	20.461	-0.274
394.367	20.11	20.541	-0.432
394.427	20.11	20.543	-0.433
394.964	20.12	20.565	-0.447
398.821	20.17	20.675	-0.500

LONGITUDINAL SECTION
Zetland Avenue (West) Ch 200.000 to Ch 398.821
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

Date	No.	By	Amendments	Chckd
	5			
	4			
	3			
21-09-2015	2	MS	100% Design	PS
23-12-2014	1	MS	80% Design	PS

ZETLAND AVENUE (WEST) LONGSECTIONS
CH 200 - 399

EPSOM PARK PRECINCT
INFRASTRUCTURE CONCEPT DESIGN

Designed: MS | Checked: PS | Drawn: MS | Approved: PS

SCALE: H = 1:500 V = 1:100 | PAPER: A1

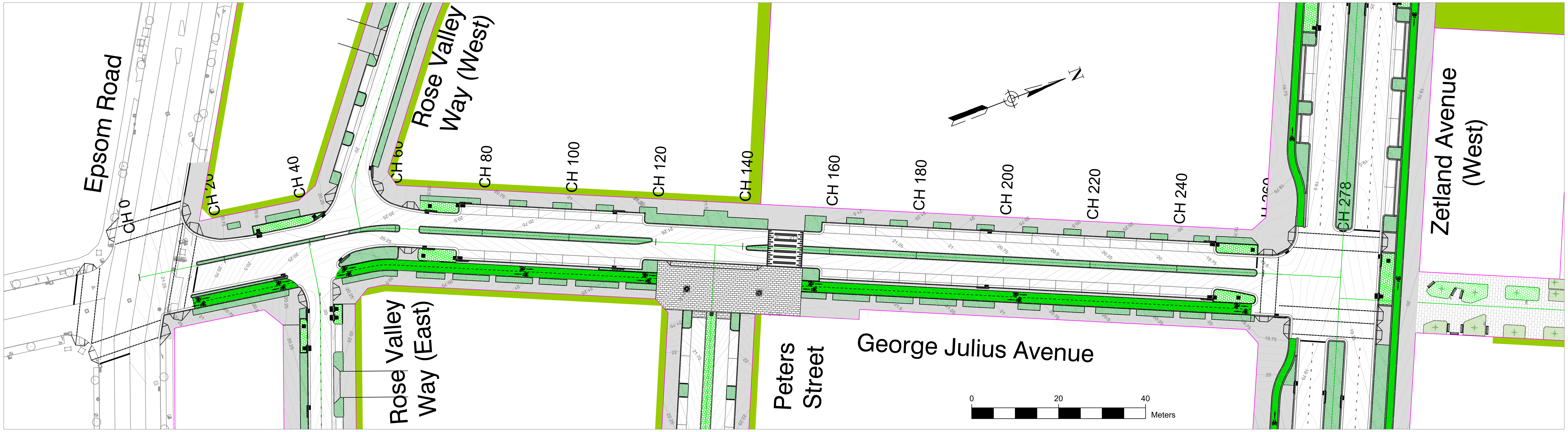
CITY OF SYDNEY 2030

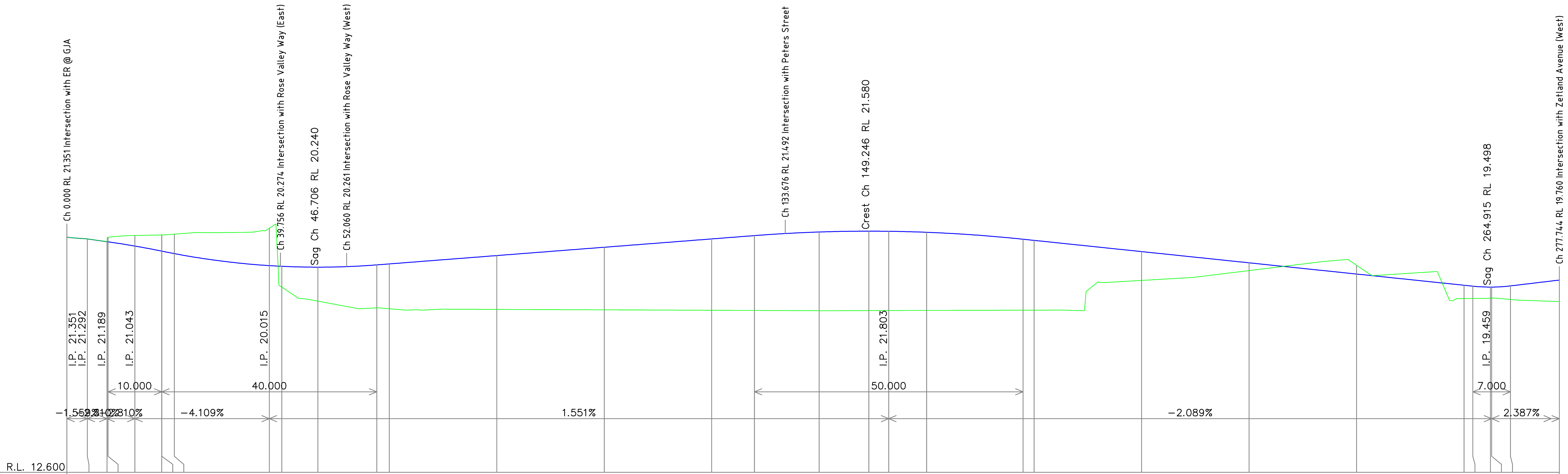
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Issue 2

Drawing No. E3-13/1164 - 702

Sheet No. 2 OF 2





R.L. 12.600

Horizontal Geometry: L=51.836 B=9°00'55"; L=9.200 R=35.850; L=216.708 B=23°43'06"

CHAINAGE	EXISTING SURFACE	DESIGN SURFACE	Cut Fill
0.000	21.35	21.351	-0.000
3.801	21.29	21.292	-0.000
7.465	21.19	21.189	+0.003
7.655	21.35	21.183	+0.171
12.655	21.42	21.027	+0.392
17.655	21.44	20.837	+0.604
17.667	21.44	20.837	+0.604
20.000	21.47	20.745	+0.724
37.667	21.69	20.298	+1.390
40.000	19.50	20.272	-0.776
46.706	18.98	20.240	-1.264
57.667	18.72	20.325	-1.601
60.000	18.69	20.361	-1.669
80.000	18.67	20.672	-2.005
100.000	18.65	20.982	-2.331
120.000	18.64	21.292	-2.657
127.940	18.63	21.415	-2.786
140.000	18.62	21.549	-2.930
149.246	18.62	21.580	-2.956
152.940	18.63	21.576	-2.949
160.000	18.63	21.538	-2.908
177.940	18.64	21.281	-2.642
180.000	18.64	21.238	-2.598
200.000	19.75	20.820	-1.073
220.000	20.11	20.402	-0.289
240.000	20.31	19.985	+0.327
260.000	19.07	19.567	-0.494
261.648	19.08	19.532	-0.456
264.915	19.08	19.498	-0.414
265.148	19.09	19.498	-0.410
268.648	19.04	19.543	-0.506
277.744	18.96	19.760	-0.799

LONGITUDINAL SECTION
George Julius Avenue Ch 0.000 to Ch 277.744
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

Date	No.	By	Amendments	Chckd
	5			
	4			
	3			
21-09-2015	2	MS	100% Design	PS
23-12-2014	1	MS	80% Design	PS

GEORGE JULIUS AVENUE LONGSECTION
CH 0 - 278

EPSOM PARK PRECINCT
INFRASTRUCTURE CONCEPT DESIGN

Designed: MS | Checked: PS | Drawn: MS | Approved: PS

SCALE: H = 1:500 V = 1:100

PAPER: A1

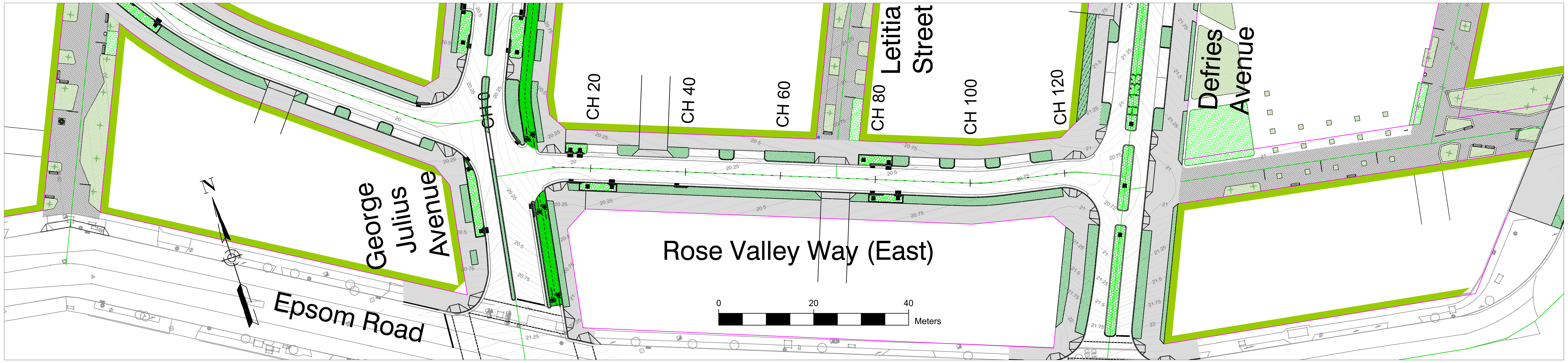
CITY OF SYDNEY 2030

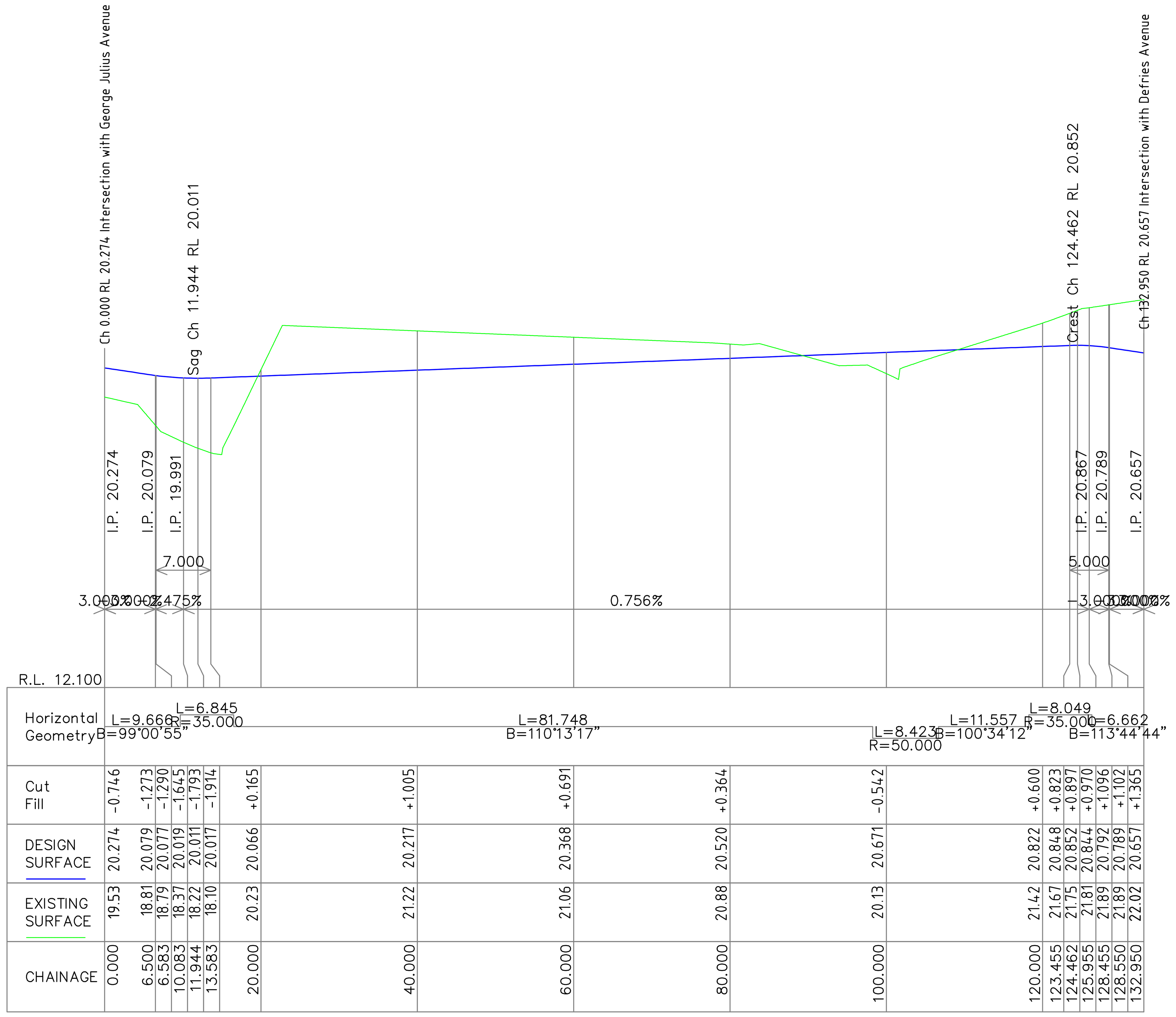
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Issue: 2

Drawing No.: E3-13/1164 - 704

Sheet No.: 1 OF 1





LONGITUDINAL SECTION
Rose Valley Way (East) Ch 0.000 to Ch 132.950
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

Date	No.	By	Amendments	Chckd
	5			
	4			
	3			
21-09-2015	2	MS	100% Design	PS
23-12-2014	1	MS	80% Design	PS

ROSE VALLEY WAY (EAST) LONGSECTION
CH 0 - 133

EPSOM PARK PRECINCT
INFRASTRUCTURE CONCEPT DESIGN

Designed: MS	Checked: PS	SCALE: H = 1:500 V = 1:100	PAPER: A1
Drawn: MS	Approved: PS		

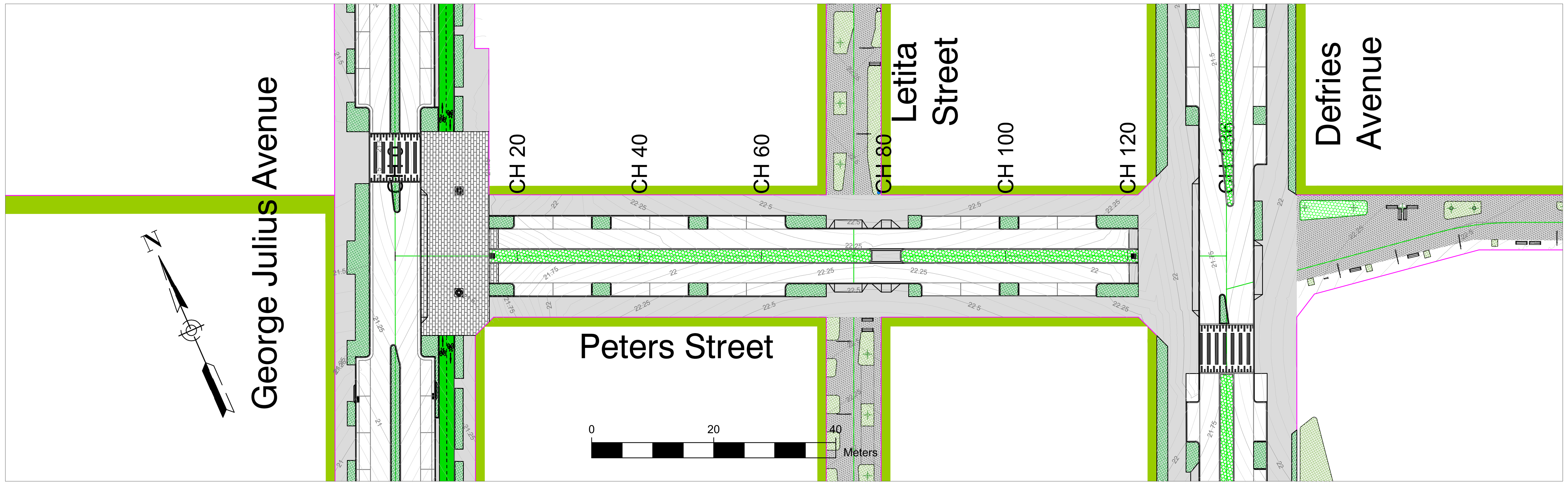
CITY OF SYDNEY 2030

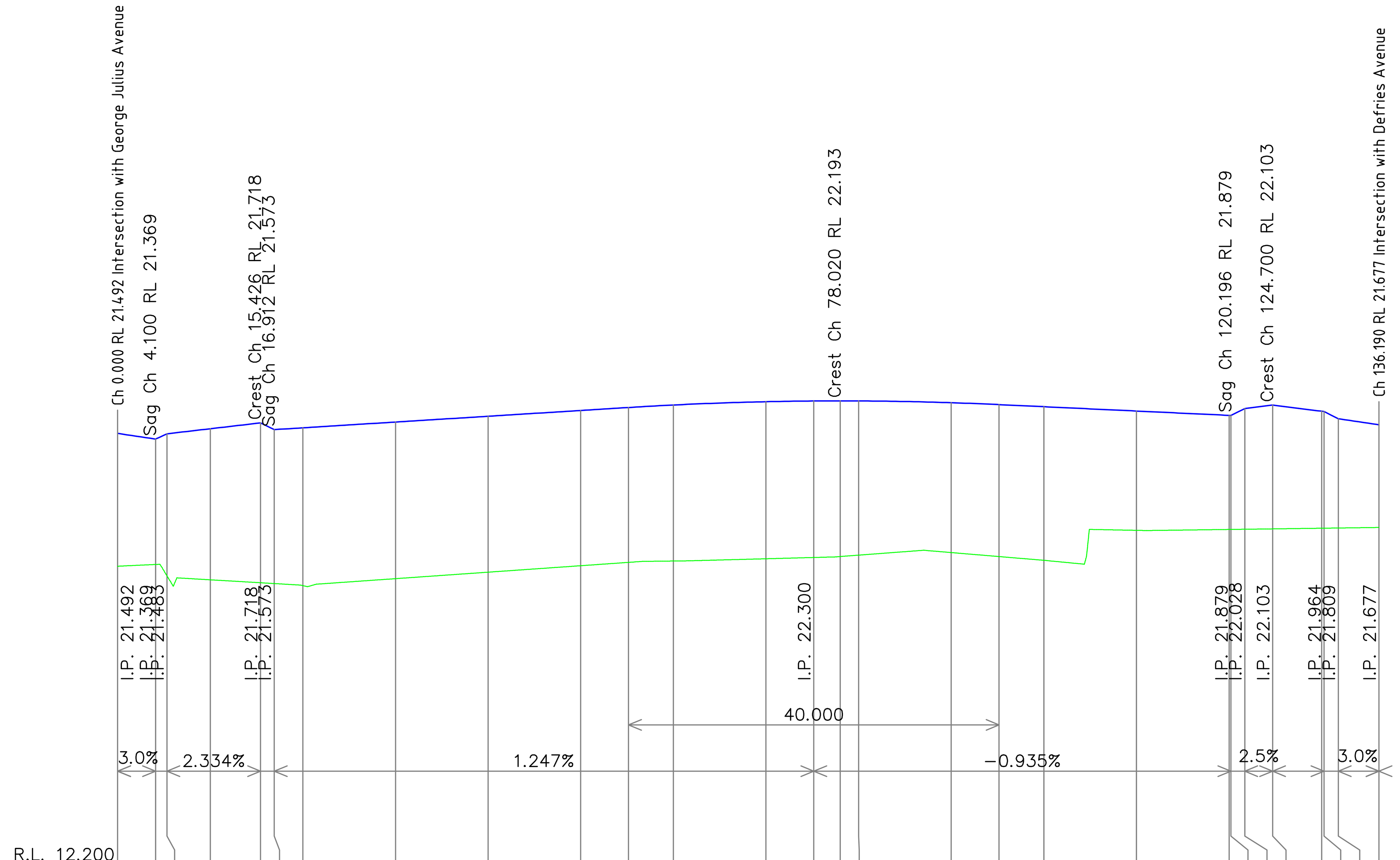
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Issue: 2

Drawing No. E3-13/1164 - 707

Sheet No. 1 OF 1





Horizontal Geometry: L=136.190, B=113°48'45"

CHAINAGE	EXISTING SURFACE	DESIGN SURFACE	Cut Fill
0.000	18.62	21.492	-2.868
4.100	18.66	21.369	-2.707
5.319	18.42	21.483	-3.064
10.000	18.33	21.592	-3.261
15.426	18.27	21.718	-3.450
16.912	18.25	21.573	-3.323
20.000	18.21	21.612	-3.406
30.000	18.36	21.737	-3.381
40.000	18.50	21.861	-3.365
50.000	18.64	21.986	-3.351
55.160	18.71	22.051	-3.344
60.000	18.74	22.105	-3.368
70.000	18.79	22.176	-3.391
75.160	18.81	22.191	-3.378
78.020	18.83	22.193	-3.359
80.000	18.86	22.192	-3.328
90.000	18.92	22.154	-3.235
95.160	18.83	22.113	-3.280
100.000	18.75	22.068	-3.316
110.000	19.40	21.974	-2.575
120.000	19.42	21.881	-2.463
120.197	19.42	21.879	-2.460
121.700	19.42	22.028	-2.605
124.700	19.43	22.103	-2.672
130.000	19.44	21.970	-2.525
130.246	19.45	21.964	-2.519
131.790	19.45	21.809	-2.360
136.190	19.46	21.677	-2.216

LONGITUDINAL SECTION
Peters Street Ch 0.000 to Ch 136.190
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

Date	No.	By	Amendments	Chckd
	5			
	4			
	3			
21-09-2015	2	MS	100% Design	PS
23-12-2014	1	MS	80% Design	PS

PETERS STREET LONGSECTION
CH 0 - 137

EPSOM PARK PRECINCT
INFRASTRUCTURE CONCEPT DESIGN

Designed: MS | Checked: PS | Drawn: MS | Approved: PS

SCALE: H = 1:500 V = 1:100

PAPER: A1

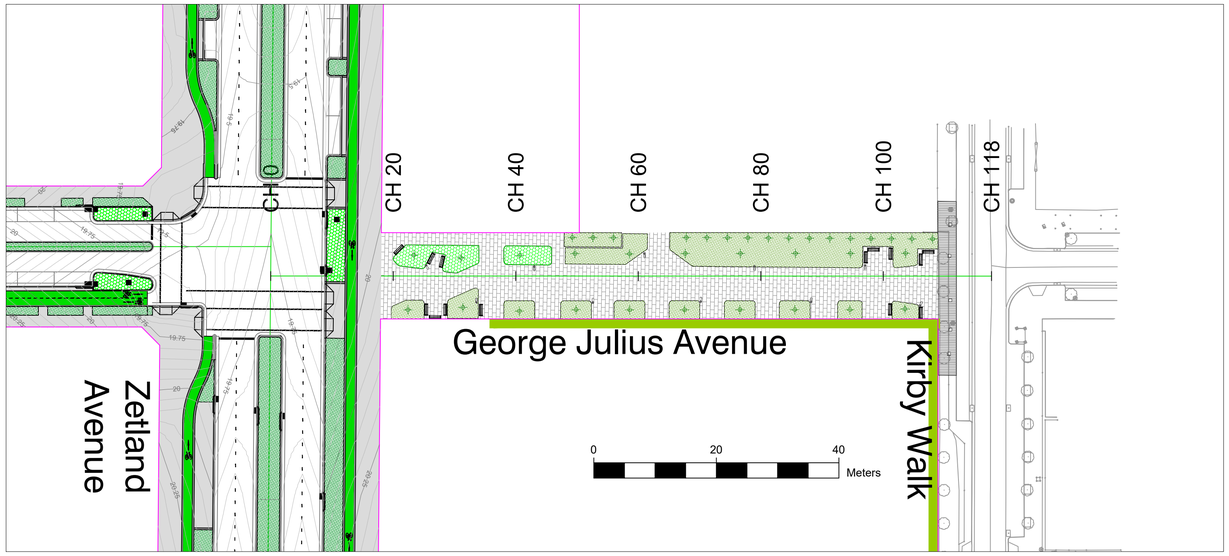
CITY OF SYDNEY 2030

PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

Issue 2

Drawing No. E3-13/1164 - 708

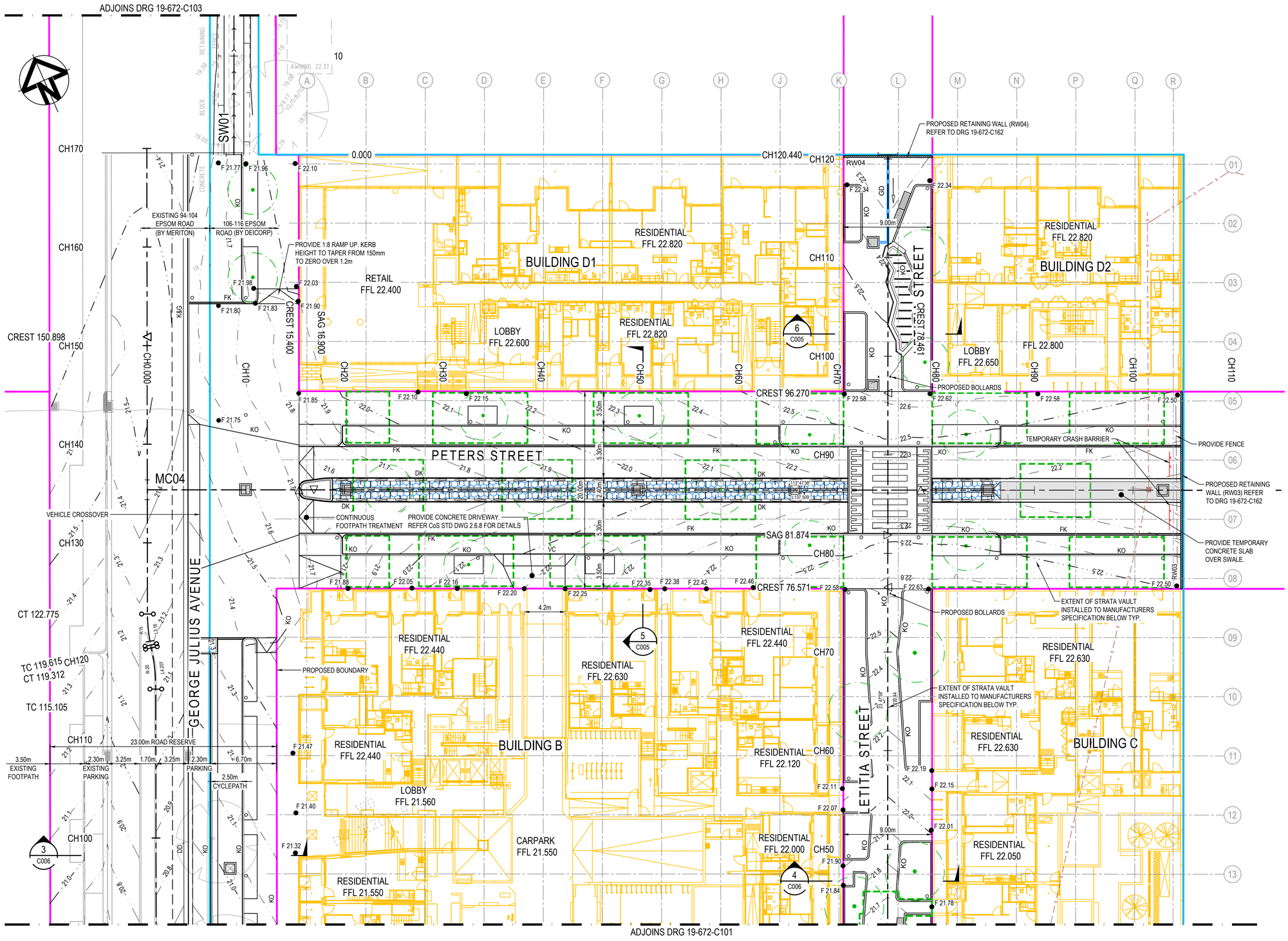
Sheet No. 1 OF 1



Horizontal Geometry	L=123.266 B=23°45'45"												
Cut	-0.783	-0.587	-0.737	-0.821	-0.921	-0.984	-0.987	-1.132	-1.168	-1.202	-0.901	-0.001	
Fill													
DESIGN SURFACE	19.787	19.583	19.733	19.853	19.954	20.050	20.064	20.204	20.344	20.484	20.624	20.728	
EXISTING SURFACE	19.00	19.00	19.00	19.03	19.03	19.07	19.08	19.07	19.18	19.28	19.72	20.73	20.73	20.75	20.65
CHAINAGE	0.000	8.831	9.000	13.937	14.000	18.000	20.000	40.000	60.000	80.000	100.000	114.908	115.000	120.000	123.266

LONGITUDINAL SECTION
George Julius Avenue (Shared) Ch 0.000 to Ch 123.266
SCALES: HORIZONTAL 1:500 VERTICAL 1:100

	5				GEORGE JULIUS AVENUE (SHARED) LONGSECTION CH 0 - 123			CITY OF SYDNEY
	4							
	3				EPSOM PARK PRECINCT INFRASTRUCTURE CONCEPT DESIGN			PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION — Issue 2
21-09-2015	2	MS	100% Design	PS				
23-12-2014	1	MS	80% Design	PS	Designed: MS	Checked: PS	SCALE: H = 1:500 V = 1:100	PAPER: A1
Date	No.	By	Amendments	Chckd	Drawn: MS	Approved: PS		Drawing No. E3-13/1164 - 718 — Sheet No. 1 OF 1



LEGEND

EXISTING

- EXISTING BOUNDARY
- EXISTING ELECTRICITY
- EXISTING ELECTRICITY OVERHEAD
- EXISTING TELSTRA CONDUITS
- EXISTING OPTICAL FIBRE SERVICE
- EXISTING SEWER SERVICE
- EXISTING WATER SERVICE
- EXISTING GAS SERVICE
- EXISTING HIGH PRESSURE GAS SERVICE
- EXISTING UNKNOWN SERVICE (ASSUMED NEXTGEN)
- EXISTING STORMWATER

PROPOSED

- PROPOSED BOUNDARY
- F 44.45 FINISHED SURFACE LEVEL
- 20.5 FINISHED SURFACE CONTOUR MAJOR
- 20.6 FINISHED SURFACE CONTOUR MINOR
- K&G PROPOSED KERB AND GUTTER. REFER TO COUNCIL STANDARD DRG 1.1.2
- KO PROPOSED KERB ONLY.
- DD PROPOSED DISH CROSSING. REFER TO COUNCIL STANDARD DRG 1.1.2
- DK PROPOSED DOLPHIN KERB
- FK PROPOSED FLUSH KERB
- PROPOSED FUTURE WORK BY OTHERS
- PR PROPOSED PEDESTRIAN RAMP. REFER TO COUNCIL STANDARD DRG 2.6.5
- VC PROPOSED VEHICLE CROSSING. REFER TO COUNCIL STANDARD DRG 2.6.8
- SAWCUT PROPOSED LOCATION OF PAVEMENT SAWCUT
- PROPOSED PALISADE FENCE
- PROPOSED PROPOSED SAFETY BARRIER (W-BEAM U.N.O.)
- RW01 PROPOSED RETAINING WALL
- GD PROPOSED 200mm WIDE GRATED DRAIN WITH HEELGUARD GRATE AND FLOW DIRECTION
- PROPOSED EARTHWORKS BATTER (1:3 SLOPE U.N.O.)
- PROPOSED STORMWATER PITS. REFER TO DRG C201-C203 FOR DETAILS
- PROPOSED RAIN GARDEN. REFER TO DRG C230-C233 FOR DETAILS
- PROPOSED TRUNK STORMWATER. REFER TO SYDNEY WATER DRGS CASE186014SW
- EXTENT OF STRATAVAULT FOR LANDSCAPING

Issue	Description	Date
O	ISSUED FOR REVIEW	19-10-21
N	ISSUED FOR REVIEW	13-10-21
M	ISSUED FOR REVIEW	23-09-21
L	ISSUED FOR REVIEW	02-09-21
K	ISSUED FOR REVIEW	19-04-21
J	ISSUED FOR REVIEW	29-03-21

Bar Scales

1 : 200 @ A1 1 : 400 @ A3

Client: DEICORP BUILT TO DELIVER

Scales	1:200
Grid	MGA (GDA20)
Height Datum	AHD
Drawn	JD
Designed	JD
Checked	GJ
Approved	AT

D/2015/913

Project: 106-116 EPSOM ROAD ZETLAND

Title: SITEWORKS PLAN SHEET 2

Civil Engineers and Project Managers
at&l
Level 7, 153 Walker Street
North Sydney NSW 2060
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status: FOR CC APPROVAL

A1

Project - Drawing No.: 19-672-C102

Issue: O

100mm on Original

F:\19-672 Epsom Deicorp\6.0 Drgs\Civil\Final\19-672-C102.dwg

Appendix C

Investigation Data

					Location	DP-BH1	DP-BH1	DP-BH1	DP-BH1	DP-BH2	DP-BH2	DP-BH3	DP-BH3
					Sample Depth	0.1-0.3	0.3-0 5	1.7-2.0	2.7-3.0	0.1-0 3	1.7-2.0	0.1-0.3	1.7-2.0
					Field Sample ID	DP-BH1_0.1-0 3	DP-BH1_0.3-0.5	DP-BH1_1.7-2.0	DP-BH1_2.7-3.0	DP-BH2_0.1-0 3	DP-BH2_1.7-2.0	DP-BH3_0.1-0.3	DP-BH3_1.7-2 0
					Sample Date	2009	2009	2009	2009	2009	2009	2009	2009
					SampleCode	-	-	-	-	-	-	-	-
						DP 2009	DP 2009	DP 2009	DP 2009	DP 2009	DP 2009	DP 2009	DP 2009
Chemical Name	**Units**	**LOR**	**NEPM (2013) EIL and ESL - Open Space**	NEPM (2013) HIL C Recreational	NEPM (2013) H L D Commercial								
Metals													
Arsenic	mg/kg	4	**100**	300	3000	<4	-	<4	-	6	<4	<4	6
Cadmium	mg/kg	0.4		90	900	<0 5	-	<0.5	-	<0 5	<0.5	<0 5	2 2
Chromium (III+VI)	mg/kg	1				6	-	1	-	4	2	5	24
Copper	mg/kg	1	**60**	17000	240000	**65**	-	11	-	36	12	16	**210**
Lead	mg/kg	1	**1100**	600	1500	97	-	14	-	59	31	99	370
Mercury	mg/kg	0.1		80	730	0 2	-	<0.1	-	0.1	<0.1	0.1	0 6
Nickel	mg/kg	1	**30**	1200	6000	12	-	2	-	4	2	3	29
Zinc	mg/kg	1	**70**	30000	400000	**84**	-	26	-	**200**	51	**110**	**270**
PAH/Phenols							-						
Acenaphthene	mg/kg	0.1				-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	0.1				-	-	-	-	-	-	-	-
Anthracene	mg/kg	0.1				-	-	-	-	-	-	-	-
Benz(a)anthracene	mg/kg	0.1				-	-	-	-	-	-	-	-
Benzo(a) pyrene	mg/kg	0.05	**0.7**			**6.6**	4.3	0.09	<0.05	0 3	-	0.2	-
Benzo(b)&(k)fluoranthene	mg/kg					-	-	-	-	-	-	-	-
Benzo[b+j]fluoranthene	mg/kg	0.5				-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	mg/kg	0.1				-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.5				-	-	-	-	-	-	-	-
Chrysene	mg/kg	0.1				-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1				-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	0.1				-	-	-	-	-	-	-	-
Fluorene	mg/kg	0.1				-	-	-	-	-	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				-	-	-	-	-	-	-	-
Naphthalene	mg/kg	0.1	**170**			-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	0.1				-	-	-	-	-	-	-	-
Pyrene	mg/kg	0.1				-	-	-	-	-	-	-	-
PAHs (Sum of total)	mg/kg	0.5		300	4000	105.9	46.1	0.39	<LOR	2.4	-	1.4	-
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		3	40	-	-	-	-	-	-	-	-
Pesticides													
Total OCPs	mg/kg					-	-	-	-	-	-	-	-
Total OPPs	mg/kg					-	-	-	-	-	-	-	-
PCBs													
Total PCBs	mg/kg			1	10	-	-	-	-	-	-	<LOR	-

Notes:
< - result less than laboratory limit of reporting (LOR)
Shading or bold - result greater than criteria
H L - Health investigation level
EIL - Ecological investigation level
ESL - Ecological screening level
RPD - relative percent differnce

					Location	DP-BH4	DP-BH4	DP-BH5	DP-BH5	BHA1	BHA1	BHA1	WSP-BH05
					Sample Depth	0.1-0.3	1.7-2 0	0.1-0.3	1.7-2.0	2	2.5	4	0 5
					Field Sample ID	DP-BH4_0.1-0 3	DP-BH4_1.7-2.0	DP-BH5_0.1-0.3	DP-BH5_1.7-2. 0	A1_2.0	A1_2 5	A1_4.0	WSP-BH05_0.5
					Sample Date	2009	2009	2009	2009	27/03/2020	27/03/2020	27/03/2020	6/06/2011
					SampleCode	-	-	-	-	S20-Ma45452	S20-Ma45453	S20-Ma45454	-
						DP 2009	DP 2009	DP 2009	DP 2009	JBS&G 2020	JBS&G 2020	JBS&G 2020	WSP 2012
Chemical Name	**Units**	**LOR**	**NEPM (2013) EIL and ESL - Open Space**	NEPM (2013) HIL C Recreational	NEPM (2013) H L D Commercial								
Metals													
Arsenic	mg/kg	4	**100**	300	3000	4	5	<4	4	-	-	-	<4
Cadmium	mg/kg	0.4		90	900	<0 5	1.7	<0.5	0.7	-	-	-	<0 5
Chromium (III+VI)	mg/kg	1				10	25	4	17	-	-	-	3
Copper	mg/kg	1	**60**	17000	240000	22	**220**	27	**160**	-	-	-	16
Lead	mg/kg	1	**1100**	600	1500	56	300	71	490	<5	<5	<5	29
Mercury	mg/kg	0.1		80	730	0 2	0.7	0.7	0.7	-	-	-	0 2
Nickel	mg/kg	1	**30**	1200	6000	3	26	4	11	-	-	-	3
Zinc	mg/kg	1	**70**	30000	400000	50	**270**	80	**280**	-	-	-	48
PAH/Phenols													
Acenaphthene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Acenaphthylene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Anthracene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Benz(a)anthracene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Benzo(a) pyrene	mg/kg	0.05	**0.7**			0.4	-	0.2	-	<0 5	<0.5	<0 5	0.1
Benzo(b)&(k)fluoranthene	mg/kg					-	-	-	-	<0 5	<0.5	<0 5	-
Benzo[b+j]fluoranthene	mg/kg	0.5				-	-	-	-	<0 5	<0.5	<0 5	-
Benzo(g,h,i)perylene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Benzo(k)fluoranthene	mg/kg	0.5				-	-	-	-	<0 5	<0.5	<0 5	-
Chrysene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Dibenz(a,h)anthracene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Fluoranthene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Fluorene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Naphthalene	mg/kg	0.1	**170**			-	-	-	-	<0 5	<0.5	<0 5	-
Phenanthrene	mg/kg	0.1				-	-	-	-	<0 5	<0.5	<0 5	-
Pyrene	mg/kg	0.1				-	-	-	-	1.1	<0.5	<0 5	-
PAHs (Sum of total)	mg/kg	0.5		300	4000	2 9	-	1.7	-	1.1	<0.5	<0 5	0 6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		3	40	-	-	-	-	<0 5	<0.5	<0 5	-
Pesticides													
Total OCPs	mg/kg					-	-	-	-	-	-	-	-
Total OPPs	mg/kg					-	-	-	-	-	-	-	-
PCBs													
Total PCBs	mg/kg			1	10	<LOR	-	-	-	-	-	-	-

Notes:
< - result less than laboratory limit of reporting (LOR)
Shading or bold - result greater than criteria
H L - Health investigation level
EIL - Ecological investigation level
ESL - Ecological screening level
RPD - relative percent differnce

					Location	WSP-BH05	WSP-BH05	WSP-BH09	WSP-BH09	WSP-BH12	WSP-BH12	BH214	BH214	BH215
					Sample Depth	2	5	0.2	1	0 5	3	1-1.1	2-2.1	0 5-0.25
					Field Sample ID	WSP-BH05_2	WSP-BH05_5	WSP-BH09_0 2	WSP-BH09_1	WSP-BH12_0.5	WSP-BH12_3	BH214_1 0-1.1	BH214_2.0-2.1	BH215_0.5-0 25
					Sample Date	6/06/2011	6/06/2011	6/06/2011	6/06/2011	9/06/2011	9/06/2011	26/11/2015	26/11/2015	26/11/2015
					SampleCode	-	-	-	-	-	-	ES1537688043	ES1537688044	ES1537688030
						WSP 2012	WSP 2012	WSP 2012	WSP 2012	WSP 2012	WSP 2012	AECOM 2015	AECOM 2015	AECOM 2015
Chemical Name		**Units**	**LOR**	**NEPM (2013) EIL and ESL - Open Space**	NEPM (2013) HIL C Recreational	NEPM (2013) H L D Commercial								
Metals														
	Arsenic	mg/kg	4	**100**	300	3000	<4	<4	<4	7	<4	<4	<5	11	<5
	Cadmium	mg/kg	0.4		90	900	<0 5	<0 5	<0.5	<0.5	<0 5	<0.5	<1	4	<1
	Chromium (III+VI)	mg/kg	1				3	<1	8	4	8	4	4	100	9
	Copper	mg/kg	1	**60**	17000	240000	21	<1	4	6	32	2	10	**701**	5
	Lead	mg/kg	1	**1100**	600	1500	53	1	13	19	66	3	63	965	16
	Mercury	mg/kg	0.1		80	730	0.2	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	1 2	<0.1
	Nickel	mg/kg	1	**30**	1200	6000	3	<1	5	2	11	2	2	**105**	5
	Zinc	mg/kg	1	**70**	30000	400000	69	3	26	**140**	**80**	24	53	**629**	33
PAH/Phenols															
	Acenaphthene	mg/kg	0.1				-	-	-	-	-	-	<0.5	<0 5	<0.5
	Acenaphthylene	mg/kg	0.1				-	-	-	-	-	-	<0.5	<0 5	<0.5
	Anthracene	mg/kg	0.1				-	-	-	-	-	-	<0.5	<0 5	<0.5
	Benz(a)anthracene	mg/kg	0.1				-	-	-	-	-	-	0.6	2 6	<0.5
	Benzo(a) pyrene	mg/kg	0.05	**0.7**			0.3	<0 05	<0.05	<0.05	**1.8**	**0.8**	**1.1**	**3.3**	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg					-	-	-	-	-	-	-	-	-
	Benzo[b+j]fluoranthene	mg/kg	0.5				-	-	-	-	-	-	1.2	4	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.1				-	-	-	-	-	-	0.8	2 8	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5				-	-	-	-	-	-	<0.5	1 6	<0.5
	Chrysene	mg/kg	0.1				-	-	-	-	-	-	0.6	2 5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.1				-	-	-	-	-	-	<0.5	<0 5	<0.5
	Fluoranthene	mg/kg	0.1				-	-	-	-	-	-	0.9	3 9	<0.5
	Fluorene	mg/kg	0.1				-	-	-	-	-	-	<0.5	<0 5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				-	-	-	-	-	-	0.6	2.1	<0.5
	Naphthalene	mg/kg	0.1	**170**			-	-	-	-	-	-	<0.5	<0 5	<0.5
	Phenanthrene	mg/kg	0.1				-	-	-	-	-	-	<0.5	1 6	<0.5
	Pyrene	mg/kg	0.1				-	-	-	-	-	-	1.1	4 2	<0.5
	PAHs (Sum of total)	mg/kg	0.5		300	4000	3.5	<LOR	<LOR	<LOR	17.9	4.7	6.9	28.6	<0.5
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		3	40	-	-	-	-	-	-	1.9	4 9	<0.5
Pesticides															
	Total OCPs	mg/kg					<LOR	-	-	<LOR	<LOR	-	-	-	-
	Total OPPs	mg/kg					<LOR	-	-	<LOR	<LOR	-	-	-	-
PCBs															
	Total PCBs	mg/kg			1	10	<LOR	-	-	<LOR	<LOR	-	-	-	-

Notes:
< - result less than laboratory limit of reporting (LOR)
Shading or bold - result greater than criteria
H L - Health investigation level
EIL - Ecological investigation level
ESL - Ecological screening level
RPD - relative percent differnce

					Location	BH215	BH216		BH216	BH217	BH217	BH218		BH218	BH219	
					Sample Depth	2-2.1	0.5-0.6		1.5-1 6	0.5-0.6	2.4-2.5	0.15-0.25		2-2.1	0-0.1	
					Field Sample ID	BH215_2.0-2.1	BH216_0.5-0.6	QC216	BH216_1.5-1 6	BH217_0 5-0.6	BH217_2.4-2 5	BH218_0.15-0.25	QC221	BH218_2.0-2.1	BH219_0.0-0.1	QC214
					Sample Date	26/11/2015	25/11/2015	25/11/2015	25/11/2015	26/11/2015	26/11/2015	26/11/2015	24/11/2015	26/11/2015	25/11/2015	25/11/2015
					SampleCode	ES1537688031	ES1537688028	ES1537688049	ES1537688029	ES1537688036	ES1537688037	ES1537688045	138129-7	ES1537688046	ES1537688026	ES1537688048
						AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015
Chemical Name	**Units**	**LOR**	**NEPM (2013) EIL and ESL - Open Space**	NEPM (2013) H L C Recreational	NEPM (2013) H L D Commercial											
Metals																
Arsenic	mg/kg	4	**100**	300	3000	<5	<5	<5	11	<5	<5	<5	<4	<5	<5	<5
Cadmium	mg/kg	0.4		90	900	<1	<1	<1	<1	<1	<1	<1	<0.4	<1	<1	<1
Chromium (III+VI)	mg/kg	1				3	4	4	27	3	<2	7	8	3	9	4
Copper	mg/kg	1	**60**	17000	240000	18	44	35	**364**	9	<5	12	7	24	9	26
Lead	mg/kg	1	**1100**	600	1500	33	110	89	729	219	6	27	17	46	19	46
Mercury	mg/kg	0.1		80	730	<0.1	0.2	0 2	1.2	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	**30**	1200	6000	2	4	4	21	2	<2	4	7	3	6	4
Zinc	mg/kg	1	**70**	30000	400000	57	**99**	**89**	**646**	35	49	44	29	**91**	36	**73**
PAH/Phenols																
Acenaphthene	mg/kg	0.1				<0 5	<0.5	<0 5	<0.5	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Acenaphthylene	mg/kg	0.1				<0 5	<0.5	<0 5	1.2	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Anthracene	mg/kg	0.1				<0 5	<0.5	<0 5	1.6	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Benz(a)anthracene	mg/kg	0.1				<0 5	<0.5	<0 5	5.9	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	0 9
Benzo(a) pyrene	mg/kg	0.05	**0.7**			<0 5	<0.5	<0 5	**7.5**	<0.5	<0 5	<0.5	0.1	<0 5	<0.5	**1.7**
Benzo(b)&(k)fluoranthene	mg/kg					-	-	-	-	-	-	-	<0 2	-	-	-
Benzo[b+j]fluoranthene	mg/kg	0.5				<0 5	<0.5	<0 5	8.5	<0.5	<0 5	<0.5	-	<0 5	<0.5	1 8
Benzo(g,h,i)perylene	mg/kg	0.1				<0 5	<0.5	<0 5	5.5	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	1 5
Benzo(k)fluoranthene	mg/kg	0.5				<0 5	<0.5	<0 5	3.4	<0.5	<0 5	<0.5	-	<0 5	<0.5	0 6
Chrysene	mg/kg	0.1				<0 5	<0.5	<0 5	5.9	<0.5	<0 5	<0.5	0.1	<0 5	<0.5	0 9
Dibenz(a,h)anthracene	mg/kg	0.1				<0 5	<0.5	<0 5	1.3	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Fluoranthene	mg/kg	0.1				0 5	<0.5	<0 5	9.5	<0.5	<0 5	<0.5	0.1	<0 5	<0.5	1 5
Fluorene	mg/kg	0.1				<0 5	<0.5	<0 5	<0.5	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				<0 5	<0.5	<0 5	4.3	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	1.1
Naphthalene	mg/kg	0.1	**170**			<0 5	<0.5	<0 5	<0.5	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Phenanthrene	mg/kg	0.1				<0 5	<0.5	<0 5	4	<0.5	<0 5	<0.5	<0.1	<0 5	<0.5	<0 5
Pyrene	mg/kg	0.1				0 5	<0.5	0 5	10.3	<0.5	<0 5	<0.5	0.1	<0 5	<0.5	1 8
PAHs (Sum of total)	mg/kg	0.5		300	4000	1	<0.5	0 5	68.9	<0.5	<0 5	<0.5	0.48	<0 5	<0.5	11.8
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		3	40	1 2	<0.5	1 2	11.1	<0.5	<0 5	<0.5	<0 5	<0 5	<0.5	2.7
Pesticides																
Total OCPs	mg/kg					-	-	-	-	-	-	-	-	-	-	-
Total OPPs	mg/kg					-	-	-	-	-	-	-	-	-	-	-
PCBs																
Total PCBs	mg/kg			1	10	-	-	-	-	-	-	-	-	-	-	-

Notes:
< - result less than laboratory limit of reporting (LOR)
Shading or bold - result greater than criteria
HIL - Health investigation level
EIL - Ecological investigation level
ESL - Ecological screening level
RPD - relative percent differnce

					Location	BH219	BH220	BH220	BH221	BH221
					Sample Depth	1 5-1.6	0 5-0.6	2-2.1	1-1.1	2.4-2.5
					Field Sample ID	BH219__1.5-1 6	BH220_0.5-0 6	BH220A_2 0-2.1	BH221_1.0-1.1	BH221_2.4-2.5
					Sample Date	25/11/2015	26/11/2015	26/11/2015	26/11/2015	26/11/2015
					SampleCode	ES1537688027	ES1537688034	ES1537688035	ES1537688040	ES1537688041
						AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015	AECOM 2015
Chemical Name	**Units**	**LOR**	**NEPM (2013) EIL and ESL - Open Space**	NEPM (2013) H L C Recreational	NEPM (2013) H L D Commercial					
Metals										
Arsenic	mg/kg	4	**100**	300	3000	<5	<5	<5	<5	<5
Cadmium	mg/kg	0.4		90	900	<1	<1	<1	<1	<1
Chromium (III+VI)	mg/kg	1				<2	3	<2	9	<2
Copper	mg/kg	1	**60**	17000	240000	13	18	15	25	22
Lead	mg/kg	1	**1100**	600	1500	32	32	27	58	27
Mercury	mg/kg	0.1		80	730	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	**30**	1200	6000	<2	3	<2	7	3
Zinc	mg/kg	1	**70**	30000	400000	**78**	46	21	**83**	69
PAH/Phenols										
Acenaphthene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Acenaphthylene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Anthracene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Benz(a)anthracene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Benzo(a) pyrene	mg/kg	0.05	**0.7**			<0 5	<0 5	<0 5	0.5	<0 5
Benzo(b)&(k)fluoranthene	mg/kg					-	-	-	-	-
Benzo[b+j]fluoranthene	mg/kg	0.5				<0 5	<0 5	<0 5	0.6	<0 5
Benzo(g,h,i)perylene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Benzo(k)fluoranthene	mg/kg	0.5				<0 5	<0 5	<0 5	<0.5	<0 5
Chrysene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Dibenz(a,h)anthracene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Fluoranthene	mg/kg	0.1				<0 5	<0 5	<0 5	0.7	<0 5
Fluorene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Naphthalene	mg/kg	0.1	**170**			<0 5	<0 5	<0 5	<0.5	<0 5
Phenanthrene	mg/kg	0.1				<0 5	<0 5	<0 5	<0.5	<0 5
Pyrene	mg/kg	0.1				<0 5	<0 5	<0 5	0.8	<0 5
PAHs (Sum of total)	mg/kg	0.5		300	4000	<0 5	<0 5	<0 5	2.6	<0 5
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		3	40	<0 5	<0 5	<0 5	1.2	<0 5
Pesticides										
Total OCPs	mg/kg					-	-	-	-	-
Total OPPs	mg/kg					-	-	-	-	-
PCBs										
Total PCBs	mg/kg			1	10	-	-	-	-	-

Notes:
< - result less than laboratory limit of reporting (LOR)
Shading or bold - result greater than criteria
HIL - Health investigation level
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RPD - relative percent differnce

										a	D -BH	D -BH	D -BH	D -BH	D -BH2	D -BH2	D -BH3	D BH3	D BH4	D BH4	D BH5	D BH5	BHA
										am e e	0 03	0305	720	2730	0 03	720	0 -03	7-20	0 -03	7-20	0 -03	7-20	2
										e am e	D -BH 0 -03	D -BH 03-05	D -BH 7-20	D -BH 27-30	D -BH2 0 -03	D -BH2 720	D -BH3 0 03	D -BH3 720	D -BH4 0 03	D -BH4 720	D BH 0 03	D -BH5 720	A 20
										am e ae	2009	2009	2009	2009	2009	2009	2009	2009	2009	009	2 09	2009	27 03 2020
										am e e	-	-	-	-	-	-	-	-	-	-	-	-	S20-Ma45452
				M 2)				A 2)			D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	BS&G 2020
			s - e a e	M	HS C - Sand 0 to < m	NE M 20 3 HS D - Sand 0 o < m	HS C - Di ect Con act	MW - Di ect Contact	W - a -<2m														
em a ame	s																						
Benzene	mg kg	2	7		N	3	20	00	77	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0
Eth lben ene	mg kg	5			N	N	5300	85000		< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0
o uene	mg kg	5			N	N	8000	280000		< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0
Xy ene o al	mg kg	5			N	230	5000	230000		< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 3
ot l B EX	mg kg	2								< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0
Naphth lene	mg kg				N	N	900	29000		< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 5
T a e ve a e a s T)																							
m nus B EX C6 C 0	mg kg	0			N	260				-	-	-	-	-	-	-	-	-	-	-	-	<20
C6-C 0	mg kg	0		7 0			5 00	82000		-	-	-	-	-	-	-	-	-	-	-	-	<20
C 0-C 6	mg kg	0		000			3800	62000		-	-	-	-	-	-	-	-	-	-	-	-	4500
C 6-C34	mg kg	00		2500				85000		-	-	-	-	-	-	-	-	-	-	-	-	2400
C34-C40	mg kg	00	2	0 00			7400	20000		-	-	-	-	-	-	-	-	-	-	-	-	<
C 0 - C40 (Sum o ota)	mg kg	0								-	-	-	-	-	-	-	-	-	-	-	-	9
T a e e m a s T)																							
C6 - C9	mg kg	0								<25	-	-	-	<25	-	<25	-	<25	-	<25	-	<20
C 0 - C 4	mg kg	0								-	-	-	-	-	-	-	-	-	-	-	-	300
C29-C36	mg kg	00								-	-	-	-	-	-	-	-	-	-	-	-	<500
+C 0 - C36 (Sum o ota	mg kg	0								470	-	-	-	< 00	-	< 00	-	< 00	-	< 00	-	6300

Notes
< - esu t less han abo a o y imit o epo ing (OR)
Shad ng o bo d - esul g ea e than c te ia
HS - Hea th sc een ng level
EI - Eco ogical nves gat on evel
ES - Eco og cal sc een ng lev l
MW - l t u ive Main ennace Wo ke
M - Managem nt imi s
R D - Rela i e e ent Di ence
*Naph hale e de ect ons om vola le anal sis (u ge) < OR o owe
concent a i n omsem -vo a t e method (S M)

em a a e	s		s - e a e	M	HS C - S nd 0 to < m	NE M 20 3 HS D - Sand 0 o < m	HS C - Di ect Con act	MW - Di ect Cont ct	MW - a <2m													
									a	BHA	BHA	WS -BH05	WS -BH05	WS -BH05	WS -BH09	WS BH09	WS BH 2	WS BH 2	BH2 4	BH2 4	BH2 5	BH2 5
									am e e	2 5	4	0 5	2	5	0 2		0 5	3	-	2-2	0 5 0 25	2 2
									e am e	A _2 5	A _4 0	WS BH05_0 5	WS -BH05_2	WS -BH05_5	WS BH09_0 2	WS BH09_	WS -BH 2_0 5	WS BH 2_3	BH2 4_ 0-	BH2 4_2 0-2	BH2 5 0 5 0 25	BH2 5_2 0 2
									am e a e	27 03 2020	27 03 2020	6 06 20	6 06 20	6 06 20	6 6 20	6 06 20	9 06 20	9 06 20	26 20 5	26 20 5	26 20 5	26 20 5
									am e e	S20-Ma45453	S20-Ma45454	-	-	-	-	-	-	-	ES 537688043	ES 537688044	ES 537688030	ES 53768803
			M 2)				A 2)			BS&G 2020	BS&G 2020	WS 20 2	WS 20 2	WS 20 2	WS 20 2	WS 20 2	WS 20 2	WS 20 2				
Benze e	mg kg	0 2	7		N	3	20	00	77	<0	<0	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 2	<0 2	<0 2	<0 2
E hy benzene	mg kg	0 5			N	N	5 00	5000		<0	<0	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 5	<0 5	<0 5	<0 5
o uene	mg kg	0 5			N	N	8000	280000		<0	<0	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 5	<0 5	<0 5	<0 5
Xy ene otal	mg kg	0 5			N	230	5000	230000		<0 3	<0 3	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 5	<0 5	<0 5	<0 5
o al B EX	mg kg	0 2								<0	<0	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 2	<0 2	<0 2	<0 2
Naph halene	mg kg	0			N	N	00	9000		<0 5	<0 5	< OR	< OR	< OR	< OR	< OR	< OR	< OR	<0 5	<0 5	<0 5	<0 5
a e ve a e a s T)																						
m nus B EX (C6-C 0	mg kg	0			N	260				22	<20	-	-	-	-	-	-	-	< 0	< 0	< 0	< 0
C6 C 0	mg kg	0		700			5 00	2000		22	<20	-	-	-	-	-	-	-	< 0	< 0	< 0	< 0
C 0 C 6	mg kg	50		000			3 00	62000		890	< 00	-	-	-	-	-	-	-	<50	<50	<50	<50
C 6 C34	mg kg	00		2500				85000		450	< 00	-	-	-	-	-	-	-	0		< 00	30
C34 C40	mg kg	00	2	0000			7 00	20000		< 00	< 00	-	-	-	-	-	-	-	< 00	200	< 00	< 00
C 0 - C40 (Sum o ota)	mg kg	50								340	< 00	-	-	-	-	-	-	-	0	830	<50	30
a e em a s T)																						
C6 - C9	mg kg	0								<2	<22	<25	<25	<25	<25	<25	<25	<25	< 0	< 0	< 0	< 0
C 0 - C 4	mg kg	50								260	<20	-	-	-	-	-	-	-	<50	<50	<50	<50
C29 C36	mg kg	00								<50	<50	-	-	-	-	-	-	-	00	4 0	< 00	00
+C 0 - C36 (Sum o ota	mg kg	50								200	<50	<250	<250	<250	<250	<250	85	<250	00	740	<50	00

No es
< - esu t ess han abo ato y im t o epo t ng (OR)
Shad ng o old - esu t g ea e than c e a
HS - Hea th sc eening le el
EI - Eco og cal in est gat on level
ES - E olog cal sc eening evel
MW - nt usi e Main ennace Wo e
M - Management m ts
R D - Rel t ve e cent Di ence
*Na htha ene de ec ions om vo at le ana ys s (u ge) < OR o owe
co cent at on omsem - ola t e me hod SIM)

									a	BH2 6		R D	BH2 6	BH2 7	BH2 7	BH2 8		R D	BH2 8
									am e e	0 5 0 6			5- 6	0 5-0 6	2 4-2 5	0 5-0 25			2-2
									e am e	BH2 6 0 5-0 6	QC2 6		BH2 6 5- 6	BH2 7 0 5-0 6	BH2 7 2 4-2 5	BH2 8 0 5-0 25	QC22		BH2 8 2 0 2
									am e a	25 20 5	25 20 5		25 20 5	26 20 5	26 20 5	26 20 5	24 20 5		26 0 5
									am e	ES 537688 28	ES 53768804		ES 53768802	ES 53768803	ES 537688037	ES 53768 045	38 29 7		ES 537688046
				M 2)				A 2)											
em a a e	s		s - e a e	M	HS C - Sand 0 o < m	NE M 20 3 HS D - Sand 0 to < m	HS C - Di ect Con act	IMW - Di ect Con act	MW - a <2m										
Ben ene	mg kg	0 2	7		N	3	20	00	77	<0 2	<0 2	nc	<0 2	<0 2	<0 2	<0 2	<0 2	nc	<0 2
E hy benzene	mg kg	0 5			N	N	5300	85000		<0 5	<0 5	nc	<0 5	<0 5	<0 5	<0 5	<	nc	<0 5
o uene	mg kg	0 5			N	N	8000	280000		<0 5	<0 5	nc	<0 5	<0 5	<0 5	<0 5	<0 5	nc	<0 5
X lene otal	mg kg	0 5			N	230	5000	230000		<0 5	<0 5	nc	<0 5	<0 5	<0 5	<0 5	<3	nc	<0 5
o al B EX	mg kg	0 2								<0 2	<0 2	nc	<0 2	<0 2	<0 2	<0 2	-	nc	<0 2
Naph ha ene	mg kg	0			N	N	900	29000		<0 5	<0 5	nc	<0 5	<0 5	<0 5	<0 5	<0	nc	<0 5
a e ve a e a s T)																			
m nus B EX (C6-C 0	mg kg	0			N	260				< 0	< 0	nc	< 0	< 0	< 0	< 0	<25	nc	< 0
C6 C 0	mg kg	0		700			5 00	82000		< 0	< 0		< 0	< 0	< 0	< 0	<25		< 0
C 0 C 6	mg kg	50		000			3800	62000		<50	<50		<50	<50	<50	<50	<50		<50
C 6 C34	mg kg	00		2500				85000		< 0	< 00	nc		< 00	< 00	< 00	< 00	nc	0
C34 C40	mg kg	00	2	0000			7400	20000		< 0	< 00	nc	2 0	< 00	< 00	< 00	< 00	nc	< 00
C 0 - C 0 (Sum o o al)	mg kg	50								<50	<50		740	<50	<50	<50	-		0
a e e m a s T)																			
C6 - C9	mg kg	0								< 0	< 0	nc	< 0	< 0	< 0	< 0	<25	nc	< 0
C 0 - C 4	mg kg	50								<50	<50	nc	<50	<50	<50	<50	<50	nc	<50
C29 C36	mg kg	00								< 0	< 00		330	< 00	< 00	< 00	< 00		< 00
+C 0 - C36 (Sum o o al	mg kg	50								<50	<50		620	<50	<50	<50	<250		<50

No es
< - esu t ess han labo ato y m t o epo t ng (OR)
Shad ng o bold - esu t g ea e th n c i e a
HS - Hea th sc eening evel
EI - Eco og cal in est ga ion le el
ES - Ecolog cal sc eening evel
MW - nt us ve Ma ntennace Wo ke
M - Management m ts
R D - Re at ve e cent Di en e
*Naphtha ene d tec ions om vo at e ana ys s (u ge) < OR o owe oncent at on omsemi vola le me hod SIM)

									a	BH2 9		R D	BH2 9	BH220	BH220	BH22	BH22
									am e e	0-0				0 5-0 6	2-2	-	2 4-2 5
									e am e	BH2 9 0 0 0	QC2 4		BH2 9 - 6	BH220 0 5-0 6	BH220A 2 -2	BH22 0-	BH22 2 4-2 5
									am e a e	25 20 5	25 20 5		25 20 5	26 20 5	26 0 5	26 20 5	26 20 5
									am e e	ES 537688026	ES 53768804		ES 537688027	ES 53768803	ES 537688035	ES 53768804	ES 53768804
				M 2)				A 2)									
em a ame	s		s - e a e	M	HS C - Sand 0 to < m	NE M 20 3 HS D - Sand 0 o< m	HS C - Di ect Con act	MW - Di ect Contact	W - a -<2m								
Benzene	mg kg	2	7		N	3	20	00	77	<0 2	<0 2	c	<0 2	<0 2	<0 2	<0 2	<0 2
Eth lbenz ne	mg kg	5			N	N	5300	85000		<0 5	<0 5	c	<0 5	<0 5	<0 5	<0 5	<0 5
ol ene	mg kg	5			N	N	8000	280000		<0 5	<0 5	c	<0 5	<0 5	<0 5	<0 5	<0 5
Xy ene o al	mg kg	5			N	230	5000	230000		<0 5	<0 5	c	<0 5	<0 5	<0 5	<0 5	<0 5
ota B EX	mg kg	2								<0 2	<0 2	c	<0 2	<0 2	<0 2	<0 2	<0 2
Naphtha ene	mg kg				N	N	900	29000		<0 5	<0 5	nc	<0 5	<0 5	<0 5	<0 5	<0 5
T a e ve a e a s T)																	
m nus B EX C6 C 0	mg kg	0			N	260				< 0	< 0	nc	< 0	< 0	< 0	< 0	< 0
C6-C 0	mg kg	0		700			5 00	82000		< 0	< 0		< 0	< 0	< 0	< 0	< 0
C 0-C 6	mg kg	0		000			3800	62000		< 0	<50		<50	<50	<50	<50	<50
C 6-C34	mg kg	00		2500				85000		< 00	2 0	nc	< 00	< 00	< 00	< 00	< 00
C34-C40	mg kg	00	2	0000			7400	20000		< 00	30	nc	< 00	< 00	< 00	< 00	< 00
C 0 - C40 (Sum o ota)	mg kg	0								< 0	340		<50	<50	<50	<50	<50
T a e e m a s T)																	
C6 - C9	mg kg	0								< 0	< 0	nc	< 0	< 0	< 0	< 0	< 0
C 0 - C 4	mg kg	0								< 0	<50	nc	<50	<50	<50	<50	<50
C29-C36	mg kg	00								< 00	60		< 00	< 00	< 00	< 00	< 00
+C 0 - C36 (Sum o t ta	mg kg	0								< 0	270		<50	<50	<50	<50	<50

Notes
< - esu t less t an abo a o y imit o epo ing (OR)
Shad ng o bo d - esult g eate han c te ia
HS - Heal h sc een ng evel
EI - Eco ogical nves i at on evel
ES - Eco ogi al sc een ng level
MW - Int u ive Main ennace Wo ke
M - Management imi s
R D - Rela i e e ce t Di ence
*Naph halene de ect ons m vola le anal sis (u ge) < OR o owe concent a ion om em -vo a t e method (S M)

				As es s e e e	es
a	am e e	e am e	am e a e		
BH2 4	-	BH2 4_ 0-	26 20 5	No	
2 4	2-2	2 4 2 -2	2 2	es	M sa s e se e a e as es s es x 2 x x mm
BH2 5	0 5-0 25	BH2 5_0 5-0 25	26 20 5	No	
BH2 5	2-2	BH2 5_2 0-2	26 20 5	No	
BH2 6	0 5-0 6	BH2 6_0 5-0 6	25 20 5	No	
BH2 6	5- 6	BH2 6_ 5- 6	25 20 5	No	
BH2 7	0 5-0 6	BH2 7_0 5-0 6	26 20 5	No	
BH2 7	2 4-2 5	BH2 7_2 4-2 5	26 20 5	No	
BH2 8	0 5-0 25	BH2 8_0 5-0 25	26 20 5	No	
BH2 8	2-2	BH2 8_2 0-2	26 20 5	No	
BH2 9		BH2 9__ 5- 6	25 20 5	No	
BH2 9	0-0	BH2 9_0 0-0	25 20 5	No	
BH220	0 5-0 6	BH220_0 5-0 6	26 20 5	No	
BH220	2-2	BH220A_2 0-2	26 20 5	No	
BH22	-	BH22 _ 0-	26 20 5	No	
BH22	2 4-2 5	BH22 _2 4-2 5	26 20 5	No	
D BH	0 -0 3	D -BH _0 -0 3	2009	-	
D BH	0 3-0 5	D -BH _0 3-0 5	2009	-	
D BH	7-2 0	D -BH _ 7-2 0	2009	-	
D BH	2 7-3 0	D -BH _2 7-3 0	2009	-	
D BH2	0 -0 3	D -BH2_0 -0 3	2009	No	
D BH2	7-2 0	D -BH2_ 7-2 0	2009	-	
D BH3	0 -0 3	D -BH3_0 -0 3	2009	No	
D BH3	7-2 0	D -BH3_ 7-2 0	2009	-	
D BH4	0 -0 3	D -BH4_0 -0 3	2009	No	
D BH4	7-2 0	D -BH4_ 7-2 0	2009	-	
D BH5	0 -0 3	D -BH5_0 -0 3	2009	No	
D BH5	7-2 0	D -BH5_ 7-2 0	2009	-	
BHA	2	A _2 0	27 03 2020	-	
BHA	2 5	A _2 5	27 03 2020	-	
BHA	4	A _4 0	27 03 2020	-	
WS -BH05	0 5	WS -BH05_0 5	6 06 20	-	
WS -BH05	2	WS -BH05_2	6 06 20	No	
WS -BH05	5	WS -BH05_5	6 06 20	-	
WS -BH09	0 2	WS -BH09_0 2	6 06 20	No	
WS -BH09		WS -BH09_	6 06 20	No	
WS -BH 2	0 5	WS -BH 2_0 5	9 06 20	No	
WS -BH 2	3	WS -BH 2_3	9 06 20	-	

			a	D -BH	D -BH	D BH	D -BH	D -BH2	D BH2	D -BH3	D BH3	D -BH4	D -BH4
			am e e	0 -0 3	0 3 0 5	7-2 0	2 7 3 0	0 -0 3	7-2 0	0 0 3	7-2 0	0 -0 3	7 2 0
			e am e	D -BH_0 0 3	D -BH_0 3-0 5	D BH_ 7 2 0	D -BH_2 7-3 0	D BH2_0 -0 3	D -BH2_ 7 2 0	D -BH3_0 -0 3	D BH3_ 7-2 0	D -BH4_0 -0 3	D -BH4_ 7-2 0
			am e a e	2009	2009	2009	2009	2009	2009	2009	2009	2009	2009
			am e e	-	-	-	-	-	-	-	-	-	-
				D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009	D 2009
em a ame	s		W A 2 4) -	T									
am a T es		T)	C	C 2									
T X													
Benzene	mg kg	0 2	0	4	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR
Ethy benzene	mg kg	0 5	600	24	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR
o uene	mg kg	0 5	288	2	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR
Xy ene o al	mg kg	0 5	000	4	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR	< OR
Me a s														
A sen c	mg kg	4	00	4	<4	-	<4	-	6	<4	<4	6	4	5
Cadmium	mg kg	0 4	20		<0 5	-	<0 5	-	<0 5	<0 5	<0 5	2 2	<0 5	7
Ch om um II +V)	mg kg				6	-		-	4	2	5	24	0	25
Coppe	mg kg				65	-		-	36	2	6	2 0	22	220
ead	mg kg		00	4	97	-	4	-	59	3	99	370	56	300
Me cu y	mg kg	0	4		0 2	-	<0	-	0	<0	0	0 6	0 2	0 7
Nickel	mg kg		40		2	-	2	-	4	2	3	29	3	26
T														
C6 - C9	mg kg	0	650	2	<25	-	-	-	<25	-	<25	-	<25	-
+C 0 - C36 (Sum o otal)	mg kg	50	0000	4	470	-	-	-	< 00	-	< 00	-	< 00	-
A s														
Benzo(a) py ene	mg kg	0 05	0 8	2		4	0 09	<0 05	0 3	-	0 2	-	0 4	-
AHs Sum o tota)	mg kg	0 5	200		05 9	46	0 39	< OR	2 4	-	4	-	2 9	-

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shading o bold - esu t g eate than c te a

			a	D -BH5	D -BH5	BHA	BHA	BHA	WS -BH05	WS BH05	WS -BH05	WS -BH09	WS BH09
			am e e	0 -0 3	7 2 0	2	2 5	4	0 5	2	5	0 2	
			e am e	D -BH5_0 0 3	D -BH5_ 7-2 0	A _2 0	A _2 5	A _4 0	WS -BH05_0 5	WS -BH05_2	WS BH05_5	WS -BH09_0 2	WS BH09_
			am e a e	2009	2009	27 03 2020	27 03 2020	27 03 2020	6 06 20	6 06 20	6 06 20	6 06 20	6 06 20
			am e e	-	-	S20 Ma45452	S20-Ma45453	S20-Ma45454	-	-	-	-	-
				D 2009	D 2009	BS&G 2020	BS&G 2020	BS&G 2020	WS 20 2	WS 20 2	WS 20 2	WS 20 2	WS 20 2
em a ame	**s**		**W A 2 4) -**	**T**									
am a T es		**T)**	C	C 2									
T X													
Benzene	mg kg	0 2	0	**4**	< OR	< OR	<0	<0	<0	< OR	< OR	< OR	< OR	< OR
Ethy benzene	mg kg	0 5	600	**24**	< OR	< OR	<0	<0	<0	< OR	< OR	< OR	< OR	< OR
o uene	mg kg	0 5	288	**2**	< OR	< OR	<0	<0	<0	< OR	< OR	< OR	< OR	< OR
Xy ene o al	mg kg	0 5	000	**4**	< OR	< OR	<0 3	<0 3	<0 3	< OR	< OR	< OR	< OR	< OR
Me a s														
A sen c	mg kg	4	00	**4**	<4	4	-	-	-	<4	<4	<4	<4	7
Cadmium	mg kg	0 4	20		<0 5	0 7	-	-	-	<0 5	<0 5	<0 5	<0 5	<0 5
Ch om um II +V)	mg kg				4	7	-	-	-	3	3	<	8	4
Coppe	mg kg				27	60	-	-	-	6	2	<	4	6
ead	mg kg		00	**4**	7	**49**	<5	<5	<5	29	53		3	9
Me cu y	mg kg	0	4		0 7	0 7	-	-	-	0 2	0 2	<0	<0	<0
Nickel	mg kg		40		4		-	-	-	3	3	<	5	2
T														
C6 - C9	mg kg	0	650	**2**	<25	**-**	<20	<2	<22	<25	<25	<25	<25	<25
+C 0 - C36 (Sum o otal)	mg kg	50	0000	**4**	< 00	**-**	6300	200	<50	<250	<250	<250	<250	<250
A s														
Benzo(a) py ene	mg kg	0 05	0 8	**2**	0 2	-	<0 5	<0 5	<0 5	0	0 3	<0 05	<0 05	<0 05
AHs Sum o tota)	mg kg	0 5	200		7	-		<0 5	<0 5	0 6	3 5	< OR	< OR	< OR

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shading o bold - esu t g eate than c te a

			a	WS -BH 2	WS BH 2	US 2-7S	US 2-8S	US 2-9S	US 2- 0S	US 2- S	US 2- 2S	US 2- 3E	US 2- 4E
			am e e	0 5	3								
			e am e	WS -BH 2_0 5	WS -BH 2_3	US 2-7S 0 4)	US 2 8S(0)	US 2-9S(2 3)	US 2- 0S(0 5)	US 2- S( )	US 2- 2S(2 2)	US 2- 3E(0 6)	US 2- 4E(9)
			am e a e	9 06 20	9 06 20	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8
			am e e	-	-	S 8-Au 0 58	S 8-Au 0 59	S 8 Au 0 60	S 8-Au 0 6	S 8-Au 0 62	S 8 Au 0 63	S 8-Au 0 64	S 8 Au 0 65
				WS 20 2	WS 20 2	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020
em a ame	**s**		**W A 2 4) -**	**T**									
am a T es		**T)**	C	C 2									
T X													
Benzene	mg kg	0 2	0	**4**	< OR	< OR	<0	<0	<0 2	<0	<0	<0	<0	<0
Ethy benzene	mg kg	0 5	600	**24**	< OR	< OR	<0	<0	<0 2	<0	<0	<0	<0	<0
o uene	mg kg	0 5	288	**2**	< OR	< OR	<0	<0	<0 2	<0	<0	<0	<0	<0
Xy ene o al	mg kg	0 5	000	**4**	< OR	< OR	<0 3	<0 3	<0 6	<0 3	<0 3	<0 3	<0 3	<0 3
Me a s														
A sen c	mg kg	4	00	**4**	<4	<4	-	-	-	-	-	-	-	-
Cadmium	mg kg	0 4	20		<0 5	<0 5	-	-	-	-	-	-	-	-
Ch om um II +V)	mg kg				8	4	-	-	-	-	-	-	-	-
Coppe	mg kg				32	2	-	-	-	-	-	-	-	-
ead	mg kg		00	**4**	66	3	240	<5	<5	20	<5	<5	90	340
Me cu y	mg kg	0	4		0 4	<0	-	-	-	-	-	-	-	-
Nickel	mg kg		40			2	-	-	-	-	-	-	-	-
T														
C6 - C9	mg kg	0	650	**2**	<25	<25	<20	<20	<40	<20	<20	<20	<20	<20
+C 0 - C36 (Sum o otal)	mg kg	50	0000	**4**	85	<250	4740	<50	5 300	2 2	73	9790	244	344
A s														
Benzo(a) py ene	mg kg	0 05	0 8	**2**	8	0 8	0 9	<0 5	<0 5	5	<0 5	<0 5	<0 5	0 7
AHs Sum o tota)	mg kg	0 5	200		7 9	4 7	9 2	<0 5	<0 5	6 8	<0 5	<0 5	8	4 3

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shading o bold - esu t g eate than c te a

			a	US 2- 5E	US 2- 6E	US 2- 7E	US 2- 8E	US 2- 9N	US 2-20N	QA2-7 8	QC2	US 2-2 N	US 2 22N
			am e e										
			e am e	US 2- 5E(2 4)	US 2- 6E(0 6)	US 2- 7E(7)	US 2- 8E 2 3)	US 2- 9N(0 2)	US 2-20N(0 7)	QA2-7 8	QC2	US 2-2 N 2 4)	US 2-22N(0 3)
			am e a e	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8
			am e e	S 8-Au 0 66	S 8-Au 0 67	S 8-Au 0 68	S 8-Au 0 69	S 8 Au 0 70	S 8-Au 0 7	S 8-Au 0 84	98044-2	S 8-Au 0 72	S 8 Au 0 73
				BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020
em a ame	**s**		**W A 2 4) -**	**T**									
am a T es		**T)**	C	C 2									
T X													
Benzene	mg kg	0 2	0	**4**	<0	<0	<0	<0	<0	<0	<0	<0 2	<0	<0
Ethy benzene	mg kg	0 5	600	**24**	<0	0 6	0 2	<0	<0	<0	<0	<	<0	<0
o uene	mg kg	0 5	288	**2**	<0		0 5	<0	0	<0	<0	<0 5	<0	<0
Xy ene o al	mg kg	0 5	000	**4**	<0 3	9	0 9	<0 3	<0 3	<0 3	<0 3	<	<0 3	<0 3
Me a s														
A sen c	mg kg	4	00	**4**	-	-	-	-	-	-	-	-	-	-
Cadmium	mg kg	0 4	20		-	-	-	-	-	-	-	-	-	-
Ch om um II +V)	mg kg				-	-	-	-	-	-	-	-	-	-
Coppe	mg kg				-	-	-	-	-	-	-	-	-	-
ead	mg kg		00	**4**	<5	50	64	<5	84	2	9	2	<5	0
Me cu y	mg kg	0	4		-	-	-	-	-	-	-	-	-	-
Nickel	mg kg		40		-	-	-	-	-	-	-	-	-	-
T														
C6 - C9	mg kg	0	650	**2**	<20	<20	<20	<20	<20	<20	<20	<25	<20	<20
+C 0 - C36 (Sum o otal)	mg kg	50	0000	**4**	263	60	7	<50	64	204	225	-	<50	75
A s														
Benzo(a) py ene	mg kg	0 05	0 8	**2**	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 05	<0 5	0 7
AHs Sum o tota)	mg kg	0 5	200		<0 5	7	<0 5	<0 5	2	<0 5	<0 5	<0 05	<0 5	5 3

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shading o bold - esu t g eate than c te a

			a	US 2-23N	QA3-7 8	QC3	US 2-24N	US 2 27B	US 2-28B	US 2 32S	US 2 33S	US 2 34S	US 2 35N
			am e e										
			e am e	US 2-23N(2)	QA3-7 8	QC3	US 2-24N 2 4)	US 2 27B(2 5)	US 2-28B(2 5)	US 2 32S(0 3)	US 2 33S(0 8)	US 2 34S 2 2)	US 2 35N(0 5)
			am e a e	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	7 08 20 8	22 08 20 8	22 08 20 8	22 08 20 8	22 08 20 8
			am e e	S 8-Au 0 74	S 8-Au 0 85	98044-3	S 8-Au 0 75	S 8 Au 0 78	S 8-Au 0 79	S 8-Au27570	S 8 Au2757	S 8-Au27572	S 8 Au27573
				BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020
em a ame	**s**		**W A 2 4) -**	**T**									
am a T es		**T)**	C	C 2									
T X													
Benzene	mg kg	0 2	0	**4**	<0	<0	<0 2	<0	<0	<0	<0	<0	<0
Ethy benzene	mg kg	0 5	600	**24**	<0	<0	<	<0	<0	<0	<0	<0	<0
o uene	mg kg	0 5	288	**2**	<0	<0	<0 5	<0	<0	<0	<0	<0	<0
Xy ene o al	mg kg	0 5	000	**4**	<0 3	<0 3	<	<0 3	<0 3	<0 3	<0 3	<0 3	<0 3
Me a s													
A sen c	mg kg	4	00	**4**	-	-	-	-	-	-	-	-	-
Cadmium	mg kg	0 4	20		-	-	-	-	-	-	-	-	-
Ch om um II +V)	mg kg				-	-	-	-	-	-	-	-	-
Coppe	mg kg				-	-	-	-	-	-	-	-	-
ead	mg kg		00	**4**	<5	<5	25	<5	<5	<5	20	<5	<5	88
Me cu y	mg kg	0	4		-	-	-	-	-	-	-	-	-	-
Nickel	mg kg		40		-	-	-	-	-	-	-	-	-	-
T													
C6 - C9	mg kg	0	650	**2**	<20	<20	<25	<20	<20	<20	<20	<20	<20	<20
+C 0 - C36 (Sum o otal)	mg kg	50	0000	**4**	70	260	-	2 0	<50	<50	306	<50	3 77	2 7
A s														
Benzo(a) py ene	mg kg	0 05	0 8	**2**	<0 5	<0 5	0 07	<0 5	<0 5	<0 5	2 7	<0 5	<0 5	2
AHs Sum o tota)	mg kg	0 5	200		<0 5	<0 5	0 07	<0 5	<0 5	<0 5	33 8	<0 5	3 3	25

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shading o bold - esu t g eate than c te a

				a	US 2_36N	US 2_37N	US 2_38B	US 2_39B	US 2-43B	US 2 44B	BH2 4	BH2 4	BH2 5	BH2 5	BH2 6
				am e e							-	2-2	0 5-0 25	2 2	0 5-0 6
				e am e	US 2 36N(0 9)	US 2 37N 2 3)	US 2 38B(2 5)	US 2 39B(2 5)	US 2-43B 2 8)	US 2 44B(3)	BH2 4_ 0-	BH2 4_2 0 2	BH2 5_0 5-0 25	BH2 5_2 0-2	BH2 6_0 5-0 6
				am e a e	22 08 20 8	22 08 20 8	22 08 20 8	22 08 20 8	22 08 20 8	22 08 20 8	26 20 5	26 20 5	26 20 5	26 20 5	25 20 5
				am e e	S 8 Au27574	S 8-Au27575	S 8-Au27576	S 8-Au27577	S 8-Se02290	S 8 Se0229	ES 537688043	ES 537688044	ES 537688030	ES 53768803	ES 537688028
					BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	BS&G 2020	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5
em a ame	**s**		**W A 2 4) -**	**T**											
am a T es		**T**	C	C 2											
T X															
Benzene	mg kg	0 2	0	**4**	<0	<0	<0	<0	-	-	<0 2	<0 2	<0 2	<0 2	<0 2
E hylbenzene	mg kg	0 5	600	**24**	<0	<0	<0	<0	-	-	<0 5	<0 5	<0 5	<0 5	<0 5
o uene	mg kg	0 5	288	**2**	<0	<0	<0	<0	-	-	<0 5	<0 5	<0 5	<0 5	<0 5
Xy ene otal	mg kg	0 5	000	**4**	<0 3	<0 3	<0 3	<0 3	-	-	<0 5	<0 5	<0 5	<0 5	<0 5
e a s															
A sen c	mg kg	4	00	**4**	-	-	-	-	-	-	<5		<5	<5	<5
Cadm um	mg kg	0 4	20		-	-	-	-	-	-	<	4	<	<	<
Ch omium (I I+VI)	mg kg				-	-	-	-	-	-	4	00	9	3	4
Coppe	mg kg				-	-	-	-	-	-	0	70	5	8	44
ead	mg kg		00	**4**	<5	<5	<5	<5	-	-	63	**9**	6	33	0
Me cu y	mg kg	0	4		-	-	-	-	-	-	<0	2	<0	<0	0 2
N ckel	mg kg		40		-	-	-	-	-	-	2	05	5	2	4
T															
C6 - C9	mg kg	0	650	**2**	<20	<20	<20	<20	<20	<20	< 0	< 0	< 0	< 0	< 0
+C 0 - C36 Sum o tota)	mg kg	50	0000	**4**	<50	<50	4300	<50	98	460	00	740	<50	00	<50
A s															
Benzo(a) py ene	mg kg	0 05	0 8	**2**	<0 5	<0 5	<0 5	<0 5	-	-			<0 5	<0 5	<0 5
AHs (Sum o to al)	mg kg	0 5	200		<0 5	<0 5	3 3	<0 5	-	-	6 9	28 6	<0 5		<0 5

No es
< - esult ess than abo ato y l m t o epo ing (OR)
Shad ng o bo d - esult g eate than c i e ia

				a	BH2 6	BH2 6	BH2 7	BH2 7	BH2 8	BH2 8	BH2 8	BH2 9	BH2 9	BH2 9	BH220	BH220
				am e e	0 5 0 6	5- 6	0 5 0 6	2 4-2 5	0 5 0 25	0 5-0 25	2 2	0-0	0 0		0 5-0 6	2-2
				e am e	QC2 6	BH2 6 5- 6	BH2 7_0 5-0 6	BH2 7_2 4 2 5	BH2 8_0 5-0 25	QC22	BH2 8_2 0-2	BH2 9_0 0 0	QC2 4	BH2 9 5- 6	BH220_0 5-0 6	BH220A_2 0-2
				am e a e	25 20 5	25 20 5	26 20 5	26 20 5	26 20 5	24 20 5	26 20 5	25 20 5	25 20 5	25 20 5	26 20 5	26 20 5
				am e e	ES 537688049	ES 537688029	ES 537688036	ES 537688037	ES 537688045	38 29-7	ES 537688046	ES 537688026	ES 537688048	ES 537688027	ES 537688034	ES 537688035
					AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5	ECOM 20	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5	AECOM 20 5
em a a e	s		W A 2 4) -	T												
am a T es		T)	C	C 2												
T X																
Benzene	mg kg	0 2	0	**4**	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2	<0 2
Ethy benzene	mg kg	0 5	600	**24**	<0 5	<0 5	<0 5	<0 5	<0 5	<	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
oluene	mg kg	0 5	288	**2**	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
Xylene o al	mg kg	0 5	000	**4**	<0 5	<0 5	<0 5	<0 5	<0 5	<3	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5
Me a s																
A senic	mg kg	4	00	**4**	<5		<5	<5	<5	<4	<5	<5	<5	<5	<5	<5
Cadmium	mg kg	0 4	20		<	<	<	<	<	<0 4	<	<	<	<	<	<
Ch om um (I +V)	mg kg				4	27	3	<2	7	8	3	9	4	<2	3	<2
Coppe	mg kg				35	364	9	<5	2	7	24	9	26	3	8	5
ead	mg kg		00	**4**	89	**729**	2 9	6	27	7	46	9	46	32	32	27
Me cu y	mg kg	0	4		0 2	2	0	<0	<0	<0	<0	<0	<0	<0	<0	<0
Nickel	mg kg		40		4	2	2	<2	4	7	3	6	4	<2	3	<2
T																
C6 - C9	mg kg	0	650	**2**	< 0	< 0	< 0	< 0	< 0	<25	< 0	< 0	< 0	< 0	< 0	< 0
+C 0 - C36 (Sum o to al)	mg kg	50	0000	**4**	<50	620	<50	<50	<50	<250	<50	<50	270	<50	<50	<50
A s																
Benzo(a) py ene	mg kg	0 05	0 8	**2**	<0 5	**7**	<0 5	<0 5	<0 5	0	<0 5	<0 5	7	<0 5	<0 5	<0 5
AHs Sum o ota)	mg kg	0 5	200		0 5	68 9	<0 5	<0 5	<0 5	0 48	<0 5	<0 5	8	<0 5	<0 5	<0 5

Notes
< - esu t ess han labo a o y im t o epo t ng (OR)
Shad ng o bold - esu t g ea e han c te a

			a	BH22	BH22
			am e e	-	2 4 2 5
			e am e	H22 _ 0-	BH22 _2 4-2 5
			am e a	26 20 5	26 20 5
			am e	S_537688040	ES_53768804
				AECOM 20 5	AECOM 20 5
em a ame	s		W A 2 4) -	T		
am a T es		T)	C	C 2		
T X						
Benzene	mg kg	0 2	0	**4**	<0 2	<0 2
Ethy benzene	mg kg	0 5	600	**24**	<0 5	<0 5
oluene	mg kg	0 5	288	**2**	<0 5	<0 5
Xylene o al	mg kg	0 5	000	**4**	<0 5	<0 5
Me a s						
A senic	mg kg	4	00	**4**	<5	<5
Cadmium	mg kg	0 4	20		<	<
Ch om um (I +V)	mg kg				9	<2
Coppe	mg kg				25	22
ead	mg kg		00	**4**	58	27
Me cu y	mg kg	0	4		<0	<0
Nickel	mg kg		40		7	3
T						
C6 - C9	mg kg	0	650	**2**	< 0	< 0
+C 0 - C36 (Sum o o al)	mg kg	50	0000	**4**	<50	<50
A s						
Benzo(a) py ene	mg kg	0 05	0 8	**2**	0 5	<0 5
AHs Sum o ota)	mg kg	0 5	200		2 6	<0 5

Notes
< - esu t less han labo a o y imit o epo t ng (OR)
Shad ng o bold - esu t g ea e han c te a

Location	Date	Easting	Northing	Total Depth of Well	Flush / Stick-up	Screened interval (m BTOC)	TOC (m AHD)	Depth to Groundwater (m BTOC)	Groundwater Elevation (m AHD)	Purge	Volume Purged (L)	Dissolved Oxygen (mg/L)	Electrical Conductivity (µs/cm)	pH	Redox* (mV)	Temp. (ºC)
MW204	30/11/2015	334404 07	6246441.64	5.968	flush	1.5 to 4 5	20.18	dry	< 14 212	PRE	-	-	-	-	-	-
										POST	-	-	-	-	-	-
MW205	30/11/2015	334468 67	6246464.79	5.461	flush	2.0 to 6 0	20.29	4.318	15.972	PRE	0.5	0.18	177	6.06	209.9	23.1
										POST	3.5	0.00	106	5.35	203.5	21.7

Notes
Pre: Pre-purge water quality parameter readings
Post: Post-purge water quality parameter readings
- denotes no data available
m BTOC: metres Below Top of Casing
m AHD: metres Australian Height Datum
mg/L - milligrams per litre
mV -millivolts
uS/cm - micro-siemens/cm
*Redox correction factor of +205 mV applied to field Redox results

							e am e	MW205	QC227	R D
								BH2 9		
							We	MW205		
							am e a	30 20 5	30 20 5	
em a ame	s		ANZECC (2000) Ma ine Ecosys ems 95% gge Values	ANZECC (2000) Ma ine Ecosystems Med-ow Rel abi ty	A MW - a - 2-<4m	M 2 - a 2 <4m	M 2 - a 2 <4m			
Me a s										
A sen c (l e ed)	mg	0 00						<0 00	<0 00	nc
Cadm um (ite ed)	mg	0 000	0 0055					<0 000	<0 000	nc
Ch om um (II+VI) (l e ed)	mg	0 00		0 0044				<0 00	<0 00	nc
Coppe (ite ed)	mg	0 00	0 00 3					<0 00	<0 00	nc
ead (ite ed)	mg	0 00	0 0044					<0 00	<0 00	nc
N ckel (ite ed)	mg	0 00	0 07					<0 00	<0 00	nc
Z nc (l e ed)	mg	0 005	0 0 5					0 009	0 009	0
A										
Acenaphthene	µg							<	-	-
Acenaphthylene	µg							<	-	-
Anth acene	µg			0 0				<	-	-
Benz(a)an h acene	µg							<	-	-
Benzo(a) py ene	µg	0 5		0				<0 5	-	-
Benzo(b)&(k) uo anthene	µg	2						-	-	-
Benzo[b+] uo anthene	mg	0 00						<0 00	-	-
Benzo(g h i pe y ene	µg							<	-	-
Benzo(k) luo an hene	µg							<	-	-
Ch ysene	µg							<	-	-
D benz a h)anth acene	µg							<	-	-
uo anthene	µg							<	-	-
uo ene	µg							<	-	-
ndeno(2 3 c d)py ene	µg							<	-	-
Naphtha ene	µg		70		N	N		<	<	nc
AHs (Sum o o al)	µg	0 5						<0 5	-	-
henanth ene	µg			0 6				<	-	-
y ene	µg							<	-	-
T X										
Benzene	µg		700		N	N		<	<	nc
E hy benzene	µg			5	N	N		<2	<2	nc
o uene	µg			80	N	N		<2	<2	nc
Xy ene (m & p)	µg	2						<2	<2	nc
Xy ene (o)	µg			350				<2	<2	nc
Xy ene o al	µg	2			N	N		<2	<2	nc
o al B EX	mg	0 00						<0 00	<0 00	nc
T										
C6 - C9	µg	20						<20	<20	nc
minus B EX (C6 C 0)	mg	0 02			N	0		<0 02	<0 02	nc
C 0-C 6	mg	0						<0	<0	nc
2-NA H HA ENE	mg	0			N	N		<0	<0	nc
C 6-C34	mg	0						<0	<0	nc
C 0 - C 4	µg	50						<50	<50	nc
C 5 - C28	µg	00						< 00	< 00	nc
C29-C36	µg	50						<50	<50	nc
C34-C40	mg	0						<0	<0	nc

								e am e	MW205	QC227	R D
								We	MW205		
								am e a	30 20 5	30 20 5	
em a ame	s		ANZECC (2000) Ma ine Ecosys ems 95% gge Values	ANZECC (2000) Ma ine Ecosystems Med-ow Rel abi ty	A MW - a - 2-<4m	M 2 - a 2 <4m	M 2 - a 2 <4m				
V a e a e a e m	s V	s)									
2 tet achlo oe hane	µg	5							<5	<5	nc
-t chlo oe hane	µg	5		270					<5	<5	nc
2 2 tet achlo oe hane	µg	5		400					<5	<5	nc
2-t chlo oe hane	µg	5	8000						<5	<5	nc
-dich o oethane	µg	5		250					<5	<5	nc
-dich o oethene	µg	5		700					<5	<5	nc
2 3-t chlo op opane	µg	5							<5	<5	nc
2-dich o oethane	µg	5		900					<5	<5	nc
Ca bon et ach o de	µg			240					<5	<5	nc
Chlo oethane	µg	50							<50	<50	nc
Chlo o o m	µg	5		370					<5	<5	nc
Chlo omethane	µg	50							<50	<50	nc
c s- 2-dich o oethene	µg	5							<5	<5	nc
c s- 3-dich o op opene	µg	5							<5	<5	nc
Hexachlo obu adiene	µg	5		0 03					<5	<5	nc
ich o oethene	µg	5		330					<5	<5	nc
et achlo oe hene	µg	5		70					<5	<5	nc
t ans- 2-dich o oethene	µg	5							<5	<5	nc
t ans- 3-dich o op opene	µg	5							<5	<5	nc
V nyl ch o de	µg	50		00					<50	<50	nc
2 3-t chlo obenzene	µg	5		3					<5	<5	nc
2 4-t chlo obenzene	µg	5	240						<5	<5	nc
2-d ch o obenzene	µg	5		60					<5	<5	nc
3-d ch o obenzene	µg	5		260					<5	<5	nc
4-d ch o obenzene	µg	5		60					<5	<5	nc
Chlo obenzene	µg	5		55					<5	<5	nc
2-d b omoethane	µg	5							<5	<5	nc
B omodich o ome hane	µg	5							<5	<5	nc
B omo o m	µg	5							<5	<5	nc
B omomethane	µg	50							<50	<50	nc
Chlo odib omomethane	µg	5							<5	<5	nc
D b omome hane	µg	5							<5	<5	nc
D ch o odi uo omethane	µg	50							<50	<50	nc
odomethane	µg	5							<5	<5	nc
ich o o uo ome hane	µg	50							<50	<50	nc
-d ch o op opene	µg	5							<5	<5	nc
2-d b omo-3 ch o op opane	µg	5							<5	<5	nc
2-d ch o op opane	µg	5		900					<5	<5	nc
3-d ch o op opane	µg	5		00					<5	<5	nc
2 2-d ch o op opane	µg	5							<5	<5	nc
2 ch o o oluene	µg	5							<5	<5	nc
4 ch o o oluene	µg	5							<5	<5	nc
B omobenzene	µg	5							<5	<5	nc
c s- 4-D chlo o-2-butene	µg	5							<5	<5	nc
entach o oethane	µg	5		80					<5	<5	nc
t ans- 4-D chlo o-2-butene	µg	5							<5	<5	nc

Notes
< - esult ess han l m t o epo t ng (OR)
µg - m c og ams pe l t e
mg - mi l g ams pe l t e
HS - Hea th Sc een ng evel
MW nt us ve Ma ntenance Wo ke
R D - Rela ive e cent Di e ence
*Naphtha ene detec ions om vola i e ana ys s (u ge) < OR o sem -vo ai le method S M)
N - non imi ing

AECOM

Client Name: City of Sydney
Project Name: Gunyama Park Stage 2 and George Julius Avenue North
Project No: 60477507

Table C7 Acid Sulfate Soil Field Test Results

Test Location	Depth (m)	Soil Description	pH_F	pH_{FOX}	pH_{FOX}-pH_F	Reaction
BH201	0.4 – 0.5	FILL/Gravelly CLAY	8.6	9	0.4	Volcanic
BH201	1.4 – 1.5	FILL/SAND	8	6.8	-1.2	Volcanic
BH202	0.4 – 0.5	FILL/Gravelly SAND	7.5	5.3	-2.2	Volcanic
BH202	1.4 – 1.5	FILL/Gravelly SAND	7.8	6.5	-1.3	Volcanic
BH203	0.4 – 0.5	FILL/Gravelly SAND	7.2	5	-2.2	Volcanic
BH203	1.4 – 1.5	FILL/Gravelly SAND	8	7	-1	Volcanic
BH204	0.4 – 0.5	FILL/Gravelly SAND	8	7	-1	Volcanic
BH204	1.4 – 1.5	FILL/Gravelly SAND	8.2	7.2	-1	Volcanic
BH204	2.4 – 2.5	FILL/Gravelly SAND	8.4	7.5	-0.9	Volcanic
BH205	0.4 – 0.5	FILL/SAND	8.3	5.5	-2.8	Volcanic
BH205	1.4 – 1.5	FILL/Clayey SAND	6.5	4	-1.5	Volcanic
BH205	2.4 – 2.5	FILL/Clayey SAND	6.7	2.6	-4.1	Volcanic
BH206	0.4 – 0.5	FILL/SAND	7.4	6.8	-0.6	Volcanic
BH206	1.4 – 1.5	FILL/SAND	6.2	3.7	-2.5	Volcanic
BH206	2.4 – 2.5	FILL/SAND	5.9	3.3	-2.6	Volcanic
BH207	0.4 – 0.5	FILL/Gravelly SAND	8.9	8.5	-0.4	Volcanic
BH207	1.4 – 1.5	FILL/Clayey SAND	8.1	6.5	-1.6	Volcanic
BH208	0.4 – 0.5	FILL/Gravelly SAND	8.6	7.9	-0.7	Volcanic
BH208	1.4 – 1.5	FILL/Clayey SAND	8.8	6.7	-2.1	Volcanic
BH208	2.1 – 2.2	FILL/Clayey SAND	8.3	6.6	-1.7	Volcanic

							Lead	TPH Fractions					TRH Fractions							BTEXN						
							Lead	C6-C9	C10-C14	C15-C28	C29-C36	C10-C36	C6-C10	C6-C10 less BTEX (F1)	>C10-C16 less Naphthalene (F2)	>C10-C16	>C16-C34	>C34-C40	>C10-C40	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m&p)	Xylene (Total)	Naphthalene
NEPM (2013)	HIL - C						600																			
	HIL - D						1500																			
	EIL - Open Space						**1100**																			**170**
	ESL - Open Space																									
	Management Limits												700			1000	2500	10000								
	HSL C Sand 0 to < 1 m													NL	NL					NL	NL	NL			NL	
	HSL D Sand 0 to < 1 m													260	NL					3	NL	NL			230	
CRC Care (2013)	**HSL C - Direct Contact**													**5100**	**3800**			**7400**		**120**	**5300**	**18000**			**150000**	**1900**
	Intrusive Maintenance Worker - Direct Contact												82000			62000	85000	120000		1100						
	Intrusive Maintenance Worker - Sand 0-<2m													*NL*	*NL*					*77*	*NL*	*NL*			*NL*	
						LOR	20	20	50	50	50	50	20	20	50	50	100	100	50	0.1	0.1	0.1	0.1	0.2	0.3	0.1
						Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location	**Field ID**	**Matrix**	**Type**	**Sample Date**	**Sample Code**	**Report No.**																				
~~UST2_1W~~	~~UST2_1W(0.2)~~	~~Fill~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10152~~	~~611326~~	~~19~~	~~<20~~	~~<20~~	~~64~~	~~<50~~	~~64~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~UST2_2W~~	~~UST2_2W(0.7)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10153~~	~~611326~~	~~<5~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<50~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~UST2_3W~~	~~UST2_3W(2.2)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10154~~	~~611326~~	~~<5~~	~~<20~~	~~1600~~	~~5600~~	~~78~~	~~7278~~	~~<20~~	~~<20~~	~~6200~~	~~6200~~	~~1900~~	~~<100~~	~~8100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~3.1~~
~~UST2_3W~~	~~UST2_3W(2.2)A~~	~~Sand~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27567~~	~~613527~~	~~<5~~	~~<20~~	~~1100~~	~~2700~~	~~<50~~	~~3800~~	~~<20~~	~~<20~~	~~3100~~	~~3100~~	~~880~~	~~<100~~	~~3980~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~0.8~~
~~UST2_4W~~	~~UST2_4W(0.3)~~	~~Fill~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10155~~	~~611326~~	~~140~~	~~<20~~	~~56~~	~~470~~	~~130~~	~~656~~	~~<20~~	~~<20~~	~~240~~	~~240~~	~~470~~	~~<100~~	~~710~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~UST2_4W~~	~~UST2_4W(0.3)A~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27568~~	~~613527~~	~~<5~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<50~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~QA1-22/8~~	~~QA1-22/8~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au33659~~	~~613527~~	~~130~~	~~<20~~	~~<20~~	~~140~~	~~84~~	~~224~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~190~~	~~<100~~	~~190~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~QC1-22/8~~	~~QC1-22/8~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~199060-1~~	~~199060~~	~~100~~	~~<25~~	~~<50~~	~~110~~	~~<100~~	-	~~<25~~	~~<25~~	~~<50~~	~~<50~~	~~140~~	~~<100~~	~~140~~	~~<0.2~~	~~<1~~	~~<0.5~~	~~<1~~	~~<2~~	~~<1~~	~~<0.1~~
~~UST2_5W~~	~~UST2_5W(0.6)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10156~~	~~611326~~	~~<5~~	~~<20~~	~~<20~~	~~<50~~	~~61~~	~~61~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~QA1-7/8~~	~~QA1-7/8~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10183~~	~~611326~~	~~<5~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<50~~	~~<20~~	~~<20~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<100~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5~~
~~QC1~~	~~QC1~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~198044-1~~	~~198044~~	~~2~~	~~<25~~	~~<50~~	~~<100~~	~~<100~~	-	~~<25~~	~~<25~~	~~<50~~	~~<50~~	~~<100~~	~~<100~~	~~<50~~	~~<0.2~~	~~<1~~	~~<0.5~~	~~<1~~	~~<2~~	~~<1~~	~~<0.1~~
~~UST2_6W~~	~~UST2_6W(2.4)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10157~~	~~611326~~	~~<5~~	~~<20~~	~~2600~~	~~11,000~~	~~240~~	~~13,840~~	~~<20~~	~~<20~~	**~~11,000~~**	~~11000~~	~~4900~~	~~<100~~	~~15,900~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5-2.6~~
~~UST2_6W~~	~~UST2_6W(2.4)A~~	~~Sand~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27569~~	~~613527~~	~~<5~~	~~<20~~	~~1500~~	~~3400~~	~~58~~	~~4958~~	~~<20~~	~~<20~~	**~~3900~~**	~~3900~~	~~1100~~	~~<100~~	~~5000~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.2~~	~~<0.3~~	~~<0.5-2.6~~
UST2-7S	UST2-7S(0.4)	Fill	South Wall	7/08/2018	S18-Au10158	611326	240	<20	1000	3600	140	4740	<20	<20	3600	3600	1700	<100	5300	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5-3
UST2-8S	UST2-8S(1.0)	Sand	South Wall	7/08/2018	S18-Au10159	611326	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-9S	UST2-9S(2.3)	Sand	South Wall	7/08/2018	S18-Au10160	611326	<5	<40	3000	12,000	300	15,300	<40	<40	**11,000**	11000	5400	100	16,500	<0.2	<0.2	<0.2	<0.2	<0.4	<0.6	<0.5-9.9
UST2-10S	UST2-10S(0.5)	Fill	South Wall	7/08/2018	S18-Au10161	611326	120	<20	<20	140	72	212	<20	<20	<50	<50	200	<100	200	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5-1.2
UST2-11S	UST2-11S(1.1)	Sand	South Wall	7/08/2018	S18-Au10162	611326	<5	<20	<20	73	<50	73	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-12S	UST2-12S(2.2)	Sand	South Wall	7/08/2018	S18-Au10163	611326	<5	<20	2000	7600	190	9790	<20	<20	**7600**	7600	**3400**	<100	11,000	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5-1.4
UST2-13E	UST2-13E(0.6)	Fill	East Wall	7/08/2018	S18-Au10164	611326	190	<20	24	220	<50	244	<20	<20	97	97	160	<100	257	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5-0.7
UST2-14E	UST2-14E(1.9)	Sand	East Wall	7/08/2018	S18-Au10165	611326	340	<20	24	270	50	344	<20	<20	110	110	190	<100	300	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5-0.6
UST2-15E	UST2-15E(2.4)	Sand	East Wall	7/08/2018	S18-Au10166	611326	<5	<20	63	200	<50	263	<20	<20	220	220	<100	<100	220	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-16E	UST2-16E(0.6)	Fill	East Wall	7/08/2018	S18-Au10167	611326	150	<20	<20	160	<50	160	<20	<20	75	76	110	<100	186	<0.1	0.6	1	0.2	1.8	1.9	<0.5-0.6
UST2-17E	UST2-17E(1.7)	Sand	East Wall	7/08/2018	S18-Au10168	611326	64	<20	21	150	<50	171	<20	<20	89	89	<100	<100	<100	<0.1	0.2	0.5	<0.1	0.8	0.9	<0.5
UST2-18E	UST2-18E(2.3)	Sand	East Wall	7/08/2018	S18-Au10169	611326	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-19N	UST2-19N(0.2)	Fill	East Wall	7/08/2018	S18-Au10170	611326	84	<20	<20	64	<50	64	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	0.1	<0.1	<0.2	<0.3	<0.5
UST2-20N	UST2-20N(0.7)	Sand	North Wall	7/08/2018	S18-Au10171	611326	12	<20	<20	150	54	204	<20	<20	<50	<50	160	<100	160	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QA2-7/8	QA2-7/8	Sand	North Wall	7/08/2018	S18-Au10184	611326	19	<20	<20	160	65	225	<20	<20	<50	<50	190	<100	190	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QC2	QC2	Sand	North Wall	7/08/2018	198044-2	198044	12	<25	<50	<100	<100	-	<25	<25	<50	<50	<100	<100	<50	<0.2	<1	<0.5	<1	<2	<1	<0.1
UST2-21N	UST2-21N(2.4)	Sand	North Wall	7/08/2018	S18-Au10172	611326	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-22N	UST2-22N(0.3)	Fill	North Wall	7/08/2018	S18-Au10173	611326	110	<20	<20	75	<50	75	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-23N	UST2-23N(1.2)	Sand	North Wall	7/08/2018	S18-Au10174	611326	<5	<20	<20	170	<50	170	<20	<20	51	51	110	<100	161	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QA3-7/8	QA3-7/8	Sand	North Wall	7/08/2018	S18-Au10185	611326	<5	<20	<20	260	<50	260	<20	<20	90	90	170	<100	260	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
QC3	QC3	Sand	North Wall	7/08/2018	198044-3	198044	25	<25	<50	130	<100	-	<25	<25	58	58	<100	<100	60	<0.2	<1	<0.5	<1	<2	<1	<0.1
UST2-24N	UST2-24N(2.4)	Sand	North Wall	7/08/2018	S18-Au10175	611326	<5	<20	280	930	<50	1210	<20	<20	990	990	210	<100	1200	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-27B	UST2-27B(2.5)	Sand	Base	7/08/2018	S18-Au10178	611326	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-28B	UST2-28B(2.5)	Sand	Base	7/08/2018	S18-Au10179	611326	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_32S	UST2_32S(0.3)	Fill	South Wall	22/08/2018	S18-Au27570	613527	120	<20	33	190	83	306	<20	<20	88	88	210	<100	298	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_33S	UST2_33S(0.8)	Sand	South Wall	22/08/2018	S18-Au27571	613527	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_34S	UST2_34S(2.2)	Sand	South Wall	22/08/2018	S18-Au27572	613527	<5	<20	810	2300	67	3177	<20	<20	2600	2600	960	<100	3560	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_35N	UST2_35N(0.5)	Fill	North Wall	22/08/2018	S18-Au27573	613527	88	<20	<20	140	77	217	<20	<20	<50	<50	190	<100	190	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_36N	UST2_36N(0.9)	Sand	North Wall	22/08/2018	S18-Au27574	613527	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_37N	UST2_37N(2.3)	Sand	North Wall	22/08/2018	S18-Au27575	613527	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2_38B	UST2_38B(2.5)	Sand	Base	22/08/2018	S18-Au27576	613527	<5	<20	1300	3000	<50	4300	<20	<20	3400	3400	980	<100	4380	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	1.8
UST2_39B	UST2_39B(2.5)	Sand	Base	22/08/2018	S18-Au27577	613527	<5	<20	<20	<50	<50	<50	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5
UST2-43B	UST2-43B(2.8)	Sand	Base	22/08/2018	S18-Se02290	615525	-	<20	<20	100	98	198	<20	<20	<50	<50	170	<100	170	-	-	-	-	-	-	<0.5
UST2-44B	UST2-44B(3.1)	Sand	Base	22/08/2018	S18-Se02291	615525	-	<20	<20	190	270	460	<20	<20	<50	<50	380	190	570	-	-	-	-	-	-	<0.5

Notes
~~Strikethrough~~ - Soil removed through further excavation to the west
< - result less than laboratory limit of reporting (LOR)
HSL - Health screening level
EIL - Ecological investigation level
ESL - Ecological screening level

							PAHs																
							Acenaphthene	Acenaphthylene	Anthracene	Benz(a)an hracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	PAHs (Total)	Phenanthrene	Pyrene
NEPM (2013)	HIL - C											3	3	3									300		
	HIL - D											40	40	40									4000		
	EIL - Open Space										**0.7**														
	ESL - Open Space																								
	Management Limits																								
	HSL C Sand 0 to < 1 m																								
	HSL D Sand 0 to < 1 m																								
CRC Care (2013)	**HSL C - Direct Contact**																								
	Intrusive Maintenance Worker - Direct Contact																								
	Intrusive Maintenance Worker - Sand 0-<2m																								
						LOR	0.1	0.1	0.1	0.1	0 05	0.5	0.5	0.5	0.5	0.2	0.1	0 5	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
						Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location	**Field ID**	**Matrix**	**Type**	**Sample Date**	**Sample Code**	**Report No.**																			
~~UST2 1W~~	~~UST2 1W(0.2)~~	~~Fill~~	~~West Wall~~	~~7/08/2018~~	~~S18 Au10152~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~UST2-2W~~	~~UST2-2W(0.7)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10153~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~UST2-3W~~	~~UST2-3W(2.2)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10154~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.7~~	~~<0.5~~	~~3 8~~	~~<0.5~~	~~<0.5~~
~~UST2_3W~~	~~UST2_3W(2.2)A~~	~~Sand~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27567~~	~~613527~~	~~<0.5~~	~~<1~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~<0.5~~	~~1.4~~	~~<0.5~~	~~<0.5~~
~~UST2 4W~~	~~UST2 4W(0.3)~~	~~Fill~~	~~West Wall~~	~~7/08/2018~~	~~S18 Au10155~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~0.9~~	~~3.3~~	~~**3.5**~~	~~5.4~~	~~5.4~~	~~5.4~~	~~1.9~~	-	~~2.9~~	~~2 3~~	~~3.5~~	~~0.9~~	~~6.1~~	~~<0.5~~	~~2.1~~	~~35.4~~	~~2.1~~	~~5.9~~
~~UST2_4W~~	~~UST2_4W(0.3)A~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27568~~	~~613527~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~QA1-22/8~~	~~QA1-22/8~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au33659~~	~~613527~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~1~~	~~**1.1**~~	~~1.5~~	~~1.7~~	~~2~~	~~0.8~~	-	~~0.7~~	~~1~~	~~1~~	~~<0.5~~	~~1.9~~	~~<0.5~~	~~0.8~~	~~11.3~~	~~1~~	~~2~~
~~QC1-22/8~~	~~QC1-22/8~~	~~Fill~~	~~West Wall~~	~~22/08/2018~~	~~199060-1~~	~~199060~~	~~<0.1~~	~~0.1~~	~~0.2~~	~~0.8~~	~~0.75~~	~~1.1~~	~~1.1~~	~~1.1~~	-	~~1~~	~~0.4~~	-	~~0.7~~	~~0.1~~	~~1.6~~	~~<0.1~~	~~0.3~~	~~8.6~~	~~0.8~~	~~1.6~~
~~UST2 5W~~	~~UST2 5W(0.6)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18 Au10156~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~QA1-7/8~~	~~QA1-7/8~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10183~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~QC1~~	~~QC1~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~198044-1~~	~~198044~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0 05~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	-	~~<0.2~~	~~<0.1~~	-	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0.1~~	~~<0 05~~	~~<0.1~~	~~<0.1~~
~~UST2-6W~~	~~UST2-6W(2.4)~~	~~Sand~~	~~West Wall~~	~~7/08/2018~~	~~S18-Au10157~~	~~611326~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	-	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
~~UST2_6W~~	~~UST2_6W(2.4)A~~	~~Sand~~	~~West Wall~~	~~22/08/2018~~	~~S18-Au27569~~	~~613527~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~0.6~~	~~1.2~~	~~<0.5~~	–	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~	~~<0.5~~
UST2-7S	UST2-7S(0.4)	Fill	South Wall	7/08/2018	S18-Au10158	611326	<0.5	<0.5	<0.5	0.9	**0.9**	1.2	1.4	1.7	0.6	-	0.7	0.7	0.8	<0.5	1.8	<0.5	0.6	9 2	0.7	1.5
UST2-8S	UST2-8S(1.0)	Sand	South Wall	7/08/2018	S18-Au10159	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-9S	UST2-9S(2.3)	Sand	South Wall	7/08/2018	S18-Au10160	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-10S	UST2-10S(0.5)	Fill	South Wall	7/08/2018	S18-Au10161	611326	<0.5	<0.5	0.6	1.5	**1.5**	2	2.2	2.5	1	-	1.2	1 2	1.4	<0.5	3.5	<0.5	0.9	16.8	1.5	2.5
UST2-11S	UST2-11S(1.1)	Sand	South Wall	7/08/2018	S18-Au10162	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-12S	UST2-12S(2.2)	Sand	South Wall	7/08/2018	S18-Au10163	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-13E	UST2-13E(0.6)	Fill	East Wall	7/08/2018	S18-Au10164	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1 8	0.5	<0.5
UST2-14E	UST2-14E(1.9)	Sand	East Wall	7/08/2018	S18-Au10165	611326	<0.5	<0.5	<0.5	<0.5	0.7	0.8	1.1	1.4	0.6	-	0.6	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	4 3	0.6	0.6
UST2-15E	UST2-15E(2.4)	Sand	East Wall	7/08/2018	S18-Au10166	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-16E	UST2-16E(0.6)	Fill	East Wall	7/08/2018	S18-Au10167	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1.7	0.5	0.6
UST2-17E	UST2-17E(1.7)	Sand	East Wall	7/08/2018	S18-Au10168	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-18E	UST2-18E(2.3)	Sand	East Wall	7/08/2018	S18-Au10169	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-19N	UST2-19N(0.2)	Fill	East Wall	7/08/2018	S18-Au10170	611326	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	1 2	<0.5	0.6
UST2-20N	UST2-20N(0.7)	Sand	North Wall	7/08/2018	S18-Au10171	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA2-7/8	QA2-7/8	Sand	North Wall	7/08/2018	S18-Au10184	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC2	QC2	Sand	North Wall	7/08/2018	198044-2	198044	<0.1	<0.1	<0.1	<0.1	<0 05	<0.5	<0.5	<0.5	-	<0.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0 05	<0.1	<0.1
UST2-21N	UST2-21N(2.4)	Sand	North Wall	7/08/2018	S18-Au10172	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-22N	UST2-22N(0.3)	Fill	North Wall	7/08/2018	S18-Au10173	611326	<0.5	<0.5	<0.5	0.6	0.7	0.8	1.1	1.4	<0.5	-	<0.5	0 5	0.6	<0.5	1.1	<0.5	<0.5	5 3	0.7	1.1
UST2-23N	UST2-23N(1.2)	Sand	North Wall	7/08/2018	S18-Au10174	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA3-7/8	QA3-7/8	Sand	North Wall	7/08/2018	S18-Au10185	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC3	QC3	Sand	North Wall	7/08/2018	198044-3	198044	<0.1	<0.1	<0.1	<0.1	0 07	<0.5	<0.5	<0.5	-	<0.2	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	0.07	<0.1	<0.1
UST2-24N	UST2-24N(2.4)	Sand	North Wall	7/08/2018	S18-Au10175	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-27B	UST2-27B(2.5)	Sand	Base	7/08/2018	S18-Au10178	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-28B	UST2-28B(2.5)	Sand	Base	7/08/2018	S18-Au10179	611326	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2_32S	UST2_32S(0.3)	Fill	South Wall	22/08/2018	S18-Au27570	613527	<0.5	0.7	1.2	2.8	**2.7**	3.6	3.9	4.1	3.1	-	1.7	1 3	2.4	<0.5	5.9	0.5	1.4	33.8	4.5	5.6
UST2_33S	UST2_33S(0.8)	Sand	South Wall	22/08/2018	S18-Au27571	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2_34S	UST2_34S(2.2)	Sand	South Wall	22/08/2018	S18-Au27572	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	3 3	1.4	<0.5
UST2_35N	UST2_35N(0.5)	Fill	North Wall	22/08/2018	S18-Au27573	613527	<0.5	<0.5	0.8	2.2	**2**	2.7	2.9	3.2	2.2	-	1.3	1	1.9	<0.5	4.9	<0.5	1	25.1	3.3	4.5
UST2_36N	UST2_36N(0.9)	Sand	North Wall	22/08/2018	S18-Au27574	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2_37N	UST2_37N(2.3)	Sand	North Wall	22/08/2018	S18-Au27575	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2_38B	UST2_38B(2.5)	Sand	Base	22/08/2018	S18-Au27576	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	3 3	0.7	<0.5
UST2_39B	UST2_39B(2.5)	Sand	Base	22/08/2018	S18-Au27577	613527	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
UST2-43B	UST2-43B(2.8)	Sand	Base	22/08/2018	S18-Se02290	615525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UST2-44B	UST2-44B(3.1)	Sand	Base	22/08/2018	S18-Se02291	615525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes
~~Strikethrough~~ - Soil removed through further excavation to the west
< - result less than laboratory limit of reporting (LOR)
HSL - Health screening level
EIL - Ecological investigation level
ESL - Ecological screening level

Table C9
Historical Off-Site Validation Soil Analytical Results (ADE, 2021)

					Lead	TPH Fractions					BTEXN					PAHs		
					Lead	C6-C9	C10-C14	C15-C28	C29-C36	C10-C36	Benzene	Ethylbenzene	Toluene	Xylene (Total)	Naphthalene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (medium bound)	PAHs (Total)
NEPM (2013)	HIL - C				600												3	300
	HIL - D				1500												40	4000
	EIL - Open Space				**1100**										**170**	**0.7**		
	ESL - Open Space																	
	Management Limits																	
	HSL C Sand 0 to < 1 m										NL	NL	NL	NL				
	HSL D Sand 0 to < 1 m										3	NL	NL	230				
CRC Care (2013)	**HSL C - Direct Contact**										**120**	**5300**	**18000**	**150000**	**1900**			
	Intrusive Maintenance Worker - Direct Contact										1100							
	Intrusive Maintenance Worker - Sand 0-<2m										*77*	*NL*	*NL*	*NL*				
				LOR	20	20	50	50	50	50	0.1	0.1	0.1	0.3	0.1	0 05	0 5	0.1
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location	**Field ID**		**Sample Date**	**Report No.**														
BH03	14531-BH3(0.8)		27/08/2018	MER-08-1453	96	<35	<50	280	<100	280	<0.5	<0.5	<1	<0.5	<0.3	**3.8**	5.4	39.6
TP03	DG-TP3 (0.3)		18/09/2020	ES2033094	197.2	<25	<50	<100	<100	<100	<0.5	<0.5	<1	<0.5	1 03	**4.15**	6.01	68 29
TP03	DG-TP3 (1.0)		18/09/2020	ES2033094	<10	<25	<50	<100	<100	<100	<0.5	<0.5	<1	<0.5	<0.3	<0.3	0.36	0
TP03	DG-TP3 (1.5)		18/09/2020	ES2033094	<10	<25	<50	<100	<100	<100	<0.5	<0.5	<1	<0.5	<0.3	<0.3	0.36	0

Notes
< - result less than laboratory limit of reporting (LOR)
HSL - Health screening level
EIL - Ecological inves igation level
ESL - Ecological screening level

Appendix D

Typical Capping Layer Cross Sections

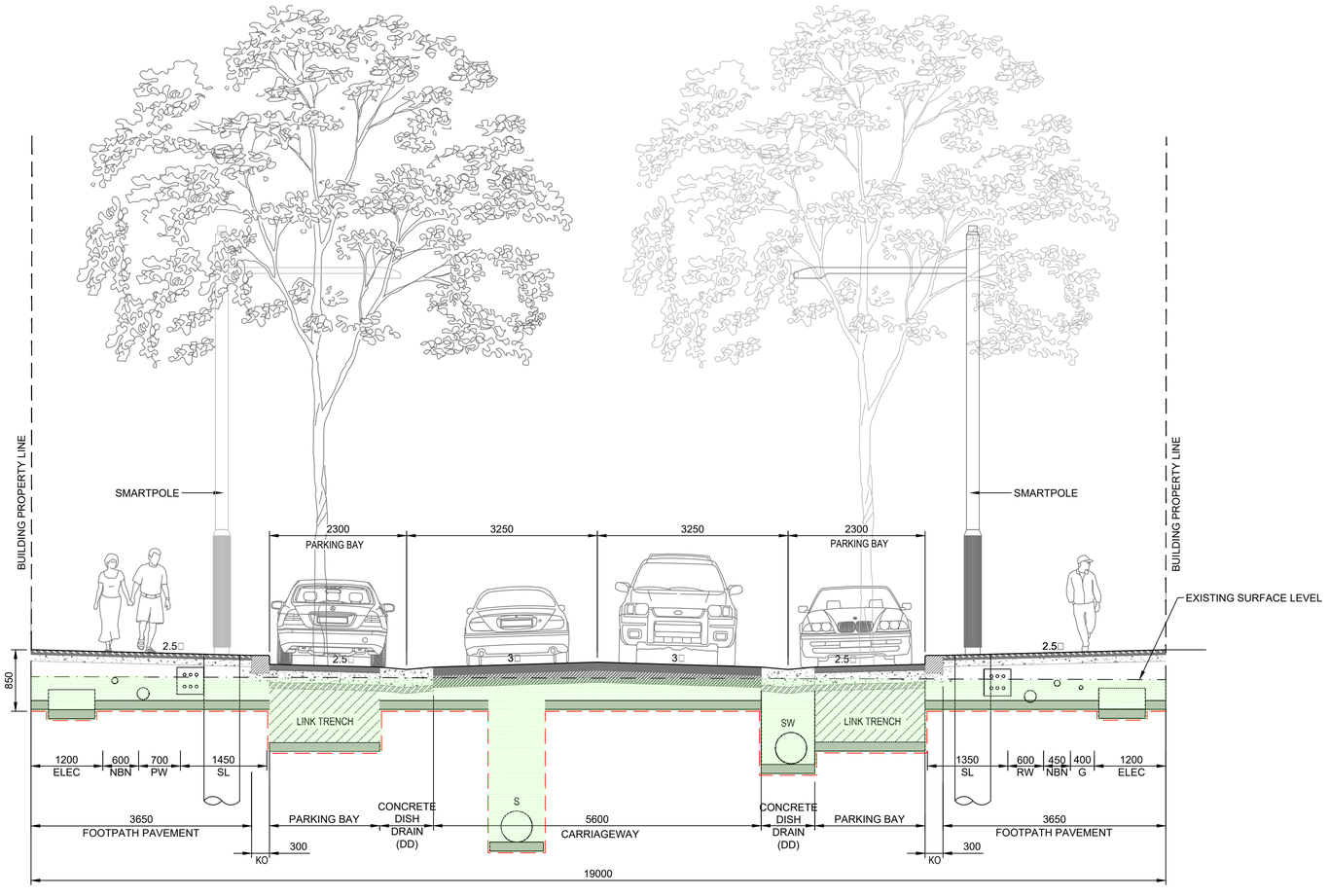
Project Management Initials: Designer: BK Checked: RM Approved: RM ISO A1 594mm x 841mm

LEGEND:

REMEDIATION EARTHWORKS AS PART OF THE WORKS.

NOTE:

1. REFER TO FIGURE 3 FOR LOCATION OF AREA OF REMEDIATION WORKS AS PART OF THE WORKS.
2. REFER TO FIGURE 8 FOR DETAILS.



TYPICAL SECTION □OTHER LANDOWNER AREAS OUTSIDE EXISTING ROAD RESERVE

SCALE 1:□□

NOT FOR CONSTRUCTION

AECOM

PROJECT

Gunyama Park and George Julius Avenue North

CLIENT

CITY OF SYDNEY

CONSULTANT

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www.aecom.com

SCALE BAR

0 1.25 2.5 m
1:50

ISSUE/REVISION

I/R	DATE	DESCRIPTION
02	19.02.2019	ISSUED FOR INFORMATION
01	06.08.2015	ISSUED FOR INFORMATION

KEY PLAN

PROJECT NUMBER

60477507

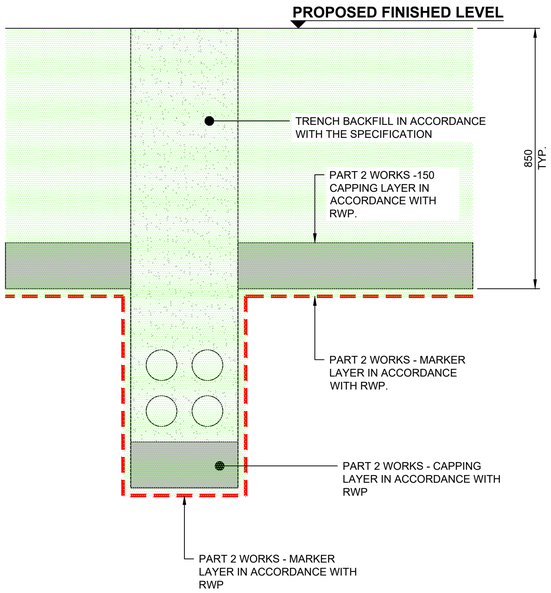
SHEET TITLE

FIGURE 07
TYPICAL CROSS SECTION
OTHER LAND OWNER AREAS

SHEET NUMBER **REV**

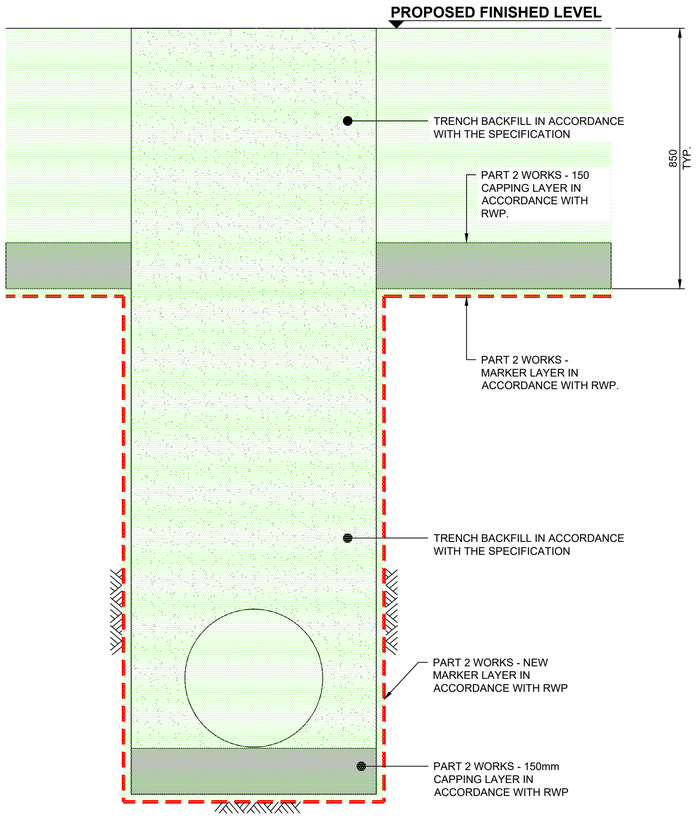
60300384-FIG-00-03-G-0007 02

Last saved by: LEONDISA (2019-02-19) Last Plotted: 2019-02-19
Filename: P:\603X\60300384\5. CAD\03-SKETCHES\60300384-FIG-00-03-G-0007.DWG



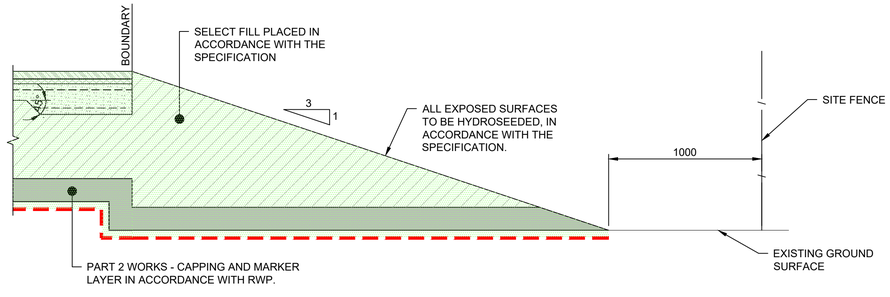
DETAIL FOR SHALLOW SERVICE (FOR SERVICES UP TO 1m BELOW EXISTING SURFACE)

SCALE 1:10



DETAIL FOR DEEP SERVICE (FOR SERVICES DEEPER THAN 1m BELOW EXISTING SURFACE)

SCALE 1:10



BATTER DETAIL AT EDGE OF WORKS

SCALE 1:20

LEGEND:

REMEDIATION EARTHWORKS BY CITY OF SYDNEY CONTRACTOR.

NOTES:

1. THESE DETAILS APPLY TO THE AREAS TO BE REMEDIATED AS PART OF THE WORKS WHICH FALL OUTSIDE THE GREEN SQUARE CONSORTIUM AREA.
2. REFER TO FIGURE 7 FOR TYPICAL CROSS-SECTION.

AECOM

PROJECT

Gunyama Park and George Julius Avenue North

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SCALE BAR

0 1.25 2.5 m
1:50

ISSUE/REVISION

I/R	DATE	DESCRIPTION
02	19.02.2019	ISSUED FOR INFORMATION
01	06.08.2015	ISSUED FOR INFORMATION

KEY PLAN

PROJECT NUMBER

60477507

SHEET TITLE

FIGURE 08
TRENCHES AND BATTER DETAILS OTHER LAND OWNER AREAS

SHEET NUMBER **REV**

60300384-FIG-00-03-G-0008 02

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