COSTIN ROE CONSULTING

CIVIL & STRUCTURAL ENGINEERS



CIVIL ENGINEERING REPORT INCORPORATING WATER CYCLE MANAGEMENT STRATEGY

DEVELOPMENT SITE

SSD-36138263: AUGUSTA STREET WAREHOUSE & DISTRIBUTION CENTRE

AUGUSTA STREET, BLACKTOWN, NSW

Prepared for:

The Trustee for Huntingwood Property Trust
Level 29 / Aurora Place, 88 Phillip Street
SYDNEY NSW 2000

Prepared by:

Costin Roe Consulting
Level 4, 8 Windmill Street
MILLERS POINT NSW 2000

DOCUMENT VERIFICATION

Project Title	SSD-36138263 - Augusta Street Warehouse and Distribution Centre
Document Title	Civil Engineering Report Incorporating Water Cycle Management Strategy
Project No.	Co13904.03
Description	SSD Report for proposed industrial development
Client Contact	The Trustee for Huntingwood Property Trust (TfHPT) – Mr Louis Towning

	Name	**Signature**
Prepared by	Lourens de Villiers & Mark Wilson	
Reviewed by	Mark Wilson	
Issued by	Lourens de Villiers	
File Name	13904.03-03h.rpt	

Document History

Date	**Revision**	**Issued to**	**No. Copies**
16 June 2023	DRAFT B	TfHPT – Mr Louis Towning	PDF
19 June 2023	FINAL DRAFT	TfHPT – Mr Louis Towning	PDF
10 July 2023	D	TfHPT – Mr Louis Towning	PDF
14 July 2023	E	TfHPT – Mr Louis Towning	PDF
11 September 2023	F	TfHPT – Mr Louis Towning	PDF
8 March 2024	G	TfHPT – Mr Louis Towning	PDF
19 March 2024	H	TfHPT – Mr Louis Towning	PDF

EXECUTIVE SUMMARY

The Trustee for Huntingwood Property Trust (TfHPT - the Applicant) are seeking to construct an industrial development located at Augusta Street, Blacktown (within the Huntingwood Precinct).

The Proposal is considered State Significant Development (SSD) and accordingly, an Environmental Impact Statement (EIS) has been prepared to support the SSD Application for the Proposal. This Water and Hydrology Assessment has been prepared by Costin Roe Consulting to support the preparation of the EIS and assess the Proposal's impact on the surrounding environment in relation to soils and water including stormwater and stormwater management for both construction and operational phases of the development.

Proposal overview

The proposed SSDA seeks approval to redevelop the site to accommodate a warehouse and distribution centre use inclusive of the following:

- Site establishment works, including tree removal, minor excavation / bulk earthworks.
- Construction and operation of four (4) new warehouse buildings comprising a multi-level warehouse building on the eastern portion of the site and three single storey warehouse buildings on the western portion of the site.
- Other associated works including landscaping, at-grade car parking and general site improvements.
- Vehicle access provided via Augusta Street and a new proposed access from the Great Western Highway.
- Lot consolidation of properties.

Access to the eastern portion of the development will be enabled by a new intersection coordinated by TfNSW to allow access to and from the site via the Great Western Highway. Access to the western portion of the site will be made via Flushcombe Road and Augusta Street.

Purpose of this assessment

This Water and Hydrology Impact Assessment has been prepared to address the following Secretary's Environmental Assessment Requirements (SEARs):

- Item Number 12: Ground and Water Conditions
- Item Number 13: Stormwater and Wastewater
- Item Number 14: Flooding Risk

Construction impacts

During the construction phase, a Sediment and Erosion Control Plan will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff.

Operational impacts

During the operational phase of the development, we propose a stormwater quality treatment system incorporating the use of a treatment train approach with the primary treatment being via either pit litter baskets and/or gross pollutant traps (GPT's). Tertiary

treatment will be facilitated via either bio-retention systems (combined with an On-Site detention (OSD) basins), or proprietary filtration within underground on-site detention tanks.

Best management practices have been applied to the development to ensure that the quality of stormwater runoff is not detrimental to the receiving environment. Further to the above, the proposed stormwater quality system meets the requirements of *Huntingwood Precinct Development Control Plan 2011*, Blacktown City Council Water Sensitive Urban Design (WSUD) 2020 document and objectives stated in Clause 2.44 of the Industrial and Employment SEPP.

Stormwater quantity management proposes detention of stormwater discharge which limits post-development flows to pre-development flows, based on the Blacktown City Council requirements and those included in the Huntingwood Precinct Development Control Plan 2011 ("*on-site detention requirements established in the "On-Site Stormwater Detention Handbook" prepared by the Upper Parramatta River Catchment Trust Fourth Edition dated December 2005 (UPRCT)"*) and councils deemed to comply on-site detention tool. On-site detention has been proposed as either open basins or underground detention tanks.

Further it has been confirmed that the development considers flood and overland flow planning requirements in relation to Blacktown Creek and unnamed tributary of Blacktown Creek. The development confirms acceptable impact criteria, and design which is consistent with the requirements of Huntingwood Precinct Development Control Plan 2011.

The development does not increase runoff from existing conditions and, as such, the site discharge will not adversely affect any land drainage system or watercourse as a result of the development.

Conclusion

The hydrological assessment of the local site drainage confirms that recommended water quality and quantity measures will ensure that no adverse impacts result on receiving waterways as a result of the development.

The detail contained in this report provides sufficient information to show the consent authority that legal points of discharge and a suitable stormwater management strategy is available for the development and the requirements associated with the strategy. It is recommended the management strategies in this report be approved and incorporated into the future detailed design.

TABLE OF CONTENTS

EXECUTIVE SUMMARY (i)

1 INTRODUCTION & SCOPE 6

1.1 Introduction 6

1.2 Consultation 6

1.3 SEAR's Responses 7

2 DEVELOPMENT SITE 14

2.1 Location 14

2.2 Existing Site Description 15

2.3 Proposed Development 17

3 SITE WORKS 18

3.1 Soil and Geological Conditions 18

3.2 Bulk Earthworks 19

3.3 Retaining Walls 20

3.4 Embankment Stability 21

3.5 Groundwater 21

3.6 Acid Sulphate Soils and Salinity 22

4 WATER CYCLE MANAGEMENT STRATEGY & DRAINAGE METHODOLOGY 23

4.1 Key Areas and Objectives 23

4.2 Existing Site Drainage 26

4.3 Proposed Surface Water Drainage System 28

4.4 Hydrologic Modelling and Analysis 29
4.4.1 Rainfall Data 29
4.4.2 Runoff Models 29

4.5 Hydraulics 30
4.5.1 General Requirements 30
4.5.2 Freeboard 30
4.5.3 Public Safety 30
4.5.4 Inlet Pit Spacing 30

4.5.5 Overland Flow (development lots) 30

5 WATER QUANTITY MANAGEMENT 31

6 STORMWATER QUALITY, REUSE AND MAINTENANCE 34

6.1 Stormwater Quality Objectives 34

6.2 Proposed Stormwater Treatment System 34

6.3 Stormwater Quality Modelling 34

6.4 Stormwater Harvesting 38
6.4.1 Rainwater Tank Sizing 39

6.5 Stream Erosion Index 40

6.6 Maintenance and Monitoring 40

7 FLOODING AND OVERLAND FLOW 40

7.1 Introduction 40

7.2 Hyder Flood Study 2010 41

7.3 Existing Overland Flow and Flood Behaviour 43

7.5 Council Flood modelling Requirements 53

7.6 Flood Assessment Conclusion 56

8 CONSTRUCTION SOIL AND WATER MANAGEMENT 57

8.1 Soil and Water Management General 57

8.2 Typical Management Measures 57

8.3 Other Management Measures 58

9 CONCLUSION 59

10 REFERENCES 60

1 INTRODUCTION & SCOPE

1.1 Introduction

Costin Roe Consulting Pty Ltd (CRC) has been commissioned by The Trustee for Huntingwood Property Trust to prepare this report in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD- 36138263) for the proposed Augusta Street warehouse and distribution centre at Augusta Street, Blacktown.

This report presents a civil engineering assessment the properties at Augusta Street, Blacktown, which is located within the Huntingwood Precinct. This report provides an assessment of the civil engineering characteristics of the development site and technical considerations of the following aspects:

- Earthworks & geotechnical paramaters;
- Water Cycle Management Strategy (WCMS).

The WCMS comprises several key areas of stormwater and water management which are provided below. These key areas have been established with the aim to reduce impacts from the development on the surrounding environment and neighbouring properties. The water cycle management strategy identifies the management measures required to meet the targets set. The key water cycle management areas assessed in this report are:

- Storm Water Quantity;
- Storm Water Quality;
- Water Supply and Reuse;
- Flooding; and
- Erosion and Sediment Control

A request for Planning Secretary's Environmental Assessment Requirements (SEAR's) to the DPIE has been made by the applicant. **Section 1.3** of this report for specific responses to civil engineering and water management related items included in the SEAR's. Reference to **Appendix E** should be made for SSD-36138263 SEAR's dated 2 August 2022.

1.2 Consultation

Consideration to the various stakeholders has been made in relation to the development, including Council has been made during the assessment period.

Stakeholder	Consultation Method and Date	Issues Discussed	Project Response
Blacktown City Council - Mr Christophe Ferguson	E-mail - 25 March 2022	Confirming that their Overland Flow Study flood extents and XP-RAFTS catchments do not cover the site under application and requests that a	See Appendix F

		hydrologic and hydraulic assessment be completed for this application.	
Blacktown City Council Flood Advice	E-mail - 9 May 2022	Confirming that the Stormwater and Flooding reports referenced in the Huntingwood Precinct DCP documents needs to be obtained from DBL Property (Pty) Ltd.	See Appendix G
Blacktown City Council – Mr Laith Almoil	E-mail - 20 June 2022	Confirming that the OSD Deemed to Comply excel spreadsheet version 1.9 is the applicable version and should be used to calculate the OSD parameters.	See Appendix H
Letter addressed to all reviewing parties	Letter – 8 March 2024	Response to RTS Comments received	See Appendix K

1.3 SEAR's Responses

This report supports an EIS for the proposal, and to address the NSW Department of Planning and Environment Amended SEARS letter dated 2 August 2022, reference SSD-36138263.

We note the below "key issues and documentation" assessments are based on the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs) recently implemented by DPIE and following key areas in the document:

- *Item 12. Ground and Water Conditions*
- *Item 13. Water Management*
- *Item 14. Flooding Risk*

Table 1.1 provides a summary of the SEARs General Requirements which relate to water and hydrology, and where these have been addressed in this report.

Table 1.1. SEARs Warehouse and Distribution Centres Key Areas

SEAR's Key Item	Response and where addressed
12. Ground and Water Conditions	
Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils.	Refer to **Section 3** and geotechnical assessments by **PSM** and **JBS&G** for confirmation of soil resources and potential impacts. A large part of the site is currently undeveloped. The exception to this are the properties which front Flushcombe Road (which comprise 4Ha in area) located on the far west of the land area, which have existing industrial development, four abandoned residential dwellings in the western portion of the site and a small access road and existing Telstra tower on the site. The site is noted to be located within an established industrial precinct, called the Huntingwood Precinct. Existing industrial warehouses are present in the precinct and these located to the west of this site. The proposed works involve bulk earthworks, construction of retaining walls, realignment of the existing creeks to prepare the site for 4 new warehouse structures and its associated drainage infrastructure to avoid adverse impacts on the downstream properties. The existing site levels range between RL66.01m and RL91.36m, naturally draining from south to north. The site comprise of two ridges dividing the site into four catchment areas. The proposed development's warehouse FFL's are noted to be between RL73.31m and RL85.30m. A maximum fill height of 10m and a maximum of -11m cut is noted across the site's total earthworks.

SEAR's Key Item	Response and where addressed
	We note there are two conservation areas within the site, one of which is considered a riparian corridor as referenced in the Huntingwood DCP. Refer to **Section 3,** the Geotechnical report by **PSM** for confirmation of soil resources and potential impacts and the Acid Sulfate Soils (ASS) report by **JBS&G** for the confirmation that an Acid Sulfate Soil Management Plan is not required.
Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on: - Surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. - Groundwater resources in accordance with the Groundwater Guidelines.	Refer to **Section 4, 5 & 6** for assessment of water resources, hydrology (including quality and quantity), watercourses and riparian lands during operation. We note there are two conservation areas/watercourses located within the property boundary. Blacktown Creek towards the east of the site and an unnamed watercourse (to be referenced as "Unnamed Watercourse" going forward) to the west of the site, both draining in a northernly direction. The two watercourses on the property have been reported to be highly dilapidated and currently of low ecological value (refer *Biodiversity Development Assessment Report – Anne Clements & Associates*). The proposed development includes rehabilitation of the existing watercourses including the provision of a riparian corridor (in accordance with NRAR guidelines and the Huntingwood DCP 2011). Further, as part of the development, revegetation and rehabilitation works are proposed to bother watercourses. Refer to **Section 8** for soil and water management measures during construction, drawings in **Appendix A** for associated erosion and sediment control drawings, and **Appendix C** for a Draft Soil and Water Management Plan. The proposed erosion and sediment control measures during the construction of the development are based on the Landcom document *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')*

SEAR's Key Item	Response and where addressed
	(Landcom, 2004). Measures proposed will limit potential for offsite impact associated with water runoff and soils during construction. Consideration to management of salinity and acid sulphate has been made based on the recommendations of the geotechnical investigations by **PSM** and **JBS&G**. A surface water runoff including surface water runoff, water quality and water quantity has been completed. The key stormwater objectives, based on relevant water sensitive urban design criteria, have been set out in **Section 4.1** and **Section 6.1** of the report. Discharge from the site is noted to be made to Blacktown Creek, the Unnamed Watercourse and a small portion draining towards the existing stormwater infrastructure in the north-eastern corner of the site. The drainage under the GWH via existing culverts from both the Blacktown Creek and the Unnamed Watercourse is controlled with fitted aperture plates. **Section 6** provides a demonstration of the key criteria being met, based on MUSIC modelling. Configuration of the proposed measures are shown on the Civil Design Drawings included in **Appendix A**. For a groundwater impact assessment, refer to Section 3.5 & the Geotechnical Engineer's report - Portions of the building foundations of the warehouses in the center and on the eastern boundary of the site will be in areas where a deep cut is expected, and ground water will likely be encountered. With no basement for the warehouse proposed, groundwater will likely not be an issue for this development. With the development's likelihood to encounter groundwater in the areas of deep cut, impact from groundwater and on groundwater systems as a result of development are to be considered.
13. Water Management	

SEAR's Key Item	Response and where addressed
Provide an Integrated Water Management Plan for the development that: • is prepared in consultation with the local council and any other relevant drainage or water authority. • outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision). • details the proposed drainage design for the site including any on-site detention facilities, water quality management measures and the nominated discharge points, on-site sewage management, and measures to treat, reuse or dispose of water. • demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.	Refer to **Section 4, 5 & 6** for assessment of water resources, hydrology (including quality and quantity), watercourses and riparian lands during operation, in consultation with the relevant local council and authorities (refer **Appendix F, G & H).** Stormwater management assessments of the site's surface water runoff, water quality and water quantity have been completed. The key stormwater objectives (proposed drainage design for the site including any on-site detention facilities, water quality management measures and the nominated discharge points), based on relevant water sensitive urban design criteria, have been set out in **Section 4.1** and **Section 6.1** of the report. A large part of the site is currently undeveloped. The exception to this are the properties which front Augusta Street (which comprise 4Ha in area) located on the far west of the land area, which have existing industrial development, four abandoned residential dwellings in the western portion of the site and a small access road and existing Telstra tower on the site. The development of the land will not result in unacceptable impacts to any resources noting similar water quantity discharge and improved stormwater quality. We note there are two conservation areas/watercourses located within the property boundary. Discharge from the site is noted to be made to the Blacktown Creek, the Unnamed Watercourse and a small portion draining towards the existing stormwater infrastructure in the north-eastern corner of the site. The existing drainage under the GWH via existing culverts from both the Blacktown Creek and the Unnamed Watercourse is currently controlled with fitted aperture plates.

SEAR's Key Item	Response and where addressed
Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.	Refer **Section 4** and drawings in **Appendix A** for detailed assessment of the existing- and post development conditions pertaining to the overland flow path. The proposal requires consideration to upstream catchments (approximately 55Ha) draining under the Western Motorway through the site via the two conservation areas/watercourses located within the property boundary. The upstream catchment south-east of the site discharge into an existing bio-retention basin within that catchment, before flowing through the site.
14. Flooding Risk	
Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual.	Refer **Section 7** for assessments pertaining to flooding and overland flow. The proposal requires consideration to upstream catchments (approximately 55Ha) draining under the Western Motorway through the site via the two watercourses and associated riparian corridors on the site. Runoff from the upstream catchment south-east of the site (which comprises the Wet and Wild amusement park) is noted to be managed via an existing detention and bio-retention basin within that catchment, before flowing through the site. These managed flows comprise the bulk of runoff within Blacktown Creek. A new flood model for the site was compiled and the assessment shows a reduction in post development 1% AEP flood levels, hence meeting impact requirements and shows the proposed building achieves flood planning and freeboard requirements. Additionally, to the new flood model created by Costin Roe Consult, the existing flood study conducted by Hyder Consult and referenced by council in the Huntingwood Precinct DCP, was referenced and compared to the new model.

SEAR's Key Item	Response and where addressed
	Both studies indicate there is no flooding in the 1% AEP local events, but some flooding in the PMF event. The development floor levels have been set allowing for freeboard to the overland flow path of greater than 0.5m during the 1% AEP flood event. The requirements of Council and NSW Floodplain Development Manual are met for this development.
Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.	Refer **Section 7** for assessments pertaining to flooding and overland flow. The assessments show the existing overland flow from the upstream catchments can be conveyed via the watercourses, with no impacts on the development site. Flood planning considerations are met. The site has suitable flood immunity to the known flood behaviour and acceptable flood risk has been demonstrated.

2 DEVELOPMENT SITE

2.1 Location

The property is located within the Blacktown City Council (BCC) local government area (LGA), as shown in **Figure 2.1 and 2.2.** The site is also located within the Huntingwood Precinct of the Western Sydney Employment Lands, an established industrial precinct.

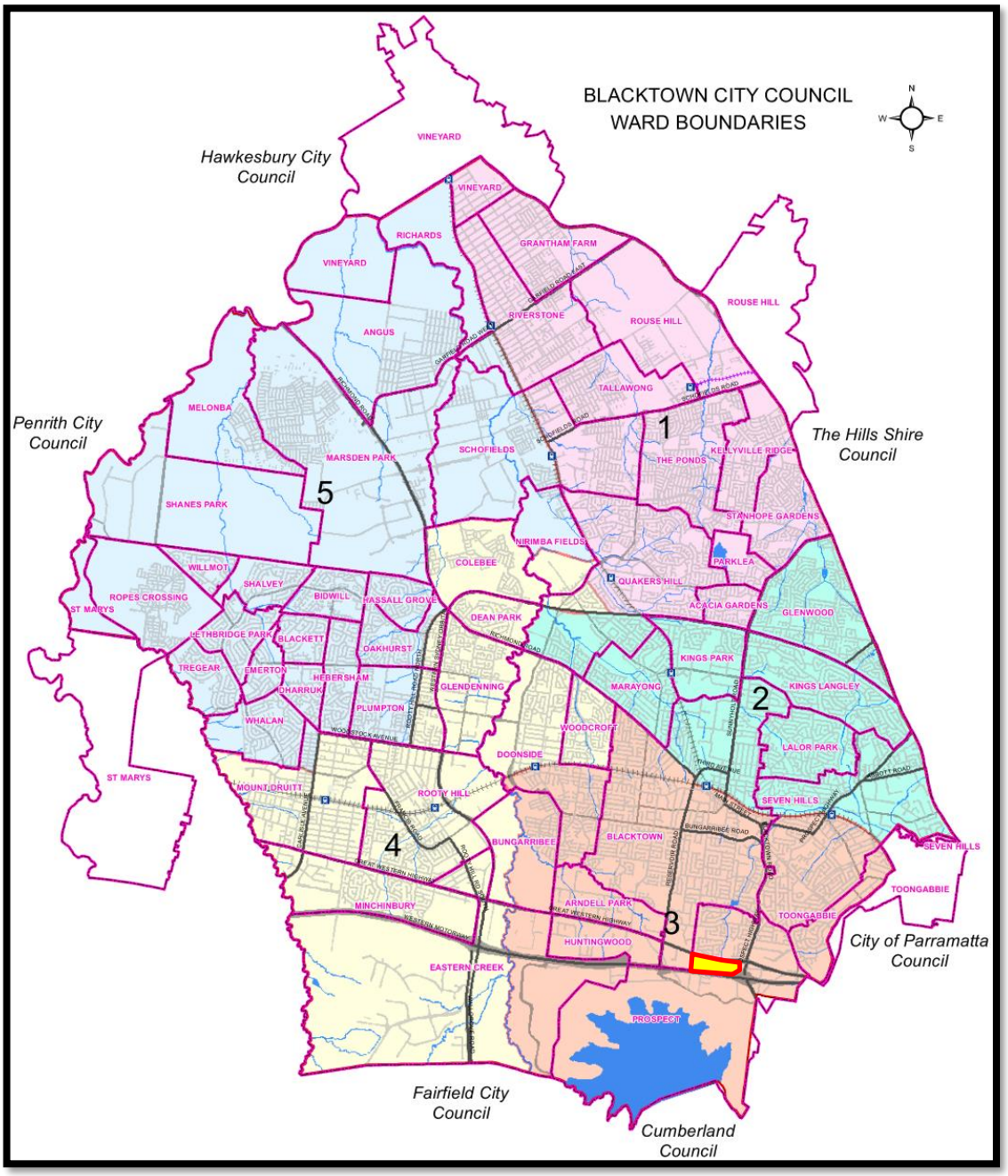


Figure 2.1. Site Location within the Blacktown Council LGA (Source: Blacktown City Council Ward Map)

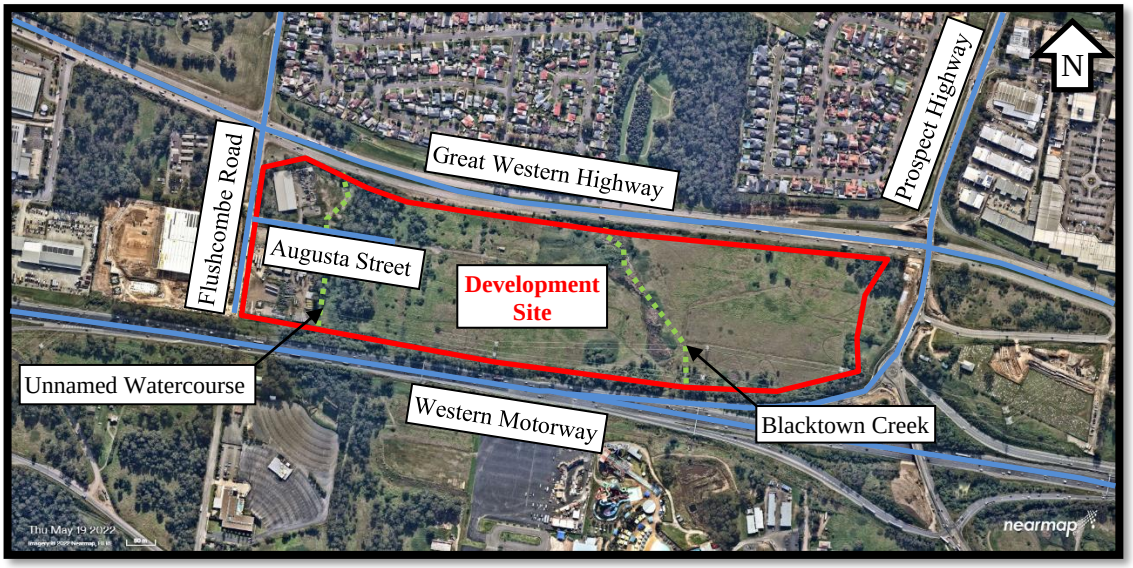


Figure 2.2. Site Location and Aerial Imagery (Source: Nearmap 16 June 2022)

2.2 Existing Site Description

The total site area is approximately 26.64 Ha. The site can be divided into four separate sub-catchment areas by the existing riparian corridors, somewhat central ridge line and Augusta Street.

The site is approximately 1100m in length fronting both the Western Motorway (south) and the Great Western Highway (GWH), and approximately 270m in width fronting Flushcombe Road.

To the north is the GWH and a residential area, to the east is a small portion of Industrial land (understood to be Transport for NSW (TfNSW) land) as well as the Prospect Highway and a cemetery, to the south is the Western Motorway as well as a waterpark (Raging Waters Sydney, temporarily closed) and a drive-in movie theatre. Further to the west are existing industrial developments.

The site is crossed by two watercourses as shown in **Figures 2.2** and **2.3**. Blacktown Creek towards the east of the site and the Unnamed Watercourse to the west of the site. Blacktown Creek is currently degraded with little to no native vegetation.

The existing site generally grades from two ridges on the site, draining east and west from the ridgeline, towards a riparian corridor and drainage swale, which drains from the south to the north, as seen in **Figure 2.3**.

Discharge from the site is via Blacktown Creek, the Unnamed Watercourse and a small portion draining towards the existing stormwater infrastructure in the north-eastern corner of the site. The drainage under the GWH via existing culverts from both the Blacktown Creek and the Unnamed Watercourse is controlled with fitted aperture plates (Source: Flood Study and Stormwater Management by Hyder Consulting, 18 January 2010).

The highest level on site is at RL91.36m AHD in the south-eastern corner of the site and the lowest is at RL66.01m AHD within the Blacktown Creek.

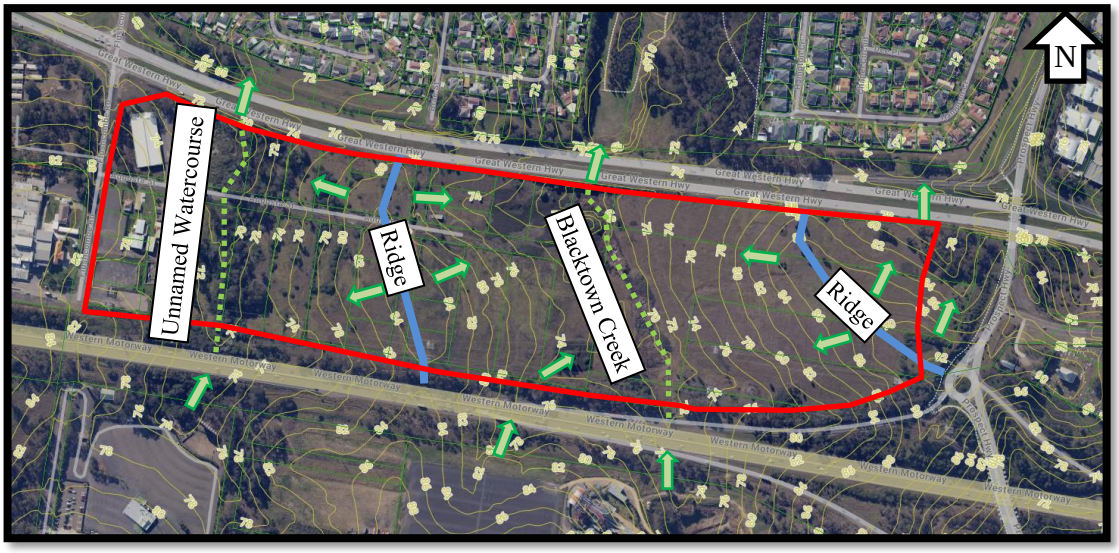


Figure 2.3. Site General overland flow drainage (Source: Nearmap 16 June 2022)

Approximately 4Ha of the site along Flushcombe Road is currently developed with warehouse and other building structures, which would be demolished with this development.

Existing fill material comprising clay material mixed with debris from demolition (e.g. tiles, bricks and glass bottles) were observed during the geotechnical investigation at localised areas, showing some historical disturbance of the existing site.

Augusta Street (asphalt surface) enters the site from Flushcombe road and crosses the existing Unnamed Watercourse over two 900mm dia. RCPs.

There are also various easements and existing services located across the site, most notably being the following:

1. Endeavour Energy's overhead cables and transmission towers spanning from the east to the west along the southern boundary of the site.
2. 100mm dia. CICL Sydney Water potable water pipeline along Augusta Street up to the existing Telstra tower, where the pipeline diverts to the north and eventually cross under the GWH.
3. 500mm and 150mm dia. CICL Sydney Water potable water pipeline along Flushcombe Road.
4. 225mm dia. PP Sydney Water sewer pipeline as well as a Vocus Communication conduit located along the eastern embankment of Blacktown Creek from the south to north.
5. Other services located along Flushcombe Road include Endeavour Energy conduits, Jemena Gas pipelines and NBN conduits.

2.3 Proposed Development

The proposed SSDA seeks approval to redevelop the site to accommodate a warehouse and distribution centre with the following:

The proposed SSDA seeks approval to redevelop the site to accommodate a warehouse and distribution centre use inclusive of the following:

- Site establishment works, including tree removal, minor excavation / bulk earthworks.
- Construction and operation of four (4) new warehouse buildings comprising a multi-level warehouse building on the eastern portion of the site and three single storey warehouse buildings on the western portion of the site. The warehouse buildings will include ancillary office space and indicative warehouse fit out works including warehouse racking.
- The warehouse and distribution tenancies are proposed to be operated 24 hours per day, 7 days per week.
- Other associated works including landscaping, at-grade car parking and general site improvements.
- Business and building identification signage including wayfinding signage.
- Vehicle access provided via Augusta Street and a new proposed access from the Great Western Highway
- Lot consolidation of properties.

The indicative site layout prepared by Pace Architects has been included in **Figure 2.4**.

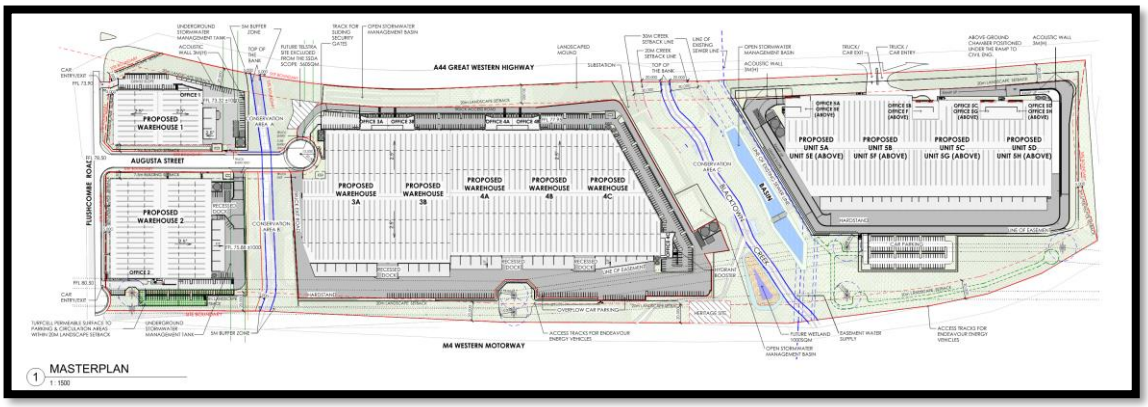


Figure 2.4. Proposed Development – Concept Layout Plan

A variance of +/-1.0m to the final building levels has been shown on the drawings. This variance is included in the concept design drawings to ensure that allowances for items unknown at the concept phase can be included in the overall development earthworks without significant export. Refer to **Section 3.2** for further discussion pertaining to earthworks and spoil allowances.

3 SITE WORKS

3.1 Soil and Geological Conditions

Based on geotechnical investigation by PSM and our knowledge of the area, the site is expected to be underlain by Bringelly Shale of the Wianamatta Group (Rwb) comprising shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.

The 1:100,000 Penrith geological map (1991) also indicated that a diatreme (Jv16) comprising volcanic breccia and basalt is located in close proximity to the site.

The summary of the inferred subsurface conditions encountered in the geotechnical investigation is summarised below in **Figure 3.1** (Source: PSM's Geotechnical Report PSM4636-006L dated 25 August 2023).

Table 3 – Summary of Inferred Subsurface Conditions Encountered in Test Locations

Inferred Unit	Inferred top of unit depth below ground surface (m)	Description
TOPSOIL	0.0	CLAY to Silty CLAY trace gravel: red and brown, high plasticity; gravel sub-angular up to 5 mm, soft to firm consistency, moist to wet condition, rootlets observed.
FILL	0.1 – 0.3	CLAY to CLAY trace gravel: red, grey and brown, low to high plasticity; gravel sub-angular up to 20 mm, soft to very stiff consistency, dry to moist condition, rootlets observed. Some debris from demolition e.g., tiles, bricks and glass bottles were observed at localised areas
NATURAL SOIL	0.0 – 1.8	CLAY to CLAY trace gravel: red, grey and yellow brown, low to high plasticity; gravel sub-angular up to 25 mm, firm to hard consistency, dry to moist condition, with ironstone embedded.
BEDROCK A	1.2 – 3.5	SHALE: red, grey and brown, extremely to slightly weathered, very low to low strength
BEDROCK B	5.7 – 7.6	SHALE: grey and brown, moderately to slightly weathered, low strength

Figure 3.1. Summary of Inferred subsurface conditions encountered in Test Locations (Source: Table 3 in geotechnical report PSM4636-006L)

A maximum fill height of 8.7m and a maximum of -9.4m cut will be encountered across the site during the bulk earthwork operation.

It is recommended that the bulk earthworks be completed in accordance with the PSM bulk earthworks specifications referenced PSM4636-003S. The geotechnical report classifies the site as Class H1 and recommend the Civil- and Structural engineers consider likely heave/settlement due to the effect of climatic factors in the design. The warehouse foundations will need to be found on either stiff clay of suitable strength or engineered fill.

It is expected that some of the existing fill material may need to be re-worked. The extent of re-work (i.e., remove and re-compact as engineered fill) will need to be confirmed on site during detailed investigations.

It is expected that some excavation through rock will be required to reach bulk excavation levels for the development. The rock material is classified as "very low to low" strength.

Acid sulphate soils are not likely to be present on the development site so are not considered to be an issue.

3.2 Bulk Earthworks

Bulk earthworks will be required to facilitate the development of the estate for industrial use. The earthworks will be undertaken to provide large flat building pads, hardstand areas and a car parking areas. Earthworks are also required to raise Augusta Street to a height which is above the 1% AEP flood level to facilitate continuous access via Flushcome Rd/Augusta Street.

A high-level earthwork volume estimate assessment has been completed for the site. The estimated volumes are shown on the Costin Roe drawings in **Appendix A**.

The earthworks analysis has been completed to a level of detail to enable general pad levels to be set and to obtain an order of magnitude cut and fill volume estimate. Given the preliminary nature of the assessment, an upper and lower bound of earthworks volumes has been included to allow for contingency in cost planning estimates. The assessment in **Appendix A** is based on the earthworks using FFL building pad RLs of 73.30m AHD, 76.00m AHD, 78.10m AHD, 79.30m AHD and 82.40m AHD respectively from west to east.

The primary drivers for the proposed earthworks levels are a balance between minimising the extent of retaining walls as well as balancing the earthworks and minimising fill as much as practically possible. As noted earlier (refer **Section 2.3**) a variance of +/-1.0m to the final building levels has been shown on the drawings. This variance is included in the concept design drawings to ensure that allowances for items unknown at the concept phase (such as building spoil generation from construction, geotechnical conditions, final grading designs, service trenching spoil and road box out) can be kept on site, without exporting, and including in the overall development earthworks.

The earthworks volume estimates are as follows:

	Apparent Volume	Upper Bound (+15%)	Lower Bound (-15%)
Cut (m^3)	-347,400	-399,510	-302,087
Fill (m^3)	278,150	319,873	241,870
Balance (m^3)	-69,250	-79,638	-60,217

Table 3.1. Earthwork Volume Estimates

Given the order of magnitude of the volume of earthworks and concept nature of the earthworks modelling, a more balanced cut and fill result is expected to be achievable through a detailed modelling exercise, unless a larger volume of unsuitable material is encountered during the earthworks process. Consideration to bulking of cut materials including rock and clay materials should be allowed for. Bulking of clay would normally be expected to be 4% of the removed volume and rock bulking can be expected in the range of 8-12%.

Earthworks allowances for services trenches, retaining walls and detailed building excavation should also be made to avoid excessive unknown exports during later stages of the project. Allowances in the range of 1,250-2,500m^3/Ha can be expected depending on the type of development and final site layouts. As noted, an upper and lower bound of earthworks volumes has been included to allow for some of these items.

Soil Erosion and Sediment Control measures, including sedimentation basins are to be placed in accordance with submitted drawings and the *Soil and Water Management Plan* in **Section 8** of this report.

All geotechnical testing and inspections performed during the filling operations will be undertaken to Level 1 geotechnical control, in accordance with AS3798-2007.

3.3 Retaining Walls

The civil engineering objective is to minimise retaining walls within the constraints of the masterplan layout, allowable grading to suit industrial development and batters in landscaped areas where possible.

Retaining will be required across the entire site with walls in cut up to 8m in height and walls in fill up to 8m in height. The walls in fill are anticipated to comprise modular masonry block system (Keystone) with reinforced soil backfill and the walls in cut to comprise either contiguous pile walls or reinforced concrete block system.

While Blacktown Development Control Plan 2015 does not apply to the site, the design geometry of walls has been completed in accordance with *Table 6.3* and *Figure 6.3* of Blacktown City Councils *DCP Part E – Development in Industrial Areas, Section 6.2*. Refer **Figure 3.2** below. Retaining walls will be tiered where walls are higher than 3m in height.

Location of retaining walls is shown on drawing **Co13904.03-SSDA500 to SSDA504.**

■ **Controls**

Provision	Control
Embankment batters from property boundary	3m:1m (length to height ratio)
Maximum height of retaining wall elements	3m
Terraced fill greater than 3m in height	1.5m:3m (length to height ratio)

Table 6.3 Cut and fill requirements

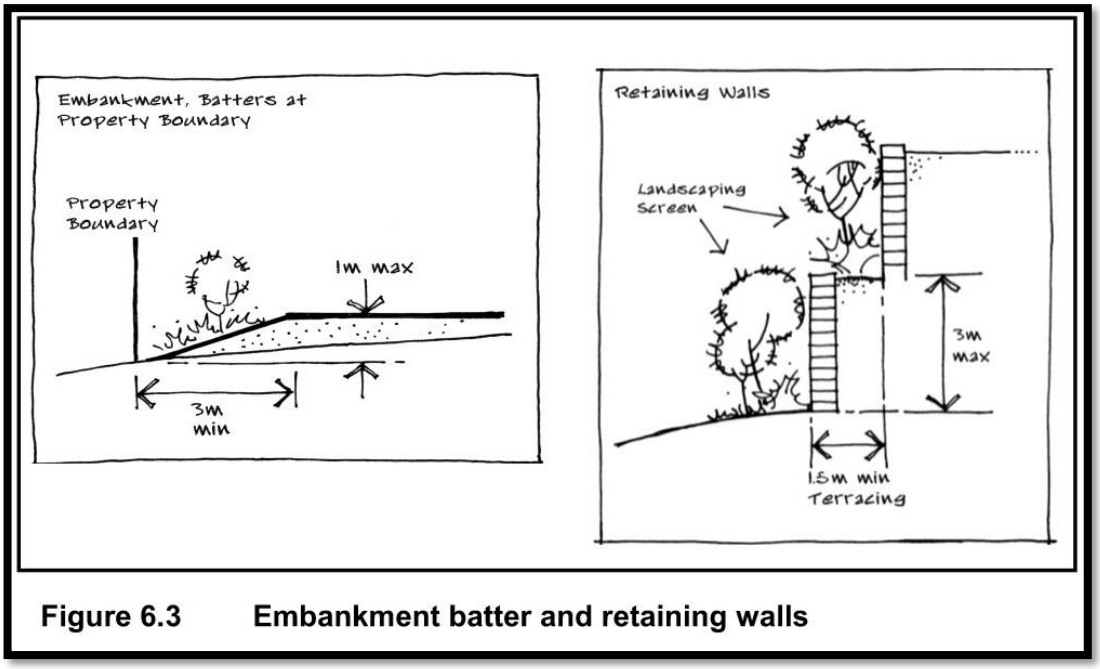


Figure 3.1 DCP *Part E – Development in Industrial Areas* Figure 6.3 & Table 6.3

3.4 Embankment Stability

To assist in maintaining embankment stability permanent batters in clay will be no steeper than 2.5 horizontal to 1 vertical while temporary batters will be no steeper than 2 horizontal to 1 vertical.

Permanent batters will also be adequately vegetated or turfed which will assist in maintaining embankment stability.

Stability of batters and reinstatement of vegetation shall be in accordance with the submitted drawings and the *Soil and Water Management Plan* in **Section 8** of this report.

3.5 Groundwater

Groundwater was identified in a geotechnical investigation completed by PSM which was referenced as *PSM4636-006L*.

The ground water levels were measured by PSM at 3.8mbgl (western portion of the site), 5.9mbgl (centre of the site) and 4.5mbgl (eastern portion of the site). Ground water will be encountered during the bulk earthworks activity during construction. Portions of the building foundations of the warehouses in the centre and on the eastern boundary of the site will be in areas where a deep cut is expected, and ground water will likely be encountered. With no basement for the warehouse proposed, groundwater will likely not be an issue for this development. The development's likelihood to encounter groundwater in the areas of deep cut, impact from groundwater and on groundwater systems as a result of development are to be considered.

Surface water management, including conveyance of surface runoff, management of water quantity (through on-site detention) and water quantity (through on-site and estate wide management systems using WSUD principles and best practice pollution reduction objectives) has been proposed in the design.

3.6 Acid Sulphate Soils and Salinity

An assessment of the potential for acid sulphate soils has been requested as part of the SEAR's requirements.

We note the **JBS&G** report confirms a very low potential for acid sulfate potential and that the management of ASS will not be required.

The **PSM** investigation confirms soils are non-saline to moderately saline.

4 WATER CYCLE MANAGEMENT STRATEGY & DRAINAGE METHODOLOGY

4.1 Key Areas and Objectives

Water Cycle Management (WCM) is a holistic approach that addresses competing demands placed on a region's water resources, whilst optimising the social and economic benefits of development in addition to enhancing and protecting the environmental values of receiving waters.

Developing a WCMS at the SSD stage of the land development process provides guidance on urban water management issues. This WCMS has been prepared to inform DPIE, and relevant stakeholders, that the development is able to provide and integrate WCM measures into the stormwater management strategy for the development.

The key WCM targets which have been adopted in the design are included in **Table 4.1** following, and included in the drawings found in **Appendix A**

Table 4.1. WCM Targets

Element	Target	Reference
Water Quantity	Minimise flooding from increased stormwater runoff due to development	Huntingwood Precinct DCP, Section 4.2.1 which requires OSD in accordance with 'On-Site Detention Handbook' prepared by UPRCT, Fourth Edition, Dec 2005.
Water Quality	Load-based pollution reduction targets based on an untreated urbanised catchment: Gross Pollutants 92% Total Suspended Solids 90% Total Phosphorus 68% Total Nitrogen 47% Total Hydrocarbons 91%	Huntingwood Precinct DCP, Section 4.2.3
Flooding	Buildings set at least 0.5m above the 1% AEP flood level (with culverts 50% blocked). 1% AEP flow path maintained through site. Restoration of degraded creek with the design width and top of bank designed to 1 in 2-year ARI. Creek crossings for driveways, or roads will be subject to DECCW requirements.	Huntingwood Precinct DCP, Section 4.2.4 NSW Floodplain Development Manual.

Element	Target	Reference
	Outside of the riparian zone the trunk drainage will be a pipe designed for the 1 in 100 year ARI flow providing a fail-safe overland flow path dedicated that can convey at least 50% of the pipe flow.	
Stream Health	Stream Erosion Index less than 3.5	Blacktown City Council Part J DCP
Water Supply (Water Conservation)	Reduce Demand on non-potable water uses. Provide 80% reduction of non-potable uses.	Huntingwood Precinct DCP, Section 4.2.2 Blacktown City Council Part J DCP
Construction Stormwater Management & Erosion and Sediment Control	A construction stormwater management plan and appropriate associated erosion and sedimentation control measures must be described in the environmental assessment for all stages of construction to mitigate potential impacts to surrounding properties.	Landcom Blue Book Council DPI

A summary of the how each of the WCM objectives will be achieved are described below. Reference to the relevant sections of the report should be made for further and technical details relating to the WCM measures:

- *Stormwater Quantity Management (Refer **Section 5**)*

  The intent of this criterion is to reduce the impact of urban development on existing drainage system by limiting post-development discharge within the receiving waters to the pre-development peak, and to ensure no affectation of upstream, downstream, or adjacent properties.

  Attenuation of stormwater runoff from the development is required in accordance with on-site detention requirements established in the "On-Site Stormwater Detention Handbook" prepared by the Upper Parramatta River Catchment Trust Fourth Edition dated December 2005 (UPRCT).

  Refer to **Section 5** of the document for further discussion pertaining to water quantity management.

- *Stormwater Quality Management (Refer **Section 6**)*

  There is a need to target pollutants that are present in stormwater runoff to minimise the adverse impact these pollutants could have on downstream receiving waters.

  The required pollutant reductions are included in **Table 4.1** of this document and MUSIC modelling has been completed to confirm the reduction objectives can be met for the estate. We note the pollutant reduction requirements included in the Huntingwood Precinct DCP are greater than those adopted in Councils 2020 WSUD Guidelines for

Development and Part J DCP. The higher level of treatment is noted to be required to offset for untreated parts of the catchment (including roadways).

A series of Stormwater quality improvement devises (SQID's) have been incorporated in the design of the estate. The proposed management strategy will include the following measures:

- Primary treatment of external areas will be made via pit inserts or GPT's.
- Tertiary treatment of the development will be made via bioretention basins where there is available space as well as via one of two proprietary treatment systems where space is limited. The second mentioned treatment systems are proposed to be syphon actuated filtration systems housed in underground tanks.
- Discharge into watercourses as noted in previous sections of the report will occur following treatment which meets the Huntingwood DCP pollution targets. Refer to drawings in the **Co13904.03-SSDA400s** series.
- Some treatment will also be present by provision of rainwater reuse tanks on development sites through reuse and settlement within the tanks.

Reference to **Section 6** of this document should be made for detailed Stormwater Quality modelling and measures.

- *Flood Management (refer **Section 7**)*

  The proposed development considered flooding and large rainfall events in relation to the two watercourses through the site (with 50% blockage of the existing culverts), and local runoff and overland flow paths including the overland flow from the upstream catchments to the south of the site (west of the Western Motorway).

  Consideration to flood requirements has been made per the Huntingwood Precinct DCP and NSW Floodplain Development Manual. Refer **Section 7** for details.

  The following measures have been incorporated in the design:

  - All buildings are sited 500mm above the 1% AEP design flood level of local flow paths.
  - Overland flow paths to manage runoff in large storm events have been made including achieving at least 500mm freeboard to building levels from the flow paths. We note that generally a greater level of flood immunity is available to the development sites than that required by flood planning policy. As such appropriate and acceptable level of flood risk to the development is available.

- *Stream Health (refer **Section 6.4**)*

  Stream Erosion Index (SEI) calculation has been made, in accordance with the methodology set out in Blacktown City Councils Water Sensitive Urban Design Handbook (2020). Blacktown City Council Require that the post development duration of stream forming flows shall be no greater than 3.5 times the pre-development duration of stream forming flows with a stretch target of 1.

- *Water Demand Reduction/ Rainwater Reuse (refer **Section 6.6**)*

  Rainwater reuse measures will be provided as part of future building development designs. Rainwater reuse will be required to reduce demand on non-potable uses by 80%. The

reduction in demand will target non-potable uses such as toilet flushing and irrigation. **Refer Section 6.6**.

- *Stormwater Management During Construction (refer **Section 8**)*

  A construction stormwater management plan and associated erosion and sediment control measures is proposed based on *Landcom Blue Book* and Council requirements. The management measures take a staged approach from initial site establishment, construction stages and the period between the completion of the estate infrastructure works and development of individual lots.

4.2 Existing Site Drainage

The majority of the site is currently undeveloped industrial zoned land, which has been described in **Section 2.2**, with the exception of the 4Ha parcel of land currently developed with warehouses, four abandoned residential dwellings and other infrastructure.

The existing site generally grades from two ridges on the site, draining east and west from the ridgeline, towards the a riparian corridor and drainage swale, which drains from the south to the north, as seen in **Figure 2.3**.

Discharge from the site is via Blacktown Creek, the Unnamed Watercourse and a small portion draining towards the existing stormwater infrastructure in the north-eastern corner of the site. The drainage under the GWH via existing culverts from both the Blacktown Creek and the Unnamed Watercourse is controlled with fitted aperture plates shown in the diagrams below (Source: Flood Study and Stormwater Management by Hyder Consulting, 18 January 2010).

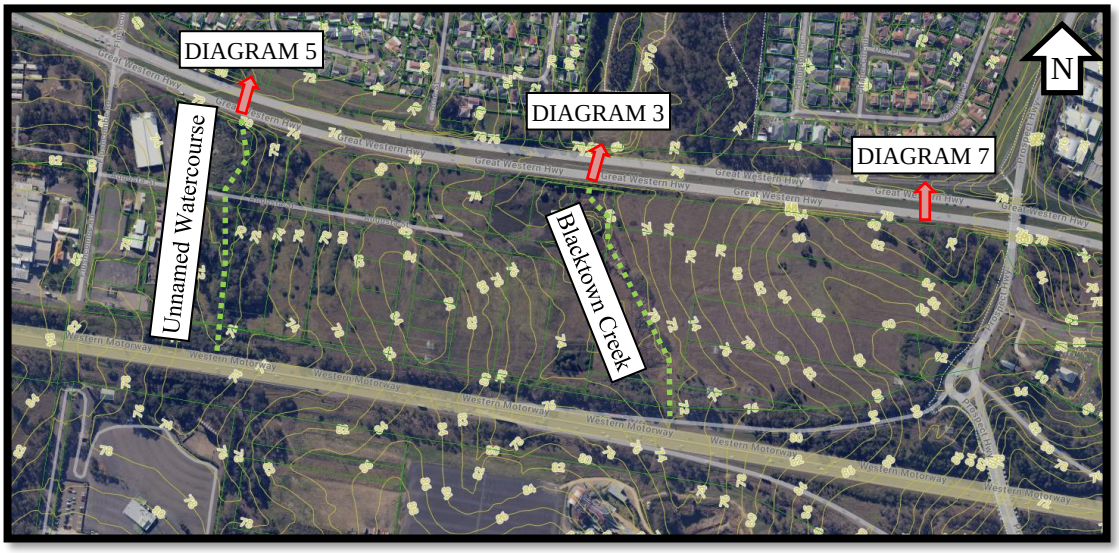


Figure 4.1 Locations of culverts under GWH (details of culverts shown in Figures 4.2 below obtained from Flood Study and Stormwater Management by Hyder Consulting, 18 January 2010)

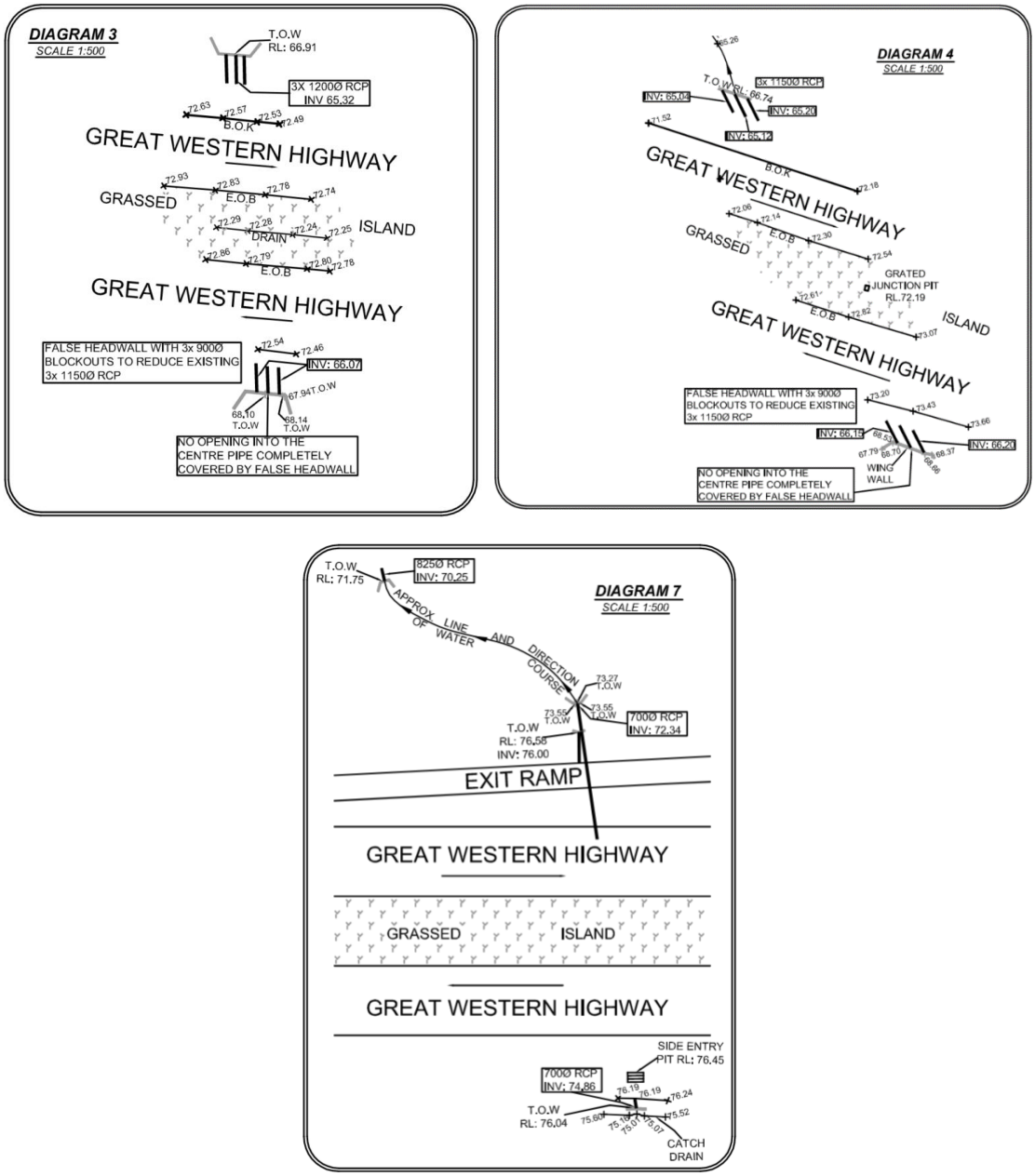


Figure 4.2 Details of culverts under GWH obtained from Appendix G in the Flood Study and Stormwater Management by Hyder Consulting, 18 January 2010

The remainder of the site has minimal existing formal inground drainage systems (mostly contained within the 4Ha of developed site to the west of the site). These systems are anticipated to be decommissioned as part of the development of the new pads, unless determined to be of value as part of the future development.

It is noted that the design allowances for the trunk drainage system is based on a design capacity which allows for the 1% AEP design flow and 50% blockage of both inlet pits and the culvert system. Further discussion on the system and overland flow considerations is included in **Section 7**.

4.3 Proposed Surface Water Drainage System

As required by the Huntingwood DCP, trunk drainage outside of the riparian zone will be a pipe designed for the 1% AEP (1 in 100 year ARI) flow providing a fail-safe overland flow path dedicated that can convey at least 50% of the pipe flow. This results in the trunk piped system being able to convey all stormwater runoff up to and including the 1% AEP event.

A typical major (1% AEP overland) and minor (5% AEP inground) drainage system, typically adopted as general engineering practice and the minimum requirements of Council, to safely and efficiently convey collected stormwater run-off from the development to the legal point of discharge as such is not relevant for this site, given the minor system in this instance caters for the capacity of the major.

We note that emergency overland flow paths (i.e., those for events greater than the 1% AEP) have been considered in the design layout. The major system will employ the use of defined overland flow paths, such as roads and open channels, to safely convey excess run-off from the site.

The design of the stormwater system for this site will be based on relevant national design guidelines, Australian Standard Codes of Practice, the standards of PCC and accepted engineering practice. Runoff from buildings will generally be designed in accordance with *AS 3500.3 National Plumbing and Drainage Code Part 3 – Stormwater Drainage*. Overall site runoff and stormwater management will generally be designed in accordance with the Institution of Engineers, Australia publication "*Australian Rainfall and Runoff*" (2019 Edition), Volumes 1 and 2 (AR&R).

Water quality and re-use are to be considered in the design to ensure that any increase in the detrimental effects of pollution is mitigated, Council Water Quality Objectives are met and that the demand on potable water resources is reduced.

The proposed drainage system will be required to convey the overland flow from upstream catchments south of the property through the site.

The legal point of discharge is a point specified by Council where stormwater from a property can be discharged. The legal point of discharge is usually Council's stormwater infrastructure (where available), the street kerb and channel for smaller developments or downstream receiving waters like an existing stream or gully, lake, pond or waterbody. Legal points of discharge for this site is via the existing Blacktown Creek culvert, the Unnamed Watercourse culvert and the culvert located in the north-eastern corner of the site, all draining from the site, under the GWH.

With reference to the drawings in **Appendix A,** the drainage system proposed can be described as follows:

- Minor System (On-lot piped drainage): 5% AEP
- Major System (Overland Flow): 1% AEP
- Trunk drainage system designed to the 1% AEP (1 in 100yr ARI);
- Site discharge via the existing inter-allotment drainage system culverts under the GWH.
- Treatment of stormwater via rainwater tanks (portion of the roof), pit inserts, bioretention basins and/or one of two proprietary filtration systems where space is limited.
- Conveyance of overland flow from the site and upstream catchments via hardstands, parking areas and other roads to the existing riparian corridors within the site.

4.4 Hydrologic Modelling and Analysis

4.4.1 Rainfall Data

Rainfall intensity Frequency Duration (IFD) data used as a basis for DRAINS modelling and initial pipe sizing based on rational method assessments for the 2 to 100 Year ARI events, was taken from The Bureau of Meteorology Online IFD Tool.

4.4.2 Runoff Models

In accordance with the recommendations and standards of Council, the calculation of the runoff from storms of the design ARI has been calculated with the catchment modelling software DRAINS for internal drainage only.

Detailed hydraulic assessment of the internal drainage system will be calculated at detail/ construction certificate stage.

The design parameters for the DRAINS model are to be based on the recommendations as defined by council and parameters for the area and are as follows:

Table 4.2. DRAINS Parameters

Model	Model for Design and analysis run	Rational method	
	Rational Method Procedure	ARR2019	
	Soil Type-Normal	3.0	
	Paved (Impervious) Area Depression Storage	1	mm
	Supplementary Area Depression Storage	1	mm
	Grassed (Pervious) Area Depression Storage	5	mm
AMC	Antecedent Moisture Condition (ARI=1-5 years)	2.5	
AMC	Antecedent Moisture Condition (ARI=10-20 years)	3.0	
AMC	Antecedent Moisture Condition (ARI=50-100 years)	3.5	
	Sag Pit Blocking Factor (Minor Systems)	0	
	On Grade Pit Blocking Factor (Minor Systems)	0	
	Sag Pit Blocking Factor (Major Systems)	0.5	
	On Grade Pit Blocking Factor (Major Systems)	0.2	

4.5 Hydraulics

4.5.1 General Requirements

Hydraulic calculations will be carried out utilising DRAINS modelling software during the detail design stage to ensure that all surface and subsurface drainage systems perform to or exceed the required standard.

4.5.2 Freeboard

The calculated water surface level in open junctions of the piped stormwater system will not exceed a freeboard level of 150mm below the finished ground/ grate level, for the peak runoff from the Minor System runoff.

The calculated water surface for the peak runoff from the Major System runoff will not exceed a freeboard level of 500mm below the finished floor level of the building.

4.5.3 Public Safety

For all areas subject to pedestrian traffic, the product (dV) of the depth of flow d (in metres) and the velocity of flow V (in metres per second) will be limited to 0.4, for all storms up to the 100-year ARI.

For other areas, the dV product will be limited to 0.6 for stability of vehicular traffic (whether parked or in motion) for all storms up to the 100-year ARI.

4.5.4 Inlet Pit Spacing

The spacing of inlets throughout the site will be such that the depth of flow, for the Major System design storm runoff, will not exceed the top of the kerb (150mm above gutter invert).

4.5.5 Overland Flow (development lots)

Dedicated flow paths have been designed to convey all storms up to and including the

100-year ARI. These flow paths will convey stormwater from the site to the detention systems prior to discharge.

5 WATER QUANTITY MANAGEMENT

Blacktown City Council's Huntingwood Precinct DCP and Water Sensitive Urban Design (WSUD) 2020 Developers Guideline require management of stormwater quantity for developments, with the intent of minimising flooding from the increased stormwater run-off due to the development.

Water quantity management may be made by providing a stormwater detention system (i.e., on-site detention), to limit the runoff discharged from private property or to provide an assessment which confirms on-site detention is not necessary for the development. It is noted that the DCP requires the OSD designs to be in accordance with the "*On-Site Stormwater Detention Handbook - Fourth Edition dated December 2005*" prepared by the Upper Parramatta River Catchment Trust (UPRCT). Further consultation with Blacktown (E-mail 20 June 2022 (Laith Almoil), confirming that the OSD Deemed to Comply excel spreadsheet version 1.9 is an appropriate version and should be used to calculate the OSD parameters (refer **Appendix J**).

The site is divided into seven catchments for on-site detention calculations, with three upstream catchments to the south and a section of the Western Motorway draining through the site. The upstream catchment (22.01Ha) associated with the water park, has an existing Stormwater attenuation basin located before the discharge point into the development site. We note existing catchments upstream of the site bypass any site detention systems and do not form part of the OSD calculations for the development. Refer to **Figure 5.1** below showing the approximate catchments and sizes.

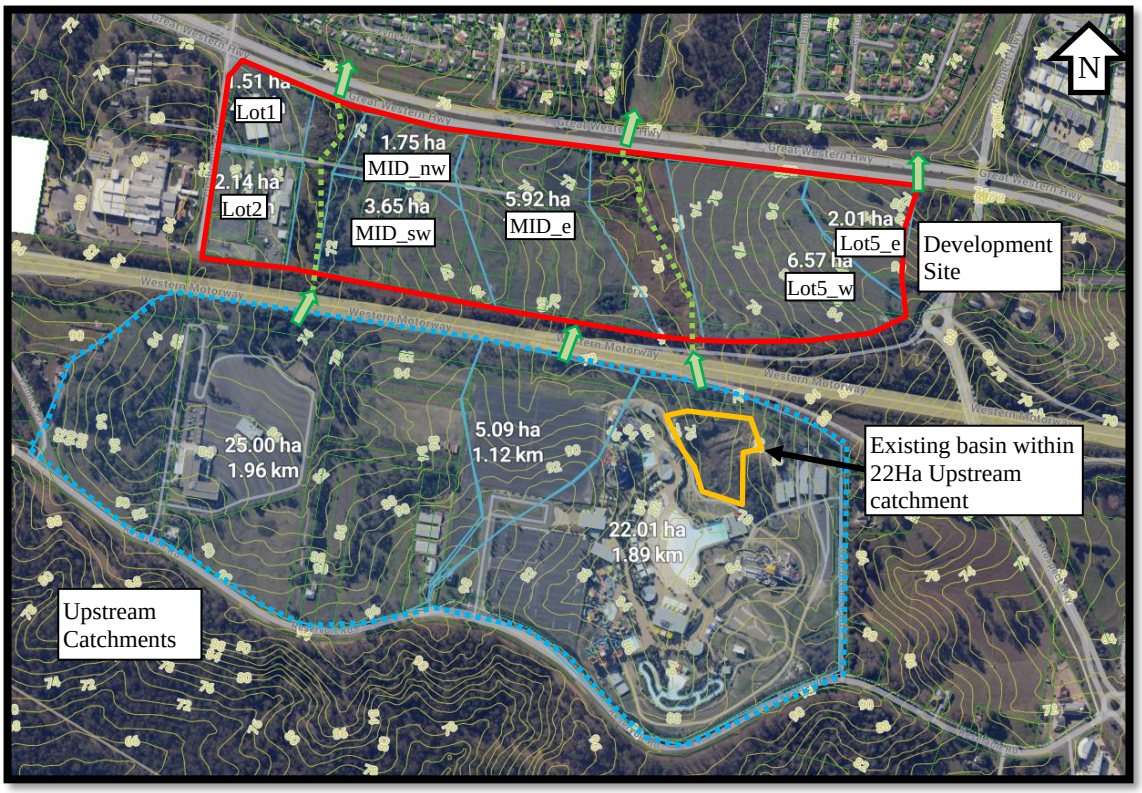


Figure 5.1 Existing Catchments (source: Mecone Mosaic 2022)

Table 5.1. OSD Volume Requirements

Catchment Name	Site Area to OSD (Ha)	Required Storage below Emergency Overflow Weir (m3)
Catchment 1 (Warehouse 1)	1.21	555
Catchment 2 (Warehouse 2)	2.15	995
Catchment 3A (Warehouse 3)	1.03	470
Catchment 3B (Warehouse 3)	2.93	1335
Catchment 4 (Warehouse 4)	5.41	2465
Catchment 5A (Warehouse 5)	4.78	2210
Catchment 5B (Warehouse 5)	2.01	915

Of the total 26.6Ha development size, approximately 4.50Ha existing landscaped areas located along the boundaries of the site will remain landscaped areas sloping away from the development, bypassing the OSD storage, in addition to the 2.58Ha of area covered by the Blacktown Creek, the Unnamed watercourse and Augusta Street. These areas of the site are sloped to eventually discharge into Blacktown creek and the Discharge swale on the west.

Blacktown Council's Mr. Laith Almoil was contacted to obtain Blacktown Council's latest '*OSD Deemed to Comply Tool*' and to confirm that this should be used to determine the On-site detention (OSD) requirements and to design the OSD tank. Mr. Almoil confirmed the above requirements in an e-mail attached under **Appendix H**.

The Q100 flood level at the respective discharge points is summarised in the table below:

Table 5.2. Approximate Q100 Flood Levels at respective discharge points

Catchment Name	Approximate Q100 Level (m ADH)
Catchment 1 (Warehouse 1)	RL69.00
Catchment 2 (Warehouse 2)	RL71.40
Catchment 3A (Warehouse 3)	RL68.90
Catchment 3B (Warehouse 3)	RL69.65
Catchment 4 (Warehouse 4)	RL69.40
Catchment 5A (Warehouse 5)	RL70.50
Catchment 5B (Warehouse 5)	RL76.50

Refer to drawing **Co13904.03-SSDA400-404** for location of OSD systems and **Appendix J** for calculations.

6 STORMWATER QUALITY, REUSE AND MAINTENANCE

6.1 Stormwater Quality Objectives

There is a need to provide a design which incorporates the principles of Water Sensitive Urban Design (WSUD) and to target pollutants that are present in the stormwater so as to minimise the adverse impact these pollutants could have on receiving waters and to also meet the requirements specified by Council.

Blacktown City Council has nominated, in the *Huntingwood Precinct DCP*, the requirements for stormwater quality to be performed on a catchment wide basis. These are presented in terms of annual percentage pollutant reductions on a developed catchment and are included in **Table 4.1**.

6.2 Proposed Stormwater Treatment System

Developed impervious areas including roof, hardstand, car parking, roads and other extensive impervious areas are required to be treated by the Stormwater Treatment Measures (STM's). The STM's shall be sized according to the whole catchment area of the development. The STM's for the development shall be based on a treatment train approach to ensure that all the objectives above are met.

Components of the treatment train for the development are as follows:

- Primary treatment to the parking, roof, and hardstand areas is to be performed via the provision of pit inserts to all grated pits;
- Tertiary treatment is to be performed via Bio-retention basins prior to discharge from the site Catchments 3A, 4&5A, and to a proprietary filtration treatment system (Ocean Protect Stormfilters (or approved equivalent))in the new OSD tanks for catchments 1, 2, 3B and 5B, prior to discharge;
- A portion of the roof will also be treated via rainwater reuse and settlement within the rainwater tank.

6.3 Stormwater Quality Modelling

The MUSIC model was chosen to model water quality. By simulating the performance of stormwater management systems, MUSIC can be used to predict if the proposed systems and changes to land use are appropriate for their catchments and capable of meeting specified water quality objectives (CRC 2002). The water quality constituents modelled in MUSIC, of relevance to this report, include Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN).

The pollutant retention criteria set as required by Council and nominated in **Section 4.1** of this report were used as a basis for assessing the effectiveness of the selected treatment trains.

The parameters used in the MUSIC model are presented in **Appendix B**. **Figure 6.1 to Figure 6.7** below shows the MUSIC model layout. The biodiversity areas and riparian corridors have been excluded from the MUSIC model.

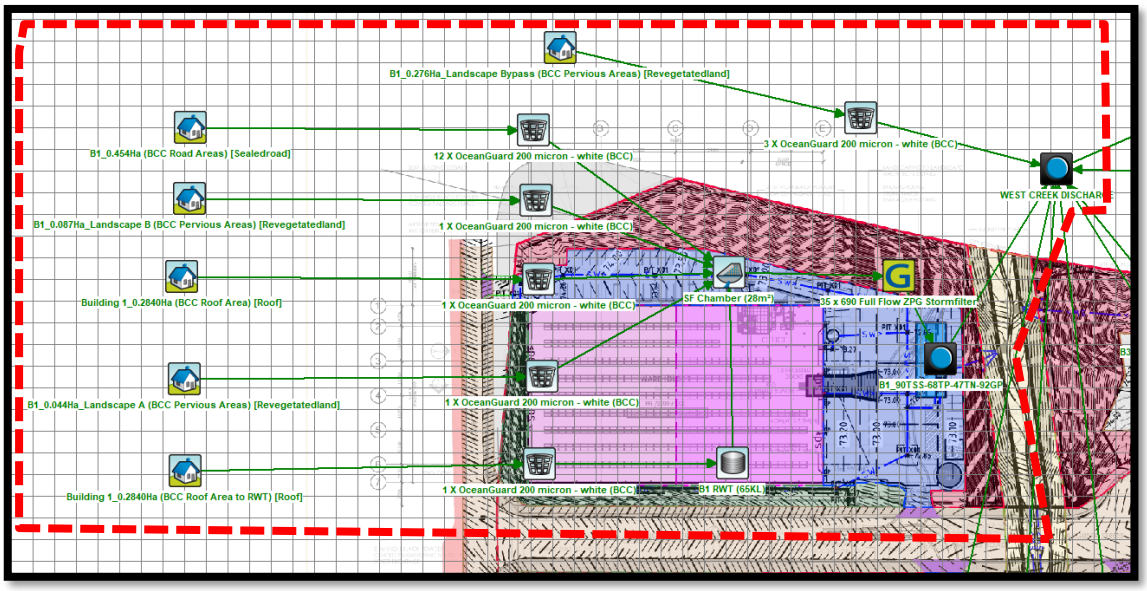


Figure 6.1. MUSIC model layout (Catchment 1)

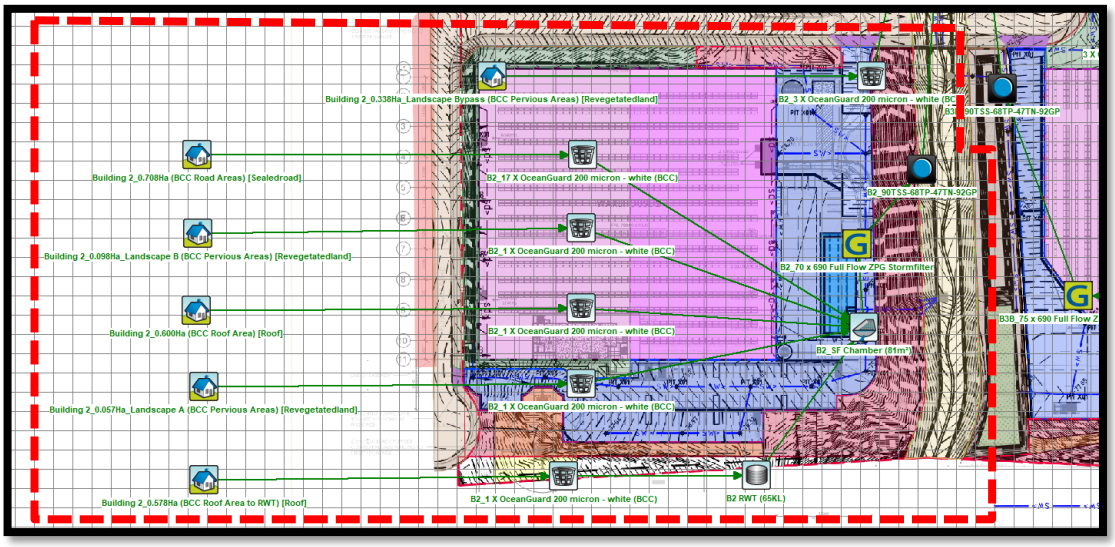


Figure 6.2. MUSIC model layout (Catchment 2)

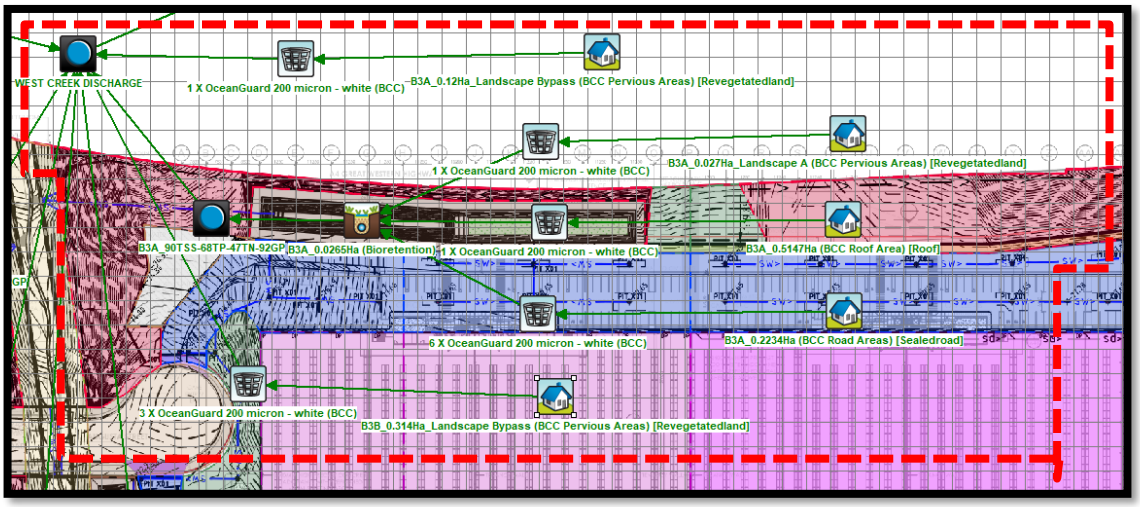


Figure 6.3. MUSIC model layout (Catchment 3A)

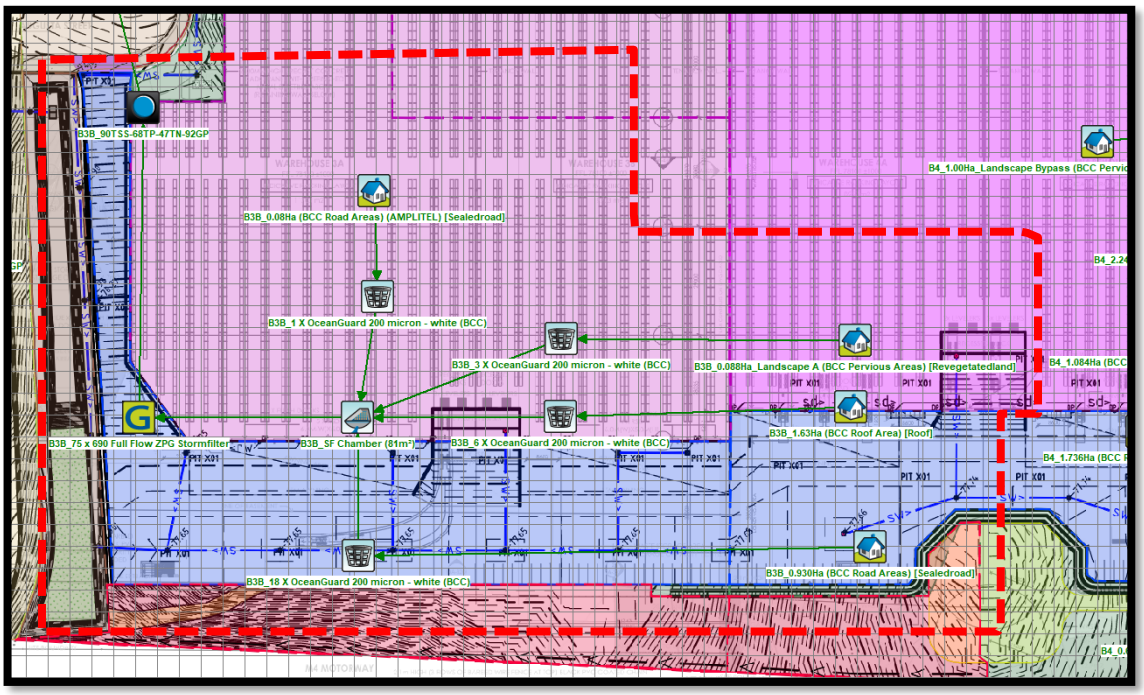


Figure 6.4. MUSIC model layout (Catchment 3B)

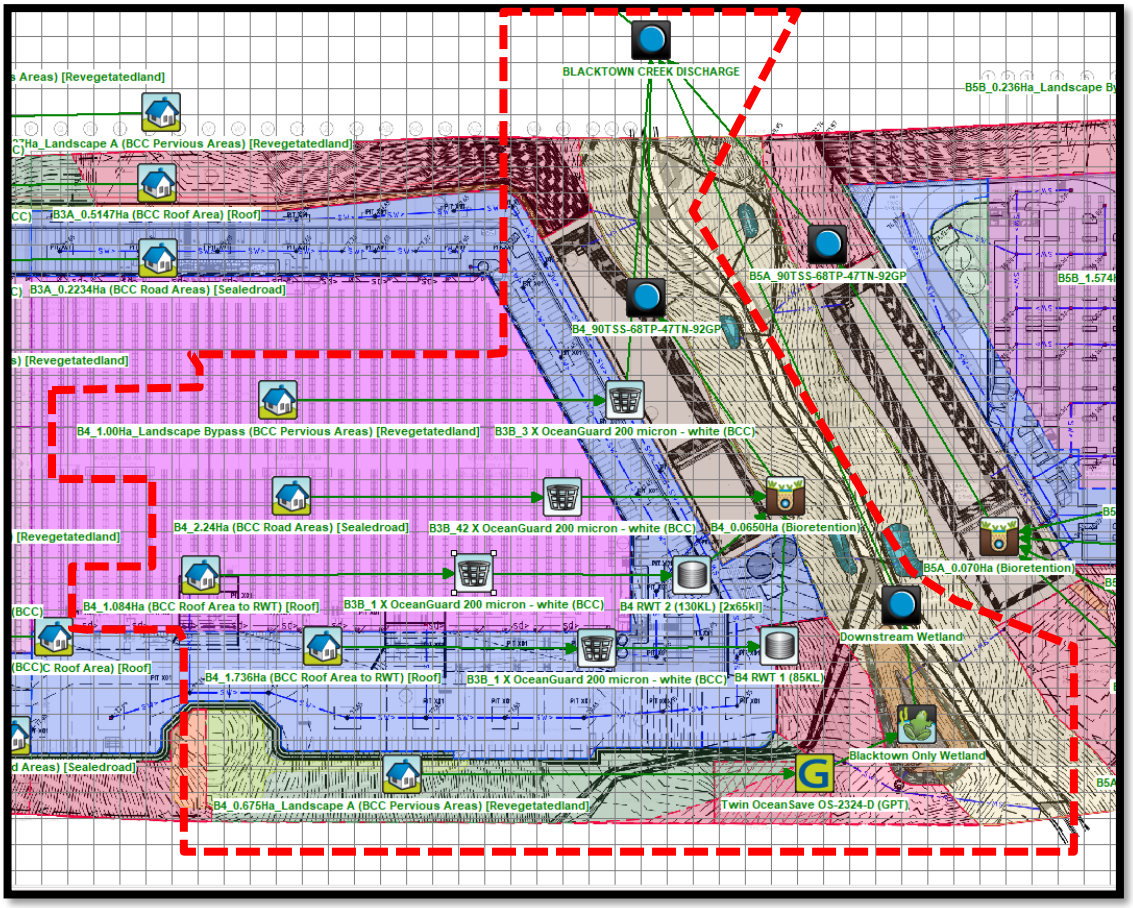


Figure 6.5. MUSIC model layout (Catchment 4)

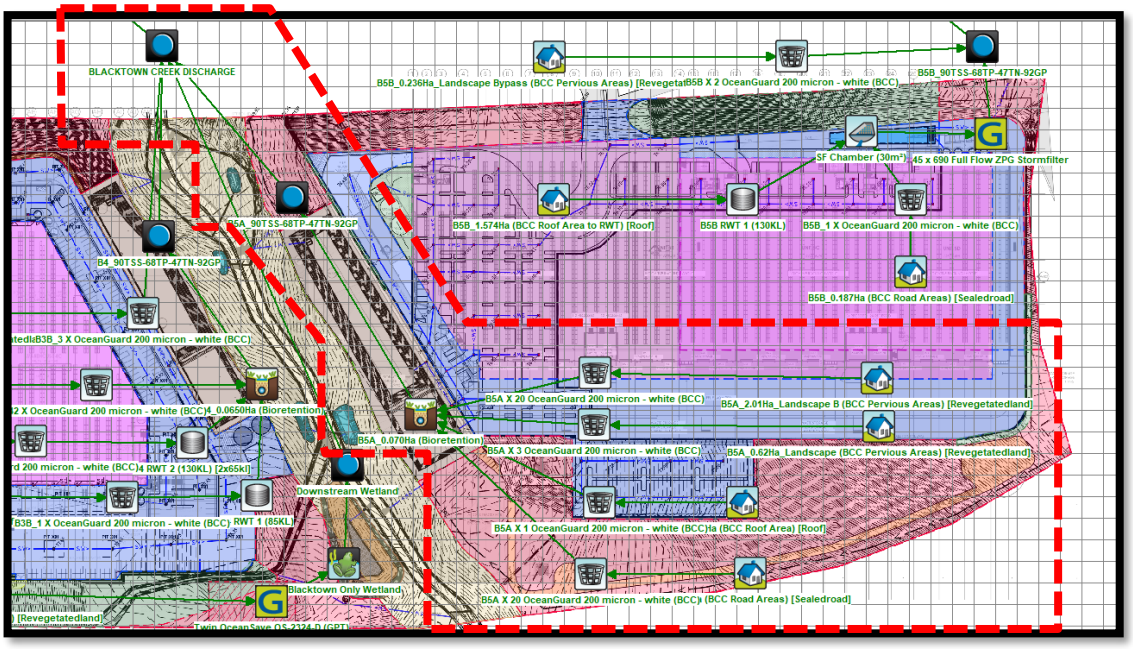


Figure 6.6. MUSIC model layout (Catchment 5A)

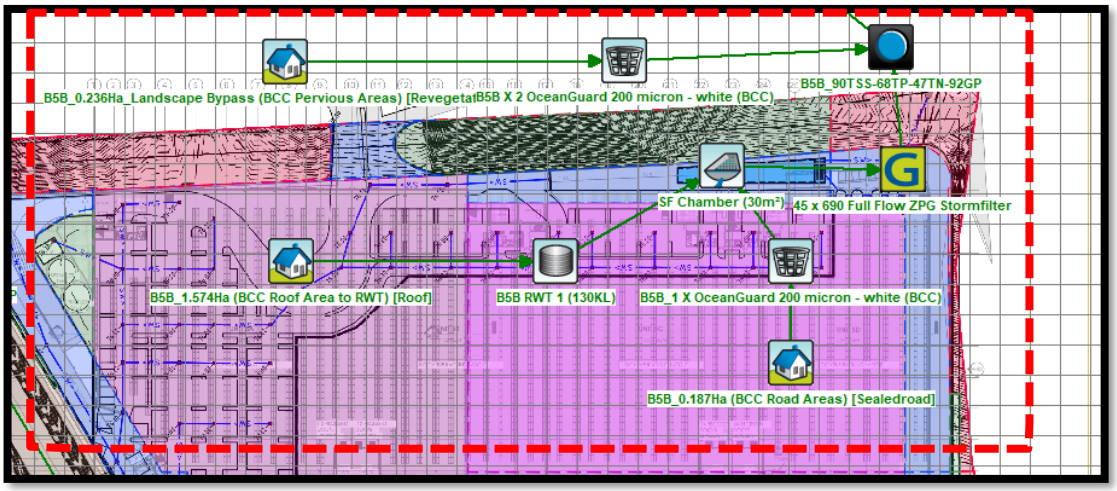


Figure 6.7. MUSIC model layout (Catchment 5B)

Table 6.1 shows the results of the MUSIC analysis. The reduction rate is expressed as a percentage and compares the post-development pollutant loads without treatment versus post-development loads with treatment.

Table 6.1. MUSIC analysis results - % reductions

	Source	Residual Load	% Reduction
Total Suspended Solids (kg/yr) (TSS)	19900	1740	91.2
Total Phosphorus (kg/yr) (TP)	42.4	12.0	71.7
Total Nitrogen (kg/yr) (TN)	300	140	53.4
Gross Pollutants (kg/yr) (GP)	3200	0	100

MUSIC modelling has been performed to assess the effectiveness of the selected treatment trains and to ensure that the pollutant retention requirements of Precinct's DCP have been met.

The MUSIC modelling has shown that the proposed treatment train of STM will provide stormwater treatment which will meet Council's and typical growth centre water quality reduction objective requirements in an effective and economical manner.

Given the expected low source loadings of hydrocarbons and oil/grease and removal efficiencies of the treatment devices we consider that the requirements of the Council have been met. Further discussion on hydrocarbons can be found in **Appendix B.**

6.4 Stormwater Harvesting

Stormwater harvesting refers to the collection of stormwater from the developments internal stormwater drainage system for re-use in non-potable applications. Stormwater from the

stormwater drainage system can be classified as either rainwater where the flow is from roof areas, or stormwater where the flow is from all areas of the development.

For the purposes of this development, we refer to a rainwater harvesting system, where benefits of collected stormwater from roof areas over a stormwater harvesting system can be made as rainwater is generally less polluted than stormwater drainage.

Rainwater harvesting is proposed for this development with re-use for non-potable applications. Internal uses include such applications as toilet flushing while external applications will be used for irrigation. The aim is to reduce the water demand for the development by 80%.

In general terms the rainwater harvesting system will be an in-line tank for the collection and storage of rainwater. At times when the rainwater storage tank is full rainwater can pass through the tank and continue to be discharged via gravity into the stormwater drainage system. Rainwater from the storage tank will be pumped for distribution throughout the development in a dedicated non-potable water reticulation system. This however would be subject to future detail design.

Rainwater tanks have been designed, using MUSIC software to balance the supply and demand, based on the below base water demands and to provide 80% reduction in non-potable water demand. Rainwater tank reuse demands were calculated based on typical water demands of toilets and irrigation of landscaped areas. Water demands for toilets was calculated using 0.1kL/day/ toilet. Water demands for irrigation of landscaped areas was calculated using 0.4kL/year/m^2.

6.4.1 Rainwater Tank Sizing

The use of rainwater reduces the mains water demand and the amount of stormwater runoff. By collecting the rainwater run-off from roof areas, rainwater tanks provide a valuable water source suitable for flushing toilets and landscape irrigation.

Rainwater tanks have been designed, using MUSIC software to balance the supply and demand, based on the calculated base water demands and proposed roof catchment areas. Allowances in the MUSIC model has been made for high flow bypass which will be managed by 300mm downpipe roofwater collection configuration along a portion of each of the warehouses.

Table 6.2. Rainwater Reuse Requirements

Warehouse	Roof Catchment (Ha)	Highflow Bypass (L/s)	Tank Size in MUSIC (kL)	Predicted Demand Reduction (%)	Provided Tank (kL)
Warehouse 1	0.284	100	50kl	84	65kl
Warehouse 2	0.578	100	60kl	82	65kl
Warehouse 3&4	2.820	100	195kl	81	2x65kl 1x85kl
Warehouse 5	1.574	100	115kl	81	2x65kl

The MUSIC model, results summarised in **Table 6.2**, predicts that the reuse demands of 80% will be met for the development with the provision of minimum rainwater tank sizes noted above.

Table 6.3. Water Demand

Warehouse	Irrigation Area (m2)	Irrigation (Annual Demand (kl/yr)	No. of Toilets estimated (No.)	Daily Demand (kL/day)
Warehouse 1	1313	525	4	0.4
Warehouse 2	2018	807	5	0.5
Warehouse 3&4	7655	1837 1225	9	0.4 0.5
Warehouse 5	5000	2000	30	3

We note that the final configuration and sizing of the rainwater tanks is subject to detail design considerations and optimum site utilisation.

6.5 Stream Erosion Index (SEI)

Blacktown Council's WSUD developer handbook confirms that SEI will not be required where permanent on-site stormwater detention is provided using Blacktown Council's spreadsheet (Appendix J), providing a low flow orifice sized at 50% AEP and with a total minimum storage volume of 300m3/Ha for the 50% AEP event. The development site also includes Rainwater tanks supplying 80% of non-potable water demand (see section 6.4.1) & Bioretention basins to Catchments 3A, 3B, 4 & 5A in its proposed treatment train process.

6.6 Maintenance and Monitoring

It is important that each component of the stormwater system and water quality treatment train is properly operated and maintained. In order to achieve the design treatment objectives, an indicative maintenance schedule has been prepared and included as **Appendix C** to assist in the effective operation and maintenance of the various water quality components.

Inspection frequency may vary depending on site specific attributes and rainfall patterns in the area. In addition to the nominated frequency, it is recommended that inspections are made following large storm events.

7 FLOODING AND OVERLAND FLOW

7.1 Introduction

A review of overland flow and flooding in relation to the proposed development has been completed. The assessment confirms the requirements of Blacktown City Council's DCP and assessments as required of the SEAR's have been met.

Our review and assessment have been based on a review of the detail survey, the proposed development, and assessment of the site in relation to the flood modelling and documented flood behaviour included in the flood study completed by Hyder in 2010 for the development

area (document ref: DN00214). This flood study was completed in support of a rezoning application for the Huntingwood East Precinct to form part of the required documentation regarding flooding and stormwater management to prepare a Precinct Plan.

One riparian corridor drain through the site from south to north, being Blacktown Creek to the east, and an unnamed drainage swale to the west (hereon referred to as Drainage Swale) to the west, both being tributaries of the Parramatta River. An upstream catchment from the opposite side of the M4 Motorway to the south discharges into the creeks through three sets of headwalls and pipes underneath the motorway, two into Blacktown Creek and one into the Drainage Swale. At the downstream site boundary to the north, each creek is discharged through a set of pipes underneath the Great Western Highway. Blacktown Creek discharges into another riparian corridor adjacent to some residential properties, and the Drainage Swale discharges as overland flow through residential properties.

In its existing condition, the creeks are responsible for conveyance of flood waters towards the Parramatta River and provide some degree of flood storage within the site boundaries. Realignment of the creeks is proposed to fit the architectural scheme and has been designed to ensure negligible flood affectation as a result of the development.

An overland flow assessment and two-dimensional flood model (TUFLOW) has been completed in relation to the overland flow path and the creeks in the existing and realigned condition. The following sections of the report describe the catchment description, flood description and proposed flood management.

Detailed technical information pertaining to the TUFLOW modelling and output completed by our office is included in **Appendix I**.

We have included the following items as part of our review:

• Hyder (2010) – Flood Study and Stormwater Management – Huntingwood East Precinct, Blacktown (document ref: DN00214)

• Review of Councils Floodplain Management Policy in relation to the development including review of potential impacts of the development on existing flooding, and potential impacts on the development from flooding.

7.2 Hyder Flood Study 2010

Extracts of flood behaviour within the site creeks were obtained from a flood study prepared by Hyder in 2010. The study involved a hydrological and hydraulic assessment of the catchment at a local level.

We provide excerpts associated with the 1% AEP storm event from the Flood Study in **Figure 7.1** and **Figure 7.2** to provide a localised overview of the flood conditions over the development site. **Figure 7.1** is noted to be an excerpt of the 1% AEP flood depths and levels and **Figure 7.2** is the 1% AEP flood hazard.

Discussion on flood behaviour are made in **Section 7.3**.



Figure 7.1. Hyder Flood Study – 1% AEP Flood Extent

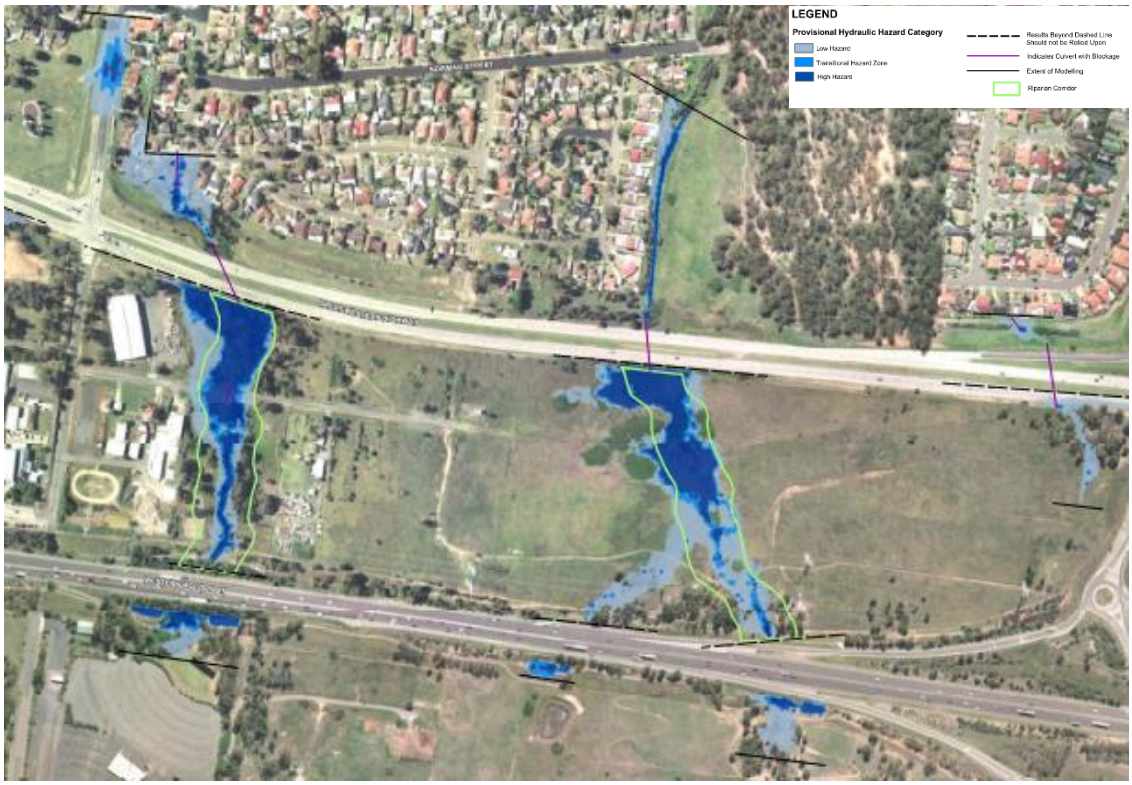


Figure 7.2. Hyder Flood Study – 1% AEP Flood Hazard Map

7.3 Existing Overland Flow and Flood Behaviour

Hyder's flood assessment confirms that the site is a major overland flow path in the 1% AEP flood event, conveying water from upstream catchments to the south towards Parramatta River. The contributing catchments total approximately 55Ha and are split across the two creeks. With reference to **Figure 7.1**, flood water enters through existing stormwater infrastructure constructed underneath the M4 Motorway and converges in the creeks on site. From the flood study, flood levels within the site range from 70m to 75m AHD, reaching depths of up to 4.3m towards the downstream end.

Given the above, the site is shown to be impacted by flooding during the 1% AEP and in more intense storm events. Additional modelling has been conducted to determine the effect of the proposed development on the existing flood behaviour.

7.4 Costin Roe Consulting Modelling

7.4.1 Introduction

A detailed site specific TUFLOW model of the pre and post development conditions has been completed by Costin Roe Consulting. The assessment being completed with consideration to Blacktown City Council's WSUD developer handbook (2020) and – Engineering Guide for Development. Technical parameters and detail included in the TUFLOW model are included as **Appendix I.**

The pre-developed model has been prepared utilising the flood levels and hydrographs as completed by our office, which has been verified against the flood information derived from a flood study completed by Hyder in 2010. Post development modelling has been completed with the introduction of the proposed development. Flood plans showing detailed pre-development and post-development results for the modelled storm events are attached in **Appendix I2**.

7.4.2 Pre-Development 1% AEP

Reference to **Figure 7.3** shows the pre-developed 1% AEP output for depth and levels. **Figure 7.4** shows velocity and **Figure 7.5** show true hazard categorisation.

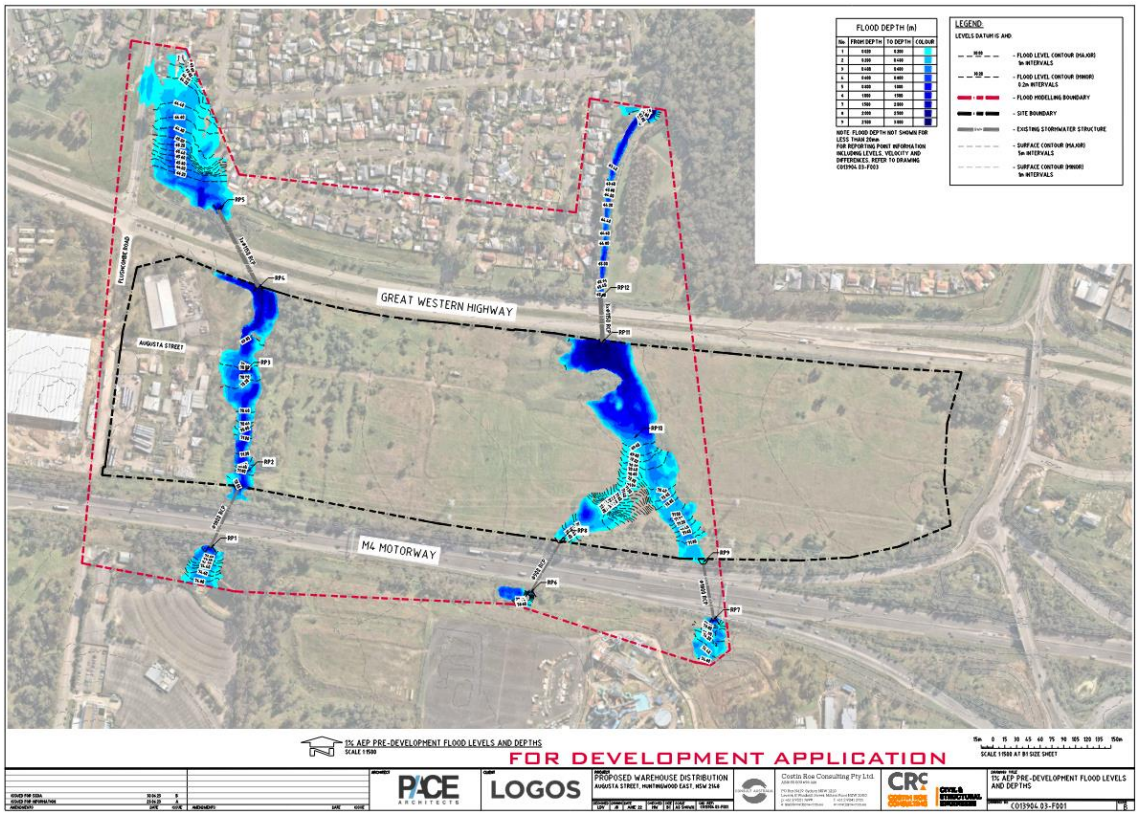


Figure 7.3: 1% AEP Pre-developed Level and Depth Output

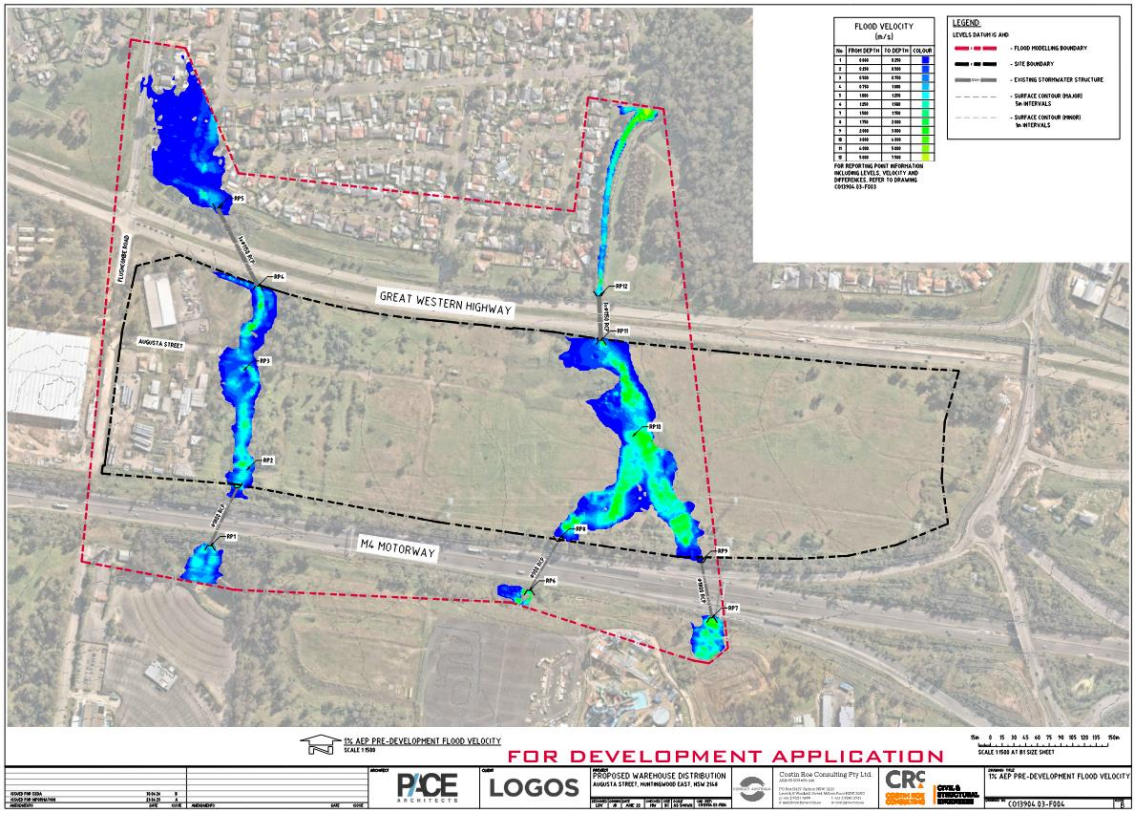


Figure 7.4: 1% AEP Pre-developed Velocity

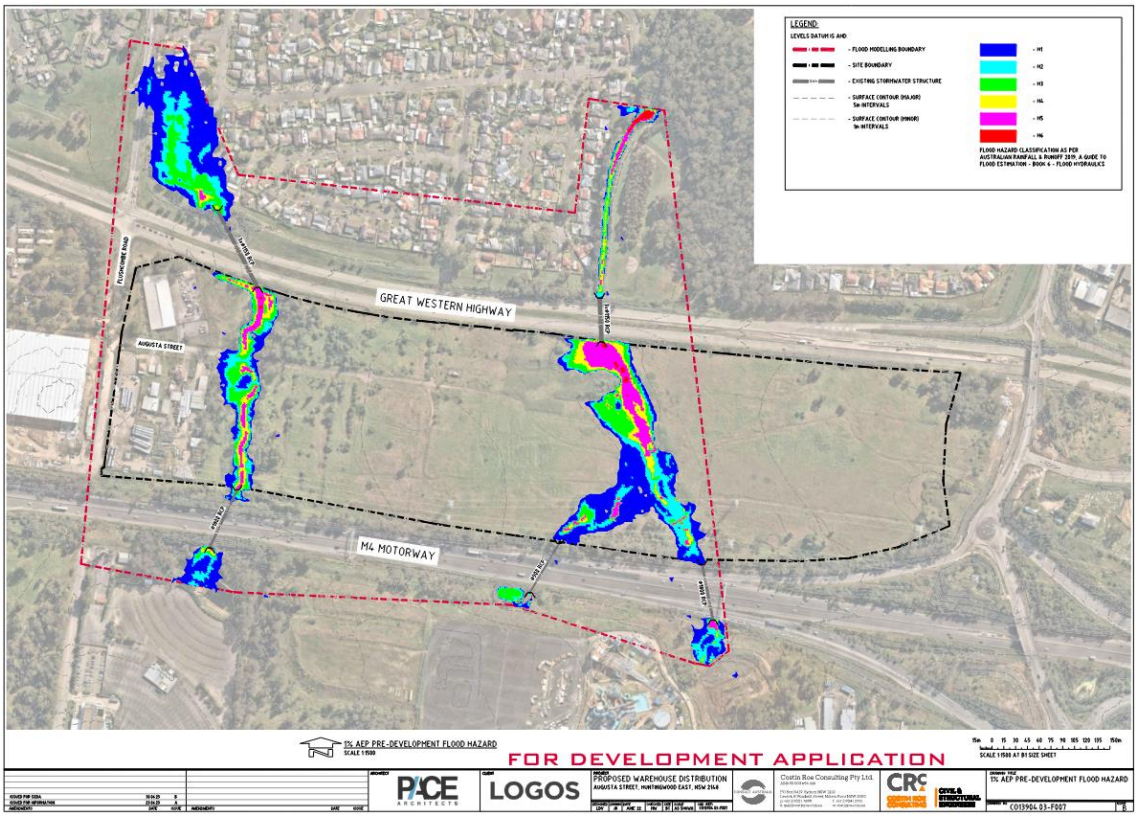


Figure 7.5: 1% AEP Pre-developed Flood Hazard Categorisation

7.4.3 Post-Development 1% AEP

Reference to **Figure 7.6** shows the post-developed 1% AEP output for depth and levels. **Figure 7.7** shows velocity and **Figure 7.8** show true hazard categorisation.

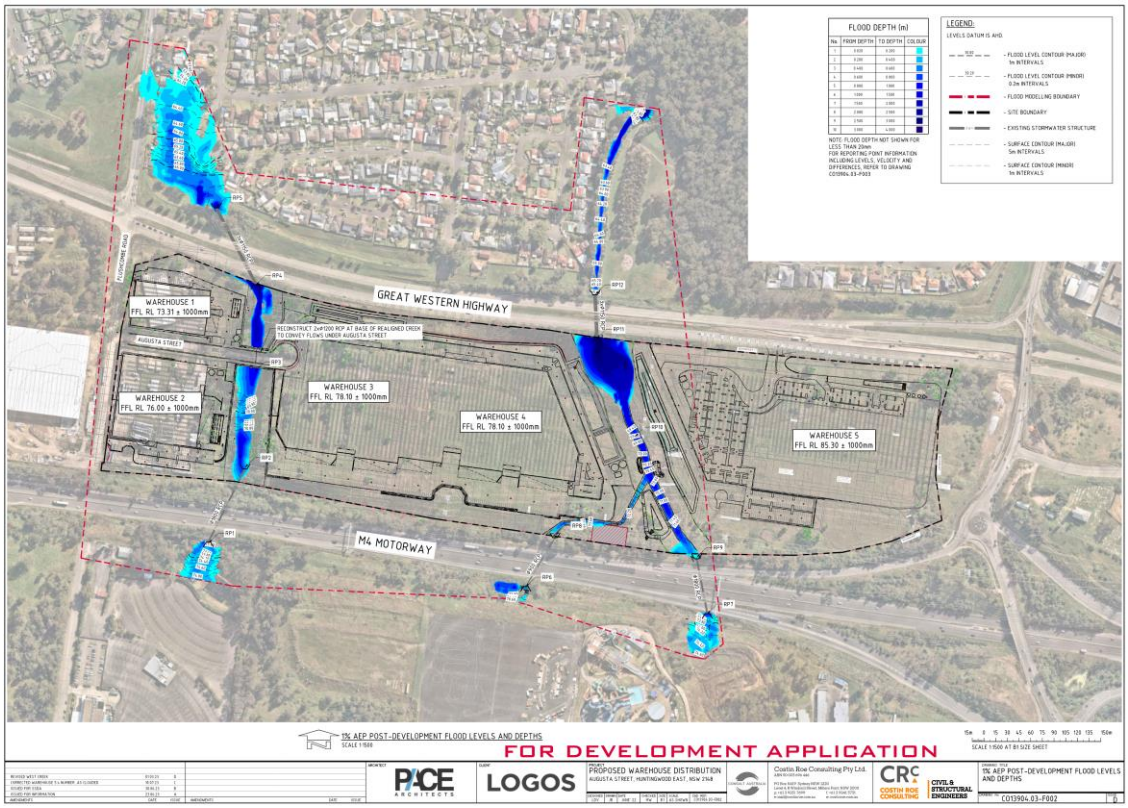


Figure 7.6: 1% AEP Post-developed Level and Depth Output

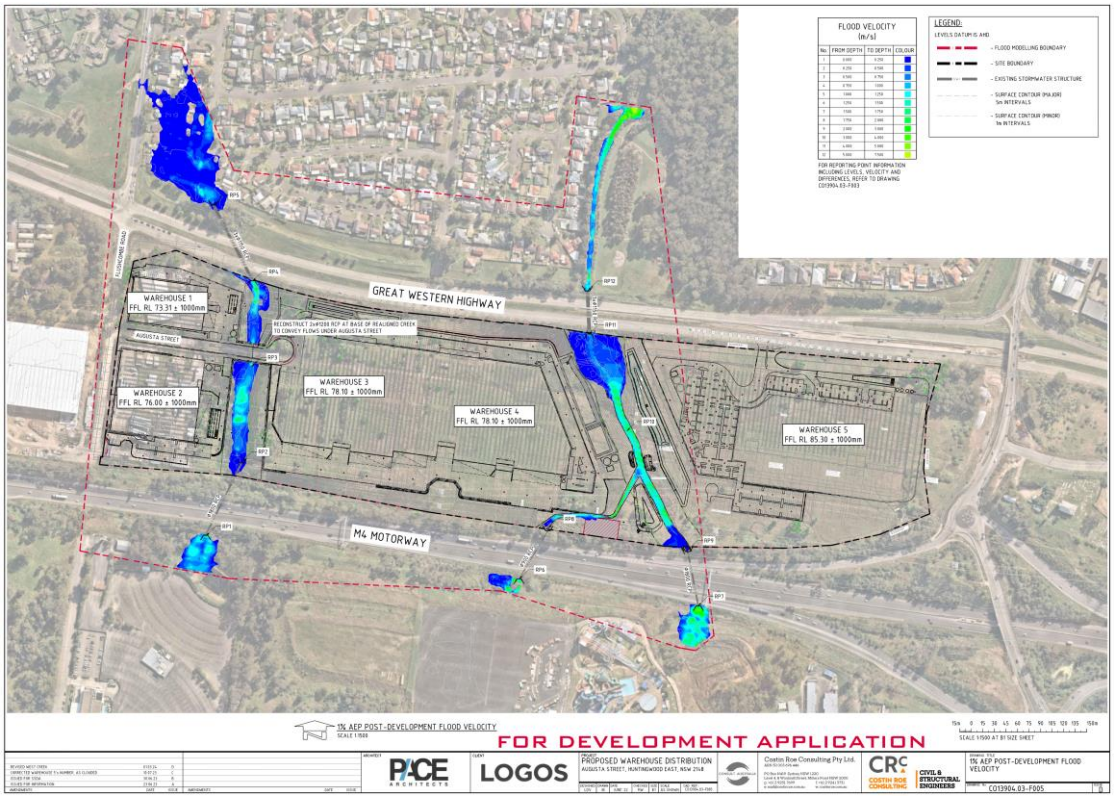


Figure 7.7: 1% AEP Post-developed Velocity

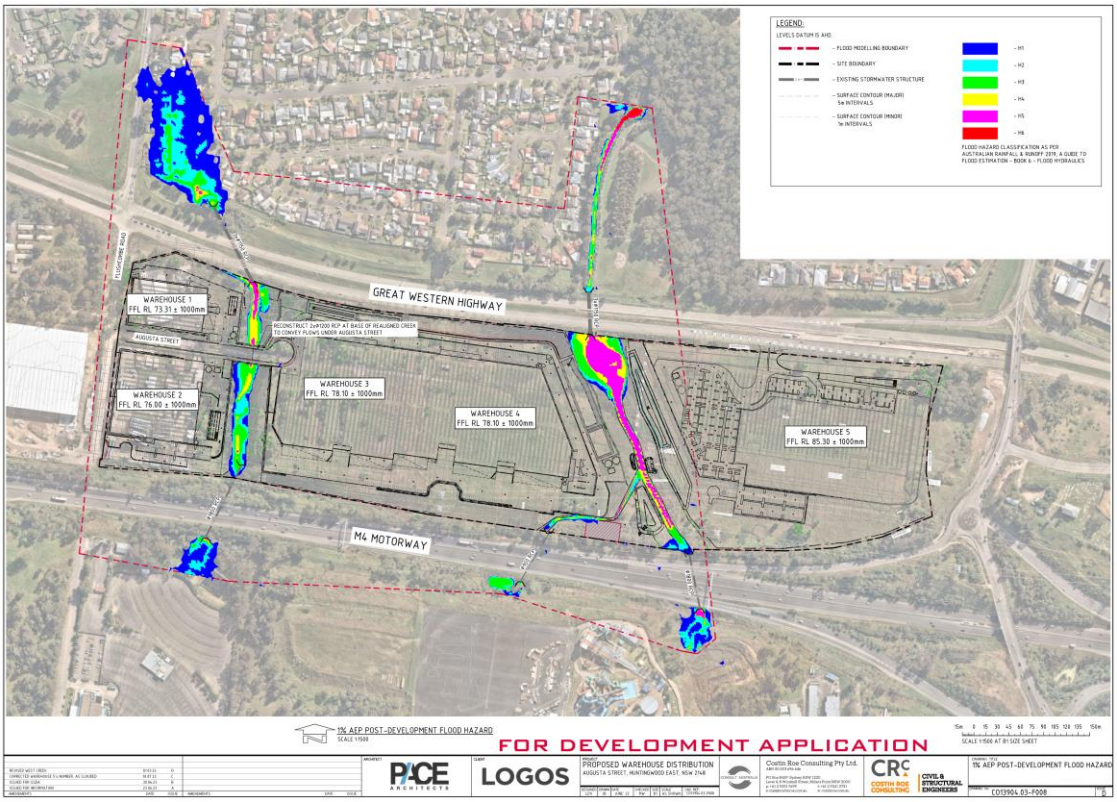


Figure 7.8: 1% AEP Post-developed Flood Hazard Categorisation

7.4.4 1% AEP Comparison

Figure 7.9 shows the 1% AEP flood level afflux (flood level difference) and **Figure 7.10** shows the 1% AEP velocity afflux, associated with the development. **Table 7.1** contains data at 12 reporting points to compare the pre and post development conditions.

The output for the 1% AEP storm event shows that:

- There is generally a decrease in flood levels upstream and downstream of the development site.
- Flood levels within the creek differ from the pre-developed condition due to the proposed creek realignment.

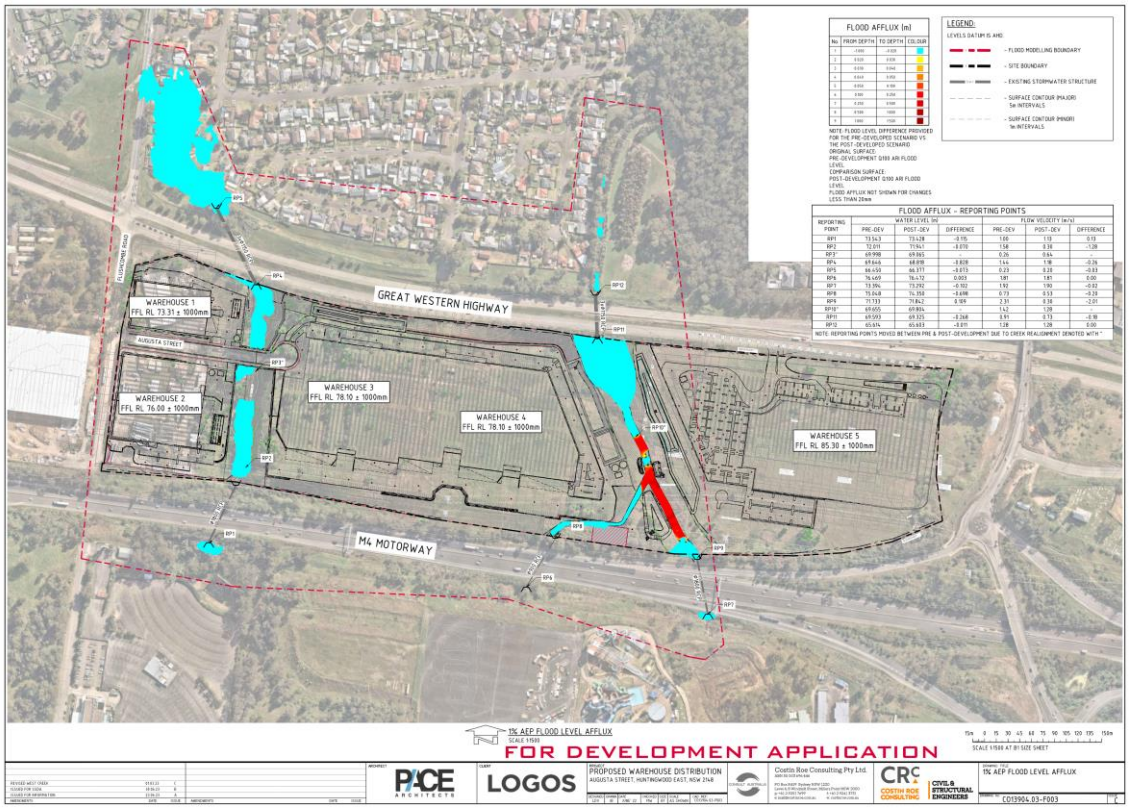


Figure 7.9: 1% AEP Post Developed Flood Level Afflux

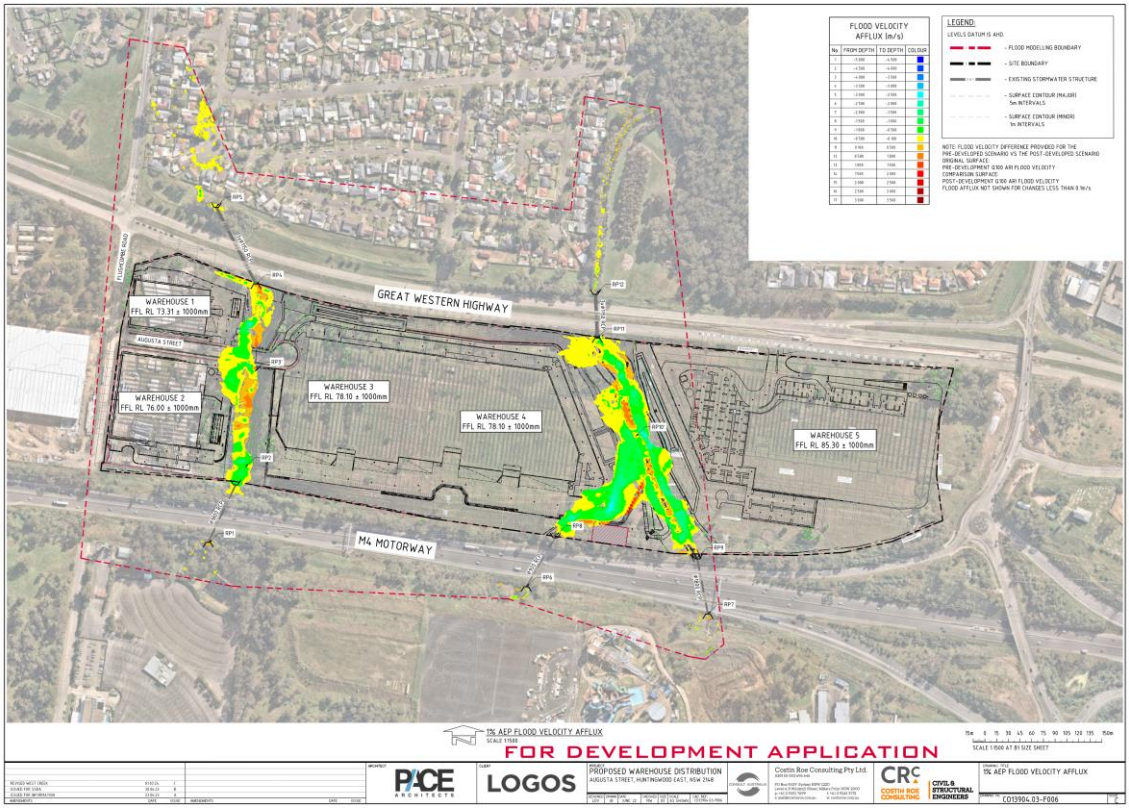


Figure 7.10: 1% AEP Post Developed Flood Velocity Afflux

Table 7.1. Reporting Points and Flood Afflux Confirmation at the Peak of the 1% AEP

FLOOD AFFLUX - REPORTING POINTS						
REPORTING POINT	WATER LEVEL (m)			FLOW VELOCITY (m/s)		
	PRE-DEV	POST-DEV	DIFFERENCE	PRE-DEV	POST-DEV	DIFFERENCE
RP1	73.543	73.428	-0.115	1.00	1.13	0.13
RP2	72.011	71.941	-0.070	1.58	0.30	-1.28
RP3"	69.998	69.065	-	0.26	0.64	-
RP4	69.646	68.818	-0.828	1.44	1.18	-0.26
RP5	66.450	66.377	-0.073	0.23	0.20	-0.03
RP6	76.469	76.472	0.003	1.81	1.81	0.00
RP7	73.394	73.292	-0.102	1.92	1.90	-0.02
RP8	75.048	74.350	-0.698	0.73	0.53	-0.20
RP9	71.733	71.842	0.109	2.31	0.30	-2.01
RP10"	69.655	69.804	-	1.42	1.28	-
RP11	69.593	69.325	-0.268	0.91	0.73	-0.18
RP12	65.614	65.603	-0.011	1.28	1.28	0.00
NOTE: REPORTING POINTS MOVED BETWEEN PRE & POST-DEVELOPMENT DUE TO CREEK REALIGNMENT DENOTED WITH "						

7.4.5 Pre-Development PMF

Reference to **Figure 7.11** shows the pre-developed PMF output for depth and levels. **Figure 7.12** shows velocity and **Figure 7.13** show true hazard categorisation.

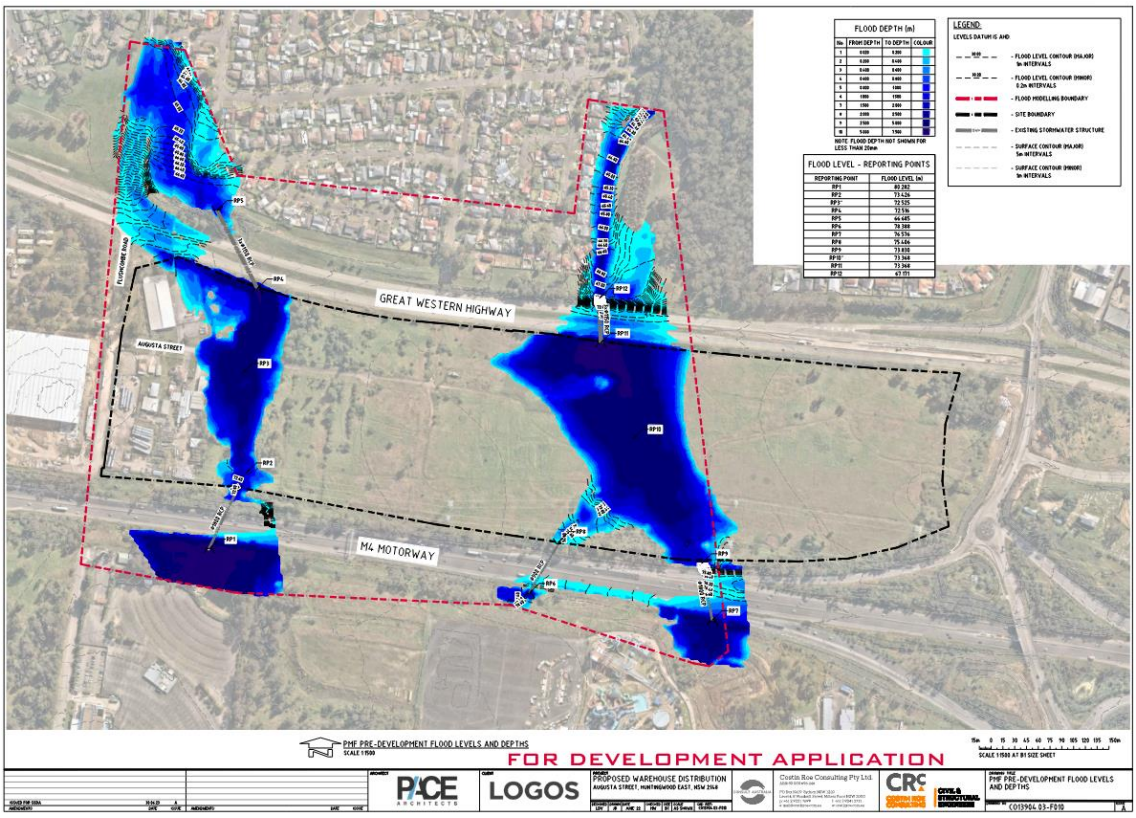


Figure 7.11: PMF Pre-developed Level and Depth Output

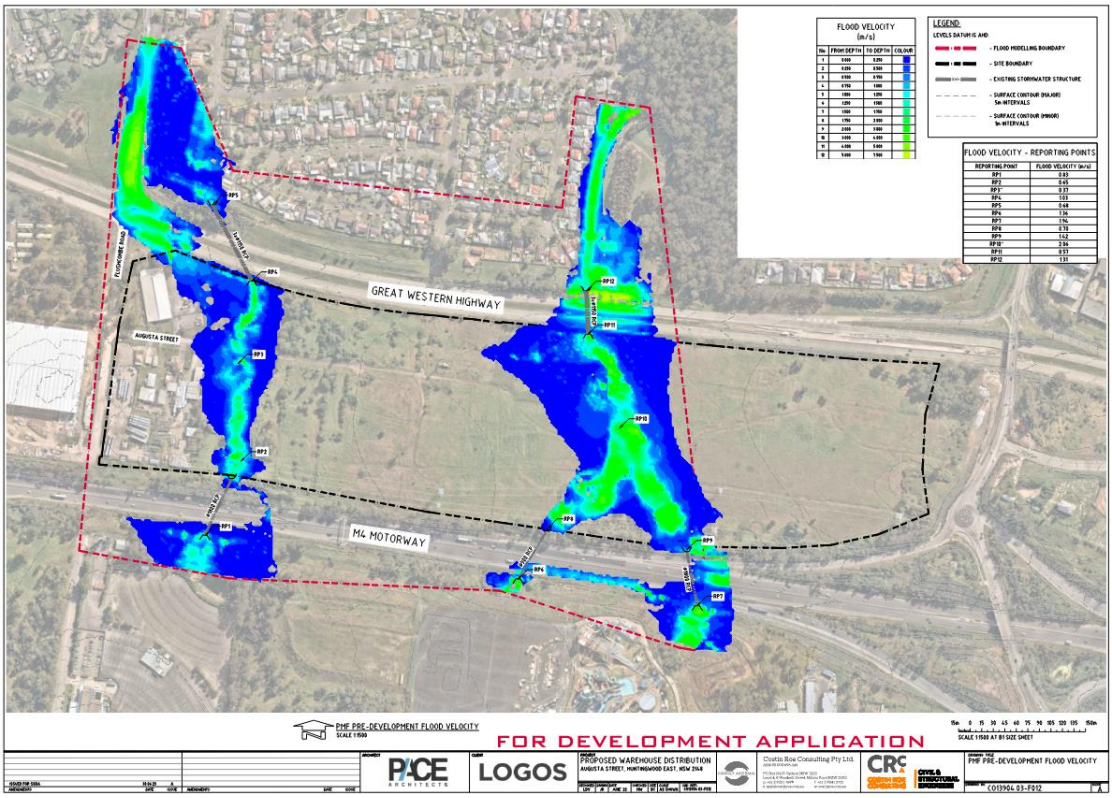


Figure 7.12: PMF Pre-developed Flood Velocity

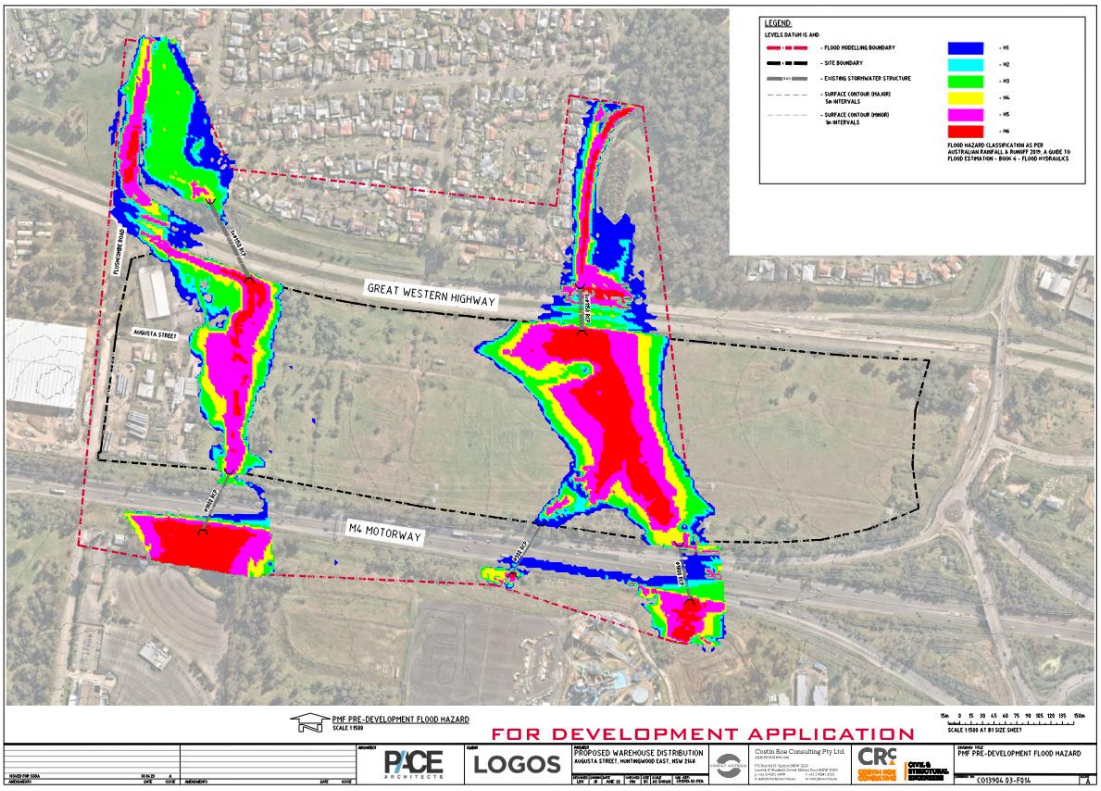


Figure 7.13: PMF Pre-developed Flood Hazard Categorisation

7.4.6 Post-Development PMF

Reference to **Figure 7.14** shows the post-developed PMF output for depth and levels. **Figure 7.15** shows velocity and **Figure 7.16** shows true hazard categorisation.

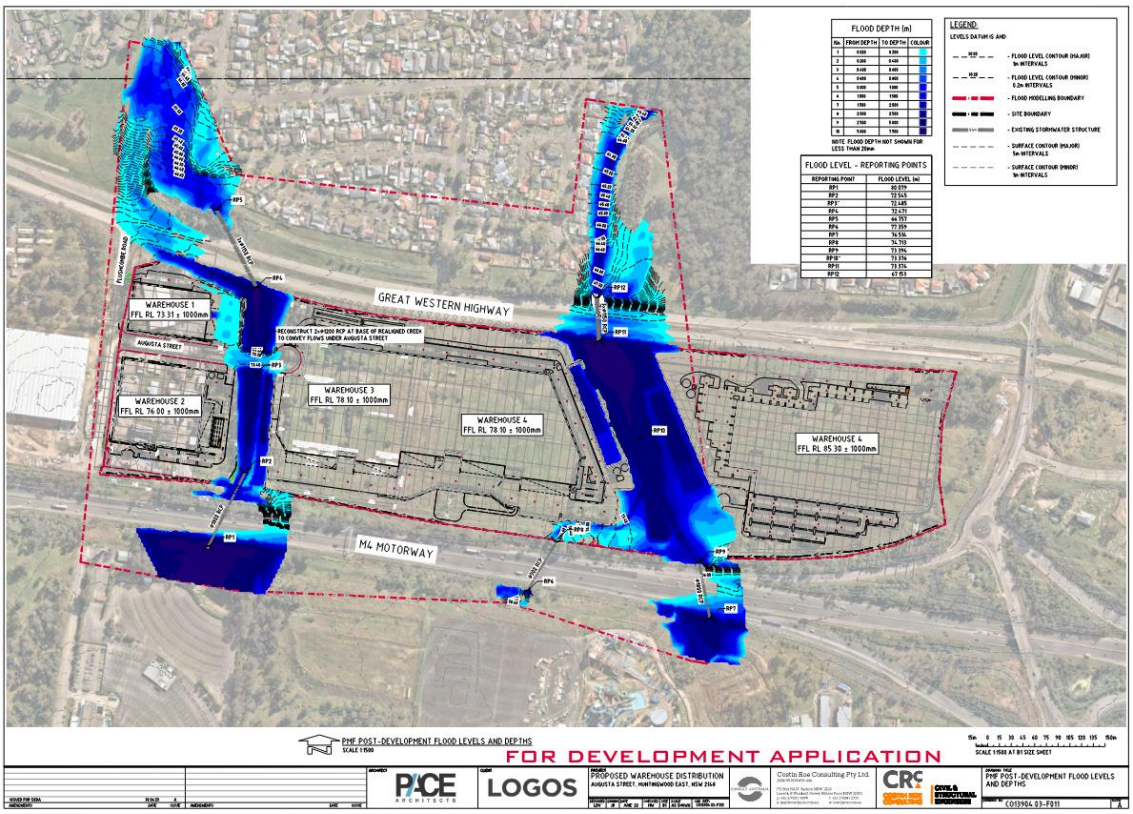


Figure 7.14: PMF Post-developed Level and Depth Output

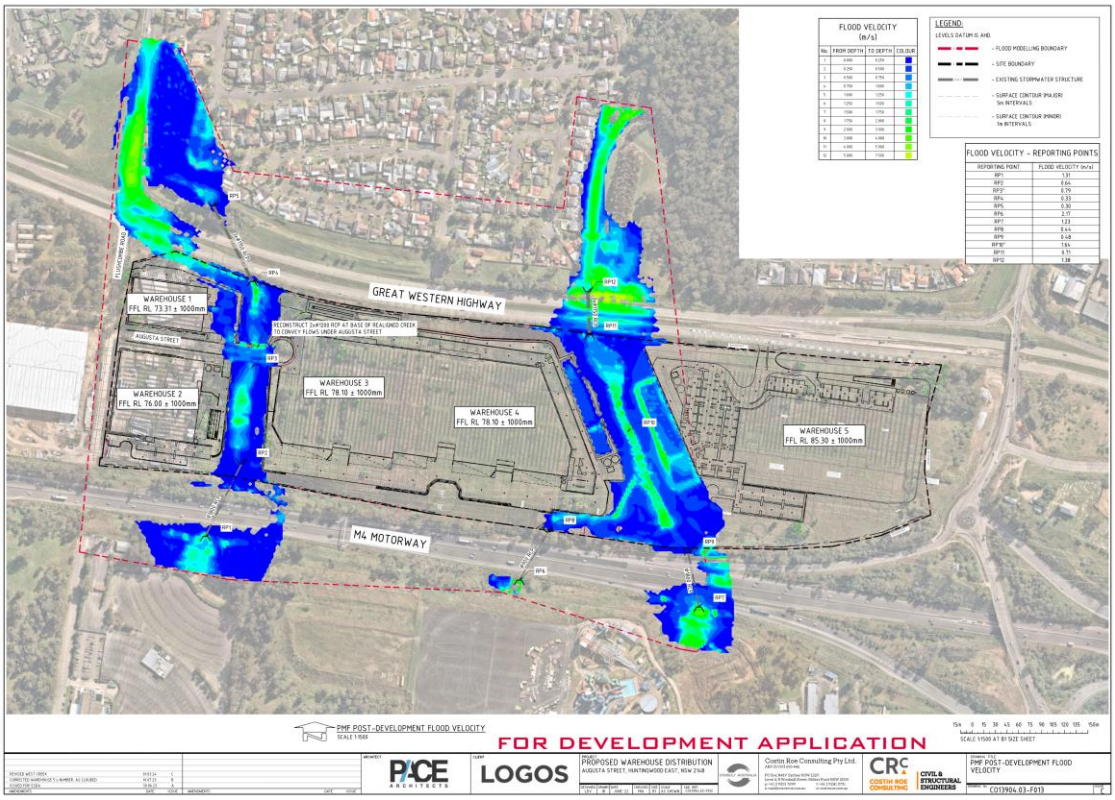


Figure 7.15: PMF Post-developed Flood Velocity

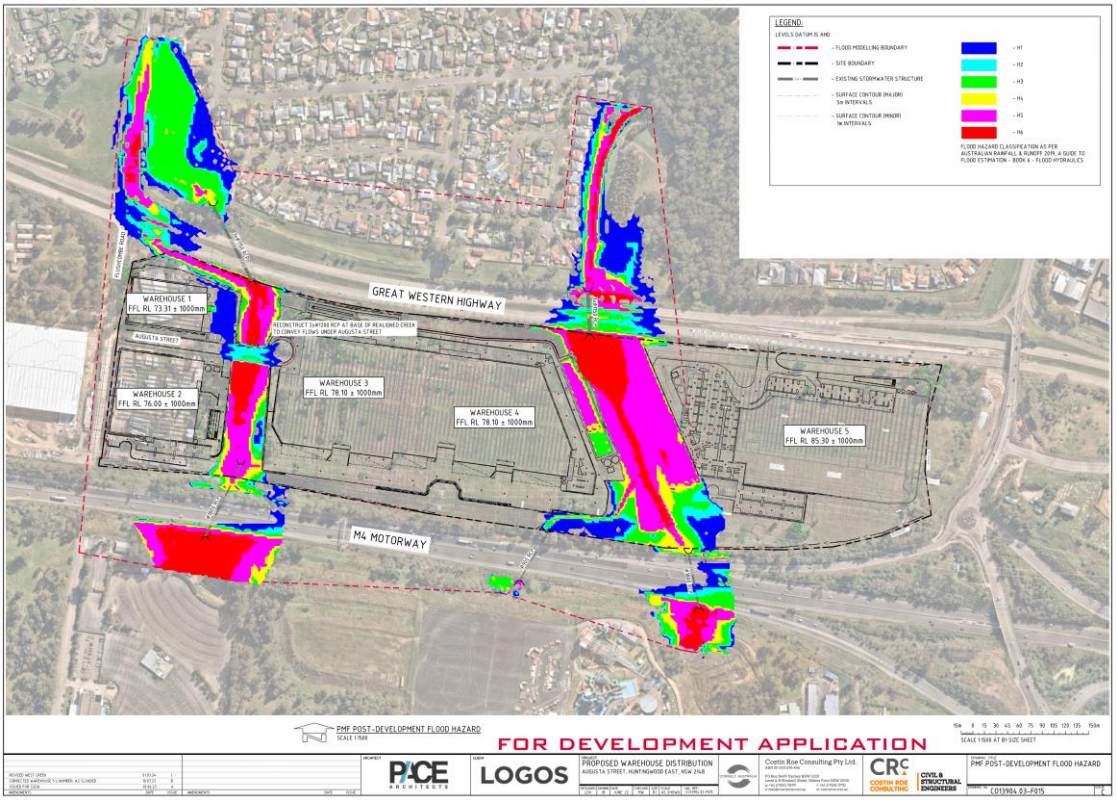


Figure 7.16: PMF Post-developed Flood Hazard Categorisation

7.5 Council Flood modelling Requirements

Council's *WSUD developer handbook* provides relevant requirements relating to development sites identified as affected by mainstream flooding, local runoff, local overland flooding, or sites situated in a defined low point with the potential for overland flows.

The intent of the document is to ensure that new developments do not experience undue flood risk and that existing development is not adversely flood affected through increased damage or hazard as a result of new development.

The flood planning level (FPL) for business/ industrial to be at or above the 1% AEP (1 in 100-year ARI) flood level plus 0.5m freeboard.

Building No	FPL	Proposed FFL
Building 1	RL69.00m	RL73.31m
Building 2	RL72.00m	RL76.00m
Building 3	RL72.00m	RL78.10m
Building 4	RL74.35m	RL78.10m
Building 5	RL76.50m	RL85.30

All levels on the site are noted to be higher than the FPL.

The PMF or extreme event provides an upper limit of flooding and associated consequences for the problem being investigated. It is used for emergency response planning purposes to address the safety of people.

In relation to flood impact on the development or impact from the development on flooding, it is noted that the modelled 1% AEP flood extent does not encroach the subject property, hence no adverse impact to existing flood conditions or surrounding developments are associated with the proposed development. As noted, that the majority of the site is not impacted by the regional PMF flood event, except for Building 1's hardstand being noted as Hazard Category H1.

Overall flood risk for the development, and from the development is considered low to negligible, and the development meets current council flood policy.

Hydraulic and Hazard Categorisation

Floodwaters can vary significantly, both in time and place across the floodplain. They can flow fast and deep at some locations and slow and shallow at other locations. This can result in large variations to the personal danger and physical property damage resulting from the flood.

Blacktown Council has 3 principles for management of the residual impacts of flooding (that is, the remaining flooding impacts once floor levels are raised to the flood planning level). These are, in order of importance:

1. Protection of people from injury.
2. Protection of building structures from damage.

3. Protection of building contents.

Blacktown Council's general standards for hazard for areas outside the Hawkesbury-Nepean backwater flooding area are based on Figure 6.7.9 Combined Flood Hazard Curves from Australian Rainfall and Runoff 2019 (ARR). These include:

- Vehicle parking (H1) - V * D <= 0.3 where V <= 2 m/s and D <= 0.2 m
- Driveways (H1) - V * D <= 0.3 where V <= 2 m/s and D <= 0.3 m
- Pedestrian Access (H2) - V * D <= 0.6 where V <= 2 m/s and D <= 0.5 m

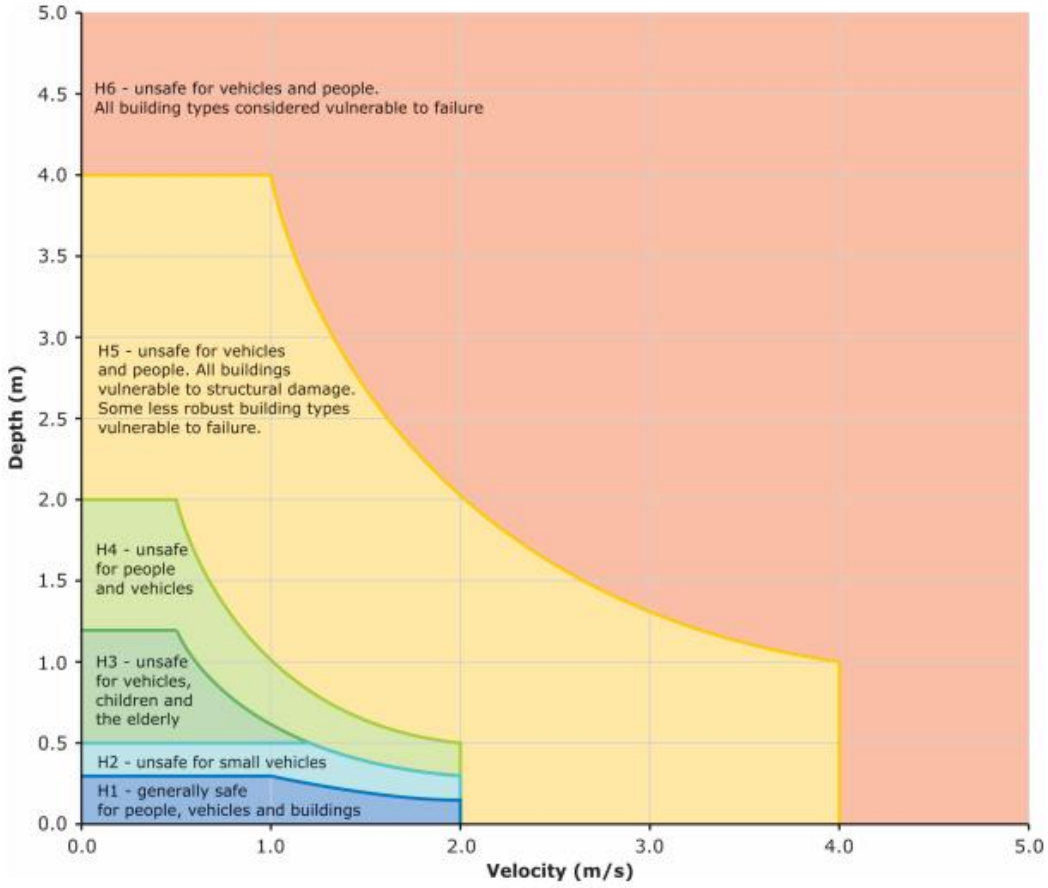


Figure 6.7.9. Combined Flood Hazard Curves (Smith et al., 2014)

Figure 7.17. Combined Flood Hazard Curves (Smith et al., 2014)

Table 6.7.3. Combined Hazard Curves - Vulnerability Thresholds (Smith et al., 2014)

Hazard Vulnerability Classification	Description
H1	Generally safe for vehicles, people and buildings.
H2	Unsafe for small vehicles.
H3	Unsafe for vehicles. children and the elderly.
H4	Unsafe for vehicles and people.
H5	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
H6	Unsafe for vehicles and people. All building types considered vulnerable to failure.

Table 6.7.4. Combined Hazard Curves - Vulnerability Thresholds Classification Limits (Smith et al., 2014)

Hazard Vulnerability Classification	Classification Limit (D and V in combination)	Limiting Still Water Depth (D)	Limiting Velocity (V)
H1	D*V ≤ 0.3	0.3	2.0
H2	D*V ≤ 0.6	0.5	2.0
H3	D*V ≤ 0.6	1.2	2.0
H4	D*V ≤ 1.0	2.0	2.0
H5	D*V ≤ 4.0	4.0	4.0
H6	D*V > 4.0	-	-

Figure 7.18. Adopted Hazard Criteria and Provisional Flood Hazard Chart (Australian Rainfall and Runoff 2019)

Flood Damages

Damage caused by floods is generally categorised as either tangible or intangible. Tangible damages are financial in nature and can be readily measured in monetary terms. They include direct damages such as damage or loss caused by floodwaters wetting goods and property, and indirect damages such as lost wages incurred during cleanup periods after the flood event. Intangible damage includes emotional stress and even mental and physical illness caused by the flood. It is difficult, if not impossible to quantify intangible damages in financial terms.

From a flood planning perspective, it is important to consider the following direct damage categories:

- Contents Damage – refers to damage to the contents of buildings, including carpets and furniture etc.;
- Structural Damage – refers to damage to the structural fabric of buildings, such as foundations, walls floors, windows, and built-in fittings; and
- External Damage – includes damage to all items external to buildings, including cars, landscaping etc.

As there is no way to prevent a flood from occurring, and it is unrealistic to exclude all development within flood-prone areas, the intent of establishing a FPL is to minimise the risk of direct damage when a flood occurs. By minimising the direct damage, there is a carry-on effect, whereby other associated indirect tangible damages and intangible damages are also minimised.

Emergency Response Planning

Flood planning refers to the preparation of a formal community-based plan of action to deal with the threat, onset and aftermath of flooding. It involves planning for an event equal to, or greater than the event used to derive the FPL.

The plan of action should include an on-site response plan that addresses what measures should be undertaken once the threat of a flood is determined to be imminent. A flood evacuation strategy should also be included so that all persons within the precinct are familiar with the processes required if a flood occurs.

7.6 Flood Assessment Conclusion

A TUFLOW hydrodynamic flood model has been completed and the pre and post development flood events assessed for the 1% AEP rainfall event.

The assessment shows a reduction in post development 1% AEP flood levels, hence meeting impact requirements. The assessment shows the proposed building achieves flood planning and freeboard requirements.

8 CONSTRUCTION SOIL AND WATER MANAGEMENT

8.1 Soil and Water Management General

Without any mitigation measures and during typical construction activities, site runoff would be expected to convey a significant sediment load. A *Soil and Water Management Plan* (SWMP) and *Erosion and Sediment Control Plan* (ESCP), or equivalent, would be implemented for the construction of the Proposal. The SWMP and ESCPs would be developed in accordance with the principles and requirements of *Managing Urban Stormwater – Soils & Construction Volume 1 ('Blue Book')(Landcom, 2004)* with a staged approach.

In accordance with the principles included in the Blue Book, a number of controls have been incorporated into a preliminary Staged ESCP (refer to accompanying Drawings in **Appendix A**. The Staged ESCP considers initial site establishment, requirements during construction of roads and infrastructure and estate earthworks, completion of estate works and the period between this and development of individual lots.

Section 1 provides a summary of the construction works for the Proposal. While all construction activities have the potential to impact on water quality, the key activities are:

- Erosion and sediment control installation.
- Grading of existing earthworks to suit building layout, drainage layout and pavements.
- Stormwater and drainage works.
- Service installation works.
- Building construction works.

We note that a more detailed ESCP and Construction Soil and Water Management Plan forms part of the Construction Environmental Management Plan (CEMP) submitted in the EIS and prepared by the Principal Contractor. The measures in **Section 8** of this report will be generally consistent with those of the CEMP.

8.2 Typical Management Measures

Sediment Basins

Sediment basins have been sized (based on 5 day, 85th percentile rainfall) and located to ensure sediment concentrations in site runoff are within acceptable limits. Preliminary basin sizes have been calculated in accordance with the Blue Book and are based on 'Type F' soils. These soils are fine grained and require a relatively long residence time to allow settling. (Or 'Type D' soils. These soils contain a significant proportion of fine (<0.005mm) "dispersible" materials that will never settle unless flocculated.)

Sediment basins for 'Type F'/'Type D' soils are typically wet basins which are pumped out following a rainfall event when suspended solids concentrations of less than 50 mg/L have been achieved.

Refer CO13904.03-SSDA200 for calculations, per the Blue Book Guidelines Section 6.3.3.

Sediment Fences & Diversion Drains

Sediment fences are located around the perimeter of the site to ensure no untreated runoff leaves the site. They have also been located around the existing drainage channels to minimise sediment migration into waterways and sediment basins. They have also been located around the proposed stockpiles on the site.

Stabilised Site Access

For the proposal, a stabilised site access is proposed at the seperate entries to the eastern works area via the GWH and the western works area via Flushcombe Road. This will limit the risk of sediment being transported onto Flushcombe Road, Great Western Highway and other public roads.

8.3 Other Management Measures

Other management measures that will be employed are expected to include:

- Minimising the extent of disturbed areas across the site at any one time.
- Progressive stabilisation of disturbed areas or previously completed earthworks to suit the proposal once trimming works are complete.
- Regular monitoring and implementation of remedial works to maintain the efficiency of all controls.

It is noted that the controls included in the preliminary ESCP are expected to be reviewed and updated as the design, staging and construction methodology is further developed for the Proposal.

9 CONCLUSION

This Civil Engineering Report has been prepared in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and in support of the State Significant Development Application (SSD- 36138263) for a Proposed Development at Augusta Street, Blacktown, NSW within the Huntingwood Precinct.

A civil engineering strategy for the site has been developed which provides a best practice solution within the constraints of the existing landform and proposed development layout. Within this strategy a stormwater quantity and quality management strategy has been developed to consider peak flows and reduce pollutant loads in stormwater leaving this site. The stormwater management for the development has been designed in accordance with Blacktown City Council requirements and ensuring acceptable impacts relating to the development.

The hydrological assessment shows local post development flows from the site will be managed to pre-development flow or lower, consistent with the requirements of Blacktown City Council, Huntingwood Precinct DCP and UPRCT OSD requirements. The assessment demonstrates that the site discharge will be acceptable per local and regional planning requirement and not unduly affect any land, drainage systems or watercourse as a result of the development.

During the construction phase, a Sediment and Erosion Control Plan will be in place to ensure the downstream drainage system and receiving waters are protected from sediment laden runoff.

During the operational phase of the development, we propose a stormwater quality treatment system incorporating the use of a treatment train approach with the Primary treatment being via either pit litter baskets and/or gross pollutant traps (GPT's) and the Tertiary treatment via adequately sized Bioretention basins combined with an On-Site detention (OSD) storage pond (one exception of Tertiary treatment will be at the most north-eastern catchment which will discharge via an underground OSD tank combined with a proprietary filtration chamber) is proposed to mitigate any increase in stormwater pollutant load generated by the development.

MUSIC modelling results indicate that the proposed STM are effective in reducing pollutant loads in stormwater discharging from the site and meet the requirements of Council's pollution reduction targets. Best management practices have been applied to the development to ensure that the quality of stormwater runoff is not detrimental to the receiving environment.

A TUFLOW hydrodynamic flood model has been completed and the pre and post development flood events assessed for the 5%, 1%, 0.5%, 0.2% AEP rainfall events and the PMF event.

The assessment shows a reduction in post development 1% AEP flood levels, hence meeting impact requirements. The assessment shows the proposed building achieves flood planning and freeboard requirements.

This Appendix confirms the technical input and detailed output completed as part of the assessment. Appendix I is to be read in conjunction with Section 7 of this report.

It is recommended the management strategies in this report be approved and incorporated into the future detailed design.

10 REFERENCES

- Engineering Guide for Development (2005), Blacktown City Council
- Huntingwood Precinct DCP, August 2011, Blacktown City Council
- Water Sensitive Urban Design – Technical Guidelines for Western Sydney (May 2004), URS Australia Pty Ltd
- Upper Parramatta River Catchment Trust On-Site Stormwater Detention Handbook (4th Edition)
- NSW Government (2005). *Floodplain Development Manual.*
- Managing Urban Stormwater: Harvesting and Reuse – 2006 (NSW DEC);
- Managing Urban Stormwater: Source Control – 1998 (NSW EPA);
- Managing Urban Stormwater: Treatment Techniques – 1997 (NSW EPA);
- Landcom (2004). *Managing Urban Stormwater – Soils and Construction* – 4th Edition.
- PSM Geotechnical Report referenced PSM4636-006L and dated 25 August 2023
- JBS&G Acid Sulfate Soils Management Report referenced *62742/143,986 L01 Huntingwood East, Augusta St Blacktown - ASSM (Rev 0)* and dated 19 July 2022
- Hyder Consulting Flood Study and Stormwater Management report referenced DN00214 and dated 18 January 2010

Appendix A

DRAWINGS BY COSTIN ROE CONSULTING

STATE SIGNIFICANT DEVELOPMENT APPLICATION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW, 2148
CIVIL WORKS PACKAGE

DRAWING LIST

DRAWING NO.	DRAWING TITLE
GENERAL:	
C013904.03-SSDA 100	DRAWING LIST & GENERAL NOTES
EROSION & SEDIMENT CONTROL:	
C013904.03-SSDA 200	EROSION AND SEDIMENT CONTROL ENGINEERING NOTES
C013904.03-SSDA 201	EROSION AND SEDIMENT CONTROL PLAN - STAGE 1
C013904.03-SSDA 202	EROSION AND SEDIMENT CONTROL PLAN - STAGE 2
C013904.03-SSDA 250	EROSION AND SEDIMENT CONTROL DETAILS - SHEET 1
C013904.03-SSDA 251	EROSION AND SEDIMENT CONTROL DETAILS - SHEET 2
EARTHWORKS PLAN:	
C013904.03-SSDA 300	BULK EARTHWORKS PLAN
C013904.03-SSDA 310	CUT & FILL PLAN
C013904.03-SSDA 350	BULK EARTHWORKS SECTIONS - SHEET 1
C013904.03-SSDA 351	BULK EARTHWORKS SECTIONS - SHEET 2
C013904.03-SSDA 352	BULK EARTHWORKS SECTIONS - SHEET 3
INFRASTRUCTURE DRAINAGE:	
C013904.03-SSDA 400	STORMWATER DRAINAGE KEY PLAN
C013904.03-SSDA 401	STORMWATER DRAINAGE PLAN - WAREHOUSE 1 & 2
C013904.03-SSDA 402	STORMWATER DRAINAGE PLAN - WAREHOUSE 3
C013904.03-SSDA 403	STORMWATER DRAINAGE PLAN - WAREHOUSE 4
C013904.03-SSDA 404	STORMWATER DRAINAGE PLAN - WAREHOUSE 5 GROUND FLOOR
C013904.03-SSDA 410	BLACKTOWN CREEK REALIGNMENT PLAN
C013904.03-SSDA 415	WESTERN SWALE PLAN (E)
C013904.03-SSDA 450	STORMWATER DRAINAGE DETAILS - SHEET 1
C013904.03-SSDA 451	STORMWATER DRAINAGE DETAILS - SHEET 2
C013904.03-SSDA 452	STORMWATER DRAINAGE DETAILS - SHEET 3
C013904.03-SSDA 453	STORMWATER DRAINAGE DETAILS - SHEET 4
C013904.03-SSDA 454	STORMWATER DRAINAGE DETAILS - SHEET 5
C013904.03-SSDA 455	STORMWATER DRAINAGE DETAILS - SHEET 6
C013904.03-SSDA 456	STORMWATER DRAINAGE DETAILS - SHEET 7
C013904.03-SSDA 457	STORMWATER DRAINAGE DETAILS - SHEET 8
C013904.03-SSDA 458	STORMWATER DRAINAGE DETAILS - SHEET 9
C013904.03-SSDA 459	TYPICAL CLAY CORE DETAIL
C013904.03-SSDA 460	STORMWATER MANAGEMENT LAYOUT & TYPICAL SECTIONS KEY PLAN
C013904.03-SSDA 461	TYPICAL BELOW GROUND OSD & WATER QUALITY TANK DETAIL
C013904.03-SSDA 462	ABOVE GROUND BIORETENTION AND OSD BASIN DETAILS - LOT 3
C013904.03-SSDA 463	ABOVE GROUND BIORETENTION AND OSD BASIN DETAILS - LOT 4
C013904.03-SSDA 464	ABOVE GROUND BIORETENTION AND OSD BASIN DETAILS - LOT 5
C013904.03-SSDA 465	TYPICAL OSD BASIN CONTROL & DISCHARGE PIT DETAIL
C013904.03-SSDA 466	TYPICAL WETLAND DETAIL - SHEET 1
C013904.03-SSDA 467	TYPICAL WETLAND DETAIL - SHEET 2
C013904.03-SSDA 470	PRE DEVELOPMENT STORMWATER CATCHMENT PLAN
C013904.03-SSDA 471	POST DEVELOPMENT STORMWATER CATCHMENT PLAN

DRAWING LIST

DRAWING NO.	DRAWING TITLE
FINISHED LEVELS:	
C013904.03-SSDA 500	FINISHED LEVELS KEY PLAN
C013904.03-SSDA 501	FINISHED LEVELS PLAN - WAREHOUSE 1 & 2
C013904.03-SSDA 502	FINISHED LEVELS PLAN - WAREHOUSE 3
C013904.03-SSDA 503	FINISHED LEVELS PLAN - WAREHOUSE 4
C013904.03-SSDA 504	FINISHED LEVELS PLAN - WAREHOUSE 5 GROUND FLOOR
C013904.03-SSDA 550	KEY SECTIONS PLAN
C013904.03-SSDA 551	BLACKTOWN CREEK SECTIONS - SHEET 1
C013904.03-SSDA 552	BLACKTOWN CREEK SECTIONS - SHEET 2
C013904.03-SSDA 553	WESTERN SWALE SECTIONS - SHEET 1 (E)
RETAINING WALLS:	
C013904.03-SSDA 650	TYPICAL RETAINING WALL DETAILS - SHEET 1
C013904.03-SSDA 651	TYPICAL RETAINING WALL DETAILS - SHEET 2
C013904.03-SSDA 652	TYPICAL RETAINING WALL DETAILS - SHEET 3
ROADWORKS:	
C013904.03-SSDA 700	ROADWORKS GENERAL ARRANGEMENT PLAN
C013904.03-SSDA 711	ROADWORKS CIVIL WORKS PLAN - SHEET 1
C013904.03-SSDA 712	ROADWORKS CIVIL WORKS PLAN - SHEET 2
C013904.03-SSDA 721	ROADWORKS LONG SECTIONS FLUSHCOMBE ROAD
C013904.03-SSDA 730	ROADWORKS CROSS SECTIONS - FLUSHCOMBE ROAD - SHEET 1
C013904.03-SSDA 731	ROADWORKS CROSS SECTIONS - FLUSHCOMBE ROAD - SHEET 2
C013904.03-SSDA 732	ROADWORKS CROSS SECTIONS - FLUSHCOMBE ROAD - SHEET 3
C013904.03-SSDA 733	ROADWORKS CROSS SECTIONS - AUGUSTA STREET - SHEET 1
C013904.03-SSDA 734	ROADWORKS CROSS SECTIONS - AUGUSTA STREET - SHEET 2
C013904.03-SSDA 735	ROADWORKS CROSS SECTIONS - AUGUSTA STREET - SHEET 3
C013904.03-SSDA 750	ROADWORKS TYPICAL SECTIONS
C013904.03-SSDA 755	ROADWORKS TYPICAL DETAILS
C013904.03-SSDA 756	PROPOSED AUGUSTA STREET CULVERT CROSSING



LOCALITY PLAN
N.TS

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
3. ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE.
   ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.
   ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
4. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
5. UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
6. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

ELECTRONIC INFORMATION NOTES:

1. THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
2. THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
4. THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	E
REVISED AS CLOUDED	08.03.24	D
REVISED AS CLOUDED	08.09.23	C
REVISED AS CLOUDED	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA100

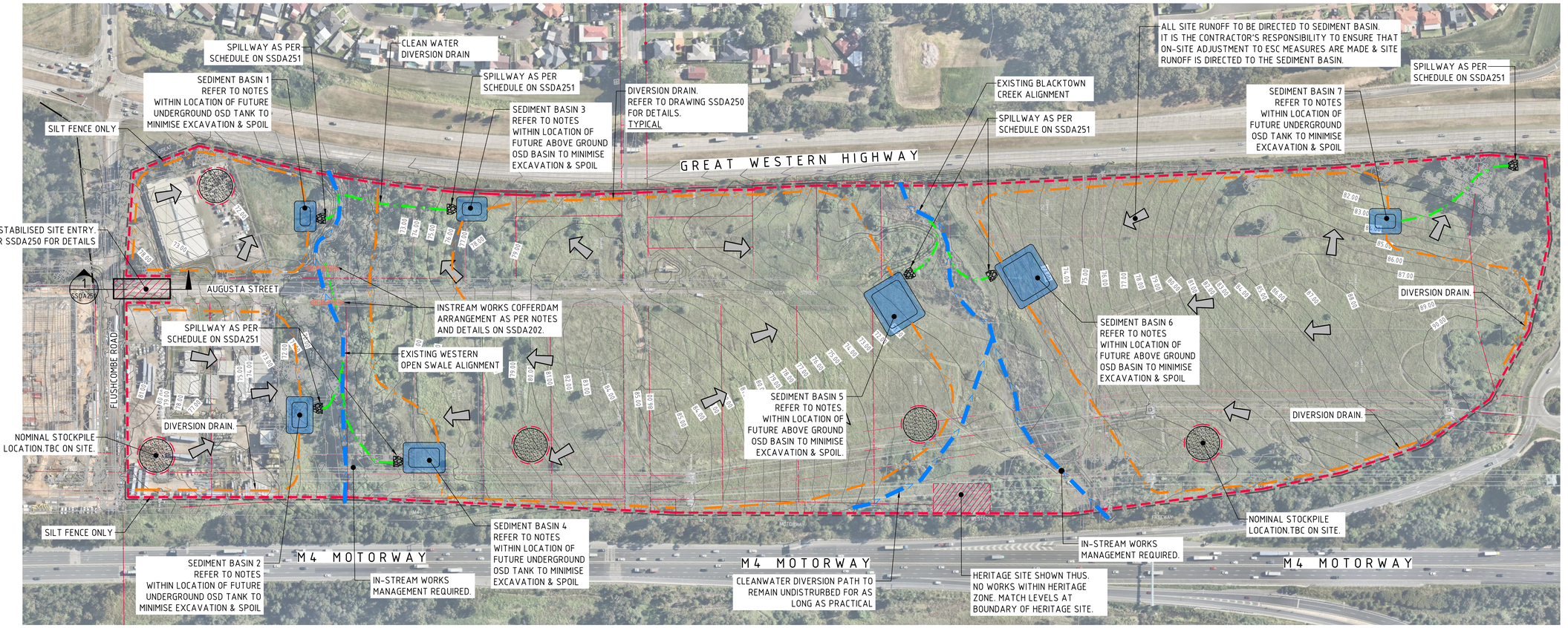
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: DRAWING LIST & GENERAL NOTES

DRAWING No: C013904.03-SSDA100

ISSUE: E



C

EROSION AND SEDIMENT CONTROL PLAN - STAGE 1
SCALE 1:1500

STAGING NOTES- STAGE 1:

STAGE 1 REPRESENTS INITIAL SITE ESTABLISHMENT. THE STAGE 1 SCOPE IS NOTED TO BE PRIOR TO SITE STRIPPING & GRUBBING.

STAGE 1 IMPLEMENTATION RECOMMENDATIONS:

1. SURVEY AND MARK BOUNDARIES, ACCESS NO GO ZONES, TREE PROTECTION ZONES (IF REQUIRED), DIVERSION DRAINS, LAYDOWN AREAS, SITE PARKING AREAS, AND SITE OFFICE ZONES.
2. PREPARE AND CONSTRUCT STABILISED SITE CONSTRUCTION ENTRY'S.
3. INSTALL ALL PRELIMINARY EROSION & SEDIMENT CONTROL MEASURES. MINIMUM ITEMS INCLUDE PERIMETER SILT FENCES, ANY SECURITY FENCING, NO GO ZONES, DIVERSION DRAINS AND SITE AREAS.
4. INSTALL ALL DIVERSION DRAINS.
5. PREPARE AND CONSTRUCT SEDIMENT BASINS.

SEDIMENT CONTROL BASIN NOTES:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C013904.03-SSDA250.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'.

SEDIMENT BASIN 1:

CATCHMENT AREA	= 1.49ha
REQUIRED BASIN VOLUME	= 360m³
BASE DIMENSION (LxB)	= 8.0m x 15.0m
TOP DIMENSION (LxB)	= 17.0m x 24.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 375m³

SEDIMENT BASIN 2:

CATCHMENT AREA	= 2.53ha
REQUIRED BASIN VOLUME	= 611m³
BASE DIMENSION (LxB)	= 12.0m x 20.0m
TOP DIMENSION (LxB)	= 21.0m x 29.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 616m³

SEDIMENT BASIN 3:

CATCHMENT AREA	= 1.73ha
REQUIRED BASIN VOLUME	= 418m³
BASE DIMENSION (LxB)	= 10.0m x 15.0m
TOP DIMENSION (LxB)	= 19.0m x 24.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 434m³

SEDIMENT BASIN 4:

CATCHMENT AREA	= 3.46ha
REQUIRED BASIN VOLUME	= 836m³
BASE DIMENSION (LxB)	= 15.0m x 24.0m
TOP DIMENSION (LxB)	= 24.0m x 33.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 843m³

SEDIMENT BASIN 5:

CATCHMENT AREA	= 6.48ha
REQUIRED BASIN VOLUME	= 1565m³
BASE DIMENSION (LxB)	= 25.0m x 31.0m
TOP DIMENSION (LxB)	= 34.0m x 40.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 1581m³

SEDIMENT BASIN 6:

CATCHMENT AREA	= 6.62ha
REQUIRED BASIN VOLUME	= 1599m³
BASE DIMENSION (LxB)	= 26.0m x 31.0m
TOP DIMENSION (LxB)	= 35.0m x 40.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 1634m³

SEDIMENT BASIN 7:

CATCHMENT AREA	= 1.96ha
REQUIRED BASIN VOLUME	= 573m³
BASE DIMENSION (LxB)	= 11.0m x 16.0m
TOP DIMENSION (LxB)	= 20.0m x 25.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 486m³

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:
1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)
3. Cv = 0.79 & LENGTH TO WIDTH RATIO OF 2 (MIN.)

SOIL TYPE TO BE ASSESSED BY A GEOTECHNICAL ENGINEER

LEGEND:

PROVIDE 1m RETURNS TO SILT FENCE AT 30m MAX. INTERVALS. TYPICAL (N.S.O.P.)

- DENOTES DIVERSION DRAIN
- DENOTES CLEAN WATER DIVERSION DRAIN
- DENOTES SILT FENCE WITH CATCH DRAIN
- DENOTES SILT FENCE ONLY
- DENOTES CONSTRUCTION ENTRY
- DENOTES OVERLAND FLOW PATH
- DENOTES NOMINAL STOCKPILE LOCATION.

NOTES:

REFER TO DRAWING SSDA200 FOR DETAILED EROSION AND SEDIMENT CONTROL NOTES.

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	08.03.24	c
REVISED AS CLOUDED	10.07.23	B
ISSUED FOR INFORMATION	30.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

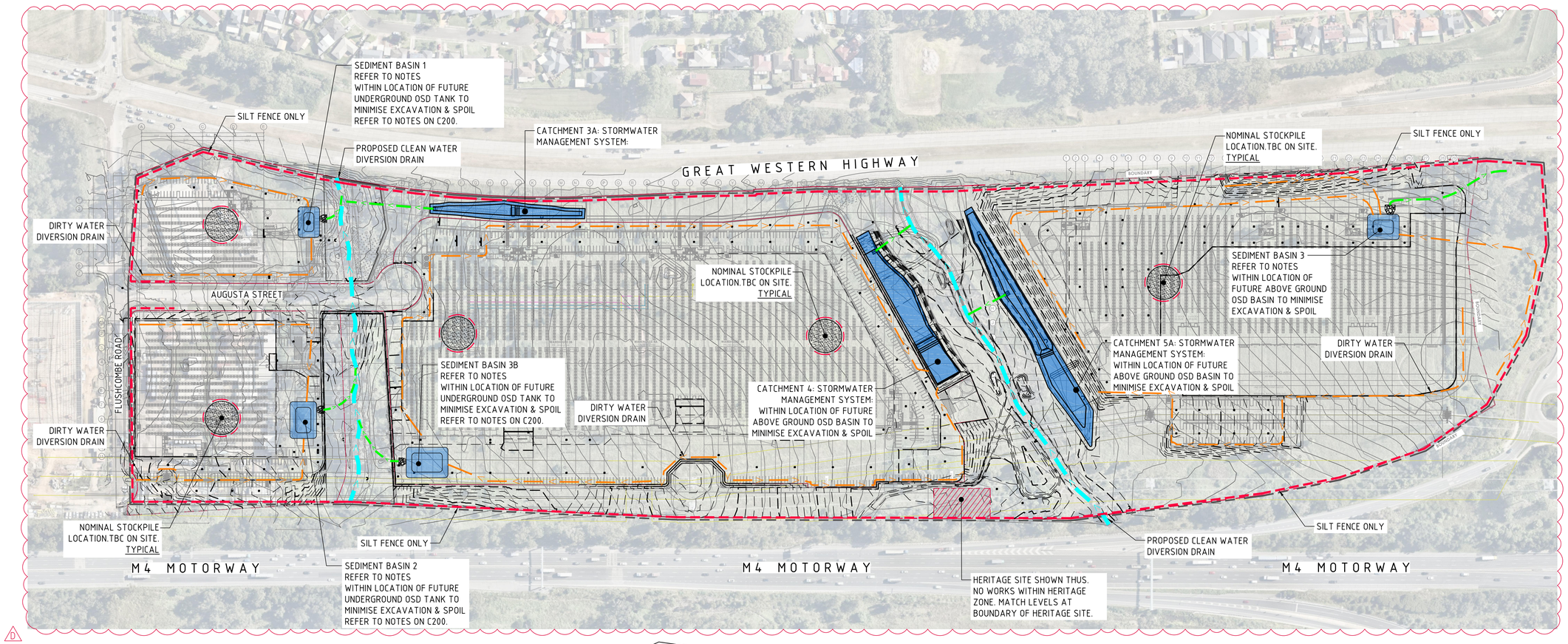
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA201

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN STAGE 1

DRAWING No: C013904.03-SSDA201 ISSUE: C



EROSION AND SEDIMENT CONTROL PLAN – STAGE 2

SCALE 1:1500

STAGING NOTES – STAGE 2:

STAGE 2 REPRESENTS WORKS FOLLOWING SITE ESTABLISHMENT INCLUDING SITE STRIPPING & GRUBBING, AND COMMENCEMENT OF EARTHWORKS.

STAGE 2 IMPLEMENTATION RECOMMENDATIONS:

1. PREPARE AND CONSTRUCT SEDIMENT BASIN.
2. ADJUST DIVERSION DRAINS TO ENSURE ALL RUNOFF IS DIRECTED TO BASIN. CHECK AND CONFIRM ON SITE FOR ANY CONTOURS OR DRAINAGE LINES NOT SHOWN ON THE ESCP AND ALLOW FOR THEM ON SITE AS REQUIRED.
3. ESTABLISH SITE COMPOUND INCLUDING OFFICE AND PARKING AREAS.
4. ENSURE ESCP MEASURES SHOWN ON PLAN ARE INSTALLED, AND EXISTING MEASURES ARE CHECKED AND MAINTAINED AS REQUIRED.
5. COMMENCE SITE STRIPPING (LIMIT TO AREA OF WORKS AS NECESSARY TO COMPLETE THE WORKS) AND CUT TO FILL EARTHWORK.
6. MONITOR AND INSPECT MEASURES IN ACCORDANCE WITH THE SITE INSPECTION CHECK SHEETS AND SOIL AND WATER MANAGEMENT PLAN INCLUDED IN THE SITE CEMP.
7. ALL CONTROLS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD, AND PROGRESSIVELY ADJUSTED TO SUIT SITE CONDITIONS IN ACCORDANCE WITH THE CEMP, THE SOIL AND WATER MANAGEMENT PLAN (SUBPLAN OF THE CEMP) AND PER BLUE BOOK/ WHITE BOOK REQUIREMENTS.

SEDIMENT CONTROL BASIN NOTES:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C013904.03-SSDA250.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'.

SEDIMENT BASIN 1:

CATCHMENT AREA	= 1.49ha
REQUIRED BASIN VOLUME	= 360m³
BASE DIMENSION (LxB)	= 8.0m x 15.0m
TOP DIMENSION (LxB)	= 17.0m x 24.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 375m³

SEDIMENT BASIN 2:

CATCHMENT AREA	= 2.53ha
REQUIRED BASIN VOLUME	= 611m³
BASE DIMENSION (LxB)	= 12.0m x 20.0m
TOP DIMENSION (LxB)	= 21.0m x 29.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 616m³

SEDIMENT BASIN 3:

CATCHMENT AREA	= 1.73ha
REQUIRED BASIN VOLUME	= 418m³
PROVIDED BASIN VOLUME	=OSD BASIN TO BE TEMPORARILY UTILISED AS A SEDIMENT BASIN

SEDIMENT BASIN 4:

CATCHMENT AREA	= 3.46ha
REQUIRED BASIN VOLUME	= 836m³
PROVIDED BASIN VOLUME	=OSD BASIN TO BE TEMPORARILY UTILISED AS A SEDIMENT BASIN

SEDIMENT BASIN 5:

CATCHMENT AREA	= 6.48ha
REQUIRED BASIN VOLUME	= 1565m³
PROVIDED BASIN VOLUME	=OSD BASIN TO BE TEMPORARILY UTILISED AS A SEDIMENT BASIN

SEDIMENT BASIN 6:

CATCHMENT AREA	= 6.62ha
REQUIRED BASIN VOLUME	= 1599m³
BASE DIMENSION (LxB)	= 26.0m x 31.0m
TOP DIMENSION (LxB)	= 35.0m x 40.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 1634m³

SEDIMENT BASIN 7:

CATCHMENT AREA	= 1.96ha
REQUIRED BASIN VOLUME	= 573m³
BASE DIMENSION (LxB)	= 11.0m x 16.0m
TOP DIMENSION (LxB)	= 20.0m x 25.0m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 486m³

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:

1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)
3. Cv = 0.79 & LENGTH TO WIDTH RATIO OF 2 (MIN.)

SOIL TYPE TO BE ASSESSED BY A GEOTECHNICAL ENGINEER

LEGEND:

PROVIDE 1m RETURNS TO SILT FENCE AT 30m MAX. INTERVALS. TYPICAL (N.S.O.P.)

- DENOTES DIVERSION DRAIN
- DENOTES CLEAN WATER DIVERSION DRAIN
- DENOTES PROPOSED CLEAN WATER DIVERSION DRAIN
- DENOTES SILT FENCE WITH CATCH DRAIN
- DENOTES SILT FENCE ONLY
- DENOTES CONSTRUCTION ENTRY
- DENOTES OVERLAND FLOW PATH
- DENOTES NOMINAL STOCKPILE LOCATION.

NOTES:

REFER TO DRAWING SSDA200 FOR DETAILED EROSION AND SEDIMENT CONTROL NOTES.

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	08.03.24	D
REVISED ARCHITECTURAL	10.09.23	C
REVISED AS CLOUDED	10.07.23	B
ISSUED FOR INFORMATION	30.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

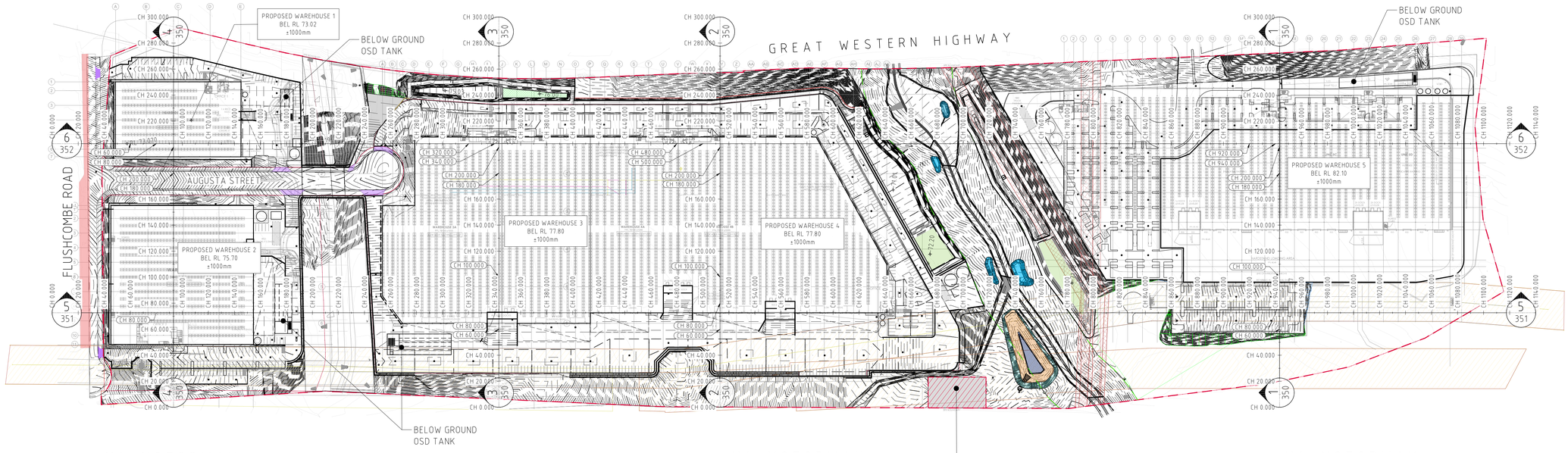
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA202

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN STAGE 2

DRAWING No: C013904.03-SSDA202 ISSUE: D



BULK EARTHWORKS PLAN
SCALE 1:1500

SITE PREPARATION NOTES:

1. ALL EARTHWORKS SHALL BE COMPLETED GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY THE GEOTECHNICAL REPORT PSM4636-007L PROVIDED BY PSM CONSULT PTY LTD DATED 22/03/2022.
2. EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.
3. STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
4. COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF +0mm/-10mm THROUGH BUILDING PADS/PAVEMENTS AND +0mm/-20mm ELSEWHERE.
5. PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION. WHERE EXPOSED ROCK (WEATHERED SHALE OR SANDSTONE) IS ENCOUNTERED AT CUT SUBGRADE LEVEL, THE EARTHWORKS CONTRACTOR IS TO ALLOW TO RIP THE SURFACE TO A NOMINAL 0.3-0.4m DEPTH AND RECOMPACT (PER THE ENGINEERING SPEC) AS REQUIRED.
6. AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHED BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.
7. SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
8. IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
9. ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN A SINGLE LAYER. FURTHER, LESS THAN 30% OF PARTICLES SHALL BE RETAINED ON THE 37.5 mm SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289.5.4.1) OR HILF TEST METHOD (AS1289.5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 mm SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 mm SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION
10. ALL EARTHWORKS SHALL BE COMPLETED UNDER LEVEL 1 CONTROL IN ACCORDANCE WITH AS 3798-2007.
11.
12. ALL THE EARTHWORKS UNDERTAKEN AND THE SUBGRADE CONDITION IN THE CUT AREAS (IN THE STATED PERIOD) ARE DOCUMENTED IN THE REPORTS AND HAVE BEEN UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.
13. PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.
14. EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
15. MATCH EXISTING LEVELS AT BATTER INTERFACE.
16. CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATIONS OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.
17. DURING EARTHWORKS THE CONTRACTOR IS TO ENSURE ALL AREAS ARE FREE DRAINING & WILL NOT RETAIN WATER DURING RAINFALL. PROVIDE TEMPORARY MEASURES AS REQUIRED TO ENSURE FREE FLOWING RUNOFF THROUGH MANAGED DRAINAGE PATHS, DIVERSION DRAINS OR OTHER SUITABLE DISPOSAL METHOD AS AGREED DURING THE WORKS. REFER ANY CONCERNS TO THE ENGINEER. REFER TO EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES.

EARTHWORK ESTIMATES

SITE AREA	= 27.4 Ha
DISTURBED AREA	= 24.6 Ha
TOPSOIL STRIP (200mm OVER 27.4 Ha)	=(~54,800m³) (TO BE EXPORTED/REUSED*)
CUT	= ~347,500m³
FILL	= +278,150m³
DIFFERENCE	= ~69,350m³ (i.e. CUT OVER FILL)

NOTE:
VOLUMES BASED ON 200mm TOPSOIL STRIP OVER THE NOMINATED AREA.

A PORTION OF THE STRIPPED TOPSOIL TO BE REUSED/BLENDED IN LANDSCAPE SETBACK AREAS ONLY SUBJECT TO DISCUSSIONS WITH THE ENGINEER.

EARTHWORKS VOLUMES ARE APPROXIMATE ONLY.

NO ALLOWANCE HAS BEEN MADE FOR DELETERIOUS MATERIAL, EROSION AND SEDIMENT CONTROL, DETAIL EXCAVATION, BULKING OR COMPACTION OF FILLED SOILS, THE REMOVAL OF UNCONTROLLED OR CONTAMINATED MATERIAL OR ANY OTHER UNSPECIFIED EXCAVATION RELATED TO CONSTRUCTION ACTIVITIES.

EARTHWORK ESTIMATES

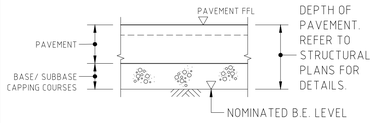
LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- 50.00 – EXISTING CONTOUR (0.2m INTERVAL)
- 50.00 – B.E.L. CONTOUR (MAJOR 1.0m)
- 50.10 – B.E.L. CONTOUR (MINOR 0.25m)
- +50.00 – B.E.L. SPOT LEVEL



NOMINATED B.E.L. DETAIL
NTS

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
UPDATED ARCHITECTURAL MASTERPLAN	08.03.24	E
UPDATED ARCHITECTURAL MASTERPLAN	11.09.23	D
ADDITIONAL PARKING ADDED TO WH2, ACOUSTIC WALL & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	22.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

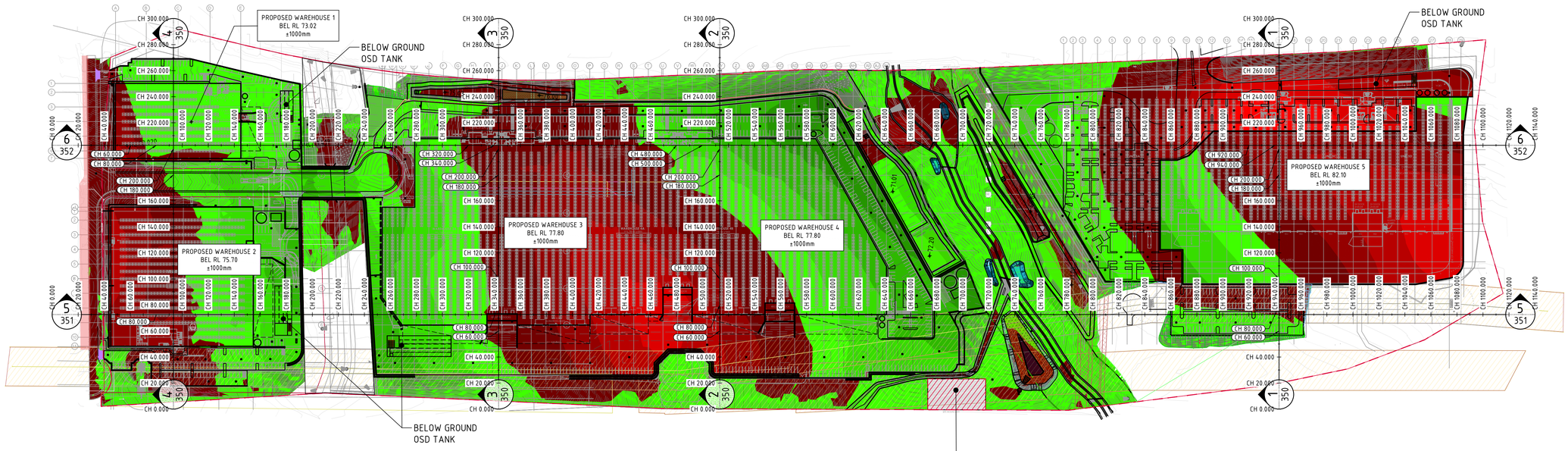
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE '22	MW	B1	AS SHOWN	C013904.03-SSDA300

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: BULK EARTHWORKS PLAN

DRAWING No: C013904.03-SSDA300 ISSUE: E



CUT/FILL PLAN
SCALE 1:1500

DEPTH RANGE			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	-11.000	-10.000	
2	-10.000	-9.000	
3	-9.000	-8.000	
4	-8.000	-7.000	
5	-7.000	-6.000	
6	-6.000	-5.000	
7	-5.000	-4.000	
8	-4.000	-3.000	
9	-3.000	-2.000	
10	-2.000	-1.000	
11	-1.000	0.000	
12	0.000	1.000	
13	1.000	2.000	
14	2.000	3.000	
15	3.000	4.000	
16	4.000	5.000	
17	5.000	6.000	
18	6.000	7.000	
19	7.000	8.000	
20	8.000	9.000	
21	9.000	10.000	

CUT

FILL

EARTHWORK ESTIMATES

LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL MASTERPLAN	08.03.24	E
REVISED ARCHITECTURAL MASTERPLAN	11.09.23	D
ADDITIONAL PARKING ADDED TO WH2, ACOUSTIC WALL & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	22.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA310

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

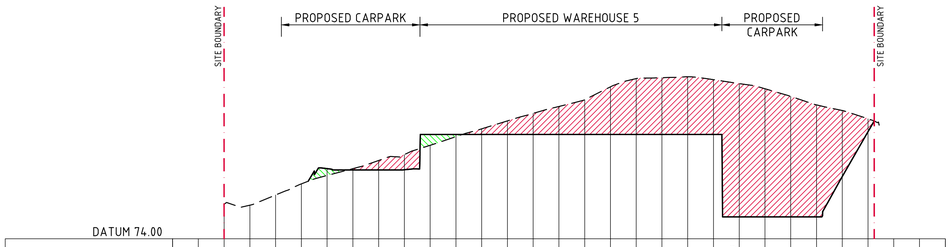
DRAWING TITLE
CUT/FILL PLAN

DRAWING No C013904.03-SSDA310

ISSUE E

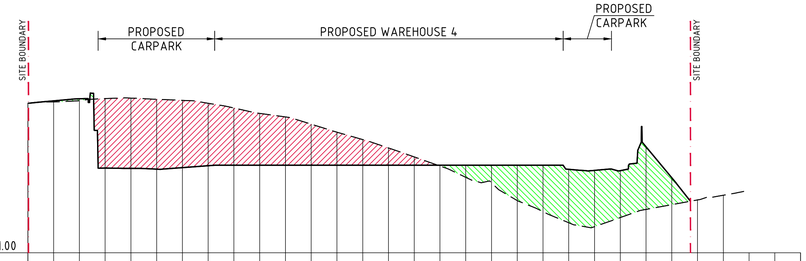
LEGEND:

- DENOTES BULK EARTHWORKS PROFILE
- DENOTES EXISTING PROFILE
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL



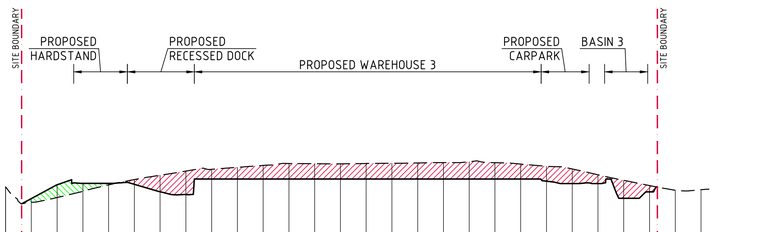
DATUM 74.00																														
CUT/FILL DEPTH							0.529	-0.102	-0.738	-1.179	0.841	0.176	-0.437	-1.055	-1.638	-2.170	-2.699	-3.693	-4.337	-4.409	-4.477	-4.255	-10.349	-9.948	-9.352	-8.700	-5.141	-1.005			
BULK EARTHWORKS LEVEL							79.445	79.345	79.345	79.359	82.100	82.100	82.100	82.100	82.100	82.100	82.100	82.100	82.100	82.100	82.100	82.100	75.700	75.700	75.700	75.700	78.822	82.310			
EXISTING SURFACE LEVEL							78.916	79.447	80.083	80.537	81.259	81.926	82.537	83.155	83.738	84.270	84.799	85.793	86.437	86.509	86.577	86.955	86.649	85.648	85.052	84.400	83.963	83.315			
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000

SECTION 1
HORIZONTAL SCALE 1:1000
VERTICAL SCALE 1:200



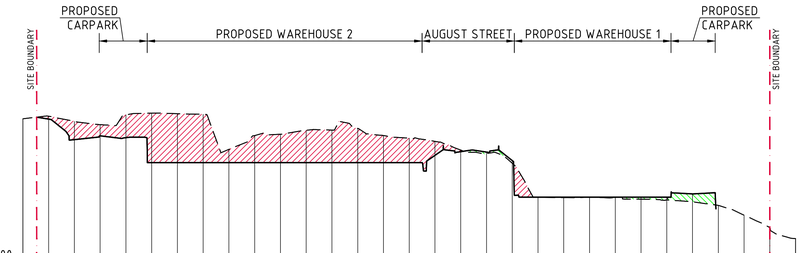
DATUM 71.00																														
CUT/FILL DEPTH		0.077	0.147	-5.400	-5.457	-5.426	-5.223	-4.847	-4.441	-4.022	-3.751	-3.384	-2.563	-1.992	-1.341	-0.644	0.061	0.938	1.364	2.748	3.605	4.146	4.366	3.644	4.860	2.083				
BULK EARTHWORKS LEVEL		82.796	82.955	77.576	77.556	77.493	77.612	77.762	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.479	77.397	77.378	79.229	76.819				
EXISTING SURFACE LEVEL	82.61	82.718	82.808	82.976	83.012	82.919	82.835	82.609	82.241	81.822	81.551	80.984	80.363	79.792	79.141	78.444	77.739	76.862	76.436	75.052	74.195	73.333	73.032	73.734	74.369	74.736	75.102	75.465			
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000

SECTION 2
HORIZONTAL SCALE 1:1000
VERTICAL SCALE 1:200



DATUM 73.00																														
CUT/FILL DEPTH		0.294	0.984	0.610	0.118	-0.373	-1.284	-1.818	-0.753	-0.903	-1.053	-1.205	-1.184	-1.174	-1.201	-1.227	-1.247	-1.274	-1.336	-1.262	-1.156	-1.156	-1.138	-0.686	-1.394	-0.491				
BULK EARTHWORKS LEVEL		76.278	77.344	77.454	77.454	77.384	76.807	76.590	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.800	77.627	77.440	77.440	76.300	76.800				
EXISTING SURFACE LEVEL	77.19	75.985	76.360	76.843	77.336	77.757	78.091	78.408	78.553	78.703	78.853	79.005	78.984	78.974	79.001	79.027	79.047	79.074	79.136	79.062	78.956	78.783	78.578	78.126	77.694	77.291	76.924	76.965			
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000

SECTION 3
HORIZONTAL SCALE 1:1000
VERTICAL SCALE 1:200



DATUM 68.00																														
CUT/FILL DEPTH		-0.224	-1.417	-0.869	-1.772	-3.838	-3.799	-3.752	-1.030	-2.103	-2.203	-2.517	-2.525	-2.658	-2.103	-1.897	-1.086	-0.128	0.117	0.262	0.012	0.038	0.007	0.032	0.160	0.220	0.620			
BULK EARTHWORKS LEVEL		79.079	77.484	77.783	77.635	75.700	75.700	75.700	75.700	75.700	75.700	75.700	75.700	75.700	75.700	75.700	76.262	76.549	76.520	75.858	73.020	73.020	73.020	73.020	73.020	73.020	73.273			
EXISTING SURFACE LEVEL	79.10	79.302	78.902	78.651	79.407	79.538	79.499	79.452	78.730	77.803	77.903	78.217	78.225	78.358	77.803	77.597	77.348	76.677	76.403	75.655	73.008	72.982	73.013	72.988	72.860	72.800	72.653	72.378	71.622	70.652	69.80
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000

SECTION 4
HORIZONTAL SCALE 1:1000
VERTICAL SCALE 1:200

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

10m 0 10 20 30 40 50 60 70 80 90 100m
SCALE 1:1000 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
UPDATED ARCHITECTURAL MASTERPLAN	08.03.24	C
UPDATED ARCHITECTURAL MASTERPLAN	11.09.23	B
ISSUED FOR INFORMATION	22.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA350

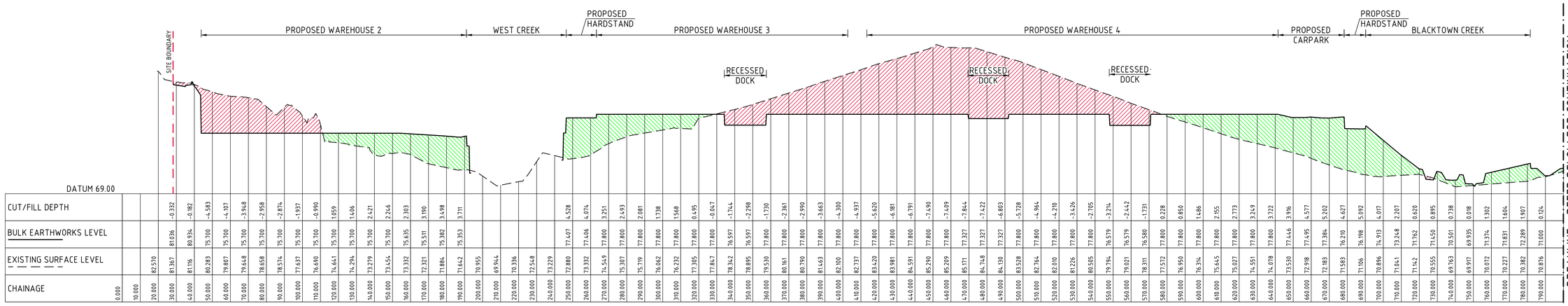
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

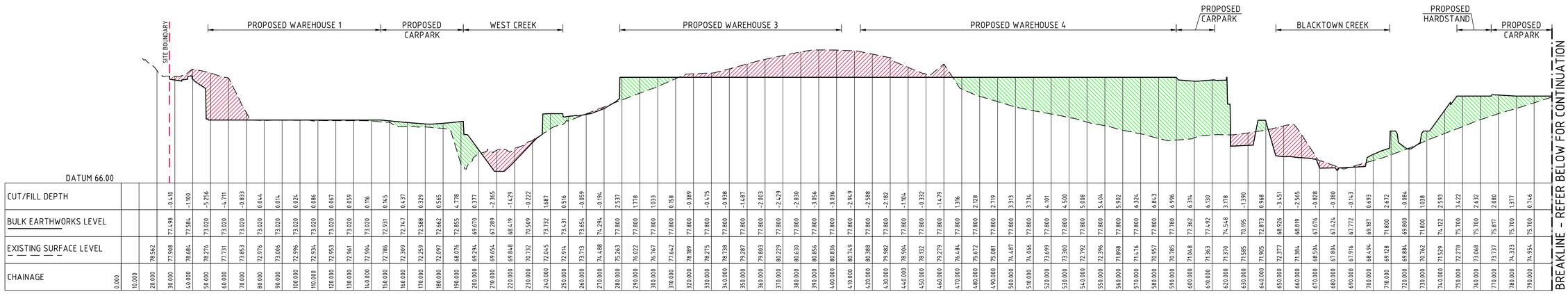
DRAWING TITLE: BULK EARTHWORKS SECTIONS SHEET 1

DRAWING No: C013904.03-SSDA350

ISSUE: C



| CHAINAGE | 0.000 | 10.000 | 20.000 | 30.000 | 40.000 | 50.000 | 60.000 | 70.000 | 80.000 | 90.000 | 100.000 | 110.000 | 120.000 | 130.000 | 140.000 | 150.000 | 160.000 | 170.000 | 180.000 | 190.000 | 200.000 | 210.000 | 220.000 | 230.000 | 240.000 | 250.000 | 260.000 | 270.000 | 280.000 | 290.000 | 300.000 | 310.000 | 320.000 | 330.000 | 340.000 | 350.000 | 360.000 | 370.000 | 380.000 | 390.000 | 400.000 | 410.000 | 420.000 | 430.000 | 440.000 | 450.000 | 460.000 | 470.000 | 480.000 | 490.000 | 500.000 | 510.000 | 520.000 | 530.000 | 540.000 | 550.000 | 560.000 | 570.000 | 580.000 | 590.000 | 600.000 | 610.000 | 620.000 | 630.000 | 640.000 | 650.000 | 660.000 | 670.000 | 680.000 | 690.000 | 700.000 | 710.000 | 720.000 | 730.000 | 740.000 | 750.000 | 760.000 | 770.000 | 780.000 | 790.000 |
|---|---|---



DATUM 66.00

| CHAINAGE | 0.000 | 10.000 | 20.000 | 30.000 | 40.000 | 50.000 | 60.000 | 70.000 | 80.000 | 90.000 | 100.000 | 110.000 | 120.000 | 130.000 | 140.000 | 150.000 | 160.000 | 170.000 | 180.000 | 190.000 | 200.000 | 210.000 | 220.000 | 230.000 | 240.000 | 250.000 | 260.000 | 270.000 | 280.000 | 290.000 | 300.000 | 310.000 | 320.000 | 330.000 | 340.000 | 350.000 | 360.000 | 370.000 | 380.000 | 390.000 | 400.000 | 410.000 | 420.000 | 430.000 | 440.000 | 450.000 | 460.000 | 470.000 | 480.000 | 490.000 | 500.000 | 510.000 | 520.000 | 530.000 | 540.000 | 550.000 | 560.000 | 570.000 | 580.000 | 590.000 | 600.000 | 610.000 | 620.000 | 630.000 | 640.000 | 650.000 | 660.000 | 670.000 | 680.000 | 690.000 | 700.000 | 710.000 | 720.000 | 730.000 | 740.000 | 750.000 | 760.000 | 770.000 | 780.000 | 790.000 |
|---|---|---

CATCHMENT 1: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS
OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE
NUMBER OF STORMFILTER CARTRIDGES = 35
ON-SITE DETENTION VOLUME PROVIDED = 550m3

ESTATE DISCHARGE POINT 1:

REHABILITATED WESTERN SWALE TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING CULVERT WITH FALSE HEADWALL WITH 3xø900. BLOCKOUTS TO REDUCE EXISTING 3xø1150 RCP.

CATCHMENT 3A: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 265m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
SURFACE AREA NOMINATED FOR BIO-RETENTION FILTRATION IS EXCLUSIVE OF SCOUR PROTECTION
ON-SITE DETENTION VOLUME PROVIDED = 467m3
REFER TO DRAWING SSDA462 FOR TYPICAL SECTIONS THROUGH BASIN

ESTATE DISCHARGE POINT 2:

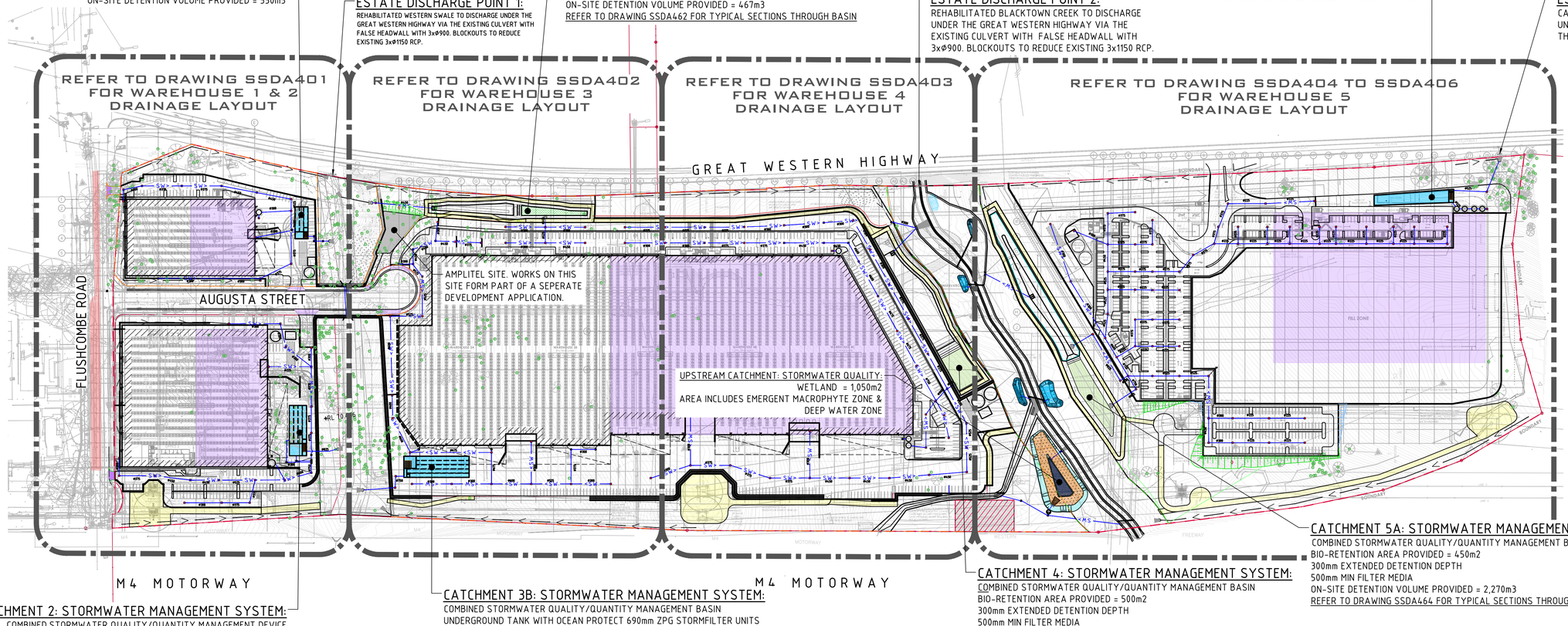
REHABILITATED BLACKTOWN CREEK TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING CULVERT WITH FALSE HEADWALL WITH 3xø900. BLOCKOUTS TO REDUCE EXISTING 3x1150 RCP.

CATCHMENT 5B STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS
OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE
NUMBER OF STORMFILTER CARTRIDGES = 45
ON-SITE DETENTION VOLUME PROVIDED = 915m³

ESTATE DISCHARGE POINT 3:

CATCHMENT 5B TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING ø700 RCP CULVERT



CATCHMENT 2: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS
OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE
NUMBER OF STORMFILTER CARTRIDGES = 70
ON-SITE DETENTION VOLUME PROVIDED = 990m3

CATCHMENT 3B: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS
OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE and = 75
ON-SITE DETENTION VOLUME PROVIDED = 1335m³

CATCHMENT 4: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 500m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
ON-SITE DETENTION VOLUME PROVIDED = 2,530m3
REFER TO DRAWING SSDA463 FOR TYPICAL SECTIONS THROUGH BASIN

CATCHMENT 5A: STORMWATER MANAGEMENT SYSTEM:

COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 450m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
ON-SITE DETENTION VOLUME PROVIDED = 2,270m3
REFER TO DRAWING SSDA464 FOR TYPICAL SECTIONS THROUGH BASIN

STORMWATER DRAINAGE KEY PLAN

SCALE 1:1500

STORMWATER DRAINAGE NOTES:

1. ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500.3 PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE.
2. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
3. ALL FINISHED PAVEMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS C013904.03-SSDA501.
4. PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
5. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
6. PUBLIC DOMAIN DRAINAGE TO BE MIN. CLASS 3 UNDER KERBS, AND CLASS 4 FOR PIPES CROSSING ROADS. ALL BEEING TO BLACKTOWN COUNCIL SPECIFICIATIONS OR MINIMUM HS2. MINIMUM SIZE 375mm.

7a. ALL PRIVATE STORMWATER PIPES ø375 OR GREATER SHALL BE CLASS 2 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.

7b. ALL PRIVATE PIPES UP TO AND INCLUDING ø300 TO BE uPVC GRADE SN8 UNO.

8. PIPE CLASS NOMINATED ARE FOR IN-SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
9. ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F'c=25 MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
10. IN ADDITION TO ITEM 9 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
11. PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EDGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
12. CONCRETE PIPES UNDER, OR WITHIN THE ZONE OF INFLUENCE OF PAVED AREAS SHALL BE LAID USING HS2 TYPE SUPPORT, AS A MINIMUM, IN ACCORDANCE WITH AS 3725. AGGREGATE BACKFILL SHALL NOT BE USED FOR PIPE BEDDING AND OR HAUNCH/SIDE SUPPORT.
13. WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED ø100 uPVC TO EACH SIDE OF PIPE.
14. ALL SUBSOIL DRAINAGE LINES SHALL BE ø100 SLOTTED uPVC WITH APPROVED FILTER WRAP LAID IN 300mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOIL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOIL LINES TO ALL PAVEMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN.
15. WHERE SUBSOIL DRAINAGE PASSES UNDER A PAVEMENT OR A SLAB, UNSLOTTED UPVC ARE TO BE PROVIDED UNLESS NOTED OTHERWISE.
16. ALL PIPE GRADES 1 IN 200 MINIMUM UNO.
17. PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
18. MIN. 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AND PEDESTRIAN AREAS.
19. PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY', THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' U.N.O.
20. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
21. DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTOR TO MATCH DP SIZE U.N.O. ON PLAN. PROVIDE CLEANING EYE AT GROUND LEVEL.
22. PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND DO NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.
23. WHERE CONNECTION TO EXISTING INGROUND DRAINAGE SYSTEMS, OPEN SWALES, CHANNELS OR ANY OTHER EXISTING SYSTEM, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND INVERT ON SITE AT THE BEGINNING OF THE CONSTRUCTION PERIOD. REFER ANY VARIANCE FROM DOCUMENTATION OR SURVEYS TO THE ENGINEER FOR CLARIFICATION.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- SW> PROPOSED DRAINAGE LINE
- SW> EXISTING DRAINAGE LINE
- DP ROOFWATER DOWNPIPE (INDICATIVE)
- RW> ROOFWATER LINE
- SS> SUBSOIL LINE
- OVERLAND FLOW DIRECTION
- 50.00 FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

LEVELS NOTE:

LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN.
FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	06.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
ADDITIONAL PARKING ADDED TO WH2, ACOUSTIC WALL & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA400

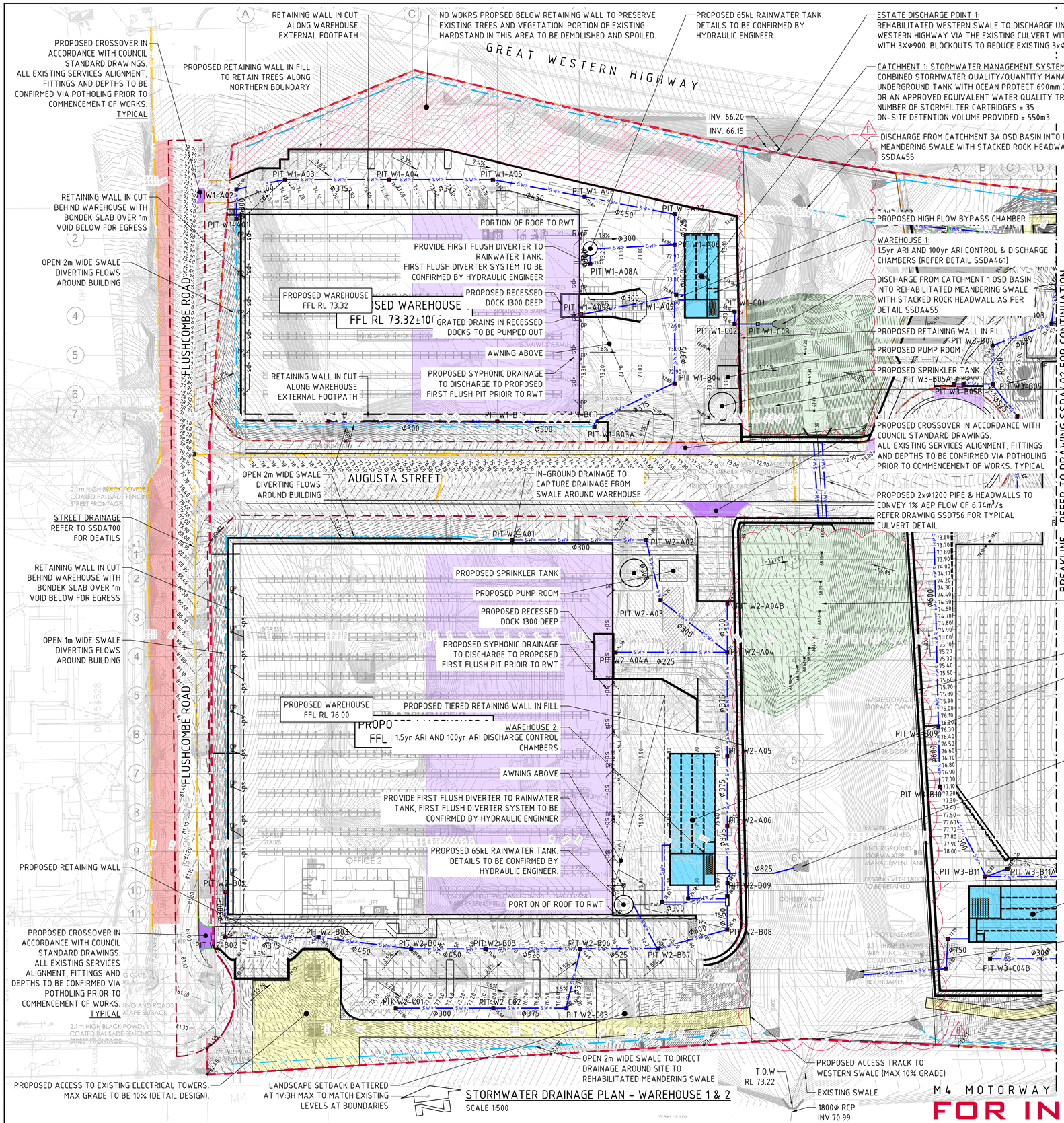
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 6 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE KEY PLAN

DRAWING No: C013904.03-SSDA400 ISSUE: E


GREAT WESTERN HIGHWAY
AUGUSTA STREET
FLUSHCOMBE ROAD
PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL
RETAINING WALL IN CUT ALONG WAREHOUSE EXTERNAL FOOTPATH
PROPOSED RETAINING WALL IN FILL TO RETAIN TREES ALONG NORTHERN BOUNDARY
NO WOKRS PROPSED BELOW RETAINING WALL TO PRESERVE EXISTING TREES AND VEGETATION. PORTION OF EXISTING HARDSTAND IN THIS AREA TO BE DEMOLISHED AND SPOILED.
PROPOSED 65kL RAINWATER TANK. DETAILS TO BE CONFIRMED BY HYDRAULIC ENGINEER.
RETAINING WALL IN CUT BEHIND WAREHOUSE WITH BONDEK SLAB OVER 1m VOID BELOW FOR EGRESS
OPEN 2m WIDE SWALE DIVERTING FLOWS AROUND BUILDING
PROPOSED WAREHOUSE FFL RL 73.32
PROPOSED WAREHOUSE FFL RL 73.32±10
PORTION OF ROOF TO RWT
PROVIDE FIRST FLUSH DIVERTER TO RAINWATER TANK. FIRST FLUSH DIVERTER SYSTEM TO BE CONFIRMED BY HYDRAULIC ENGINEER
PROPOSED RECESSED DOCK 1300 DEEP
GRATED DRAINS IN RECESSED DOCKS TO BE PUMPED OUT
AWNING ABOVE
PROPOSED SYPHONIC DRAINAGE TO DISCHARGE TO PROPOSED FIRST FLUSH PIT PRIOIR TO RWT
RETAINING WALL IN CUT ALONG WAREHOUSE EXTERNAL FOOTPATH
OPEN 2m WIDE SWALE DIVERTING FLOWS AROUND BUILDING
IN-GROUND DRAINAGE TO CAPTURE DRAINAGE FROM SWALE AROUND WAREHOUSE
STREET DRAINAGE REFER TO SSDA700 FOR DEATILS
RETAINING WALL IN CUT BEHIND WAREHOUSE WITH BONDEK SLAB OVER 1m VOID BELOW FOR EGRESS
OPEN 1m WIDE SWALE DIVERTING FLOWS AROUND BUILDING
PROPOSED SPRINKLER TANK
PROPOSED PUMP ROOM
PROPOSED RECESSED DOCK 1300 DEEP
PROPOSED SYPHONIC DRAINAGE TO DISCHARGE TO PROPOSED FIRST FLUSH PIT PRIOIR TO RWT
PROPOSED WAREHOUSE FFL RL 76.00
PROPOSED TIERED RETAINING WALL IN FILL
WAREHOUSE 2: 1.5yr ARI AND 100yr ARI DISCHARGE CONTROL CHAMBERS
AWNING ABOVE
PROVIDE FIRST FLUSH DIVERTER TO RAINWATER TANK, FIRST FLUSH DIVERTER SYSTEM TO BE CONFIRMED BY HYDRAULIC ENGINNER
PROPOSED 65kL RAINWATER TANK. DETAILS TO BE CONFIRMED BY HYDRAULIC ENGINEER.
PROPOSED RETAINING WALL
PORTION OF ROOF TO RWT
PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL
PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS. MAX GRADE TO BE 10% (DETAIL DESIGN).
LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES
OPEN 2m WIDE SWALE TO DIRECT DRAINAGE AROUND SITE TO REHABILITATED MEANDERING SWALE
T.O.W RL 73.22
PROPOSED ACCESS TRACK TO WESTERN SWALE (MAX 10% GRADE)
EXISTING SWALE
1800Φ RCP INV:70.99
M4 MOTORWAY
INV. 66.20
INV. 66.15
ESTATE DISCHARGE POINT 1: REHABILITATED WESTERN SWALE TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING CULVERT WITH FALSE HEADWALL WITH 3XΦ900. BLOCKOUTS TO REDUCE EXISTING 3xΦ1150 RCP.
CATCHMENT 1: STORMWATER MANAGEMENT SYSTEM: COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE NUMBER OF STORMFILTER CARTRIDGES = 35 ON-SITE DETENTION VOLUME PROVIDED = 550m3
DISCHARGE FROM CATCHMENT 3A OSD BASIN INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455
PROPOSED HIGH FLOW BYPASS CHAMBER
WAREHOUSE 1: 1.5yr ARI AND 100yr ARI CONTROL & DISCHARGE CHAMBERS (REFER DETAIL SSDA461)
DISCHARGE FROM CATCHMENT 1 OSD BASIN INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455
PROPOSED RETAINING WALL IN FILL
PROPOSED PUMP ROOM
PROPOSED SPRINKLER TANK
REALIGN FLOW PATH FROM NEW CULVERT STRUCTURE TO EXISTING WESTERN SWALE FLOW PATH IN THE EXTENT SHOWN. REMAINDER OF WESTERN SWALE TO REMAIN TO CONSERVE TREES WHERE POSSIBLE.
PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL
PROPOSED 2xΦ1200 PIPE & HEADWALLS TO CONVEY 1% AEP FLOW OF 6.74m³/s REFER DRAWING SSD756 FOR TYPICAL CULVERT DETAIL.
REALIGN FLOW PATH TO NEW CULVERT STRUCTURE FROM EXISTING WESTERN SWALE FLOW PATH IN THE EXTENT SHOWN. REMAINDER OF WESTERN SWALE TO REMAIN TO CONSERVE TREES WHERE POSSIBLE.
PROPOSED TIERED RETAINING WALL IN FILL
CATCHMENT 2: STORMWATER MANAGEMENT SYSTEM: COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE NUMBER OF STORMFILTER CARTRIDGES = 70 ON-SITE DETENTION VOLUME PROVIDED = 990m3
DISCHARGE FROM CATCHMENT 2 OSD TANK INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455
PROPOSED HIGH FLOW BYPASS CHAMBER
CATCHMENT 3B: STORMWATER MANAGEMENT SYSTEM: REFER TO DRAWING SSDA402 FOR DETAILS.
DISCHARGE FROM CATCHMENT 3B OSD TANK INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455
PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH FROM MOTORWAY AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.
BREAKLINE - REFER TO DRAWING SSDA402 FOR CONTINUATION
PIT W1-A01
PIT W1-A02
PIT W1-A03
PIT W1-A04
PIT W1-A05
PIT W1-A06
PIT W1-A07
PIT W1-A08
PIT W1-A08A
PIT W1-A09
PIT W1-A09A
PIT W1-B01
PIT W1-B02
PIT W1-B03
PIT W1-B03A
PIT W1-B04
PIT W1-C01
PIT W1-C02
PIT W1-C03
PIT W2-A01
PIT W2-A02
PIT W2-A03
PIT W2-A04
PIT W2-A04A
PIT W2-A04B
PIT W2-A05
PIT W2-A06
PIT W2-B01
PIT W2-B02
PIT W2-B03
PIT W2-B04
PIT W2-B05
PIT W2-B06
PIT W2-B07
PIT W2-B08
PIT W2-B09
PIT W2-C01
PIT W2-C02
PIT W2-C03
PIT W3-B01
PIT W3-B02
PIT W3-B03
PIT W3-B04
PIT W3-B05
PIT W3-B05A
PIT W3-B05B
PIT W3-B06
PIT W3-B07
PIT W3-B08
PIT W3-B09
PIT W3-B10
PIT W3-B11
PIT W3-B11A
PIT W3-C04
PIT W3-C04A
PIT W3-C04B
PIT W3-C05
PIT W3-C06
PIT W3-C07
PIT W3-C08
PIT W3-C09
PIT W3-C10
PIT W3-C11
PIT W3-C12
PIT W3-C13
PIT W3-C14
PIT W3-C15
PIT W3-C16
PIT W3-C17
PIT W3-C18
PIT W3-C19
PIT W3-C20
PIT W3-C21
PIT W3-C22
PIT W3-C23
PIT W3-C24
PIT

ESTATE DISCHARGE POINT 1:

REHABILITATED WESTERN SWALE TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING CULVERT WITH FALSE HEADWALL WITH 3xø900. BLOCKOUTS TO REDUCE EXISTING 3xø1150 RCP.

INV. 66.20

INV. 66.15

PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH TO GWH AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.

OPEN 2m WIDE SWALE TO DIRECT DRAINAGE AROUND SITE TO REHABILITATED MEANDERING SWALE

DISCHARGE FROM CATCHMENT 3A OSD BASIN INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

REALIGN FLOW PATH FROM NEW CULVERT STRUCTURE TO EXISTING WESTERN SWALE FLOW PATH SHOWN. REMAINDER OF WESTERN SWALE TO REMAIN TO CONSERVE TREES WHERE POSSIBLE. REFER DRAWING SSD756 FOR TYPICAL CULVERT DETAILS TBC AT DETAIL DESIGN

PROPOSED 2xø1200 PIPE & HEADWALLS TO CONVEY 1% AEP FLOW OF 6.74m³/s REFER DRAWING SSD756 FOR TYPICAL CULVERT DETAILS

REALIGN FLOW PATH FROM NEW CULVERT STRUCTURE TO EXISTING WESTERN SWALE FLOW PATH SHOWN. REMAINDER OF WESTERN SWALE TO REMAIN TO CONSERVE TREES WHERE POSSIBLE. REFER DRAWING SSD756 FOR TYPICAL CULVERT DETAILS TBC AT DETAIL DESIGN

PROPOSED TIERED RETAINING WALL

BREAKLINE - REFER TO DRAWING SSDA401 FOR CONTINUATION

DISCHARGE FROM CATCHMENT 2 OSD TANK INTO REHABILITATED MEANDERING SWALE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

CATCHMENT 3B SITE DISCHARGE PONT INTO EXISTING WESTERN WATERCOURSE WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

PROPOSED SERVICING ACCESS ROUTE TO WESTERN SWALE. ALL ACCESS TRACKS TO HAVE A MAX 10% GRADE. TBC DURING DETAIL DESIGN.

T.O.W RL 73.22

1800ø RCP INV:70.99

PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH FROM MOTORWAY AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.

LANDSCAPE BATTERED AT 1V:3H MAX TO MATCH REALIGNED SWALE'S RIPARIAN CORRIDOR LEVELS.

AMPLITEL SITE.
WORKS ON THIS SITE FORM PART OF A SEPERATE DEVELOPMENT APPLICATION.

1.5yr ARI AND 100yr ARI CONTROL & DISCHARGE CONTROL CHAMBERS (REFER DETAIL SSDA461)

MAX 1V:2.5H BATTER TO EXISTING LEVELS ON BOUNDARY

CATCHMENT 3A SITE DISCHARGE PONT 1 INTO BIORETENTION BASIN WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

CATCHMENT 3A: STORMWATER MANAGEMENT SYSTEM:
COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 265m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
SURFACE AREA NOMINATED FOR BIO-RETENTION FILTRATION IS EXCLUSIVE OF SCOUR PROTECTION
ON-SITE DETENTION VOLUME PROVIDED = 467m3
REFER TO DRAWING SSDA462 FOR TYPICAL SECTIONS THROUGH BASIN

PROPOSED MAINTENANCE ACCESS TRACK TO AND AROUND BASIN. ALL ACCESS TRACKS TO HAVE A MAX 10% GRADE. TBC DURING DETAIL DESIGN.

PROPOSED RAINWATER TANKS

RETAINING BY STRUCTURE

ROOFWATER LINES TO HAVE NOMINAL 0.5% FALL TO PITS. ENSURE MINIMUM 600 COVER IS MAINTAINED TO ALL PIPES. REFER ALL CONCERN TO ENGINEER. TYPICAL

PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL

RETAINING WALL ALONG RAMP WITH BONDEK SLAB OVER 1m VOID BELOW

PROPOSED WAREHOUSE 3
FFL RL 78.10±

PROPOSED WAREHOUSE
FFL RL 78.10

CATCHMENT 3B: STORMWATER MANAGEMENT SYSTEM:
COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE and = 75
ON-SITE DETENTION VOLUME PROVIDED = 1335m³

PROPOSED RECESSED DOCK 1300 DEEP

GRATED DRAINS IN RECESSED DOCK TO BE PUMPED OUT

AWNING ABOVE

AWNING ABOVE

PROPOSED TIERED RETAINING WALL

PROPOSED RETAINING WALL

M4 MOTORWAY

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES.

OPEN 2m WIDE SWALE TO DIRECT DRAINAGE AROUND SITE TO REHABILITATED MEANDERING SWALE

BREAKLINE - REFER TO DRAWING SSDA403 FOR CONTINUATION

GREAT WESTERN HIGHWAY

SITE BOUNDARY

STORMWATER DRAINAGE PLAN - WAREHOUSE 3

SCALE 1:500

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

NOTE:

PITS TO BE FITTED WITH OCEAN PROTECT 'OCEANGUARD OG200' INSERT. SHOWN THUS ◇
TOTAL NUMBER OF PIT INSERTS
REFER TO PIT SCHEDULE BELOW.

ROOFWATER NOTE:

ROOFWATER LINES TO HAVE NOMINAL 0.5% FALL TO PITS.
ENSURE MINIMUM 600 COVER IS MAINTAINED TO ALL PIPES.
REFER ALL CONCERN TO ENGINEER. TYPICAL

LEVELS NOTE:

LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN.
FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

GENERAL NOTES:

SUBSOIL DRAINAGE TO BE INSTALLED ALONG ALL KERB AND LANDSCAPED INTERFACES.

NOTES:

1. REFER TO DRAWING SSDA400 FOR STORMWATER DRAINAGE NOTES.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- SIPHONIC LINE
- OPEN SWALE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- DENOTES PROPOSED BIORETENTION AREA

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	F
REVISED ARCHITECTURAL MASTERPLAN	06.03.24	E
REVISED ARCHITECTURAL MASTERPLAN	11.09.23	D
ACOUSTIC BUNDING & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA402

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE PLAN WAREHOUSE 3

DRAWING No: C013904.03-SSDA402 ISSUE: F

LANDSCAPE SETBACK BATTERED AT 1V:2.5H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

PROPOSED MAINTENANCE ACCESS TRACK. ALL ACCESS TRACKS TO HAVE A MAX 10% GRADE. TBC DURING DETAIL DESIGN.

PROPOSED 1m HIGH WALL BEHIND ACCESS TRACK WITH A 2m WIDE 1V:2.5H MAX BATTER BEHIND WALL

DISCHARGE FROM CATCHMENT 4 OSD BASIN INTO REHABILITATED BLACKTOWN CREEK WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

PROPOSED ACOUSTIC FENCE ALONG GREAT WESTERN HIGHWAY BOUNDARY ON TOP OF BATTER SHOWN

PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH TO GWH AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.".

FALSE HEADWALL WITH 3x900ϕ BLOCKOUTS TO REDUCE EXISTING 3x1150ϕ RCP

ESTATE DISCHARGE POINT 2:
REHABILITATED BLACKTOWN CREEK TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING CULVERT WITH FALSE HEADWALL WITH 3xϕ900mmϕ. BLOCKOUTS TO REDUCE EXISTING 3xϕ1150 RCP.

GREAT WESTERN HIGHWAY

SITE BOUNDARY

INV. 66.07

LOW FLOW DIVERSION ROCK WALL TO FROG POND

DISCHARGE FROM CATCHMENT 5A OSD BASIN INTO REHABILITATED BLACKTOWN CREEK WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

PROPOSED MAINTENANCE ACCESS TRACK AROUND BASIN

REFER TO DETAIL SURVEY PLAN FOR EASEMENT DETAILS

LOW FLOW DIVERSION ROCK WALL TO FROG POND

CATCHMENT 5: STORMWATER MANAGEMENT SYSTEM:
REFER TO DRAWING SSDA403

PROPOSED BATTER MAX 1V:3H

PROPOSED STACKED BOULDER WALL

BREAKLINE - REFER TO DRAWING SSDA402 FOR CONTINUATION

BREAKLINE - REFER TO DRAWING SSDA404 FOR CONTINUATION

ROOFWATER LINES TO HAVE NOMINAL 0.5% FALL TO PITS. ENSURE MINIMUM 600 COVER IS MAINTAINED TO ALL PIPES. REFER ALL CONCERN TO ENGINEER. TYPICAL

PROVIDE FIRST FLUSH DIVERTER TO RAINWATER TANK. FIRST FLUSH DIVERTER SYSTEM TO BE CONFIRMED BY HYDRAULIC ENGINEER

PROPOSED 85KL RAINWATER TANK. DETAILS TO BE CONFIRMED BY HYDRAULIC ENGINEER.

PROPOSED 1V:1H BOULDER & MASS CONCRETE STABILISED BATTER OR STABILISED BY LANDLOK 450 OR SIMILAR APPROVED (TBC DURING DETAIL DESIGN)

CATCHMENT 4: STORMWATER MANAGEMENT SYSTEM:
COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 500m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
ON-SITE DETENTION VOLUME PROVIDED = 2,530m3
REFER TO DRAWING SSDA463 FOR TYPICAL SECTIONS THROUGH BASIN

PORTION OF ROOF TO RWT

PROPOSED WAREHOUSE FFL RL 78.10

WAREHOUSE 4A FFL 78100 ±1000

WAREHOUSE 4B FFL 78100 ±1000

WAREHOUSE 4C FFL 78100 ±1000

PROPOSED RETAINING WALL

CATCHMENT 4 SITE DISCHARGE POINT 1 INTO BIORETENTION BASIN WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

PROPOSED SYPHONIC DRAINAGE TO DISCHARGE TO PROPOSED FIRST FLUSH PIT PRIOIR TO RWT

PROPOSED RECESSED DOCK 1300 DEEP

GRATED DRAIN IN RECESSED DOCK TO BE PUMPED OUT

PROPOSED RECESSED DOCK 1300 DEEP

GRATED DRAIN IN RECESSED DOCK TO BE PUMPED OUT

PROPOSED 2x65KL RAINWATER TANK. DETAILS TO BE CONFIRMED BY HYDRAULIC ENGINEER.

PROVIDE FIRST FLUSH DIVERTER TO RAINWATER TANK. FIRST FLUSH DIVERTER SYSTEM TO BE CONFIRMED BY HYDRAULIC ENGINEER

AWNING ABOVE

AWNING ABOVE

AWNING ABOVE

PROPOSED PUMP ROOM

PROPOSED RETAINING WALL

RAMP UP TO HARDSTAND ABOVE

DISCHARGE FROM OVERLAND FLOW CHANNEL INTO REHABILITATED BLACKTOWN CREEK WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

WETLAND EMERGENCY SPILLWAY

DISCHARGE FROM WETLAND INTO REHABILITATED BLACKTOWN CREEK WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

LOW FLOW DIVERSION ROCK WALL TO GPT

WETLAND
REFER TO DRAWING SSDA410

PROPOSED TIERED RETAINING WALL

OPEN SWALE DIVERTING OVERLAND FLOW FROM UPSTREAM CATCHMENT AROUND SITE ALONG SIMILAR ROUTE TO EXISTING

T.O.W RL 76.16

900ϕ RCP INV:74.80

BREAK IN KERB TO ALLOW OVERLAND FLOW TO ESCAPE IN THE EVENT OF BLOCKAGES IN DRAINAGE SYSTEM

PROPOSED ACCESS RAMP DOWN TO BLACKTOWN CREEK. MAX 10% GRADE.

GROSS POLLUTANT TRAP PRIOR TO DISCHARGE INTO WETLAND. OCEANPROTECT OCEANSAVE OR SIMILAR APPROVED

M4 MOTORWAY

PROPOSED TIERED RETAINING WALL

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS. ALL ACCESS TRACKS TO HAVE A MAX 10% GRADE. TBC DURING DETAIL DESIGN.

HERITAGE SITE SHOWN THUS. NO WORKS WITHIN HERITAGE ZONE. MATCH LEVELS AT BOUNDARY OF HERITAGE SITE.

AREA OF HARDSTAND SET LOWER TO CLEAR OF OVERHEAD CABLES

STORMWATER DRAINAGE PLAN - WAREHOUSE 4
SCALE 1:500

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

LEVELS NOTE:
LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN.
FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

ROOFWATER NOTE:
ROOFWATER LINES TO HAVE NOMINAL 0.5% FALL TO PITS.
ENSURE MINIMUM 600 COVER IS MAINTAINED TO ALL PIPES.
REFER ALL CONCERN TO ENGINEER. TYPICAL

NOTE:
PITS TO BE FITTED WITH OCEAN PROTECT 'OCEANGUARD OG200' INSERT. SHOWN THUS ◇
TOTAL NUMBER OF PIT INSERTS
REFER TO PIT SCHEDULE BELOW.

GENERAL NOTES:
SUBSOIL DRAINAGE TO BE INSTALLED ALONG ALL KERB AND LANDSCAPED INTERFACES.

NOTES:
1. REFER TO DRAWING SSDA400 FOR STORMWATER DRAINAGE NOTES.

LEGEND:
LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- SIPHONIC LINE
- OPEN SWALE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- DENOTES PROPOSED BIORETENTION AREA
- DENOTES EXISTING SYDNEY WATER EASEMENT
  REFER TO SURVEY FOR DETAILS

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL MASTERPLAN	06.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
ACOUSTIC BUNDING & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA403

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 6 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE PLAN WAREHOUSE 4

DRAWING No: C013904.03-SSDA403 ISSUE: E

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

ACCESS TO WAREHOUSE 5 FROM GWH DESIGNED BY ALTERNATE CONSULTANT. DESIGN DOCUMENTS REGARDING ACCESS FROM TFNSW ASSET TO FORM PART OF THE SSDA APPLICATION

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

GREAT WESTERN HIGHWAY

BOUNDARY

SITE BOUNDARY

700ø RCP
INV: 74.06

ITE BOUNDARY

TOW: 76.04

ESTATE DISCHARGE POINT 2:
CATCHMENT 5B TO DISCHARGE UNDER THE GREAT WESTERN HIGHWAY VIA THE EXISTING 700mm ø RCP CULVERT

EXISTING LEVELS TO BE RETAINED BELOW RETAINING WALLS TO RETAIN EXISTING TREES

PROPOSED RETAINING WALL IN CUT

PROPOSED 2x65KL RAINWATER TANK. DETAILS TO BE CONFIRMED BY HYDRAULIC ENGINEER.

PROVIDE FIRST FLUSH DIVERTER TO RAINWATER TANK.
FIRST FLUSH DIVERTER SYSTEM TO BE CONFIRMED BY HYDRAULIC ENGINEER

PROPOSED RETAINING WALL

EXISTING LEVELS TO BE RETAINED BELOW RETAINING WALLS TO RETAIN EXISTING TREES

PROPOSED RETAINING WALL IN CUT.

PROPOSED SPRINKLER TANK

CARPARK SET BELOW SUSPENDED WAREHOUSING ABOVE"

CATCHMENT 5A: STORMWATER MANAGEMENT SYSTEM:
COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT BASIN
BIO-RETENTION AREA PROVIDED = 450m2
300mm EXTENDED DETENTION DEPTH
500mm MIN FILTER MEDIA
ON-SITE DETENTION VOLUME PROVIDED = 2,270m3
REFER TO DRAWING SSDA464 FOR TYPICAL SECTIONS THROUGH BASIN

CATCHMENT 5B STORMWATER MANAGEMENT SYSTEM:
COMBINED STORMWATER QUALITY/QUANTITY MANAGEMENT DEVICE
UNDERGROUND TANK WITH OCEAN PROTECT 690mm ZPG STORMFILTER UNITS
OR AN APPROVED EQUIVALENT WATER QUALITY TREATMENT DEVICE
NUMBER OF STORMFILTER CARTRIDGES = 45
ON-SITE DETENTION VOLUME PROVIDED = 915m³

BATTER TO MAINTENANCE ROAD MAX 1V:3H

PROPOSED HIGH FLOW/LOW FLOW SPLITTER PIT

CATCHMENT 5A SITE DISCHARGE POINT 1 INTO BIORETENTION BASIN WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

PORTION OF ROOF TO RWT
INDICATIVELY SHOWN INDICATIVELY SHOWN TO BE DISCHARGED VIA SYPHONIC ROOF DRAINAGE TO PROPOSED FIRST FLUSH PIT PRIOIR TO RWT

DROPPER PIPE:
DISCHARGE SUSPENDED DRAINAGE ABOVE TO LEVELS ABOVE

CARPARK SET BELOW SUSPENDED WAREHOUSING ABOVE

CULVERT OR SIMILAR BRIDGING STRUCTURE BELOW WAREHHOUSE TO EXTERNAL PARKING AREA

PROPOSED RETAINING WALL

WETLAND EMERGENCY SPILLWAY

DISCHARGE FROM WETLAND INTO REHABILITATED BLACKTOWN CREEK WITH STACKED ROCK HEADWALL AS PER DETAIL SSDA455

WETLAND
REFER TO DRAWING SSDA410 FOR PLAN

PROPOSED MAINTENANCE ACCESS TRACK AROUND BASIN

GROSS POLLUTANT TRAP PRIOR TO DISCHARGE INTO WETLAND. OCEANPROTECT OCEANSAVE OR SIMILAR APPROVED

LOW FLOW DIVERSION ROCK WALL TO GPT

PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH FROM MOTORWAY AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.

TOW: 73.76

1800ø RCP
INV: 71.50

M4 MOTORWAY

PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS

EXISTING LEVELS TO BE RETAINED BELOW RETAINING WALLS TO RETAIN EXISTING TREES

BREAKLINE - REFER TO DRAWING SSDA403 FOR CONTINUATION

FILL ZONE

SLOPE

BOUNDARY

GENERAL NOTES:

SUBSOIL DRAINAGE TO BE INSTALLED ALONG ALL KERB AND LANDSCAPED INTERFACES.

NOTES:

1. REFER TO DRAWING SSDA400 FOR STORMWATER DRAINAGE NOTES.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- SIPHONIC LINE
- OPEN SWALE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- DENOTES PROPOSED BIORETENTION AREA
- DENOTES EXISTING SYDNEY WATER EASEMENT
  REFER TO SURVEY FOR DETAILS

NOTE:

PITS TO BE FITTED WITH OCEAN PROTECT 'OCEANGUARD OG200' INSERT. SHOWN THUS ◇
TOTAL NUMBER OF PIT INSERTS
REFER TO PIT SCHEDULE BELOW.

LEVELS NOTE:

LEVELS SHOWN TO BE +/-1000mm FROM THOSE SHOWN.
FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

ROOFWATER NOTE:

ROOFWATER LINES TO HAVE NOMINAL 0.5% FALL TO PITS.
ENSURE MINIMUM 600 COVER IS MAINTAINED TO ALL PIPES.
REFER ALL CONCERN TO ENGINEER. TYPICAL

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

STORMWATER DRAINAGE PLAN - WAREHOUSE 5 GROUND FLOOR

SCALE 1:500

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	06.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
REVISED AS CLOUDED	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

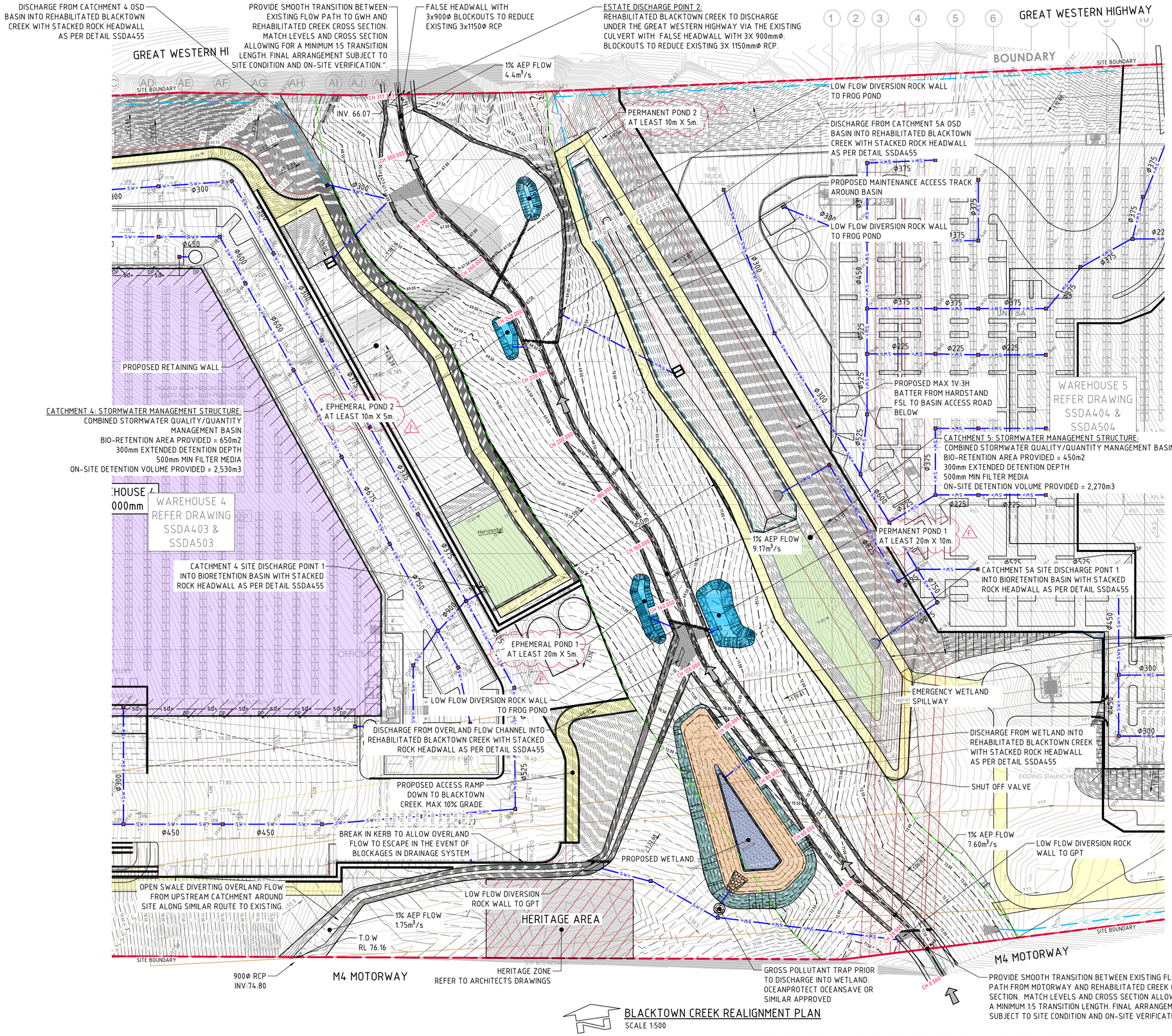
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA404

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE PLAN WAREHOUSE 5 GROUND FLOOR

DRAWING No: C013904.03-SSDA404 ISSUE: D



LEGEND:

ECOLOGY INFORMATION PROVIDED BY TRAVERS BUSHFIRE & ECOLOGY REF No. 20CHH02 DATED 04.05.2021

- FULL REVEGETATION OF PCT 1071 FRESHWATER WETLAND
- FULL REVEGETATION OF PCT 1071 (EMERGENT ZONE)
- FULL REVEGETATION OF PCT 1071 (DEEP WATER ZONE)
- DENOTES BIO-RETENTION ZONE

LEGEND:

LEVELS DATUM IS AHD.

EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LANDPARTNERS TITLED SY074904.002.2.2 DATED 04/03/2022.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- SUBSOIL LINE
- SIPHONIC LINE
- OPEN SWALE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- DENOTES PROPOSED BIORETENTION AREA
- DENOTES EXISTING SYDNEY WATER EASEMENT REFER TO SURVEY FOR DETAILS

NOTES:

1. REFER TO DRAWINGS SSDA550 TO SSDA 552 FOR SECTIONS THROUGH BLACKTOWN CREEK

BLACKTOWN CREEK REALIGNMENT PLAN

SCALE 1:500

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	F
REVISED ARCHITECTURAL MASTERPLAN	06.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
REVISED AS CLOUDED	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA410

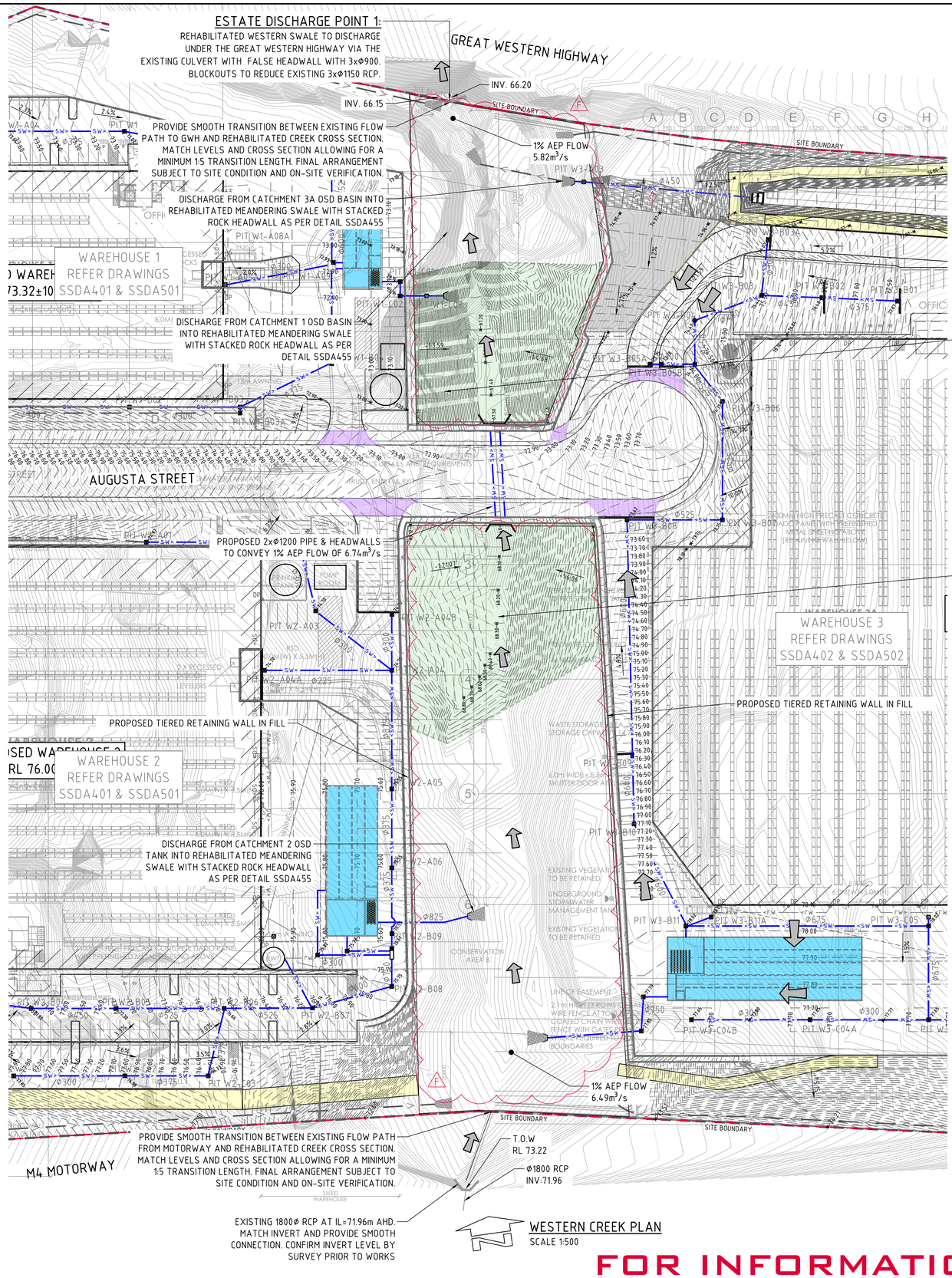
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: BLACKTOWN CREEK REALIGNMENT PLAN

DRAWING No: C013904.03-SSDA410

ISSUE: F



NOTES:

1. REFER TO DRAWINGS SSDA553 FOR SECTIONS THROUGH EXISTING WESTERN WATERCOURSE

WESTERN CREEK PLAN

SCALE 1:500

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	F
REVISED ARCHITECTURAL MASTERPLAN	06.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
REVISED AS CLOUDED	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

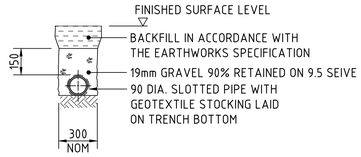
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA415

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

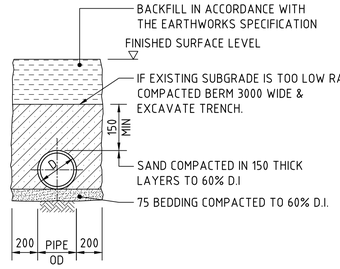
DRAWING TITLE: WESTERN SWALE PLAN (F)

DRAWING No: C013904.03-SSDA415 ISSUE: F



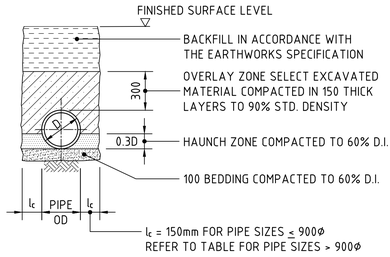
SUPPORT TO AGRICULTURAL DRAIN

SCALE 1:20



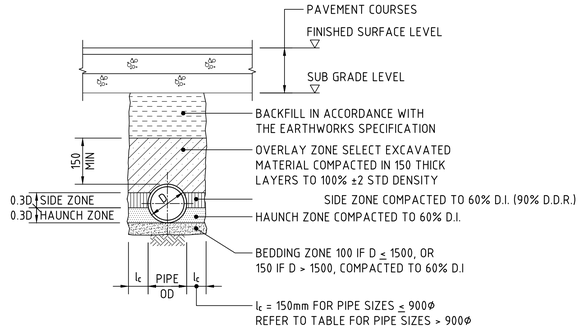
SUPPORT TO uPVC PIPES

SCALE 1:20



TYPE H1 SUPPORT TO CONCRETE PIPES AT LANDSCAPED AREAS

SCALE 1:20

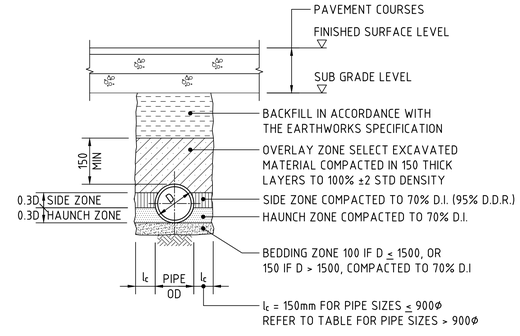


TYPE HS2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT

SCALE 1:20

D ≤ 1350, MAX FILL = 4.0m

D > 1350, MAX FILL = 3.0m

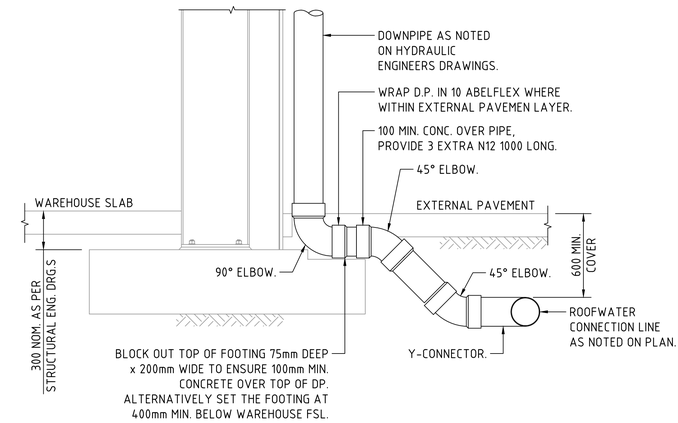


TYPE HS3 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT

SCALE 1:20

D ≤ 1050, MAX FILL = 6.0m

D > 1050, MAX FILL = 4.8m



DOWNPIPE TURN-UP DETAIL A

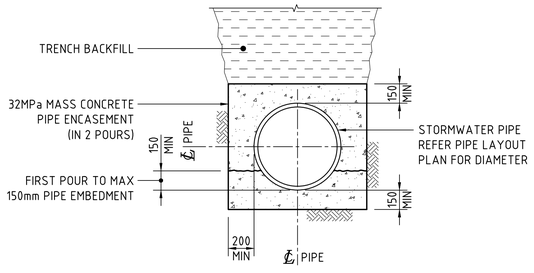
(AT FOOTING LOCATION)

SCALE 1:20

BEDDING & HAUNCH MATERIAL GRADING	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.0	100
2.36	100 TO 50
0.60	90 TO 20
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

SIDE ZONE WIDTH	
PIPE SIZE (mm)	l_c (mm)
≤ 900Ø	150
1050Ø	175
1200Ø	200
1350Ø	225
1500Ø	250
1650Ø	275
1800Ø	300
ENGINEER TO SPECIFY TRENCH WIDTHS FOR PIPE SIZES GREATER THAN 1800Ø	

SIDE ZONE MATERIAL GRADING	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.0	100
9.5	100 TO 50
2.6	100 TO 30
0.60	50 TO 15
0.075	25 TO 0
SELECT FILL MATERIAL IN ACCORDANCE WITH TABLE 1 AS 3725	

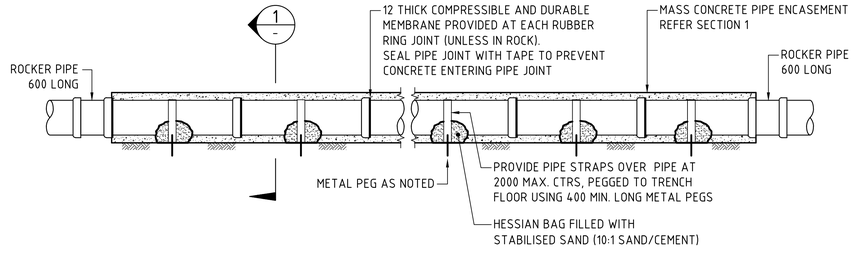


SECTION 1:20 — 1 / –

TYPICAL ACROSS PIPE

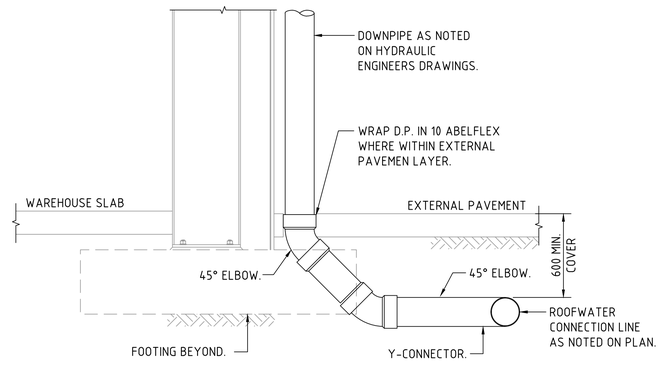
NOTE :

DURING THE ENCASEMENT PROCESS THE CONTRACTOR IS TO PROVIDE SUPPORT TO THE PIPE TO PREVENT PIPE MOVEMENT AND/OR FLOAT. CONCRETE ENCASEMENT TO BE INSTALLED IN 2 POURS.



STORMWATER PIPE CONCRETE ENCASEMENT TYPICAL DETAIL

SCALE 1:50



DOWNPIPE TURN-UP DETAIL B

(CLEAR OF FOOTING)

SCALE 1:20

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	16.06.23	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA450

CONSULT AUSTRALIA

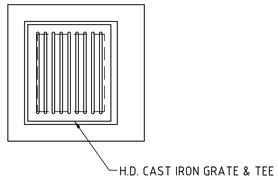
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

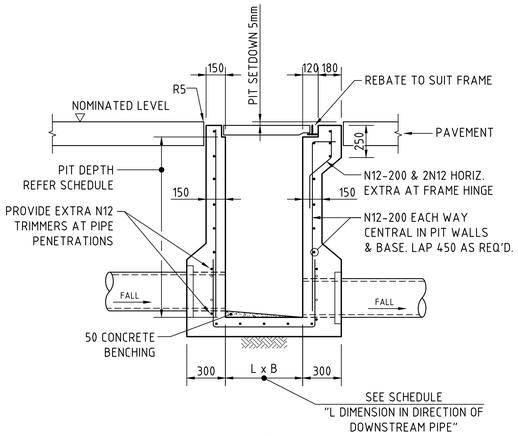
DRAWING TITLE: STORMWATER DRAINAGE DETAILS SHEET 1

DRAWING No: C013904.03-SSDA450

ISSUE: A

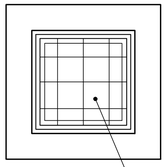


PLAN
SCALE 1:20

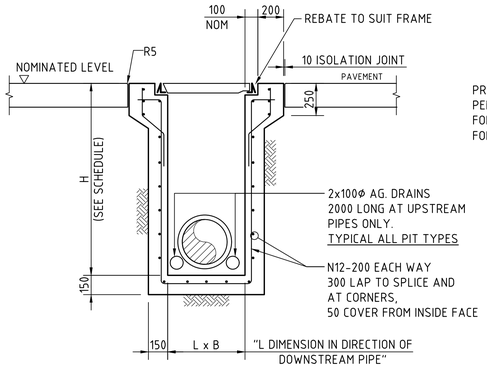


SECTION
SCALE 1:20

SINGLE GRATED GULLY PIT - SGGP

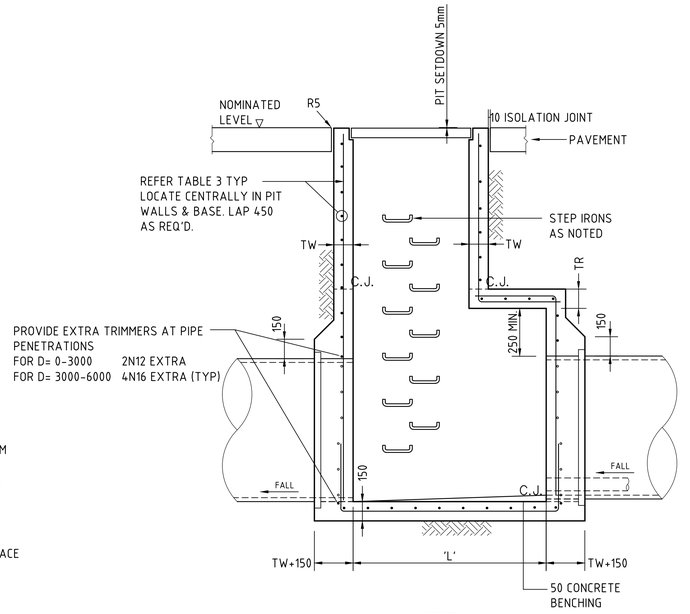


PLAN
SCALE 1:20

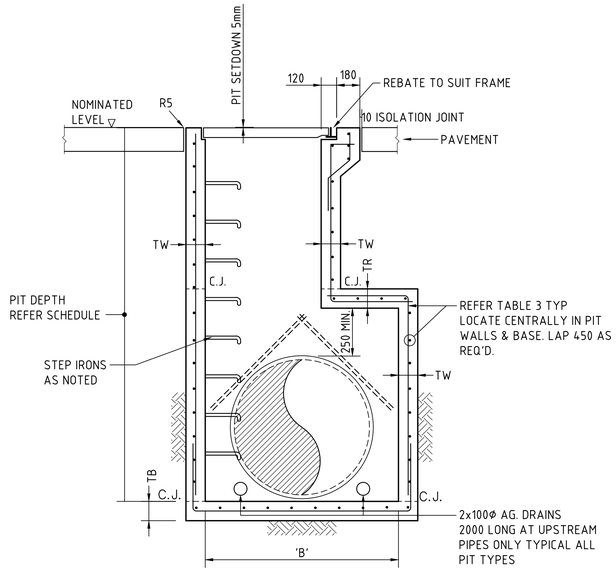


SECTION
SCALE 1:20

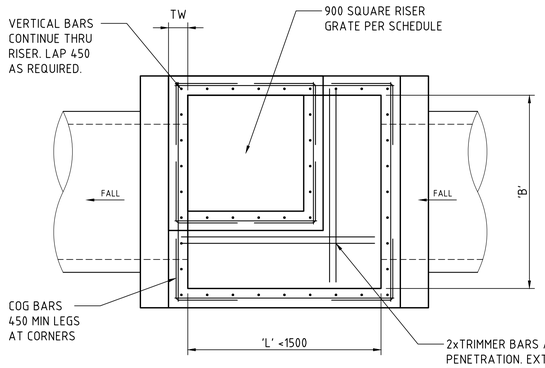
SEALED JUNCTION PIT - SJP



SECTION
SCALE 1:20



SECTION
SCALE 1:20

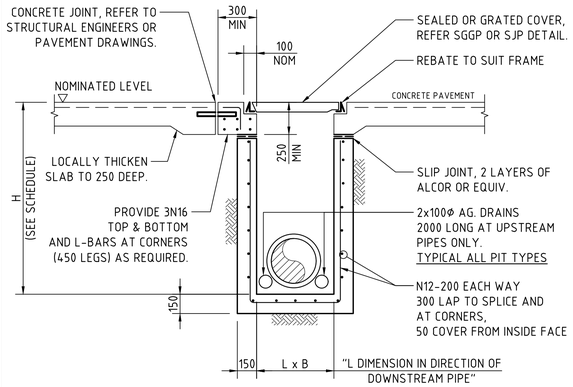


PLAN
SCALE 1:20

TAPERED SINGLE GRATED GULLY PIT - SGGP

SUBSOIL NOT SHOWN
FOR CLARITY.

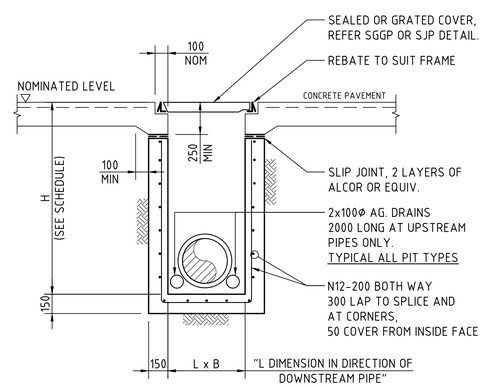
TABLE 3 - TAPERED CLASS D PIT REINFORCEMENT & WALL THICKNESS						
DEPTH 'H'	WALL THICKNESS 'TW'	WALL REINFORCEMENT	ROOF THICKNESS 'TR'	ROOF REINFORCEMENT	BASE THICKNESS 'TB'	BASE REINFORCEMENT
<1.5m	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY
1.5m-3.0m	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY
3.0m-4.5m	200mm	N16-200 EACH WAY	200mm	N16-200 EACH WAY	200mm	N12-200 EACH WAY
4.5-6.0	250mm	N16-200 EACH WAY	250mm	N16-200 EACH WAY	250mm	N16-200 EACH WAY



SECTION
SCALE 1:20

SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENT FOR SGGP's & SJP's, WHERE PITS ARE LOCATED IN THE CORNER OF SLAB PANELS OR ADJACENT TO SLAB PANEL JOINTS)



SECTION
SCALE 1:20

SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENTS FOR SGGP's & SJP's, WHERE JOINTS ARE NOT LOCATED WITHIN PROXIMITY OF THE GRATE)

FOR INFORMATION

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

ISSUED FOR INFORMATION	16.06.23	A	
AMENDMENTS	DATE	ISSUE	

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

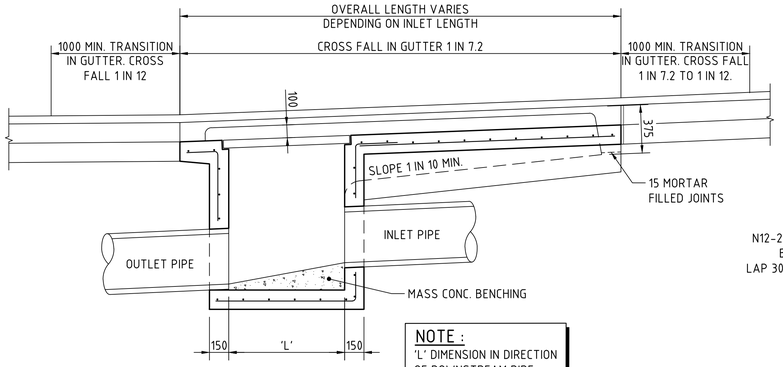
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA451

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

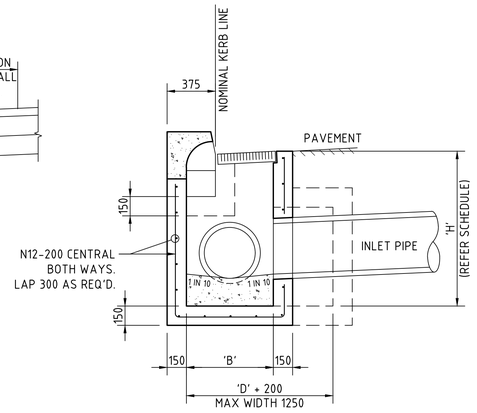
COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE DETAILS SHEET 2
DRAWING No: C013904.03-SSDA451
ISSUE: A

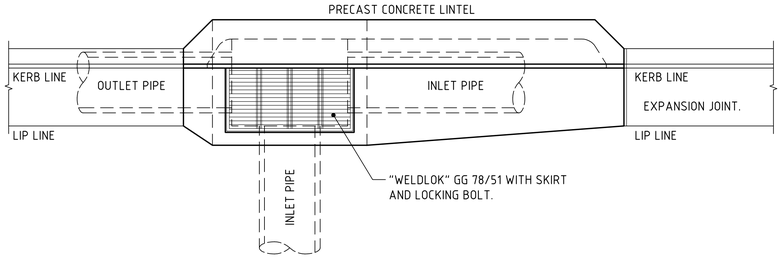


NOTE :
'L' DIMENSION IN DIRECTION OF DOWNSTREAM PIPE

LONG SECTION
SCALE 1:20



CROSS SECTION
SCALE 1:20

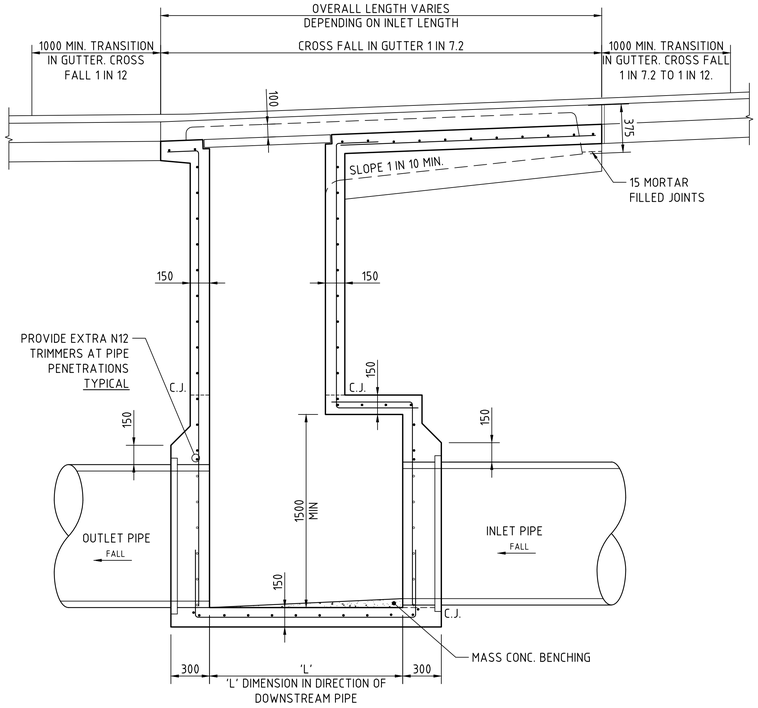


PLAN
SCALE 1:20

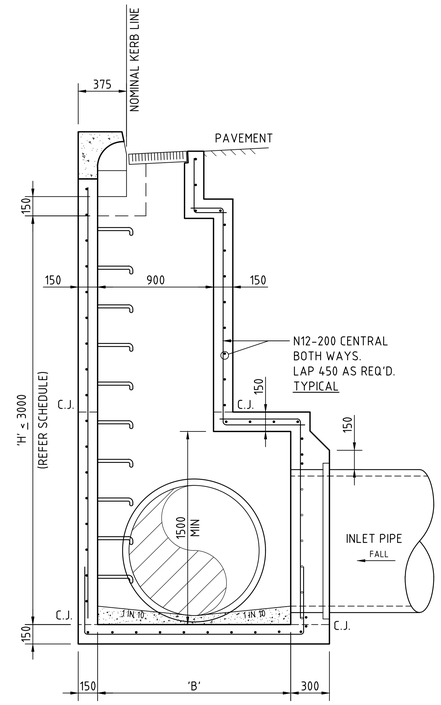
CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PIT	80	20	GP	NIL	32

NOTE :

1. WHERE GULLY PIT IS LOCATED ON KERB RETURNS OR BULB OF CUL-DE-SACS PROVIDE CURVED PRECAST CONCRETE LINTELS.
2. SAG PITS SHALL HAVE LINTEL PLACED CENTRALLY ABOUT THE GRATE.
3. ALL REINFORCING TO HAVE 30 MIN. CLAER CONCRETE COVER.
4. FOR PITS DEEPER THAN 1000mm CLIMB RAILS SHALL BE PROVIDED.

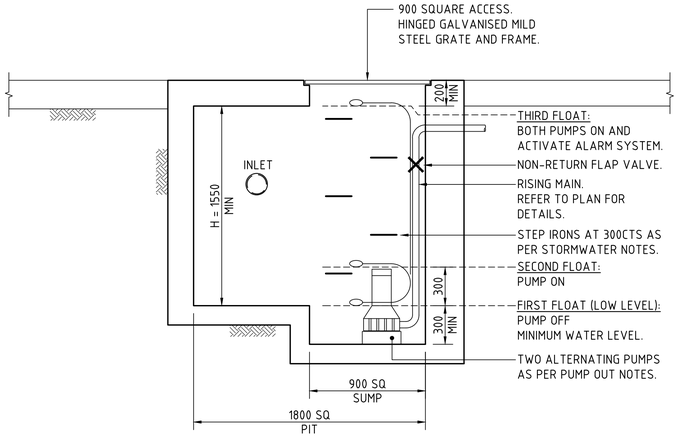


LONG SECTION
SCALE 1:20



CROSS SECTION
SCALE 1:20

KERB INLET PIT - KIP



PUMP OUT PIT DETAIL
SCALE 1:20
REFER TYPICAL PIT DETAILS FOR ALL ITEMS NOT LABELED.

BASEMENT PUMP OUT NOTES:

PUMP SYSTEM IS TO CONSIST OF DUAL ALTERNATING PUMPS. THE PUMP OUT SYSTEM SHALL BE DESIGNED TO BE OPERATED IN THE FOLLOWING MANNER:

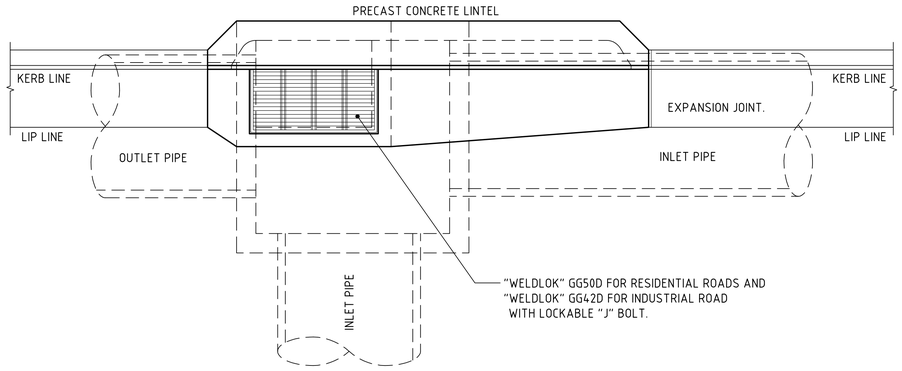
Q PUMP = 25 L/s VOLUME = 5.0 m^3 (MIN.)
THE PUMPS SHALL BE PROGRAMMED TO WORK ALTERNATIVELY SO AS TO ALLOW BOTH PUMPS TO HAVE AN EQUAL OPERATION LOAD AND PUMP LIFE.

A LOW LEVEL FLOAT SHALL BE PROVIDED TO ENSURE THAT THE MINIMUM REQUIRED WATER LEVEL IS MAINTAINED WITHIN THE SUMP AREA OF THE PIT . IN THIS REGARD THIS FLOAT WILL FUNCTION AS AN OFF SWITCH FOR THE PUMPS.

A SECOND FLOAT SHALL BE PROVIDED AT A HIGHER LEVEL, APPROXIMATELY 300mm ABOVE THE MINIMUM WATER LEVEL, WHEREBY ONE OF THE PUMPS WILL OPERATE AND DRAIN THE PIT TO THE LEVEL OF THE LOW-LEVEL FLOAT.

A THIRD FLOAT SHALL BE PROVIDED AT A HIGH LEVEL, WHICH IS APPROXIMATELY THE TOP LEVEL OF THE PIT. THIS FLOAT SHOULD START THE OTHER PUMP THAT IS NOT OPERATING AND ACTIVATE THE ALARM.

AN ALARM SYSTEM SHALL BE PROVIDED WITH A FLASHING STROBE LIGHT AND A PUMP FAILURE WARNING SIGN WHICH ARE TO BE LOCATED AT THE ENTRANCE TO THE BASEMENT LEVEL. THE ALARM SYSTEM SHALL BE PROVIDED WITH A BATTERY BACK-UP IN CASE OF POWER FAILURE.



PLAN
SCALE 1:20

TAPERED KERB INLET PIT - KIP

SUBSOIL NOT SHOWN FOR CLARITY

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	16.06.23	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA452

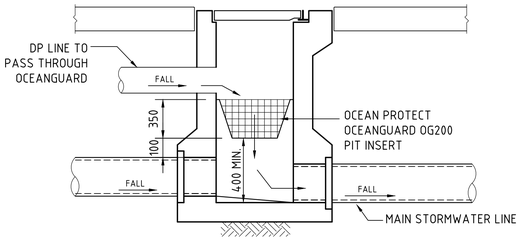
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

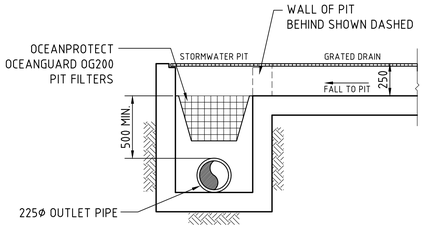
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
STORMWATER DRAINAGE DETAILS SHEET 3

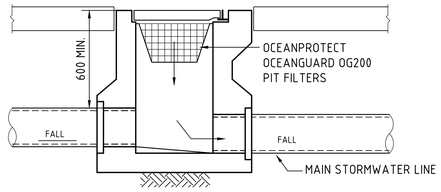
DRAWING No C013904.03-SSDA452
ISSUE A



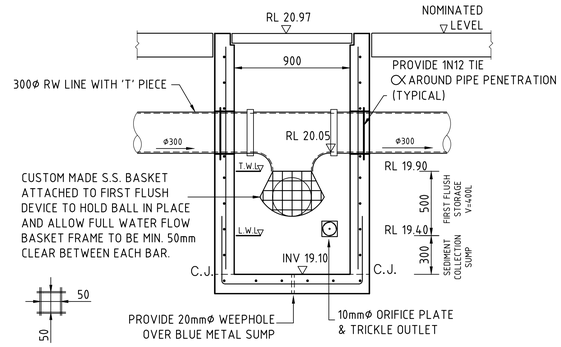
ROOFWATER/STORMWATER PIT WITH
OCEANGUARD CONFIGURATION
SCALE 1:20



GRATED DRAIN/STORMWATER PIT WITH OCEANPROTECT
OCEANGUARD OG200 PIT CONFIGURATION
SCALE 1:20

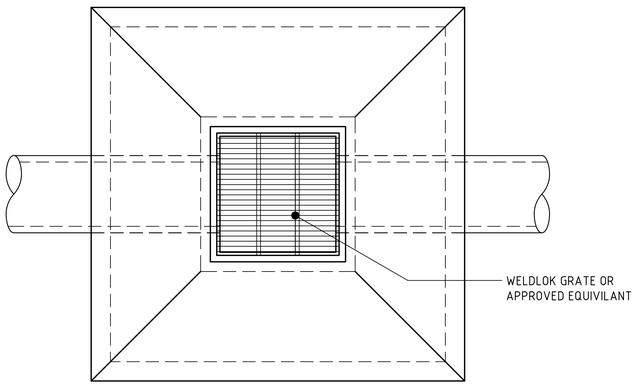


STORMWATER PIT WITH OCEANPROTECT
OCEANGUARD OG200 PIT CONFIGURATION
SCALE 1:20

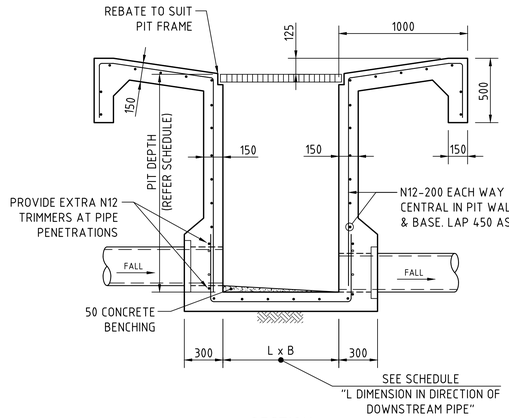


FIRST FLUSH PIT DETAIL
SCALE 1:20

OCEANGUARD OG200 PIT CONFIGURATION



PLAN
SCALE 1:20



SECTION
SCALE 1:20

FIELD INLET PIT - FIP

FOR INFORMATION

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

ISSUED FOR INFORMATION	16.06.23	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA453

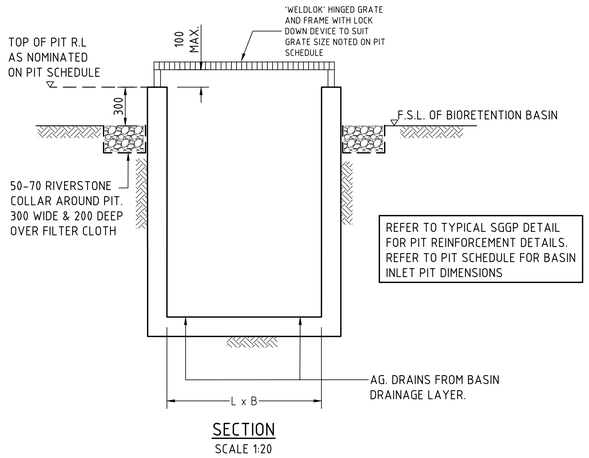
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

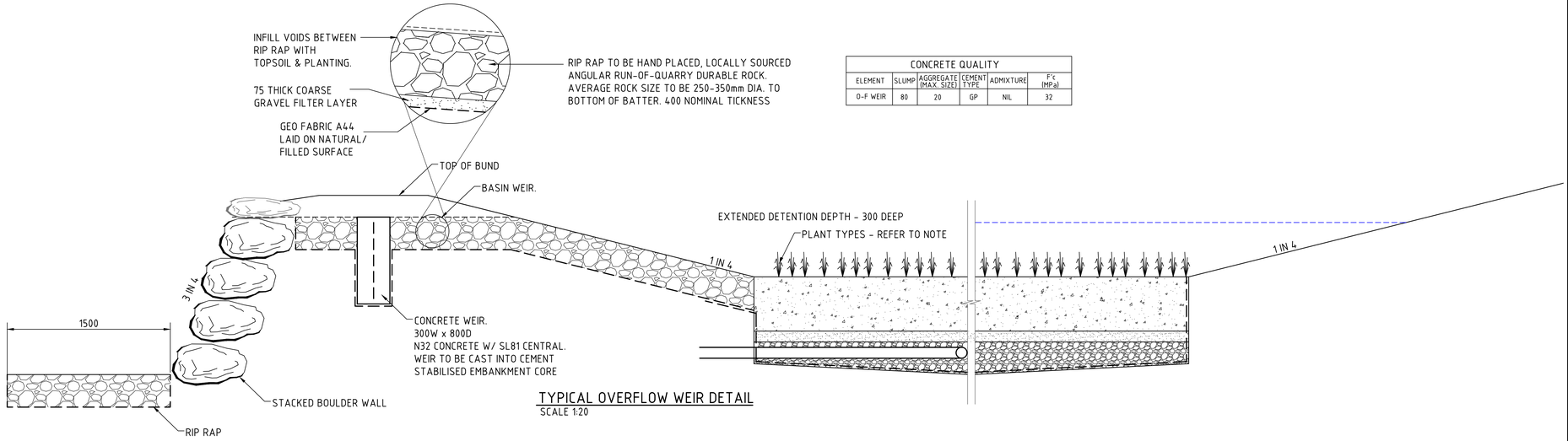
DRAWING TITLE
STORMWATER DRAINAGE DETAILS
SHEET 4

DRAWING No C013904.03-SSDA453
ISSUE A



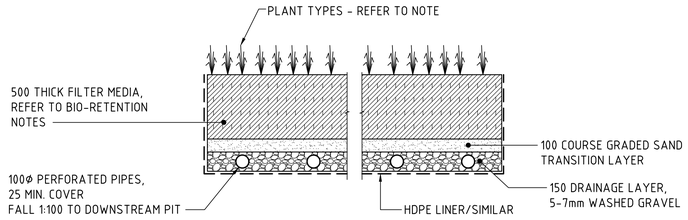
SECTION
SCALE 1:20

BASIN INLET PIT - BIP

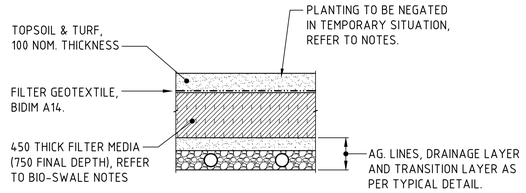


CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
O-F WEIR	80	20	GP	NIL	32

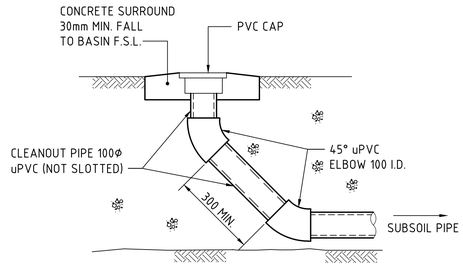
TYPICAL OVERFLOW WEIR DETAIL
SCALE 1:20



TYPICAL BIO-RETENTION DETAIL
SCALE 1:20

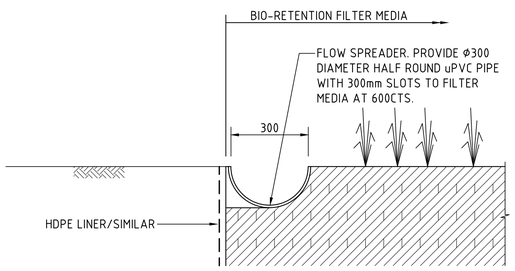


TEMPORARY BIO-RETENTION PROTECTION DETAIL
SCALE 1:20
TEMPORARY CONSTRUCTION REQUIREMENT DETAIL -
REFER TO NOTES FOR IMPLEMENTATION PERIODS.



BIORETENTION CLEANOUT EYE ELEVATION
SCALE 1:20
DENOTED C.E. ON PLAN

BIO-RETENTION BASIN DETAILS



TYPICAL HALF-ROUND FLOW SPREADER DETAIL
SCALE 1:10

BIO-RETENTION NOTES :

FILTER MEDIA TO BE LOAMY SAND WITH A PERMEABILITY NOT LESS THAN 200mm/hr. FILTER MEDIA TO BE FREE OF RUBBISH, DELETERIOUS MATERIAL, TOXICANTS, DECLARED PLANTS AND LOCAL WEEDS, AND IS TO NOT BE HYDROPHOBIC.

FILTER MEDIA TO HAVE THE FOLLOWING COMPOSITION RANGE:

CLAY & SILT (<0.05mm)	<3%
VERY FINE SAND (0.05-0.15mm)	5-30%
FINE SAND (0.15-0.25mm)	10-30%
MEDIUM TO COARSE SAND (0.25-1.00mm)	40-60%
COARSE SAND (1.0-2.0mm)	7-10%
FINE GRAVEL (2.0-3.4mm)	<3%

FILTER MEDIA THAT DOES NOT MEET THE FOLLOWING CRITERIA SHALL BE REJECTED:

a. ORGANIC MATTER CONTENT TO BE IDEALLY WITHIN 1% TO 3% (W/W) AND TO BE NO GREATER THAN 5%(W/W).
b. PH TO BE BETWEEN 5.5 AND 7.5
c. PHOSPHOROUS CONTENT TO BE NO GREATER THAN 35mg/kg

FILTER MEDIA TO BE ASSESSED BY QUALIFIED HORTICULTURALIST TO ENSURE CAPABILITY OF SUPPORTING PLANT LIFE.

DRAINAGE LAYER TO BE CLEAN GRAVEL 5-7mm.

PLANTS TO BE IN ACCORDANCE WITH PENRITH CITY COUNCIL REQUIREMENTS.

PROVIDE 100mm TOPSOIL AND TEMPORARY EROSION PROTECTION (JUTEMASTER OR EQUIV) TO SWALE BATTER SLOPES AND ADJACENT LANDSCAPED AREAS. NOTE THAT NO TOPSOIL IS TO BE PLACED OVER FILTRATION MEDIA. PROVIDE SILT FENCE TO TOP OF BANK UNTIL SUCH TIME AS THIS STABILISING AND VEGETATION HAS BEEN COMPLETED.

BIO-RETENTION TO BE PARTIALLY INSTALLED, FOLLOWING COMPLETION OF ROADWORKS, WITH THE TOP 75-100mm OF FILTER MEDIA REPLACED WITH A FINE TO COARSE SAND UNDERLAIN WITH A GEOTEXTILE LAYER (REFER TO DETAIL). FOLLOWING COMPLETION OF THE UPSTREAM DEVELOPMENT AND SITE STABILISATION, THE SAND IS TO BE REMOVED, REPLACED WITH FILTER MATERIAL AND PLANTED OUT. REFER TO TEMPORARY BIO-BASIN DETAIL

PRIOR TO PLANTING, THE TOP 100mm OF THE BIORETENTION FILTER MEDIA IS TO BE AMELIORATED WITH APPROPRIATE ORGANIC MATTER, FERTILISER AND TRACE ELEMENTS TO AID PLANT ESTABLISHMENT AS PER THE TABLE BELOW:

TABLE: RECIPE FOR AMELIORATING TOP 100mm OF BIORETENTION FILTER MEDIA

CONSTITUENT	QUANTITY (kg/m2 OF FILTER AREA)
GRANULATED POULTRY MANURE FINES	50
SUPERPHOSPHATE	2
MAGNESIUM SULPHATE	3
POTASSIUM SULPHATE	2
TRACE ELEMENT MIX	1
FERTILISER NPK (16.4.14)	4
LIME	20

100mm 0 200 400 600 800 1000mm
SCALE 1:10 AT B1 SIZE SHEET

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA454

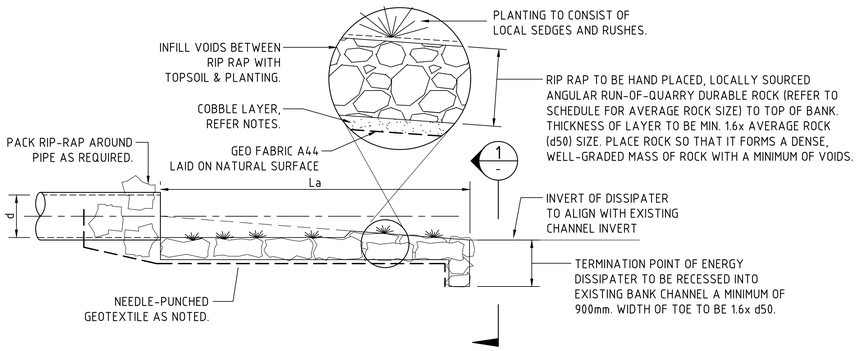
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

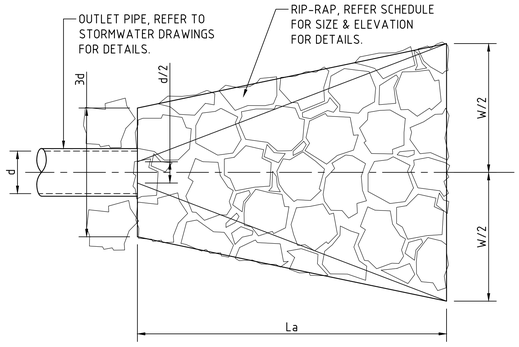
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
STORMWATER DRAINAGE DETAILS
SHEET 5

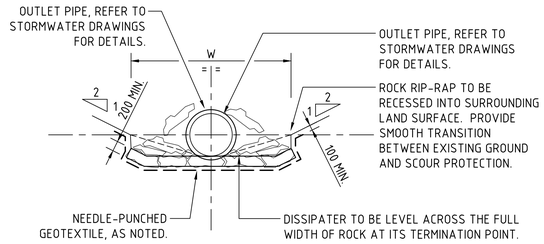
DRAWING No C013904.03-SSDA454
ISSUE A



ELEVATION
SCALE 1:50



PLAN
SCALE 1:50



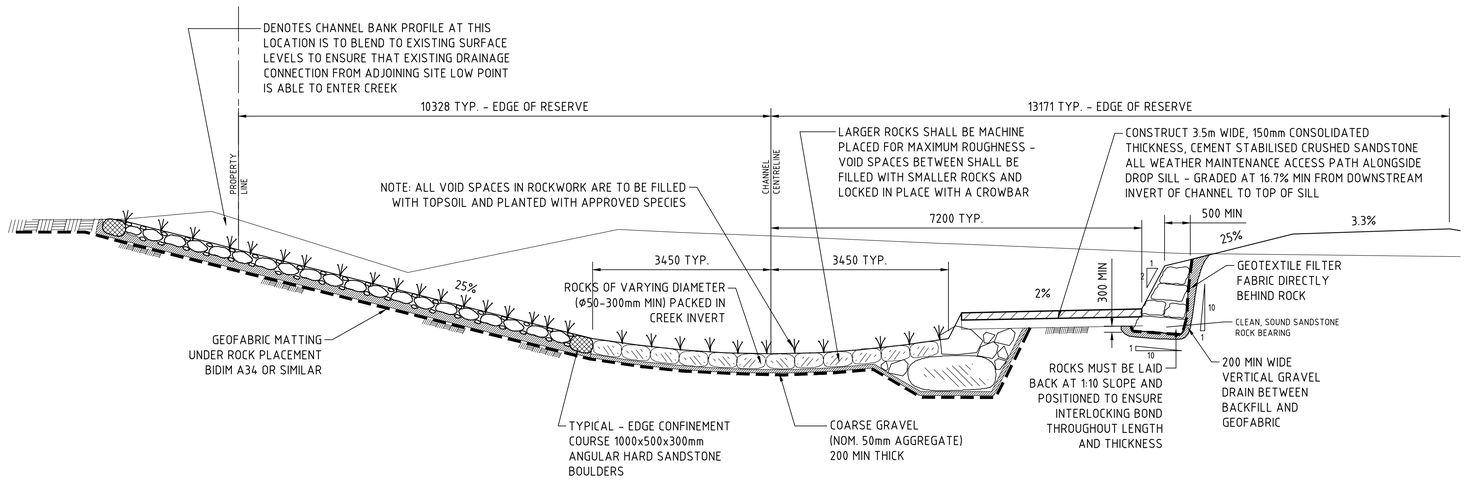
SECTION 1:50 (1)

DISSIPATER NOTES:

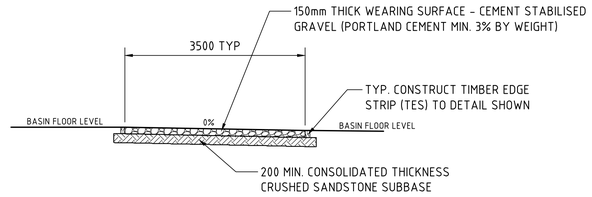
1. ALIGN STRUCTURE EVENLY WITH BANK.
2. LOCATE STRUCTURE AT INVERT LEVEL OF STREAM AND POINT IN A DOWNSTREAM DIRECTION.
3. PIPE TO REST ON, AND BE PACKED IN, BY RIP-RAP (SIZE AS NOTED).
4. DISCHARGE INTO STREAM WHERE BEDROCK IS PRESENT, OTHERWISE SCOUR PROTECT AS REQUIRED.
5. SCOUR PROTECT THE OPPOSITE BANK AS REQUIRED. SCOUR PROTECTION TO BE PROVIDED WHERE OPPOSITE BANK IS WITHIN 12-14 TIMES THE PIPE DIAMETER.
6. RIP-RAP TO CONSIST OF ANGULAR RUN-OF-QUARRY ROCK (d50= 150mm MINIMUM) AS NOTED IN THE SCHEDULE. RIP-RAP TO BE MINIMUM THICKNESS OF RIP-RAP LAYER TO BE 1.6x AVERAGE ROCK SIZE (d50).
7. RIP-RAP IS TO BE PLACED OVER A 200mm LAYER OF 140mm COBBLES OVER NEEDLE-PUNCHED GEOFAB A44.
8. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS. THE FINISHED RIP-RAP SURFACE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS.
9. GAPS IN RIP-RAP TO BE HAND PACKED WITH TOPSOIL & PLANTED WITH NATIVE SEDGES & RUSHES TO PROVIDE. THE INTENT IS FOR THERE TO BE NO VOIDS BETWEEN RIP-RAP BOULDERS.
10. ENSURE THE FINISHED ROCK SURFACE BLENDS WITH THE SURROUNDING GROUND LEVELS. NO OVERFALL OR PROTRUSION OF ROCK SHOULD BE APPARENT.
11. ENSURE THAT STORMWATER FROM SURROUNDING GROUND IS FREE TO ENTER THE STRUCTURE WITHOUT CAUSING UNDESIRABLE PONDING OR SCOUR.

DISSIPATER SCHEDULE				
DISCHARGE POINT	d	La	W	RIP-RAP (d50)
OUTLET B	852ø	5000	3000	300

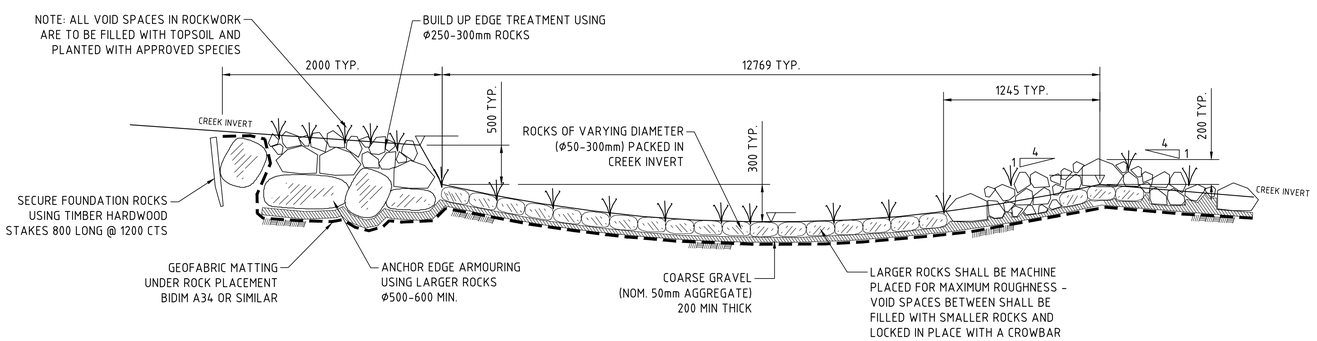
STORMWATER OUTLET DISSIPATER



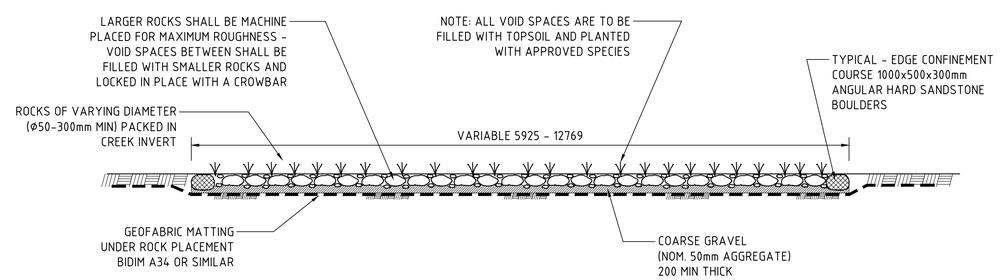
TYPICAL SECTION - PLUNGE POOL
SCALE 1:50



TYPICAL DETAIL - MAINTENANCE ACCESS DRIVE PAVEMENT CONSTRUCTION
SCALE 1:50



TYPICAL DETAIL - PLUNGE POOL AND WEIR
SCALE 1:50



TYPICAL DETAIL - BATTER STABILISATION SCOUR PROTECTION
SCALE 1:50

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

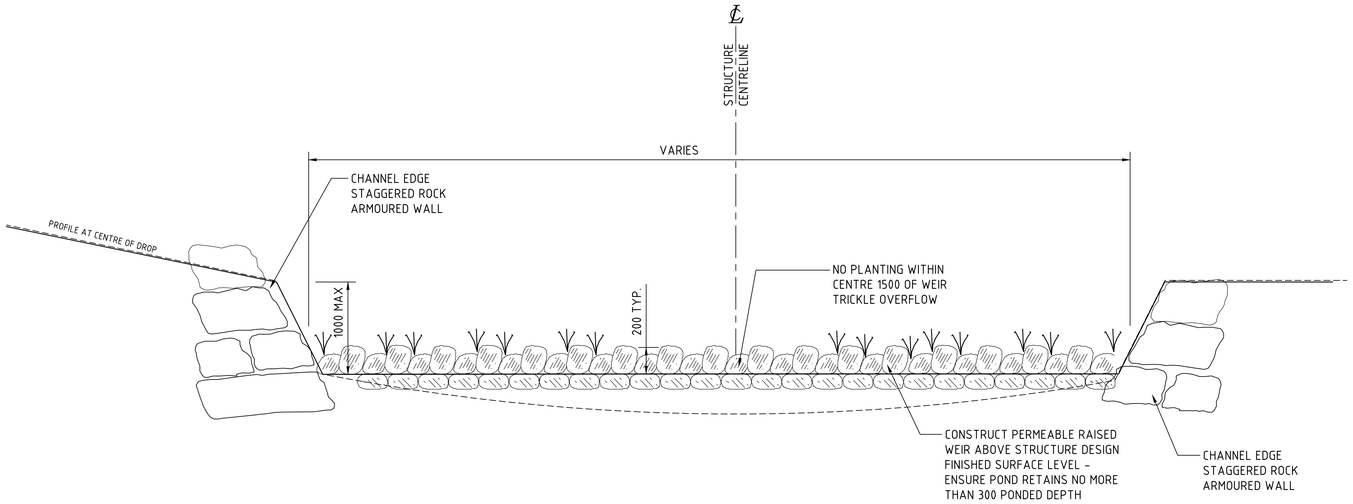
ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA455

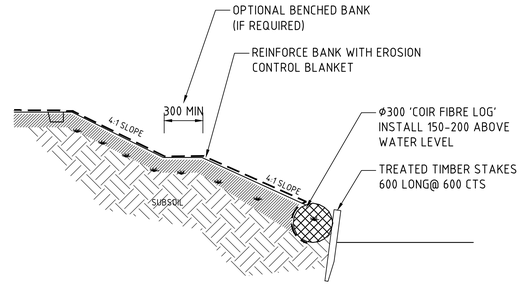
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

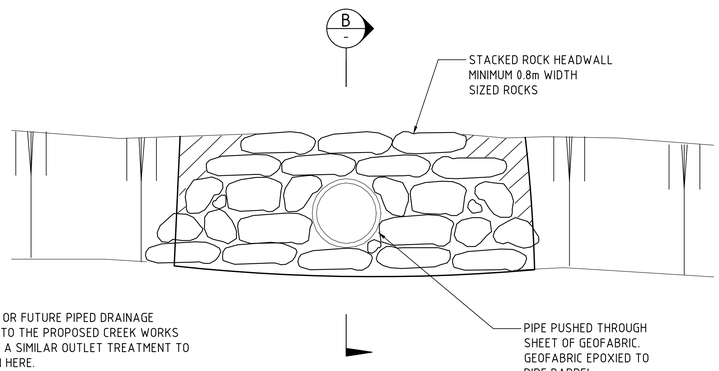
DRAWING TITLE: STORMWATER DRAINAGE DETAILS SHEET 6
DRAWING No: C013904.03-SSDA455
ISSUE: A



TYPICAL DETAIL - ROCK DROP SILL AND WEIR
SCALE 1:20



TYPICAL DETAIL - COIR FIBRE LOG PLACEMENT ANY LOCATION
SCALE 1:20

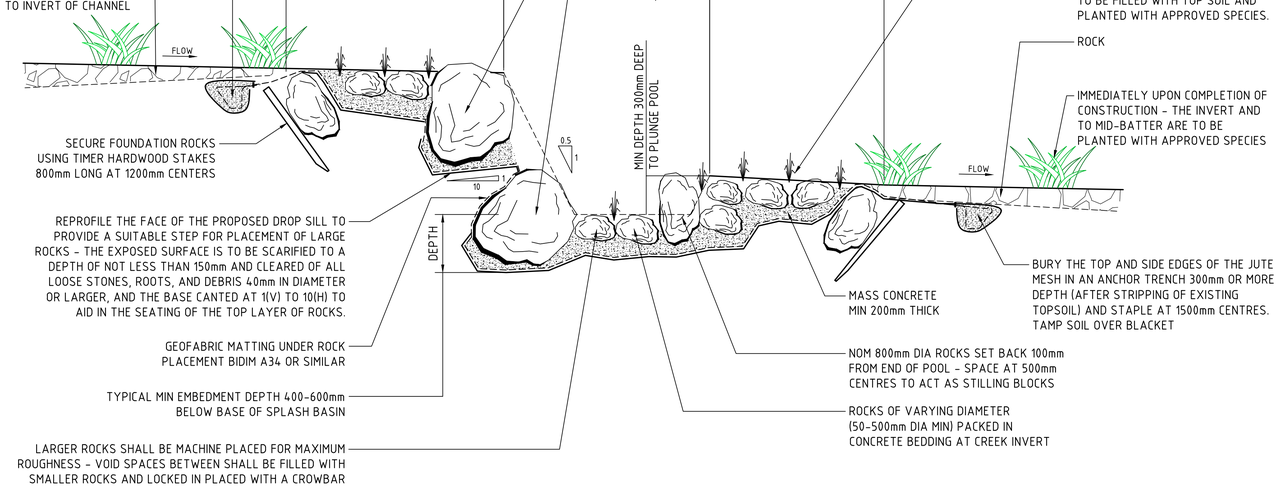


APPLICABILITY:

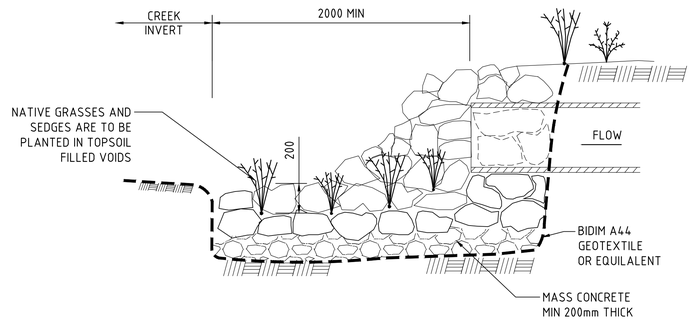
1) ALL PROPOSED OR FUTURE PIPED DRAINAGE CONNECTIONS TO THE PROPOSED CREEK WORKS SHOULD HAVE A SIMILAR OUTLET TREATMENT TO THOSE SHOWN HERE.

2) MIN. ROCK SIZE IN OUTLET DEPRESSED APRON SHOULD BE Φ500-600mm.

TYPICAL STACKED ROCK HEADWALL TREATMENT
SCALE 1:20



TYPICAL DETAIL - ROCK DROP SILL AND WEIR
SCALE 1:20



SECTION 1:20 B

FOR INFORMATION

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

ISSUED FOR INFORMATION	16.06.23	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

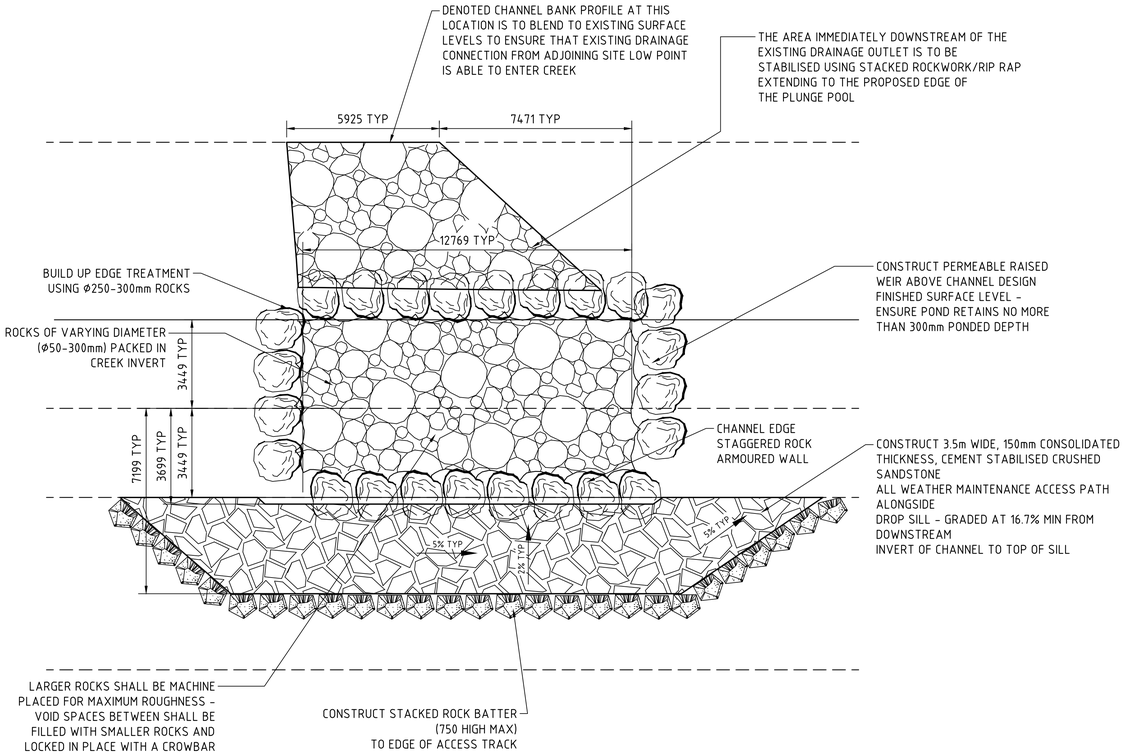
ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA456

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: STORMWATER DRAINAGE DETAILS SHEET 7
DRAWING No: C013904.03-SSDA456
ISSUE: A



TYPICAL PLAN - PLUNGE POOL
SCALE 1:100

FOR INFORMATION

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT B1 SIZE SHEET

ISSUED FOR INFORMATION	16.06.23	A	
AMENDMENTS	DATE	ISSUE	

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

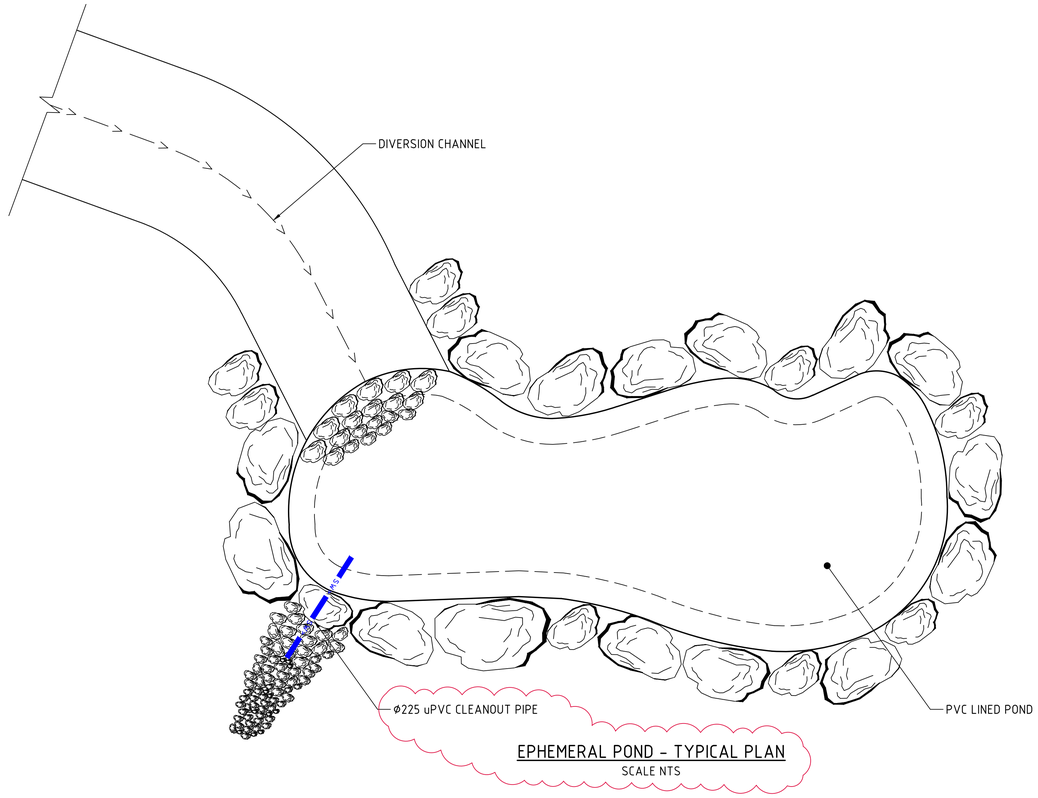
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA457

CONSULT AUSTRALIA

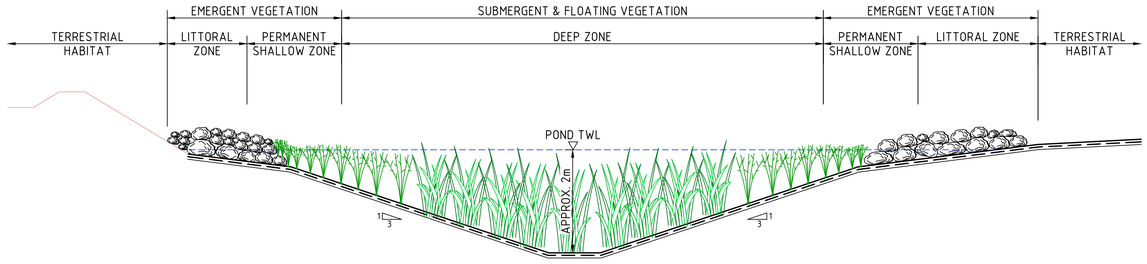
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
STORMWATER DRAINAGE DETAILS
SHEET 8

DRAWING No C013904.03-SSDA457
ISSUE A



EPHEMERAL POND – TYPICAL PLAN
SCALE NTS



EPHEMERAL POND – TYPICAL SECTION
SCALE 1:50

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA458

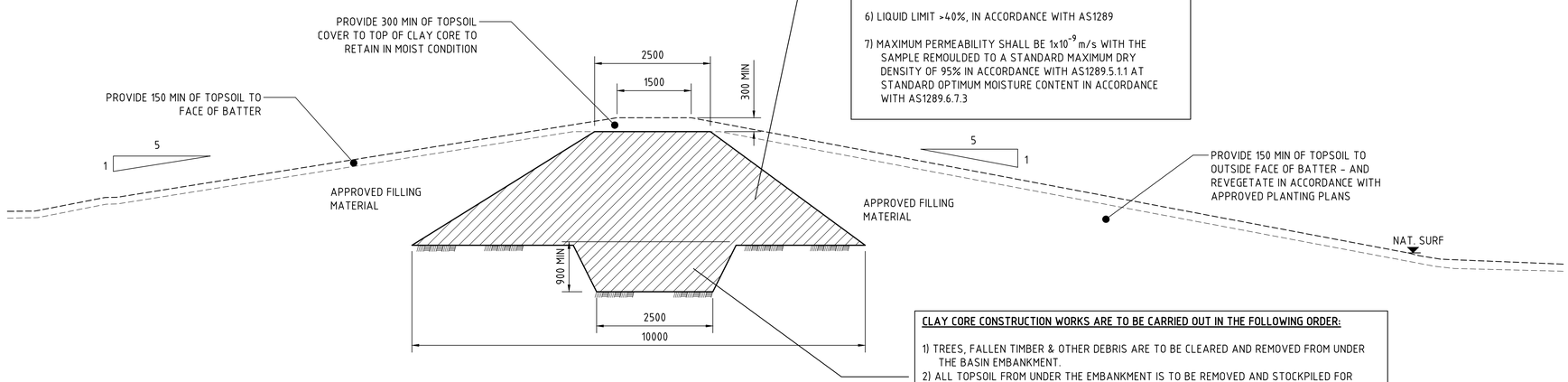
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
STORMWATER DRAINAGE DETAILS
SHEET 9

DRAWING No C013904.03-SSDA458
ISSUE B



CLAY CORE MATERIAL COMPLIANCE NOTES:

1) THE MATERIAL SHALL BE FREE OF ROCK GREATER THAN 50mm IN ANY DIRECTION.
2) THE MATERIAL SHALL BE GENERALLY FREE OF TOPSOIL, ORGANIC AND ROOT MATTER.
3) THE MATERIAL SHALL HAVE NO MORE TAHN 10% EXCEEDING 19mm PARTICLE SIZE.
4) THE MATERIAL SHALL HAVE THE PERCENTAGE FINE (PASSING 0.075mm SIEVE) MORE THAN 50 % (IN ACCORDANCE WITH AS1289)
5) THE PLASTICITY INDEX >20%, IN ACCORDANCE WITH AS1289
6) LIQUID LIMIT >40%, IN ACCORDANCE WITH AS1289
7) MAXIMUM PERMEABILITY SHALL BE $1x10^{-9}$ m/s WITH THE SAMPLE REMOULDED TO A STANDARD MAXIMUM DRY DENSITY OF 95% IN ACCORDANCE WITH AS1289.5.1.1 AT STANDARD OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH AS1289.6.7.3

CLAY CORE CONSTRUCTION WORKS ARE TO BE CARRIED OUT IN THE FOLLOWING ORDER:

1) TREES, FALLEN TIMBER & OTHER DEBRIS ARE TO BE CLEARED AND REMOVED FROM UNDER THE BASIN EMBANKMENT.
2) ALL TOPSOIL FROM UNDER THE EMBANKMENT IS TO BE REMOVED AND STOCKPILED FOR LATER REUSE.
3) OVERBURDEN FROM UNDER THE EMBANKMENT IS TO BE REMOVED UNTIL FIRM CLAY OR BEDROCK IS HAS BEEN EXPOSED.
4) A CORE TRENCH OF AT LEAST 900mm DEEP IS TO BE EXCAVATED INTO IMPERMEABLE, STABLE FOUNDATION MATERIAL CONSISTING OF EITHER CLAY OR BEDROCK.
5) THE STRIPPED AREA BELOW THE EMBANKMENT IS TO BE SLIGHTLY SCARIFIED TO A DEPTH NOT EXCEEDING 100mm.
6) THE CLAY CORE MUST BE CENTRALLY PLACED AND EXTEND FOR THE FULL LENGTH AND HEIGHT OF THE BANK.
7) CLAY CORE TO BE LAYED IN LIFTS OF NO MORE THAN 250mm, EACH LAYER IS TO BE COMPACTED WITH A SHEEPS FOOT ROLLER, TO ACHIEVE A MIN DRY DENSITY RATIO OF AT LEAST 95% STANDARD (IN ACCORDANCE WITH AS1289.5.1.1 AND 5.4.1) OR MINIMUM HILF DENSITY RATIO OF 95% (IN ACCORDANCE WITH AS1289.5.7.1) AT MOISTURE CONTENT WITHIN THE RANGE OF 0-35% (WET) OF THE STANDARD OPTIMUM MOISTURE CONTENT.
8) THE COMPLETED CORE AND EMBANKMENT SHOULD BE BUILT 5% HIGHER THAN SPECIFIED, ALLOW FOR SETTLEMENT.
9) UPON COMPLETION OF EACH STAGE OF THE CLAY CORE CONSTRUCTION, THE EXPOSED CLAY SURFACE IF THE CORE SHALL BE LIMITED FROM TRAFFIC MOVEMENTS AND MAINTAINED IN MOIST CONDITION UNTIL IT IS FULLY COVERED BY THE NEXT LAYER. IF THE SURFACE OF THE PREVIOUS PLACED LAYER HAS DRIED OUT OR WETTED UP EXCESSIVELY, THE MATERIAL IN THE AFFECTED AREA SHALL BE EXCAVATED AND CONDITIONED TO MOISTURE WITHIN THE SPECIFIED TOLERANCE OR DISCARDED.

TYPICAL DETAIL - BASIN CLAY CORE AND EMBANKMENT
SCALE 1:50

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	08.03.24	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

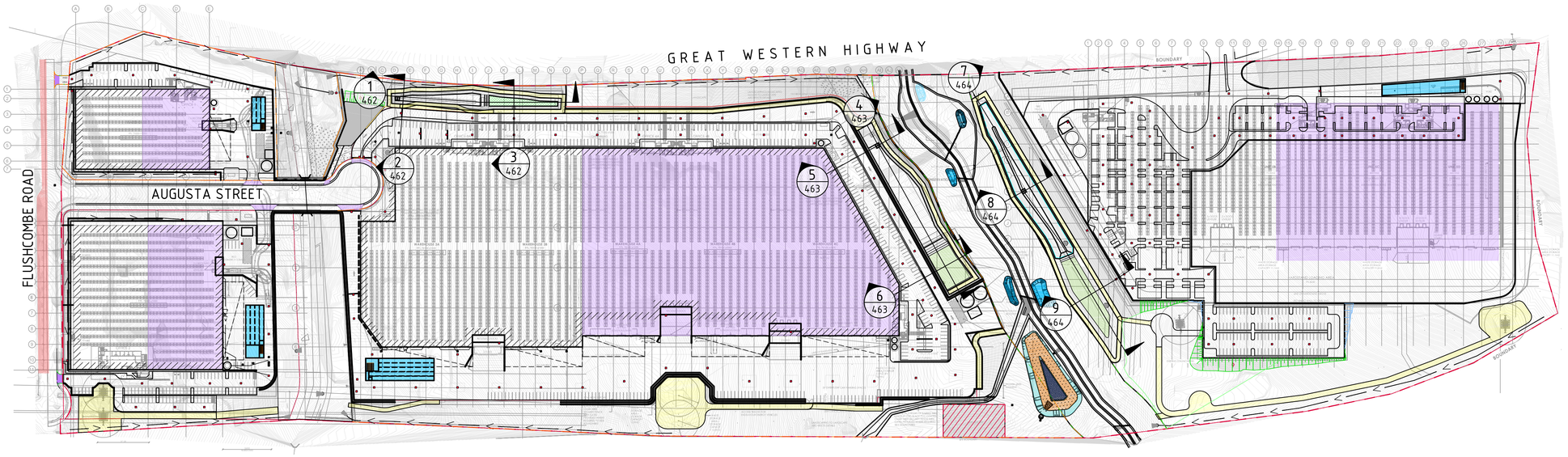
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA459

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: TYPICAL CLAY CORE DETAIL

DRAWING No: C013904.03-SSDA459 ISSUE: A



M4 MOTORWAY

M4 MOTORWAY

M4 MOTORWAY

STORMWATER MANAGEMENT KEY PLAN
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA460

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446

PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

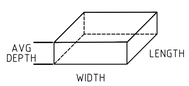
DRAWING TITLE
STORMWATER MANAGEMENT LAYOUT & TYPICAL SECTIONS KEY PLAN

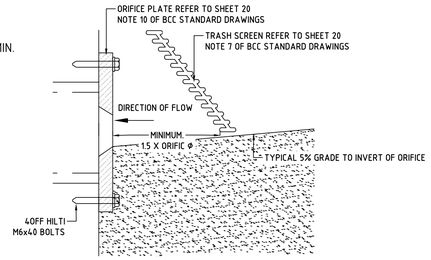
DRAWING No C013904.03-SSDA460

ISSUE A

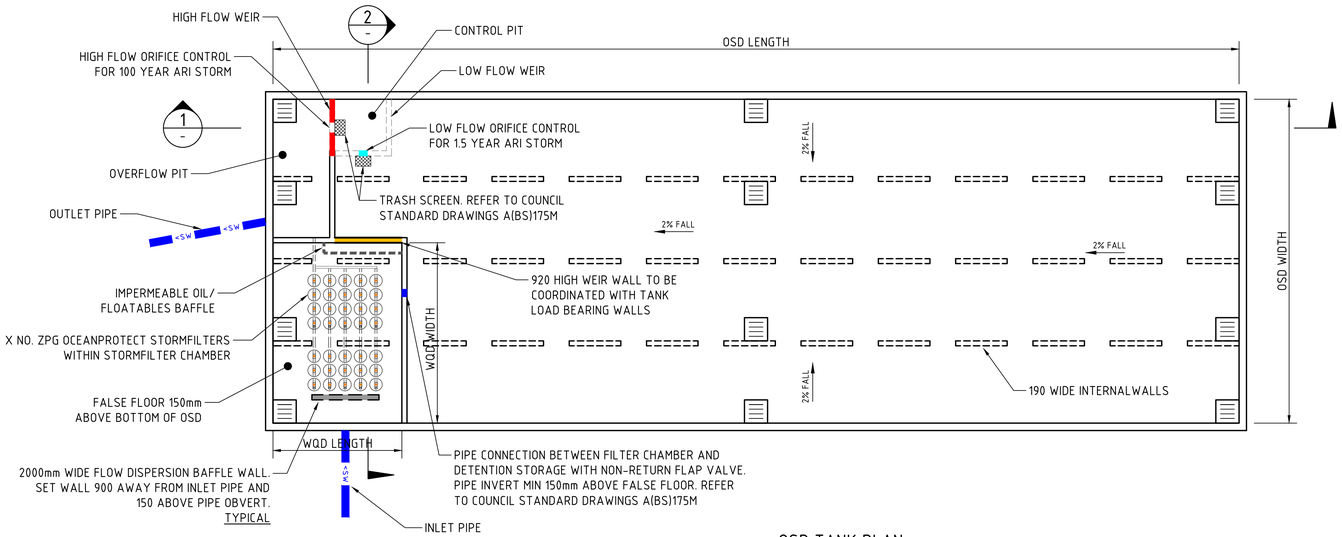
OSD TANK DETAILS

	TANK LOT 1	TANK LOT 2	TANK LOT 3	TANK LOT 5
TOTAL SITE AREA DRAINING TO STORAGE (85% IMPERVIOUS)	11,085m^2	21,540m^2	29,330m^2	20,100m^2
OSD INLET PIPE RL	RL 70.86	RL 71.94	RL 71.56	RL 73.95
OSD INLET PIPE ⌀	750mm	825mm	600mm	600mm
STORAGE				
Q100 ORIFICE ⌀	181.5mm	253.0mm	330.5mm	288.5mm
Q100 ORIFICE ℄	RL 68.93	RL 71.77	RL 71.31	RL 73.74
VOLUME PROVIDED	560.0m^3	1016.6m^3	1486.3m^3	962.4m^3
VOLUME REQUIRED	552.1m^3 MIN.	991.9m^3 MIN.	1334.6m^3 MIN.	914.6m^3 MIN.
OSD AVERAGE DEPTH	3.01m	3.30m	2.60m	2.30m
OSD LENGTH	23.80m	30.20m	45.00m	60.00m
OSD WIDTH	9.40m	12.60m	15.80m	10.00m
INTERNAL TANK DIMENSIONS (INC. HIGH FLOW CHAMBERS)				
Q1.5 ORIFICE ⌀	N/A	47.00mm	51.00mm	61.00mm
Q1.5 ORIFICE ℄	N/A	RL 71.97	RL 71.51	RL 73.94
RL OF Q1.5 CONTROL PIT WEIR	RL 71.00	RL 73.97	RL 73.03	RL 75.32
RL OF INVERT OF DISCHARGE	RL 68.80	RL 70.21	RL 71.00	RL 73.25
OUTLET PIPE ⌀	750mm	825mm	525mm	600mm
RL OF EMERGENCY BYPASS WEIR	RL 71.95	RL 74.99	RL 73.79	RL 76.00
RL OF TOP OF OSD TANK	RL 72.16	RL 75.30	RL 74.16	RL 76.30
RL OF HARDSTAND ABOVE	RL 73.00	RL 75.70	RL 77.80	N/A
Q100 WATER LEVEL	RL 71.95	RL 74.99	RL 73.79	RL 76.00
Q1.5 WATER LEVEL	RL 71.00	RL 73.97	RL 73.03	RL 75.32
WATER QUALITY				
WQD DEPTH	0.75m	0.75m	0.75m	0.75m
WQD WIDTH	3.50m	9.00m	9.00m	10.00m
WQD LENGTH	8.00m	9.00m	9.00m	3.00m
NUMBER OF ZPG FILTERS	35	70	75	45
FALSE FLOOR RL	RL 69.28	RL 72.12	RL 71.66	RL 74.09

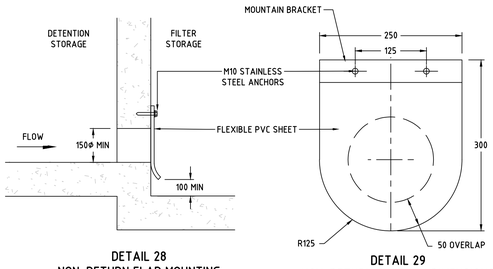




DETAIL 25
ORIFICE PLATE
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)

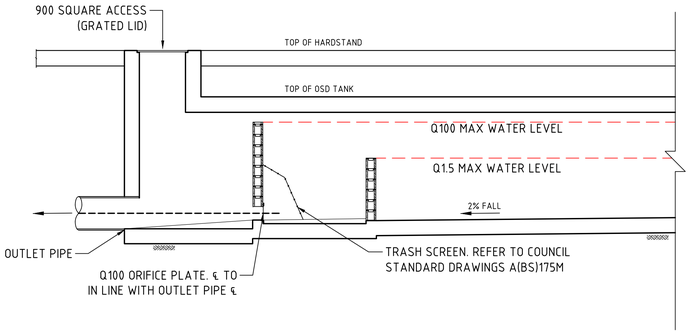


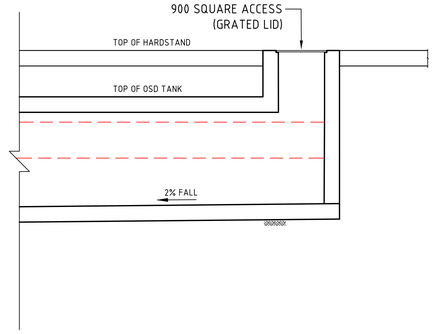
OSD TANK PLAN
SCALE 1:100



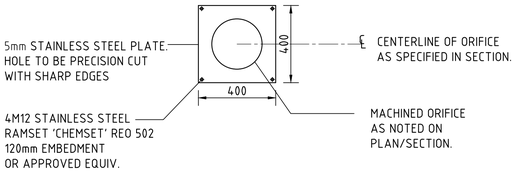
DETAIL 28
NON-RETURN FLAP MOUNTING
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)

DETAIL 29
NON-RETURN FLAP MIN DIMENSIONS
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)

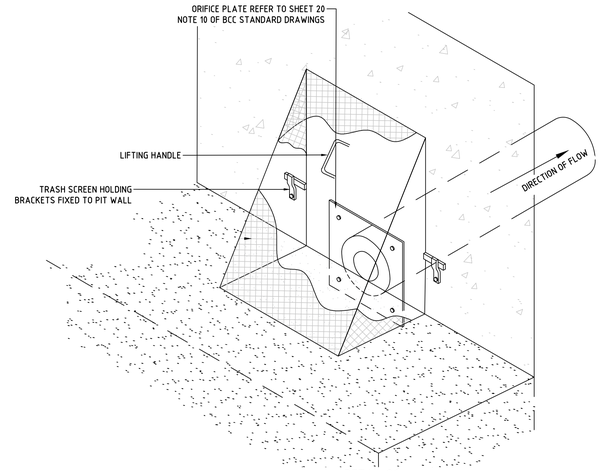




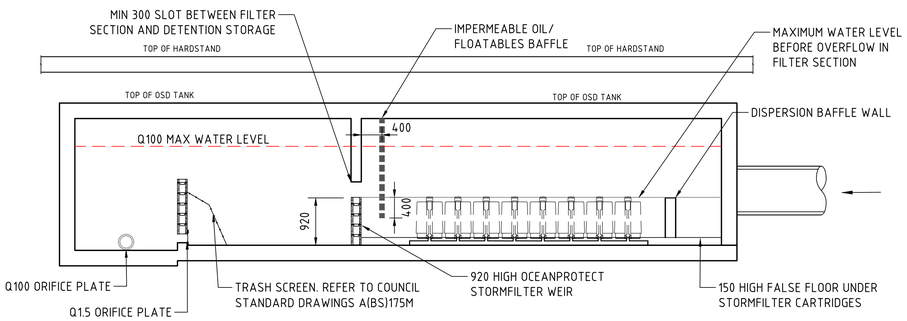
SECTION 1:50 (1)



ORIFICE PLATE DETAIL
NTS



DETAIL 26
ORIFICE PLATE & TRASH SCREEN
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)



SECTION 1:50 (2)



OSD WARNING SIGN
N.T.S
SUGGESTED SIZE 600mm x 450mm
TO BE PROVIDED ADJACENT TO OSD
TANKS IN SUITABLE AREA T.B.C ON SITE



CONFINED SPACE SIGN
N.T.S
SUGGESTED SIZE 300mm x 450mm
TO BE PROVIDED ADJACENT TO OSD
TANKS IN SUITABLE AREA T.B.C ON SITE



OSD SIGN
N.T.S
SUGGESTED SIZE 110mm x 80mm
TO BE PROVIDED ADJACENT TO OSD
TANKS IN SUITABLE AREA T.B.C ON SITE

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	08.03.24	A.	
AMENDMENTS	DATE	ISSUE	
AMENDMENTS	DATE	ISSUE	

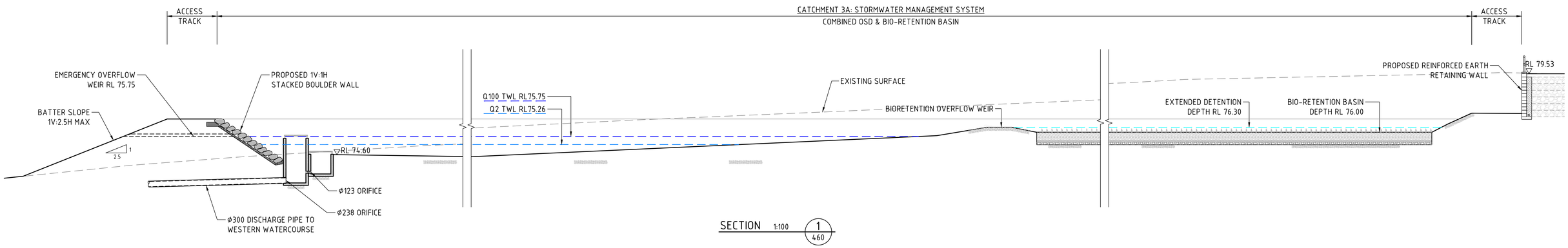
ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA461

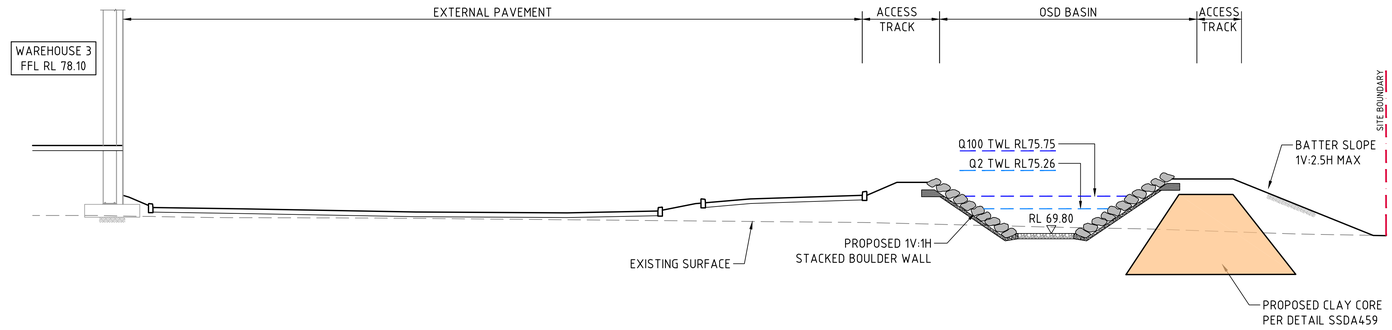
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

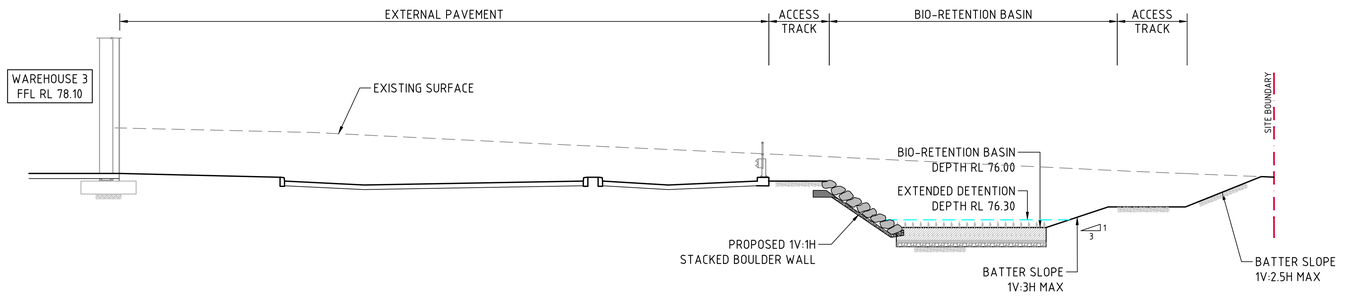
DRAWING TITLE: TYPICAL BELOW GROUND OSD & WATER QUALITY TANK DETAILS
DRAWING No: C013904.03-SSDA461
ISSUE: A



SECTION 1:100 — 1 / 460



SECTION 1:100 — 2 / 460



SECTION 1:100 — 3 / 460

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	06.03.24	A	
AMENDMENTS	DATE	ISSUE	AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

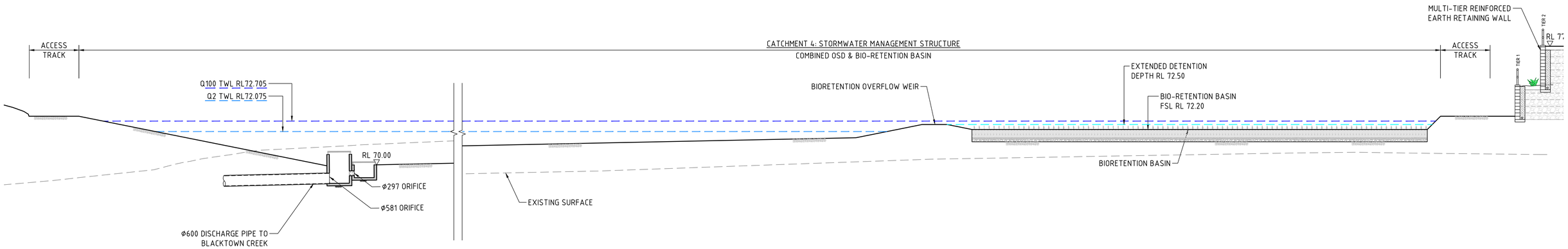
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA462

CONSULT AUSTRALIA

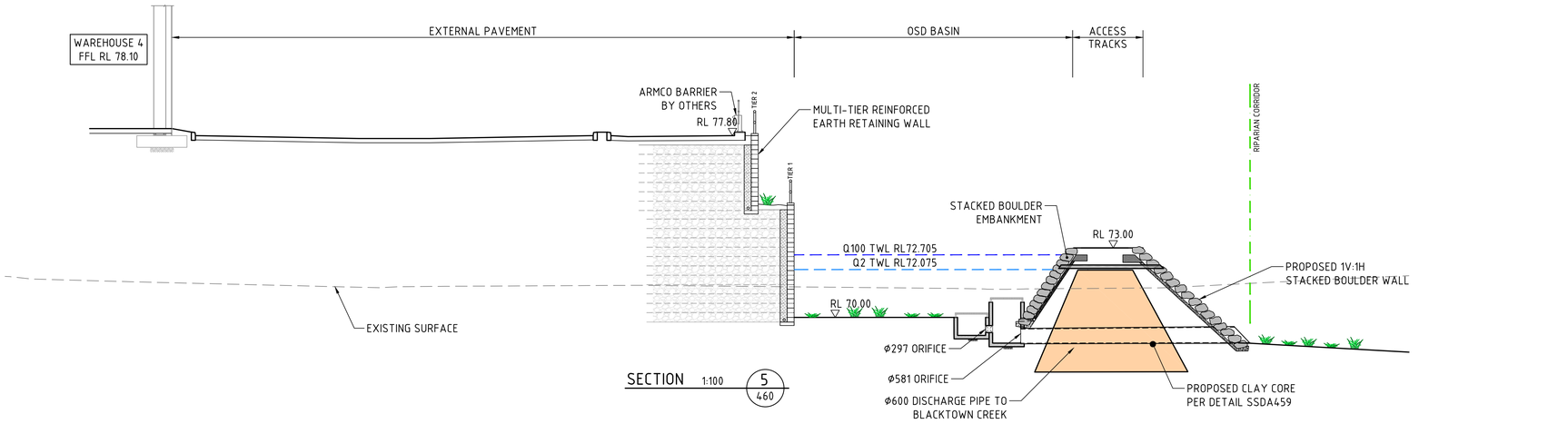
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: ABOVE GROUND BIOETENTION AND OSD BASIN DETAILS - LOT 3

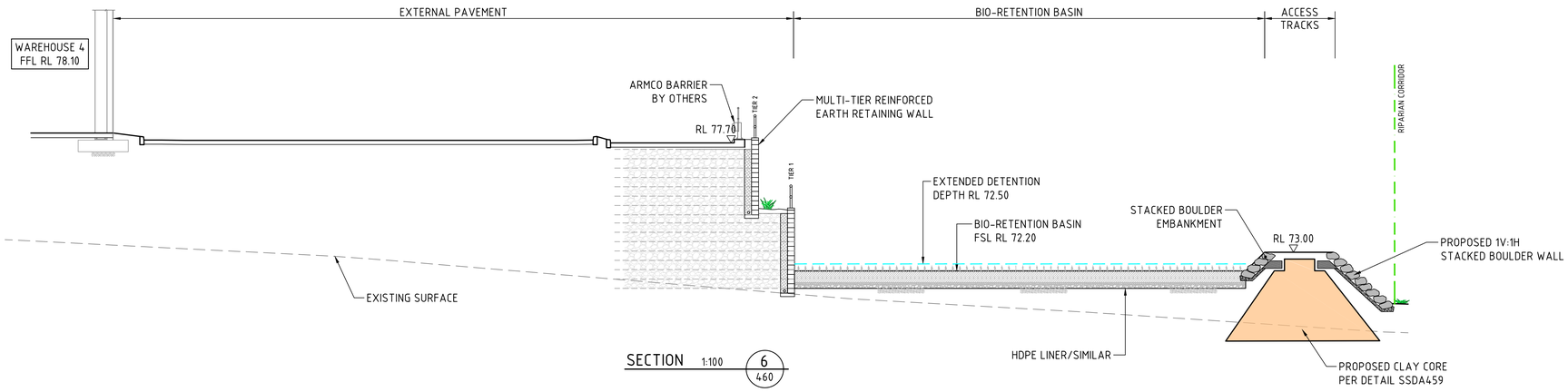
DRAWING No: C013904.03-SSDA462 ISSUE: A



SECTION 1:100 (4/460)



SECTION 1:100 (5/460)



SECTION 1:100 (6/460)

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	06.03.24	A	
AMENDMENTS	DATE	ISSUE	

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA463

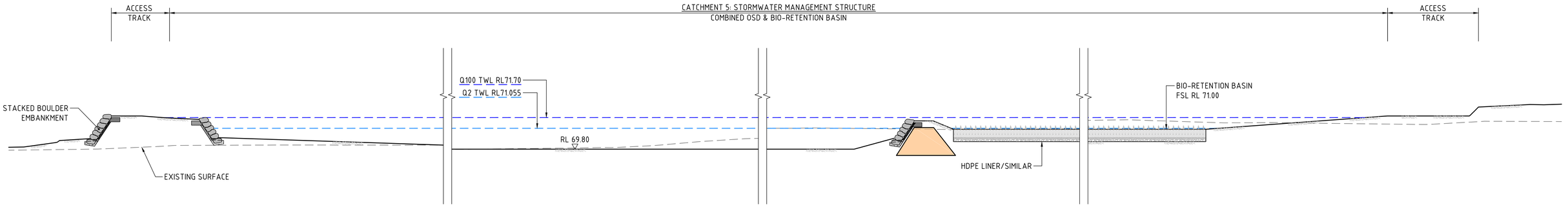
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

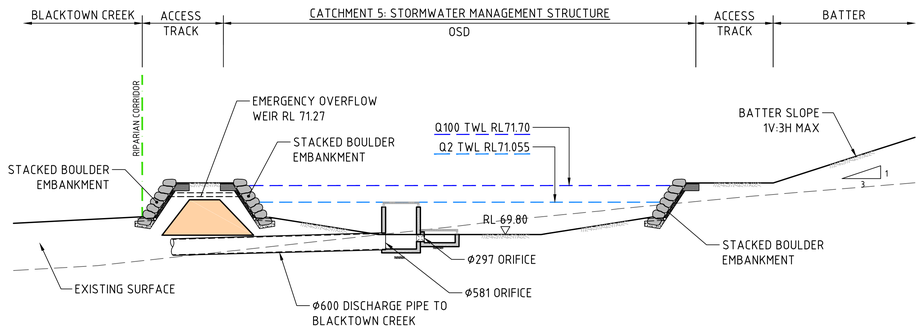
DRAWING TITLE: ABOVE GROUND BIOETENTION AND OSD BASIN DETAILS - LOT 4

DRAWING No: C013904.03-SSDA463

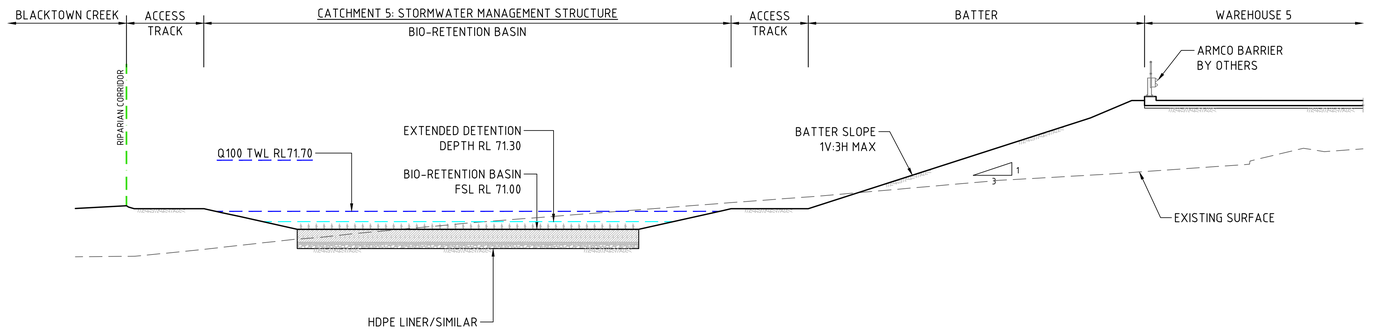
ISSUE: A



SECTION 1:100 — 7 / 460



SECTION 1:100 — 8 / 460



SECTION 1:100 — 9 / 460

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	06.03.24	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA464

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

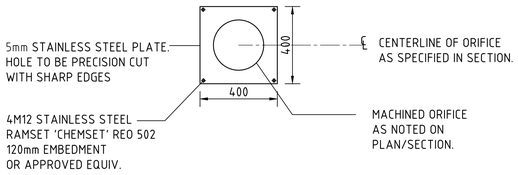
CRC COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: ABOVE GROUND BIOETENTION AND OSD BASIN DETAILS - LOT 5

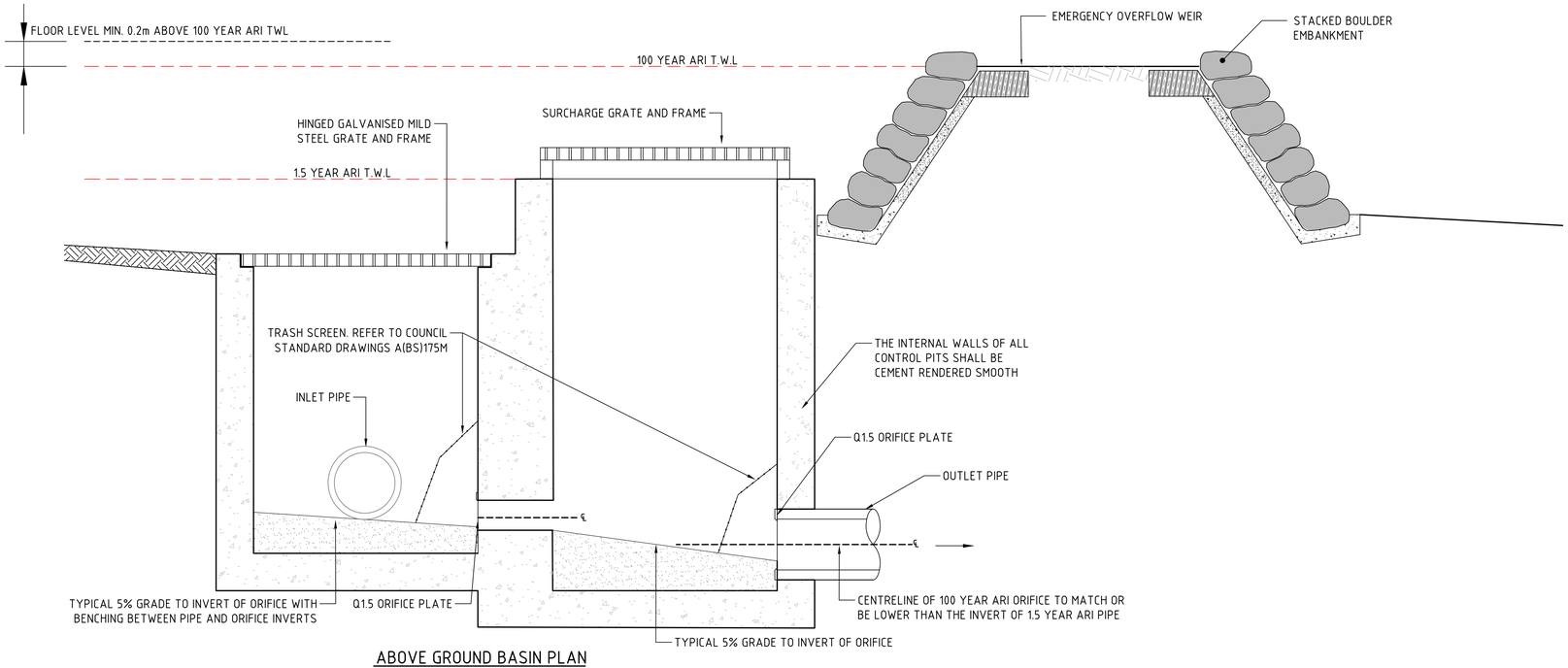
DRAWING No: C013904.03-SSDA464 — ISSUE: A

OSD BASIN DETAILS

	BASIN LOT 3	BASIN LOT 4	BASIN LOT 5
TOTAL SITE AREA DRAINING TO STORAGE (85% IMPERVIOUS)	10,260m^2	54,135m^2	47,760m^2
INLET PIPE RL	RL 76.26	RL 72.52	RL 77.69
INLET PIPE ⌀	600mm	900mm	825mm
STORAGE			
Q100 ORIFICE ⌀	226.5mm	553.5mm	531.0mm
Q100 ORIFICE ℄	RL 73.10	RL 70.20	RL 69.55
RL OF EMERGENCY BYPASS WEIR	RL 76.31	RL 72.71	RL 71.70
VOLUME PROVIDED	467.0m^3	2,530m^3	2,270m^3
VOLUME REQUIRED	466.8m^3 MIN.	2,463m^3 MIN.	2,210m^3 MIN.
Q1.5 ORIFICE ⌀	112.5mm	285.0mm	279.5mm
Q1.5 ORIFICE ℄	RL 73.60	RL 70.50	RL 69.75
RL OF Q1.5 CONTROL PIT WEIR	RL 75.93	RL 72.08	RL 71.06
RL OF INVERT OF DISCHARGE	RL 72.50	RL 67.02	RL 66.83
OUTLET PIPE ⌀	300mm	600mm	600mm
AVERAGE BOTTOM OF BASIN RL	RL 75.18	RL 70.85	RL 69.80
Q100 WATER LEVEL	RL 76.31	RL 72.71	RL 71.70
Q1.5 WATER LEVEL	RL 75.93	RL 72.08	RL 71.06



ORIFICE PLATE DETAIL
NTS



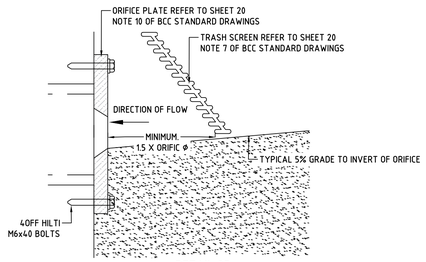
ABOVE GROUND BASIN PLAN
SCALE 1:20



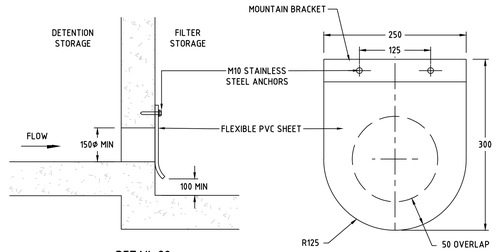
OSD WARNING SIGN
N.T.S
SUGGESTED SIZE 600mm x 450mm
TO BE PROVIDED ADJACENT TO OSD
TANKS IN SUITABLE AREA T.B.C ON SITE



OSD SIGN
N.T.S
SUGGESTED SIZE 110mm x 80mm
TO BE PROVIDED ADJACENT TO OSD
TANKS IN SUITABLE AREA T.B.C ON SITE

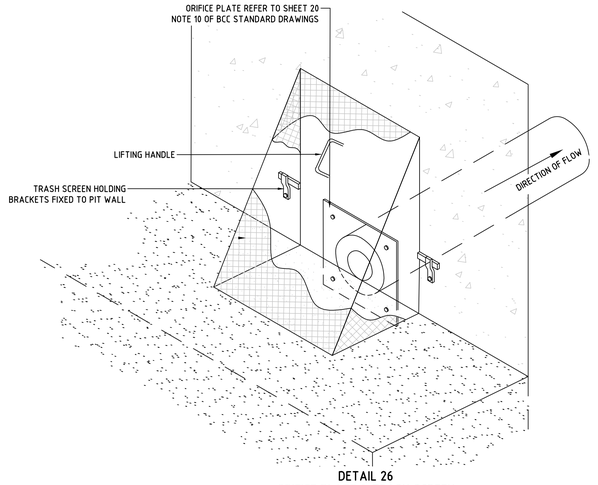


DETAIL 25
ORIFICE PLATE
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)



DETAIL 28
NON-RETURN FLAP MOUNTING
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)

DETAIL 29
NON-RETURN FLAP MIN DIMENSIONS
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)



DETAIL 26
ORIFICE PLATE & TRASH SCREEN
NTS
(REFER TO BCC STANDARD DRAWING A(BS)175M)

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	08.03.24	A	
AMENDMENTS	DATE	ISSUE	
AMENDMENTS	DATE	ISSUE	

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

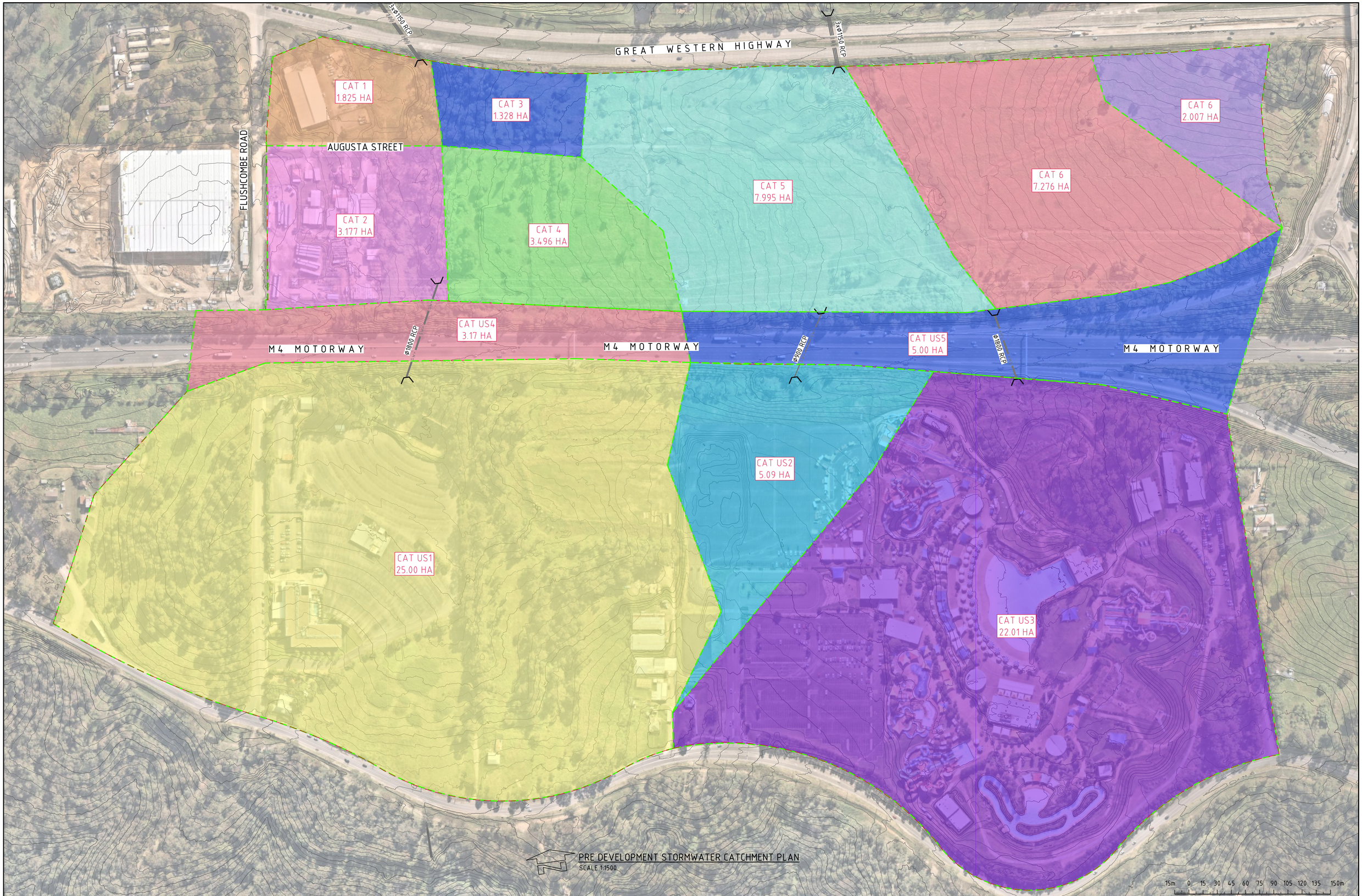
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA465

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: TYPICAL OSD BASIN CONTROL & DISCHARGE PIT DETAIL

DRAWING No: C013904.03-SSDA465
ISSUE: A



PRE DEVELOPMENT STORMWATER CATCHMENT PLAN
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA470

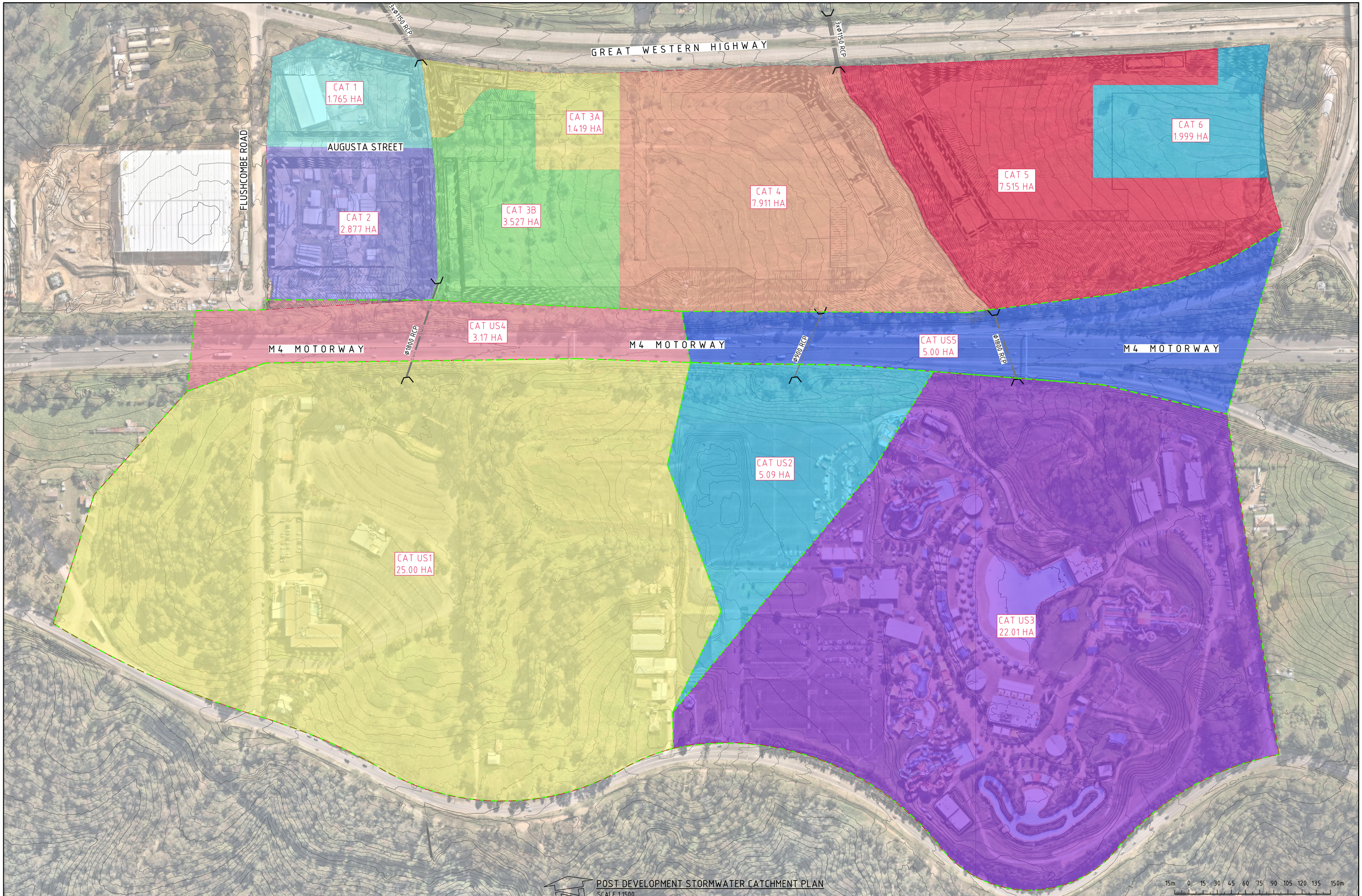
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
PRE DEVELOPMENT STORMWATER CATCHMENT PLAN

DRAWING No C013904.03-SSDA470
ISSUE B



POST DEVELOPMENT STORMWATER CATCHMENT PLAN
SCALE 1:1500

FOR INFORMATION

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA471

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
POST DEVELOPMENT STORMWATER CATCHMENT PLAN

DRAWING No C013904.03-SSDA471
ISSUE B

RAMP WITH MAX GRADE AS SHOWN AND TRANSITIONS TOP AND BOTTOM PER NOTE 7.

PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL

RETAINING WALL IN CUT ALONG WAREHOUSE EXTERNAL FOOTPATH

RETAINING WALL IN CUT BEHIND WAREHOUSE WITH BONDEK SLAB OVER 1m VOID BELOW FOR EGRESS

FLUSHCOMBE ROAD REFER TO DRAWING SSDA711 FOR DETAILS

RETAINING WALL IN CUT BEHIND WAREHOUSE WITH BONDEK SLAB OVER 1m VOID BELOW FOR EGRESS

PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL

PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS

AUGUSTA STREET REFER TO DRAWING SSDA712 FOR DETAILS

RAMP WITH MAX GRADE AS SHOWN AND TRANSITIONS TOP AND BOTTOM PER NOTE 7.

PROPOSED WAREHOUSE 1
FFL RL 73.32±1000mm

PROPOSED RECESSED DOCK 1300 DEEP

AWNING ABOVE

PROPOSED WAREHOUSE 2
FFL RL 76.00±1000mm

PROPOSED RETAINING WALL IN FILL

PROPOSED PUMP ROOM

PROPOSED SPRINKLER TANK

PROPOSED CROSSOVER IN ACCORDANCE WITH COUNCIL STANDARD DRAWINGS. ALL EXISTING SERVICES ALIGNMENT, FITTINGS AND DEPTHS TO BE CONFIRMED VIA POTHOLING PRIOR TO COMMENCEMENT OF WORKS. TYPICAL

RAMP WITH MAX GRADE AS SHOWN AND TRANSITIONS TOP AND BOTTOM PER NOTE 7.

WESTERN CREEK REFER TO DRAWING SSDA415 FOR DETAILS

GREAT WESTERN HIGHWAY

FLUSHCOMBE ROAD

AUGUSTA STREET

M4 MOTORWAY

SITE BOUNDARY

OFFICE 1

OFFICE 2

EGRESS

STAIRS

RECESSED DOCK

RSD 6.0M(W) X 5.5M(H)

LEGEND:

LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 – FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 – FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ROAD PAVEMENT
- NEW ASPHALT ROAD PAVEMENT
- FOOTPATH
- NEW VEHICLE CROSSING
- MAINTENANCE ACCESS TRACK

NOTES:

REFER TO DRAWING SSDA500 FOR FINISHED LEVELS NOTES.

FINISHED LEVELS PLAN - WAREHOUSE 1 & 2
SCALE 1:500

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL MASTERPLAN	08.03.24	E
REVISED ARCHITECTURAL MASTERPLAN	11.09.23	D
ADDITIONAL PARKING SHOWN TO WH2	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA501

CONSULT AUSTRALIA

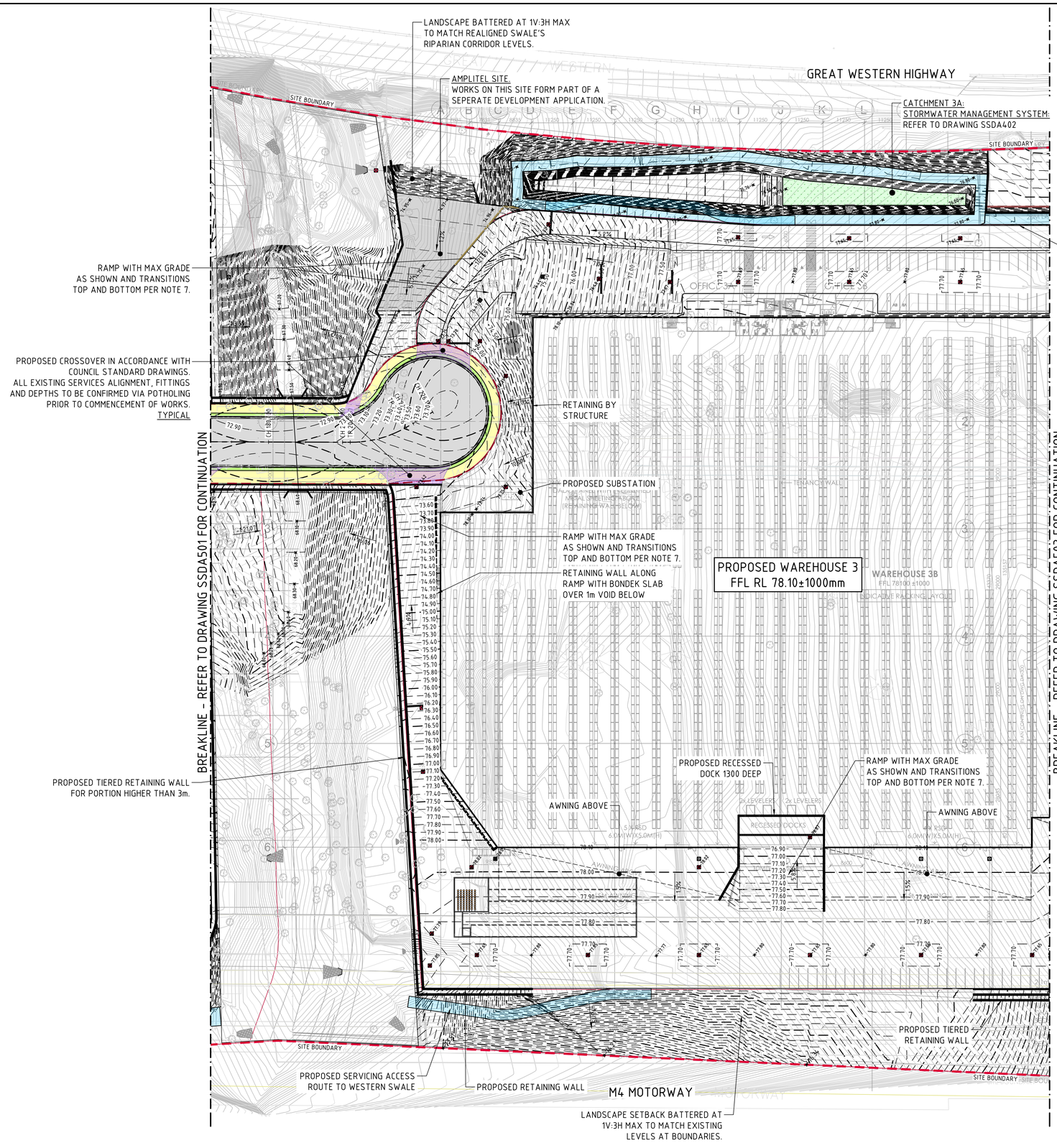
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: FINISHED LEVELS PLAN WAREHOUSE 1 & 2

DRAWING No: C013904.03-SSDA501

ISSUE: E



LEGEND:

LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ROAD PAVEMENT
- NEW ASPHALT ROAD PAVEMENT
- FOOTPATH
- NEW VEHICLE CROSSING
- MAINTENANCE ACCESS TRACK

NOTES:

REFER TO DRAWING SSDA500 FOR FINISHED LEVELS NOTES.

FINISHED LEVELS PLAN - WAREHOUSE 3

SCALE 1:500

FOR INFORMATION

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL MASTERPLAN	08.03.24	E
REVISED ARCHITECTURAL MASTERPLAN	11.09.23	D
ACOUSTIC FENCE ADDED TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA502

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: FINISHED LEVELS PLAN WAREHOUSE 3

DRAWING No: C013904.03-SSDA502 ISSUE: E

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

PROPOSED MAINTENANCE ACCESS TRACK TO AND AROUND BASIN

GREAT WESTERN HIGHWAY

PROPOSED ACOUSTIC FENCE ALONG GREAT WESTERN HIGHWAY BOUNDARY ON TOP OF BATTER SHOWN

PROPOSED 1m HIGH WALL BEHIND ACCESS TRACK WITH A 2m WIDE 1V:2.5H MAC BATTER BEHIND WALL

PROVIDE SMOOTH TRANSITION BETWEEN EXISTING FLOW PATH TO GWH AND REHABILITATED CREEK CROSS SECTION. MATCH LEVELS AND CROSS SECTION ALLOWING FOR A MINIMUM 1:5 TRANSITION LENGTH. FINAL ARRANGEMENT SUBJECT TO SITE CONDITION AND ON-SITE VERIFICATION.".

1V:1H BATTER TO BE STABILISED WITH ROCK BOULDERS ON MASS CONCRETE OR LANDLOK 450 (OR SIMILAR APPROVED). TBC DURING DETAILED DESIGN.

PROPOSED TIERED RETAINING WALL FOR PORTION HIGHER THAN 3m

PROPOSED STACKED BOULDER WALL

CATCHMENT 5:
STORMWATER MANAGEMENT SYSTEM:
REFER TO DRAWING SSDA403

1V:1H BATTER TO BE STABILISED WITH ROCK BOULDERS ON MASS CONCRETE OR LANDLOK 450 (OR SIMILAR APPROVED). TBC DURING DETAILED DESIGN.

1V:1H BATTER TO BE STABILISED WITH ROCK BOULDERS ON MASS CONCRETE OR LANDLOK 450 (OR SIMILAR APPROVED). TBC DURING DETAILED DESIGN.

PROPOSED WAREHOUSE 4
FFL RL 78.10±1000mm

CATCHMENT 4:
STORMWATER MANAGEMENT SYSTEM:
REFER TO DRAWING SSDA403

RAMP WITH MAX GRADE AS SHOWN AND TRANSITIONS TOP AND BOTTOM PER NOTE 7.

PROPOSED RECESSED DOCK 1300 DEEP

AWNING ABOVE

PROPOSED TIERED RETAINING WALL

PROPOSED PUMP ROOM

PROPOSED SPRINKLER TANK

PROPOSED TIERED RETAINING WALL FOR PORTION HIGHER THAN 3m

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS

M4 MOTORWAY

HERITAGE SITE SHOWN THUS. NO WORKS WITHIN HERITAGE ZONE. MATCH LEVELS AT BOUNDARY OF HERITAGE SITE.

WETLAND
REFER TO DRAWING SSDA410

BREAKLINE – REFER TO DRAWING SSDA502 FOR CONTINUATION

BREAKLINE – REFER TO DRAWING SSDA504 FOR CONTINUATION

FINISHED LEVELS PLAN – WAREHOUSE 4
SCALE 1:500

LEGEND:
LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 – FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 – FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- MAINTENANCE ACCESS TRACK

NOTES:
REFER TO DRAWING SSDA500 FOR FINISHED LEVELS NOTES.

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	08.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
ACOUSTIC BUNDING & WALL TO WH3	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA503

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: FINISHED LEVELS PLAN WAREHOUSE 4

DRAWING No: C013904.03-SSDA503 ISSUE: E

GREAT WESTERN HIGHWAY

PROPOSED TIERED RETAINING WALL FOR PORTION HIGHER THAN 3m

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

ACCESS TO WAREHOUSE 5 FROM GWH DESIGNED BY ALTERNATE CONSULTANT. DESIGN DOCUMENTS REGARDING ACCESS FROM TFNSW ASSET TO FORM PART OF THE SSDA APPLICATION. LEVELS AT BOUNDARIES TO BE CONFIRMED.

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

SITE BOUNDARY

BOUNDARY

PROPOSED SPRINKLER TANK & PUMP ROOM

PROPOSED RETAINING BELOW STRUCTURE

PROPOSED COMBINED OSD AND STORMWATER QUALITY SYSTEM: REFER TO DRAWING SSDA404

UNIT 5A

UNIT 5B
7538m2
FFL 82.40

UNIT 5C
6889m2
FFL 82.40

UNIT 5D
6423m2
FFL 82.40

INDICATIVE RACKING

CARPARK SET BELOW SUSPENDED WAREHOUSING ABOVE"

CATCHMENT 5A: STORMWATER MANAGEMENT SYSTEM: REFER TO DRAWING SSDA404

PROPOSED WAREHOUSE 5
FFL RL 82.40±1000mm

PROPOSED RETAINING WALL

PROPOSED RETAINING BELOW STRUCTURE

2X DOCK LEVELER

FIRE EGRESS STAIRS

LENGTH OF LEVEL ABOVE 74

RETAINING WALL TO CIVIL ENG.

WASTE STORAGE AREA STORAGE CAPACITY 11.1m2

WASTE STORAGE AREA STORAGE CAPACITY 9.2m2

WASTE STORAGE AREA STORAGE CAPACITY 12.9m2

HARDSTAND LOADING AREA
FFL 82.40

LINE OF HARDSTAND ABOVE

CULVERT OR SIMILAR BRIDGING STRUCTURE BELOW WAREHHOUSE TO EXTERNAL PARKING AREA

PROPOSED RETAINING WALL

EXISTING STAUNCHION

M4 MOTORWAY

FREEWAY

PROPOSED ACCESS TO EXISTING ELECTRICAL TOWERS

LANDSCAPE SETBACK BATTERED AT 1V:3H MAX TO MATCH EXISTING LEVELS AT BOUNDARIES

WETLAND
REFER TO DRAWING SSDA410

1V:1H BATTER TO BE STABILISED WITH ROCK BOULDERS ON MASS CONCRETE OR LANDLOK 450 (OR SIMILAR APPROVED). TBC DURING DETAILED DESIGN.

BREAKLINE - REFER TO DRAWING SSDA503 FOR CONTINUATION

LEGEND:

LEVELS DATUM IS AHD.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- 50.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- MAINTENANCE ACCESS TRACK

NOTES:

REFER TO DRAWING SSDA500 FOR FINISHED LEVELS NOTES.

FINISHED LEVELS PLAN - WAREHOUSE 5 GROUND FLOOR
SCALE 1:500

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL MASTERPLAN	08.03.24	E
REVISED ARCHITECTURAL MASTERPLAN	11.09.23	D
REVISED AS CLOUDED	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA504

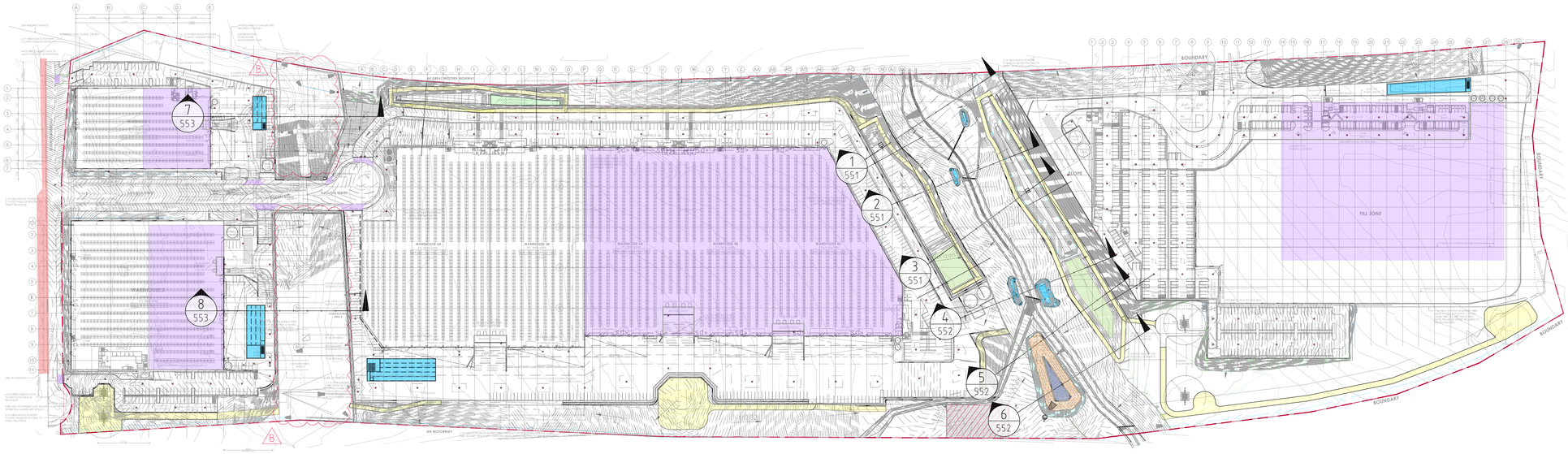
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: FINISHED LEVELS PLAN
WAREHOUSE 5 GROUND FLOOR

DRAWING No: C013904.03-SSDA504 ISSUE: E



KEY SECTIONS PLAN
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	B
ISSUED FOR INFORMATION	06.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA550

CONSULT AUSTRALIA

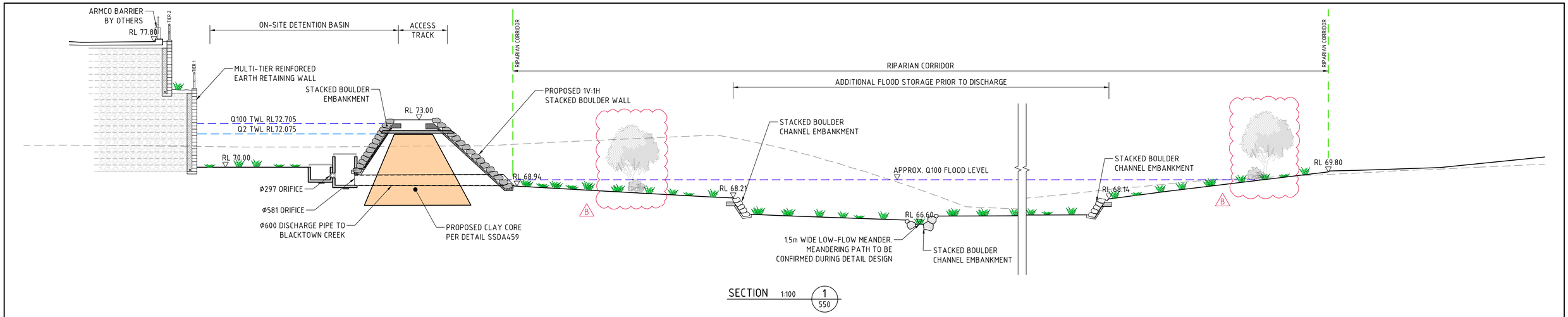
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

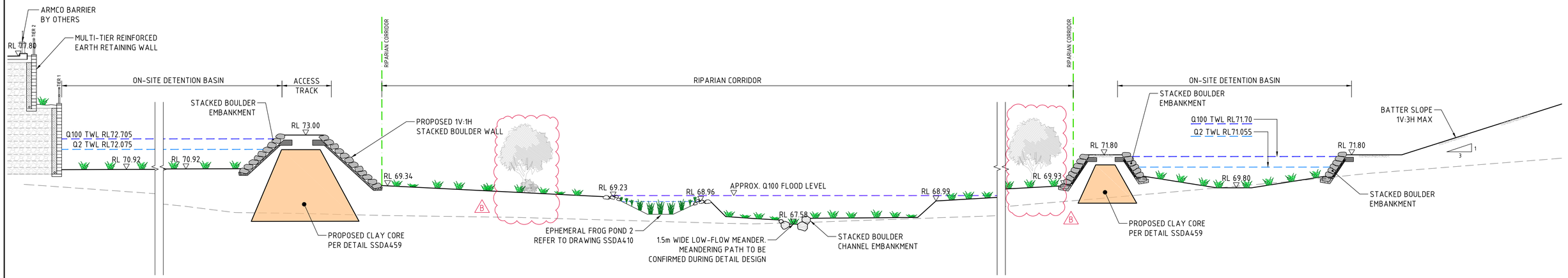
DRAWING TITLE: KEY SECTIONS PLAN BLACKTOWN CREEK AND WESTERN SWALE

DRAWING No: C013904.03-SSDA550

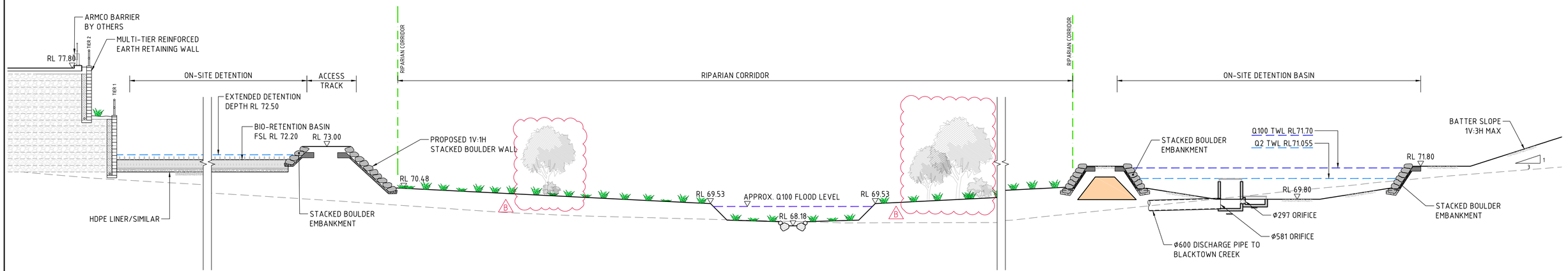
ISSUE: B



SECTION 1:100 1/550



SECTION 1:100 2/550



SECTION 1:100 3/550

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	B
ISSUED FOR INFORMATION	06.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA551

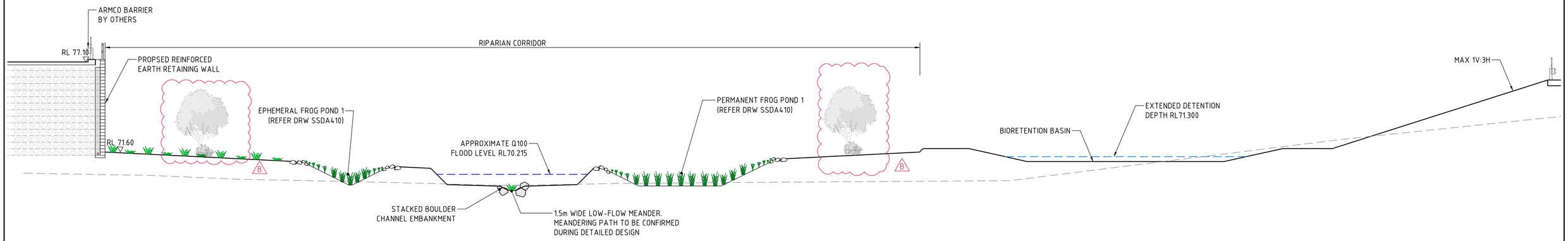
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

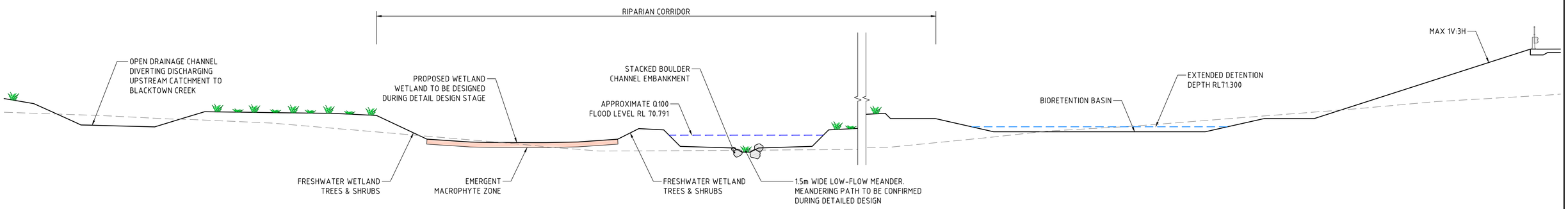
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
BLACKTOWN CREEK SECTIONS
SHEET 1

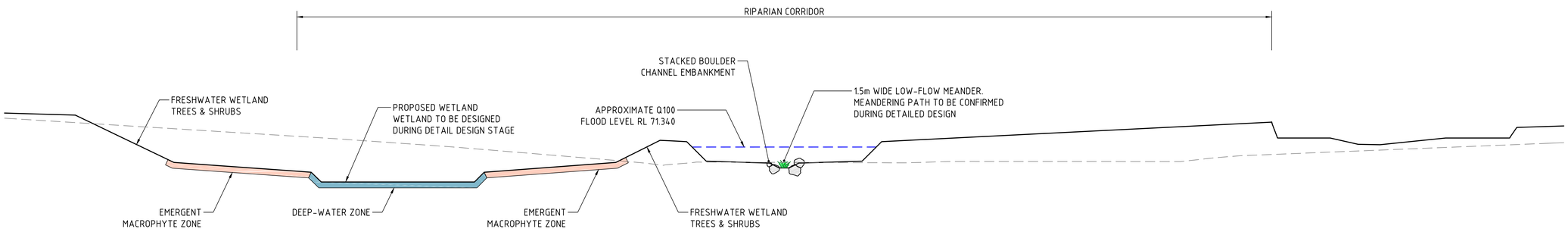
DRAWING No C013904.03-SSDA551 ISSUE B



SECTION 1:100 4/550



SECTION 1:100 5/550



SECTION 1:100 6/550

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	B
ISSUED FOR INFORMATION	06.03.24	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA552

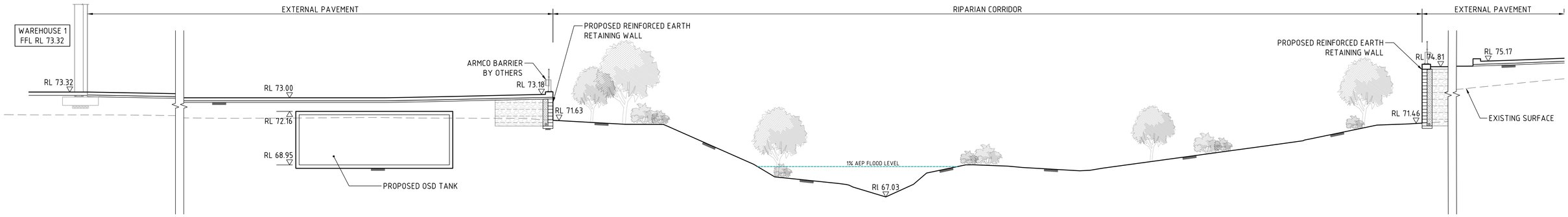
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 5731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

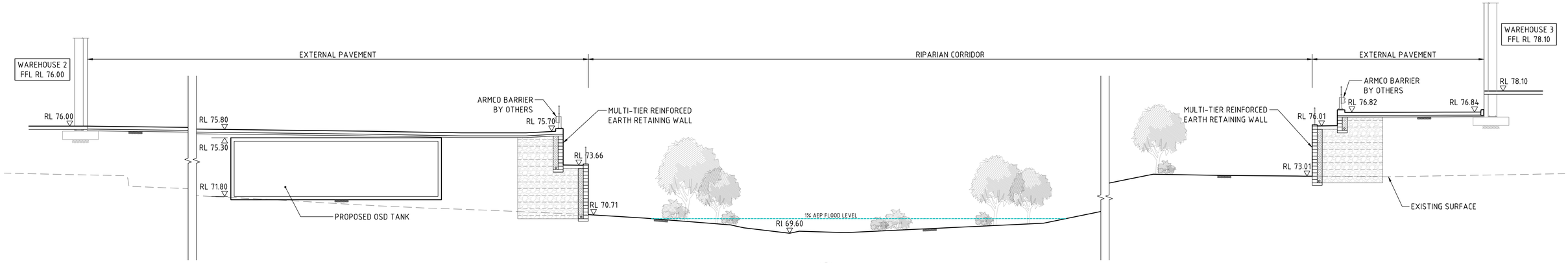
DRAWING TITLE: BLACKTOWN CREEK SECTIONS
SHEET 2

DRAWING No: C013904.03-SSDA552

ISSUE: B



SECTION 1:100 — 7 / 550



SECTION 1:100 — 8 / 550

1m 0 1 2 3 4 5 6 7 8 9 10m

SCALE 1:100 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	13.03.24	B
ISSUED FOR INFORMATION	06.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA 553

CONSULT AUSTRALIA

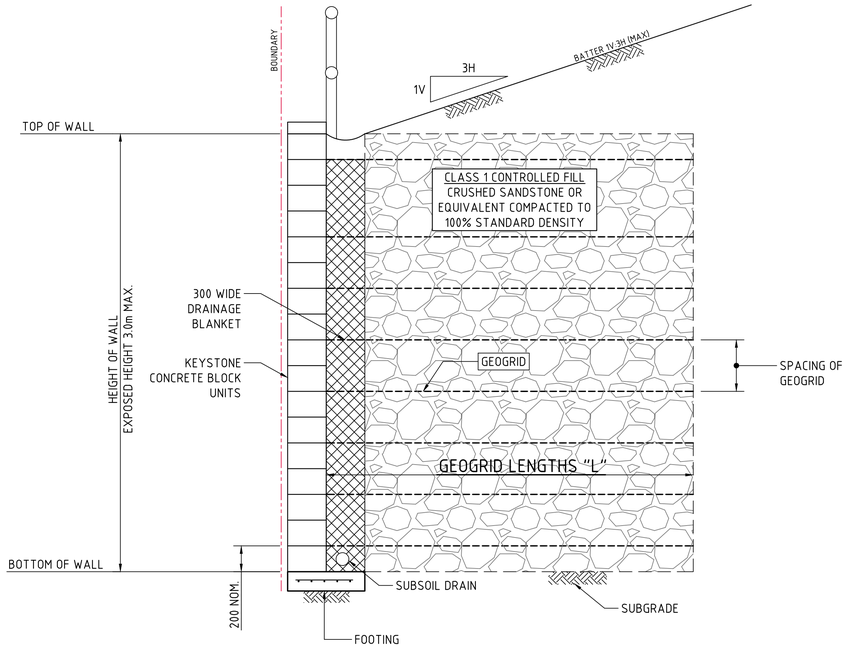
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

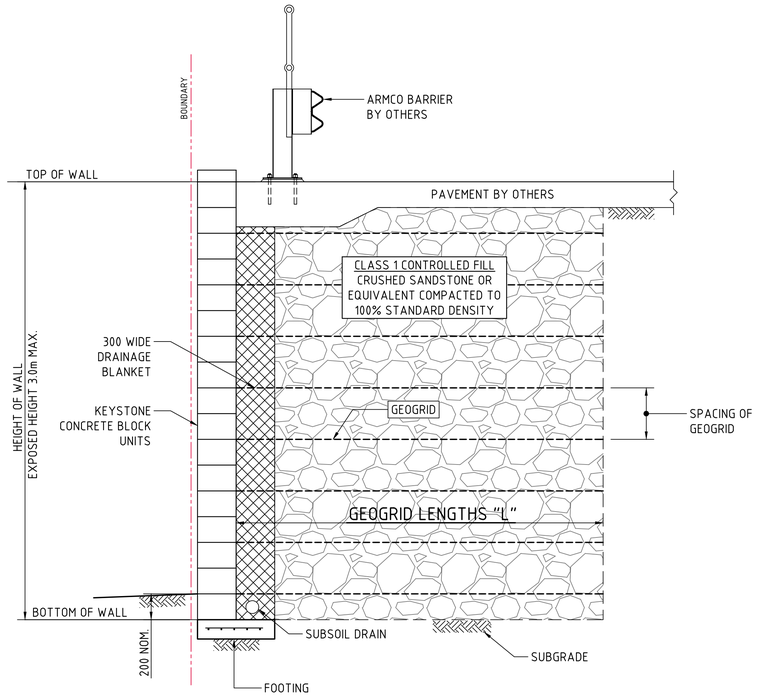
DRAWING TITLE
WESTERN SWALE SECTIONS
SHEET 1

DRAWING No C013904.03-SSDA553

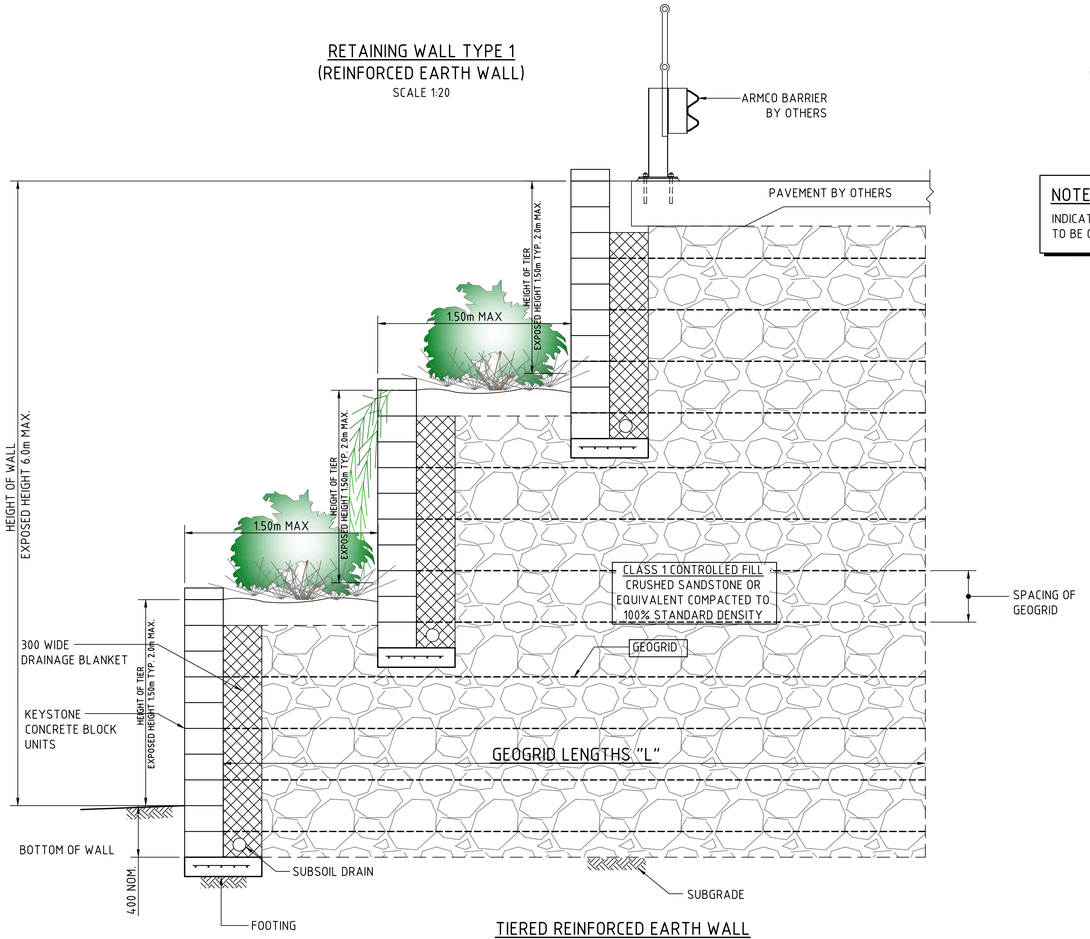
ISSUE B



RETAINING WALL TYPE 1
(REINFORCED EARTH WALL)
SCALE 1:20



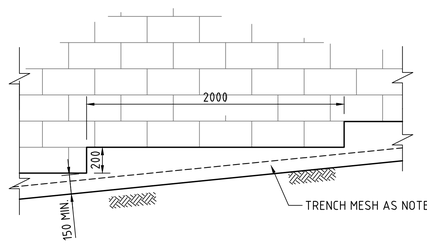
RETAINING WALL TYPE 2
(REINFORCED EARTH WALL)
SCALE 1:20



TIERED REINFORCED EARTH WALL
SCALE 1:20

NOTE :

INDICATIVE REINFORCEMENT LENGTHS SHOWN. DESIGN TO BE CONFIRMED / PROVIDED BY D+C CONTRACTOR.



REINFORCED EARTH WALL TYPICAL LEVELLING STRIP STEP DETAIL
SCALE 1:20

RETAINING WALL NOTES:

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM BEARING CAPACITY OF FOUNDATION TO BE AS FOLLOWS :
   a. H MAX. 2.0m = 100 kPa
   b. H MAX. 3.5m = 150 kPa
   c. H MAX. 5.0m = 200 kPa
   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
3. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
4. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O.
5. ON PLAN :
   a. LIVE LOAD = 20 kPa
   b. DEAD LOAD = 5 kPa
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
6. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm MINIMUM UNLESS NOTED OTHERWISE.
7. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
8. TIED WALLS ARE TO BE TEMPORARILY PROPPED AT TOP UNTIL SUCH TIME THE TOP OF WALL IS TIED TO THE SLAB AND 28-DAY CONCRETE STRENGTH HAS BEEN ACHIEVED.
9. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500KG STATIC WEIGHT IS TO BE KEPT BACK 1.5m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
10. ALL DESIGN AND CONSTRUCT WALL SYSTEMS TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.

REINFORCED EARTH RETAINING WALL NOTES:

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM HEIGHT (H) TO GEOGRID REINFORCEMENT LENGTH (L) TO BE 1.0.
3. MINIMUM BEARING CAPACITY OF FOUNDATION (BASED ON MINIMUM H/L RATIO OF 1.0) TO BE AS FOLLOWS :
   a. H MAX. 2.0m = 100 kPa
   b. H MAX. 3.5m = 150 kPa
   c. H MAX. 5.0m = 200 kPa
   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
4. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
5. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O. ON PLAN:
   a. LIVE LOAD = 20 kPa
   b. DEAD LOAD = 5 kPa
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
6. THE GEOGRIDS SHALL BE OF THE TYPE AND INDEX STRENGTH NOMINATED ON THE DRAWINGS. THE MINIMUM GEOGRIDS SHALL BE A SINGLE LENGTH IN THE DIRECTION OF DESIGN TENSION, NOT LAPPED, MAKING PROVISION FOR CONNECTION TO THE FACING ACROSS THE WHOLE WIDTH OF THE FACING AND PROVIDING FOR THE SPECIFIED ANCHORAGE WITHIN THE DESIGNATED ANCHORAGE ZONE. GEOGRIDS SHALL COVER THE WHOLE OF THE PLAN AREA BEHIND THE WALL FOR THE SPECIFIED ANCHORAGE LENGTH AND SHALL BE LAPPED WITH ADJACENT SECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm.
8. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
9. SELECT BACKFILL MATERIAL WITHIN THE REINFORCED SOIL BLOCK SHALL BE SOUND GRANULAR MATERIAL OF NATURAL OR INDUSTRIAL ORIGIN, NON-EXPANSIVE, FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIAL CONFORMING TO THE PHYSICAL, CHEMICAL AND ELECTROCHEMICAL LIMITS AS SPECIFIED AND SHALL NOT BE SUBJECT TO BREAKDOWN UNDER COMPACTION. THE SELECT BACKFILL MATERIAL IS TO HAVE THE FOLLOWING PARAMETERS:
   a. MINIMUM INTERNAL FRICTION, Ø = 34°
   b. EFFECTIVE COHESION, C' = 0 kPa
   c. UNIT WEIGHT = 21 kN/m³
   d. PH BETWEEN 4 AND 9.
10. SELECT BACKFILL IS TO BE PLACED AND COMPACTED IN LAYERS NOT MORE THAN 300mm (LOOSE). COMPACTION TO NOT LESS THAN 100% SMDD WILL BE ACHIEVED AND MATERIAL PLACED WITHIN 2% OF OMC DENSITY TESTING SHALL BE PERFORMED IN EACH COMPACTED LIFT IN ACCORDANCE WITH AS3798.
11. PROVIDE A DRAINAGE LAYER DIRECTLY BEHIND THE FACING UNITS IN A MINIMUM 300mm WIDE 12–20mm AGGREGATE LAYER. FACING UNIT VOIDS TO BE FILLED WITH AGGREGATE. PROVIDE 100mm MINIMUM AG. DRAIN IN GEOTEXTILE SOCK AT TOE OF WALL FACING AND CONNECT TO DRAINAGE SYSTEM AT 30m MAX. SPACING.
12. THE NEED FOR A CHIMNEY DRAIN OR DRAINAGE AT THE REAR OF THE MASS SOIL BLOCK IS TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER AND DESIGNER FOLLOWING PREPARATION OF THE FOUNDATION AND PRIOR TO CONSTRUCTION OF THE MASS SOIL BLOCK.
13. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500kG STATIC WEIGHT IS TO BE KEPT BACK 1.5m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
14. ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.
15. TOP OF WALL HEIGHTS ARE NOTED TO ALIGN WITH FINISHED PAVEMENT HEIGHTS. THE CONTRACTOR AND THEIR DESIGN AND CONSTRUCT WALLING CONTRACTORS ARE TO ENSURE THAT ALL WALL STRAPS ARE INSTALLED BELOW THE DESIGN EARTHWORKS SUBGRADE. CONTRACTOR TO ALLOW FOR WALL STRAPS TO BE GRADED AWAY FROM THE FACE OF THE WALL OR OTHERWISE INSTALLED TO SUIT EARTHWORKS DESIGN LEVELS AND GRADES.
16. DIFFERENTIAL SETTLEMENT NOTE:
    FUTURE BUILDING AND SERVICE DESIGNERS TO CONSIDER DIFFERENTIAL SETTLEMENT OF REINFORCED EARTH WALL BLOCK AND GENERAL FILL AREAS. PARTICULAR ATTENTION TO BE DRAWN TO HEAVILY LOADED AREAS, OR DIFFERING LOADED AREAS (INCLUDING SPRINKLER TANK AND TRUCK PAVEMENT AREAS) AND WHERE SIGNIFICANT CHANGES IN OVERALL WALL HEIGHT OR FILL AMOUNTS ARE EXPERIENCED. IT IS THE RESPONSIBILITY OF THE FUTURE DESIGNERS TO ENSURE APPROPRIATE DESIGN CONSIDERATION TO DIFFERENTIAL SETTLEMENT ARE MADE DEPENDING ON THE DESIGN ELEMENT AND INTERACTION WITH RETAINED ELEMENTS AND GENERAL FILL MATERIAL.

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	05.03.24	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

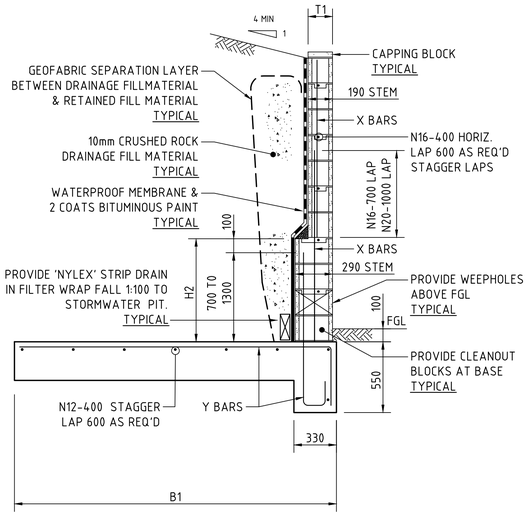
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA650

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: RETAINING WALL DETAILS SHEET 1

DRAWING No: C013904.03-SSDA650 ISSUE: A



WALL WITH THIN STEM OF 190 BLOCK AND THICK STEM OF 290 BLOCK

1:20 SCALE

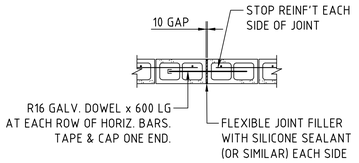
NOTE :
ALL BLOCK CORES TO BE FULLY GROUTED.
NOTES SHOWN ARE TYPICAL FOR ALL WALLS.
ALL BASE KEYS TO BE POURED AGAINST
UNDISTURBED NATURAL GROUND.

RETAINING WALL TYPE 1 SPECIFICATIONS FOR 1 IN 4 BACKFILL OR 5kPa SURCHARGE :

RETAINED HEIGHT H1	290 STEM HEIGHT H2	BASE WIDTH B1	(THIN) STEM THICKNESS T1	REINF'T. X BARS	REINF'T. Y BARS
3400	1400	3600	190	N16-200	N20-200
3200	1200	3300	190	N16-200	N20-200
3000	1000	3000	190	N16-200	N16-200
2800	1000	2800	190	N16-400	N16-200
2600	1000	2500	190	N16-400	N16-200
2400	800	2300	190	N16-400	N16-400
2200	800	2100	190	N16-400	N16-400
2000	N/A	1800	190	N16-400	N16-200
1800	N/A	1600	190	N16-400	N16-400
1600	N/A	1400	190	N16-400	N16-400
1400	N/A	1200	190	N16-400	N16-400
1200	N/A	1000	140	N12-400	N12-400
1000	N/A	900	140	N12-400	N12-400
800	N/A	800	140	N12-400	N12-400
600	N/A	600	140	N12-400	N12-400

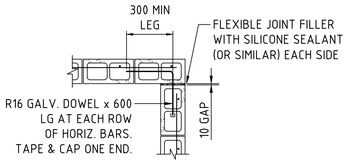
CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
CORE FILL	230	10	GP	NIL	20

NOTE :
INDICATIVE REINFORCEMENT LENGTHS SHOWN. DESIGN TO BE CONFIRMED / PROVIDED BY D+C CONTRACTOR.



VERTICAL JOINT DETAIL

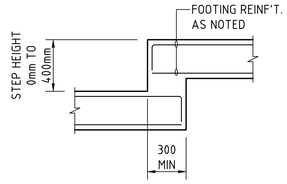
PROVIDE VERTICAL JOINTS IN BLOCKWORK 8.0M MAX. CENTRES



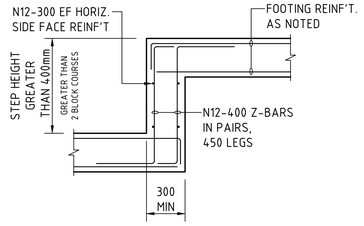
CORNER DETAIL

RETAINING WALL BLOCKWORK JOINTING DETAILS

1:20 SCALE



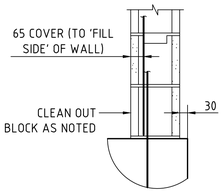
STEP HEIGHT
0mm TO 400mm



STEP HEIGHT
GREATER THAN 400mm

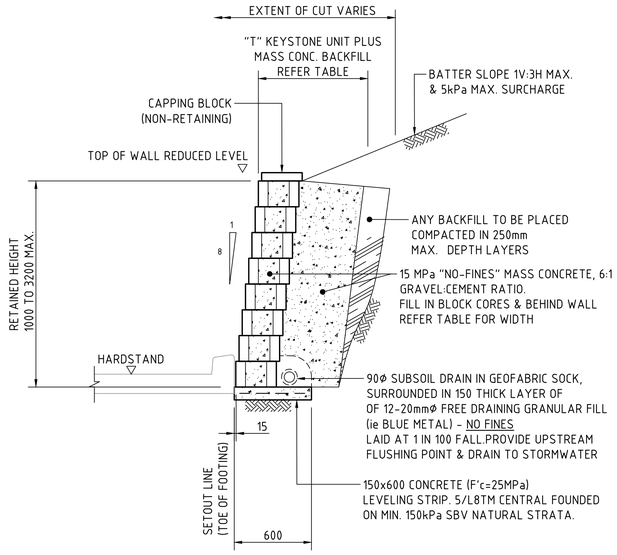
TYPICAL WALL FOOTING STEPS

1:20 SCALE



WALL VERTICAL REINF'T DETAIL TYPICAL

NOT TO SCALE



TYPICAL THRU' KEYSTONE RETAINING WALL (1000 TO 2500 MAXIMUM RETAINED HEIGHT)

1:20 SCALE

KEYSTONE WALL SPECIFICATIONS :	
RETAINED HEIGHT (mm)	OVERALL THICKNESS "T" (mm)
UP TO 1000	600 - NO FINES MASS. CONC. FILL
1000 TO 1200	700 - NO FINES MASS. CONC. FILL
1200 TO 1800	950 - NO FINES MASS. CONC. FILL
1800 TO 2400	1200 - NO FINES MASS. CONC. FILL
2400 TO 2500	1450 - NO FINES MASS. CONC. FILL

NOTE :
INDICATIVE REINFORCEMENT LENGTHS SHOWN. DESIGN TO BE CONFIRMED / PROVIDED BY D+C CONTRACTOR.

MASONRY BLOCKWORK

M1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3700.

M2 STRENGTH OF BRICKS, CLASS OF BLOCKS AND TYPE OF MORTAR SHALL BE AS LISTED BELOW :

MATERIAL:	CHARACTERISTIC UNCONFINED COMPRESSIVE STRENGTH, F'_{uc}	MORTAR CLASSIFICATION:
CONCRETE BLOCKS	15 MPa	M3

M3 MORTAR ADMIXTURES SHALL NOT BE USED WITHOUT THE WRITTEN APPROVAL OF THE SUPERINTENDENT

M4 ALL MASONRY WALLS AND PIERS SUPPORTING SLABS AND BEAMS SHALL HAVE A PRE-GREASED GALVANISED STEEL SLIP JOINT BETWEEN CONCRETE SOFFIT AND THE TOP OF OF THE MASONRY ELEMENT U.N.O.

M5 ALL MASONRY SUPPORTING OR SUPPORTED BY CONCRETE FLOORS SHALL BE PROVIDED WITH VERTICAL JOINTS TO MATCH ALL CONTROL JOINTS IN THE CONCRETE.

M6 NON LOAD BEARING WALLS SHALL BE SEPARATED FROM CONCRETE ABOVE BY A 12mm THICK CLOSED CELL POLYETHYLENE STRIP.

M7 NO CHASES OR RECESSES ARE PERMITTED IN LOAD BEARING MASONRY WITHOUT THE APPROVAL OF THE ENGINEER.

M8 PROVIDE CLEANOUT HOLES AT BASE OF ALL WALLS. ROD CORE HOLES TO REMOVE PROTRUDING MORTAR FOLLOWING APPROVAL FROM THE ENGINEER.

M9 CORE FILLING GROUT TO HAVE A CHARACTERISTIC STRENGTH OF 20 MPa, 10mm AGGREGATE, 230mm SLUMP. GROUT FILL ALL BLOCK CORES.

M10 PROVIDE 65mm COVER TO REINFORCING BARS FROM THE OUTSIDE FACE OF THE BLOCKWORK IF REINFORCEMENT IS NOT TO BE PLACED CENTRALLY.

M11 PROVIDE VERTICAL CONTROL JOINTS AT 10 METRE MAX CENTRES, AND AT 5 METRE MAXIMUM FROM CORNERS IN ALL BRICKWORK WALLS

M12 PROVIDE VERTICAL CONTROL JOINTS AT 8 METRE MAX CENTRES, AND AT 4 METRE MAXIMUM FROM CORNERS IN ALL CONCRETE BLOCK WALLS.

M13 BACKFILL TO RETAINING WALLS TO BE FREE DRAINING GRANULAR MATERIAL U.N.O. PROVIDE SUBSOIL DRAIN BEHIND WEEP HOLES.

M14 DO NOT CONSTRUCT MASONRY WALLS ON SUSPENDED CONCRETE UNTIL SLAB HAS BEEN STRIPPED AND DE-PROPPED.

M15 ALL CAVITY CONSTRUCTION TO HAVE GALVANISED OR STAINLESS STEEL WALL TIES INSTALLED AS PER AS 3700

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	05.03.24	A	
AMENDMENTS	DATE	ISSUE	

AMENDMENTS	DATE	ISSUE	

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA651

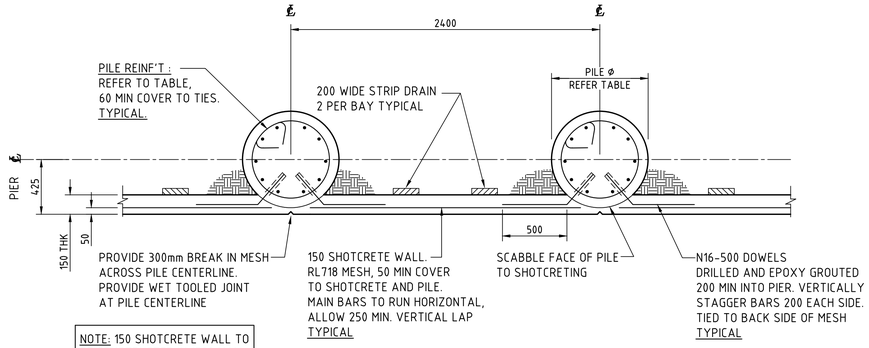
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: RETAINING WALL DETAILS SHEET 2

DRAWING No: C013904.03-SSDA651

ISSUE: A



NOTE: 150 SHOTCRETE WALL TO BE CONSTRUCTED IN 1500 MAX. DROPS.

CONTIGUOUS PILE WALL
SCALE 1:20

CONTIGUOUS PILE WALL SCHEDULE

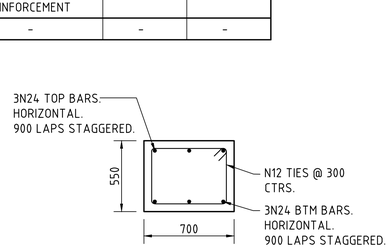
PILE TYPE	MAX. HEIGHT "H" (m)	PILE DIA. (mm)	PILE SPACING (mm)	SOCKET DEPTH "S" (mm)	PILE REINFORCEMENT	CLOSED TIES	CAPPING BEAM
-	-	-	-	-	-	-	-

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PILE	80	20	SL	NIL	32
SHOT CRETE	230	10	SL	NIL	32
CAPPING	80	20	GP	NIL	32

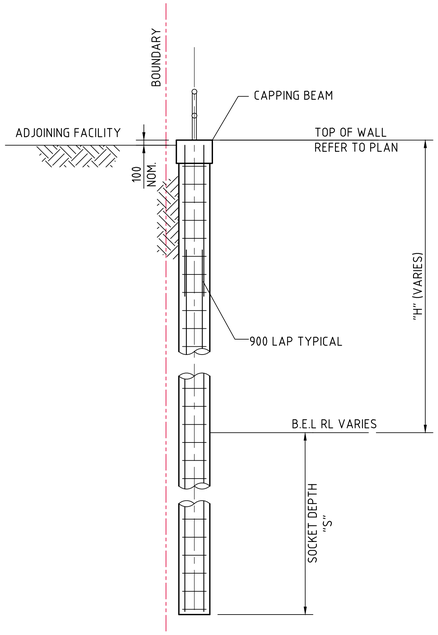
NOTE:
SOCKET DEPTH NOTED IS MINIMUM INTO CLASS IV ROCK OR HIGHER. THIS IS TO BE CONFIRMED BY GEOTECHNICAL ENGINEER DURING INSTALLATION. IF SOFTER ROCK IS ENCOUNTERED, ENGINEER TO BE NOTIFIED IMMEDIATELY AND WILL ADVICE OF ADJUSTED SOCKET DEPTH.

NOTE:
THE DETAILS ON THIS DRAWING ARE INDICATIVE ONLY AND ARE SUBJECT TO DETAIL DESIGN.

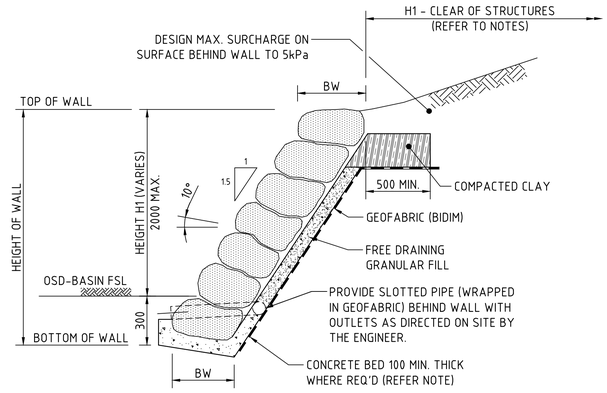
NOTE :
INDICATIVE REINFORCEMENT LENGTHS SHOWN. DESIGN TO BE CONFIRMED / PROVIDED BY D+C CONTRACTOR.



DETAIL OF 700x550 CAPPING BEAM
SCALE 1:20



CONTIGUOUS PILE WALL TYPICAL SECTION
SCALE 1:50



BOULDER RETAINING WALL
SCALE 1:20

BOULDER RETAINING WALL NOTES

MINIMUM BEARING CAPACITY OF FOUNDATION TO BE 100kPa ASSUMING THE FOLLOWING:
- CLAY FOUNDATION Cu=50kPa, Φ=0

SLIDING STABILITY IS BASED ON THE FOLLOWING
- FRICTION ANGLE OF BOULDER WALL : NOT LESS THAN 40°
- EFFECTIVE FRICTION ANGLE OF SOIL SUBGRADE: NOT LESS THAN 30° FOR SOIL OR 35° FOR ROCK

SOIL AND ROCK DESIGN PARAMETERS SHALL BE CONFIRMED BY GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF BOULDERS OR CONCRETE BED.

BOULDERS TO BE A NOMINAL 750mm DIA. (400mm DIA. UP TO 800mm DIA.) PLACED ON THEIR BROADEST BASE. BOULDERS TO BE PLACED IN AN INTERLOCKING ARRANGEMENT ON THE CONTACT SURFACES DIPPING TOWARDS BACK OF THE WALL AT 10° AND SHALL BE INSPECTED BY THE ENGINEER DURING CONSTRUCTION

DENSITY OF INDIVIDUAL BOULDERS SHALL BE MINIMUM 2.5 TONNES/m

FOR WALLS ABOVE 1000mm IN HEIGHT, THE FIRST LAYER OF BOULDERS ARE TO SET IN A BED OF N15 CONCRETE AND THE JOINTS BETWEEN SHALL BE FILLED WITH CONCRETE TO A LEVEL EQUAL TO THE SURFACE LEVEL OF THE TOE OF THE WALL.

NO STRUCTURE TO BE BUILT WITHIN H1 FROM THE BACK OF THE TOP OF THE WALL (WHERE H1=HEIGHT OF WALL), UNLESS THE STRUCTURE IS FOUNDED ON ROCK WITH SBV>150kPA

CONSTRUCTION METHODS AND SEQUENCE TO ENSURE THAT DESIGN MAX. SURCHARGE OF 5kPa IS NOT EXCEEDED.

CONSTRUCTION TO BE IN ACCORDANCE WITH AS 4678:2002

WALL DIMENSIONS	
HEIGHT H1	BW
500	500
1000	700
1500	800
2000	900

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT B1 SIZE SHEET

FOR INFORMATION

ISSUED FOR INFORMATION	05.03.24	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA652

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
RETAINING WALL DETAILS
SHEET 3

DRAWING No C013904.03-SSDA652
ISSUE A

GREAT WESTERN HIGHWAY

GREAT WESTERN HIGHWAY

FLUSHCOMBE ROAD

LIMIT OF WORKS

TIE IN OF FLUSHCOMBE ROAD TO BE COORDINATED WITH MUGROUP DESIGN OF THE GREAT WESTERN HIGHWAY & FLUSHCOMBE ROAD INTERSECTION

DRIVEWAY ACCESS FROM FLUSHCOMBE ROAD TO BE CONSTRUCTED IN ACCORDANCE WITH BLACKTOWN COUNCIL. TYPICAL HATCHED.

WAREHOUSE 1
REFER TO DRAWING SSDA401

DRIVEWAY ACCESS FROM AUGUSTA STREET TO BE CONSTRUCTED IN ACCORDANCE WITH BLACKTOWN COUNCIL. TYPICAL HATCHED.

DRIVEWAY ACCESS FROM AUGUSTA STREET TO BE CONSTRUCTED IN ACCORDANCE WITH BLACKTOWN COUNCIL. TYPICAL HATCHED.

CUL-DE-SAC DESIGNED TO HUNTINGWOOD PRECINCT DCP REQUIREMENTS.

REFER TO SSDA712

AUGUSTA STREET

AUGUSTASTREET ROAD WIDTH TO BE CONSTRUCTED AS PER TYPICAL CROSS SECTION SHOWN ON DRAWING SSDA750.

HEADWALL DESIGN TO BE CONFIRMED DURING DETAILED DIESGN STAGE.

PROPOSED 2x⌀1200 PIPE & HEADWALLS

REFER TO SSDA711

FLUSHCOMBE ROAD

LOCATION OF EXISTING SERVICES TO BE CONFIRMED BEFORE CONSTRUCTION

FLUSHCOMBE ROAD HALF WIDTH TO BE CONSTRUCTED AS PER TYPICAL CROSS SECTION SHOWN ON DRAWING SSDA750.

WAREHOUSE 2
REFER TO DRAWING SSDA401

DRIVEWAY ACCESS FROM FLUSHCOMBE ROAD TO BE CONSTRUCTED IN ACCORDANCE WITH BLACKTOWN COUNCIL. TYPICAL HATCHED.

WAREHOUSE 3A
FFL 78100 ±1000
INDICATIVE RACKING LAYOUT

WAREHOUSE 3B
FFL 78100 ±1000
INDICATIVE RACKING LAYOUT

ROADWORKS GENERAL ARRANGEMENT PLAN

SCALE 1:500

5m 0 10 20 30 40 50m

SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	08.03.24	E
REVISED ARCHITECTURAL	11.09.23	D
REVISED AS CLOUDED	10.07.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA 700

CONSULT AUSTRALIA

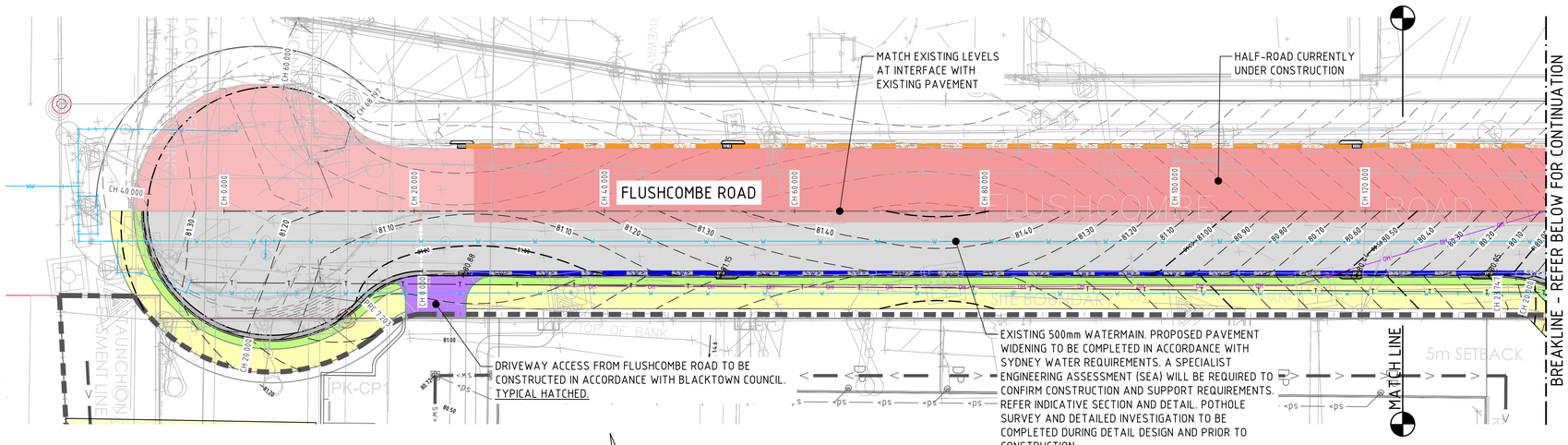
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

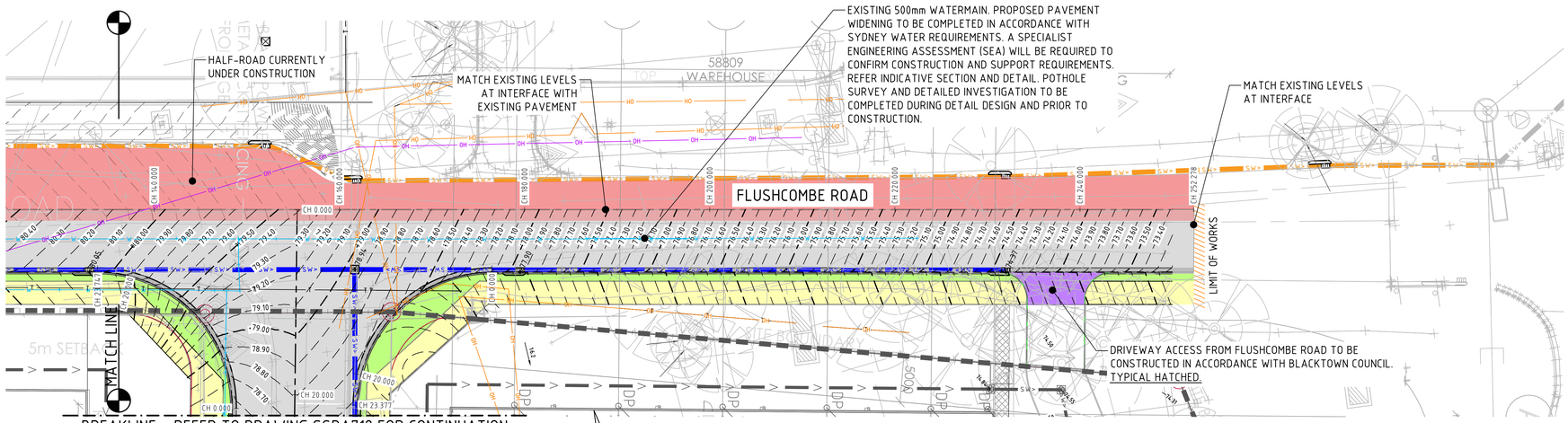
DRAWING TITLE
ROADWORKS GENERAL ARRANGEMENT PLAN

DRAWING No C013904.03-SSDA700

ISSUE E



FLUSHCOMBE ROAD GENERAL ARRANGEMENT & FINISHED LEVELS PLAN
SCALE 1:250



FLUSHCOMBE ROAD GENERAL ARRANGEMENT & FINISHED LEVELS PLAN
SCALE 1:250

LEGEND:

- EXISTING ROAD PAVEMENT
- NEW ASPHALT ROAD PAVEMENT
- FOOTPATH
- NEW VEHICLE CROSSING
- NEW KERB INLET PIT
- EXISTING KERB INLET PIT
- NEW STORMWATER PIPE
- EXISTING STORMWATER PIPE
- EXISTING WATERMAIN PIPE

NOTE:

REFER TO C013904.03-SSDA721 FOR LONG-SECTIONS
REFER TO C013904.03-SSDA750 FOR TYPICAL SECTIONS
REFER TO C013904.03-SSDA755 FOR TYPICAL DETAILS

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS

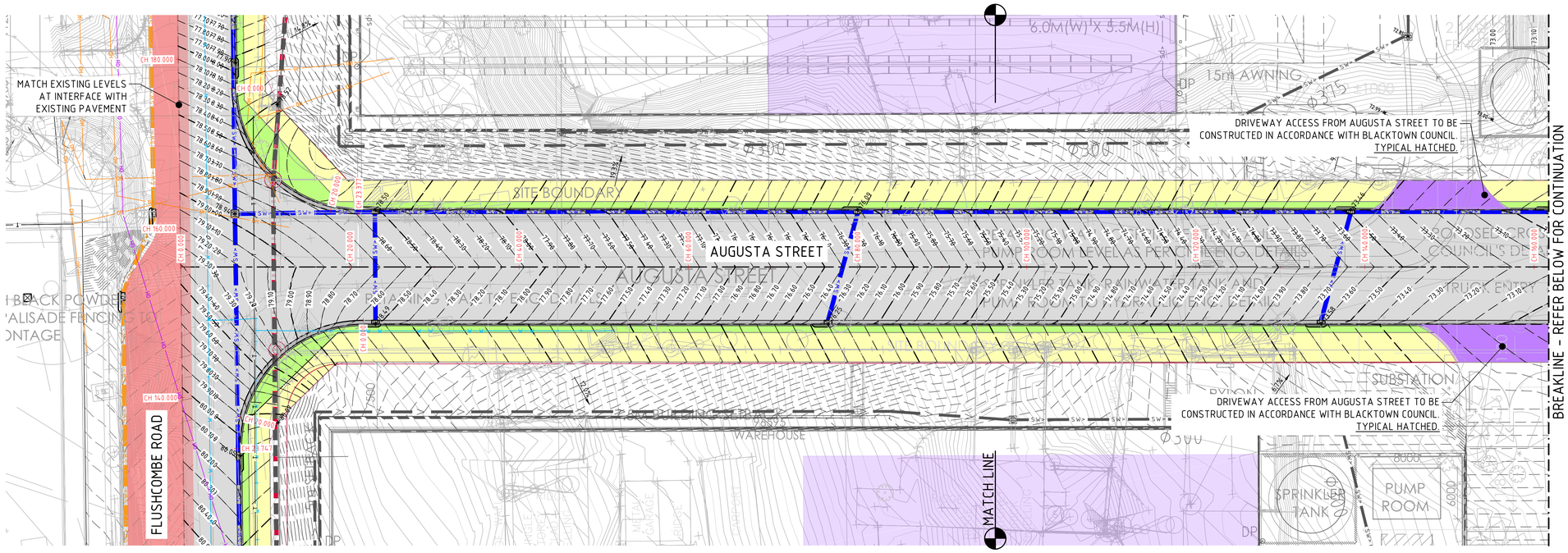
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA 711

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: ROADWORKS CIVIL WORKS PLAN SHEET 1
DRAWING No: C013904.03-SSDA711
ISSUE: B



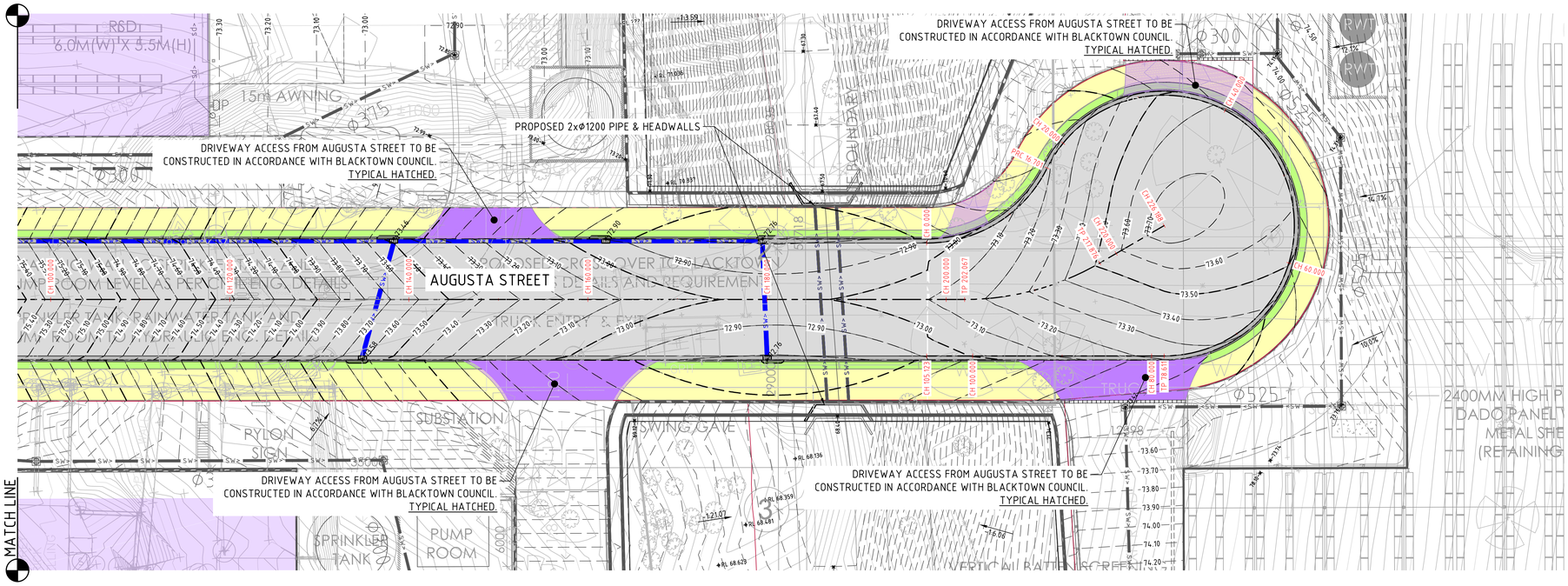
AUGUSTA STREET GENERAL ARRANGEMENT & FINISHED LEVELS PLAN
SCALE 1:250

LEGEND:

- EXISTING ROAD PAVEMENT
- NEW ASPHALT ROAD PAVEMENT
- FOOTPATH
- NEW VEHICLE CROSSING
- NEW KERB INLET PIT
- EXISTING KERB INLET PIT
- SW> NEW STORMWATER PIPE
- SW> EXISTING STORMWATER PIPE

NOTE:

REFER TO C013904.03-SSDA721 FOR LONG-SECTIONS
REFER TO C013904.03-SSDA750 FOR TYPICAL SECTIONS
REFER TO C013904.03-SSDA755 FOR TYPICAL DETAILS



AUGUSTA STREET GENERAL ARRANGEMENT & FINISHED LEVELS PLAN
SCALE 1:250

2m 0 5 10 15 20 25m
SCALE 1:250 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED ARCHITECTURAL	08.03.24	D
ISSUED FOR INFORMATION	11.09.23	C
ISSUED FOR INFORMATION	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

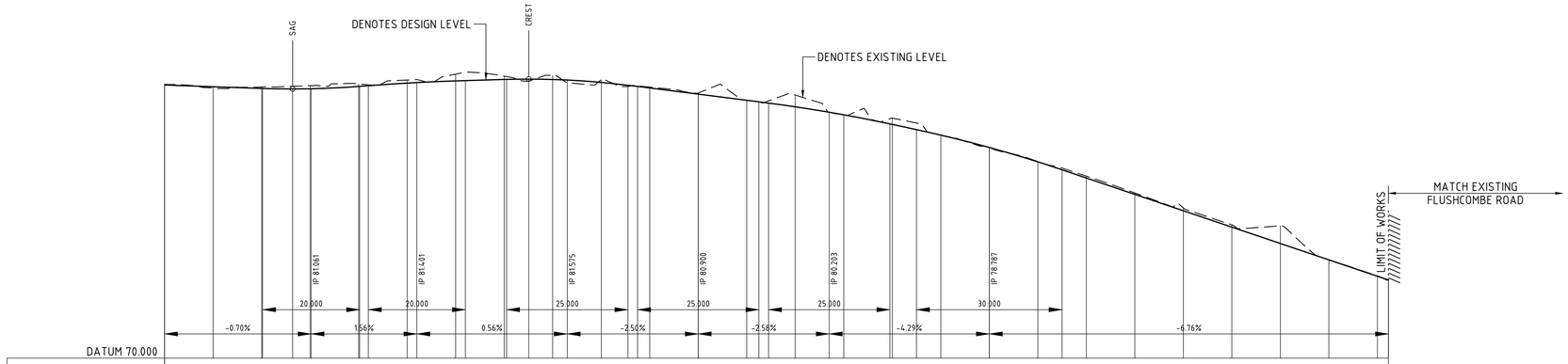
ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA 712

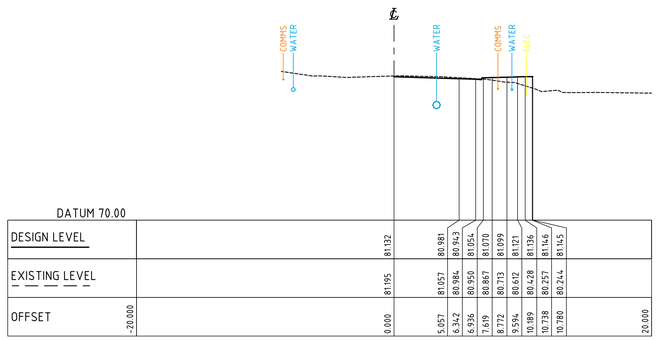
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

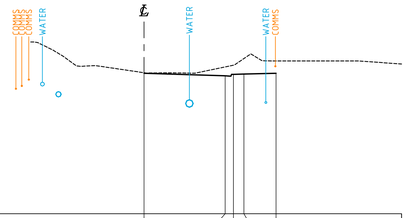
DRAWING TITLE: ROADWORKS CIVIL WORKS PLAN SHEET 2
DRAWING No: C013904.03-SSDA712
ISSUE: D


SAG
DENOTES DESIGN LEVEL
CREST
DENOTES EXISTING LEVEL
MATCH EXISTING
FLUSHCOMBE ROAD
LIMIT OF WORKS
IP 81.061
IP 81.401
IP 81.575
IP 80.900
IP 80.203
IP 78.787
20.000
20.000
25.000
25.000
25.000
30.000
-0.70%
1.56%
0.56%
-2.50%
-2.58%
-4.29%
-6.76%

| | | |

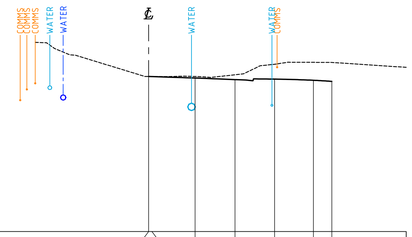

COMMS
WATER
WATER
COMMS
WATER
ELEC

| | | |



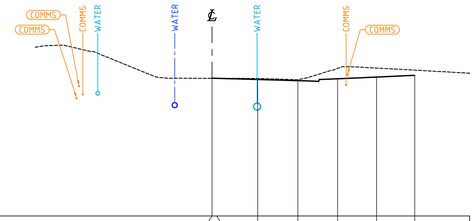
DATUM 70.00										
DESIGN LEVEL			80.897		80.708	80.818	80.839	80.901		
EXISTING LEVEL			80.943		81.391	81.523	82.059	81.860		
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250		20.000

CL FLUSHCOMBE RD HALF-RHS
CH 110.000
SCALE 1:200



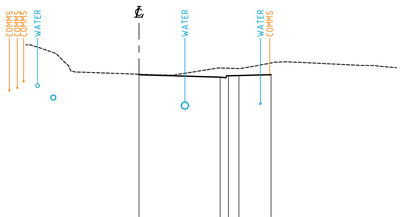
DATUM 68.00										
DESIGN LEVEL			80.044	80.035	79.919	79.800	79.836	79.747	79.659	
EXISTING LEVEL			80.040		80.041	80.174	80.988	81.139	81.131	
OFFSET	-20.000		0.000	0.259	3.608	6.710	9.784	12.796	14.230	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 140.000
SCALE 1:200



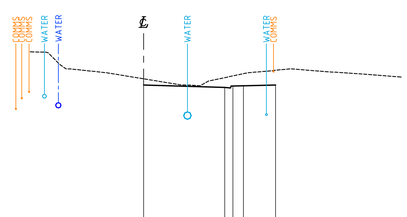
DATUM 68.00										
DESIGN LEVEL			78.695	78.685	78.592	78.504	78.648	78.781	78.914	
EXISTING LEVEL			78.683		78.672	78.579	79.451	79.480	79.320	
OFFSET	-20.000		0.000	0.348	3.545	6.656	9.754	12.775	15.733	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 170.000
SCALE 1:200



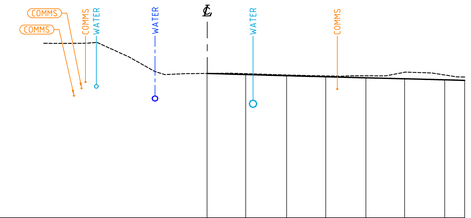
DATUM 70.00										
DESIGN LEVEL			81.150		80.961	81.071	81.091	81.153		
EXISTING LEVEL			81.188		81.672	81.657	81.628	82.059		
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250		20.000

CL FLUSHCOMBE RD HALF-RHS
CH 100.000
SCALE 1:200



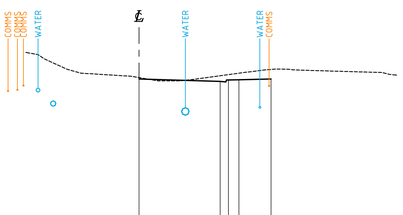
DATUM 70.00										
DESIGN LEVEL			80.373		80.184	80.294	80.315	80.377		
EXISTING LEVEL			80.856		80.948	81.082	81.251	81.523		
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250		20.000

CL FLUSHCOMBE RD HALF-RHS
CH 130.000
SCALE 1:200



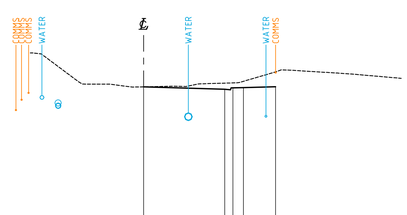
DATUM 68.00										
DESIGN LEVEL			79.206	79.196	79.102	79.015	78.933	78.854	78.778	78.696	78.668
EXISTING LEVEL			79.206		79.190	79.089	79.014	79.024	79.298	79.087	78.932
OFFSET	-20.000		0.000	0.354	3.609	6.668	9.766	12.912	15.931	19.020	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 160.000
SCALE 1:200



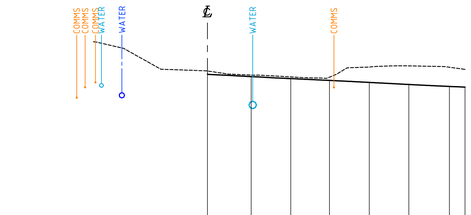
DATUM 70.00										
DESIGN LEVEL			81.381		81.192	81.302	81.322	81.385		
EXISTING LEVEL			81.491		81.633	81.719	81.828	82.125		
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250		20.000

CL FLUSHCOMBE RD HALF-RHS
CH 90.000
SCALE 1:200



DATUM 70.00										
DESIGN LEVEL			80.642		80.653	80.563	80.583	80.645		
EXISTING LEVEL			80.640		80.928	80.946	81.069	81.804		
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250		20.000

CL FLUSHCOMBE RD HALF-RHS
CH 120.000
SCALE 1:200



DATUM 68.00										
DESIGN LEVEL			79.645	79.642	79.475	79.319	79.176	79.022	78.858	78.707	78.659
EXISTING LEVEL			79.908		79.591	79.448	79.431	80.216	80.393	80.195	80.033
OFFSET	-20.000		0.000	0.084	3.398	6.476	9.481	12.568	15.639	18.792	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 150.000
SCALE 1:200

LEGEND:

- DENOTES DESIGN ROAD SURFACE
- DENOTES EXISTING SURFACE
- DENOTES EXISTING WATER SERVICES
- DENOTES EXISTING COMMUNICATIONS CABLE/ PIPE SERVICES
- DENOTES EXISTING DRAINAGE SERVICES
- DENOTES EXISTING ELECTRICAL SERVICES

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA731

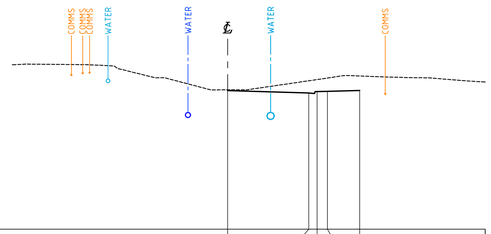
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

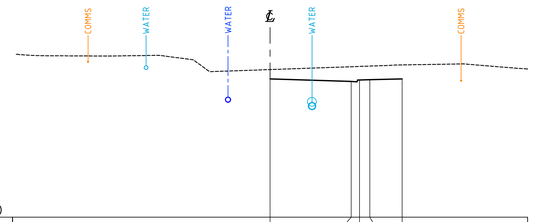
DRAWING TITLE: ROADWORKS CROSS SECTIONS
FLUSHCOMBE ROAD
SHEET 2

DRAWING No: C013904.03-SSDA731
ISSUE: A



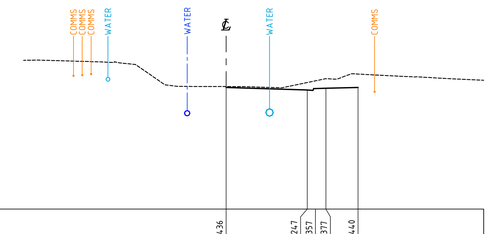
DATUM 66.00								
DESIGN LEVEL			76.761		76.572	76.682	76.702	76.764
EXISTING LEVEL			76.817		77.519	77.612	77.731	77.892
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 200.000
SCALE 1:200



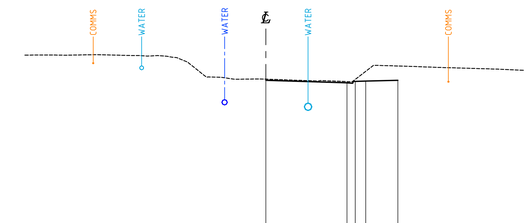
DATUM 64.00								
DESIGN LEVEL			74.734		74.545	74.655	74.675	74.737
EXISTING LEVEL			75.461		75.681	75.703	75.732	75.823
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 230.000
SCALE 1:200



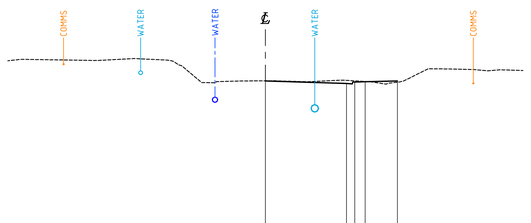
DATUM 68.00								
DESIGN LEVEL			77.436		77.247	77.357	77.377	77.440
EXISTING LEVEL			77.512		77.823	77.955	78.123	78.481
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 190.000
SCALE 1:200



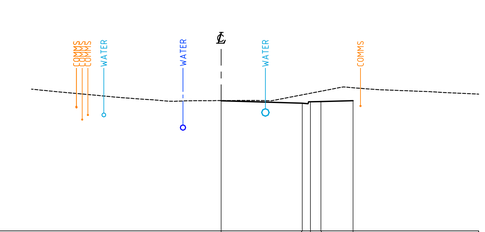
DATUM 64.00								
DESIGN LEVEL			75.409		75.220	75.338	75.358	75.413
EXISTING LEVEL			75.501		75.313	75.477	76.103	76.324
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 220.000
SCALE 1:200



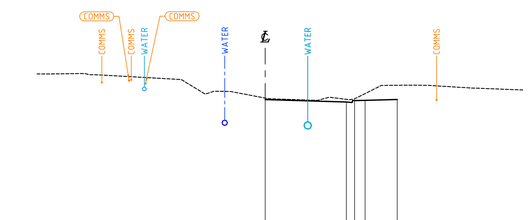
DATUM 62.00								
DESIGN LEVEL			73.382		73.193	73.303	73.323	73.386
EXISTING LEVEL			73.396		73.432	73.393	73.343	73.290
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 250.000
SCALE 1:200



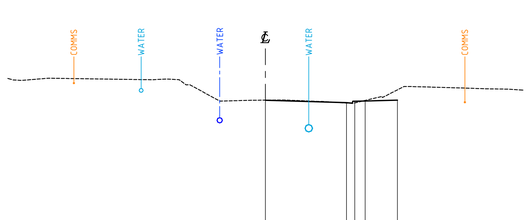
DATUM 68.00								
DESIGN LEVEL			78.102		77.913	78.023	78.043	78.105
EXISTING LEVEL			78.115		78.562	78.686	78.843	79.114
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 180.000
SCALE 1:200



DATUM 66.00								
DESIGN LEVEL			76.085		75.896	76.006	76.026	76.089
EXISTING LEVEL			76.200		76.105	76.141	76.547	77.195
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 210.000
SCALE 1:200



DATUM 64.00								
DESIGN LEVEL			74.058		73.869	73.979	73.999	74.062
EXISTING LEVEL			74.063		73.845	73.851	74.042	74.860
OFFSET	-20.000		0.000		6.300	6.940	7.750	10.250	20.000

CL FLUSHCOMBE RD HALF-RHS
CH 240.000
SCALE 1:200

LEGEND:

- DENOTES DESIGN ROAD SURFACE
- DENOTES EXISTING SURFACE
- DENOTES EXISTING WATER SERVICES
- DENOTES EXISTING COMMUNICATIONS CABLE/ PIPE SERVICES
- DENOTES EXISTING DRAINAGE SERVICES
- DENOTES EXISTING ELECTRICAL SERVICES

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA732

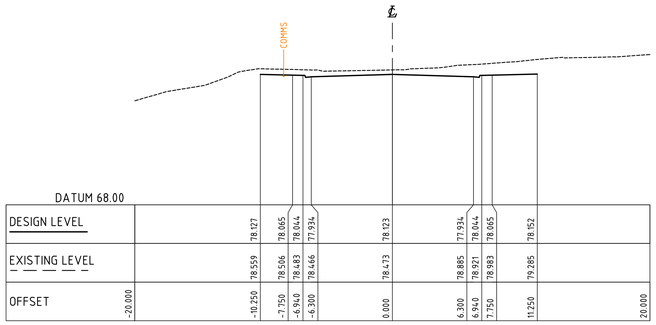
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

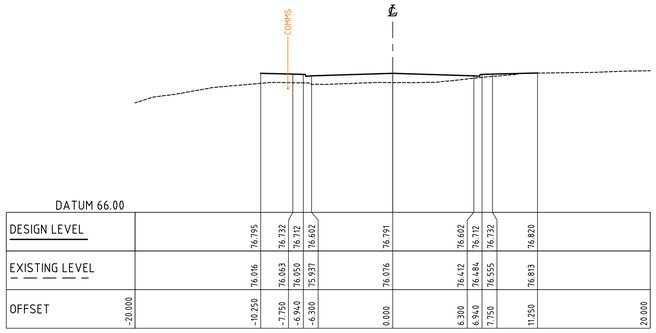
DRAWING TITLE
ROADWORKS CROSS SECTIONS
FLUSHCOMBE ROAD
SHEET 3

DRAWING No C013904.03-SSDA732
ISSUE A



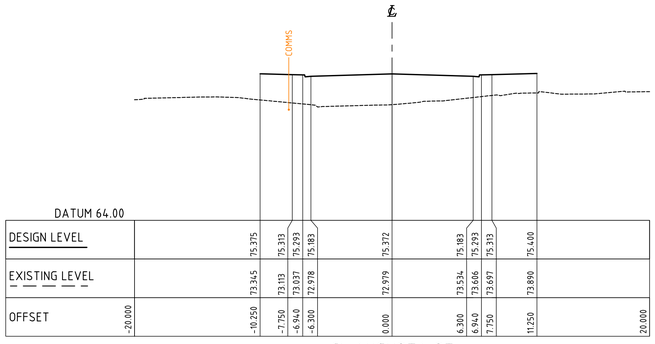
DATUM 68.00													
DESIGN LEVEL		78.127	78.065	78.044	77.934	78.123		77.934	78.044	78.065	78.152		
EXISTING LEVEL		78.559	78.506	78.483	78.466	78.473		78.885	78.921	78.983	79.285		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 40.000
SCALE 1:200



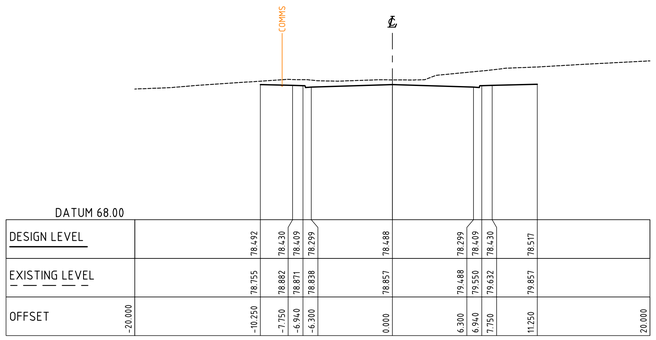
DATUM 66.00													
DESIGN LEVEL		76.795	76.732	76.712	76.652	76.791		76.662	76.712	76.732	76.820		
EXISTING LEVEL		76.616	76.663	76.650	75.937	76.976		76.412	76.484	76.555	76.813		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 70.000
SCALE 1:200



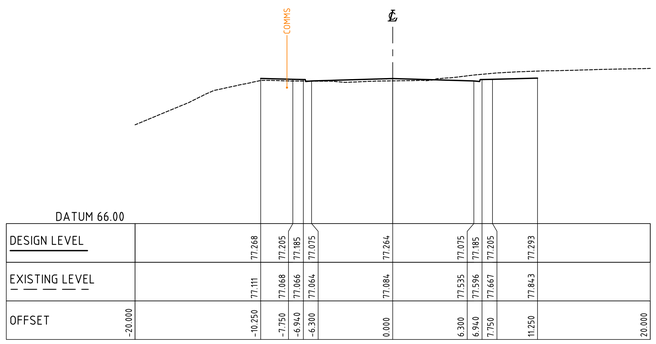
DATUM 64.00													
DESIGN LEVEL		75.375	75.313	75.293	75.183	75.372		75.183	75.293	75.313	75.400		
EXISTING LEVEL		73.345	73.113	73.037	72.978	72.979		73.534	73.606	73.697	73.899		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 100.000
SCALE 1:200



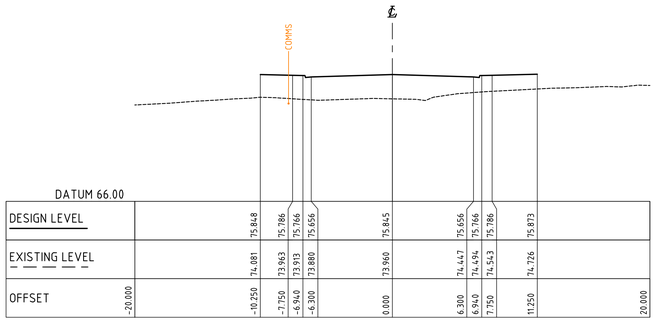
DATUM 68.00													
DESIGN LEVEL		78.492	78.430	78.409	78.299	78.488		78.299	78.409	78.430	78.517		
EXISTING LEVEL		78.755	78.882	78.871	78.838	78.857		79.488	79.550	79.632	79.857		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 30.000
SCALE 1:200



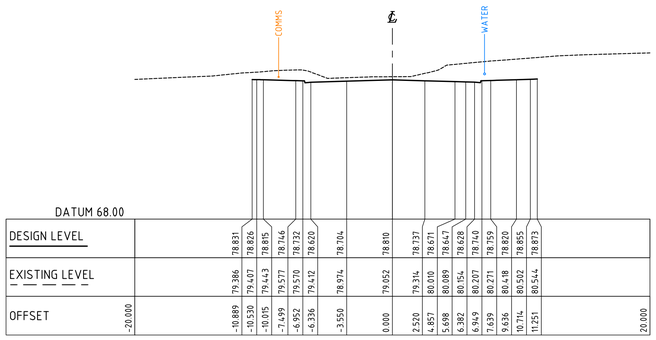
DATUM 66.00													
DESIGN LEVEL		77.268	77.205	77.185	77.075	77.264		77.075	77.185	77.205	77.293		
EXISTING LEVEL		77.111	77.068	77.066	77.064	77.084		77.535	77.596	77.667	77.863		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 60.000
SCALE 1:200



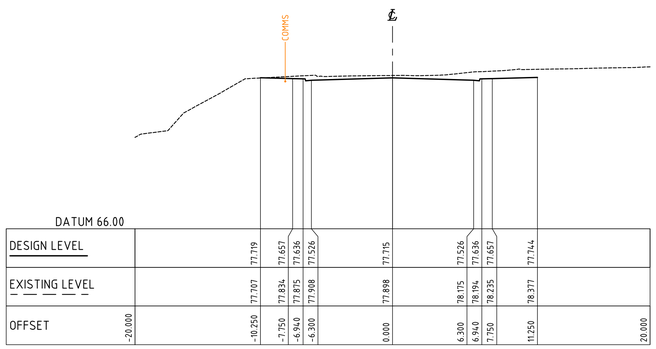
DATUM 66.00													
DESIGN LEVEL		75.848	75.786	75.766	75.656	75.845		75.656	75.766	75.786	75.873		
EXISTING LEVEL		74.081	73.963	73.913	73.880	73.960		74.447	74.494	74.543	74.726		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 90.000
SCALE 1:200



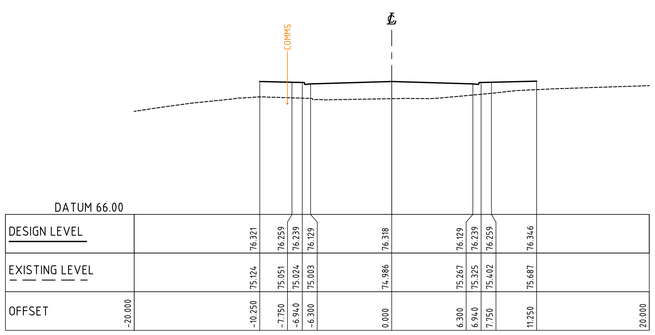
DATUM 68.00													
DESIGN LEVEL		78.831	78.826	78.815	78.746	78.732	78.620	78.704	78.810	78.737	78.671	78.647	78.628	78.740	78.759	78.820	78.855	78.873	
EXISTING LEVEL		79.386	79.407	79.443	79.577	79.570	79.412	78.974	79.052	79.314	80.010	80.089	80.154	80.207	80.271	80.418	80.502	80.544	
OFFSET	-20.000	-10.889	-10.530	-10.015	-7.499	-6.952	-6.336	-3.550	0.000	2.520	4.857	5.698	6.382	6.949	7.639	9.636	10.714	11.251	20.000

CL AUGUSTA ST
CH 20.000
SCALE 1:200



DATUM 66.00													
DESIGN LEVEL		77.719	77.657	77.636	77.526	77.715		77.526	77.636	77.657	77.744		
EXISTING LEVEL		77.707	77.834	77.875	77.908	77.898		78.175	78.194	78.235	78.377		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 50.000
SCALE 1:200



DATUM 66.00													
DESIGN LEVEL		76.321	76.259	76.239	76.129	76.318		76.129	76.239	76.259	76.346		
EXISTING LEVEL		75.124	75.051	75.024	75.003	74.986		75.267	75.325	75.402	75.687		
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000		6.300	6.940	7.750	11.250		20.000

CL AUGUSTA ST
CH 80.000
SCALE 1:200

LEGEND:

- DENOTES DESIGN ROAD SURFACE
- DENOTES EXISTING SURFACE
- DENOTES EXISTING WATER SERVICES
- DENOTES EXISTING COMMUNICATIONS CABLE/ PIPE SERVICES
- DENOTES EXISTING ELECTRIC CABLE/PIPE SERVICES

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA733

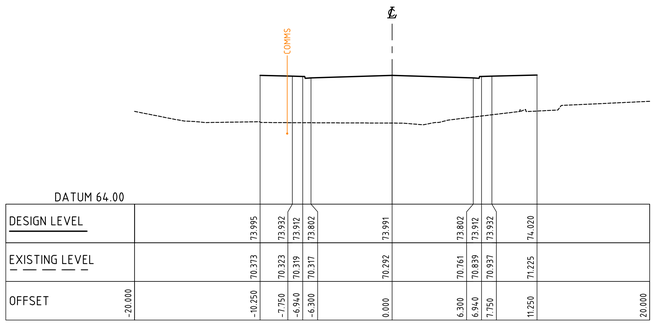
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 6 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

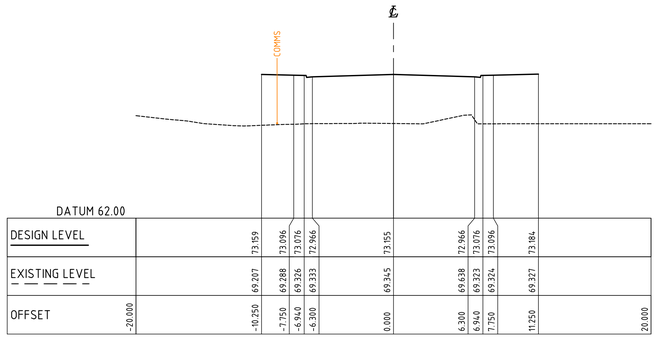
DRAWING TITLE
ROADWORKS CROSS SECTIONS
AUGUSTA STREET
SHEET 1

DRAWING No C013904.03-SSDA733
ISSUE A



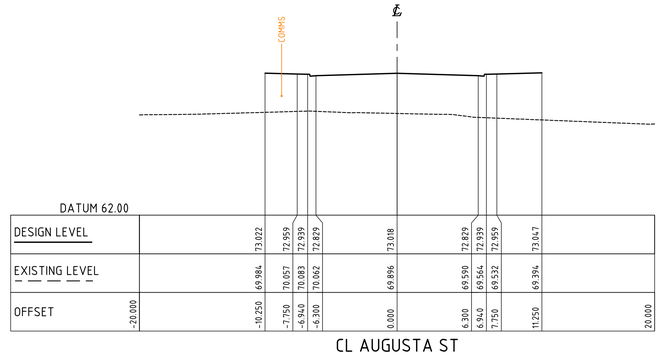
DATUM 64.00													
DESIGN LEVEL		73.995	73.932	73.912	73.802	73.991	73.802	73.912	73.932	74.020			
EXISTING LEVEL		70.373	70.323	70.319	70.317	70.292	70.761	70.839	70.937	71.225			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 130.000
SCALE 1:200



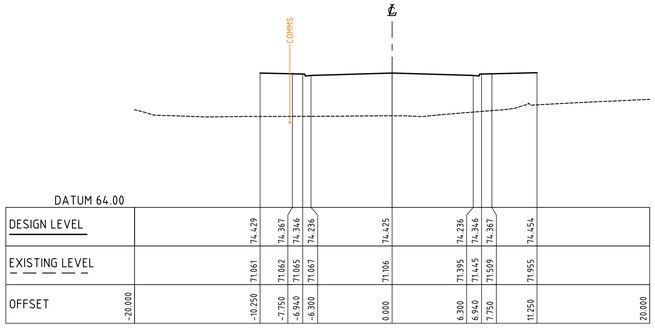
DATUM 62.00													
DESIGN LEVEL		73.159	73.096	73.076	72.966	73.155	72.966	73.076	73.096	73.184			
EXISTING LEVEL		69.207	69.288	69.326	69.333	69.345	69.638	69.323	69.324	69.327			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 160.000
SCALE 1:200



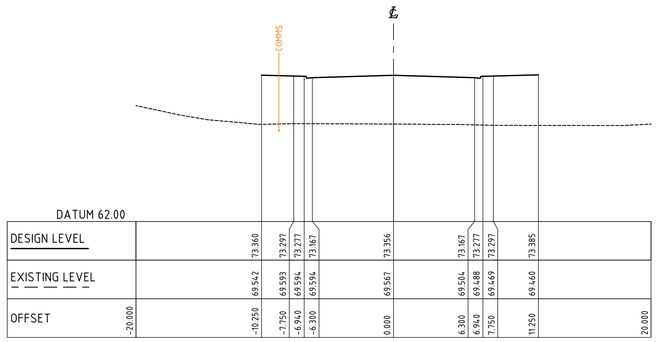
DATUM 62.00													
DESIGN LEVEL		73.022	72.959	72.939	72.829	73.018	72.829	72.939	72.959	73.047			
EXISTING LEVEL		69.984	70.057	70.083	70.062	69.896	69.590	69.564	69.532	69.394			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 190.000
SCALE 1:200



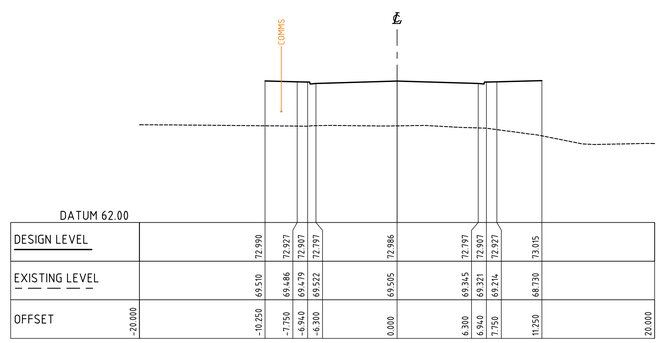
DATUM 64.00													
DESIGN LEVEL		74.429	74.367	74.346	74.236	74.425	74.236	74.346	74.367	74.454			
EXISTING LEVEL		71.061	71.062	71.065	71.067	71.106	71.395	71.445	71.509	71.955			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 120.000
SCALE 1:200



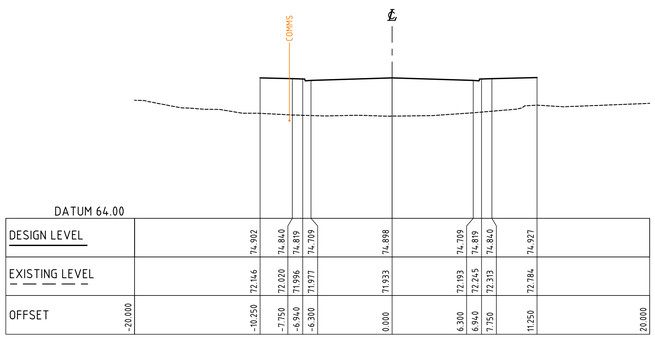
DATUM 62.00													
DESIGN LEVEL		73.360	73.297	73.277	73.167	73.356	73.167	73.277	73.297	73.385			
EXISTING LEVEL		69.542	69.593	69.594	69.594	69.567	69.504	69.488	69.469	69.460			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 150.000
SCALE 1:200



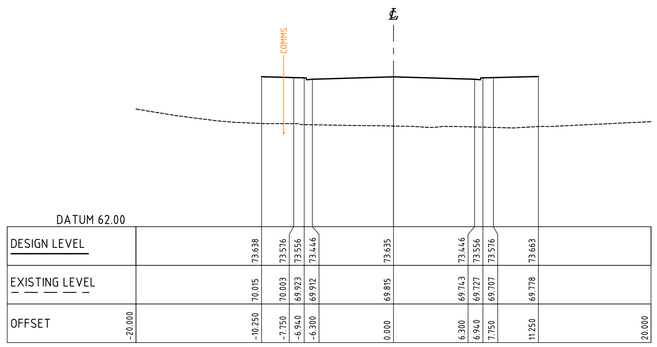
DATUM 62.00													
DESIGN LEVEL		72.990	72.927	72.907	72.797	72.986	72.797	72.907	72.927	73.015			
EXISTING LEVEL		69.510	69.486	69.479	69.522	69.505	69.345	69.321	69.214	68.730			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 180.000
SCALE 1:200



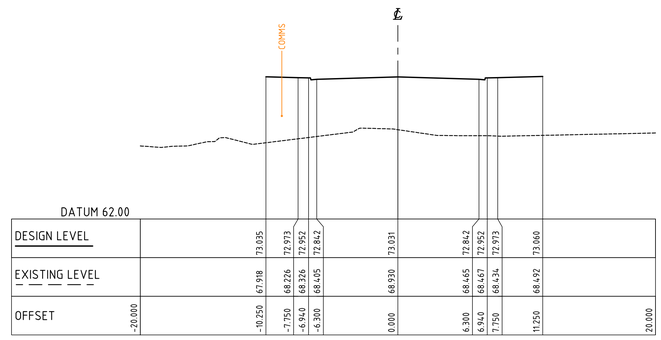
DATUM 64.00													
DESIGN LEVEL		74.902	74.840	74.819	74.709	74.998	74.709	74.819	74.840	74.927			
EXISTING LEVEL		72.146	72.020	71.996	71.977	71.933	72.193	72.245	72.313	72.784			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 110.000
SCALE 1:200



DATUM 62.00													
DESIGN LEVEL		73.638	73.576	73.556	73.446	73.635	73.446	73.556	73.576	73.663			
EXISTING LEVEL		70.015	70.003	69.923	69.912	69.815	69.743	69.727	69.707	69.718			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 140.000
SCALE 1:200



DATUM 62.00													
DESIGN LEVEL		73.035	72.973	72.952	72.842	73.031	72.842	72.952	72.973	73.060			
EXISTING LEVEL		67.918	68.226	68.326	68.405	68.930	68.465	68.467	68.434	68.492			
OFFSET	-20.000	-10.250	-7.750	-6.940	-6.300	0.000	6.300	6.940	7.750	11.250	20.000		

CL AUGUSTA ST
CH 170.000
SCALE 1:200

LEGEND:

- DENOTES DESIGN ROAD SURFACE
- DENOTES EXISTING SURFACE
- DENOTES EXISTING WATER SERVICES
- DENOTES EXISTING COMMUNICATIONS CABLE/ PIPE SERVICES
- DENOTES EXISTING ELECTRIC CABLE/PIPE SERVICES

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA734

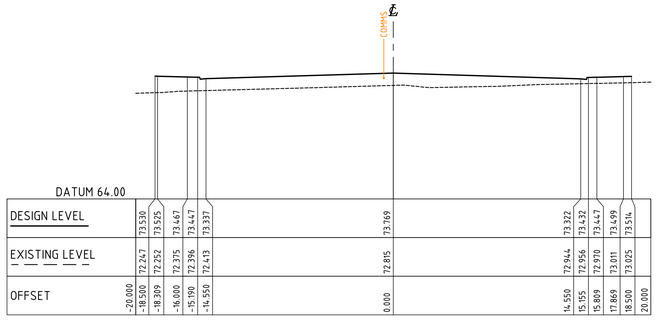
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

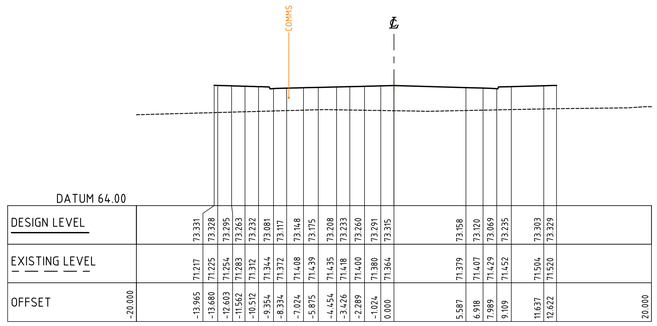
DRAWING TITLE
ROADWORKS CROSS SECTIONS
AUGUSTA STREET
SHEET 2

DRAWING No: C013904.03-SSDA734
ISSUE: A



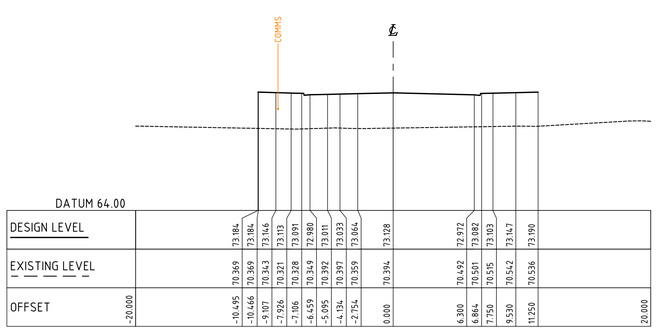
DATUM 64.00																						
DESIGN LEVEL		73.530	73.525	73.467	73.447	73.337				73.369							73.322	73.432	73.447	73.499	73.514	
EXISTING LEVEL		72.247	72.252	72.375	72.396	72.419				72.815							72.944	72.956	72.970	73.011	73.025	
OFFSET	-20.000	-18.500	-18.309	-16.000	-15.190	-14.550				0.000							14.550	15.155	15.809	17.869	18.500	20.000

CL AUGUSTA ST
CH 226.188
SCALE 1:200



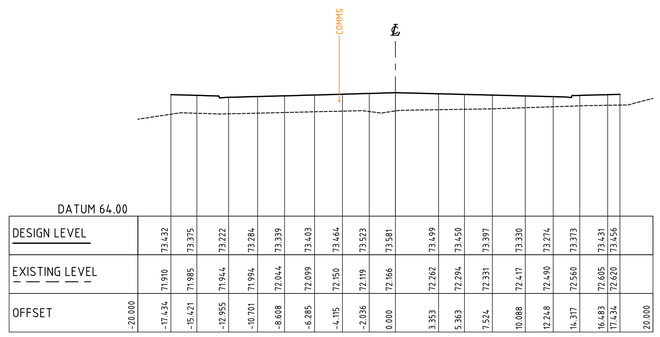
DATUM 64.00																						
DESIGN LEVEL			73.331	73.328	73.295	73.263	73.232	73.081	73.117	73.148	73.175	73.208	73.233	73.260	73.291	73.315			73.158	73.120	73.069	73.235		73.303	73.329	
EXISTING LEVEL			71.217	71.225	71.254	71.283	71.312	71.344	71.372	71.408	71.439	71.435	71.418	71.400	71.380	71.364			71.379	71.407	71.429	71.452		71.504	71.520	
OFFSET	-20.000		-13.965	-13.680	-12.603	-11.562	-10.512	-9.354	-8.334	-7.024	-5.875	-4.454	-3.426	-2.289	-1.024	0.000			5.587	6.918	7.989	9.109		11.637	12.622	20.000

CL AUGUSTA ST
CH 210.000
SCALE 1:200



DATUM 64.00																						
DESIGN LEVEL		73.184	73.184	73.146	73.113	73.091	72.980	73.011	73.033	73.064	73.138			72.972	73.082	73.103	73.147	73.190				
EXISTING LEVEL		70.369	70.369	70.343	70.321	70.328	70.349	70.392	70.397	70.359	70.394			70.492	70.501	70.515	70.542	70.536				
OFFSET	-20.000	-10.495	-10.466	-9.107	-7.926	-7.106	-6.459	-5.095	-4.134	-2.754	0.000			6.300	6.864	7.750	9.530	11.250				20.000

CL AUGUSTA ST
CH 200.000
SCALE 1:200



DATUM 64.00																						
DESIGN LEVEL		73.432	73.375	73.222	73.284	73.339	73.403	73.464	73.523	73.581			73.499	73.450	73.397	73.330	73.274	73.373	73.431	73.556		
EXISTING LEVEL		71.910	71.985	71.944	71.994	72.044	72.099	72.150	72.119	72.166			72.262	72.294	72.331	72.417	72.490	72.560	72.605	72.620		
OFFSET	-20.000	-17.434	-15.421	-12.955	-10.701	-8.608	-6.285	-4.115	-2.036	0.000			3.353	5.363	7.524	10.088	12.248	14.317	16.483	17.434		20.000

CL AUGUSTA ST
CH 220.000
SCALE 1:200

LEGEND:

- DENOTES DESIGN ROAD SURFACE
- DENOTES EXISTING SURFACE
- DENOTES EXISTING WATER SERVICES
- DENOTES EXISTING COMMUNICATIONS CABLE/ PIPE SERVICES
- DENOTES EXISTING ELECTRIC CABLE/PIPE SERVICES

2m 0 5 10 15 20m
SCALE 1:200 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	08.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

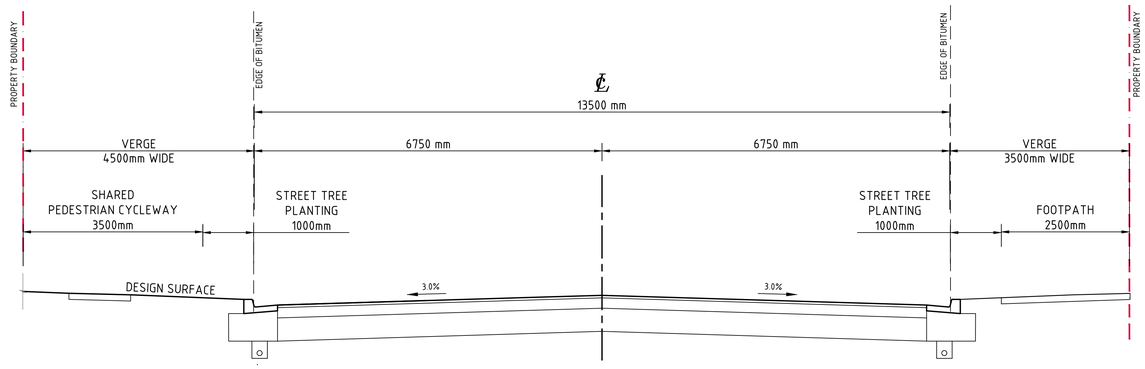
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA735

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

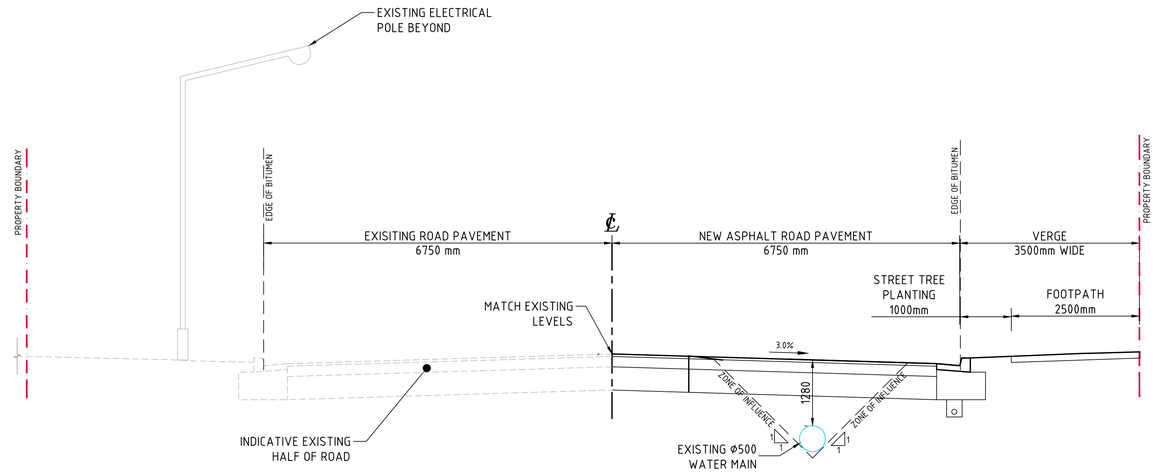
DRAWING TITLE
ROADWORKS CROSS SECTIONS
AUGUSTA STREET
SHEET 3

DRAWING No: C013904.03-SSDA735
ISSUE: A



AUGUSTA STREET TYPICAL SECTION

SCALE 1:50



FLUSHCOMBE ROAD TYPICAL SECTION

SCALE 1:50

500mm 0 1 2 3 4 5m

SCALE 1:50 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
REVISED AS CLOUDED	30.06.23	B
ISSUED FOR INFORMATION	16.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA750

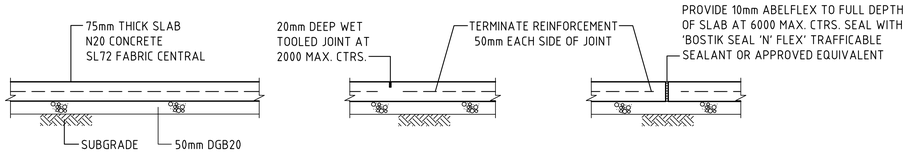
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
ROADWORKS TYPICAL SECTIONS

DRAWING No: C013904.03-SSDA750

ISSUE: B

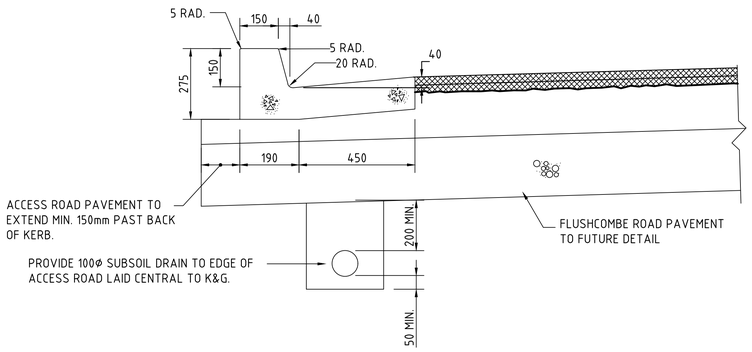


PEDESTRIAN SLAB PROFILE DETAIL | WET TOOLED JOINT | BUTT JOINT

PEDESTRIAN SLAB DETAILS

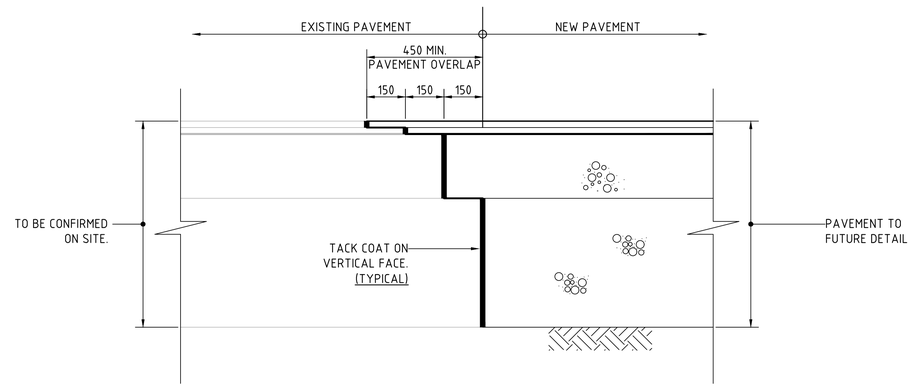
SCALE 1:10

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PEDESTRIAN SLABS	80	20	SL	NIL	25



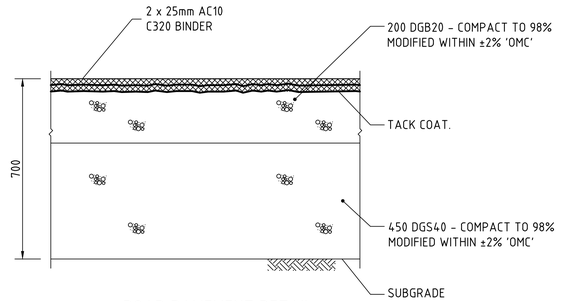
KERB & GUTTER (K&G) & SUBSOIL DETAIL

SCALE 1:10



TYPICAL NEW / EXISTING PAVEMENT INTERFACE DETAIL

SCALE 1:10



ROAD PAVEMENT DETAIL

SCALE 1:10

DESIGN TRAFFIC OF 1 x 10^7 ESA's
DESIGN CBR VALUE OF 3.0%
CBR OF SUBGRADE TO BE CONFIRMED TO ENGINEER FOR FINAL PAVEMENT OPTIMISATION AND DESIGN.
CBR OF SELECT FILL TO BE CONFIRMED PRIOR TO CONSTRUCTION OF ANY SUBSEQUENT PAVEMENT LAYER

NOTE:

CONFIRMATION OF PAVEMENT DESIGN THROUGH FLUSHCOMBE ROAD SUBJECT TO COUNCIL APPROVAL & CONFIRMATION OF EXISTING FLUSHCOMBE PAVEMENT.

500mm 0 1 2 3 4 5m

SCALE 1:50 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	16.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-SSDA755

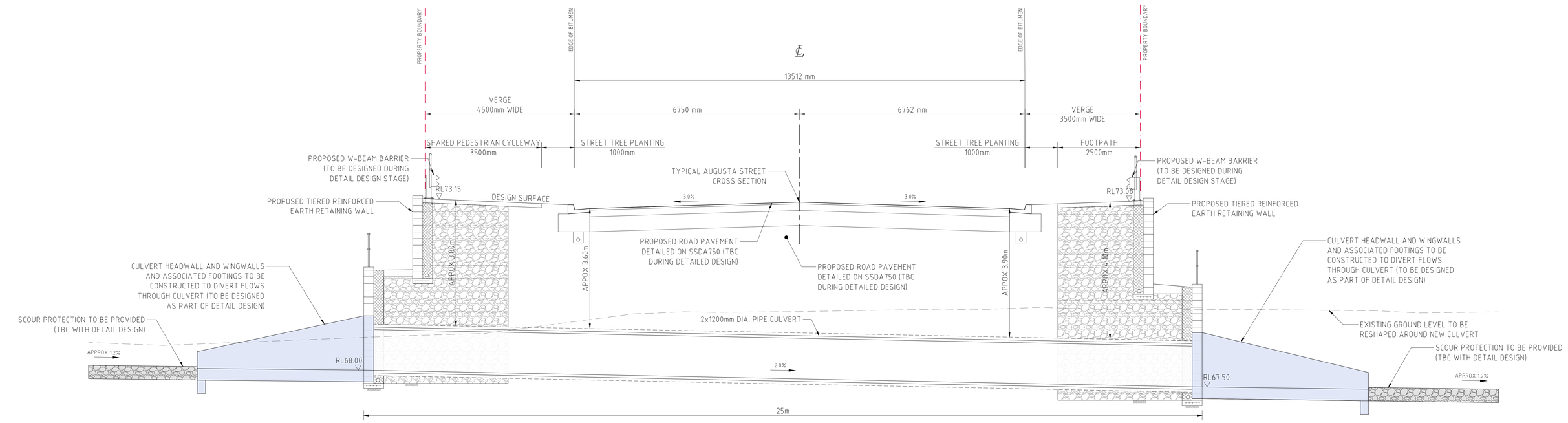
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

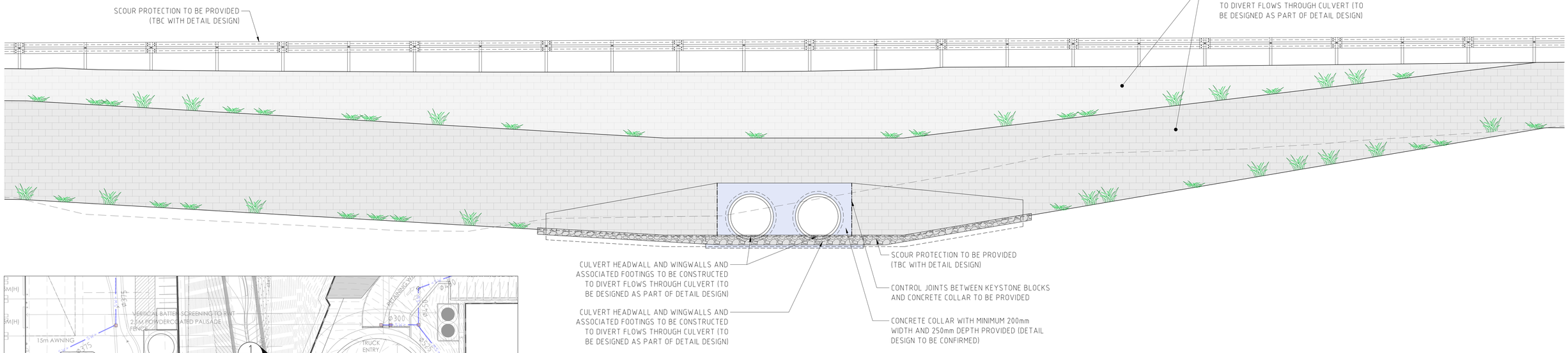
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: ROADWORKS TYPICAL DETAILS

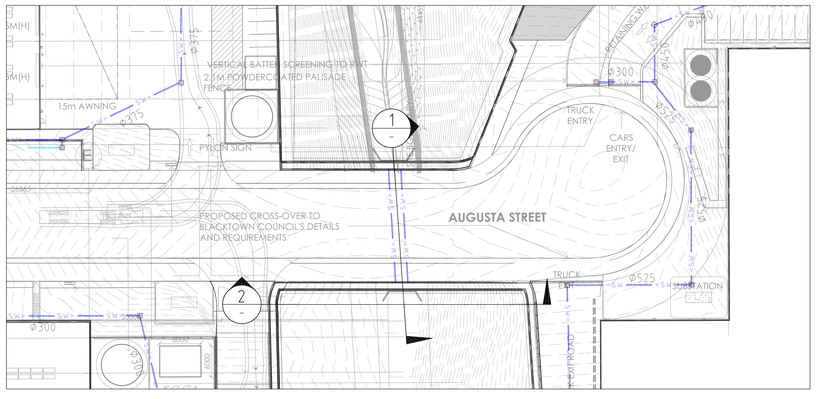
DRAWING No: C013904.03-SSDA755 | ISSUE: A



SECTION 1:50 (1)
PROPOSED DUAL PIPE CULVERT UNDER AUGUSTA STREET



SECTION 1:50 (2)
PROPOSED DUAL PIPE CULVERT UNDER AUGUSTA STREET



PLAN
SCALE 1:500

500mm 0 1 2 3 4 5m
SCALE 1:50 AT B1 SIZE SHEET

5m 0 10 20 30 40 50m
SCALE 1:500 AT B1 SIZE SHEET

FOR INFORMATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR INFORMATION	06.03.24	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE '22	MW	B1	AS SHOWN	C013904.03-SSDA756

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: ROADWORKS TYPICAL SECTIONS

DRAWING No: C013904.03-SSDA756 ISSUE: A

Appendix B

MUSIC MODEL CONFIGURATION & PARAMETERS

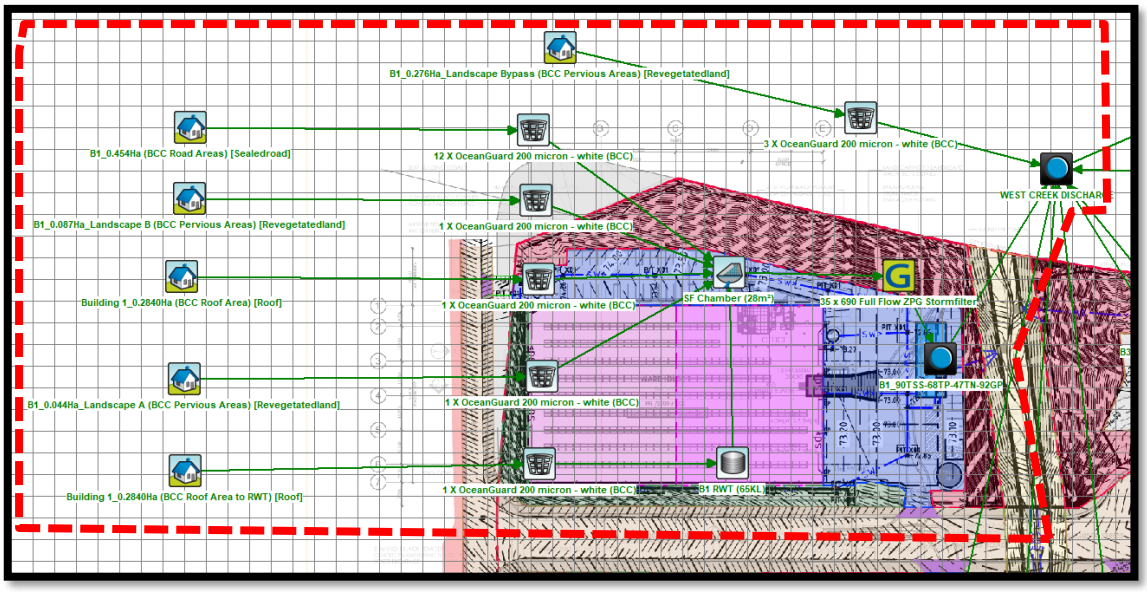


Figure 6.1. MUSIC model layout (Catchment 1)

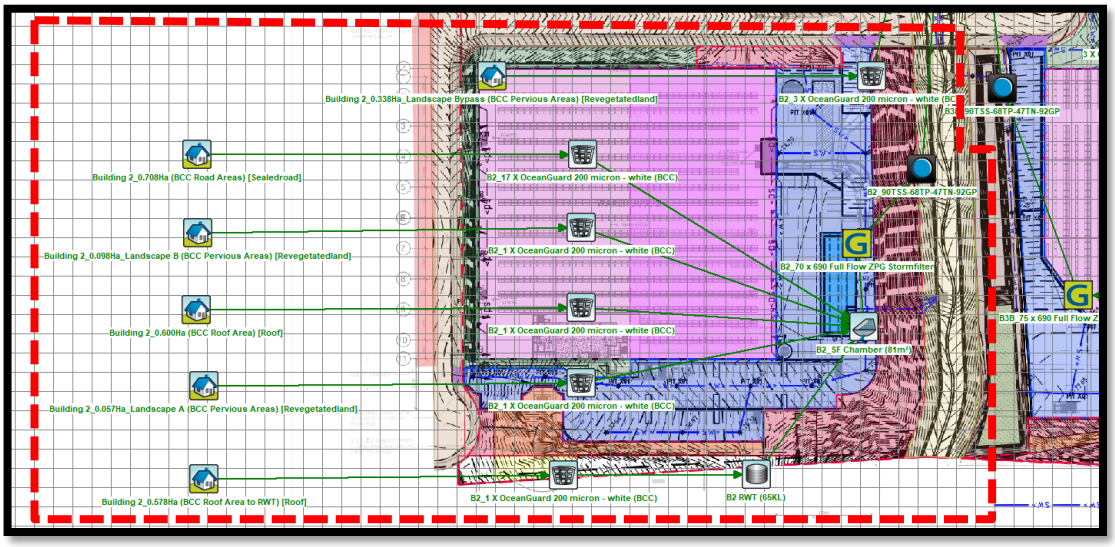


Figure 6.2. MUSIC model layout (Catchment 2)

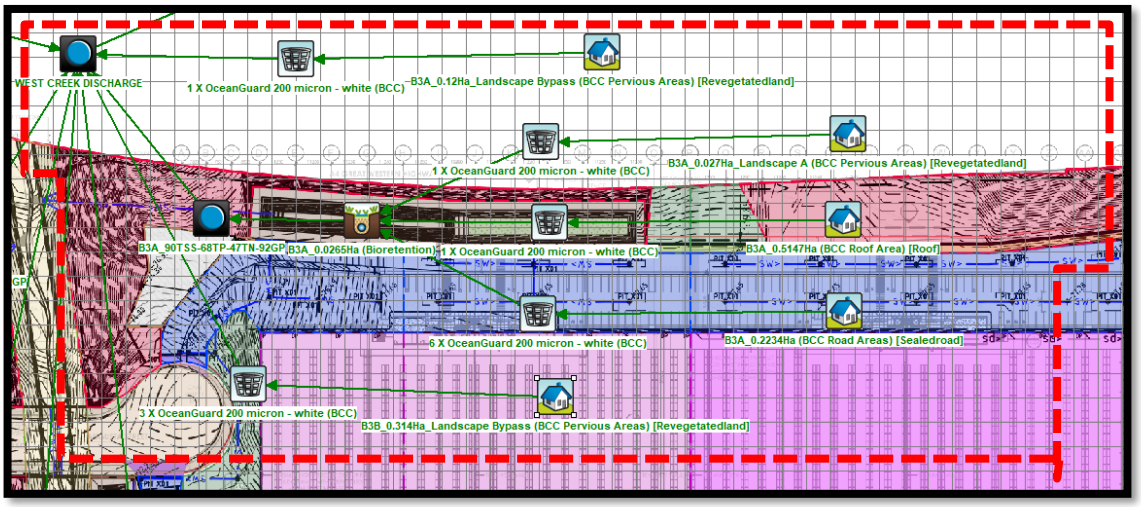


Figure 6.3. MUSIC model layout (Catchment 3A)

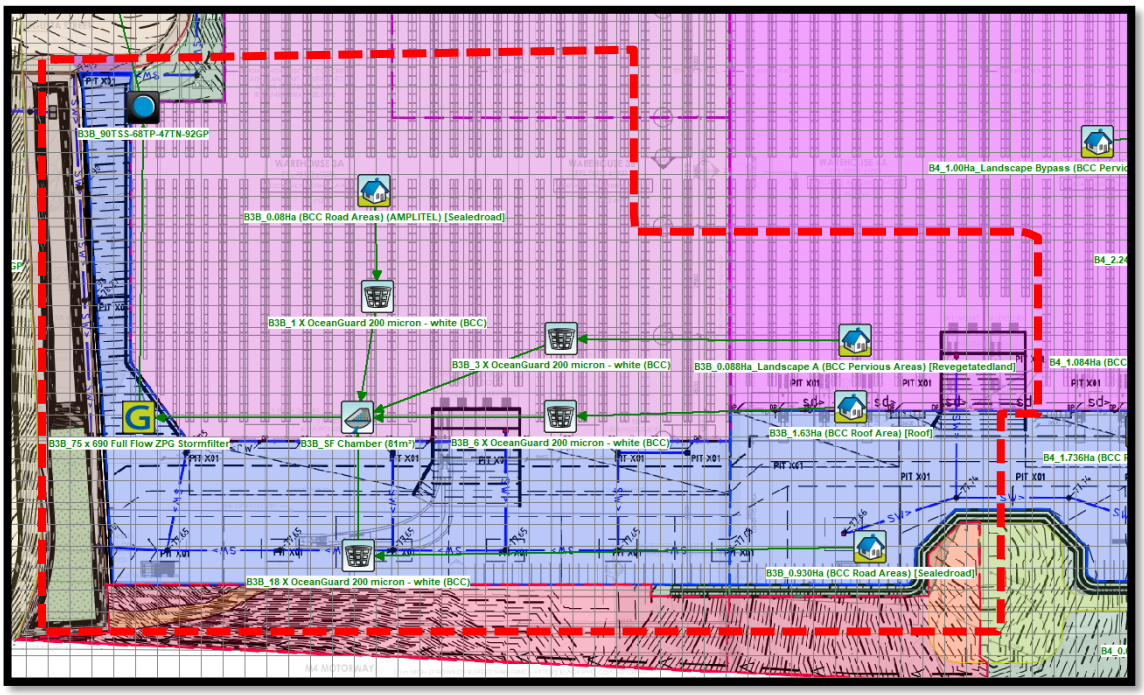


Figure 6.4. MUSIC model layout (Catchment 3B)

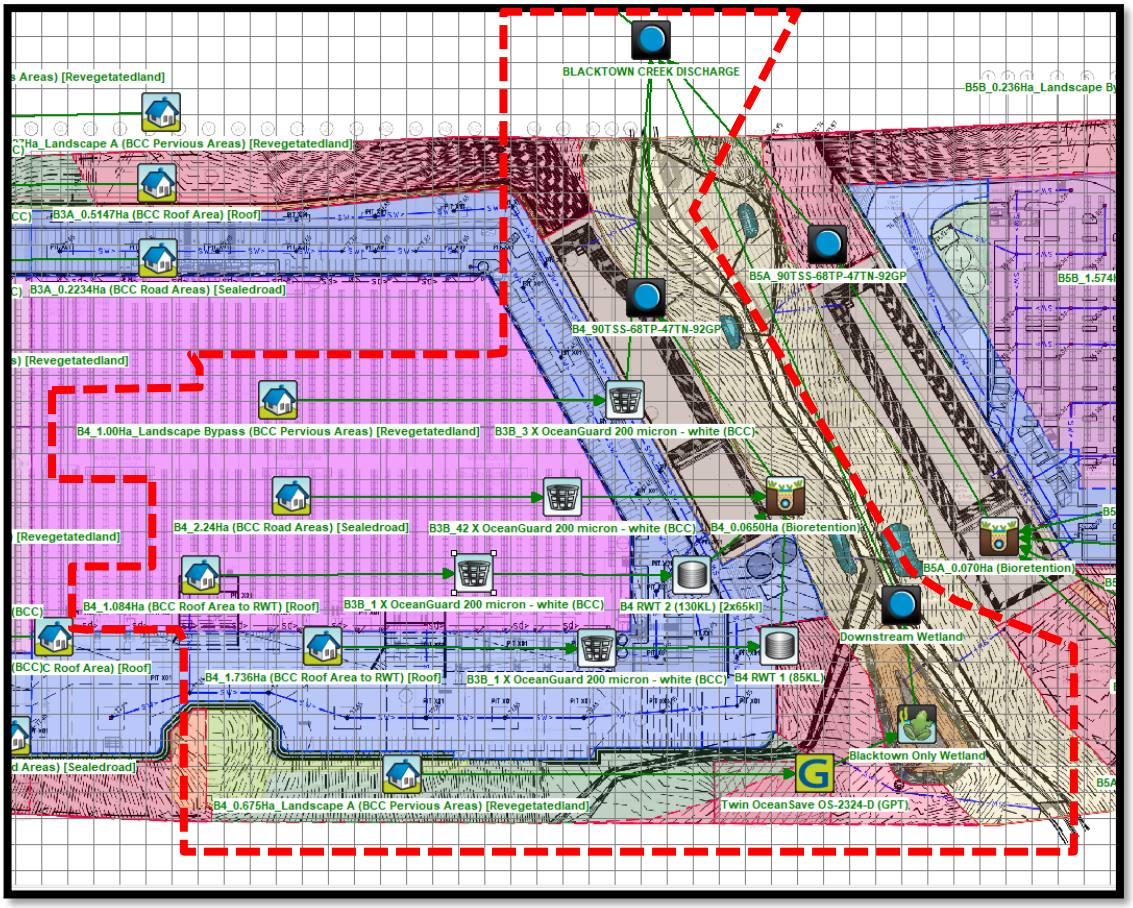


Figure 6.5. MUSIC model layout (Catchment 4)

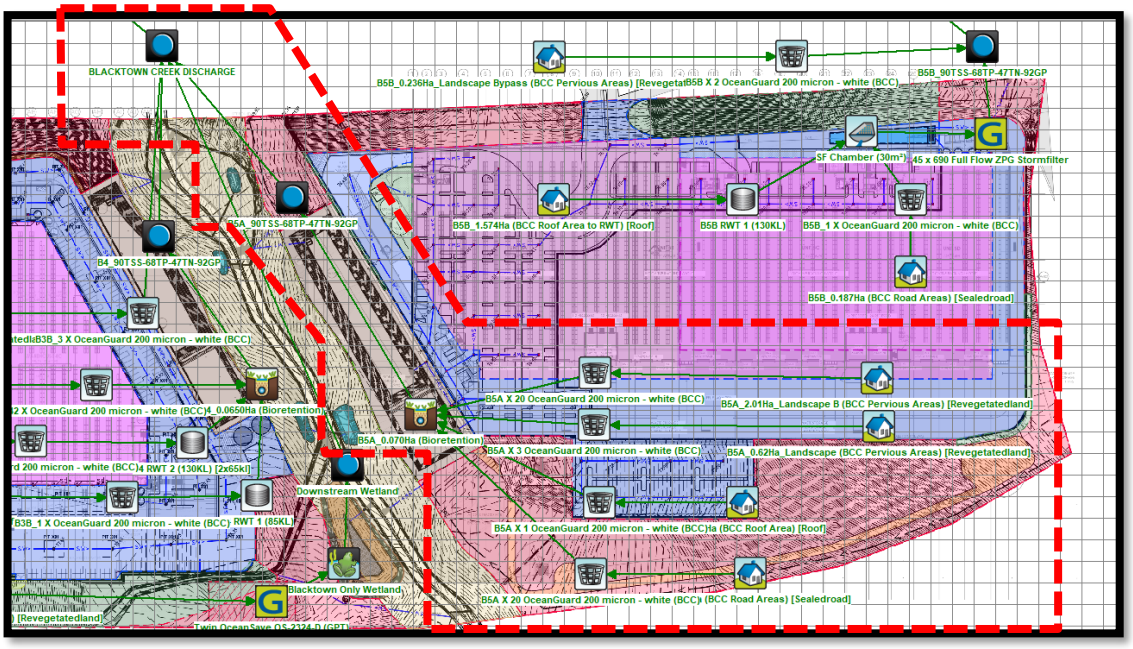


Figure 6.6. MUSIC model layout (Catchment 5A)

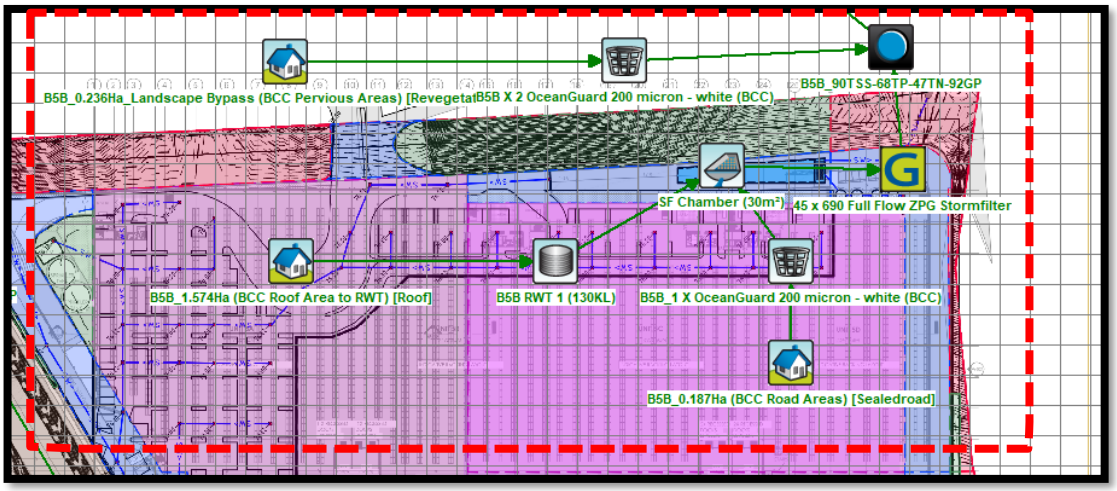


Figure 6.7. MUSIC model layout (Catchment 5B)

B.1 Introduction

The MUSIC modelling software was chosen to model water quality. This model has been released by the Cooperative Research Centre for Catchment Hydrology (CRCCH) and is a standard industry model for this purpose. MUSIC (the Model for Urban Stormwater Improvement Conceptualisation) is suitable for simulating catchment areas of up to 100 km^2 and utilises a continuous simulation approach to model water quality.

By simulating the performance of stormwater management systems, MUSIC can be used to predict if these proposed systems and changes to land use are appropriate for their catchments and are capable of meeting specified water quality objectives (CRC 2002). The water quality constituents modelled in MUSIC and of relevance to this report include Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN).

The pollutant retention criteria set out in Blacktown City Council's Huntingwood Precinct DCP and nominated in **Section 4.1** of this report were used as a basis for assessing the effectiveness of the selected treatment trains.

The MUSIC model "*Co13904_03_Huntingwood Precinct_REV07.sqz*" was set up to examine the effectiveness of the water quality treatment train and to predict if council requirements have been achieved. The model was set up using the latest Blacktown City Council *MUSICLINK* parameters for clay soil and the layout of the MUSIC model is presented in this **Appendix B** and **Section 3** of the report.

Modelling parameters used are based on the latest Blacktown City Council *MUSICLINK* parameters.

B.2 Rainfall Data

As per the recommendation of Council, six-minute pluviographic data for the Sydney Meteorological Office Station was sourced from the Bureau of Meteorology (BOM) as nominated below. Evapo-transpiration data for the period was sourced from the Sydney Monthly Areal PET data set supplied with the MUSIC software.

Input	**Data Used**
Rainfall Station	67035 Liverpool (Whitlam)
Rainfall Period	1 January 1967 – 31 December 1976
	(10 years)
Mean Annual Rainfall (mm)	857
Evapotanspiration	Sydney Monthly Areal PET
Model Timestep	6 minutes

B.3 Rainfall Runoff Parameters

Parameter	**Value**
Rainfall Threshold	1.40
Soil Storage Capacity (mm)	170

Initial Storage (% capacity)	30
Field Capacity (mm)	70
Infiltration Capacity Coefficient a	210
Infiltration Capacity exponent b	4.7
Initial Depth (mm)	10
Daily Recharge Rate (%)	50
Daily Baseflow Rate (%)	4
Daily Seepage Rate (%)	0

B.4 Pollutant Concentrations & Source Nodes

Pollutant concentrations for source nodes are based on parameters adopted by the SCA as per **Table B.1**.

Flow Type	Surface Type	TSS (log_{10} values)		TP (log_{10} values)		TN (log_{10} values)	
		Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Baseflow	Roof	1.20	0.17	-0.85	0.19	0.11	0.12
	Roads	1.20	0.17	-0.85	0.19	0.11	0.12
	Landscaping	1.2	0.17	-0.85	0.19	0.11	0.12
Stormflow	Roof	1.30	0.32	-0.89	0.25	0.30	0.19
	Roads	2.43	0.32	-0.30	0.25	0.34	0.19
	Landscaping	2.15	0.32	-0.6	0.25	0.30	0.19

Table B.1. Pollutant Concentrations

The MUSIC model has been setup with a treatment train approach based on the pollutant concentrations in **Table B.1** above and using the Blacktown Council specific MUSIC nodes. The MUSIC-Link generated report can be found attached to the end of this Appendix B, showing the relevant stormwater catchment nodes and sizes and their configuration within the MUSIC model.

B.5 Treatment Nodes

Gross Pollutant Trap and Siphon-Actuated Filtration device treatment nodes have been used in the modelling of the development as provided by the suppliers of the products based on testing completed by the product manufacturers. Detention basin nodes were also introduced to the model using typical parameters contained in MUSIC modelling guidelines.

Gross Pollutant Trap

Parameter	**Value**
Treatable Flow	0.020m^3/s (per OceanGuard)
Pollutant Reductions	
Per Ocean Protect Technical Guidelines	

Filtration Device (Ocean Protect StormFilters)

Parameter	**Value**
Treatable Flow	0.0016m^3/s (per ZPG Cartridge)
Pollutant Reductions	
Per Ocean Protect Technical Guidelines	

B.6 Results

Table B.2 shows the results of the MUSIC analysis. The reduction rate is expressed as a percentage and compares the post-development pollutant loads without treatment versus post-development loads with treatment.

	Source	Residual Load	% Reduction
Total Suspended Solids (kg/yr) (TSS)	**19900**	**1740**	**91.2**
Total Phosphorus (kg/yr) (TP)	**42.4**	**12.0**	**71.7**
Total Nitrogen (kg/yr) (TN)	**300**	**140**	**53.4**
Gross Pollutants (kg/yr) (GP)	**3200**	**0**	**100**

Table B.2. MUSIC analysis results

The model results indicate that, through the use of the STM in the treatment train, pollutant load reductions for Total Suspended Solids, Total Phosphorous, Total Nitrogen and Gross Pollutants will meet the requirements of Council's *DCP* on an overall catchment basis.

B.7 Modelling Discussion

MUSIC modelling has been performed to assess the effectiveness of the selected treatment trains and to ensure that the pollutant retention requirements of Council have been met.

The MUSIC modelling has shown that the proposed treatment train of STM will provide stormwater treatment which will meet Council's requirements in an effective and economical manner.

Hydrocarbon and oil & grease removal cannot be modelled with MUSIC software. As an industrial estate with users for individual development sites not known, the exact levels of hydrocarbons would not be known however given the expected use of the site as a warehouse distribution centre these pollutants would not be expected to be large. Potential sources of hydrocarbons and/or oil & grease which drain to the stormwater system would be limited to leaking engine sumps or for accidental fuel spills/leaks and leaching of bituminous pavements (car parking only). The potential for these pollutants is low and published data from the CSIRO indicates that average concentrations from industrial sites are in the order of 10mg/L and we would expect source loading from this site to be near to or below this concentration. Hydrocarbon pollution would also be limited to surface areas which will be treated via OceanProtect OceanGuard absorbent material which are predicted to reduce this pollutant.

Further, the provision of an oil baffle within the treatment system which captures and contains hydrocarbons and oils has been included. This is considered a deemed to comply solution by Blacktown City Council.

Given the expected low source loadings of hydrocarbons and oil/grease and removal efficiencies of the treatment devices and filtration systems we consider that the requirements of the Council have been met.

MUSIC-*link* Report

Project Details		Company Details	
Project:	SSD-36138263_AUGUSTA STREET WAREHOUSE & DISTRIBUTION CENTRE	**Company:**	Costin Roe Consulting
Report Export Date:	8/03/2024	**Contact:**	Lourens de Villiers
Catchment Name:	Co13904_03_Huntingwood Precinct_REV07	**Address:**	
Catchment Area:	22.7ha	**Phone:**	
Impervious Area*:	73.67%	**Email:**	lourens.devilliers@costinroe.com.au
Rainfall Station:	67035 LIVERPOOL(WHITLAM		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1967 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	857mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Blacktown		
Scenario:	Blacktown Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: 90TSS-68TP-47TN-92GP	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	7.92%	Wetland Node	1	Urban Source Node	33
TSS	91.2%	Sedimentation Basin Node	4		
TP	71.7%	Rain Water Tank Node	5		
TN	53.4%	Bio Retention Node	3		
GP	100%	Generic Node	5		
		GPT Node	31		

Comments

All nodes are set to Blacktown City Council's requirements. Roof Nodes incorrectly showing errors on the MUSIC Link report

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bio	B3A_0.0265Ha (Bioretention)	Hi-flow bypass rate (cum/sec)	None	None	100
Bio	B3A_0.0265Ha (Bioretention)	PET Scaling Factor	2.1	2.1	2.1
Bio	B4_0.0650Ha (Bioretention)	Hi-flow bypass rate (cum/sec)	None	None	100
Bio	B4_0.0650Ha (Bioretention)	PET Scaling Factor	2.1	2.1	2.1
Bio	B5A_0.070Ha (Bioretention)	Hi-flow bypass rate (cum/sec)	None	None	100
Bio	B5A_0.070Ha (Bioretention)	PET Scaling Factor	2.1	2.1	2.1
GPT	B5A X 1 OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	12 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.24
GPT	3 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	3 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	6 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.12
GPT	B2_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B2_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B2_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B2_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B2_17 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.34
GPT	B2_3 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	B3B_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B3B_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B3B_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
GPT	B3B_18 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.36
GPT	B3B_3 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	B3B_3 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	B3B_42 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.84
GPT	B3B_6 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.12
GPT	B5A X 20 OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.4
GPT	B5A X 20 OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.4
GPT	B5A X 3 OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.06
GPT	B5B X 2 OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.04
GPT	B5B_1 X OceanGuard 200 micron - white (BCC)	Hi-flow bypass rate (cum/sec)	None	None	0.02
Rain	B1 RWT (65KL)	% Reuse Demand Met	80	None	84.04
Rain	B2 RWT (65KL)	% Reuse Demand Met	80	None	81.60
Rain	B4 RWT 1 (85KL)	% Reuse Demand Met	80	None	82.15

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Rain	B4 RWT 2 (130KL) [2x65kl]	% Reuse Demand Met	80	None	80.39
Rain	B5B RWT 1 (2x65KL)	% Reuse Demand Met	80	None	80.90
Receiving	90TSS-68TP-47TN-92GP	% Load Reduction	None	None	7.92
Receiving	90TSS-68TP-47TN-92GP	GP % Load Reduction	90	None	100
Receiving	90TSS-68TP-47TN-92GP	TN % Load Reduction	45	None	53.4
Receiving	90TSS-68TP-47TN-92GP	TP % Load Reduction	65	None	71.7
Receiving	90TSS-68TP-47TN-92GP	TSS % Load Reduction	85	None	91.2
Sedimentation	B2_SF Chamber (81m&#65533;)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	B2_SF Chamber (81m&#65533;)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	B2_SF Chamber (81m&#65533;)	Notional Detention Time (hrs)	None	None	0.105
Sedimentation	B3B_SF Chamber (81m&#65533;)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	B3B_SF Chamber (81m&#65533;)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	B3B_SF Chamber (81m&#65533;)	Notional Detention Time (hrs)	None	None	0.0972
Sedimentation	SF Chamber (28m&#65533;)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Chamber (28m&#65533;)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (28m&#65533;)	Notional Detention Time (hrs)	None	None	0.0666
Sedimentation	SF Chamber (30m&#65533;)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Chamber (30m&#65533;)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (30m&#65533;)	Notional Detention Time (hrs)	None	None	0.0522
Urban	B1_0.044Ha_Landscape A (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B1_0.044Ha_Landscape A (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.044
Urban	B1_0.044Ha_Landscape A (BCC Pervious Areas)	Total Area (ha)	None	None	0.044
Urban	B1_0.087Ha_Landscape B (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B1_0.087Ha_Landscape B (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.087
Urban	B1_0.087Ha_Landscape B (BCC Pervious Areas)	Total Area (ha)	None	None	0.087
Urban	B1_0.276Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B1_0.276Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.276
Urban	B1_0.276Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	0.276
Urban	B1_0.454Ha (BCC Road Areas)	Area Impervious (ha)	None	None	0.454
Urban	B1_0.454Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B1_0.454Ha (BCC Road Areas)	Total Area (ha)	None	None	0.454
Urban	B3A_0.027Ha_Landscape A (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B3A_0.027Ha_Landscape A (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.027
Urban	B3A_0.027Ha_Landscape A (BCC Pervious Areas)	Total Area (ha)	None	None	0.027
Urban	B3A_0.12Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B3A_0.12Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.121
Urban	B3A_0.12Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	0.121
Urban	B3A_0.2234Ha (BCC Road Areas)	Area Impervious (ha)	None	None	0.223
Urban	B3A_0.2234Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B3A_0.2234Ha (BCC Road Areas)	Total Area (ha)	None	None	0.223

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	B3A_0.5147Ha (BCC Roof Area)	Area Impervious (ha)	None	None	0.515
Urban	B3A_0.5147Ha (BCC Roof Area)	Area Pervious (ha)	None	None	0
Urban	B3A_0.5147Ha (BCC Roof Area)	Total Area (ha)	None	None	0.515
Urban	B3B_0.088Ha_Landscape A (BCC Pervious Areas)	Area Impervious (ha)	None	None	0.017
Urban	B3B_0.088Ha_Landscape A (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.070
Urban	B3B_0.088Ha_Landscape A (BCC Pervious Areas)	Total Area (ha)	None	None	0.088
Urban	B3B_0.08Ha (BCC Road Areas) (AMPLITEL)	Area Impervious (ha)	None	None	0.040
Urban	B3B_0.08Ha (BCC Road Areas) (AMPLITEL)	Area Pervious (ha)	None	None	0.039
Urban	B3B_0.08Ha (BCC Road Areas) (AMPLITEL)	Total Area (ha)	None	None	0.08
Urban	B3B_0.314Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B3B_0.314Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.314
Urban	B3B_0.314Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	0.314
Urban	B3B_0.930Ha (BCC Road Areas)	Area Impervious (ha)	None	None	0.93
Urban	B3B_0.930Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B3B_0.930Ha (BCC Road Areas)	Total Area (ha)	None	None	0.93
Urban	B3B_1.63Ha (BCC Roof Area)	Area Impervious (ha)	None	None	1.63
Urban	B3B_1.63Ha (BCC Roof Area)	Area Pervious (ha)	None	None	0
Urban	B3B_1.63Ha (BCC Roof Area)	Total Area (ha)	None	None	1.63
Urban	B4_0.675Ha_Landscape A (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B4_0.675Ha_Landscape A (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.675
Urban	B4_0.675Ha_Landscape A (BCC Pervious Areas)	Total Area (ha)	None	None	0.675
Urban	B4_1.00Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B4_1.00Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	1
Urban	B4_1.00Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	1
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Area Impervious (ha)	None	None	1.084
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Area Pervious (ha)	None	None	0
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Total Area (ha)	None	None	1.084
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Area Impervious (ha)	None	None	1.736
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Area Pervious (ha)	None	None	0
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Total Area (ha)	None	None	1.736
Urban	B4_2.24Ha (BCC Road Areas)	Area Impervious (ha)	None	None	2.24
Urban	B4_2.24Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B4_2.24Ha (BCC Road Areas)	Total Area (ha)	None	None	2.24
Urban	B5A_0.62Ha_Landscape (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B5A_0.62Ha_Landscape (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.62
Urban	B5A_0.62Ha_Landscape (BCC Pervious Areas)	Total Area (ha)	None	None	0.62
Urban	B5A_1.792Ha (BCC Roof Area)	Area Impervious (ha)	None	None	1.792
Urban	B5A_1.792Ha (BCC Roof Area)	Area Pervious (ha)	None	None	0
Urban	B5A_1.792Ha (BCC Roof Area)	Total Area (ha)	None	None	1.792
Urban	B5A_1.81Ha (BCC Road Areas)	Area Impervious (ha)	None	None	1.81

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	B5A_1.81Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B5A_1.81Ha (BCC Road Areas)	Total Area (ha)	None	None	1.81
Urban	B5A_2.01Ha_Landscape B (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B5A_2.01Ha_Landscape B (BCC Pervious Areas)	Area Pervious (ha)	None	None	2.01
Urban	B5A_2.01Ha_Landscape B (BCC Pervious Areas)	Total Area (ha)	None	None	2.01
Urban	B5B_0.187Ha (BCC Road Areas)	Area Impervious (ha)	None	None	0.187
Urban	B5B_0.187Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	B5B_0.187Ha (BCC Road Areas)	Total Area (ha)	None	None	0.187
Urban	B5B_0.236Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	B5B_0.236Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.236
Urban	B5B_0.236Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	0.236
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Area Impervious (ha)	None	None	1.574
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Area Pervious (ha)	None	None	0
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Total Area (ha)	None	None	1.574
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Area Impervious (ha)	None	None	0.284
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Area Pervious (ha)	None	None	0
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Total Area (ha)	None	None	0.284
Urban	Building 1_0.2840Ha (BCC Roof Area)	Area Impervious (ha)	None	None	0.284
Urban	Building 1_0.2840Ha (BCC Roof Area)	Area Pervious (ha)	None	None	0
Urban	Building 1_0.2840Ha (BCC Roof Area)	Total Area (ha)	None	None	0.284
Urban	Building 2_0.057Ha_Landscape A (BCC Pervious Areas)	Area Impervious (ha)	None	None	0.017
Urban	Building 2_0.057Ha_Landscape A (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.039
Urban	Building 2_0.057Ha_Landscape A (BCC Pervious Areas)	Total Area (ha)	None	None	0.057
Urban	Building 2_0.098Ha_Landscape B (BCC Pervious Areas)	Area Impervious (ha)	None	None	0.019
Urban	Building 2_0.098Ha_Landscape B (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.078
Urban	Building 2_0.098Ha_Landscape B (BCC Pervious Areas)	Total Area (ha)	None	None	0.098
Urban	Building 2_0.338Ha_Landscape Bypass (BCC Pervious Areas)	Area Impervious (ha)	None	None	0
Urban	Building 2_0.338Ha_Landscape Bypass (BCC Pervious Areas)	Area Pervious (ha)	None	None	0.338
Urban	Building 2_0.338Ha_Landscape Bypass (BCC Pervious Areas)	Total Area (ha)	None	None	0.338
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Area Impervious (ha)	None	None	0.578
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Area Pervious (ha)	None	None	0
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Total Area (ha)	None	None	0.578
Urban	Building 2_0.600Ha (BCC Roof Area)	Area Impervious (ha)	None	None	0.6
Urban	Building 2_0.600Ha (BCC Roof Area)	Area Pervious (ha)	None	None	0
Urban	Building 2_0.600Ha (BCC Roof Area)	Total Area (ha)	None	None	0.6
Urban	Building 2_0.708Ha (BCC Road Areas)	Area Impervious (ha)	None	None	0.708
Urban	Building 2_0.708Ha (BCC Road Areas)	Area Pervious (ha)	None	None	0
Urban	Building 2_0.708Ha (BCC Road Areas)	Total Area (ha)	None	None	0.708
Wetland	Blacktown Only Wetland	% Reuse Demand Met	None	None	0

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	B3A_0.5147Ha (BCC Roof Area)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B3A_0.5147Ha (BCC Roof Area)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B3A_0.5147Ha (BCC Roof Area)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	B3B_1.63Ha (BCC Roof Area)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B3B_1.63Ha (BCC Roof Area)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B3B_1.63Ha (BCC Roof Area)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B4_1.084Ha (BCC Roof Area to RWT)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B4_1.736Ha (BCC Roof Area to RWT)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	B5A_1.792Ha (BCC Roof Area)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B5A_1.792Ha (BCC Roof Area)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B5A_1.792Ha (BCC Roof Area)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	B5B_1.574Ha (BCC Roof Area to RWT)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	Building 1_0.2840Ha (BCC Roof Area to RWT)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	Building 1_0.2840Ha (BCC Roof Area)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	Building 1_0.2840Ha (BCC Roof Area)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	Building 1_0.2840Ha (BCC Roof Area)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	Building 2_0.578Ha (BCC Roof Area to RWT)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2
Urban	Building 2_0.600Ha (BCC Roof Area)	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.11
Urban	Building 2_0.600Ha (BCC Roof Area)	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.85
Urban	Building 2_0.600Ha (BCC Roof Area)	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.2

Only certain parameters are reported when they pass validation

Appendix C

STORMWATER SYSTEM

DRAFT MAINTENANCE SCHEDULE

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
SWALES/ LANDSCAPED AREAS			
Check density of vegetation and ensure minimum height of 150mm is maintained. Check for any evidence of weed infestation	Six monthly	Maintenance Contractor	Replant and/or fertilise, weed and water in accordance with landscape consultant specifications
Inspect swale for excessive litter and sediment build up	Six monthly	Maintenance Contractor	Remove sediment and litter and dispose in accordance with local authorities' requirements.
Check for any evidence of channelisation and erosion	Six monthly/ After Major Storm	Maintenance Contractor	Reinstate eroded areas so that original, designed swale profile is maintained
Weed Infestation	Three Monthly	Maintenance Contractor	Remove any weed infestation ensuring all root ball of weed is removed. Replace with vegetation where required.
Inspect swale surface for erosion	Six Monthly	Maintenance Contractor	Replace topsoil in eroded area and cover and secure with biodegradable fabric. Cut hole in fabric and revegetate.
INLET & JUNCTION PITS			
Inside of pits	Six Monthly	Maintenance Contractor	Remove grate and inspect internal walls and base, repair where required. Remove any collected sediment, debris, litter.

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Outside of pits	Four Monthly/ After Major Storm	Maintenance Contractor	Clean grate of collected sediment, debris, litter and vegetation.
PROPRIETARY TREATMENT DEVICES (OceanGuards & StormFilters)			
Refer to Manufacturers Operation and Maintenance Manual	Annually	Maintenance Contractor	Refer to Manufacturers Operation and Maintenance Manual
RAINWATER TANK			
Check for any clogging and blockage of the first flush device	Monthly	Maintenance Contractor	First flush device to be cleaned out
Check for any clogging and blockage of the tank inlet -leaf/litter screen	Six monthly	Maintenance Contractor	Leaves and debris to be removed from the inlet leaf/litter screen
Check the level of sediment within the tank	Every two years	Maintenance Contractor	Sediment and debris to be removed from rainwater tank floor if sediment level is greater than the maximum allowable depth as specified by the hydraulic consultant
STORMWATER SYSTEM			
General Inspection of complete stormwater drainage system	Bi-annually	Maintenance Contractor	Inspect all drainage structures noting any dilapidation in structures and carry out required repairs.
TANKS			

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Inspect and remove any blockage from orifice	Six Monthly	Maintenance Contractor/ Owner	Remove grate and screen to inspect orifice.
Inspect trash screen and clean	Six Monthly	Maintenance Contractor/ Owner	Remove grate and screen if required to clean it.
Inspect flap valve and remove any blockage.	Six Monthly	Maintenance Contractor/ Owner	Remove grate. Ensure flap valve moves freely and remove any blockages or debris.
Inspect pit sump for damage or blockage.	Six Monthly	Maintenance Contractor/ Owner	Remove grate & screen. Remove sediment/ sludge build up and check orifice and flap valve are clear.
Inspect storage areas and remove debris/ mulch/ litter etc likely to block screens/ grates.	Six Monthly	Maintenance Contractor/ Owner	Remove debris and floatable materials.
Check attachment of orifice plate and screen to wall of pit	Annually	Maintenance Contractor	Remove grate and screen. Ensure plate or screen mounted securely, tighten fixings if required. Seal gaps if required.
Check orifice diameter is correct and retains sharp edge.	Five yearly	Maintenance Contractor	Compare diameter to design (see Work-as-Executed) and ensure edge is not pitted or damaged.
Check screen for corrosion	Annually	Maintenance Contractor	Remove grate and screen and examine for rust or corrosion, especially at corners or welds.

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Inspect overflow weir and remove any blockage	Six monthly	Maintenance Contractor/ Owner	Ensure weir is free of blockage.
Inspect walls for cracks or spalling	Annually	Maintenance Contractor	Remove grate to inspect internal walls, repair as necessary.
Check step irons	Annually	Maintenance Contractor	Ensure fixings are secure and irons are free from corrosion.

Appendix D

DRAFT SOIL AND WATER MANAGEMENT PLAN

C.1 Introduction

An erosion and sediment control plan (ESCP) is shown on drawings **Co13904.03-SSDA200-SSDA202** with details on **SSDA250**. These are conceptual plans only providing sufficient detail to clearly show that the works can proceed without undue pollution to receiving waters. A detailed plan will be prepared once consent is given and before works start.

The ESCP considers initial site establishment, requirements during construction of the development, and completion of development.

C.2 General Conditions

1. The ESCP will be read in conjunction with the engineering plans, and any other plans or written instructions that may be issued in relation to development at the subject site.
2. Contractors will ensure that all soil and water management works are undertaken as instructed in this specification and constructed following the guidelines stated in *Managing Urban Stormwater, Soils and Construction (2004) "The Blue Book"* and Cumberland City Council specifications.
3. All subcontractors will be informed of their responsibilities in minimising the potential for soil erosion and pollution to down slope areas.

C.3 Land Disturbance

1. Where practicable, the soil erosion hazard on the site will be kept as low as possible and as recommended in Table C.1.

Land Use	Limitation	Comments
Construction areas	Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans.	All site workers will clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope), or similar materials.
Access areas	Limited to a maximum width of 5 metres	The site manager will determine and mark the location of these zones onsite. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries.
Remaining lands	Entry prohibited except for essential management works	

Table C.1 Limitations to access

C.4 Erosion Control Conditions

1. Clearly visible barrier fencing shall be installed as shown on the plan and elsewhere at the discretion of the site superintendent to ensure traffic control and prohibit unnecessary site disturbance. Vehicular access to the site shall be limited to only those essential for construction work and they shall enter the site only through the stabilised access points.
2. Soil materials will be replaced in the same order they are removed from the ground. It is particularly important that all subsoils are buried and topsoils remain on the surface at the completion of works.
3. Where practicable, schedule the construction program so that the time from starting land disturbance to stabilisation has a duration of less than six months.
4. Notwithstanding this, schedule works so that the duration from the conclusion of land shaping to completion of final stabilisation is less than 20 working days.
5. Land recently established with grass species will be watered regularly until an effective cover has properly established and plants are growing vigorously. Further application of seed might be necessary later in areas of inadequate vegetation establishment.
6. Where practical, foot and vehicular traffic will be kept away from all recently established areas
7. Earth batters shall be constructed in accordance with the Geotechnical Engineers Report or with as law a gradient as practical but not steeper than:

Unit	Temporary	Permanent
SOIL UNITS, e.g. ENGINEERED FILL / NATURAL SOIL	2H : 1V	2.5H : 1V
BEDROCK A	1.5H : 1V	2.0H : 1V
BEDROCK B	0.5H : 1V	1H : 1V

8. All earthworks, including waterways/drains/spillways and their outlets, will be constructed to be stable in at least the design storm event.
9. During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control. In the event water is not available in sufficient quantities, soil binders and/or dust retardants will be used or the surface will be left in a cloddy state that resists removal by wind.

C.5 Pollution Control Conditions

1. Stockpiles will not be located within 5 metres of hazard areas, including likely areas of high velocity flows such as waterways, paved areas and driveways. Silt/ sediment fences and appropriate stabilisation of stockpiles are to be provided as detailed on the drawings.
2. Sediment fences will:
   a) Be installed where shown on the drawings, and elsewhere at the discretion of the site superintendent to contain the coarser sediment fraction (including aggregated fines) as near as possible to their source.
   b) Have a catchment area not exceeding 720 square meters, a storage depth (including both settling and settled zones) of at least 0.6 meters, and internal dimensions that provide maximum surface area for settling, and
   c) Provide a return of 1 metre upslope at intervals along the fence where catchment area exceeds 720 square meters, to limit discharge reaching each section to 10 litres/second in a maximum 20-year t_c discharge.
3. Sediment removed from any trapping device will be disposed in locations where further erosion and consequent pollution to down slope lands and waterways will not occur.
4. Water will be prevented from directly entering the permanent drainage system unless it is relatively sediment free (i.e. the catchment area has been permanently landscaped and/or likely sediment has been treated in an approved device). Nevertheless, stormwater inlets will be protected.
5. Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.

C.6 Waste Management Conditions

Acceptable bind will be provided for any concrete and mortar slurries, paints, acid washings, lightweight waste materials and litter. Clearance service will be provided at least weekly.

C.7 Site Inspection and Maintenance

1. A self-auditing program will be established based on a Check Sheet. A site inspection using the Check Sheet will be made by the site manager:
   - At least weekly.
   - Immediately before site closure.
   - Immediately following rainfall events in excess of 5mm in any 24-hour period.

The self-audit will include:

- Recording the condition of every sediment control device
- Recording maintenance requirements (if any) for each sediment control device
- Recording the volumes of sediment removed from sediment retention systems, where applicable

- Recording the site where sediment is disposed
- Forwarding a signed duplicate of the completed Check Sheet to the project manager/developer for their information

2. In addition, a suitably qualified person will be required to oversee the installation and maintenance of all soil and water management works on the site. The person shall be required to provide a short monthly written report. The responsible person will ensure that:
   - The plan is being implemented correctly
   - Repairs are undertaken as required
   - Essential modifications are made to the plan if and when necessary

The report shall carry a certificate that works have been carried out in accordance with the plan.

3. Waste bins will be emptied as necessary. Disposal of waste will be in a manner approved by the Site Superintendent.
4. Proper drainage will be maintained. To this end drains (including inlet and outlet works) will be checked to ensure that they are operating as intended, especially that,
   - No low points exist that can overtop in a large storm event
   - Areas of erosion are repaired (e.g. lined with a suitable material) and/or velocity of flow is reduced appropriately through construction of small check dams of installing additional diversion upslope.
   - Blockages are cleared (these might occur because of sediment pollution, sand/soil/spoil being deposited in or too close to them, breached by vehicle wheels, etc.).
5. Sand/soil/spoil materials placed closer than 2 meters from hazard areas will be removed. Such hazard areas include and areas of high velocity water flows (e.g. waterways and gutters), paved areas and driveways.
6. Recently stabilised lands will be checked to ensure that erosion hazard has been effectively reduced. Any repairs will be initiated as appropriate.
7. Excessive vegetation growth will be controlled through mowing or slashing.
8. All sediment detention systems will be kept in good, working condition. In particular, attention will be given to:
   a) Recent works to ensure they have not resulted in diversion of sediment laden water away from them
   b) Degradable products to ensure they are replaced as required, and
   c) Sediment removal, to ensure the design capacity or less remains in the settling zone.
9. Any pollutants removed from sediment basins or litter traps will be disposed of in areas where further pollution to down slope lands and waterways should not occur.
10. Additional erosion and/or sediment control works will be constructed as necessary to ensure the desired protection is given to down slope lands and waterways, i.e. make ongoing changes to the plan where it proves inadequate in practice or is subjected to changes in conditions at the work site or elsewhere in the catchment.

11. Erosion and sediment control measures will be maintained in a functioning condition until all earthwork activities are completed and the site stabilised
12. Litter, debris and sediment will be removed from the gross pollutant traps and trash racks as required.

EROSION AND SEDIMENT CONTROL
WEEKLY SITE INSPECTION SHEET

LOCATION . . . . . .
INSPECTION OFFICER . . . . . **DATE** . . . . . .
SIGNATURE . . . . . .

Legend: □ OK □ Not OK N/A Not applicable

Item	Consideration	Assessment
1	Public roadways clear of sediment.	. . . . .
2	Entry/exit pads clear of excessive sediment deposition.	. . . . .
3	Entry/exit pads have adequate void spacing to trap sediment.	. . . . .
4	The construction site is clear of litter and unconfined rubbish.	. . . . .
5	Adequate stockpiles of emergency ESC materials exist on site.	. . . . .
6	Site dust is being adequately controlled.	. . . . .
7	Appropriate drainage and sediment controls have been installed prior to new areas being cleared or disturbed.	. . . . .
8	Up-slope "clean" water is being appropriately diverted around/through the site.	. . . . .
9	Drainage lines are free of soil scour and sediment deposition.	. . . . .
10	No areas of exposed soil are in need of erosion control.	. . . . .
11	Earth batters are free of "rill" erosion.	. . . . .
12	Erosion control mulch is not being displaced by wind or water.	. . . . .
13	Long-term soil stockpiles are protected from wind, rain and stormwater flow with appropriate drainage and erosion controls.	. . . . .
14	Sediment fences are free from damage.	. . . . .
15	Sediment-laden stormwater is not simply flowing "around" the sediment fences or other sediment traps.	. . . . .
16	Sediment controls placed up-slope/around stormwater inlets are appropriate for the type of inlet structure.	. . . . .
17	All sediment traps are free of excessive sediment deposition.	. . . . .
18	The settled sediment layer within a sediment basin is clearly visible through the supernatant prior to discharge such water.	. . . . .
19	All reasonable and practicable measures are being taken to control sediment runoff from the site.	. . . . .
20	All soil surfaces are being appropriately prepared (i.e. pH, nutrients, roughness and density) prior to revegetation.	. . . . .
21	Stabilised surfaces have a minimum 70% soil coverage.	. . . . .
22	The site is adequately prepared for imminent storms.	. . . . .
23	All ESC measures are in proper working order.	. . . . .

Appendix E

PLANNING SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

SSDA-36138263 (2 August 2022)

Planning Secretary's Environmental Assessment Requirements

Warehouses and distribution centres

Development details

Application number	SSD-36138263
Project name	Augusta Street Warehouse and Distribution Centre
Location	Augusta Street, Blacktown within Blacktown
Property Description	Lots 218-219 DP457024, Lot 2151 DP135859, Lot 2 DP516449, Lot 163-164, 168-188 and 216 DP8716, Lot 4 DP585492, Lot 1 DP119616, Lots 4-6 DP226294, Lot 1 DP835264, Lots 50-52 DP1144623, Lot 7 DP803359, Lots 6-10 DP801210, Lot 4 DP585492, Lot 4 DP5853442 and Lot 2 DP1263824
Applicant	The Trustee for Huntingwood Property Trust
Date of issue	02/08/2022

Content and guidance

Any Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and the *State Significant Development Guidelines*.

Relevant policies and guidelines can be found at https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines.

Key issues and documentation

Issue and Assessment Requirements	Documentation
1. Statutory Context • Address all relevant legislation, environmental planning instruments (EPIs) (including drafts), plans, policies and guidelines. • Identify compliance with applicable development standards and provide a detailed justification for any non-compliances. • If the development is only partly State significant development (SSD) declared under Chapter 2 of SEPP (Planning Systems) 2021, provide an explanation of how the remainder of the development is sufficiently related to the component that is SSD. • Address the requirements of any approvals applying to the site, including any concept approval or recommendation from any Gateway determination.	• Address in EIS
2. Capital Investment Value and Employment	• Cost Summary

Issue and Assessment Requirements	Documentation
• Provide a detailed calculation of the capital investment value (CIV) of the development, prepared by a qualified quantity surveyor in accordance with planning circular *Calculation of Capital Investment Value (PS 21-020)*. • Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the development, including details of the methodology to determine the figures provided.	Report

3. Design Quality
• Demonstrate how the development will achieve:
  ○ design excellence in accordance with any applicable EPI provisions.
  ○ good design in accordance with the seven objectives for good design in *Better Placed*.
• Where required by an EPI or concept approval, demonstrate that the development has been subject to a competitive design process, or reviewed by the State Design Review Panel (SDRP) consistent with the *NSW SDRP: Guidelines for Project Teams*. Recommendations are to be addressed prior to lodgement.
	• Address in EIS
	If required:
	• Design Review Report (where the project has been reviewed by the SDRP)
	• Design Excellence Strategy (where design excellence is required by an EPI)
	• Competition Report (where a competitive design process has been held)

4. Built Form and Urban Design • Explain and illustrate the proposed built form, including a detailed site and context analysis to justify the proposed site planning and design approach. • Demonstrate how the proposed built form (layout, height, bulk, scale, separation, setbacks, interface and articulation) addresses and responds to the context, site characteristics, streetscape and existing and future character of the locality. • Demonstrate how the building design will deliver a high-quality development, including consideration of façade design, articulation, materials, finishes, colours, any signage and integration of services. • Assess how the development complies with the relevant accessibility requirements.	• Architectural drawings • Design Report • Survey Plan • Building Code of Australia Compliance Report • Accessibility Report
5. Visual Impact • Provide a visual analysis of the development from key viewpoints, including photomontages or perspectives showing the proposed and likely future	• Visual Analysis • Visual Impact Assessment

Issue and Assessment Requirements	Documentation
development. • Where the visual analysis has identified potential for significant visual impact, provide a visual impact assessment that addresses the impacts of the development on the existing catchment.	
6. Traffic, Transport and Accessibility • Provide a transport and accessibility impact assessment, which includes: ○ details of all traffic types and volumes likely to be generated during construction and operation, including a description of key access and haul routes. ○ an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts on existing performance levels of nearby intersections (using industry standard modelling). ○ plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network. ○ details and plans of any proposed internal road network, loading dock provision and servicing, on-site parking provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards. ○ swept path analysis for the largest vehicle requiring access to the development. ○ details of road upgrades, infrastructure works, or new roads or access points required for the development if necessary. • Provide a Construction Traffic Management Plan detailing predicted construction vehicle, routes, access and parking arrangements, coordination with other construction occurring in the area, and how impacts on existing traffic, pedestrian and bicycle networks would be managed and mitigated.	• Transport and Accessibility Impact Assessment • Construction Traffic Management Plan • Green Travel Plan or equivalent
7. Trees and Landscaping • Provide a detailed site-wide landscape plan, that: ○ identifies the number and location of trees to be removed and retained, and how opportunities to retain significant trees have been explored and/or informs the plan. ○ details the proposed site planting, including location, number and species of plantings, heights of trees at maturity and proposed canopy coverage (as a percentage of the site area).	• Landscape Plan

Issue and Assessment Requirements	Documentation
○ demonstrates how the proposed development would: ▪ contribute to long term landscape setting in respect of the site and streetscape. ▪ mitigate the urban heat island effect and ensure appropriate comfort levels on-site. ▪ contribute to the objective of increased urban tree canopy cover. ▪ maximise opportunities for green infrastructure, consistent with *Greener Places* and having regard to any bush fire risk.	
8. Ecologically Sustainable Development (ESD) • Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development. • Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards. • Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.	• ESD Report
9. Biodiversity • Assess any biodiversity impacts associated with the development in accordance with the *Biodiversity Conservation Act 2016* and the *Biodiversity Assessment Method 2020*, including the preparation of a Biodiversity Development Assessment Report (BDAR), unless a waiver is granted, or the site is on biodiversity certified land. • If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification.	• Biodiversity Development Assessment Report or BDAR Waiver
10. Air Quality • Identify significant air emission sources at the proposed development (during construction and operation), assess their potential to cause adverse off-site impacts, and detail proposed management and mitigation measures that would be implemented. Where air emissions during operation have the potential to cause adverse off-site impacts, provide a quantitative air quality impact assessment prepared in accordance with the relevant NSW	• Address in EIS If required: • Air Quality Impact Assessment

Issue and Assessment Requirements	Documentation
Environment Protection Authority (EPA) guidelines.	
11. Noise and Vibration • Provide a noise and vibration assessment prepared in accordance with the relevant EPA guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management and mitigation measures that would be implemented.	• Noise and Vibration Impact Assessment

12. Ground and Water Conditions
• Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils.
• Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on:
  ○ surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses.
  ○ groundwater resources in accordance with the *Groundwater Guidelines*.
	• Geotechnical Assessment
	• Surface and Groundwater Impact Assessment
	• Salinity Management Plan and/or Acid Sulfate Soils Management Plan

13. Water Management
• Provide an Integrated Water Management Plan for the development that:
  ○ is prepared in consultation with the local council and any other relevant drainage or water authority.
  ○ outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision).
  ○ details the proposed drainage design (stormwater and wastewater) for the site including any on-site detention facilities, water quality management measures and nominated discharge points, on-site sewage management, and measures to treat, reuse or dispose of water.
  ○ demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts.
• Where water and drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.
	• Integrated Water Management Plan

Issue and Assessment Requirements	Documentation
14. Flooding Risk • Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the *NSW Floodplain Development Manual*. • Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required.	• Flood Risk Assessment
15. Hazards and Risks • Where there are dangerous goods and hazardous materials associated with the development provide a preliminary risk screening in accordance with Chapter 3 of SEPP (Resilience and Hazards) 2021. • Where required by SEPP (Resilience and Hazards) 2021, provide a Preliminary Hazard Analysis prepared in accordance with *Hazardous Industry Planning Advisory Paper No.6 – Guidelines for Hazard Analysis* and *Multi-Level Risk Assessment*. • If the development is adjacent to or on land in a pipeline corridor, report on consultation outcomes with the operator of the pipeline, and prepare a hazard analysis.	• Preliminary Hazard Analysis If required: • Hazard Analysis (Pipeline)
16. Contamination and Remediation • In accordance with Chapter 4 of SEPP (Resilience and Hazards) 2021, assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable (or will be suitable, after remediation) for the development.	• Preliminary Site Investigation If required: • Detailed Site Investigation • Remedial Action Plan • Preliminary Long-term Environmental Management Plan
17. Waste Management • Identify, quantify and classify the likely waste streams to be generated during construction and operation. • Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. • Identify appropriate servicing arrangements for the site. • If buildings are proposed to be demolished or altered, provide a hazardous	• Waste Management Plan • Hazardous Material Survey

Issue and Assessment Requirements	Documentation
materials survey.	
18. Aboriginal Cultural Heritage • Provide an Aboriginal Cultural Heritage Assessment Report prepared in accordance with relevant guidelines, identifying, describing and assessing any impacts on any Aboriginal cultural heritage values on the land.	• Aboriginal Cultural Heritage Assessment Report
19. Environmental Heritage • Where there is potential for direct or indirect impacts on the heritage significance of environmental heritage, provide a Statement of Heritage Impact and Archaeological Assessment (if potential impacts to archaeological resources are identified), prepared in accordance with the relevant guidelines, which assesses any impacts and outlines measures to ensure they are minimised and mitigated.	• Statement of Heritage Impact • Archaeological Assessment
20. Social Impact • Provide a Social Impact Assessment prepared in accordance with the *Social Impact Assessment Guidelines for State Significant Projects*.	• Social Impact Assessment
21. Infrastructure Requirements and Utilities • In consultation with relevant service providers: o assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site. o identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained. o provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development.	• Infrastructure Delivery, Management and Staging Plan
22. Bush Fire Risk • If the development is on bush fire prone land, or a bush fire threat is identified on or adjoining the site, provide a bush fire assessment that details proposed bush fire protection measures and demonstrates compliance with *Planning for Bush Fire Protection*.	• Bush Fire Assessment

Issue and Assessment Requirements	Documentation
23. Construction, Operation and Staging • If staging is proposed, provide details of how construction and operation would be managed and any impacts mitigated.	• Address in EIS
24. Contributions and Public Benefit • Address the requirements of any relevant contribution plan(s), planning agreement or EPI requiring a monetary contribution, dedication of land and/or works-in-kind and include details of any proposal for further material public benefit. • Where the development proposes alternative public benefits or a departure from an existing contributions framework, the local council, the Department and relevant State agencies are to be consulted prior to lodgement and details, including how comments have been addressed, are to be provided.	• Address in EIS
25. Engagement • Detail engagement undertaken and demonstrate how it was consistent with the *Undertaking Engagement Guidelines for State Significant Projects*. Detail how issues raised and feedback provided have been considered and responded to in the project. In particular, applicants must consult with: o the relevant Department assessment team. o any relevant local councils. o any relevant agencies (including the Western Parkland City Authority for development within the Western Parkland City). o the community. o if the development would have required an approval or authorisation under another Act but for the application of s 4.41 of the EP&A Act or requires an approval or authorisation under another Act to be applied consistently by s 4.42 of the EP&A Act, the agency relevant to that approval or authorisation.	• Engagement Report

Appendix F

BLACKTOWN COUNCIL CORESPONDENCE

E-MAIL DATED 25 March 2022 (Mr Christophe Ferguson)

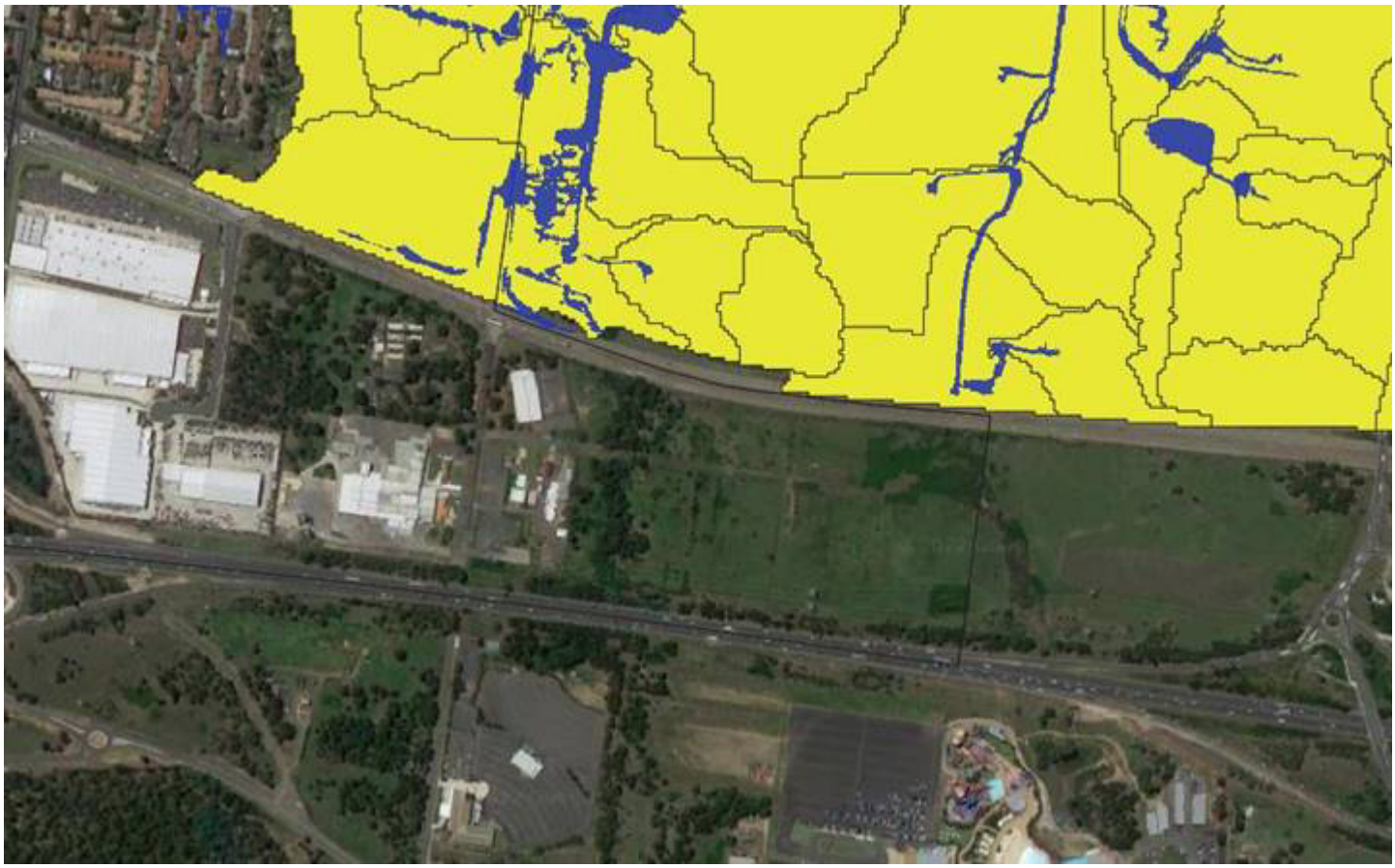
Referenced: *Augusta Street Blacktown - Flood Information*

Lourens de Villiers

From: Christophe Ferguson <Christophe.Ferguson@blacktown.nsw.gov.au>
Sent: Friday, 25 March 2022 4:11 PM
To: Lourens de Villiers
Cc: Flood Advice
Subject: Augusta Street Blacktown - Flood Information

Hi Lourens

The area in question does fall within the catchment of the UPRCT, however our Overland Flow Study flood extents (shown in blue below) and XP-RAFTS catchments (shown in yellow) do not cover your site. We would be happy to provide our latest Lidar data to assist you in the preparation of your own hydrologic and hydraulic assessment. Please note that with regards to flood related assessments, Blacktown Council requires new assessments to be undertaken using ARR 2019. If you would like to request LiDAR/ALS tiles, please email floodadvice@blacktown.nsw.gov.au



Kind Regards

Christophe Ferguson | Floodplain Officer
Blacktown City Council | PO Box 63 Blacktown NSW 2148
P. (02) 9839 6350 | E. Christophe.Ferguson@blacktown.nsw.gov.au |
W. www.blacktown.nsw.gov.au

From: Christophe Ferguson
Sent: Monday, 21 March 2022 4:31 PM
To: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Subject: RE: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148

Hi Lourens,

Thank you for your patience.

I have directed this request to my supervisor as they have the proper expertise to best try and satisfy your initial request. We shall respond in due course.

Kind Regards

Christophe Ferguson | Floodplain Officer
Blacktown City Council | PO Box 63 Blacktown NSW 2148
P. (02) 9839 6350 | E. Christophe.Ferguson@blacktown.nsw.gov.au |
W. www.blacktown.nsw.gov.au

From: Flood Advice
Sent: Wednesday, 16 March 2022 12:18 PM
To: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Cc: Christophe Ferguson <Christophe.Ferguson@blacktown.nsw.gov.au>
Subject: RE: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148

Hi Lourens,

Thank you for your email and for your time on the phone earlier.

As Christophe has been looking after your request unfortunately, I am unable to assist further with providing the information in his absence.

However, please be advised that I will follow up your query with Christophe upon his return next week.

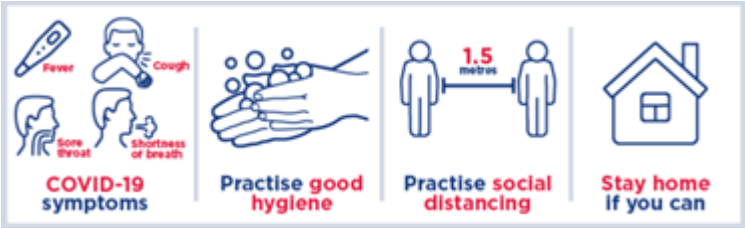
Kind Regards,

Amanda Schembri
Floodplain Support Officer

9839 6362

Amanda.Schembri@blacktown.nsw.gov.au
PO Box 63 Blacktown NSW 2148
blacktown.nsw.gov.au

Follow us on social media



From: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Sent: Monday, 14 March 2022 10:54 AM
To: Christophe Ferguson <Christophe.Ferguson@blacktown.nsw.gov.au>; Amanda Schembri <Amanda.Schembri@blacktown.nsw.gov.au>
Subject: RE: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148

Good Morning Amanda,

Kindly refer to my e-mail below.

I have spoken to Lee Toscan last week, who confirmed that Christophe have received my e-mail below and was busy obtaining the information. Would you be able to assist me in Christophe's absence?

Kind Regards

Best Regards,

Lourens de Villiers
Civil Design Engineer

Costin Roe Consulting Pty Ltd
ABN 50 003 696 446
Level 4, 8 Windmill Street, Walsh Bay
PO Box N419, Sydney, NSW 1220 Australia
tel: +61 2 9251 7699 fax: +61 2 9241 3731 mobile: 0488 448 277
email: lourens.devilliers@costinroe.com.au
web: www.costinroe.com.au

Postal address: PO Box N419, Sydney NSW 1220
Phone: 02-9251 7699 Fax: 02-9241 3731
Email: mail@costinroe.com.au Email: mail@strataeng.com.au Web: www.costinroe.com.au

Offices in Sydney, Adelaide, Brisbane, Melbourne, Newcastle and Wollongong.

The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review retransmission, dissemination, or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is

prohibited. If you receive this in error, please contact the sender and delete the material from any computer. It is the duty of the recipient to virus scan and otherwise test the information provided before loading it onto any computer system. Costin Roe Consulting Pty Ltd does not warrant that the information is free of a virus or any other defect or error.

From: Lourens de Villiers
Sent: Monday, 14 March 2022 10:49 AM
To: 'Christophe.Ferguson@blacktown.nsw.gov.au' <Christophe.Ferguson@blacktown.nsw.gov.au>
Subject: RE: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148

Good morning Christophe,

This is just a friendly follow up on the below request. Could you kindly give me an indication of when we could expect this information, to plan my outputs for the week around this date.

Thank you

From: Lourens de Villiers
Sent: Monday, 7 March 2022 8:31 AM
To: 'Christophe.Ferguson@blacktown.nsw.gov.au' <Christophe.Ferguson@blacktown.nsw.gov.au>
Subject: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148 [Filed 07 Mar 2022 08:31]

Good morning, Christophe,

I spoke to Fay Buttler this morning, who referred me to you wrt the below information. I have also sent an e-mail to floodadvice@blacktown.nsw.gov.au on Friday, 25 Feb 2022, requesting this information, but have not yet received any feedback or direction to obtain this information.

I am in the process of obtaining stormwater and flood information for a site located as shown on the figure 1 below, and I am hoping you could kindly assist me with this information or directing me to the correct person who could assist me with obtaining this data.

I am specifically looking for the following information:

1. To obtain the 1% AEP and PMF hydrographs around this site (locations A-F shown on the figure below)
2. To obtain information on flooding and flood levels

Site Information:
Address: Augusta Street, Blacktown, NSW, 2148.
Coordinate: 33°48'8.23"S, 150°54'24.95"E
Google Maps link: https://goo.gl/maps/Jdpciz7Z5tBJSvEL9



Figure 1 - Location of Site and locations where flood hydrographs are required

Looking forward to hearing from you, and please do not hesitate to let me know if you require more information from my side. I will give you a call a bit later this afternoon to discuss this request if needed.

Thank you in advance.

This email and any files transmitted with it may be confidential and contain privileged information. It is intended solely for the use of the addressee only. If you are not the intended recipient you must not use,

disclose or copy this communication. If you have received this email in error please delete it and notify the sender. This footnote also confirms that this email message has been swept for the presence of computer viruses.

Appendix G

BLACKTOWN COUNCIL CORESPONDENCE

E-MAIL DATED 9 May 2022 (Flood Advice at Blacktown City Council)

Referenced: *Hyder Stormwater Report Augusta Street Blacktown*

Lourens de Villiers

From: Flood Advice <floodadvice@blacktown.nsw.gov.au>
Sent: Monday, 9 May 2022 11:42 AM
To: Lourens de Villiers
Subject: Hyder Stormwater Report Augusta Street Blacktown

Hi Lourens,

Thank you for your email.

The "*Hyder Consulting. 2007. Huntingwood East Precinct Civil Infrastructure and Stormwater Report*" was prepared by **Hyder Consulting** for **DBL Property Pty Ltd**.

As the report is not a Council document, we kindly suggest contacting either *Hyder Consulting* or *DBL Property Pty Ltd* to obtain.

We hope this has provided some clarification.

Kind Regards

Flood Advice at Blacktown City Council
Blacktown City Council | PO Box 63 Blacktown NSW 2148
P. (02) 9839 6350 | E. floodadvice@blacktown.nsw.gov.au |
W. www.blacktown.nsw.gov.au

From: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Sent: Monday, 9 May 2022 11:07 AM
To: Amanda Schembri <Amanda.Schembri@blacktown.nsw.gov.au>
Subject: FW: Hyder Stormwater Report: Augusta Street, Blacktown, NSW, 2148

Good morning Amanda,

With reference to our telephonic conversation last week regarding the below "*Hyder Consulting. 2007. Huntingwood East Precinct Civil Infrastructure and Stormwater Report*", could you kindly confirm that for whom this report was completed?

You mentioned that it was completed for DPI, could you confirm whether this is the Dept. of Primary Industries or a different private company?

Thank you

From: Lourens de Villiers
Sent: Tuesday, 3 May 2022 9:55 AM
To: floodadvice@blacktown.nsw.gov.au

Cc: Hiroshi Ueki <hiroshi.ueki@costinroe.com.au>; Xavier Cure <Xavier.Cure@costinroe.com.au>
Subject: Hyder Stormwater Report: Augusta Street, Blacktown, NSW, 2148

Good morning,

Thank you for taking my call this morning.

As discussed, we are busy doing an internal flood study of the sites along Augusta Street in the Blacktown LGA, within the Huntingwood Precinct. Your Huntingwood Precinct DCP (together with various other available reports) make several references to a Stormwater report for this Huntingwood Precinct completed by Hyder Consulting.

The report that we are looking for is referenced as "*Hyder Consulting. 2007. Huntingwood East Precinct Civil Infrastructure and Stormwater Report*" in the Huntingwood Precinct DCP, but there are also mention of this report as being completed in January 2010.

Could you kindy assist us with obtaining access to this report?

Please refer to our historical e-mail below for details about the location of the site.

Thank you in advance.

From: Lourens de Villiers
Sent: Monday, 7 March 2022 8:31 AM
To: 'Christophe.Ferguson@blacktown.nsw.gov.au' <Christophe.Ferguson@blacktown.nsw.gov.au>
Subject: Flood Hydrograph information and Flood Advice Letter: Augusta Street, Blacktown, NSW, 2148 [Filed 07 Mar 2022 08:31]

Good morning, Christophe,

I spoke to Fay Buttler this morning, who referred me to you wrt the below information. I have also sent an e-mail to floodadvice@blacktown.nsw.gov.au on Friday, 25 Feb 2022, requesting this information, but have not yet received any feedback or direction to obtain this information.

I am in the process of obtaining stormwater and flood information for a site located as shown on the figure 1 below, and I am hoping you could kindly assist me with this information or directing me to the correct person who could assist me with obtaining this data.

I am specifically looking for the following information:

1. To obtain the 1% AEP and PMF hydrographs around this site (locations A-F shown on the figure below)
2. To obtain information on flooding and flood levels

Site Information:
Address: Augusta Street, Blacktown, NSW, 2148.
Coordinate: 33°48'8.23"S, 150°54'24.95"E
Google Maps link: https://goo.gl/maps/Jdpciz7Z5tBJSvEL9



Figure 1 - Location of Site and locations where flood hydrographs are required

Looking forward to hearing from you, and please do not hesitate to let me know if you require more information from my side. I will give you a call a bit later this afternoon to discuss this request if needed.

Thank you in advance.

This email and any files transmitted with it may be confidential and contain privileged information. It is intended solely for the use of the addressee only. If you are not the intended recipient you must not use, disclose or copy this communication. If you have received this email in error please delete it and notify the sender. This footnote also confirms that this email message has been swept for the presence of computer viruses.

Appendix H

BLACKTOWN COUNCIL CORESPONDENCE

E-MAIL DATED 20 June 2022 (Mr Laith Almoil)

Referenced: *Blacktown City Council - OSD Deemed to Comply Tool*

Lourens de Villiers

From: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Sent: Monday, 20 June 2022 10:13 AM
To: Lourens de Villiers
Cc: Andrew.Jones@blacktown.nsw.gov.au; Tony Merrilees
Subject: RE: Blacktown City Council - OSD Deemed to Comply Tool

Follow Up Flag: Follow up
Flag Status: Completed

Hi Lourens

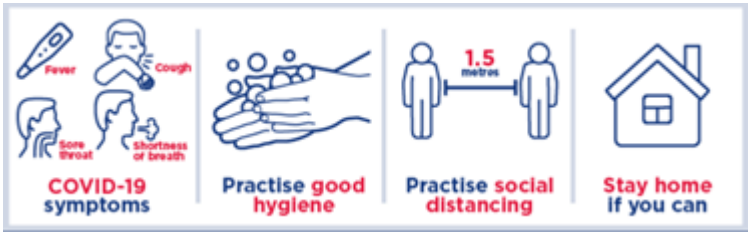
Yes that is the latest spreadsheet. It is used throughout the Blacktown LGA including Huntingwood.

Regards

Laith Almoil
Senior Drainage Engineer (Development Assessment)

9839 6821
Laith.Almoil@blacktown.nsw.gov.au
PO Box 63 Blacktown NSW 2148
blacktown.nsw.gov.au

Follow us on social media



From: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Sent: Friday, 17 June 2022 3:04 PM
To: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Cc: Andrew.Jones@blacktown.nsw.gov.au; Tony Merrilees <Tony.Merrilees@blacktown.nsw.gov.au>
Subject: Blacktown City Council - OSD Deemed to Comply Tool

Good afternoon Laith,

Hope you are doing well.

Could you kindly confirm whether:

1. the attached OSD Deemed to Comply tool version 2.3.0 is the latest spreadsheet available for OSD calculations and
2. that this spreadsheet is to be used for a development's OSD calculations within the Huntingwood Precinct Development area.

Thank you very much.

Lourens de Villiers
Civil Design Engineer



Costin Roe Consulting Pty Ltd
ABN 50 003 696 446
Level 4, 8 Windmill Street, Millers Point
PO Box N419, Sydney, NSW 1220 Australia
p: +61 2 9251 7699
m: +61 488 448 277
e: lourens.devilliers@costinroe.com.au
w: costinroe.com.au

Offices in Sydney, Adelaide, Brisbane, Melbourne, Newcastle and Wollongong.

The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review retransmission, dissemination, or other use of, or taking
of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. If you receive this in error, please contact the sender and delete the material from any computer. It is
the duty of the recipient to virus scan and otherwise test the information provided before loading it onto any computer system. Costin Roe Consulting Pty Ltd does not warrant that the information is free of a virus or
any other defect or error.

This email and any files transmitted with it may be confidential and contain privileged information. It is intended solely for the use of the addressee only. If you are not the intended recipient you must not use, disclose or copy this communication. If you have received this email in error please delete it and notify the sender. This footnote also confirms that this email message has been swept for the presence of computer viruses.

Lourens de Villiers

From: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Sent: Monday, 1 May 2023 10:20 AM
To: Lourens de Villiers
Subject: RE: Blacktown City Council - OSD Deemed to Comply Tool

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Lourens

For Huntingwood development it is the higher volume of:

1. Councils OSD spreadsheet as you have attached v1.9 is still suitable; or
2. Pre to post modelling with runoff volumes to be maintained.

Also please refer to Huntingwood DCP

Regards

Laith Almoil
Development Services Engineer
9839 6224

Blacktown City Council

PO Box 63 Blacktown NSW 2148
blacktown.nsw.gov.au

From: Lourens de Villiers <lourens.devilliers@costinroe.com.au>
Sent: Friday, 28 April 2023 3:41 PM
To: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Subject: FW: Blacktown City Council - OSD Deemed to Comply Tool

Good afternoon Laith,

Could you kindly confirm the below would still apply for our proposed development within the Huntingwood Precinct.

1. the attached OSD Deemed to Comply tool version 1.9 is the spreadsheet that should be used for OSD calculations (rather than the latest 2.3.0 version) and
2. that this spreadsheet is to be used for a development's OSD calculations within the **Huntingwood Precinct Development** area.

Thank you kindly.

Lourens de Villiers
Civil Design Engineer

Costin Roe Consulting Pty Ltd
ABN 50 003 696 446
Level 4, 8 Windmill Street, Millers Point
PO Box N419, Sydney, NSW 1220 Australia
p: +61 2 9251 7699
m: +61 488 448 277
e: lourens.devilliers@costinroe.com.au
w: costinroe.com.au

Offices in Sydney, Adelaide, Brisbane, Melbourne, Newcastle and Wollongong.

The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review retransmission, dissemination, or other use of, or taking
of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. If you receive this in error, please contact the sender and delete the material from any computer. It is
the duty of the recipient to virus scan and otherwise test the information provided before loading it onto any computer system. Costin Roe Consulting Pty Ltd does not warrant that the information is free of a virus or
any other defect or error.

From: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Sent: Monday, February 27, 2023 11:00 AM
To: Italo Leardini <italo.leardini@costinroe.com.au>
Subject: RE: Blacktown City Council - OSD Deemed to Comply Tool

Hi Italo

Andrew Jones (CC'd) no longer works in Council. The latest OSD spreadsheet has a few glitches unfortunately.

So you can either design the OSD as per S3QM or use the attached spreadsheet.

Let me know if you run into any issues.

Regards

Laith Almoil
Development Services Engineer

9839 6224
Laith.Almoil@blacktown.nsw.gov.au
PO Box 63 Blacktown NSW 2148
blacktown.nsw.gov.au

From: Italo Leardini <italo.leardini@costinroe.com.au>
Sent: Monday, 27 February 2023 10:27 AM
To: Laith Almoil <Laith.Almoil@blacktown.nsw.gov.au>
Cc: Andrew.Jones@blacktown.nsw.gov.au
Subject: Blacktown City Council - OSD Deemed to Comply Tool

Good morning Laith,

Hope you are doing well.

Could you kindly confirm if the attached OSD Deemed to Comply tool version 2.3.0 is the latest spreadsheet available for OSD calculations? If not, Could you please provide the latest version?

Thank you very much.

Regards,
Italo Leardini
Design Engineer

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

Costin Roe Consulting Pty Ltd
ABN 50 003 696 446
Level 4, 8 Windmill Street, Millers Point
PO Box N419, Sydney, NSW 1220 Australia
p: +61 2 9251 7699
m: 0400 411 438
e: italo.leardini@costinroe.com.au
w: costinroe.com.au

Offices in Sydney, Adelaide, Brisbane, Melbourne, Newcastle and Wollongong.

The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review retransmission, dissemination, or other use of, or taking
of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. If you receive this in error, please contact the sender and delete the material from any computer. It is
the duty of the recipient to virus scan and otherwise test the information provided before loading it onto any computer system. Costin Roe Consulting Pty Ltd does not warrant that the information is free of a virus or
any other defect or error.

This email and any files transmitted with it may be confidential and contain privileged information. It is intended solely for the use of the addressee only. If you are not the intended recipient you must not use, disclose or copy this communication. If you have received this email in error please delete it and notify the sender. This footnote also confirms that this email message has been swept for the presence of computer viruses.
This email and any files transmitted with it may be confidential and contain privileged information. It is intended solely for the use of the addressee only. If you are not the intended recipient you must not use, disclose or copy this communication. If you have received this email in error please delete it and notify the sender. This footnote also confirms that this email message has been swept for the presence of computer viruses.

Appendix I

FLOOD ASSESSMENT

I.1. INTRODUCTION

I.1.1. Introduction

This Appendix is provided to confirm technical parameters adopted in the *Overland Flow Assessment*, as summarised in **Section 7** of this report, for the proposed industrial estate development. The *Study Area* has been identified by Blacktown City Council as being unaffected by overland flow through Blacktown Creek and the unnamed creek along the west of the site. The scope and primary objectives of the overland flow assessment, are as follows:

- Determine the design flows generated by the contributing external catchments for the 1% AEP & PMF; Hydrology would be based on RAFTS modelling.
- Assess the pre-development overland flow path through the development site for the 1% AEP storm event;
- Assess the post-development levels on the effect of overland flow around the development site for the listed range of storms including 1% AEP storm event so that potential impacts on the development can be assessed and mitigated;
- Confirm that there is no adverse impact to upstream, downstream and adjacent properties as a result of the development; and
- Confirm flood planning levels applicable to the development.

Appendix I provides technical detail to the summary and conclusions discussed in the **Section 7** of this report.

I.1.2. Survey/DTM

Survey is required to define the physical attributes of the floodplain topography including the channel cross sections and the associated floodplain levels.
The pre-development scenario survey has been compiled based on a detail site survey for areas within the site, and for areas external to the site where detail survey is not available, digital terrain information has been obtained through government sources in the form of ALS survey. The on-ground survey information was completed in and around the study area to properly define the existing overland flow path cross section and features.
For assessment of the post-development scenario, the proposed development levels and drainage system (where appropriate) were then added to the pre-developed survey surface to create a post developed surface to use in the TUFLOW model and scenario modelling. This DTM was imported to the TUFLOW model to simulate land filling and proposed compensation areas in and around the flood affected land.
The surveys and design surfaces were used as the basis for the digital terrain model (DTM) used in the hydraulic modelling of the pre and post development scenario respectively.

I.1.3. Previous Studies

Hyder have undertaken a flood study of the the development site and the surrounding area in January 2010 (document ref: DN00214). The study was completed in support of a rezoning application for the Huntingwood East Precinct.
The site is located within the Industrial Zone and an excerpt of the flood model output is shown in **Figure I1.1**. Two creeks run through the development site, Blacktown Creek on the east, and an unnamed swale (hereon referred to as the Drainage Swale) to the west.

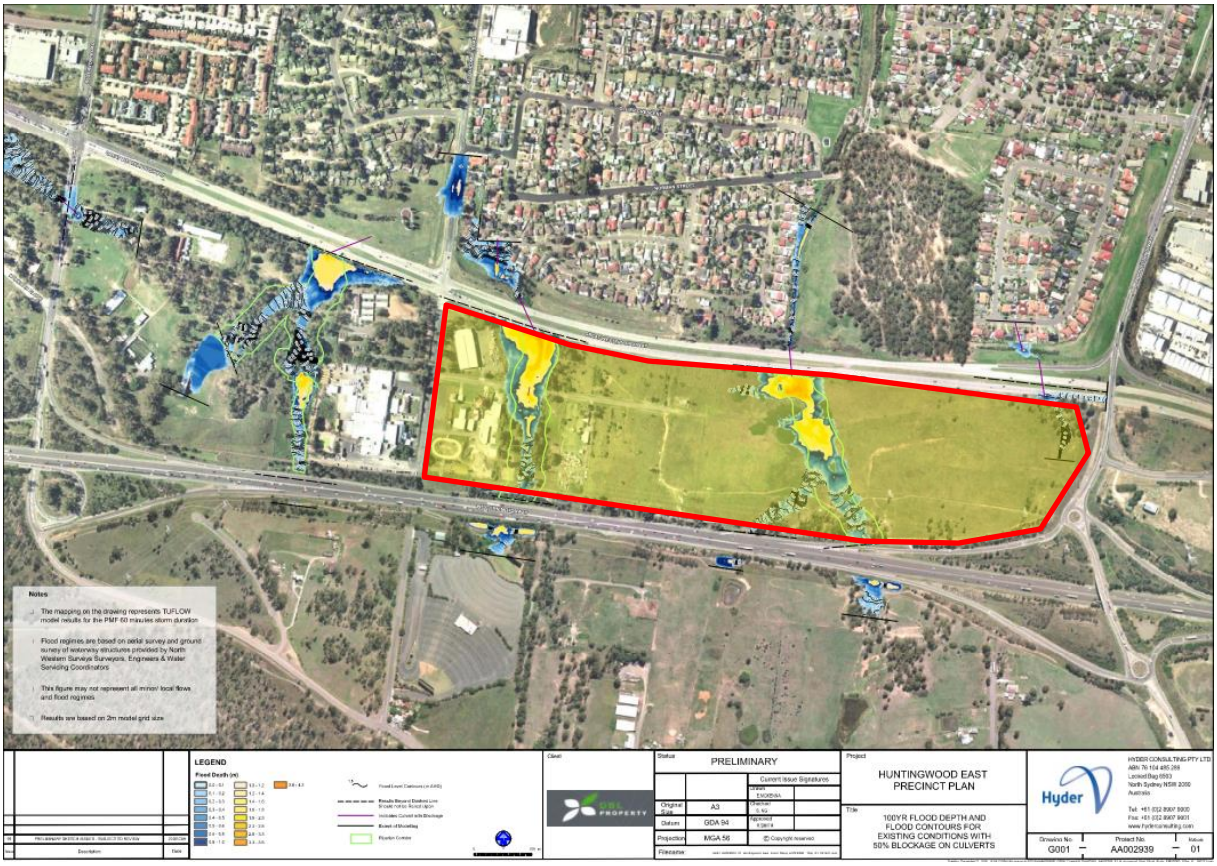


Figure I1.1. Excerpt of Drawing G001 of Hyder 2010 Study

I.2 CATCHMENT INVESTIGATION & HYDROLOGY

I.2.1. Contributing Catchment Definition

Three major upstream catchments on the southern side of the M4 Motorway contribute to the overland flows through the site. The contributing catchments comprises a combination of undeveloped and commercial land use, totalling approximately 55Ha.
Figure I2.1 & Figure I2.2 contains catchment breakdowns of the pre and post development conditions as defined in the flood model.

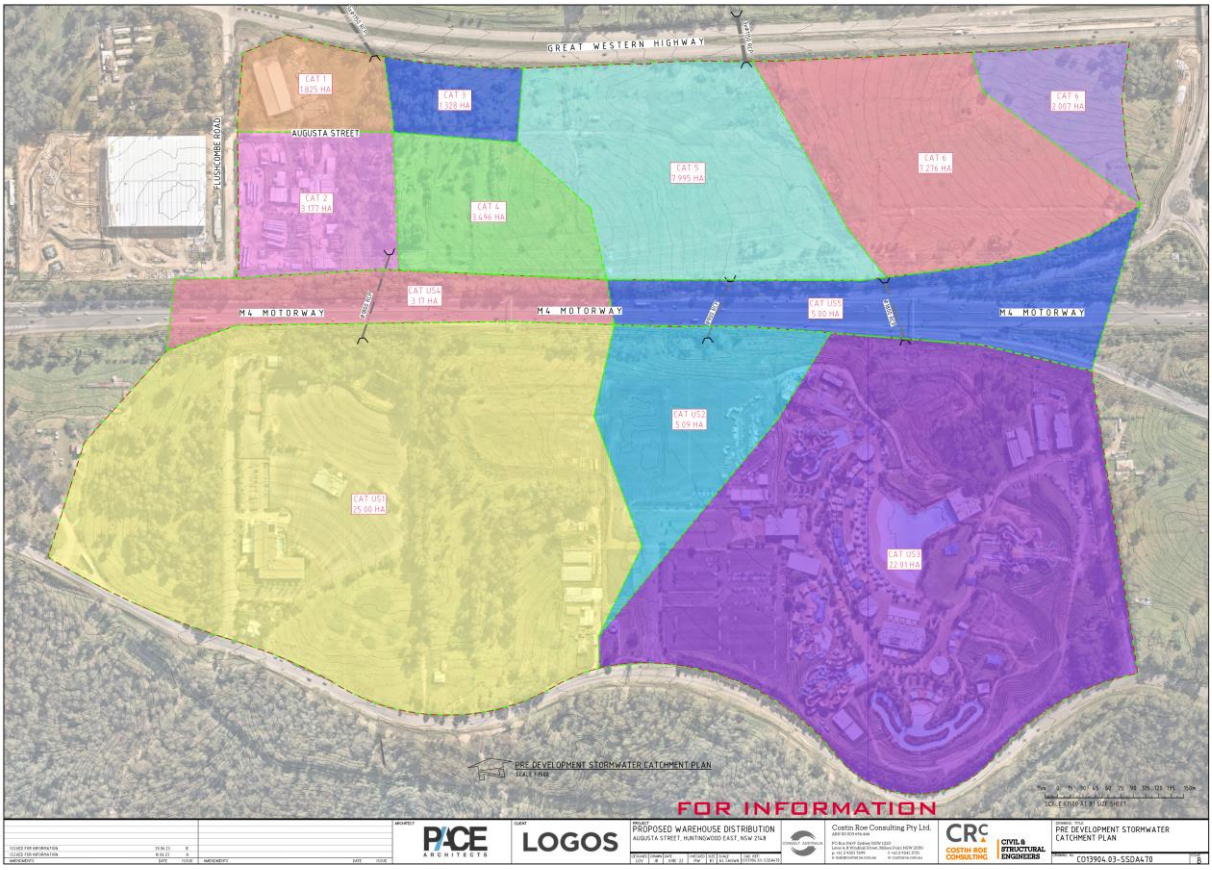


Figure I2.1. Pre-development Flood Model Catchment Plan.

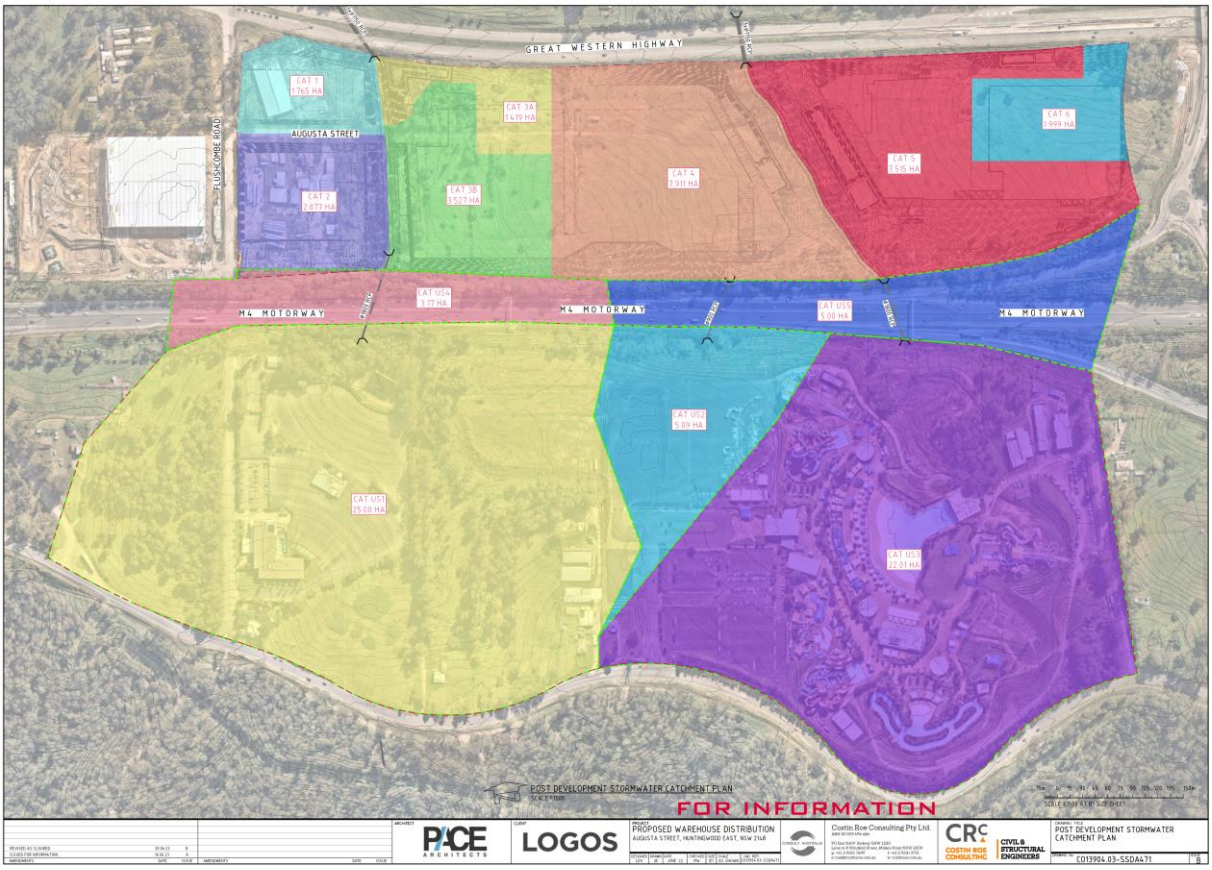


Figure I2.2 Post-development Flood Model Catchment Plan

I.2.2. Hydrological Assessment of Existing Catchment

Flood hydrographs were assessed using a DRAINS model based on the contributing catchments. The inflow hydrographs for catchments in the pre & post development conditions were extrapolated from the DRAINS model for the 1% AEP event. Inflow hydrographs for the upstream catchments on the opposite side of the M4 Motorway are shown in **Figure I2.3 to I2.5**. Hydrographs for the pre-developed site catchments for the 1% AEP event are provided in **Figures I2.6 to I2.11**. Hydrographs for the post-development site condition have taken into consideration the attenuation of discharge by the proposed OSD basins on each lot. These basins have been sized using the UPRCT Deemed-to-Comply spreadsheet, modelled in DRAINS, and hydrographs of their attenuated discharge have been extracted and shown in **Figure I2.12 to I2.17**.

Rainfall intensities and temporal patterns were derived from the Bureau of Meteorology online IFD tool and Australian Rainfall and Runoff. It was determined that the critical storm duration which produces peak flows for the contributing catchments is the 20 minute storm event.

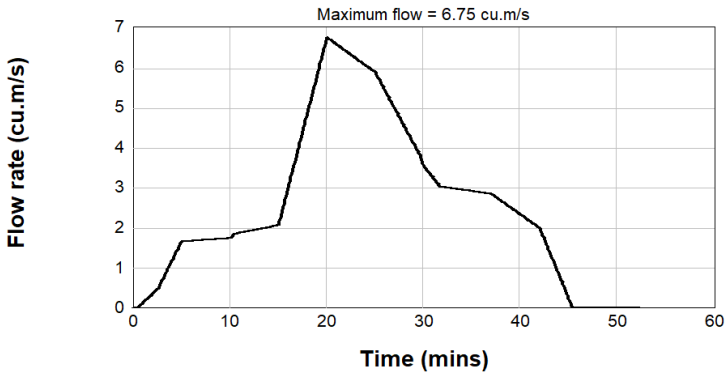


Figure I2.3. 1% AEP Inflow Hydrograph – USC 1.

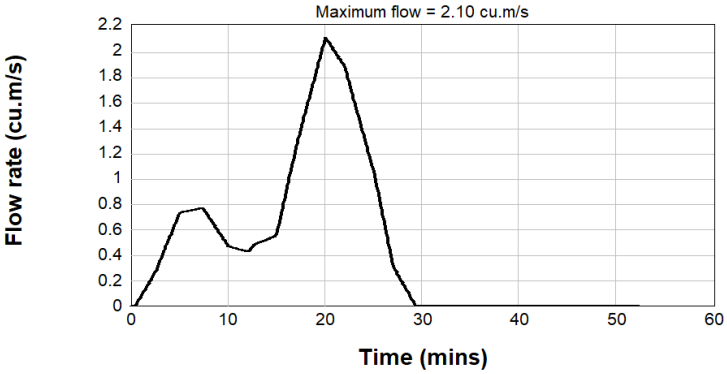


Figure I2.4. 1% AEP Inflow Hydrograph – USC 2.

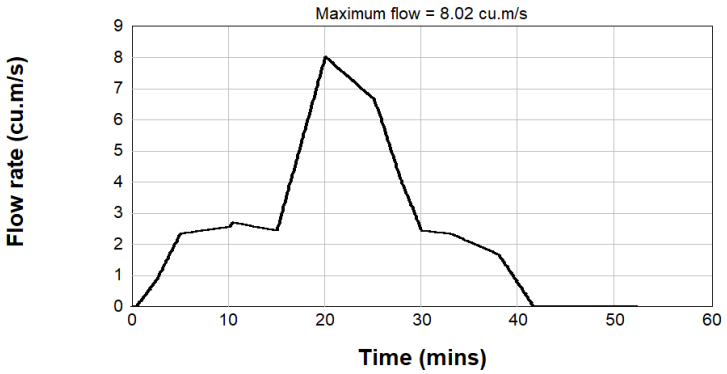


Figure I2.5. 1% AEP Inflow Hydrograph – USC 3.

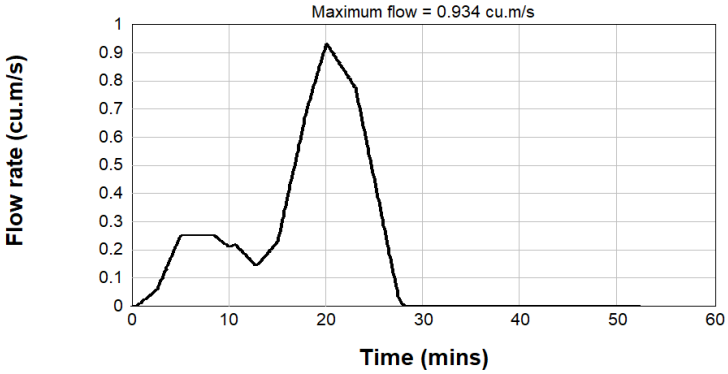


Figure I2.6. 1% AEP Inflow Hydrograph – Pre-dev Lot 1

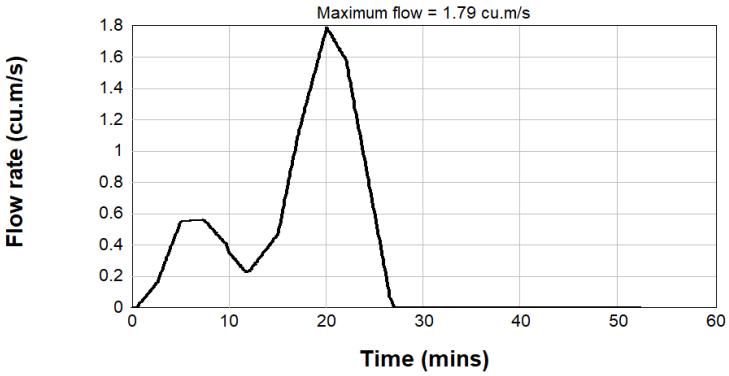


Figure I2.7. 1% AEP Inflow Hydrograph – Pre-dev Lot 2

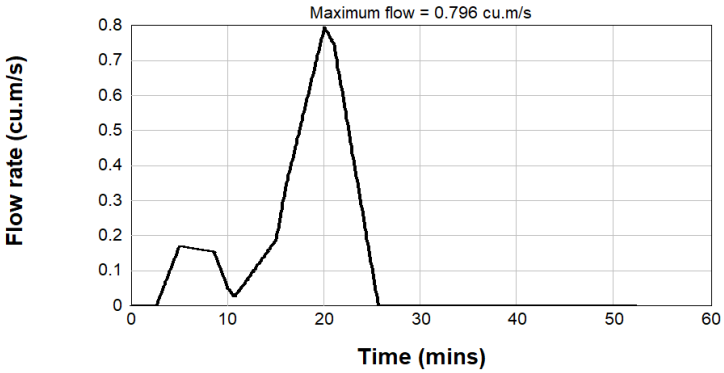


Figure I2.8. 1% AEP Inflow Hydrograph – Pre-dev Lot 3A

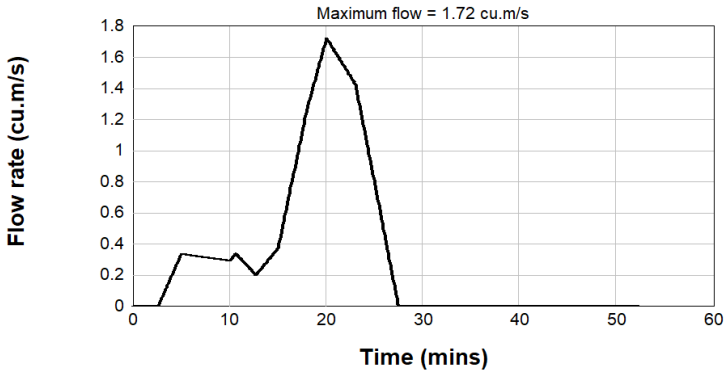


Figure I2.9 1% AEP Inflow Hydrograph – Pre-dev Lot 3B

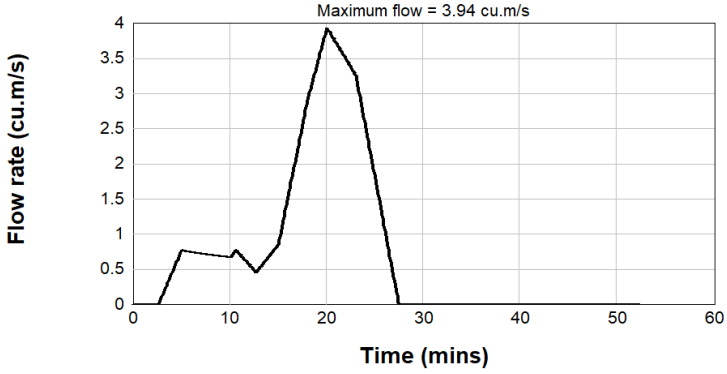


Figure I2.10 1% AEP Inflow Hydrograph – Pre-dev Lot 4

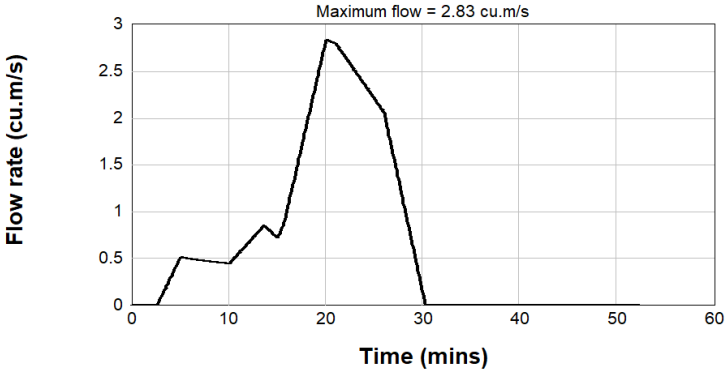


Figure I2.11 1% AEP Inflow Hydrograph – Pre-dev Lot 5A

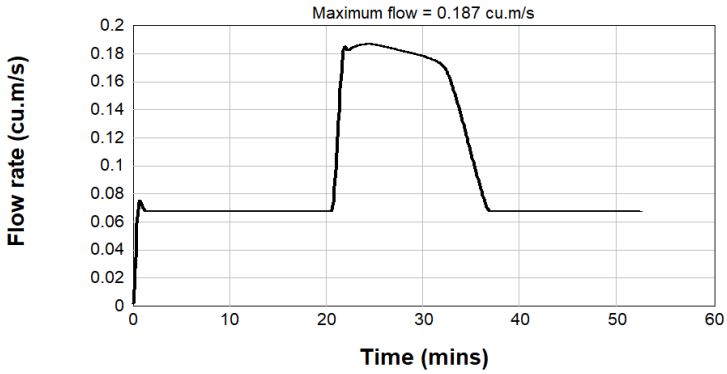


Figure I2.12 1% AEP Inflow Hydrograph – Post-dev Lot 1

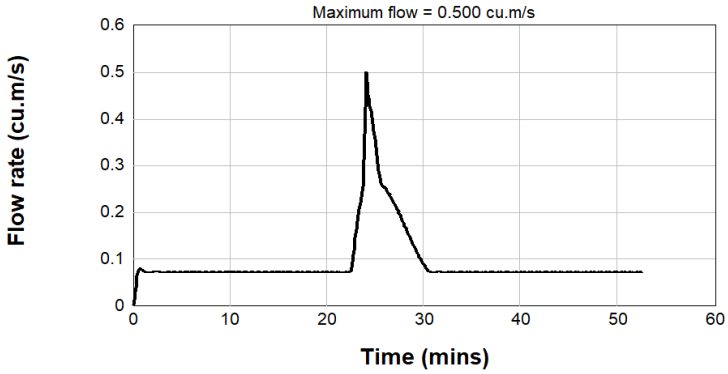


Figure I2.13 1% AEP Inflow Hydrograph – Post-dev Lot 2

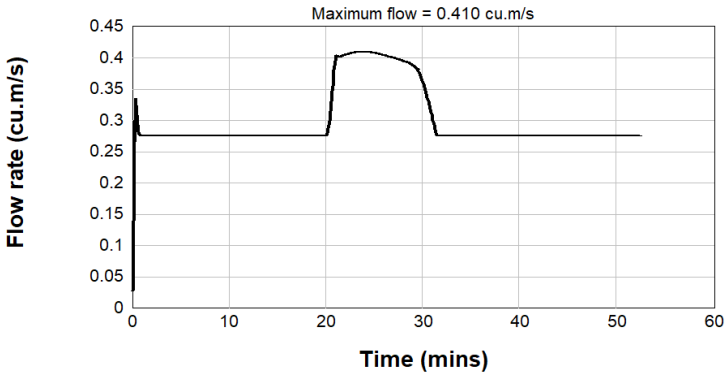


Figure I2.14 1% AEP Inflow Hydrograph – Post-dev Lot 3A

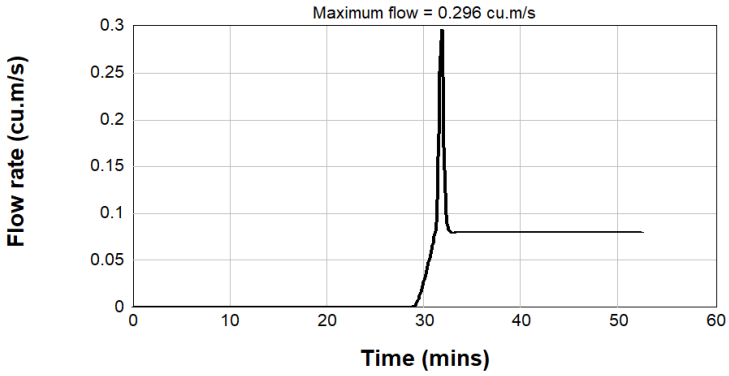


Figure I2.15 1% AEP Inflow Hydrograph – Post-dev Lot 3B

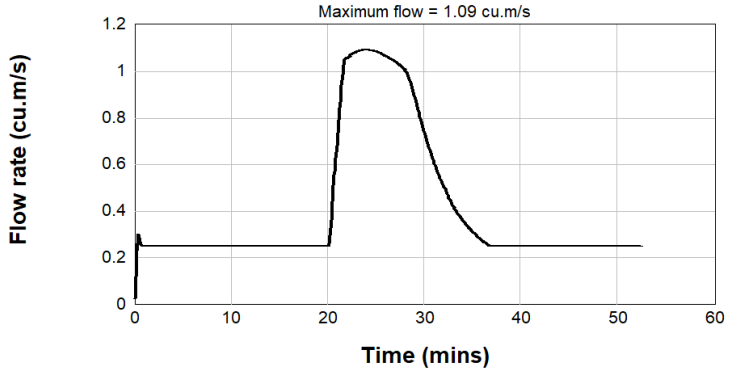


Figure I2.16 1% AEP Inflow Hydrograph – Post-dev Lot 4

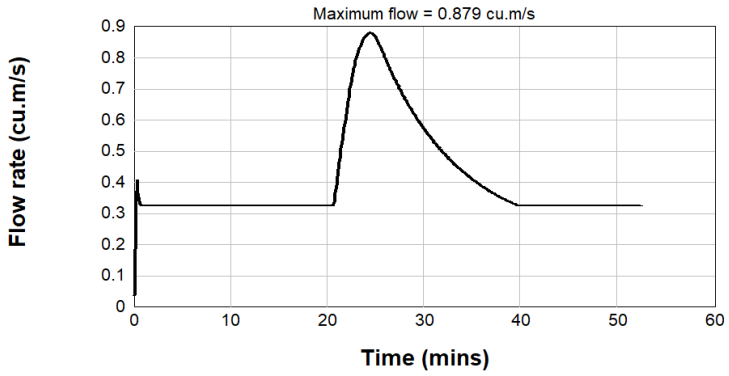


Figure I2.17 1% AEP Inflow Hydrograph – Post-dev Lot 5A

I.3 HYDRODYNAMIC MODEL DEVELOPMENT

I.3.1. Extent and Topography

The model extent is shown in **Figure I3.1** of this appendix. The model begins approximately 150m upstream of the development and extends approximately 300m downstream of the development site.

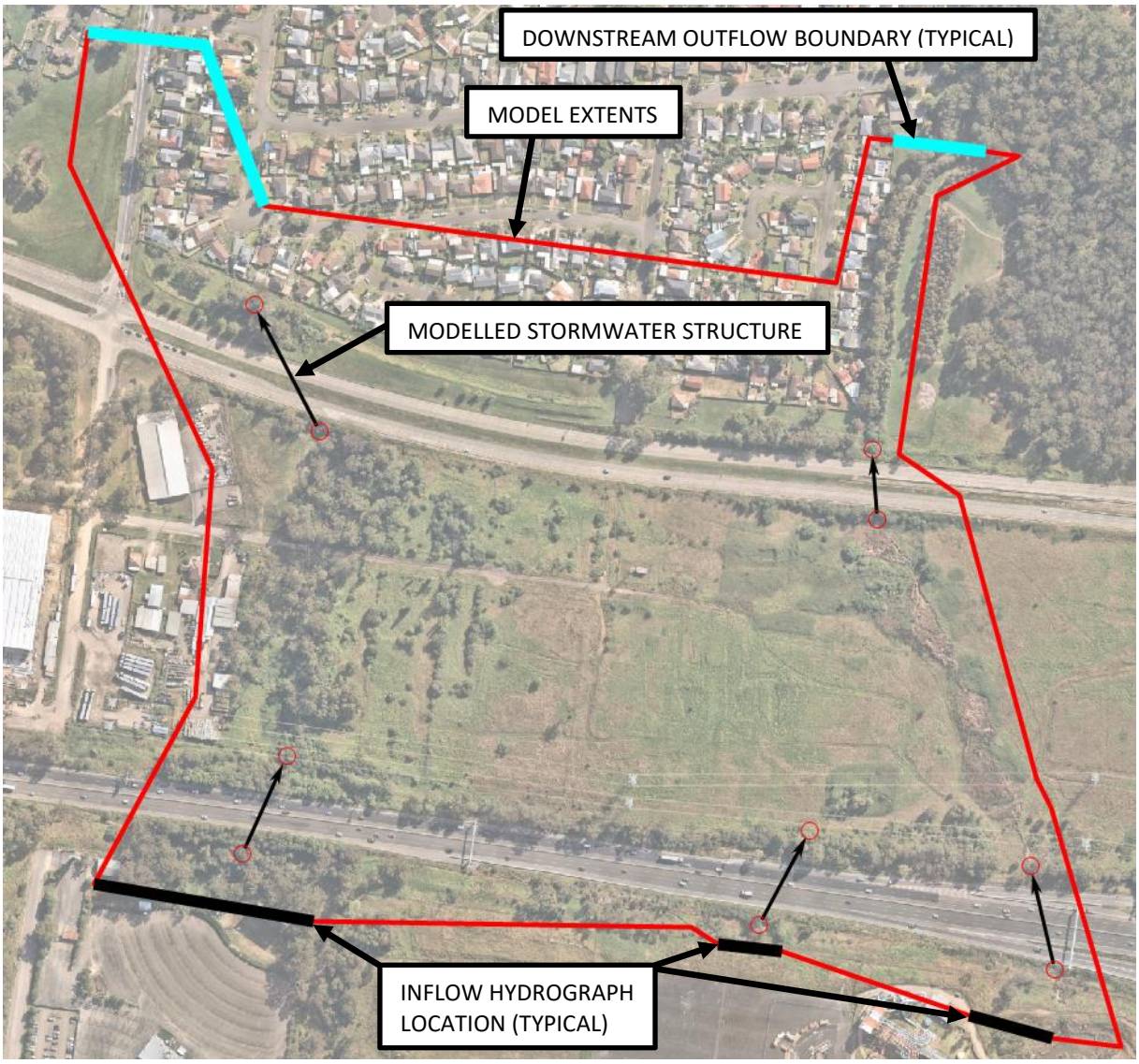


Figure I3.1: Model Extent and Model Boundary Locations

Inflow Boundaries

Design inflow hydrographs for the model have been included at the location approximately 150m upstream of the development site. Flows are based on hydrology as discussed in **Section I.2.2** of this Appendix.

The upstream boundary was located sufficiently upstream of the development to ensure the extent of predicted impacts from the development would be covered and any modelling iterations would be resolved clear of the development affectation zone.

Downstream Water Level Boundaries

The downstream water levels have been based on a normal outflow and design gradient of 1%.

Surrounding/ Modelled Stormwater Network

Modelling of the surrounding stormwater network has been based on survey information by North Western Surveys (document ref: 13989/005-01 dated November 2009) and Whelans (document ref: D336-002b dated April 2007).

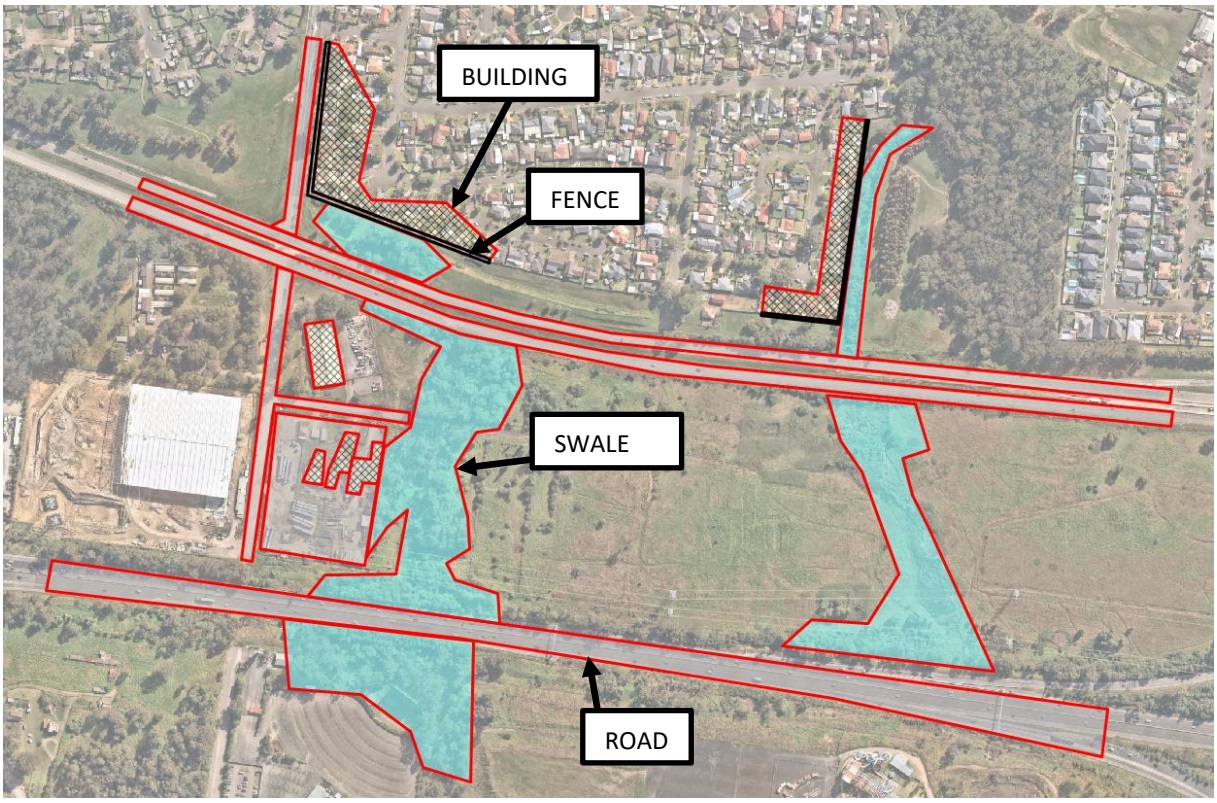
Several reinforced concrete pipes have been identified underneath the M4 Motorway and the Great Western Highway at the upstream and downstream ends of the site's creeks. Existing 2x900mm diameter reinforced concrete pipes have been modelled where the Drainage Swale crosses under Augusta Street in the pre-developed condition. As part of the proposed works, these pipes are to be replaced by 2x1200mm diameter pipes, which have been modelled in the post-development condition.

I.3.3. Channel and Floodplain Roughness

Roughness values adopted in the model are contained in **Table I2** below. These are generally consistent with previous studies completed within the Council area and have been adopted in this overland flow study. Refer to **Figure I3.2** for a breakdown of the adopted roughness values over the study area.

Table I2. Adopted TUFLOW Element Roughness Values

Model Element	Description	Roughness Parameter Value
1	Grassland (default)	0.035
2	Road	0.02
3	Swale	0.08
4	Building	0.1
5	Fence	2.0



I.3.4. Model Validation

Model validation has been completed by comparing results of the TUFLOW modelling against the results contained in the Hyder study from 2010. Model parameters were adjusted as required to achieve acceptable agreement between the model output. The process for the validation was as follows:

- Establish hydrology, peak flows and hydrograph for modelled events;
- Establish TUFLOW Model using defined parameters;
- Compare results of TUFLOW modelling with the Hyder Figures including flood depths, flood levels, flood extents and hydraulics. The comparison is made at the peak of the predicted parameters;

- Adjust roughness factors to align TUFLOW flood extent to align with the Hyder results.

Hydrology and peak flows were established as described in **Section J.2.2** of this report.
A number of trial models and iterations of the TUFLOW model were performed. Adjustment of roughness parameters were used to align the flood levels with those compiled in the Hyder figures.
The comparison of the flood level results shows general alignment of those produced in the TUFLOW model when compared with those of the council figures. The predicted flood extent is consistent between the two models for the flood event modelled.
Given the differences in modelling techniques, parameters, predicted model accuracy (+/- 0.2m) and model components these differences are considered acceptable for the base model and for continuation of post-developed scenario modelling.

I.3.5. Proposed Overland Flow Management Strategy

Flows from within the development sites have been only considered in the sizing of the stormwater system and erosion control for the development sites. The proposed buildings will be set at the 1% AEP level plus 0.5m freeboard per council policy.
Blacktown City Council require that overland flows from the upstream catchment to be conveyed through the site. Council also requires proof that the proposed development does not increase the flood risk to the surrounding properties. Further, the TUFLOW modelling and assessment confirms there is negligible impact on upstream, downstream and/ or adjoining sites as a result of the proposed developments.

I.4 MODEL OUTPUT

Model output for pre and post development conditions for the Catchment flooding events on site as discussed in earlier sections have been included in the following Figures.
We note the below figures represent predicted values at the peak of each event. The figures represent predicted values at the peak of the 1% AEP.

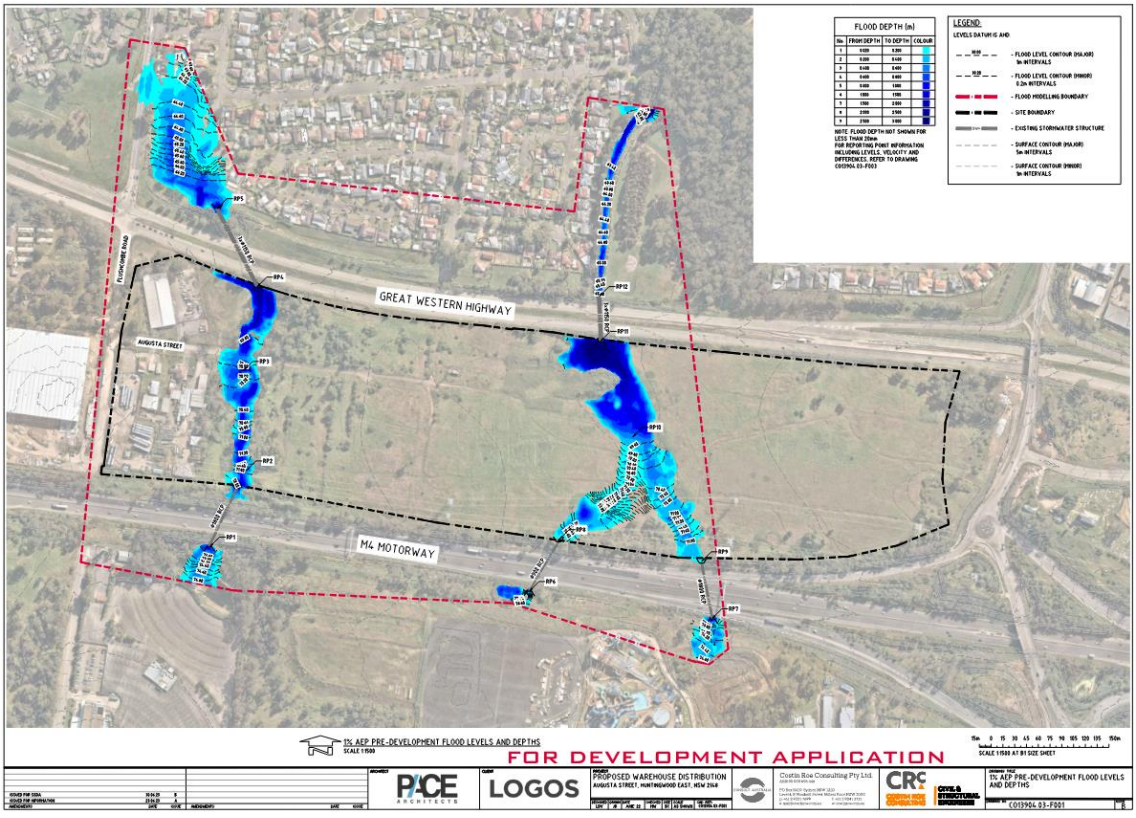


Figure J4.1: 1% AEP Flood Depths – Pre-Development

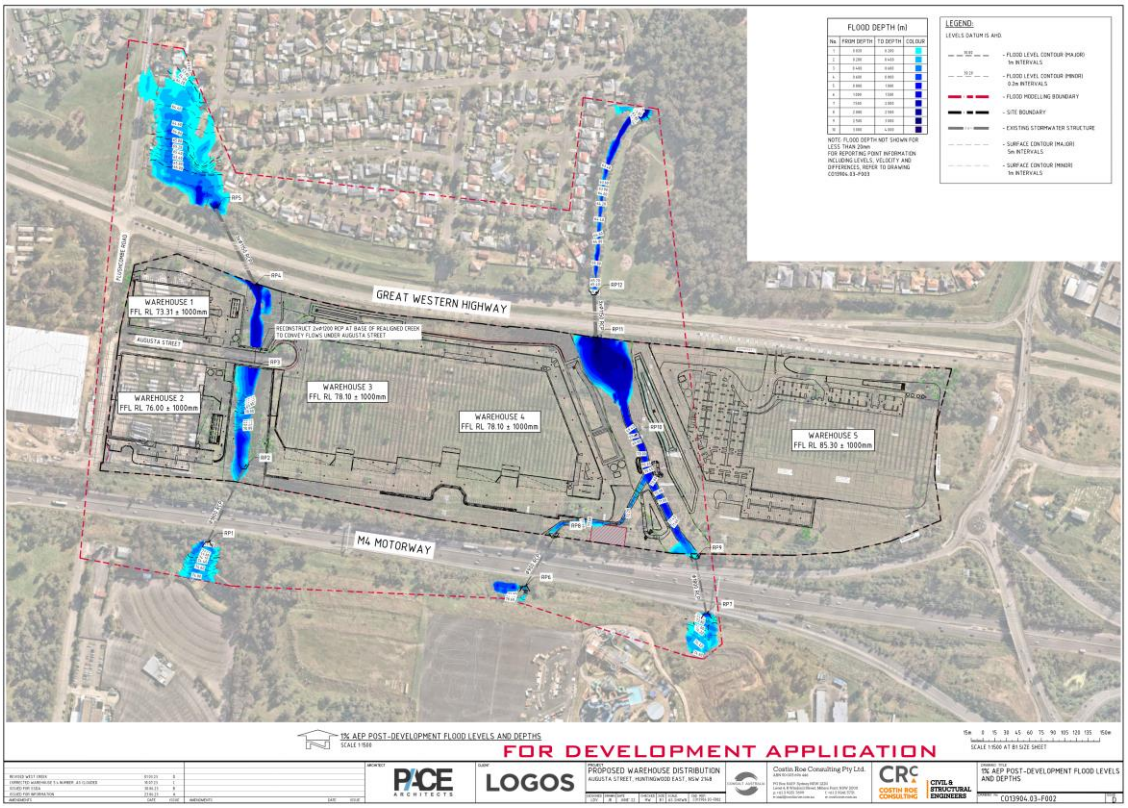


Figure I4.2: 1% AEP Flood Depths – Post Development

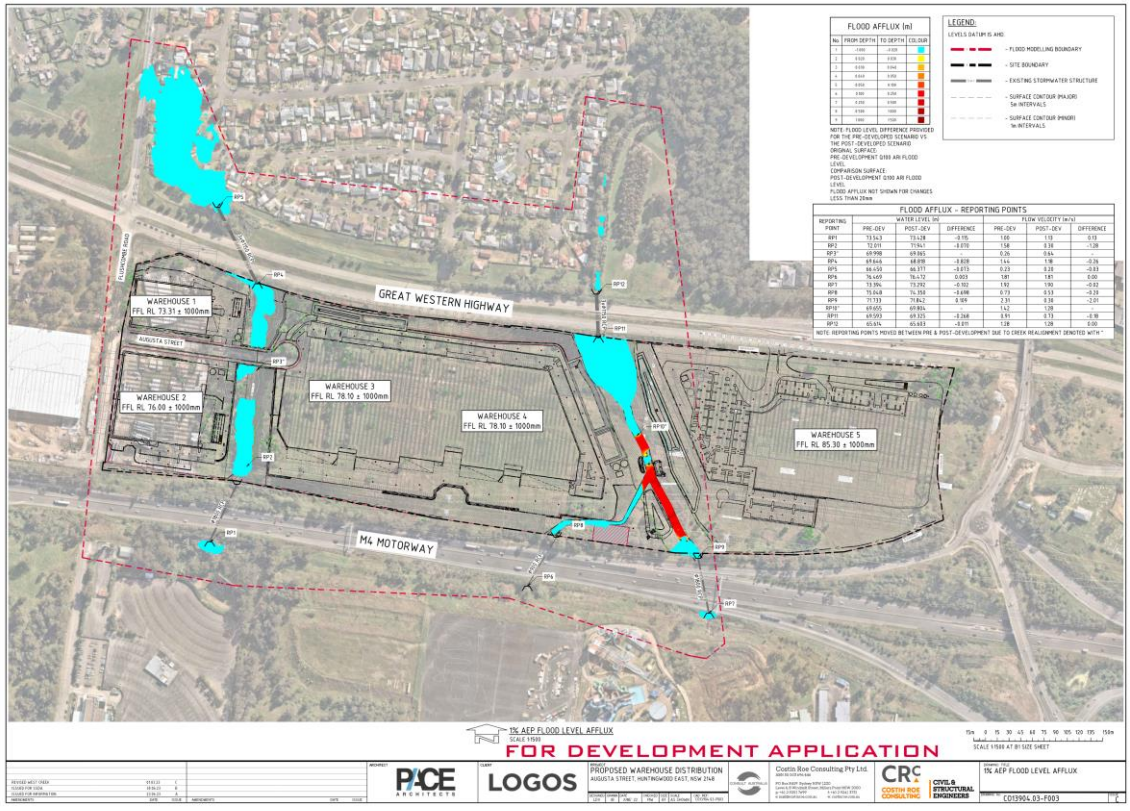


Figure I4.3: 1% AEP Flood Afflux Plan

I.1. FLOOD ASSESSMENT DISCUSSION

This Appendix to the *Civil Engineering Report* for Augusta Street Warehouse & Distribution Centre, NSW, has been prepared to assess the effect of flooding on the proposed development, and also to confirm no affectation on upstream downstream or adjoining properties.

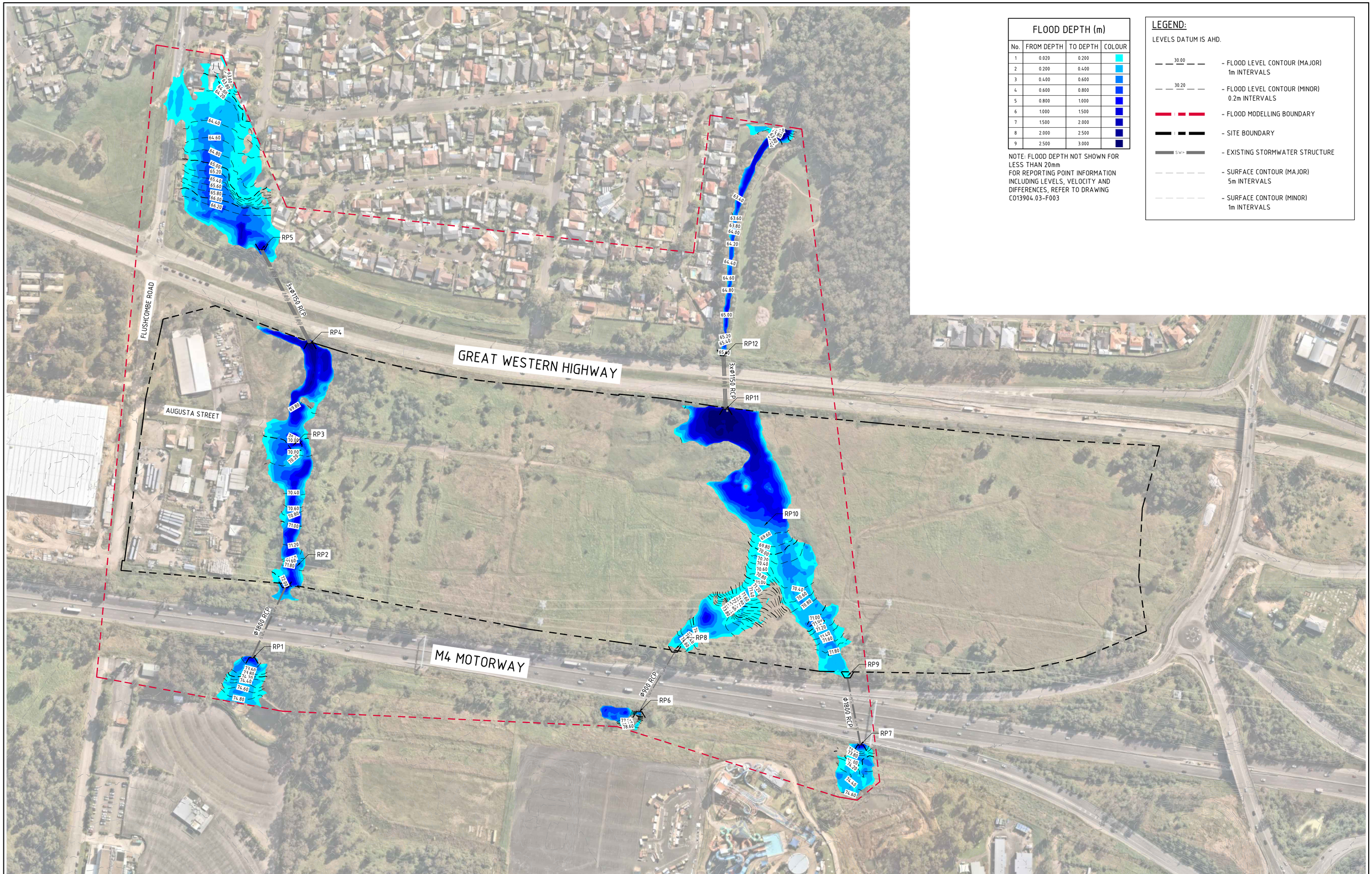
A TUFLOW hydrodynamic flood model has been completed and the pre and post development flood events assessed for the 1% AEP rainfall event.

The assessment shows a reduction in post development 1% AEP flood levels, hence meeting impact requirements.

The assessment shows the proposed building achieves flood planning and freeboard requirements. This Appendix confirms the technical input and detailed output completed as part of the assessment. **Appendix I** is to be read in conjunction with **Section 7** of this report.

Appendix I2

FLOOD ASSESSMENT FIGURES



FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm
FOR REPORTING POINT INFORMATION INCLUDING LEVELS, VELOCITY AND DIFFERENCES, REFER TO DRAWING C013904.03-F003

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

1% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F001

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS
DRAWING No: C013904.03-F001
ISSUE: B

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	
10	3.000	4.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm
FOR REPORTING POINT INFORMATION INCLUDING LEVELS, VELOCITY AND DIFFERENCES, REFER TO DRAWING C013904.03-F003

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLUSHCOMBE ROAD
GREAT WESTERN HIGHWAY
M4 MOTORWAY
AUGUSTA STREET
BOUNDARY
RP1
RP2
RP3
RP4
RP5
RP6
RP7
RP8
RP9
RP10
RP11
RP12
3x Ø1150 RCP
Ø1800 RCP
Ø900 RCP
RECONSTRUCT 2xØ1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
WAREHOUSE 1 FFL RL 73.31 ± 1000mm
WAREHOUSE 2 FFL RL 76.00 ± 1000mm
WAREHOUSE 3 FFL RL 78.10 ± 1000mm
WAREHOUSE 4 FFL RL 78.10 ± 1000mm
WAREHOUSE 5 FFL RL 85.30 ± 1000mm

1% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.23	D
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	C
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F002

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
DRAWING No: C013904.03-F002
ISSUE: D

FLOOD AFFLUX (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	-1.000	-0.020	
2	0.020	0.030	
3	0.030	0.040	
4	0.040	0.050	
5	0.050	0.100	
6	0.100	0.250	
7	0.250	0.500	
8	0.500	1.000	
9	1.000	1.500	

NOTE: FLOOD LEVEL DIFFERENCE PROVIDED FOR THE PRE-DEVELOPED SCENARIO VS THE POST-DEVELOPED SCENARIO
ORIGINAL SURFACE:
PRE-DEVELOPMENT Q100 ARI FLOOD LEVEL
COMPARISON SURFACE:
POST-DEVELOPMENT Q100 ARI FLOOD LEVEL
FLOOD AFFLUX NOT SHOWN FOR CHANGES LESS THAN 20mm

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD AFFLUX - REPORTING POINTS

REPORTING POINT	WATER LEVEL (m)			FLOW VELOCITY (m/s)		
	PRE-DEV	POST-DEV	DIFFERENCE	PRE-DEV	POST-DEV	DIFFERENCE
RP1	73.543	73.428	-0.115	1.00	1.13	0.13
RP2	72.011	71.941	-0.070	1.58	0.30	-1.28
RP3"	69.998	69.065	-	0.26	0.64	-
RP4	69.646	68.818	-0.828	1.44	1.18	-0.26
RP5	66.450	66.377	-0.073	0.23	0.20	-0.03
RP6	76.469	76.472	0.003	1.81	1.81	0.00
RP7	73.394	73.292	-0.102	1.92	1.90	-0.02
RP8	75.048	74.350	-0.698	0.73	0.53	-0.20
RP9	71.733	71.842	0.109	2.31	0.30	-2.01
RP10"	69.655	69.804	-	1.42	1.28	-
RP11	69.593	69.325	-0.268	0.91	0.73	-0.18
RP12	65.614	65.603	-0.011	1.28	1.28	0.00

NOTE: REPORTING POINTS MOVED BETWEEN PRE & POST-DEVELOPMENT DUE TO CREEK REALIGNMENT DENOTED WITH "

RP5
3x ø1150 RCP
RP4
FLUSHCOMBE ROAD
WAREHOUSE 1
FFL RL 73.31 ± 1000mm
GREAT WESTERN HIGHWAY
RP12
3x ø1150 RCP
RP11
AUGUSTA STREET
RP3"
WAREHOUSE 2
FFL RL 76.00 ± 1000mm
WAREHOUSE 3
FFL RL 78.10 ± 1000mm
WAREHOUSE 4
FFL RL 78.10 ± 1000mm
RP10"
WAREHOUSE 5
FFL RL 85.30 ± 1000mm
RP2
ø1800 RCP
RP1
M4 MOTORWAY
RP8
ø900 RCP
RP6
RP9
ø1800 RCP
RP7

1% AEP FLOOD LEVEL AFFLUX
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.23	C
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

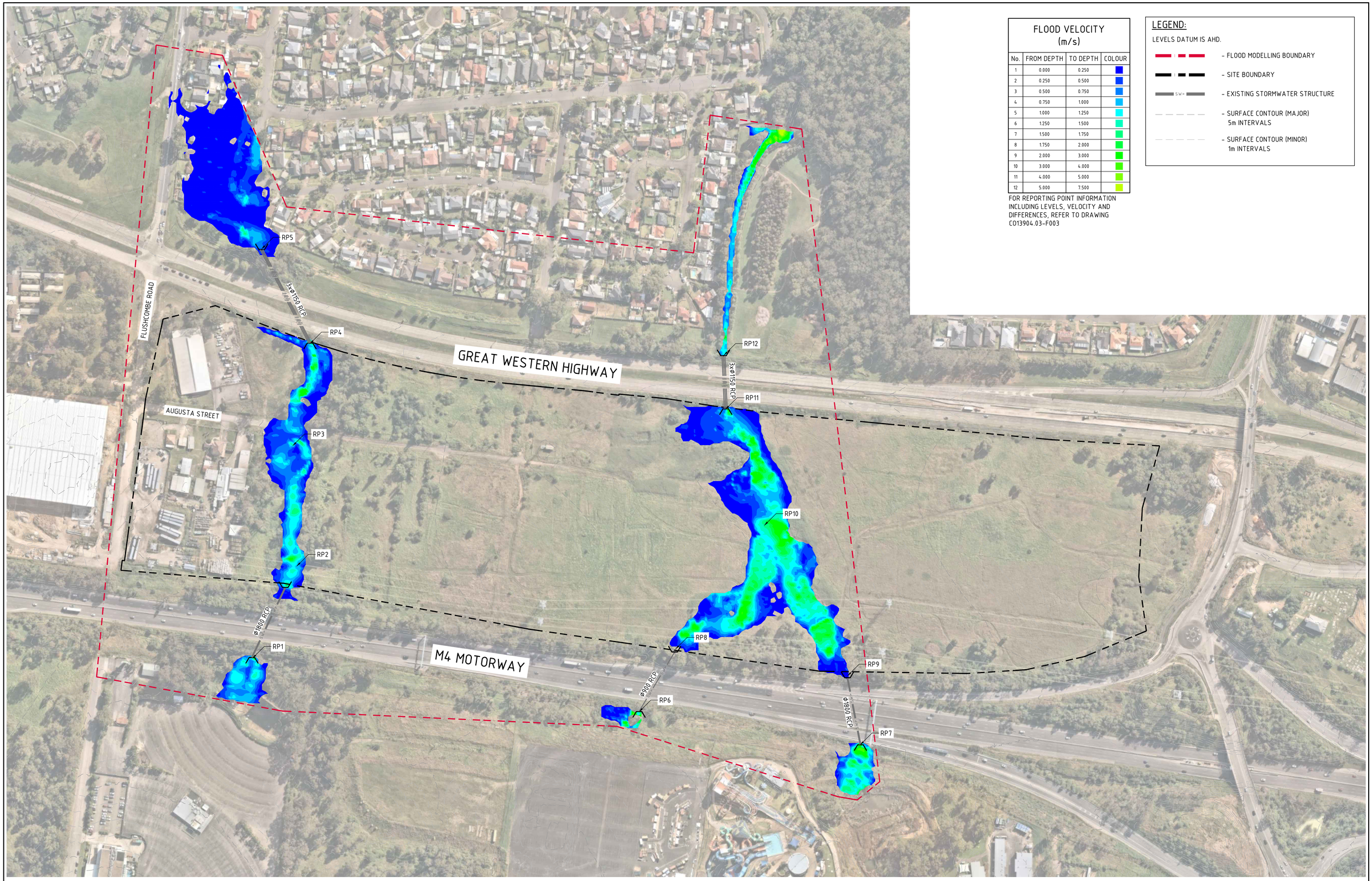
ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F003

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 6 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP FLOOD LEVEL AFFLUX
DRAWING No: C013904.03-F003
ISSUE: C



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

FOR REPORTING POINT INFORMATION INCLUDING LEVELS, VELOCITY AND DIFFERENCES, REFER TO DRAWING C013904.03-F003

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

1% AEP PRE-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.26	B
ISSUED FOR INFORMATION	23.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

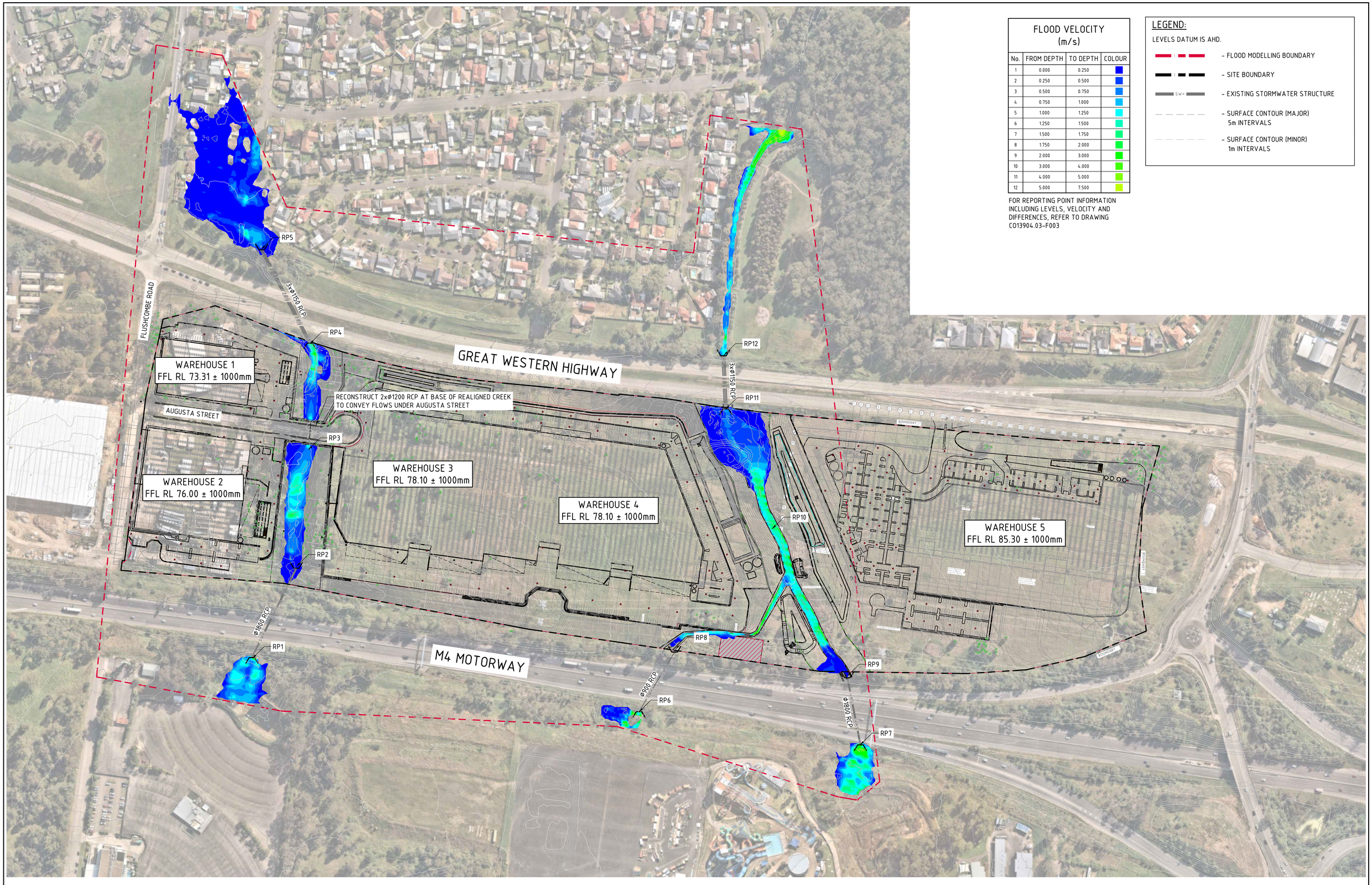
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F004

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP PRE-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F004 ISSUE: B



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

FOR REPORTING POINT INFORMATION INCLUDING LEVELS, VELOCITY AND DIFFERENCES, REFER TO DRAWING C013904.03-F003

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

1% AEP POST-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	D
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	C
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F005

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP POST-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F005 ISSUE: D

FLOOD VELOCITY AFFLUX (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	-5.000	-4.500	
2	-4.500	-4.000	
3	-4.000	-3.500	
4	-3.500	-3.000	
5	-3.000	-2.500	
6	-2.500	-2.000	
7	-2.000	-1.500	
8	-1.500	-1.000	
9	-1.000	-0.500	
10	-0.500	-0.100	
11	0.100	0.500	
12	0.500	1.000	
13	1.000	1.500	
14	1.500	2.000	
15	2.000	2.500	
16	2.500	3.000	
17	3.000	3.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

NOTE: FLOOD VELOCITY DIFFERENCE PROVIDED FOR THE PRE-DEVELOPED SCENARIO VS THE POST-DEVELOPED SCENARIO
ORIGINAL SURFACE:
PRE-DEVELOPMENT Q100 ARI FLOOD VELOCITY
COMPARISON SURFACE:
POST-DEVELOPMENT Q100 ARI FLOOD VELOCITY
FLOOD AFFLUX NOT SHOWN FOR CHANGES LESS THAN 0.1m/s

RP5
3x Ø1150 RCP
RP4
FLUSHCOMBE ROAD
GREAT WESTERN HIGHWAY
RP12
3x Ø1150 RCP
RP11
WAREHOUSE 1
FFL RL 73.31 ± 1000mm
AUGUSTA STREET
RP3'
WAREHOUSE 2
FFL RL 76.00 ± 1000mm
WAREHOUSE 3
FFL RL 78.10 ± 1000mm
WAREHOUSE 4
FFL RL 78.10 ± 1000mm
RP10'
WAREHOUSE 5
FFL RL 85.30 ± 1000mm
RP2
Ø1800 RCP
RP1
M4 MOTORWAY
RP8
Ø900 RCP
RP6
Ø1800 RCP
RP9
RP7

1% AEP FLOOD VELOCITY AFFLUX
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

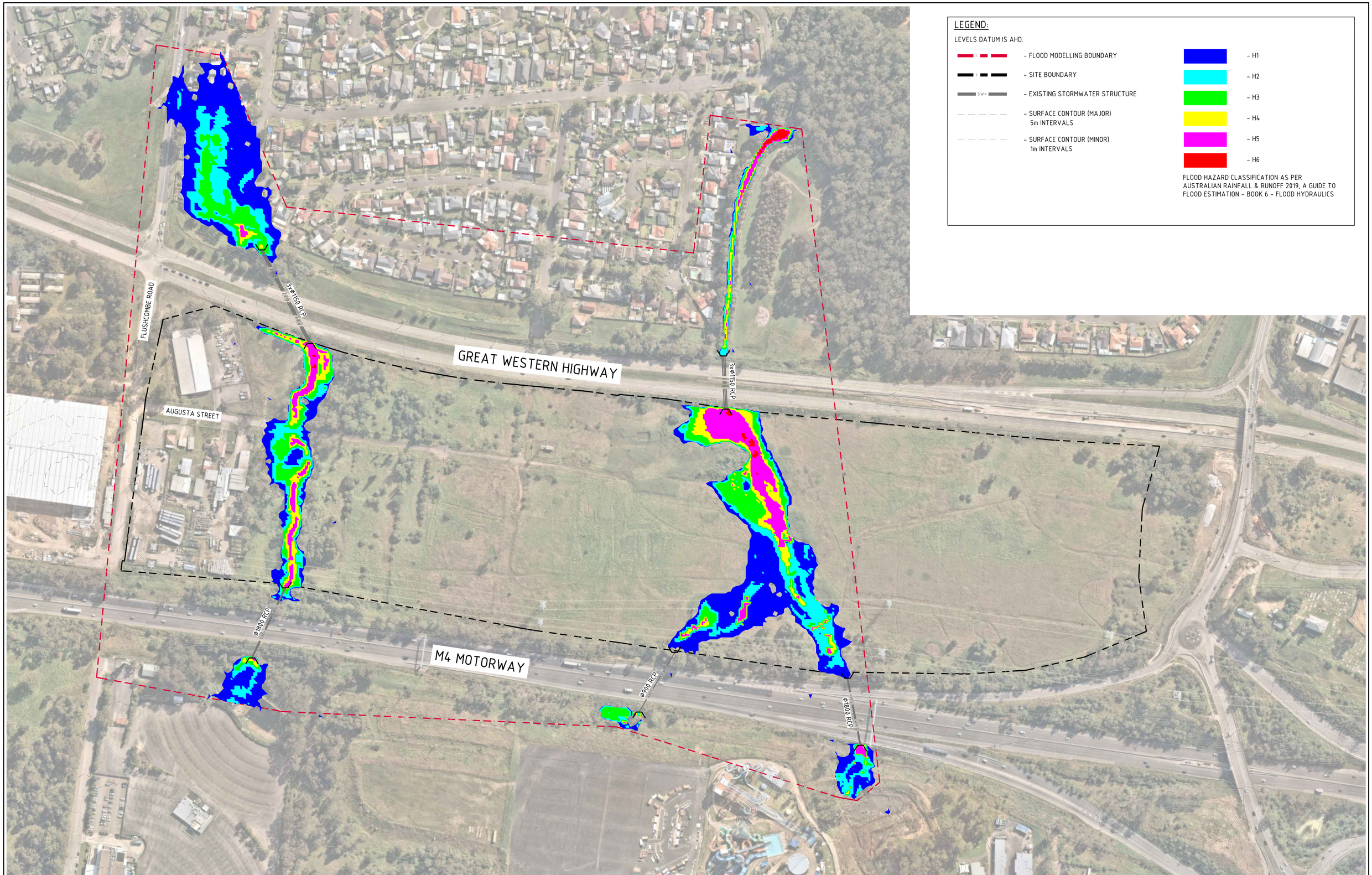
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F006

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 6 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP FLOOD VELOCITY AFFLUX
DRAWING No: C013904.03-F006
ISSUE: C



LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

- H1
- H2
- H3
- H4
- H5
- H6

FLOOD HAZARD CLASSIFICATION AS PER AUSTRALIAN RAINFALL & RUNOFF 2019, A GUIDE TO FLOOD ESTIMATION - BOOK 6 - FLOOD HYDRAULICS

1% AEP PRE-DEVELOPMENT FLOOD HAZARD

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F007

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446

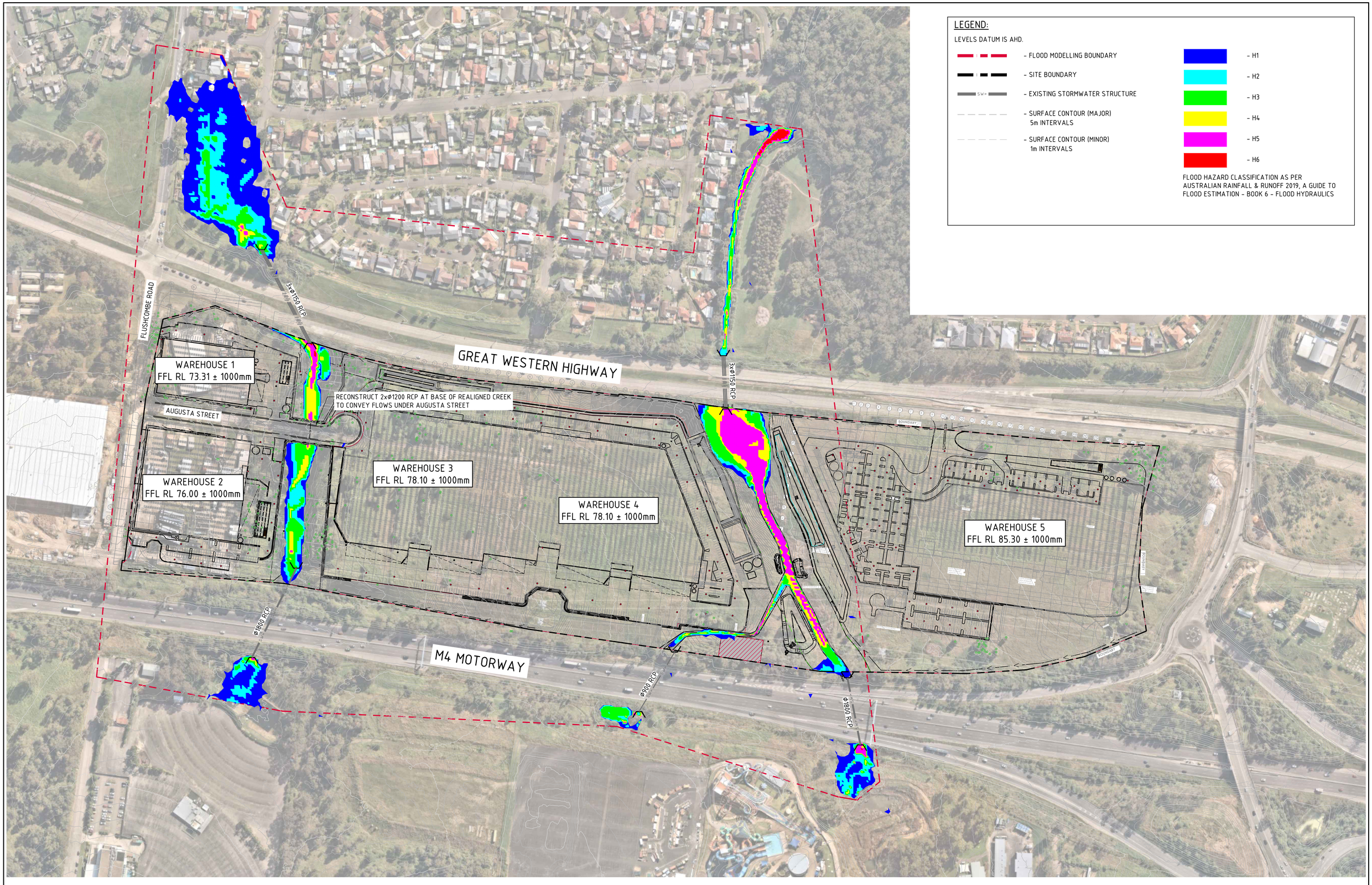
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 1% AEP PRE-DEVELOPMENT FLOOD HAZARD

DRAWING No: C013904.03-F007

ISSUE: B



LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

- H1
- H2
- H3
- H4
- H5
- H6

FLOOD HAZARD CLASSIFICATION AS PER AUSTRALIAN RAINFALL & RUNOFF 2019, A GUIDE TO FLOOD ESTIMATION - BOOK 6 - FLOOD HYDRAULICS

1% AEP POST-DEVELOPMENT FLOOD HAZARD
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	D
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	C
ISSUED FOR SSDA	30.06.23	B
ISSUED FOR INFORMATION	23.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F008

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
1% AEP POST-DEVELOPMENT FLOOD HAZARD

DRAWING No C013904.03-F008
ISSUE D

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	5.000	
10	5.000	7.500	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	80.282
RP2	73.426
RP3"	72.525
RP4	72.516
RP5	66.685
RP6	78.388
RP7	76.576
RP8	75.406
RP9	73.830
RP10"	73.368
RP11	73.368
RP12	67.171

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 - FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 - FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> - EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

GREAT WESTERN HIGHWAY

M4 MOTORWAY

FLUSHCOMBE ROAD

AUGUSTA STREET

RP1 RP2 RP3 RP4 RP5 RP6 RP7 RP8 RP9 RP10 RP11 RP12

3x Ø1150 RCP

Ø1800 RCP

Ø900 RCP

PMF PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F010

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: PMF PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

DRAWING No: C013904.03-F010 ISSUE: A

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	5.000	
10	5.000	7.500	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	80.195
RP2	73.441
RP3"	73.439
RP4	72.452
RP5	66.750
RP6	77.359
RP7	76.514
RP8	74.713
RP9	73.394
RP10"	73.376
RP11	73.374
RP12	67.153

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLUSHCOMBE ROAD
GREAT WESTERN HIGHWAY
AUGUSTA STREET
M4 MOTORWAY
3x Ø1150 RCP
RECONSTRUCT 2xØ1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
Ø1800 RCP
Ø900 RCP
WAREHOUSE 1 FFL RL 73.31 ± 1000mm
WAREHOUSE 2 FFL RL 76.00 ± 1000mm
WAREHOUSE 3 FFL RL 78.10 ± 1000mm
WAREHOUSE 4 FFL RL 78.10 ± 1000mm
WAREHOUSE 5 FFL RL 85.30 ± 1000mm
RP1 RP2 RP3" RP4 RP5 RP6 RP7 RP8 RP9 RP10" RP11 RP12

PMF POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

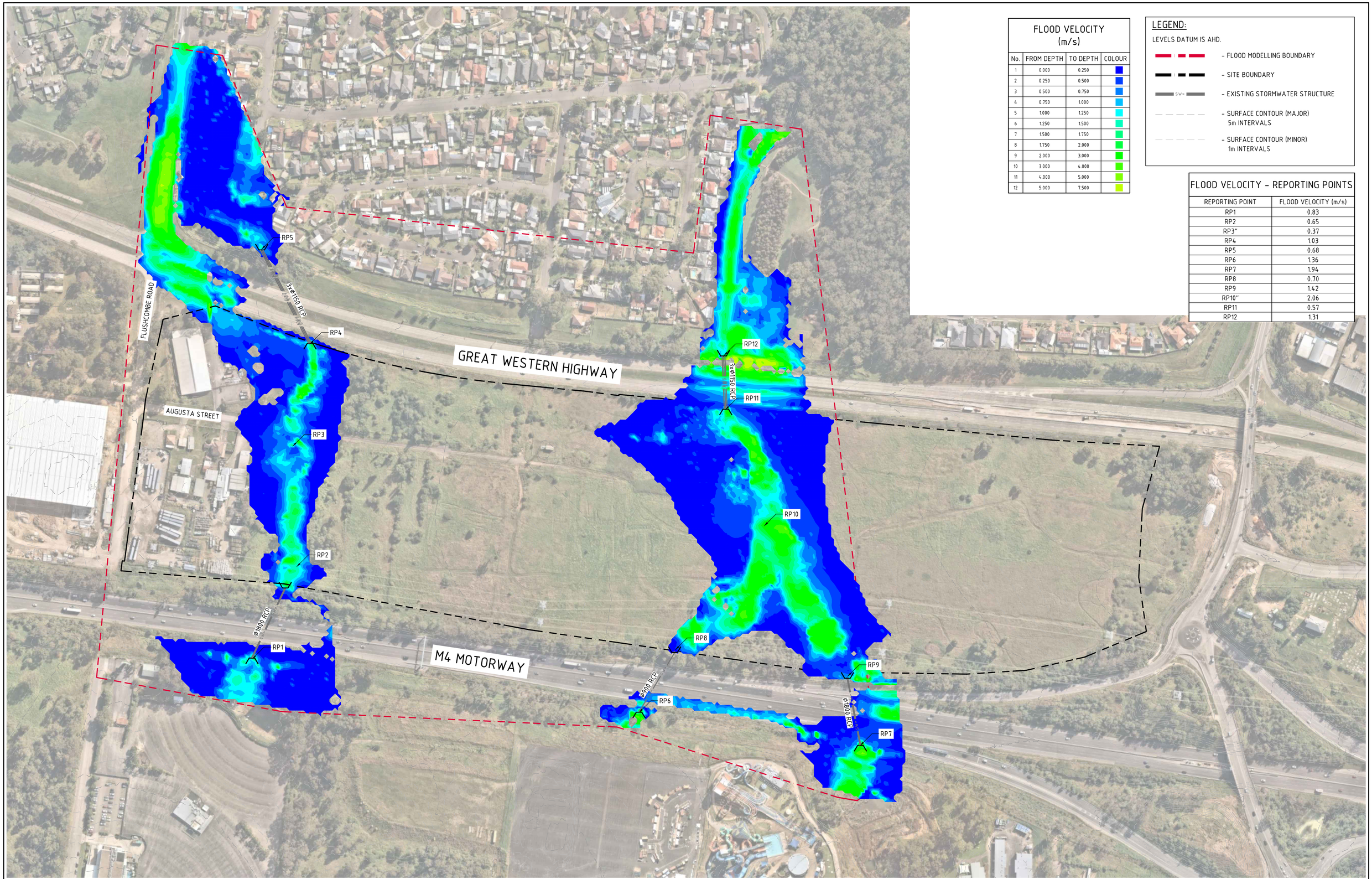
AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F011

CONSULT AUSTRALIA
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: PMF POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
DRAWING No: C013904.03-F011
ISSUE: C



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	0.83
RP2	0.65
RP3"	0.37
RP4	1.03
RP5	0.68
RP6	1.36
RP7	1.94
RP8	0.70
RP9	1.42
RP10"	2.06
RP11	0.57
RP12	1.31

PMF PRE-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F012

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: PMF PRE-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F012 ISSUE: A

FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

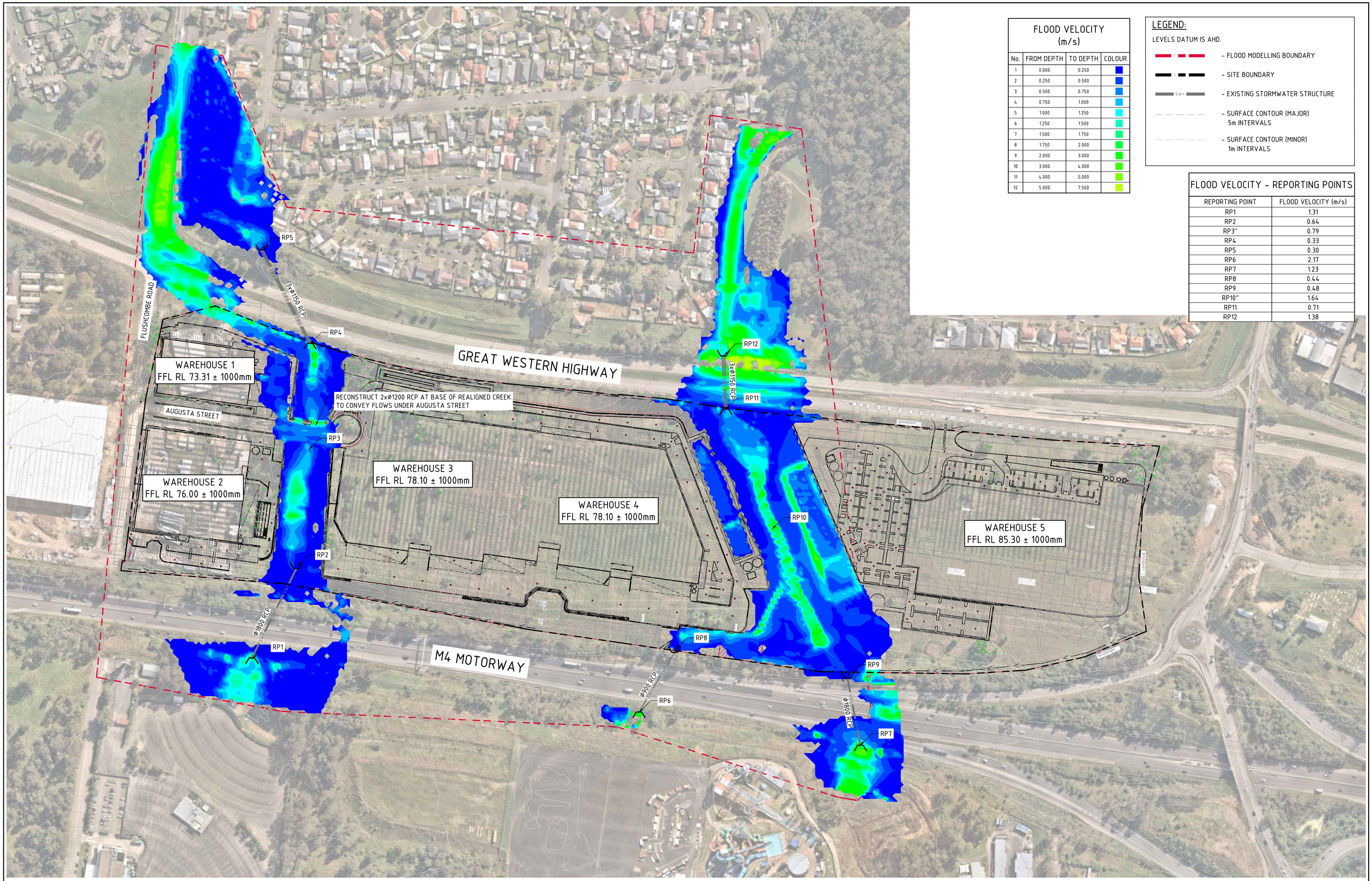
LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.31
RP2	0.64
RP3"	0.79
RP4	0.33
RP5	0.30
RP6	2.17
RP7	1.23
RP8	0.44
RP9	0.48
RP10"	1.64
RP11	0.71
RP12	1.38



PMF POST-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F013

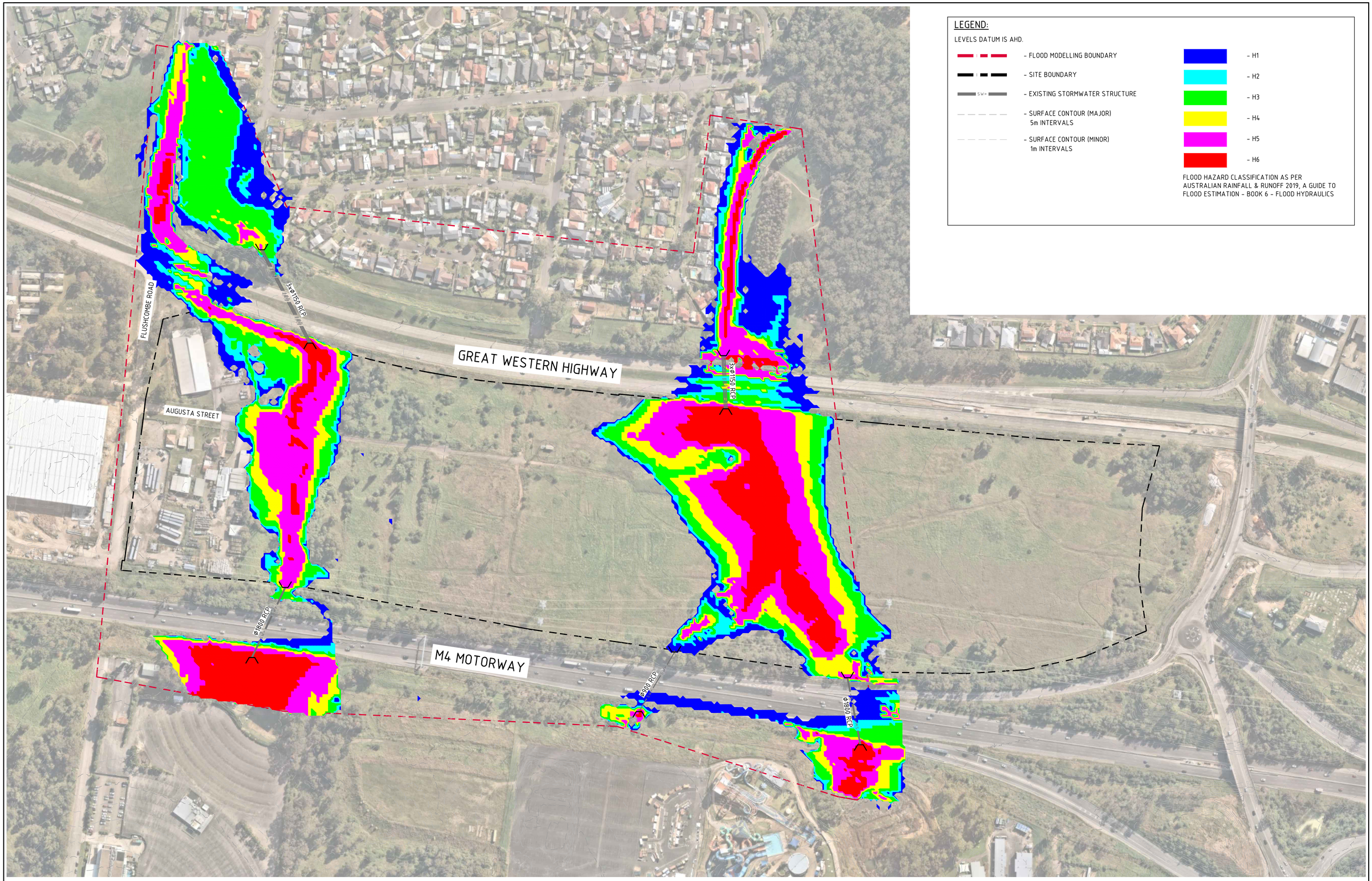
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: PMF POST-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F013 ISSUE: C



LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

- H1
- H2
- H3
- H4
- H5
- H6

FLOOD HAZARD CLASSIFICATION AS PER AUSTRALIAN RAINFALL & RUNOFF 2019, A GUIDE TO FLOOD ESTIMATION - BOOK 6 - FLOOD HYDRAULICS

PMF PRE-DEVELOPMENT FLOOD HAZARD

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F014

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446

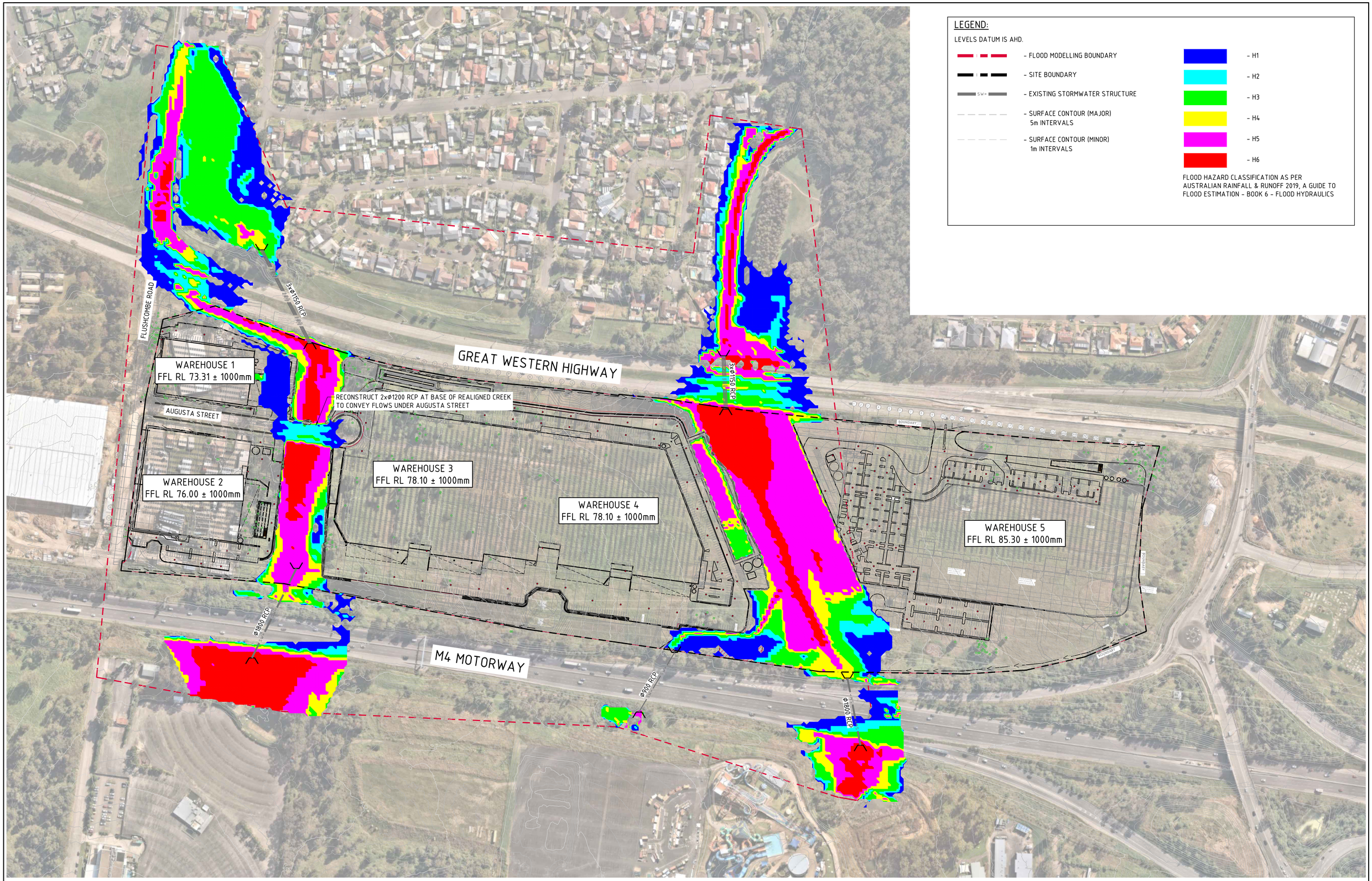
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: PMF PRE-DEVELOPMENT FLOOD HAZARD

DRAWING No: C013904.03-F014

ISSUE: A



LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

- H1
- H2
- H3
- H4
- H5
- H6

FLOOD HAZARD CLASSIFICATION AS PER AUSTRALIAN RAINFALL & RUNOFF 2019, A GUIDE TO FLOOD ESTIMATION - BOOK 6 - FLOOD HYDRAULICS

PMF POST-DEVELOPMENT FLOOD HAZARD
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

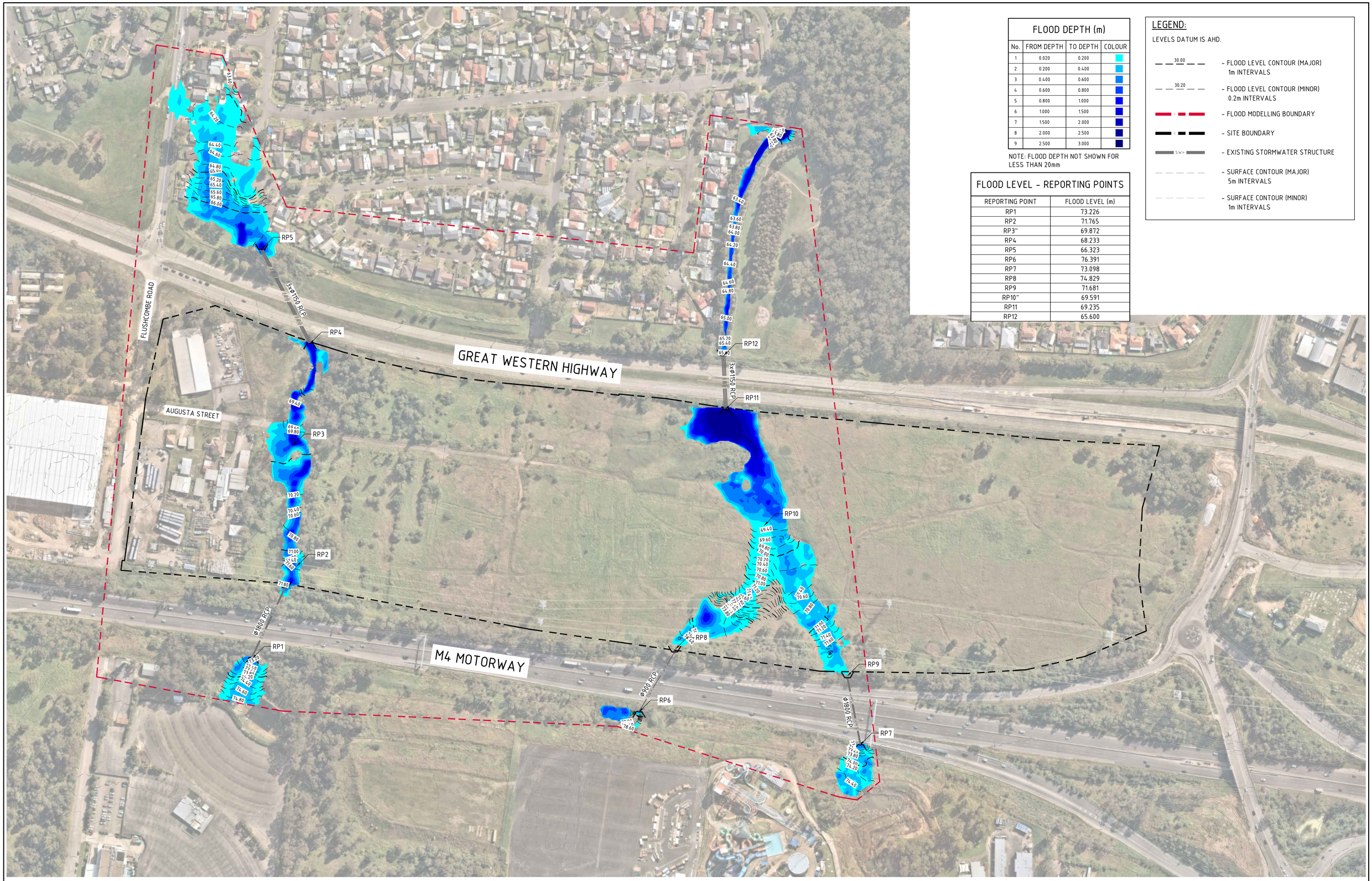
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F015

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
PMF POST-DEVELOPMENT FLOOD HAZARD

DRAWING No: C013904.03-F015
ISSUE: C



FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	73.226
RP2	71.765
RP3"	69.872
RP4	68.233
RP5	66.323
RP6	76.391
RP7	73.098
RP8	74.829
RP9	71.681
RP10"	69.591
RP11	69.235
RP12	65.600

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

5% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F020

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 5% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

DRAWING No: C013904.03-F020

ISSUE: A

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	
10	3.000	4.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	73.296
RP2	70.812
RP3"	68.853
RP4	68.349
RP5	66.336
RP6	76.396
RP7	73.058
RP8	74.172
RP9	71.763
RP10"	69.638
RP11	68.203
RP12	65.575

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

GREAT WESTERN HIGHWAY

M4 MOTORWAY

FLUSHCOMBE ROAD

AUGUSTA STREET

WAREHOUSE 1
FFL RL 73.31 ± 1000mm

WAREHOUSE 2
FFL RL 76.00 ± 1000mm

WAREHOUSE 3
FFL RL 78.10 ± 1000mm

WAREHOUSE 4
FFL RL 78.10 ± 1000mm

WAREHOUSE 5
FFL RL 85.30 ± 1000mm

RECONSTRUCT 2xØ1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET

3xØ1150 RCP

Ø1800 RCP

Ø900 RCP

RP1 RP2 RP3 RP4 RP5 RP6 RP7 RP8 RP9 RP10 RP11 RP12

BOUNDARY

5% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

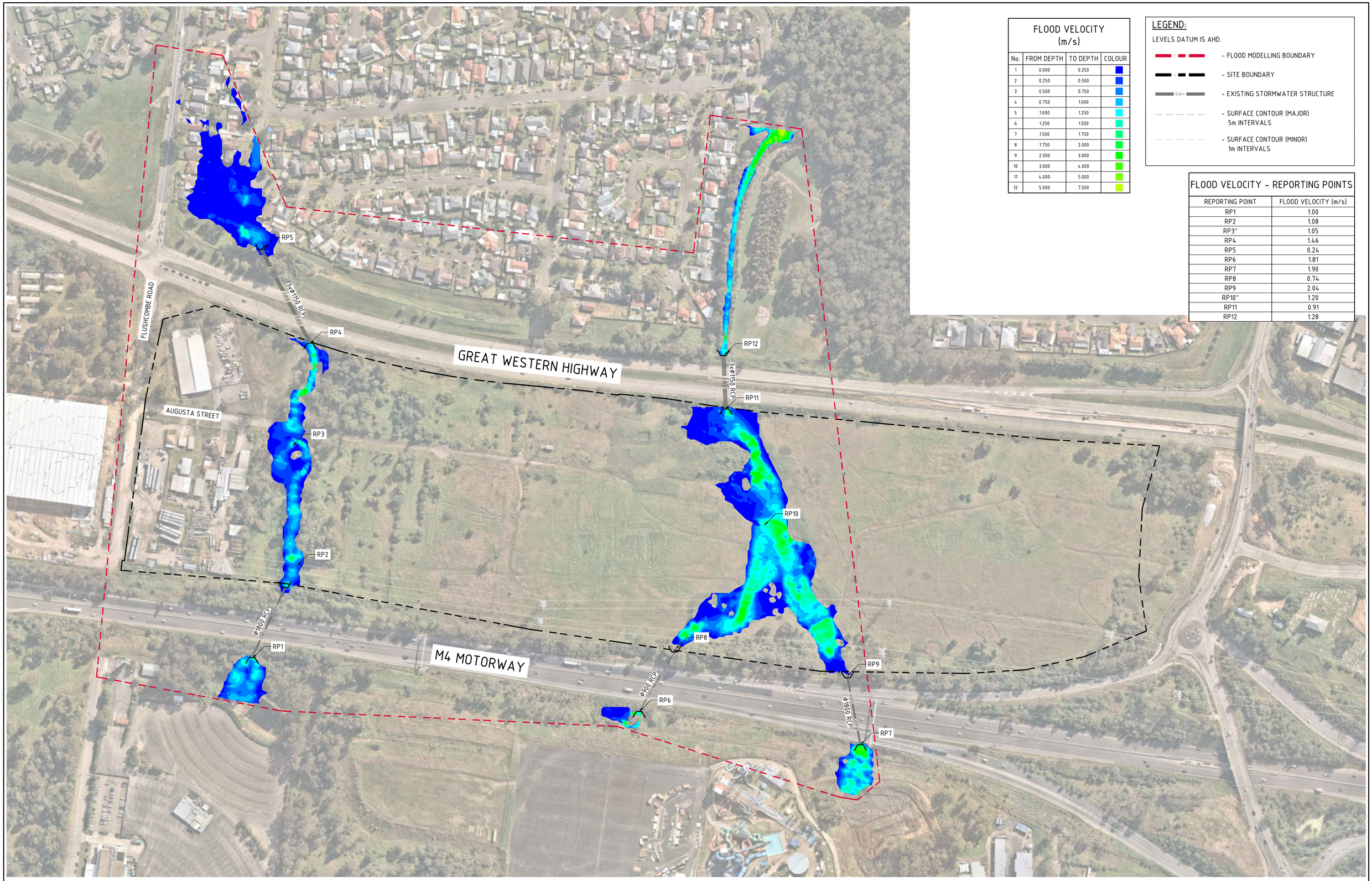
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F021

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 5% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS

DRAWING No: C013904.03-F021 ISSUE: C



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.00
RP2	1.08
RP3"	1.05
RP4	1.46
RP5	0.24
RP6	1.81
RP7	1.90
RP8	0.74
RP9	2.04
RP10"	1.20
RP11	0.91
RP12	1.28

5% AEP PRE-DEVELOPMENT FLOOD VELOCITY

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F022

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 5% AEP PRE-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F022 ISSUE: A

FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.06
RP2	0.34
RP3"	0.58
RP4	0.37
RP5	0.20
RP6	1.80
RP7	1.82
RP8	0.45
RP9	1.05
RP10"	1.17
RP11	0.72
RP12	1.27

RP5
3x⌀1150 RCP
FLUSHCOMBE ROAD
RP4
GREAT WESTERN HIGHWAY
RP12
3x⌀1150 RCP
RP11
WAREHOUSE 1
FFL RL 73.31 ± 1000mm
AUGUSTA STREET
RECONSTRUCT 2x⌀1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
RP3
WAREHOUSE 3
FFL RL 78.10 ± 1000mm
WAREHOUSE 2
FFL RL 76.00 ± 1000mm
WAREHOUSE 4
FFL RL 78.10 ± 1000mm
RP10
WAREHOUSE 5
FFL RL 85.30 ± 1000mm
BOUNDARY
RP2
⌀1800 RCP
RP1
M4 MOTORWAY
RP8
⌀900 RCP
RP6
⌀1800 RCP
RP9
RP7

5% AEP POST-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F023

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 5% AEP POST-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F023 ISSUE: C

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	73.653
RP2	72.034
RP3"	70.091
RP4	69.821
RP5	66.469
RP6	76.476
RP7	73.469
RP8	75.093
RP9	71.747
RP10"	69.728
RP11	69.722
RP12	65.619

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLUSHCOMBE ROAD
AUGUSTA STREET
GREAT WESTERN HIGHWAY
M4 MOTORWAY
3x Ø1150 RCP
Ø1800 RCP
Ø900 RCP
RP1
RP2
RP3
RP4
RP5
RP6
RP7
RP8
RP9
RP10
RP11
RP12

0.5% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F030

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.5% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS
DRAWING No: C013904.03-F030
ISSUE: A

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	
10	3.000	5.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	73.426
RP2	70.901
RP3"	69.170
RP4	68.993
RP5	66.394
RP6	76.479
RP7	73.371
RP8	74.376
RP9	71.898
RP10"	69.838
RP11	69.519
RP12	65.610

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLUSHCOMBE ROAD
GREAT WESTERN HIGHWAY
M4 MOTORWAY
AUGUSTA STREET
3xØ1150 RCP
Ø1800 RCP
Ø900 RCP
RECONSTRUCT 2xØ1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
WAREHOUSE 1 FFL RL 73.31 ± 1000mm
WAREHOUSE 2 FFL RL 76.00 ± 1000mm
WAREHOUSE 3 FFL RL 78.10 ± 1000mm
WAREHOUSE 4 FFL RL 78.10 ± 1000mm
WAREHOUSE 5 FFL RL 85.30 ± 1000mm
RP1 RP2 RP3" RP4 RP5 RP6 RP7 RP8 RP9 RP10" RP11 RP12

0.5% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

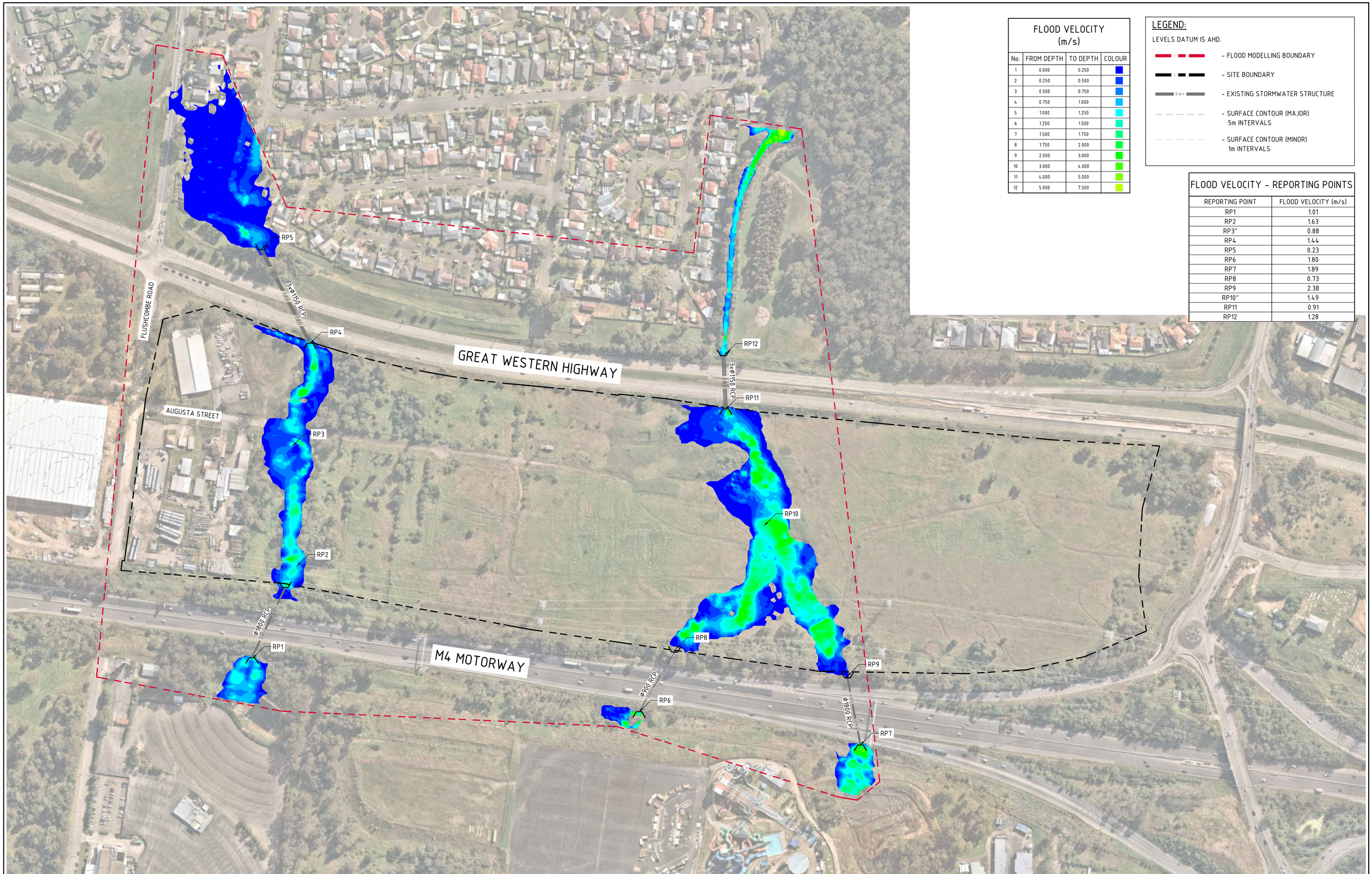
AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS
CLIENT: LOGOS
PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F031

CONSULT AUSTRALIA
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.5% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS
DRAWING No: C013904.03-F031
ISSUE: C



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.01
RP2	1.63
RP3"	0.88
RP4	1.44
RP5	0.23
RP6	1.80
RP7	1.89
RP8	0.73
RP9	2.38
RP10"	1.49
RP11	0.91
RP12	1.28

0.5% AEP PRE-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F032

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
0.5% AEP PRE-DEVELOPMENT FLOOD VELOCITY

DRAWING No C013904.03-F032 ISSUE A

FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.15
RP2	0.43
RP3"	0.64
RP4	0.50
RP5	0.20
RP6	1.81
RP7	1.90
RP8	0.47
RP9	1.35
RP10"	1.31
RP11	0.73
RP12	1.28

RP5
3x⌀1150 RCP
FLUSHCOMBE ROAD
RP4
GREAT WESTERN HIGHWAY
RP12
3x⌀1150 RCP
RP11
WAREHOUSE 1
FFL RL 73.31 ± 1000mm
AUGUSTA STREET
RECONSTRUCT 2x⌀1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
RP3
WAREHOUSE 3
FFL RL 78.10 ± 1000mm
WAREHOUSE 2
FFL RL 76.00 ± 1000mm
WAREHOUSE 4
FFL RL 78.10 ± 1000mm
RP10
WAREHOUSE 5
FFL RL 85.30 ± 1000mm
RP2
⌀1800 RCP
RP1
M4 MOTORWAY
RP8
RP9
⌀900 RCP
RP6
⌀1800 RCP
RP7

0.5% AEP POST-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F033

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.5% AEP POST-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F033 ISSUE: C

FLOOD DEPTH (m)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.500	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS

REPORTING POINT	FLOOD LEVEL (m)
RP1	73.951
RP2	72.067
RP3"	70.132
RP4	70.055
RP5	66.492
RP6	76.504
RP7	73.661
RP8	75.182
RP9	71.775
RP10"	69.952
RP11	69.946
RP12	65.631

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 – FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 – FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> – EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

RP5 RP4 RP3 RP2 RP1 RP12 RP11 RP10 RP8 RP9 RP6 RP7

3x Ø1150 RCP

Ø1800 RCP

Ø900 RCP

FLUSHCOMBE ROAD

AUGUSTA STREET

GREAT WESTERN HIGHWAY

M4 MOTORWAY

0.2% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS DATE ISSUE

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

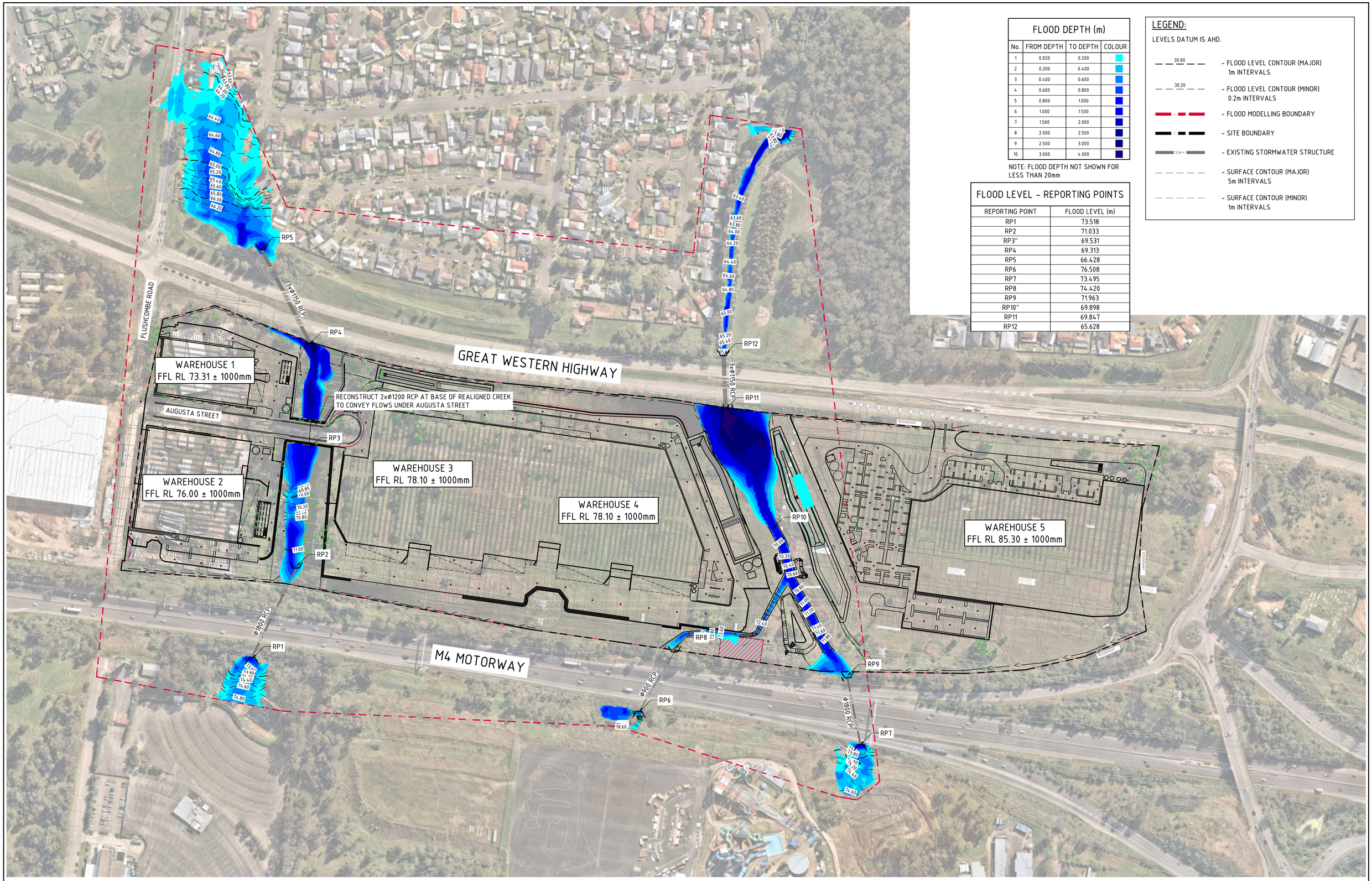
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F040

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.2% AEP PRE-DEVELOPMENT FLOOD LEVELS AND DEPTHS

DRAWING No: C013904.03-F040 ISSUE: B



FLOOD DEPTH (m)			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.020	0.200	
2	0.200	0.400	
3	0.400	0.600	
4	0.600	0.800	
5	0.800	1.000	
6	1.000	1.500	
7	1.500	2.000	
8	2.000	2.500	
9	2.500	3.000	
10	3.000	4.000	

NOTE: FLOOD DEPTH NOT SHOWN FOR LESS THAN 20mm

FLOOD LEVEL - REPORTING POINTS	
REPORTING POINT	FLOOD LEVEL (m)
RP1	73.518
RP2	71.033
RP3"	69.531
RP4	69.313
RP5	66.428
RP6	76.508
RP7	73.495
RP8	74.420
RP9	71.963
RP10"	69.898
RP11	69.847
RP12	65.628

LEGEND:

LEVELS DATUM IS AHD.

- 30.00 - FLOOD LEVEL CONTOUR (MAJOR) 1m INTERVALS
- 30.20 - FLOOD LEVEL CONTOUR (MINOR) 0.2m INTERVALS
- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW> - EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

0.2% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS

SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m

SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F041

CONSULT AUSTRALIA

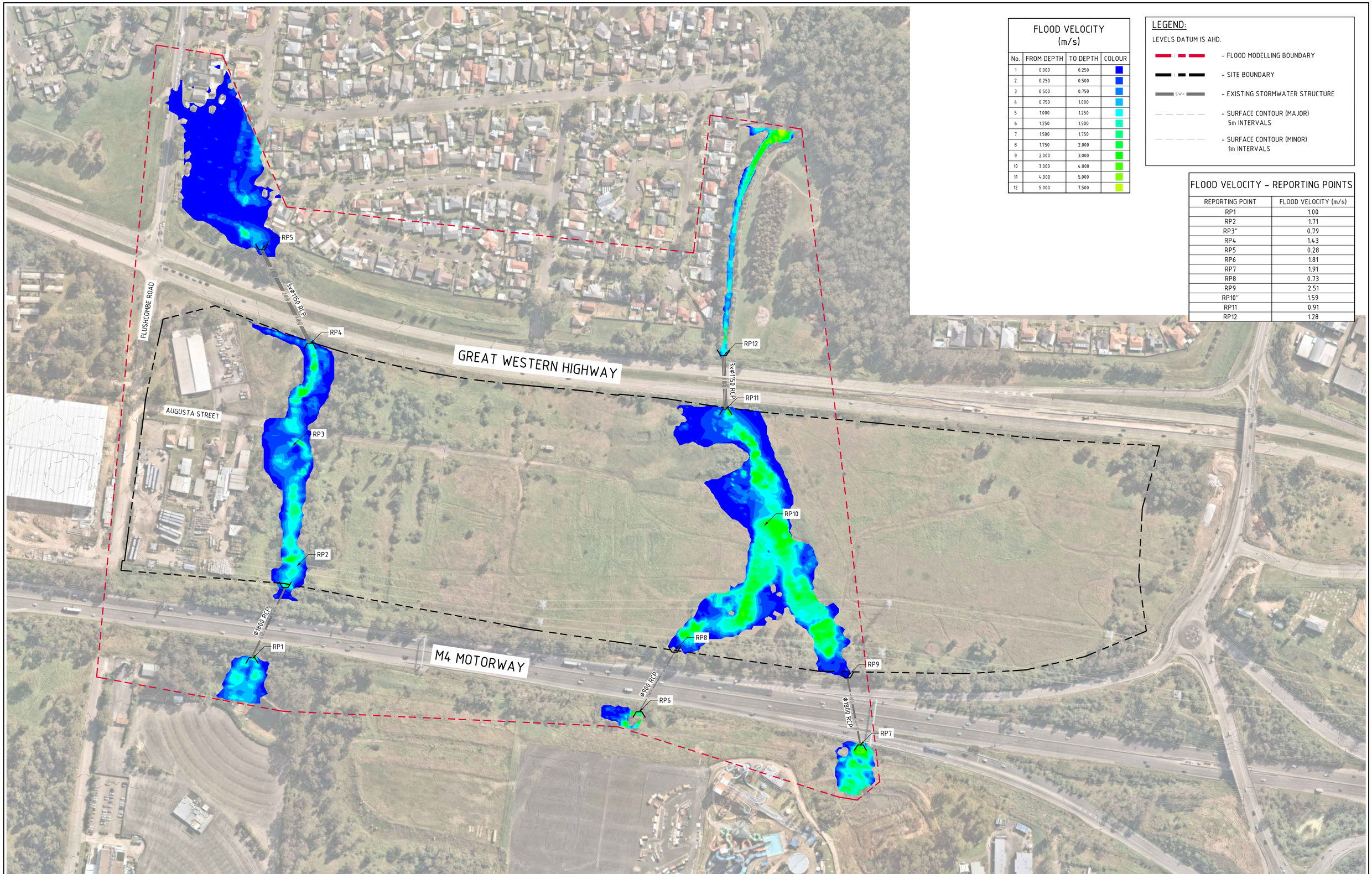
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

CRC COSTIN ROE CONSULTING — CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.2% AEP POST-DEVELOPMENT FLOOD LEVELS AND DEPTHS

DRAWING No: C013904.03-F041

ISSUE: C



FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.00
RP2	1.71
RP3"	0.79
RP4	1.43
RP5	0.28
RP6	1.81
RP7	1.91
RP8	0.73
RP9	2.51
RP10"	1.59
RP11	0.91
RP12	1.28

0.2% AEP PRE-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR SSDA	30.06.23	A

AMENDMENTS	DATE	ISSUE

ARCHITECT
PACE ARCHITECTS

CLIENT
LOGOS

PROJECT
PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F042

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
0.2% AEP PRE-DEVELOPMENT FLOOD VELOCITY

DRAWING No C013904.03-F042
ISSUE A

FLOOD VELOCITY (m/s)

No.	FROM DEPTH	TO DEPTH	COLOUR
1	0.000	0.250	
2	0.250	0.500	
3	0.500	0.750	
4	0.750	1.000	
5	1.000	1.250	
6	1.250	1.500	
7	1.500	1.750	
8	1.750	2.000	
9	2.000	3.000	
10	3.000	4.000	
11	4.000	5.000	
12	5.000	7.500	

LEGEND:

LEVELS DATUM IS AHD.

- FLOOD MODELLING BOUNDARY
- SITE BOUNDARY
- SW EXISTING STORMWATER STRUCTURE
- SURFACE CONTOUR (MAJOR) 5m INTERVALS
- SURFACE CONTOUR (MINOR) 1m INTERVALS

FLOOD VELOCITY - REPORTING POINTS

REPORTING POINT	FLOOD VELOCITY (m/s)
RP1	1.16
RP2	0.49
RP3"	0.64
RP4	0.43
RP5	0.20
RP6	1.81
RP7	1.89
RP8	0.45
RP9	1.42
RP10"	1.41
RP11	0.74
RP12	1.28

RP5
3xØ1150 RCP
FLUSHCOMBE ROAD
RP4
GREAT WESTERN HIGHWAY
RP12
3xØ1150 RCP
RP11
WAREHOUSE 1
FFL RL 73.31 ± 1000mm
AUGUSTA STREET
RECONSTRUCT 2xØ1200 RCP AT BASE OF REALIGNED CREEK TO CONVEY FLOWS UNDER AUGUSTA STREET
RP3
WAREHOUSE 3
FFL RL 78.10 ± 1000mm
WAREHOUSE 2
FFL RL 76.00 ± 1000mm
WAREHOUSE 4
FFL RL 78.10 ± 1000mm
RP10
WAREHOUSE 5
FFL RL 85.30 ± 1000mm
RP2
Ø1800 RCP
RP1
M4 MOTORWAY
RP8
RP9
Ø900 RCP
RP6
Ø1800 RCP
RP7

0.2% AEP POST-DEVELOPMENT FLOOD VELOCITY
SCALE 1:1500

15m 0 15 30 45 60 75 90 105 120 135 150m
SCALE 1:1500 AT B1 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
REVISED WEST CREEK	01.03.24	C
CORRECTED WAREHOUSE 5's NUMBER, AS CLOUDED	10.07.23	B
ISSUED FOR SSDA	30.06.23	A

ARCHITECT: PACE ARCHITECTS

CLIENT: LOGOS

PROJECT: PROPOSED WAREHOUSE DISTRIBUTION
AUGUSTA STREET, HUNTINGWOOD EAST, NSW 2148

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
LDV	JB	JUNE' 22	MW	B1	AS SHOWN	C013904.03-F043

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: 0.2% AEP POST-DEVELOPMENT FLOOD VELOCITY

DRAWING No: C013904.03-F043 ISSUE: C

Appendix J

BLACKTOWN CITY COUNCIL – ON-SITE DETENTION DEEMED TO COMPLY TOOL – RESULTS

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 1
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	12135 m^2
Area Draining to OSD (m^2)	12085 m^2

On-Site Detention Data:

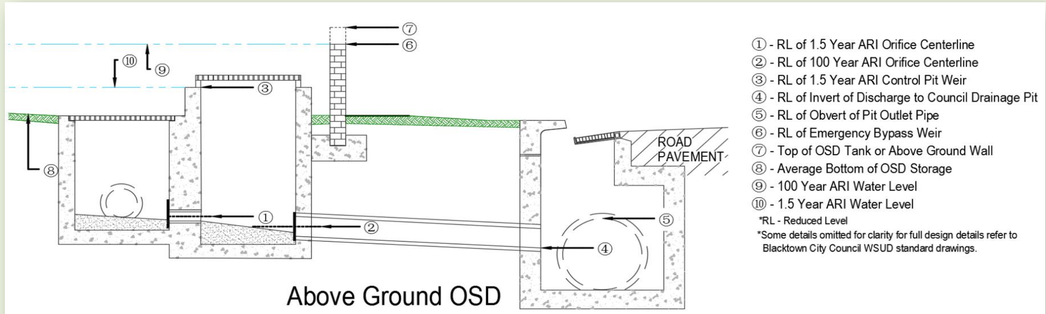
OSD Location	Below Ground
OSD Discharge Location	West Creek
RL of Bottom of OSD Storage Area	69.150
RL of Top of OSD Storage Area	72.160
Length of Emergency Overflow Weir (m)	3.00 m

Filter Cartridges:

Will filter cartridges be used to manage water quality?	Yes
Design flow from Filter Cartridges (L/s)	55.28 L/s
Filter Cartridges flow with 100 Year ARI Head (L/s)	106.05 L/s

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	69.130
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	68.930
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	68.800



① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level

*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Below Ground OSD Summary with calculated values

Site:	
Site Area	12135 m^2
Site Area NOT Draining to OSD	50 m^2
Reduced Levels (AHD):	
RL of Top of Tank	72.16
RL of Bottom of OSD Tank	69.15
RL of 1.5 Year ARI Overflow Weir	70.995
RL of Emergency Overflow Weir	71.945
RL of 1.5 Year ARI Orifice Centerline	69.13
RL of 100 Year ARI Orifice Centreline	68.93
RL of Invert of Discharge to Council Drainage Pit	68.80
Minium RL of Garage Floor	72.25
Minium RL of House Floor	72.35
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	364.1 m^3
Required Storage BELOW Emergency Overflow Weir	552.1 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	Yes
Discharge Location	West Creek
Length of Emergency Overflow Weir	3.00 m
Maximum 1.5 Year ARI Site Discharge	55.28 L/s
1.5 Year ARI Orifice Discharge	No Orifice Needed
Maximum 100 Year ARI Site Discharge	227.77 L/s
100 Year ARI Orifice Discharge	121.72 L/s
Filter Cartridges design flow	55.28 L/s
Filter Cartridges Discharge with Additional Head	106.05 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	No Orifice Needed
100 Year ARI Orifice Size (mm)	181.5 mm

Notifications:

Access grates to be provided such that the maximum reach from any point in the tank to the neaest grate is 6.0m. As there is no 1.5year ARI orifice the under drain flow from the filter cartridges will control the minorstorms. To ensure the storage can drain the base of the tank is to be configured to direct flows through the Non-Return flap to the filter storage chamber.

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 2
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	21800 m^2
Area Draining to OSD (m^2)	21540 m^2

On-Site Detention Data:

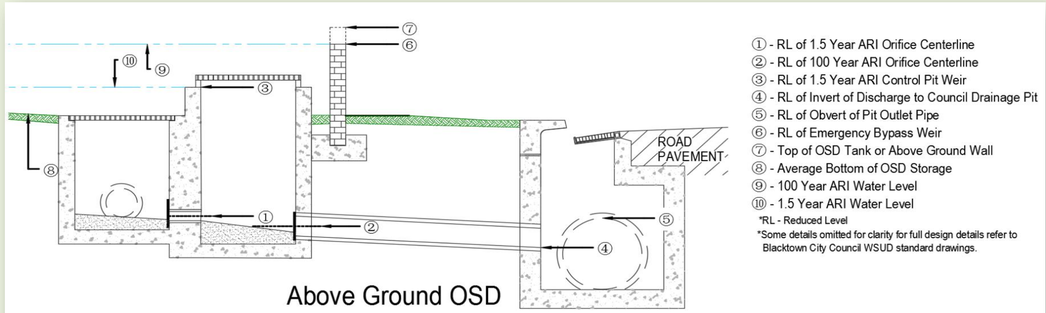
OSD Location	Below Ground
OSD Discharge Location	West Creek
RL of Bottom of OSD Storage Area	72.000
RL of Top of OSD Storage Area	75.300
Length of Emergency Overflow Weir (m)	3.00 m

Filter Cartridges:

Will filter cartridges be used to manage water quality?	Yes
Design flow from Filter Cartridges (L/s)	78.98 L/s
Filter Cartridges flow with 100 Year ARI Head (L/s)	155.84 L/s

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	71.970
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	71.770
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	70.210



① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level

*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Below Ground OSD Summary with calculated values

Site:	
Site Area	21800 m^2
Site Area NOT Draining to OSD	260 m^2
Reduced Levels (AHD):	
RL of Top of Tank	75.3
RL of Bottom of OSD Tank	72
RL of 1.5 Year ARI Overflow Weir	73.97
RL of Emergency Overflow Weir	74.99
RL of 1.5 Year ARI Orifice Centerline	71.97
RL of 100 Year ARI Orifice Centreline	71.77
RL of Invert of Discharge to Council Drainage Pit	70.21
	0
Minium RL of Garage Floor	75.39
Minium RL of House Floor	75.49
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	654.0 m^3
Required Storage BELOW Emergency Overflow Weir	991.9 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	Yes
Discharge Location	West Creek
Length of Emergency Overflow Weir	3.00 m
Maximum 1.5 Year ARI Site Discharge	85.64 L/s
1.5 Year ARI Orifice Discharge	6.66 L/s
Maximum 100 Year ARI Site Discharge	399.64 L/s
100 Year ARI Orifice Discharge	243.80 L/s
Filter Cartridges design flow	78.98 L/s
Filter Cartridges Discharge with Additional Head	155.84 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	47.0 mm
100 Year ARI Orifice Size (mm)	253.0 mm
Notifications:	

Access grates to be provided such that the maximum reach from any point in the tank to the neaest grate is 6.0m.

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 3A
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	10260 m^2
Area Draining to OSD (m^2)	10260 m^2

On-Site Detention Data:

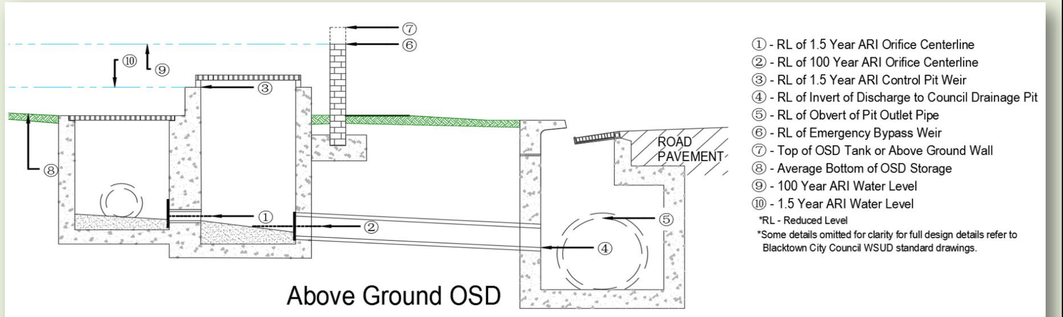
OSD Location	Above Ground
OSD Discharge Location	
RL of Bottom of OSD Storage Area	75.182
RL of Top of OSD Storage Area	76.700
Length of Emergency Overflow Weir (m)	1.00 m

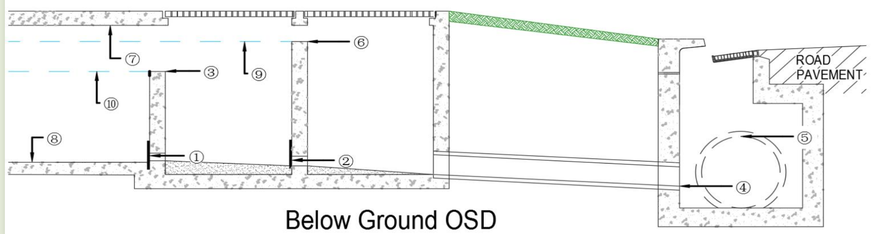
Filter Cartridges:

Will filter cartridges be used to manage water quality?	No

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	73.600
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	73.100
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	72.500
	74.000





① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level

*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Above Ground OSD Summary with calculated values

Site:	
Site Area	10260 m^2
Site Area NOT Draining to OSD	0 m^2
Reduced Levels (AHD):	
RL of Top of Tank	76.7
RL of Bottom of OSD Tank	75.182
RL of 1.5 Year ARI Overflow Weir	75.925
RL of Emergency Overflow Weir	76.31
RL of 1.5 Year ARI Orifice Centerline	73.6
RL of 100 Year ARI Orifice Centreline	73.1
RL of Invert of Discharge to Council Drainage Pit	72.5
	74
Minium RL of Garage Floor	76.79
Minium RL of House Floor	76.89
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	307.8 m^3
Required Storage BELOW Emergency Overflow Weir	466.8 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	No
Discharge Location	
Length of Emergency Overflow Weir	1.00 m
Maximum 1.5 Year ARI Site Discharge	41.04 L/s
1.5 Year ARI Orifice Discharge	41.04 L/s
Maximum 100 Year ARI Site Discharge	194.94 L/s
100 Year ARI Orifice Discharge	194.94 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	112.5 mm
100 Year ARI Orifice Size (mm)	226.5 mm
Notifications:	

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 3B
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	29331 m^2
Area Draining to OSD (m^2)	29331 m^2

On-Site Detention Data:

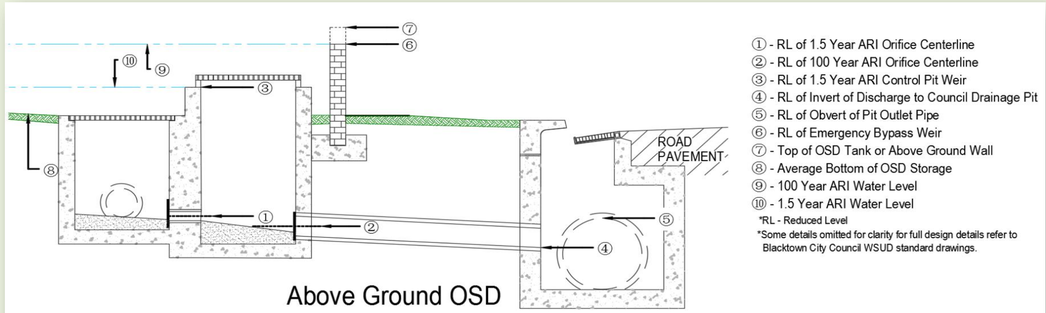
OSD Location	Below Ground
OSD Discharge Location	
RL of Bottom of OSD Storage Area	71.560
RL of Top of OSD Storage Area	74.160
Length of Emergency Overflow Weir (m)	3.00 m

Filter Cartridges:

Will filter cartridges be used to manage water quality?	Yes
Design flow from Filter Cartridges (L/s)	110.57 L/s
Filter Cartridges flow with 100 Year ARI Head (L/s)	192.36 L/s

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	71.510
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	71.310
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	71.000



① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level

*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Below Ground OSD Summary with calculated values

Site:	
Site Area	29331 m^2
Site Area NOT Draining to OSD	0 m^2
Reduced Levels (AHD):	
RL of Top of Tank	74.16
RL of Bottom of OSD Tank	71.56
RL of 1.5 Year ARI Overflow Weir	73.025
RL of Emergency Overflow Weir	73.785
RL of 1.5 Year ARI Orifice Centerline	71.51
RL of 100 Year ARI Orifice Centreline	71.31
RL of Invert of Discharge to Council Drainage Pit	71
	0
Minium RL of Garage Floor	74.25
Minium RL of House Floor	74.35
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	879.9 m^3
Required Storage BELOW Emergency Overflow Weir	1334.6 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	Yes
Discharge Location	
Length of Emergency Overflow Weir	3.00 m
Maximum 1.5 Year ARI Site Discharge	117.32 L/s
1.5 Year ARI Orifice Discharge	6.75 L/s
Maximum 100 Year ARI Site Discharge	557.29 L/s
100 Year ARI Orifice Discharge	364.93 L/s
Filter Cartridges design flow	110.57 L/s
Filter Cartridges Discharge with Additional Head	192.36 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	51.0 mm
100 Year ARI Orifice Size (mm)	330.5 mm
Notifications:	

Access grates to be provided such that the maximum reach from any point in the tank to the neaest grate is 6.0m.

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 4
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	54135 m^2
Area Draining to OSD (m^2)	54135 m^2

On-Site Detention Data:

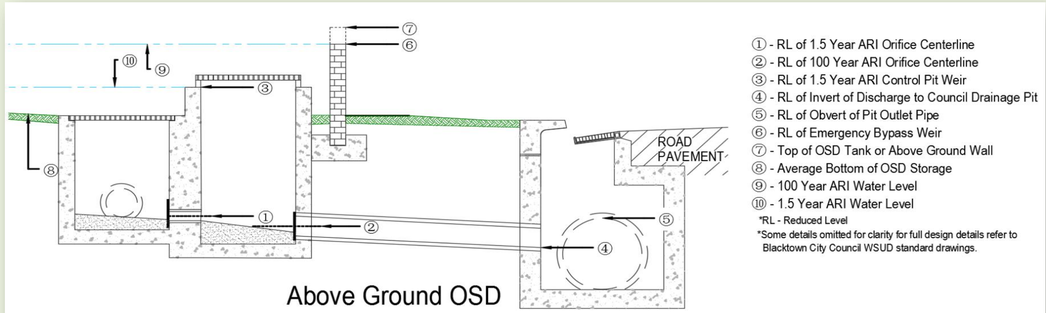
OSD Location	Above Ground
OSD Discharge Location	
RL of Bottom of OSD Storage Area	70.850
RL of Top of OSD Storage Area	73.000
Length of Emergency Overflow Weir (m)	8.00 m

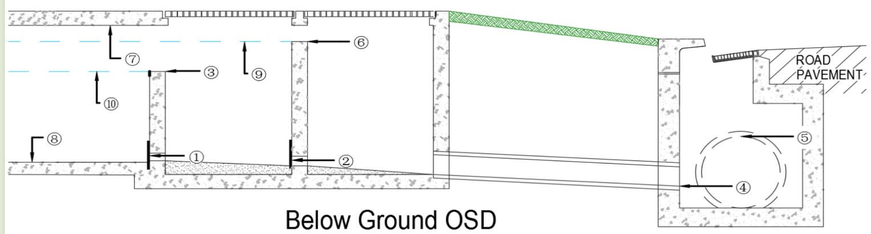
Filter Cartridges:

Will filter cartridges be used to manage water quality?	No

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	70.500
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	70.200
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	69.500
	70.750





① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level
*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Above Ground OSD Summary with calculated values

Site:	
Site Area	54135 m^2
Site Area NOT Draining to OSD	0 m^2
Reduced Levels (AHD):	
RL of Top of Tank	73
RL of Bottom of OSD Tank	70.85
RL of 1.5 Year ARI Overflow Weir	72.075
RL of Emergency Overflow Weir	72.705
RL of 1.5 Year ARI Orifice Centerline	70.5
RL of 100 Year ARI Orifice Centreline	70.2
RL of Invert of Discharge to Council Drainage Pit	69.5
	70.75
Minium RL of Garage Floor	73.09
Minium RL of House Floor	73.19
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	1624.1 m^3
Required Storage BELOW Emergency Overflow Weir	2463.1 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	No
Discharge Location	
Length of Emergency Overflow Weir	8.00 m
Maximum 1.5 Year ARI Site Discharge	216.54 L/s
1.5 Year ARI Orifice Discharge	216.54 L/s
Maximum 100 Year ARI Site Discharge	1028.57 L/s
100 Year ARI Orifice Discharge	1028.57 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	285.0 mm
100 Year ARI Orifice Size (mm)	553.5 mm
Notifications:	

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	WAREHOUSE 5A
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	48570 m^2
Area Draining to OSD (m^2)	47760 m^2

On-Site Detention Data:

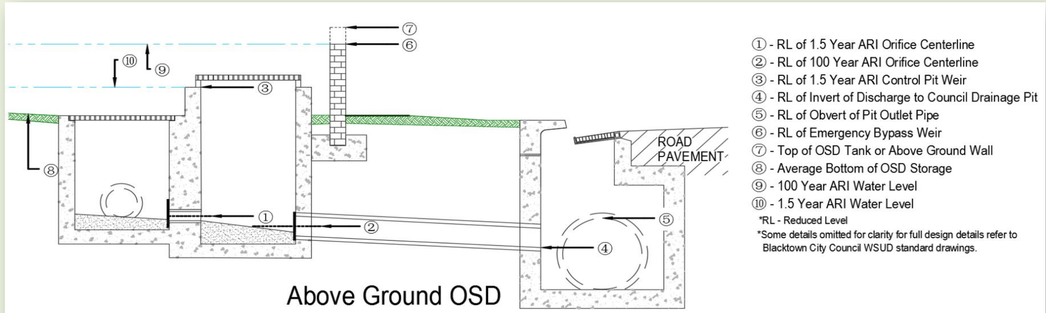
OSD Location	Above Ground
OSD Discharge Location	
RL of Bottom of OSD Storage Area	69.800
RL of Top of OSD Storage Area	72.000
Length of Emergency Overflow Weir (m)	7.00 m

Filter Cartridges:

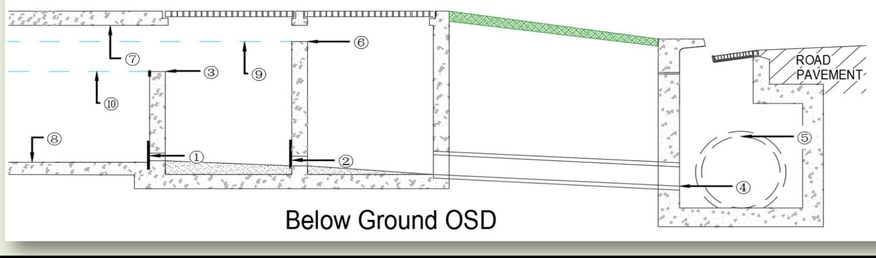
Will filter cartridges be used to manage water quality?	No

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	69.750
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	69.550
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	69.350
	69.500



① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level
*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.



Above Ground OSD Summary with calculated values	
Site:	
Site Area	48570 m^2
Site Area NOT Draining to OSD	810 m^2
Reduced Levels (AHD):	
RL of Top of Tank	72
RL of Bottom of OSD Tank	69.8
RL of 1.5 Year ARI Overflow Weir	71.055
RL of Emergency Overflow Weir	71.7
RL of 1.5 Year ARI Orifice Centerline	69.75
RL of 100 Year ARI Orifice Centreline	69.55
RL of Invert of Discharge to Council Drainage Pit	69.35
	69.5
Minium RL of Garage Floor	72.09
Minium RL of House Floor	72.19
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	1457.1 m^3
Required Storage BELOW Emergency Overflow Weir	2209.9 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	No
Discharge Location	
Length of Emergency Overflow Weir	7.00 m
Maximum 1.5 Year ARI Site Discharge	189.42 L/s
1.5 Year ARI Orifice Discharge	189.42 L/s
Maximum 100 Year ARI Site Discharge	877.47 L/s
100 Year ARI Orifice Discharge	877.47 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	279.5 mm
100 Year ARI Orifice Size (mm)	531.0 mm
Notifications:	

Blacktown City Council - On-site Detention Deemed to Comply Tool

Select project to Load or Delete:

v1.9

Project Details:

Project Title	Huntingwood Precinct - LOT 5B
Address	Augusta Street, Blacktown
Reference Number	SSD-36138263

General Site Data:

Site Area (m^2)	20100 m^2
Area Draining to OSD (m^2)	20100 m^2

On-Site Detention Data:

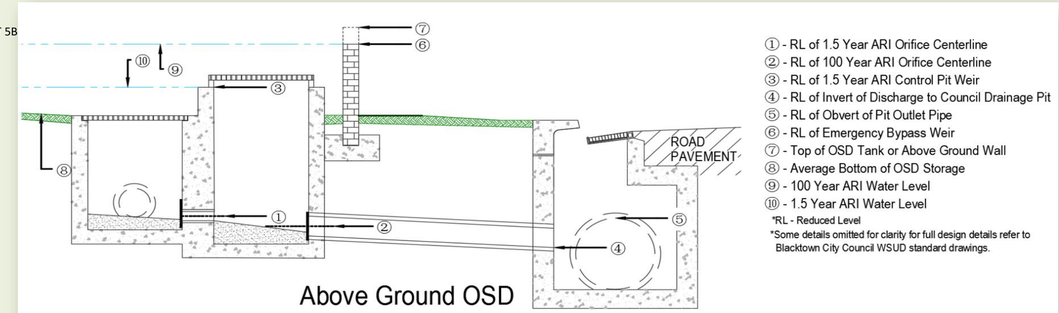
OSD Location	Below Ground
OSD Discharge Location	Council Drainage Pit
RL of Bottom of OSD Storage Area	74.000
RL of Top of OSD Storage Area	76.300
Length of Emergency Overflow Weir (m)	3.00 m

Filter Cartridges:

Will filter cartridges be used to manage water quality?	Yes
Design flow from Filter Cartridges (L/s)	71.08 L/s
Filter Cartridges flow with 100 Year ARI Head (L/s)	116.07 L/s

Discharge Data:

RL of 1.5 Year ARI Orifice Centreline	73.940
Number of Orifices	1
RL of 100 Year ARI Orifice Centreline	73.740
Number of Orifices	1
RL of Invert of Discharge to Council Drainage Pit	73.250
RL of obvert of Pit outlet pipe	73.500



① - RL of 1.5 Year ARI Orifice Centerline
② - RL of 100 Year ARI Orifice Centerline
③ - RL of 1.5 Year ARI Control Pit Weir
④ - RL of Invert of Discharge to Council Drainage Pit
⑤ - RL of Obvert of Pit Outlet Pipe
⑥ - RL of Emergency Bypass Weir
⑦ - Top of OSD Tank or Above Ground Wall
⑧ - Average Bottom of OSD Storage
⑨ - 100 Year ARI Water Level
⑩ - 1.5 Year ARI Water Level

*RL - Reduced Level
*Some details omitted for clarity for full design details refer to Blacktown City Council WSUD standard drawings.

Below Ground OSD Summary with calculated values

Site:	
Site Area	20100 m^2
Site Area NOT Draining to OSD	0 m^2
Reduced Levels (AHD):	
RL of Top of Tank	76.3
RL of Bottom of OSD Tank	74
RL of 1.5 Year ARI Overflow Weir	75.32
RL of Emergency Overflow Weir	76.005
RL of 1.5 Year ARI Orifice Centerline	73.94
RL of 100 Year ARI Orifice Centreline	73.74
RL of Invert of Discharge to Council Drainage Pit	73.25
RL of obvert of Pit outlet pipe	73.5
Minium RL of Garage Floor	76.39
Minium RL of House Floor	76.49
OSD Volume:	
Required Storage BELOW 1.5 Year ARI Overflow Weir	603.0 m^3
Required Storage BELOW Emergency Overflow Weir	914.6 m^3
Discharge Details:	
Using Filter Cartridges to Manage Water Quality	Yes
Discharge Location	Council Drainage Pit
Length of Emergency Overflow Weir	3.00 m
Maximum 1.5 Year ARI Site Discharge	80.40 L/s
1.5 Year ARI Orifice Discharge	9.32 L/s
Maximum 100 Year ARI Site Discharge	381.90 L/s
100 Year ARI Orifice Discharge	265.83 L/s
Filter Cartridges design flow	71.08 L/s
Filter Cartridges Discharge with Additional Head	116.07 L/s
Orifice Details:	
Number of 1.5 Year ARI Orifices	1
Number of 100 Year ARI Orifices	1
1.5 Year ARI Orifice Size (mm)	61.0 mm
100 Year ARI Orifice Size (mm)	288.5 mm
Notifications:	

Access grates to be provided such that the maximum reach from any point in the tank to the neaest grate is 4.0m.

Appendix K

RESPONSE TO RTS COMMENTS – LETTER REFERENCED CO13904.03-04.LTR DATED 26 FEB 2024

Costin Roe Consulting Pty Ltd
ABN 50 003 696 446

PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000

e: mail@costinroe.com.au
p: +61 2 9251 7699
f: +61 2 9241 3731
w: costinroe.com.au

8 March 2024

LOGOS Property
Attention: Mr. Louis Towning

email: louistowning@logosproperty.com

Re: Response to Submissions (RtS) - SSD- 36138263
Augusta Street Warehouse and Distribution Centre, Augusta Street, Blacktown, NSW

In response to the letter from Blacktown City Council dated 17 November 2023, referenced MC-23-00005, we provide the following responses to the Civil Engineering and Drainage matters:

18. Engineering Matters	**CRC Response**
The limit of works on Flushcombe Road is to extend up to the Great Western Highway Intersection.	The Flushcombe Road intersection with the Great Western Highway is designed by MU Group. The design of Flushcombe Road will tie into the extent of MU Group's design.
27. Drainage Matters	**CRC Response**
The following supporting documents shall be provided in electric formal for assessment: i. The OSD spreadsheet shall be provided. ii. MUSIC model shall be provided to confirm the reduction target and the non-potable reuse target are achieved. iii. DRAINS model to confirm the drainage design on both internal and external of the site iv. Tuflow model to show the waterway in both pre and post development	 i. Electronic format OSD Spreadsheets have been submitted with the updated package and report ii. MUSIC Model has been submitted with the updated package and report iii. DRAINS model has been submitted with the updated package and report iv. Tuflow model (Software - XPStorm) has been submitted with the updated package and report
The submitted Civil Work package, Costin Roe Consulting, Job NumberC013904.03, Revision 3 and dated 08/09/23 shall be amended: i. the details of the proposed OSD and storm filter tank shall be provided including details of the	 i. Refer to drawings SSDA460-465 & SSDA550-553 for the typical OSD and stormfilter tank details.

Member of: CONSULT AUSTRALIA

control pit, orifice level weir level and cross-section of the tanks etc in both warehouse 1 & 2. The required details can be found in Council's Engineering Guideline for Development and WSUD Standard drawin A(BS)175M.	
ii. the details of the proposed bioretention & detention basin shall be provided including details of the control pit, orifice level weir level and cross-section of the basins etc in both warehouse 3 & 4. The required details can be found in Council's Engineering Guideline for Development and WSUD Standard drawing A(BS)175M. Secondly, the longitude section of the access track shall be provided to prove the gradient is not more the 10%. Furthermore, the solar access of the both basins are uncertain. The consultant shall confirm the basin meet the minimum solar access.	ii. (a) Refer to drawings SSDA454, SSDA460-465 & SSDA550-553 for the typical above ground OSD basins- and bioretention details. ii. (b) All access tracks will be designed to have a gradient of no more than 10% during the detail design stage ii. (c) The interface between the open basins and surrounding levels have been revised. Refer to the typical sections through the basins (SSDA460-465 & SSDA550-553) for interface details.
iii. The details of the permanent ponds and wetland are insufficient for assessment. More details must be provided.	iii. Refer to drawing SSDA552 for sections through Wetland. Wetland will be designed in accordance with Blacktown Council's typical WSUD details and guidelines during the detail design stage. Refer to drawings SSDA458 for typical frog pond details.
iv. All pipeline details were not included in the submitted plan.	iv. Refer to the provided electronic DRAINS model for all pipeline details.
v. The details of rehabilitated creek must be provided including cross-sections, longitudinal section with 1% AEP and PMF water level.	v. Refer to the sections through Blacktown Creek and the unnamed western swale on drawings SSDA550-553
vi. The detail of the culvert on Augusta Street must be provided	vi. Refer to drawing SSDA 756 for the proposed culvert under Augusta Street. To be progressed and designed during the detail design stage.

Yours faithfully,
COSTIN ROE CONSULTING PTY LTD



LOURENS DE VILLIERS
Senior Design Engineer