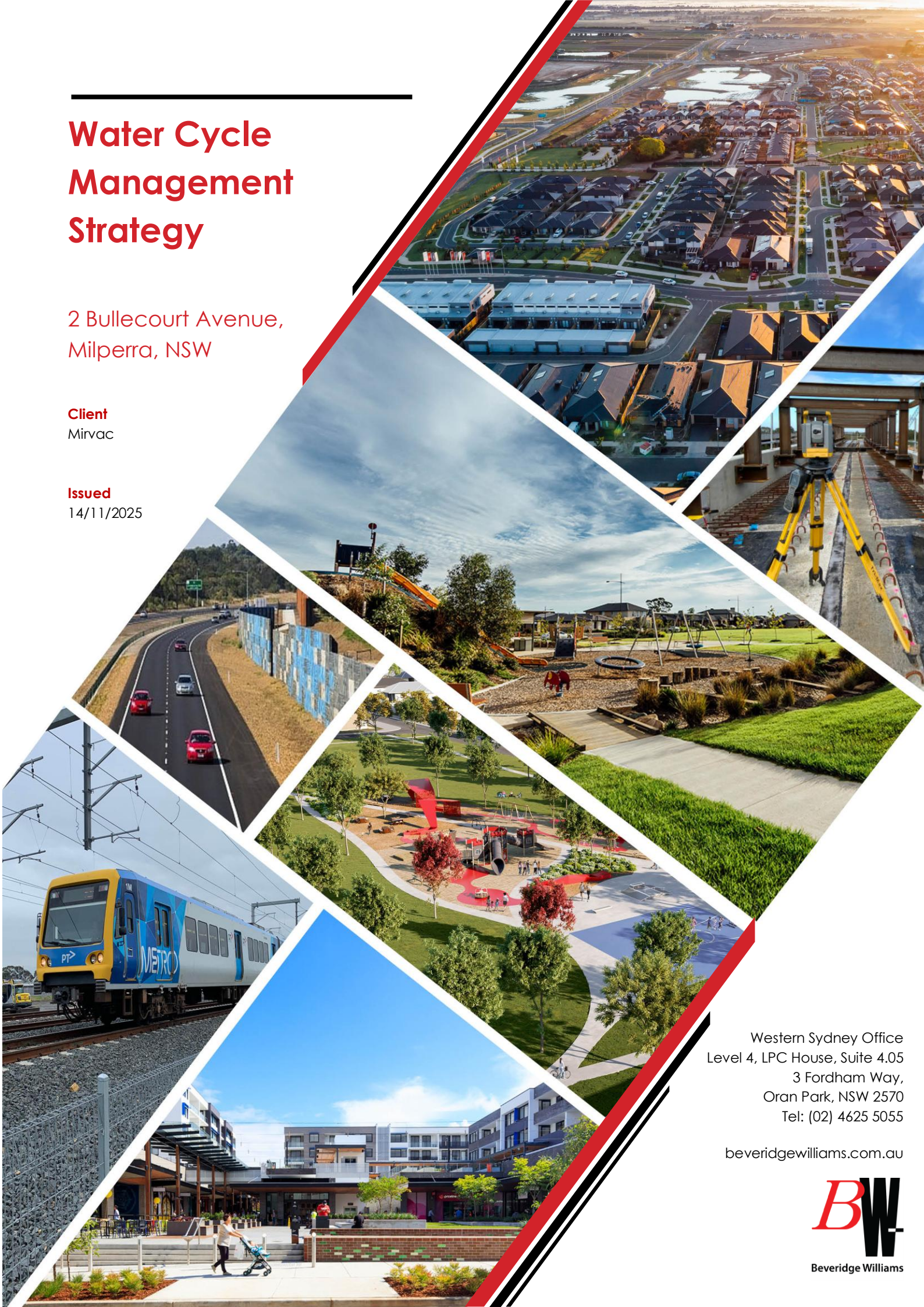
Water Cycle Management Strategy

2 Bullecourt Avenue,
Milperra, NSW

Client
Mirvac

Issued
14/11/2025



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7	Updated compensatory storage plan & issue for formal SSDA lodgement	14/11/2025	SG

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1. INTRODUCTION

This water cycle management study (WCMS) is submitted the Department of Planning, Housing and Infrastructure (the Department) on behalf of Mirvac Residential (NSW) Pty Ltd (the Applicant) in support of a State Significant Development Application (SSDA) for a staged residential development at 2 and 2A Bullecourt Avenue (the site).

This report will outline how stormwater quantity and quality will be managed throughout the staged construction of the development in line with the best practice floodplain and stormwater management guidelines and stormwater planning controls outlined in *Canterbury-Bankstown Development Control Plan (DCP), 2023*.

This report is to be read in conjunction with the following documents which are separate:

- **Flood and Risk Impact Assessment, WSU Campus Milperra, Planning Proposal**, J. Wyndham Prince, Rev C May 2023
- **Stormwater Systems Report,** City of Canterbury Bankstown, 09 Jul 2025 (**Appendix A**)
- **Flood Impacts Assessment**, Beveridge Williams, dated 14 Nov 2025

Proposed works will be carried out in stages with the ultimate development to include up to 430 small and medium sized residential lots, one commercial lot, one active open space area, and three drainage reserves to include on-site detention (OSD) and water sensitive urban design (WSUD) infrastructure. Staging details including a staging plan are provided in **Section 5.3**.

1.1. Objectives

The following objectives will be addressed for the both the ultimate and staged scenarios:

- Prepare catchment plans to support the drainage modelling.
- Prepare a DRAINS model in accordance with *Australian Rainfall & Runoff (ARR) Guidelines (2019)* to determine the existing site discharges and on-site detention requirements
- Design an on-site detention (OSD) solution to satisfy the post development site discharge requirements.
- Design a stormwater treatment train using water sensitive urban design (WSUD) principles and prepare a MUSIC model to address water quality management
- Determine the flood management requirements and design a compensatory floodplain storage solution for areas currently impacted by regional flooding from Georges River.
- Assess the above for the staged development works to determine if temporary measures are required.

2. RELEVANT SEARS

This water cycle management study (WCMS) addresses the following relevant Secretary's Environmental Assessment Requirements (SEARs) set out in the table below.

Table 1: SEARs Compliance Table

SEARS REQUEST	RESPONSE/LOCATION IN REPORT
The Water Management Plan is to detail the proposed drainage design and servicing infrastructure to be incorporated as part of the development (stormwater and wastewater).	The overall watercycle management strategy is summarised in **Section 5**. This includes details of the concept stormwater network in **Section 5.3** The proposed water quantity management strategy including stormwater detention is provided in **Section 6**
The plan must also demonstrate how the development complies with council's drainage requirements	**Section 5.2** outlines Council's drainage requirements and details as to how each has been addressed in the strategy.
The plan must identify the proposed stormwater treatment and water quality management measures to minimise adverse environmental impacts.	The proposed stormwater treatment and water quality management strategy is provided in **Section 7**

3. THE SITE

The site is currently owned by Western Sydney University and is located within the Canterbury-Bankstown Council (CBC) LGA Local Government Area (LGA), at 2 and 2A Bullecourt Avenue, Milperra, being legally described as Lot 2 in DP1291984 and Lot 1 in DP101147 (refer to **Figure 1**).

The total site has an area of approximately 19.64 ha and is the subject of numerous easements affecting the site, including two easements to drain water, easements for electricity and other purposes, and a right of carriageway.

Figure 1: Site Plan (NTS)

Since the demolition of the previous buildings on the site, the site currently comprises:

- Existing at-grade car park (within Zone 4) to be repurposed as parking and hardstand area for the temporary sales office.
- Existing at-grade car park (generally within the location of the future Road 2B).
- At-grade roads off Bullecourt Avenue.
- A large oval to the south.
- The Western Sydney University Early Learning Centre (Child-care centre).
- Vegetation of varying significance, including Cumberland Plain Woodland.

The site is bound by the M5 Motorway to the south, Ashford Avenue / existing residential dwellings to the west, Bullecourt Avenue / existing industrial development to the north, and Horsley Road / existing industrial development to the east. Adjoining the site along the southeastern boundary is Mount St Joseph Catholic College. A noise attenuation barrier and 15m wide vegetated swale runs along the southern boundary between the site and the motorway.

A substantial number of bus stops are located along Bullecourt Avenue and Horsley Road, servicing routes that connect passengers both within and beyond the LGA, including direct links to Bankstown Central (approximately 8.5km drive from the site), Westfield Burwood, and Westfield Miranda. While the nearest train line is the T8, accessible via East Hills, Panania, and Revesby stations, the T6 line at Bankstown Station can also be reached via bus services operating near the site.

The site is characterised by steep terrain with grades of 3%-8%. A ridgeline separates flows into 2 directions with flows running from the high point in the northeast corner of the site towards the intersection of Ashford and Bullecourt Avenue in the northwest, and south/southwest towards the swale along the southern boundary. The existing southern swale conveys flows to culverts (4 x 1500mm dia. RCP) under the freeway which ultimately discharge to the watercourse on the southern side of the M5.

The Georges River is located approximately 1.6 km west of the site, as such the south-west corner of the site is subject to flooding during major storm events caused by backflows from the river.

4. THE PROPOSED DEVELOPMENT

The project will be delivered in stages and across two separate SSDA Projects, and comprises the construction of up to 430 dwelling houses, dual occupancies and attached dwellings, three (3) public parks, new roads and shared paths, civil infrastructure, a car park, and the management of conservation land.

Specifically, across the two SSDAs, consent is sought for:

- Tree removal
- Site remediation (excluding works carried out as category 2 remediation works)
- Construction of bulk earthworks, public roads and landscaping, and services
- Augmentation of existing services and road infrastructure
- Construction of three (3) public parks
- Construction of up to 430 dwelling houses
- Construction of a carpark to service the existing childcare centre and E1 Local Centre zoned land
- Subdivision resulting in up to 430 residential lots, infrastructure lots, and creation of community title lot for land zoned C2 Environmental Conservation and E1 Local Centre
- Conservation works including the management of >2Ha Cumberland Plain Woodland Species.

This SSDA comprises of all Civil works across the entirety of the site as well as the construction of all 62 dwellings in Stages 1 and 2 only, which are as follows:

- Stage 1 – Commencement of site-wide tree removal and land remediation, creation of two (2) super lots and total of 22 residential lots, and construction of 22 dwelling houses fronting Ashford Avenue. This will be the first stage to be delivered and will connect into the existing infrastructure located within Ashford Avenue.
- Stage 2 – Creation of four (4) super lots, a new lot (Lot 25) across the RE1 Public Recreation zoned land, and 40 residential lots. This stage also involves the construction of 40 dwellings within Stage 2, and the construction of new roads and the new public park referred to in the Civil Plans as the 'Central Park'.
- Stage 3a – Creation of a new super lot, and the construction of perimeter roads surrounding the existing childcare centre and C2 Environmental Conservation zoned land. It is proposed all associated civil works required to enable the operation of the existing childcare centre will be delivered under this stage. The new traffic intersections at both Bullecourt Avenue and Horsley Road will be constructed.
- Stage 3b – Creation of three (3) lots to be delivered under a Community Title Scheme for the E1 Local Centre zoned land.
- Stage 4 – Creation of eight (8) super lots, a new lot (Lot 50) across the RE1 Public Recreation zoned land, and a new lot (Lot 49) across the SP2 Infrastructure zoned land. This stage also involves the construction of new roads, the stormwater infrastructure Basin 1 and Basin 2, and the new public park referred to in the Civil Plans as the 'Southern Park', all to be dedicated to Council.
- Stage 5 – Creation of six (6) super lots, and construction of new roads and civil works.
- Stage 6 – Creation of nine (9) super lots and a new lot (70) across the RE1 Public Recreation zoned land. This stage also involves the construction of new roads and civil works, and the new public park referred to in the Civil Plans as the 'Northern Park', all to be dedicated to Council.
- Stage 7 – Creation of six (6) super lots, and construction of road and civil works.

The second SSDA will seek consent for all outstanding works in stages 3 to 7, which are as follows:

- Stage 3 – Construction of the Childcare Alterations and Additions and Construction of a permanent structure for Commercial use.
- Stage 4, 5, 6 & 7 – Creation of the subsequent subdivision into residential lots and construction of dwellings.

5. WATER CYCLE MANAGEMENT STRATEGY

The water cycle management strategy aims to achieve the stormwater quantity and quality objectives in line with the *Canterbury-Bankstown DCP (2023)* and as well as best practice stormwater and floodplain management principles. The concept design has been informed by zoning boundaries as well as the "Flood and Risk Impact Assessment Report" prepared by J. Wyndham Prince.

The proposed subdivision will include a stormwater drainage system that conforms with the existing natural drainage paths where practicable. An integrated design approach has been adopted for the OSD and WSUD assets which have been incorporated within public reserve spaces. These assets will be landscaped to improve their appeal and contribute to the overall amenity and usability of the site and provide opportunities for passive recreation.

5.1. Existing Flood Conditions

Flood modelling for the site and surrounding area has been previously assessed in the Flood and Risk Impact Assessment Report, WSU Campus (J. Wyndham Prince, 2023). The JWP report which was prepared in support of the rezoning of the site. As part of the assessment JWP prepared a preliminary grading plan of the site that considered the proposed zones and basin locations and parks. The report assessed the regrading of the site and illustrated that compensatory storage could be achieved by filling the areas affected by flooding while excavating to produce extra flood volume in the proposed basins.

In addition, a Stormwater Systems Report (SSR) has been issued by Council on 9th Jul 2025 with reference "WP-SIAONL-699/2025". Flood levels within the SSR are based on *Stormwater Catchment Flooding from Milperra Catchment Flood Study (BMT WBM, 2015*), *Kelso Swamp Catchment Flood Study and Georges River Floodplain Risk Management Study & Plan 2004 by Bewsher Consulting Pty Ltd May 2004*. The SSR states that a flood study is NOT Required. As these reports have a slightly lower 1% AEP and PMF level than the JWP report, the flood levels identified in the JWP Report have been adopted as they are more conservative, adopted levels are as follows:

- PMF level of 11.8m AHD.
- regional 1% AEP flood level of 5.55m AHD.

5.2. Key Stormwater DCP Controls

The site is identified as a key development site in the *Canterbury Bankstown DCP*, as such, development of the site is subject to objectives and controls as specified in *Chapter 11.13 - Former WSU Campus – Milperra* of the *Canterbury-Bankstown DCP (2023);* the stormwater objectives and controls listed under section 3.7 will be addressed as follows:

Objectives

O1: To control Stormwater runoff and minimise discharge impacts on adjoining properties and into natural drainage systems before, during and after construction

During the whole lifecycle of the project and following completion, the runoff conveyed from this area will not affect the natural drainage systems. Retarding basins, sediment basins and Bioretention basins designed for this project will ensure that runoff during construction work and post-development will not increase peak flows or pollute natural drainage systems.

O2: To prevent flood damage to the built and natural environment, inundation of dwellings and stormwater damage to properties

Stormwater assets such as pits and pipes will be appropriately placed, sized, and graded to ensure that they will capture and convey runoff respective to the design storm being catered to. Furthermore, the precinct's road and lot layout has been designed to convey runoff and prevent inundation and damage to dwellings. In addition, the flood compensatory storage will be provided by the construction of the basins.

O3: To ensure the design of buildings and structures does not create any unreasonable risks to life and assets

Stormwater assets have been designed to meet safety requirements such as ensuring that freeboard and runoff velocity requirements have been met. Appropriate grades and berms will be adopted for basin designs to ensure safety for maintenance vehicles and staff.

O4: To ensure that proposed development does not adversely affect the operational capacity of the downstream stormwater system

Analysis using DRAINS has been conducted to determine whether post development flows are greater than the corresponding predevelopment flows. Where post development flows are larger than predevelopment flows, OSD basins have been proposed to reduce peak flows to predevelopment levels. The basins 1 &2 will ensure that the Milperra development will not impact the operational capacity of the downstream stormwater system.

O5: To ensure an integrated water cycle management approach through water-sensitive urban design principles and does not adversely impact public recreation opportunities within the RE1 Public Recreation zoned land

All basins are located in accordance with the rezoning documents, proposed zoning and recently adopted site specific DCP. Outside of major storm events, there is opportunity for the basins to be utilised for public recreation opportunities as the space is not designed to retain runoff.

Controls:

C1: The following devices must be provided in accordance with Council's specifications and subject to Council approval:

a) **Bio Basin in Southern Open Space (Basin 1), with an area of approximately 650 sqm**
b) **Bio Basin in Drainage Basin (Basin 2), with an area of approximately 210 sqm**
c) **Bio Basins in Northern Open Space (Basin 3), with an area of approximately 350 sqm**

All three Bio Basins stated above have been detailed in the following report. With the addition of GPT's, the bioretention portion of the basins were able to be reduced which helps provide more usable park land for Basins 1 and 2 and allows easier maintenance by Council.

C2: All proposed dwellings must comply with Section 3.1 Development Engineering Standards of the Canterbury Bankstown Development Control Plan 2023

Of the ultimate dwellings to be constructed in the development, only 62 dwellings to be constructed under the initial masterplan DA. The masterplan DA takes into consideration all residential lots and considers but not limited to yard grading, retaining wall drainage, Common Drainage Line drainage, and house service outlets to the street drainage. All stormwater runoff from future residential dwellings will be designed in accordance with Section 3.1 of the Canterbury Bankstown Development Control Plan.

C3: Drainage systems should be sized to consider increases in rainfall intensity, frequency and duration under future climate change

OSD basins have been designed based on the design storm which was determined from data obtained from the ARR using the 'Interim Climate Change Factor' which reflects the increase in rainfall intensity, frequency, and duration under future climate change. The final drainage pit and pipe network will be designed during the Subdivision Works Certification phase will design and detail all pipe sizes. This final design will also include the 'Interim Climate Change Factor'.

C4: A local Stormwater Management Plan is to be provided with the first Development Application for proposing subdivision/construction of residential accommodation of the site

The local Stormwater Management plan is provided by the submission of this Water Cycle Management Strategy report. Included in this report is a copy of the SSD prepared and issued by Council (Provided in **Appendix A**).

5.3. Concept Stormwater Network Design

The concept Masterplan of the stormwater layout can be found in **Appendix B.** The Masterplan concept is indicative only and will be designed in detail at the subdivision works certificate phase when the design levels of the subdivision are finalised. The concept masterplan stormwater layout considers three discharge points in the existing condition:

- DSP1 (south) - the swale which runs adjacent to the southern boundary of the site, these flows ultimately discharge to the existing M5 culverts.
- DSP2 (northeast) - the existing drainage network at the intersections of Bullecourt Avenue and Horsley Road
- DSP3 (northwest) - the existing drainage network at the intersections of Bullecourt Avenue and Ashford Avenue.

5.1. Integrated Stormwater Management for Water Quantity and Quality

The proposed overall water cycle management strategy will include and integrated solution for stormwater detention and treatment with select bioretention basins including an allocation for detention. Proposed basins have been designed with a combination of vertical retaining walls and varying embankment grades to manage the steep terrain of the site; these design elements will reduce the impact to existing and future vegetation and allow for safe and easy access to the invert of each basin. Final configuration of walls and embankments will be designed in collaboration with Council. The layout of key stormwater features in the post-developed condition is presented in **Figure 4** in **Section 6.1.2.**

The site will be regraded to increase the portion of the site draining south to basins 1 and 2 which will include an allocation for detention, flows discharging to the existing road and drainage network to the north will be decreased. The proposed OSD system aligns with the previous concept design presented by JWP and approved by council as part of the approved Planning Proposal. Details of water quantity management have been discussed in **Section 6.**

Water quality will be managed by rainwater tanks on individual lots, GPTs at the inlets to bioretention basin noting bioretention treatment is combined with OSD in the case of basin 1 and 2. Details of water quality management are discussed in **Section 7**.

5.2. Floodplain Management and Compensatory Storage

A detailed flood assessment including 2-dimensional hydraulic modelling has been conducted by J. Wyndham Prince in the Flood and Risk Impact Assessment Report to determine the 1% AEP flood level and ensure that the proposed development does not create unacceptable flood impacts external to the site, and no loss in floodplain storage occurs due to the proposed development. Updated finished surface level modelling has been designed to provide the required compensatory floodplain storage for the 1% AEP event. The assessment of floodplain management and compensatory storages is presented in **Section 8.**

While the JWP report identified that there are no adverse flood level impacts external to the site in the 1% AEP event, a separate Flood Impacts Assessment prepared by Beveridge Williams has been prepared to assess overland flows along Ashford Avenue and potential flood impacts to existing lots to the west of the site. Refer to this document for the overland flow and a flood assessment of the proposed development and impact on existing residential properties.

5.3. Staged Water Cycle Management Strategy

Construction of the subdivison will be carried out in 7 stages, **Figure 2**. A staged stormwater management strategy has been developed to ensure the water management obligations are met throughout the staged construction with consideration for both stormwater conveyance, discharge quantity and quality, and flood storage requirements. The staged stormwater management objectives and approach are consistent with those specified for the overall masterplan as specified in **Section 5.** Where the staged approach differs from the overall scheme, details have been summarised in **Sections 5.3.2** to **5.3.8**

Figure 2: Staging Plan

5.3.1. Early Works

Demolition works were carried out in accordance with the DA1512/2023. The existing childcare centre building and adjoining carparking/landscape area within the Stage 3 and Stage 5 works area was retained, all other existing structures and hardscaped areas were removed. A temporary sediment basin was constructed in the south-west area of the site. Diversion drains were installed along the school property and Ashford Avenue to divert runoff from the site to the temporary sediment basin.

5.3.2. Stage 1

Stage 1 lots will discharge to the temporary sediment basin which ultimately outlets at DSP1, upstream of the M5 culverts. Following the demolition of the site under DA1512/2023 the imperviousness of the site has dramatically reduced resulting in less runoff from the site. While Stage 1 does increase the impervious area of the site, the total impervious area of the site is still less than the pre-demolition and as a result the peak flows leaving the site are less than pre-development levels, as such additional OSD is not required as part of the Stage 1 works. The temporary sediment basin is proposed to be converted to a temporary bioretention raingarden following site stabilisation and 80% construction completion for houses from contributing catchments in the ultimate condition, this would provide the stormwater treatment required for Stages 1 and 2.

Ultimately, Stage 1 lots will discharge to Basin 2 which is proposed to be constructed as part of the Stage 4 works. Basin 2 will provide stormwater detention and treatment before discharging to DSP1, upstream of the M5 culverts. No compensatory flood storage is required for Stage 1.

5.3.3. Stage 2

Stage 2 works area will discharge to the Stage 1 temporary sediment basin, which ultimately discharges to DSP1. Following the demolition of the site under DA1512/2023 the imperviousness of the site has dramatically reduced resulting in less runoff from the site. While Stage 1 and 2 works will result in an increase of impervious area, the total impervious area of the site is reduced compared to the pre-development conditions. In addition, Stages 1 and 2 has less impervious area than the existing northern catchment under existing conditions and therefore has less runoff than pre-demolition resulting in less peak flow reaching DSP1, as such additional OSD is not required as part of the Stage 2 works. Stormwater treatment would be satisfied through the proposed conversion of the temporary sediment basin to a bioretention raingarden following site stabilisation and 80% construction completion for homes from contributing catchments in the ultimate condition. The Design of the pit and pipe system is in accordance with the ultimate design. As such, temporary tail out and diversion drains will be used to direct the water from Stage 2 to the temporary sediment basin.

Ultimately, Stage 2 will discharge to Basins 1 and 2 which are proposed to be constructed as part of the Stage 4 works. These will provide stormwater detention and treatment before discharging to DSP1, upstream of the M5 culverts. No compensatory flood storage is required for Stage 2.

5.3.4. Stage 3

Stage 3 works area will discharge to two locations - the conservation area which makes up the eastern portion of Stage 3 will remain unchanged and discharge to DSP2 per the existing conditions, as such no additional detention or treatment interventions are required for this area; the remaining portion of the Stage 3 works will discharge to the temporary sediment basin to the west which ultimately outlets to DSP3. The temporary sediment basin is proposed to be converted to a temporary bioretention raingarden to provide stormwater treatment for the contributing area of Stage 3 following site stabilisation and 80% construction completion of houses from contributing catchments in the ultimate condition. Like Stages 1 and 2 above, following the demolition of the site under DA1512/2023 the imperviousness of the site has dramatically reduced resulting in less runoff from the site. Together Stages 1, 2 and 3 has less impervious area than the existing site. In addition, Stage 3 has less impervious area than the existing northern catchment under existing conditions and therefore has less runoff than pre-demolition resulting in less peak flow reaching DSP3. Proposed works will result in a net increase of the pervious area compared with the existing conditions leading to an overall reduction in stormwater runoff for Stage 3 works area, as such additional OSD is not required as part of the Stage 3 works.

Ultimately, the west portion of Stage 3 will discharge to Basin 3 which is proposed to be constructed as part of the Stage 6 works. Basin 3 will provide stormwater detention and treatment before discharging to DSP3. No compensatory flood storage is required for Stage 3.

5.3.5. Stage 4

Stage 4 ill include construction of two permanent Stormwater Management Facilities. In this case Basin No.1 will be constructed in the Southern Park (to be dedicated as Public Reserve), this includes a bioretention basin and the entire park doubles as an OSD Basin. Basin No.2 is located in the drainage reserve and addresses both bioretention and OSD.

Basins 1 and 2 receives stormwater flows from stages 1, 2, 4, 5, a portion of Stage 6, and majority of the stage 7 area, and provides the required detention and treatment in both the interim and ultimate conditions without the requirement for additional temporary assets in the interim condition. Basin 1 will also provide the compensatory flood storage capacity required for the Stage 4 area. The bioretention raingarden components of basins 1 and 2 would be constructed following site stabilisation and 80% construction completion of houses from contributing catchments in the ultimate condition.

5.3.6. Stage 5

Stage 5 will discharge to the Basin 2 which will provide stormwater detention and treatment before discharging to DSP1, upstream of the M5 culverts; Basin 2 is proposed to be constructed as part of the Stage 4 works. No compensatory flood storage is required for Stage 5.

5.3.7. Stage 6

Stage 6 will include construction of the final permanent Stormwater Management Facilities. In this case Basin No.3 will be a bioretention basin only and be constructed in the Northern Park (to be dedicated as public reserve). Basin 3 will provide stormwater treatment for contributing portions of Stage 6 and Stage 3 works areas before ultimately discharging to DSP3 on Bullecourt Avenue.

Works up to Stage 6 include a realignment of the ridgeline which separates catchments discharging north and south, resulting in a smaller catchment discharging north. Despite the development creating more impervious area than under existing conditions, the reduction in catchment area ensures the peak flows discharging to DSP3 are less than the pre-development flows discharging to DSP3. In addition, it is noted that Basins 1 and 2 constructed in Stage 4 compensate for the larger catchment area being diverted to the south.

5.3.8. Stage 7

The majority of the Stage 7 works area will discharge south to Basin 2 with the exception that Superlot 71 and laneway will drain directly to Ashford Avenue without detention. A GPT is all that is required for this small area to address water quality, and this will be installed in Ashford Avenue.

6. WATER QUANTITY MANAGEMENT

The water quantity management strategy aims to meet the following key objective per the *Canterbury-Bankstown DCP (2023)*:

- limiting runoff from the development to pre-developed levels, i.e. post-development flow must be less than or equal to pre-developed levels

The proposed solution includes onsite detention (OSD) within basin 1 and basin 2, with the proposed location within the reserve areas at the south of the site, prior to DSP1. The site will be regraded to increase the portion of the site draining south to these basins and decrease the flows discharging to the existing road and drainage network. The proposed OSD system aligns with the previous concept design presented by JWP and approved by council as part of the approved Planning Proposal.

6.1. Hydrological Modelling

A DRAINS model was created to estimate the peak flow rates discharging from the site for the pre- and post-developed scenarios. DRAINS is a hydrology and hydraulic modelling package recognised by ARR 2019. The procedures and model inputs for this assessment are consistent with the *Australian Rainfall and Run Off 2019*. and the *Canterbury-Bankstown DCP (2023)*.

It should be noted that the JWP report, the hydrologic modelling uses ARR 1987 procedures and rainfall intensity-frequency-durations (IFD) inputs, whereas modelling undertaken in this study uses the latest ARR 2019 procedures. Due to this, it is expected that the hydrology and hydraulic parameters presented from the analysis and modelling from this study will vary from previous reports. The modelling in this report supersedes previous modelling as it is in line with the current industry standard.

6.1.1. Hydrological Modelling Input Parameters

The hydrologic modelling was carried out using a RAFTS Storage Routing model muddle within the DRAINS software interface, RAFTS is one of the recommended models under ARR2019 and is suitable for modelling a range of catchment sizes and configurations. Due to the lumped catchments adopted for this model, RAFTS was deemed appropriate as it provides a more reliable hydrological estimates than alternate hydrological models such as IL/CL models, for medium to large catchment sizes.

In both the pre-development and post-development models the area is categorised as urbanised with similar levels of compaction, as such the same pervious area initial loss (IL) was adopted for both scenarios.

The DRAINS model configuration and results are provided in **Appendix C**and **Appendix D.**

Parameters for the hydrologic modelling have been summarised in **Table 2.**

Table 2: Hydrological Parameters and Considerations

DESIGN PARAMETER	REQUIREMENT/ASSUMPTION	COMMENT
Software Package	DRAINS Version 2021.02 – 4 Aug 2021	
Rainfall Estimation Procedures	ARR 2019	
Rainfall Runoff Model	RAFTS Storage Routing model (as applied in DRAINS)	
IFD Data	ARR 2019 Design Rainfalls	Bureau of Meteorology
Losses	Impervious Area IL = 0 mm Impervious Area CL = 0 mm/h Pervious Area IL = 29 mm Pervious Area CL = 0.8 mm/h	ARR Book 5, Section 3.5.3.1.2 ARR Datahub ARR Datahub Value x 0.4
Temporal Patterns	10 Rainfall Patterns from the East Coast South region	ARR Datahub
Mannings	Pre-Development Catchment= 0.03 Post-Development Catchment = 0.02 Post-Development Catchment with 10% effective impervious= 0.03	
Percentage Impervious Area	Existing buildings/hardstand = 100% Proposed Lots = 85% Road Reserve = 95% Parks/Open space = 10%	

6.1.2. Catchment Mapping

There are three discharge points in the existing conditions, details are as follows:

- DSP1 (south) - the swale which runs adjacent to the southern boundary of the site, these flows ultimately discharge to the existing M5 culverts.
- DSP2 (northeast) - the existing drainage network at the intersections of Bullecourt Avenue and Horsley Road
- DSP3 (northwest) - the existing drainage network at the intersections of Bullecourt Avenue and Ashford Avenue.

The pre-developed condition has been taken as the site prior to demolition which includes buildings for education, student housing and administration spread out across the site as well as paved areas for parking and footbaths, and grassed open spaces, and vegetated areas.

Catchment plans from the pre-developed scenario were adjusted for the post-development scenario to account for proposed works including demolition, construction, and regrading of the site to shift the existing ridgeline further north and increasing the proportion of catchments draining south to proposed OSD basins 1 and 2, prior to DSP1. Catchment plans for pre-developed and developed scenarios are shown in **Figure 3**, and **Figure 4**, respectively.

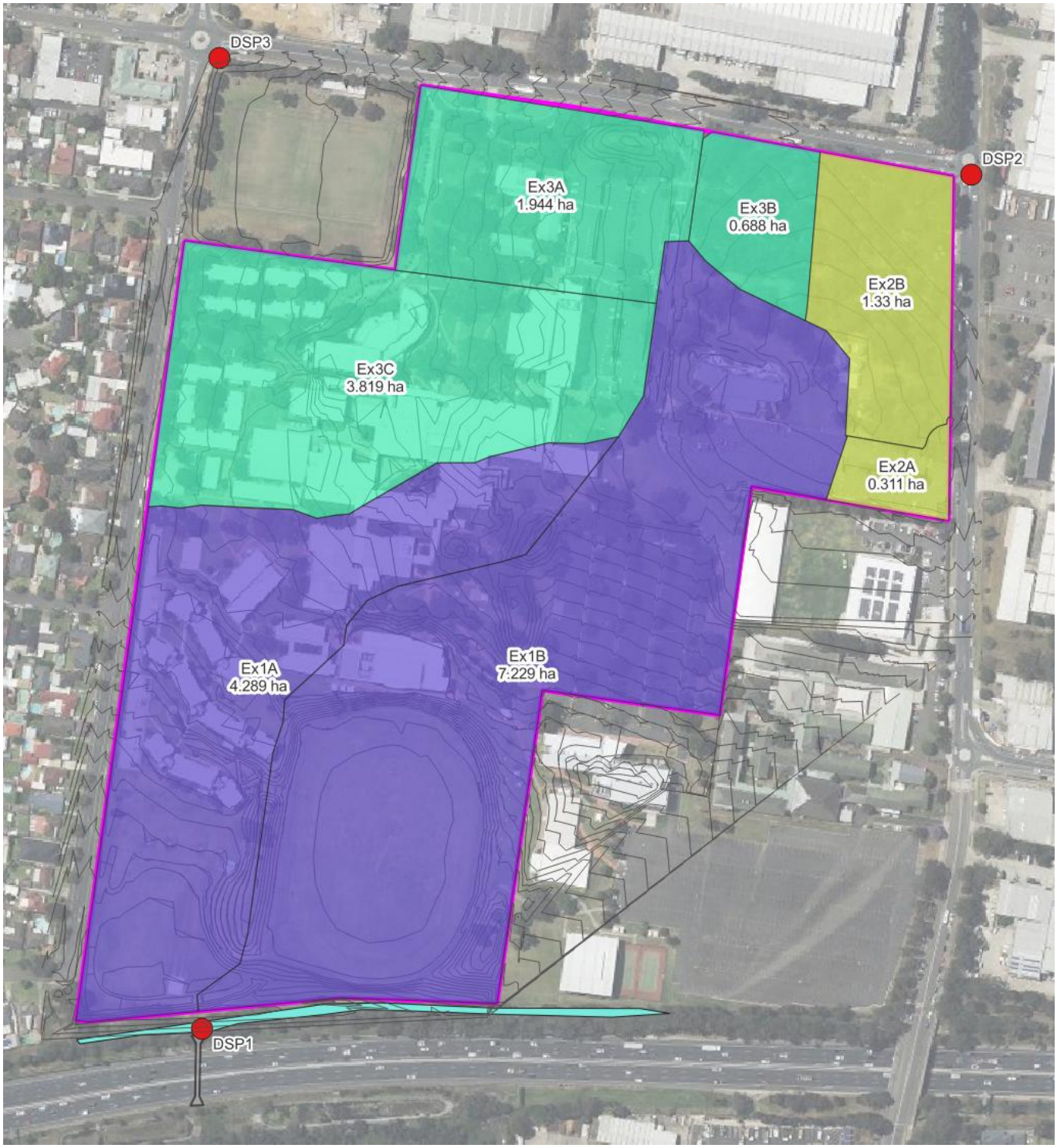


Figure 3: Pre-Development Catchment Plan

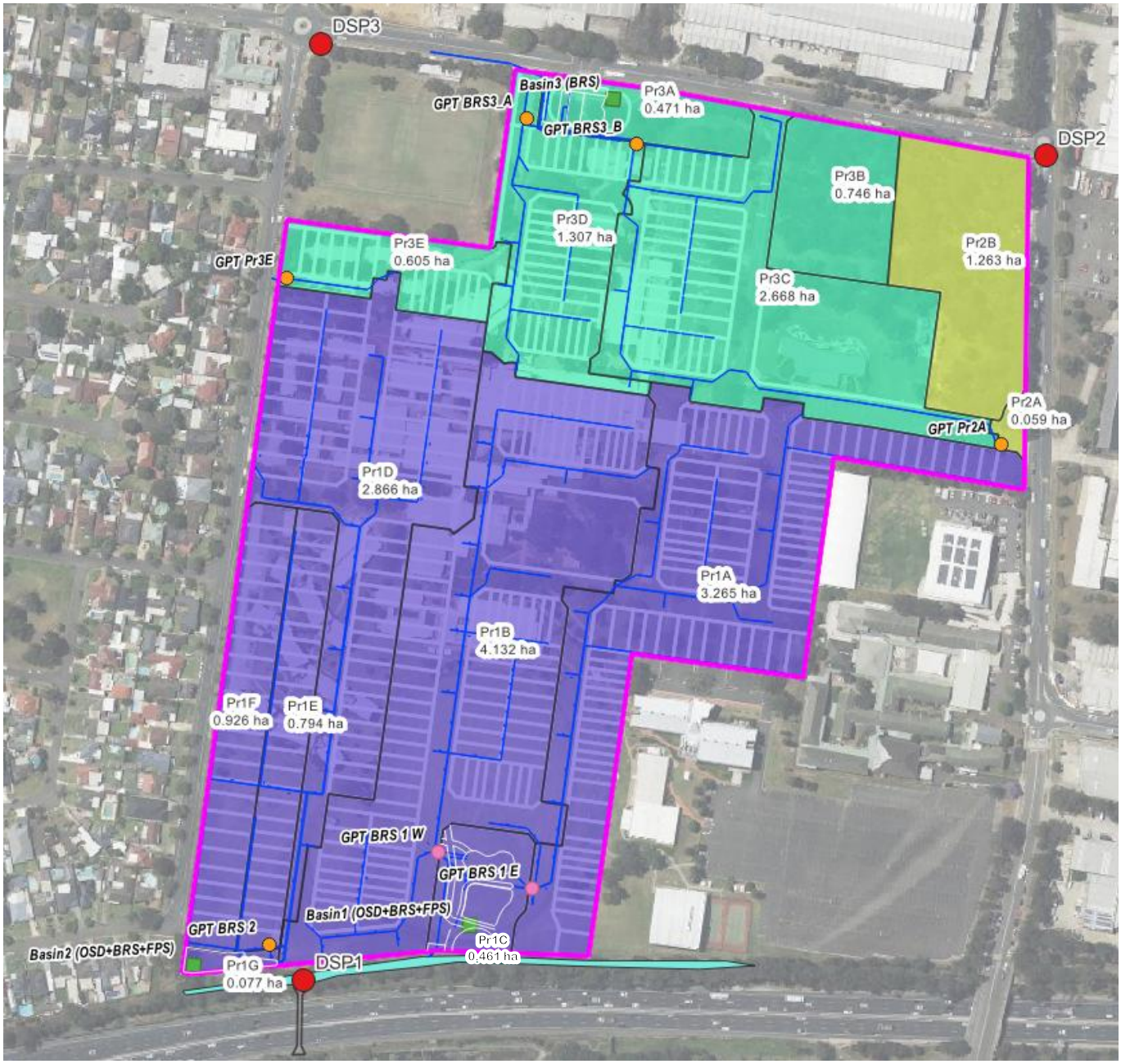


Figure 4: Post-Development Catchment Plan

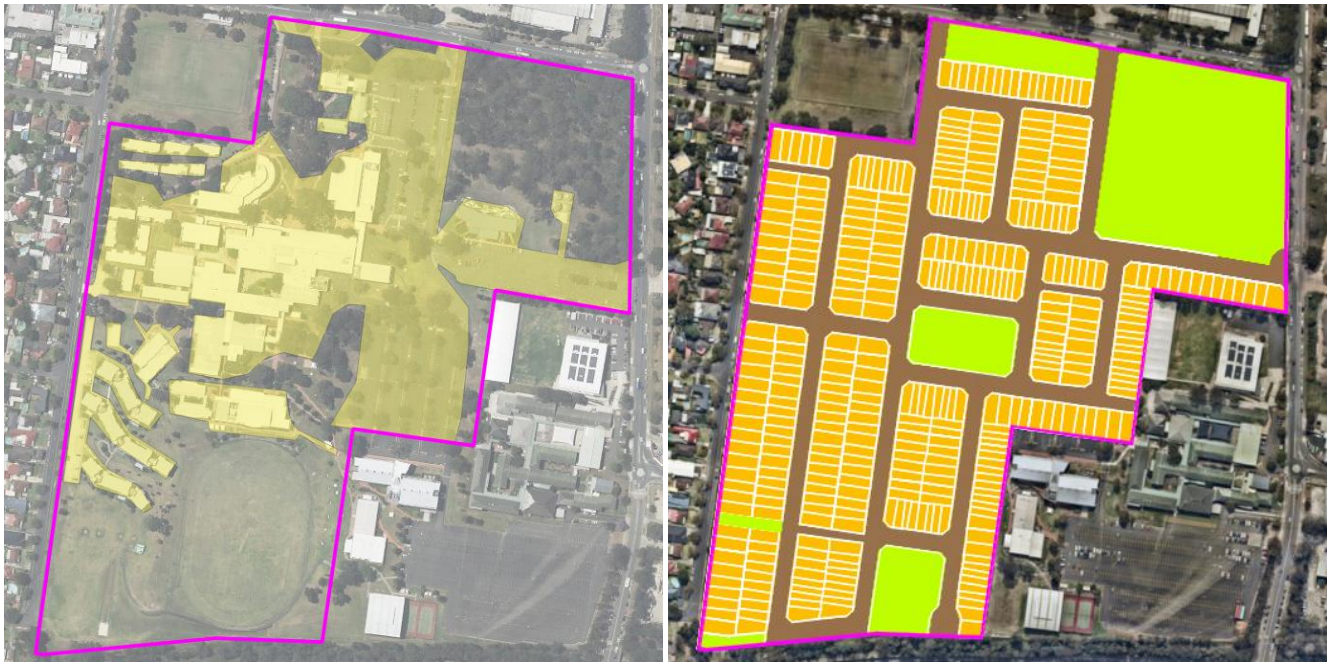


Figure 5: Areas for determination of imperviousness, pre-development (L), post-development (R)

The imperviousness adopted for the pre-developed scenario is based on the pre-demolition conditions which includes existing buildings and hardstand areas. **Figure 5,** shows the delineation of areas used to determine the overall imperviousness for catchments in both the pre-developed and developed scenarios. Catchment properties for the pre-developed and developed scenarios are summarised in **Table 3**, and **Table 4**, respectively.

Table 3: DRAINS Pre-Development Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUSNESS % *()
DSP1	**Ex1A**	4.289	47 (2.02)
	Ex1B	7.229	38 (2.75)
	Total Area of DSP1	11.52	41
DSP2	**Ex2A**	0.311	16.08 (0.05)
	Ex2B	1.33	21.88 (0.291)
	Total Area of DSP2	1.64	21
DSP3	**Ex3A**	1.944	58.64 (1.14)
	Ex3B	0.688	3.2 (0.022)
	Ex3C	3.819	83.77 (3.199)
	Total Area of DSP 3	6.45	68
Total Area		**19.6**	**48**

*Impervious areas in hectares ()

Table 4: DRAINS Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUSNESS % *()
DSP1	**Pr1A**	3.265	88.44 (2.93)
	Pr1B	4.132	77.83 (2.87)
	Pr1C	0.461	10 (0.05)
	Pr1D	2.866	88.15 (2.87)
	Pr1E	0.794	85 (0.67)
	Pr1F	0.926	85 (0.79)
	Pr1G	0.077	19.80 (0.02)
	Total Area of DSP1	12.52	81
DSP2	**P2A**	0.059	94.64 (0.06)
	Pr2B	1.263	10 (0.13)
	Total Area of DSP2	1.32	14
DSP3	**P3A**	0.471	10 (0.05)
	Pr3B	0.746	10 (0.07)
	Pr3C	2.668	66.54 (1.78)
	Pr3D	1.307	86.72 (1.13)
	Pr3E	0.605	89 (0.54)
	Total Area of DSP 3	5.80	62
Total Area		19.6	71

*Impervious areas in hectares ()

6.1.3. OSD Basin Design

Using the DRAINS retention basin feature, two OSD basins were modelled prior to the DSP1 in the post-developed scenario. OSD basins were sized to accommodate the 1% AEP storm and outlets designed to ensure peak flow rates in the post-developed scenario were maintained at or below pre-development peak flow rates for the design storms.

Modelling of the 1% AEP considered two scenarios, with and without tailwater of RL5.55 from George's River; this was necessary to understand a worst-case scenario if the peak flows in the basin were to coincide with peak levels in the river. The basins were designed to with sufficient volume to accommodate this worst-case scenario with available storage assumed to be above RL5.55. Resulting ground levels adjacent to the basins are relatively high, this was necessary to ensure lot levels are above peak water levels in the basins for this worst-case scenario.

The outlet controls for each basin include three low flow orifices and an overflow weir. The narrow weir in basin 1 was necessary to accommodate the 1% AEP storm event under both tailwater and non-tailwater conditions, ensuring backflows into the basin from George's River are controlled under tailwater conditions while also minimising the overall water levels in the basin for both scenarios as a risk management measure given the basin is designed for use as a public open space. As a blockage prevention measure, the basin 1 weir includes a trash screen. Further, the retaining wall is designed to act as an emergency spillway weir with the top of the wall low point (@ RL 6.00) below surrounding road levels (minimum kerb RL6.150). Outlet controls have been designed to eliminate ponding points as a sediment mitigation measure.

Concept OSD design parameters are provided for basins 1 and 2 in **Table 5** and **Table 6,** respectively. The proposed OSD basins were designed using the 12d software package and the concept design is presented on Masterplan which is included in **Appendix B.**

Table 5: OSD Design Details – Basin 1

PARAMETER	VALUE
low flow discharge – orifice plates	0.6 m wide x 0.4 m high @ IL2.64
	0.8 m wide x 0.45 m high @ IL3.85
	0.8 m wide x 0.45 m high @ IL3.85
Overflow Weir	0.25 m wide @ RL4.00 (located in the retaining wall)
Effective Detention Volume at 1% AEP without tailwater	1253 m^3 (at 4.30m)
Effective Detention Volume at 1% AEP with tailwater	5813 m^3 (at 5.85m)
Volume to crest (top of retaining wall)	6692 m^3 (at 6.00m)

Table 6: OSD Design Details – Basin 2

PARAMETER	VALUE
low flow discharge – orifice plates	0.2 m wide x 0.15 m high@ IL2.60
	0.8 m wide x 0.4 m high@ IL4.04
	0.9 m wide x 0.3 m high@ IL5.00
Overflow Weir	14.2 m @ RL5.50
Effective Detention Volume at 1% AEP without tailwater	958 m^3 (at 5.24 m)
Effective Detention Volume at 1% AEP with tailwater	1221 m^3 (at 5.68m)
Volume to crest (top of retaining wall)	1264 m^3 (at 5.75m)

6.1.4. DRAINS Model Results

The model results demonstrated that with the proposed regrading a peak flow below the pre-developed target flows was achieved for DSP2 and DSP3. Regrading and proposed works results in an increase of peak flows in the developed condition compared to the pre-developed targets, with the addition of OSD basin 1 and 2 at the south of the site, a post-developed flow of less than the pre-developed target flow was achieved for DSP1.

Modelling results are provided **Table 7** as well as **Appendix D.**

Table 7: Peak Flow Rates Comparison

DISCHARGE POINT	SCENARIO	10% AEP (m^3/s)	1% AEP (m^3/s)
DSP1	**Pre-Development**	2.521	4.01
	Post-Development	4.03	6.39
	Post Development with OSD (Basin1 + Basin2)	1.792	2.896(No TW), 4.019(TW*)
DSP2	**Pre-Development**	0.309	0.496
	Post-Development	0.219	0.377
DSP3	**Pre-Development**	1.843	2.764
	Post-Development	1.371	2.067

*Tailwater level – Georges River 1% AEP Flood Level of 5.55m

6.2. Stage Modelling

The DRAINS model was modified to estimate the peak flow rates discharging from the site for the post-developed scenarios for stage 1-6, where stage 7 represents completion of the masterplan development. These were compared with the pre-development peak flows rates for each discharge point.

The catchment plans from the pre-/post-development scenarios were adjusted to account for the staged works including demolition of existing buildings and hard surfaces. The pre-development catchment for comparison to the staged scenarios was consistent with the original model per **Figure 3** and **Table 3**.

The overall imperviousness for Stages 1, 2 and 3 are reduced compared to the pre-developed scenario which includes existing buildings and hardstand surfaces. Stage 4 works include the construction of OSD basins for the southern portion of the site, noting there is no detention requirement for catchments draining to DSP2 and DSP3 in the ultimate condition; Stages 4, 5, and 6 were modelled with the OSD basins. The catchment plans and tabulated properties for the staged scenarios are provided in **Appendix E** All other modelling inputs and assumptions are consistent with the previous model.

For simplicity, staged DRAINS models have been configured assuming stages are concurrent.

Results from the proposed Stage 1, 2, and 3 scenarios demonstrate a reduction in the post development flows for both the major and minor storm event therefore additional OSD is not required for these staged works. Results for proposed Stages 4, 5, and 6 demonstrate the OSD assets per the ultimate condition which will be constructed in Stage 4 provide sufficient detention to achieve the water quantity peak flow targets for both the major and minor storm events. Result for all stages are summarised in **Table 8.**

Table 8: DRAINS Results – Stages 1-6

DISCHARGE POINT	STAGE COMPLETION	PEAK FLOW (m^3/s) 10% AEP	PEAK FLOW (m^3/s) 1% AEP**
DSP1	**Pre-Development**	**2.516**	**3.978**
	Proposed – Stage 1*	1.303	2.087
	Proposed – Stage 2*	1.501	2.363
	Proposed – Stage 3	1.305	2.033
	Proposed – Stage 4 with ultimate OSD basins 1 & 2	1.078	1.785
	Proposed – Stage 5 with ultimate OSD basins 1 & 2	1.244	2.188
	Proposed – Stage 6 with ultimate OSD basins 1 & 2	1.297	2.278
	Proposed – Stage 7 (Ultimate)	1.792	2.896
DSP2	**Pre-Development**	**0.299**	**0.471**
	Proposed – Stage 1 & 2*	-	-
	Proposed – Stage 3 and 4	0.225	0.383
	Proposed – Stage 5, 6, and 7 (Ultimate)	0.219	0.377
DSP3	**Pre-Development**	**1.800**	**2.590**
	Proposed – Stage 1 & 2*	**-**	**-**
	Proposed – Stage 3 and 4	0.742	1.164
	Proposed – Stage 5	0.743	1.168
	Proposed – Stage 6	1.302	2.031
	Proposed – Stage 7 (Ultimate)	1.371	2.067

*Stage 1 and 2 pre-development and proposed catchments are all contained within the area discharging to DSP1
**No tailwater from Georges River

6.3. Climate Change Sensitivity Modelling

A sensitivity test of the DRAINS model was carried out to assess the performance outcomes of the proposed design under a climate change (cc) scenario in line with the *ARR 2019 Guidelines, version 4.2*. An SSP3 (high) scenario was selected as a reasonable prediction of the future climate scenario where SSP3 represents high future development. Rainfall intensities were modified to reflect a SSP3 climate change scenario for the horizon year 2090 (midpoint of the 'long-term' horizon) using the *Watercom Climate Change Rainfall Modifier*. All other parameters remained consistent with the details specified in **Section 6.1**. Tailwater was applied for the 1% AEP event for basin 1 and 2 outlets.

Results are for peak flows and peak water levels are provided in **Table 9** and **Table 10**, respectively, full results are provided in **Appendix G**. Results from the base case per **Section 6.1** have also been provided for comparison.

Table 9: Peak Flow Rates Comparison – SSP3 2090 Climate Change Scenario

DISCHARGE POINT	SCENARIO	10% AEP (m^3/s)	1% AEP (m^3/s)
DSP1	Pre-Development (base case)	2.521	4.01
	Post-Development with OSD (Basin1 + Basin2) (base case)	1.792	4.019(TW*)
	SSP3 2090 cc Pre-Development	3.493	5.82
	SSP3 2090 cc Post-Development with OSD	2.977	5.776
DSP2	Pre-Development (base case)	0.309	0.496
	Post-Development (base case)	0.219	0.377
	SSP3 2090 cc Pre-Development	0.425	0.748
	SSP3 2090 cc Post-Development	0.321	0.534
DSP3	Pre-Development (base case)	1.843	2.764
	Post-Development (base case)	1.371	2.067
	SSP3 2090 cc Pre-Development	2.67	3.98
	SSP3 2090 cc Post-Development	1.874	2.882

*Tailwater level – Georges River 1% AEP Flood Level of 5.55 m AHD

Design of the pit and pipe stormwater including overland flows through the road network will be designed to ensure to SSP3 2090 flows are conveyed to the basin.

Table 10: OSD Basin Peak Water Levels – 1% AEP SSP3 2090 Climate Change Scenario

PARAMETER	BASIN 1	BASIN 2
1% AEP Peak Water Level (base case per **Section 6.1**)	5.85 m AHD*	5.68 m AHD*
1% AEP Peak Water Level (SSP3 2090 cc scenario)	6.01 m AHD*	5.74 m AHD*
Basin Crest (top of retaining wall)	6.00 m AHD	5.75 m AHD
Finished Floor Level of adjacent lots	6.51 m AHD	6.18 m AHD
Freeboard (SSP3 2090 cc scenario)	500 mm	440 mm

*Tailwater level – Georges River 1% AEP Flood Level of 5.55 m AHD

Results demonstrate an increase in flows for both the pre- and post-development scenarios when applying the SSP3 2090 climate change conditions. Post-development flows were maintained at less than the pre-development flows for all three discharge locations.

Under climate change conditions for the 1% AEP storm event with tailwater from Georges River of 5.55 m AHD, basin 1 overtops the retaining wall, for basin 2 the peak water level reaches 10mm below the top of the retaining wall. For relevant lots, the resulting freeboard to finished floor levels under climate change conditions for basins 1 and 2 is 500mm and 440 mm, respectively.

7. WATER QUALITY MANAGEMENT

A stormwater quality treatment train has been assessed utilising the MUSIC software package. Assets within the treatment train have been selected and sized to meet the targets specified in CBC DCP 2023, specifically:

- 85% reduction in the post-development mean annual load of Total Suspended Solids (TSS)
- 65% reduction in the post-development mean annual load of Total Phosphorous (TP)
- 45% reduction in the post-development mean annual load of Total Nitrogen (TN)
- 90% reduction in the post-development mean annual load of Gross Pollutants (GP)

The proposed treatment train to achieve the water quality treatment targets comprises 2kL rainwater tanks (RWTs) on each lot, and bioretention raingardens (BRS) treating with gross pollutant traps (GPTs) at the basin inlets. Bioretention treatment and GPTs will be configured as follows:

- BRS1 treats flows from catchments Pr1A, Pr1B, Pr1C
    - Pr1A and Pr1B will each undergo additional primary treatment from an Atlan Ecoceptor series 8000, each, with 1 GPT connected at the west and another at the east inlet to BRS1
    - Pr1C represents the catchment for the basin
- BRS2 treats flows from Pr1D, Pr1E, Pr1F, and Pr1G
    - Pr1D, Pr1E, and Pr1F will undergo additional primary treatment from a single Atlan Ecoceptor series 6000 at the inlet to BRS2
    - Pr1G represents the catchment for the basin
- BRS3 treats flows from catchments 3PrA, Pr3B, Pr3C, Pr3D. This basin will be configured as a split, tiered basin (3A and 3B) to accommodate the level difference at the proposed basin location. This configuration will provide sufficient treatment while reducing the depth of the asset.
    - Pr3D will undergo additional primary treatment from an Atlan Ecoceptor series 8000 at the inlet to basin BRS3A
    - Pr3C will undergo additional primary treatment from an Atlan Ecoceptor series 8000 at the inlet basin BRS3B
    - Pr3A represents the catchments for the basin
- Catchment Pr3E will receive primary treatment from Atlan Ecoceptor series 4000 before discharge to the existing drainage network on Ashford Avenue
- Catchment Pr2A will receive primary treatment from Atlan Ecoceptor series 4000 before discharge to the existing drainage network on Horsley Road.

The location of treatment assets is shown in **Figure 6**.

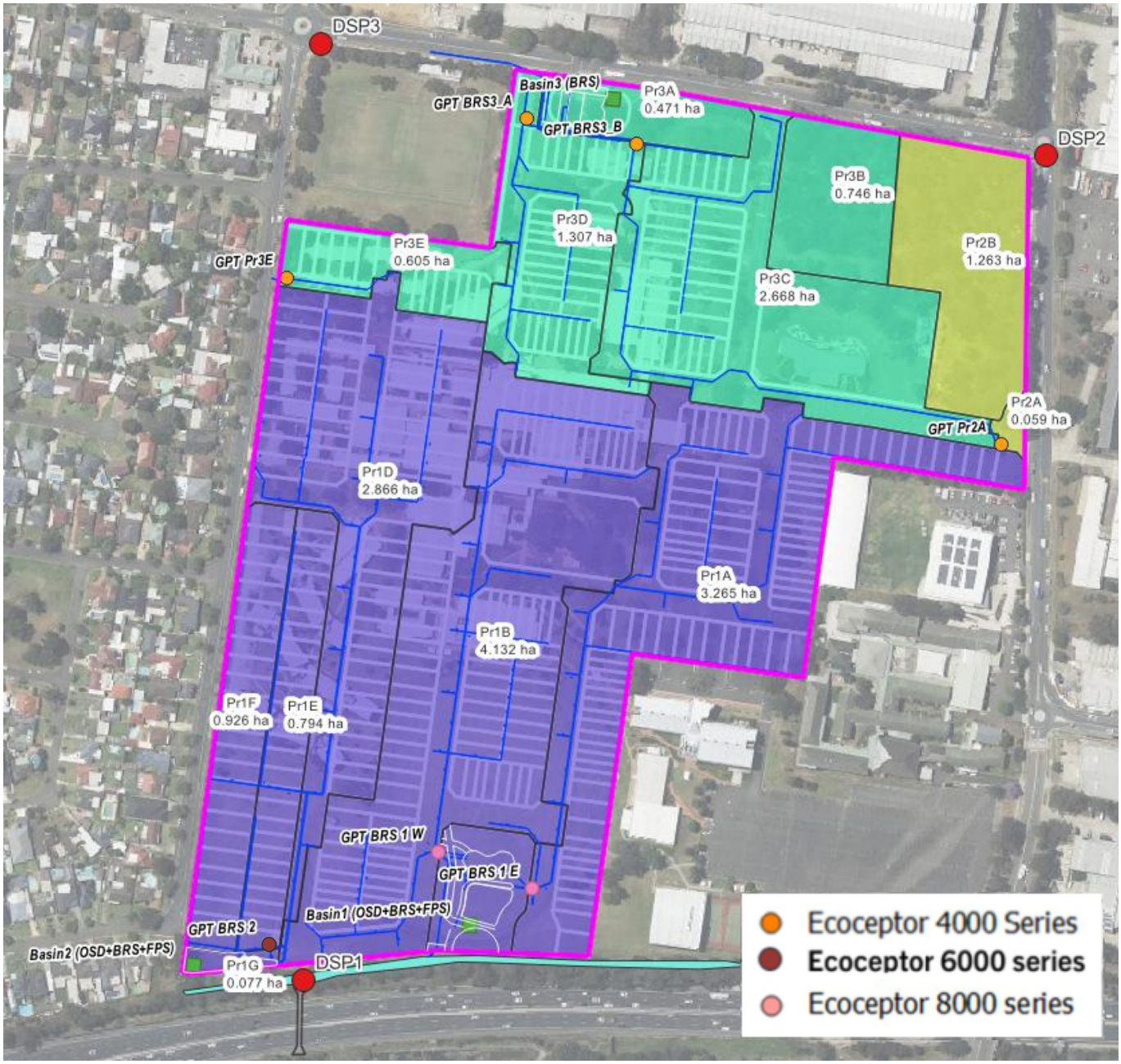


Figure 6: MUSIC Catchments

7.1. Model Configuration

The configuration of the treatment train in MUSIC is presented in **Figure 7**. MUSIC-link file for Liverpool City Council (Clay) was selected to generate appropriate rainfall and soil parameters given the proximity of the site to Canterbury Bankstown Council. A clay soil type was selected as a conservative assumption in lieu of an option for sandy loam which characterises Georges River.

Source node, rainwater tanks (RWT) and gross pollutant trap (GPT) parameters have been adopted from *Using MUSIC in Sydney's Drinking Water Catchment (Water NSW, 2019*) or left as recommended model defaults. Design parameters for the bioretention basins have been adopted following the recommendations of *Bioretention Technical Design Guidelines (Water by Design,* 2014) and *Advancing the Design of Stormwater Biofiltration (FAWB, 2008)*.

The following assumptions were adopted for generating catchment parameters:

- Roof Area for lots within Catchment Pr1F = 300m^2
- Roof Area of lots within Catchment Pr1D & Pr1E = 240m^2
- Roof Area of lots remaining = 180 m^2
- Roof Area contributing to Rainwater Tank (RWT) = 75% of the Roof Area
- Effective Impervious of Lot = 85%
- Effective Impervious of Roof = 100%
- Effective Impervious of Yard = varies, 19% to 51%
- Effective Impervious of Road Reserve = 95%
- Effective Impervious of Open Space = 10%

Inputs for the MUSIC the model are as follows:

- Catchment properties adopted in the model are summarised in **Table 11**.
- Soil parameters in the model are summarised in **Table** 12**.**
- Pollutant generation parameters are summarised in **Table 13.**
- GPT input parameters are summarised in **Table 14**.
- Bioretention input parameters are summarised in **Table 15.**
- RWT input parameters are summarised in **Table 16.**

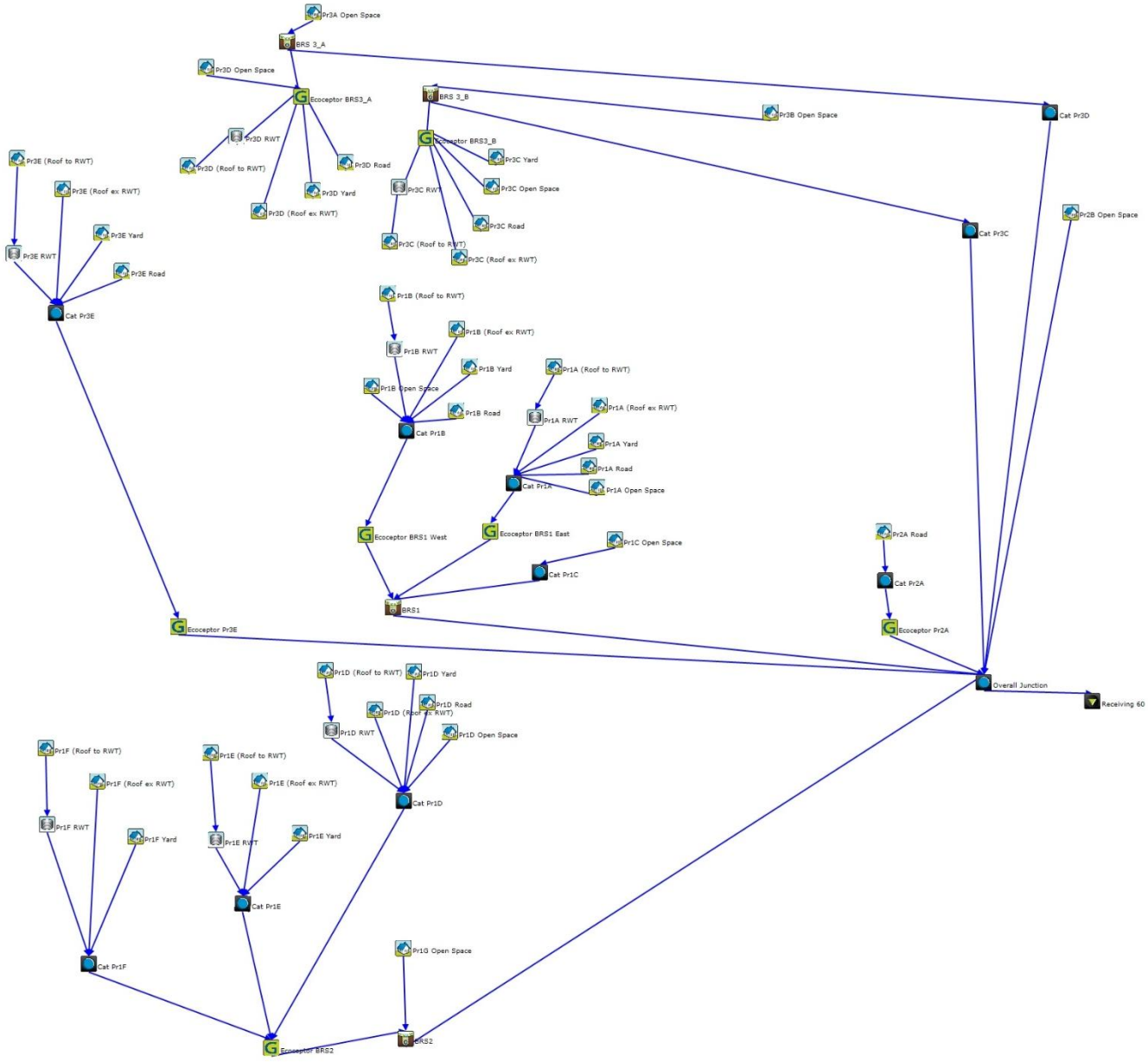


Figure 7: MUSIC Treatment Train

Table 11: MUSIC Catchment Properties

				MUSIC SOURCE NODE INPUTS						
CATCHMENT	TOTAL CATCHMENT AREA (HA)	NO. OF LOTS	LOT AREA (HA)	ROAD RESERVE AREA (HA)	COMM-ERCIAL (HA)	OPEN SPACE (HA)	ROOF TO RWT (HA)	ROOF EX RWT (HA)	YARD (HA)	EFFEC-TIVE % IMP
Pr1A	3.265	92	2.146	1.116	0	0.003	1.242	0.414	0.490	88.35
Pr1B	4.132	94	2.246	1.379	0	0.507	1.269	0.423	0.554	79.13
Pr1C	0.461	0	0	0	0	0.461	0	0	0	10.00
Pr1D	2.866	63	1.953	0.910	0	0.003	1.134	0.378	0.441	88.10
Pr1E	0.794	27	0.794	0	0	0	0.486	0.162	0.146	85.00
Pr1F	0.925	24	0.925	0	0	0	0.540	0.180	0.205	85.00
Pr1G	0.077	0	0	0	0	0.077	0	0	0	9.95
Pr2A	0.059	0	0	0.059	0	0	0	0	0	95.00
Pr2B	1.263	0	0	0	0	1.263	0	0	0	10.00
Pr3A	0.471	0	0	0	0	0.471	0	0	0	10.00
Pr3B	0.746	0	0	0	0	0.746	0	0	0	10.00
Pr3C	2.668	33	0.860	1.016	0.79	0	0.446	0.149	0.266	93.26
Pr3D	1.307	34	0.751	0.517	0	0.039	0.459	0.153	0.139	86.72
Pr3E	0.605	14	0.357	0.247	0	0	0.189	0.063	0.105	88.99
Total	19.6	381.0	10.0	5.2	0.8	3.6	5.8	1.9	2.3	74.64

Table 12: MUSIC Soil Properties

PARAMETER	VALUE
Rainfall Threshold (mm)	0.3
Soil Storage Capacity (mm)	187
Initial Storage (%)	30
Field Capacity (mm)	127
Infiltration Capacity Coefficient A	135
Infiltration Capacity Coefficient B	4
Initial Depth (mm)	10
Daily Recharge Rate (%)	10
Daily Baseflow Rate (%)	10
Daily Deep Seepage Rate (%)	0

Table 13: MUSIC Pollutant Generation Parameters

PARAMETER	ROOF	RESIDENTIAL	SEALED ROAD
TSS Baseflow Mean (Log mg/L)	1.1	1.2	1.2
TSS Baseflow Std Dev (Log mg/L)	0.17	0.17	0.17
TSS Stormflow Mean (Log mg/L)	1.3	2.15	2.43
TSS Stormflow Std Dev (Log mg/L)	0.32	0.32	0.32
TP Baseflow Mean (Log mg/L)	-0.82	-0.85	-0.85
TP Baseflow Std Dev (Log mg/L)	0.19	0.19	0.19
TP Stormflow Mean (Log mg/L)	-0.89	-0.6	-0.3
TP Stormflow Std Dev (Log mg/L)	0.25	0.25	0.25
TN Baseflow Mean (Log mg/L)	0.32	0.11	0.11
TN Baseflow Std Dev (Log mg/L)	0.12	0.12	0.12
TN Stormflow Mean (Log mg/L)	0.3	0.3	0.34
TN Stormflow Std Dev (Log mg/L)	0.19	0.19	0.19

Table 14: GPT Parameters

PARAMETER	VALUE	
Low Flow Bypass (m^3/s)	0.00	
High Flow Bypass (m^3/s)*	**Location**	**Flow Rate**
	BRS1 (8000 series)	0.22(west) 0.22 (east)
	BRS2 (6000 series)	0.140
	BRS3_A (4000 series)	0.060
	BRS3_B (4000 series)	0.060
Concentration Based Capture Efficiency	**Input**	**Output**
TSS (mg/L)	0	0
	15	0
TP (mg/L)	0	0
	100	31
TN (mg/L)	0	0
	100	53
GP (mg/L)	0	0
	1000	290

*Splitter Pits will be used to separate low and high flows. The intent is to send low flows to the GPT's and bioretention basins while the high flows will bypass the treatment train and discharge directly to outlets.

Table 15: Bioretention Parameters

PARAMETER	BRS1	BRS2	BRS3_A	BRS3_B
Low Flow Bypass (m^3/s)	0	0	0	0
High Flow Bypass (m^3/s)	0.44	0.22	0.22	0.22
Extended Detention Depth (m)	0.30	0.30	0.30	0.30
Surface Area (m^2)	262	210	180	180
Filter Area (m^2)	262	210	180	180
Saturated Hydraulic Conductivity (mm/h)	100	100	100	100
Filter Depth (m)	0.40	0.40	0.40	0.40
TN Content of Filter Media (mg/kg)	600	600	600	600
Orthophosphate Content of Filter Media (mg/kg)	30	30	30	30
Base Lined?	Yes	Yes	Yes	Yes
Unlined Filter Media Perimeter (m)	0.01	0.01	0.01	0.01
Exfiltration Rate (mm/hr)	0	0	0	0
Effective Nutrient Removal Plants	Yes	Yes	Yes	Yes
Overflow Weir Width (m)	3	3	3	3
Underdrain Present?	Yes	Yes	Yes	Yes
Submerged Zone Present?	No	No	No	No

Table 16: Rainwater Tank Parameters

CATCHMENT	NUMBER OF TANKS	TOTAL DAILY DEMAND* (kL/d)	TANK VOLUME	OUTLET DIAMETER
Pr1A	92	43.24	2000 L per tank	100 mm
Pr1B	94	44.18		
Pr1C	0	-		
Pr1D	63	29.61		
Pr1E	27	12.69		
Pr1F	24	11.28		
Pr1G	0	-		
Pr2A	0	-		
Pr2B	0	-		
Pr3A	0	-		
Pr3B	0	-		
Pr3C	33	15.51		
Pr3D	34	15.98		
Pr3E	14	6.58		

*Total Daily Demand is based on 0.47kL/d per household lot

7.2. Music Model Results

Model results are presented in **Table 14** and demonstrate that all pollutant load reduction targets have been achieved.

Table 17: Overall Treatment Train Effectiveness

PARAMETER	SOURCES (kg/yr)	RESIDUAL (kg/yr)	DIFFERENCE (kg/yr)	REDUCTION (%)	TARGET (%)	COMPLIANT?
TSS	19588.733	2316.447	-17272.286	88.2	85	Yes
TP	39.674	9.575	-30.099	75.9	65	Yes
TN	278.228	105.133	-173.095	62.2	45	Yes
GP	3290.477	131.679	-3158.80	96.0	90	Yes

7.3. Stage Modelling

The MUSIC model was modified to estimate the water quality outcomes from the site for the post-developed scenarios for stage 1-6, where stage 7 represents completion of the masterplan development.

The staged water quality management strategy is as follows:

- RWTs will be included on lots throughout staged construction per the ultimate scenario.
- Proposed Stage 1 developed areas will discharge to a temporary bioretention raingarden basin to be located south of the Stage 1 works area in the interim condition, prior to outfall at DSP1. Parameters for the temporary bioretention basin are provided in **Table 18**.
- Stage 2 developed area will discharge to the stage 1 temporary bioretention raingarden basin, with catchments Pr1A, Pr1B, and Pr1D.
- Stage 3 proposed works include construction of a temporary bioretention raingarden basin to be located west of the Stage 3 works area in the interim condition, prior to outfall at DSP3. A portion of the stage 3 works will discharge to DSP2 without treatment. Parameters for the temporary bioretention basin are provided in **Table 18.**
- Stage 4 proposed works include construction of bioretention basins 1 and 2 per the ultimate scenario; these, along with associated GPTs, will replace the treatment provided to stages 1 and 2 from the temporary bioretention basin.
- Assets constructed in Stage 4 will provide water quality treatment to the stage 5 works area
- Stage 6 proposed works include construction of bioretention basins 3A and 3B per the ultimate condition; these, along with associated GPTs, will replace the treatment provided to stage 3 from the temporary bioretention basin.

The catchment plans from the ultimate developed scenarios was adjusted to account for the staged works including demolition of existing buildings and hard surfaces. Number of lots and rainwater tanks for each catchment were adjusted to represent the staged conditions, catchment properties and RWT input parameters are provided in **Appendix I**. All other modelling inputs and assumptions are consistent with the previous model.

Table 18: Temporary Bioretention Basin Parameters

PARAMETER	TEMP BRS STAGE 1 & 2	TEMP BRS STAGE 3
Low Flow Bypass (m^3/s)	0	0
High Flow Bypass (m^3/s)	100	100
Extended Detention Depth (m)	0.30	0.30
Surface Area (m^2)	675	138
Filter Area (m^2)	68	138
Saturated Hydraulic Conductivity (mm/h)	200	200
Filter Depth (m)	0.40	0.40
TN Content of Filter Media (mg/kg)	600	600
Orthophosphate Content of Filter Media (mg/kg)	30	30
Base Lined?	No	No
Unlined Filter Media Perimeter (m)	0.01	0.01
Exfiltration Rate (mm/hr)	0	0
Effective Nutrient Removal Plants	Yes	Yes
Overflow Weir Width (m)	3.4	3.4
Underdrain Present?	Yes	Yes
Submerged Zone Present?	No	No

Results, provided in **Table 19**, demonstrate that with the addition of the proposed temporary stormwater treatment assets, the water quality targets are achieved for each stage. MUSIC link reports are provided in **Appendix H.**

Table 19: Overall Treatment Train Effectiveness

PARAMETER	TARGET (%)	PERCENTAGE REDUCTION						
		STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5	STAGE 6	STAGE 7 (ULTIMATE)
TSS	**85**	92	88	85	86	85	86	88
TP	**65**	83	76	78	78	76	78	76
TN	**45**	74	52	57	61	60	62	62
GP	**90**	100	100	99	99	99	99	96

7.1. Sediment and Erosion Management During Construction

Sediment and erosion controls must be appropriately managed during construction, as a minimum these controls would include sediment fencing and straw bales located on the downstream side of the subject property. Additional protections for receiving stormwater network will include sand filled hessian socks to be placed within kerbs and geofabric filter to be installed on drainage surface inlet pits.

Sediment basins are also included as part of the sediment and erosion management strategy. A temporary sediment basin was constructed in the south-west area of the site as part of the early works and demolition. Diversion drains were installed along the school property and Ashford Avenue to divert runoff from the site to the temporary sediment basin. The existing sediment basin at the south of the site installed for the demolition will be maintained and be used during the Staged works. An additional temporary sediment basin is proposed to be constructed as part of Stage 3 which will be located to the west of the Stage 3 works area. Temporary sediment basins were sized according to the principles of Volume 1 of the Managing Urban Stormwater – Soils and Construction, otherwise referred to as the Bluebook.

8. FLOODPLAIN MANAGEMENT AND COMPENSATORY STORAGE

The Flood impact study prepared by J. Wyndham Prince (JWP) as part of the Rezoning documentation states that a minimum flood storage volume of 6,400 m^3 is required in the developed scenario to offset the volume from the existing site which is affected by regional flooding in the 1% AEP event; JWP proposed these compensatory storages to be provide in the location of OSD basin 1.

A compensatory storage assessment was undertaken in 12D to ensure that adequate compensatory flood storage was provided within the proposed development, this assessment is documented in the planset provided in **Appendix B**.

A topographic survey of the existing conditions was prepared by BW which included comprehensive road and surface grading model of the entire site. The surface modelling was adjusted to account for post development works including proposed retaining walls, battering etc. Surface levels and volumes were assessed in 12D for both the pre- and post-developed scenarios between RL 3.00 and RL 5.55, that is between the lowest part of the site under pre-development conditions and the 1% AEP tailwater level from George's River.

Results demonstrated that the required compensatory flood storage below RL 5.55 is provided within OSD Basins 1 and 2. Results are provided in **Table 20** with the JWP study results for comparison.

Table 20: Flood Storage Results Comparison

PARAMETER	THIS STUDY	JWP'S STUDY
Pre-development Flood Storage	6400 m^3	6400 m^3
Post-development Flood Storage	6610 m^3 (within Basin 1 & Basin 2)	9600 m^3
Balance	210 m^3	3200 m^3

BW has prepared a flood impacts assessment which assesses the overland flow from Ashford Avenue, this should be referred to for the overland flow and a flood assessment of the proposed development and impact on existing residential properties.

9. CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that:

- Proposed works will result in changes to land use and impervious areas which, without supplementary measures, will have an impact on water quantities and quality discharged from the site
- The proposed water cycle management strategy and floodplain management strategy is generally in alignment with the Planning Proposal Report as well as the "Flood and Risk Impact Assessment Report" prepared by J. Wyndham Prince noting that the JWP report identifies that there will be no detrimental offsite impacts as a result from the proposed development
- The digital terrain modelling of the developed site which was prepared as part of this assessment is generally in accordance with the original grading concept prepared by JWP as part of the rezoning documentation.

- A DRAINS RAFTS Storage Routing model in accordance with ARR 2019 has been prepared for both pre-development and developed conditions. Based on the DRAINS modelling summarised in this report:
    - Proposed regrading of the site results in no OSD requirements for proposed contributing catchments to DSP2 and DSP3.
    - Proposed works including regrading of the site and development will result in an increase to peak flows at DSP1 therefore OSD is required to manage these flows to acceptable levels.
    - Proposed Basins 1 and 2 which will incorporate an allocation for detention which is sufficient to achieve post-development flows of less than pre-development flows at DSP1 for both the major and minor storm events.
    - OSD assets per the ultimate configuration will be constructed as part of Stage 4, additional OSD will not be required for other stages.
    - The sensitivity DRAINS model which considers an SSP3 climate change scenario for 2090 resulted in:
        - post-development flows maintained at less than pre-development flows for all discharge points.
        - Peak water levels in basin 1 overtopped the retaining wall
        - Freeboard to finished surface levels of 500 mm and 440 mm achieved for basins 1 and 2, respectively

- Based on the MUSIC modelling summarised in this report, the requirement stormwater treatment efficiencies can be achieved with the following treatment train:
    - 2kL rainwater tanks (RWTs) to be included on each lot,
    - Bioretention raingardens (BRS) with gross pollutant traps (GPTs) at the basin inlets configured as follows:
        - Two bioretention basins at the south of the site, basin 1 and basin 2, these will include an allocation for OSD and GPTs at each of the inlets; two Atlan Ecoceptor series 8000 GPTs at the inlets to basin 1, and one Atlan Ecoceptor series 6000 GPT at the inlet to basin 2
        - 1 bioretention basin at the north of the site comprising 2 parts, basin 3A and basin 3B; in a split, tiered configuration to accommodate the level difference at the proposed basin location and provide sufficient treatment while reducing the depth of the asset. Each basin will include an Atlan Ecoceptor series 8000 at the inlet.
    - Additional GPTs (Atlan Ecoceptor series 4000s) treating residual catchments not captured by the bioretention basins, Pr3E and Pr2A, prior to outfall to the existing drainage networks on Ashford Avenue and Horsley Road, respectively
    - A temporary bioretention basin is required to treat stages 1 and 2, with the addition of a and Atlan Ecoceptor series 6000 GPT treating a portion of stage 2 flows, prior to construction of the ultimate assets at the south of the site in Stage 4
    - A temporary bioretention basin is required to treat stage 3 prior to construction of the ultimate assets at the north of the site in Stage 6

- Compensatory storage approach and outcomes are in line with the JWP Flood Impact study which was accepted and endorsed by Council; low-lying
- The combined flood storage volumes below RL 5.55 provided within OSD Basin 1 and 2 exceeds the minimum flood storage volume of 6,400 m^3 per the JWP report.

- A further Flood assessment has been prepared by Beveridge Williams to assess the overland flow from Ashford Avenue, refer to that report for additional details.
- Proposed regrading of the site ensures that all lots are above the 1% AEP Regional Flood Level of RL5.55

It is recommended that:

- The proposed water cycle management plan be adopted for the proposed development of the site, 2 and 2A Bullecourt Avenue, Milperra (Lot 2 of DP1291984).

Paige Mandy
Water Resources Engineer
mandyp@bevwill.com.au

Frank Guo
Senior Water Resources Engineer
GuoF@bevwill.com.au

APPENDIX A: STORMWATER SYSTEM REPORT

Level 1, 66 - 72 Rickard Road, Bankstown NSW
PO Box 8, Bankstown NSW 1885
Tel: (02) 9707 9010 - Fax: (02) 9707 9408
DX 11220 BANKSTOWN
council@cbcity.nsw.gov.au

CITY OF CANTERBURY BANKSTOWN

To: Beveridge Williams & Co. Pty Ltd
Suite 4-05, LPC House
Level 4, 3 Fordham Way
ORAN PARK NSW 2570

STORMWATER SYSTEM REPORT
2 Bullecourt Avenue, MILPERRA NSW 2214

Date:	09-Jul-2025
Ref:	WP-SIAONL-699/2025
Development type:	Mixture of detached dwellings and attached dwellings

NO	FLOOD STUDY REQUIRED

This Stormwater System Report (SSR) provides flood and stormwater information about the property.

The information in this report should be reviewed by those who are knowledgeable in flooding or have a technical requirement to understand more about Council's building development controls (such as surveyors, builders, certifiers, architects and engineers).

Stormwater Infrastructure

The site is affected by the following Private stormwater system components.

- A 3m wide and variable width private drainage easement located adjacent to the southeastern boundary of the site.

Property Levels

Description	Minimum (m AHD)	Maximum (m AHD)
Approximate Ground Level	3.01	22.45

Flooding Levels

Stormwater Catchment Flooding from Milperra Catchment Flood Study (BMT WBM, 2015), Kelso Swamp Catchment Flood Study and Georges River Floodplain Risk Management Study & Plan 2004" by Bewsher Consulting Pty Ltd May 2004

Flood Event	Minimum Level (m AHD)	Maximum Level (m AHD)
1% AEP (100 year ARI)	4.40	17.90
PMF (Probable Maximum Flood)	10.14	20.00

Terms and Definitions

Annual Exceedance Probability (AEP)	The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.
Average Recurrence Interval (ARI):	Similar to AEP. The long-term average number of years between the occurrence of a flood as big as (or larger than) the selected event.
metres above Australian Height Datum (m AHD)	The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.
Maximum and Minimum Ground Level –	Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.
Probable Maximum Flood	An extreme flood deemed to be the largest flood that could conceivably occur at a specific location. The PMF defines the extent of flood prone land (i.e. the floodplain).

Further Information
For further information on flood-related development controls which may be applicable to this property, refer to the following guidelines:

- Canterbury Bankstown Development Control Plan (2023, Chapter 2.2 Flood Risk Management)
- Canterbury Bankstown Development Engineering Standards (2023)
- Council Standard Drawings.

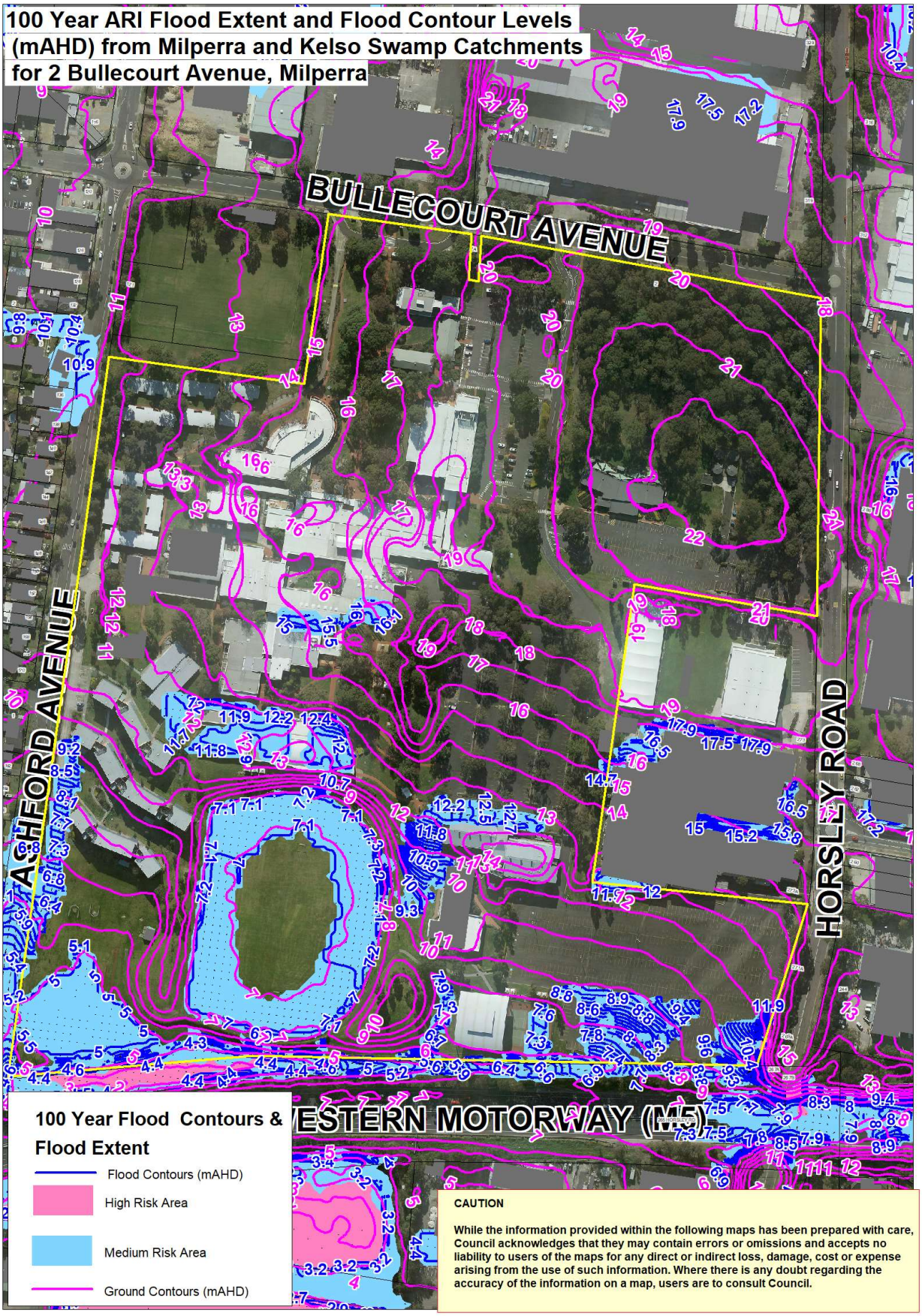
Disclaimer
The information contained in this document is not endorsed by the Council as without error, omission or mis-description. Council accordingly expressly disclaims all and any liability and responsibility in respect of loss, damage or injury to person or property arising from anything done or omitted to be done by any person in reliance, whether wholly or in part, upon any part of this information.

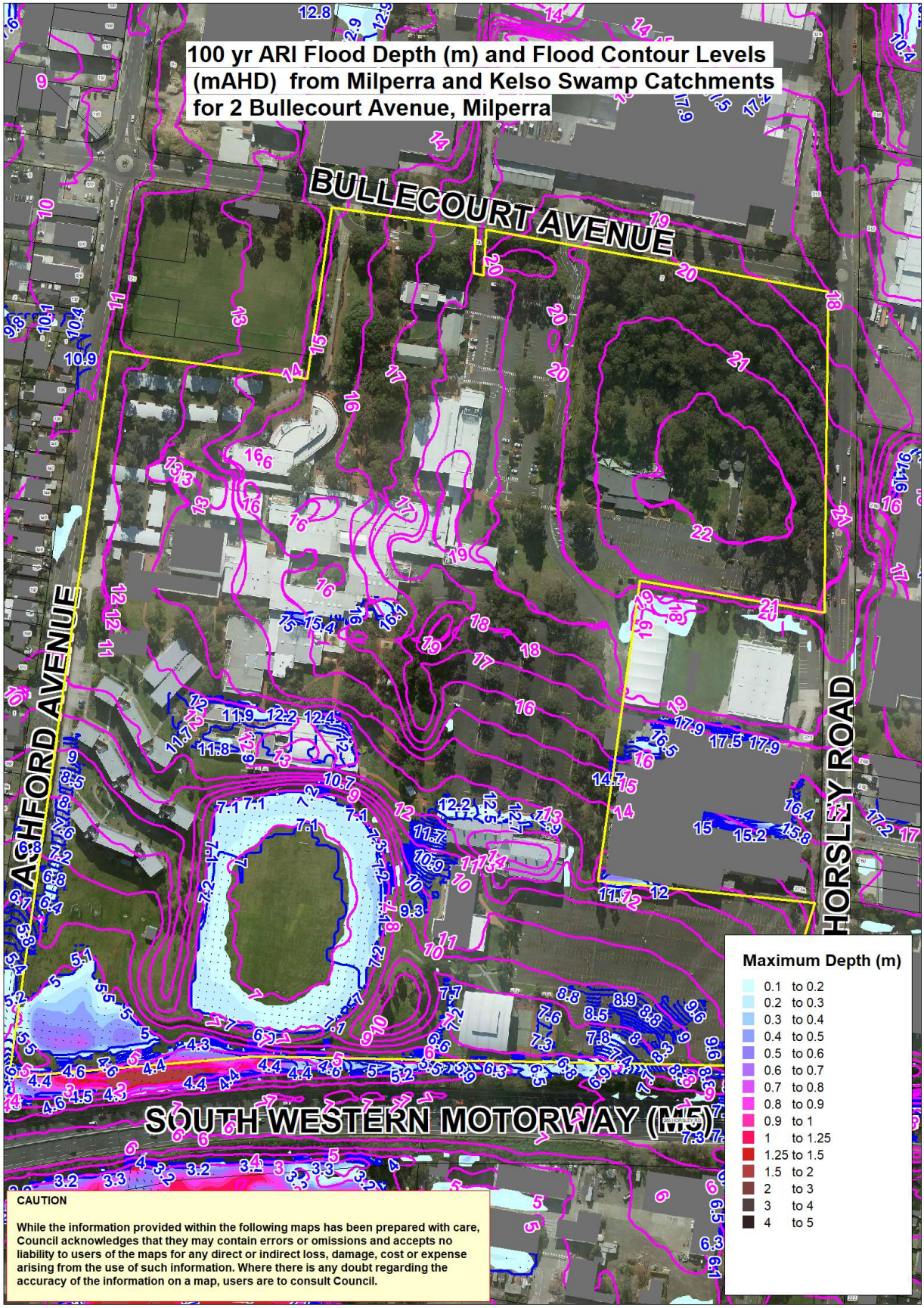
Any person having regard to the information contained in this document is encouraged to seek, at their discretion, all other sources of information on the subject matter as they consider appropriate, which may include local knowledge and/or professional advice.

ATTACHMENTS

For 1% AEP (100 year ARI)
1. Flood Extent & Flood Contours Map
2. Flood Depth Map
3. Velocity Depth Product Map

For PMF
4. Flood Contours & Flood extent Map
5. GIS Map (from Council's Data)
6. Aerial Map (from Council 's Data)


100 Year ARI Flood Extent and Flood Contour Levels (mAHD) from Milperra and Kelso Swamp Catchments for 2 Bullecourt Avenue, Milperra
BULLECOURT AVENUE
ASHFORD AVENUE
HORSLEY ROAD
WESTERN MOTORWAY (M5)
100 Year Flood Contours & Flood Extent
Flood Contours (mAHD)
High Risk Area
Medium Risk Area
Ground Contours (mAHD)
CAUTION
While the information provided within the following maps has been prepared with care, Council acknowledges that they may contain errors or omissions and accepts no liability to users of the maps for any direct or indirect loss, damage, cost or expense arising from the use of such information. Where there is any doubt regarding the accuracy of the information on a map, users are to consult Council.


100 yr ARI Flood Depth (m) and Flood Contour Levels (mAHD) from Milperra and Kelso Swamp Catchments for 2 Bullecourt Avenue, Milperra
BULLECOURT AVENUE
ASHFORD AVENUE
HORSLEY ROAD
SOUTH WESTERN MOTORWAY (M5)
Maximum Depth (m)
0.1 to 0.2
0.2 to 0.3
0.3 to 0.4
0.4 to 0.5
0.5 to 0.6
0.6 to 0.7
0.7 to 0.8
0.8 to 0.9
0.9 to 1
1 to 1.25
1.25 to 1.5
1.5 to 2
2 to 3
3 to 4
4 to 5
CAUTION
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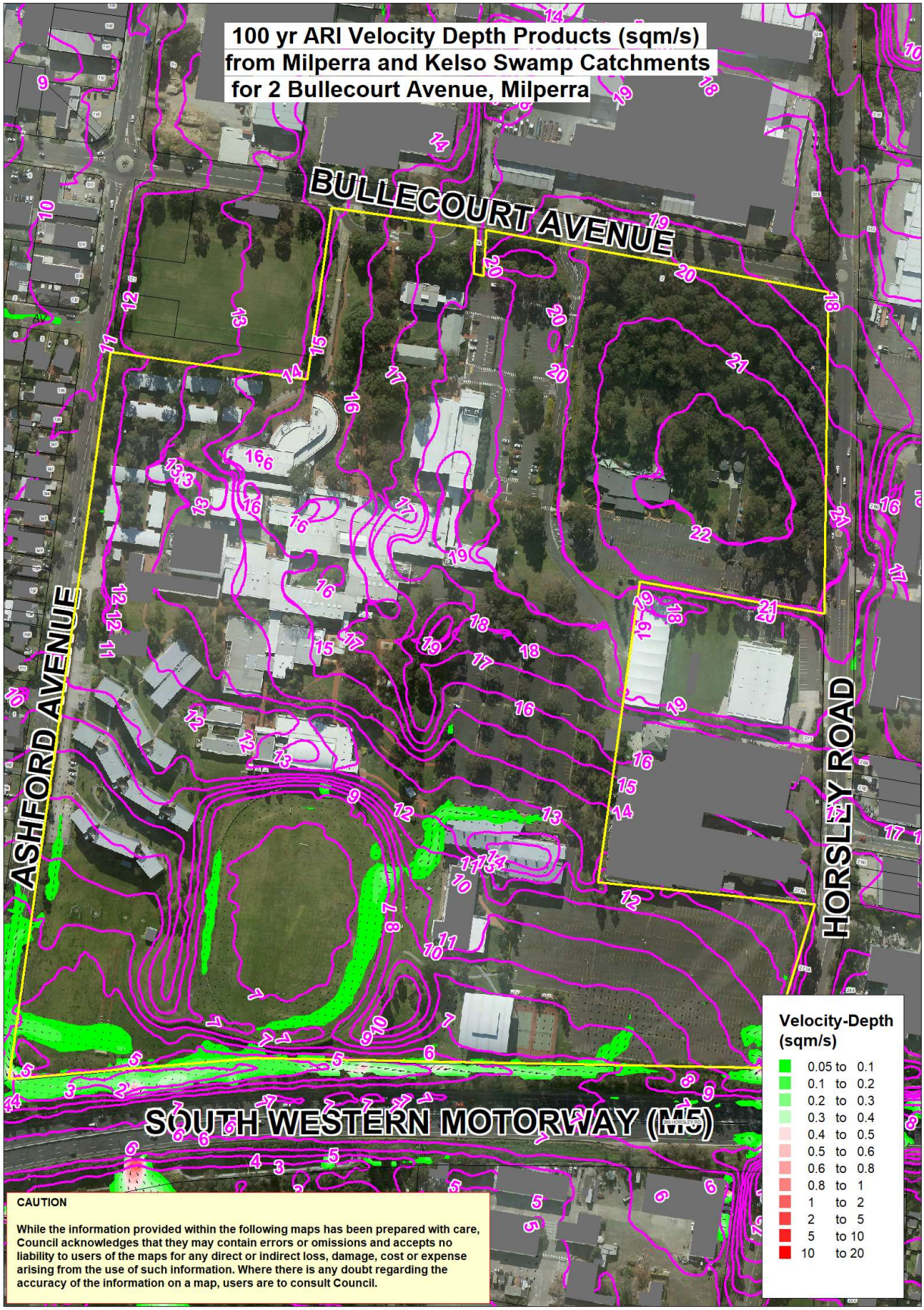
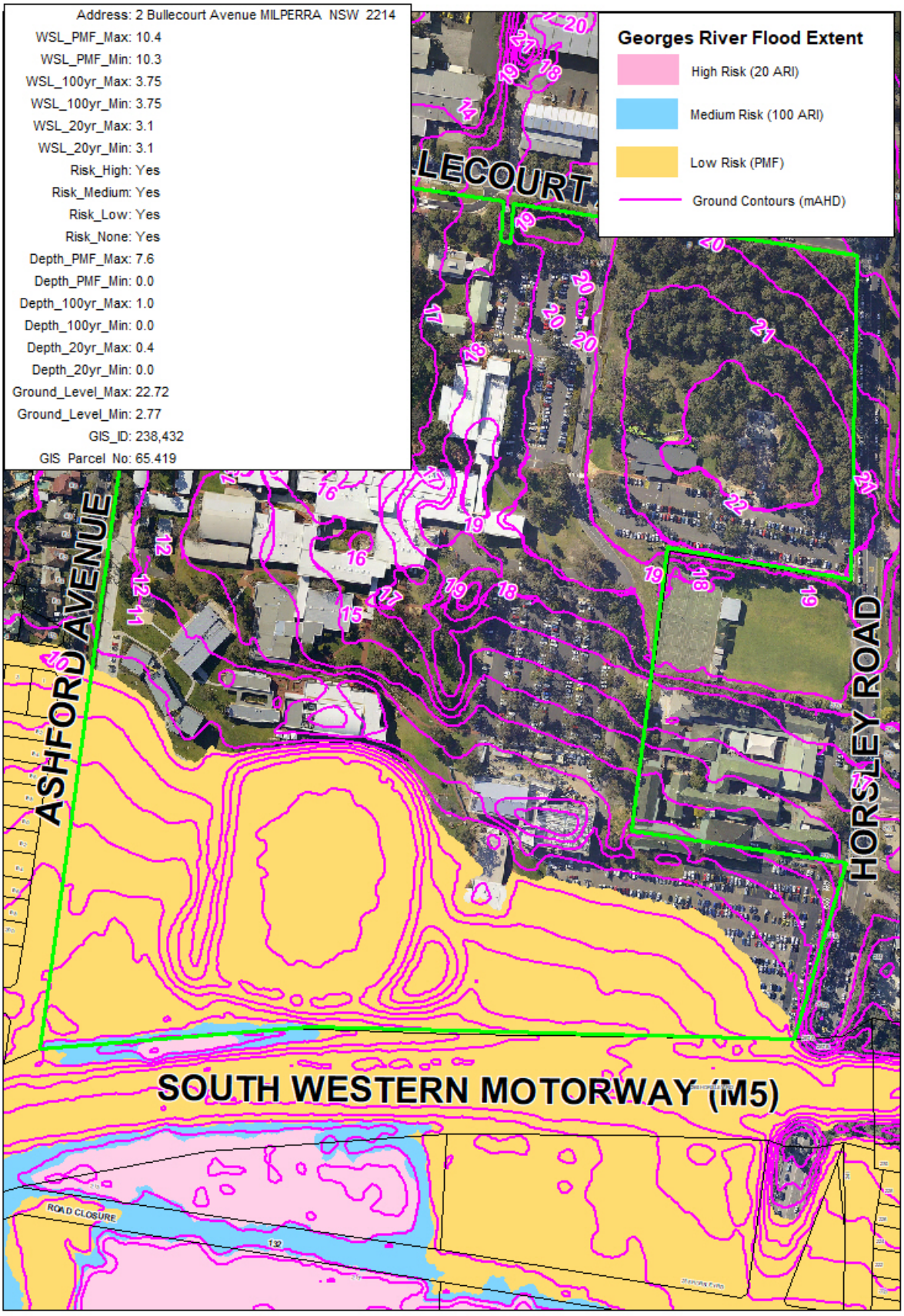
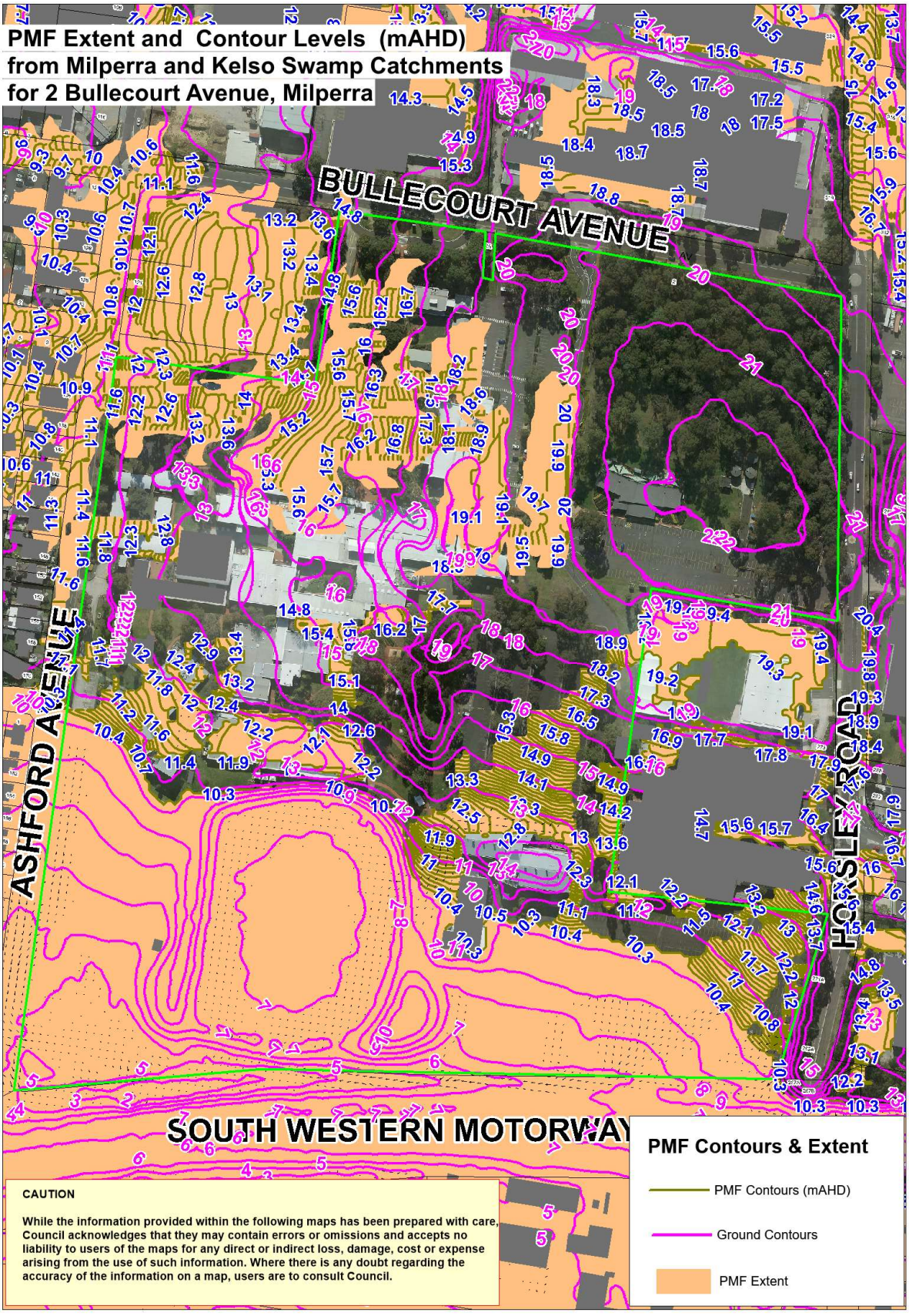
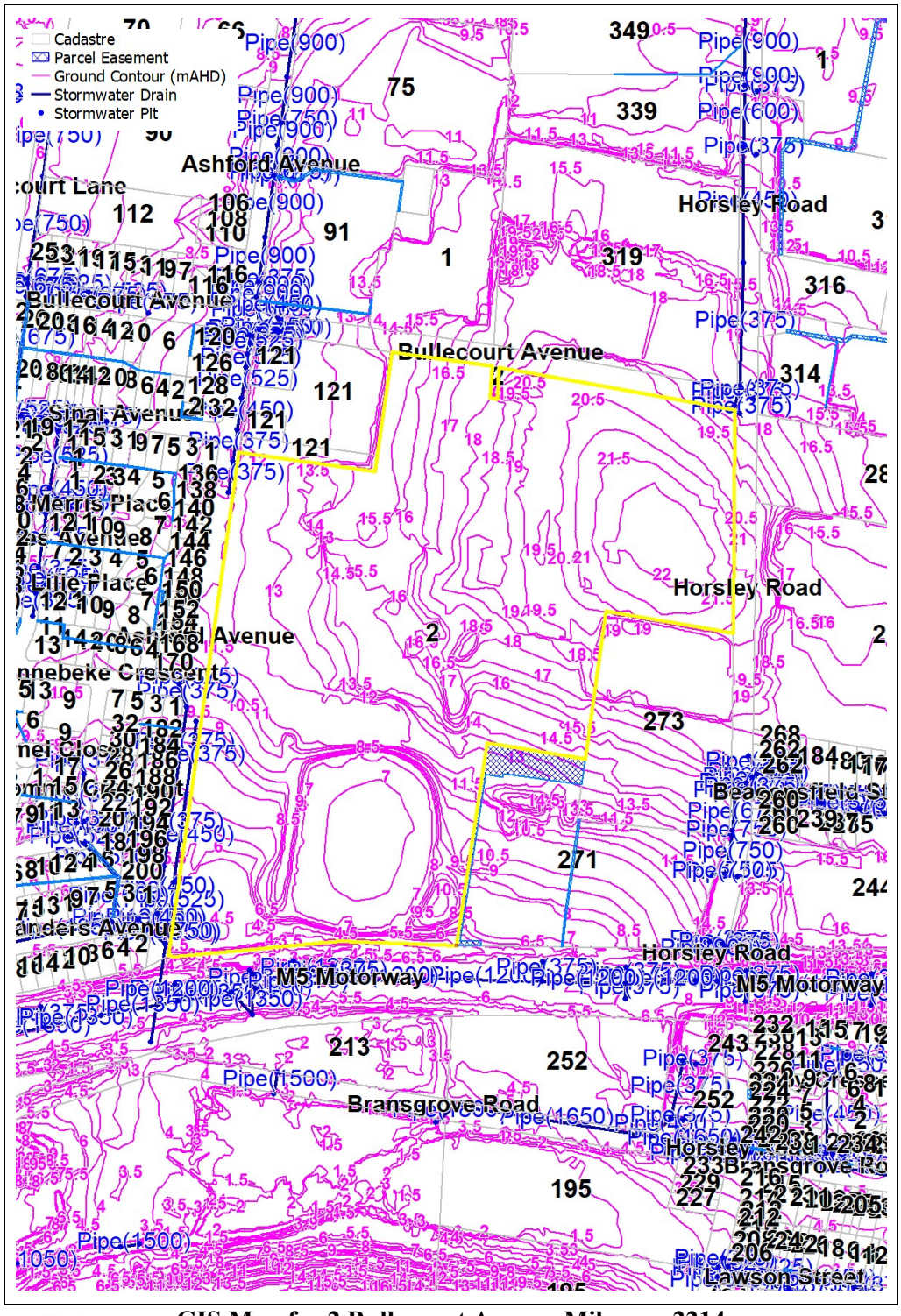

100 yr ARI Velocity Depth Products (sqm/s)
from Milperra and Kelso Swamp Catchments
for 2 Bullecourt Avenue, Milperra
BULLECOURT AVENUE
ASHFORD AVENUE
HORSLEY ROAD
SOUTH WESTERN MOTORWAY (M5)
Velocity-Depth (sqm/s)
0.05 to 0.1
0.1 to 0.2
0.2 to 0.3
0.3 to 0.4
0.4 to 0.5
0.5 to 0.6
0.6 to 0.8
0.8 to 1
1 to 2
2 to 5
5 to 10
10 to 20
CAUTION
While the information provided within the following maps has been prepared with care, Council acknowledges that they may contain errors or omissions and accepts no liability to users of the maps for any direct or indirect loss, damage, cost or expense arising from the use of such information. Where there is any doubt regarding the accuracy of the information on a map, users are to consult Council.


Address: 2 Bullecourt Avenue MILPERRA NSW 2214
WSL_PMF_Max: 10.4
WSL_PMF_Min: 10.3
WSL_100yr_Max: 3.75
WSL_100yr_Min: 3.75
WSL_20yr_Max: 3.1
WSL_20yr_Min: 3.1
Risk_High: Yes
Risk_Medium: Yes
Risk_Low: Yes
Risk_None: Yes
Depth_PMF_Max: 7.6
Depth_PMF_Min: 0.0
Depth_100yr_Max: 1.0
Depth_100yr_Min: 0.0
Depth_20yr_Max: 0.4
Depth_20yr_Min: 0.0
Ground_Level_Max: 22.72
Ground_Level_Min: 2.77
GIS_ID: 238,432
GIS Parcel No: 65.419
Georges River Flood Extent
High Risk (20 ARI)
Medium Risk (100 ARI)
Low Risk (PMF)
Ground Contours (mAHD)
LECOURT
ASHFORD AVENUE
HORSLEY ROAD
SOUTH WESTERN MOTORWAY (M5)
ROAD CLOSURE

1% AEP (100 year ARI) Flood Hydraulic Category


PMF Extent and Contour Levels (mAHD)
from Milperra and Kelso Swamp Catchments
for 2 Bullecourt Avenue, Milperra
BULLECOURT AVENUE
ASHFORD AVENUE
HORSLEY ROAD
SOUTH WESTERN MOTORWAY
CAUTION
While the information provided within the following maps has been prepared with care, Council acknowledges that they may contain errors or omissions and accepts no liability to users of the maps for any direct or indirect loss, damage, cost or expense arising from the use of such information. Where there is any doubt regarding the accuracy of the information on a map, users are to consult Council.
PMF Contours & Extent
PMF Contours (mAHD)
Ground Contours
PMF Extent



GIS Map for 2 Bullecourt Avenue Milperra 2214

Aerial Map for 2 Bullecourt Avenue Milperra 2214

APPENDIX B: OVERALL MASTERPLAN CONCEPT

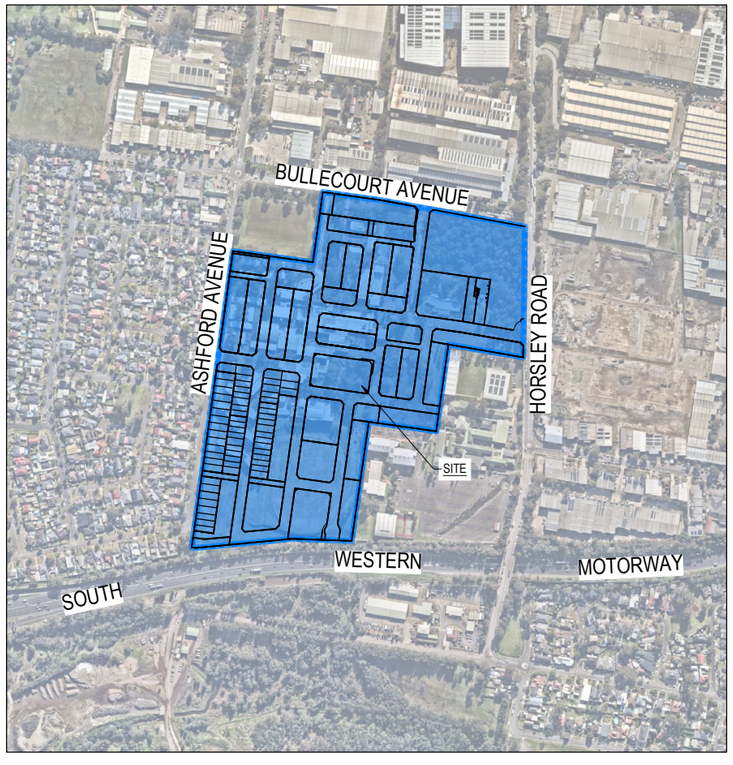
WSU MILPERRA PROPOSED SUBDIVISON

CIVIL ENGINEERING PLANS ISSUED FOR DEVELOPMENT APPLICATION

2A BULLECOURT AVENUE, MILPERRA (LOT 1 IN DP101147 AND LOT 2 IN DP1291984)

CANTERBURY-BANKSTOWN COUNCIL

MIRVAC RESIDENTIAL (NSW) DEVELOPMENTS PTY LTD



SITE PLAN

NOT TO SCALE

DRAWING INDEX

DRAWING No.	TITLE	REVISION
2301879-320-001	COVER SHEET	C
2301879-320-002	GENERAL ARRANGEMENT & STAGING PLAN	B
2301879-320-003	TYPICAL ROAD CROSS SECTIONS SHEET 1 OF 4	B
2301879-320-004	TYPICAL ROAD CROSS SECTIONS SHEET 2 OF 4	B
2301879-320-005	TYPICAL ROAD CROSS SECTIONS SHEET 3 OF 4	B
2301879-320-006	TYPICAL ROAD CROSS SECTIONS SHEET 4 OF 4	B
2301879-320-007	TYPICAL DETAILS SHEET 1 OF 2	B
2301879-320-008	TYPICAL DETAILS SHEET 2 OF 2	B
2301879-320-009	RETAINING WALL DETAILS	B
2301879-320-030	OVERALL DEMOLITION PLAN	B
2301879-320-031	DEMOLITION PLAN SHEET 1 OF 6	B
2301879-320-032	DEMOLITION PLAN SHEET 2 OF 6	B
2301879-320-033	DEMOLITION PLAN SHEET 3 OF 6	B
2301879-320-034	DEMOLITION PLAN SHEET 4 OF 6	B
2301879-320-035	DEMOLITION PLAN SHEET 5 OF 6	B
2301879-320-036	DEMOLITION PLAN SHEET 6 OF 6	B
2301879-320-045	OVERALL LOT LAYOUT PLAN	B
2301879-320-050	OVERALL LAYOUT PLAN	B
2301879-320-051	LAYOUT PLAN STAGE 1	B
2301879-320-052	LAYOUT PLAN STAGE 2 SHEET 1 OF 2	B
2301879-320-053	LAYOUT PLAN STAGE 2 SHEET 2 OF 2	B
2301879-320-054	LAYOUT PLAN STAGE 3A SHEET 1 OF 2	C
2301879-320-055	LAYOUT PLAN STAGE 3A SHEET 2 OF 2	C
2301879-320-056	LAYOUT PLAN STAGE 4 SHEET 1 OF 2	B
2301879-320-057	LAYOUT PLAN STAGE 4 SHEET 2 OF 2	B
2301879-320-058	LAYOUT PLAN STAGE 5	B
2301879-320-059	LAYOUT PLAN STAGE 6 SHEET 1 OF 2	B
2301879-320-060	LAYOUT PLAN STAGE 6 SHEET 2 OF 2	B
2301879-320-061	LAYOUT PLAN STAGE 7	B
2301879-320-070	BULK EARTHWORKS OVERALL PLAN	B
2301879-320-071	BULK EARTHWORKS SECTION A	B
2301879-320-072	BULK EARTHWORKS SECTION B	B
2301879-320-073	BULK EARTHWORKS SECTIONS C, D & E	B
2301879-320-074	BULK EARTHWORKS SECTION F	B
2301879-320-101	ROAD LONGITUDINAL SECTIONS	B
2301879-320-102	ROAD LONGITUDINAL SECTIONS	B
2301879-320-103	ROAD LONGITUDINAL SECTIONS	B
2301879-320-104	ROAD LONGITUDINAL SECTIONS	B
2301879-320-105	ROAD LONGITUDINAL SECTIONS	B
2301879-320-106	ROAD LONGITUDINAL SECTIONS	B
2301879-320-200	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 1 OF 6)	B
2301879-320-201	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 2 OF 6)	B
2301879-320-202	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 3 OF 6)	B
2301879-320-203	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 4 OF 6)	B
2301879-320-204	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 5 OF 6)	B
2301879-320-205	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 6 OF 6)	B
2301879-320-206	ROAD CROSS SECTIONS STAGE 2 - ROAD 1	B
2301879-320-207	ROAD CROSS SECTIONS STAGE 2 - ROAD 2A (SHEET 1 OF 3)	B
2301879-320-208	ROAD CROSS SECTIONS STAGE 2 - ROAD 2A (SHEET 2 OF 3)	B
2301879-320-209	ROAD CROSS SECTIONS STAGE 2 - ROAD 2A (SHEET 3 OF 3)	B
2301879-320-210	ROAD CROSS SECTIONS STAGE 2 - ROAD 3	B

DRAWING INDEX

DRAWING No.	TITLE	REVISION
2301879-320-211	ROAD CROSS SECTIONS STAGE 2 - ROAD 5	B
2301879-320-212	ROAD CROSS SECTIONS STAGE 2 - ROAD 6	B
2301879-320-213	ROAD CROSS SECTIONS STAGE 2 - ROAD 7	B
2301879-320-214	ROAD CROSS SECTIONS STAGE 2 - ROAD 10	B
2301879-320-215	ROAD CROSS SECTIONS STAGE 3 - ROAD 2B (SHEET 1 OF 2)	B
2301879-320-216	ROAD CROSS SECTIONS STAGE 3 - ROAD 2B (SHEET 2 OF 2)	B
2301879-320-217	ROAD CROSS SECTIONS STAGE 3 - ROAD 3	B
2301879-320-218	ROAD CROSS SECTIONS STAGE 3- LANE 5	B
2301879-320-219	ROAD CROSS SECTIONS STAGE 3 - ROAD 9 (SHEET 1 OF 2)	B
2301879-320-220	ROAD CROSS SECTIONS STAGE 3 - ROAD 9 (SHEET 2 OF 2)	B
2301879-320-221	ROAD CROSS SECTIONS STAGE 4 - ROAD 2A (SHEET 1 OF 4)	B
2301879-320-222	ROAD CROSS SECTIONS STAGE 4 - ROAD 2A (SHEET 2 OF 4)	B
2301879-320-223	ROAD CROSS SECTIONS STAGE 4 - ROAD 2A (SHEET 3 OF 4)	B
2301879-320-224	ROAD CROSS SECTIONS STAGE 4 - ROAD 2A (SHEET 4 OF 4)	B
2301879-320-225	ROAD CROSS SECTIONS STAGE 4 - ROAD 4	B
2301879-320-226	ROAD CROSS SECTIONS STAGE 4 - ROAD 5 (SHEET 1 OF 3)	B
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2301879-320-228	ROAD CROSS SECTIONS STAGE 4 - ROAD 5 (SHEET 3 OF 3)	B
2301879-320-229	ROAD CROSS SECTIONS STAGE 5 - ROAD 2B	B
2301879-320-230	ROAD CROSS SECTIONS STAGE 5 - ROAD 3 (SHEET 1 OF 2)	B
2301879-320-231	ROAD CROSS SECTIONS STAGE 5 - ROAD 3 (SHEET 2 OF 2)	B
2301879-320-232	ROAD CROSS SECTIONS STAGE 5 - LANE 1	B
2301879-320-233	ROAD CROSS SECTIONS STAGE 5 - LANE 2	B
2301879-320-234	ROAD CROSS SECTIONS STAGE 6 - ROAD 2A	B
2301879-320-235	ROAD CROSS SECTIONS STAGE 6 - ROAD 2B	B
2301879-320-236	ROAD CROSS SECTIONS STAGE 6 - ROAD 8 (SHEET 1 OF 3)	B
2301879-320-237	ROAD CROSS SECTIONS STAGE 6 - ROAD 8 (SHEET 2 OF 3)	B
2301879-320-238	ROAD CROSS SECTIONS STAGE 6 - ROAD 8 (SHEET 3 OF 3)	B
2301879-320-239	ROAD CROSS SECTIONS STAGE 6 - ROAD 10	B
2301879-320-240	ROAD CROSS SECTIONS STAGE 6 - LANE 5	B
2301879-320-241	ROAD CROSS SECTIONS STAGE 7 - ROAD 10	B
2301879-320-242	ROAD CROSS SECTIONS STAGE 7 - ROAD 10	B
2301879-320-243	ROAD CROSS SECTIONS STAGE 7 - LANE 3	B
2301879-320-250	OVERALL SIGNAGE & LINE MARKING PLAN	B
2301879-320-251	SIGNAGE & LINE MARKING PLANS SHEET 1 OF 5	B
2301879-320-252	SIGNAGE & LINE MARKING PLANS SHEET 2 OF 5	B
2301879-320-253	SIGNAGE & LINE MARKING PLANS SHEET 3 OF 5	B
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2301879-320-300	INTERSECTION DETAILS SHEET 1 OF 3	B
2301879-320-301	INTERSECTION DETAILS SHEET 2 OF 3	B
2301879-320-302	INTERSECTION DETAILS SHEET 3 OF 3	B
2301879-320-303	INTERSECTION DETAILS CARPARK	C
2301879-320-400	OVERALL RETAINING WALLS	B
2301879-320-401	RETAINING WALL ALONG SOUTH WESTERN MORTORWAY LAYOUT & LONG-SECTION	B
2301879-320-402	RETAINING WALL CROSS SECTIONS	B
2301879-320-500	TEMPORARY OSD BASIN 1 SHEET 1 OF 2	B
2301879-320-501	TEMPORARY OSD BASIN 1 SHEET 2 OF 2	B
2301879-320-502	TEMPORARY OSD BASIN 2	B
2301879-320-505	OSD BASIN	B
2301879-320-506	OSD BASIN	B

DRAWING INDEX

DRAWING No.	TITLE	REVISION
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2301879-320-508	OSD BASIN	B
2301879-320-509	OSD BASIN	B
2301879-320-510	OSD BASIN	B
2301879-320-511	OSD BASIN	B
2301879-320-550	OVERALL CATCHMENT PLAN	B
2301879-320-600	OVERALL TRUNK DRAINAGE LAYOUT PLAN	B
2301879-320-601	DRAINAGE LONGITUDINAL SECTIONS SHEET 1 OF 6	B
2301879-320-602	DRAINAGE LONGITUDINAL SECTIONS SHEET 2 OF 6	B
2301879-320-603	DRAINAGE LONGITUDINAL SECTIONS SHEET 3 OF 6	B
2301879-320-604	DRAINAGE LONGITUDINAL SECTIONS SHEET 4 OF 6	B
2301879-320-605	DRAINAGE LONGITUDINAL SECTIONS SHEET 5 OF 6	B
2301879-320-606	DRAINAGE LONGITUDINAL SECTIONS SHEET 6 OF 6	B
2301879-320-700	TURNING MOVEMENTS SHEET 1 OF18	B
2301879-320-701	TURNING MOVEMENTS SHEET 2 OF 18	B
2301879-320-702	TURNING MOVEMENTS SHEET 3 OF 18	B
2301879-320-703	TURNING MOVEMENTS SHEET 4 OF 18	B
2301879-320-704	TURNING MOVEMENTS SHEET 5 OF 18	B
2301879-320-705	TURNING MOVEMENTS SHEET 6 OF 18	B
2301879-320-706	TURNING MOVEMENTS SHEET 7 OF 18	B
2301879-320-707	TURNING MOVEMENTS SHEET 8 OF 18	C
2301879-320-708	TURNING MOVEMENTS SHEET 9 OF 18	B
2301879-320-709	TURNING MOVEMENTS SHEET 10 OF 18	B
2301879-320-710	TURNING MOVEMENTS SHEET 11 OF 18	B
2301879-320-711	TURNING MOVEMENTS SHEET 12 OF 18	B
2301879-320-712	TURNING MOVEMENTS SHEET 13 OF 18	B
2301879-320-713	TURNING MOVEMENTS SHEET 14 OF 18	B
2301879-320-714	TURNING MOVEMENTS SHEET 15 OF 18	B
2301879-320-715	TURNING MOVEMENTS SHEET 16 OF 18	B
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2301879-320-800	OVERALL SOIL & WATER MANAGEMENT PLAN	B
2301879-320-801	SOIL & WATER MANAGEMENT PLAN STAGE 1	B
2301879-320-802	SOIL & WATER MANAGEMENT PLAN STAGE 2 SHEET 1 OF 2	B
2301879-320-803	SOIL & WATER MANAGEMENT PLAN STAGE 2 SHEET 2 OF 2	B
2301879-320-804	SOIL & WATER MANAGEMENT PLAN STAGE 3	B
2301879-320-806	SOIL & WATER MANAGEMENT PLAN STAGE 4 SHEET 1 OF 2	B
2301879-320-807	SOIL & WATER MANAGEMENT PLAN STAGE 4 SHEET 2 OF 2	B
2301879-320-808	SOIL & WATER MANAGEMENT PLAN STAGE 5	B
2301879-320-809	SOIL & WATER MANAGEMENT PLAN STAGE 6 SHEET 1 OF 2	B
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REV	DESCRIPTION	DATE	DRN.	APP.
C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	CARPARK & SIGNAGE AMENDMENTS	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
PS Number	-

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	COVER SHEET

Sheet	1 of 145		
Scale	AS SHOWN		
Project Ref	Stage No	Drawing No	Rev
2301879	321	001	C

F:\synergytempl12d\Synergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-001-COV.dwg

LEGEND - FUNCTIONAL LAYOUT PLAN

- PROPOSED SUPER LOTS
- PROPOSED HOUSING LOTS
- DENOTES COMMUNITY TITLE SCHEME LOTS
- ROADS DEDICATED TO COUNCIL
- DENOTES PUBLIC OPEN SPACE OR DRAINAGE RESERVE TO BE CONSTRUCTED AND DEDICATED TO COUNCIL UNDER THIS STAGE

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works

BEFORE YOU DIG

www.byda.com.au

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
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0 12.5 25 50 75 100
SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
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Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: GENERAL ARRANGEMENT & STAGING PLAN

Sheet 2 of 145

Scale 1:1250 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	002	B

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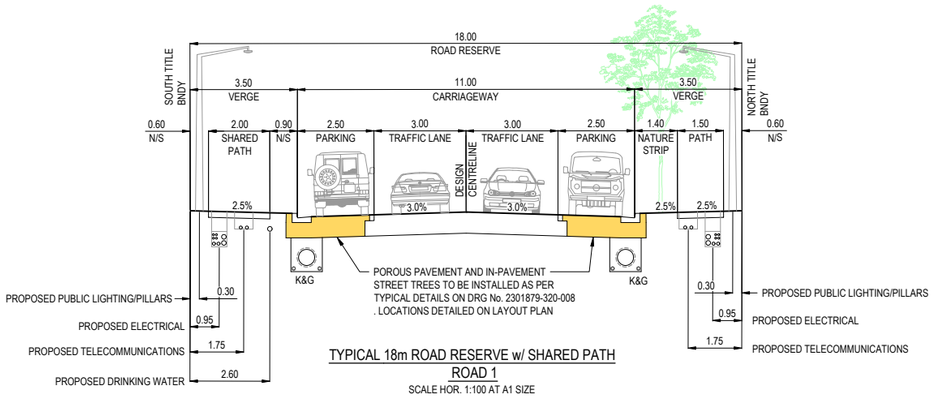
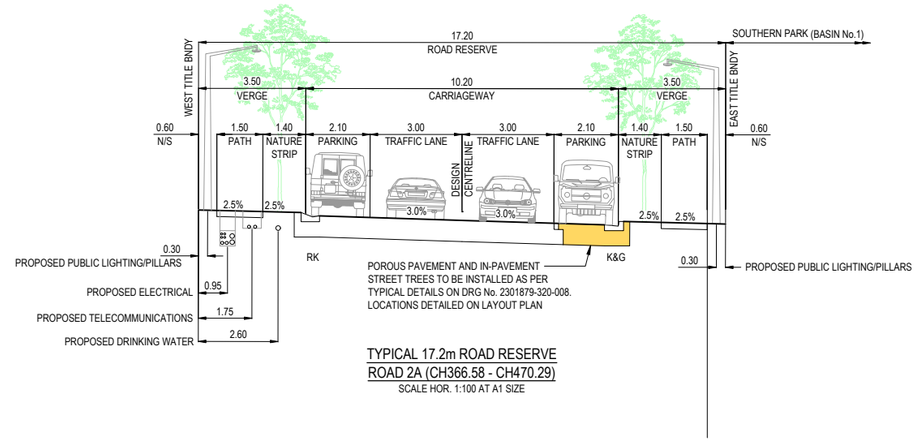


TYPICAL 18m ROAD RESERVE w/ SHARED PATH
ROAD 1
SCALE HOR. 1:100 AT A1 SIZE



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ROAD 2A (CH366.58 - CH470.29)
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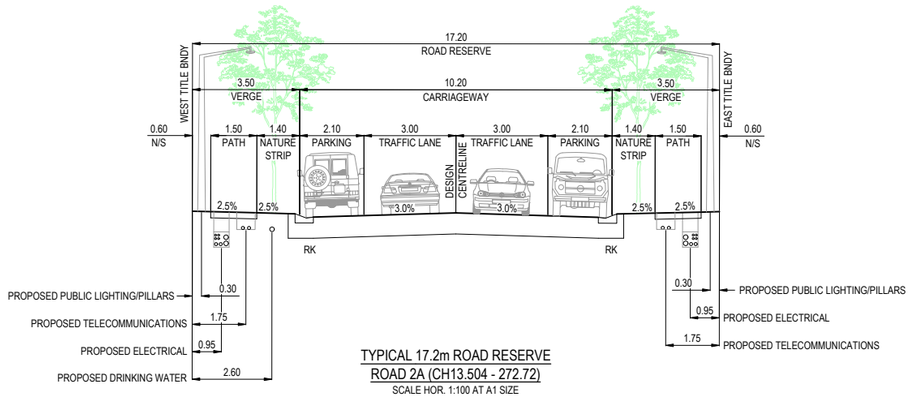

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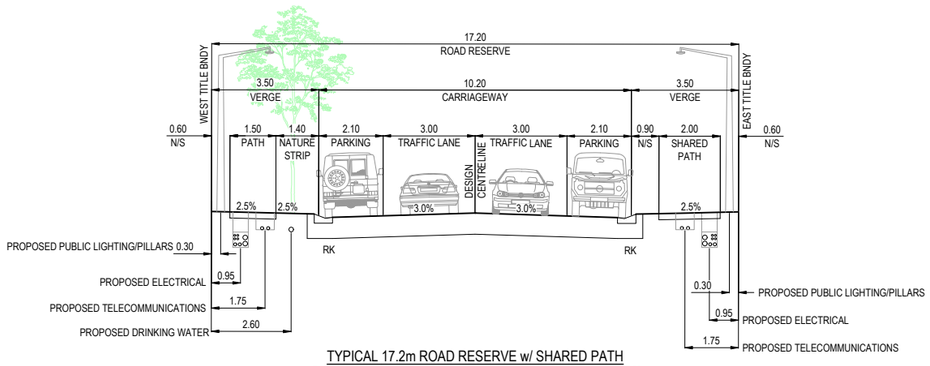
ROAD 2A (CH13.504 - 272.72)
SCALE HOR. 1:100 AT A1 SIZE



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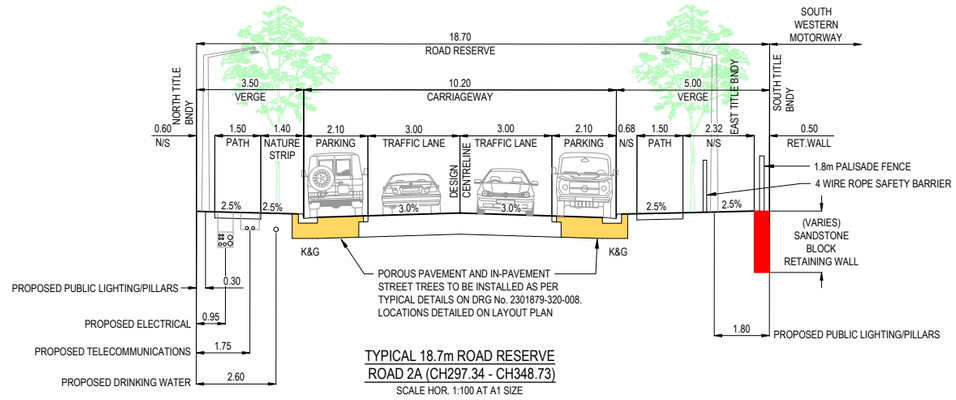
ROAD 2A (CH470.29 - CH579.182 & CH675.59 - CH716.59)
SCALE HOR. 1:100 AT A1 SIZE



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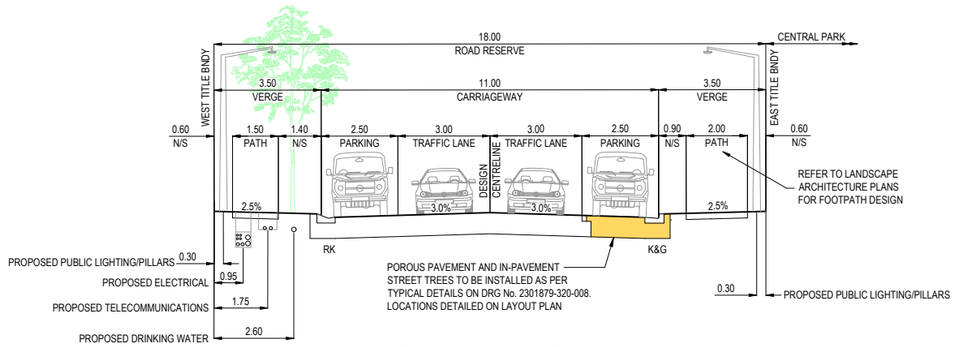

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ROAD 2A (CH610.32 - CH644.58)
SCALE HOR. 1:100 AT A1 SIZE

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SCALE 1:100 AT A1 SIZE

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TYPICAL ROAD CROSS SECTIONS SHEET 1 OF 4

Sheet	3 of 145		
Scale	1:100 @ A1		
Project Ref	Stage No	Drawing No	Rev
2301879	321	003	B

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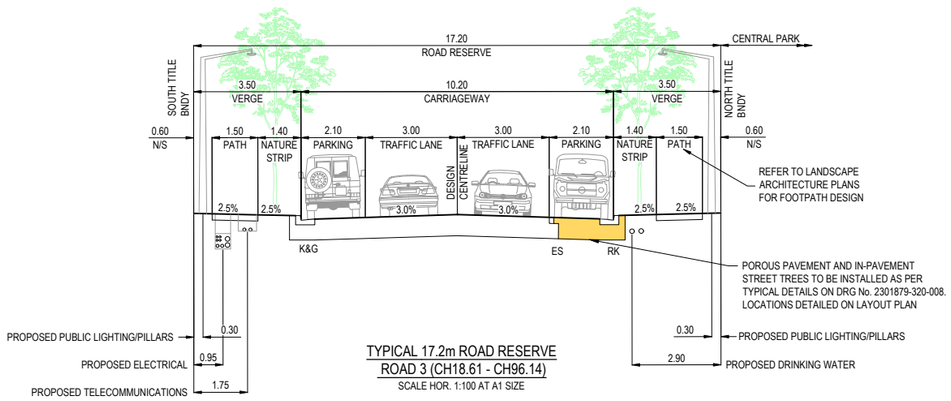

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ROAD 3 (CH18.61 - CH96.14)
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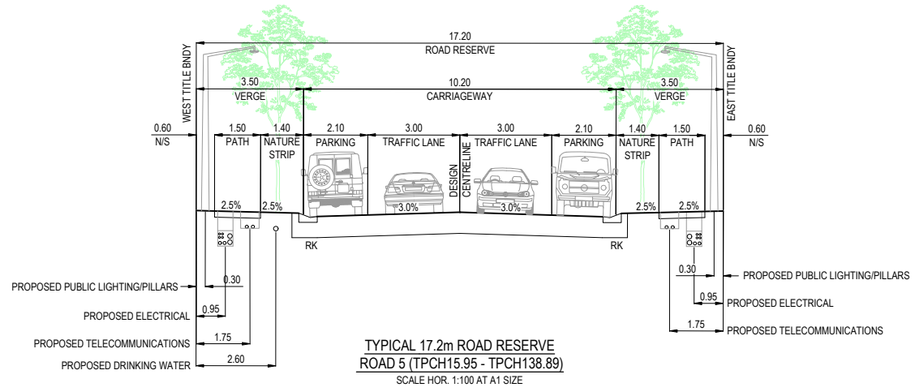

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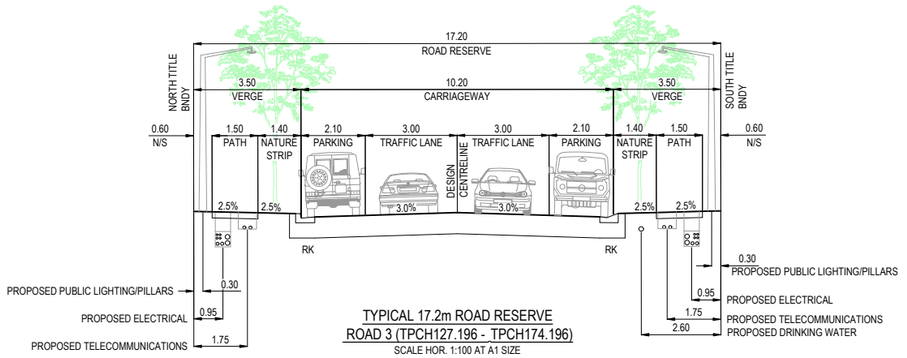

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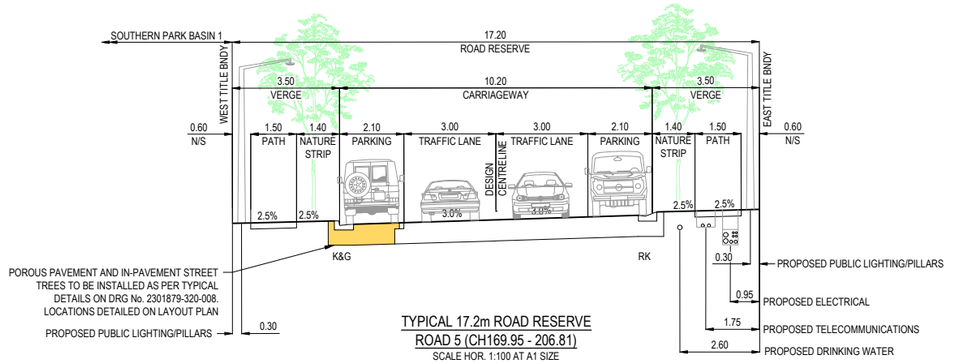

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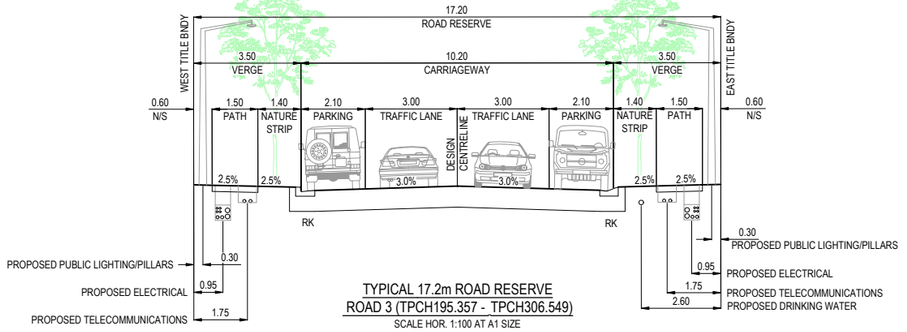

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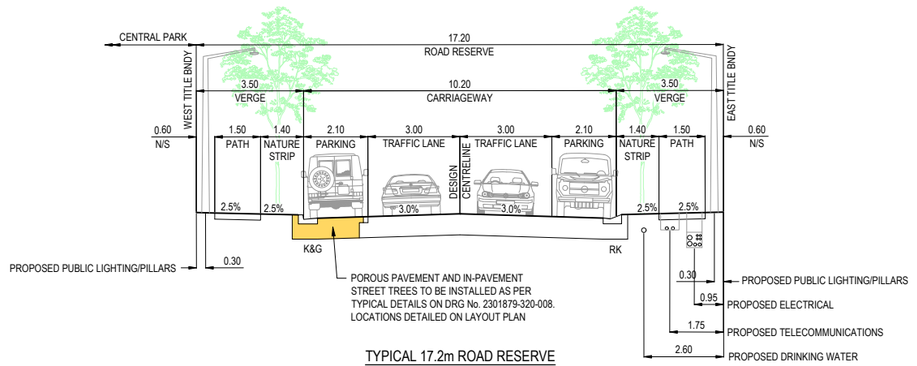

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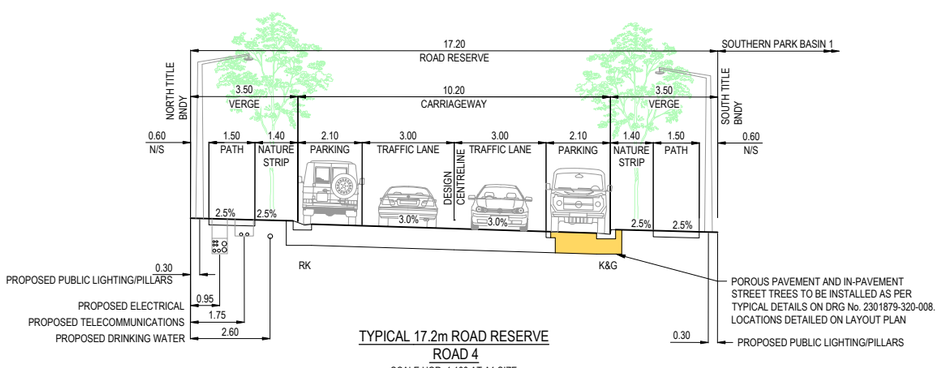

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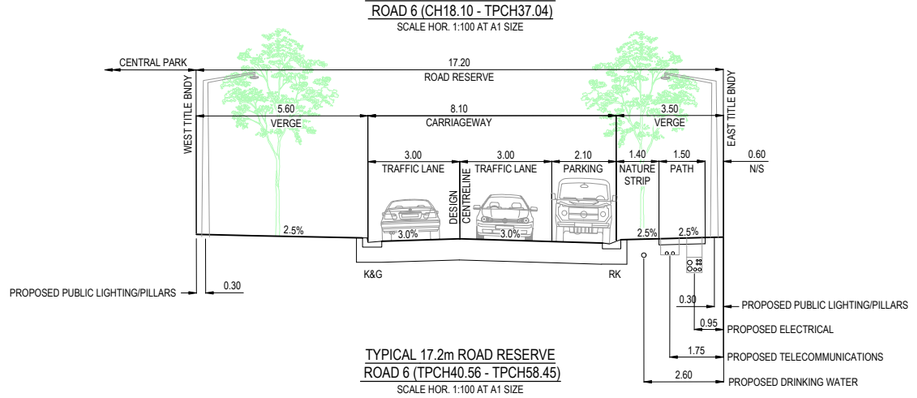

TYPICAL 17.2m ROAD RESERVE
ROAD 6 (TPCH40.56 - TPCH58.45)
SCALE HOR. 1:100 AT A1 SIZE

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0 1 2 4 6 8
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Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
PS Number	PS

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TYPICAL ROAD CROSS SECTIONS SHEET 2 OF 4

Sheet	4 of145		
Scale	1:100 @ A1		
Project Ref	Stage No	Drawing No	Rev
2301879	321	004	B

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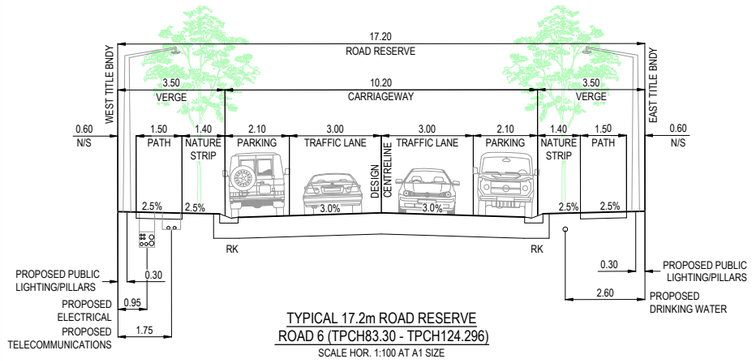

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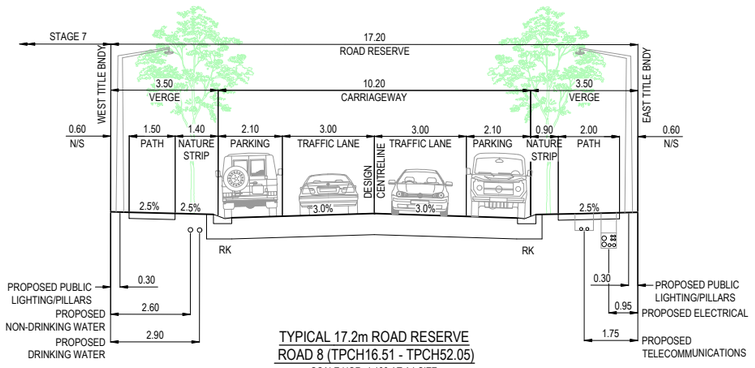
SCALE HOR. 1:100 AT A1 SIZE



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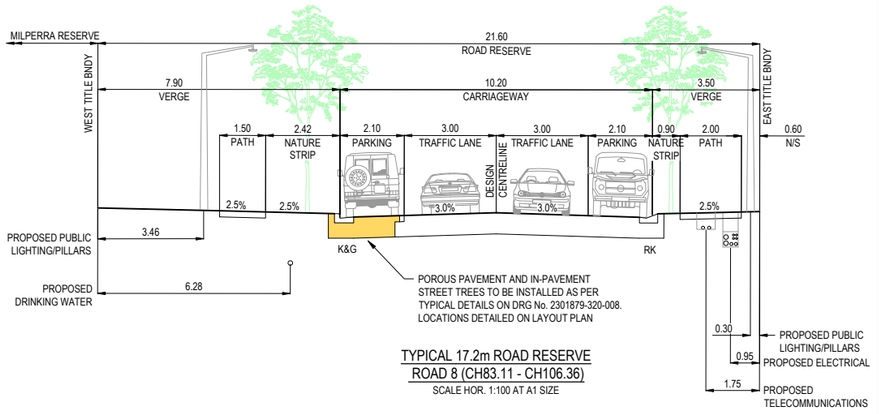

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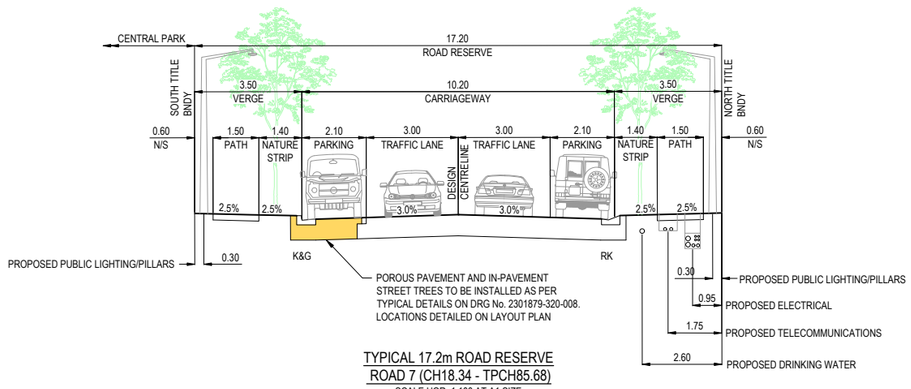

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ROAD 7 (CH18.34 - TPCH85.68)
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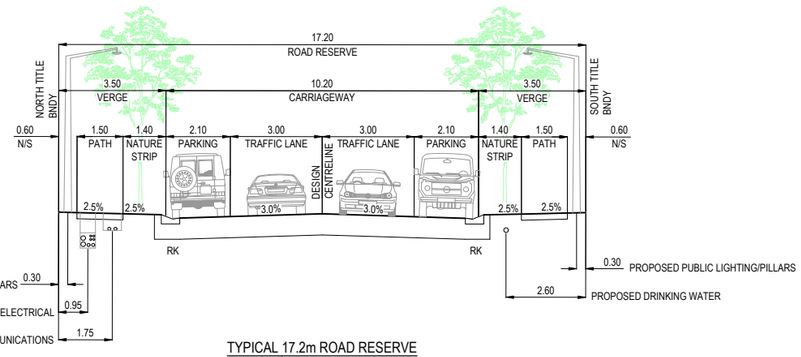
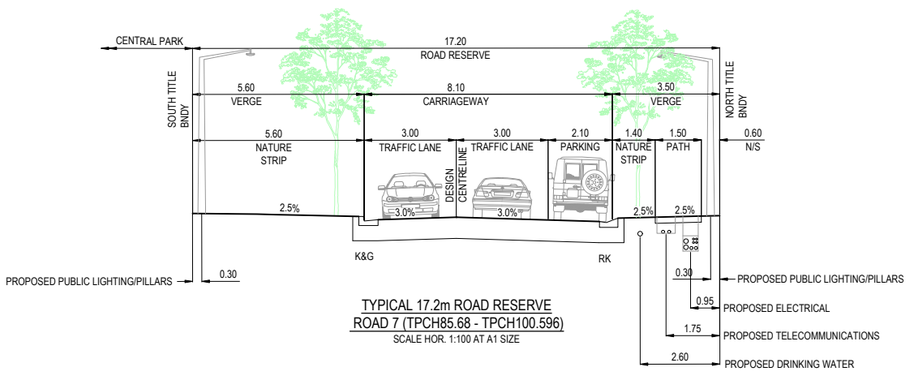


TYPICAL 17.2m ROAD RESERVE
ROAD 8 (CH128.67 - CH176.48 &
CH197.64 - CH288.64)
SCALE HOR. 1:100 AT A1 SIZE



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ROAD 7 (TPCH85.68 - TPCH100.596)
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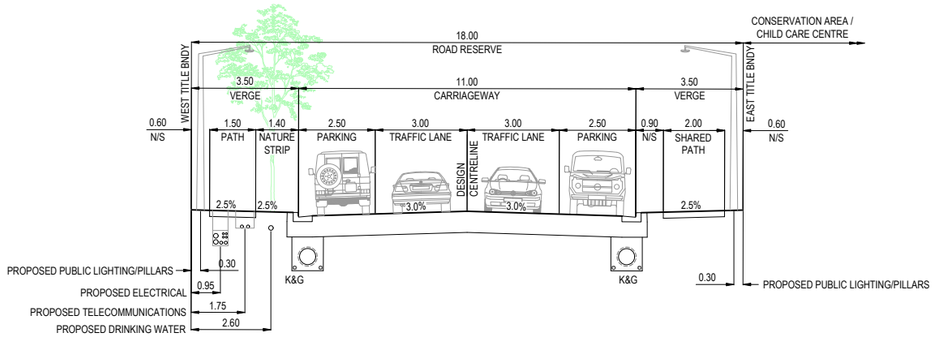

TYPICAL 18m ROAD RESERVE w/ SHARED PATH
ROAD 9 (CH13.50 - CH123.44)
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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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0 1 2 4 6 8
SCALE 1:100 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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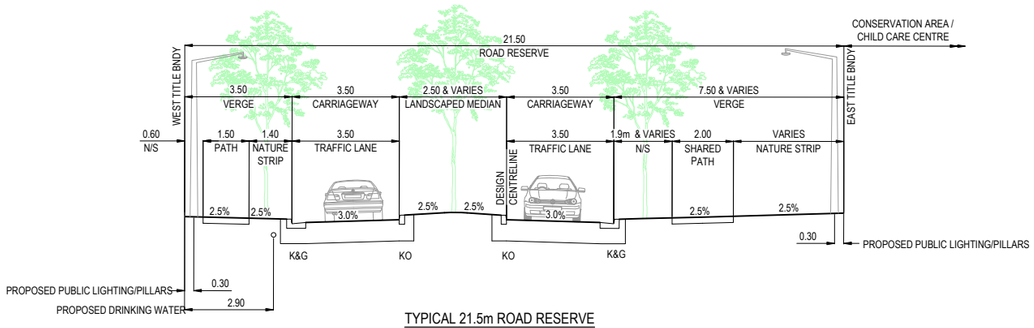
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TYPICAL ROAD CROSS SECTIONS
SHEET 3 OF 4

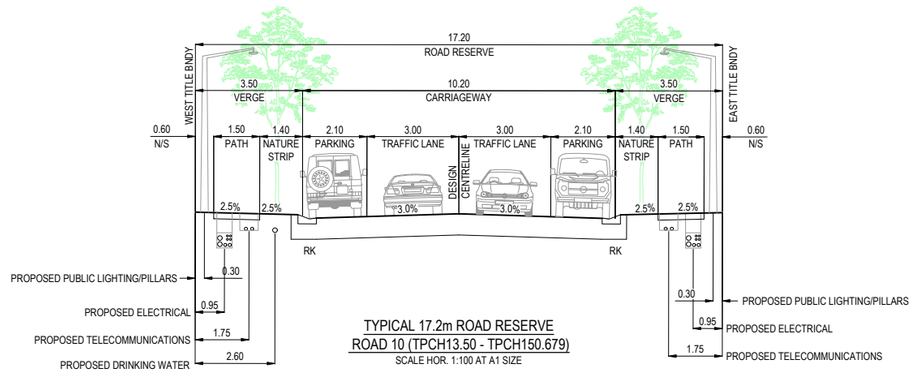
Sheet 5 of145
Scale 1:100 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	005	B

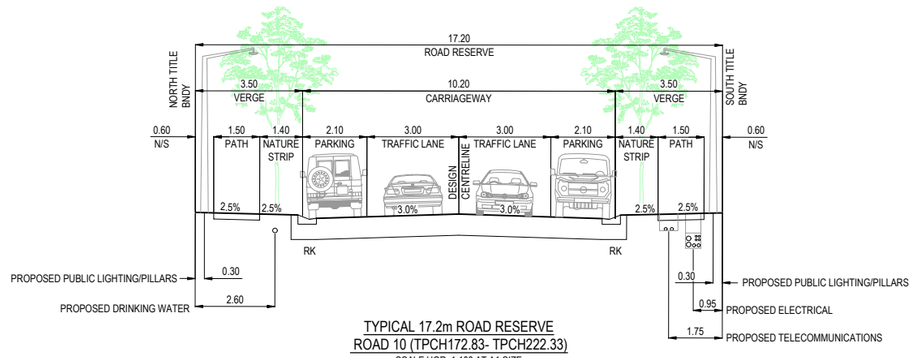
F:\synergy\temp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-003-DET.dwg



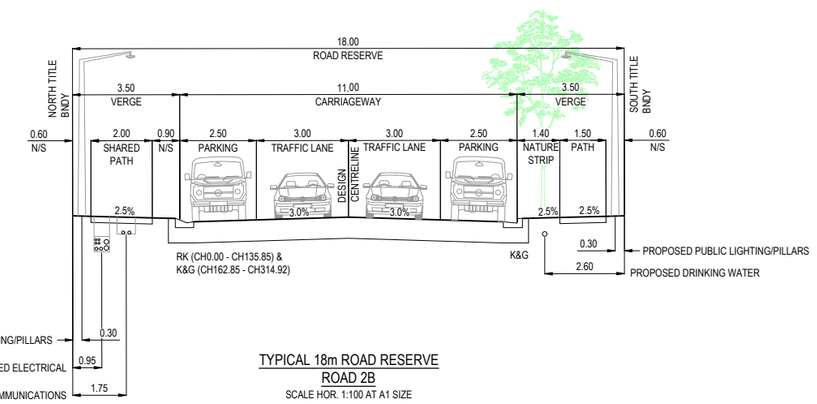
TYPICAL 21.5m ROAD RESERVE
ROAD 9 (CH123.44 & CH178.88)
SCALE HOR. 1:100 AT A1 SIZE



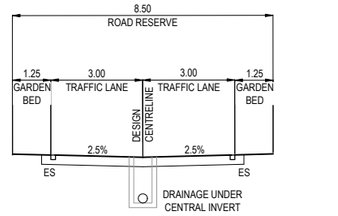
TYPICAL 17.2m ROAD RESERVE
ROAD 10 (TPCH13.50 - TPCH150.679)
SCALE HOR. 1:100 AT A1 SIZE



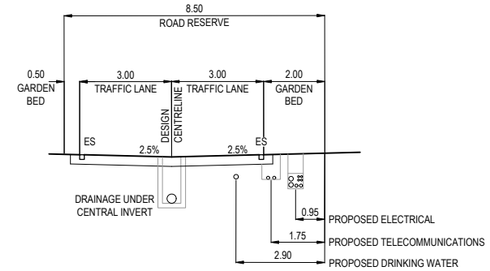
TYPICAL 17.2m ROAD RESERVE
ROAD 10 (TPCH172.83- TPCH222.33)
SCALE HOR. 1:100 AT A1 SIZE



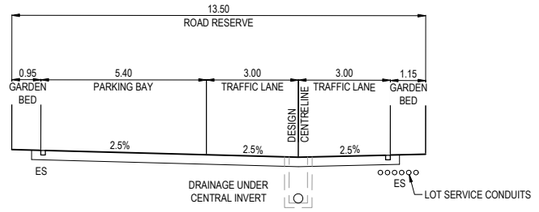
TYPICAL 18m ROAD RESERVE
ROAD 2B
SCALE HOR. 1:100 AT A1 SIZE



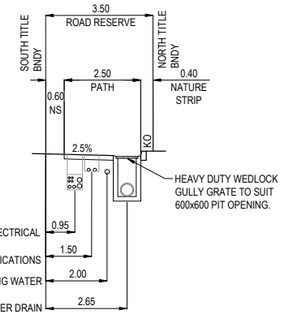
TYPICAL 8.5m ROAD RESERVE
LANE 1 & 3
SCALE HOR. 1:100 AT A1 SIZE



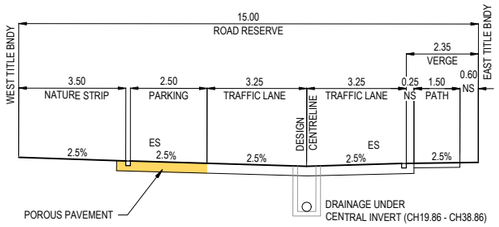
TYPICAL 8.5m ROAD RESERVE
LANE 5
SCALE HOR. 1:100 AT A1 SIZE



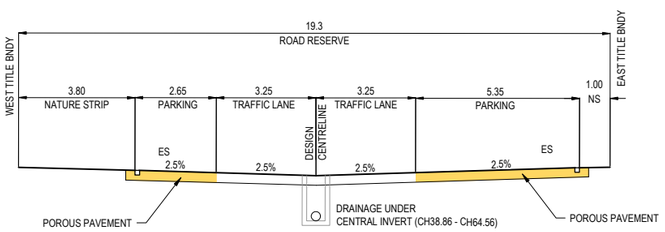
TYPICAL 13.5m ROAD RESERVE
LANE 2
SCALE HOR. 1:100 AT A1 SIZE



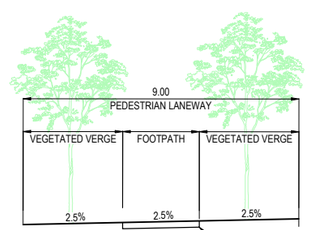
TYPICAL 3.5m
WALK 1
SCALE HOR. 1:100 AT A1 SIZE



TYPICAL 15m ROAD RESERVE
LANE 4 (CH16.44 - CH38.86)
SCALE HOR. 1:100 AT A1 SIZE



TYPICAL 19.3m ROAD RESERVE
LANE 4 (CH38.86 - CH72.858)
SCALE HOR. 1:100 AT A1 SIZE



TYPICAL 9.0m PEDESTRIAN LINK
SCALE HOR. 1:100 AT A1 SIZE

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SCALE 1:100 AT A1 SIZE

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TYPICAL ROAD CROSS SECTIONS SHEET 4 OF 4

Sheet 6 of145
Scale 1:100 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	006	B

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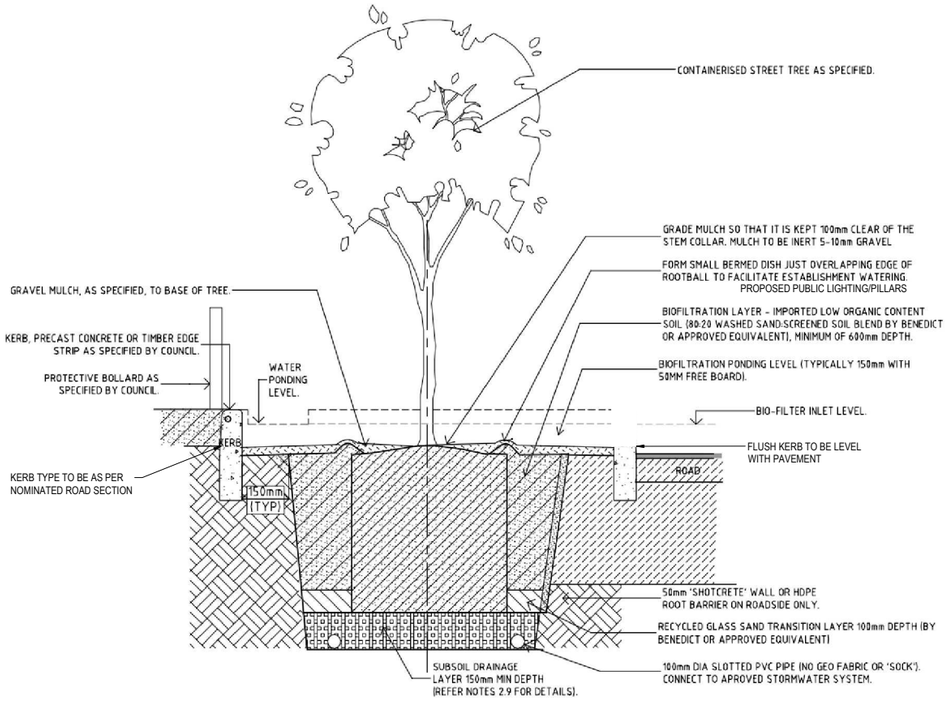
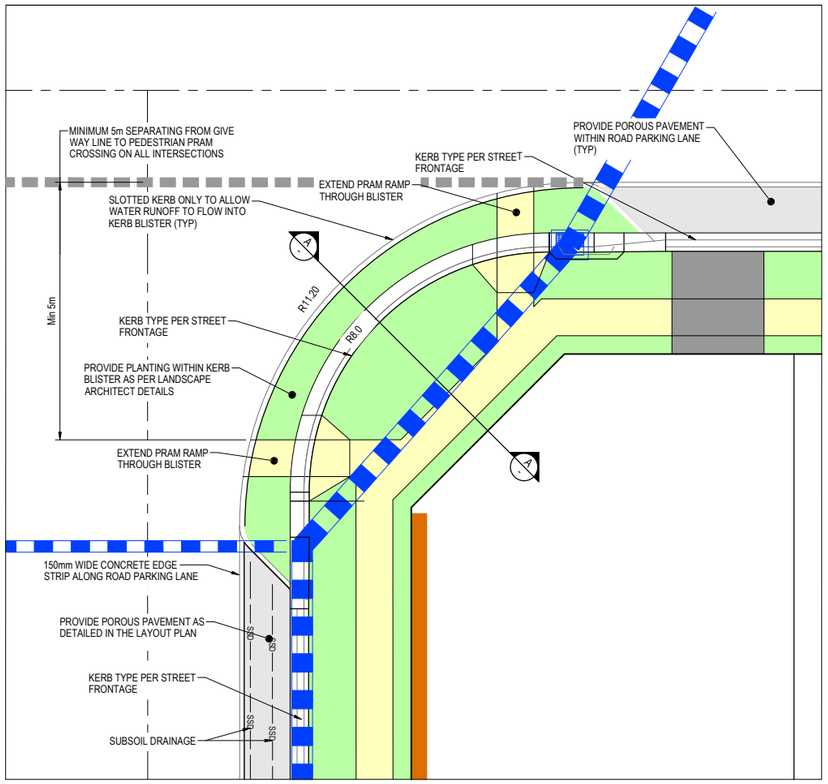


SECTION SCALE: NTS

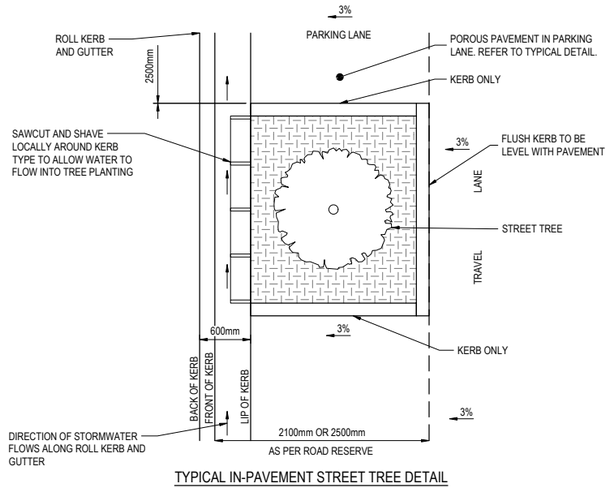
HOLD POINTS:

1. COUNCIL TO INSPECT AT COMPLETION OF CONCRETE KERB TO ALLOW CONFIRMATION OF CORRECT LEVELS/DEPTH.
2. COUNCIL TO INSPECT AT COMPLETION OF ALL LAYERS-DRAINAGE, TRANSITION OF BIOFILTER & DEPTH OF GRAVEL MULCH
3. COUNCIL TO INSPECT THE POSITIONING & COVERING OF SUB-SOIL DRAINAGE

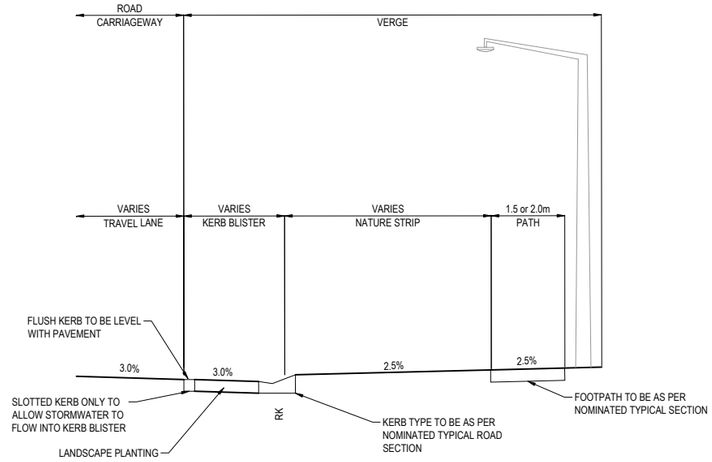
TYPICAL IN-PAVEMENT STREET TREE DETAIL
N.T.S



TYPICAL KERB BLISTER PLAN AND DETAILS
N.T.S



TYPICAL IN-PAVEMENT STREET TREE DETAIL
N.T.S



SECTION A: KERB BLISTER AT INTERSECTION
N.T.S

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TYPICAL DETAILS SHEET 1 OF 2

Sheet	7 of145		
Scale	AS SHOWN		
Project Ref	Stage No	Drawing No	Rev
2301879	321	007	B

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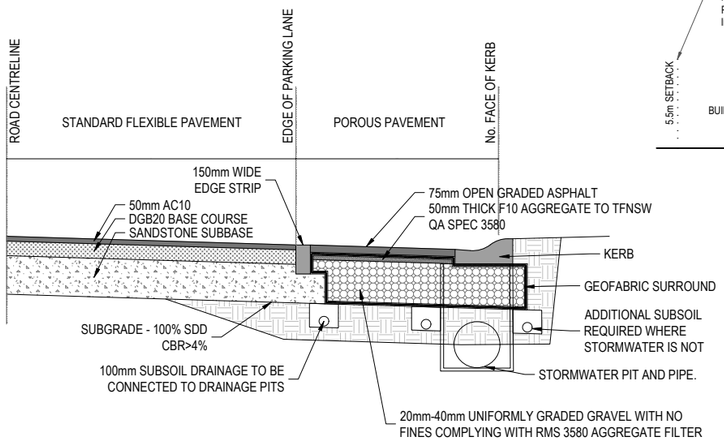
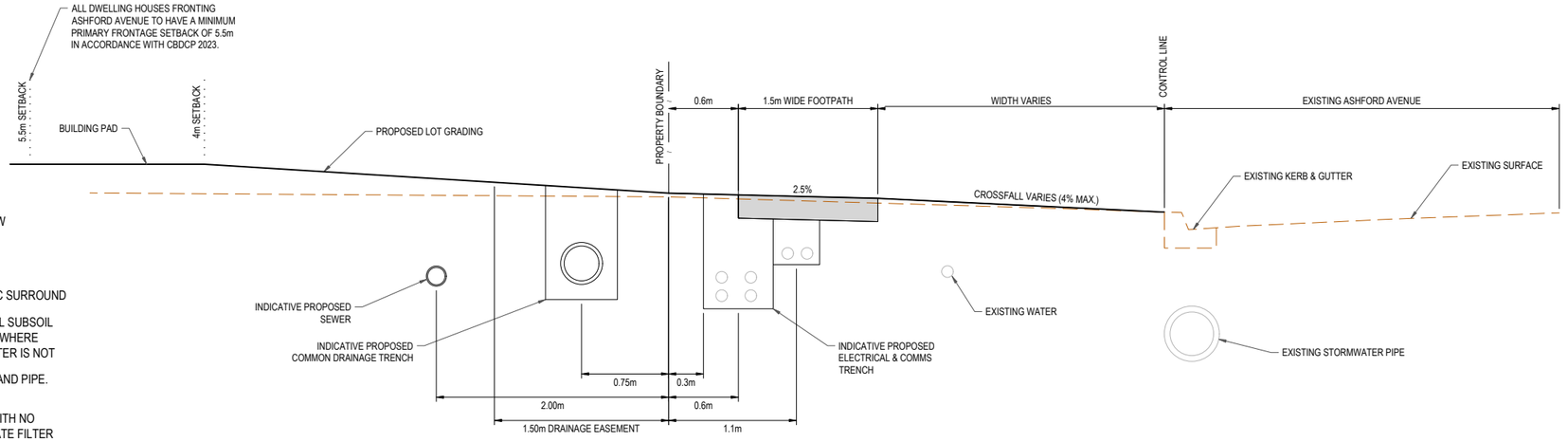
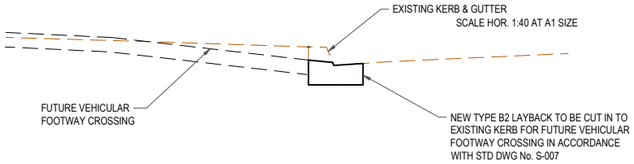


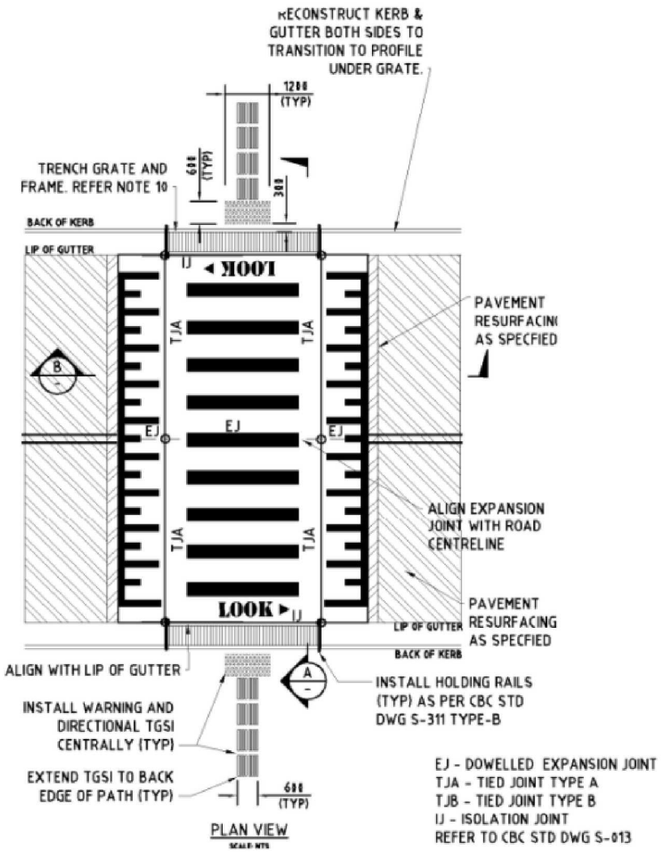
TYPICAL POROUS PAVEMENT DETAIL IN PARKING LANE
N.T.S



ASHFORD AVENUE TYPICAL CROSS SECTION

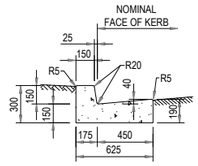


LAYBACK FOR VEHICULAR CROSSING TYPICAL SECTION
SCALE HOR. 1:40 AT A1 SIZE

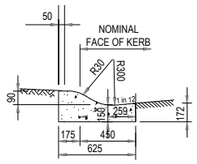


FOR DETAILS REFER TO CITY OF CANTERBURY BANKSTOWN STANDARD DWG No. S-306

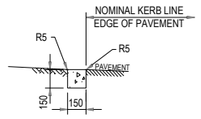
STANDARD RAISED PEDESTRIAN THRESHOLD WITH GRATED GUTTER BRIDGE: TYPE 1
N.T.S



TYPICAL KERB & GUTTER (K&G)
N.T.S

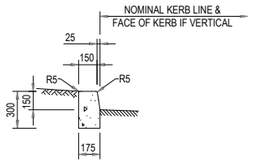


TYPICAL ROLL KERB AND GUTTER (RK)
N.T.S



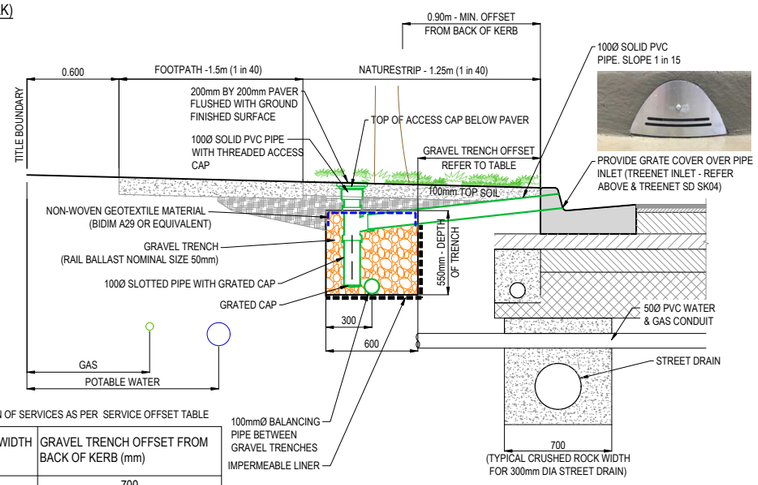
150mm EDGE STRIP

TYPICAL 150mm EDGE STRIP (ES)
N.T.S



KERB ONLY

TYPICAL KERB ONLY (KO)
N.T.S



NOTE: LOCATION OF SERVICES AS PER SERVICE OFFSET TABLE

NATURESTRIP WIDTH (m)	GRAVEL TRENCH OFFSET FROM BACK OF KERB (mm)
≤ 2.50	700
2.80	800

ACCESS STREET LEVEL 1
SECTION A-A

PASSIVE IN-VERGE STREET TREE IRRIGATION GRAVEL TRENCH (KERB INLET DIVERSION)

NOT TO SCALE

NOTES:

1. AT HIGHLY CONSTRAINED SITES, GRAVEL TRENCHES CAN BE MODIFIED IN THE FOLLOWING WAYS:
   - REDUCED OFFSET OF 0.75m FROM TREE CENTRELINE
   - DIMENSION 1.0m LONG x 0.6m WIDE x 0.75m DEEP
   - NATURESTRIP ≤ 2.5m DIMENSION CAN BE 1.5m LONG x 0.4m WIDE x 0.75m DEEP
2. PASSIVE IRRIGATION PLANS TO BE READ IN CONJUNCTION WITH LANDSCAPE PLANS.

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TYPICAL DETAILS SHEET 2 OF 2

Sheet 8 of145
Scale AS SHOWN

Project Ref	Stage No	Drawing No	Rev
2301879	321	008	B

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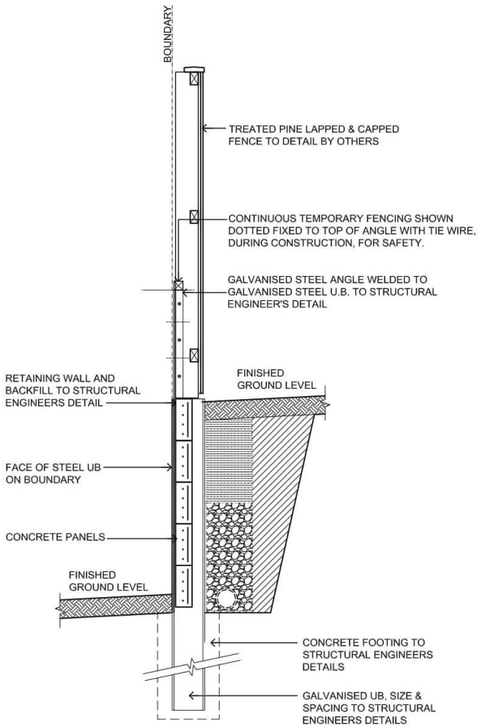
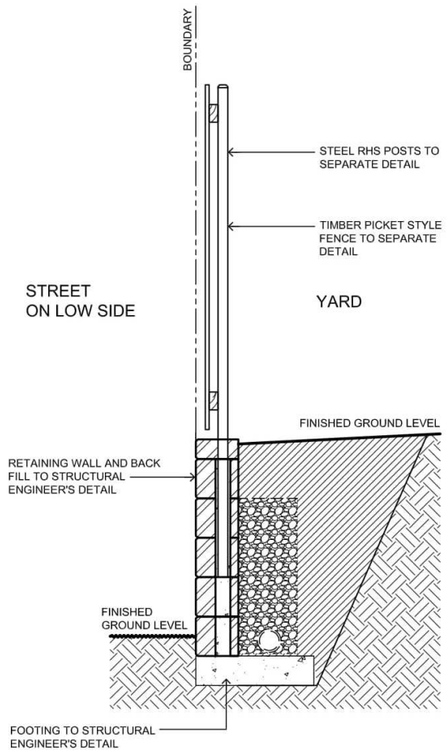
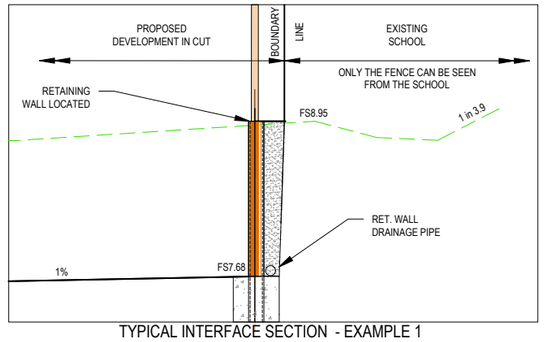


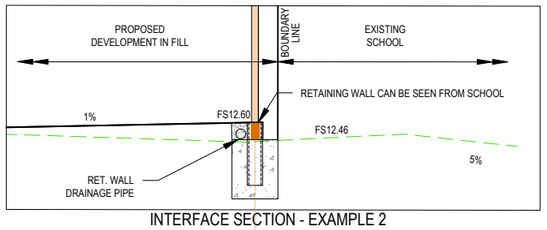
5.1 (a) RETAINING WALL STANDARD DETAIL:
POST AND CONCRETE SLEEPER WALL



5.1 (c) RETAINING WALL STANDARD DETAIL:
MASONRY BLOCK - STREET LOW SIDE



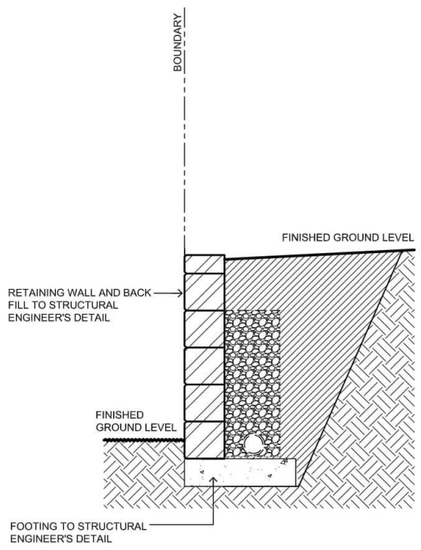
TYPICAL INTERFACE SECTION - EXAMPLE 1



INTERFACE SECTION - EXAMPLE 2

EXAMPLE 1: LAPPED AND CAPPED FENCE ON TOP OF POST AND SLEEPER MASONRY RETAINING WALL - VIEW FROM THE SCHOOL WHEN THE SITE IS IN CUT

EXAMPLE 2: LAPPED AND CAPPED FENCE ON TOP OF A POST AND SLEEPER MASONRY RETAINING WALL - VIEW FROM THE SCHOOL WHEN THE SITE IS IN FILL



5.1 (c) RETAINING WALL STANDARD DETAIL:
MASONRY BLOCK NO FENCE

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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: RETAINING WALL DETAILS

Sheet 9 of145

Scale: AS SHOWN

Project Ref	Stage No	Drawing No	Rev
2301879	321	009	B

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LEGEND - DEMOLITION PLAN PLAN

- EXISTING TREE TO BE REMOVED
- EXISTING TREE
- EXISTING TREE TO BE REMOVED DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS. REFER TO ARBORIST REPORT
- EXISTING TREE TO BE REMOVED UNDER CHAPTER 2.3 OF THE CANTERBURY-BANKSTOWN DCP (2023). REFER TO ARBORIST REPORT
- EXTENT OF WORKS
- EXISTING STORMWATER PIT/PIPE TO BE REMOVED
- ExS — EXISTING SEWER TO BE REMOVED
- EXISTING FENCE TO BE REMOVED
- ExE — EXISTING ELECTRICITY (UNDERGROUND) TO BE REMOVED
- ExO/H E — EXISTING ELECTRICITY (OVERHEAD) TO BE REMOVED
- ExG — EXISTING GAS TO BE REMOVED
- ExT — EXISTING TELECOMMUNICATIONS TO BE REMOVED
- ExW — EXISTING WATER TO BE REMOVED
- ExFS — EXISTING FIRE SERVICE TO BE REMOVED
- EXISTING LIGHT POLE TO BE REMOVED
- EXISTING TELECOMMUNICATIONS PIT TO BE REMOVED
- EXISTING GRATED PIT TO BE REMOVED
- EXISTING GRATED PIT TO BE REMOVED
- EXISTING SEWER STRUCTURE TO BE REMOVED
- EXISTING STOP VALVE TO BE REMOVED
- EXISTING WATER HYDRANT TO BE REMOVED
- EXISTING GAS VALVE TO BE REMOVED
- EXISTING CARPARK AND ROAD TO BE DEMOLISHED AS PART OF STAGE 3A WORKS.

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works
BEFORE YOU DIG
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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 15 30 60 90 120
SCALE 1:1500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL DEMOLITION PLAN

Sheet 10 of 145
Scale 1:1500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	030	B

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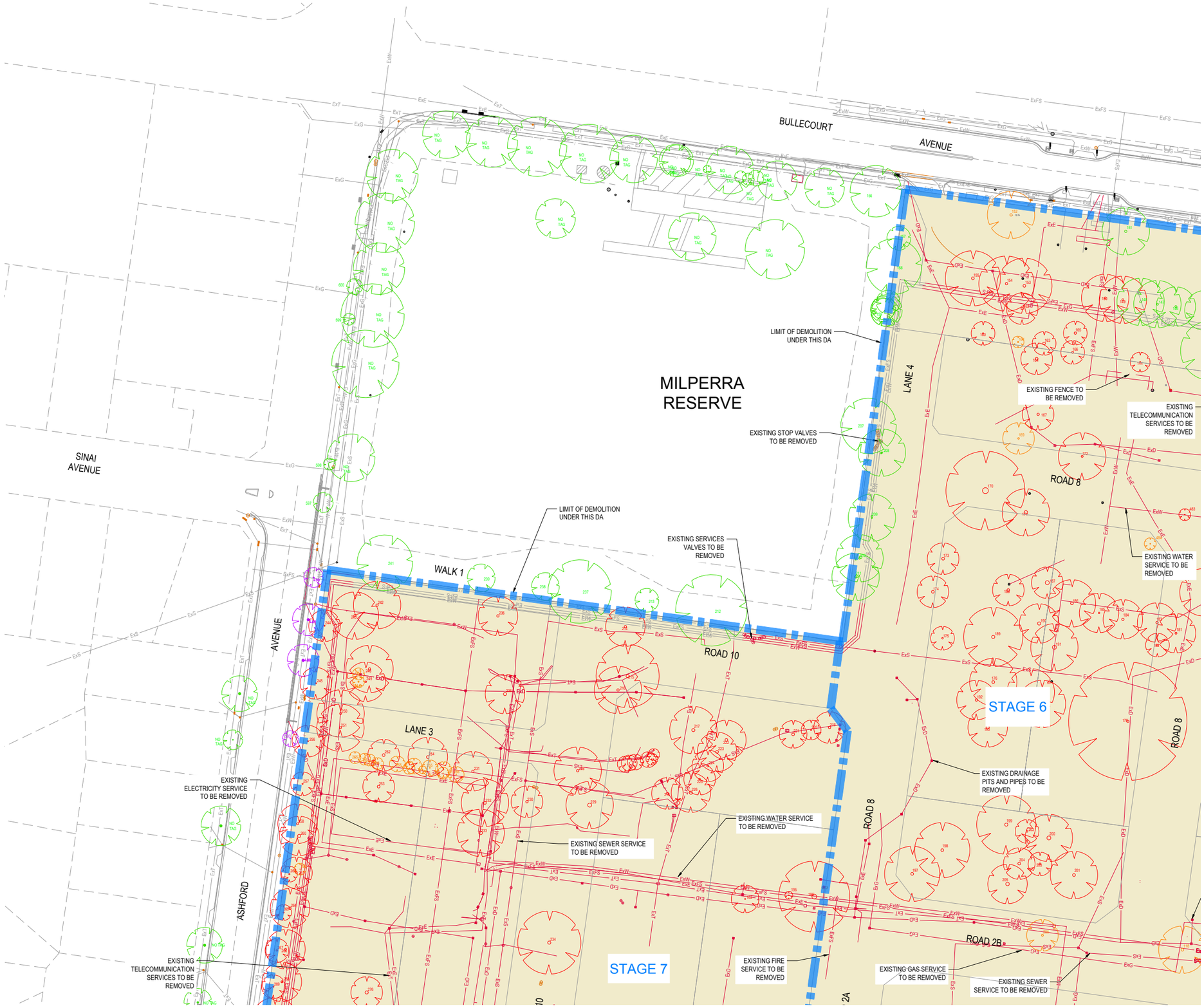

LEGEND - DEMOLITION PLAN PLAN

- EXISTING TREE TO BE REMOVED
- EXISTING TREE
- EXISTING TREE TO BE REMOVED DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS. REFER TO ARBORIST REPORT
- EXISTING TREE TO BE REMOVED UNDER CHAPTER 2.3 OF THE CANTERBURY-BANKSTOWN DCP (2023). REFER TO ARBORIST REPORT
- EXTENT OF WORKS
- EXISTING STORMWATER PIT/PIPE TO BE REMOVED
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- ExG — EXISTING GAS TO BE REMOVED
- ExT — EXISTING TELECOMMUNICATIONS TO BE REMOVED
- ExW — EXISTING WATER TO BE REMOVED
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- EXISTING TELECOMMUNICATIONS PIT TO BE REMOVED
- EXISTING GRATED PIT TO BE REMOVED
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WARNING
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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 1 OF 6

Sheet 11 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	031	B

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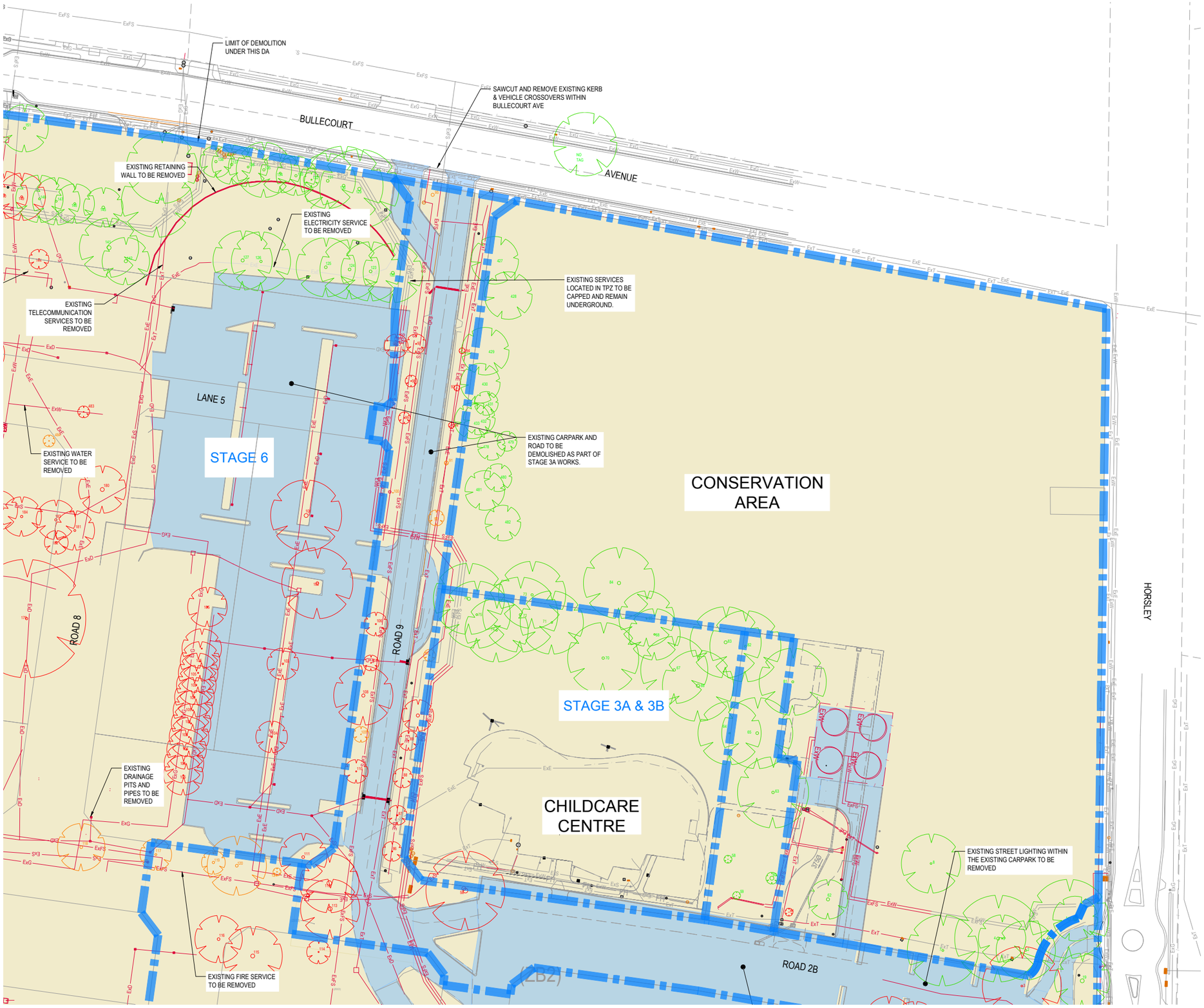

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 2 OF 6

Sheet 12 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	032	B

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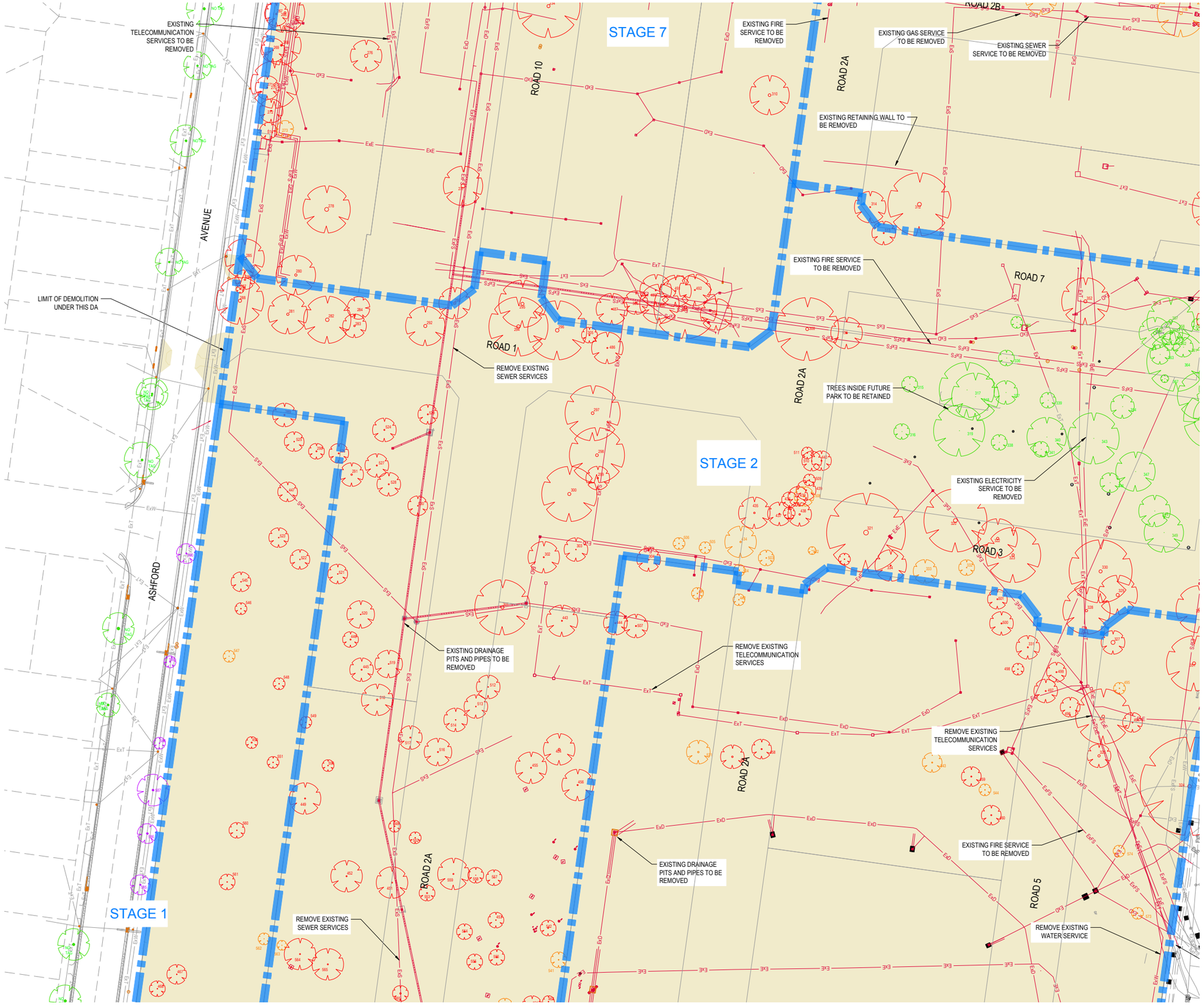

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
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www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 3 OF 6

Sheet 13 of 145

Scale 1:500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	033	B

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LEGEND - DEMOLITION PLAN PLAN

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 4 OF 6

Sheet 14 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	034	B

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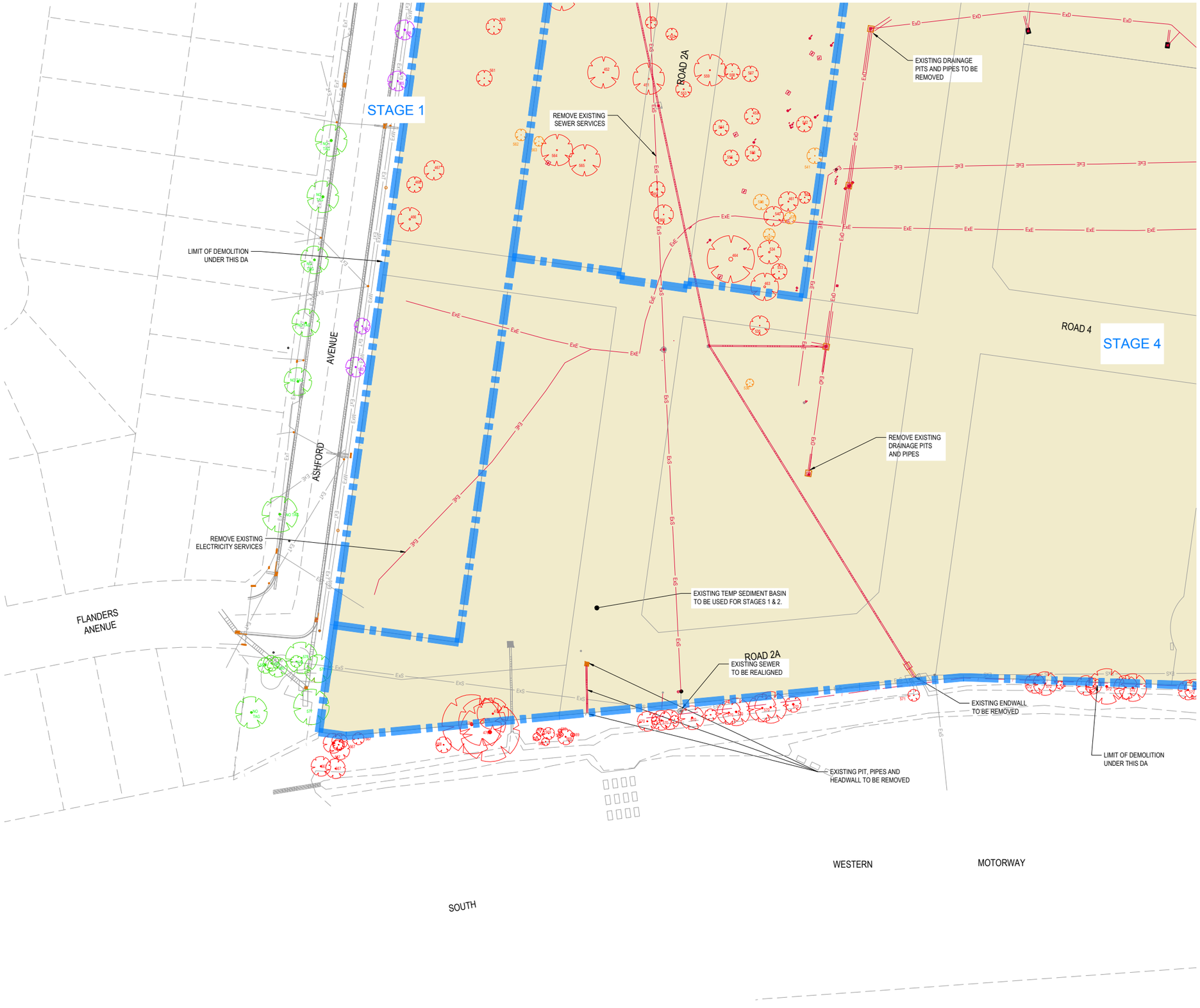

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 5 OF 6

Sheet 15 of 145

Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	035	B

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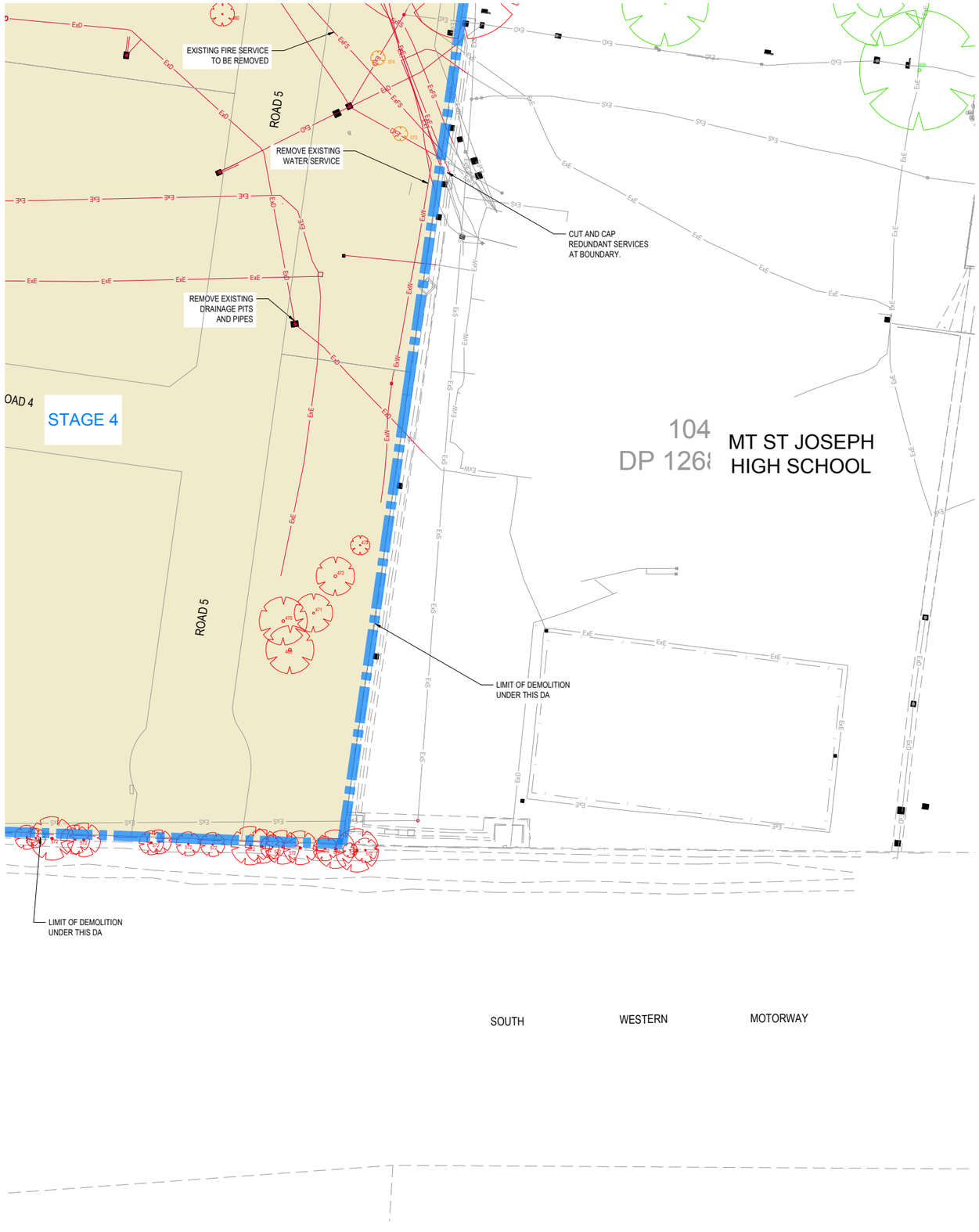

LEGEND - DEMOLITION PLAN PLAN

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mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed Date	R. GOVENDER 23.06.2025
Drawn	G.N.
Checked Date	S. FERGUSON 07.11.25
Approved Reg. No. Date	S. FERGUSON PE0008347 07.11.25
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DEMOLITION PLAN
SHEET 6 OF 6

Sheet 16 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	036	B

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LEGEND - FUNCTIONAL LAYOUT PLAN

- PROPOSED SUPER LOT BOUNDARY
- PROPOSED INTERNAL LOT BOUNDARY
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL
- 11 SUPER LOT NUMBER
- *C1 INDICATES COMMUNITY TITLE SCHEME LOT NUMBER

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 12.5 25 50 75 100
SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL LOT LAYOUT PLAN

Sheet 17 of 145

Scale 1:1250 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	045	B

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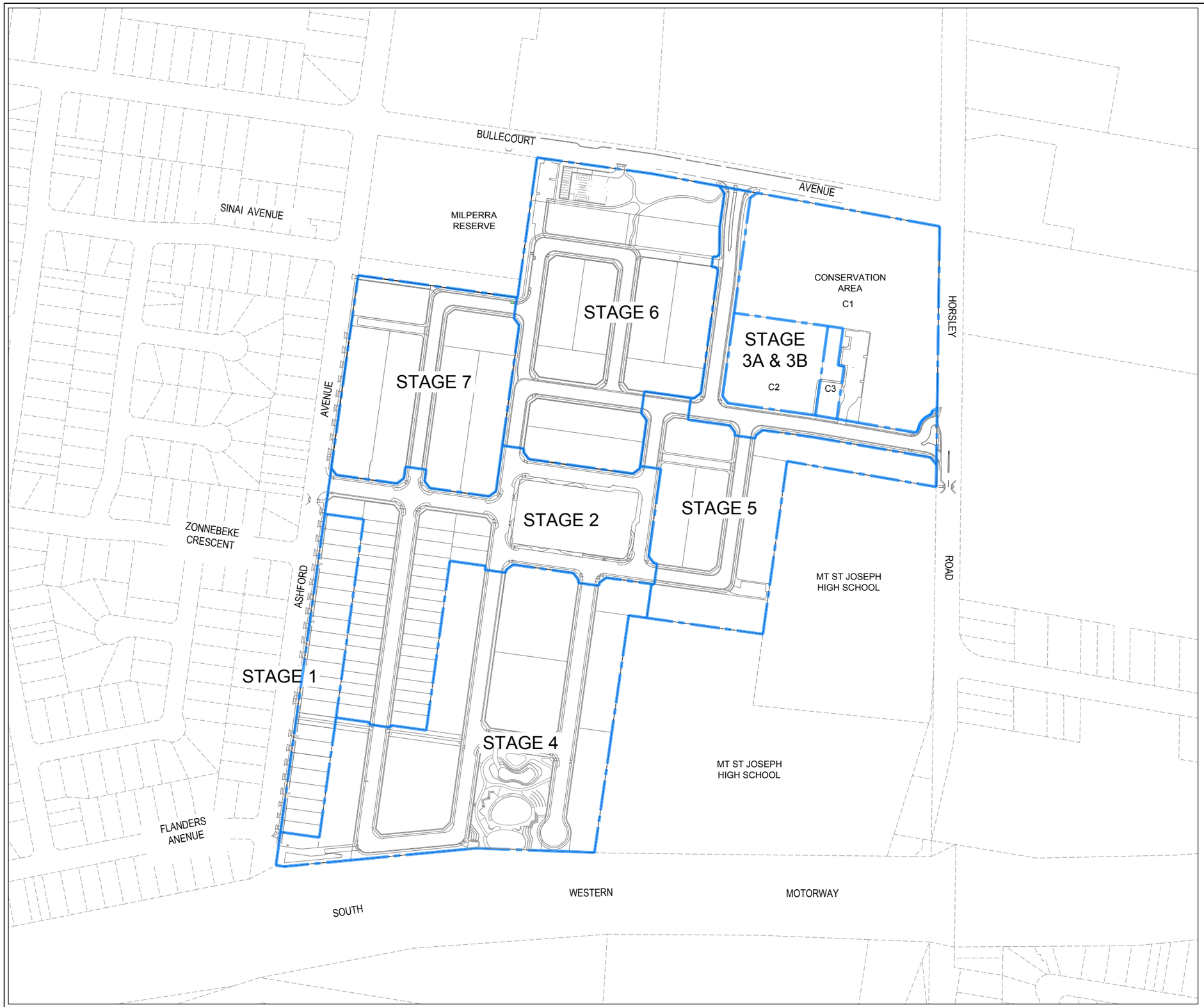

LEGEND

- ELECTRICITY (UNDERGROUND)
- OPTIC FIBRE
- TELECOMMUNICATION
- GAS
- WATER
- RECYCLED WATER
- STORMWATER DRAIN, PIT & PROPERTY INLET
- MELBOURNE WATER DRAIN & PIT
- SWALE DRAIN
- SEWER & MAINTENANCE STRUCTURES
- TACTILE PAVERS (INDICATIVE ONLY)
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING TELECOMMUNICATION
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED
- RIDGE LINE
- RETAINING WALL
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

SITE PLAN

NOT TO SCALE

WARNING

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 20 40 80 120 160

SCALE 1:2000 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL LAYOUT PLAN

Sheet 18 of 145

Scale 1:2000 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	050	B

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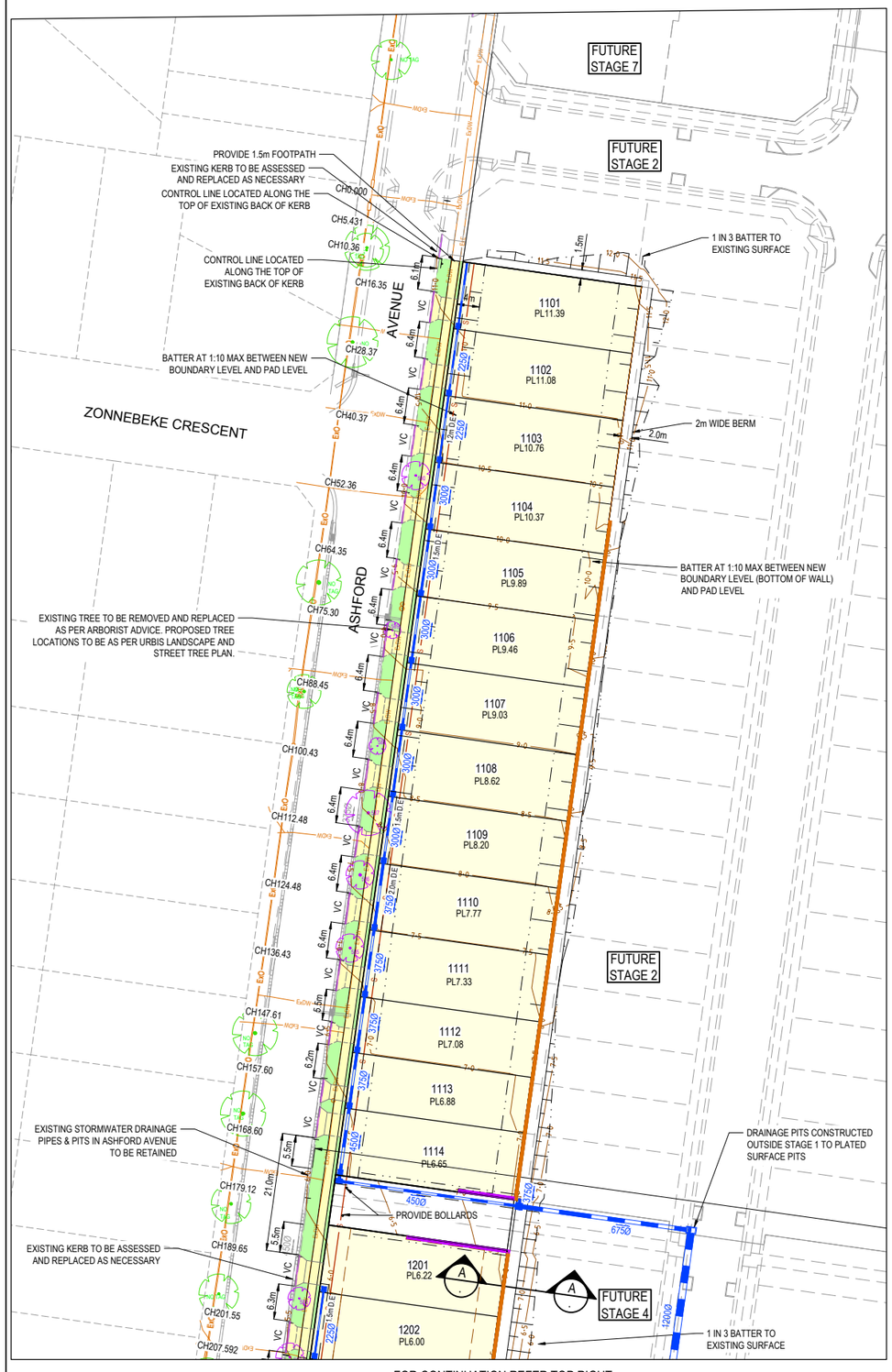

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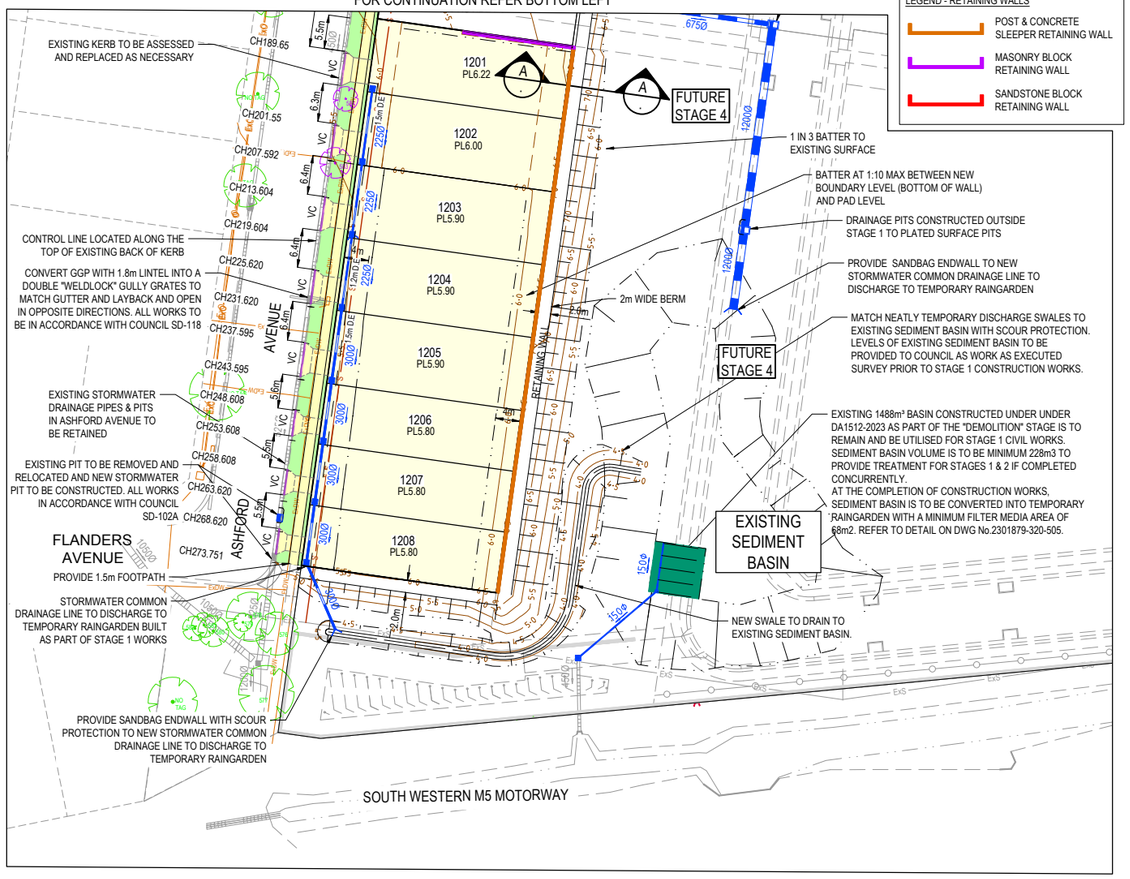
FOR CONTINUATION REFER BOTTOM LEFT



LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
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- SANDSTONE BLOCK RETAINING WALL

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- HOUSE DRAIN
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- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
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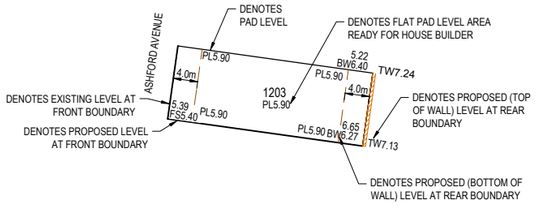
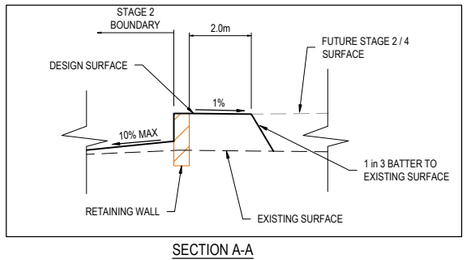
- SUBJECT AREA OF WORKS
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL



LOT LEVEL LEGEND

NOT TO SCALE



SECTION A-A
TYPICAL REAR LOTS INTERFACE

NOT TO SCALE

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SITE PLAN

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

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SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 1

Sheet 19 of 145

Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	051	B

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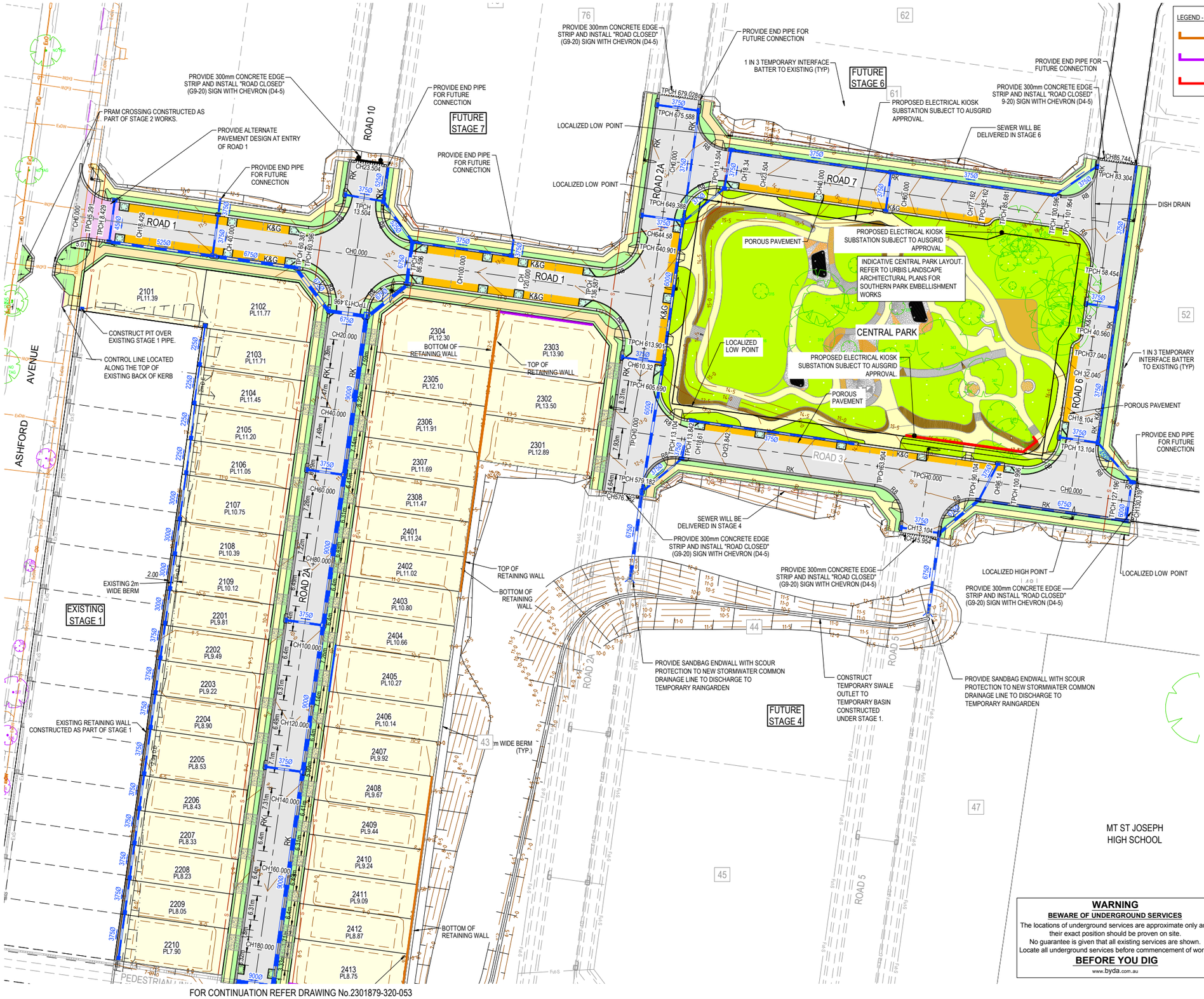

FOR CONTINUATION REFER DRAWING No.2301879-320-053

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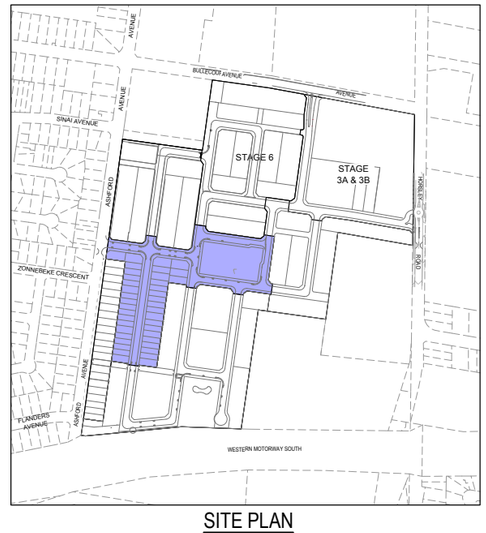

SITE PLAN
NOT TO SCALE

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
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ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 2
SHEET 1 OF 2

Sheet 20 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No.	Rev
2301879	321	052	B

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FOR CONTINUATION REFER DRAWING No.2301879-320-052

LEGEND - RETAINING WALLS

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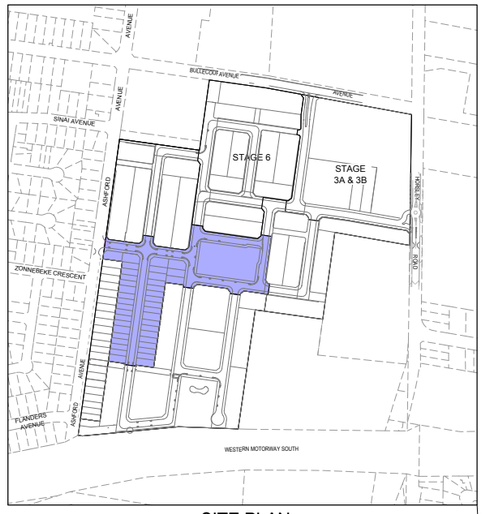

SITE PLAN
NOT TO SCALE

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 2
SHEET 2 OF 2

Sheet 21 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	053	B

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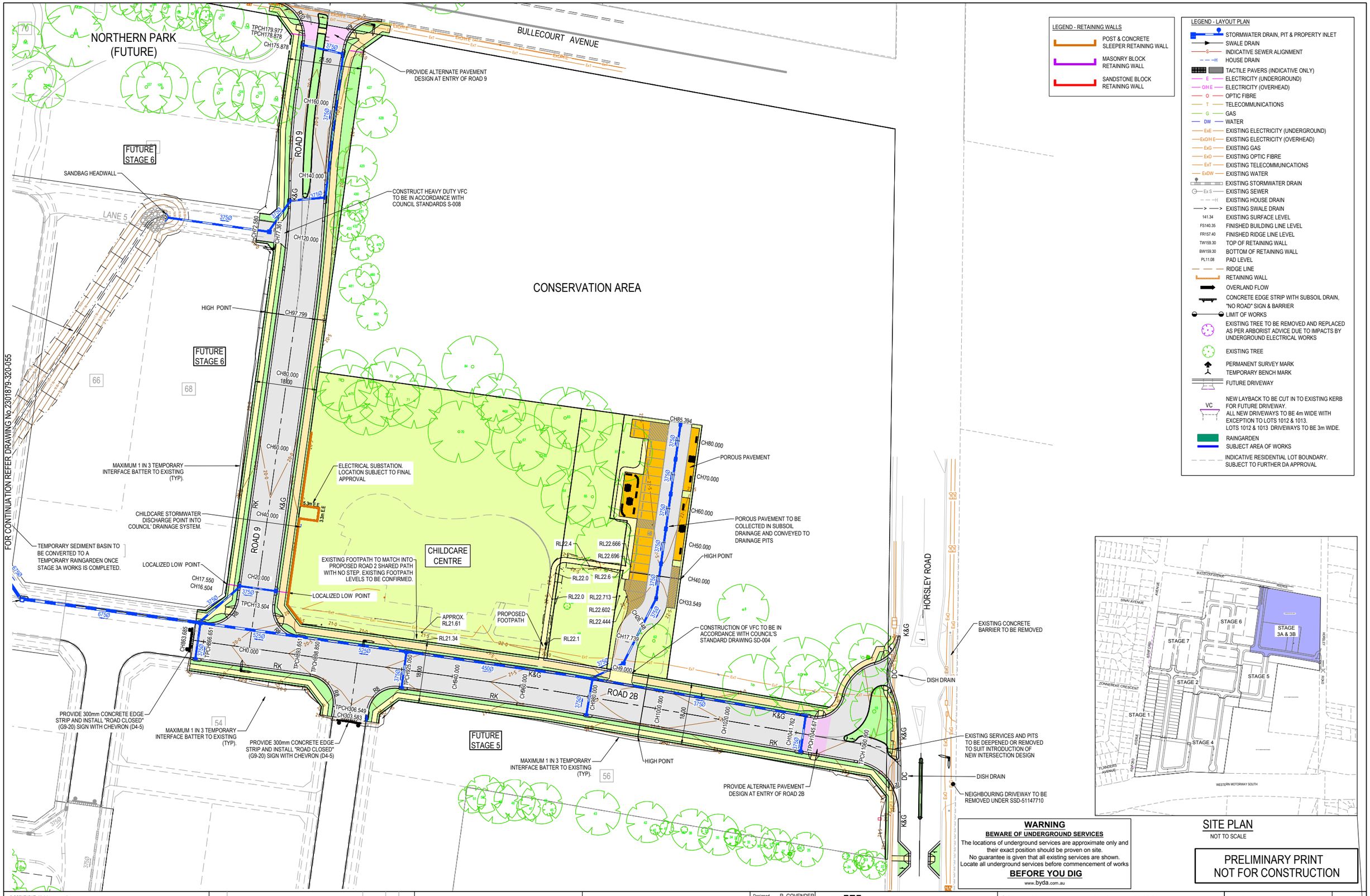

LEGEND - RETAINING WALLS

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SITE PLAN

NOT TO SCALE

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REV	DESCRIPTION	DATE	DRN.	APP.
C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	CARPARK AMENDED	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 3A
SHEET 1 OF 2

Sheet 22 of 145
Scale 1:500 @ A1
N

Project Ref	Stage No	Drawing No	Rev
2301879	321	054	C

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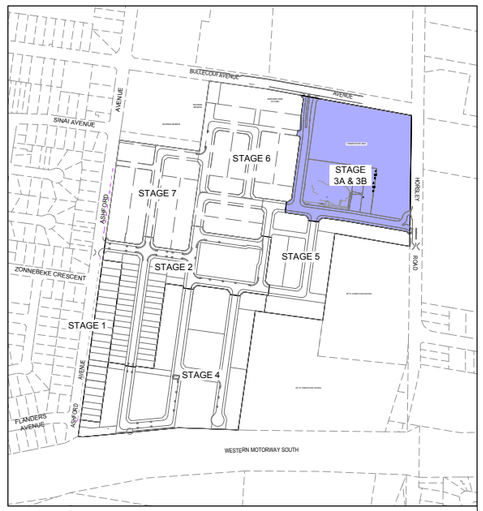
MILPERRA RESERVE
NORTHERN PARK (FUTURE)
BULLECOURT AVENUE
CONSERVATION AREA
FOR CONTINUATION REFER DRAWING No.2301879-320-054
LANE 4
ROAD 8
LANE 5
ROAD 9
ROAD 2B
ROAD 2A
FUTURE STAGE 6
FUTURE STAGE 7
FUTURE STAGE 5
CHILDCARE CENTRE
PROVIDE ALTERNATE PAVEMENT DESIGN AT ENTRY OF ROAD 9
SANDBAG HEADWALL
CONSTRUCT HEAVY DUTY VFC TO BE IN ACCORDANCE WITH COUNCIL STANDARDS S-008
TEMPORARY TAIL OUT SWALE
HIGH POINT
SEDIMENT BASIN
SOLID 150mm DIA. UPVC PIPE
SOLID 150mm DIA. UPVC PIPE GRADED AT 1% TO DRAIN TO EXISTING SURFACE LEVEL
DISCHARGE CONTROL PIT
PERMANENT DRAINAGE PIT
TEMPORARY SEDIMENT BASIN TO BE CONVERTED TO A TEMPORARY RAINGARDEN ONCE STAGE 3A WORKS IS COMPLETED.
MAXIMUM 1 IN 3 TEMPORARY INTERFACE BATTER TO EXISTING (TYP).
CHILDCARE STORMWATER DISCHARGE POINT INTO COUNCIL' DRAINAGE SYSTEM.
ELECTRICAL SUBSTATION. LOCATION SUBJECT TO FINAL APPROVAL
EXISTING FOOTPATH TO MATCH INTO PROPOSED ROAD 2 SHARED PATH WITH NO STEP. EXISTING FOOTPATH LEVELS TO BE CONFIRMED.
LOCALIZED LOW POINT
PROPOSED FOOTPATH
APPROX. RL21.61
RL21.34
PERMANENT DRAINAGE PIT AND PIPES CONSTRUCTED OUTSIDE OF STAGE 3 TO HAVE LINTELS PLATED OFF.
PROVIDE 300mm CONCRETE EDGE STRIP AND INSTALL "ROAD CLOSED" (G9-20) SIGN WITH CHEVRON (D4-5)
MAXIMUM 1 IN 3 TEMPORARY INTERFACE BATTER TO EXISTING (TYP).
PROVIDE 300mm CONCRETE EDGE STRIP AND INSTALL "ROAD CLOSED" (G9-20) SIGN WITH CHEVRON (D4-5)
CH175.878 TPCH178.878 TPCH179.977
CH160.000
CH140.000
CH120.000
CH97.799
CH80.000
CH60.000
CH40.000
CH20.000
CH0.000
CH17.550 CH16.504
TPCH13.504
CH863.685 TPCH866.665
TPCH883.651 TPCH888.850
TPCH825.050
CH940.000
CH960.000
CH980.000
CH9.000
CH1000.000
TPCH306.549 CH303.583
CH772.580 CH777.381
RL22.4 RL22.666 RL22.696 RL22.0 RL22.6 RL22.0 RL22.713 RL22.602 RL22.444 RL22.1
CH17.739 CH26.748
CH85.3



SITE PLAN
NOT TO SCALE

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REV	DESCRIPTION	DATE	DRN.	APP.
C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	CARPARK AMENDED	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 3A
SHEET 2 OF 2

Sheet 23 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	055	C

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FOR CONTINUATION REFER DRAWING No.2301879-320-057

EXISTING STAGE 1

EXISTING STAGE 2

PEDESTRIAN LINK 1

PEDESTRIAN LINK 2

ROAD 2A

ROAD 4

ROAD 5

AVENUE

ASHFORD

SOUTHERN PARK (BASIN No.1)

BASIN 2

MT ST JOSEPH HIGH SCHOOL

WESTERN MOTORWAY SOUTH

SOUTH WESTERN MOTORWAY

EXISTING SWALE TO BE DE-SLUDGED AND FILLED TO LEVEL 1 SUPERVISION AS PART OF STAGE 4 WORKS.

PROPOSED STANDARD RAISED PEDESTRAIN THRESHOLD WITH GRATED GUTTER BRIDGE: TYPE 1 REFER TO DETAILS ON DWG 027.

TOP OF Ex. RETAINING WALL

BOTTOM OF Ex. RETAINING WALL

REMOVE EXISTING EDGE STRIP, NO ROAD SIGN, TEMPORARY TURNING AREA & BARRIER AND MATCH NEATLY INTO EXISTING CONSTRUCTION

PROVIDE BOLLARDS

INDICATIVE SUBSTATION LOCATION WITHIN SOUTHERN PARK. FINAL LOCATION SUBJECT TO DETAILED DESIGN.

CONSTRUCT HEAVY DUTY VFC TO BE IN ACCORDANCE WITH COUNCIL STANDARDS S-008

BOTTOM OF RETAINING WALL (TYP)

TOP OF RETAINING WALL. (TYP.)

PROVIDE 1.8m DOUBLE LAPPED AND CAPPED FENCING ABOVE RETAINING WALL ALONGSIDE SCHOOL BOUNDARY

REMOVE EXISTING ENDWALL AND CONNECT NEW STORMWATER DRAIN.

EXISTING RETAINING WALL CONSTRUCTED AS PART OF STAGE 1.

EXISTING SEDIMENTATION BASIN TO BE DE-SLUDGED AND FILLED TO LEVEL 1 SUPERVISION AS PART OF STAGE 4 WORKS.

DELIVERY OF THIS LOT IS TO ENSURE RE-GRADING ALONG ASHFORD AVENUE AND CONSTRUCT VC TO EXISTING KERB AND GUTTER

EXISTING SEWER TO BE REALIGNED AS PER OF SEPARATE SYDNEY WATER APPLICATION APPROVAL

PROVIDE HANDRAIL BALL FENCE ALONG THE RETAINING WALL.

PROPOSED 4 WIRE ROPE SAFETY BARRIER SYSTEM 3m FROM BACK OF KERB

PROPOSED NEW SEWER ALIGNMENT

EXISTING SEWER TO BE REALIGNED AS PER OF SEPARATE SYDNEY WATER APPLICATION APPROVAL

PROVIDE HANDRAIL BALL FENCE ALONG THE RETAINING WALL.

CONSTRUCT HEAVY DUTY VFC TO BE IN ACCORDANCE WITH COUNCIL STANDARDS S-008

PROVIDE 1.8m PALISADE FENCING ABOVE RETAINING WALL ALONGSIDE M5 BOUNDARY

REFER TO URBIS LANDSCAPE ARCHITECTURAL PLANS FOR SOUTHERN PARK EMBELLISHMENT WORKS

BOTTOM OF RETAINING WALL

TOP OF RETAINING WALL

PROVIDE 1.8m DOUBLE LAPPED AND CAPPED FENCING ABOVE RETAINING WALL

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
- MASONRY BLOCK RETAINING WALL
- SANDSTONE BLOCK RETAINING WALL

LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- INDICATIVE SEWER ALIGNMENT
- HOUSE DRAIN
- TACTILE PAVERS (INDICATIVE ONLY)
- ELECTRICITY (UNDERGROUND)
- ELECTRICITY (OVERHEAD)
- OPTIC FIBRE
- TELECOMMUNICATIONS
- GAS
- WATER
- EXISTING ELECTRICITY (UNDERGROUND)
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- EXISTING TELECOMMUNICATIONS
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- PL11.08 PAD LEVEL
- RIDGE LINE
- RETAINING WALL
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- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
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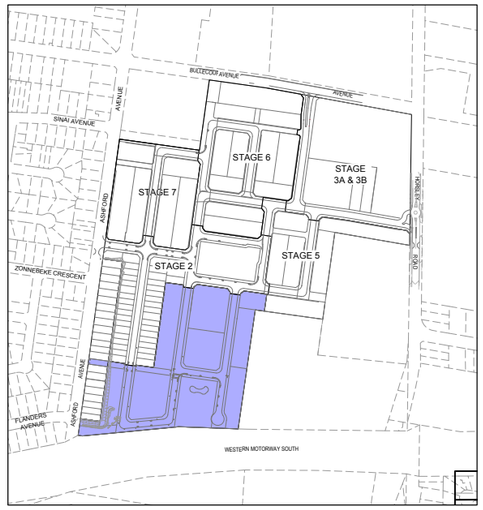
- RAINGARDEN
- SUBJECT AREA OF WORKS
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL



SITE PLAN
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WARNING
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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 4
SHEET 1 OF 2

Sheet 24 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	056	B

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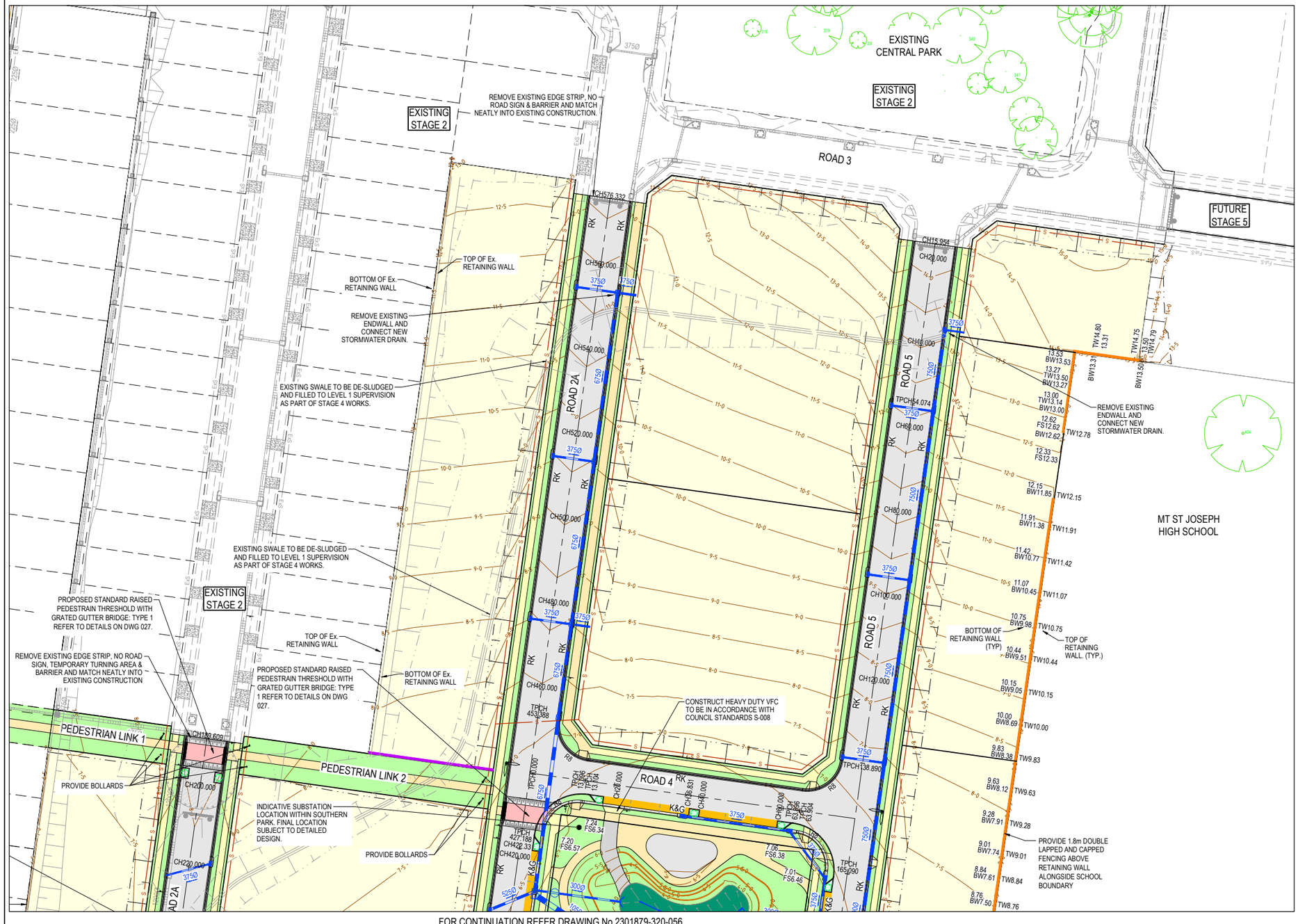

FOR CONTINUATION REFER DRAWING No.2301879-320-056

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
- MASONRY BLOCK RETAINING WALL
- SANDSTONE BLOCK RETAINING WALL

LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- INDICATIVE SEWER ALIGNMENT
- HOUSE DRAIN
- TACTILE PAVERS (INDICATIVE ONLY)
- ELECTRICITY (UNDERGROUND)
- ELECTRICITY (OVERHEAD)
- OPTIC FIBRE
- TELECOMMUNICATIONS
- GAS
- WATER
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
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- EXISTING SWALE DRAIN
- EXISTING SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
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- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
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- RAINGARDEN
- SUBJECT AREA OF WORKS
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

SITE PLAN

NOT TO SCALE

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

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SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 4
SHEET 2 OF 2

Sheet 25 of 145

Scale 1:500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	057	B

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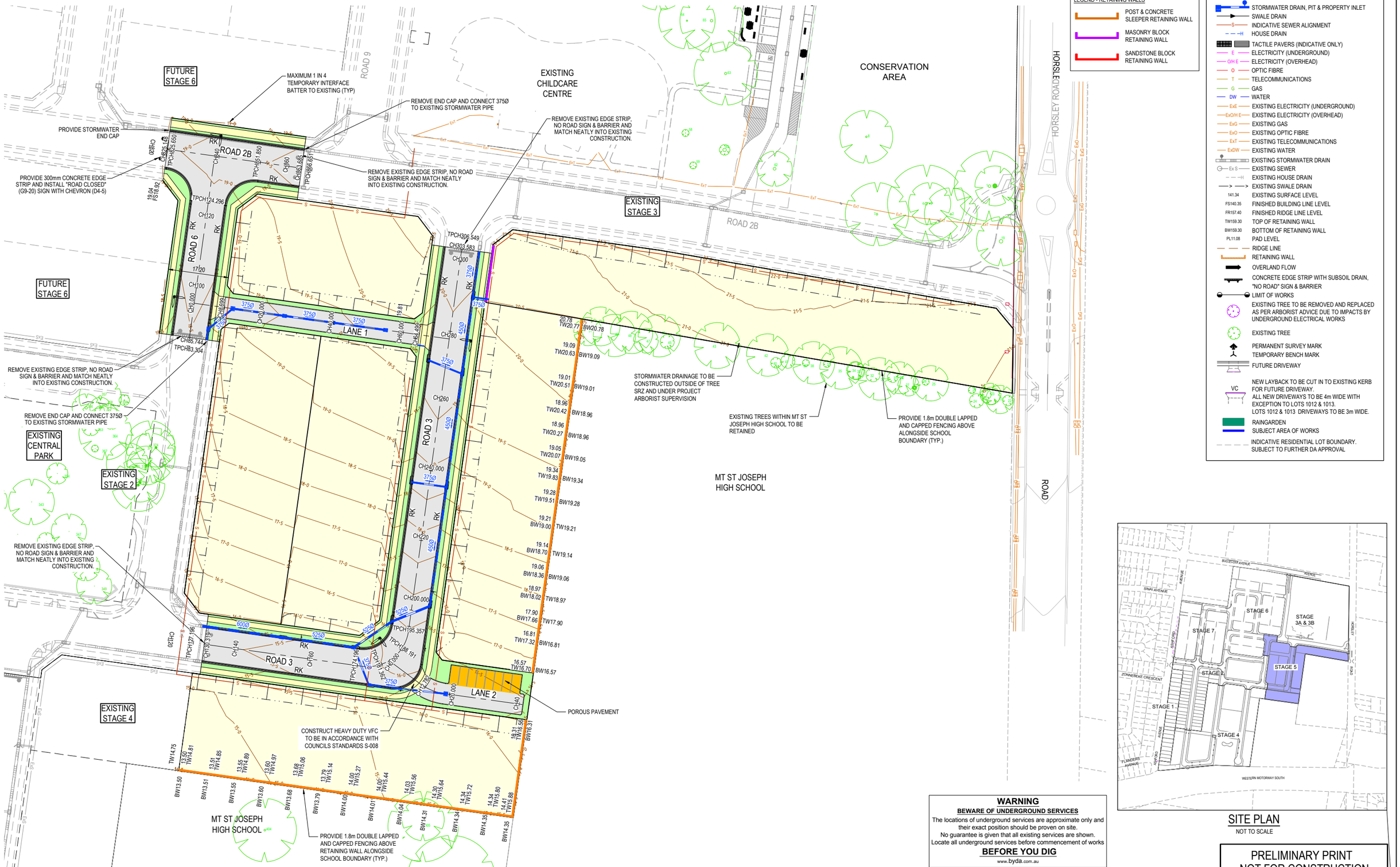

LEGEND - RETAINING WALLS

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LEGEND - LAYOUT PLAN

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SITE PLAN
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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
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mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
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Date	07.11.25
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www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	LAYOUT PLAN STAGE 5

Sheet 26 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	058	B

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FOR CONTINUATION REFER DRAWING No.2301879-320-060

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
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LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
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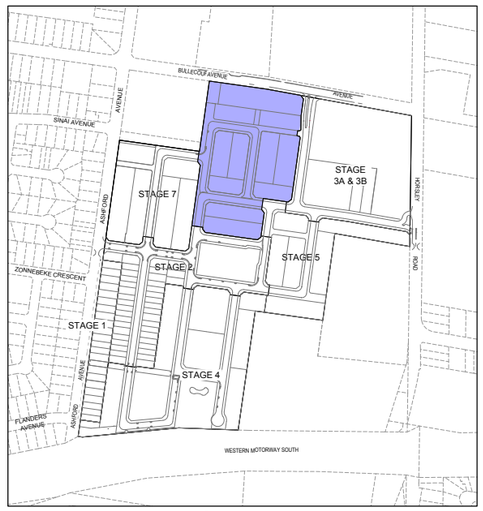

SITE PLAN

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN
STAGE 6
SHEET 1 OF 2

Sheet 27 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	059	B

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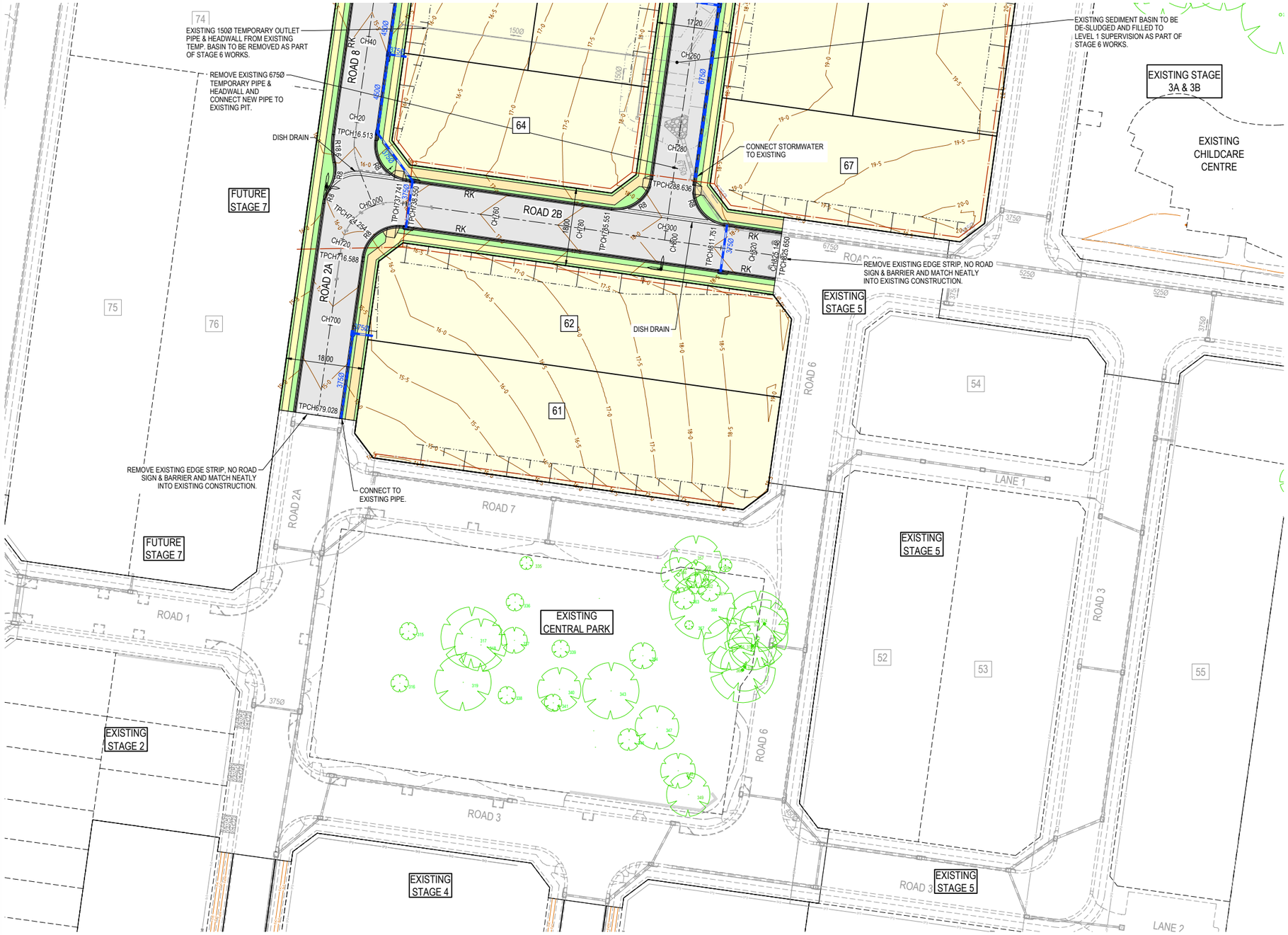

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
- MASONRY BLOCK RETAINING WALL
- SANDSTONE BLOCK RETAINING WALL

LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- S — INDICATIVE SEWER ALIGNMENT
- H — HOUSE DRAIN
- TACTILE PAVERS (INDICATIVE ONLY)
- E — ELECTRICITY (UNDERGROUND)
- O/H E — ELECTRICITY (OVERHEAD)
- O — OPTIC FIBRE
- T — TELECOMMUNICATIONS
- G — GAS
- DW — WATER
- ExE — EXISTING ELECTRICITY (UNDERGROUND)
- ExO/H E — EXISTING ELECTRICITY (OVERHEAD)
- ExG — EXISTING GAS
- ExO — EXISTING OPTIC FIBRE
- ExT — EXISTING TELECOMMUNICATIONS
- ExDW — EXISTING WATER
- EXISTING STORMWATER DRAIN
- Ex S — EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- 141.34 — EXISTING SURFACE LEVEL
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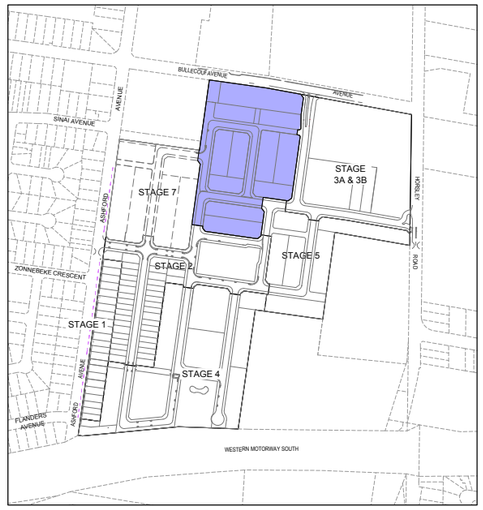

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	LAYOUT PLAN STAGE 6 SHEET 2 OF 2

Sheet 28 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	060	B

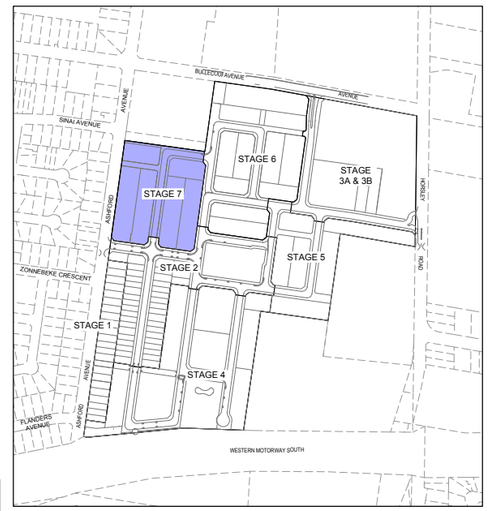
F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-056-LAY.dwg

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
- MASONRY BLOCK RETAINING WALL
- SANDSTONE BLOCK RETAINING WALL

LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- INDICATIVE SEWER ALIGNMENT
- HOUSE DRAIN
- TACTILE PAVERS (INDICATIVE ONLY)
- ELECTRICITY (UNDERGROUND)
- ELECTRICITY (OVERHEAD)
- OPTIC FIBRE
- TELECOMMUNICATIONS
- GAS
- WATER
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- EXISTING SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
- TOP OF RETAINING WALL
- BOTTOM OF RETAINING WALL
- PAD LEVEL
- RIDGE LINE
- RETAINING WALL
- OVERLAND FLOW
- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
- PERMANENT SURVEY MARK
- TEMPORARY BENCH MARK
- FUTURE DRIVEWAY
- NEW LAYBACK TO BE CUT IN TO EXISTING KERB FOR FUTURE DRIVEWAY. ALL NEW DRIVEWAYS TO BE 4m WIDE WITH EXCEPTION TO LOTS 1012 & 1013. LOTS 1012 & 1013 DRIVEWAYS TO BE 3m WIDE.
- RAINGARDEN
- SUBJECT AREA OF WORKS
- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL



SITE PLAN
NOT TO SCALE

WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works
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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: LAYOUT PLAN STAGE 7

Sheet 29 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	061	B

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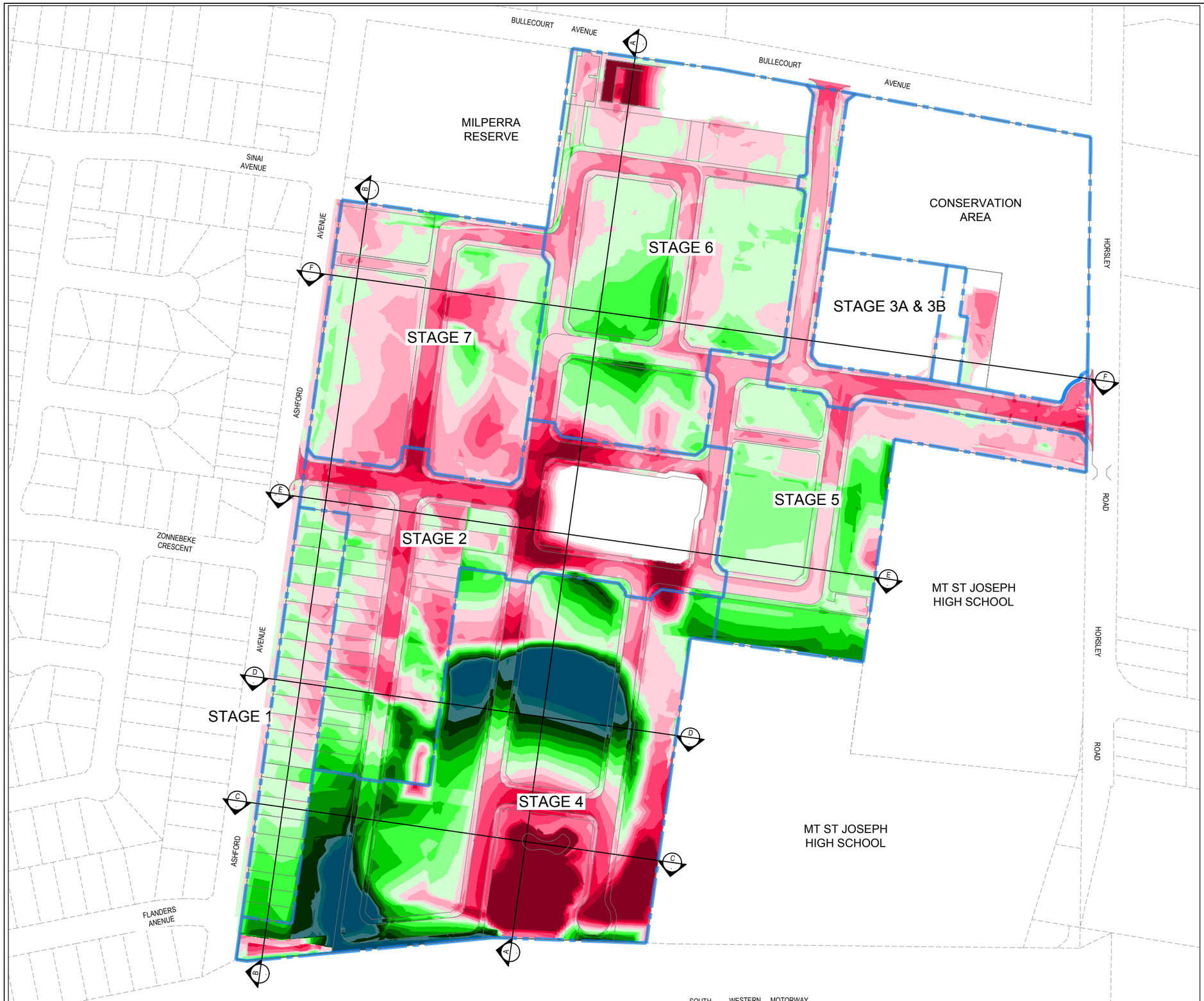

CUT AND FILL LEGEND		
DEPTH RANGE (m)		COLOUR
>1.8m CUT		
-1.8	-1.5	
-1.5	-1.2	
-1.2	-0.9	
-0.9	-0.6	
-0.6	-0.3	
-0.3	0.0	
0.0	0.3	
0.3	0.6	
0.6	0.9	
0.9	1.2	
1.2	1.5	
1.5	1.8	
1.8	2.1	
2.1	2.4	
2.4	2.7	
>2.7m FILL		

APPROXIMATE EARTHWORKS VOLUMES:

CUT - 55,868m³
FILL - 58,694m³

BALANCE - 2,826m³ OF FILL

* THIS ESTIMATE IS BASED ON POST DEMOLITION EXISTING SURFACE TO BOXING DESIGN SURFACE

WARNING

BEWARE OF UNDERGROUND SERVICES

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 12.5 25 50 75 100
SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
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Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	BULK EARTHWORKS OVERALL PLAN

Sheet 30 of 145
Scale 1:1250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	070	B

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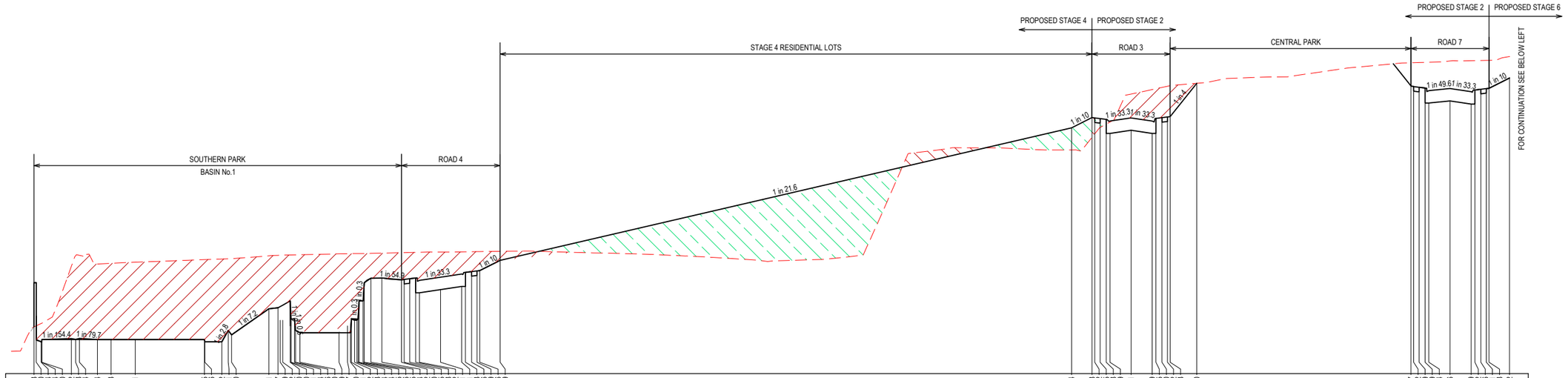

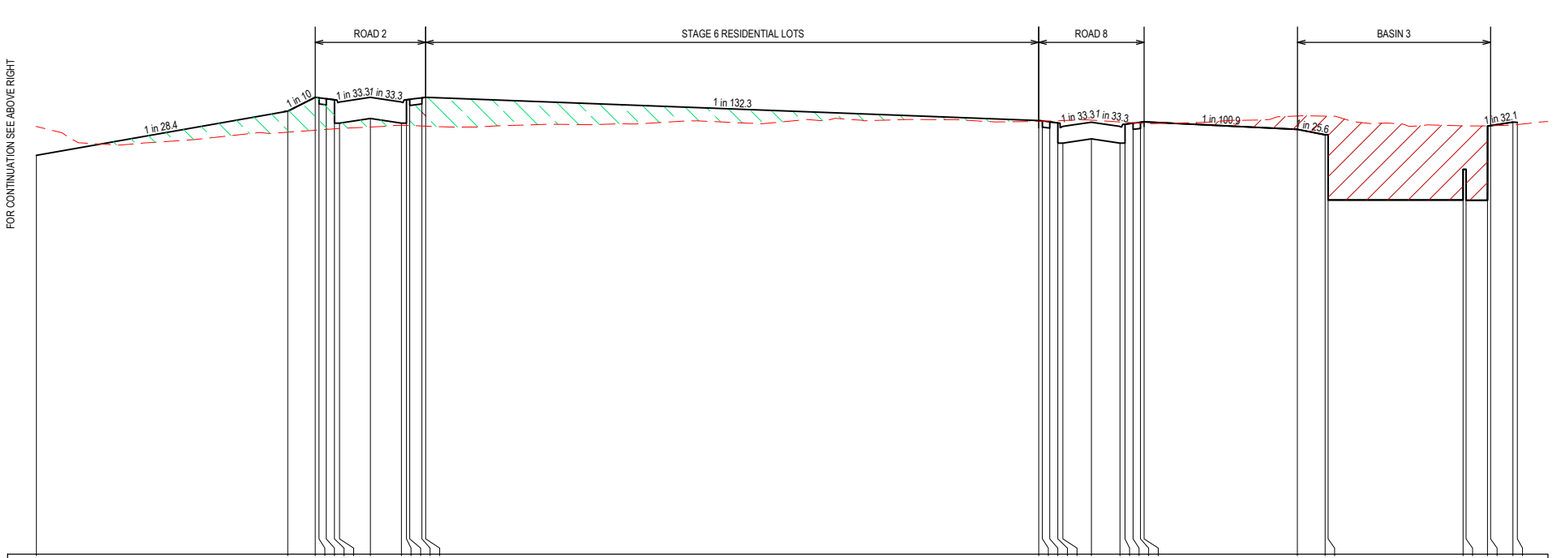

LEGEND
- EXISTING SURFACE
- DESIGN LINE
- FILL HATCH
- CUT HATCH

SECTION A-A
CROSS SECTIONS

WARNING

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ 1:500 0 5 10 20 30
VERT 1:100 0 1 2 4 6
SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: BULK EARTHWORKS
SECTION A

Sheet 31 of 145
Scale 1:500 H 1:100 V @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	071	B

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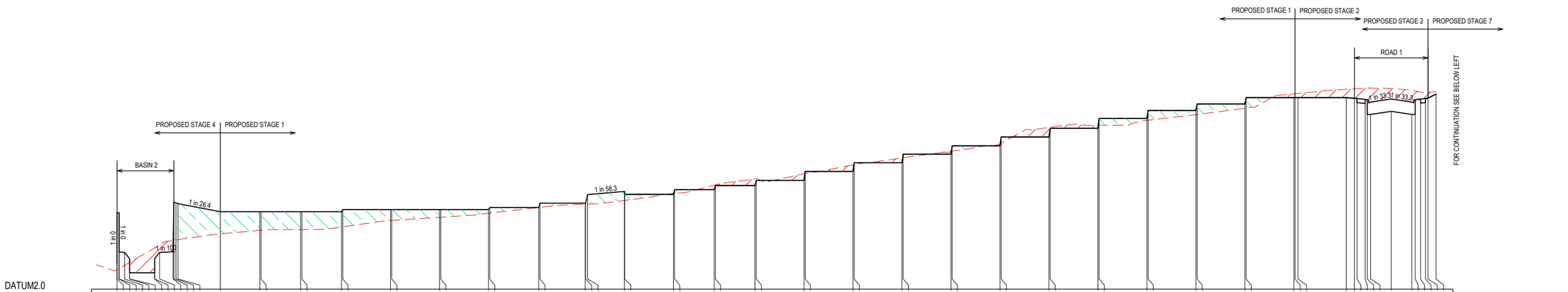
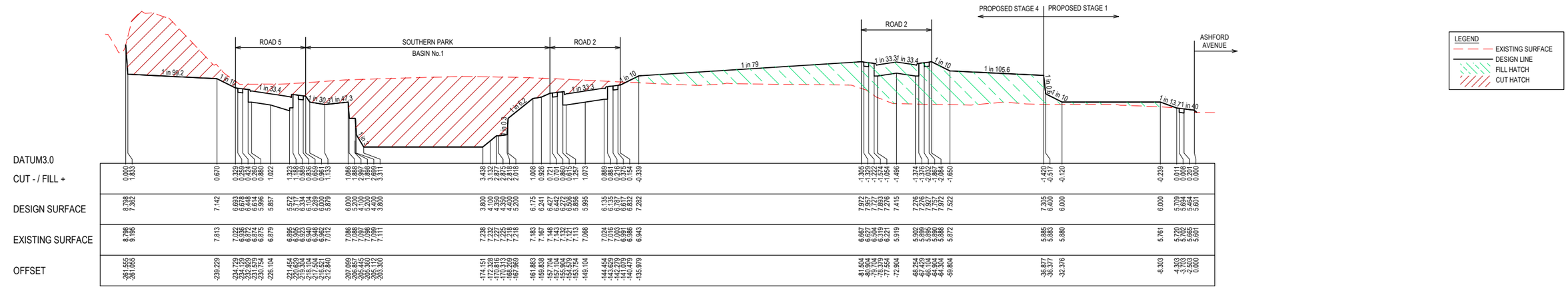
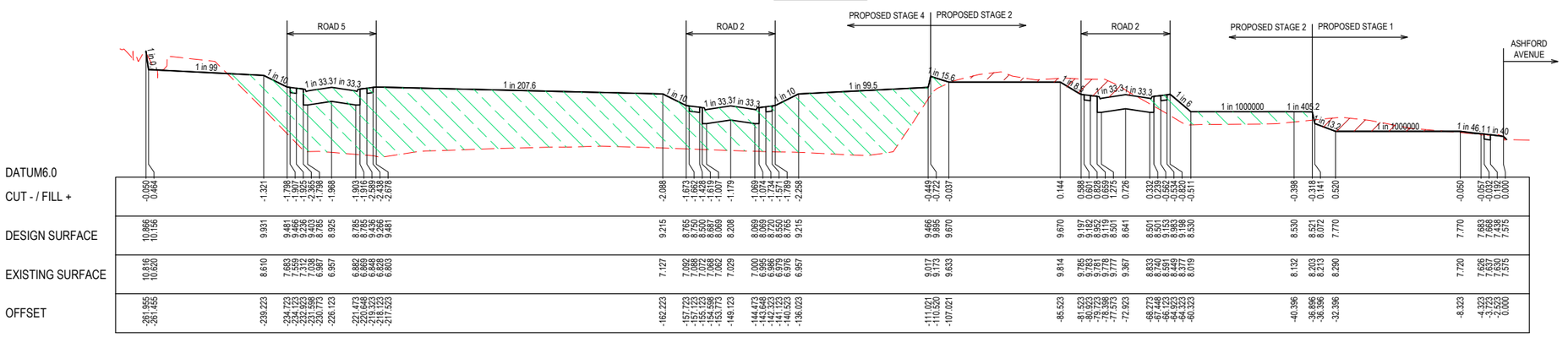

PROPOSED STAGE 1
PROPOSED STAGE 2
PROPOSED STAGE 2
PROPOSED STAGE 7
ROAD 1
PROPOSED STAGE 4
PROPOSED STAGE 1
BASIN 2
1 in 26.4
1 in 58.3
1 in 33.31 in 33.3
FOR CONTINUATION SEE BELOW LEFT
DATUM2.0
CUT - / FILL +
DESIGN SURFACE
EXISTING SURFACE
OFFSET

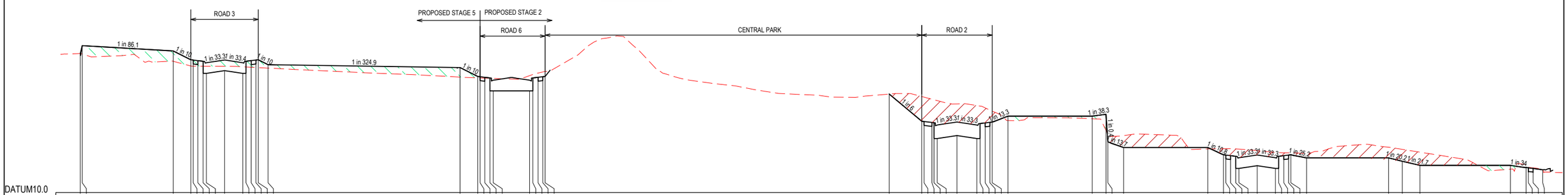
| | | |



SECTION C-C
CROSS SECTIONS



SECTION D-D
CROSS SECTIONS



SECTION E-E
CROSS SECTIONS

WARNING
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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

HORIZ 1:500 0 5 10 20 30
VERT 1:100 0 1 2 4 6
SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	G.N.
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
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Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

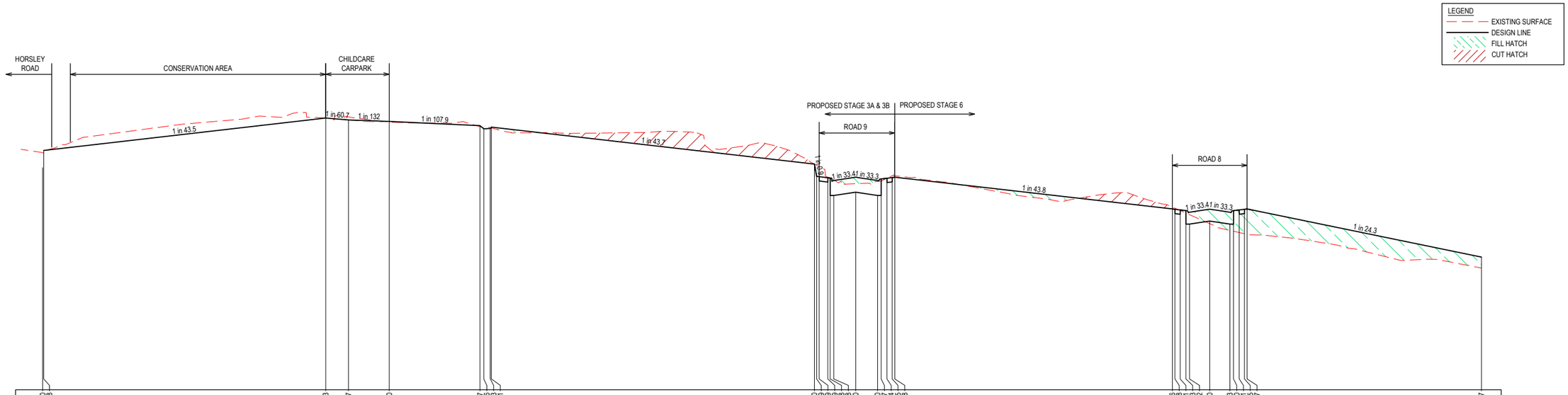
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: BULK EARTHWORKS SECTIONS C, D & E

Sheet 33 of 145
Scale 1:500 H 1:100 V @ A1

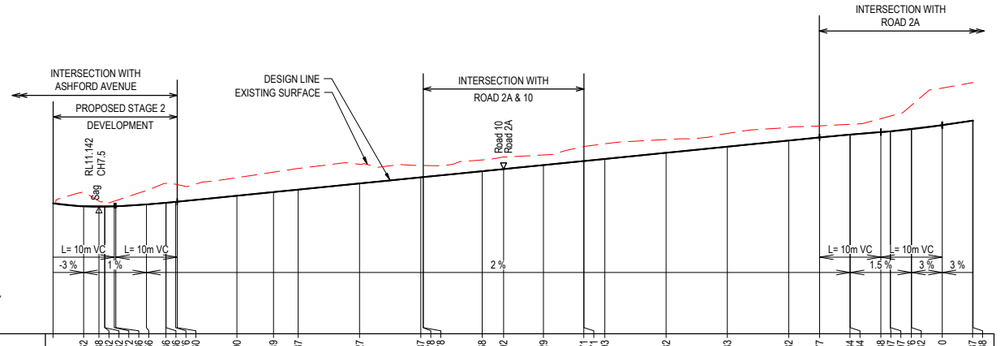
Project Ref	Stage No	Drawing No	Rev
2301879	321	073	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-070-BULK.dwg


LEGEND
EXISTING SURFACE
DESIGN LINE
FILL HATCH
CUT HATCH
HORSLEY ROAD
CONSERVATION AREA
CHILDCARE CARPARK
PROPOSED STAGE 3A & 3B
PROPOSED STAGE 6
ROAD 9
ROAD 8
1 in 43.5
1 in 60.7
1 in 132
1 in 107.9
1 in 43.7
1 in 33.4
1 in 33.3
1 in 43.8
1 in 24.3

| | | |

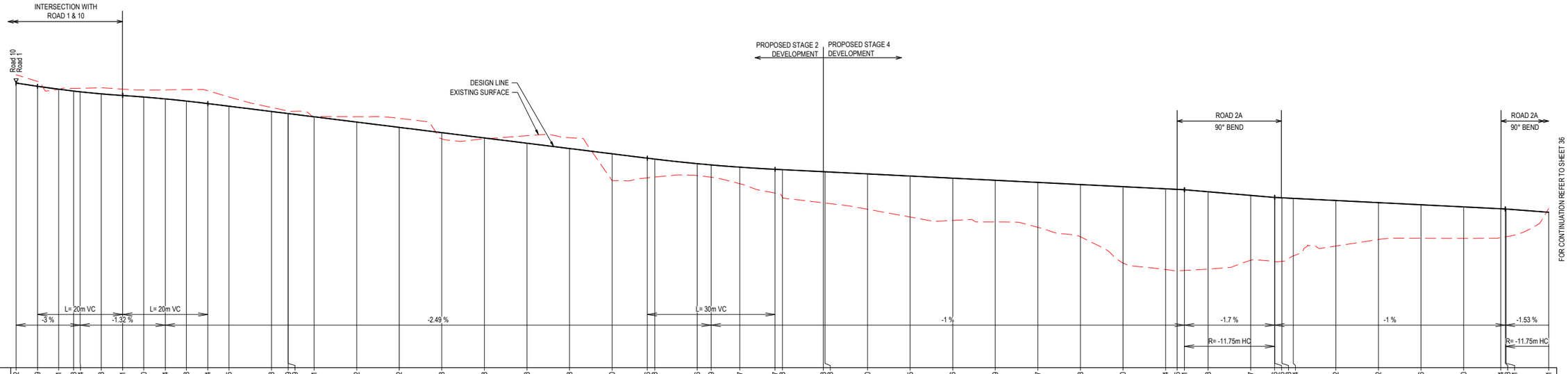
LEGEND
EXISTING SURFACE
DESIGN LINE



DATUM RL7

CHAINAGE	0.000	5.000	7.500	8.429	8.445	10.000	10.253	15.253	18.429	18.445	20.000	20.253	30.000	35.967	40.000	50.000	60.000	60.387	60.396	70.000	73.491	80.000	86.587	86.596	90.000	100.000	110.000	120.000	125.041	130.000	130.041	135.041	136.587	140.000	140.041	145.041	150.000	150.051
EXISTING SURFACE		11.616	11.330	11.276	11.276	11.205	11.343	11.675	11.909	11.909	11.909	11.867	12.092	12.271	12.389	12.529	12.489	12.488	12.488	12.670	12.764	12.832	13.105	13.105	13.195	13.334	13.535	13.734	13.780	13.831	13.831	14.017	14.100	14.100	14.447	14.454	15.014	15.188	15.102
DESIGN CENTRELINE	11.255	11.155	11.142	11.144	11.144	11.155	11.157	11.220	11.273	11.273	11.302	11.307	11.502	11.622	11.702	11.902	12.102	12.110	12.110	12.302	12.372	12.502	12.634	12.634	12.702	12.902	13.102	13.302	13.403	13.496	13.497	13.578	13.603	13.671	13.672	13.803	13.952	13.958
CUT - / FILL +		-0.462	-0.188	-0.132	-0.132	-0.172	-0.186	-0.456	-0.636	-0.636	-0.575	-0.560	-0.590	-0.649	-0.687	-0.627	-0.387	-0.378	-0.378	-0.368	-0.392	-0.329	-0.471	-0.471	-0.493	-0.432	-0.433	-0.432	-0.377	-0.334	-0.334	-0.438	-0.497	-0.497	-0.776	-0.782	-1.210	-1.237	-1.238

ROAD 1 LONGITUDINAL SECTION



DATUM RL-1

CHAINAGE	0.000	5.041	10.000	13.504	15.041	20.000	25.041	30.000	35.041	40.000	45.041	50.000	60.000	63.896	63.904	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	148.265	150.000	160.000	163.265	170.000	178.265	180.000	189.609	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	272.723	274.451	280.000	290.000	295.630	296.651	297.340	300.000	310.000	320.000	330.000	340.000	348.734	349.801	350.000	360.000
EXISTING SURFACE	12.764	12.450	12.082	12.121	12.127	12.149	12.090	12.047	12.052	12.065	12.013	11.721	11.225	11.059	11.059	10.800	10.732	10.714	9.750	9.747	9.900	9.806	7.789	7.918	7.954	8.031	7.947	7.644	7.205	7.016	6.745	6.736	6.444	6.079	5.918	5.845	5.597	5.151	3.914	3.610	3.552	3.568	3.632	4.048	3.983	3.983	3.999	4.252	4.714	5.024	5.080	5.075	5.114	5.149	5.153	6.483
DESIGN CENTRELINE	12.372	12.221	12.082	11.997	11.963	11.866	11.789	11.717	11.628	11.527	11.409	11.286	11.037	10.941	10.940	10.789	10.540	10.292	10.043	9.795	9.546	9.298	9.049	8.844	8.802	8.586	8.527	8.421	8.321	8.304	8.208	8.204	8.104	8.004	7.904	7.804	7.704	7.604	7.504	7.404	7.377	7.360	7.265	7.095	6.999	6.999	6.982	6.956	6.856	6.756	6.656	6.556	6.468	6.458	6.455	6.301
CUT - / FILL +	-0.392	-0.229	0.001	-0.123	-0.164	-0.283	-0.301	-0.330	-0.424	-0.538	-0.604	-0.435	-0.188	-0.119	-0.119	-0.011	-0.252	-0.422	0.293	0.048	-0.353	-0.508	1.260	0.926	0.848	0.556	0.579	0.777	1.117	1.288	1.463	1.468	1.660	1.925	1.986	1.959	2.107	2.453	3.590	3.794	3.825	3.791	3.633	3.047	3.016	3.016	2.983	2.704	2.142	1.732	1.576	1.480	1.354	1.308	1.301	-0.181

ROAD 2A LONGITUDINAL SECTION

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

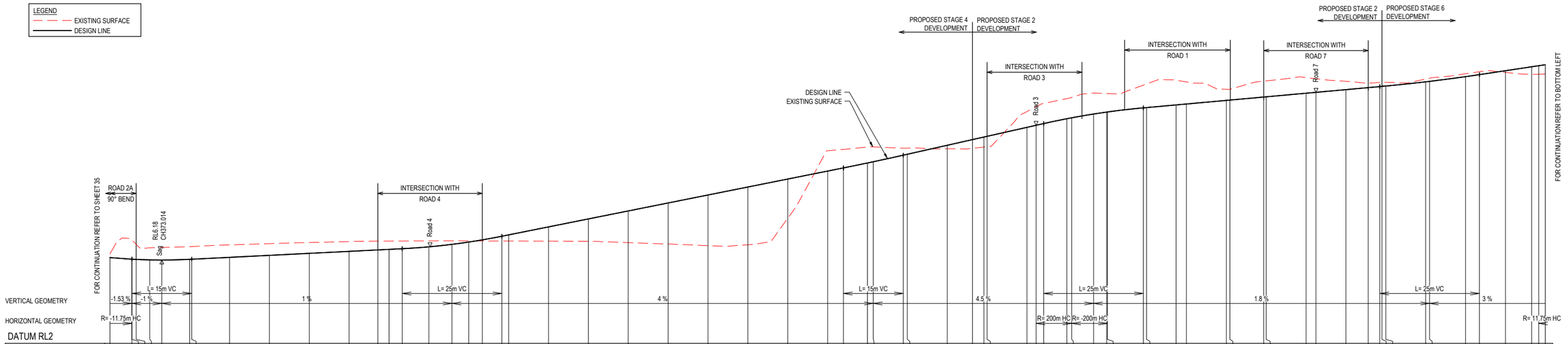
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD LONGITUDINAL SECTIONS

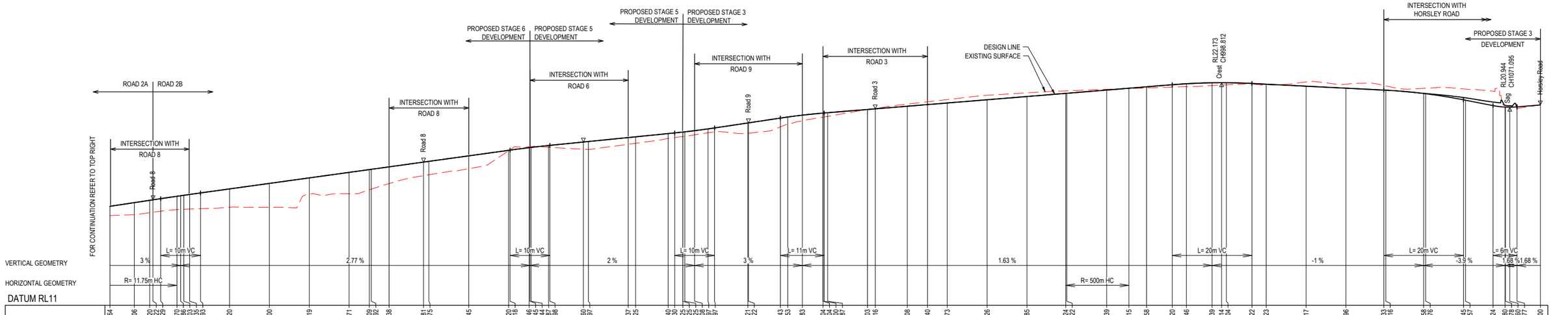
Sheet 35 of 145
Scale 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	101	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-100-RLS.dwg



ROAD 2A LONGITUDINAL SECTION



ROAD 2A LONGITUDINAL SECTION ROAD 2B LONGITUDINAL SECTION ROAD 2B LONGITUDINAL SECTION

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
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ph: 02 46255055
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

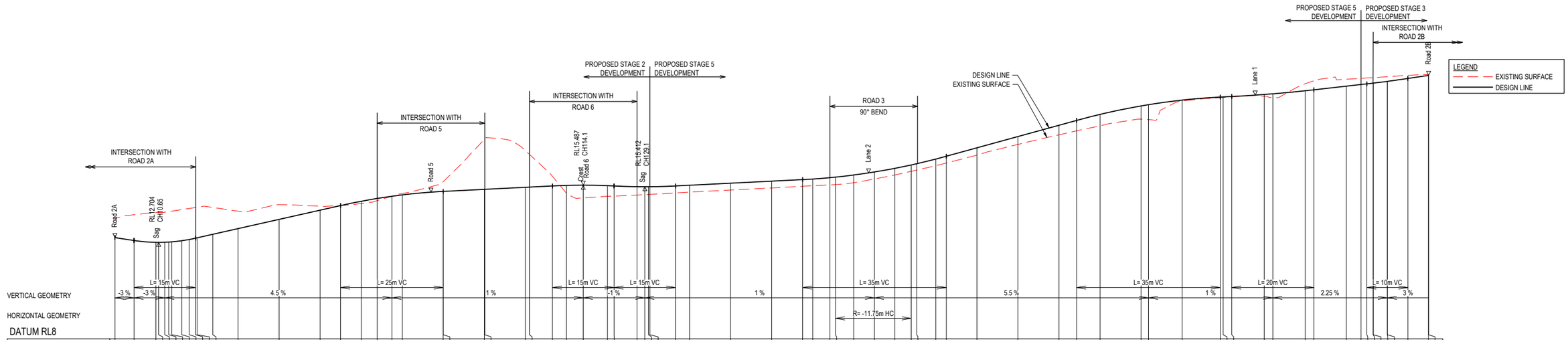
Drawing Title: ROAD LONGITUDINAL SECTIONS

Sheet 36 of 145

Scale 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	102	B

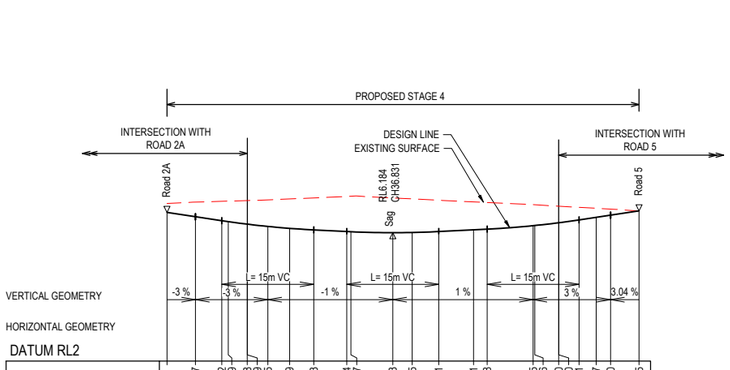
F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-100-RLS.dwg



DATUM RL8

CHAINAGE	CUT - / FILL +	DESIGN CENTRELINE	EXISTING SURFACE
0.000	-0.930	12.933	13.864
4.650	-1.255	12.794	14.049
10.000	-1.445	12.705	14.150
10.650	-1.450	12.700	14.150
12.150	-1.458	12.709	14.168
13.104	-1.479	12.719	14.197
14.242	-1.503	12.731	14.234
16.282	-1.513	12.783	14.296
18.104	-1.510	12.843	14.353
19.600	-1.494	12.926	14.411
23.842	-1.307	13.095	14.402
30.000	-0.849	13.372	14.221
40.000	-0.718	13.822	14.540
50.000	-0.190	14.272	14.462
54.980	-0.001	14.496	14.497
60.000	0.109	14.704	14.596
63.904	0.106	14.842	14.736
67.480	0.002	14.949	14.947
70.000	-0.070	15.014	15.084
79.980	-0.473	15.184	15.657
80.000	-0.477	15.184	15.661
90.000	-0.435	15.284	17.718
90.104	-0.436	15.285	17.740
100.000	-1.789	15.384	17.173
100.996	-1.595	15.394	16.988
106.600	-0.466	15.450	15.916
110.000	0.381	15.476	15.095
114.100	0.619	15.487	14.868
120.000	0.520	15.464	14.944
121.600	0.492	15.450	14.956
127.196	0.409	15.415	15.006
129.100	0.387	15.412	15.025
130.319	0.376	15.413	15.037
136.600	0.341	15.450	15.108
140.000	0.333	15.484	15.151
150.000	0.332	15.584	15.252
160.000	0.330	15.684	15.354
167.544	0.325	15.759	15.434
170.000	0.329	15.788	15.459
174.196	0.351	15.854	15.503
175.546	0.362	15.880	15.518
180.000	0.375	15.984	15.608
185.044	0.337	16.131	15.794
190.000	0.322	16.308	15.986
194.007	0.310	16.474	16.164
195.357	0.310	16.535	16.224
200.000	0.323	16.761	16.438
202.544	0.329	16.897	16.568
210.000	0.351	17.307	16.956
220.000	0.384	17.857	17.473
230.000	0.467	18.407	17.940
234.302	0.508	18.644	18.135
240.000	0.560	18.936	18.376
250.000	0.641	19.348	18.707
251.882	0.724	19.409	18.885
260.000	0.039	19.632	19.593
269.302	0.029	19.781	19.752
270.000	0.027	19.788	19.761
272.091	0.021	19.809	19.788
280.000	0.083	19.908	19.825
282.091	0.184	19.940	19.756
290.000	-0.343	20.088	20.431
292.091	-0.435	20.134	20.569
300.000	-0.336	20.312	20.648
303.583	-0.301	20.392	20.693
305.033	-0.286	20.424	20.710
306.567	-0.268	20.460	20.728
310.000	-0.227	20.546	20.773
310.003	-0.227	20.546	20.773
315.003	-0.151	20.686	20.837
320.000	-0.041	20.836	20.877
320.053	-0.039	20.838	20.877

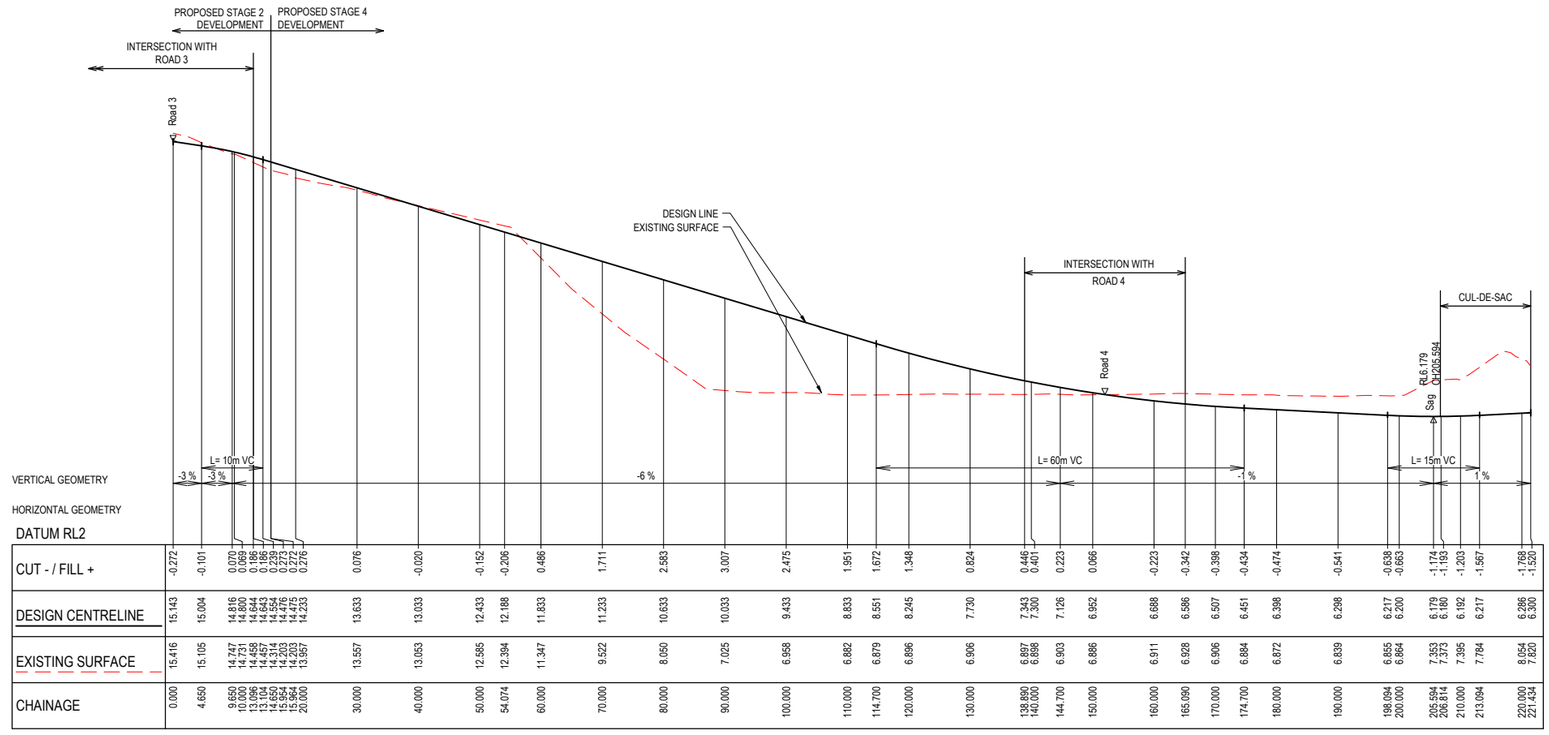
ROAD 3 LONGITUDINAL SECTION



DATUM RL2

CHAINAGE	CUT - / FILL +	DESIGN CENTRELINE	EXISTING SURFACE
0.000	-0.477	6.844	7.181
4.650	-0.632	6.705	7.208
8.945	-0.669	6.576	7.214
10.000	-0.768	6.545	7.231
13.096	-0.889	6.463	7.352
13.104	-0.865	6.388	7.254
16.445	-0.959	6.326	7.285
20.000	-1.043	6.276	7.319
23.945	-1.144	6.222	7.365
29.331	-1.157	6.215	7.372
30.000	-1.133	6.184	7.318
36.831	-1.095	6.191	7.286
40.000	-1.021	6.222	7.243
44.331	-0.911	6.279	7.189
50.000	-0.868	6.301	7.168
52.220	-0.885	6.413	7.099
59.720	-0.676	6.419	7.095
60.000	-0.540	6.508	7.048
63.896	-0.540	6.509	7.048
63.904	-0.411	6.601	7.012
67.220	-0.297	6.684	6.981
70.000	-0.200	6.755	6.955
72.350	0.005	6.896	6.890
77.000			

ROAD 4 LONGITUDINAL SECTION



DATUM RL2

CHAINAGE	CUT - / FILL +	DESIGN CENTRELINE	EXISTING SURFACE
0.000	-0.272	15.143	15.416
4.650	-0.101	15.004	15.105
9.650	0.070	14.816	14.747
10.000	0.069	14.800	14.731
13.096	0.186	14.644	14.458
13.104	0.186	14.643	14.457
15.954	0.273	14.476	14.203
15.964	0.272	14.475	14.203
20.000	0.276	14.233	13.957
30.000	0.076	13.633	13.557
40.000	-0.020	13.033	13.053
50.000	-0.152	12.433	12.585
54.074	-0.206	12.188	12.394
60.000	0.486	11.833	11.347
70.000	1.711	11.233	9.522
80.000	2.583	10.633	8.050
90.000	3.007	10.033	7.025
100.000	2.475	9.433	6.958
110.000	1.951	8.833	6.882
114.700	1.672	8.551	6.879
120.000	1.348	8.245	6.896
130.000	0.824	7.730	6.906
138.890	0.446	7.343	6.897
140.000	0.401	7.300	6.898
144.700	0.223	7.126	6.903
150.000	0.066	6.952	6.886
160.000	-0.223	6.688	6.911
165.090	-0.342	6.586	6.928
170.000	-0.398	6.507	6.906
174.700	-0.434	6.451	6.884
180.000	-0.474	6.398	6.872
190.000	-0.541	6.298	6.839
198.094	-0.638	6.217	6.855
200.000	-0.663	6.200	6.864
205.594	-1.174	6.179	7.353
206.814	-1.193	6.180	7.373
210.000	-1.203	6.192	7.395
213.094	-1.567	6.217	7.784
220.000	1.768	6.286	8.054
221.434	1.520	6.300	7.820

ROAD 5 LONGITUDINAL SECTION

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

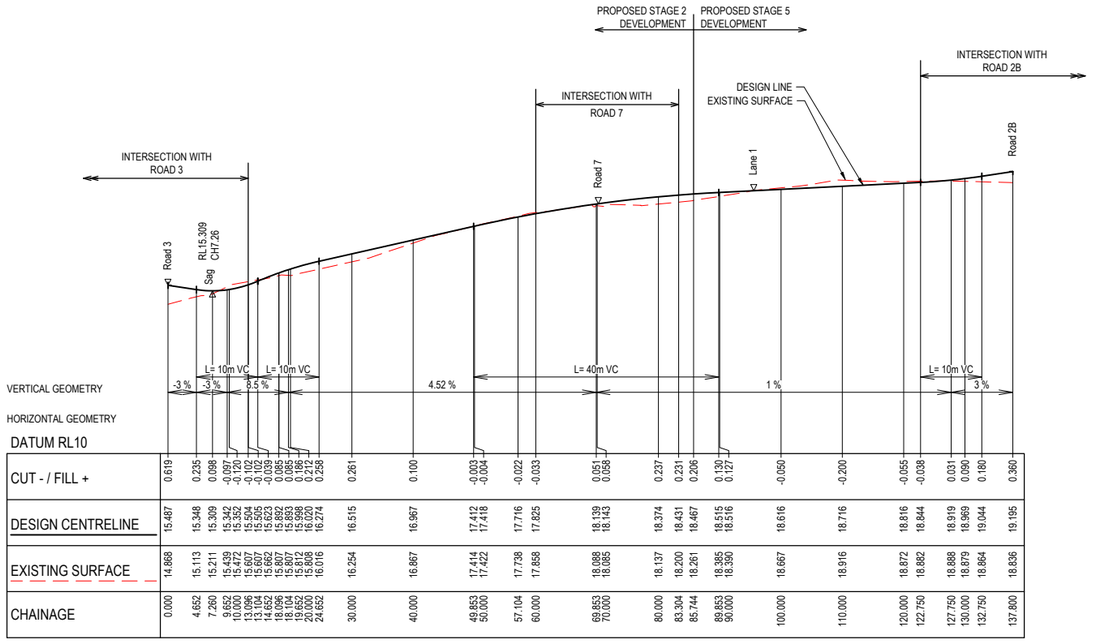
Drawing Title: ROAD LONGITUDINAL SECTIONS

Sheet 37 of 145

Scale: 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	103	B

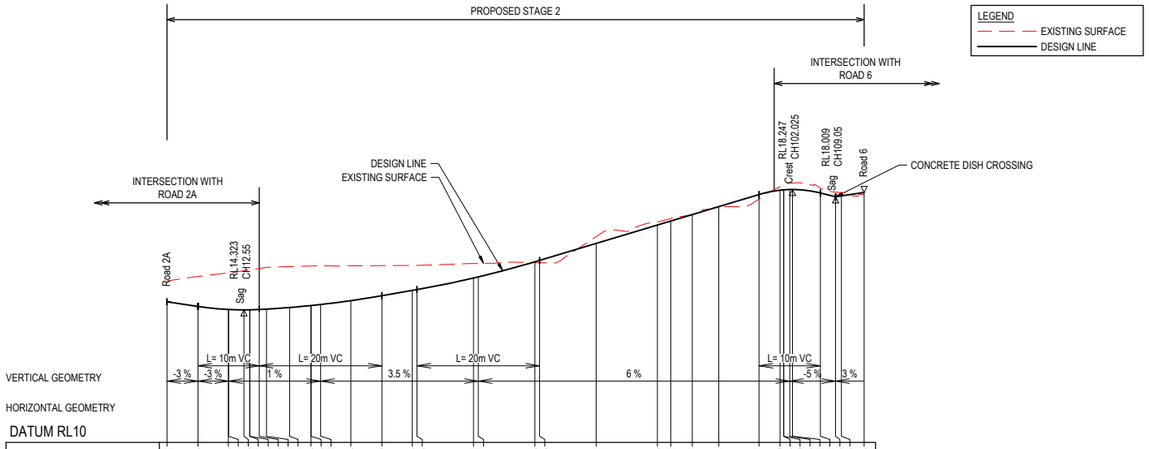
F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-100-RLS.dwg



DATUM RL10

CHAINAGE	0.000	4.652	7.260	9.652	10.000	13.104	14.652	15.000	18.104	19.652	20.000	24.652	30.000	40.000	49.853	50.000	57.104	60.000	69.853	70.000	80.000	83.304	85.744	89.853	90.000	100.000	110.000	120.000	122.750	127.750	130.000	132.750	137.800
EXISTING SURFACE	14.868	15.113	15.211	15.439	15.472	15.607	15.622	15.807	15.893	15.998	16.020	16.274	16.254	16.867	17.414	17.422	17.738	17.858	18.088	18.085	18.137	18.200	18.261	18.385	18.380	18.667	18.916	18.872	18.882	18.888	18.879	18.864	18.836
DESIGN CENTRELINE	15.487	15.348	15.309	15.342	15.352	15.505	15.623	15.807	15.893	15.998	16.020	16.274	16.515	16.967	17.412	17.418	17.716	17.825	18.139	18.143	18.374	18.431	18.467	18.515	18.516	18.616	18.716	18.816	18.844	18.919	18.969	19.044	19.195
CUT - / FILL +	0.619	0.235	0.098	-0.097	-0.120	-0.102	-0.039	0.000	0.085	0.186	0.212	0.288	0.261	0.100	-0.003	-0.004	-0.022	-0.033	0.051	0.058	0.237	0.231	0.206	0.130	0.127	-0.050	-0.200	-0.055	-0.038	0.031	0.090	0.180	0.360

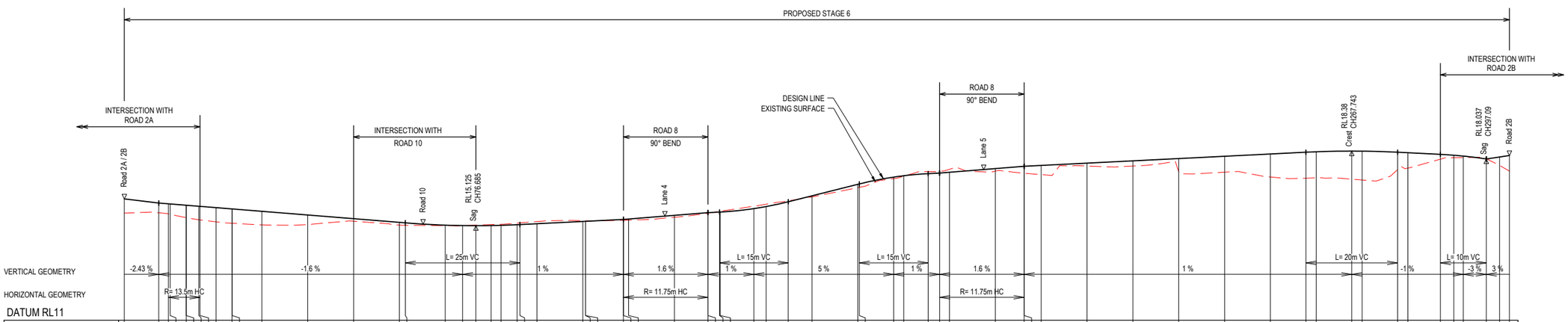
ROAD 6 LONGITUDINAL SECTION



DATUM RL10

CHAINAGE	0.000	5.050	10.000	10.050	12.550	13.946	15.050	16.241	20.000	30.000	35.050	40.000	40.774	50.000	50.774	60.000	60.774	70.000	80.000	82.162	85.681	90.000	96.571	100.000	100.696	101.571	102.025	105.571	109.050	110.000	113.700
EXISTING SURFACE	15.268	15.411	15.528	15.529	15.598	15.627	15.673	15.709	15.752	15.752	15.759	15.762	15.765	15.832	15.835	15.864	15.861	16.711	17.194	17.301	17.423	17.693	17.936	18.343	18.404	18.452	18.458	18.247	18.162	18.144	18.081
DESIGN CENTRELINE	14.586	14.435	14.336	14.335	14.323	14.324	14.335	14.348	14.400	14.464	14.464	14.498	14.624	14.785	14.968	14.965	15.361	15.398	15.889	15.935	16.489	17.089	17.219	18.224	18.236	18.246	18.247	18.243	18.009	18.038	18.149
CUT - / FILL +	-0.682	-0.976	-1.193	-1.194	-1.276	-1.302	-1.338	-1.361	-1.334	-1.288	-1.288	-1.261	-1.138	-0.980	-0.813	-0.788	-0.471	-0.437	0.026	0.075	-0.222	-0.105	-0.082	0.007	-0.004	0.147	-0.119	-0.169	-0.206	-0.211	-0.153	-0.106	0.068

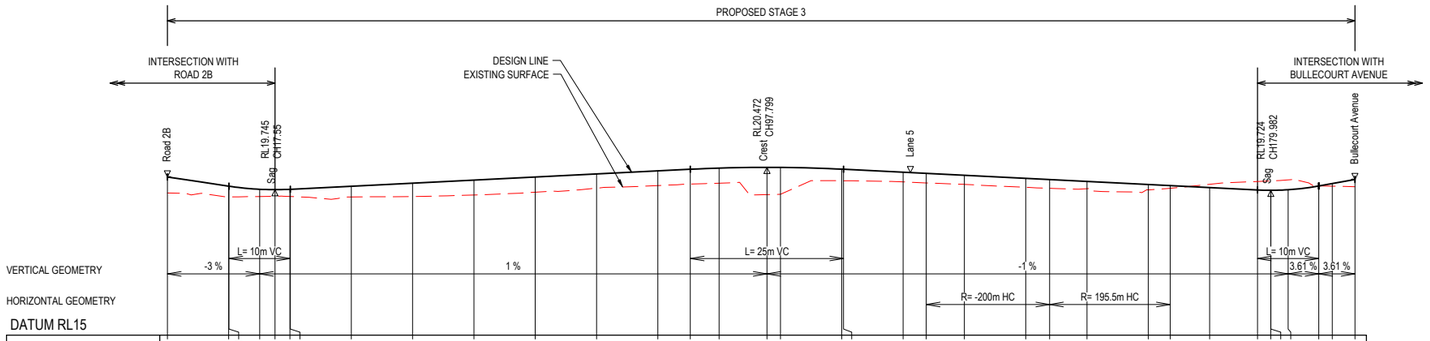
ROAD 7 LONGITUDINAL SECTION



DATUM RL11

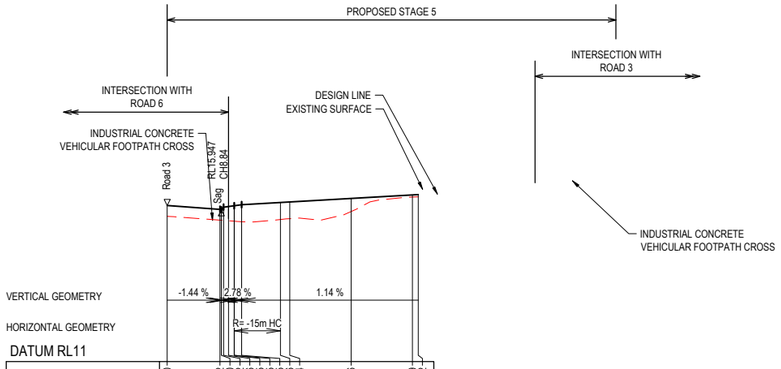
| CHAINAGE | 0.000 | 7.499 | 8.630 | 10.000 | 13.496 | 16.241 | 19.504 | 20.000 | 23.496 | 23.504 | 30.000 | 40.000 | 50.000 | 60.000 | 67.285 | 70.000 | 73.785 | 76.685 | 80.000 | 82.162 | 85.681 | 86.285 | 90.000 | 100.000 | 100.596 | 100.604 | 108.863 | 108.867 | 110.000 | 120.000 | 127.322 | 127.323 | 128.823 | 130.000 | 137.323 | 140.000 | 144.823 | 150.000 | 160.000 | 160.333 | 167.833 | 170.000 | 175.333 | 177.833 | 180.000 | 190.000 | 196.286 | 196.287 | 200.000 | 210.000 | 220.000 | 230.000 | 240.000 | 250.000 | 257.743 | 260.000 | 267.743 | 270.000 | 277.743 | 280.000 | 287.090 | 290.000 | 292.090 | 297.090 | 300.000 | 302.140 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

LEGEND
EXISTING SURFACE
DESIGN LINE



DATUM RL15

| | | |


PROPOSED STAGE 5
INTERSECTION WITH ROAD 6
INTERSECTION WITH ROAD 3
DESIGN LINE
EXISTING SURFACE
INDUSTRIAL CONCRETE VEHICULAR FOOTPATH CROSS
INDUSTRIAL CONCRETE VEHICULAR FOOTPATH CROSS
Road 3
RL15.947
CH8.84
Sag
VERTICAL GEOMETRY
HORIZONTAL GEOMETRY
-1.44 %
2.78 %
1.14 %
R= -15m HC

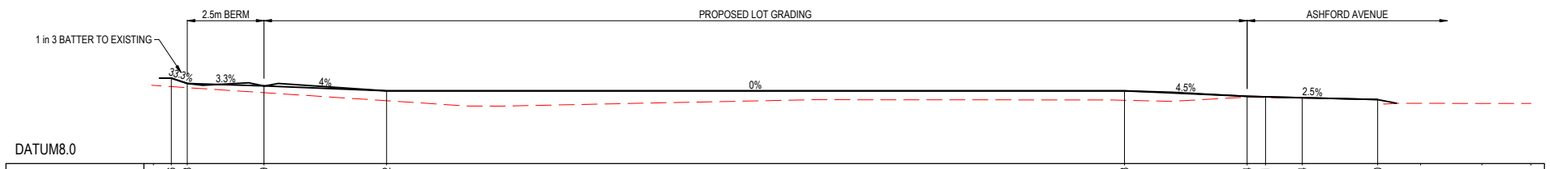
DATUM RL11

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



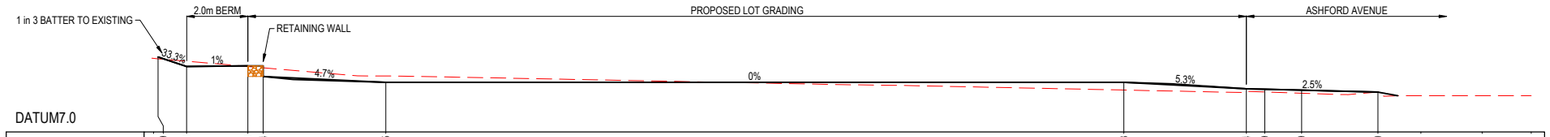
DATUM8.0

| | | |

LEGEND

EXISTING SURFACE

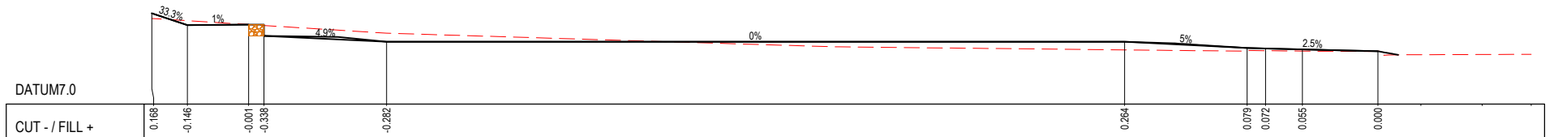
DESIGN SURFACE



DATUM7.0

CUT - / FILL +	0.059	-0.171	0.021	-0.284	-0.205	0.253	0.084	0.089	0.099	0.000														
DESIGN SURFACE	9.446	9.136	9.156	8.808	8.620	8.620	8.408	8.393	8.363	8.301														
EXISTING SURFACE	9.404	9.386	9.307	9.135	9.092	8.825	8.367	8.324	8.304	8.264	8.301	8.174	8.166	8.160										
OFFSET	-40.000	-39.793	-38.864	-36.864	-36.364	-32.364	-8.291	-4.291	-3.691	-2.491	0.000	1.400	3.400	5.000										

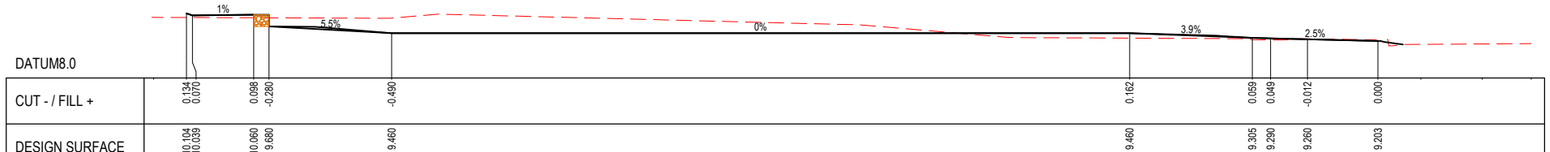
LOT 1108 CH 100.429



DATUM7.0

CUT - / FILL +	0.168	-0.146	-0.001	-0.338	-0.282	0.264	0.079	0.072	0.055	0.000														
DESIGN SURFACE	9.959	9.572	9.592	9.224	9.030	9.030	8.828	8.813	8.783	8.722														
EXISTING SURFACE	9.791	9.718	9.593	9.562	9.312	8.766	8.750	8.741	8.728	8.722	8.601	8.598	8.596											
OFFSET	-40.000	-38.839	-36.839	-36.339	-32.339	-8.266	-4.266	-3.666	-2.466	0.000	1.400	3.400	5.000											

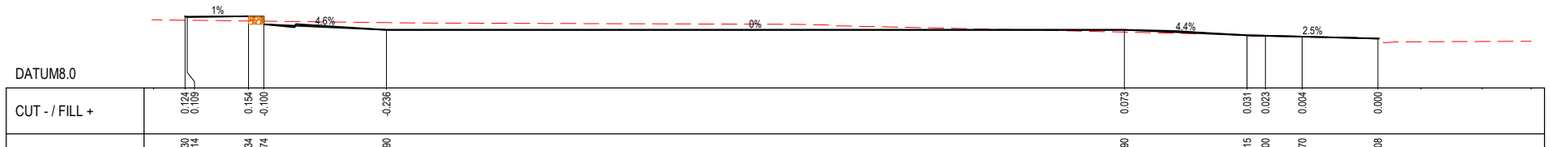
LOT 1107 CH 88.455



DATUM8.0

CUT - / FILL +	0.134	0.070	0.098	-0.280	-0.490	0.162	0.059	0.049	-0.012	0.000														
DESIGN SURFACE	10.104	10.039	10.060	9.680	9.460	9.460	9.305	9.290	9.260	9.203														
EXISTING SURFACE	9.974	9.970	9.969	9.961	9.959	9.950	9.298	9.247	9.241	9.272	9.203	9.087	9.089	9.091										
OFFSET	-40.000	-38.867	-38.673	-36.673	-36.173	-32.173	-8.099	-4.099	-3.499	-2.299	0.000	1.400	3.400	5.000										

LOT 1106 CH 75.198



DATUM8.0

CUT - / FILL +	0.124	0.109	0.154	-0.100	-0.236	0.073	0.031	0.023	0.004	0.000														
DESIGN SURFACE	10.330	10.314	10.334	10.074	9.890	9.890	9.715	9.700	9.670	9.608														
EXISTING SURFACE	10.219	10.205	10.204	10.180	10.174	10.126	9.817	9.684	9.677	9.665	9.608	9.495	9.494	9.492										
OFFSET	-40.000	-38.916	-38.844	-36.844	-36.344	-32.344	-8.271	-4.271	-3.671	-2.471	0.000	1.400	3.400	5.000										

LOT 1105 CH 64.346

ASHFORD AVENUE - ROAD CROSS SECTIONS

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 2 OF 6)

Sheet 42 of 145

Scale 1:100 H 1:50 V @ A1

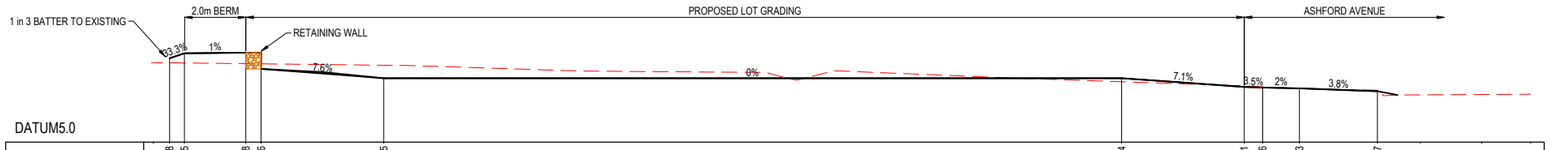
Project Ref	Stage No	Drawing No	Rev
2301879	321	201	B

F:\synergy\temp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

EXISTING SURFACE

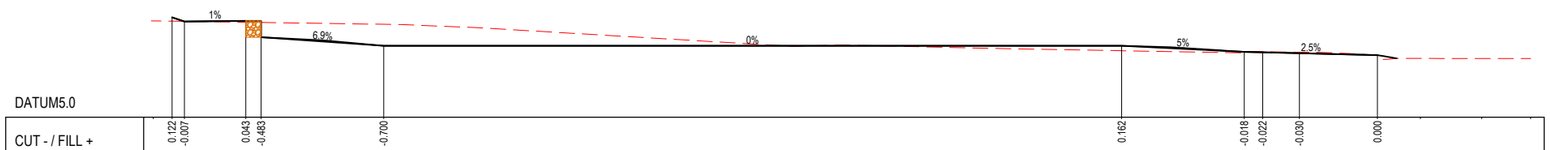
DESIGN SURFACE



DATUM5.0

CUT - / FILL +	0.148	0.315	0.358	-0.166	-0.425	0.114	-0.031	-0.026	0.003	-0.037														
DESIGN SURFACE	7.732	7.894	7.914	7.384	7.080	7.080	6.798	6.777	6.753	6.656														
EXISTING SURFACE	7.591	7.584	7.578	7.556	7.550	7.505	6.966	6.829	6.803	6.750	6.693	6.534	6.537	6.540										
OFFSET	-40.000	-39.403	-38.919	-36.919	-36.419	-32.419	-8.346	-4.346	-3.746	-2.545	0.000	1.400	3.400	5.000										

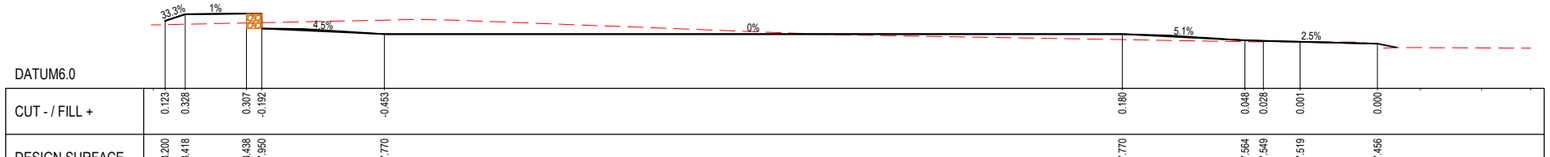
LOT 1112 CH 147.610



DATUM5.0

CUT - / FILL +	0.122	-0.007	0.043	-0.483	-0.700	0.162	-0.018	-0.022	-0.030	0.000														
DESIGN SURFACE	8.255	8.120	8.140	7.606	7.330	7.330	7.132	7.117	7.087	7.023														
EXISTING SURFACE	8.143	8.133	8.127	8.097	8.090	8.030	7.168	7.150	7.139	7.117	7.023	6.910	6.899	6.890										
OFFSET	-40.000	-39.323	-38.918	-36.918	-36.418	-32.418	-8.345	-4.345	-3.745	-2.545	0.000	1.400	3.400	5.000										

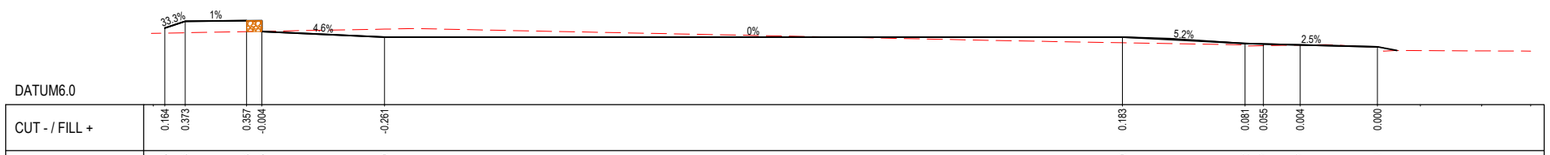
LOT 1111 CH 136.431



DATUM6.0

CUT - / FILL +	0.123	0.328	0.307	-0.192	-0.453	0.180	0.048	0.028	0.001	0.000														
DESIGN SURFACE	8.200	8.418	8.438	7.950	7.770	7.770	7.564	7.549	7.519	7.456														
EXISTING SURFACE	8.068	8.077	8.091	8.131	8.142	8.223	7.590	7.516	7.521	7.518	7.456	7.320	7.301	7.287										
OFFSET	-40.000	-39.551	-38.897	-36.897	-36.397	-32.397	-8.324	-4.324	-3.724	-2.524	0.000	1.400	3.400	5.000										

LOT 1110 CH 124.480



DATUM6.0

CUT - / FILL +	0.164	0.373	0.357	-0.004	-0.261	0.183	0.081	0.055	0.004	0.000														
DESIGN SURFACE	8.495	8.716	8.736	8.385	8.200	8.200	7.992	7.977	7.947	7.884														
EXISTING SURFACE	8.323	8.331	8.343	8.380	8.389	8.461	8.017	7.911	7.922	7.943	7.884	7.754	7.735	7.719										
OFFSET	-40.000	-39.558	-38.894	-36.894	-36.394	-32.394	-8.321	-4.321	-3.721	-2.521	0.000	1.400	3.400	5.000										

LOT 1109 CH 112.480

ASHFORD AVENUE - ROAD CROSS SECTIONS

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REV	DESCRIPTION	DATE	DRN.	APP.
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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
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www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	ROAD CROSS SECTIONS STAGE 1 - ASHFORD AVENUE (SHEET 3 OF 6)

Sheet 43 of 145

Scale 1:100 H 1:50 V @ A1

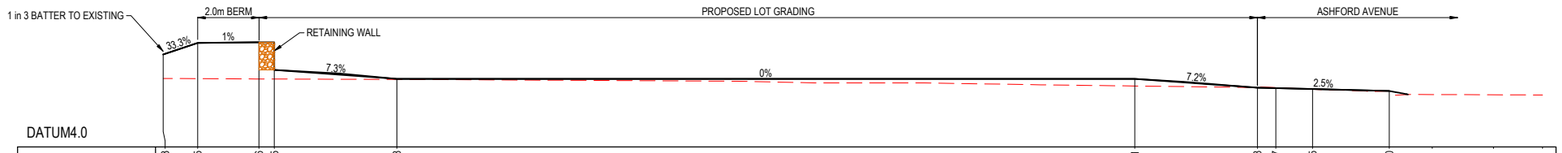
Project Ref	Stage No	Drawing No	Rev
2301879	321	202	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

EXISTING SURFACE

DESIGN SURFACE



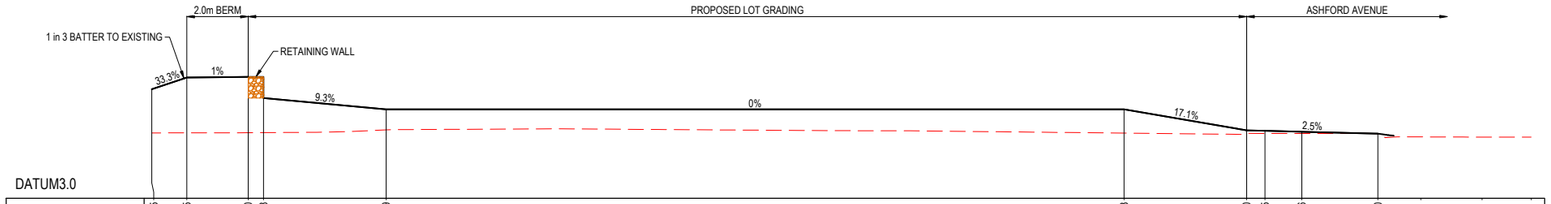
DATUM4.0

| | | |

LEGEND

EXISTING SURFACE

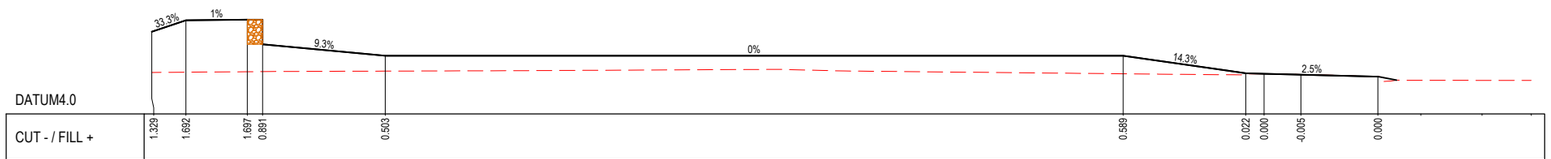
DESIGN SURFACE



DATUM3.0

CUT - / FILL +	1.425	1.805	1.820	1.128	0.669	0.773	0.100	0.085	0.056	0.000												
DESIGN SURFACE	6.658	6.940	6.960	6.271	5.900	5.900	5.216	5.201	5.171	5.109												
EXISTING SURFACE	5.133	5.135	5.140	5.143	5.231	5.127	5.117	5.116	5.115	5.109	5.002	4.994	4.991									
OFFSET	-40.000	-38.855	-36.856	-36.356	-32.356	-8.283	-4.283	-3.683	-2.483	0.000	1.400	3.400	5.000									

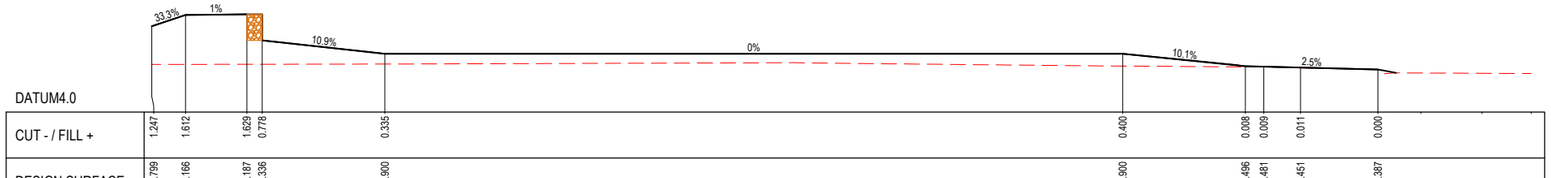
LOT 1205 CH 237.595



DATUM4.0

CUT - / FILL +	1.329	1.692	1.697	0.891	0.503	0.589	0.022	0.000	-0.005	0.000												
DESIGN SURFACE	6.683	7.055	7.075	6.272	5.900	5.900	5.326	5.311	5.281	5.219												
EXISTING SURFACE	5.354	5.363	5.377	5.381	5.397	5.311	5.304	5.311	5.287	5.219	5.097	5.090	5.084									
OFFSET	-40.000	-38.865	-36.886	-36.386	-32.385	-8.312	-4.312	-3.712	-2.512	0.000	1.400	3.400	5.000									

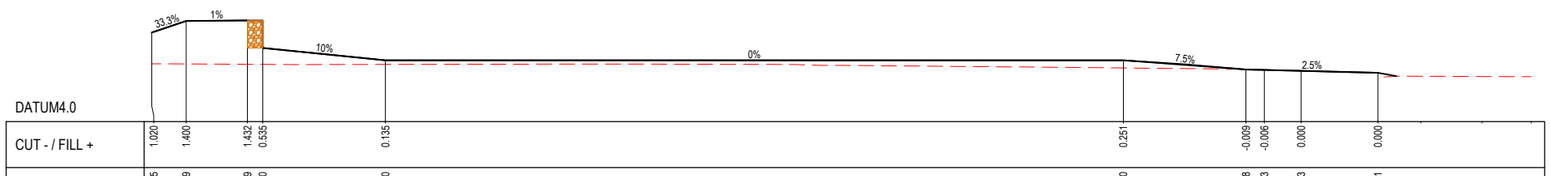
LOT 1204 CH 225.620



DATUM4.0

CUT - / FILL +	1.247	1.612	1.629	0.778	0.335	0.400	0.008	0.009	0.011	0.000												
DESIGN SURFACE	6.799	7.166	7.187	6.336	5.900	5.900	5.496	5.481	5.451	5.387												
EXISTING SURFACE	5.552	5.554	5.557	5.558	5.565	5.500	5.487	5.472	5.440	5.387	5.270	5.256	5.244									
OFFSET	-40.000	-38.898	-36.898	-36.398	-32.398	-8.325	-4.325	-3.725	-2.525	0.000	1.400	3.400	5.000									

LOT 1203 CH 213.604



DATUM4.0

CUT - / FILL +	1.020	1.400	1.432	0.535	0.135	0.251	-0.009	-0.006	0.000	0.000												
DESIGN SURFACE	6.905	7.279	7.299	6.400	6.000	6.000	5.698	5.683	5.653	5.591												
EXISTING SURFACE	5.885	5.879	5.868	5.865	5.865	5.749	5.708	5.689	5.653	5.591	5.475	5.461	5.450									
OFFSET	-40.000	-38.878	-36.878	-36.378	-32.378	-8.305	-4.305	-3.705	-2.505	0.000	1.400	3.400	5.000									

LOT 1202 CH 201.549

ASHFORD AVENUE - ROAD CROSS SECTIONS

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD CROSS SECTIONS
STAGE 1 - ASHFORD AVENUE
(SHEET 5 OF 6)

Sheet 45 of 145

Scale 1:100 H 1:50 V @ A1

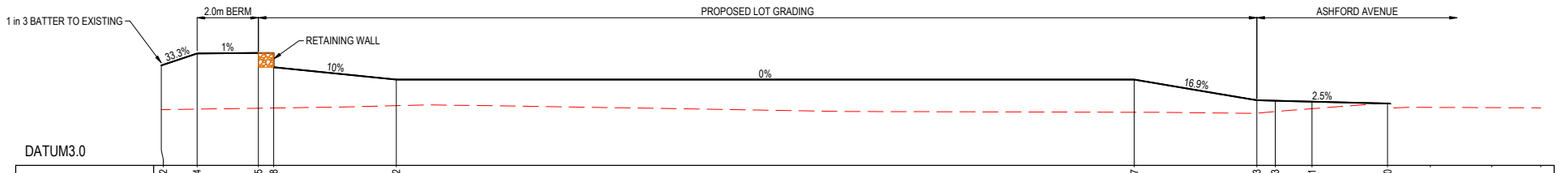
Project Ref	Stage No	Drawing No	Rev
2301879	321	204	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

EXISTING SURFACE

DESIGN SURFACE



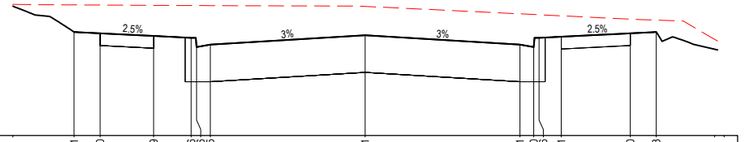
DATUM3.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



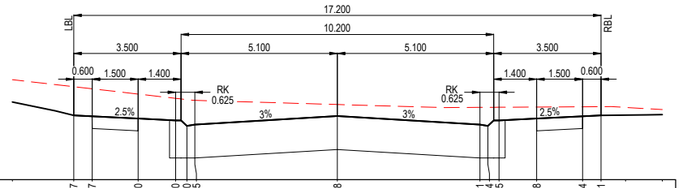
DATUM11.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



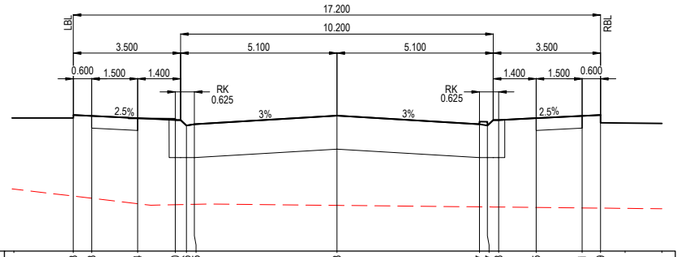
DATUM10.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



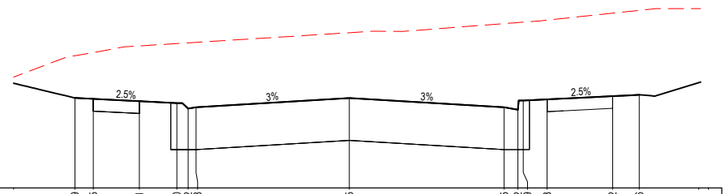
DATUM6.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



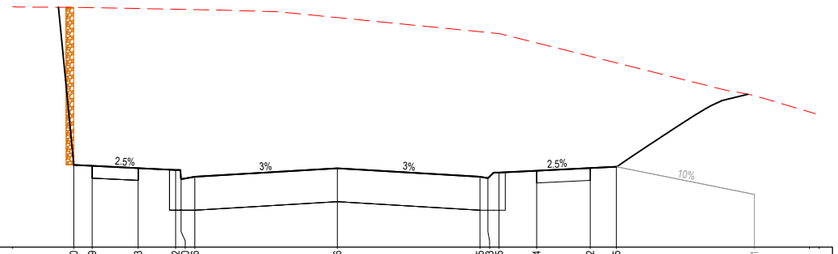
DATUM12.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



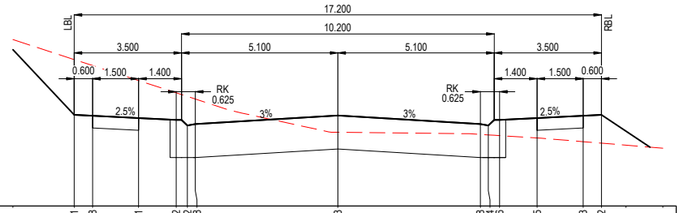
DATUM14.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



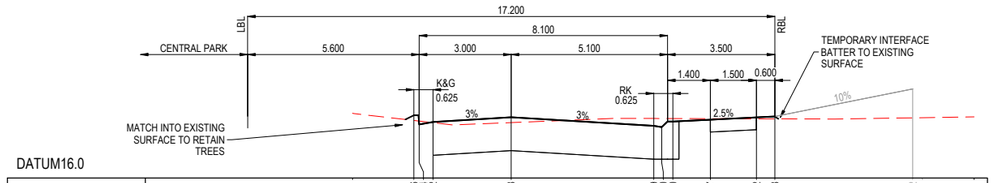
DATUM13.0

| | | |

LEGEND

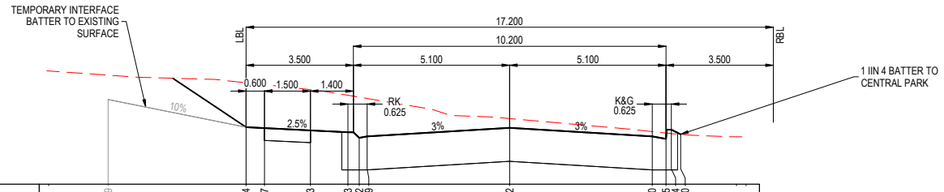
EXISTING SURFACE

DESIGN SURFACE



DATUM16.0

| | | |


TEMPORARY INTERFACE BATTER TO EXISTING SURFACE
LBL
RBL
17.200
10.200
3.500
5.100
5.100
3.500
0.600
1.500
1.400
RK 0.625
K&G 0.625
1 IIN 4 BATTER TO CENTRAL PARK
10%
2.5%
3%
3%

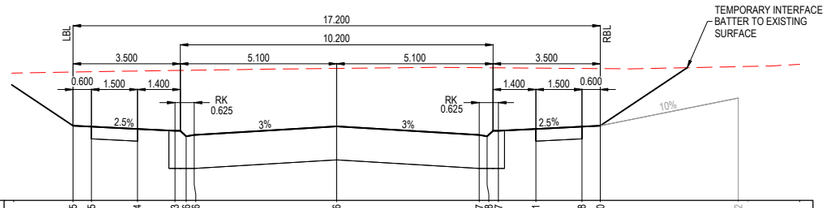
DATUM16.0

| | | |

LEGEND

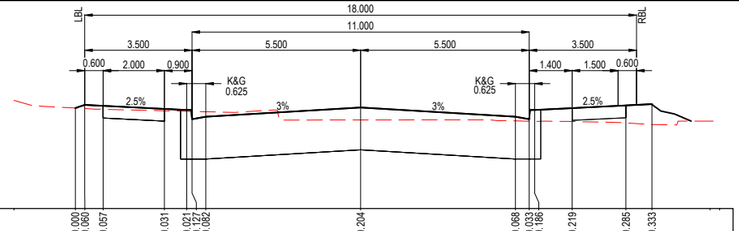
EXISTING SURFACE

DESIGN SURFACE



DATUM11.0

| | | |


LBL
RBL
18.000
11.000
3.500
5.500
5.500
3.500
0.600
2.000
0.900
1.400
1.500
0.600
K&G
0.625
K&G
0.625
2.5%
3%
3%
2.5%

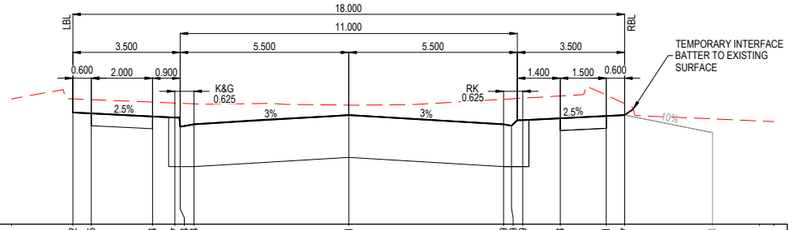
DATUM19.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



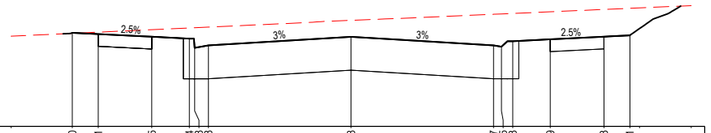
DATUM20.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



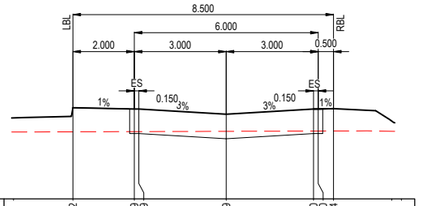
DATUM19.0

| | | |

LEGEND

EXISTING SURFACE

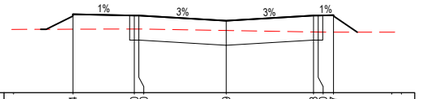
DESIGN SURFACE



DATUM19.0

CUT - / FILL +		0.392		0.369	0.369		0.279		0.360	0.360	0.364												
DESIGN SURFACE		20.487		20.467	20.467		20.381		20.467	20.467	20.472												
EXISTING SURFACE	20.091	20.094		20.097	20.097		20.102		20.107	20.107	20.108		20.102	20.102									
OFFSET	-7.000	-5.000		-3.000	-2.850		0.000		2.850	3.000	3.500		5.400	5.500									

CH 77.367



DATUM19.0

CUT - / FILL +		0.244		0.220	0.220		0.159		0.268	0.270	0.277												
DESIGN SURFACE		20.279		20.259	20.259		20.173		20.259	20.259	20.264												
EXISTING SURFACE	20.032	20.035		20.038	20.039		20.015		19.990	19.989	19.987		19.986	19.986									
OFFSET	-7.000	-5.000		-3.000	-2.850		0.000		2.850	3.000	3.500		5.400	5.500									

LOW CH 72.487

LANE 5 - ROAD CROSS SECTIONS

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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Oran Park NSW 2570
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD CROSS SECTIONS STAGE 3- LANE 5

Sheet 59 of 145

Scale 1:100 H 1:50 V @ A1

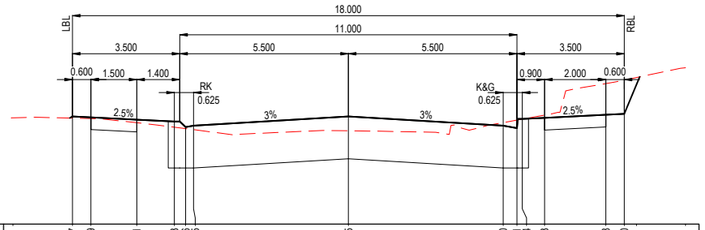
Project Ref	Stage No	Drawing No	Rev
2301879	321	218	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

EXISTING SURFACE

DESIGN SURFACE



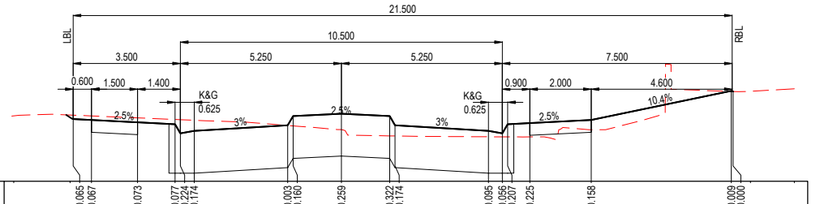
DATUM18.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



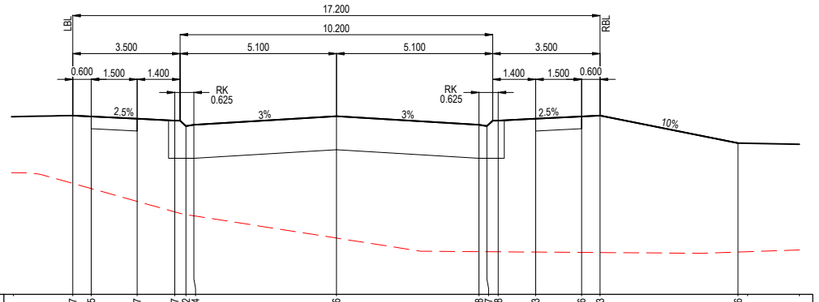
DATUM19.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



DATUM5.0

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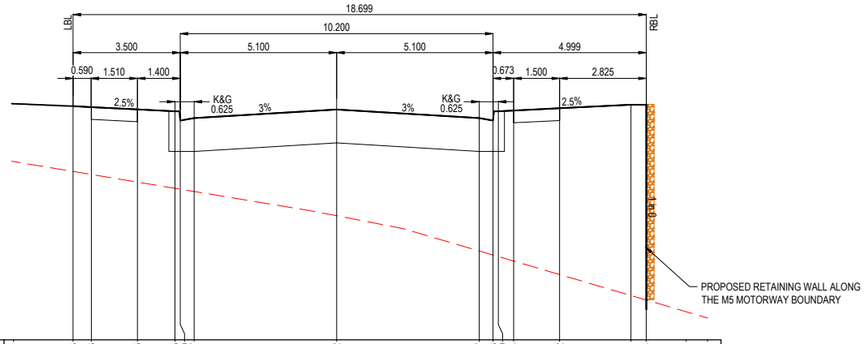

LBL
RBL
18.699
10.200
3.500
5.100
5.100
4.999
0.590
1.510
1.400
0.673
1.500
2.825
2.5%
K&G
0.625
3%
3%
K&G
0.625
2.5%
1 in 0
PROPOSED RETAINING WALL ALONG
THE M5 MOTORWAY BOUNDARY

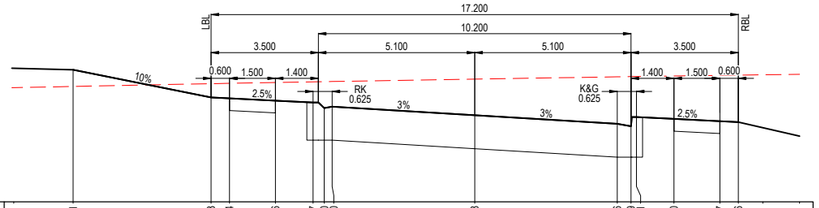
DATUM3.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



DATUM5.0

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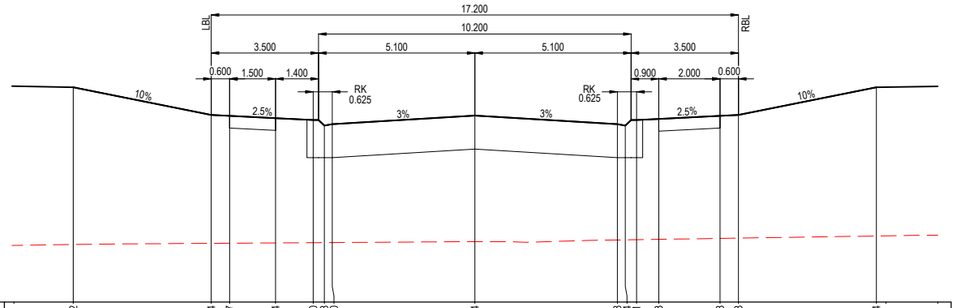

LBL
RBL
17.200
10.200
3.500
5.100
5.100
3.500
0.600
1.500
1.400
0.900
2.000
0.600
RK
0.625
RK
0.625
10%
2.5%
3%
3%
2.5%
10%

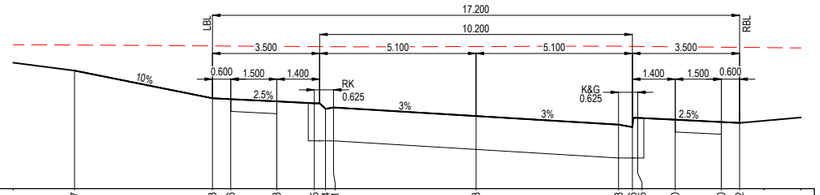
DATUM6.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



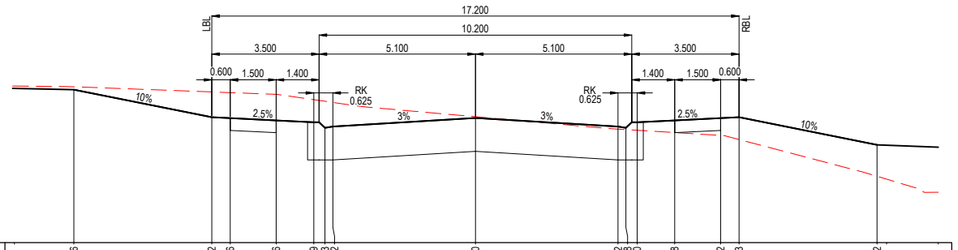
DATUM5.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



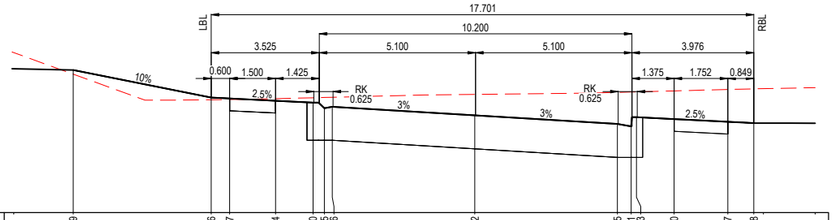
DATUM11.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



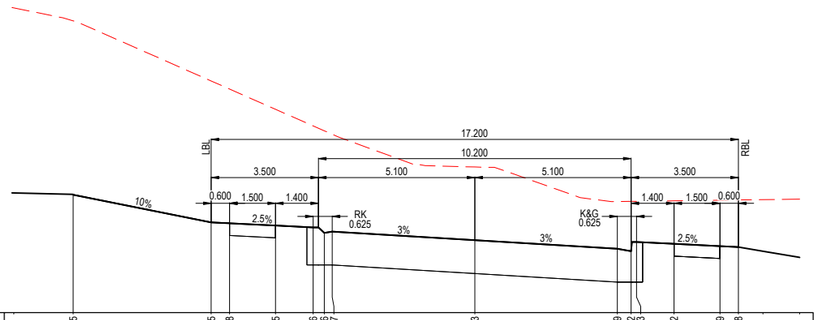
DATUM5.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



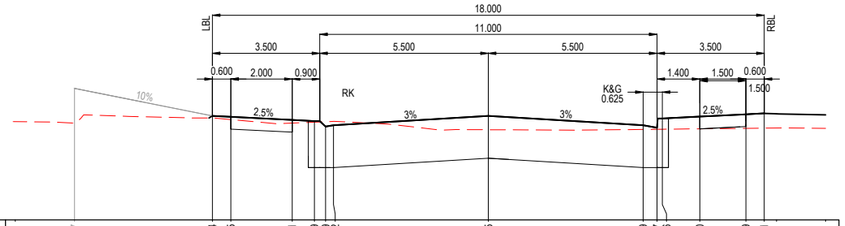
DATUM5.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



DATUM18.0

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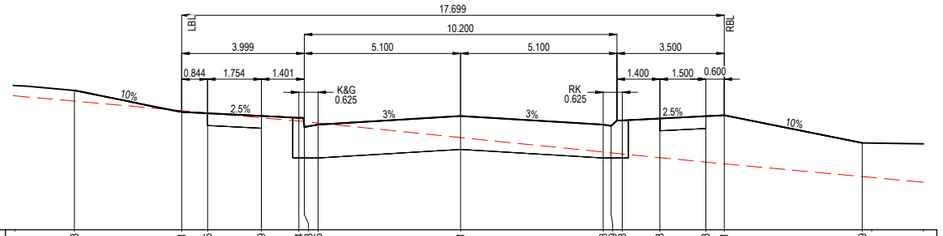
LEGEND

EXISTING SURFACE

DESIGN SURFACE



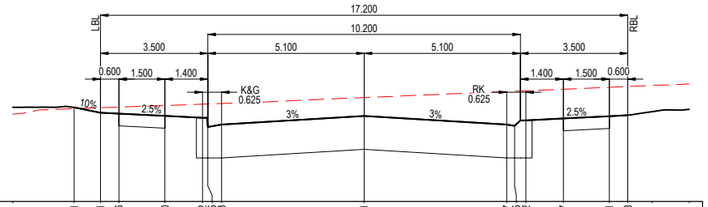
DATUM14.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



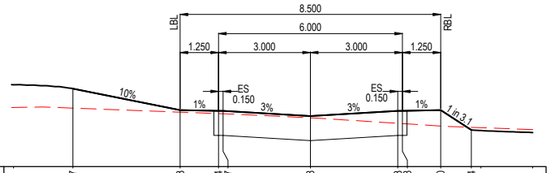
DATUM19.0

| | | |

LEGEND

EXISTING SURFACE

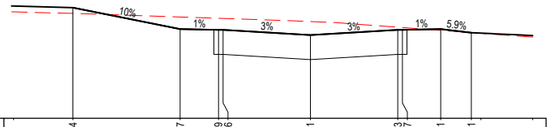
DESIGN SURFACE



DATUM19.0

CUT - / FILL +		0.317		0.033	0.044 0.047	0.028		0.203 0.208	0.260	-0.044				
DESIGN SURFACE		20.271		19.921	19.908 19.908	19.823		19.908 19.908	19.921	19.596				
EXISTING SURFACE	19.963	19.953		19.887	19.864 19.861	19.795		19.705 19.701	19.661	19.640 19.637		19.603		
OFFSET	-9.750	-7.750		-4.250	-3.000 -2.850	0.000		2.850 3.000	4.250	5.250 5.400		7.250		

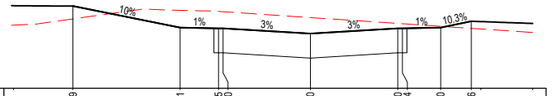
CH 60.000



DATUM18.0

CUT - / FILL +		0.094		-0.197	-0.188 -0.186	-0.221		-0.043 -0.037	0.021	-0.001				
DESIGN SURFACE		19.805		19.455	19.442 19.442	19.357		19.442 19.442	19.455	19.396				
EXISTING SURFACE	19.736	19.711		19.652	19.631 19.629	19.578		19.485 19.480	19.434	19.397 19.392		19.326		
OFFSET	-9.750	-7.750		-4.250	-3.000 -2.850	0.000		2.850 3.000	4.250	5.250 5.400		7.250		

CH 40.000



DATUM18.0

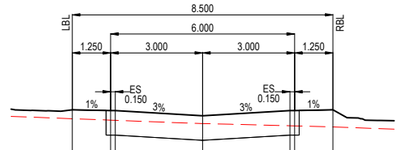
CUT - / FILL +		0.209		-0.281	-0.275 -0.270	-0.260		-0.080 -0.074	-0.020	0.116				
DESIGN SURFACE		19.339		18.989	18.977 18.977	18.891		18.977 18.977	18.989	19.092				
EXISTING SURFACE	19.027	19.130		19.270	19.252 19.247	19.152		19.056 19.051	19.009	18.976 18.971		18.907		
OFFSET	-9.750	-7.750		-4.250	-3.000 -2.850	0.000		2.850 3.000	4.250	5.250 5.400		7.250		

CH 20.000

DATUM18.0

CUT - / FILL +				0.018	0.027 0.029	-0.135		-0.110 -0.106	-0.058					
DESIGN SURFACE				18.726	18.713 18.713	18.628		18.713 18.713	18.726					
EXISTING SURFACE		18.752		18.714 18.708	18.687 18.684	18.763		18.824 18.820	18.784	18.719		18.668		
OFFSET	-6.250		-4.600 -4.250		-3.000 -2.850	0.000		2.850 3.000	4.250	5.400		6.250		

CH 8.699



DATUM19.0

CUT - / FILL +				0.145	0.156 0.159	0.126		0.248 0.250	0.279					
DESIGN SURFACE				20.026	20.013 20.013	19.928		20.013 20.013	20.026					
EXISTING SURFACE		19.918		19.887 19.880	19.857 19.854	19.801		19.765 19.763	19.746	19.725		19.710		
OFFSET	-6.250		-4.600 -4.250		-3.000 -2.850	0.000		2.850 3.000	4.250	5.400		6.250		

CH 64.499

LANE 1 - ROAD CROSS SECTIONS

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	ROAD CROSS SECTIONS STAGE 5 - LANE 1

Sheet 73 of 145

Scale 1:100 H 1:50 V @ A1

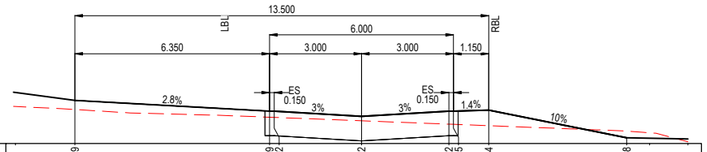
Project Ref	Stage No	Drawing No	Rev
2301879	321	232	B

F:\synergy\temp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

EXISTING SURFACE

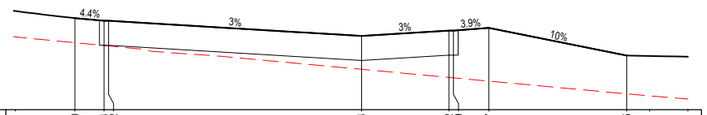
DESIGN SURFACE



DATUM16.0

CUT - / FILL +		0.149		0.099 0.102		0.072		0.212 0.215	0.254		-0.108			
DESIGN SURFACE		16.702		16.527 16.527		16.441		16.527 16.527	16.543		16.093			
EXISTING SURFACE	16.604	16.554		16.428 16.425		16.370		16.315 16.312	16.290		16.202	16.174		16.027
OFFSET	-11.352	-9.352		-3.000 -2.850		0.000		2.850 3.000	4.150		8.650	9.400		10.650

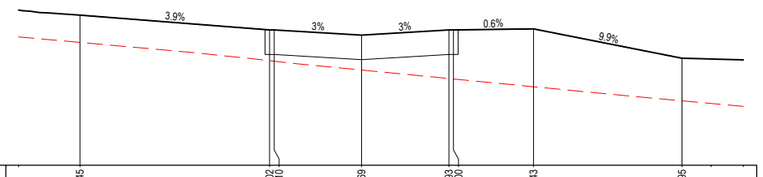
CH 40.964



DATUM15.0

CUT - / FILL +		0.400		0.404 0.412		0.544		0.762 0.769	0.867		0.625			
DESIGN SURFACE		16.493		16.451 16.451		16.203		16.269 16.269	16.334		15.884			
EXISTING SURFACE	16.189	16.092		16.046 16.039		15.659		15.527 15.520	15.467		15.259	15.227		15.174
OFFSET	-11.350	-9.350		-8.400 -8.250		0.000		2.850 3.000	4.150		8.650	9.400		10.650

CH 20.000



DATUM14.0

CUT - / FILL +		0.445		0.502 0.510		0.589		0.793 0.800	0.943		0.695			
DESIGN SURFACE		16.448		16.207 16.207		16.121		16.207 16.207	16.223		15.746			
EXISTING SURFACE	16.092	16.003		15.705 15.697		15.552		15.414 15.407	15.280		15.050	15.007		14.959
OFFSET	-11.188	-9.188		-3.000 -2.850		0.000		2.850 3.000	5.611		10.454	11.400		12.454

CH 12.782

LANE 2 - ROAD CROSS SECTIONS

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD CROSS SECTIONS
STAGE 5 - LANE 2

Sheet 74 of 145

Scale 1:100 H 1:50 V @ A1

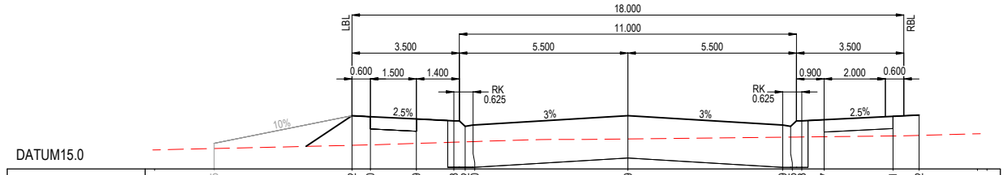
Project Ref	Stage No	Drawing No	Rev
2301879	321	233	B

F:\synergytemp\12d\Synergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND

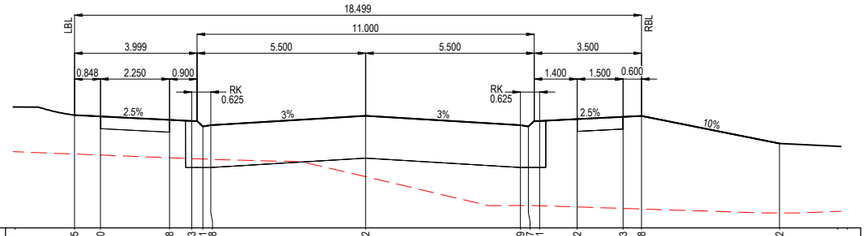
EXISTING SURFACE

DESIGN SURFACE



DATUM15.0

| | | |


18.499
11.000
LBL
RBL
3.999
5.500
5.500
3.500
0.848
2.250
0.900
1.400
1.500
0.600
RK
0.625
RK
0.625
2.5%
3%
3%
2.5%
10%

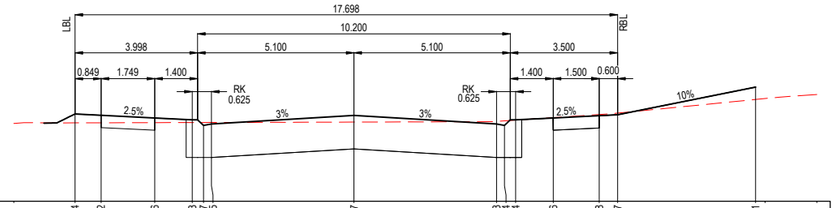
DATUM16.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



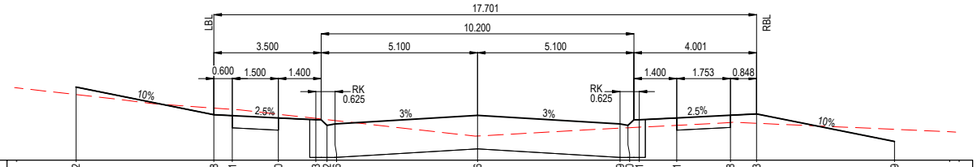
DATUM14.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



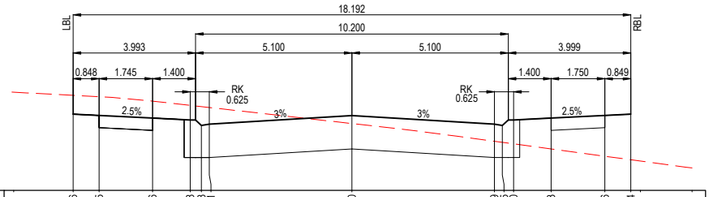
DATUM17.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



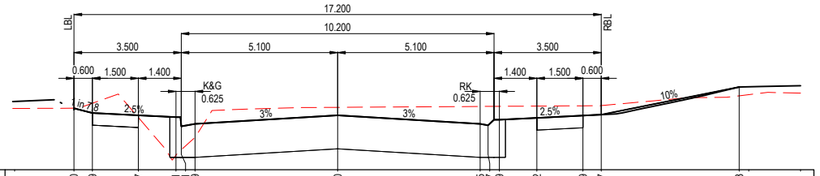
DATUM17.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



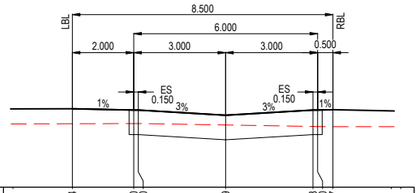
DATUM14.0

| | | |

LEGEND

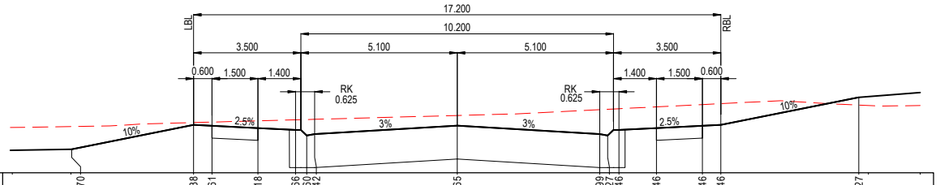
EXISTING SURFACE

DESIGN SURFACE



DATUM19.0

| | | |


LBL
RBL
17.200
10.200
3.500
5.100
5.100
3.500
0.600
1.500
1.400
1.400
1.500
0.600
RK
0.625
RK
0.625
10%
2.5%
3%
3%
2.5%
10%

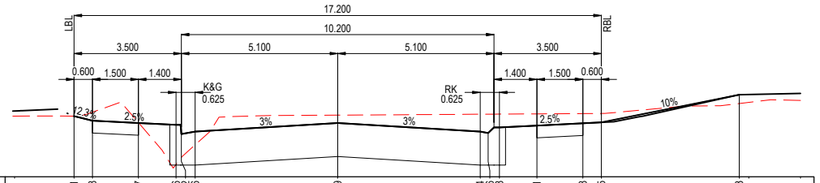
DATUM12.0

| | | |

LEGEND

EXISTING SURFACE

DESIGN SURFACE



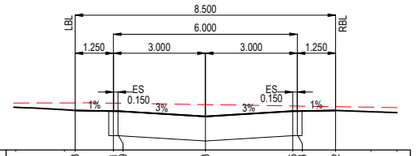
DATUM14.0

| | | |

LEGEND

EXISTING SURFACE

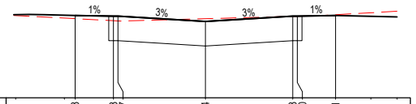
DESIGN SURFACE



DATUM11.0

CUT - / FILL +		-0.123	-0.131 -0.129		-0.193		-0.085 -0.084	-0.062	
DESIGN SURFACE		11.644	11.632 11.632		11.546		11.632 11.632	11.644	
EXISTING SURFACE	11.764	11.766 11.767	11.762 11.761		11.739		11.717 11.716	11.706	11.697	11.690
OFFSET	-6.250	-4.600 -4.250	-3.000 -2.850		0.000		2.850 3.000	4.250	5.400	6.250

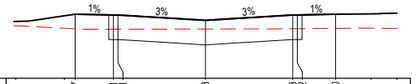
CH 60.000



DATUM11.0

CUT - / FILL +		0.053	0.073 0.077		-0.044		0.003 0.000	-0.011	
DESIGN SURFACE		12.343	12.331 12.331		12.245		12.331 12.331	12.343	
EXISTING SURFACE	12.342	12.299 12.290	12.298 12.294		12.289		12.328 12.330	12.355	12.387	12.411
OFFSET	-6.250	-4.600 -4.250	-3.000 -2.850		0.000		2.850 3.000	4.250	5.400	6.250

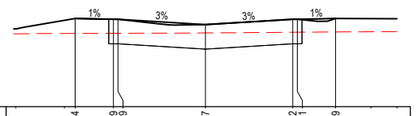
CH 40.000



DATUM12.0

CUT - / FILL +		0.237	0.231 0.231		0.143		0.223 0.222	0.230	
DESIGN SURFACE		13.042	13.030 13.030		12.944		13.030 13.030	13.042	
EXISTING SURFACE	12.856	12.814 12.805	12.798 12.799		12.802		12.807 12.807	12.812	12.815	12.811
OFFSET	-6.250	-4.600 -4.250	-3.000 -2.850		0.000		2.850 3.000	4.250	5.400	6.250

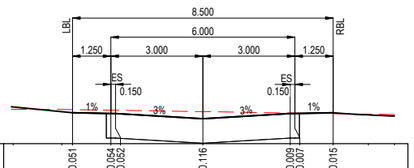
CH 20.000



DATUM12.0

CUT - / FILL +		0.244	0.229 0.229		0.137		0.212 0.211	0.219	
DESIGN SURFACE		13.437	13.425 13.425		13.339		13.425 13.425	13.437	
EXISTING SURFACE	13.189	13.193 13.193	13.196 13.198		13.202		13.213 13.213	13.218	13.222	13.224
OFFSET	-6.250	-4.600 -4.250	-3.000 -2.850		0.000		2.850 3.000	4.250	5.400	6.250

CH 8.702



DATUM11.0

CUT - / FILL +		-0.051	-0.054 -0.052		-0.116		-0.007 -0.007	0.015	
DESIGN SURFACE		11.504	11.492 11.492		11.406		11.492 11.492	11.504	
EXISTING SURFACE	11.559	11.558 11.555	11.546 11.544		11.522		11.500 11.499	11.490	11.481	11.474
OFFSET	-6.250	-4.600 -4.250	-3.000 -2.850		0.000		2.850 3.000	4.250	5.400	6.250

CH 63.995

LANE 3 - ROAD CROSS SECTIONS

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

HORIZ. 1:100 0 1 2 4 6

VERT. 1:50 0 0.5 1 2 3

SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
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Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: ROAD CROSS SECTIONS
STAGE 7 - LANE 3

Sheet 84 of 145

Scale: 1:100 H 1:50 V @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	243	B

F:\synergy\temp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-200-RXS.dwg

LEGEND:

INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

WARNING

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 15 30 60 90 120
SCALE 1:1500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	L.S
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
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ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL SIGNAGE & LINE MARKING PLAN

Sheet 85 of 145

Scale 1:1500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	250	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-250-LMP.dwg

NOTES
1. LINEMARKING TO BE EXTENDED AT LEAST 6m FROM THE TANGENT POINT
2. LINEMARKING IN ACCORDANCE WITH AS1742.
3. ALL STREET NAME SIGNS AT INTERSECTIONS TO INCLUDE RELEVENT STREET NUMBERING.
4. ALL LINE MARKING PAINT SHALL BE LONG LIFE TYPE. LATERAL WORKS AND ARROWS BEING COLD APPLIED PLASTIC TROWELLED INTO PLACE (MATERIAL DEGADUR PLASTELINE) AND LONGITUDINAL LINES BEING EXTRUDED THERMOPLASTIC MATERIAL.
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LEGEND:
- - - - - INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

BULLECOURT AVENUE
SINAI AVENUE
ASHFORD AVENUE
MILPERRA RESERVE
NORTHERN PARK
STAGE 6
STAGE 7
LANE 4
LANE 3
WALK 1
ROAD 8
ROAD 10
ROAD 2B
ROAD CLOSED G9-20
D4-5
D4-1-2A
W1-3(L)
W1-3(R)
G2-3 LANE 3 ROAD 10
G2-3 ROAD 8 LANE 5
G2-3 ROAD 8 ROAD 10
G2-3 ROAD 2 ROAD 2 ROAD 8
GIVE WAY R1-2A

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SIGNAGE & LINE MARKING PLANS SHEET 1 OF 5

Sheet 86 of 145
Scale 1:500 @ A1
N

Project Ref	Stage No	Drawing No	Rev
2301879	321	251	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-250-LMP.dwg

NOTES

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LEGEND:

INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Oran Park NSW 2570
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www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SIGNAGE & LINE MARKING PLANS
SHEET 2 OF 5

Sheet 87 of 145

Scale 1:500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	252	B

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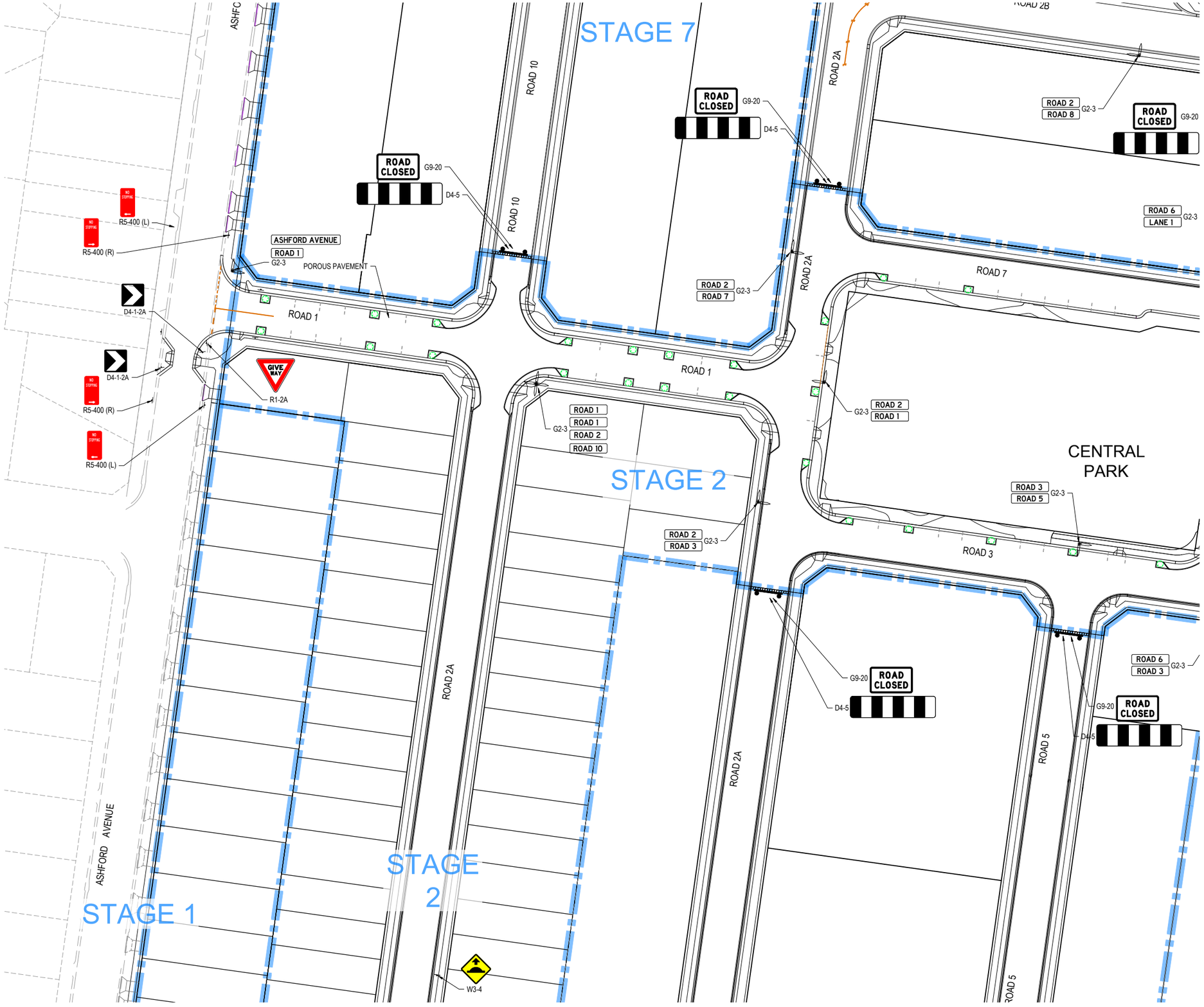

NOTES

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LEGEND:

- - - - - - INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
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ph: 02 46255055
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SIGNAGE & LINE MARKING PLANS
SHEET 3 OF 5

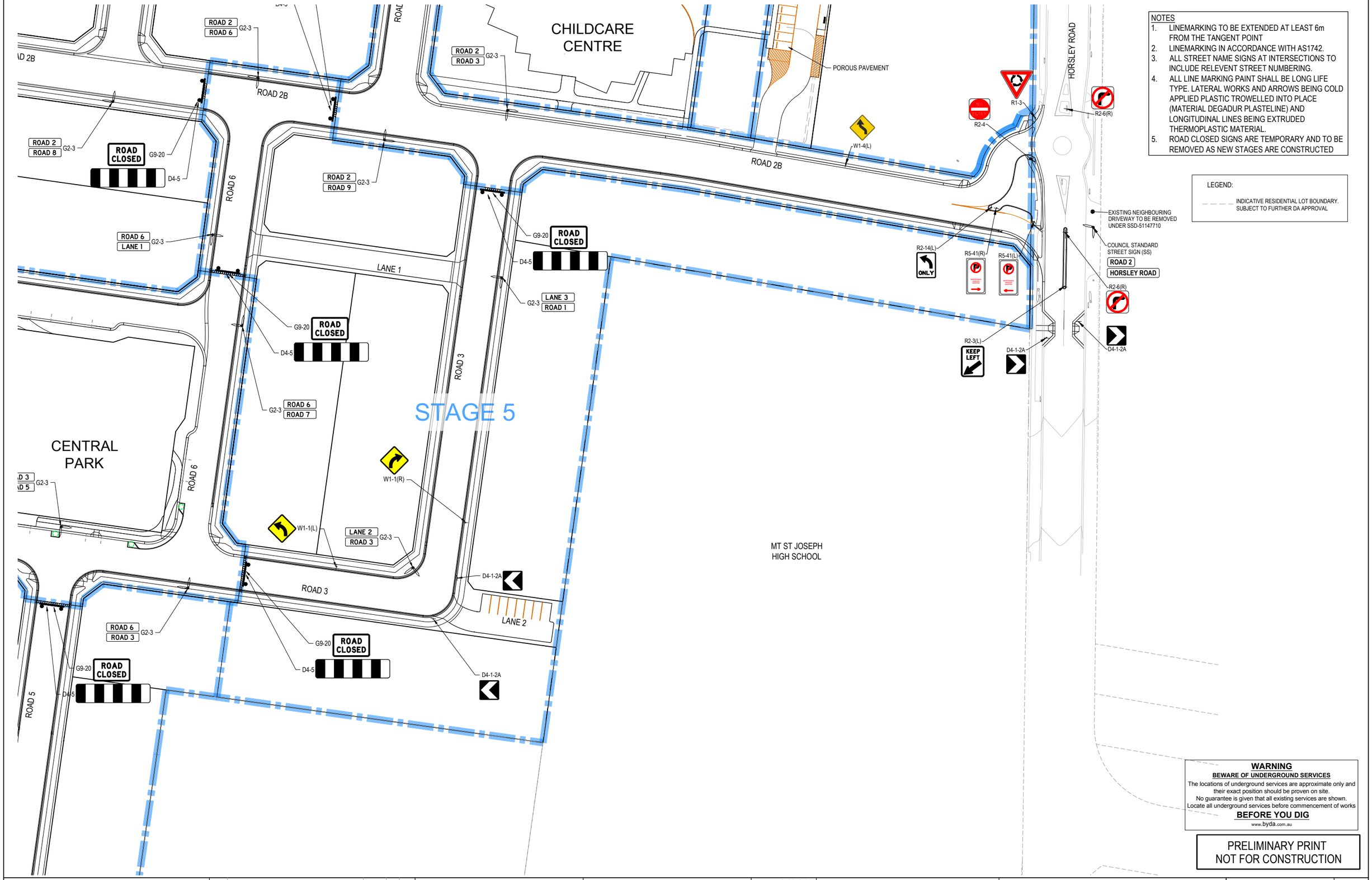
Sheet 88 of 145

Scale 1:500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	253	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-250-LMP.dwg



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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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ph: 02 46255055
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

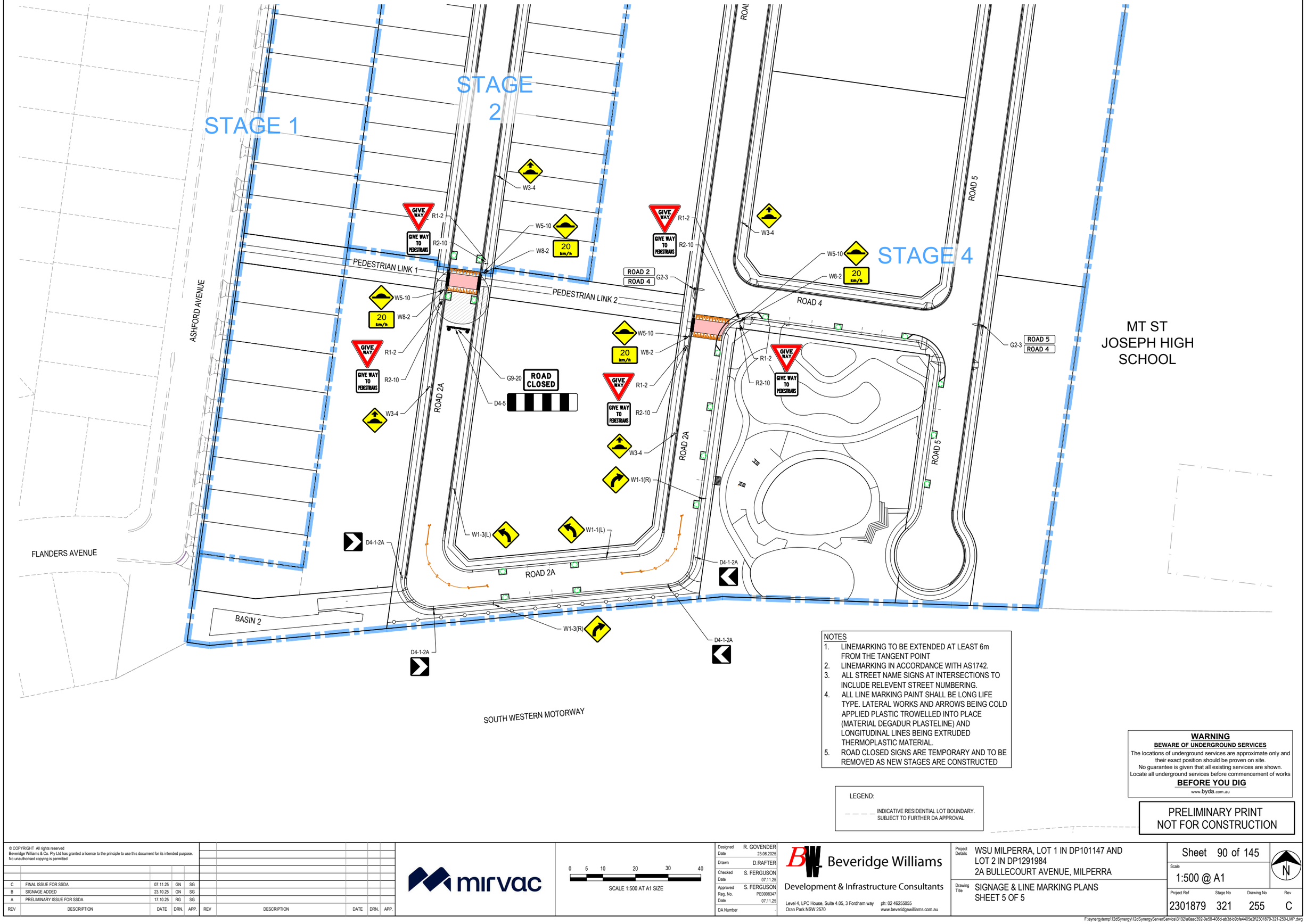
Drawing Title: SIGNAGE & LINE MARKING PLANS
SHEET 4 OF 5

Sheet 89 of 145

Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	254	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-250-LMP.dwg



NOTES
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5. ROAD CLOSED SIGNS ARE TEMPORARY AND TO BE REMOVED AS NEW STAGES ARE CONSTRUCTED

LEGEND:

_ _ _ _ _ INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	SIGNAGE ADDED	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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ph: 02 46255055
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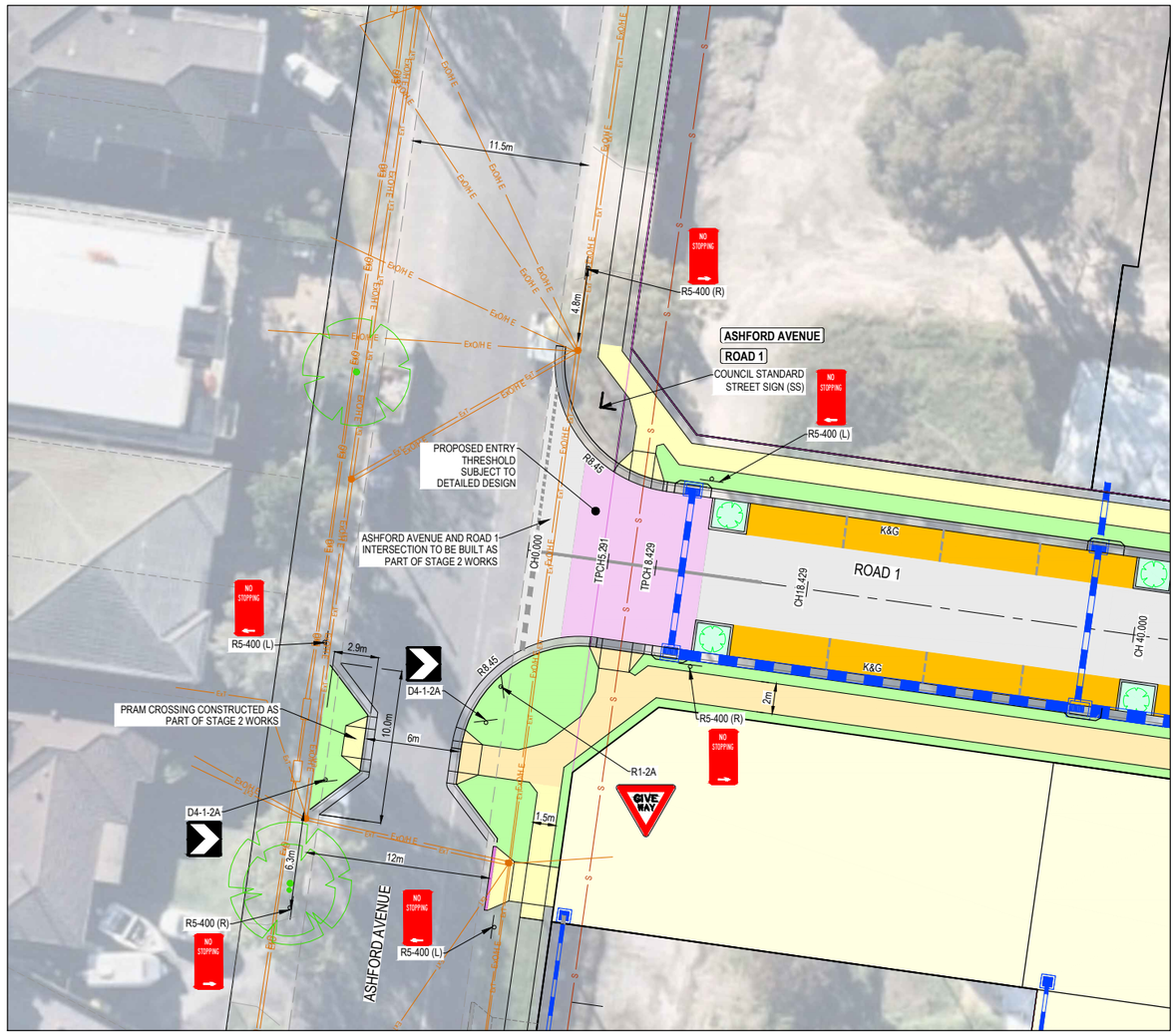
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SIGNAGE & LINE MARKING PLANS
SHEET 5 OF 5

Sheet 90 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	255	C

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-250-LMP.dwg



LEGEND

- STORMWATER PIPE & PIT
- SEWER & MAINTENANCE STRUCTURES
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
- PROPOSED FOOTPATH (1.5m)
- PROPOSED SHARED PATH (2.0m)
- PROPOSED NATURE STRIP
- ALTERNATIVE PAVEMENT DESIGN

LEGEND:

- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Oran Park NSW 2570
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: INTERSECTION DETAILS
SHEET 1 OF 3

Sheet 91 of 145

Scale 1:200 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	300	B

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LEGEND

- STORMWATER PIPE & PIT
- SEWER & MAINTENANCE STRUCTURES
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
- PROPOSED FOOTPATH (1.5m)
- PROPOSED SHARED PATH (2.0m)
- PROPOSED NATURE STRIP
- ALTERNATIVE PAVEMENT DESIGN

LEGEND:

- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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0 2.5 5 10 15 20
SCALE 1:250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: INTERSECTION DETAILS
SHEET 2 OF 3

Sheet 92 of 145

Scale 1:250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	301	B

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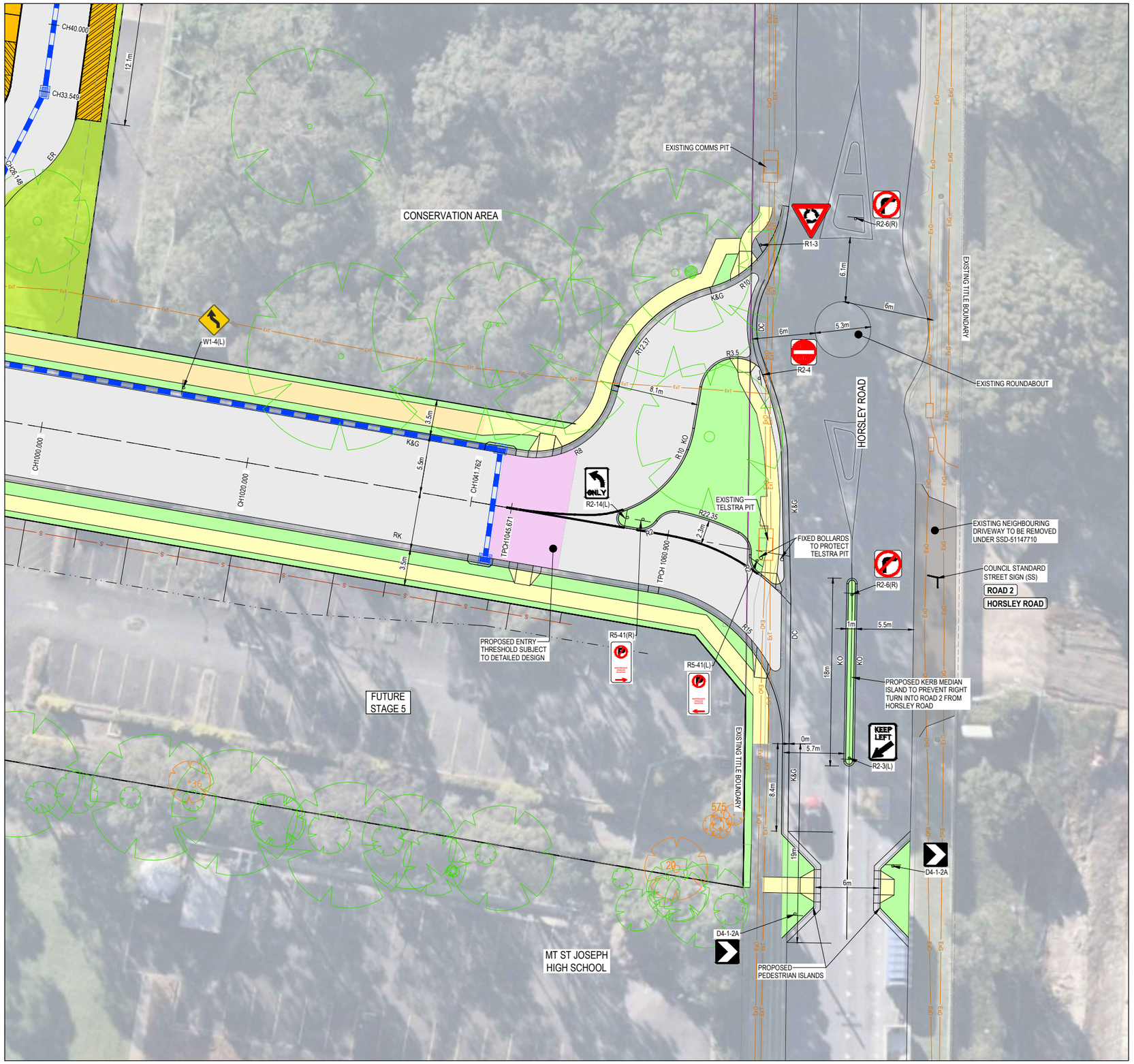

LEGEND

- STORMWATER PIPE & PIT
- SEWER & MAINTENANCE STRUCTURES
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
- PROPOSED FOOTPATH (1.5m)
- PROPOSED SHARED PATH (2.0m)
- PROPOSED NATURE STRIP
- ALTERNATIVE PAVEMENT DESIGN

LEGEND:

- INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: INTERSECTION DETAILS
SHEET 3 OF 3

Sheet 93 of 145

Scale 1:200 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	302	B

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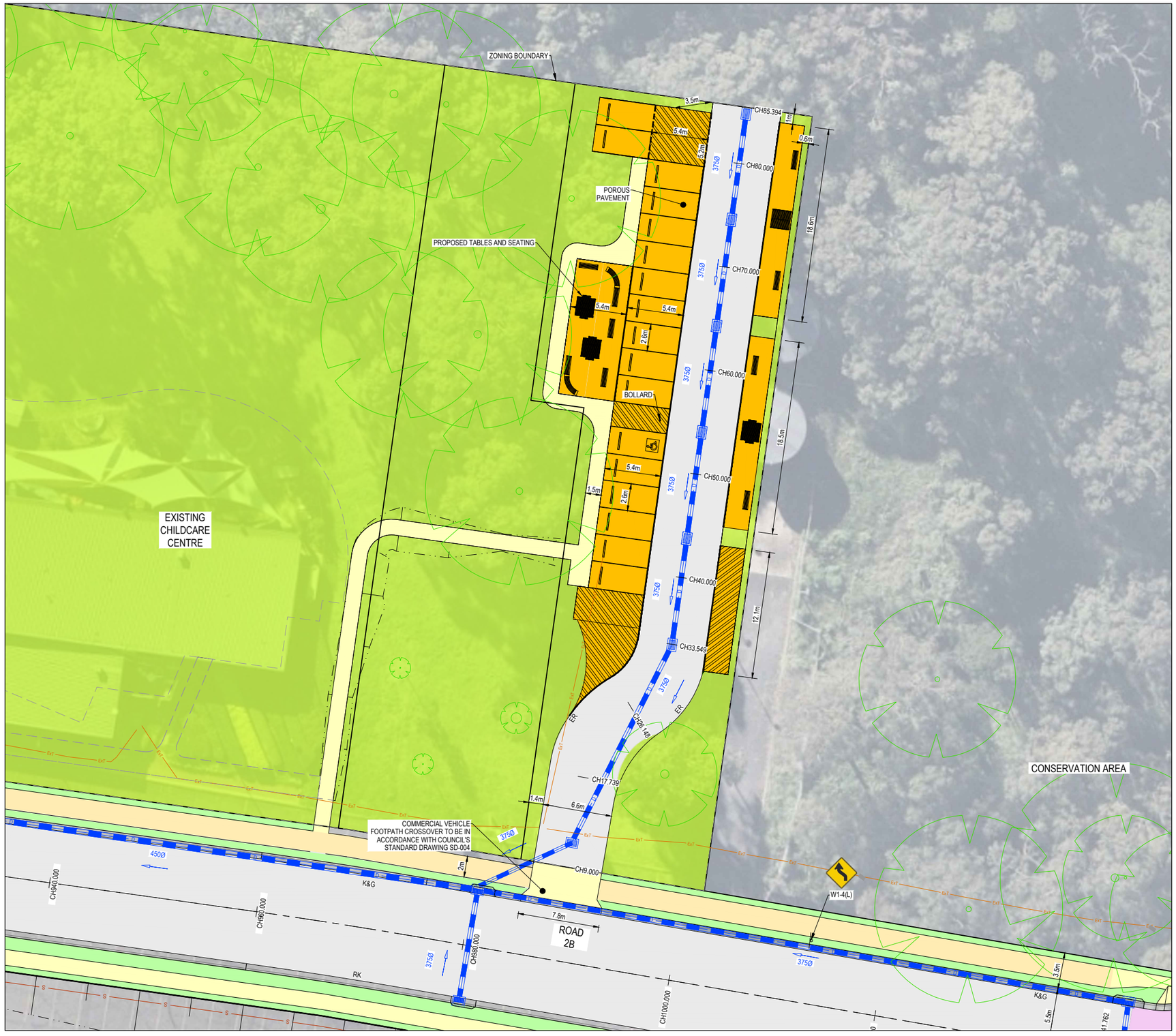

LEGEND

- STORMWATER PIPE & PIT
- SEWER & MAINTENANCE STRUCTURES
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELECOMMUNICATIONS
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING TREE TO BE REMOVED AND REPLACED AS PER ARBORIST ADVICE DUE TO IMPACTS BY UNDERGROUND ELECTRICAL WORKS
- EXISTING TREE
- PROPOSED FOOTPATH
- PROPOSED NATURE STRIP
- ALTERNATIVE PAVEMENT DESIGN
- POROUS PAVEMENT

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REV	DESCRIPTION	DATE	DRN.	APP.
C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	CARPARK AMENDED	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: INTERSECTION DETAILS
CARPARK

Sheet 94 of 145

Scale 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	303	C

C:\12DWS\data\MELSQL01\Eng - 321_3578\Drawings\2301879-321-300-INT.dwg

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 12.5 25 50 75 100
SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
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Date	07.11.25
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL RETAINING WALLS

Sheet 95 of 145

Scale 1:1250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	400	B

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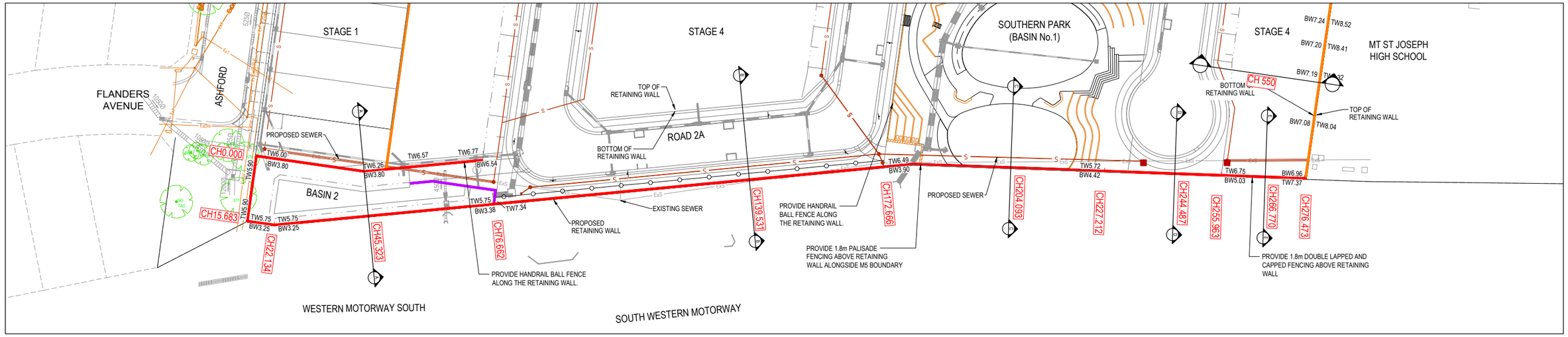
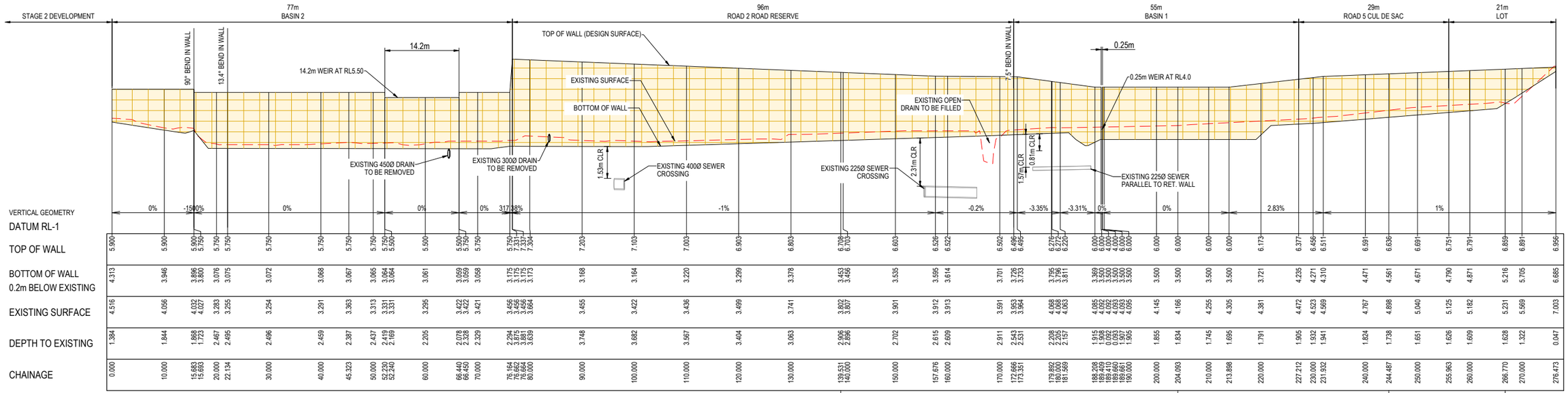


LAYOUT PLAN
SCALE 1:500 AT A1 SIZE

LEGEND - RETAINING WALLS

- POST & CONCRETE SLEEPER RETAINING WALL
- MASONRY BLOCK RETAINING WALL
- SANDSTONE BLOCK RETAINING WALL



RETAINING WALL LONGITUDINAL SECTION
SCALE H1:400 V1:100AT A1 SIZE

HORIZ. 1:400 0 4 8 16 24 32
VERT. 1:100 0 1 2 4 6 8
SCALE AT A1 SIZE

WARNING
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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

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0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: RETAINING WALL
ALONG SOUTH WESTERN MORTORWAY
LAYOUT & LONG-SECTION

Sheet 96 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	401	B

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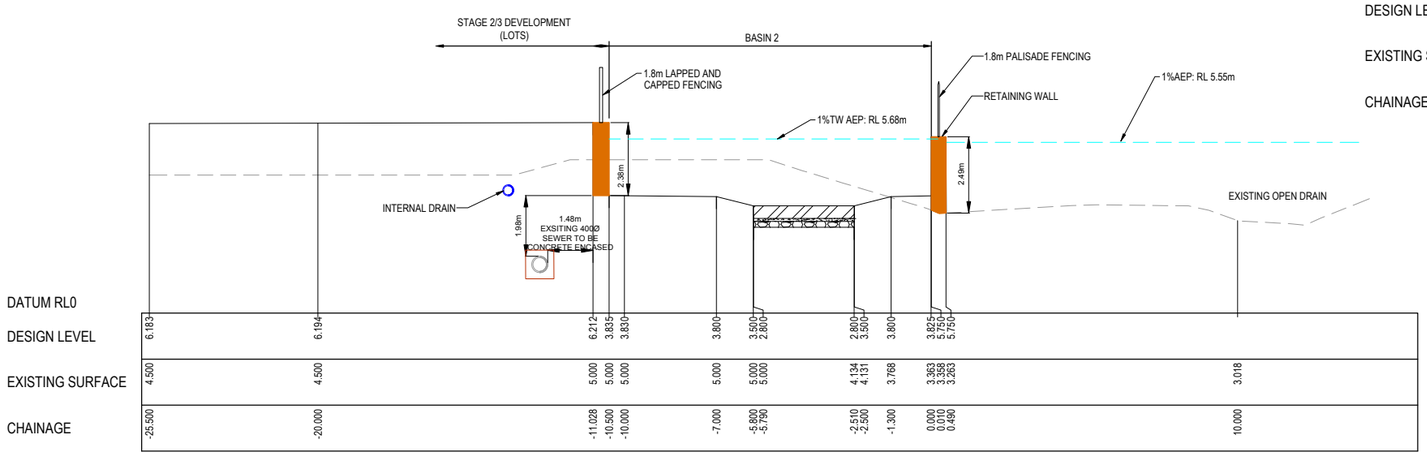
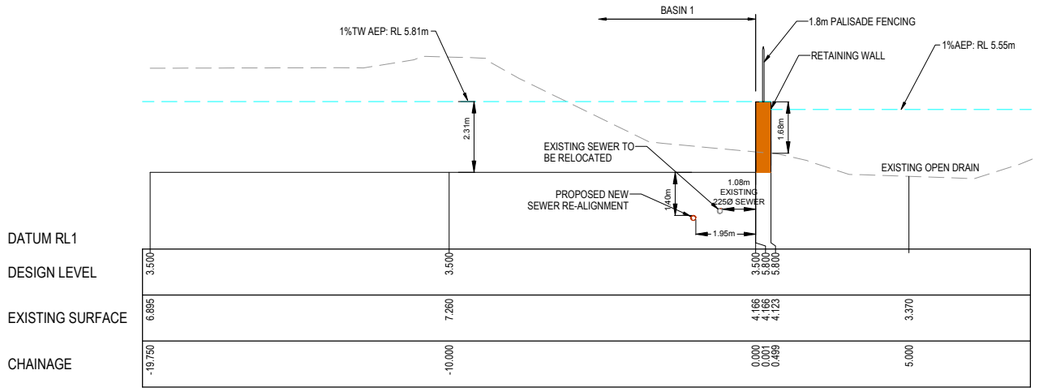


SECTION A-A - CH 45.323



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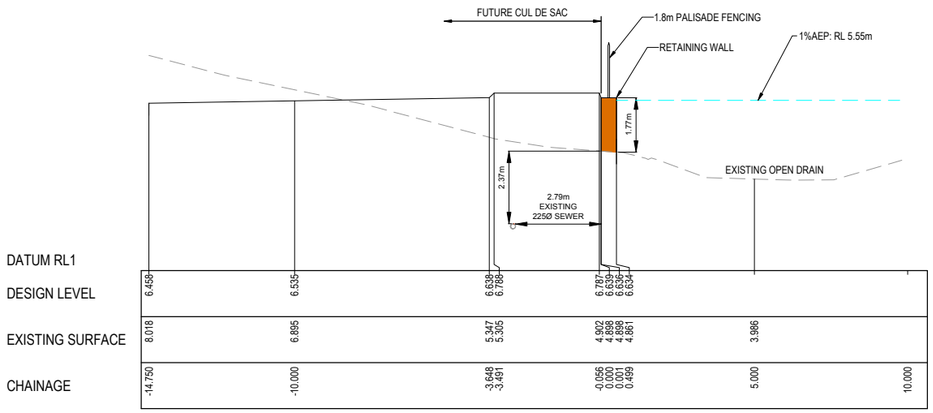

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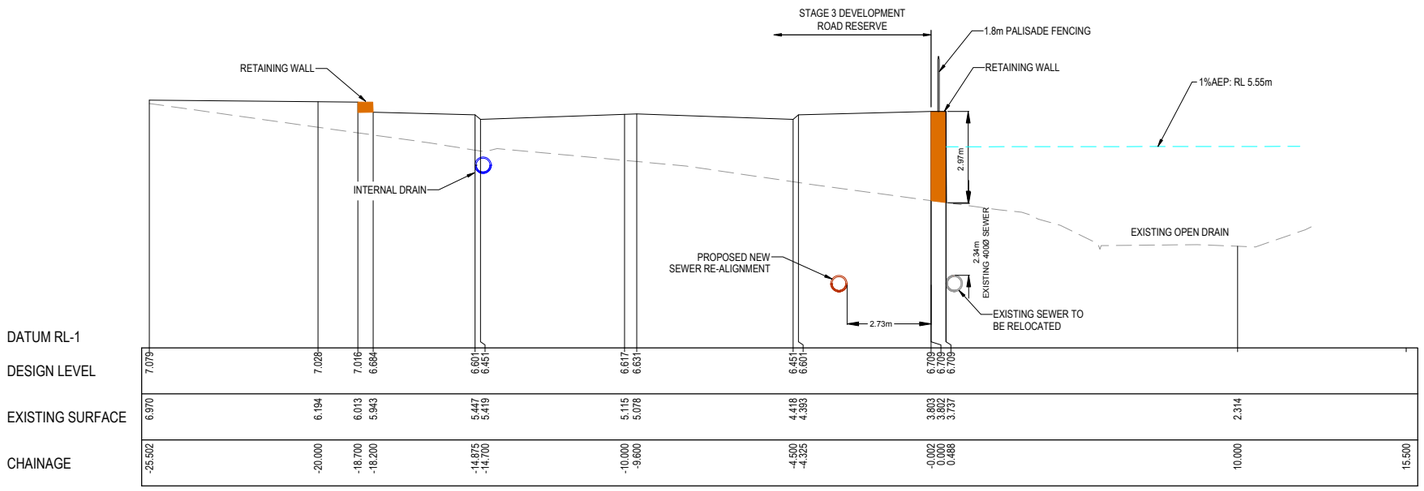
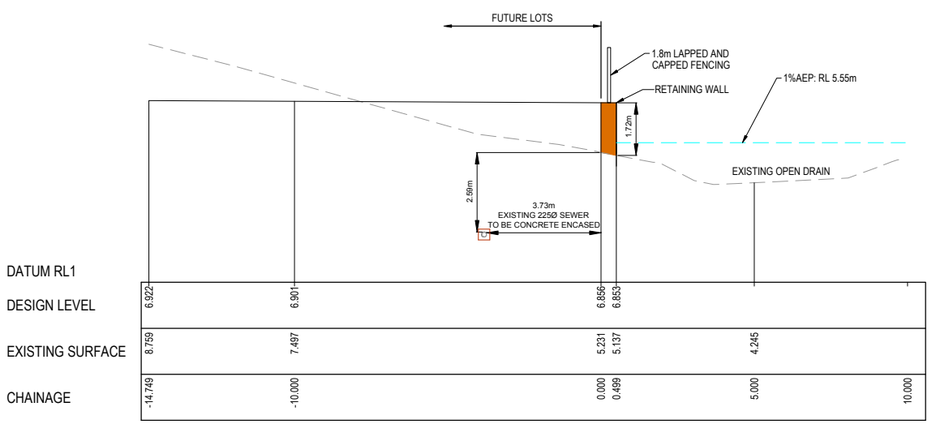


SECTION B-B - CH 139.531



SECTION E-E - CH 266.770

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
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Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: RETAINING WALL CROSS SECTIONS

Sheet 97 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	402	B

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NOTE:
TEMPORARY OSD BASIN 1 TO BE CONSTRUCTED WITH STAGE 1 WORKS AND DECOMMISSIONED WITH STAGE 4 WORKS

ASHFORD AVENUE

STAGE 1

STAGE 2

FUTURE STAGE 4

1.5m D.E

1.2m D.E

1.5m D.E

900Ø

1200Ø

1200Ø

300Ø

450Ø

150Ø

1 IN 3 BATTER TO EXISTING

TEMPORARY TURNING AREA WITH 1 IN 6 BATTERS PART OF STAGE 2 WORKS

MINIMUM 500mm COVER TO PROVIDE TO PIPE

SWALE WITH 1 IN 3 BATTERS TO EXISTING PART OF STAGE 2 WORK

PROVIDE TEMPORARY SANDBAG ENDWALL TO NEW STORMWATER COMMON DRAINAGE LINE TO DISCHARGE TO TEMPORARY RAINGARDEN PART OF STAGE 1 WORKS

STAGE 1 BOUNDARY

EXISTING 1488m³ BASIN CONSTRUCTED UNDER UNDER DA1512-2023 AS PART OF THE "DEMOLITION" STAGE IS TO REMAIN AND BE UTILISED FOR STAGE 1 CIVIL WORKS. SEDIMENT BASIN VOLUME IS TO BE MINIMUM 228m3 TO PROVIDE TREATMENT FOR STAGES 1 & 2 IF COMPLETED CONCURRENTLY.

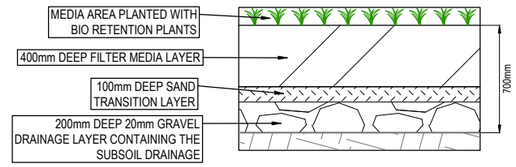
AT THE COMPLETION OF CONSTRUCTION WORKS, SEDIMENT BASIN IS TO BE CONVERTED INTO TEMPORARY RAINGARDEN WITH A MINIMUM FILTER MEDIA AREA OF 68m2. REFER TO DETAIL ON THIS SHEET.

PROPOSED RAINGARDEN

SWALE WITH 1 IN 3 BATTERS TO EXISTING PART OF STAGE 1 WORK

STAGE 4 BOUNDARY

SOUTH WESTERN M5 MOTORWAY



DETAIL B
TEMPORARY RAINGAREDEN DETAIL
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0 2.5 5 10 15 20
SCALE 1:250 AT A1 SIZE

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Date	23.06.2025
Drawn	D.RAFTER
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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TEMPORARY OSD BASIN 1 SHEET 1 OF 2

Sheet 98 of 145
Scale 1:250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	500	B

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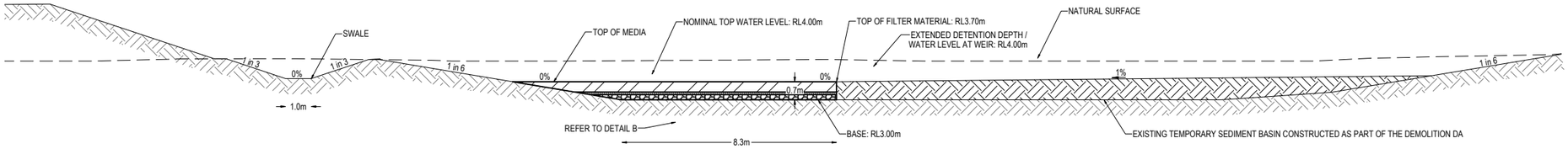
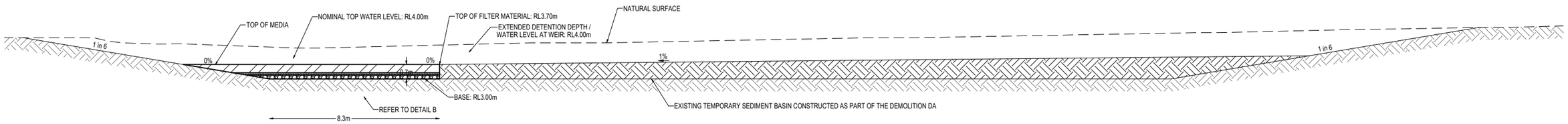
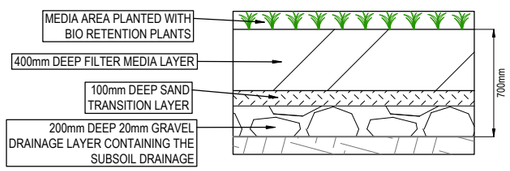


SECTION A-A
SEDIMENT BASIN TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE



SECTION B-B
SEDIMENT BASIN TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE



DETAIL B
TEMPORARY RAINGAREDEN DETAIL
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REV	DESCRIPTION	DATE	DRN.	APP.

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SCALE 1:200 AT A1 SIZE

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Date	23.06.2025
Drawn	D.RAFTER
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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TEMPORARY OSD BASIN 1 SHEET 2 OF 2

Sheet 99 of 145
Scale 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	501	B

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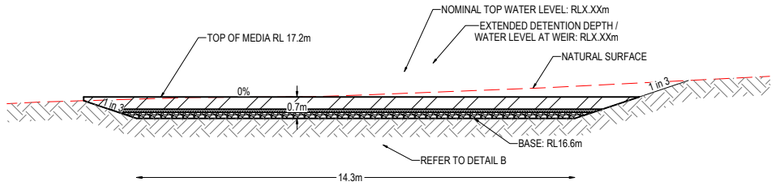


SECTION A-A
SEDIMENT BASIN TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE

FUTURE STAGE 6

SEDIMENT BASIN TO BE CONSTRUCTED PRIOR TO COMMENCEMENT OF WORKS AND CLEANED AS NECESSARY FOR USE. SEDIMENT BASIN VOLUME IS TO BE MINIMUM 169m³ TO PROVIDE TREATMENT FOR DEVELOPMENT

AT THE COMPLETION OF CONSTRUCTION WORKS, SEDIMENT BASIN TO BE CONVERTED INTO TEMPORARY RAINGARDEN WITH A MINIMUM FILTER AREA OF 169m². REFER TO DETAIL ON THIS SHEET

150Ø

SOLID 150mm DIA. UPVC PIPE GRADED AT 1% TO DAYLIGHT

1500

1 IN 3 BATTERS

DISCHARGE CONTROL PIT

PROVIDE TEMPORARY SANDBAG ENDWALL TO TEMPORARY STORMWATER COMMON DRAINAGE LINE TO DISCHARGE TO TEMPORARY RAINGARDEN PART OF STAGE 3 WORKS

TEMPORARY DRAINAGE PIPE INTO SEDIMENT BASIN

6750

PERMANENT DRAINAGE PIT AND PIPES CONSTRUCTED OUTSIDE OF STAGE 3 TO HAVE LINTELS PLATED OFF

ROAD 2B

PROVIDE TEMPORARY SANDBAG ENDWALL TO NEW STORMWATER COMMON DRAINAGE LINE TO DISCHARGE TO TEMPORARY RAINGARDEN PART OF STAGE 1 WORKS

TEMPORARY SWALE WITH 1 IN 3 BATTERS GRADED AT 0.5% TO BASIN

DISCHARGE CONTROL PIT

6750

FUTURE STAGE 5

375Ø

PERMANENT DRAINAGE PIPE CONSTRUCTED OUTSIDE OF STAGE 3 TO HAVE LINTELS PLATED OFF

FUTURE STAGE 6

STAGE 6 BOUNDARY

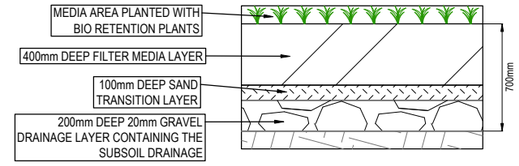
STAGE 3

ROAD 9

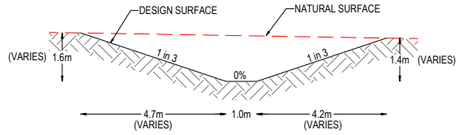
NOTE:
TEMPORARY OSD BASIN 2 TO BE CONSTRUCTED WITH STAGE 3 WORKS AND DECOMMISSIONED WITH STAGE 6 WORKS.

CONSERVATION AREA

STAGE 3A & 3B



DETAIL B
TEMPORARY RAINGAREDEN DETAIL
NOT TO SCALE



SECTION B-B
SWALE TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE

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0 2.5 5 10 15 20
SCALE 1:250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
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Date	07.11.25
DA Number	-

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Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

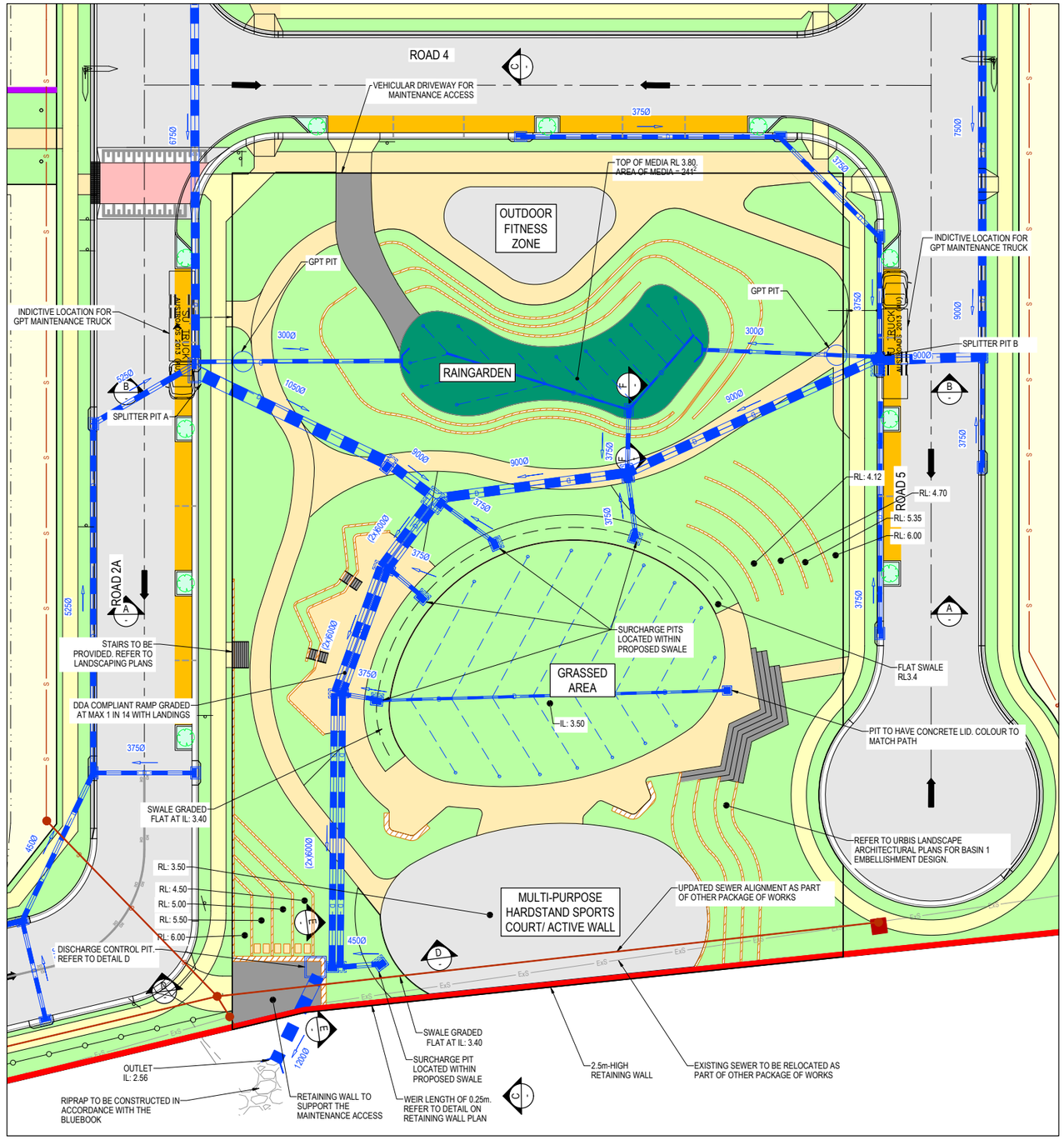
Drawing Title: TEMPORARY OSD BASIN 2

Sheet 100 of 145

Scale: 1:250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	502	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b5bfe4405e2f\2301879-321-500-OSD.dwg

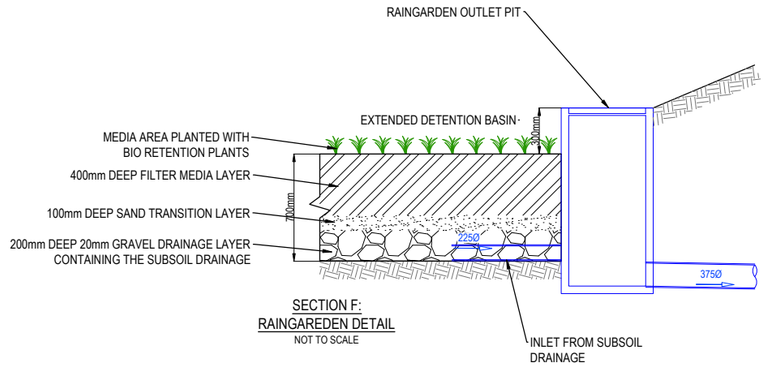


LEGEND:

INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

LEGEND - LAYOUT PLAN

- GRASSED AREA
- FOOTPATH
- CONCRETED AREA
- RETAINING WALL
- RAINGARDEN
- DRIVEWAY
- SUBSOIL DRAINAGE
- STORMWATER DRAIN & PIT



SECTION F:
RAINGAREDEN DETAIL
NOT TO SCALE

REFER TO URBIS LANDSCAPE ARCHITECTURAL PLANS FOR BASIN 1 EMBELLISHMENT DESIGN.

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2.5 5 10 15 20
SCALE 1:250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	OSD BASIN

Sheet 101 of 145

Scale 1:250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	505	B

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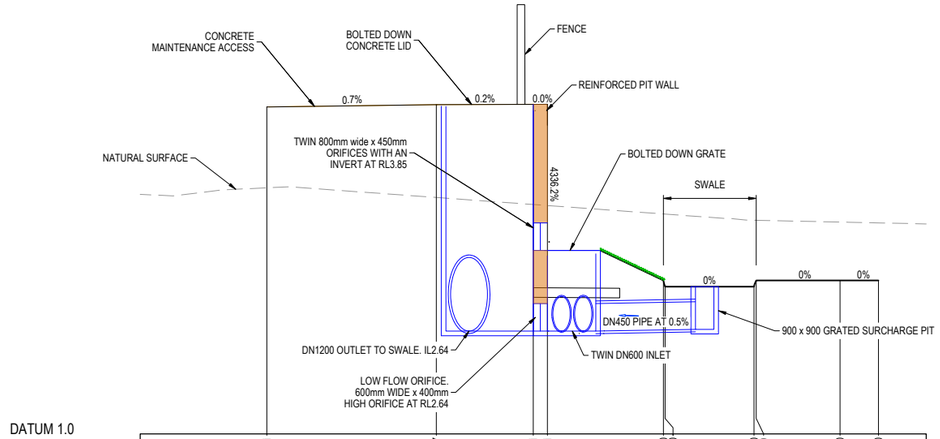

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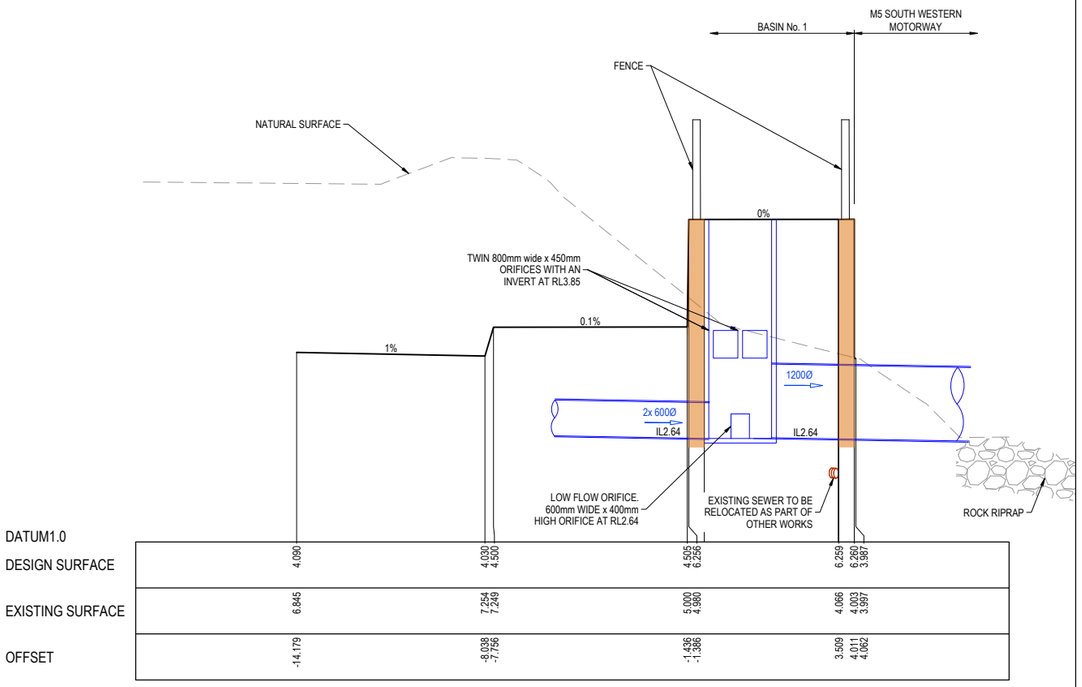

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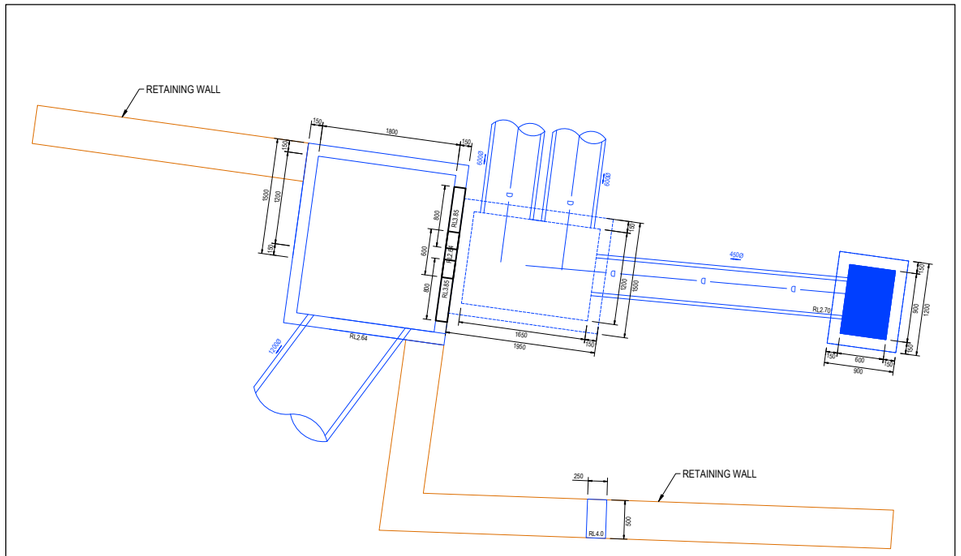
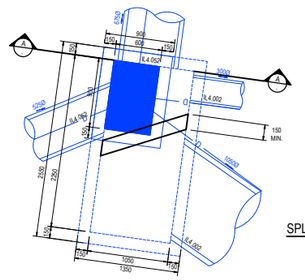
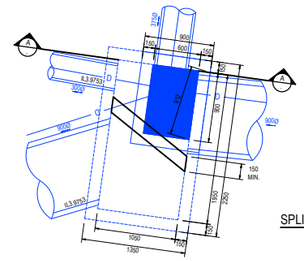


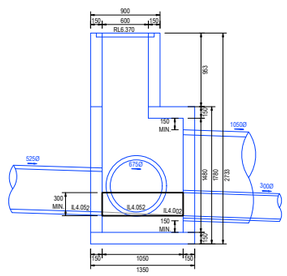
DISCHARGE CONTROL PIT D
PLAN
SCALE 1:50



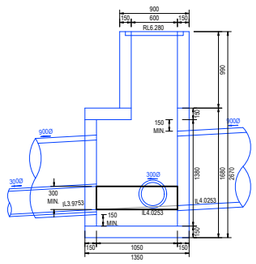
SPLITTER PIT A
PLAN
SCALE 1:50



SPLITTER PIT B
PLAN
SCALE 1:50



SPLITTER PIT A
DETAIL AA
SCALE 1:50



SPLITTER PIT B
DETAIL AA
SCALE 1:50

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

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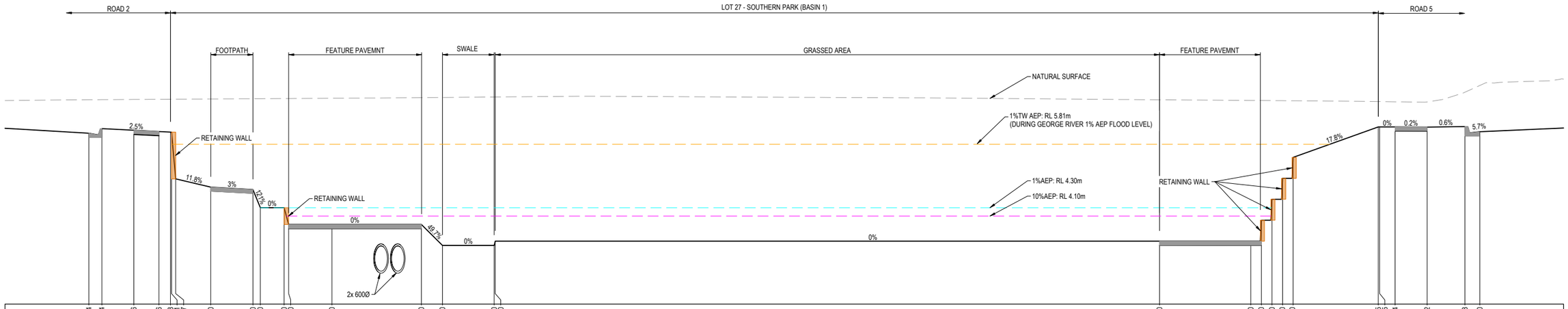
Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	OSD BASIN

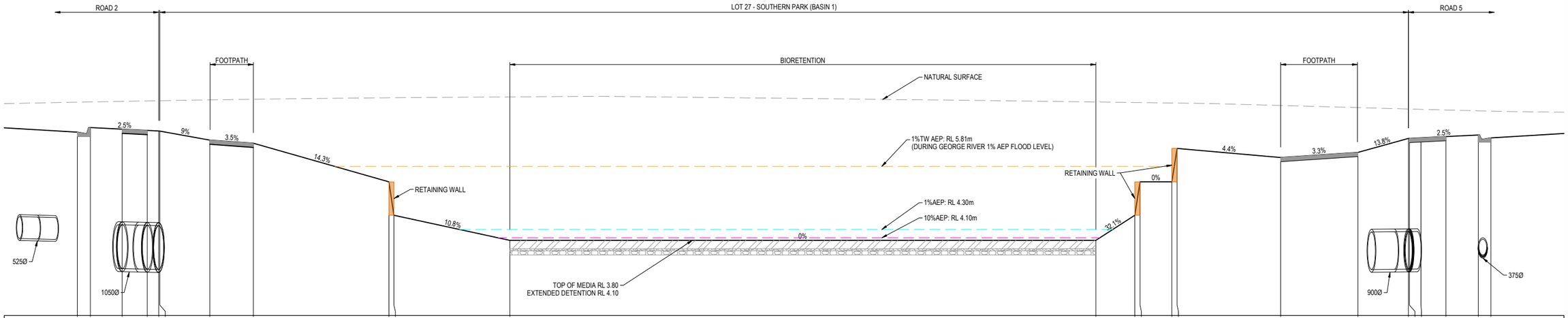
Sheet 102 of 145
Scale 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	506	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-505-OSD.dwg



SECTION A



SECTION B

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

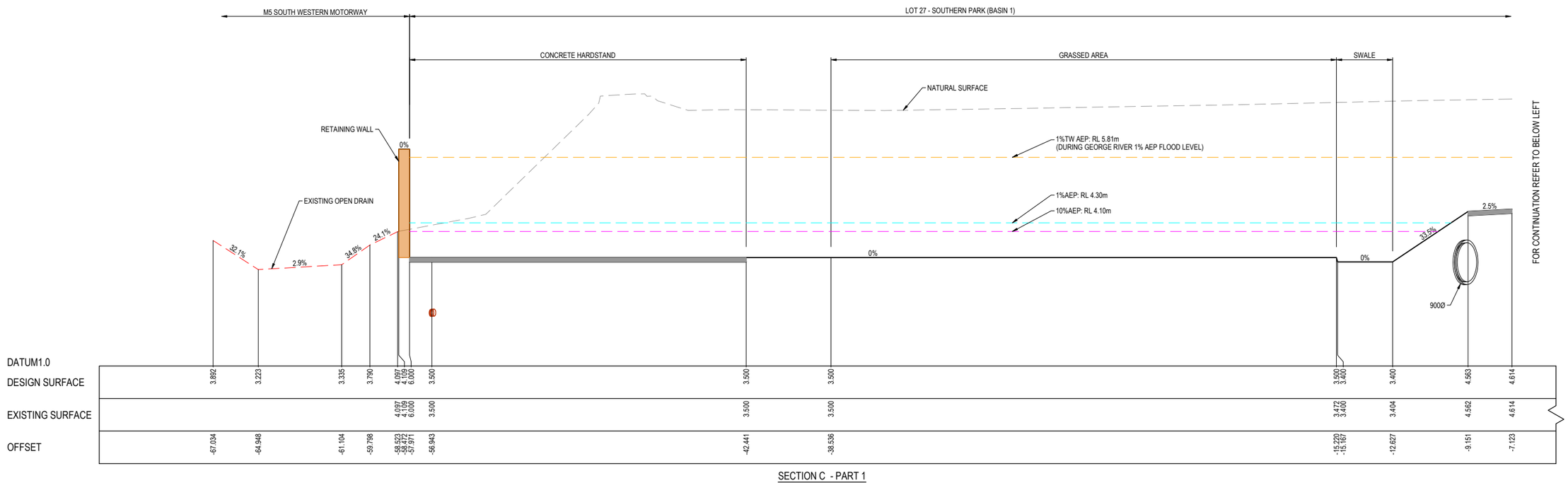
Drawing Title: OSD BASIN

Sheet 103 of 145

Scale: 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	507	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-505-OSD.dwg



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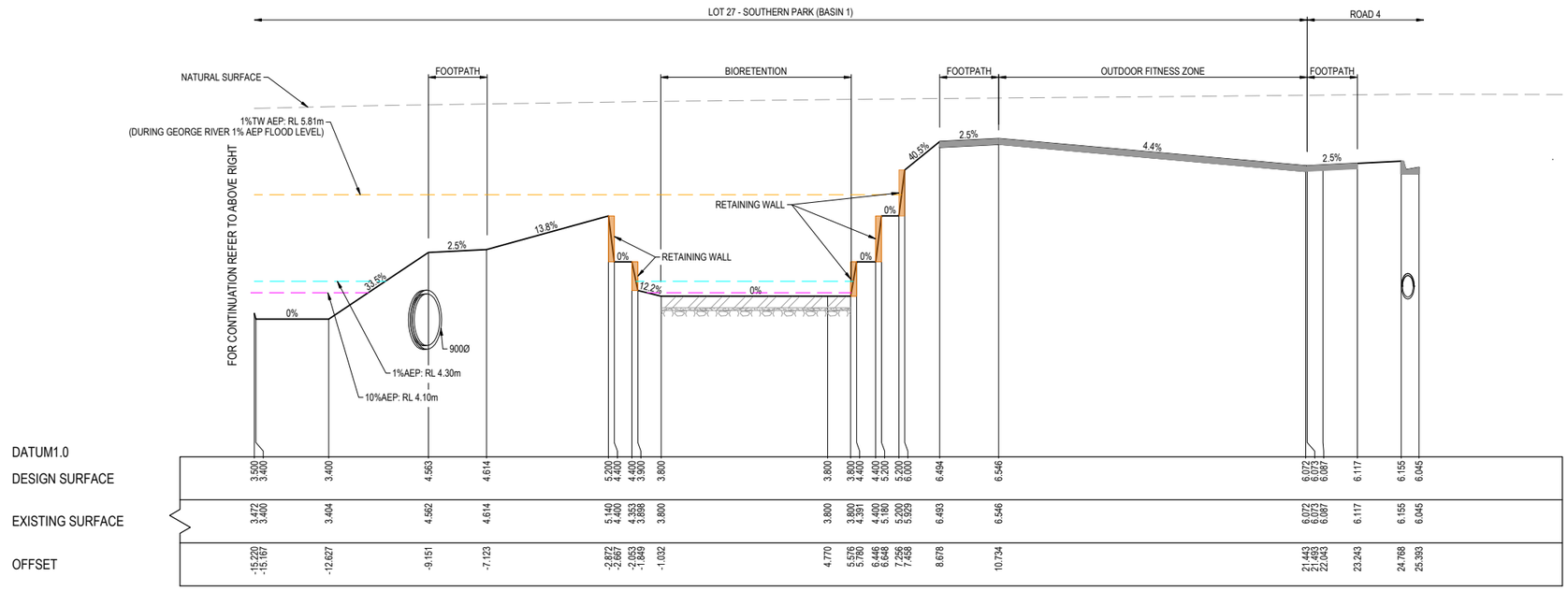

SECTION C - PART 2

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A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

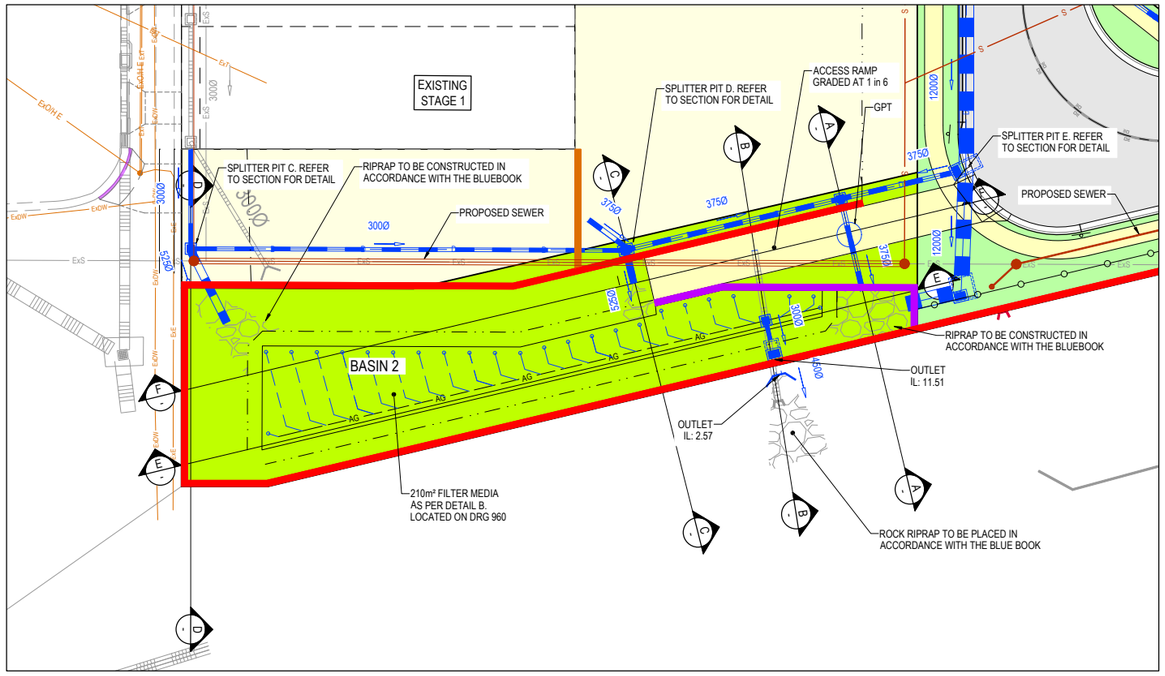
Drawing Title: OSD BASIN

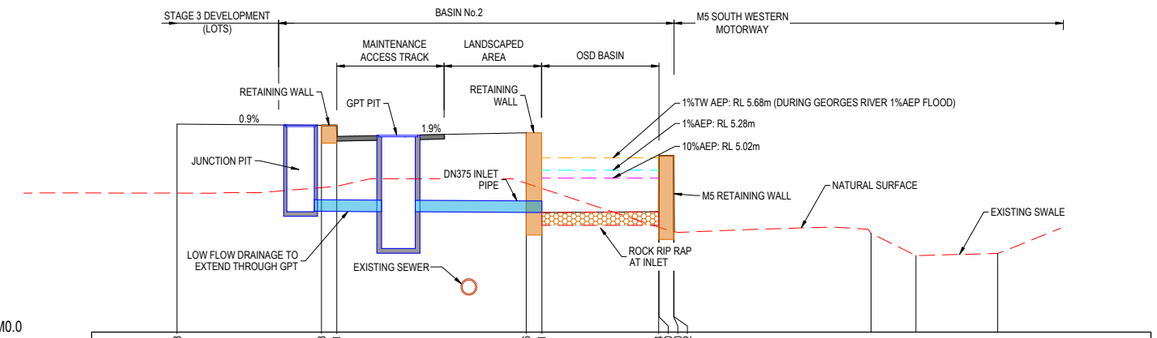
Sheet 104 of 145

Scale: 1:200 @ A1

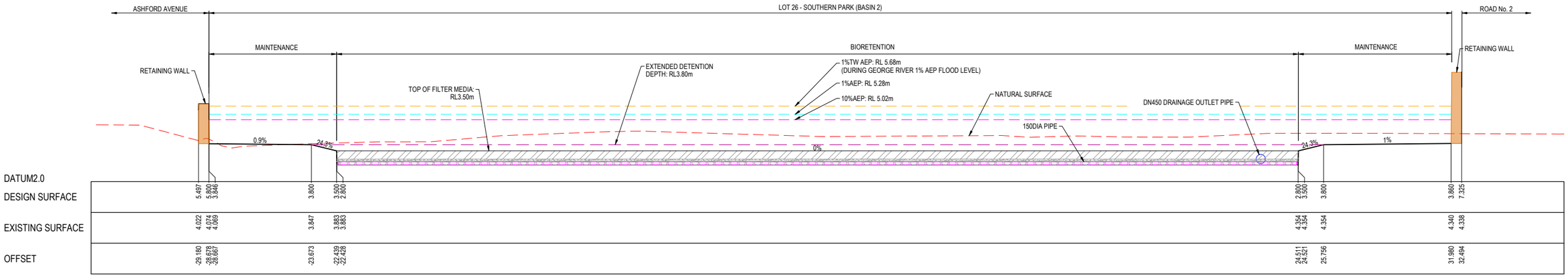
Project Ref	Stage No	Drawing No	Rev
2301879	321	508	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-505-OSD.dwg


EXISTING STAGE 1
SPLITTER PIT C. REFER TO SECTION FOR DETAIL
RIPRAP TO BE CONSTRUCTED IN ACCORDANCE WITH THE BLUEBOOK
PROPOSED SEWER
SPLITTER PIT D. REFER TO SECTION FOR DETAIL
ACCESS RAMP GRADED AT 1 in 6
GPT
SPLITTER PIT E. REFER TO SECTION FOR DETAIL
PROPOSED SEWER
RIPRAP TO BE CONSTRUCTED IN ACCORDANCE WITH THE BLUEBOOK
BASIN 2
OUTLET IL: 11.51
OUTLET IL: 2.57
210m² FILTER MEDIA AS PER DETAIL B. LOCATED ON DRG 960
ROCK RIPRAP TO BE PLACED IN ACCORDANCE WITH THE BLUE BOOK


STAGE 3 DEVELOPMENT (LOTS)
BASIN No.2
M5 SOUTH WESTERN MOTORWAY
MAINTENANCE ACCESS TRACK
LANDSCAPED AREA
OSD BASIN
RETAINING WALL
GPT PIT
RETAINING WALL
0.9%
1.9%
1%TW AEP: RL 5.68m (DURING GEORGES RIVER 1%AEP FLOOD)
1%AEP: RL 5.28m
10%AEP: RL 5.02m
JUNCTION PIT
DN375 INLET PIPE
M5 RETAINING WALL
NATURAL SURFACE
EXISTING SWALE
LOW FLOW DRAINAGE TO EXTEND THROUGH GPT
EXISTING SEWER
ROCK RIP RAP AT INLET

| | | |



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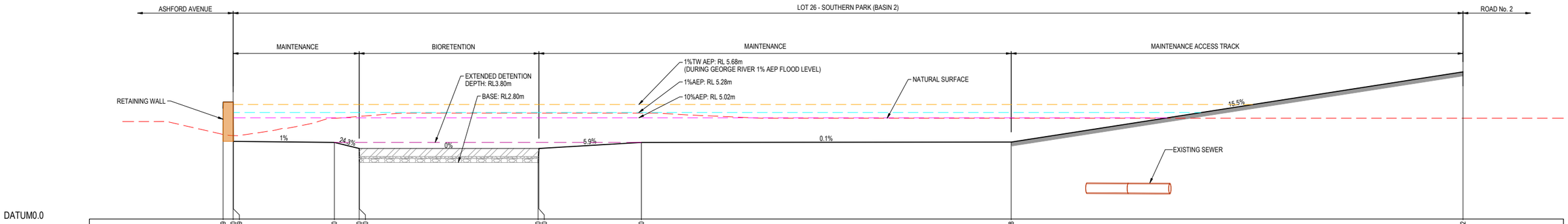

SECTION F

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
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Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OSD BASIN

Sheet 106 of 145

Scale: 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	510	B

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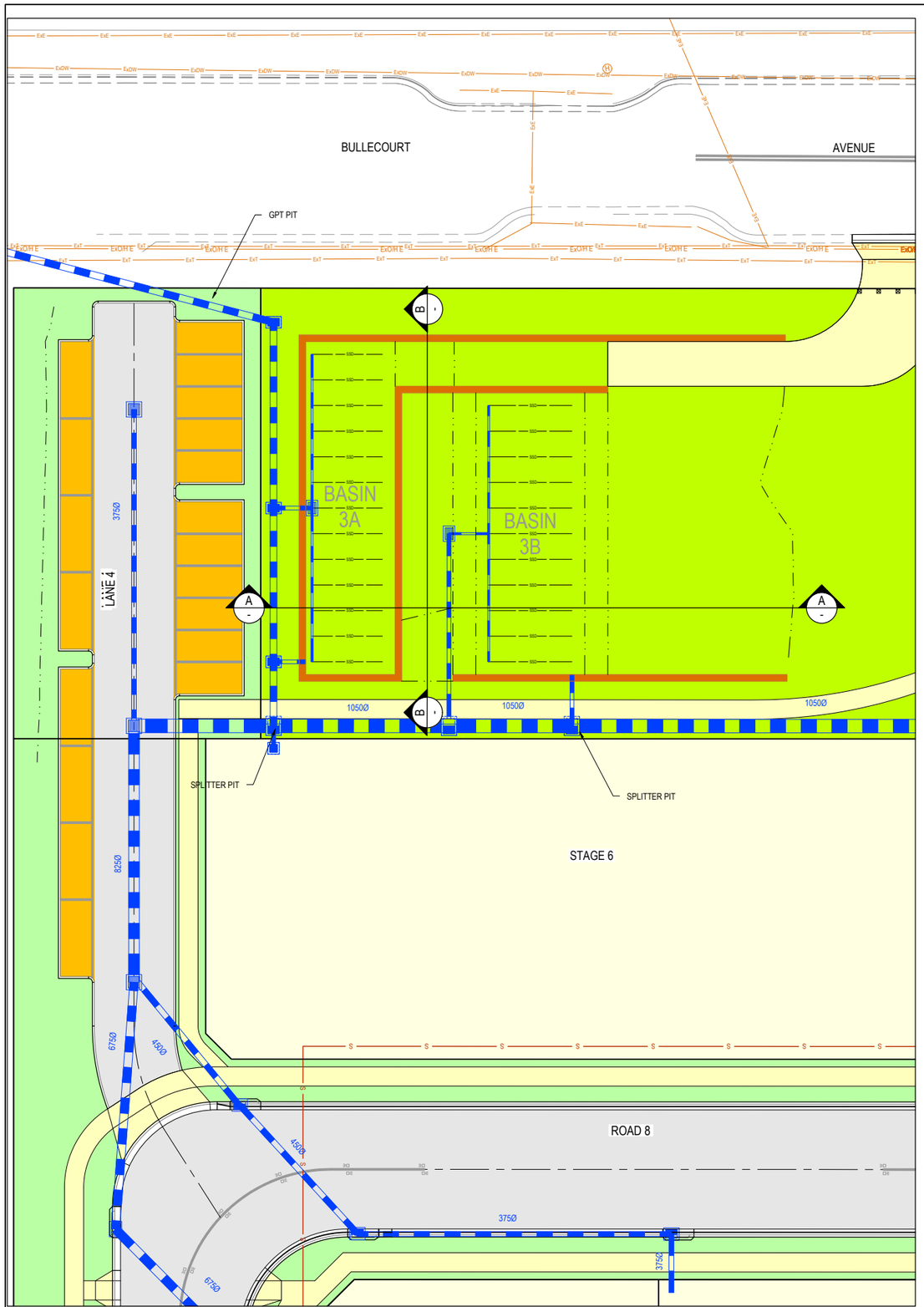
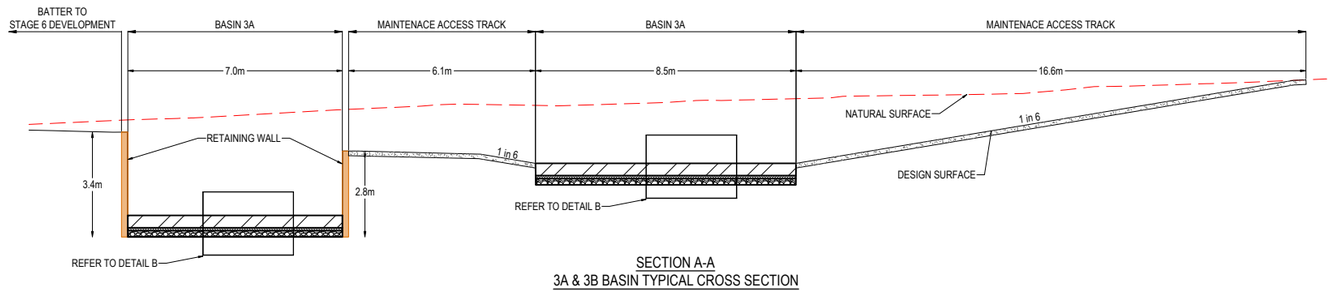
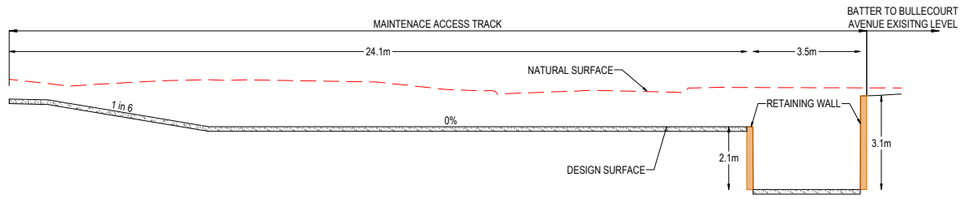


LEGEND:

_ _ _ _ INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL



SECTION A-A
3A & 3B BASIN TYPICAL CROSS SECTION
SCALE HOR. 1:100 AT A1 SIZE



SECTION B-B
3A & 3B BASIN TYPICAL CROSS SECTION
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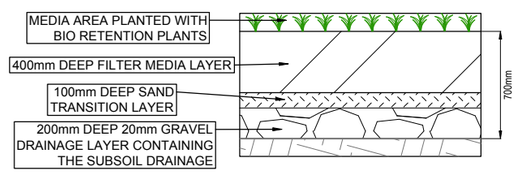

DETAIL B
TEMPORARY RAINGAREDEN DETAIL
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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
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Drawn	D.RAFTER
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www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

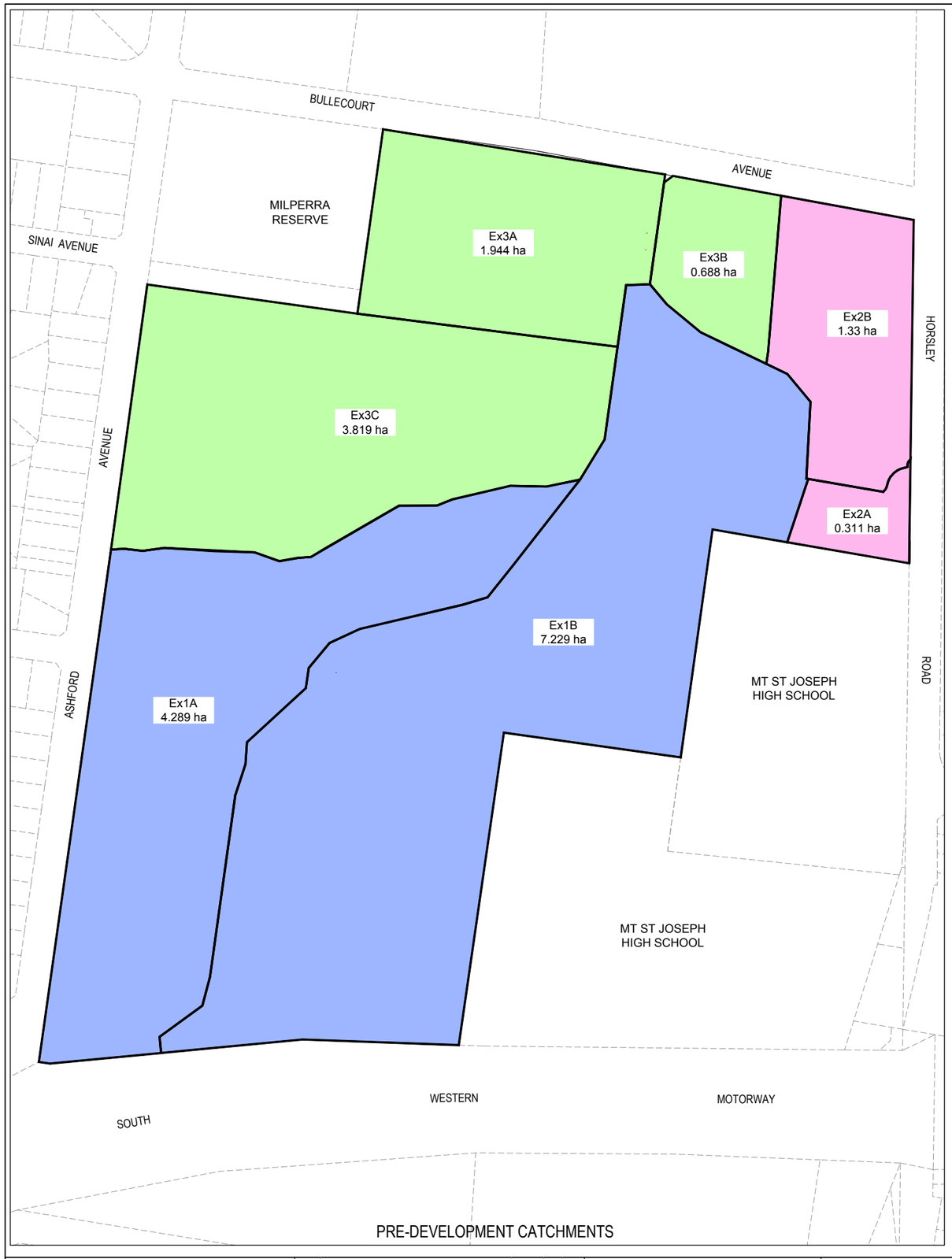
Drawing Title: OSD BASIN

Sheet 107 of 145

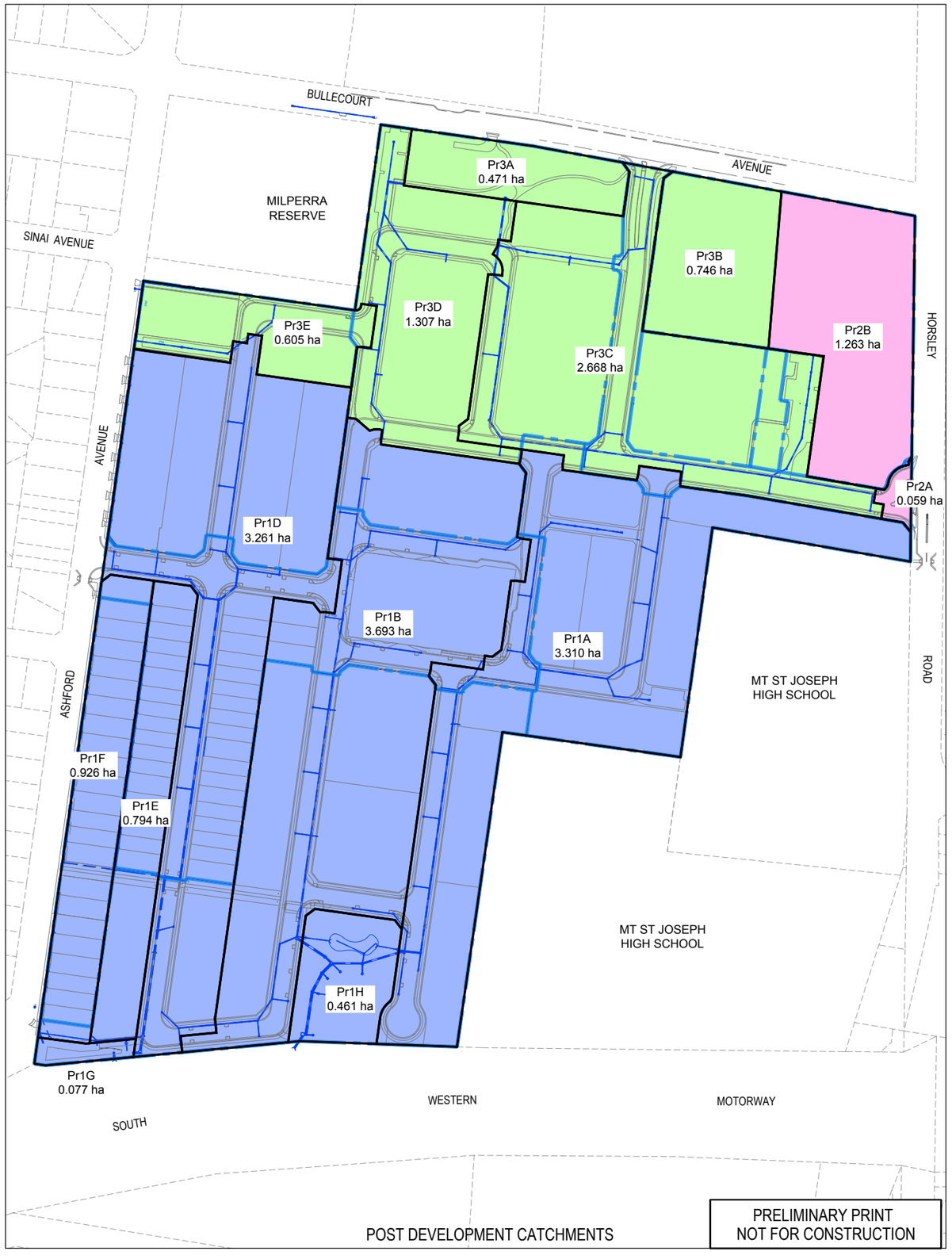
Scale: 1:200 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	511	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-505-OSD.dwg



PRE-DEVELOPMENT CATCHMENTS



POST DEVELOPMENT CATCHMENTS

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 15 30 60 90 120
SCALE 1:1500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL CATCHMENT PLAN

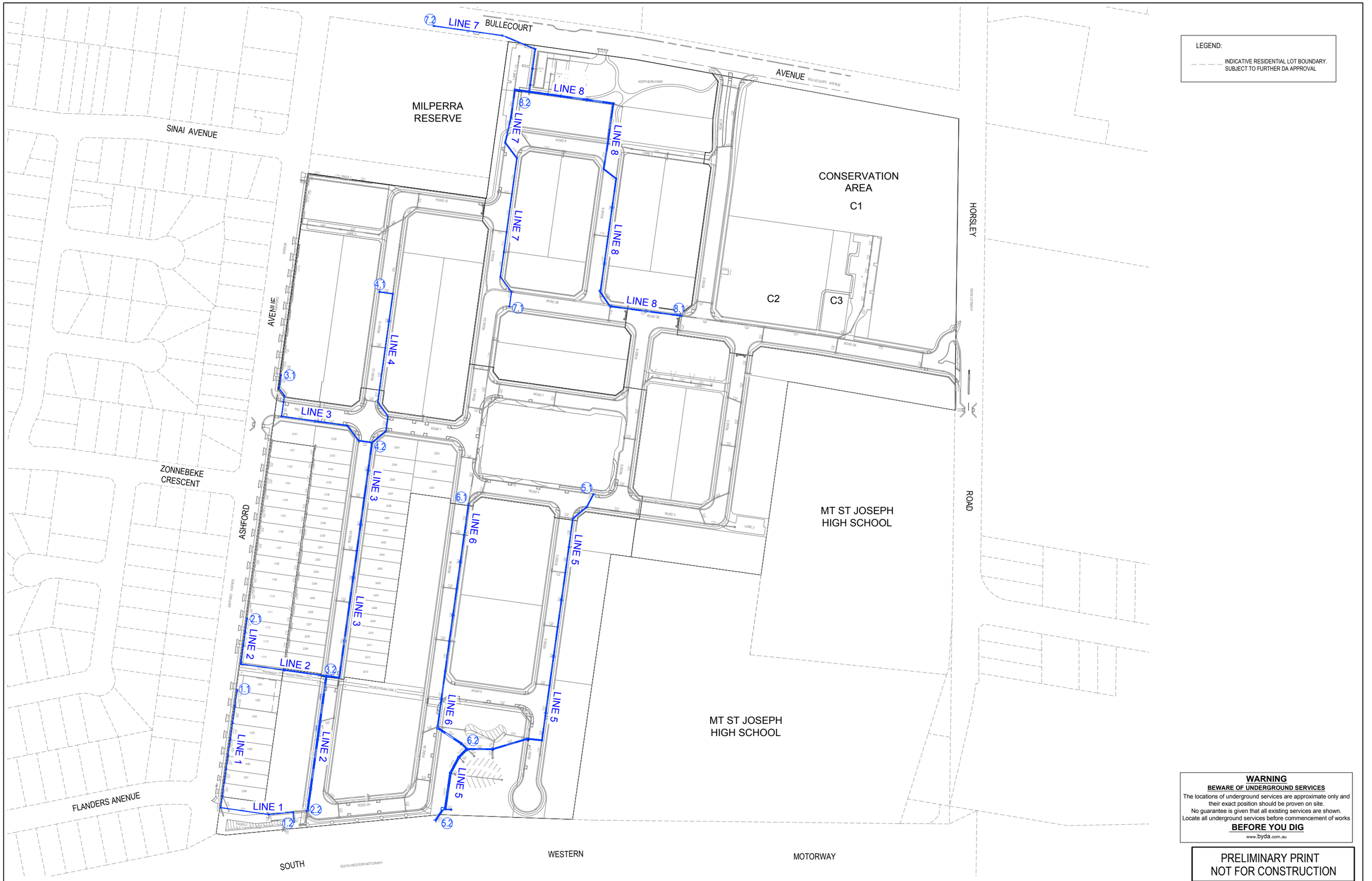
Sheet 108 of 145

Scale: 1:1500 @ A1

N

Project Ref	Stage No	Drawing No	Rev
2301879	321	550	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-550-CP.dwg



WARNING
BEWARE OF UNDERGROUND SERVICES
The locations of underground services are approximate only and their exact position should be proven on site.
No guarantee is given that all existing services are shown.
Locate all underground services before commencement of works
BEFORE YOU DIG
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REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 12.5 25 50 75 100
SCALE 1:1250 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL TRUNK DRAINAGE LAYOUT PLAN

Sheet 109 of 145

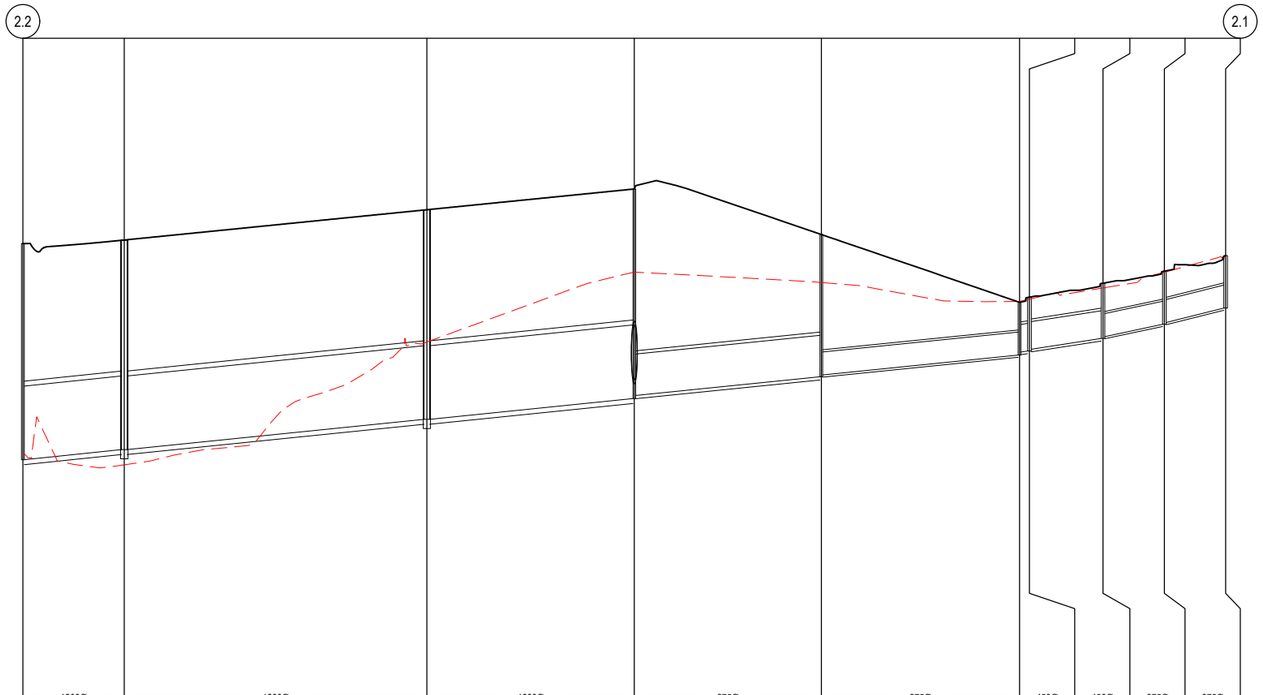
Scale: 1:1250 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	600	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-590-DRN.dwg

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

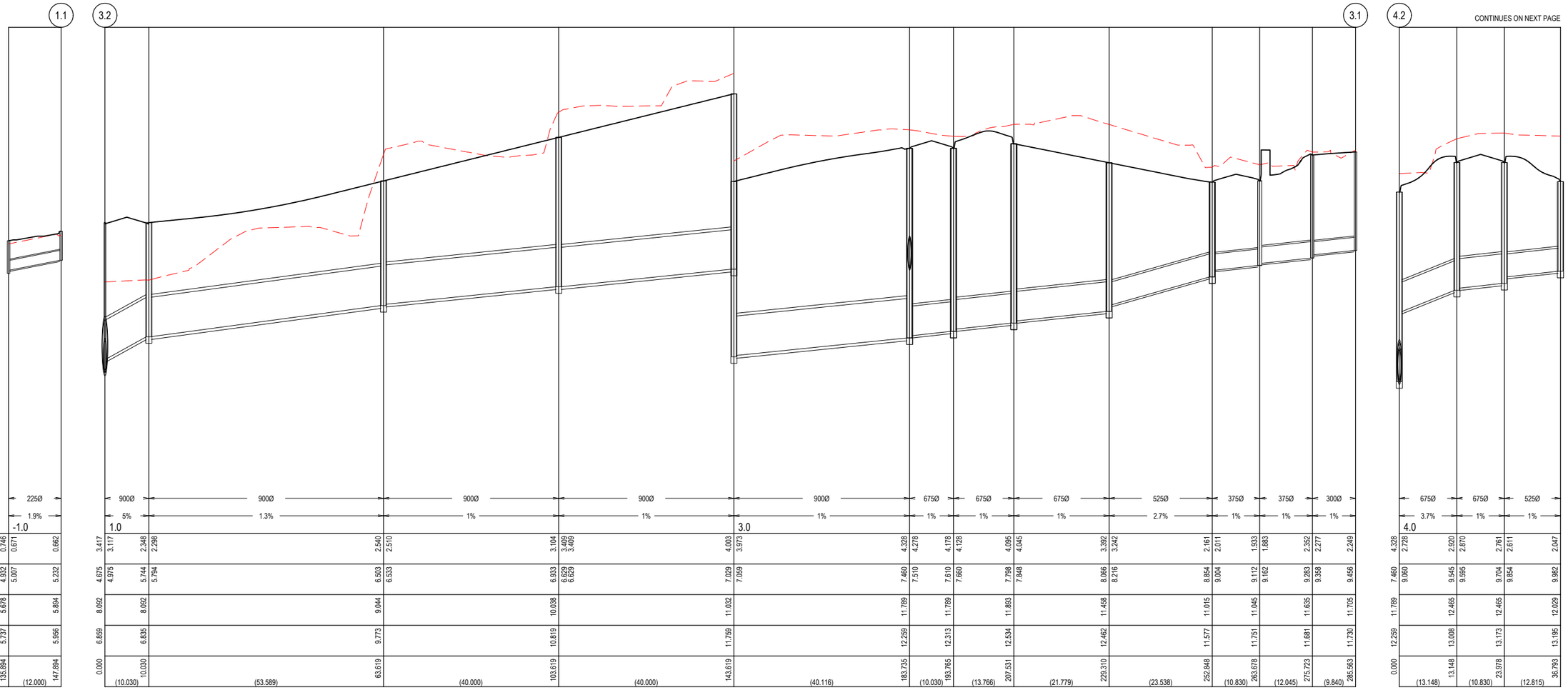
LEGEND
EXISTING SURFACE
DESIGN SURFACE



| | | |

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

LEGEND
EXISTING SURFACE
DESIGN SURFACE



| | | |

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

LEGEND
EXISTING SURFACE
DESIGN SURFACE

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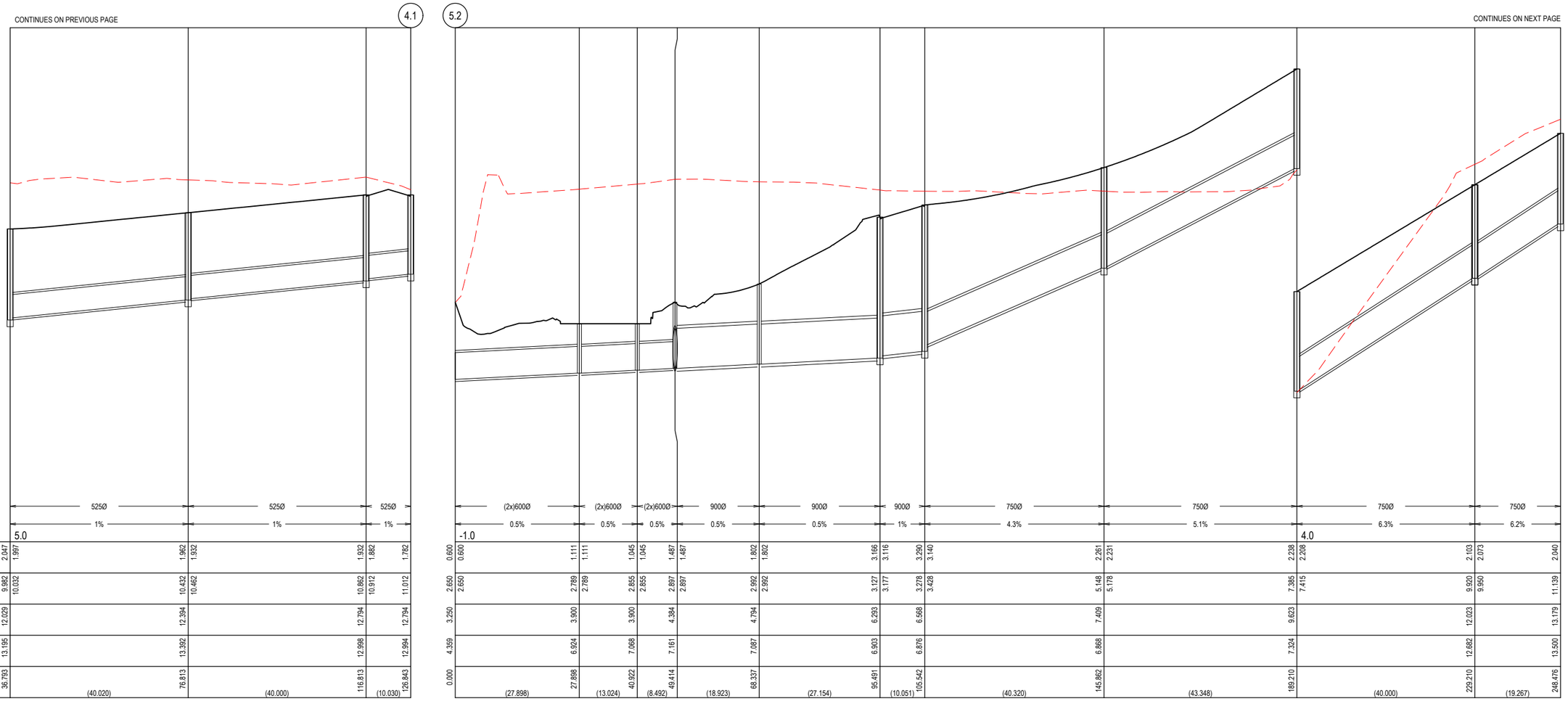


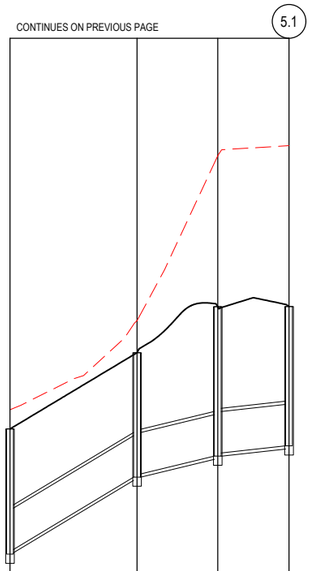
LINE 4

| | | |

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

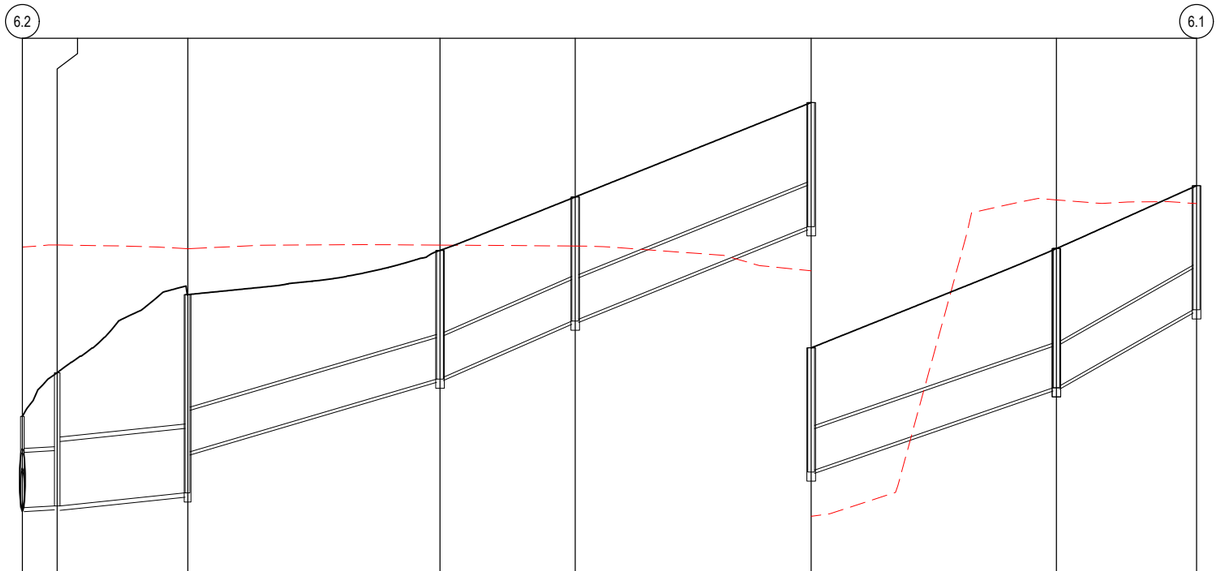
LEGEND
EXISTING SURFACE
DESIGN SURFACE

CONTINUES ON PREVIOUS PAGE



	5.1			
PIPE SIZE (mm)		675Ø	675Ø	675Ø
PIPE GRADE (%)		5.7%	2.2%	1%
DATUM	8.0			
DEPTH TO INVERT	2.040	1.965	2.028	1.978	2.436	2.386	2.272
INVERT LEVEL	11.139	11.214	12.395	12.445	12.737	12.787	12.904
FINISHED SURFACE	13.179		14.423		15.174		15.176
EXISTING SURFACE	13.500		14.945		17.633		17.798
PIPE CHAINAGE	248.476		269.210		282.358		293.997
(Reach Length)		(20.733)		(13.148)		(11.639)	

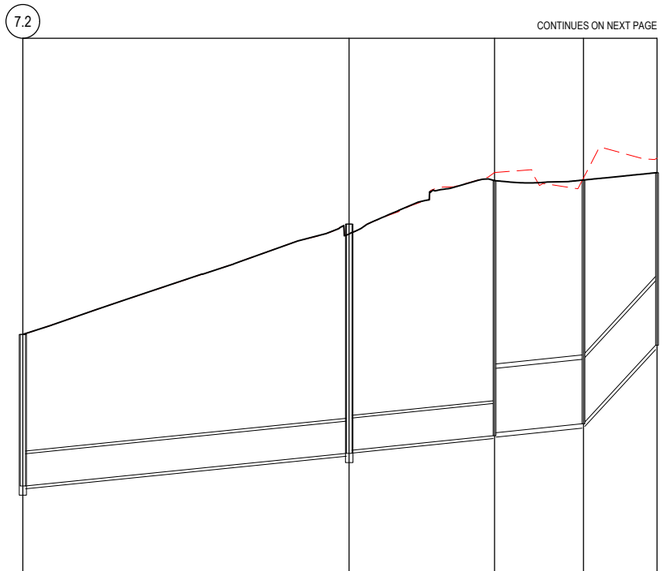
LINE 5



	6.2								6.1
PIPE SIZE (mm)		900Ø	1050Ø	675Ø	675Ø	675Ø	675Ø	675Ø	
PIPE GRADE (%)		0.5%	1%	2.9%	4.2%	3.9%	3.4%	5.4%	
DATUM	-1.0						3.0		
DEPTH TO INVERT	1.487	1.487	2.171	3.231	2.563	2.098	2.068	2.024	1.994	2.270	2.240	2.024
INVERT LEVEL	2.897	2.897	2.925	3.139	3.808	4.993	5.023	5.938	5.968	7.478	7.508	8.852	8.882	10.122
FINISHED SURFACE	4.384		5.096	6.370		7.090		7.962		9.502		11.121		12.146
EXISTING SURFACE	7.161		7.179	7.117		7.177		7.162		6.757		11.716		11.994
PIPE CHAINAGE	0.000		5.675	26.998		68.121		90.172		128.668		168.673		191.515
(Reach Length)		(5.675)		(21.323)		(41.124)		(22.050)		(38.496)		(40.005)		(22.843)	

LINE 6

CONTINUES ON NEXT PAGE



	7.2				
PIPE SIZE (mm)		525Ø	525Ø	1050Ø	1050Ø
PIPE GRADE (%)		1%	1%	1%	10.4%
DATUM	6.0				
DEPTH TO INVERT	2.471	2.471	3.738	3.688	4.160	4.110	3.974	3.944	2.813
INVERT LEVEL	10.250	10.250	10.782	10.832	11.069	11.119	11.264	11.294	12.545
FINISHED SURFACE	12.720		14.520		15.229		15.238		15.358
EXISTING SURFACE	12.720		14.359		15.449		15.382		15.596
PIPE CHAINAGE	0.000		53.223		76.945		91.445		103.445
(Reach Length)		(53.223)		(23.722)		(14.500)		(12.000)	

LINE 400

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

HORIZ 1:500 0 5 10 20 30
VERT 1:50 0 0.5 1 2 3
SCALE AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: DRAINAGE LONGITUDINAL SECTIONS
SHEET 4 OF 6

Sheet 113 of 145

Scale: 1:500 H 1:50 V @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	604	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-600-DLS.dwg

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

LEGEND
EXISTING SURFACE
DESIGN SURFACE

CONTINUES ON PREVIOUS PAGE

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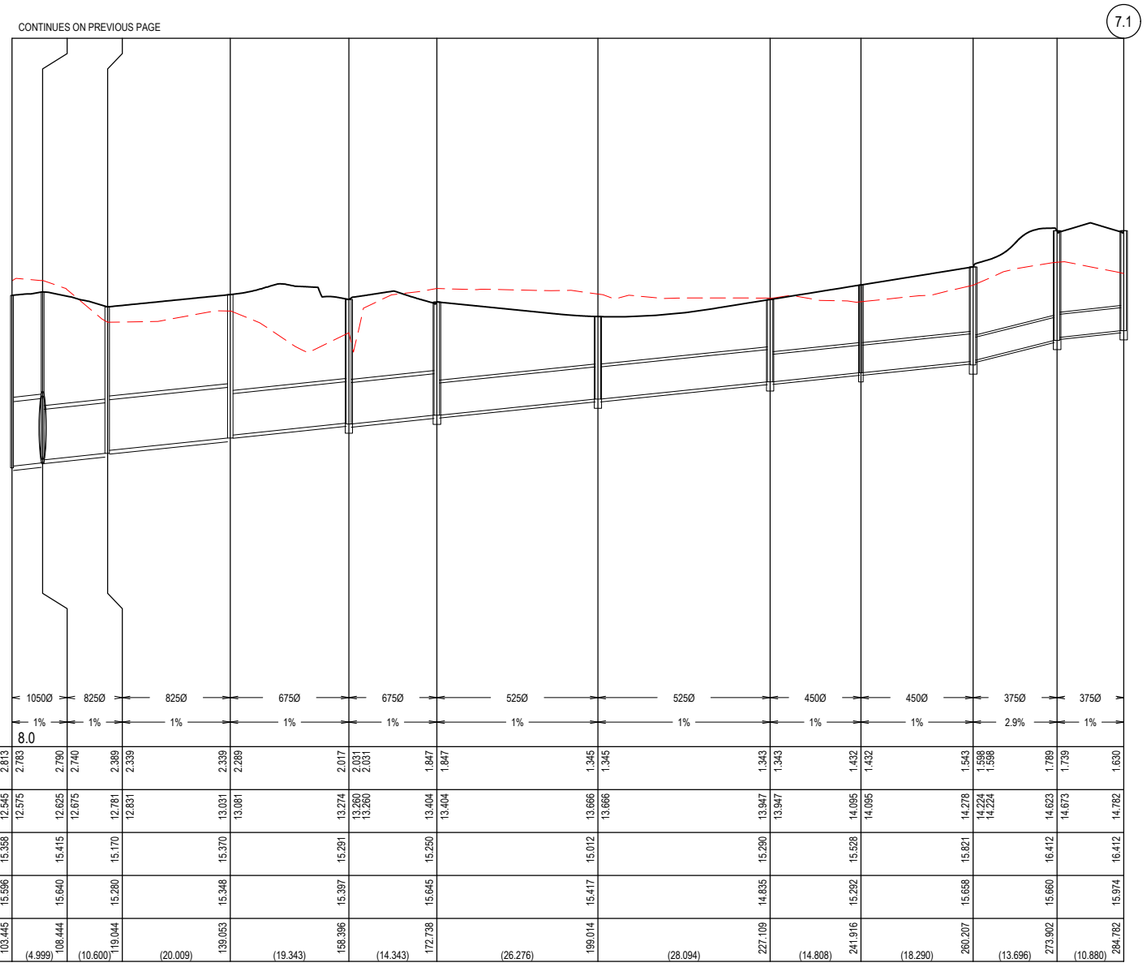


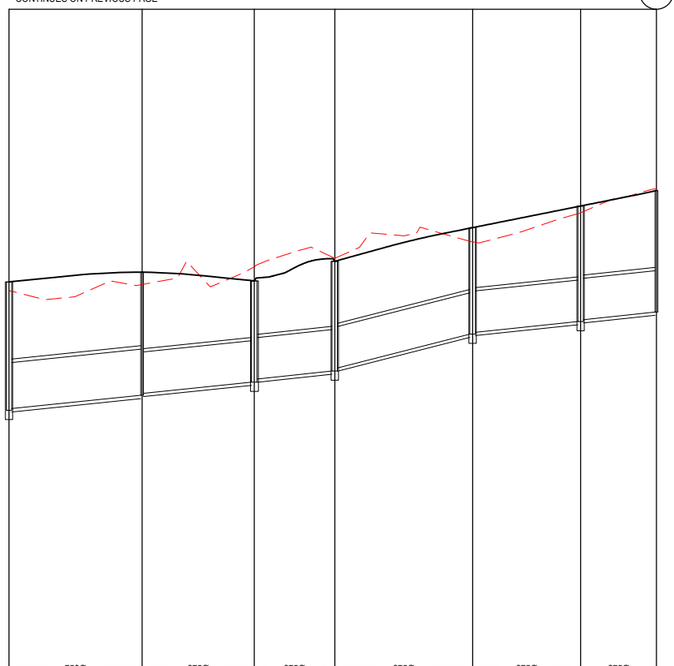
| | | |

NOTES:
ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

LEGEND
EXISTING SURFACE
DESIGN SURFACE

CONTINUES ON PREVIOUS PAGE

8.1



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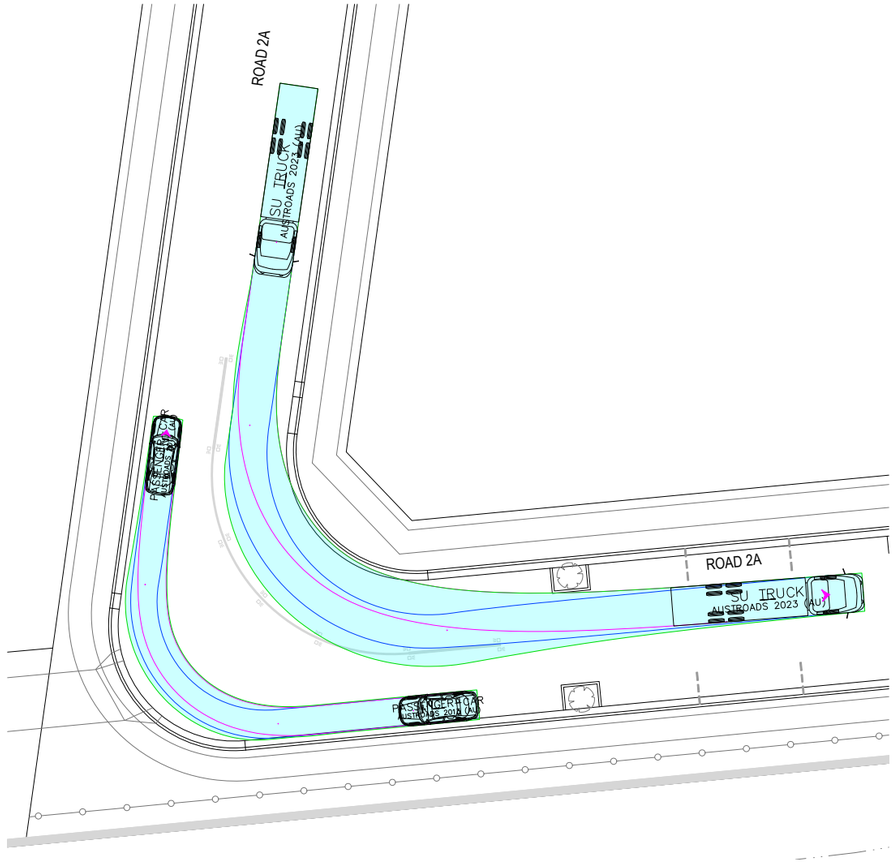
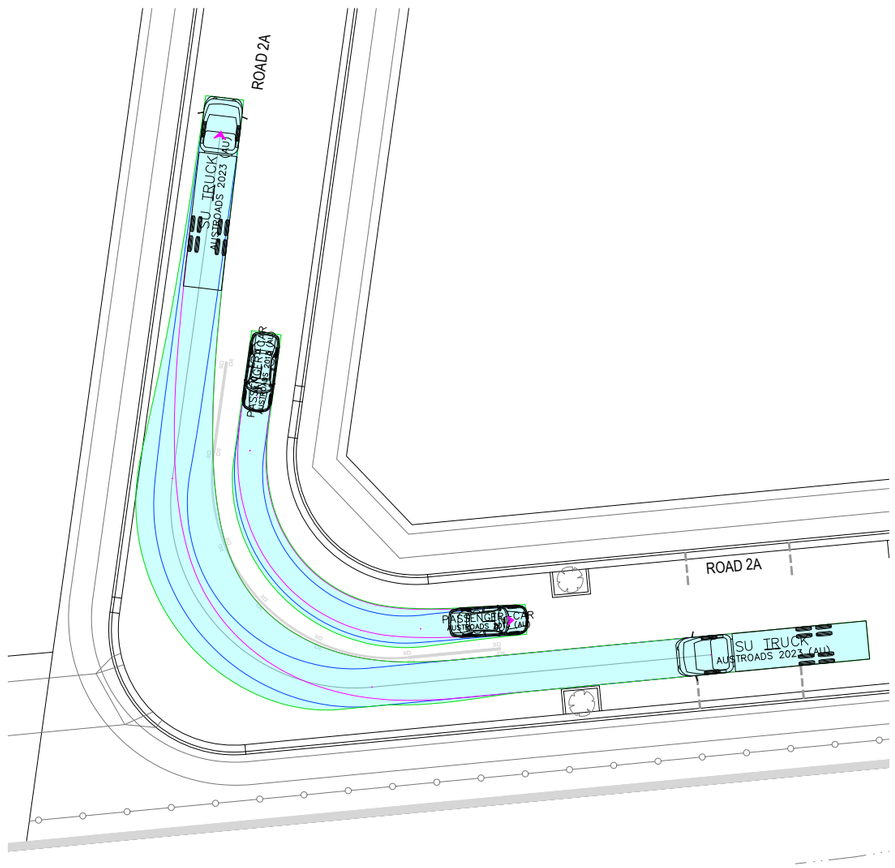
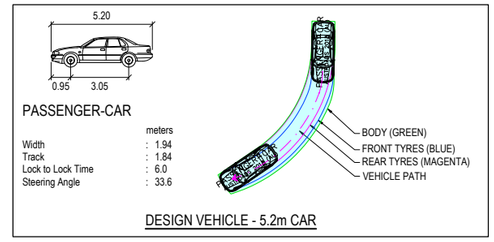


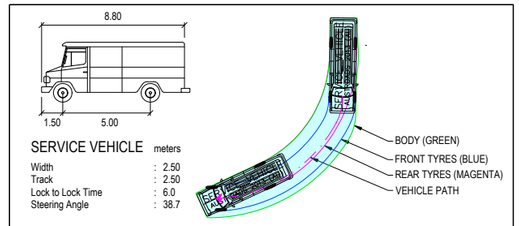
CAR OUTSIDE / SU TRUCK INSIDE



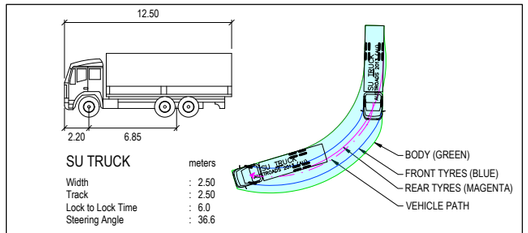
CAR INSIDE / SU TRUCK OUTSIDE



DESIGN VEHICLE - 5.2m CAR

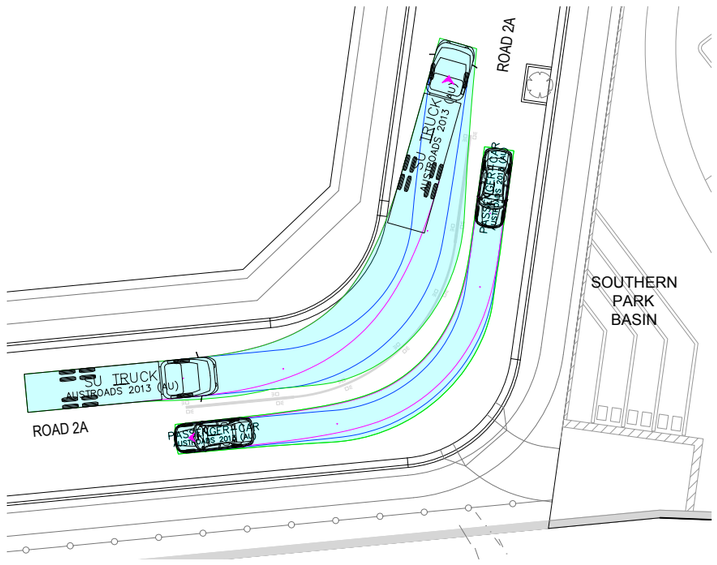


DESIGN VEHICLE - 8.8m SERVICE VEHICLE



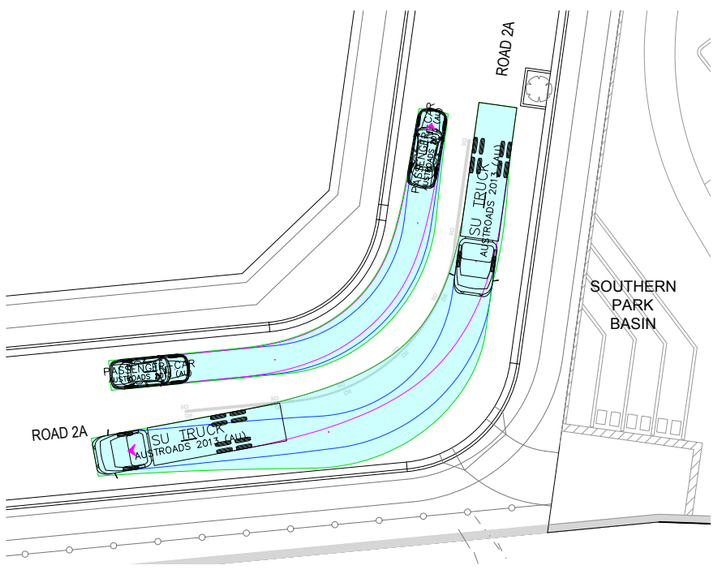
DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

CAR OUTSIDE / SU TRUCK INSIDE



CAR OUTSIDE / SU TRUCK INSIDE

CAR INSIDE / SU TRUCK OUTSIDE



CAR INSIDE / SU TRUCK OUTSIDE

SERVICE VEHICLE INTO SOUTHERN BASIN

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

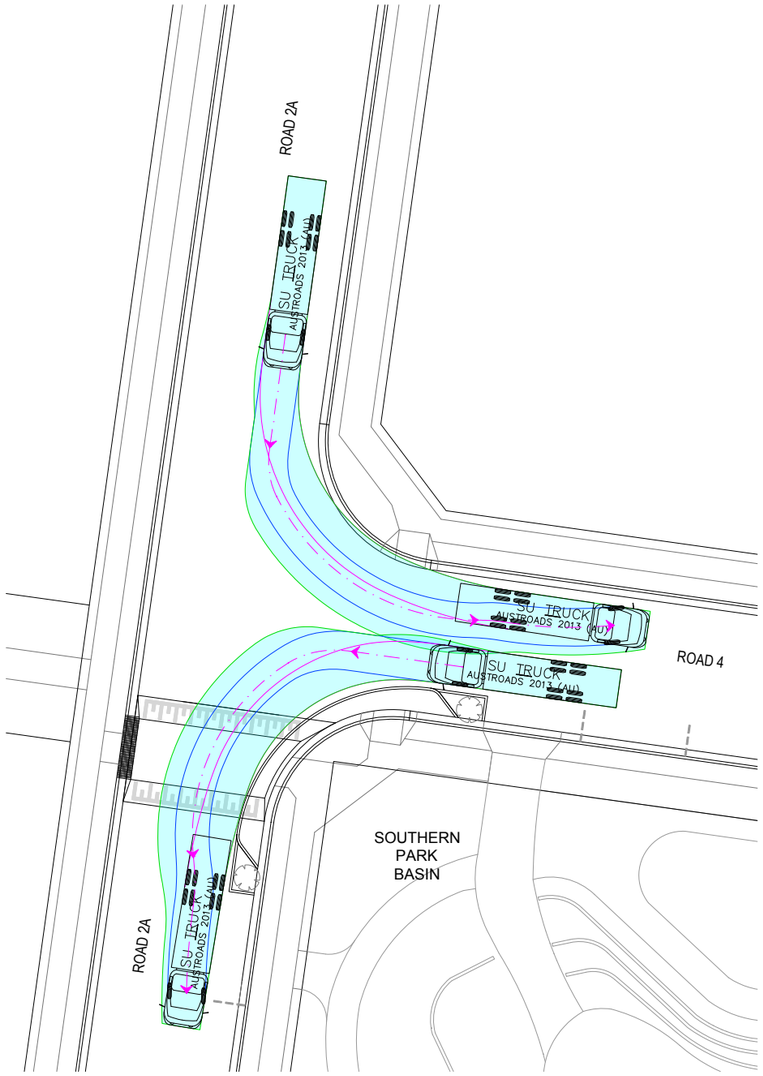
Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 1 OF1 8

Sheet 116 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	700	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-700-TURN.dwg



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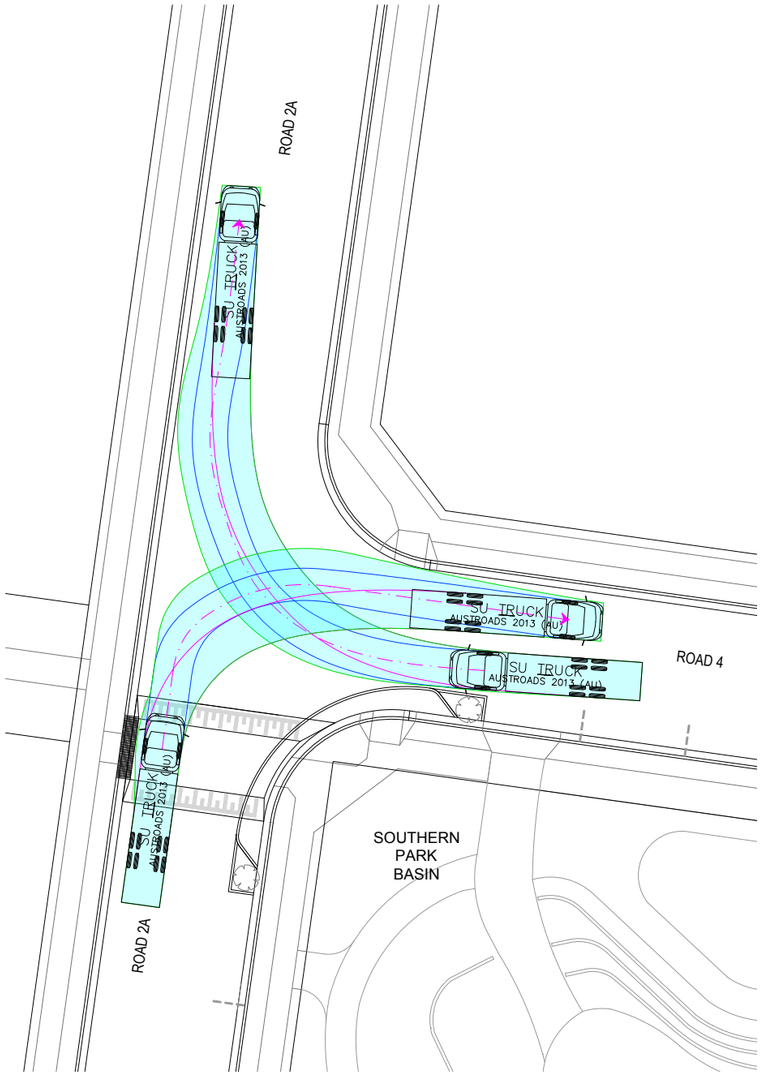
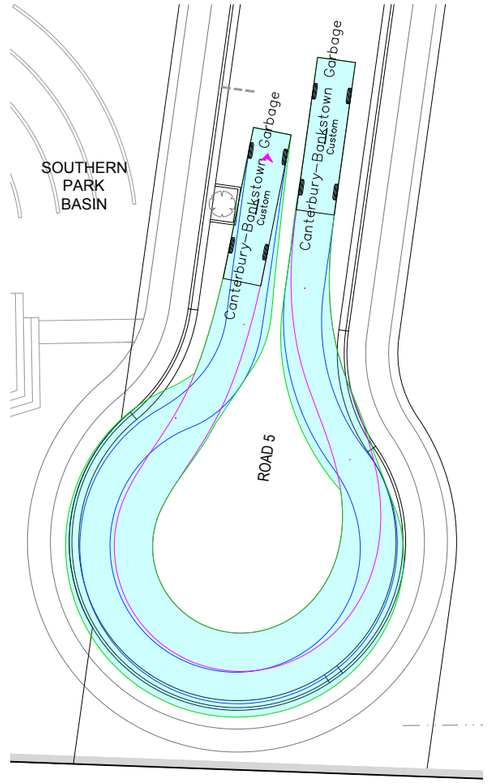
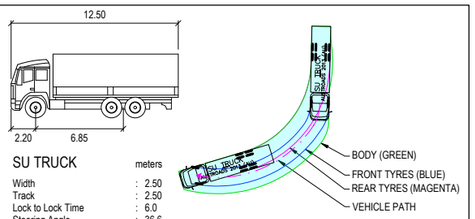


SU TRUCK - RIGHT IN / RIGHT OUT

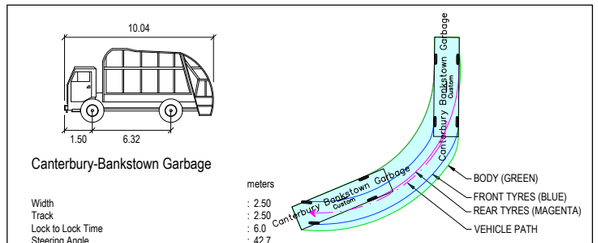


TURN AROUND AREA
(CANTERBURY-BANKSTOWN GARBAGE)



SU TRUCK	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.6

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



Canterbury-Bankstown Garbage	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 42.7

DESIGN VEHICLE - 10.04m CANTERBURY-BANKSTOWN GARBAGE

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B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 2 OF 18

Sheet 117 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	701	B

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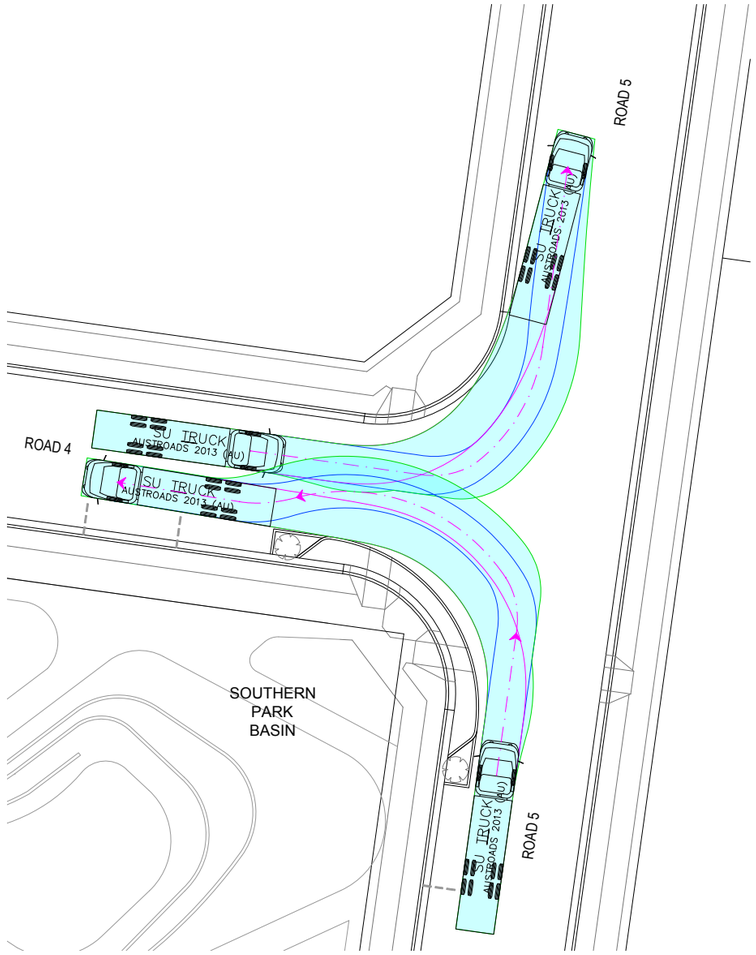

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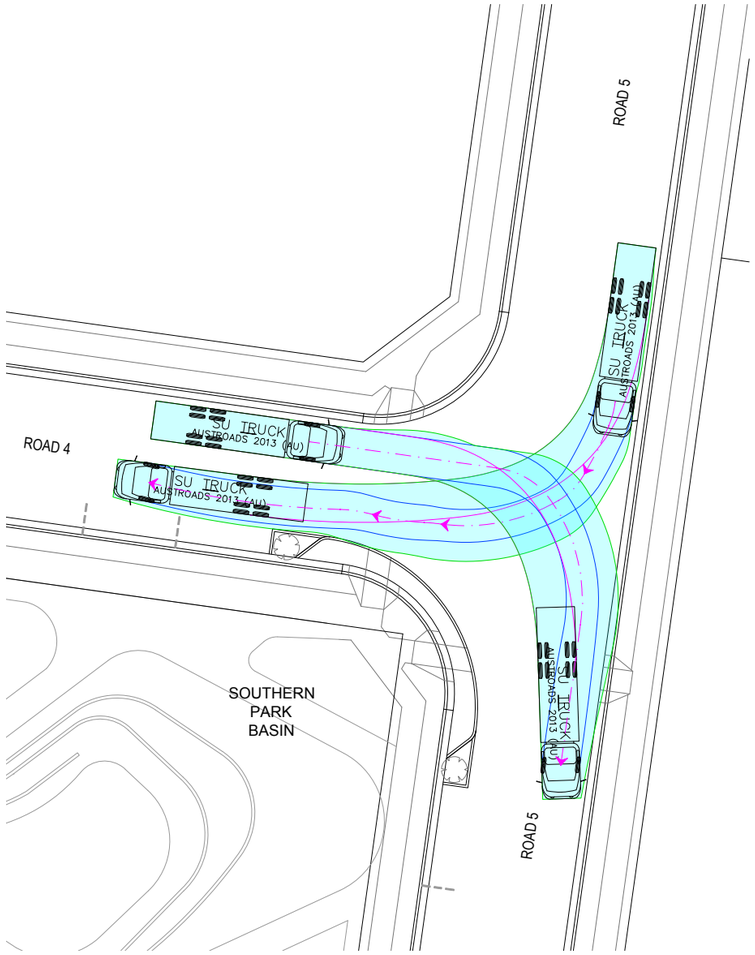
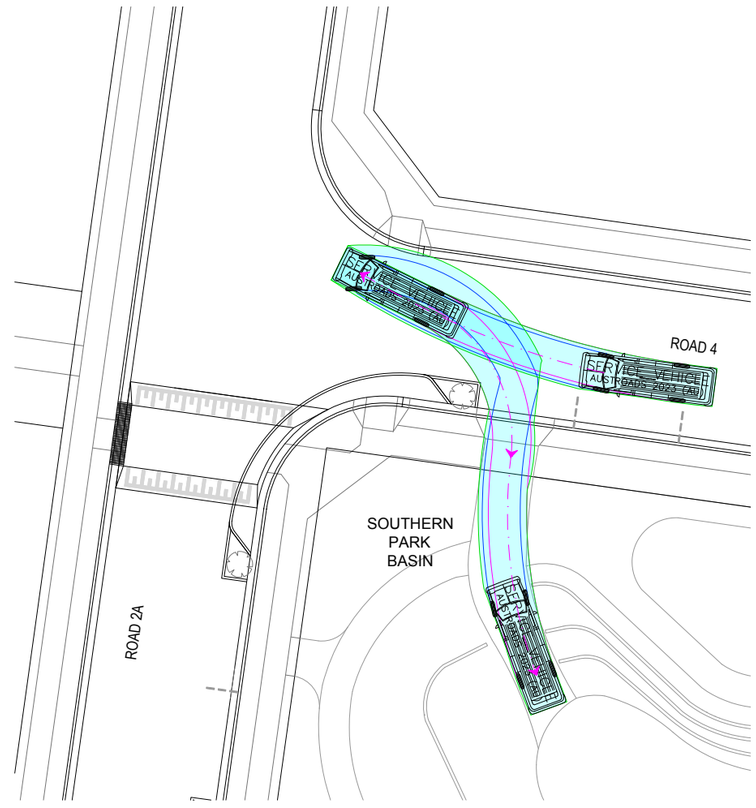
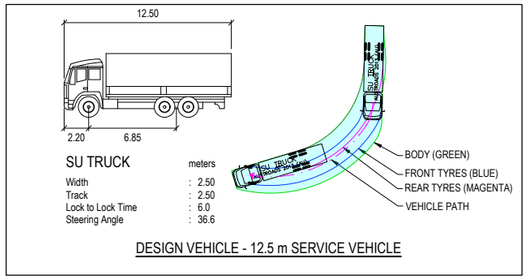


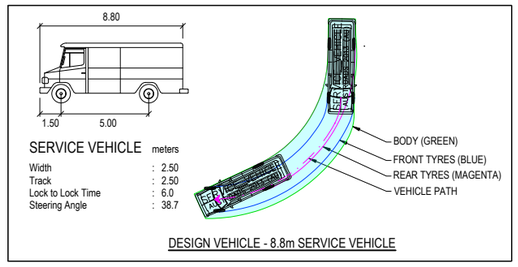
SU TRUCK - RIGHT IN / RIGHT OUT



SERVICE VEHICLE INTO SOUTHERN BASIN



DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



DESIGN VEHICLE - 8.8m SERVICE VEHICLE

SERVICE VEHICLE INTO SOUTHERN BASIN

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA

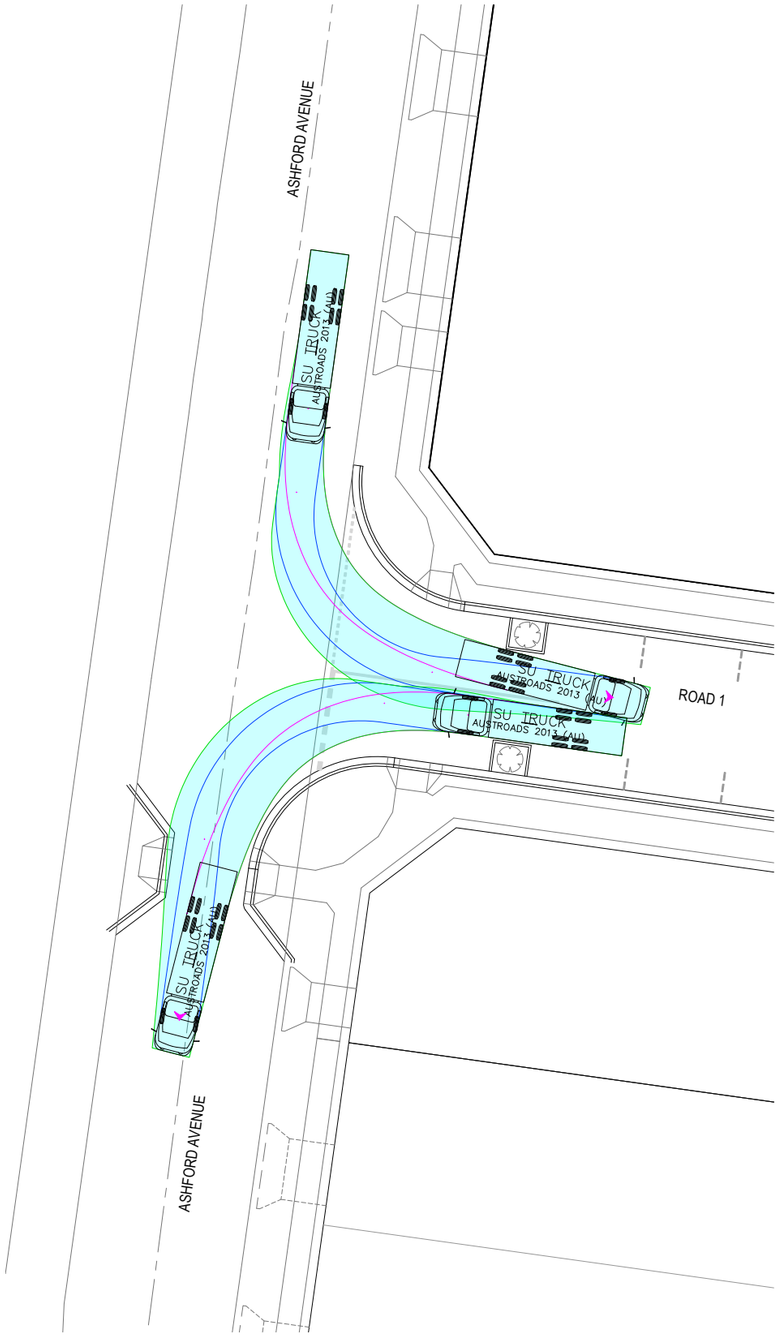
Drawing Title: TURNING MOVEMENTS SHEET 3 OF 18

Sheet 118 of145

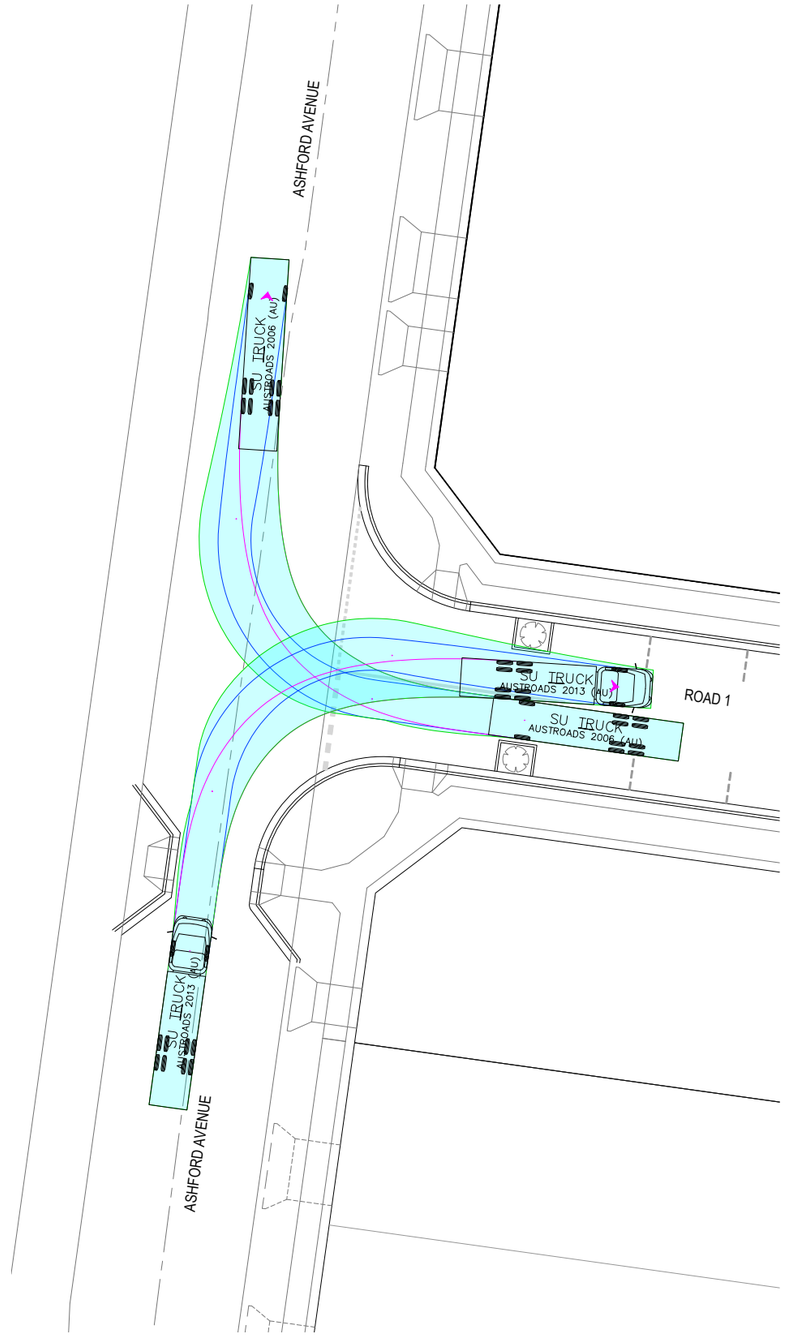
Scale: 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	702	B

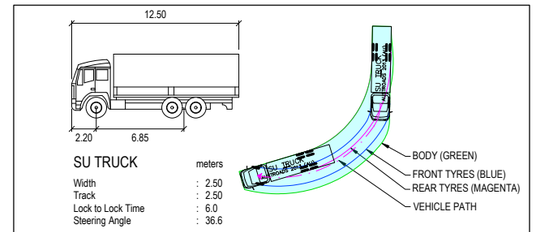
F:\synergytemp\12dSynergy\12dSynergyServerService\3192a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-700-TURN.dwg



SU TRUCK - LEFT IN / LEFT OUT



SU TRUCK - RIGHT IN / RIGHT OUT



DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 4 OF 18

Sheet 119 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	703	B

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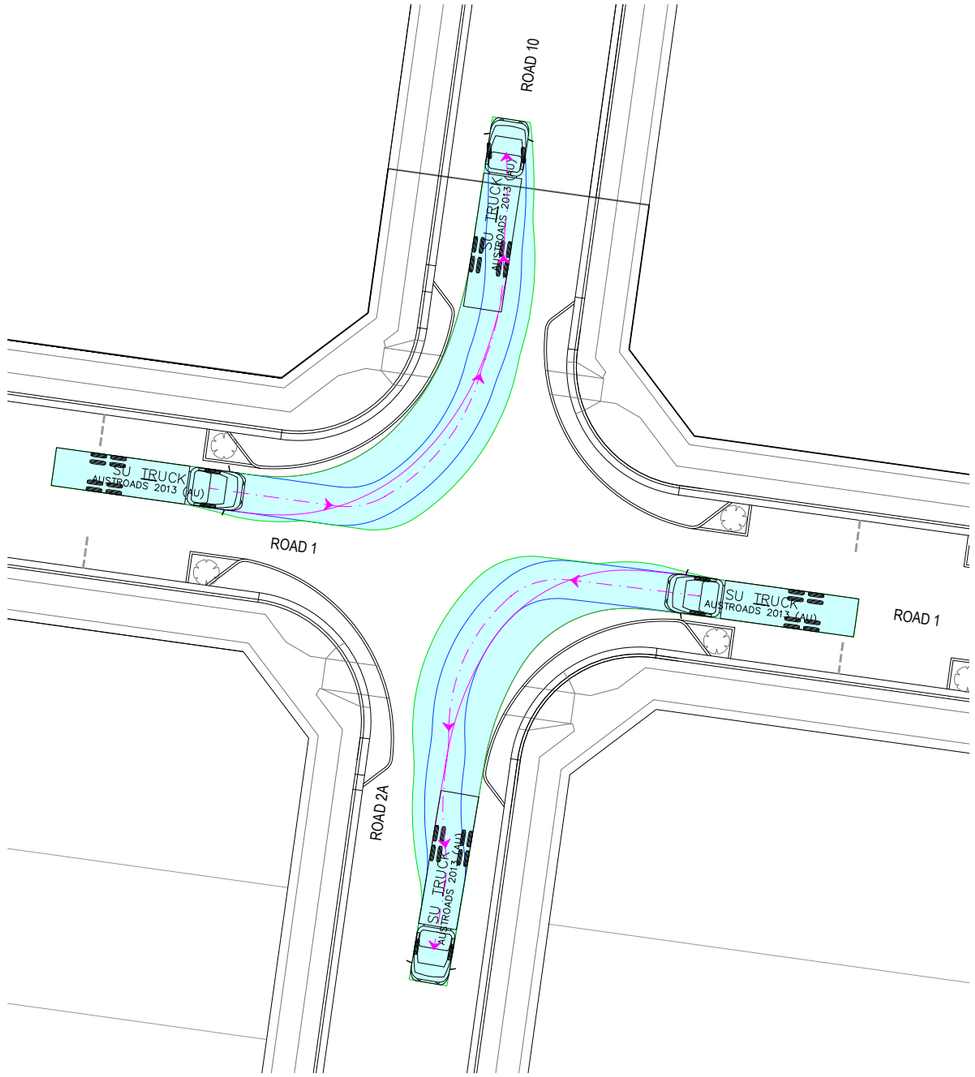

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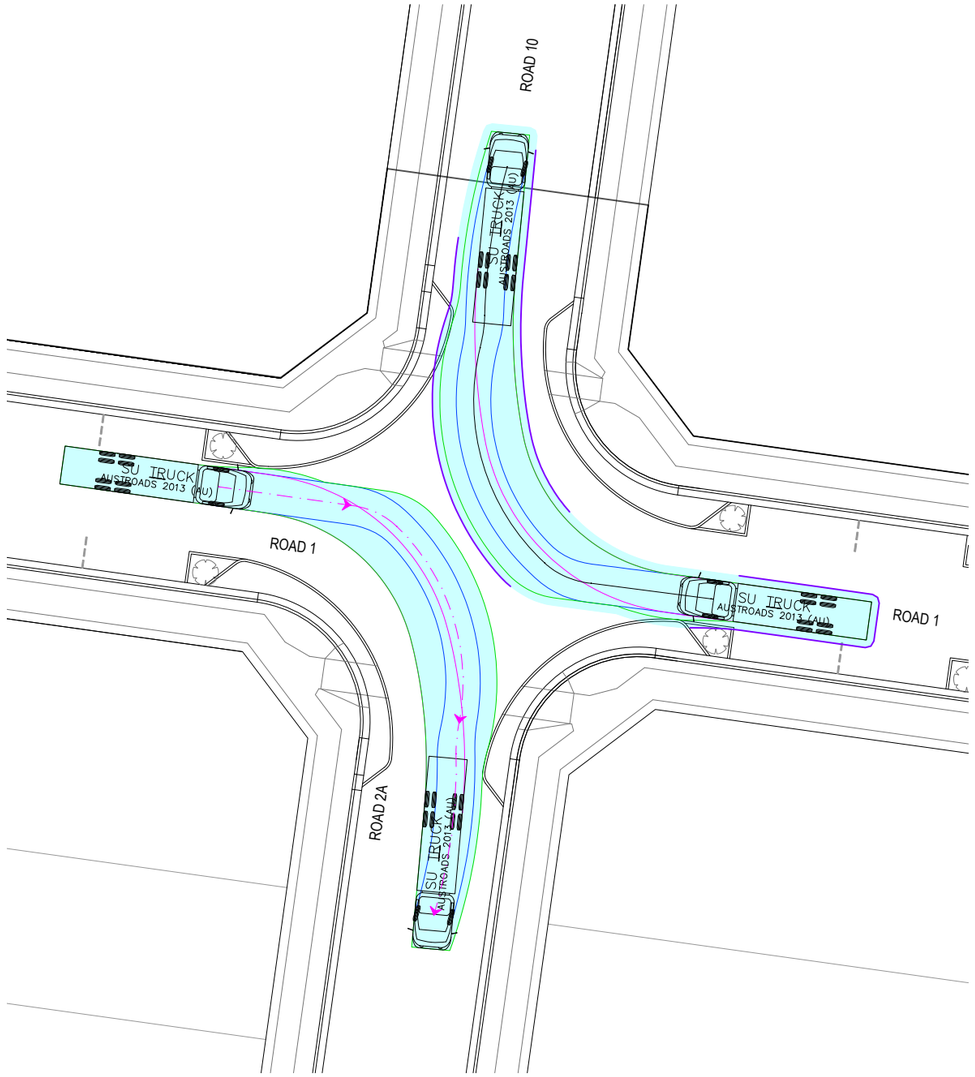

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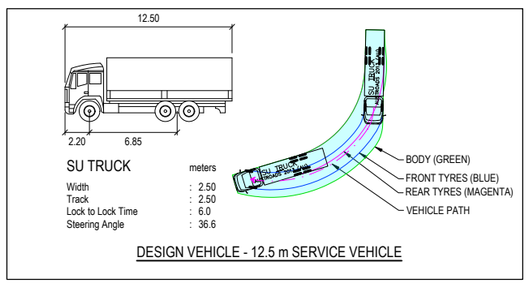

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 5 OF 18

Sheet 120 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	704	B

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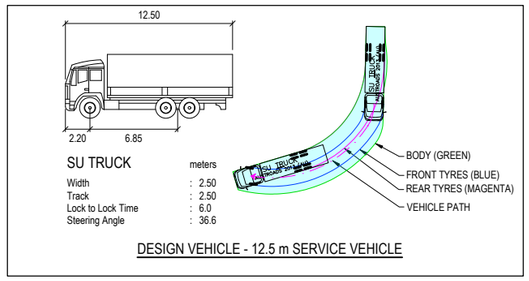
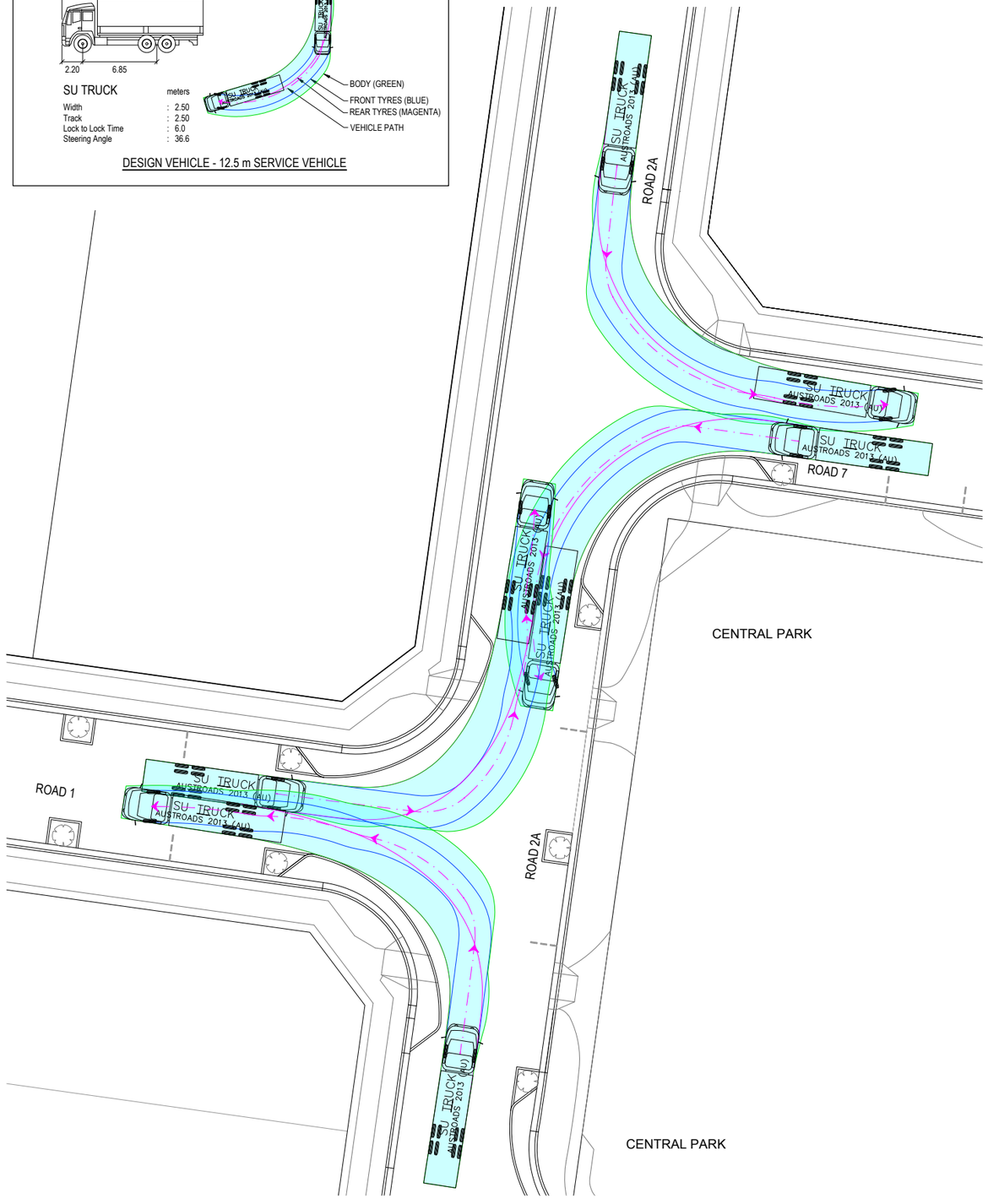


DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



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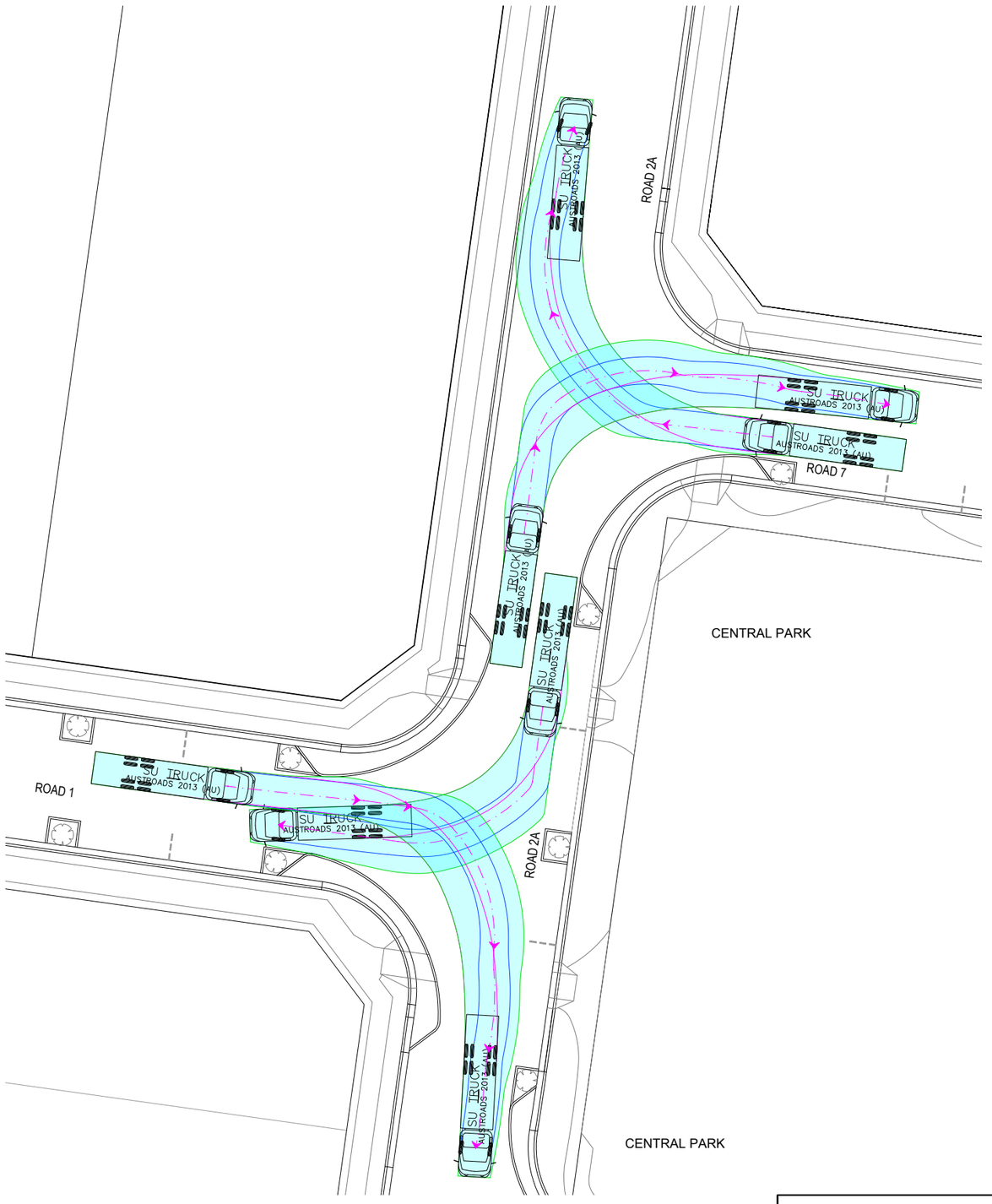

SU TRUCK - RIGHT IN / RIGHT OUT

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
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Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
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www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 6 OF 18

Sheet 121 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	705	B

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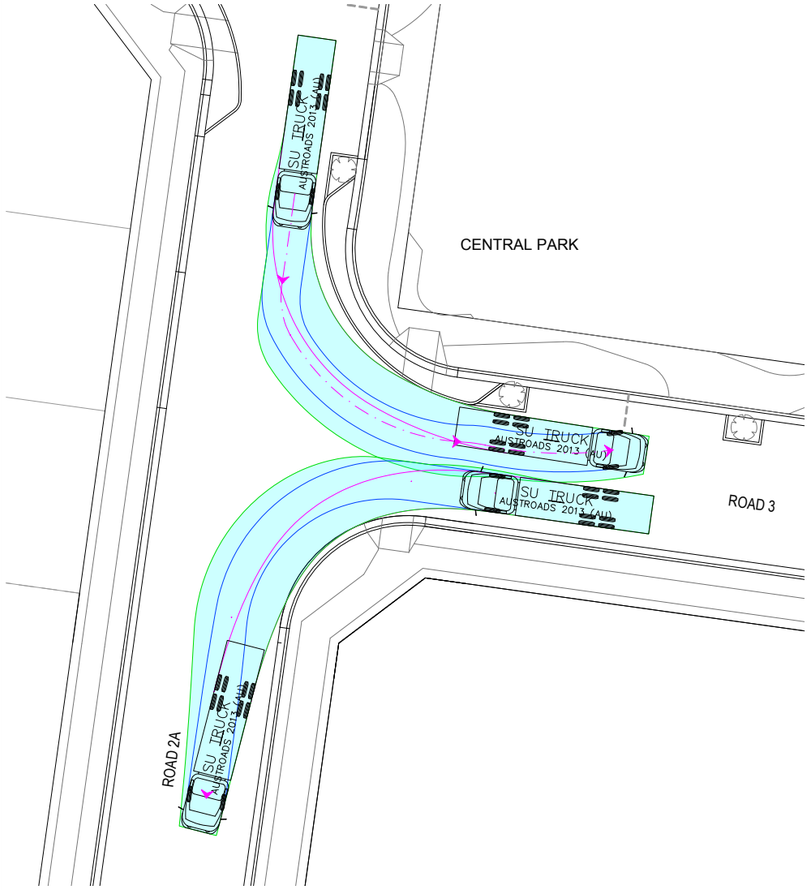

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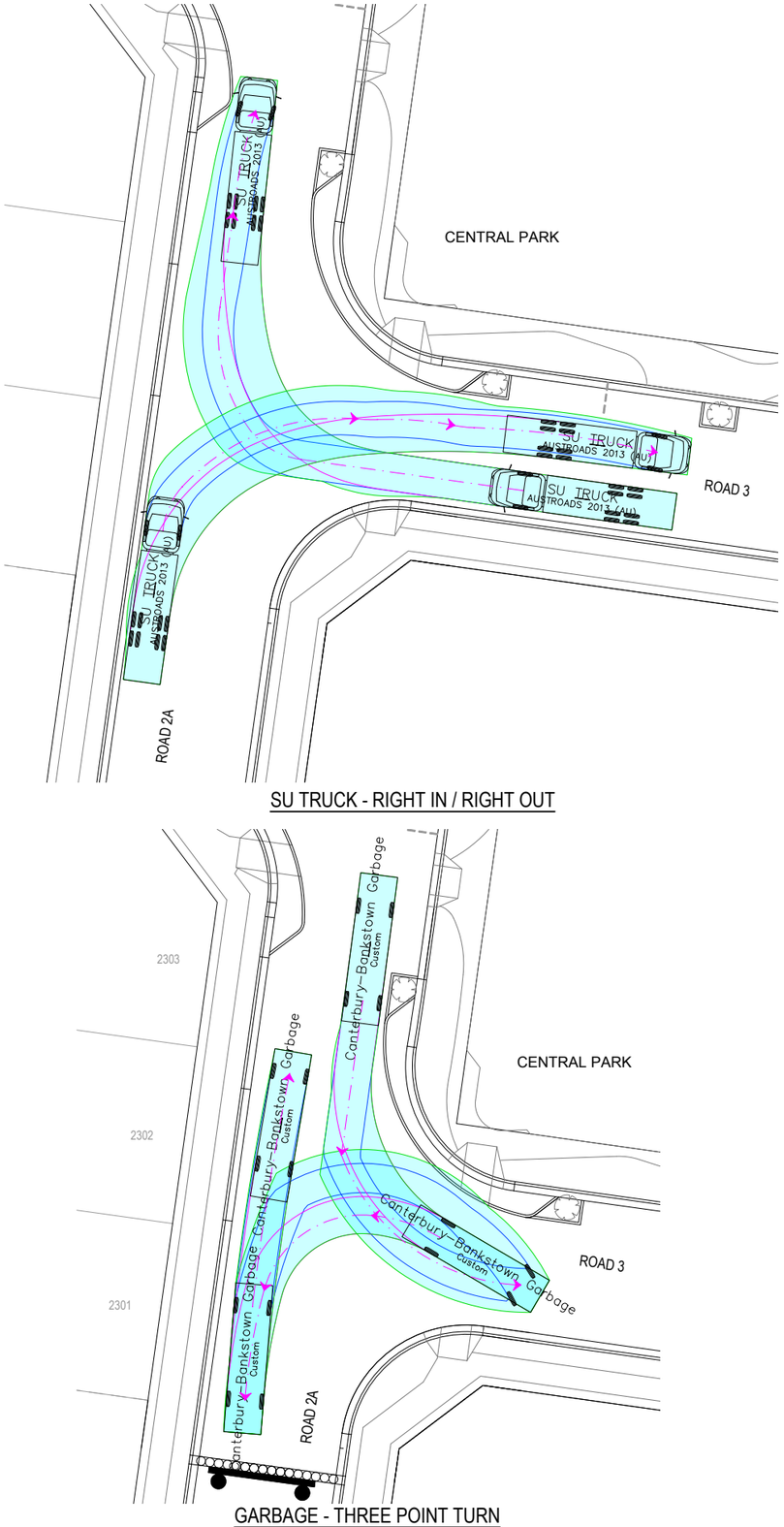
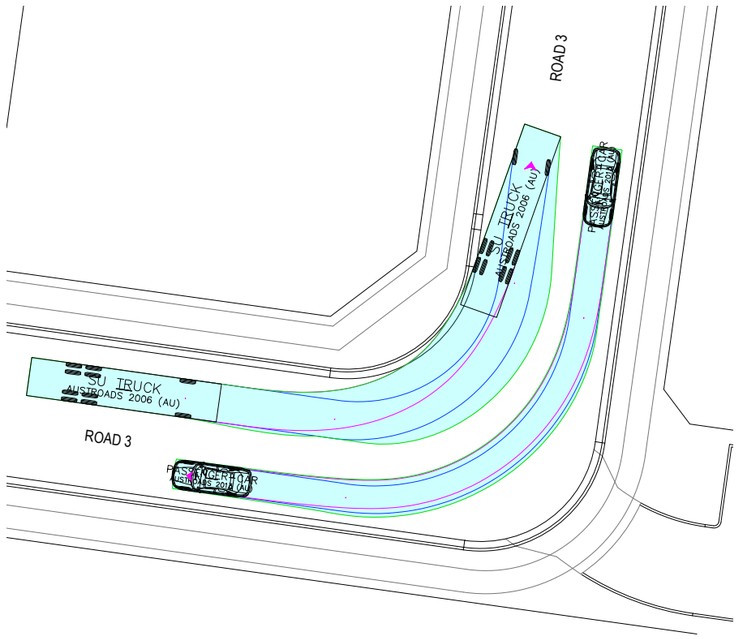
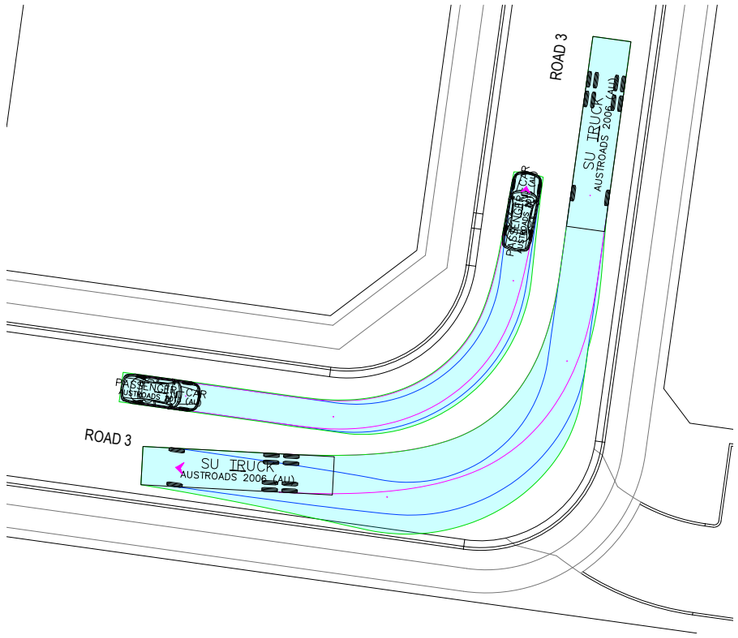


SU TRUCK - RIGHT IN / RIGHT OUT

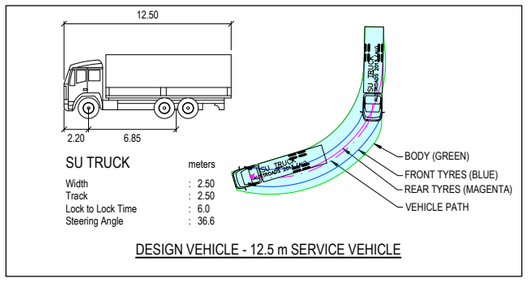
GARBAGE - THREE POINT TURN



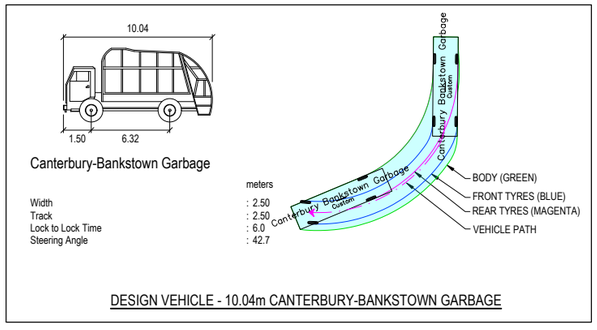
CAR OUTSIDE / SU TRUCK INSIDE



CAR INSIDE / SU TRUCK OUTSIDE



DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



DESIGN VEHICLE - 10.04m CANTERBURY-BANKSTOWN GARBAGE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	S. FERGUSON
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 7 OF 18

Sheet 122 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	706	B

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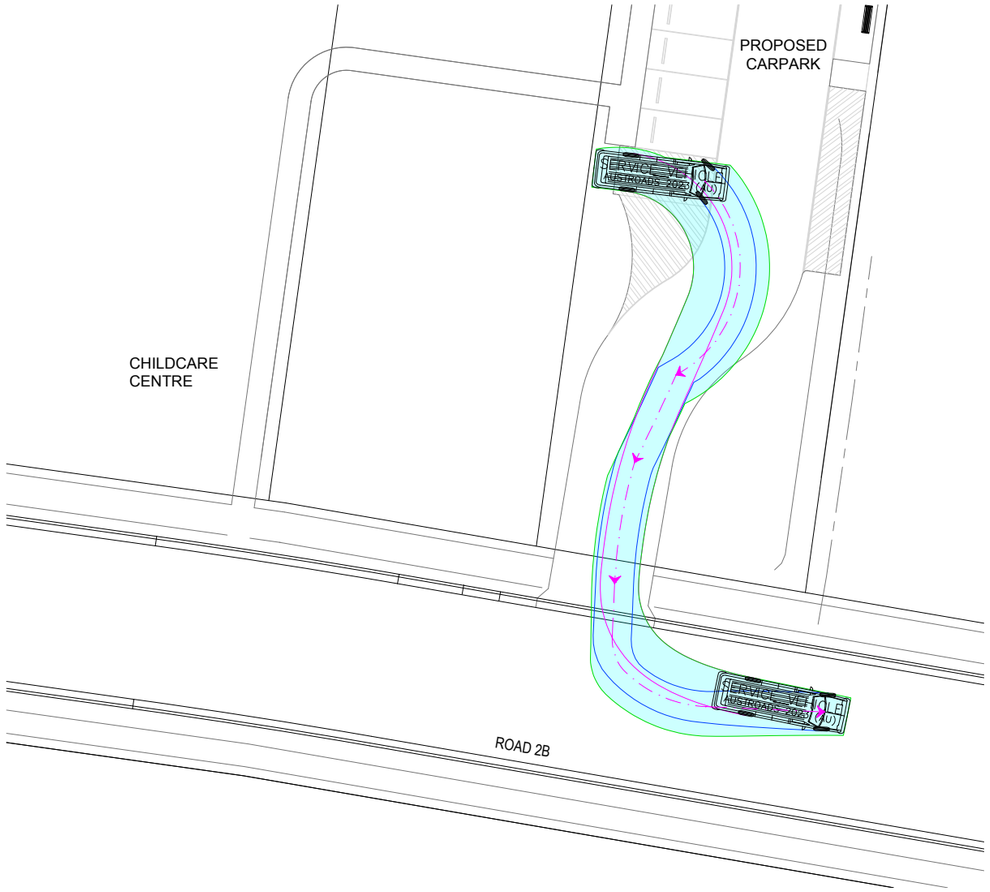

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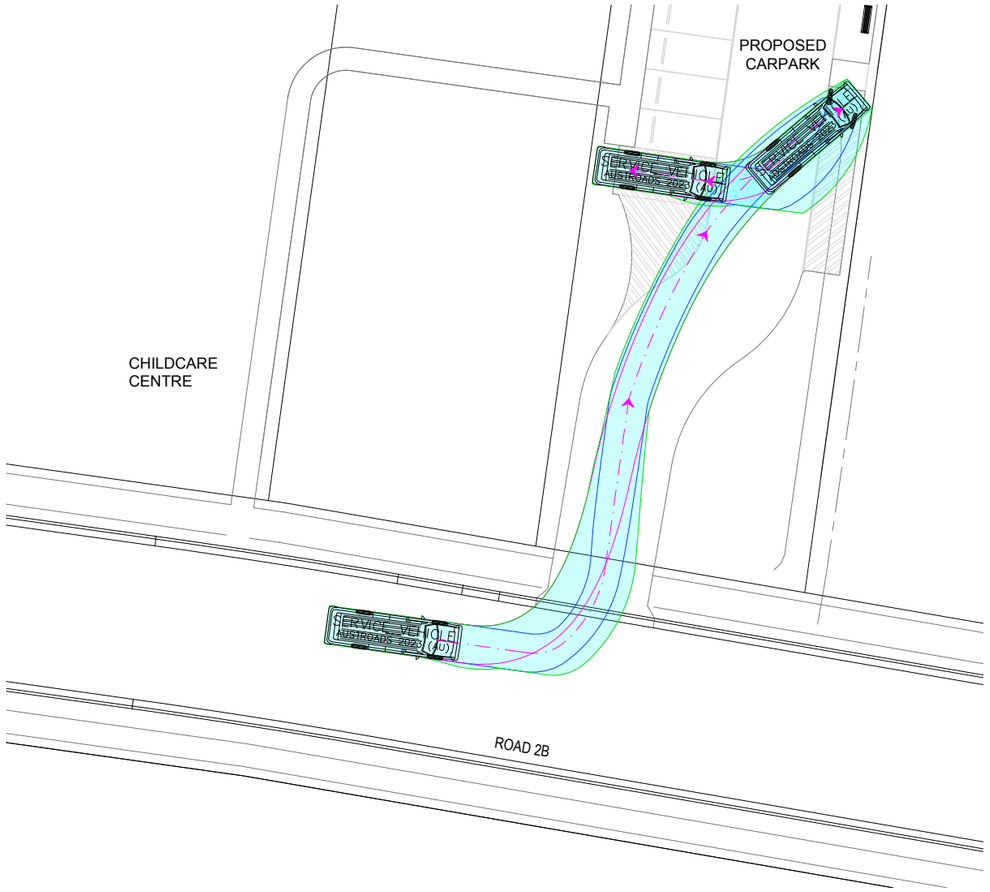

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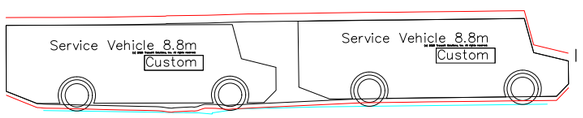
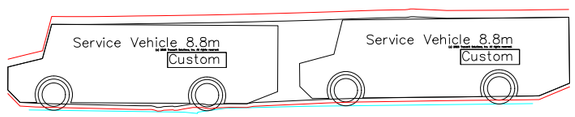


Ground Clearance (units: m)

Part #	Front	Wheelbase	Rear
#1	0.25	0.25	0.25

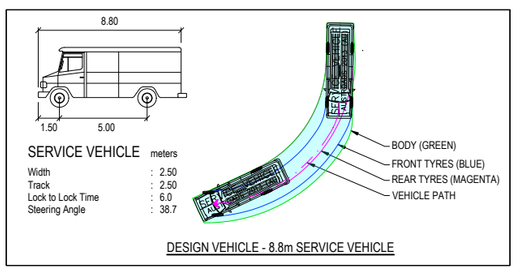
8.8m SERVICE VEHICLE - CHILDCARE CARPARK ENTRY VERTICAL CLEARANCE



Ground Clearance (units: m)

Part #	Front	Wheelbase	Rear
#1	0.25	0.25	0.25

8.8m SERVICE VEHICLE - CHILDCARE CARPARK EXIT VERTICAL CLEARANCE



DESIGN VEHICLE - 8.8m SERVICE VEHICLE

LEGEND

ROAD ALIGNMENT

BODY CLEARANCE

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C	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
B	UPDATED TURNING TEMPLATE	23.10.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16

SCALE 1:200 AT A1 SIZE

Designed R. GOVENDER
Date 23.06.2025
Drawn D.RAFTER
Approved
Date 07.11.25
DA Number -

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 8 OF 18

Sheet 123 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	707	C

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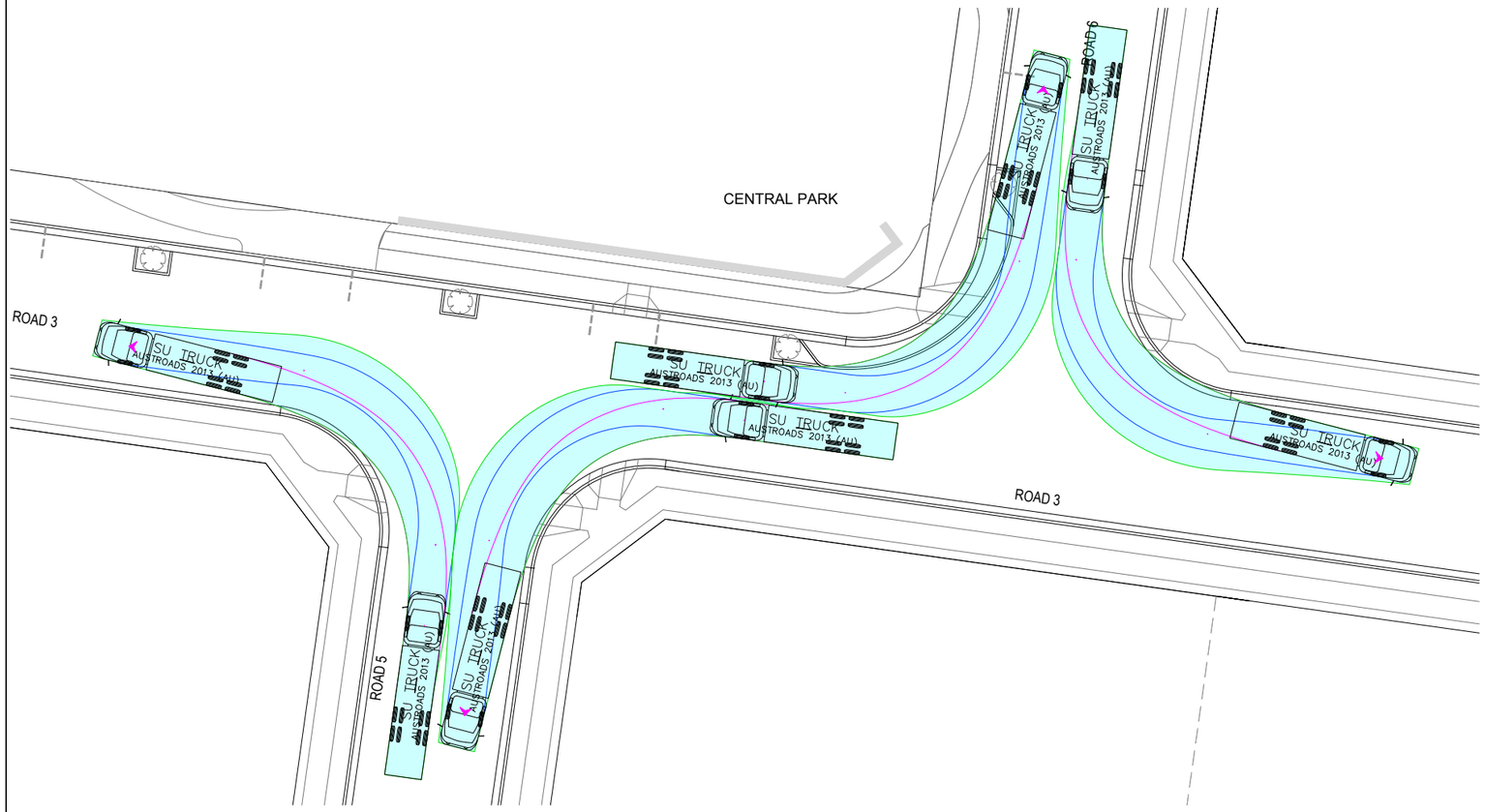

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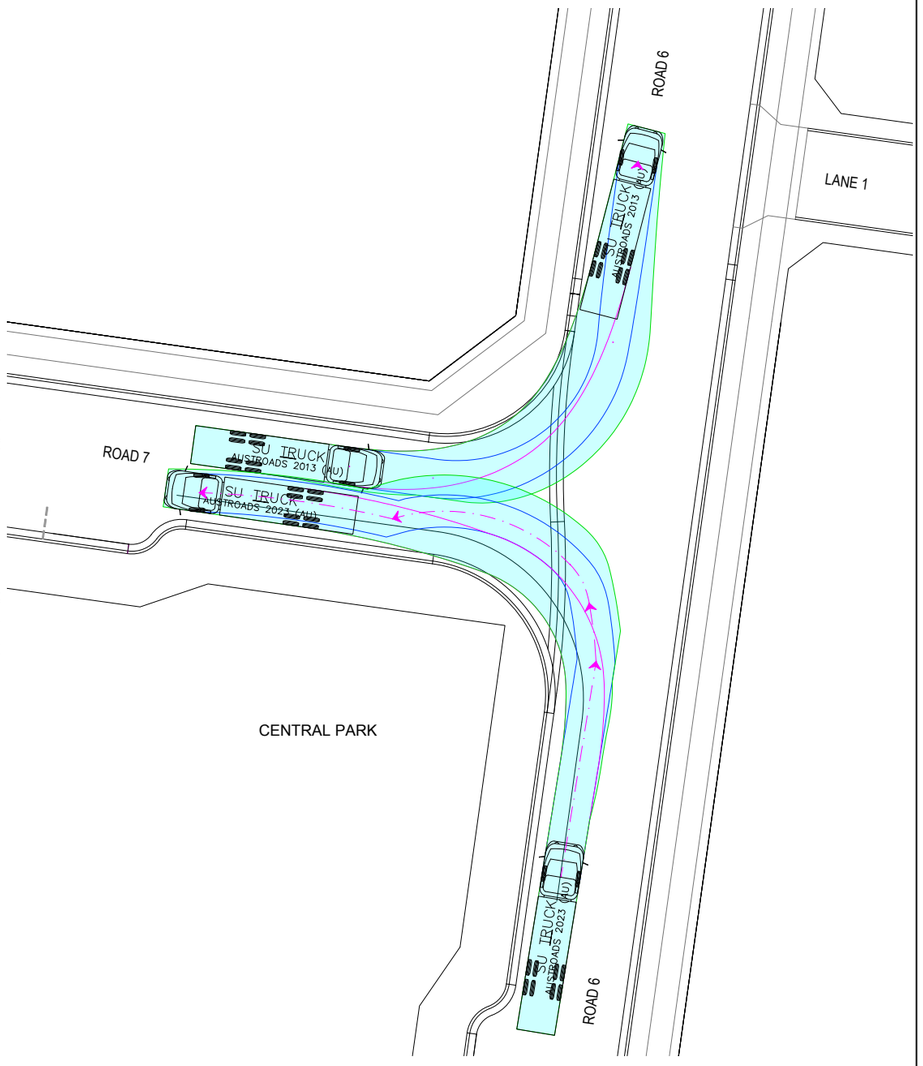

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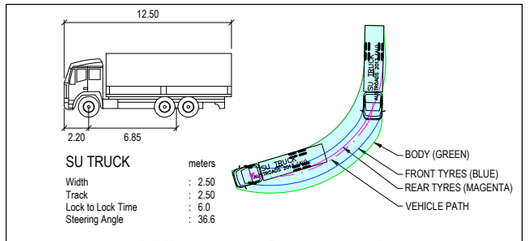

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed R. GOVENDER
Date 23.06.2025
Drawn D.RAFTER
Approved
Date 07.11.25
DA Number -

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 9 OF 18

Sheet 124 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	708	B

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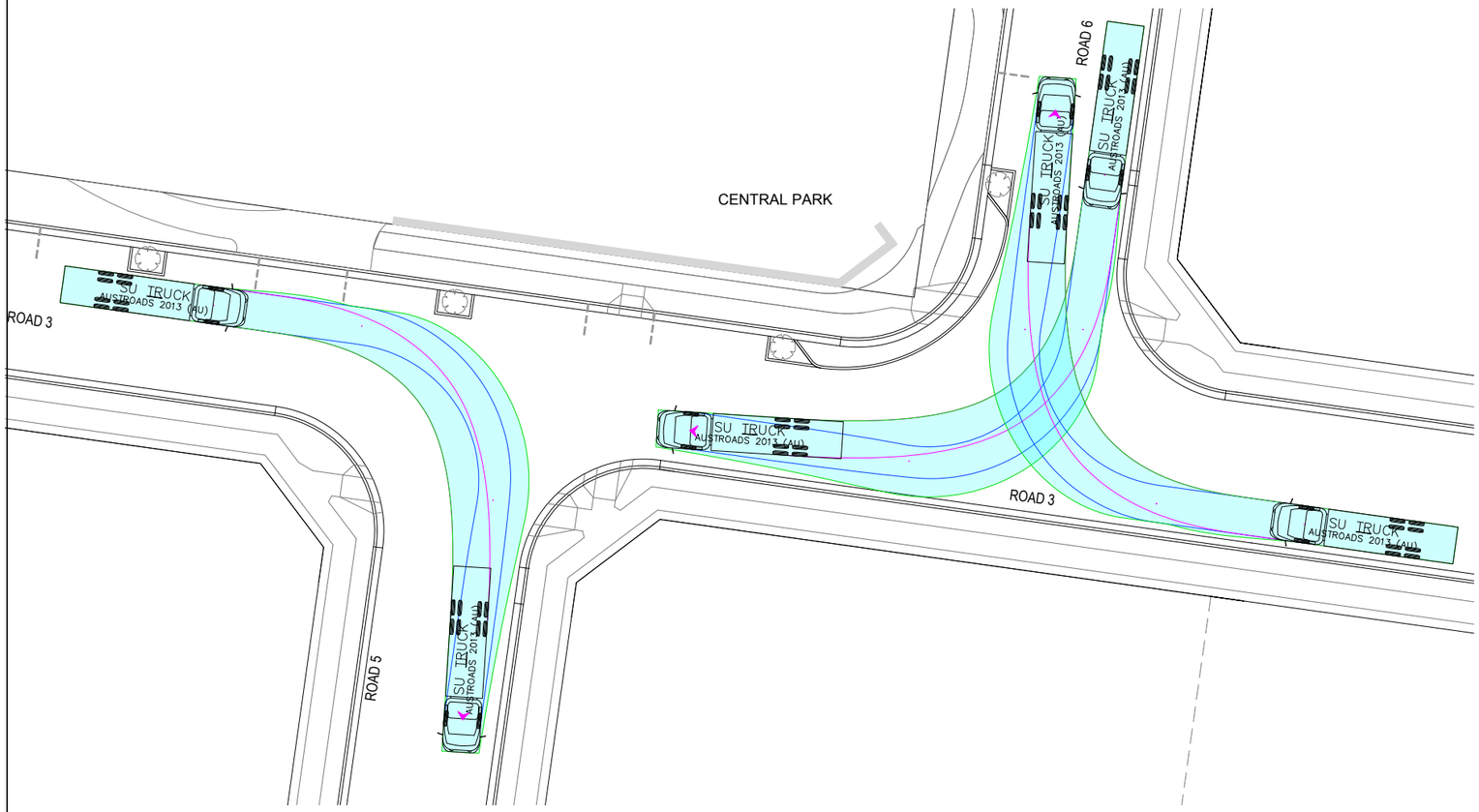

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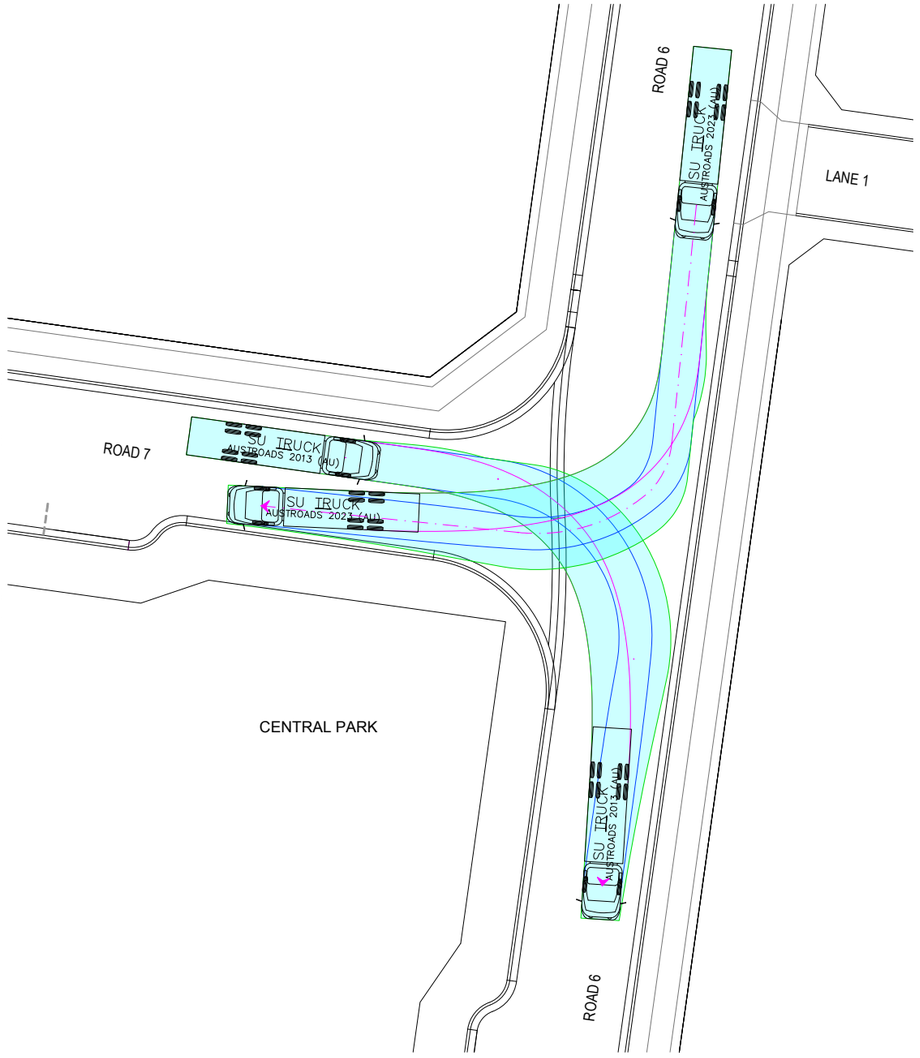

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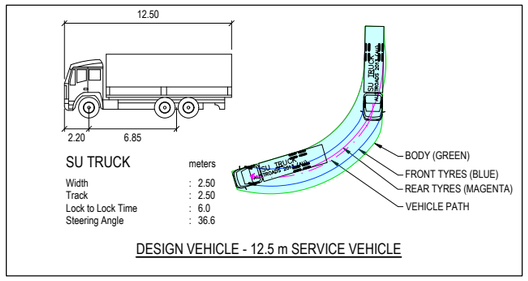

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	
Date	07.11.25
DA Number	-

Beveridge Williams
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Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 10 OF 18

Sheet 125 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	709	B

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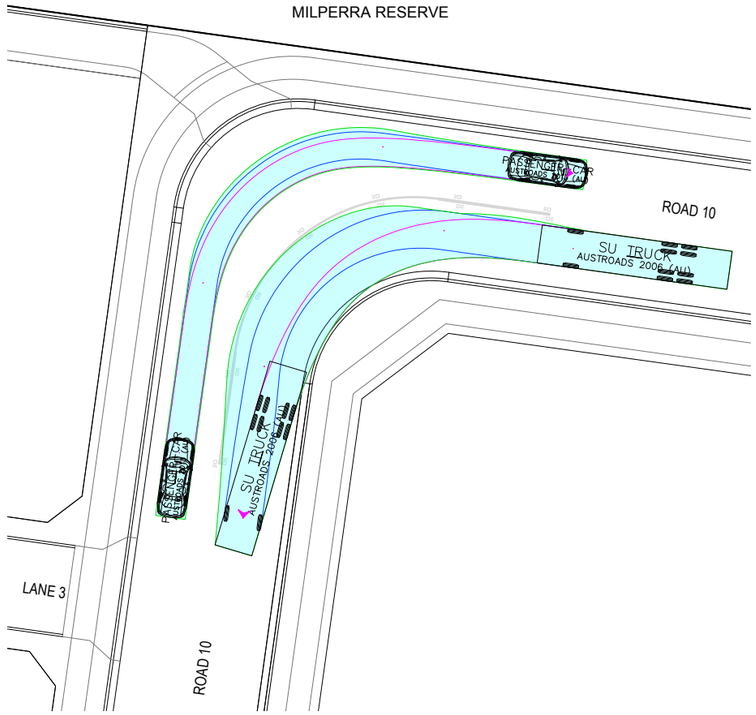
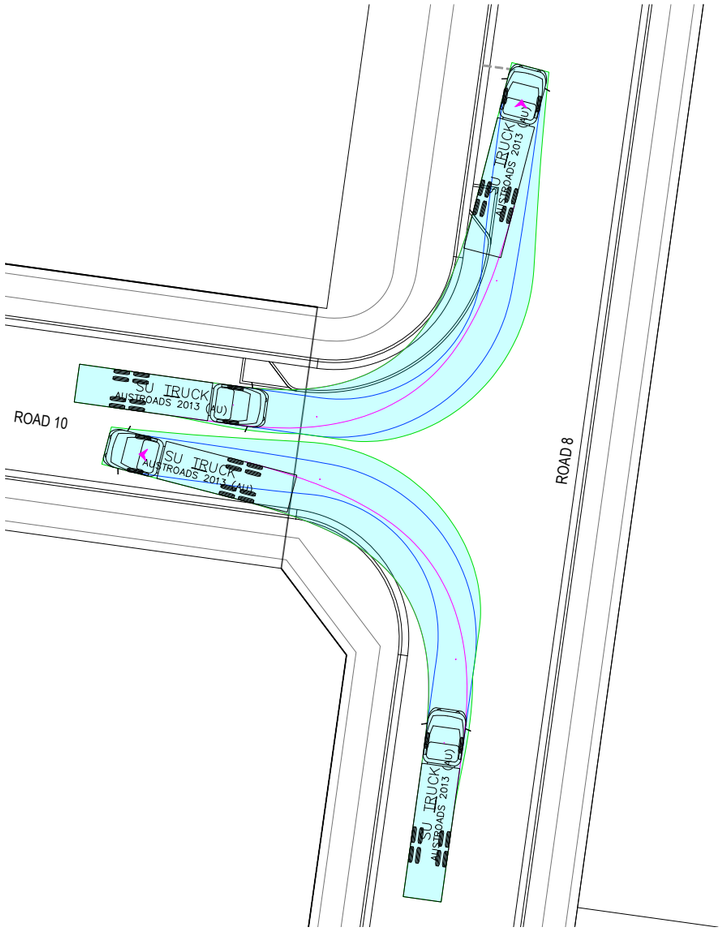
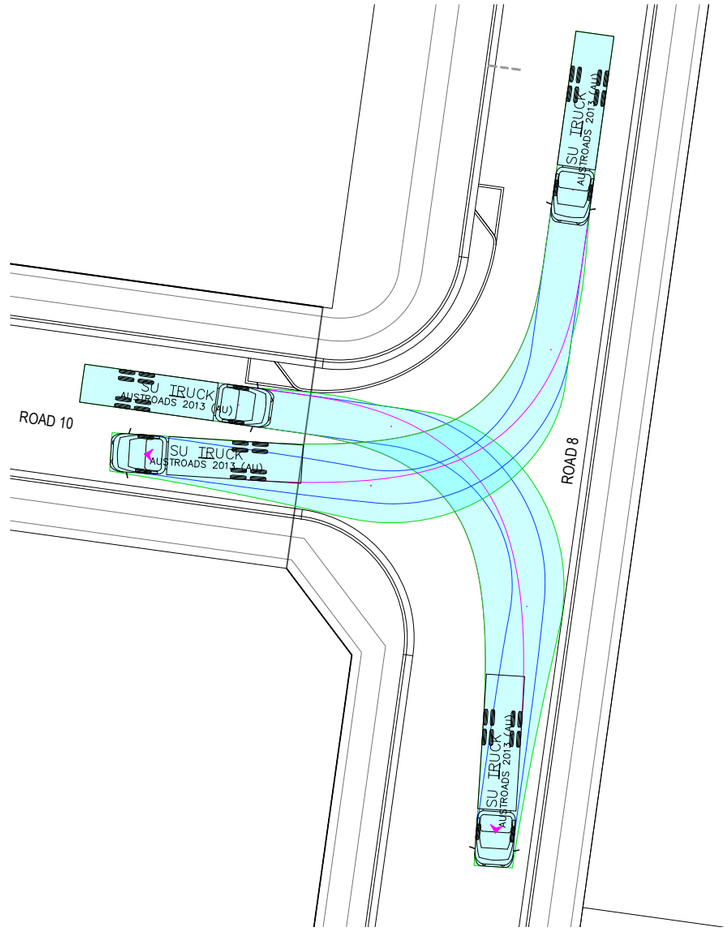


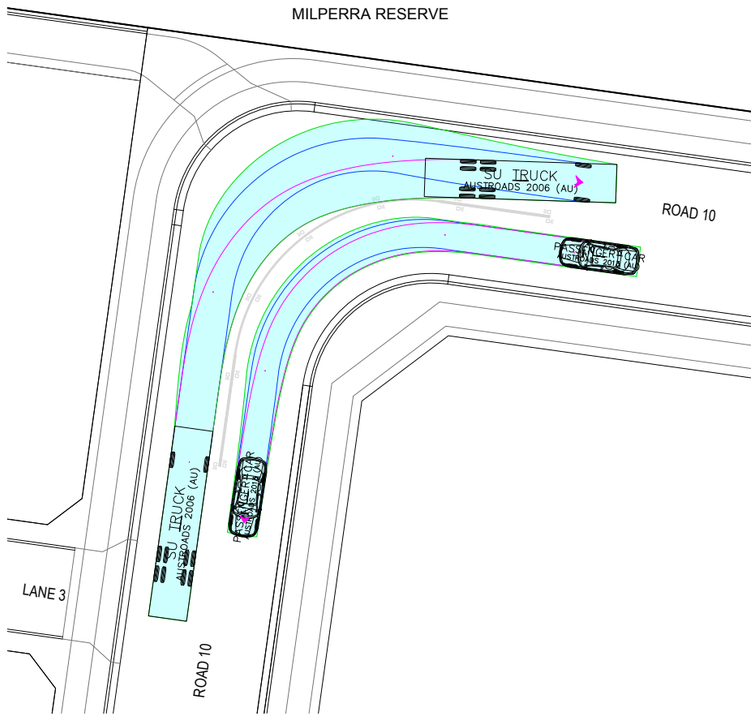
CAR OUTSIDE / SU TRUCK INSIDE



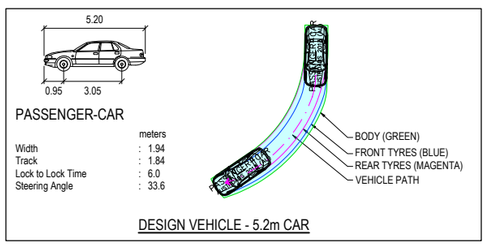
SU TRUCK - LEFT IN / LEFT OUT



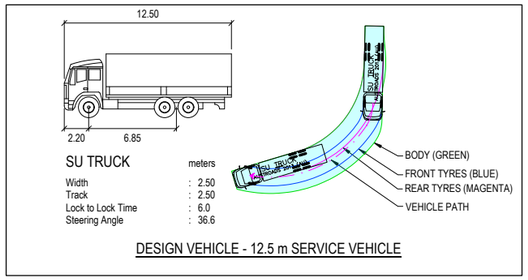
SU TRUCK - RIGHT IN / RIGHT OUT



CAR INSIDE / SU TRUCK OUTSIDE



DESIGN VEHICLE - 5.2m CAR



DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way, Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 11 OF 18

Sheet 126 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	710	B

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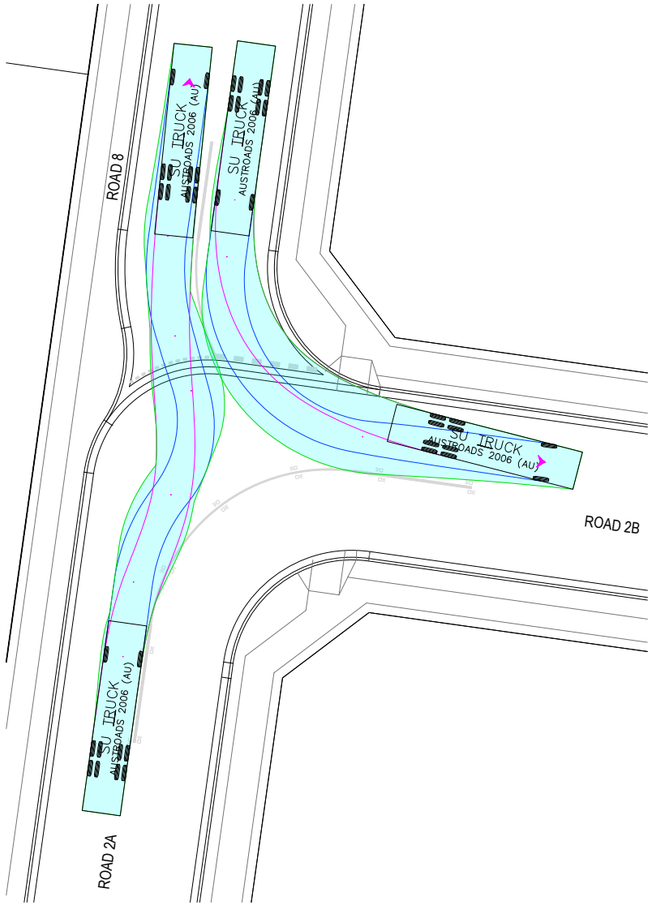
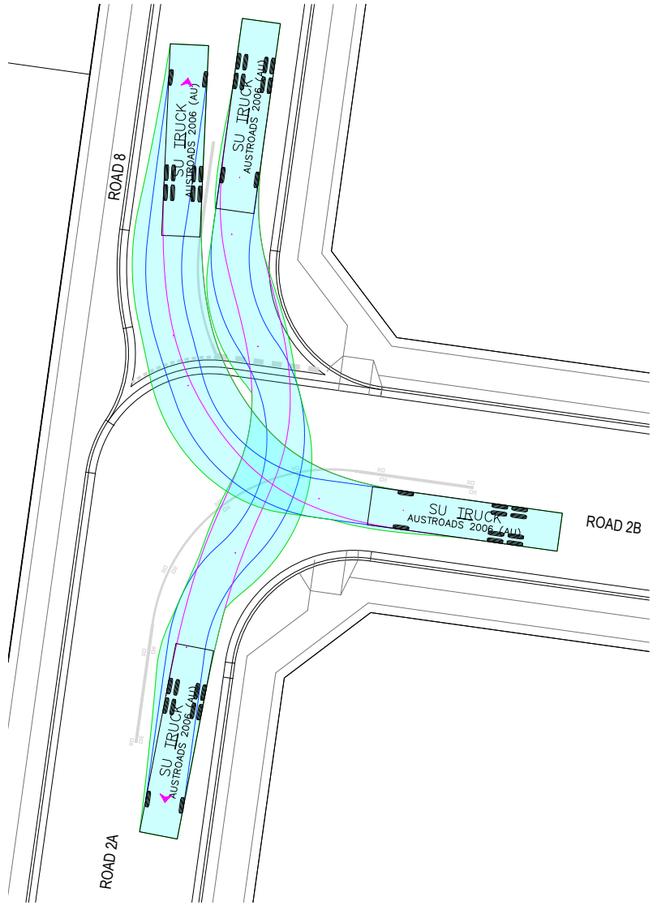


SU TRUCK - LEFT IN / LEFT OUT



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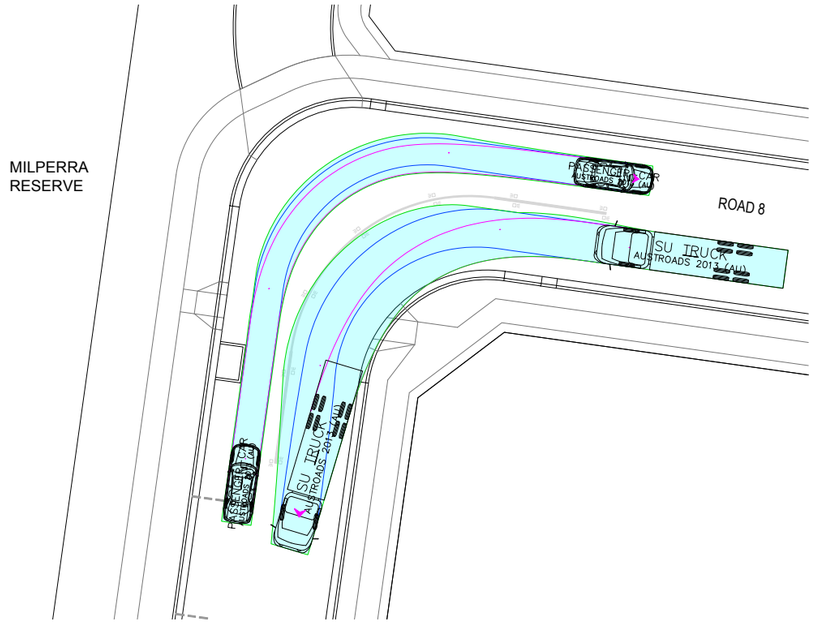
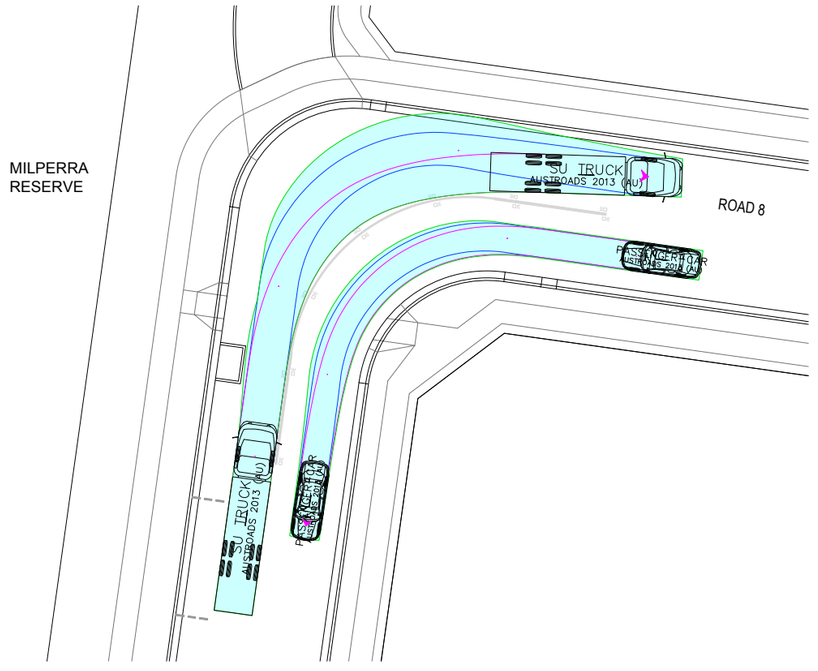


CAR OUTSIDE / SU TRUCK INSIDE



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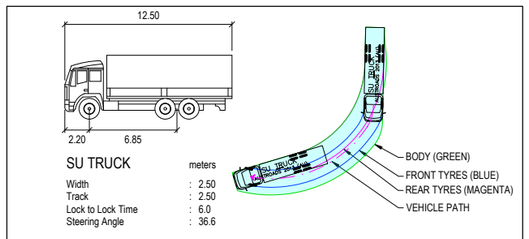

DESIGN VEHICLE - 12.5 m SERVICE VEHICLE

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REV	DESCRIPTION	DATE	DRN.	APP.

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0 2 4 8 12 16
SCALE 1:200 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Approved	
Date	07.11.25
DA Number	-

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 12 OF 18

Sheet 127 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	711	B

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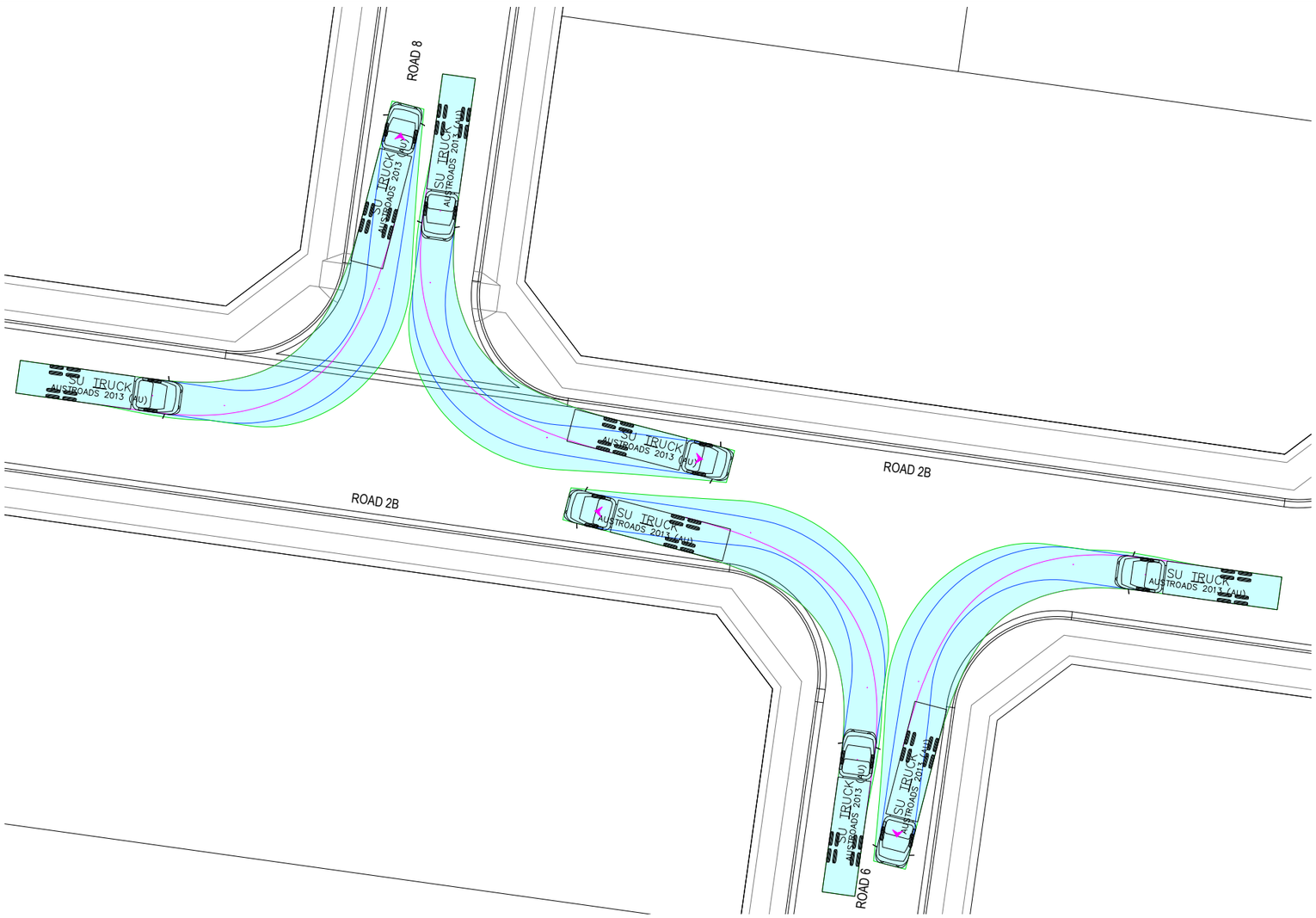

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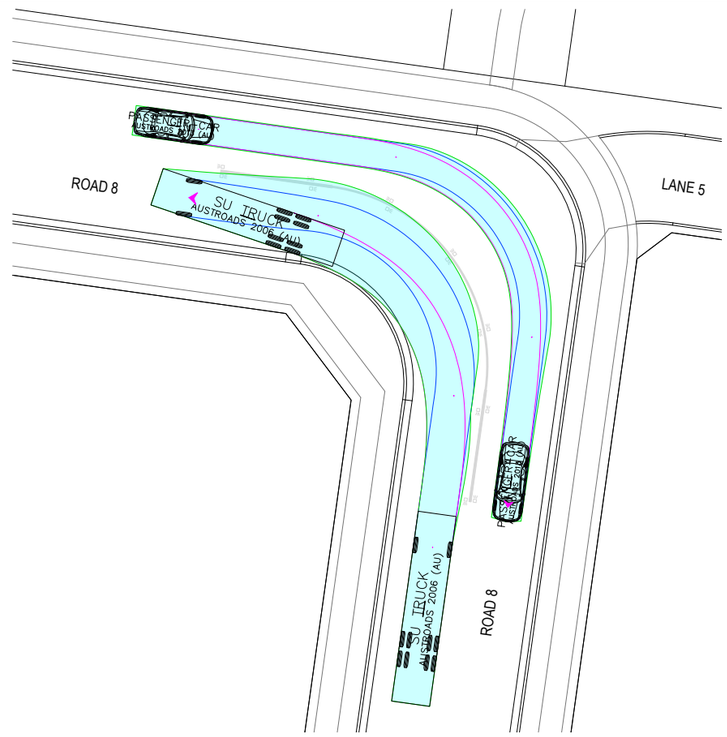

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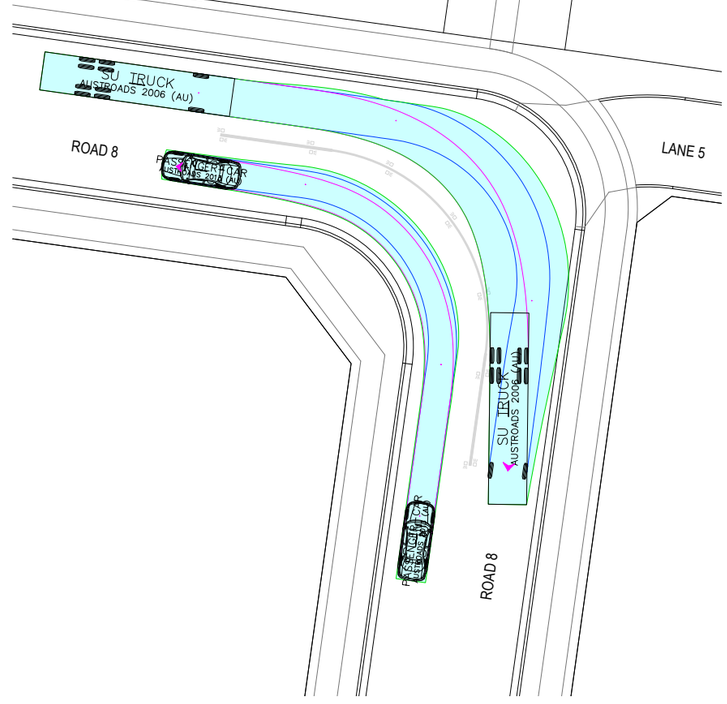

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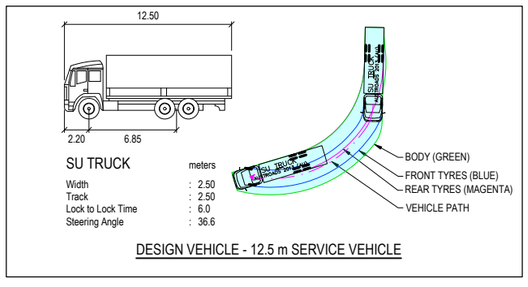
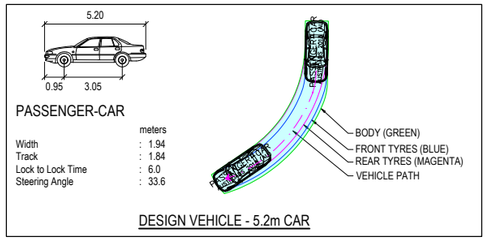


DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



DESIGN VEHICLE - 5.2m CAR

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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 13 OF 18

Sheet 128 of145

Scale: 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	712	B

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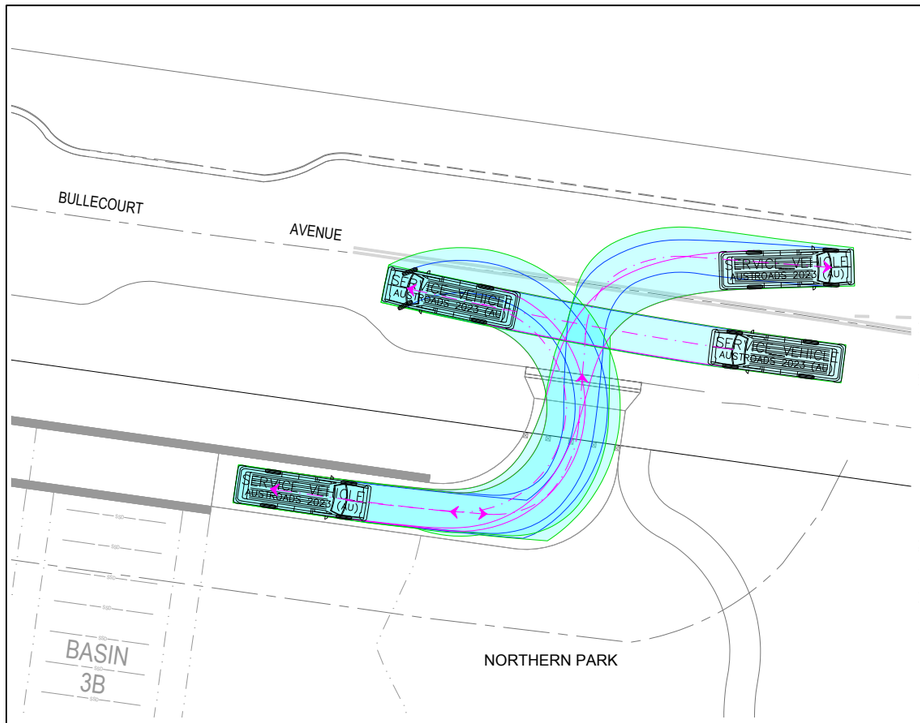

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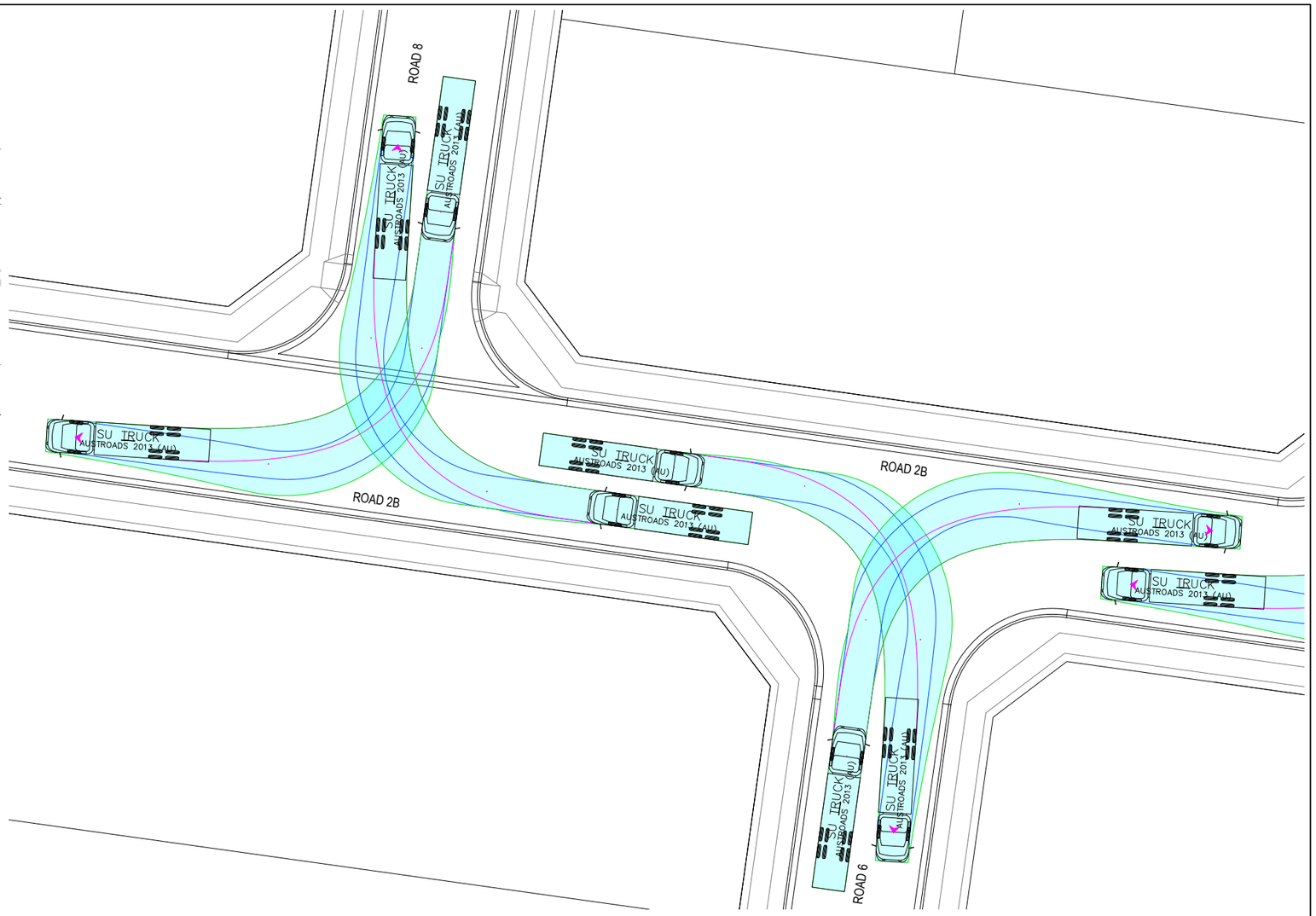

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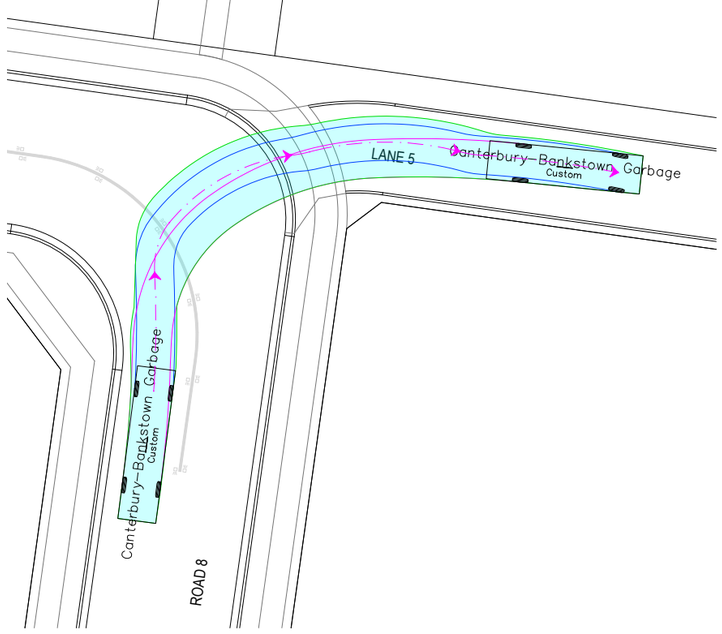
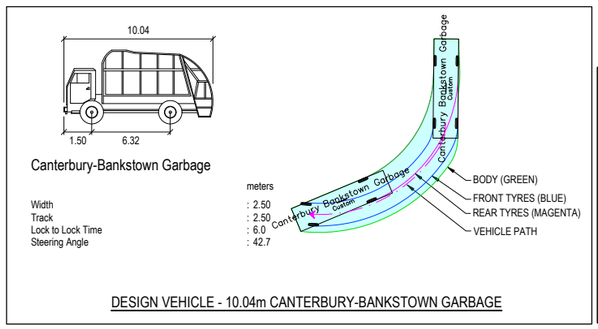
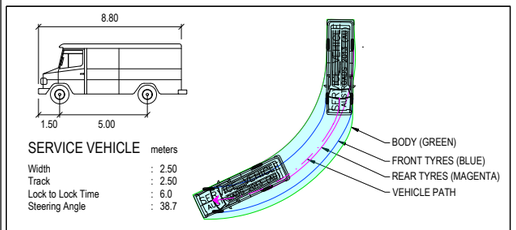


GARBAGE TRUCK - RIGHT IN



DESIGN VEHICLE - 10.04m CANTERBURY-BANKSTOWN GARBAGE



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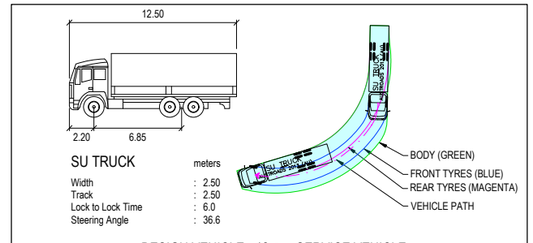

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REV	DESCRIPTION	DATE	DRN.	APP.

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Designed R. GOVENDER
Date 23.06.2025
Drawn D.RAFTER
Approved
Date 07.11.25
DA Number -

Beveridge Williams
Development & Infrastructure Consultants
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ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title: TURNING MOVEMENTS SHEET 14 OF 18

Sheet 129 of145
Scale 1:200 @ A1
N

Project Number	Reference	Drawing No	Revision
2301879	321	713	B

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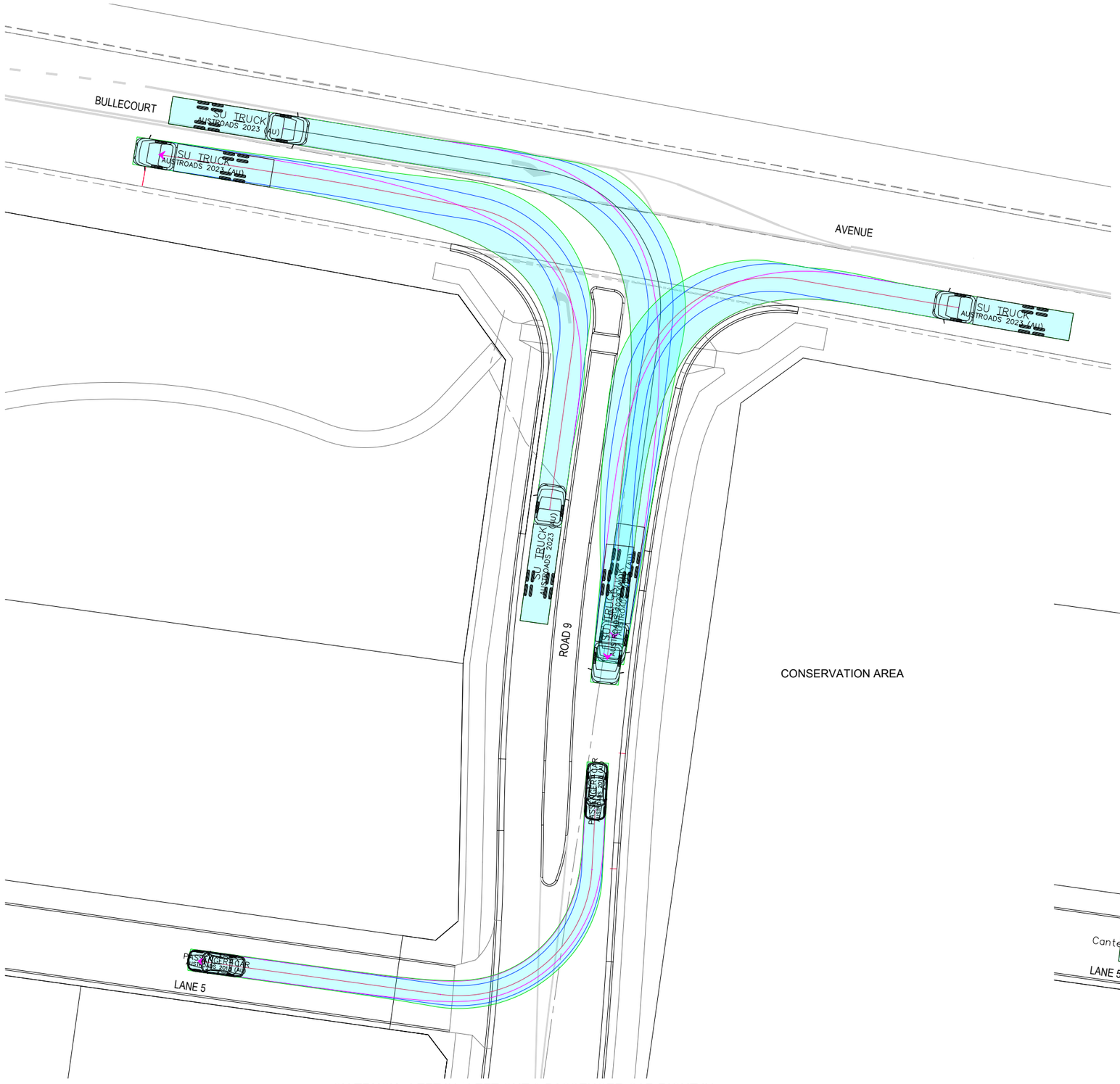

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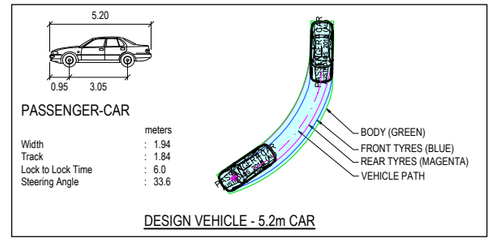
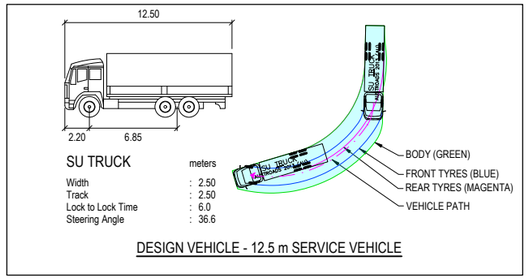
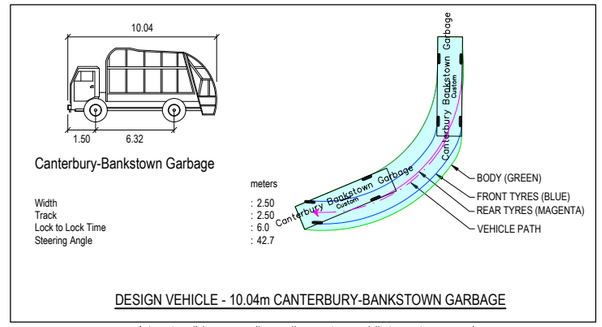


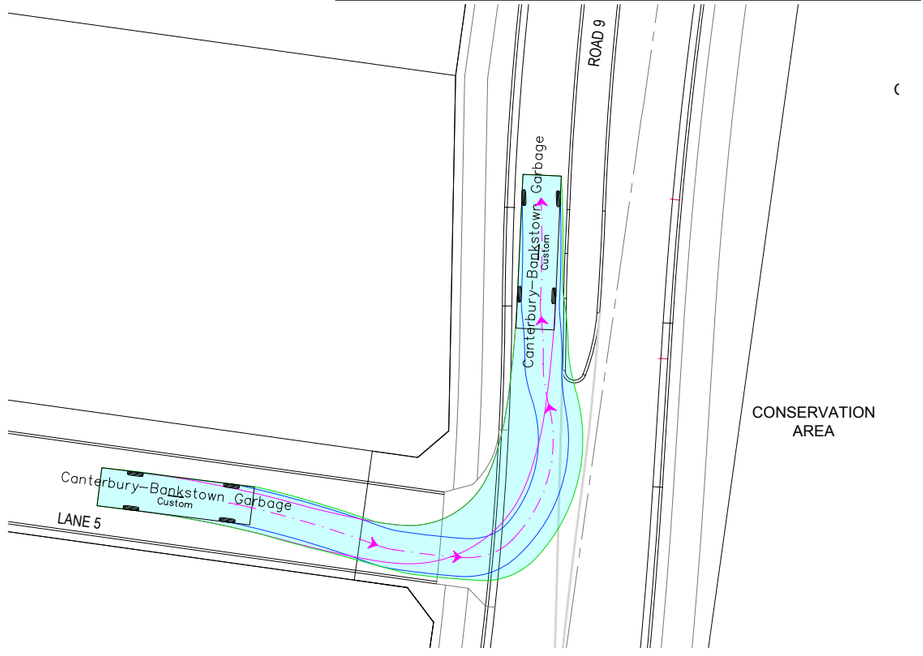
DESIGN VEHICLE - 5.2m CAR



DESIGN VEHICLE - 12.5 m SERVICE VEHICLE



DESIGN VEHICLE - 10.04m CANTERBURY-BANKSTOWN GARBAGE



GARBAGE TRUCK - LEFT OUT

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Date 23.06.2025
Drawn D.RAFTER
Approved
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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 15 OF 18

Sheet 130 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
2301879	321	714	B

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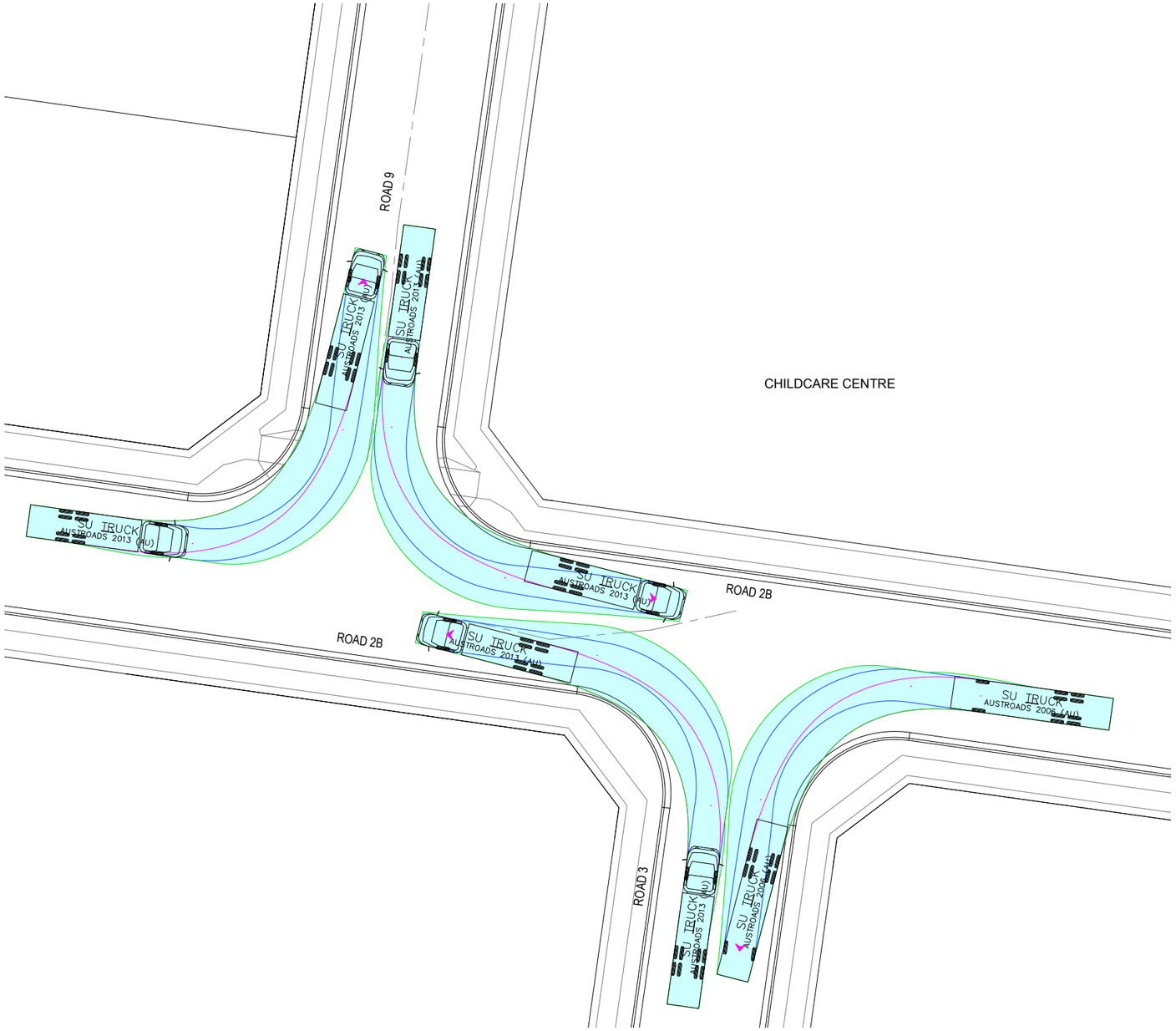

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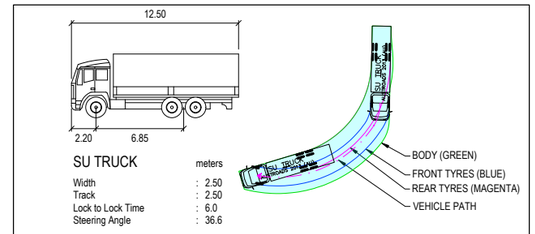

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	TURNING MOVEMENTS SHEET 16 OF 18

Sheet 131 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
2301879	321	715	B

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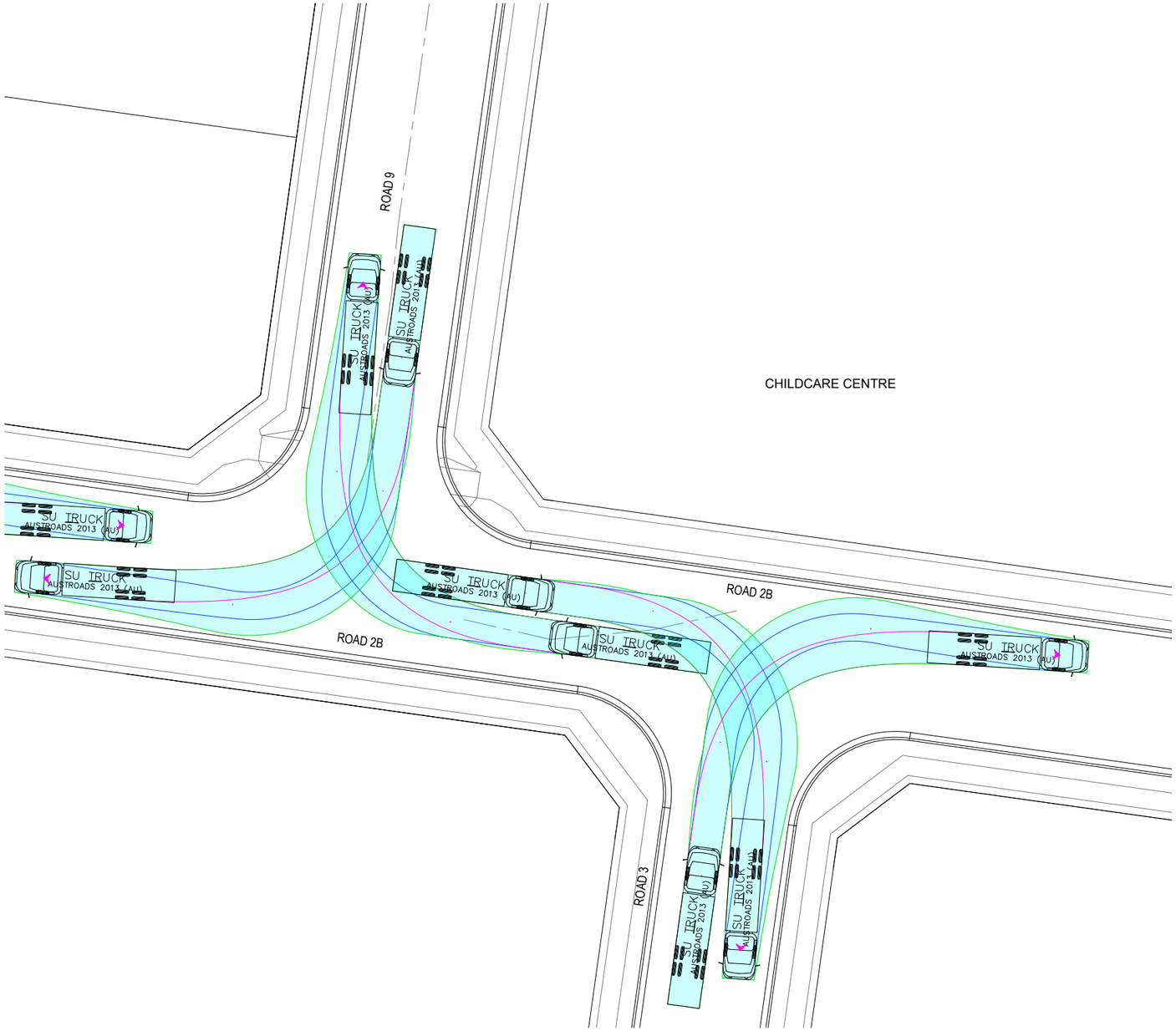

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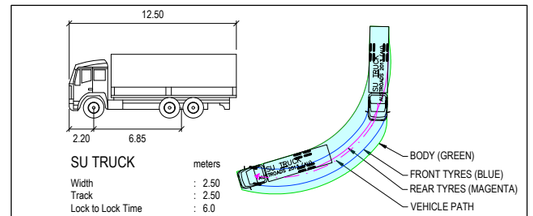

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Drawing Title	TURNING MOVEMENTS SHEET 17 OF 18

Sheet 132 of145

Scale 1:200 @ A1

N

Project Number	Reference	Drawing No	Revision
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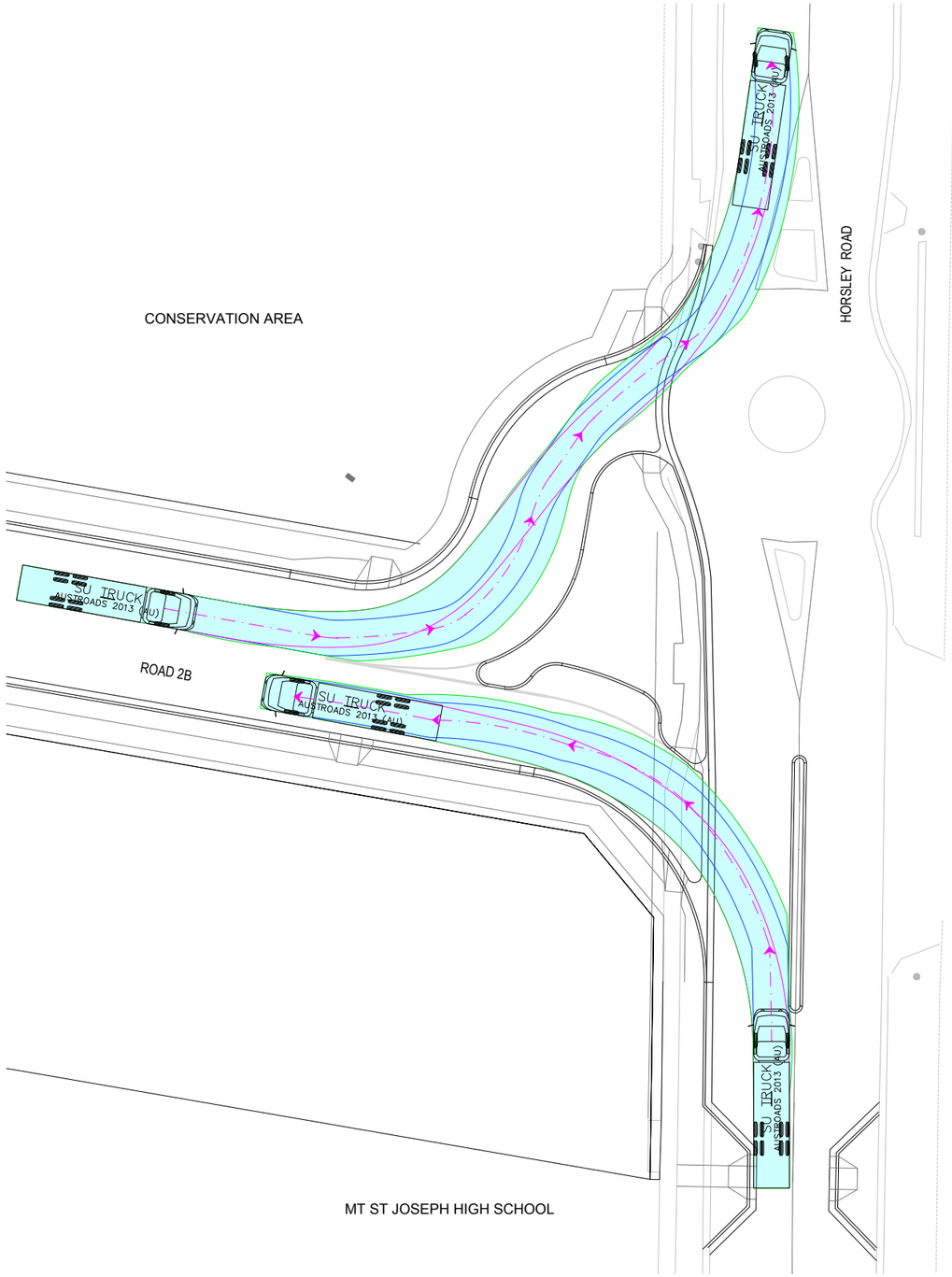
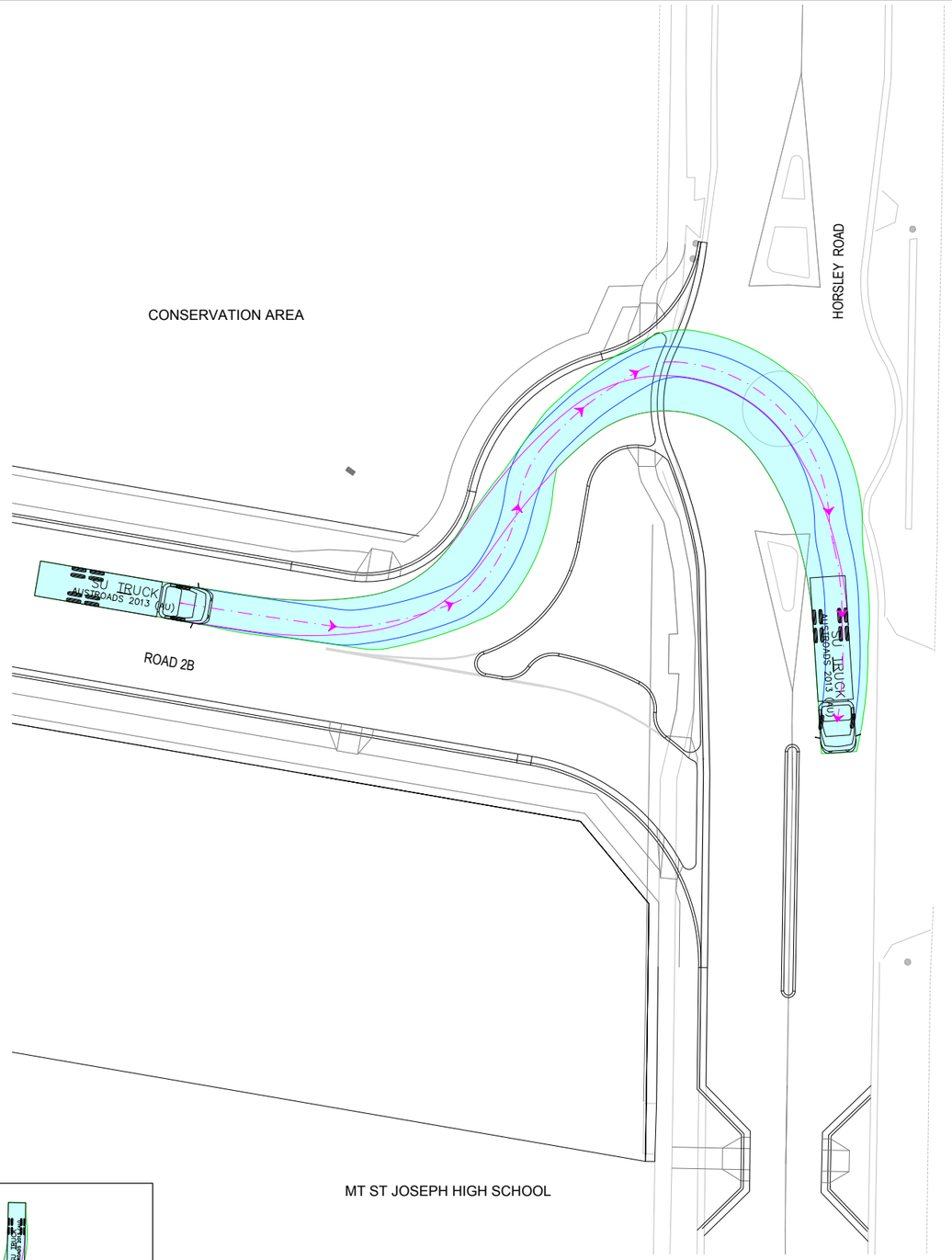


TRUCK - ENTRY AND EXIT - ROAD 2 & HORSLEY ROAD



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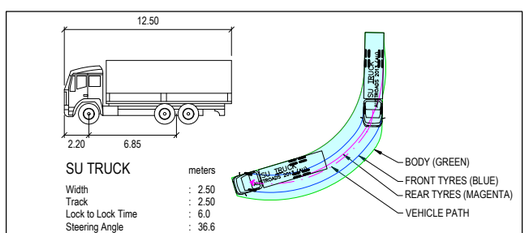

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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: TURNING MOVEMENTS
SHEET 18 OF 18

Sheet 133 of145
Scale 1:200 @ A1

Project Number	Reference	Drawing No	Revision
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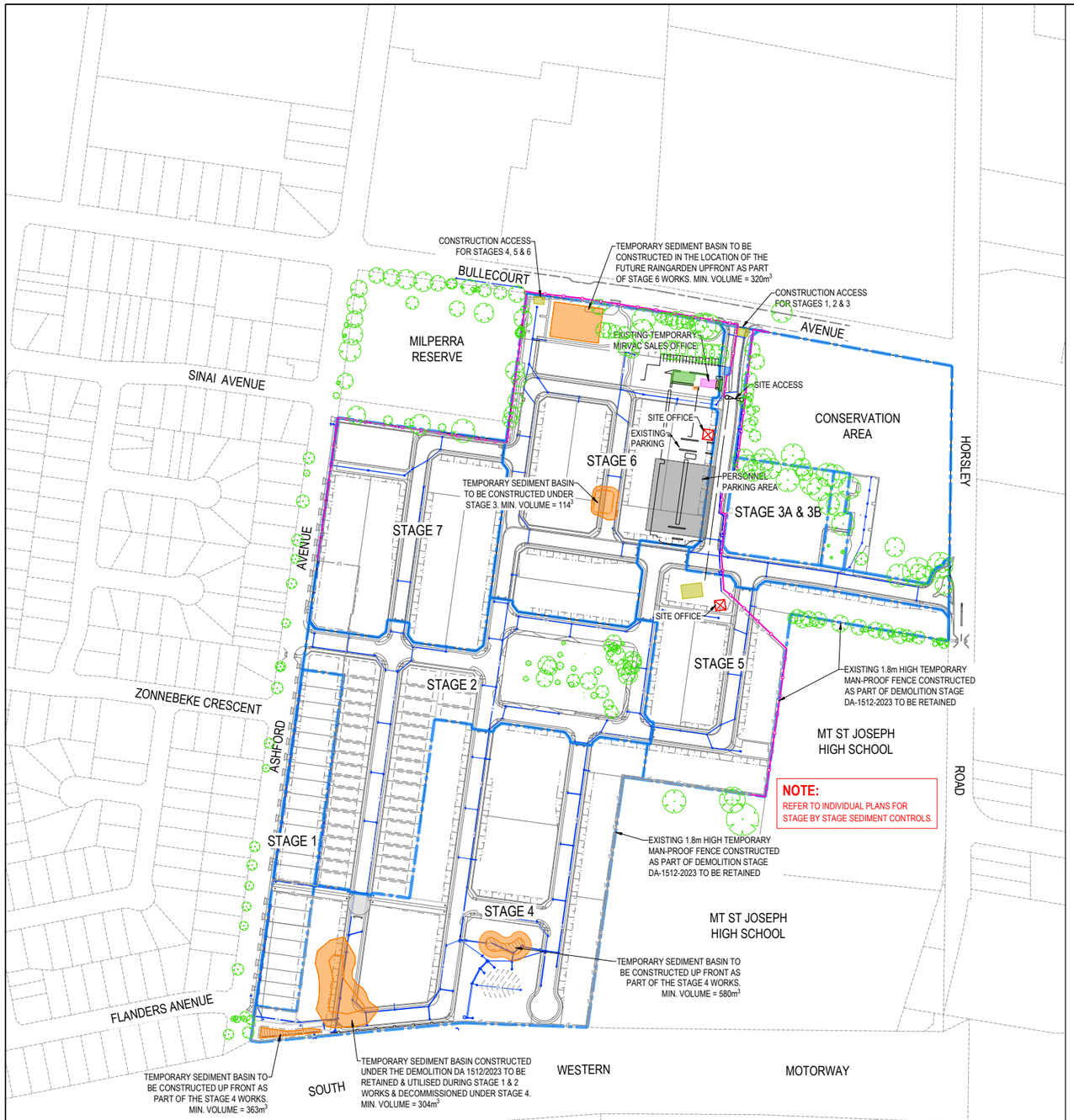

1. Erosion Hazard and Sediment Basins

Site Name: WSU Milperra

Site Location: 2 Bullecourt Ave, Milperra

Precinct/Stage: All Stages

Other Details: Stage 1 & 2 (Temp), 3 (Temp), 4B & 5 (Temp in Permanent), 4A & 7 (Temp in Permanent), 6 & 3 (Temp in Permanent)

Site area	Sub-catchment or Name of Structure						Notes
	1 & 2	3	4B & 5	4A & 7	6 & 3		
Total catchment area (ha)	3.838	1.562	7.712	5.033	4.337		
Disturbed catchment area (ha)	3.838	0.876	5.575	2.584	2.775		
Soil analysis (enter sediment type if known, or laboratory particle size data)							
Sediment Type (C , F or D) if known:	F	F	F	F	F		From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	33	33	33	33	33		Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	33	33	33	33	33		
% clay (fraction finer than 0.002 mm)	33	33	33	33	33		
Dispersion percentage	10.0	10.0	10.0	10.0	10.0		E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.95	4.95	4.95	4.95	4.95		See Section 6.3.3(e). Auto-calculated
Soil Texture Group	F	F	F	F	F		Automatic calculation from above
Rainfall data							
Design rainfall depth (no of days)	5	5	5	5	5		See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	75	75	75	75	75		
x-day, y-percentile rainfall event (mm)	19.4	19.4	19.4	19.4	19.4		
Rainfall R-factor (if known)	2600	2600	2600	2600	2600		Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	8.3	8.3	8.3	8.3	8.3		
RUSLE Factors							
Rainfall erosivity (*R*-factor)	2600	2600	2600	2600	2600		Auto-filled from above
Soil erodibility (*K*-factor)	0.038	0.038	0.038	0.038	0.038		RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	300	150	220	130	180		
Slope gradient (%)	2	2	2	2	2		
Length/gradient (*LS*-factor)	0.68	0.52	0.61	0.49	0.56		
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	
Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)							
Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35	0.35	0.35	0.35	0.35	0.35	See Table F2, page F-4 in Appendix F
Calculations and Type D/F Sediment Basin Volumes							
Soil loss (t/ha/yr)	88	67	78	63	72		
Soil Loss Class	1	1	1	1	1		See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	68	51	60	49	55		Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	43	8	56	21	26		See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	261	106	524	342	294		See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	304	114	580	363	320		

CONSTRUCTION SEQUENCE

FOLLOWING REMEDIATION OF THE AREA:

1. PLACE ALL SEDIMENT CONTROLS INCLUDING BASINS & OVERLAND FLOW PATHS FOR PCA APPROVAL BEFORE STARTING ANY WORKS ON SITE.
2. ALL TOPSOIL CONTAINING VEGETATION TO BE STRIPPED FROM EXISTING SURFACE & STOCKPILED FOR REMOVAL OFF-SITE (APPROX. 75mm THICK).
3. ALL TOPSOIL NOT CONTAINING VEGETATION TO BE STRIPPED FROM THE SITE & STOCKPILED FOR AMELIORATION FOR USE ELSEWHERE IN THE SITE OR BLENDING WITH CLAY / FILL TO BE USED AS FILL MATERIAL ON SITE.
4. PLACE REMEDIATION MATERIAL AT DEPTH IN ACCORDANCE WITH GEOTECHNICAL & ENVIRONMENTAL / SITE AUDITOR DIRECTION. MATERIAL TO BE BLENDED WITH FILL MATERIAL TO ACHIEVE COMPACTION REQUIREMENTS. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
5. STRIPPED SURFACE TO BE INSPECTED & CERTIFIED READY FOR FILL PLACEMENT BY GEOTECHNICAL ENGINEER.
6. COMPLETE INITIAL EARTHWORKS IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S REPORT
7. IMPORTED FILL TO BE CERTIFIED AS V.E.N.M. & FREE OF SLAG, HAZARDOUS, CONTAMINATED, TOXIC, PUTRESCIBLE OR RADIO-ACTIVE MATTER & INDUSTRIAL WASTE & BUILDING DEBRIS. THE ORIGIN OF FILL PROPOSED TO BE IMPORTED & THE ABOVE CERTIFICATION TO BE REVIEWED & APPROVED BY COUNCIL PRIOR TO ANY IMPORTED FILL ARRIVING ON SITE.
8. ALL FILL IS TO BE PLACED & COMPACTED IN ACCORDANCE WITH COUNCIL'S CONSTRUCTION SPECIFICATION.
9. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
10. COPIES OF ALL FILL COMPACTION TESTS TO BE PROVIDED TO PRINCIPLE.
11. INSTALL ALL PIT & KERB INLET FILTERS / SEDIMENT TRAPS.
12. 300mm WIDE, 50mm THICK TOPSOIL TO BE PLACED BEHIND KERBS & TURFED WITH KIKUYU TURF WITH ADDITIONAL SEDIMENT FENCING FOR BUILDING SITES
13. FINAL TOPSOIL/ TURF & PATHWAYS WITHIN ROAD VERGES TO BE BONDED WITH COUNCIL & COMPLETED BY BUILDERS FOLLOWING HOUSE CONSTRUCTION

SEDIMENT BASIN

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2. DIVERSION MOUNDS & FLOW PATHS ARE TO BE ADJUSTED AS FILLING LAYERS PROGRESS & SURFACE LEVELS RISE.
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5. UPON ADEQUATE SITE REVEGETATION & COUNCIL APPROVAL SEDIMENT BASIN IS TO BE DECOMMISSIONED & CONVERTED INTO RAINGARDENS PER DESIGN.

LEGEND

- EXISTING SURFACE CONTOURS (45.5)
- PROPOSED DRAINAGE PIPE AND PIT
- GRAVEL KERB INLET SEDIMENT TRAP
- GEOTEXTILE FILTER AROUND GRATED SURFACE INLET PITS
- STABILISED ACCESS POINT
- NEW 1.8m HIGH TEMPORARY MANPROOF FENCE W/ SHADE CLOTH
- HI-VIS MESH FENCING TO LIMIT CONTRACTORS ACTIVITIES TO THE STAGE 1 LIMITS
- SFS — SAND OR AGGREGATE FILLED HESSIAN FILTER LAIDACROSS ROAD PAVEMENT TO TRAP LOCALISED SILT MATERIAL
- SEDIMENT FENCING
- STRAW BALE
- TEMPORARY MOUND TO DIVERT DIRTY WATER TO TEMPORARY SEDIMENT BASIN
- TEMPORARY SEDIMENT BASIN
- SITE OFFICE
- PERSONNEL PARKING AREA

NOTE: ALL SOIL AND WATER MANAGEMENT DETAILS ARE NOTED ON SOIL AND WATER MANAGEMENT NOTES. SEDIMENT & MANPROOF FENCES ARE TO BE LOCATED WHOLLY WITHIN BOUNDARIES & HAVE BEEN SHOWN DIAGRAMMATICALLY. PROVIDE CONSTRUCTION SIGN & AMENITIES IN ACCORDANCE WITH CONDITIONS OF THE DA.

NOTE: MEASURES PROPOSED IN THE PLAN ARE FOR GUIDANCE AND SUBJECT TO MODIFICATION TO SUIT CONTRACTORS METHODOLOGY & APPROVAL OF THE PRINCIPLE CERTIFYING AUTHORITY.

LEGEND:

_ _ _ _ _ _ INDICATIVE RESIDENTIAL LOT BOUNDARY. SUBJECT TO FURTHER DA APPROVAL

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REV	DESCRIPTION	DATE	DRN.	APP.

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SCALE 1:2000 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: OVERALL SOIL & WATER MANAGEMENT PLAN

Sheet 134 of 145

Scale 1:2000 @ A1

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Project Ref	Stage No	Drawing No	Rev
2301879	321	800	B

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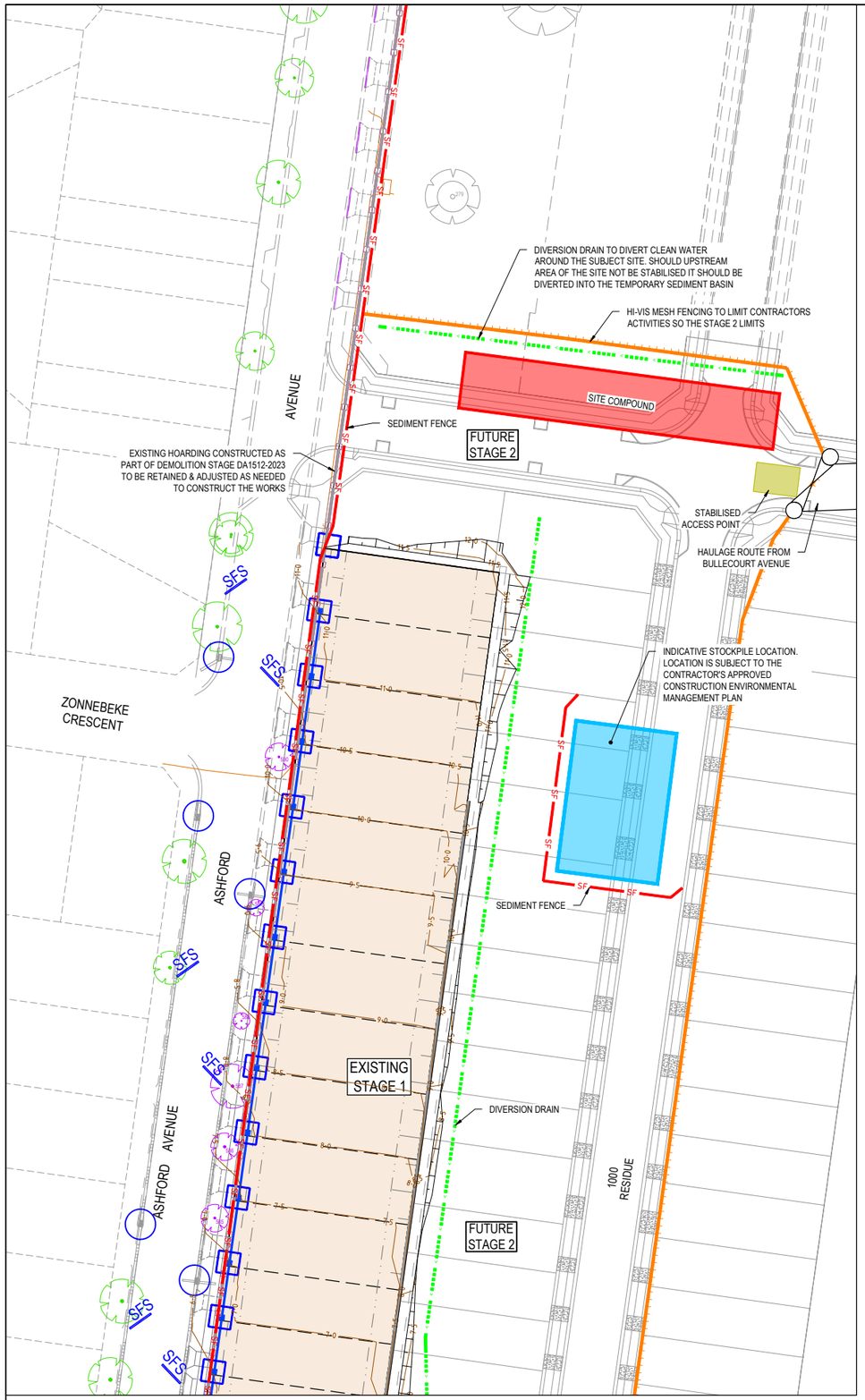

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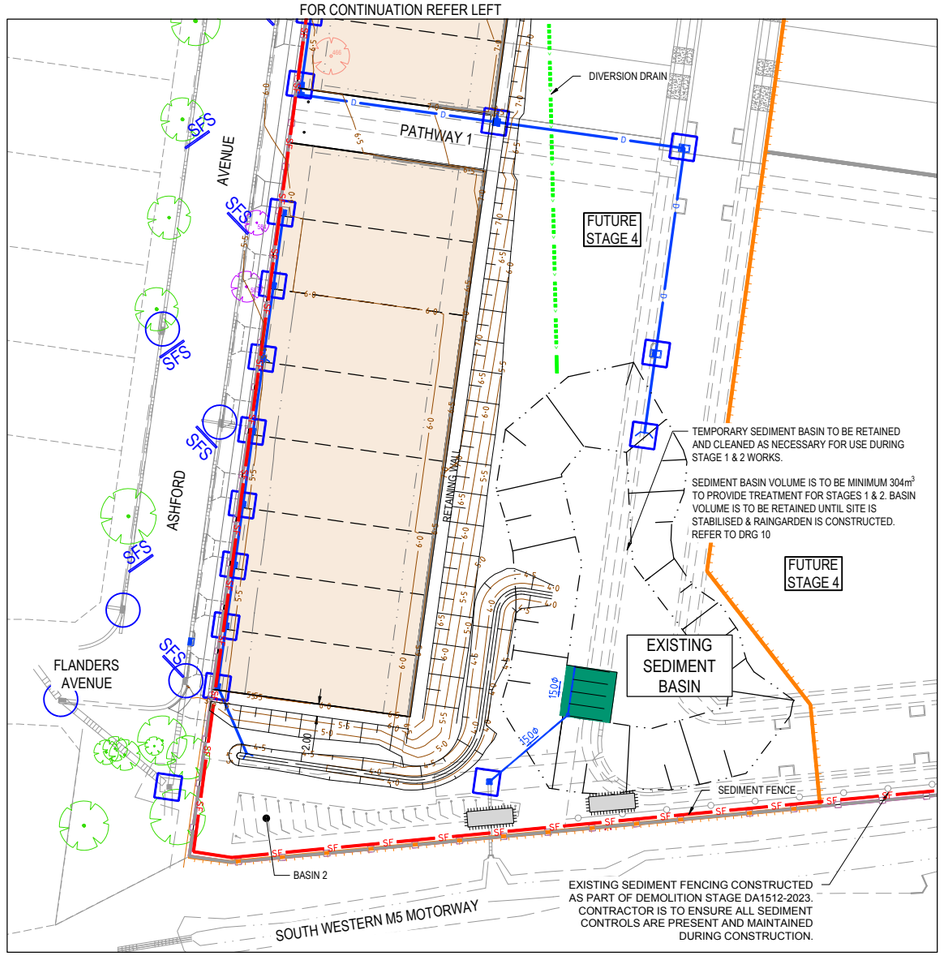
FOR CONTINUATION REFER LEFT



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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN STAGE 1

Sheet 135 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	801	B

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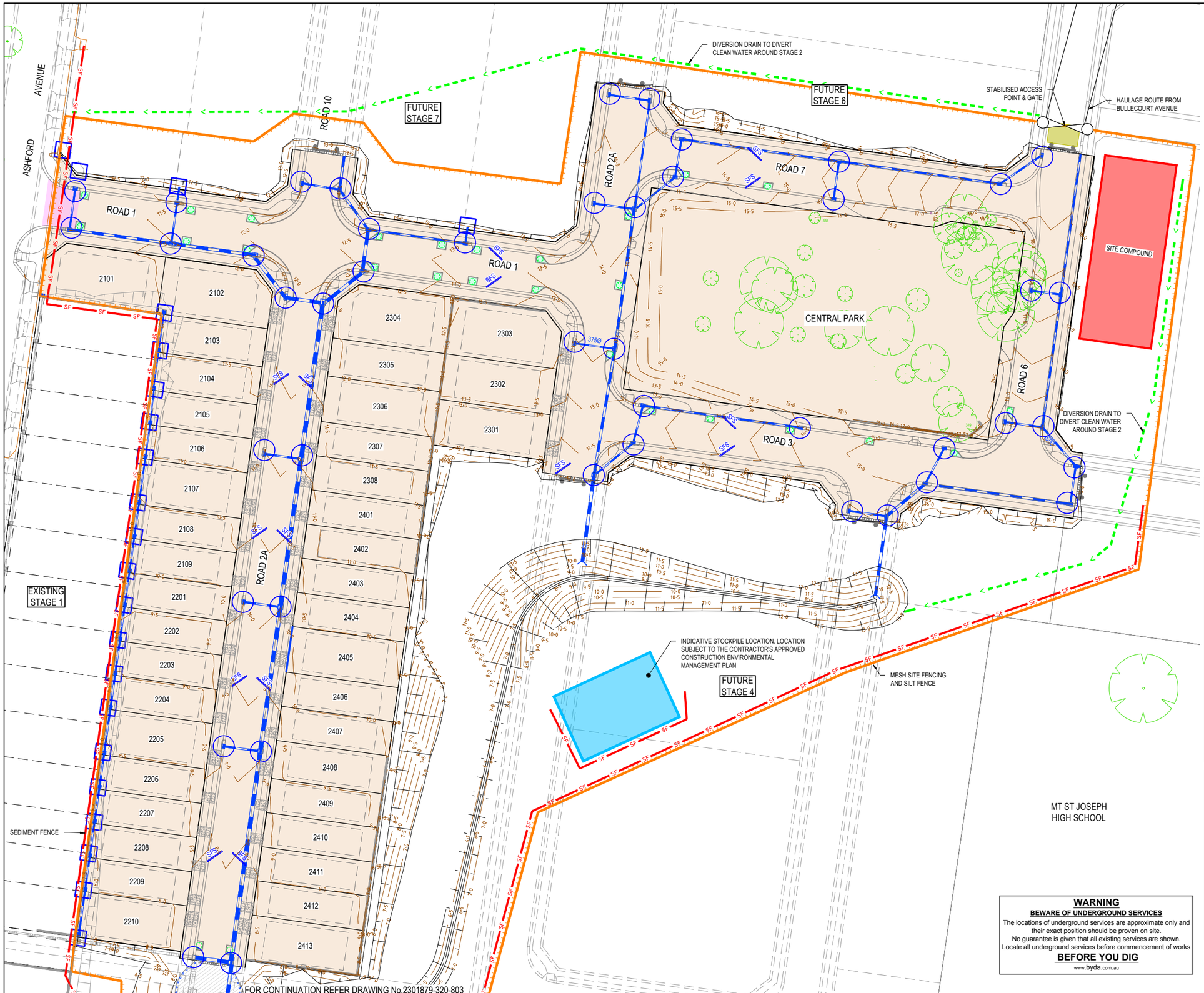

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	SOIL & WATER MANAGEMENT PLAN STAGE 2 SHEET 1 OF 2

Sheet 136 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	802	B

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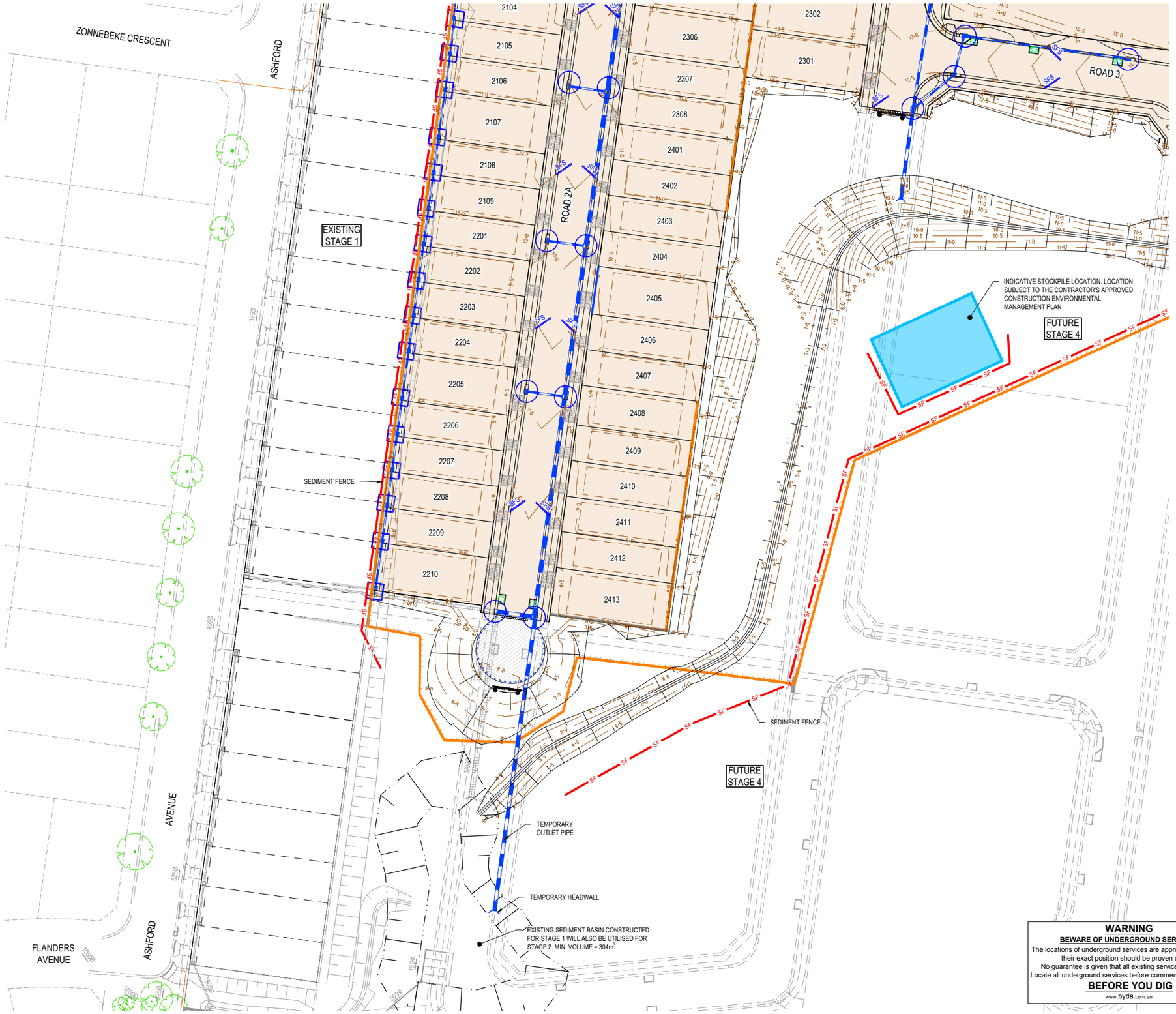

LEGEND

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4. BASINS ARE TO BE FLOCCULATED WITH GYPSUM WHEN SUSPENDED SOLID CONCENTRATION EXCEEDS 50 *milligrams per litre.* SPREADING RATE TO BE DETERMINED AFTER TESTING AND ANALYSIS OF THE INITIAL STORM EVENT. FIRST APPLICATION IS TO BE *30 kilograms GYPSUM PER 100 cum.* OF STORED WATER & THEREAFTER AS DETERMINED BY TESTING. PUMP OUT CLEAN WATER TO LARGE GRASSED / VEGETATED AREA WITHIN 72 hrs OF TREATMENT. REFER LANDCOM SOIL & CONSTRUCTION - "MANAGING URBAN STORMWATER" MANUAL - APPENDIX E
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mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
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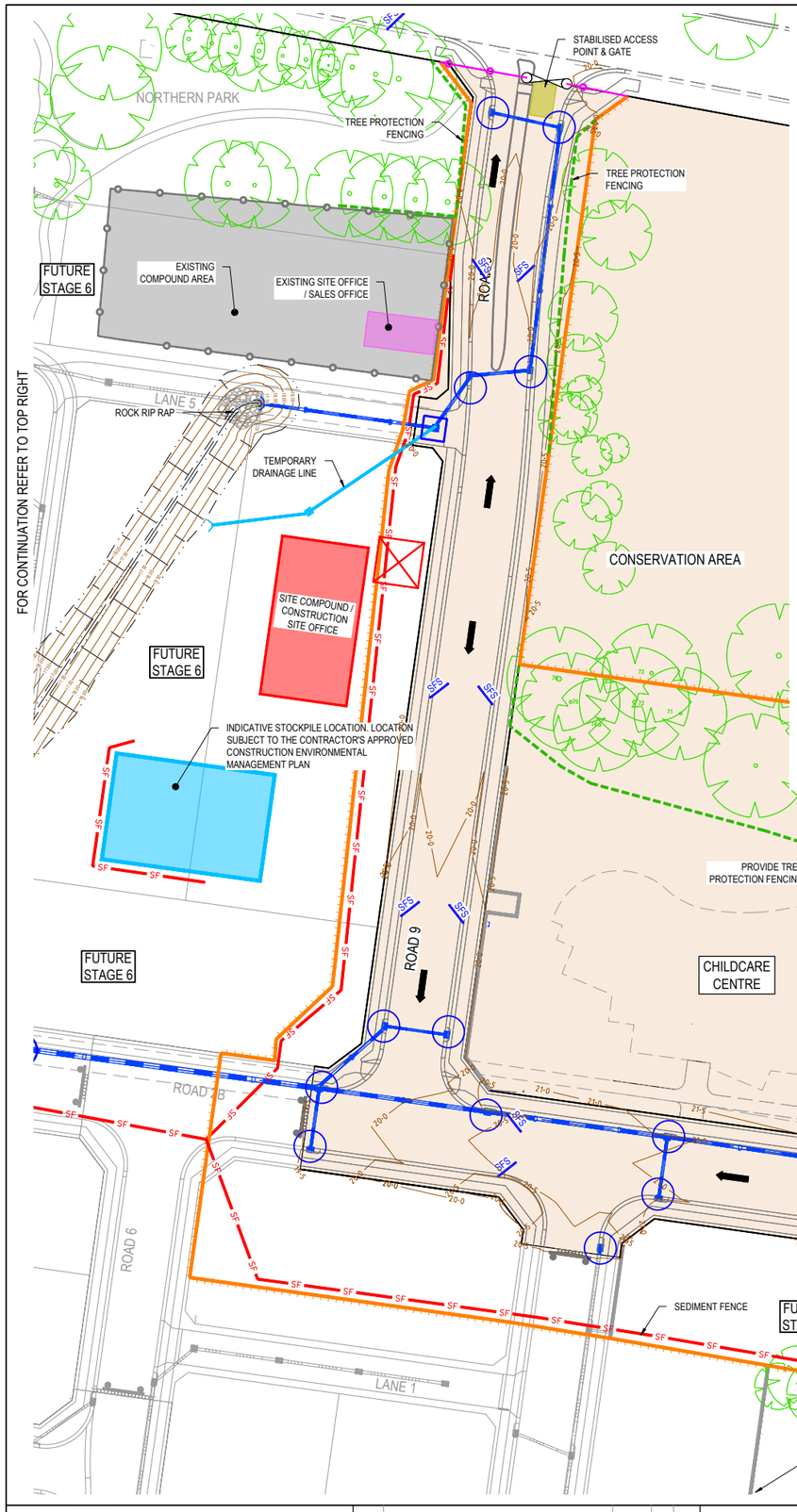
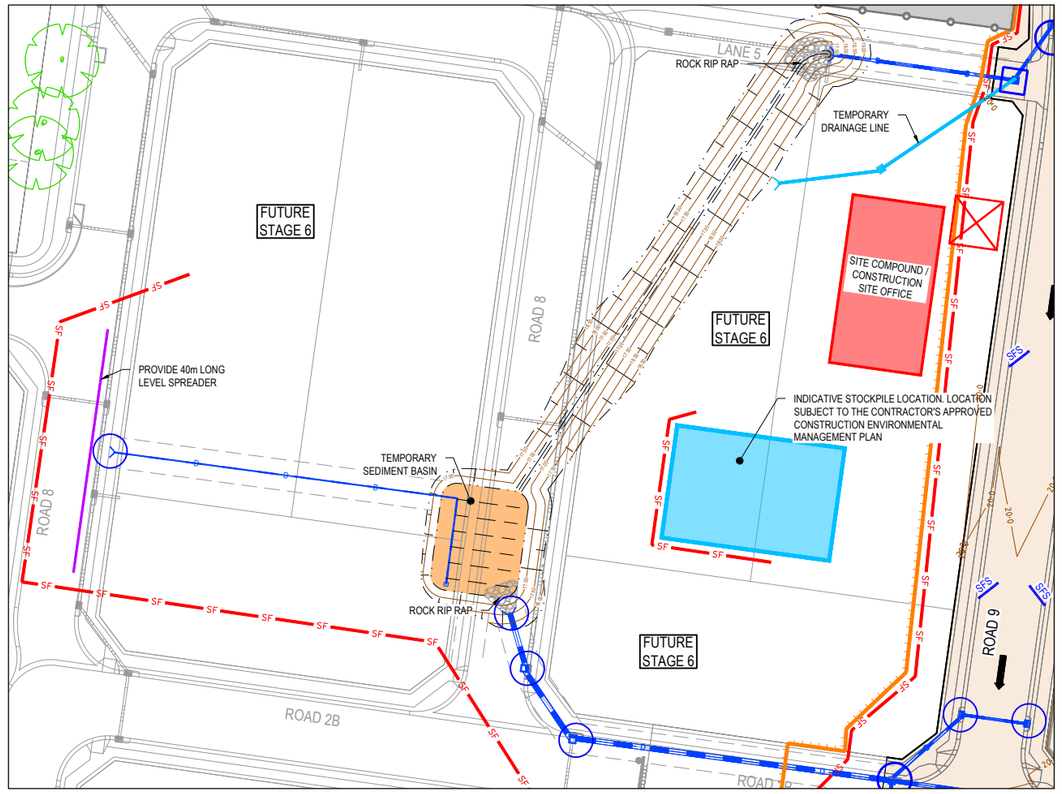
Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	SOIL & WATER MANAGEMENT PLAN STAGE 2 SHEET 2 OF 2

Sheet 137 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	803	B

F:\synergytemp\12dSynergy\12dSynergyServerService\3192\a0aac392-9e58-408d-ab3d-b9bfe4405e2f\2301879-321-802-SWM.dwg





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- EXISTING SURFACE CONTOURS
- PROPOSED DRAINAGE PIPE AND PIT
- TEMPORARY DRAINAGE PIPE AND PIT
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- STABILISED ACCESS POINT
- NEW 1.8m HIGH TEMPORARY MANPROOF FENCE W/ SHADE CLOTH
- HI-VIS MESH FENCING TO LIMIT CONTRACTORS ACTIVITIES TO THE STAGE 2 LIMITS
- SAND OR AGGREGATE FILLED HESSIAN FILTER LAIDACROSS ROAD PAVEMENT TO TRAP LOCALISED SILT MATERIAL
- SEDIMENT FENCING
- STRAW BALE
- DIVERSION DRAIN
- TEMPORARY SEDIMENT BASIN
- SITE COMPOUND
- INDICATIVE STOCKPILE LOCATION
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2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN
STAGE 3

Sheet 138 of 145

Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	804	B

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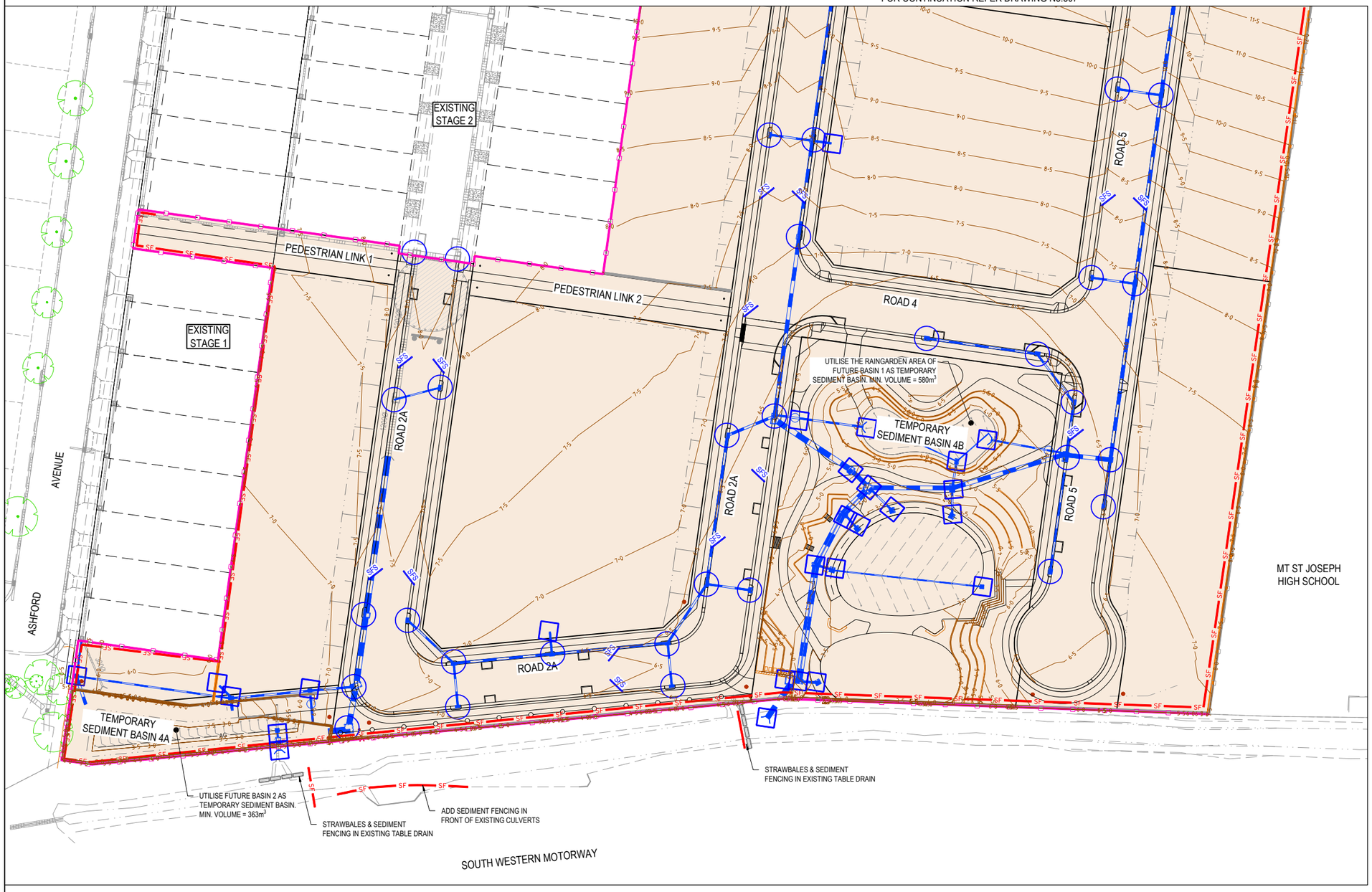
FOR CONTINUATION REFER DRAWING No.807



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mirvac

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SCALE 1:500 AT A1 SIZE

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Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN
STAGE 4
SHEET 1 OF 2

Sheet 139 of 145

Scale 1:500 @ A1

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Project Ref	Stage No	Drawing No	Rev
2301879	321	806	B

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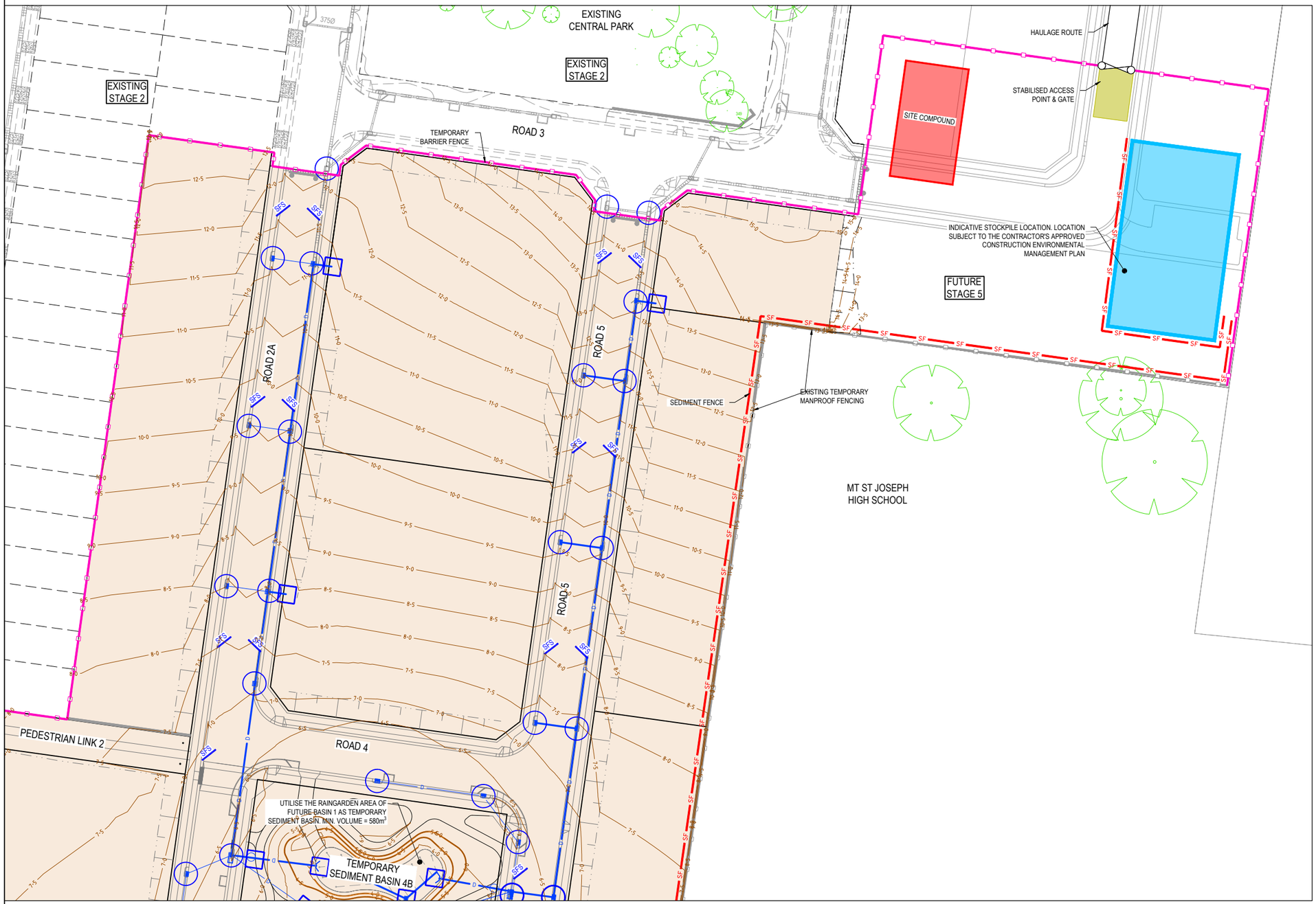

FOR CONTINUATION REFER DRAWING No.806

LEGEND

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Drawing Title: SOIL & WATER MANAGEMENT PLAN
STAGE 4
SHEET 2 OF 2

Sheet 140 of 145
Scale 1:500 @ A1

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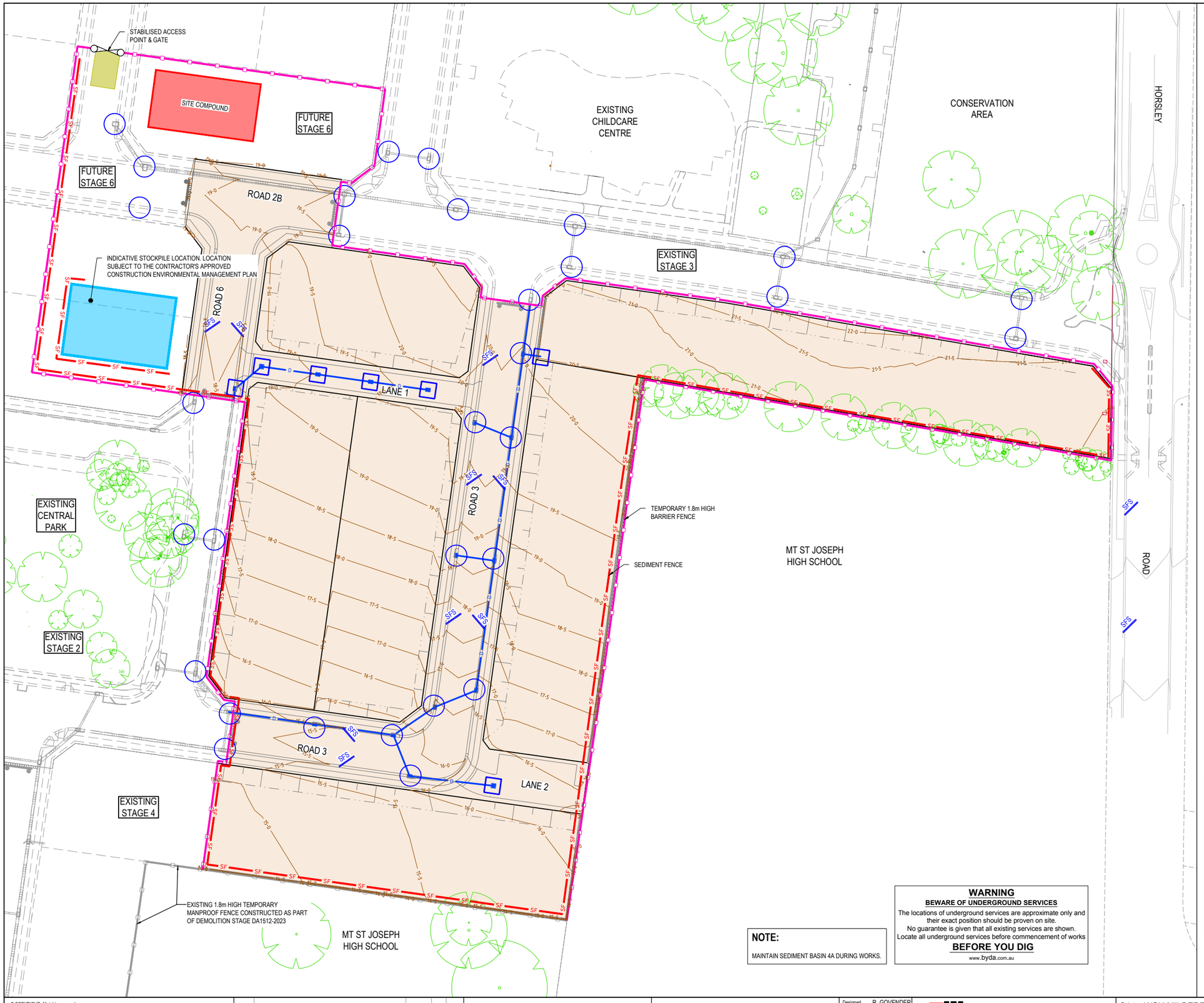

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NOTE: MEASURES PROPOSED IN THE PLAN ARE FOR GUIDANCE AND SUBJECT TO MODIFICATION TO SUIT CONTRACTORS METHODOLOGY & APPROVAL OF THE PRINCIPLE CERTIFYING AUTHORITY.

CONSTRUCTION SEQUENCE

FOLLOWING REMEDIATION OF THE AREA:

1. PLACE ALL SEDIMENT CONTROLS INCLUDING BASINS & OVERLAND FLOW PATHS FOR PCA APPROVAL BEFORE STARTING ANY WORKS ON SITE.
2. ALL TOPSOIL CONTAINING VEGETATION TO BE STRIPPED FROM EXISTING SURFACE & STOCKPILED FOR REMOVAL OFF-SITE (APPROX. 75mm THICK).
3. ALL TOPSOIL NOT CONTAINING VEGETATION TO BE STRIPPED FROM THE SITE & STOCKPILED FOR AMELIORATION FOR USE ELSEWHERE IN THE SITE OR BLENDING WITH CLAY / FILL TO BE USED AS FILL MATERIAL ON SITE.
4. PLACE REMEDIATION MATERIAL AT DEPTH IN ACCORDANCE WITH GEOTECHNICAL & ENVIRONMENTAL / SITE AUDITOR DIRECTION. MATERIAL TO BE BLENDED WITH FILL MATERIAL TO ACHIEVE COMPACTION REQUIREMENTS. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
5. STRIPPED SURFACE TO BE INSPECTED & CERTIFIED READY FOR FILL PLACEMENT BY GEOTECHNICAL ENGINEER.
6. COMPLETE INITIAL EARTHWORKS IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S REPORT
7. IMPORTED FILL TO BE CERTIFIED AS V.E.N.M. & FREE OF SLAG, HAZARDOUS, CONTAMINATED, TOXIC, PUTRESCIBLE OR RADIO-ACTIVE MATTER & INDUSTRIAL WASTE & BUILDING DEBRIS. THE ORIGIN OF FILL PROPOSED TO BE IMPORTED & THE ABOVE CERTIFICATION TO BE REVIEWED & APPROVED BY COUNCIL PRIOR TO ANY IMPORTED FILL ARRIVING ON SITE.
8. ALL FILL IS TO BE PLACED & COMPACTED IN ACCORDANCE WITH COUNCIL'S CONSTRUCTION SPECIFICATION.
9. ALL FILL TO BE PLACED UNDER LEVEL 1 GEOTECHNICAL SUPERVISION.
10. COPIES OF ALL FILL COMPACTION TESTS TO BE PROVIDED TO PRINCIPLE.
11. INSTALL ALL PIT & KERB INLET FILTERS / SEDIMENT TRAPS.
12. 300mm WIDE, 50mm THICK TOPSOIL TO BE PLACED BEHIND KERBS & TURFED WITH KIKUYU TURF WITH ADDITIONAL SEDIMENT FENCING FOR BUILDING SITES
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3. SEDIMENT IS TO BE REMOVED SUCH THAT NOT LESS THAN 70% OF THE DESIGN CAPACITY IS AVAILABLE AT ALL TIMES MARKERS WITH DEPTH INDICATORS ARE TO BE PLACED IN EACH BASIN TO INDICATE WHEN SEDIMENT ACCUMULATION EXCEEDS 30% OF STORAGE REQUIREMENTS.
4. BASINS ARE TO BE FLOCCULATED WITH GYPSUM WHEN SUSPENDED SOLID CONCENTRATION EXCEEDS *50 milligrams per litre*. SPREADING RATE TO BE DETERMINED AFTER TESTING AND ANALYSIS OF THE INITIAL STORM EVENT. FIRST APPLICATION IS TO BE *30 kilograms GYPSUM PER 100 cum.* OF STORED WATER & THEREAFTER AS DETERMINED BY TESTING. PUMP OUT CLEAN WATER TO LARGE GRASSED / VEGETATED AREA WITHIN 72 hrs OF TREATMENT. REFER LANDCOM SOIL & CONSTRUCTION - "MANAGING URBAN STORMWATER" MANUAL - APPENDIX E
5. UPON ADEQUATE SITE REVEGETATION & COUNCIL APPROVAL SEDIMENT BASIN IS TO BE DECOMMISSIONED & CONVERTED INTO RAINGARDENS PER DESIGN.

NOTE:

MAINTAIN SEDIMENT BASIN 4A DURING WORKS.

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0 5 10 20 30 40
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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN STAGE 5

Sheet 141 of 145

Scale: 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	808	B

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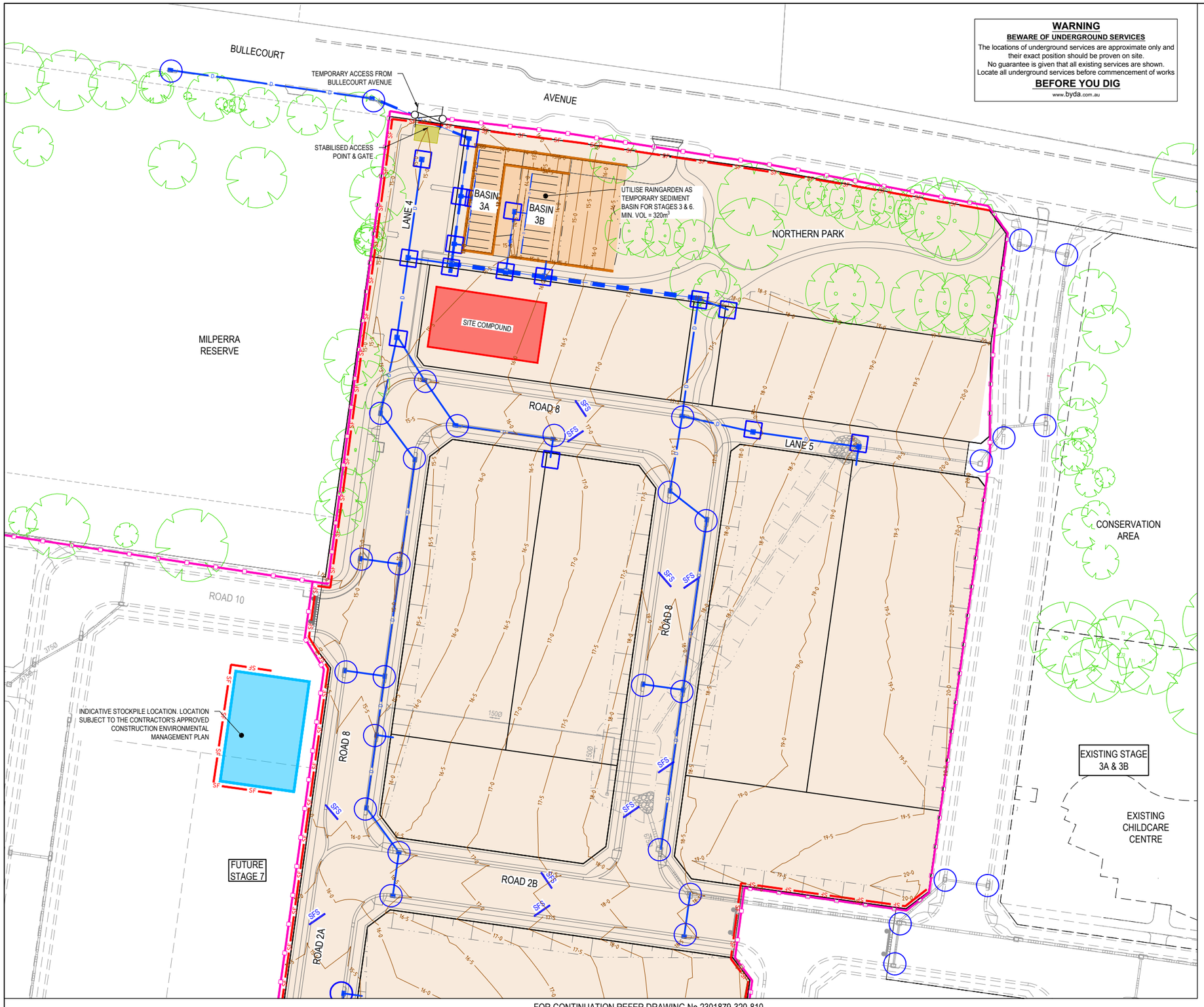

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LEGEND

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- TEMPORARY DRAINAGE PIPE AND PIT
- GRAVEL KERB INLET SEDIMENT TRAP
- GEOTEXTILE FILTER AROUND GRATED SURFACE INLET PITS
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- HI-VIS MESH FENCING TO LIMIT CONTRACTORS ACTIVITIES TO THE STAGE 6 LIMITS
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FOR CONTINUATION REFER DRAWING No.2301879-320-810

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Project Details	WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984 2A BULLECOURT AVENUE, MILPERRA
Drawing Title	SOIL & WATER MANAGEMENT PLAN STAGE 6 SHEET 1 OF 2

Sheet 142 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	809	B

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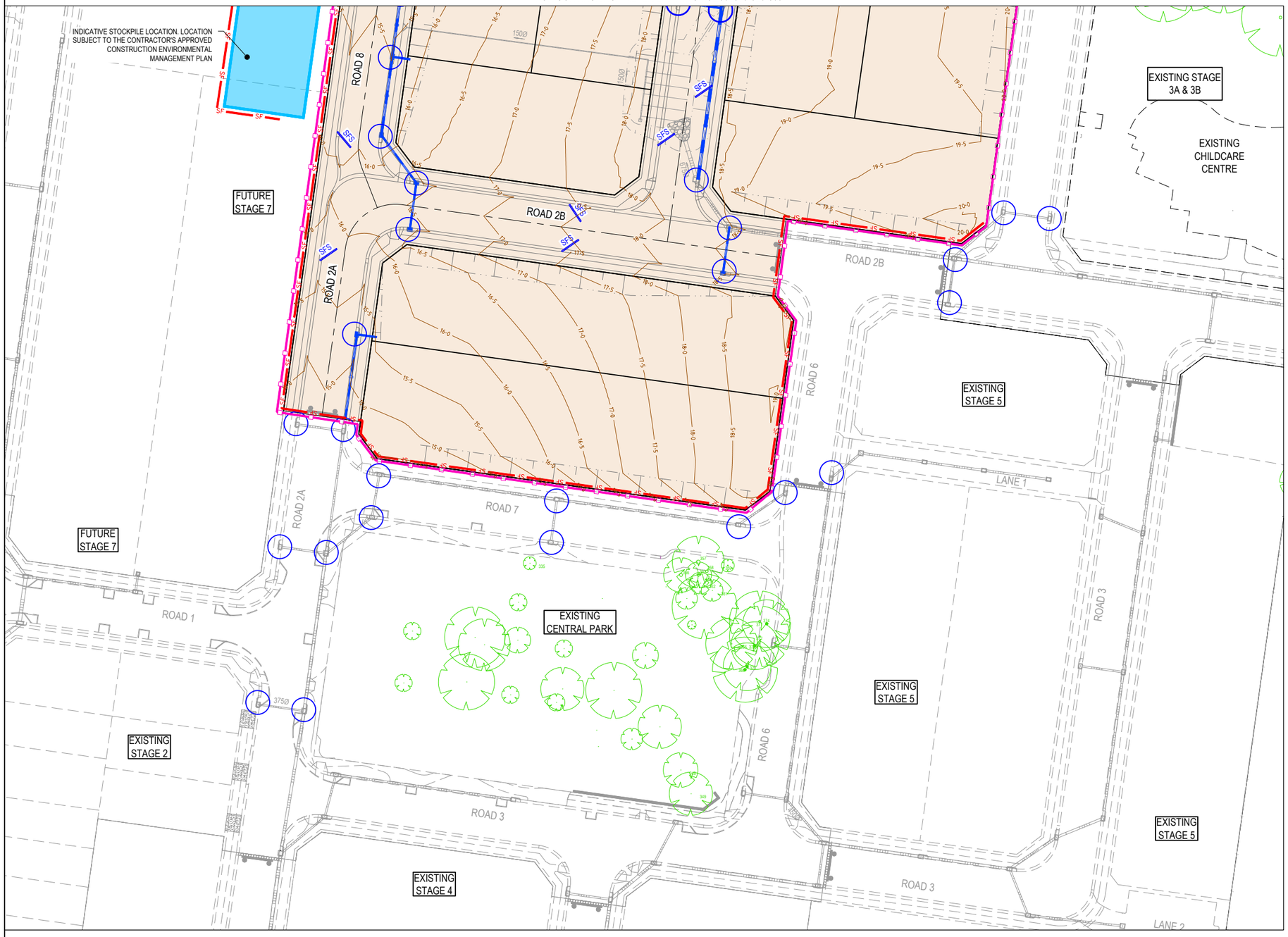

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Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN
STAGE 6
SHEET 2 OF 2

Sheet 143 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	810	B

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Drawing Title	SOIL & WATER MANAGEMENT PLAN STAGE 7

Sheet 144 of 145
Scale 1:500 @ A1

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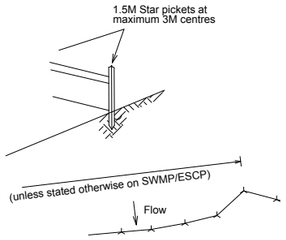
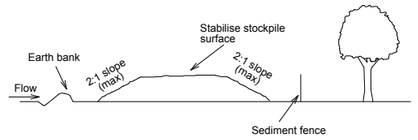


Star pickets at maximum 3M spacings

1. Construct sediment fence as close as possible to parallel to the contours of the site
2. Drive 1.5 metre long star pickets into ground, 3 metres apart.
3. Dig a 150MM deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched
5. Fix self supporting geotextile to upslope side of posts with wire ties or as recommended by geotextile manufacturer
6. Join sections of fabric at a support post with a 150mm overlap

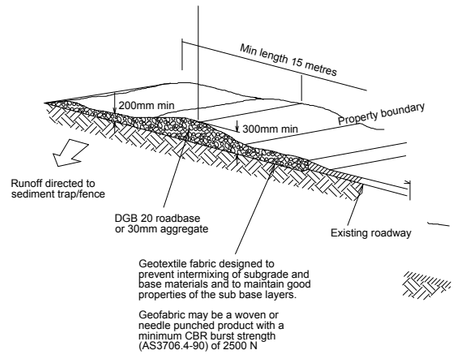
SEDIMENT FENCE



Construction Notes

1. Locate stockpile at least 5 metres from existing vegetation, concentrated water flows, roads and hazard areas.
2. Construct on the contour as a low, flat elongated mound.
3. All stockpiles shall be less than 2 metres in height
4. Rehabilitate in accordance with the SWMP/ESCP.
5. Construct earth bank (Standard Drawing 5-2) on the upslope side to divert run off around the stockpile and a sediment fence (standard Drawing 6-7) 1 to 2 metres downslope of stockpile.
6. Seeded areas to be watered twice weekly until established. Substantial growth required within 14 days or bitumen straw mulch to be placed.
7. Dust to be controlled by watering

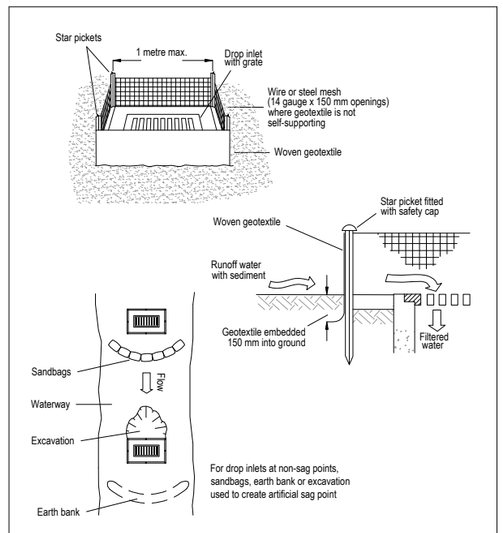
STOCKPILES



Construction Notes

1. Strip topsoil and level site.
2. Compact subgrade
3. Cover area with needle punch geotextile.
4. Construct 200mm thick pad over geotextile using roadbase or 30mm aggregate. Minimum length 15 metres or to building alignment width 3 metres
5. Construct hump immediately within boundary to divert water to a sediment fence or other sediment trap.

STABILISED SITE ACCESS

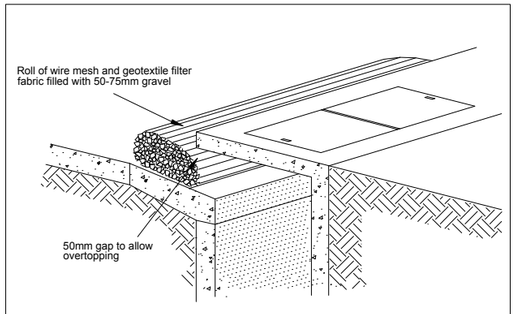


GEOTEXTILE INLET FILTER (SD 6-12)

NTS

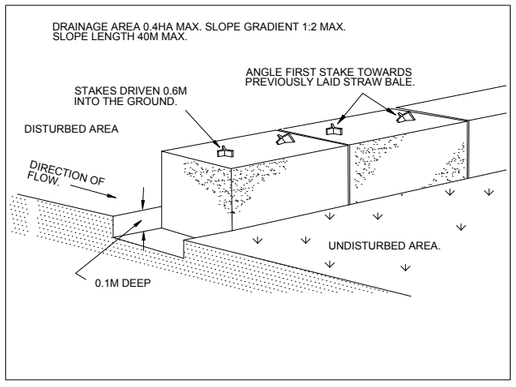
Construction Notes

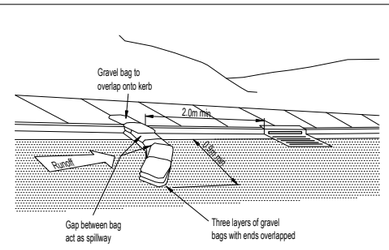
1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.



Portable Gravel Kerb Inlet

Sediment Trap





KERB INLET CONTROL - ON GRADE

Gravel Bag Check Dam

SFS

NOTES

ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE LANDCOM'S MANUAL "MANAGING URBAN STORMWATER" 4TH EDITION AUGUST 2004.

WORKS SHALL BE UNDERTAKEN AS OUTLINED ON PLANS EROSION AND SEDIMENT CONTROL MEASURES AFFECTED BY WORKS ARE TO BE RE-ESTABLISHED PRIOR TO THE COMPLETION OF EACH DAY'S WORK.

THE CONTRACTOR IS TO STABILISE ALL STOCKPILES AND DISTURBED AREAS AS SOON AS THEY ARE FORMED TO FINAL LEVELS. STABILISATION TO BE BY HYDROSEEDING / SPRAY GRASS, OR AS DIRECTED BY COUNCIL ENGINEER.

SEED MIXTURE FOR FOOTWAYS AND OTHER AREAS UNDER THE CONTROL OF COUNCIL ARE TO BE IN ACCORDANCE WITH COUNCIL'S SPECIFICATION. FOR OTHER AREAS, THE LIST OF PLANT SPECIES FOR TEMPORARY COVER IS:-

JAPANESE MILLET AND OATS(RYECORN) AT 25kg/ha EACH - SPRING/SUMMER
JAPANESE MILLET AT 10kg/ha AND OATS(RYECORN) AT 30kg/ha - AUTUMN/WINTER

ALL SEEDED AREAS ARE TO BE WATERED TWICE WEEKLY.

WHERE SURFACE SLOPES ARE MORE THAN 4H:1V BATTER THEY SHALL BE TURFED.

DUST CONTROL MEASURES SHALL BE IMPLEMENTED CONTINUOUSLY DURING CONSTRUCTION WORKS. SUCH MEASURES ARE TO BE TO THE SATISFACTION OF THE SUPERINTENDENT AND COUNCIL.

TOPSOIL SHALL BE RESPREAD ON CONSTRUCTION AREAS AND STABILISED AS SOON AS POSSIBLE WITHIN 60 DAYS OF DISTURBANCE. ALL DISTURBED AREAS ARE TO BE LEFT WITH A SCARIFIED SURFACE AT ALL TIMES TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING OF TOPSOIL.

FOLLOWING COMPLETION OF WORKS AND STABILISATION OF ALL DISTURBED SURFACES, ALL MATERIALS AND CONTROL MEASURES ARE TO BE REMOVED FROM SITE AND TEMPORARY BASINS FILLED, COMPACTED AND STABILISED.

ALL SITE ACCESS TO BE ACHIEVED FROM DESIGNATED SITE ACCESS. SITE ACCESS TO BE PROTECTED BY THE INSTALLATION OF AN APPROVED SHAKER RAMP. SHAKER RAMP TO BE REGULARLY MAINTAINED TO ENSURE EFFECTIVENESS.

UPON COMPLETION OF FINAL EARTHWORKS OR AFTER WRITTEN DIRECTION OF COUNCIL, IMMEDIATE SILT CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.

ALL DISTURBED OVER ALL STORMWATER, POWER, TELEPHONE, GAS AND SEWER LINES NOT WITHIN STREETS IS TO BE SPRAY GRASSED AS SOON AS POSSIBLE BUT NO LATER THAN WITHIN 14 DAYS AFTER BACKFILL.

NO MORE THAN 150m OF TRENCH IS TO BE OPEN AT ANY ONE TIME. ALL TEMPORARY EARTH BERMS, DIVERSION AND SEDIMENT BASIN EMBANKMENTS ARE TO BE TRACK ROLLED, SEEDED OR MULCHED OR SPRAYED WITH BITUMEN AS SOON AS THEY HAVE BEEN FORMED.

ALL FILLS ARE TO BE LEFT WITH A WINDROW AT LEAST 20cm HIGH AT THE TOP OF THE SLOPE AT THE END OF EACH DAY'S EARTHWORKS AMD ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO "SEAL" THE EARTHWORKS.

STABILISATION OF ALL CUT AND FILL SLOPES SHALL BE COMMENCED WITHIN 14 DAYS OF COMPLETION OF FORMATION.

THE CONTRACTOR SHALL MAINTAIN AND PRODUCE ON REQUEST A LOGBOOK ON SITE DETAILING THE FOLLOWING:-

- RECORDS OF ALL RAINFALL
- DAILY CONDITION OF ALL EROSION AND SEDIMENT CONTROL MEASURES
- ANY APPLICATION OF FLOCCULATION AGENTS TO BASINS
- VOLUMES OF WATER DISCHARGED FROM BASINS
- METHOD OF DISPOSAL OF WATER FROM BASINS
- ANY ADDITIONAL REMEDIAL WORKS REQUIRED.

THE ORIGINAL LOGBOOK SHALL BE ISSUED TO THE PROJECT MANAGER ON COMPLETION OF THE WORKS. SEDIMENT CONTROL MEASURES TO BE MONITORED ONCE A WEEK AND AFTER EVERY STORM EVENT.

STOCKPILES TO BE MAX 2 METRE HIGH WITH SEDIMENT FENCING TO LOW SIDE LOCATED CLEAR OF WATERCOURSES

ALL STORMWATER PITS TO BE BLOCKED DURING CONSTRUCTION UNTIL SITE STABILISED.

DURING CONSTRUCTION WORKS ANY WORK AND STORAGE AREAS WHERE SPILLAGE MAY OCCUR MUST BE BUNDED. THE SIZE OF THE AREA TO BE BUNDED AND HEIGHT OF THE BUND WALLS MUST BE CALCULATED AS BEING EQUAL TO 110% OF THE TOTAL VOLUME STORED OR EQUAL TO THE LARGEST STORAGE CONTAINER, WHICH EVER IS GREATER. ALL PIPE WORK EXTENDING FROM THE BUNDED AREA MUST BE DIRECTED OVER THE BUND WALL AND HOSE COUPLINGS MUST BE PLACED SUCH THAT LEAKS AND SPILLAGE'S ARE CONTAINED. THE AREAS MUST BE GRADED TO A PIT/SUMP TO FACILITATE EMPTYING.

ANY IMPORTED FILL USED MUST BE VALIDATED & SUITABLE & FREE OF SALINE & CONTAMINATION

SEDIMENT & EROSION CONTROL

SE1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO DISTURBANCE OF THE WORK AREA & TO BE CARRIED OUT IN ACCORDANCE WITH LANDCOM'S "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION" VOLUME 1.

SE2. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL SEDIMENT AND EROSION CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES BEFORE MORE THAN 60% OF THEIR CAPACITY IS LOST. ALL THE SILT REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT. NO SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND LONGER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR COUNCIL.

SE3. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS.

SE4. WHEN ANY DEVICES ARE TO BE HANDED OVER TO COUNCIL, THEY SHALL BE IN A CLEAN & STABLE CONDITION.

SE5. THE CONTRACTOR SHALL MAINTAIN ALL REVEGETATED AREAS INCLUDING WATERING UNTIL FINAL COMPLETION OF WORKS.

SE6. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL UNTIL FINAL COMPLETION OF WORKS.

SE7. THE CONTRACTOR'S RESPONSIBILITY IS TO ENSURE ALL NECESSARY MEASURES SO AS TO PROTECT ALL DISTURBED AREAS AS PER NOTE SE1. ALL ADDITIONAL COSTS ARE TO BE REFLECTED IN TENDER PRICE EVEN IF SUCH MEASURES ARE NOT INDICATED ON THE SEDIMENT AND EROSION CONTROL PLAN.

SE8. THE CONTRACTOR MUST COMMENCE REHABILITATION WITHIN 5 DAYS OF ANY SITE REGRADING & BATTER FORMATION.

SE9. A 0.3m WIDE STRIP OF TURF TO BE PLACED BEHIND NEW ROADS.

SE10. PROVIDE TURF AROUND ALL SURFACE INLET PITS IN ADDITION TO THE GEOTEXTILE INLET FILTER.

SE11. STOCKPILES TO BE STABILISED WITHIN 14 DAYS OF COMPLETING THE STOCKPILE.

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REV	DESCRIPTION	DATE	DRN.	APP.
B	FINAL ISSUE FOR SSDA	07.11.25	GN	SG
A	PRELIMINARY ISSUE FOR SSDA	17.10.25	RG	SG

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed	R. GOVENDER
Date	23.06.2025
Drawn	D.RAFTER
Checked	S. FERGUSON
Date	07.11.25
Approved	S. FERGUSON
Reg. No.	PE0008347
Date	07.11.25
DA Number	-

Beveridge Williams
Development & Infrastructure Consultants
Level 4, LPC House, Suite 4.05, 3 Fordham way
Oran Park NSW 2570
ph: 02 46255055
www.beveridgewilliams.com.au

Project Details: WSU MILPERRA, LOT 1 IN DP101147 AND LOT 2 IN DP1291984
2A BULLECOURT AVENUE, MILPERRA

Drawing Title: SOIL & WATER MANAGEMENT PLAN DETAILS AND NOTES

Sheet 145 of 145
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
2301879	321	820	B

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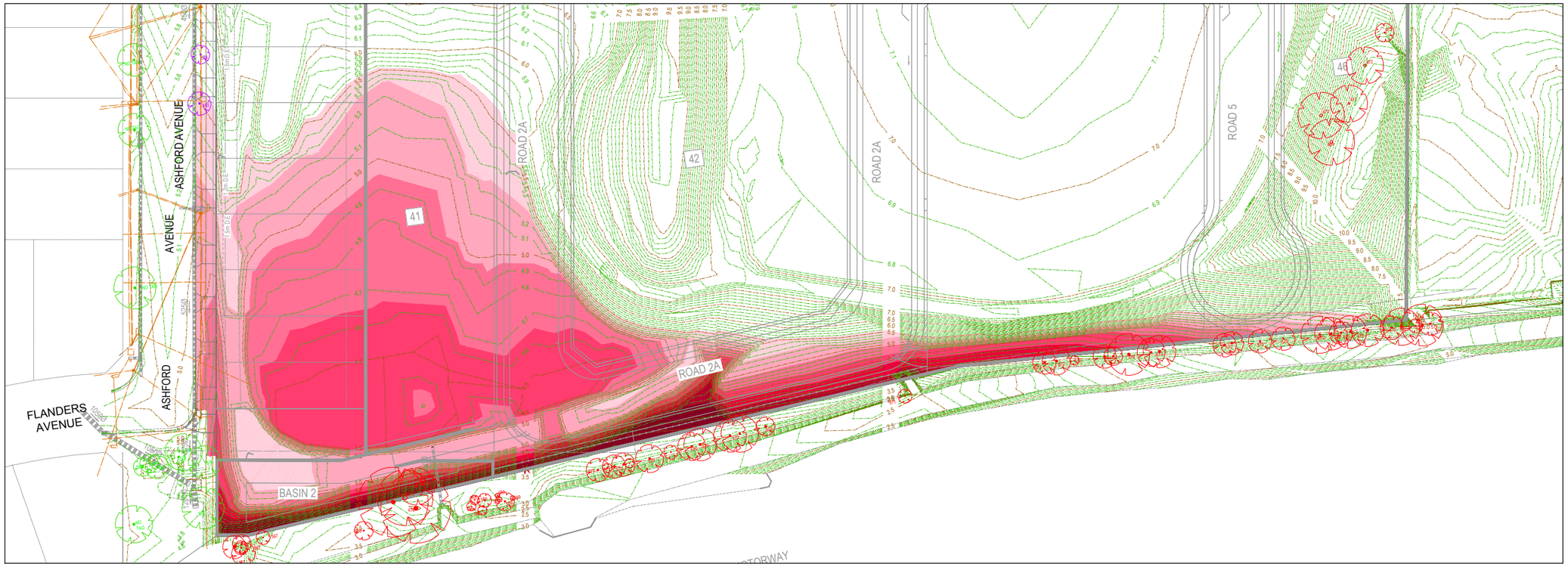
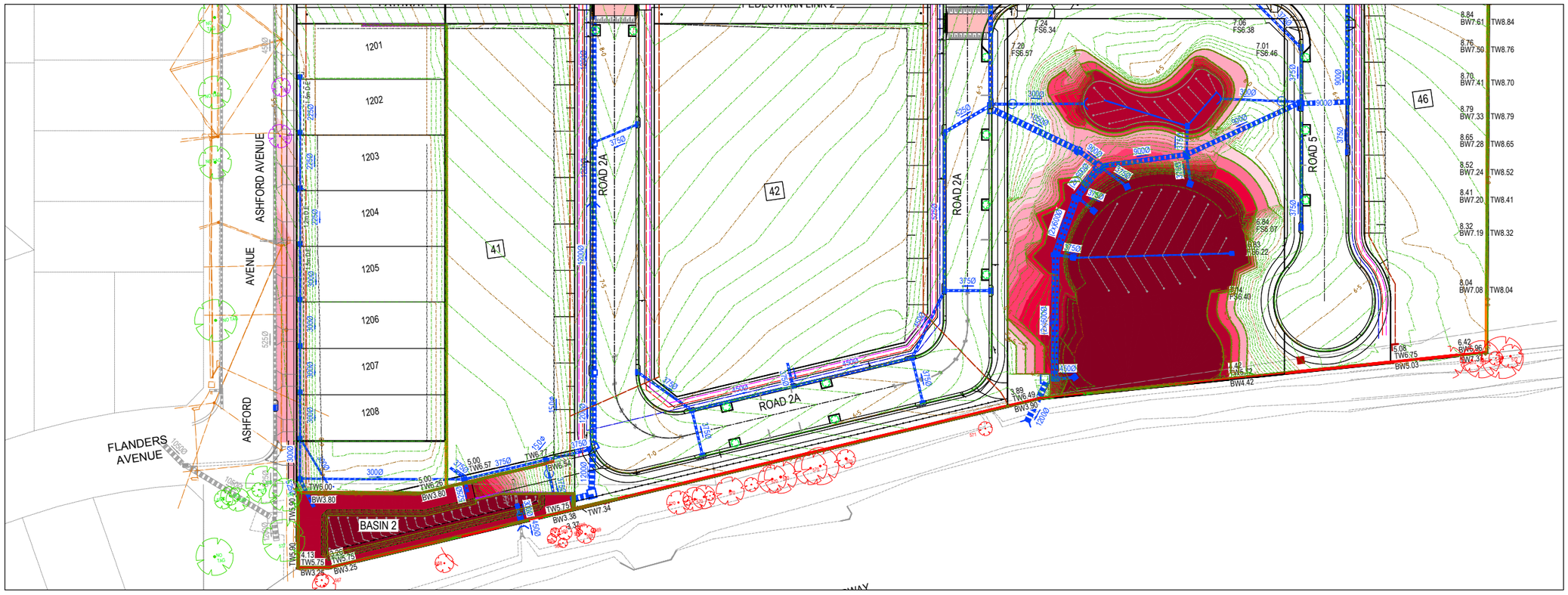


FLOOD STORAGE - EXISTING SCENARIO



FLOOD STORAGE - DEVELOPED SCENARIO

STORAGE LEGEND	
DEPTH RANGE (m)	COLOUR
>1.8m STORAGE	
1.8 – 1.5	
1.5 – 1.2	
1.2 – 0.9	
0.9 – 0.6	
0.6 – 0.3	
0.3 – 0.0	

STORAGE VOLUMES:

EXISTING SCENARIO : 6400 m^3
DEVELOPED SCENARIO : 6610 m^3

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REV	DESCRIPTION	DATE	DRN.	APP.
P4	DRAWING REVISED	13.11.25	R.G	S.G
P3	DRAWING REVISED	10.03.25	S.F.	S.G.
P2	DRAWING REVISED	07.08.24	C.Y.	S.F.
P1	ISSUED FOR INFORMATION	14.05.24	C.Y.	S.F.

mirvac

0 5 10 20 30 40
SCALE 1:500 AT A1 SIZE

Designed S.FERGUSON Date 14.05.2024
Drawn C.YAP
Approved S.FERGUSON Date 14.05.2024
PS Number -

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Project Details: 2 BULLECOURT AVENUE, MILPERRA
OVERALL ESTATE
MIRVAC

Drawing Title: COMPENSATORY STORAGE PLAN

Sheet 01 of 01
Scale 1:500 @ A1

Project Ref	Stage No	Drawing No	Rev
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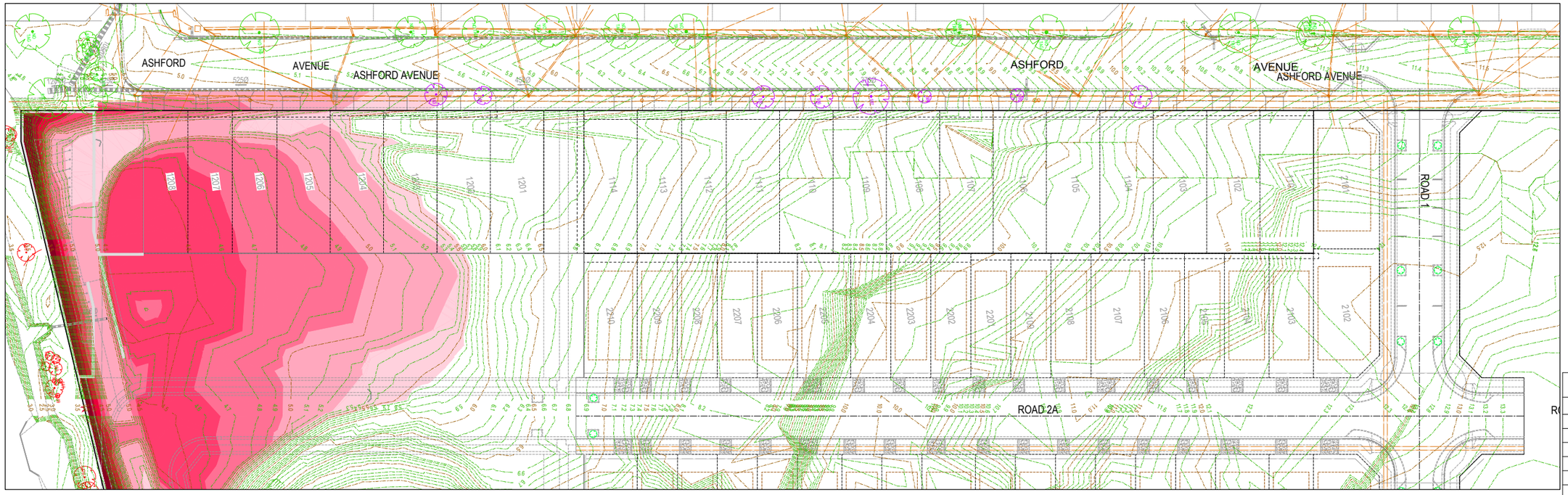
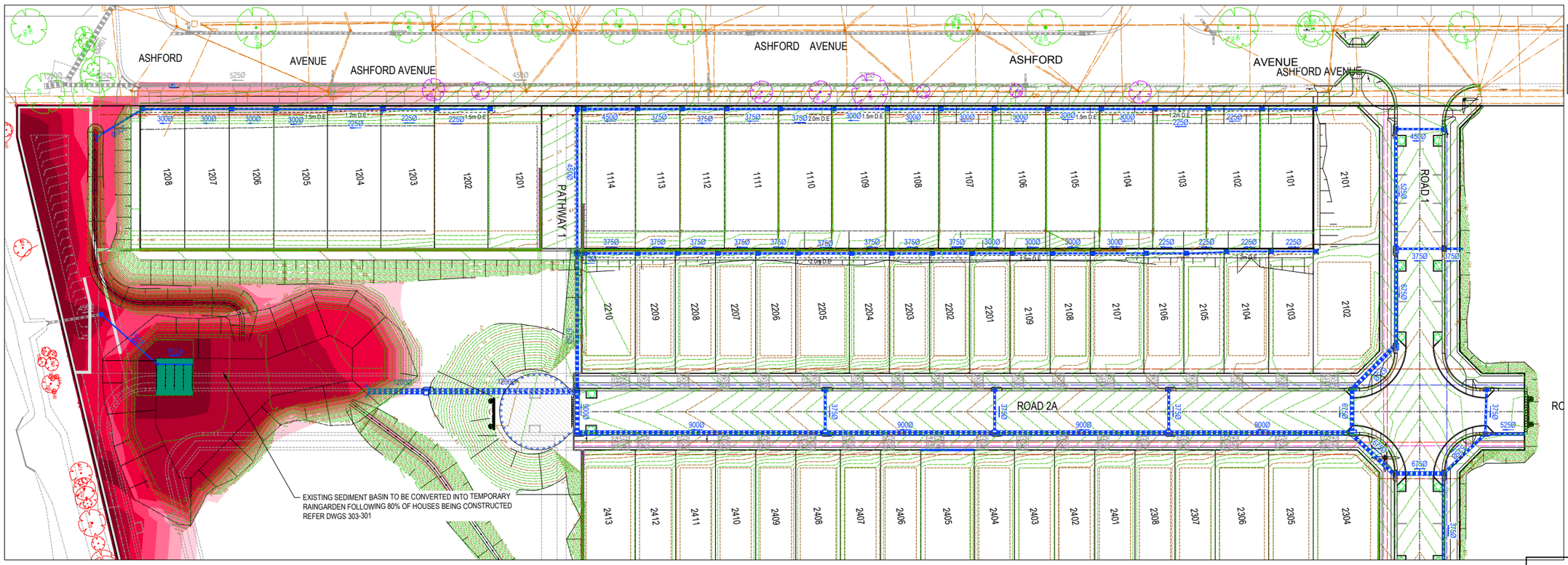


FLOOD STORAGE - EXISTING SCENARIO

STORAGE LEGEND	
DEPTH RANGE (m)	COLOUR
>1.8m STORAGE	
1.8 – 1.5	
1.5 – 1.2	
1.2 – 0.9	
0.9 – 0.6	
0.6 – 0.3	
0.3 – 0.0	



FLOOD STORAGE - DEVELOPED SCENARIO

STORAGE VOLUMES:

EXISTING SCENARIO : 6400 m^3
DEVELOPED SCENARIO : 7060 m^3

ISSUED FOR D.A.

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REV	DESCRIPTION	DATE	DRN.	APP.
D	ISSUED FOR INFORMATION	13.11.25	R.G	S.G
C	ISSUED FOR INFORMATION	03.10.24	R.G	S.G
B	ISSUED FOR INFORMATION	19.09.24	R.G	S.G
A	ISSUED FOR INFORMATION	23.05.24	S.F	S.G

REV	DESCRIPTION	DATE	DRN.	APP.

mirvac

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SCALE 1:500 AT A1 SIZE

Designed	S. FERGUSON
Date	20.05.2024
Drawn	C.YAP
Approved	S. GRAY
Date	20.05.2024
PS Number	-

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Project Details	WSU MILPERRA, LOT 2 IN DP1291984 2 BULLECOURT AVE, MILPERRA STAGE 1 & 2 SUBDIVISION
Drawing Title	COMPENSATORY STORAGE PLAN

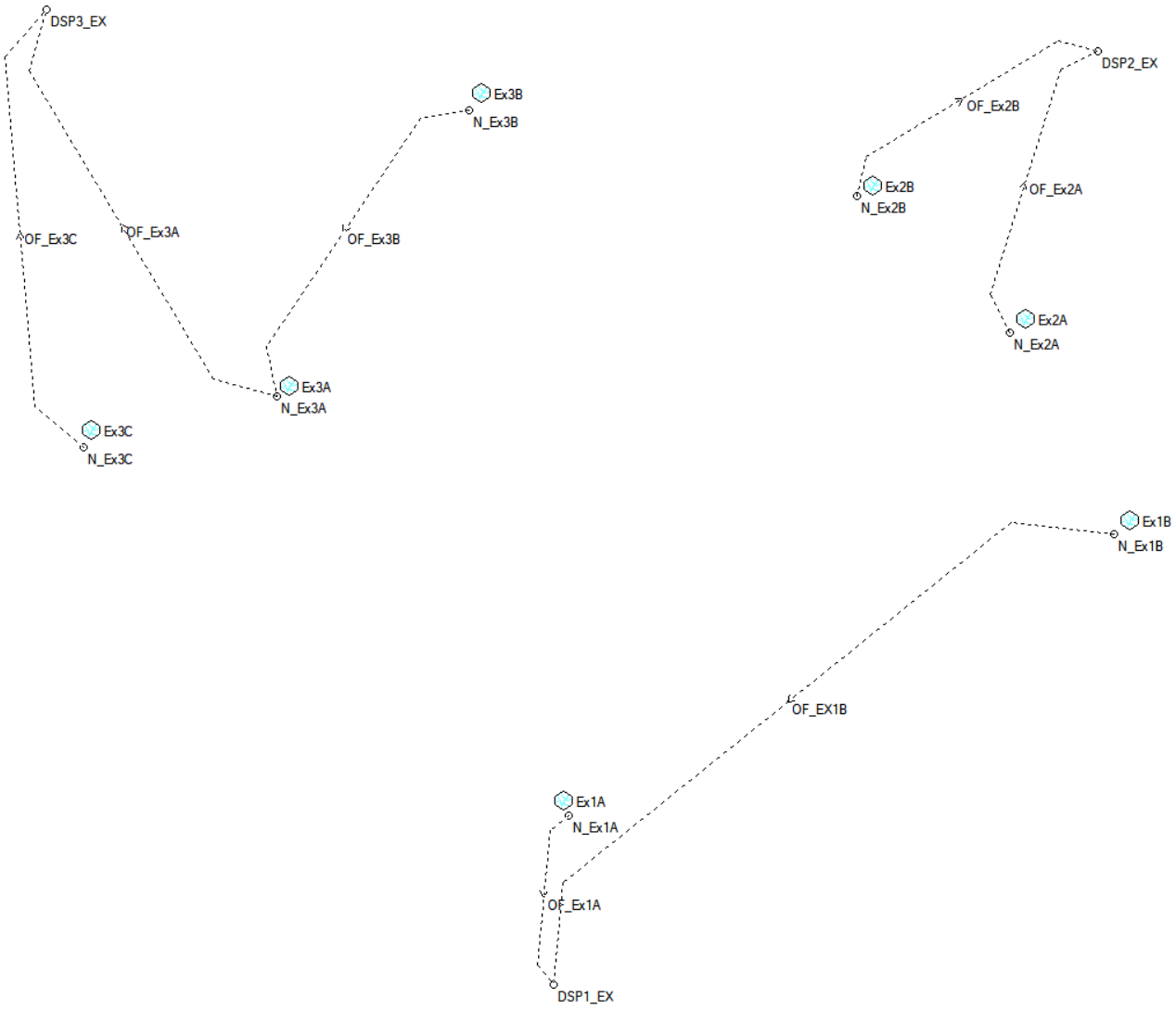
Sheet 01 of 01
Scale 1:500 @ A1

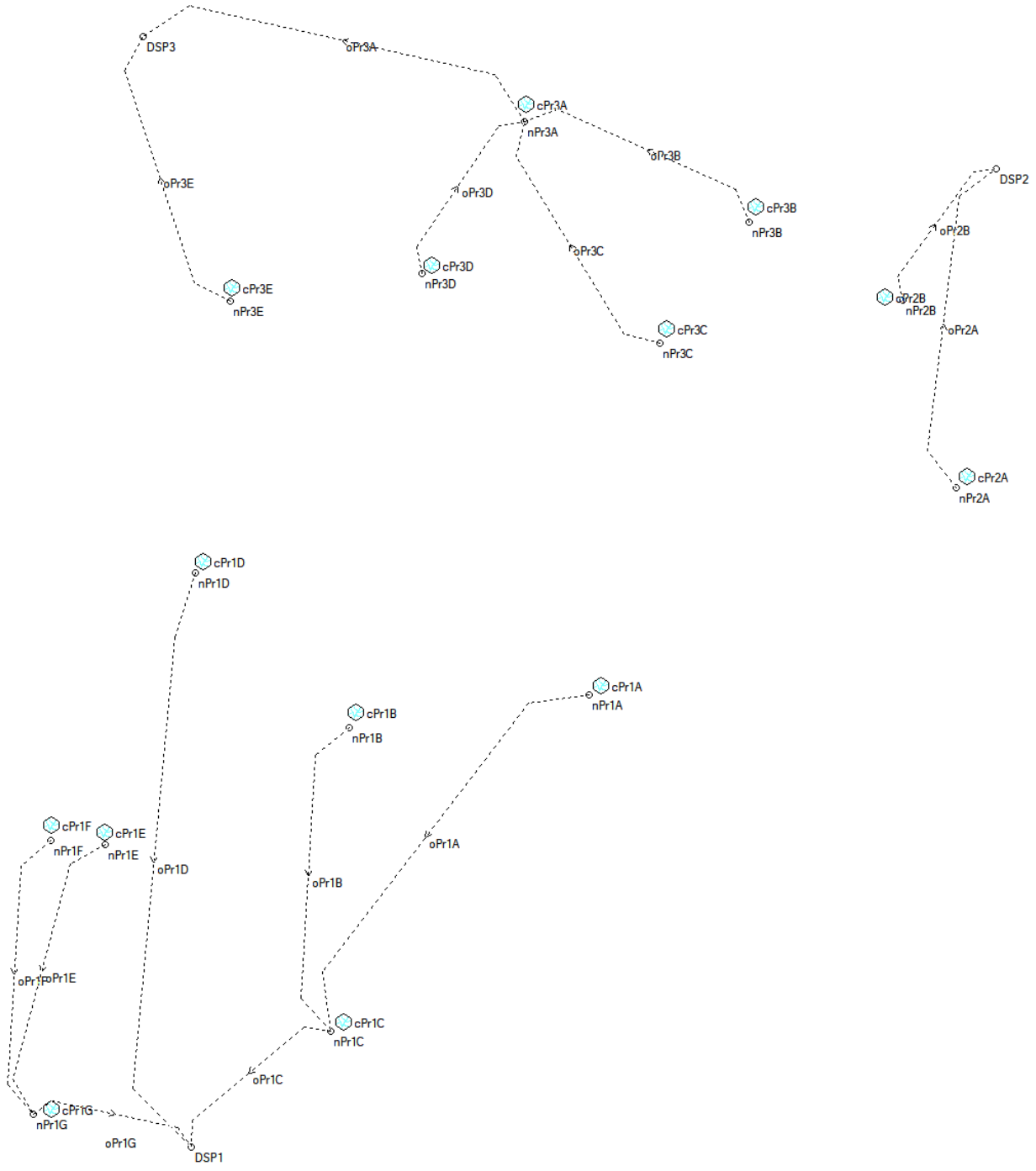
Project Ref	Stage No	Drawing No	Rev
2301879	306	850	D

C:\12DWS\data\MELSQL01\Eng - 321_3578\Drawings\Compensatory Storage\2301879-306-850-CSP.dwg

APPENDIX C: DRAINS MODEL – SETUP & DATA

Pre Development

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nPr3A
oPr3B
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nPr3B
oPr3E
oPr3D
oPr3C
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nPr3D
cPr3E
nPr3E
cPr3C
nPr3C
DSP2
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nPr1D
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oPr1D
oPr1A
oPr1B
oPr1E
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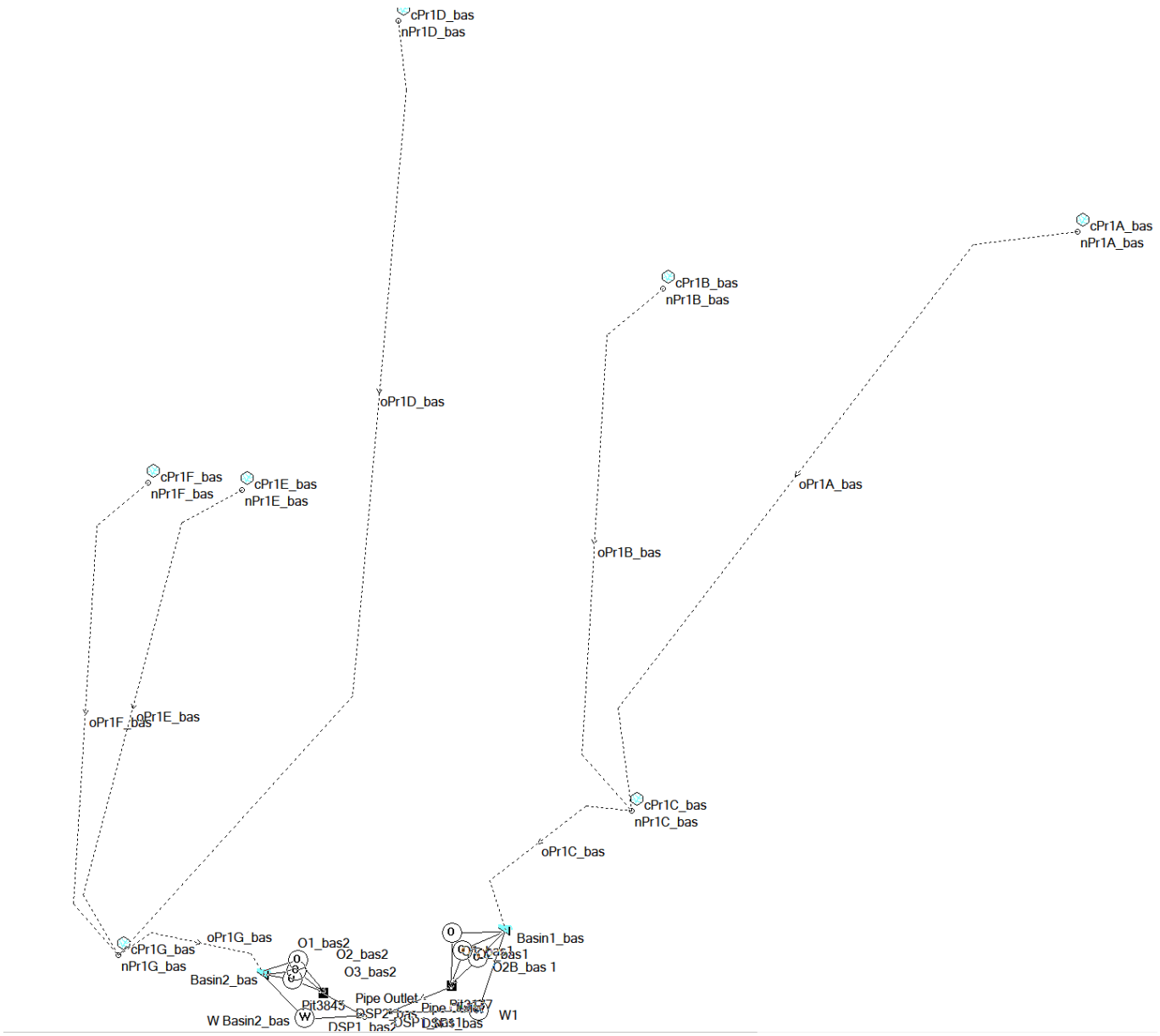
cPr1G
nPr1G
oPr1G
DSP1

Post development DSP1 with OSD



PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node							0		313423.7	6242436		18	No					
N_Ex1A	Node							0		313430.9	6242518		19	No					
N_Ex1B	Node							0		313694.5	6242654		20	No					
DSP3_EX	Node							0		313178.5	6242908		21	No					
DSP2_EX	Node							0		313686.8	6242887		22	No					
N_Ex3B	Node							0		313382.7	6242859		23	No					
N_Ex3A	Node							0		313289.6	6242721		24	No					
N_Ex2B	Node							0		313570.2	6242817		25	No					
N_Ex2A	Node							0		313644.3	6242752		26	No					
N_Ex3C	Node							0		313196.4	6242696		27	No					
nPr1A	Node							0		314421.9	6242548		1	No					
nPr1B	Node							0		314290.9	6242530		2	No					
nPr1C	Node							0		314281	6242365		3	No					
nPr1D	Node							0		314207	6242615		4	No					
nPr1E	Node							0		314157.7	6242466		5	No					
nPr1F	Node							0		314127.8	6242468		6	No					
nPr1G	Node							0		314118.7	6242319		7	No					
nPr2A	Node							0		314622.5	6242661		8	No					
nPr2B	Node							0		314593.4	6242764		9	No					
nPr3A	Node							0		314387	6242861		10	No					
nPr3B	Node							0		314509.3	6242806		11	No					
nPr3C	Node							0		314460.8	6242740		12	No					
nPr3D	Node							0		314330.6	6242779		13	No					
nPr3E	Node							0		314226.2	6242763		14	No					
DSP3	Node							0		314178.5	6242908		15	No					
DSP2	Node							0		314644.5	6242835		16	No					
DSP1	Node							0		314204.6	6242301		17	No					
nPr1A_bas	Node							0		314071.9	6242248		28	No					
nPr1B_bas	Node							0		313940.9	6242230		29	No					
nPr1C_bas	Node							0		313931	6242065		30	No					
nPr1D_bas	Node							0		313857	6242315		31	No					
nPr1E_bas	Node							0		313807.7	6242166		32	No					
nPr1F_bas	Node							0		313777.8	6242168		33	No					
nPr1G_bas	Node							0		313768.7	6242019		34	No					
Pit3845	OnGrade	Junction Pit	Junction Pit or Manhole		1.5	5.5		0	0	313833.5	6242007	Yes	2163549 1 x Ku	No	New				
DSP1_bas2	Node					2.57		0		313846.5	6242000		932258	No					
Pit2177	OnGrade	Junction Pit	Junction Pit or Manhole		1.5	6		0	0	313874.1	6242009	Yes	1819492 1 x Ku	No	New				
DSP1_bas1	Node					2.56		0		313854.6	6242001		35	No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
Basin2_bas	2.6	1		None						313814.8	6242013	No			931880
	3.4	1													
	3.5	1													
	3.6	605.114													
	3.7	608.178													
	3.8	611.149													
	3.9	614.026													
	4	616.811													
	4.1	619.52													
	4.2	622.159													
	4.3	624.727													
	4.4	627.223													
	4.5	629.67													
	4.6	632.158													
	4.7	634.694													
	4.8	637.281													
	4.9	639.917													
	5	642.603													
	5.1	645.338													
	5.2	648.123													
	5.3	650.958													
	5.4	653.842													
	5.5	656.776													
	6	656.776													
Basin1_bas	2.64	1		None						313891.1	6242027	No			931883
	3.2	1													
	3.3	89.872													
	3.4	149.953													
	3.5	218.535													
	3.6	797.596													
	3.7	1075.9													
	3.8	1317.05													
	3.9	1750.7													
	4	1890.04													
	4.1	2009.35													
	4.2	2123.45													
	4.3	2240.17													
	4.4	2360.88													
	4.5	2449.34													
	4.6	2540.03													
	4.7	2641.8													
	4.8	2762.35													
	4.9	2885.75													
	5	2999.68													
	5.1	3094.98													
	5.2	3194.7													
	5.3	3294.25													
	5.4	3391.96													
	5.5	3490.77													
	5.6	3592.25													
	5.7	3695.36													
	5.8	3802.66													
	5.9	3914.36													
	6	4045.06													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS
cPr1A	nPr1A	3.31	88.4	4	0.02	0	1	RAFTS
cPr1B	nPr1B	3.693	77.8	3	0.02	0	1	RAFTS
cPr1C	nPr1C	0.461	10	0.5	0.03	0	1	RAFTS
cPr1D	nPr1D	3.261	88.2	1.4	0.02	0	1	RAFTS
cPr1E	nPr1E	0.794	85	2.8	0.02	0	1	RAFTS
cPr1F	nPr1F	0.925	85	2.8	0.02	0	1	RAFTS
cPr1G	nPr1G	0.077	19.8	0.5	0.02	0	1	RAFTS
cPr2A	nPr2A	0.059	94.6	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cPr3A	nPr3A	0.471	10	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C	nPr3C	2.668	66.5	1	0.02	0	1	RAFTS
cPr3D	nPr3D	1.307	86.7	0.7	0.02	0	1	RAFTS
cPr3E	nPr3E	0.605	89	3.7	0.02	0	1	RAFTS
cPr1A_bas	nPr1A_bas	3.31	88.4	4	0.02	0.290258	1	RAFTS
cPr1B_bas	nPr1B_bas	3.693	77.8	3	0.02	0.253458	1	RAFTS
cPr1C_bas	nPr1C_bas	0.461	10	0.5	0.03	1.23736	1	RAFTS
cPr1D_bas	nPr1D_bas	3.261	88.1	1.4	0.02	0.1105	1	RAFTS
cPr1E_bas	nPr1E_bas	0.794	85	3	0.02	0.103067	1	RAFTS
cPr1F_bas	nPr1F_bas	0.925	85	2.8	0.02	0.268267	1	RAFTS
cPr1G_bas	nPr1G_bas	0.077	19.8	0.5	0.02	0.150542	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
Pipe Outlet	Pit3845	DSP1_bas2	4	2.6	2.58	0.5	Concrete, (	450	450	0.013	New	1	Pit3845	0					
Pipe Outlet	Pit2177	DSP1_bas1	7.5	2.64	2.56	1.07	Concrete, (	450	450	0.013	New	1	Pit2177	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	Chg (m)	Bottom Elev (m)	Height of S (m)	etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storm (m)	Safe Depth Minor Storm (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m roadv	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m roadv	0.6	0.6	0.4	3.111282	100	102	19.041	6	419.152
oPr1C	nPr1C	DSP1	0.1				7.5 m roadv	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	DSP1	0.1				7.5 m roadv	0.6	0.6	0.4	2.039669	100	104	14.682	4.81	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m roadv	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922
oPr1F	nPr1F	nPr1G	0.1				7.5 m roadv	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61
oPr1G	nPr1G	DSP1	0.1				7.5 m roadv	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1				7.5 m roadv	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1				7.5 m roadv	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oPr3A	nPr3A	DSP3	0.1				7.5 m roadv	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nPr3A	0.1				7.5 m roadv	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nPr3A	0.1				7.5 m roadv	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
oPr3D	nPr3D	nPr3A	0.1				7.5 m roadv	0.6	0.6	0.4	0.423548	100	113	16.199	15.454	175.895
oPr3E	nPr3E	DSP3	0.1				7.5 m roadv	0.6	0.6	0.4	1.384615	100	114	15.1	10.78	312
oPr1A_bas	nPr1A_bas	nPr1C_bas	0.1				7.5 m roadv	0.6	0.6	0.4	2.64864	100	122	21.17	6	572.747
oPr1B_bas	nPr1B_bas	nPr1C_bas	0.1				7.5 m roadv	0.6	0.6	0.4	3.111282	100	123	19.041	6	419.152
oPr1C_bas	nPr1C_bas	Basin1_bas	0.1				7.5 m roadv	0.6	0.6	0.4	3.33	100	124	6	5.9	3
oPr1D_bas	nPr1D_bas	Basin1_bas	0.1				7.5 m roadv	0.6	0.6	0.4	2.039669	100	125	14.682	4.81	484
oPr1E_bas	nPr1E_bas	nPr1G_bas	0.1				7.5 m roadv	0.6	0.6	0.4	1.746149	100	126	11.499	6	314.922
oPr1F_bas	nPr1F_bas	nPr1G_bas	0.1				7.5 m roadv	0.6	0.6	0.4	1.508106	100	127	11.182	6	343.61
oPr1G_bas	nPr1G_bas	Basin2_bas	0.1				7.5 m roadv	0.6	0.6	0.4	3.33	100	128	6	5.9	3

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
Pipe Outlet	Concrete, (	450	0.6	-0.5	Unsafe
Pipe Outlet	Concrete, (	450	0.6	-0.49	Unsafe

This model has no pipes with non-return valves

APPENDIX D: DRAINS MODEL – PRE-/POST-DEVELOPMENT RESULTS

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivir (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	0		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.37				
DSP3_EX	0		3.737				
DSP2_EX	0		0.672				
N_Ex3B	6.02		0.156				
N_Ex3A	5.05		0.709				
N_Ex2B	5.03		0.618				
N_Ex2A	5.01		0.07				
N_Ex3C	5.08		2.439				
nPr1A	21.39		2.136				
nPr1B	19.26		2.382				
nPr1C	6.35		4.518				
nPr1D	14.91		2.097				
nPr1E	11.65		0.512				
nPr1F	11.34		0.597				
nPr1G	6.21		1.109				
nPr2A	21.62		0.038				
nPr2B	22.24		0.409				
nPr3A	15.68		2.431				
nPr3B	22.22		0.184				
nPr3C	21.88		1.605				
nPr3D	16.42		0.833				
nPr3E	3.79E+22		0.39				
DSP3	0		2.479				
DSP2	0		0.422				
DSP1	0		7.857				
nPr1A_bas	21.39		2.136				
nPr1B_bas	19.26		2.382				
nPr1C_bas	6.28		4.518				
nPr1D_bas	14.91		2.097				
nPr1E_bas	11.65		0.512				
nPr1F_bas	11.34		0.597				
nPr1G_bas	6.17		1.109				
Pit3845	5.56		0		0		Outlet System
DSP1_bas2	5.55		0				
Pit2177	5.65		0		0.35		None
DSP1_bas1	5.55		0				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
Ex3B	0.135	1% AEP, 30 min burst, Storm 5
Ex3A	0.849	1% AEP, 10 min burst, Storm 7
Ex2B	0.434	1% AEP, 25 min burst, Storm 7
Ex2A	0.062	1% AEP, 30 min burst, Storm 5
Ex3C	1.86	1% AEP, 5 min burst, Storm 1
cPr1A	1.777	1% AEP, 5 min burst, Storm 1
cPr1B	1.912	1% AEP, 5 min burst, Storm 1
cPr1C	0.074	1% AEP, 45 min burst, Storm 6
cPr1D	1.677	1% AEP, 5 min burst, Storm 1
cPr1E	0.427	1% AEP, 5 min burst, Storm 1
cPr1F	0.497	1% AEP, 5 min burst, Storm 1
cPr1G	0.025	1% AEP, 25 min burst, Storm 1
cPr2A	0.032	1% AEP, 5 min burst, Storm 1
cPr2B	0.351	1% AEP, 20 min burst, Storm 5
cPr3A	0.076	1% AEP, 45 min burst, Storm 6
cPr3B	0.163	1% AEP, 25 min burst, Storm 1
cPr3C	1.162	1% AEP, 10 min burst, Storm 7
cPr3D	0.639	1% AEP, 5 min burst, Storm 1
cPr3E	0.326	1% AEP, 5 min burst, Storm 1
cPr1A_bas	1.779	1% AEP, 5 min burst, Storm 1
cPr1B_bas	1.923	1% AEP, 5 min burst, Storm 1
cPr1C_bas	0.074	1% AEP, 45 min burst, Storm 6
cPr1D_bas	1.686	1% AEP, 5 min burst, Storm 1
cPr1E_bas	0.427	1% AEP, 5 min burst, Storm 1
cPr1F_bas	0.497	1% AEP, 5 min burst, Storm 1
cPr1G_bas	0.025	1% AEP, 25 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe Outlet	0.055	0.34	5.557	5.55	1% AEP, 5 min burst, Storm 1
Pipe Outlet	0.158	0.99	5.573	5.55	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1A	1.607	1.606	12.321	0.072	0.15	11.44	2.09	1% AEP, 5 min burst, Storm 1
OF_EX1B	2.398	2.399	12.321	0.091	0.22	11.83	2.44	1% AEP, 5 min burst, Storm 1
OF_Ex3B	0.058	0.906	12.321	0.051	0.09	11.03	inf	1% AEP, 10 min burst, Storm 7
OF_Ex3A	0.905	0.904	12.321	0.051	0.09	11.03	1.68	1% AEP, 5 min burst, Storm 1
OF_Ex2B	0.434	0.434	12.321	0.033	0.04	10.66	1.29	1% AEP, 5 min burst, Storm 1
OF_Ex2A	0.062	0.062	12.321	0.01	0.01	10.21	0.6	1% AEP, 5 min burst, Storm 1
OF_Ex3C	1.86	1.866	12.321	0.079	0.17	11.57	inf	1% AEP, 5 min burst, Storm 1
oPr1A	1.703	2.083	0.903	0.235	0.68	6.47	inf	1% AEP, 5 min burst, Storm 1
oPr1B	1.808	1.85	0.857	0.22	0.65	6.11	inf	1% AEP, 5 min burst, Storm 1
oPr1C	3.924	4.474	1.189	0.357	0.94	8.85	inf	1% AEP, 5 min burst, Storm 1
oPr1D	1.534	1.742	0.975	0.232	0.58	6.39	inf	1% AEP, 5 min burst, Storm 1
oPr1E	0.408	0.466	1.033	0.158	0.25	4.55	inf	1% AEP, 5 min burst, Storm 1
oPr1F	0.477	0.496	1.072	0.165	0.25	4.72	inf	1% AEP, 5 min burst, Storm 1
oPr1G	0.921	0.967	1.187	0.213	0.35	5.91	inf	1% AEP, 5 min burst, Storm 1
oPr2A	0.032	0.029	1.004	0.071	0.07	1.51	1.05	1% AEP, 5 min burst, Storm 1
oPr2B	0.346	0.345	0.834	0.126	0.26	3.34	2.07	1% AEP, 5 min burst, Storm 1
oPr3A	1.748	1.753	0.959	0.229	0.59	6.34	2.57	1% AEP, 5 min burst, Storm 1
oPr3B	0.158	0.226	0.973	0.119	0.18	3.11	inf	1% AEP, 30 min burst, Storm 5
oPr3C	1.129	1.15	1.174	0.224	0.39	6.21	inf	1% AEP, 10 min burst, Storm 7
oPr3D	0.614	0.644	1.535	0.216	0.23	6.01	inf	1% AEP, 10 min burst, Storm 1
oPr3E	0.323	0.323	1.102	0.148	0.2	4.07	1.39	1% AEP, 5 min burst, Storm 1
oPr1A_bas	1.721	2.08	0.903	0.235	0.68	6.47	inf	1% AEP, 5 min burst, Storm 1
oPr1B_bas	1.824	1.861	0.857	0.221	0.65	6.12	inf	1% AEP, 5 min burst, Storm 1
oPr1C_bas	3.866	3.857	0.848	0.283	1.05	7.67	3.77	1% AEP, 5 min burst, Storm 1
oPr1D_bas	1.541	1.61	0.975	0.225	0.88	6.24	inf	1% AEP, 5 min burst, Storm 1
oPr1E_bas	0.412	0.463	1.033	0.157	0.25	4.54	inf	1% AEP, 5 min burst, Storm 1
oPr1F_bas	0.477	0.497	1.072	0.165	0.25	4.72	inf	1% AEP, 5 min burst, Storm 1
oPr1G_bas	0.911	0.912	0.848	0.175	0.42	4.99	inf	1% AEP, 5 min burst, Storm 1
O3	0.061	0.061						1% AEP, 5 min burst, Storm 1
W Basin2_t	0.853	0.853						1% AEP, 5 min burst, Storm 1
W1	2.891	2.891						1% AEP, 5 min burst, Storm 1
O2								
O1	0.158	0.158						1% AEP, 5 min burst, Storm 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.57	1263.9	0.914	0	0.914
Basin1_bas	5.86	6027	3.049	0	3.049

Run Log for DRAINS v2023.11.8726.15750 - 240708_basin1_outlet_design FINAL

{\colortbl;\red0\green0\blue0;\red192\green0\blue0;}Run Log for DRAINS v2023.11.8726.15750 - 240708_basin1_outlet_design FINAL.drn run at 10:34:40 on 10/7/2024 using Watercom Drains v2023.11.8726.15750

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oPr1A, oPr1B, oPr1C, oPr1D, oPr3A, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1D_bas, oPr1G_bas

APPENDIX E: DRAINS – STAGED CATCHMENT PLANS AND PROPERTIES

Table 20: DRAINS Stage 1 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	3.443	0
	Ex1B Residual Demolished	7.237	2.3
	Pr1F Staged Developed	0.841	85
	TOTAL	**11.52**	**8%**

Figure 8: Stage 1 Post-Development Catchment Plan

Table 21: DRAINS Stage 2 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	1.203	0
	Ex1B Residual Demolished	6.544	2.3
	Pr1A Developed Portion	0.216	95
	Pr1B Staged Developed	1.084	55
	Pr1D Staged Developed	1.131	90
	Pr1E Staged Developed	0.502	85
	Pr1F Staged Developed	0.892	85
	TOTAL	**11.57**	**27%**

Figure 9: Stage 2 Post-Development Catchment Plan

Table 22: DRAINS Stage 3 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	1.203	0
	Ex1B Residual Demolished	5.283	0
	Pr1A Staged Developed	0.216	94
	Pr1B Staged Developed	1.084	55
	Pr1D Staged Developed	1.131	90
	Pr1E Staged Developed	0.502	85
	Pr1F Staged Developed	0.892	85
	Total	10.31	29
2	Ex2A Residual Demolished	0.172	0
	Pr2A Staged Developed	0.059	95
	Pr2B Staged Developed	1.263	10
	Total	1.49	12
3	Ex3A Residual Demolished	1.783	0
	Ex3C Residual Demolished	3.743	0
	Pr3B Staged Developed	0.746	10
	Pr3C Staged Developed	1.49	87.8
	Total	7.76	18%
DSP 1 + 2 + 3	**TOTAL**	**19.6**	**23%**

Figure 10: Stage 3 Post-Development Catchment Plan

Table 23: DRAINS Stage 4 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	0.361	0
	Ex1B Residual Demolished	1.715	0
	Pr1A Staged Developed	1.308	90
	Pr1B Staged Developed	3.101	76.1
	Pr1C Staged Developed	0.461	11.9
	Pr1D Staged Developed	1.6136	90.1
	Pr1E Staged Developed	0.7923	85.2
	Pr1F Staged Developed	0.925	85.1
	Pr1G Staged Developed	0.0772	94.4
	Total	10.35	64%
2	Ex2A Residual Demolished	0.172	0
	Pr2A Staged Developed	0.059	95
	Pr2B Staged Developed	1.263	10
	Total	1.49	12%
3	Ex3A Residual Demolished	1.783	0
	Ex3C Residual Demolished	3.743	0
	Pr3B Staged Developed	0.746	10
	Pr3C Staged Developed	1.49	87.8
	Total	7.76	18%
DSP 1 + 2 + 3	**TOTAL**	**19.55**	**50%**

Figure 11: Stage 4 Post-Development Catchment Plan

Table 24: DRAINS Stage 5 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	0.292	0
	Pr1A Staged Developed	3.265	88.5
	Pr1B Staged Developed	3.1	76.1
	Pr1C Staged Developed	0.461	11.9
	Pr1D Staged Developed	1.614	90.1
	Pr1E Staged Developed	0.794	85.2
	Pr1F Staged Developed	0.925	85.1
	Pr1G Staged Developed	0.077	94.4
	Total	10.53	79%
2	Pr2A Staged Developed	0.059	95
	Pr2B Staged Developed	1.263	10
	Total	1.32	14%
3	Ex3A Residual Demolished	1.783	0
	Ex3C Residual Demolished	3.648	0
	Pr3B Staged Developed	0.746	10
	Pr3C Staged Developed	1.53	88
	Total	7.71	18%
DSP 1 + 2 + 3	**TOTAL**	**19.6**	**51**

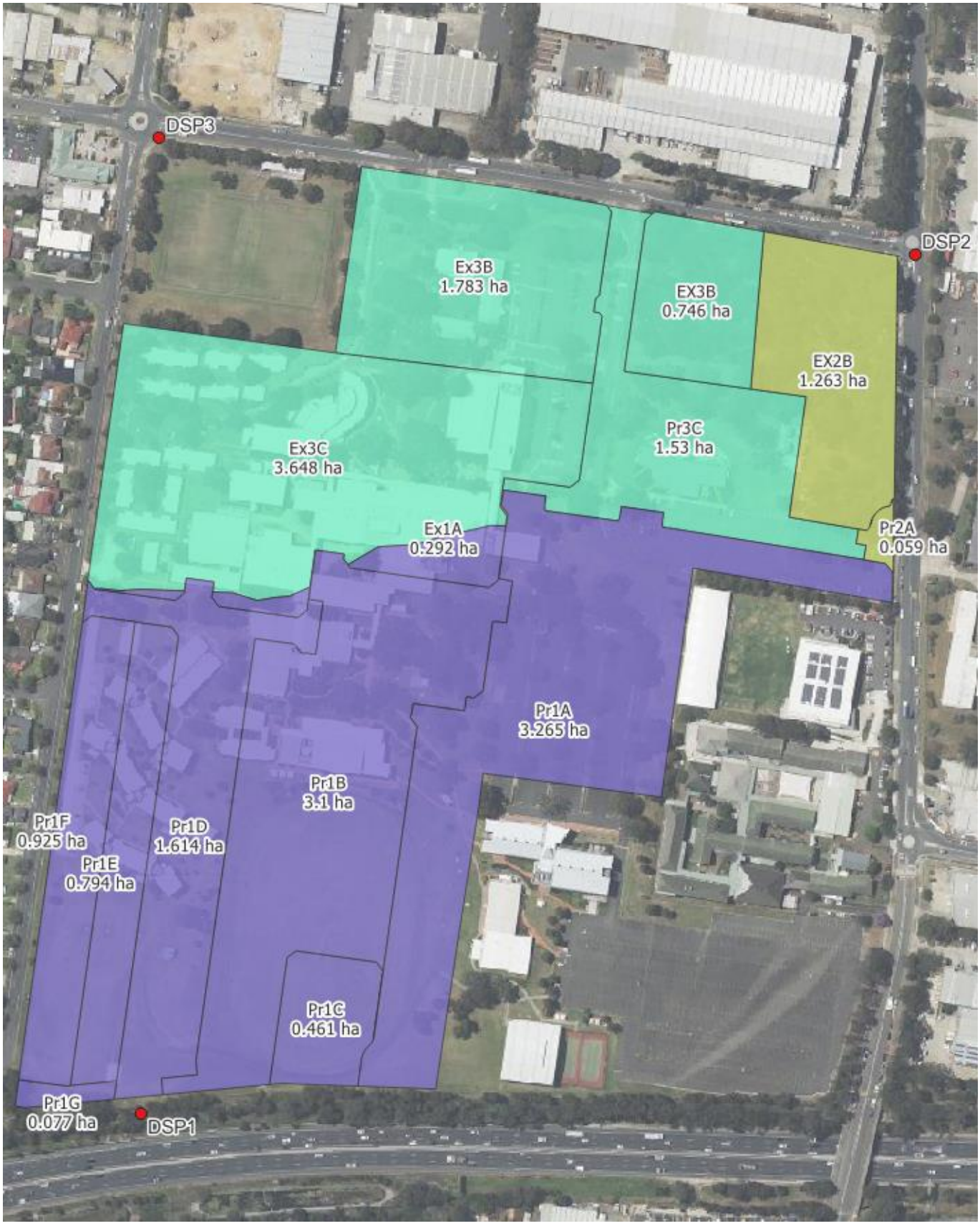


Figure 12: Stage 5 Post-Development Catchment Plan

Table 25: DRAINS Stage 6 Proposed Catchment Properties

DISCHARGE POINT	CATCHMENT	AREA (ha)	IMPERVIOUS %
1	Ex1A Residual Demolished	0.076	0
	Pr1A Staged Developed	3.265	88.5
	Pr1B Staged Developed	3.693	77.8
	Pr1C Staged Developed	0.461	10
	Pr1D Staged Developed	1.614	90.1
	Pr1E Staged Developed	0.794	85.2
	Pr1F Staged Developed	0.925	85.1
	Pr1G Staged Developed	0.077	10
	Total	10.905	80%
2	Pr2A Staged Developed	0.059	95
	Pr2B Staged Developed	1.263	10
	Total	1.32	14%
3	Ex3C Residual Demolished	2.12	0
	Pr3A Staged Developed	0.471	10
	Pr3B Staged Developed	0.746	10
	Pr3C Staged Developed	2.668	87.4
	Pr3D Staged Developed	1.307	86.7
	Pr3E Staged Developed	0.035	95
	Total	7.35	49%
DSP 1 + 2 + 3	**TOTAL**	**19.6**	**64%**

Figure 13: Stage 6 Post-Development Catchment Plan

APPENDIX F: DRAINS – STAGED DATA AND RESULTS

Stage 1

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
nPr1F	Node								0	314127.8	6242468		6		No					
DSP1	Node								0	314204.6	6242301		17		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx1A	Node								0	314210.2	6242669		21590177		No					
nEx1B	Node								0	314321	6242600		22323161		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
cPr1F	nPr1F	0.841	85	2.8	0.02	0	1	RAFTS
cEx1A-dem	nEx1A	3.443	0	2.8	0.03	0	1	RAFTS
cEx1B-dem	nEx1B	7.237	2.3	3	0.02	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se (m)	Chg (m)	Bottom Elev (m)	Height of Se (m)	Chg (m)	Bottom Elev (m)	Height of Se (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storm (m)	SafeDepth Minor Storm (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
oPr1F	nPr1F	DSP1	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	4.81	260
oPr1	DSP1	Pr1	0.1				Channel se	1	0.5	1	1	100	21590139	4.81	4.8	10
oEx1A	nEx1A	DSP1	3.9				7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	4.81	470
oEx1B	nEx1B	DSP1	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	22325456	19.041	4.81	419.152

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)

This model has no pipes with non-return valves

Stage 2

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
DSP3_EX	Node								0	313178.5	6242908		21		No					
DSP2_EX	Node								0	313686.8	6242887		22		No					
N_Ex3B	Node								0	313382.7	6242859		23		No					
N_Ex3A	Node								0	313289.6	6242721		24		No					
N_Ex2B	Node								0	313570.2	6242817		25		No					
N_Ex2A	Node								0	313644.3	6242752		26		No					
N_Ex3C	Node								0	313196.4	6242696		27		No					
nPr1A	Node								0	314421.9	6242548		1		No					
nPr1B	Node								0	314290.9	6242530		2		No					
nPr1C	Node								0	314281	6242365		3		No					
nPr1D	Node								0	314207	6242615		4		No					
nPr1E	Node								0	314157.7	6242466		5		No					
nPr1F	Node								0	314127.8	6242468		6		No					
nPr1G	Node								0	314118.7	6242319		7		No					
nPr2A	Node								0	314622.5	6242661		8		No					
nPr2B	Node								0	314593.4	6242764		9		No					
nEx3A	Node								0	314387	6242861		10		No					
nPr3B	Node								0	314509.3	6242806		11		No					
nPr3C	Node								0	314460.8	6242740		12		No					
DSP3	Node								0	314178.5	6242908		15		No					
DSP2	Node								0	314644.5	6242835		16		No					
DSP1	Node								0	314204.6	6242301		17		No					
Ex3	Node								0	313199.8	6242943		21566981		No					
Ex2	Node								0	313728.2	6242910		21567759		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr3	Node								0	314150.7	6242931		21585843		No					
Pr2	Node								0	314647.5	6242875		21587012		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx3C	Node								0	314171.6	6242745		21590176		No					
nEx1A	Node								0	314210.2	6242669		21590177		No					
nEx2A	Node								0	314540.1	6242651		22314622		No					
nEx1B	Node								0	314321	6242600		22323161		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS
cPr1A	nPr1A	0.216	94	4	0.02	0	1	RAFTS
cPr1B*	nPr1B	1.084	55	3	0.02	0	1	RAFTS
cPr1D*	nPr1D	1.131	90	1.4	0.02	0	1	RAFTS
cPr1E	nPr1E	0.502	85	2.8	0.02	0	1	RAFTS
cPr1F	nPr1F	0.892	85	2.8	0.02	0	1	RAFTS
cPr2A	nPr2A	0.059	95	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cEx3A-dem	nEx3A	1.783	0	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C*	nPr3C	1.49	87.8	1	0.02	0	1	RAFTS
cEx3C-dem	nEx3C	3.743	0	3	0.03	0	1	RAFTS
cEx1A-dem	nEx1A	1.203	0	2.8	0.03	0	1	RAFTS
cEx2A-dem	nEx2A	0.172	0	2.2	0.02	0	1	RAFTS
cEx1B-dem	nEx1B	5.283	0	3	0.02	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se (m)	Chg (m)	Bottom Elev (m)	Height of Se (m)	Chg (m)	Bottom Elev (m)	Height of Se (m)	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storm (m)	Safe Depth Minor Storm (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3	DSP3_EX	Ex3	0.1				Channel se	1	0.5	1	1	100	21576394	4	3.9	10
OF_Ex2	DSP2_EX	Ex2	0.1				Channel se	1	0.5	1	1	100	21574118	4	3.9	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	102	12	6	419.152
oPr1C	nPr1C	DSP1	0.1				7.5 m road\	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	nPr1G	4				7.5 m road\	0.3	0.15	0.4	1.79	100	13986192	14.682	6	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922
oPr1F	nPr1F	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61

oPr1G	nPr1G	DSP1	0.1	7.5 m road\	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1	7.5 m road\	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1	7.5 m road\	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oEx3A	nEx3A	DSP3	0.1	7.5 m road\	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nEx3A	0.1	7.5 m road\	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nEx3A	0.1	7.5 m road\	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
oPr3	DSP3	Pr3	0.1	Channel se	1	0.5	1	1	100	21584594	10.78	10.7	10
oPr2	DSP2	Pr2	0.1	Channel se	1	0.5	1	1	100	21590134	17.7	17.6	10
oPr1	DSP1	Pr1	0.1	Channel se	1	0.5	1	1	100	21590139	4.81	4.8	10
oEx3C	nEx3C	DSP3	0.1	7.5 m road\	0.6	0.6	0.4	1.384615	100	21590182	15.1	10.78	312
oEx1A	nEx1A	nPr1D	0.1	7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	14.682	10
oEx2A	nEx2A	nPr2A	0.1	7.5 m road\	0.6	0.6	0.4	1.849884	100	22310534	22	21.547	207.959
oEx1B	nEx1B	nPr1B	0.1	7.5 m road\	0.6	0.6	0.4	3.111282	100	22325456	19.041	12	419.152

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)

This model has no pipes with non-return valves

Stage 3

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
DSP3_EX	Node								0	313178.5	6242908		21		No					
DSP2_EX	Node								0	313686.8	6242887		22		No					
N_Ex3B	Node								0	313382.7	6242859		23		No					
N_Ex3A	Node								0	313289.6	6242721		24		No					
N_Ex2B	Node								0	313570.2	6242817		25		No					
N_Ex2A	Node								0	313644.3	6242752		26		No					
N_Ex3C	Node								0	313196.4	6242696		27		No					
nPr1A	Node								0	314421.9	6242548		1		No					
nPr1B	Node								0	314290.9	6242530		2		No					
nPr1C	Node								0	314281	6242365		3		No					
nPr1D	Node								0	314207	6242615		4		No					
nPr1E	Node								0	314157.7	6242466		5		No					
nPr1F	Node								0	314127.8	6242468		6		No					
nPr1G	Node								0	314118.7	6242319		7		No					
nPr2A	Node								0	314622.5	6242661		8		No					
nPr2B	Node								0	314593.4	6242764		9		No					
nEx3A	Node								0	314387	6242861		10		No					
nPr3B	Node								0	314509.3	6242806		11		No					
nPr3C	Node								0	314460.8	6242740		12		No					
DSP3	Node								0	314178.5	6242908		15		No					
DSP2	Node								0	314644.5	6242835		16		No					
DSP1	Node								0	314204.6	6242301		17		No					
Ex3	Node								0	313199.8	6242943		21566981		No					
Ex2	Node								0	313728.2	6242910		21567759		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr3	Node								0	314150.7	6242931		21585843		No					
Pr2	Node								0	314647.5	6242875		21587012		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx3C	Node								0	314171.6	6242745		21590176		No					
nEx1A	Node								0	314210.2	6242669		21590177		No					
nEx2A	Node								0	314540.1	6242651		22314622		No					
nEx1B	Node								0	314321	6242600		22323161		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS
cPr1A	nPr1A	0.216	94	4	0.02	0	1	RAFTS
cPr1B*	nPr1B	1.084	55	3	0.02	0	1	RAFTS
cPr1D*	nPr1D	1.131	90	1.4	0.02	0	1	RAFTS
cPr1E	nPr1E	0.502	85	2.8	0.02	0	1	RAFTS
cPr1F	nPr1F	0.892	85	2.8	0.02	0	1	RAFTS
cPr2A	nPr2A	0.059	95	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cEx3A-dem	nEx3A	1.783	0	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C*	nPr3C	1.49	87.8	1	0.02	0	1	RAFTS
cEx3C-dem	nEx3C	3.743	0	3	0.03	0	1	RAFTS
cEx1A-dem	nEx1A	1.203	0	2.8	0.03	0	1	RAFTS
cEx2A-dem	nEx2A	0.172	0	2.2	0.02	0	1	RAFTS
cEx1B-dem	nEx1B	5.283	0	3	0.02	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storm (m)	Safe Depth Minor Storm (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3	DSP3_EX	Ex3	0.1				Channel se	1	0.5	1	1	100	21576394	4	3.9	10
OF_Ex2	DSP2_EX	Ex2	0.1				Channel se	1	0.5	1	1	100	21574118	4	3.9	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	102	12	6	419.152
oPr1C	nPr1C	DSP1	0.1				7.5 m road\	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	nPr1G	4				7.5 m road\	0.3	0.15	0.4	1.79	100	13986192	14.682	6	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922

oPr1F	nPr1F	nPr1G	0.1	7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61
oPr1G	nPr1G	DSP1	0.1	7.5 m road\	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1	7.5 m road\	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1	7.5 m road\	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oEx3A	nEx3A	DSP3	0.1	7.5 m road\	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nEx3A	0.1	7.5 m road\	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nEx3A	0.1	7.5 m road\	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
oPr3	DSP3	Pr3	0.1	Channel se	1	0.5	1	1	100	21584594	10.78	10.7	10
oPr2	DSP2	Pr2	0.1	Channel se	1	0.5	1	1	100	21590134	17.7	17.6	10
oPr1	DSP1	Pr1	0.1	Channel se	1	0.5	1	1	100	21590139	4.81	4.8	10
oEx3C	nEx3C	DSP3	0.1	7.5 m road\	0.6	0.6	0.4	1.384615	100	21590182	15.1	10.78	312
oEx1A	nEx1A	nPr1D	0.1	7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	14.682	10
oEx2A	nEx2A	nPr2A	0.1	7.5 m road\	0.6	0.6	0.4	1.849884	100	22310534	22	21.547	207.959
oEx1B	nEx1B	nPr1B	0.1	7.5 m road\	0.6	0.6	0.4	3.111282	100	22325456	19.041	12	419.152

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)

This model has no pipes with non-return valves

Stage 4

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
DSP3_EX	Node								0	313178.5	6242908		21		No					
DSP2_EX	Node								0	313686.8	6242887		22		No					
N_Ex3B	Node								0	313382.7	6242859		23		No					
N_Ex3A	Node								0	313289.6	6242721		24		No					
N_Ex2B	Node								0	313570.2	6242817		25		No					
N_Ex2A	Node								0	313644.3	6242752		26		No					
N_Ex3C	Node								0	313196.4	6242696		27		No					
nPr1A	Node								0	314421.9	6242548		1		No					
nPr1B	Node								0	314290.9	6242530		2		No					
nPr1C	Node								0	314281	6242365		3		No					
nPr1D	Node								0	314207	6242615		4		No					
nPr1E	Node								0	314157.7	6242466		5		No					
nPr1F	Node								0	314127.8	6242468		6		No					
nPr1G	Node								0	314118.7	6242319		7		No					
nPr2A	Node								0	314622.5	6242661		8		No					
nPr2B	Node								0	314593.4	6242764		9		No					
nEx3A	Node								0	314387	6242861		10		No					
nPr3B	Node								0	314509.3	6242806		11		No					
nPr3C	Node								0	314460.8	6242740		12		No					
DSP3	Node								0	314178.5	6242908		15		No					
DSP2	Node								0	314644.5	6242835		16		No					
nPr1A_bas	Node								0	314071.9	6242248		28		No					
nPr1B_bas	Node								0	313940.9	6242230		29		No					
nPr1C_bas	Node								0	313931	6242065		30		No					
nPr1D_bas	Node								0	313857	6242315		31		No					
nPr1E_bas	Node								0	313807.7	6242166		32		No					
nPr1F_bas	Node								0	313777.8	6242168		33		No					
nPr1G_bas	Node								0	313768.7	6242019		34		No					
Ex3	Node								0	313199.8	6242943		21566981		No					
Ex2	Node								0	313728.2	6242910		21567759		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr3	Node								0	314150.7	6242931		21585843		No					
Pr2	Node								0	314647.5	6242875		21587012		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx3C	Node								0	314171.6	6242745		21590176		No					
nEx1A	Node								0	314210.2	6242669		21590177		No					
DSP1_bas	Node								0	313851	6241990		21648984		No					
Pr1_bas	Node								0	313853.3	6241973		21638395		No					
nEx2A	Node								0	314540.1	6242651		22314622		No					
nEx1B	Node								0	314321	6242600		22323161		No					
Pit41384	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6			0	0	314228.5	6242321	Yes	23439944	1 x Ku	No	New				
N1355393	Node				2.56			0		314208.6	6242313		23407388		No					
Pit41382	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5			0	0	314172.9	6242309	Yes	23351961	1 x Ku	No	New				
N1355390	Node				2.57			0		314186.5	6242301		23377141		No					
Pit3845	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5			0	0	313833.5	6242007	Yes	21591183	1 x Ku	No	New				
DSP1_bas2	Node				2.57			0		313846.5	6242000		932258		No					
Pit2177	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6			0	0	313874.1	6242009	Yes	21592183	1 x Ku	No	New				
DSP1_bas1	Node				2.56			0		313854.6	6242001		35		No					
DSP1	Node							0		314204.6	6242301		17		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id
Basin2_bas	2.6	1		None						313814.8	6242013	No			931880
	3.4	1													
	3.5	1													
	3.6	1													
	3.7	1													
	3.8	611.149													
	3.9	614.026													
	4	616.811													
	4.1	619.52													
	4.2	622.159													
	4.3	624.727													
	4.4	627.223													
	4.5	629.67													
	4.6	632.158													
	4.7	634.694													
	4.8	637.281													
	4.9	639.917													
	5	642.603													
	5.1	645.338													
	5.2	648.123													
	5.3	650.958													
	5.4	653.842													
	5.5	656.776													
	6	656.776													
	8	657													
Basin1_bas	2.64	1		None						313891.1	6242027	No			931883
	3.2	1													
	3.3	89.872													
	3.4	149.953													
	3.5	218.535													
	3.6	797.596													
	3.7	1075.9													
	3.8	1317.05													
	3.9	1750.7													
	4	1890.04													
	4.1	2009.35													
	4.2	2123.45													
	4.3	2240.17													
	4.4	2360.88													
	4.5	2449.34													

	4.6	2540.03							
	4.7	2641.8							
	4.8	2762.35							
	4.9	2885.75							
	5	2999.68							
	5.1	3094.98							
	5.2	3194.7							
	5.3	3294.25							
	5.4	3391.96							
	5.5	3490.77							
	5.6	3592.25							
	5.7	3695.36							
	5.8	3802.66							
	5.9	3914.36							
	6	4045.06							
	8	4050							
Basin8185	2.6	1	None		314151.1	6242310	No		23335043
	3.4	1							
	3.5	1							
	3.6	1							
	3.7	1							
	3.8	611.149							
	3.9	614.026							
	4	616.811							
	4.1	619.52							
	4.2	622.159							
	4.3	624.727							
	4.4	627.223							
	4.5	629.67							
	4.6	632.158							
	4.7	634.694							
	4.8	637.281							
	4.9	639.917							
	5	642.603							
	5.1	645.338							
	5.2	648.123							
	5.3	650.958							
	5.4	653.842							
	5.5	656.776							
	6	656.776							
	8	657							
Basin8185	2.64	1	None		314241.2	6242326	No		23395916
	3.2	1							
	3.3	89.872							
	3.4	149.953							
	3.5	218.535							
	3.6	797.596							
	3.7	1075.9							
	3.8	1317.05							
	3.9	1750.7							
	4	1890.04							
	4.1	2009.35							
	4.2	2123.45							
	4.3	2240.17							
	4.4	2360.88							
	4.5	2449.34							
	4.6	2540.03							
	4.7	2641.8							
	4.8	2762.35							
	4.9	2885.75							
	5	2999.68							
	5.1	3094.98							
	5.2	3194.7							
	5.3	3294.25							
	5.4	3391.96							
	5.5	3490.77							
	5.6	3592.25							
	5.7	3695.36							
	5.8	3802.66							
	5.9	3914.36							
	6	4045.06							
	8	4050							

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS
cPr1A	nPr1A	1.308	90	4	0.02	0	1	RAFTS
cPr1B*	nPr1B	3.101	76.1	3	0.02	0	1	RAFTS
cPr1C	nPr1C	0.461	11.9	0.5	0.03	0	1	RAFTS
cPr1D*	nPr1D	1.6136	90.1	1.4	0.02	0	1	RAFTS
cPr1E	nPr1E	0.7923	85.2	2.8	0.02	0	1	RAFTS
cPr1F	nPr1F	0.925	85.1	2.8	0.02	0	1	RAFTS
cPr1G	nPr1G	0.0772	94.4	0.5	0.02	0	1	RAFTS
cPr2A	nPr2A	0.059	95	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cEx3A-dem	nEx3A	1.783	0	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C*	nPr3C	1.49	87.8	1	0.02	0	1	RAFTS
cPr1A_bas	nPr1A_bas	3.265	88.4	4	0.02	0.290258	1	RAFTS
cPr1B_bas	nPr1B_bas	4.132	77.8	3	0.02	0.253458	1	RAFTS
cPr1C_bas	nPr1C_bas	0.461	10	0.5	0.03	1.23736	1	RAFTS
cPr1D_bas	nPr1D_bas	2.866	88.1	1.4	0.02	0.1105	1	RAFTS
cPr1E_bas	nPr1E_bas	0.794	85	3	0.02	0.103067	1	RAFTS
cPr1F_bas	nPr1F_bas	0.925	85	2.8	0.02	0.268267	1	RAFTS
cPr1G_bas	nPr1G_bas	0.077	19.8	0.5	0.02	0.150542	1	RAFTS
cEx3C-dem	nEx3C	3.743	0	3	0.03	0	1	RAFTS

cEx1A-dem	nEx1A	0.361	0	2.8	0.03	0	1	RAFTS
cEx2A-dem	nEx2A	0.172	0	2.2	0.02	0	1	RAFTS
cEx1B-dem	nEx1B	1.715	0	3	0.02	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
P85548	Pit41384	N1355393	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit41384	0					
P85546	Pit41382	N1355390	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit41382	0					
Pipe Outlet	Pit3845	DSP1_bas2	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit3845	0					
Pipe Outlet	Pit2177	DSP1_bas1	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit2177	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storn (m)	SafeDepth Minor Storn (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3	DSP3_EX	Ex3	0.1				Channel se	1	0.5	1	1	100	21576394	4	3.9	10
OF_Ex2	DSP2_EX	Ex2	0.1				Channel se	1	0.5	1	1	100	21574118	4	3.9	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	102	12	6	419.152
oPr1C	nPr1C	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	nPr1G	4				7.5 m road\	0.3	0.15	0.4	1.79	100	13986192	14.682	6	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922
oPr1F	nPr1F	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61
oPr1G	nPr1G	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oEx3A	nEx3A	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nEx3A	0.1				7.5 m road\	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nEx3A	0.1				7.5 m road\	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
oPr3	DSP3	Pr3	0.1				Channel se	1	0.5	1	1	100	21584594	10.78	10.7	10
oPr2	DSP2	Pr2	0.1				Channel se	1	0.5	1	1	100	21590134	17.7	17.6	10
oPr1A_bas	nPr1A_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	122	21.17	6	572.747
oPr1B_bas	nPr1B_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	123	19.041	6	419.152
oPr1C_bas	nPr1C_bas	Basin1_bas	0.1				7.5 m road\	0.6	0.6	0.4	90	100	124	6	5.9	3
oPr1D_bas	nPr1D_bas	nPr1G_bas	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	3262434	14.682	6	484
oPr1E_bas	nPr1E_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	126	11.499	6	314.922
oPr1F_bas	nPr1F_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	127	11.182	6	343.61
oPr1G_bas	nPr1G_bas	Basin2_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.33	100	128	6	5.9	3
oEx3C	nEx3C	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	1.384615	100	21590182	15.1	10.78	312
oEx1A	nEx1A	nPr1D	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	14.682	10
o_DSP1	DSP1_bas	Pr1_bas	0.1				Channel se	1	0.5	1	1	100	21646966	2.4	2.3	10
oEx2A	nEx2A	nPr2A	0.1				7.5 m road\	0.6	0.6	0.4	1.849884	100	22310534	22	21.547	207.959
oEx1B	nEx1B	nPr1B	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	22325456	19.041	12	419.152
OF112622	N1355393	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23401161	2.56	2.4	10
OF112621	N1355390	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23380781	2.56	2.4	10
o_bas2	DSP1_bas2	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21643446	2.56	2.4	10
o_bas1	DSP1_bas1	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21653364	2.56	2.4	10
oPr1	DSP1	Pr1	0.1				Channel se	1	0.5	1	1	100	21590139	2.4	2.3	10

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
P85548	Concrete, u	1200	0.6	-1.29	Unsafe
P85546	Concrete, u	600	0.6	-0.65	Unsafe
Pipe Outlet	Concrete, u	600	0.6	-0.65	Unsafe
Pipe Outlet	Concrete, u	1200	0.6	-1.29	Unsafe

This model has no pipes with non-return valves

Stage 5

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
DSP3_EX	Node								0	313178.5	6242908		21		No					
DSP2_EX	Node								0	313686.8	6242887		22		No					
N_Ex3B	Node								0	313382.7	6242859		23		No					
N_Ex3A	Node								0	313289.6	6242721		24		No					
N_Ex2B	Node								0	313570.2	6242817		25		No					
N_Ex2A	Node								0	313644.3	6242752		26		No					
N_Ex3C	Node								0	313196.4	6242696		27		No					
nPr1A	Node								0	314421.9	6242548		1		No					
nPr1B	Node								0	314290.9	6242530		2		No					
nPr1C	Node								0	314281	6242365		3		No					
nPr1D	Node								0	314207	6242615		4		No					
nPr1E	Node								0	314157.7	6242466		5		No					
nPr1F	Node								0	314127.8	6242468		6		No					
nPr1G	Node								0	314118.7	6242319		7		No					
nPr2A	Node								0	314622.5	6242661		8		No					
nPr2B	Node								0	314593.4	6242764		9		No					
nEx3A	Node								0	314387	6242861		10		No					
nPr3B	Node								0	314509.3	6242806		11		No					
nPr3C	Node								0	314460.8	6242740		12		No					
DSP3	Node								0	314178.5	6242908		15		No					
DSP2	Node								0	314644.5	6242835		16		No					
DSP1	Node								0	314204.6	6242301		17		No					
nPr1A_bas	Node								0	314071.9	6242248		28		No					
nPr1B_bas	Node								0	313940.9	6242230		29		No					
nPr1C_bas	Node								0	313931	6242065		30		No					
nPr1D_bas	Node								0	313857	6242315		31		No					
nPr1E_bas	Node								0	313807.7	6242166		32		No					
nPr1F_bas	Node								0	313777.8	6242168		33		No					
nPr1G_bas	Node								0	313768.7	6242019		34		No					
Ex3	Node								0	313199.8	6242943		21566981		No					
Ex2	Node								0	313728.2	6242910		21567759		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr3	Node								0	314150.7	6242931		21585843		No					
Pr2	Node								0	314647.5	6242875		21587012		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx3C	Node								0	314171.6	6242745		21590176		No					
nEx1A	Node								0	314210.2	6242669		21590177		No					
DSP1_bas	Node								0	313851	6241990		21648984		No					
Pr1_bas	Node								0	313853.3	6241973		21638395		No					
Pit41382	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5			0	0	314172.9	6242309	Yes	23351961	1 x Ku	No	New				
N1355390	Node				2.57			0		314186.5	6242301		23377141		No					
Pit41384	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6			0	0	314228.5	6242321	Yes	23439944	1 x Ku	No	New				
N1355393	Node				2.56			0		314208.6	6242313		23407388		No					
Pit3845	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5			0	0	313833.5	6242007	Yes	21591183	1 x Ku	No	New				
DSP1_bas2	Node				2.57			0		313846.5	6242000		932258		No					
Pit2177	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6			0	0	313874.1	6242009	Yes	21592183	1 x Ku	No	New				
DSP1_bas1	Node				2.56			0		313854.6	6242001		35		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id
Basin2_bas	2.6	1		None						313814.8	6242013	No			931880
	3.4	1													
	3.5	1													
	3.6	1													
	3.7	1													
	3.8	611.149													
	3.9	614.026													
	4	616.811													
	4.1	619.52													
	4.2	622.159													
	4.3	624.727													
	4.4	627.223													
	4.5	629.67													
	4.6	632.158													
	4.7	634.694													
	4.8	637.281													
	4.9	639.917													
	5	642.603													
	5.1	645.338													
	5.2	648.123													
	5.3	650.958													
	5.4	653.842													
	5.5	656.776													
	6	656.776													
	8	657													
Basin1_bas	2.64	1		None						313891.1	6242027	No			931883
	3.2	1													
	3.3	89.872													
	3.4	149.953													
	3.5	218.535													
	3.6	797.596													
	3.7	1075.9													
	3.8	1317.05													
	3.9	1750.7													
	4	1890.04													
	4.1	2009.35													
	4.2	2123.45													
	4.3	2240.17													
	4.4	2360.88													
	4.5	2449.34													
	4.6	2540.03													
	4.7	2641.8													

	4.8	2762.35						
	4.9	2885.75						
	5	2999.68						
	5.1	3094.98						
	5.2	3194.7						
	5.3	3294.25						
	5.4	3391.96						
	5.5	3490.77						
	5.6	3592.25						
	5.7	3695.36						
	5.8	3802.66						
	5.9	3914.36						
	6	4045.06						
	8	4050.00						
Basin81857	2.6	1	None	314151.1	6242310	No	23335043	
	3.4	1.00						
	3.5	1						
	3.6	1.00						
	3.7	1.00						
	3.8	611.149						
	3.9	614.03						
	4	616.81						
	4.1	619.52						
	4.2	622.159						
	4.3	624.73						
	4.4	627.22						
	4.5	629.67						
	4.6	632.16						
	4.7	634.694						
	4.8	637.281						
	4.9	639.917						
	5	642.603						
	5.1	645.34						
	5.2	648.123						
	5.3	650.96						
	5.4	653.84						
	5.5	656.776						
	6	656.776						
	8	657						
Basin81859	2.64	1	None	314241.2	6242326	No	23395916	
	3.2	1						
	3.3	89.872						
	3.4	149.953						
	3.5	218.535						
	3.6	797.596						
	3.7	1075.9						
	3.8	1317.05						
	3.9	1750.7						
	4	1890.04						
	4.1	2009.35						
	4.2	2123.45						
	4.3	2240.17						
	4.4	2360.88						
	4.5	2449.34						
	4.6	2540.03						
	4.7	2641.8						
	4.8	2762.35						
	4.9	2885.75						
	5	2999.68						
	5.1	3094.98						
	5.2	3194.7						
	5.3	3294.25						
	5.4	3391.96						
	5.5	3490.77						
	5.6	3592.25						
	5.7	3695.36						
	5.8	3802.66						
	5.9	3914.36						
	6	4045.06						
	8	4050						

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS
cPr1A	nPr1A	3.265	88.5	4	0.02	0	1	RAFTS
cPr1B*	nPr1B	3.1	76.1	3	0.02	0	1	RAFTS
cPr1C	nPr1C	0.461	11.9	0.5	0.03	0	1	RAFTS
cPr1D*	nPr1D	1.614	90.1	1.4	0.02	0	1	RAFTS
cPr1E	nPr1E	0.794	85.2	2.8	0.02	0	1	RAFTS
cPr1F	nPr1F	0.925	85.1	2.8	0.02	0	1	RAFTS
cPr1G	nPr1G	0.077	94.4	0.5	0.02	0	1	RAFTS
cPr2A	nPr2A	0.059	95	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cEx3A-dem	nEx3A	1.783	0	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C*	nPr3C	1.53	88	1	0.02	0	1	RAFTS
cPr1A_bas	nPr1A_bas	3.265	88.4	4	0.02	0.290258	1	RAFTS
cPr1B_bas	nPr1B_bas	4.132	77.8	3	0.02	0.253458	1	RAFTS
cPr1C_bas	nPr1C_bas	0.461	10	0.5	0.03	1.23736	1	RAFTS
cPr1D_bas	nPr1D_bas	2.866	88.1	1.4	0.02	0.1105	1	RAFTS
cPr1E_bas	nPr1E_bas	0.794	85	3	0.02	0.103067	1	RAFTS
cPr1F_bas	nPr1F_bas	0.925	85	2.8	0.02	0.268267	1	RAFTS
cPr1G_bas	nPr1G_bas	0.077	19.8	0.5	0.02	0.150542	1	RAFTS
cEx3C-dem	nEx3C	3.648	0	3	0.03	0	1	RAFTS
cEx1A-dem	nEx1A	0.292	0	2.8	0.03	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
P85546	Pit41382	N1355390	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit41382	0					
P85548	Pit41384	N1355393	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit41384	0					
Pipe Outlet	Pit3845	DSP1_bas2	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit3845	0					
Pipe Outlet	Pit2177	DSP1_bas1	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit2177	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storm (m)	Safe Depth Minor Storm (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3	DSP3_EX	Ex3	0.1				Channel se	1	0.5	1	1	100	21576394	4	3.9	10
OF_Ex2	DSP2_EX	Ex2	0.1				Channel se	1	0.5	1	1	100	21574118	4	3.9	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	102	19.041	6	419.152
oPr1C	nPr1C	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	nPr1G	4				7.5 m road\	0.3	0.15	0.4	1.79	100	13986192	14.682	6	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922
oPr1F	nPr1F	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61
oPr1G	nPr1G	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oEx3A	nEx3A	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nEx3A	0.1				7.5 m road\	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nEx3A	0.1				7.5 m road\	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
OF_Pr3	DSP3	Pr3	0.1				Channel se	1	0.5	1	1	100	21584594	10.78	10.7	10
OF_Pr2	DSP2	Pr2	0.1				Channel se	1	0.5	1	1	100	21590134	17.7	17.6	10
oPr1	DSP1	Pr1	0.1				Channel se	1	0.5	1	1	100	21590139	2.4	2.3	10
oPr1A_bas	nPr1A_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	122	21.17	6	572.747
oPr1B_bas	nPr1B_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	123	19.041	6	419.152
oPr1C_bas	nPr1C_bas	Basin1_bas	0.1				7.5 m road\	0.6	0.6	0.4	90	100	124	6	5.9	3
oPr1D_bas	nPr1D_bas	nPr1G_bas	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	3262434	14.682	6	484
oPr1E_bas	nPr1E_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	126	11.499	6	314.922
oPr1F_bas	nPr1F_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	127	11.182	6	343.61
oPr1G_bas	nPr1G_bas	Basin2_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.33	100	128	6	5.9	3
oEx3C	nEx3C	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	1.384615	100	21590182	15.1	10.78	312
oEx1A	nEx1A	nPr1D	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	14.682	10
o_DSP1	DSP1_bas	Pr1_bas	0.1				Channel se	1	0.5	1	1	100	21646966	2.4	2.3	10
OF112621	N1355390	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23380781	2.56	2.4	10
OF112622	N1355393	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23401161	2.56	2.4	10
o_bas2	DSP1_bas2	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21643446	2.56	2.4	10
o_bas1	DSP1_bas1	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21653364	2.56	2.4	10

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
P85546	Concrete, u	600	0.6	-0.65	Unsafe
P85548	Concrete, u	1200	0.6	-1.29	Unsafe
Pipe Outlet	Concrete, u	600	0.6	-0.65	Unsafe
Pipe Outlet	Concrete, u	1200	0.6	-1.29	Unsafe

This model has no pipes with non-return valves

Stage 6

PIT / NODE DETAILS Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
DSP1_EX	Node								0	313423.7	6242436		18		No					
N_Ex1A	Node								0	313430.9	6242518		19		No					
N_Ex1B	Node								0	313694.5	6242654		20		No					
DSP3_EX	Node								0	313178.5	6242908		21		No					
DSP2_EX	Node								0	313686.8	6242887		22		No					
N_Ex3B	Node								0	313382.7	6242859		23		No					
N_Ex3A	Node								0	313289.6	6242721		24		No					
N_Ex2B	Node								0	313570.2	6242817		25		No					
N_Ex2A	Node								0	313644.3	6242752		26		No					
N_Ex3C	Node								0	313196.4	6242696		27		No					
nPr1A	Node								0	314421.9	6242548		1		No					
nPr1B	Node								0	314290.9	6242530		2		No					
nPr1C	Node								0	314281	6242365		3		No					
nPr1D	Node								0	314207	6242615		4		No					
nPr1E	Node								0	314157.7	6242466		5		No					
nPr1F	Node								0	314127.8	6242468		6		No					
nPr1G	Node								0	314118.7	6242319		7		No					
nPr2A	Node								0	314622.5	6242661		8		No					
nPr2B	Node								0	314593.4	6242764		9		No					
nPr3A	Node								0	314387	6242861		10		No					
nPr3B	Node								0	314509.3	6242806		11		No					
nPr3C	Node								0	314460.8	6242740		12		No					
nPr3D	Node								0	314330.6	6242779		13		No					
nPr3E	Node								0	314226.2	6242763		14		No					
DSP3	Node								0	314178.5	6242908		15		No					
DSP2	Node								0	314644.5	6242835		16		No					
DSP1	Node								0	314204.6	6242301		17		No					
nPr1A_bas	Node								0	314071.9	6242248		28		No					
nPr1B_bas	Node								0	313940.9	6242230		29		No					
nPr1C_bas	Node								0	313931	6242065		30		No					
nPr1D_bas	Node								0	313857	6242315		31		No					
nPr1E_bas	Node								0	313807.7	6242166		32		No					
nPr1F_bas	Node								0	313777.8	6242168		33		No					
nPr1G_bas	Node								0	313768.7	6242019		34		No					
Ex3	Node								0	313199.8	6242943		21566981		No					
Ex2	Node								0	313728.2	6242910		21567759		No					
Ex1	Node								0	313432	6242399		21570219		No					
Pr3	Node								0	314150.7	6242931		21585843		No					
Pr2	Node								0	314647.5	6242875		21587012		No					
Pr1	Node								0	314207.3	6242269		21588508		No					
nEx3C*	Node								0	314171.6	6242745		21590176		No					
nEx1A*	Node								0	314210.2	6242669		21590177		No					
Pr1_bas	Node								0	313853.3	6241973		21638395		No					
DSP1_bas	Node								0	313851	6241990		21648984		No					
Pit41382	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5		0	0	314172.9	6242309	Yes	23351961	1 x Ku		No	New				
N1355390	Node				2.57		0			314186.5	6242301		23377141		No					
Pit41384	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6		0	0	314228.5	6242321	Yes	23439944	1 x Ku		No	New				
N1355393	Node				2.56		0			314208.6	6242313		23407388		No					
Pit3845	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	5.5		0	0	313833.5	6242007	Yes	2163549	1 x Ku		No	New				
DSP1_bas2	Node				2.57		0			313846.5	6242000		932258		No					
Pit2177	OnGrade	Junction Pit	Junction Pit or Manhole	1.5	6		0	0	313874.1	6242009	Yes	1819492	1 x Ku		No	New				
DSP1_bas1	Node				2.56		0			313854.6	6242001		35		No					

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lengt	id
Basin2_bas	2.6	1		None						313814.8	6242013	No			931880
	3.4	1													
	3.5	1													
	3.6	1													
	3.7	1													
	3.8	611.149													
	3.9	614.026													
	4	616.811													
	4.1	619.52													
	4.2	622.159													
	4.3	624.727													
	4.4	627.223													
	4.5	629.67													
	4.6	632.158													
	4.7	634.694													
	4.8	637.281													
	4.9	639.917													
	5	642.603													
	5.1	645.338													
	5.2	648.123													
	5.3	650.958													
	5.4	653.842													
	5.5	656.776													
	6	656.776													
	8	657													
Basin1_bas	2.64	1		None						313891.1	6242027	No			931883
	3.2	1													
	3.3	89.872													
	3.4	149.953													
	3.5	218.535													
	3.6	797.596													
	3.7	1075.9													
	3.8	1317.05													
	3.9	1750.7													
	4	1890.04													
	4.1	2009.35													
	4.2	2123.45													
	4.3	2240.17													
	4.4	2360.88													
	4.5	2449.34													

	4.6	2540.03							
	4.7	2641.8							
	4.8	2762.35							
	4.9	2885.75							
	5	2999.68							
	5.1	3094.98							
	5.2	3194.7							
	5.3	3294.25							
	5.4	3391.96							
	5.5	3490.77							
	5.6	3592.25							
	5.7	3695.36							
	5.8	3802.66							
	5.9	3914.36							
	6	4045.06							
	8	4050							
Basin8185	2.6	1	None		314151.1	6242310	No		23335043
	3.4	1							
	3.5	1							
	3.6	1							
	3.7	1							
	3.8	611.149							
	3.9	614.026							
	4	616.811							
	4.1	619.52							
	4.2	622.159							
	4.3	624.727							
	4.4	627.223							
	4.5	629.67							
	4.6	632.158							
	4.7	634.694							
	4.8	637.281							
	4.9	639.917							
	5	642.603							
	5.1	645.338							
	5.2	648.123							
	5.3	650.958							
	5.4	653.842							
	5.5	656.776							
	6	656.776							
	8	657							
Basin8185	2.64	1	None		314241.2	6242326	No		23395916
	3.2	1							
	3.3	89.872							
	3.4	149.953							
	3.5	218.535							
	3.6	797.596							
	3.7	1075.9							
	3.8	1317.05							
	3.9	1750.7							
	4	1890.04							
	4.1	2009.35							
	4.2	2123.45							
	4.3	2240.17							
	4.4	2360.88							
	4.5	2449.34							
	4.6	2540.03							
	4.7	2641.8							
	4.8	2762.35							
	4.9	2885.75							
	5	2999.68							
	5.1	3094.98							
	5.2	3194.7							
	5.3	3294.25							
	5.4	3391.96							
	5.5	3490.77							
	5.6	3592.25							
	5.7	3695.36							
	5.8	3802.66							
	5.9	3914.36							
	6	4045.06							
	8	4050							

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area	Impervious Area	Avg Slope(%)	Mannings n	Time lag (mins)	Rainfall Multiplier	Hydrological Model
cEx1A-dem	nEx1A*	0.076	0	2.8	0.03	0	1	RAFTS
cEx3C-dem	nEx3C*	2.12	0	3	0.03	0	1	RAFTS
cPr1A	nPr1A	3.265	88.5	4	0.02	0	1	RAFTS
cPr1A_bas	nPr1A_bas	3.265	88.4	4	0.02	0.290258	1	RAFTS
cPr1B	nPr1B	3.693	77.8	3	0.02	0	1	RAFTS
cPr1B_bas	nPr1B_bas	4.132	77.8	3	0.02	0.253458	1	RAFTS
cPr1C	nPr1C	0.461	10	0.5	0.03	0	1	RAFTS
cPr1C_bas	nPr1C_bas	0.461	10	0.5	0.03	1.23736	1	RAFTS
cPr1D*	nPr1D	1.614	90.1	1.4	0.02	0	1	RAFTS
cPr1D_bas	nPr1D_bas	2.866	88.1	1.4	0.02	0.1105	1	RAFTS
cPr1E	nPr1E	0.794	85.2	2.8	0.02	0	1	RAFTS
cPr1E_bas	nPr1E_bas	0.794	85	3	0.02	0.103067	1	RAFTS
cPr1F	nPr1F	0.925	85.1	2.8	0.02	0	1	RAFTS
cPr1F_bas	nPr1F_bas	0.925	85	2.8	0.02	0.268267	1	RAFTS
cPr1G	nPr1G	0.077	10	0.5	0.02	0	1	RAFTS
cPr1G_bas	nPr1G_bas	0.077	19.8	0.5	0.02	0.150542	1	RAFTS
cPr2A	nPr2A	0.059	95	2.2	0.02	0	1	RAFTS
cPr2B	nPr2B	1.263	10	3.4	0.03	0	1	RAFTS
cPr3A	nPr3A	0.471	10	0.5	0.03	0	1	RAFTS
cPr3B	nPr3B	0.746	10	1.4	0.03	0	1	RAFTS
cPr3C	nPr3C	2.668	87.4	1	0.02	0	1	RAFTS
cPr3D	nPr3D	1.307	86.7	0.7	0.02	0	1	RAFTS
cPr3E*	nPr3E	0.035	95	3.7	0.02	0	1	RAFTS
Ex1A	N_Ex1A	4.289	47	2.8	0.03	0	1	RAFTS
Ex1B	N_Ex1B	7.229	38	3.7	0.03	0	1	RAFTS
Ex2A	N_Ex2A	0.311	16.1	0.5	0.03	0	1	RAFTS
Ex2B	N_Ex2B	1.33	21.9	3.5	0.03	0	1	RAFTS

Ex3A	N_Ex3A	1.944	58.6	2.9	0.03	0	1	RAFTS
Ex3B	N_Ex3B	0.688	3.2	1.8	0.03	0	1	RAFTS
Ex3C	N_Ex3C	3.819	83.8	3	0.03	0	1	RAFTS

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	Rl (m)	Chg (m)	RL (m)	etc (m)
P85546	Pit41382	N1355390	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit41382	0					
P85548	Pit41384	N1355393	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit41384	0					
Pipe Outlet	Pit3845	DSP1_bas2	4	2.6	2.58	0.5	Concrete, u	600	600	0.013	New	10	Pit3845	0					
Pipe Outlet	Pit2177	DSP1_bas1	7.5	2.64	2.56	1.07	Concrete, u	1200	1200	0.013	New	10	Pit2177	0					

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	Chg (m)	Bottom Elev (m)	Height of Se	etc etc

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storn (m)	SafeDepth Minor Storn (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF_Ex1	DSP1_EX	Ex1	0.1				Channel se	1	0.5	1	1	100	21581132	4	3.9	10
OF_Ex1A	N_Ex1A	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	115	5	4	10
OF_EX1B	N_Ex1B	DSP1_EX	0.1				Channel se	0.6	0.6	1	10	100	116	5	4	10
OF_Ex3	DSP3_EX	Ex3	0.1				Channel se	1	0.5	1	1	100	21576394	4	3.9	10
OF_Ex2	DSP2_EX	Ex2	0.1				Channel se	1	0.5	1	1	100	21574118	4	3.9	10
OF_Ex3B	N_Ex3B	N_Ex3A	0.1				Channel se	0.6	0.6	1	10	100	117	6	5	10
OF_Ex3A	N_Ex3A	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	118	5	4	10
OF_Ex2B	N_Ex2B	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	119	5	4	10
OF_Ex2A	N_Ex2A	DSP2_EX	0.1				Channel se	0.6	0.6	1	10	100	120	5	4	10
OF_Ex3C	N_Ex3C	DSP3_EX	0.1				Channel se	0.6	0.6	1	10	100	121	5	4	10
oPr1A	nPr1A	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	101	21.17	6	572.747
oPr1B	nPr1B	nPr1C	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	102	19.041	6	419.152
oPr1C	nPr1C	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.043793	100	103	6	4.81	114.007
oPr1D	nPr1D	nPr1G	4				7.5 m road\	0.3	0.15	0.4	1.79	100	13986192	14.682	6	484
oPr1E	nPr1E	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	105	11.499	6	314.922
oPr1F	nPr1F	nPr1G	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	106	11.182	6	343.61
oPr1G	nPr1G	Basin8185	0.1				7.5 m road\	0.6	0.6	0.4	1.074412	100	107	6	4.81	110.758
oPr2A	nPr2A	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	1.849884	100	108	21.547	17.7	207.959
oPr2B	nPr2B	DSP2	0.1				7.5 m road\	0.6	0.6	0.4	3.373079	100	109	22.12	17.7	131.038
oPr3A	nPr3A	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	2.229769	100	110	15.454	10.78	209.618
oPr3B	nPr3B	nPr3A	0.1				7.5 m road\	0.6	0.6	0.4	2.031285	100	111	22.12	20.18	95.5061
oPr3C	nPr3C	nPr3A	0.1				7.5 m road\	0.6	0.6	0.4	1.086508	100	112	21.651	17.354	395.487
oPr3D	nPr3D	nPr3A	0.1				7.5 m road\	0.6	0.6	0.4	0.423548	100	113	16.199	15.454	175.895
oPr3E	nPr3E	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	1.384615	100	114	15.1	10.78	312
OF_Pr3	DSP3	Pr3	0.1				Channel se	1	0.5	1	1	100	21584594	10.78	10.7	10
OF_Pr2	DSP2	Pr2	0.1				Channel se	1	0.5	1	1	100	21590134	17.7	17.6	10
oPr1	DSP1	Pr1	0.1				Channel se	1	0.5	1	1	100	21590139	2.4	2.3	10
oPr1A_bas	nPr1A_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	2.64864	100	122	21.17	6	572.747
oPr1B_bas	nPr1B_bas	nPr1C_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.111282	100	123	19.041	6	419.152
oPr1C_bas	nPr1C_bas	Basin1_bas	0.1				7.5 m road\	0.6	0.6	0.4	90	100	124	6	5.9	3
oPr1D_bas	nPr1D_bas	nPr1G_bas	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	3262434	14.682	6	484
oPr1E_bas	nPr1E_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.746149	100	126	11.499	6	314.922
oPr1F_bas	nPr1F_bas	nPr1G_bas	0.1				7.5 m road\	0.6	0.6	0.4	1.508106	100	127	11.182	6	343.61
oPr1G_bas	nPr1G_bas	Basin2_bas	0.1				7.5 m road\	0.6	0.6	0.4	3.33	100	128	6	5.9	3
oEx3C	nEx3C*	DSP3	0.1				7.5 m road\	0.6	0.6	0.4	1.384615	100	21590182	15.1	10.78	312
oEx1A	nEx1A*	nPr1D	0.1				7.5 m road\	0.3	0.15	0.4	1.79	100	21590183	15.5	14.682	10
o_DSP1	DSP1_bas	Pr1_bas	0.1				Channel se	1	0.5	1	1	100	21646966	2.4	2.3	10
OF112621	N1355390	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23380781	2.56	2.4	10
OF112622	N1355393	DSP1	0.1				Channel se	1	0.5	1	1.6	100	23401161	2.56	2.4	10
o_bas2	DSP1_bas2	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21643446	2.56	2.4	10
o_bas1	DSP1_bas1	DSP1_bas	0.1				Channel se	1	0.5	1	1.6	100	21653364	2.56	2.4	10

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)	
P85546	Concrete, u	600	0.6	-0.65	Unsafe
P85548	Concrete, u	1200	0.6	-1.29	Unsafe
Pipe Outlet	Concrete, u	600	0.6	-0.65	Unsafe
Pipe Outlet	Concrete, u	1200	0.6	-1.29	Unsafe

This model has no pipes with non-return valves

Stage 1

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.369				
nPr1F	11.33		0.543				
DSP1	5.12		2.485				
nEx1A	15.66		0.645				
nEx1B	19.24		1.752				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
cPr1F	0.452	1% AEP, 5 min burst, Storm 1
cEx1A-dem	0.559	1% AEP, 45 min burst, Storm 6
cEx1B-dem	1.514	1% AEP, 25 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.977	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.398	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8
oPr1F	0.434	0.454	1.072	0.155	0.28	4.47	1.93	1% AEP, 5 min burst, Storm 1
oPr1	2.087	2.087	14.838	0.314	0.18	16.29	1.16	1% AEP, 30 min burst, Storm 5
oEx1A	0.557	0.558	1.026	0.16	0.3	4.61	1.92	1% AEP, 45 min burst, Storm 6
oEx1B	1.492	1.499	0.857	0.204	0.58	5.69	2.84	1% AEP, 25 min burst, Storm 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage1

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage1.drn run at 12:34:45 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oEx1B

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cover	Cover (m)

This model has no pipes with non-return valves

Stage 1

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.355				
N_Ex1B	5.07		2.057				
nPr1F	11.31		0.369				
DSP1	5.05		1.499				
nEx1A	15.63		0.36				
nEx1B	19.21		1.104				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.543	10% AEP, 15 min burst, Storm 8
cPr1F	0.289	10% AEP, 5 min burst, Storm 1
cEx1A-dem	0.329	10% AEP, 1 hour burst, Storm 6
cEx1B-dem	0.9	10% AEP, 1 hour burst, Storm 7

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.52	14.838	0.183	0.21	13.66	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.981	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8
oPr1F	0.273	0.298	1.072	0.138	0.23	3.74	1.88	10% AEP, 5 min burst, Storm 1
oPr1	1.303	1.302	14.838	0.242	0.12	14.83	1.01	10% AEP, 1 hour burst, Storm 7
oEx1A	0.325	0.326	0.411	0.132	0.23	3.53	1.72	10% AEP, 1 hour burst, Storm 6
oEx1B	0.897	0.897	0.857	0.174	0.42	4.96	2.47	10% AEP, 1 hour burst, Storm 6

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage1

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage1.drn run at 12:35:05 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oEx1B

Stage 2

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.369				
nPr1A	21.27		0.139				
nPr1B	12.24		1.734				
nPr1C	6.25		1.812				
nPr1D	14.85		0.553				
nPr1E	11.63		0.324				
nPr1F	11.34		0.575				
nPr1G	6.23		1.727				
DSP1	5.15		2.93				
nEx1A	15.59		0.264				
nEx1B	19.26		1.605				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
cPr1A	0.116	1% AEP, 5 min burst, Storm 1
cPr1B*	0.514	1% AEP, 5 min burst, Storm 1
cPr1D*	0.602	1% AEP, 5 min burst, Storm 1
cPr1E	0.27	1% AEP, 5 min burst, Storm 1
cPr1F	0.479	1% AEP, 5 min burst, Storm 1
cEx1A-dem	0.225	1% AEP, 30 min burst, Storm 7
cEx1B-dem	1.4	1% AEP, 25 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.977	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.398	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8
oPr1A	0.096	0.126	0.903	0.095	0.15	2.3	1.68	1% AEP, 10 min burst, Storm 7
oPr1B	1.545	1.554	0.857	0.237	0.5	6.53	2.13	1% AEP, 30 min burst, Storm 6
oPr1C	1.605	1.602	1.189	0.252	0.48	6.91	1.93	1% AEP, 30 min burst, Storm 6
oPr1D	0.569	0.599	1.026	0.179	0.3	5.07	1.78	1% AEP, 10 min burst, Storm 1
oPr1E	0.268	0.275	1.033	0.132	0.2	3.53	1.56	1% AEP, 5 min burst, Storm 1
oPr1F	0.468	0.485	1.072	0.164	0.26	4.69	1.64	1% AEP, 5 min burst, Storm 1
oPr1G	1.165	1.197	1.187	0.231	0.41	6.38	1.79	1% AEP, 10 min burst, Storm 1
oPr1	2.363	2.363	14.838	0.337	0.2	16.74	1.2	1% AEP, 25 min burst, Storm 7
oEx1A	0.027	0.628	1.026	0.133	0.43	3.56	3.2	1% AEP, 5 min burst, Storm 1
oEx1B	1.365	1.558	0.857	0.231	0.52	6.37	2.25	1% AEP, 30 min burst, Storm 6

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage2

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage2.drn run at 12:37:27 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oEx1B, oEx1A, oPr1B, oPr1C, oPr1G

Stage 2

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.355				
N_Ex1B	5.07		2.057				
nPr1A	21.26		0.095				
nPr1B	12.2		1.135				
nPr1C	6.21		1.143				
nPr1D	14.83		0.337				
nPr1E	11.61		0.22				
nPr1F	11.32		0.392				
nPr1G	6.2		1.094				
DSP1	5.07		1.775				
nEx1A	15.58		0.159				
nEx1B	19.23		1.022				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.543	10% AEP, 15 min burst, Storm 8
cPr1A	0.08	10% AEP, 5 min burst, Storm 1
cPr1B*	0.357	10% AEP, 15 min burst, Storm 4
cPr1D*	0.395	10% AEP, 5 min burst, Storm 1
cPr1E	0.174	10% AEP, 5 min burst, Storm 1
cPr1F	0.307	10% AEP, 5 min burst, Storm 1
cEx1A-dem	0.137	10% AEP, 1 hour burst, Storm 7
cEx1B-dem	0.828	10% AEP, 1 hour burst, Storm 6

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.52	14.838	0.183	0.21	13.66	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.981	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8
oPr1A	0.067	0.085	0.903	0.086	0.12	1.99	1.51	10% AEP, 10 min burst, Storm 7
oPr1B	0.934	0.935	0.857	0.201	0.36	5.62	1.82	10% AEP, 1 hour burst, Storm 7
oPr1C	0.972	0.972	1.189	0.214	0.35	5.94	1.65	10% AEP, 1 hour burst, Storm 7
oPr1D	0.37	0.396	0.411	0.158	0.24	4.55	1.62	10% AEP, 15 min burst, Storm 3
oPr1E	0.169	0.181	1.033	0.115	0.16	2.98	1.41	10% AEP, 5 min burst, Storm 1
oPr1F	0.282	0.294	1.072	0.139	0.19	3.76	1.42	10% AEP, 5 min burst, Storm 1
oPr1G	0.769	0.779	1.187	0.2	0.31	5.61	1.57	10% AEP, 15 min burst, Storm 5
oPr1	1.501	1.501	14.838	0.262	0.13	15.23	1.06	10% AEP, 1 hour burst, Storm 7
oEx1A	0.065	0.441	0.411	0.118	0.35	3.08	2.99	10% AEP, 15 min burst, Storm 5
oEx1B	0.821	0.935	0.857	0.196	0.37	5.51	1.91	10% AEP, 1 hour burst, Storm 7

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage2

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage2.drn run at 12:37:52 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oPr1D

Stage 3

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.37				
DSP3_EX	4.19		3.737				
DSP2_EX	4.07		0.671				
N_Ex3B	6.02		0.156				
N_Ex3A	5.05		0.709				
N_Ex2B	5.03		0.618				
N_Ex2A	5.01		0.07				
N_Ex3C	5.08		2.439				
nPr1A	21.27		0.139				
nPr1B	12.22		1.384				
nPr1C	6.24		1.462				
nPr1D	14.85		0.554				
nPr1E	11.63		0.324				
nPr1F	11.34		0.575				
nPr1G	6.23		1.728				
nPr2A	21.62		0.071				
nPr2B	22.25		0.409				
nEx3A	15.63		1.108				
nPr3B	22.22		0.184				
nPr3C	21.85		0.958				
DSP3	10.9		1.576				
DSP2	17.76		0.439				
DSP1	5.12		2.521				
nEx3C	15.28		0.709				
nEx1A	15.59		0.265				
nEx2A	22.1		0.068				
nEx1B	19.25		1.257				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
Ex3B	0.135	1% AEP, 30 min burst, Storm 5
Ex3A	0.849	1% AEP, 10 min burst, Storm 7
Ex2B	0.434	1% AEP, 25 min burst, Storm 7
Ex2A	0.062	1% AEP, 30 min burst, Storm 5
Ex3C	1.861	1% AEP, 5 min burst, Storm 1
cPr1A	0.116	1% AEP, 5 min burst, Storm 1
cPr1B*	0.514	1% AEP, 5 min burst, Storm 1
cPr1D*	0.602	1% AEP, 5 min burst, Storm 1
cPr1E	0.27	1% AEP, 5 min burst, Storm 1
cPr1F	0.479	1% AEP, 5 min burst, Storm 1
cPr2A	0.032	1% AEP, 5 min burst, Storm 1
cPr2B	0.351	1% AEP, 20 min burst, Storm 5
cEx3A-dem	0.167	1% AEP, 1.5 hour burst, Storm 8
cPr3B	0.163	1% AEP, 25 min burst, Storm 1
cPr3C*	0.767	1% AEP, 5 min burst, Storm 1
cEx3C-dem	0.615	1% AEP, 45 min burst, Storm 6
cEx1A-dem	0.226	1% AEP, 30 min burst, Storm 7
cEx2A-dem	0.052	1% AEP, 20 min burst, Storm 4
cEx1B-dem	1.082	1% AEP, 30 min burst, Storm 5

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.978	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.398	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8
OF_Ex3	2.594	2.596	14.838	0.186	0.22	13.71	1.23	1% AEP, 10 min burst, Storm 7
OF_Ex2	0.471	0.471	14.838	0.069	0.04	11.37	0.74	1% AEP, 20 min burst, Storm 4
OF_Ex3B	0.058	0.906	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex3A	0.904	0.904	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex2B	0.434	0.434	12.321	0.033	0.04	10.66	1.29	1% AEP, 25 min burst, Storm 7
OF_Ex2A	0.062	0.062	12.321	0.01	0.01	10.21	0.6	1% AEP, 30 min burst, Storm 5
OF_Ex3C	1.861	1.862	12.321	0.079	0.17	11.57	2.2	1% AEP, 5 min burst, Storm 1
oPr1A	0.096	0.125	0.903	0.095	0.15	2.3	1.69	1% AEP, 10 min burst, Storm 7
oPr1B	1.237	1.241	0.857	0.22	0.44	6.1	1.98	1% AEP, 30 min burst, Storm 5
oPr1C	1.306	1.304	1.189	0.236	0.43	6.5	1.81	1% AEP, 30 min burst, Storm 6
oPr1D	0.569	0.6	1.026	0.179	0.3	5.07	1.78	1% AEP, 10 min burst, Storm 1
oPr1E	0.268	0.275	1.033	0.132	0.2	3.53	1.56	1% AEP, 5 min burst, Storm 1
oPr1F	0.468	0.485	1.072	0.164	0.26	4.69	1.64	1% AEP, 5 min burst, Storm 1
oPr1G	1.165	1.198	1.187	0.231	0.41	6.38	1.79	1% AEP, 10 min burst, Storm 1
oPr2A	0.057	0.055	1.004	0.083	0.09	1.89	1.14	1% AEP, 25 min burst, Storm 6
oPr2B	0.346	0.346	0.834	0.141	0.26	3.83	2.07	1% AEP, 20 min burst, Storm 7
oEx3A	0.753	0.79	0.959	0.193	0.36	5.42	2.06	1% AEP, 10 min burst, Storm 1
oPr3B	0.127	0.285	0.973	0.128	0.2	3.41	1.58	1% AEP, 2 hour burst, Storm 2
oPr3C	0.682	0.711	1.174	0.205	0.29	5.73	1.51	1% AEP, 10 min burst, Storm 1
oPr3	1.164	1.164	14.838	0.125	0.11	12.49	0.98	1% AEP, 25 min burst, Storm 7
oPr2	0.383	0.383	14.838	0.061	0.04	11.22	0.7	1% AEP, 25 min burst, Storm 6
oPr1	2.033	2.033	14.838	0.31	0.18	16.2	1.15	1% AEP, 25 min burst, Storm 7
oEx3C	0.614	0.612	1.102	0.186	0.28	5.25	1.59	1% AEP, 45 min burst, Storm 6
oEx1A	0.027	0.628	1.026	0.133	0.43	3.56	3.21	1% AEP, 5 min burst, Storm 1
oEx2A	0.049	0.058	1.004	0.11	0.06	2.79	0.62	1% AEP, 25 min burst, Storm 6

oEx1B	1.08	1.248	0.857	0.215	0.45	5.97	2.09	1% AEP, 30 min burst, Storm 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage3
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage3.drn run at 14:17:18 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oEx1B, oEx1A, oPr1B, oPr1C, oPr1G

Stage 3

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.354				
N_Ex1B	5.07		2.057				
DSP3_EX	4.15		2.46				
DSP2_EX	4.05		0.389				
N_Ex3B	6.01		0.094				
N_Ex3A	5.04		0.441				
N_Ex2B	5.03		0.365				
N_Ex2A	5.01		0.042				
N_Ex3C	5.06		1.638				
nPr1A	21.26		0.095				
nPr1B	12.19		0.894				
nPr1C	6.2		0.905				
nPr1D	14.83		0.337				
nPr1E	11.61		0.22				
nPr1F	11.32		0.392				
nPr1G	6.2		1.094				
nPr2A	21.61		0.042				
nPr2B	22.22		0.251				
nEx3A	15.61		0.642				
nPr3B	22.21		0.117				
nPr3C	21.82		0.649				
DSP3	10.88		0.901				
DSP2	17.74		0.276				
DSP1	5.05		1.546				
nEx3C	15.25		0.4				
nEx1A	15.58		0.16				
nEx2A	22.09		0.04				
nEx1B	19.21		0.78				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.544	10% AEP, 15 min burst, Storm 8
Ex3B	0.08	10% AEP, 1 hour burst, Storm 7
Ex3A	0.554	10% AEP, 10 min burst, Storm 7
Ex2B	0.274	10% AEP, 20 min burst, Storm 4
Ex2A	0.036	10% AEP, 1 hour burst, Storm 7
Ex3C	1.267	10% AEP, 15 min burst, Storm 4
cPr1A	0.08	10% AEP, 5 min burst, Storm 1
cPr1B*	0.357	10% AEP, 15 min burst, Storm 4
cPr1D*	0.395	10% AEP, 5 min burst, Storm 1
cPr1E	0.174	10% AEP, 5 min burst, Storm 1
cPr1F	0.307	10% AEP, 5 min burst, Storm 1
cPr2A	0.022	10% AEP, 5 min burst, Storm 1
cPr2B	0.198	10% AEP, 30 min burst, Storm 8
cEx3A-dem	0.086	10% AEP, 2 hour burst, Storm 4
cPr3B	0.095	10% AEP, 1 hour burst, Storm 6
cPr3C*	0.509	10% AEP, 15 min burst, Storm 4
cEx3C-dem	0.363	10% AEP, 1 hour burst, Storm 6
cEx1A-dem	0.138	10% AEP, 1 hour burst, Storm 7
cEx2A-dem	0.031	10% AEP, 20 min burst, Storm 4
cEx1B-dem	0.646	10% AEP, 1 hour burst, Storm 7

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.519	14.838	0.183	0.21	13.66	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.98	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8
OF_Ex3	1.8	1.802	14.838	0.151	0.16	13.02	1.11	10% AEP, 15 min burst, Storm 4
OF_Ex2	0.299	0.299	14.838	0.052	0.03	11.05	0.65	10% AEP, 20 min burst, Storm 4
OF_Ex3B	0.022	0.575	12.321	0.039	0.06	10.78	1.44	10% AEP, 10 min burst, Storm 7
OF_Ex3A	0.573	0.573	12.321	0.039	0.06	10.78	1.43	10% AEP, 10 min burst, Storm 7
OF_Ex2B	0.274	0.274	12.321	0.025	0.03	10.5	1.07	10% AEP, 20 min burst, Storm 4
OF_Ex2A	0.036	0.036	12.321	0.007	0	10.15	0.48	10% AEP, 1 hour burst, Storm 7
OF_Ex3C	1.267	1.266	12.321	0.063	0.12	11.25	1.92	10% AEP, 15 min burst, Storm 4
oPr1A	0.067	0.085	0.903	0.086	0.12	1.99	1.51	10% AEP, 10 min burst, Storm 7
oPr1B	0.754	0.755	0.857	0.188	0.32	5.31	1.69	10% AEP, 1 hour burst, Storm 7
oPr1C	0.79	0.79	1.189	0.2	0.31	5.6	1.55	10% AEP, 1 hour burst, Storm 7
oPr1D	0.37	0.396	0.411	0.158	0.24	4.55	1.62	10% AEP, 15 min burst, Storm 3
oPr1E	0.169	0.181	1.033	0.115	0.16	2.98	1.41	10% AEP, 5 min burst, Storm 1
oPr1F	0.282	0.294	1.072	0.139	0.19	3.76	1.42	10% AEP, 5 min burst, Storm 1
oPr1G	0.77	0.779	1.187	0.2	0.31	5.61	1.57	10% AEP, 15 min burst, Storm 5
oPr2A	0.032	0.031	1.004	0.071	0.07	1.49	1.05	10% AEP, 30 min burst, Storm 4
oPr2B	0.198	0.198	0.834	0.118	0.19	3.08	1.89	10% AEP, 30 min burst, Storm 8
oEx3A	0.508	0.506	0.959	0.165	0.28	4.73	1.87	10% AEP, 15 min burst, Storm 5
oPr3B	0.1	0.157	0.973	0.106	0.15	2.66	1.4	10% AEP, 1 hour burst, Storm 3
oPr3C	0.46	0.477	1.174	0.181	0.23	5.12	1.35	10% AEP, 15 min burst, Storm 3
oPr3	0.742	0.742	14.838	0.096	0.07	11.92	0.86	10% AEP, 1 hour burst, Storm 3
oPr2	0.225	0.225	14.838	0.044	0.02	10.89	0.59	10% AEP, 1 hour burst, Storm 3
oPr1	1.305	1.306	14.838	0.242	0.12	14.84	1.01	10% AEP, 1 hour burst, Storm 3
oEx3C	0.361	0.361	1.102	0.158	0.21	4.56	1.44	10% AEP, 1 hour burst, Storm 6
oEx1A	0.065	0.441	0.411	0.118	0.35	3.08	2.99	10% AEP, 15 min burst, Storm 5
oEx2A	0.029	0.032	1.004	0.093	0.05	2.23	0.55	10% AEP, 30 min burst, Storm 4

oEx1B	0.645	0.756	0.857	0.184	0.33	5.2	1.78	10% AEP, 1 hour burst, Storm 7

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage3
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage3.drn run at 14:18:23 on 18/8/2025.

The maximum flow in these overflow routes is unsafe: oPr1D

Stage 4

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.37				
DSP3_EX	4.19		3.737				
DSP2_EX	4.07		0.672				
N_Ex3B	6.02		0.156				
N_Ex3A	5.05		0.708				
N_Ex2B	5.03		0.618				
N_Ex2A	5.01		0.07				
N_Ex3C	5.08		2.439				
nPr1A	21.33		0.844				
nPr1B	12.23		1.429				
nPr1C	6.28		2.372				
nPr1D	14.87		0.602				
nPr1E	11.65		0.511				
nPr1F	11.34		0.597				
nPr1G	6.25		2.203				
nPr2A	21.62		0.072				
nPr2B	22.25		0.409				
nEx3A	15.63		1.107				
nPr3B	22.22		0.184				
nPr3C	21.85		0.958				
DSP3	10.9		1.575				
DSP2	17.76		0.44				
nPr1A_bas	21.39		2.107				
nPr1B_bas	19.27		2.664				
nPr1C_bas	6.29		4.771				
nPr1D_bas	14.91		1.845				
nPr1E_bas	11.65		0.512				
nPr1F_bas	11.34		0.597				
nPr1G_bas	6.24		2.921				
nEx3C	15.28		0.709				
nEx1A	15.57		0.094				
DSP1_bas	2.6		3.223				
nEx2A	22.1		0.068				
nEx1B	19.19		0.496				
Pit41384	2.83		0		3.17		None
N1355393	2.66		0				
Pit41382	2.81		0		2.69		None
N1355390	2.64		0				
Pit3845	2.87		0		2.63		None
DSP1_bas2	2.67		0				
Pit2177	2.88		0		3.12		None
DSP1_bas1	2.69		0				
DSP1	2.55		1.974				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
Ex3B	0.135	1% AEP, 30 min burst, Storm 5
Ex3A	0.849	1% AEP, 10 min burst, Storm 7
Ex2B	0.434	1% AEP, 25 min burst, Storm 7
Ex2A	0.062	1% AEP, 30 min burst, Storm 5
Ex3C	1.861	1% AEP, 5 min burst, Storm 1
cPr1A	0.705	1% AEP, 5 min burst, Storm 1
cPr1B*	1.603	1% AEP, 5 min burst, Storm 1
cPr1C	0.078	1% AEP, 45 min burst, Storm 6
cPr1D*	0.854	1% AEP, 5 min burst, Storm 1
cPr1E	0.426	1% AEP, 5 min burst, Storm 1
cPr1F	0.497	1% AEP, 5 min burst, Storm 1
cPr1G	0.041	1% AEP, 5 min burst, Storm 1
cPr2A	0.032	1% AEP, 5 min burst, Storm 1
cPr2B	0.351	1% AEP, 20 min burst, Storm 5
cEx3A-dem	0.168	1% AEP, 1.5 hour burst, Storm 10
cPr3B	0.163	1% AEP, 25 min burst, Storm 1
cPr3C*	0.767	1% AEP, 5 min burst, Storm 1
cPr1A_bas	1.755	1% AEP, 5 min burst, Storm 1
cPr1B_bas	2.143	1% AEP, 5 min burst, Storm 1
cPr1C_bas	0.074	1% AEP, 45 min burst, Storm 6
cPr1D_bas	1.49	1% AEP, 5 min burst, Storm 1
cPr1E_bas	0.427	1% AEP, 5 min burst, Storm 1
cPr1F_bas	0.497	1% AEP, 5 min burst, Storm 1
cPr1G_bas	0.025	1% AEP, 25 min burst, Storm 1
cEx3C-dem	0.615	1% AEP, 45 min burst, Storm 6
cEx1A-dem	0.084	1% AEP, 25 min burst, Storm 1
cEx2A-dem	0.052	1% AEP, 20 min burst, Storm 4
cEx1B-dem	0.429	1% AEP, 25 min burst, Storm 5

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85548	1.057	1.51	2.834	2.695	1% AEP, 30 min burst, Storm 5
P85546	0.763	1.2	2.814	2.745	1% AEP, 25 min burst, Storm 5
Pipe Outlet	1.135	1.29	2.866	2.79	1% AEP, 20 min burst, Storm 10
Pipe Outlet	1.646	1.91	2.883	2.716	1% AEP, 20 min burst, Storm 4

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.977	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.399	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8
OF_Ex3	2.594	2.595	14.838	0.186	0.22	13.71	1.23	1% AEP, 10 min burst, Storm 7
OF_Ex2	0.471	0.471	14.838	0.069	0.04	11.37	0.74	1% AEP, 20 min burst, Storm 4
OF_Ex3B	0.058	0.906	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex3A	0.904	0.904	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex2B	0.434	0.434	12.321	0.033	0.04	10.66	1.29	1% AEP, 25 min burst, Storm 7
OF_Ex2A	0.062	0.062	12.321	0.01	0.01	10.21	0.6	1% AEP, 30 min burst, Storm 5
OF_Ex3C	1.861	1.866	12.321	0.079	0.17	11.57	2.2	1% AEP, 5 min burst, Storm 1
oPr1A	0.705	0.86	0.903	0.182	0.4	5.16	2.4	1% AEP, 5 min burst, Storm 1
oPr1B	1.568	1.617	0.857	0.241	0.52	6.63	2.15	1% AEP, 10 min burst, Storm 10
oPr1C	2.205	2.203	1.189	0.283	0.59	7.66	2.12	1% AEP, 10 min burst, Storm 5
oPr1D	0.84	0.857	1.026	0.19	0.36	5.35	1.9	1% AEP, 10 min burst, Storm 5
oPr1E	0.426	0.51	1.033	0.163	0.28	4.66	1.84	1% AEP, 5 min burst, Storm 1
oPr1F	0.496	0.534	1.072	0.168	0.26	4.8	1.62	1% AEP, 5 min burst, Storm 1
oPr1G	1.702	1.7	1.187	0.257	0.51	7.01	1.98	1% AEP, 10 min burst, Storm 5
oPr2A	0.057	0.055	1.004	0.083	0.09	1.9	1.15	1% AEP, 25 min burst, Storm 6
oPr2B	0.346	0.346	0.834	0.14	0.26	3.82	2.07	1% AEP, 20 min burst, Storm 7
oEx3A	0.778	0.828	0.959	0.196	0.37	5.49	2.07	1% AEP, 10 min burst, Storm 1
oPr3B	0.127	0.287	0.973	0.129	0.2	3.43	1.57	1% AEP, 2 hour burst, Storm 2
oPr3C	0.711	0.745	1.174	0.208	0.3	5.8	1.53	1% AEP, 10 min burst, Storm 1
oPr3	1.164	1.164	14.838	0.125	0.11	12.49	0.98	1% AEP, 25 min burst, Storm 7
oPr2	0.383	0.383	14.838	0.061	0.04	11.22	0.7	1% AEP, 25 min burst, Storm 6
oPr1A_bas	1.719	2.059	0.903	0.251	0.69	6.88	3.12	1% AEP, 5 min burst, Storm 1
oPr1B_bas	2.029	2.072	0.857	0.232	0.69	6.39	3.04	1% AEP, 5 min burst, Storm 1
oPr1C_bas	4.111	4.133	0.152	0.287	1.09	7.77	3.84	1% AEP, 5 min burst, Storm 1
oPr1D_bas	1.395	1.692	1.026	0.242	0.58	6.65	2.59	1% AEP, 5 min burst, Storm 1
oPr1E_bas	0.416	0.481	1.033	0.159	0.27	4.58	1.8	1% AEP, 5 min burst, Storm 1
oPr1F_bas	0.492	0.505	1.072	0.167	0.26	4.77	1.59	1% AEP, 5 min burst, Storm 1
oPr1G_bas	2.478	2.481	0.848	0.241	0.79	6.62	3.3	1% AEP, 5 min burst, Storm 1
O3_bas2	0.234	0.234						1% AEP, 20 min burst, Storm 10
O2_bas2	0.776	0.776						1% AEP, 20 min burst, Storm 10
O1_bas2	0.126	0.126						1% AEP, 20 min burst, Storm 10
W Basin2_bas								
O2B_bas 1	0.441	0.441						1% AEP, 20 min burst, Storm 4
W1	0.067	0.067						1% AEP, 20 min burst, Storm 4
O2_bas1	0.441	0.441						1% AEP, 20 min burst, Storm 4
O1_bas1	0.765	0.765						1% AEP, 20 min burst, Storm 4
oEx3C	0.614	0.613	1.102	0.186	0.28	5.25	1.59	1% AEP, 45 min burst, Storm 6
oEx1A	0.012	0.866	1.026	0.147	0.51	4.05	3.44	1% AEP, 5 min burst, Storm 1
o_DSP1	2.842	2.843	14.838	0.196	0.24	13.91	1.26	1% AEP, 20 min burst, Storm 4
oEx2A	0.049	0.058	1.004	0.11	0.06	2.79	0.62	1% AEP, 25 min burst, Storm 6
oEx1B	0.224	1.446	0.857	0.225	0.49	6.23	2.2	1% AEP, 10 min burst, Storm 7
W1126231								
O1126195	0.037	0.037						1% AEP, 25 min burst, Storm 5
O1126194	0.604	0.604						1% AEP, 25 min burst, Storm 5
O1126193	0.122	0.122						1% AEP, 25 min burst, Storm 5
O1126240	0.173	0.173						1% AEP, 30 min burst, Storm 5
O1126239	0.173	0.173						1% AEP, 30 min burst, Storm 5
O1126238	0.712	0.712						1% AEP, 30 min burst, Storm 5
W1126227	0.011	0.011						1% AEP, 30 min burst, Storm 5
OF112622[illegible]	1.057	1.058	14.151	0.115	0.1	12.3	1	1% AEP, 30 min burst, Storm 5
OF112621[illegible]	0.762	0.761	14.151	0.107	0.07	12.14	0.89	1% AEP, 25 min burst, Storm 5
o_bas2	1.135	1.137	14.151	0.15	0.1	13	1.03	1% AEP, 20 min burst, Storm 10
o_bas1	1.713	1.713	14.151	0.16	0.15	13.2	1.19	1% AEP, 20 min burst, Storm 4
oPr1	1.785	1.785	14.838	0.15	0.16	12.99	1.11	1% AEP, 25 min burst, Storm 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.28	952.6	1.135	0	1.135
Basin1_bas	4.3	1258.6	1.714	0	1.714
Basin8185[illegible]	5.08	826.3	0.763	0	0.763
Basin8185[illegible]	4.09	810.4	1.069	0	1.069

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage4
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage4.drn run at 14:13:00 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oEx1B, oEx1A, oPr1D_bas, oPr1B, oPr1C, oPr1G, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

Stage 4

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.354				
N_Ex1B	5.07		2.057				
DSP3_EX	4.15		2.459				
DSP2_EX	4.05		0.389				
N_Ex3B	6.01		0.094				
N_Ex3A	5.04		0.44				
N_Ex2B	5.03		0.365				
N_Ex2A	5.01		0.042				
N_Ex3C	5.06		1.637				
nPr1A	21.31		0.575				
nPr1B	12.2		0.88				
nPr1C	6.24		1.379				
nPr1D	14.85		0.393				
nPr1E	11.63		0.348				
nPr1F	11.32		0.406				
nPr1G	6.22		1.391				
nPr2A	21.61		0.042				
nPr2B	22.22		0.252				
nEx3A	15.61		0.641				
nPr3B	22.21		0.117				
nPr3C	21.82		0.649				
DSP3	10.88		0.9				
DSP2	17.74		0.278				
nPr1A_bas	21.36		1.435				
nPr1B_bas	19.24		1.812				
nPr1C_bas	6.24		3.236				
nPr1D_bas	14.88		1.25				
nPr1E_bas	11.63		0.349				
nPr1F_bas	11.32		0.406				
nPr1G_bas	6.2		1.936				
nEx3C	15.25		0.401				
nEx1A	15.56		0.061				
DSP1_bas	2.55		1.942				
nEx2A	22.09		0.04				
nEx1B	19.17		0.316				
Pit41384	2.79		0		3.21		None
N1355393	2.63		0				
Pit41382	2.76		0		2.74		None
N1355390	2.62		0				
Pit3845	2.8		0		2.7		None
DSP1_bas2	2.63		0				
Pit2177	2.84		0		3.16		None
DSP1_bas1	2.66		0				
DSP1	2.51		1.208				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.543	10% AEP, 15 min burst, Storm 8
Ex3B	0.08	10% AEP, 1 hour burst, Storm 7
Ex3A	0.554	10% AEP, 10 min burst, Storm 7
Ex2B	0.274	10% AEP, 20 min burst, Storm 4
Ex2A	0.035	10% AEP, 1 hour burst, Storm 7
Ex3C	1.267	10% AEP, 15 min burst, Storm 4
cPr1A	0.468	10% AEP, 5 min burst, Storm 1
cPr1B*	1.066	10% AEP, 15 min burst, Storm 10
cPr1C	0.045	10% AEP, 1 hour burst, Storm 6
cPr1D*	0.56	10% AEP, 5 min burst, Storm 1
cPr1E	0.273	10% AEP, 5 min burst, Storm 1
cPr1F	0.318	10% AEP, 5 min burst, Storm 1
cPr1G	0.028	10% AEP, 5 min burst, Storm 1
cPr2A	0.022	10% AEP, 5 min burst, Storm 1
cPr2B	0.199	10% AEP, 30 min burst, Storm 8
cEx3A-dem	0.087	10% AEP, 2 hour burst, Storm 4
cPr3B	0.095	10% AEP, 1 hour burst, Storm 6
cPr3C*	0.509	10% AEP, 15 min burst, Storm 4
cPr1A_bas	1.151	10% AEP, 5 min burst, Storm 1
cPr1B_bas	1.42	10% AEP, 15 min burst, Storm 10
cPr1C_bas	0.041	10% AEP, 1 hour burst, Storm 9
cPr1D_bas	0.982	10% AEP, 15 min burst, Storm 10
cPr1E_bas	0.277	10% AEP, 5 min burst, Storm 1
cPr1F_bas	0.321	10% AEP, 5 min burst, Storm 1
cPr1G_bas	0.015	10% AEP, 20 min burst, Storm 4
cEx3C-dem	0.363	10% AEP, 1 hour burst, Storm 6
cEx1A-dem	0.05	10% AEP, 1 hour burst, Storm 6
cEx2A-dem	0.031	10% AEP, 20 min burst, Storm 4
cEx1B-dem	0.256	10% AEP, 1 hour burst, Storm 3

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85548	0.661	1.11	2.794	2.681	10% AEP, 30 min burst, Storm 8
P85546	0.44	1.08	2.76	2.701	10% AEP, 1 hour burst, Storm 3
Pipe Outlet	0.671	1.18	2.8	2.733	10% AEP, 1 hour burst, Storm 3
Pipe Outlet	1.073	1.53	2.836	2.695	10% AEP, 20 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.519	14.838	0.183	0.21	13.65	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.98	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8
OF_Ex3	1.8	1.807	14.838	0.151	0.16	13.02	1.11	10% AEP, 15 min burst, Storm 4
OF_Ex2	0.299	0.299	14.838	0.053	0.03	11.05	0.65	10% AEP, 20 min burst, Storm 4
OF_Ex3B	0.022	0.576	12.321	0.039	0.06	10.78	1.44	10% AEP, 10 min burst, Storm 7
OF_Ex3A	0.573	0.573	12.321	0.039	0.06	10.78	1.43	10% AEP, 10 min burst, Storm 7
OF_Ex2B	0.274	0.274	12.321	0.025	0.03	10.5	1.08	10% AEP, 20 min burst, Storm 4
OF_Ex2A	0.035	0.035	12.321	0.007	0	10.15	0.48	10% AEP, 1 hour burst, Storm 7
OF_Ex3C	1.267	1.268	12.321	0.063	0.12	11.25	1.92	10% AEP, 15 min burst, Storm 4
oPr1A	0.455	0.53	0.903	0.155	0.3	4.48	2.07	10% AEP, 5 min burst, Storm 1
oPr1B	0.943	0.977	0.857	0.205	0.37	5.73	1.84	10% AEP, 15 min burst, Storm 5
oPr1C	1.383	1.389	1.189	0.242	0.44	6.64	1.84	10% AEP, 15 min burst, Storm 5
oPr1D	0.541	0.564	0.411	0.166	0.28	4.76	1.74	10% AEP, 15 min burst, Storm 4
oPr1E	0.267	0.319	1.033	0.14	0.21	3.81	1.67	10% AEP, 5 min burst, Storm 1
oPr1F	0.317	0.328	1.072	0.143	0.2	3.89	1.44	10% AEP, 15 min burst, Storm 4
oPr1G	1.117	1.116	1.187	0.223	0.39	6.17	1.74	10% AEP, 15 min burst, Storm 4
oPr2A	0.032	0.031	1.004	0.071	0.07	1.49	1.05	10% AEP, 30 min burst, Storm 4
oPr2B	0.198	0.198	0.834	0.118	0.2	3.08	1.89	10% AEP, 30 min burst, Storm 8
oEx3A	0.512	0.523	0.959	0.17	0.29	4.85	1.86	10% AEP, 15 min burst, Storm 3
oPr3B	0.101	0.157	0.973	0.106	0.15	2.66	1.4	10% AEP, 1 hour burst, Storm 3
oPr3C	0.469	0.489	1.174	0.172	0.23	4.9	1.36	10% AEP, 15 min burst, Storm 4
oPr3	0.742	0.742	14.838	0.096	0.07	11.92	0.86	10% AEP, 1 hour burst, Storm 3
oPr2	0.225	0.225	14.838	0.044	0.02	10.89	0.59	10% AEP, 1 hour burst, Storm 3
oPr1A_bas	1.139	1.224	0.903	0.214	0.49	5.95	2.52	10% AEP, 5 min burst, Storm 1
oPr1B_bas	1.378	1.395	0.857	0.202	0.54	5.66	2.68	10% AEP, 15 min burst, Storm 4
oPr1C_bas	2.533	2.534	0.152	0.243	0.8	6.66	3.32	10% AEP, 15 min burst, Storm 4
oPr1D_bas	0.847	0.982	0.411	0.206	0.4	5.76	2.06	10% AEP, 5 min burst, Storm 1
oPr1E_bas	0.27	0.303	1.033	0.137	0.21	3.72	1.64	10% AEP, 5 min burst, Storm 1
oPr1F_bas	0.31	0.295	1.072	0.143	0.2	3.9	1.42	10% AEP, 5 min burst, Storm 1
oPr1G_bas	1.528	1.529	0.848	0.205	0.58	5.73	2.84	10% AEP, 15 min burst, Storm 4
O3_bas2	0.007	0.007						10% AEP, 1 hour burst, Storm 3
O2_bas2	0.544	0.544						10% AEP, 1 hour burst, Storm 3
O1_bas2	0.121	0.121						10% AEP, 1 hour burst, Storm 3
W Basin2_bas								
O2B_bas 1	0.18	0.18						10% AEP, 20 min burst, Storm 8
W1	0.013	0.013						10% AEP, 20 min burst, Storm 8
O2_bas1	0.18	0.18						10% AEP, 20 min burst, Storm 8
O1_bas1	0.714	0.714						10% AEP, 20 min burst, Storm 8
oEx3C	0.361	0.361	1.102	0.158	0.21	4.56	1.44	10% AEP, 1 hour burst, Storm 6
oEx1A	0.029	0.571	0.411	0.128	0.41	3.41	3.17	10% AEP, 15 min burst, Storm 4
o_DSP1	1.698	1.698	14.838	0.145	0.15	12.91	1.09	10% AEP, 30 min burst, Storm 5
oEx2A	0.029	0.032	1.004	0.093	0.05	2.23	0.55	10% AEP, 30 min burst, Storm 8
oEx1B	0.156	0.956	0.857	0.197	0.38	5.53	1.93	10% AEP, 15 min burst, Storm 4
W1126231								
O1126195								
O1126194	0.323	0.323						10% AEP, 1 hour burst, Storm 3
O1126193	0.118	0.118						10% AEP, 1 hour burst, Storm 3
O1126240	0.006	0.006						10% AEP, 30 min burst, Storm 8
O1126239	0.006	0.006						10% AEP, 30 min burst, Storm 8
O1126238	0.65	0.65						10% AEP, 30 min burst, Storm 8
W1126227								
OF112622[illegible]	0.661	0.661	14.151	0.081	0.06	11.63	0.85	10% AEP, 30 min burst, Storm 8
OF112621[illegible]	0.44	0.44	14.151	0.071	0.04	11.42	0.73	10% AEP, 1 hour burst, Storm 3
o_bas2	0.671	0.671	14.151	0.102	0.06	12.04	0.85	10% AEP, 1 hour burst, Storm 3
o_bas1	1.085	1.084	14.151	0.114	0.1	12.27	1.02	10% AEP, 20 min burst, Storm 8
oPr1	1.078	1.078	14.838	0.112	0.1	12.25	0.96	10% AEP, 1 hour burst, Storm 7

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.03	791.5	0.671	0	0.671
Basin1_bas	4.1	823.6	1.086	0	1.086
Basin8185[illegible]	4.87	690.7	0.44	0	0.44
Basin8185[illegible]	3.87	404.9	0.661	0	0.661

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage4
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage4.drn run at 14:14:43 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oEx1A, oPr1D, oPr1D_bas, oPr1C, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

Stage 5

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.37				
DSP3_EX	4.19		3.737				
DSP2_EX	4.07		0.672				
N_Ex3B	6.02		0.156				
N_Ex3A	5.05		0.708				
N_Ex2B	5.03		0.618				
N_Ex2A	5.01		0.07				
N_Ex3C	5.08		2.439				
nPr1A	21.39		2.107				
nPr1B	19.25		1.999				
nPr1C	6.34		4.106				
nPr1D	14.87		0.591				
nPr1E	11.65		0.512				
nPr1F	11.34		0.597				
nPr1G	6.26		2.193				
nPr2A	21.62		0.038				
nPr2B	22.25		0.409				
nEx3A	15.63		1.131				
nPr3B	22.22		0.184				
nPr3C	21.85		0.984				
DSP3	10.9		1.593				
DSP2	17.76		0.42				
DSP1	2.57		2.421				
nPr1A_bas	21.39		2.107				
nPr1B_bas	19.27		2.664				
nPr1C_bas	6.29		4.771				
nPr1D_bas	14.91		1.845				
nPr1E_bas	11.65		0.512				
nPr1F_bas	11.34		0.597				
nPr1G_bas	6.24		2.921				
nEx3C	15.28		0.694				
nEx1A	15.57		0.08				
DSP1_bas	2.6		3.212				
Pit41382	2.81		0		2.69		None
N1355390	2.64		0				
Pit41384	2.86		0		3.14		None
N1355393	2.68		0				
Pit3845	2.87		0		2.63		None
DSP1_bas2	2.67		0				
Pit2177	2.88		0		3.12		None
DSP1_bas1	2.69		0				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
Ex3B	0.135	1% AEP, 30 min burst, Storm 5
Ex3A	0.849	1% AEP, 10 min burst, Storm 7
Ex2B	0.434	1% AEP, 25 min burst, Storm 7
Ex2A	0.062	1% AEP, 30 min burst, Storm 5
Ex3C	1.861	1% AEP, 5 min burst, Storm 1
cPr1A	1.753	1% AEP, 5 min burst, Storm 1
cPr1B*	1.603	1% AEP, 5 min burst, Storm 1
cPr1C	0.078	1% AEP, 45 min burst, Storm 6
cPr1D*	0.855	1% AEP, 5 min burst, Storm 1
cPr1E	0.427	1% AEP, 5 min burst, Storm 1
cPr1F	0.497	1% AEP, 5 min burst, Storm 1
cPr1G	0.041	1% AEP, 5 min burst, Storm 1
cPr2A	0.032	1% AEP, 5 min burst, Storm 1
cPr2B	0.351	1% AEP, 20 min burst, Storm 5
cEx3A-dem	0.168	1% AEP, 1.5 hour burst, Storm 10
cPr3B	0.163	1% AEP, 25 min burst, Storm 1
cPr3C*	0.787	1% AEP, 5 min burst, Storm 1
cPr1A_bas	1.755	1% AEP, 5 min burst, Storm 1
cPr1B_bas	2.143	1% AEP, 5 min burst, Storm 1
cPr1C_bas	0.074	1% AEP, 45 min burst, Storm 6
cPr1D_bas	1.49	1% AEP, 5 min burst, Storm 1
cPr1E_bas	0.427	1% AEP, 5 min burst, Storm 1
cPr1F_bas	0.497	1% AEP, 5 min burst, Storm 1
cPr1G_bas	0.025	1% AEP, 25 min burst, Storm 1
cEx3C-dem	0.602	1% AEP, 45 min burst, Storm 6
cEx1A-dem	0.07	1% AEP, 25 min burst, Storm 5

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85546	0.762	1.2	2.814	2.745	1% AEP, 25 min burst, Storm 5
P85548	1.394	1.76	2.863	2.707	1% AEP, 20 min burst, Storm 5
Pipe Outlet	1.146	1.29	2.868	2.791	1% AEP, 20 min burst, Storm 10
Pipe Outlet	1.652	1.91	2.883	2.716	1% AEP, 20 min burst, Storm 5

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.978	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.399	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8

OF_Ex3	2.594	2.595	14.838	0.186	0.22	13.71	1.23	1% AEP, 10 min burst, Storm 7
OF_Ex2	0.471	0.471	14.838	0.069	0.04	11.37	0.74	1% AEP, 20 min burst, Storm 4
OF_Ex3B	0.058	0.906	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex3A	0.904	0.904	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex2B	0.434	0.434	12.321	0.033	0.04	10.66	1.29	1% AEP, 25 min burst, Storm 7
OF_Ex2A	0.062	0.062	12.321	0.01	0.01	10.21	0.6	1% AEP, 30 min burst, Storm 5
OF_Ex3C	1.861	1.865	12.321	0.079	0.17	11.57	2.2	1% AEP, 5 min burst, Storm 1
oPr1A	1.711	2.057	0.903	0.249	0.69	6.82	3.12	1% AEP, 5 min burst, Storm 1
oPr1B	1.501	1.587	0.857	0.212	0.59	5.9	2.81	1% AEP, 5 min burst, Storm 1
oPr1C	3.571	3.872	1.189	0.353	0.85	8.85	2.51	1% AEP, 5 min burst, Storm 1
oPr1D	0.81	0.85	1.026	0.201	0.36	5.62	1.9	1% AEP, 5 min burst, Storm 1
oPr1E	0.426	0.509	1.033	0.162	0.28	4.66	1.85	1% AEP, 5 min burst, Storm 1
oPr1F	0.496	0.532	1.072	0.168	0.26	4.8	1.62	1% AEP, 5 min burst, Storm 1
oPr1G	1.691	1.689	1.187	0.256	0.5	7	1.98	1% AEP, 10 min burst, Storm 5
oPr2A	0.032	0.022	1.004	0.071	0.07	1.49	1.05	1% AEP, 5 min burst, Storm 1
oPr2B	0.346	0.345	0.834	0.141	0.26	3.82	2.07	1% AEP, 20 min burst, Storm 7
oEx3A	0.797	0.847	0.959	0.197	0.37	5.52	2.07	1% AEP, 10 min burst, Storm 1
oPr3B	0.127	0.287	0.973	0.129	0.2	3.43	1.57	1% AEP, 2 hour burst, Storm 2
oPr3C	0.73	0.772	1.174	0.211	0.31	5.87	1.55	1% AEP, 10 min burst, Storm 1
OF_Pr3	1.168	1.168	14.838	0.125	0.11	12.5	0.98	1% AEP, 25 min burst, Storm 7
OF_Pr2	0.364	0.364	14.838	0.059	0.03	11.18	0.69	1% AEP, 20 min burst, Storm 4
oPr1	2.188	2.188	14.838	0.168	0.19	13.37	1.18	1% AEP, 25 min burst, Storm 6
oPr1A_bas	1.711	2.01	0.903	0.25	0.68	6.85	3.06	1% AEP, 5 min burst, Storm 1
oPr1B_bas	2.028	2.073	0.857	0.232	0.69	6.39	3.04	1% AEP, 5 min burst, Storm 1
oPr1C_bas	4.125	4.123	0.152	0.288	1.09	7.8	3.85	1% AEP, 5 min burst, Storm 1
oPr1D_bas	1.383	1.699	1.026	0.242	0.58	6.65	2.6	1% AEP, 5 min burst, Storm 1
oPr1E_bas	0.414	0.481	1.033	0.159	0.27	4.58	1.81	1% AEP, 5 min burst, Storm 1
oPr1F_bas	0.49	0.505	1.072	0.167	0.26	4.77	1.59	1% AEP, 5 min burst, Storm 1
oPr1G_bas	2.496	2.499	0.848	0.242	0.79	6.64	3.31	1% AEP, 5 min burst, Storm 1
O3_bas2	0.24	0.24						1% AEP, 20 min burst, Storm 10
O2_bas2	0.779	0.779						1% AEP, 20 min burst, Storm 10
O1_bas2	0.126	0.126						1% AEP, 20 min burst, Storm 10
W Basin2_bas								
O2B_bas 1	0.443	0.443						1% AEP, 20 min burst, Storm 5
W1	0.068	0.068						1% AEP, 20 min burst, Storm 5
O2_bas1	0.443	0.443						1% AEP, 20 min burst, Storm 5
O1_bas1	0.765	0.765						1% AEP, 20 min burst, Storm 5
oEx3C	0.601	0.6	1.102	0.185	0.28	5.22	1.58	1% AEP, 45 min burst, Storm 6
oEx1A	0.01	0.864	1.026	0.147	0.51	4.05	3.43	1% AEP, 5 min burst, Storm 1
o_DSP1	2.87	2.87	14.838	0.197	0.24	13.94	1.27	1% AEP, 20 min burst, Storm 4
W1096601								
O1096600	0.037	0.037						1% AEP, 25 min burst, Storm 5
O1096599	0.604	0.604						1% AEP, 25 min burst, Storm 5
O1096598	0.122	0.122						1% AEP, 25 min burst, Storm 5
W1096671	0.041	0.041						1% AEP, 20 min burst, Storm 5
O1096670	0.325	0.325						1% AEP, 20 min burst, Storm 5
O1096669	0.325	0.325						1% AEP, 20 min burst, Storm 5
O1096668	0.745	0.745						1% AEP, 20 min burst, Storm 5
OF112621	0.763	0.764	14.151	0.123	0.07	12.45	0.89	1% AEP, 25 min burst, Storm 5
OF112622	1.435	1.434	14.151	0.136	0.13	12.73	1.12	1% AEP, 20 min burst, Storm 5
o_bas2	1.146	1.147	14.151	0.151	0.1	13.02	1.03	1% AEP, 20 min burst, Storm 10
o_bas1	1.719	1.719	14.151	0.163	0.15	13.26	1.2	1% AEP, 20 min burst, Storm 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.28	955.9	1.146	0	1.146
Basin1_bas	4.31	1263	1.72	0	1.72
Basin8185	5.08	826.2	0.763	0	0.763
Basin8185	4.22	1074.6	1.436	0	1.436

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage5
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage5.drn run at 14:08:28 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oEx1A, oPr1D_bas, oPr1A, oPr1B, oPr1C, oPr1G, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

Stage 5

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surfac Flow Arrivin (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.354				
N_Ex1B	5.07		2.057				
DSP3_EX	4.15		2.459				
DSP2_EX	4.05		0.389				
N_Ex3B	6.01		0.094				
N_Ex3A	5.04		0.44				
N_Ex2B	5.03		0.365				
N_Ex2A	5.01		0.043				
N_Ex3C	5.06		1.637				
nPr1A	21.36		1.435				
nPr1B	19.23		1.36				
nPr1C	6.28		2.787				
nPr1D	14.85		0.387				
nPr1E	11.63		0.349				
nPr1F	11.32		0.406				
nPr1G	6.22		1.389				
nPr2A	21.61		0.026				
nPr2B	22.22		0.252				
nEx3A	15.61		0.658				
nPr3B	22.21		0.117				
nPr3C	21.82		0.666				
DSP3	10.88		0.902				
DSP2	17.74		0.259				
DSP1	2.52		1.382				
nPr1A_bas	21.36		1.435				
nPr1B_bas	19.24		1.812				
nPr1C_bas	6.24		3.236				
nPr1D_bas	14.88		1.25				
nPr1E_bas	11.63		0.349				
nPr1F_bas	11.32		0.406				
nPr1G_bas	6.21		1.936				
nEx3C	15.25		0.393				
nEx1A	15.56		0.051				
DSP1_bas	2.55		1.943				
Pit41382	2.76		0		2.74		None
N1355390	2.62		0				
Pit41384	2.82		0		3.18		None
N1355393	2.65		0				
Pit3845	2.8		0		2.7		None
DSP1_bas2	2.63		0				
Pit2177	2.84		0		3.16		None
DSP1_bas1	2.66		0				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.543	10% AEP, 15 min burst, Storm 8
Ex3B	0.08	10% AEP, 1 hour burst, Storm 7
Ex3A	0.554	10% AEP, 10 min burst, Storm 7
Ex2B	0.274	10% AEP, 20 min burst, Storm 4
Ex2A	0.036	10% AEP, 1 hour burst, Storm 7
Ex3C	1.267	10% AEP, 15 min burst, Storm 4
cPr1A	1.144	10% AEP, 5 min burst, Storm 1
cPr1B*	1.066	10% AEP, 15 min burst, Storm 10
cPr1C	0.045	10% AEP, 1 hour burst, Storm 6
cPr1D*	0.561	10% AEP, 5 min burst, Storm 1
cPr1E	0.274	10% AEP, 5 min burst, Storm 1
cPr1F	0.318	10% AEP, 5 min burst, Storm 1
cPr1G	0.028	10% AEP, 5 min burst, Storm 1
cPr2A	0.022	10% AEP, 5 min burst, Storm 1
cPr2B	0.199	10% AEP, 30 min burst, Storm 8
cEx3A-dem	0.087	10% AEP, 2 hour burst, Storm 4
cPr3B	0.095	10% AEP, 1 hour burst, Storm 6
cPr3C*	0.523	10% AEP, 15 min burst, Storm 4
cPr1A_bas	1.151	10% AEP, 5 min burst, Storm 1
cPr1B_bas	1.42	10% AEP, 15 min burst, Storm 10
cPr1C_bas	0.041	10% AEP, 1 hour burst, Storm 9
cPr1D_bas	0.982	10% AEP, 15 min burst, Storm 10
cPr1E_bas	0.277	10% AEP, 5 min burst, Storm 1
cPr1F_bas	0.321	10% AEP, 5 min burst, Storm 1
cPr1G_bas	0.015	10% AEP, 20 min burst, Storm 4
cEx3C-dem	0.356	10% AEP, 1 hour burst, Storm 6
cEx1A-dem	0.042	10% AEP, 1 hour burst, Storm 6

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85546	0.436	1.08	2.759	2.7	10% AEP, 1 hour burst, Storm 3
P85548	0.892	1.36	2.818	2.689	10% AEP, 20 min burst, Storm 8
Pipe Outlet	0.672	1.18	2.8	2.733	10% AEP, 1 hour burst, Storm 3
Pipe Outlet	1.07	1.52	2.835	2.695	10% AEP, 20 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.519	14.838	0.183	0.21	13.65	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.98	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8

OF_Ex3	1.803	1.808	14.838	0.151	0.16	13.02	1.11	10% AEP, 15 min burst, Storm 4
OF_Ex2	0.299	0.299	14.838	0.053	0.03	11.05	0.65	10% AEP, 20 min burst, Storm 4
OF_Ex3B	0.022	0.575	12.321	0.039	0.06	10.78	1.44	10% AEP, 10 min burst, Storm 7
OF_Ex3A	0.573	0.573	12.321	0.039	0.06	10.78	1.43	10% AEP, 10 min burst, Storm 7
OF_Ex2B	0.274	0.274	12.321	0.025	0.03	10.5	1.08	10% AEP, 20 min burst, Storm 4
OF_Ex2A	0.036	0.036	12.321	0.007	0	10.15	0.48	10% AEP, 1 hour burst, Storm 7
OF_Ex3C	1.267	1.268	12.321	0.062	0.12	11.25	1.93	10% AEP, 15 min burst, Storm 4
oPr1A	1.14	1.211	0.903	0.213	0.48	5.92	2.5	10% AEP, 5 min burst, Storm 1
oPr1B	0.987	1.021	0.857	0.188	0.44	5.29	2.43	10% AEP, 15 min burst, Storm 3
oPr1C	2.18	2.198	1.189	0.282	0.59	7.64	2.12	10% AEP, 15 min burst, Storm 4
oPr1D	0.552	0.564	0.411	0.166	0.28	4.76	1.74	10% AEP, 15 min burst, Storm 9
oPr1E	0.267	0.321	1.033	0.14	0.21	3.82	1.68	10% AEP, 5 min burst, Storm 1
oPr1F	0.32	0.325	1.072	0.143	0.2	3.89	1.43	10% AEP, 15 min burst, Storm 9
oPr1G	1.12	1.117	1.187	0.223	0.39	6.18	1.74	10% AEP, 15 min burst, Storm 9
oPr2A	0.02	0.015	1.004	0.064	0.05	1.27	0.98	10% AEP, 15 min burst, Storm 3
oPr2B	0.198	0.198	0.834	0.118	0.19	3.07	1.89	10% AEP, 30 min burst, Storm 8
oEx3A	0.527	0.536	0.959	0.171	0.29	4.88	1.87	10% AEP, 15 min burst, Storm 3
oPr3B	0.101	0.157	0.973	0.106	0.15	2.66	1.4	10% AEP, 1 hour burst, Storm 3
oPr3C	0.487	0.503	1.174	0.174	0.23	4.95	1.36	10% AEP, 15 min burst, Storm 9
OF_Pr3	0.743	0.743	14.838	0.096	0.07	11.92	0.86	10% AEP, 1 hour burst, Storm 3
OF_Pr2	0.21	0.21	14.838	0.043	0.02	10.85	0.58	10% AEP, 30 min burst, Storm 8
oPr1	1.244	1.244	14.838	0.121	0.11	12.43	1	10% AEP, 30 min burst, Storm 5
oPr1A_bas	1.139	1.236	0.903	0.214	0.49	5.94	2.55	10% AEP, 5 min burst, Storm 1
oPr1B_bas	1.38	1.398	0.857	0.202	0.54	5.66	2.68	10% AEP, 15 min burst, Storm 4
oPr1C_bas	2.537	2.537	0.152	0.243	0.8	6.67	3.31	10% AEP, 15 min burst, Storm 4
oPr1D_bas	0.851	1.003	0.411	0.207	0.41	5.79	2.11	10% AEP, 5 min burst, Storm 1
oPr1E_bas	0.27	0.303	1.033	0.137	0.21	3.72	1.63	10% AEP, 5 min burst, Storm 1
oPr1F_bas	0.311	0.297	1.072	0.143	0.2	3.9	1.42	10% AEP, 5 min burst, Storm 1
oPr1G_bas	1.532	1.532	0.848	0.205	0.58	5.73	2.84	10% AEP, 15 min burst, Storm 4
O3_bas2	0.007	0.007						10% AEP, 1 hour burst, Storm 3
O2_bas2	0.544	0.544						10% AEP, 1 hour burst, Storm 3
O1_bas2	0.121	0.121						10% AEP, 1 hour burst, Storm 3
W Basin2_bas								
O2B_bas 1	0.179	0.179						10% AEP, 20 min burst, Storm 8
W1	0.012	0.012						10% AEP, 20 min burst, Storm 8
O2_bas1	0.179	0.179						10% AEP, 20 min burst, Storm 8
O1_bas1	0.713	0.713						10% AEP, 20 min burst, Storm 8
oEx3C	0.353	0.353	1.102	0.157	0.21	4.53	1.43	10% AEP, 1 hour burst, Storm 6
oEx1A	0.025	0.569	0.411	0.128	0.4	3.41	3.15	10% AEP, 15 min burst, Storm 4
o_DSP1	1.691	1.691	14.838	0.145	0.15	12.9	1.09	10% AEP, 30 min burst, Storm 5
W1096601								
O1096600								
O1096599	0.318	0.318						10% AEP, 1 hour burst, Storm 3
O1096598	0.118	0.118						10% AEP, 1 hour burst, Storm 3
W1096671	0.001	0.001						10% AEP, 20 min burst, Storm 8
O1096670	0.1	0.1						10% AEP, 20 min burst, Storm 8
O1096669	0.1	0.1						10% AEP, 20 min burst, Storm 8
O1096668	0.692	0.692						10% AEP, 20 min burst, Storm 8
OF112621	0.435	0.436	14.151	0.078	0.04	11.57	0.73	10% AEP, 1 hour burst, Storm 3
OF112622	0.892	0.892	14.151	0.094	0.08	11.88	0.94	10% AEP, 20 min burst, Storm 8
o_bas2	0.672	0.672	14.151	0.102	0.06	12.04	0.85	10% AEP, 1 hour burst, Storm 3
o_bas1	1.082	1.081	14.151	0.113	0.1	12.27	1.02	10% AEP, 20 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.03	791.7	0.672	0	0.672
Basin1_bas	4.1	821.4	1.083	0	1.083
Basin8185	4.87	688.3	0.436	0	0.436
Basin8185	4.02	665.1	0.893	0	0.893

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage5
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage5.drn run at 14:10:13 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oEx1A, oPr1D, oPr1D_bas, oPr1A, oPr1B, oPr1C, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

Stage 6

MAJOR (1% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.24		5.544				
N_Ex1A	5.07		2.175				
N_Ex1B	5.09		3.37				
DSP3_EX	4.19		3.737				
DSP2_EX	4.07		0.672				
N_Ex3B	6.02		0.156				
N_Ex3A	5.05		0.708				
N_Ex2B	5.03		0.618				
N_Ex2A	5.01		0.07				
N_Ex3C	5.08		2.439				
nPr1A	21.39		2.107				
nPr1B	19.26		2.382				
nPr1C	6.35		4.489				
nPr1D	14.87		0.546				
nPr1E	11.65		0.512				
nPr1F	11.34		0.597				
nPr1G	6.25		2.162				
nPr2A	21.62		0.038				
nPr2B	22.25		0.409				
nPr3A	15.69		2.6				
nPr3B	22.22		0.184				
nPr3C	21.89		1.704				
nPr3D	16.42		0.833				
nPr3E	15.16		0.022				
DSP3	10.95		2.915				
DSP2	17.76		0.42				
DSP1	2.57		2.528				
nPr1A_bas	21.39		2.107				
nPr1B_bas	19.27		2.664				
nPr1C_bas	6.29		4.771				
nPr1D_bas	14.91		1.845				
nPr1E_bas	11.65		0.512				
nPr1F_bas	11.34		0.597				
nPr1G_bas	6.24		2.921				
nEx3C*	15.25		0.434				
nEx1A*	15.54		0.026				
DSP1_bas	2.6		3.212				
Pit41382	2.81		0		2.69		None
N1355390	2.64		0				
Pit41384	2.87		0		3.13		None
N1355393	2.68		0				
Pit3845	2.87		0		2.63		None
DSP1_bas2	2.67		0				
Pit2177	2.88		0		3.12		None
DSP1_bas1	2.69		0				

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	1.607	1% AEP, 10 min burst, Storm 7
Ex1B	2.398	1% AEP, 20 min burst, Storm 8
Ex3B	0.135	1% AEP, 30 min burst, Storm 5
Ex3A	0.849	1% AEP, 10 min burst, Storm 7
Ex2B	0.434	1% AEP, 25 min burst, Storm 7
Ex2A	0.062	1% AEP, 30 min burst, Storm 5
Ex3C	1.861	1% AEP, 5 min burst, Storm 1
cPr1A	1.753	1% AEP, 5 min burst, Storm 1
cPr1B	1.912	1% AEP, 5 min burst, Storm 1
cPr1C	0.074	1% AEP, 45 min burst, Storm 6
cPr1D*	0.855	1% AEP, 5 min burst, Storm 1
cPr1E	0.427	1% AEP, 5 min burst, Storm 1
cPr1F	0.497	1% AEP, 5 min burst, Storm 1
cPr1G	0.022	1% AEP, 20 min burst, Storm 5
cPr2A	0.032	1% AEP, 5 min burst, Storm 1
cPr2B	0.351	1% AEP, 20 min burst, Storm 5
cPr3A	0.076	1% AEP, 45 min burst, Storm 6
cPr3B	0.163	1% AEP, 25 min burst, Storm 1
cPr3C	1.32	1% AEP, 5 min burst, Storm 1
cPr3D	0.639	1% AEP, 5 min burst, Storm 1
cPr3E*	0.019	1% AEP, 5 min burst, Storm 1
cPr1A_bas	1.755	1% AEP, 5 min burst, Storm 1
cPr1B_bas	2.143	1% AEP, 5 min burst, Storm 1
cPr1C_bas	0.074	1% AEP, 45 min burst, Storm 6
cPr1D_bas	1.49	1% AEP, 5 min burst, Storm 1
cPr1E_bas	0.427	1% AEP, 5 min burst, Storm 1
cPr1F_bas	0.497	1% AEP, 5 min burst, Storm 1
cPr1G_bas	0.025	1% AEP, 25 min burst, Storm 1
cEx3C-dem	0.383	1% AEP, 45 min burst, Storm 6
cEx1A-dem	0.022	1% AEP, 20 min burst, Storm 4

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85546	0.708	1.19	2.806	2.738	1% AEP, 25 min burst, Storm 5
P85548	1.535	1.85	2.874	2.712	1% AEP, 20 min burst, Storm 5
Pipe Outlet	1.146	1.29	2.868	2.791	1% AEP, 20 min burst, Storm 10
Pipe Outlet	1.653	1.91	2.883	2.716	1% AEP, 20 min burst, Storm 5

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	3.978	3.989	14.838	0.238	0.32	14.76	1.39	1% AEP, 10 min burst, Storm 7
OF_Ex1A	1.607	1.607	12.321	0.072	0.15	11.44	2.09	1% AEP, 10 min burst, Storm 7
OF_EX1B	2.398	2.399	12.321	0.091	0.22	11.82	2.44	1% AEP, 20 min burst, Storm 8
OF_Ex3	2.594	2.595	14.838	0.186	0.22	13.71	1.23	1% AEP, 10 min burst, Storm 7
OF_Ex2	0.471	0.471	14.838	0.069	0.04	11.37	0.74	1% AEP, 20 min burst, Storm 4
OF_Ex3B	0.058	0.906	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex3A	0.904	0.904	12.321	0.051	0.09	11.03	1.68	1% AEP, 10 min burst, Storm 7
OF_Ex2B	0.434	0.434	12.321	0.033	0.04	10.66	1.29	1% AEP, 25 min burst, Storm 7
OF_Ex2A	0.062	0.062	12.321	0.01	0.01	10.21	0.6	1% AEP, 30 min burst, Storm 5
OF_Ex3C	1.861	1.865	12.321	0.079	0.17	11.57	2.2	1% AEP, 5 min burst, Storm 1
oPr1A	1.711	1.995	0.903	0.25	0.67	6.85	3.03	1% AEP, 5 min burst, Storm 1
oPr1B	1.796	1.848	0.857	0.225	0.65	6.23	2.93	1% AEP, 5 min burst, Storm 1
oPr1C	3.819	4.186	1.189	0.363	0.9	8.85	2.58	1% AEP, 5 min burst, Storm 1
oPr1D	0.804	0.836	1.026	0.202	0.35	5.65	1.88	1% AEP, 5 min burst, Storm 1
oPr1E	0.413	0.477	1.033	0.159	0.27	4.58	1.8	1% AEP, 5 min burst, Storm 1
oPr1F	0.489	0.508	1.072	0.166	0.26	4.76	1.62	1% AEP, 5 min burst, Storm 1
oPr1G	1.58	1.608	1.187	0.252	0.49	6.89	1.94	1% AEP, 10 min burst, Storm 8
oPr2A	0.032	0.022	1.004	0.071	0.07	1.49	1.05	1% AEP, 5 min burst, Storm 1
oPr2B	0.346	0.345	0.834	0.141	0.26	3.82	2.07	1% AEP, 20 min burst, Storm 7
oPr3A	1.91	2.094	0.959	0.258	0.67	7.05	2.77	1% AEP, 10 min burst, Storm 6
oPr3B	0.158	0.225	0.973	0.119	0.18	3.1	1.51	1% AEP, 30 min burst, Storm 5
oPr3C	1.192	1.328	1.174	0.251	0.43	6.86	1.84	1% AEP, 5 min burst, Storm 1
oPr3D	0.612	0.643	1.535	0.217	0.23	6.02	1.06	1% AEP, 10 min burst, Storm 1
oPr3E	0.015	0.004	1.102	0.062	0.04	1.18	0.85	1% AEP, 10 min burst, Storm 5
OF_Pr3	2.031	2.036	14.838	0.173	0.18	13.45	1.15	1% AEP, 10 min burst, Storm 8
OF_Pr2	0.364	0.364	14.838	0.059	0.03	11.18	0.69	1% AEP, 20 min burst, Storm 4
oPr1	2.278	2.278	14.838	0.172	0.2	13.45	1.19	1% AEP, 25 min burst, Storm 6
oPr1A_bas	1.711	2.041	0.903	0.25	0.69	6.85	3.1	1% AEP, 5 min burst, Storm 1
oPr1B_bas	2.028	2.073	0.857	0.232	0.69	6.39	3.04	1% AEP, 5 min burst, Storm 1
oPr1C_bas	4.122	4.119	0.152	0.288	1.09	7.8	3.84	1% AEP, 5 min burst, Storm 1
oPr1D_bas	1.383	1.689	1.026	0.242	0.58	6.64	2.58	1% AEP, 5 min burst, Storm 1
oPr1E_bas	0.414	0.482	1.033	0.16	0.27	4.59	1.81	1% AEP, 5 min burst, Storm 1
oPr1F_bas	0.49	0.505	1.072	0.167	0.26	4.77	1.59	1% AEP, 5 min burst, Storm 1
oPr1G_bas	2.491	2.493	0.848	0.242	0.79	6.64	3.3	1% AEP, 5 min burst, Storm 1
O3_bas2	0.241	0.241						1% AEP, 20 min burst, Storm 10
O2_bas2	0.78	0.78						1% AEP, 20 min burst, Storm 10
O1_bas2	0.126	0.126						1% AEP, 20 min burst, Storm 10
W Basin2_bas								
O2B_bas 1	0.444	0.444						1% AEP, 20 min burst, Storm 5
W1	0.068	0.068						1% AEP, 20 min burst, Storm 5
O2_bas1	0.444	0.444						1% AEP, 20 min burst, Storm 5
O1_bas1	0.765	0.765						1% AEP, 20 min burst, Storm 5
oEx3C	0.382	0.38	1.102	0.154	0.22	4.44	1.45	1% AEP, 45 min burst, Storm 6
oEx1A	0.004	0.858	1.026	0.147	0.51	4.03	3.44	1% AEP, 5 min burst, Storm 1
o_DSP1	2.87	2.87	14.838	0.197	0.24	13.94	1.27	1% AEP, 20 min burst, Storm 4
O1117902	0.017	0.017						1% AEP, 25 min burst, Storm 5
O1117901	0.57	0.57						1% AEP, 25 min burst, Storm 5
O1117900	0.121	0.121						1% AEP, 25 min burst, Storm 5
W1117899								
W1117908	0.056	0.056						1% AEP, 20 min burst, Storm 5
O1117907	0.39	0.39						1% AEP, 20 min burst, Storm 5
O1117906	0.39	0.39						1% AEP, 20 min burst, Storm 5
O1117904	0.756	0.756						1% AEP, 20 min burst, Storm 5
OF112621	0.708	0.71	14.151	0.126	0.07	12.51	0.87	1% AEP, 25 min burst, Storm 5
OF112622	1.59	1.588	14.151	0.142	0.14	12.85	1.17	1% AEP, 20 min burst, Storm 5
o_bas2	1.146	1.147	14.151	0.151	0.1	13.02	1.03	1% AEP, 20 min burst, Storm 10
o_bas1	1.72	1.72	14.151	0.163	0.15	13.26	1.2	1% AEP, 20 min burst, Storm 5

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.28	956	1.146	0	1.146
Basin1_bas	4.31	1263.9	1.721	0	1.721
Basin8185	5.05	805.7	0.708	0	0.708
Basin8185	4.27	1178.4	1.591	0	1.591

Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage6
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage6.drn run at 13:58:13 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

The maximum flow in these overflow routes is unsafe: oEx1A, oPr1D_bas, oPr1A, oPr1B, oPr1C, oPr1G, oPr3A, oPr3C, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

Stage 6

MINOR (10% AEP)

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
DSP1_EX	4.18		3.411				
N_Ex1A	5.05		1.354				
N_Ex1B	5.07		2.057				
DSP3_EX	4.15		2.459				
DSP2_EX	4.05		0.389				
N_Ex3B	6.01		0.094				
N_Ex3A	5.04		0.44				
N_Ex2B	5.03		0.365				
N_Ex2A	5.01		0.043				
N_Ex3C	5.06		1.637				
nPr1A	21.36		1.435				
nPr1B	19.24		1.62				
nPr1C	6.29		3.048				
nPr1D	14.84		0.366				
nPr1E	11.63		0.349				
nPr1F	11.32		0.406				
nPr1G	6.22		1.378				
nPr2A	21.61		0.026				
nPr2B	22.22		0.252				
nPr3A	15.66		1.645				
nPr3B	22.21		0.117				
nPr3C	21.86		1.144				
nPr3D	16.39		0.558				
nPr3E	15.16		0.015				
DSP3	10.91		1.77				
DSP2	17.74		0.259				
DSP1	2.52		1.428				
nPr1A_bas	21.36		1.435				
nPr1B_bas	19.24		1.812				
nPr1C_bas	6.24		3.236				
nPr1D_bas	14.88		1.25				
nPr1E_bas	11.63		0.349				
nPr1F_bas	11.32		0.406				
nPr1G_bas	6.2		1.936				
nEx3C*	15.23		0.259				
nEx1A*	15.54		0.015				
DSP1_bas	2.55		1.943				
Pit41382	2.75	0			2.75		None
N1355390	2.61	0					
Pit41384	2.83	0			3.17		None
N1355393	2.65	0					
Pit3845	2.8	0			2.7		None
DSP1_bas2	2.63	0					
Pit2177	2.84	0			3.16		None
DSP1_bas1	2.66	0					

SUB-CATCHMENT DETAILS

Name	Max Flow (cu.m/s)	Due to Storm
Ex1A	0.981	10% AEP, 15 min burst, Storm 8
Ex1B	1.543	10% AEP, 15 min burst, Storm 8
Ex3B	0.08	10% AEP, 1 hour burst, Storm 7
Ex3A	0.554	10% AEP, 10 min burst, Storm 7
Ex2B	0.274	10% AEP, 20 min burst, Storm 4
Ex2A	0.036	10% AEP, 1 hour burst, Storm 7
Ex3C	1.267	10% AEP, 15 min burst, Storm 4
cPr1A	1.144	10% AEP, 5 min burst, Storm 1
cPr1B	1.27	10% AEP, 15 min burst, Storm 10
cPr1C	0.041	10% AEP, 1 hour burst, Storm 3
cPr1D*	0.561	10% AEP, 5 min burst, Storm 1
cPr1E	0.274	10% AEP, 5 min burst, Storm 1
cPr1F	0.318	10% AEP, 5 min burst, Storm 1
cPr1G	0.012	10% AEP, 30 min burst, Storm 8
cPr2A	0.022	10% AEP, 5 min burst, Storm 1
cPr2B	0.199	10% AEP, 30 min burst, Storm 8
cPr3A	0.041	10% AEP, 1 hour burst, Storm 3
cPr3B	0.095	10% AEP, 1 hour burst, Storm 6
cPr3C	0.893	10% AEP, 15 min burst, Storm 4
cPr3D	0.435	10% AEP, 15 min burst, Storm 4
cPr3E*	0.013	10% AEP, 5 min burst, Storm 1
cPr1A_bas	1.151	10% AEP, 5 min burst, Storm 1
cPr1B_bas	1.42	10% AEP, 15 min burst, Storm 10
cPr1C_bas	0.041	10% AEP, 1 hour burst, Storm 9
cPr1D_bas	0.982	10% AEP, 15 min burst, Storm 10
cPr1E_bas	0.277	10% AEP, 5 min burst, Storm 1
cPr1F_bas	0.321	10% AEP, 5 min burst, Storm 1
cPr1G_bas	0.015	10% AEP, 20 min burst, Storm 4
cEx3C-dem	0.226	10% AEP, 1 hour burst, Storm 3
cEx1A-dem	0.012	10% AEP, 30 min burst, Storm 8

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P85546	0.401	1.06	2.752	2.695	10% AEP, 1 hour burst, Storm 3
P85548	0.988	1.45	2.828	2.692	10% AEP, 20 min burst, Storm 8
Pipe Outlet	0.672	1.18	2.8	2.733	10% AEP, 1 hour burst, Storm 3
Pipe Outlet	1.071	1.52	2.835	2.695	10% AEP, 20 min burst, Storm 8

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF_Ex1	2.516	2.519	14.838	0.183	0.21	13.65	1.22	10% AEP, 15 min burst, Storm 8
OF_Ex1A	0.981	0.98	12.321	0.054	0.09	11.07	1.75	10% AEP, 15 min burst, Storm 8
OF_EX1B	1.543	1.543	12.321	0.07	0.14	11.4	2.07	10% AEP, 15 min burst, Storm 8
OF_Ex3	1.801	1.808	14.838	0.151	0.16	13.02	1.11	10% AEP, 15 min burst, Storm 4
OF_Ex2	0.299	0.299	14.838	0.053	0.03	11.05	0.65	10% AEP, 20 min burst, Storm 4
OF_Ex3B	0.022	0.575	12.321	0.039	0.06	10.78	1.44	10% AEP, 10 min burst, Storm 7
OF_Ex3A	0.573	0.573	12.321	0.039	0.06	10.78	1.43	10% AEP, 10 min burst, Storm 7
OF_Ex2B	0.274	0.274	12.321	0.025	0.03	10.5	1.08	10% AEP, 20 min burst, Storm 4
OF_Ex2A	0.036	0.036	12.321	0.007	0	10.15	0.48	10% AEP, 1 hour burst, Storm 7
OF_Ex3C	1.267	1.268	12.321	0.063	0.12	11.25	1.93	10% AEP, 15 min burst, Storm 4
oPr1A	1.14	1.195	0.903	0.214	0.48	5.94	2.48	10% AEP, 5 min burst, Storm 1
oPr1B	1.232	1.249	0.857	0.196	0.5	5.49	2.59	10% AEP, 15 min burst, Storm 4
oPr1C	2.405	2.421	1.189	0.292	0.63	7.89	2.18	10% AEP, 15 min burst, Storm 10
oPr1D	0.533	0.545	0.411	0.165	0.28	4.72	1.74	10% AEP, 15 min burst, Storm 4
oPr1E	0.268	0.305	1.033	0.137	0.21	3.71	1.67	10% AEP, 5 min burst, Storm 1
oPr1F	0.308	0.297	1.072	0.142	0.2	3.88	1.42	10% AEP, 5 min burst, Storm 1
oPr1G	1.074	1.071	1.187	0.22	0.38	6.11	1.72	10% AEP, 15 min burst, Storm 9
oPr2A	0.02	0.015	1.004	0.064	0.05	1.27	0.98	10% AEP, 15 min burst, Storm 3
oPr2B	0.198	0.198	0.834	0.118	0.19	3.07	1.89	10% AEP, 30 min burst, Storm 8
oPr3A	1.303	1.305	0.959	0.221	0.49	6.13	2.35	10% AEP, 15 min burst, Storm 4
oPr3B	0.093	0.136	0.973	0.101	0.14	2.49	1.37	10% AEP, 1 hour burst, Storm 7
oPr3C	0.85	0.874	1.174	0.206	0.33	5.76	1.62	10% AEP, 15 min burst, Storm 4
oPr3D	0.418	0.432	1.535	0.194	0.18	5.44	0.93	10% AEP, 15 min burst, Storm 3
oPr3E	0.009	0.004	1.102	0.053	0.03	0.9	0.76	10% AEP, 20 min burst, Storm 10
OF_Pr3	1.302	1.302	14.838	0.133	0.12	12.66	1.01	10% AEP, 15 min burst, Storm 4
OF_Pr2	0.21	0.21	14.838	0.043	0.02	10.85	0.58	10% AEP, 30 min burst, Storm 8
oPr1	1.297	1.297	14.838	0.124	0.12	12.49	1.01	10% AEP, 30 min burst, Storm 8
oPr1A_bas	1.139	1.258	0.903	0.214	0.5	5.94	2.6	10% AEP, 5 min burst, Storm 1
oPr1B_bas	1.382	1.396	0.857	0.202	0.54	5.66	2.68	10% AEP, 15 min burst, Storm 4
oPr1C_bas	2.533	2.533	0.152	0.243	0.8	6.66	3.32	10% AEP, 15 min burst, Storm 4
oPr1D_bas	0.851	1.004	0.411	0.207	0.41	5.78	2.11	10% AEP, 5 min burst, Storm 1
oPr1E_bas	0.27	0.303	1.033	0.137	0.21	3.72	1.63	10% AEP, 5 min burst, Storm 1
oPr1F_bas	0.311	0.297	1.072	0.143	0.2	3.9	1.42	10% AEP, 5 min burst, Storm 1
oPr1G_bas	1.529	1.529	0.848	0.205	0.58	5.73	2.84	10% AEP, 15 min burst, Storm 4
O3_bas2	0.007	0.007						10% AEP, 1 hour burst, Storm 3
O2_bas2	0.544	0.544						10% AEP, 1 hour burst, Storm 3
O1_bas2	0.121	0.121						10% AEP, 1 hour burst, Storm 3
W Basin2_bas								
O2B_bas 1	0.179	0.179						10% AEP, 20 min burst, Storm 8
W1	0.012	0.012						10% AEP, 20 min burst, Storm 8
O2_bas1	0.179	0.179						10% AEP, 20 min burst, Storm 8
O1_bas1	0.713	0.713						10% AEP, 20 min burst, Storm 8
oEx3C	0.224	0.222	1.102	0.13	0.16	3.49	1.31	10% AEP, 1 hour burst, Storm 3
oEx1A	0	0.561	0.411	0.128	0.4	3.4	3.14	10% AEP, 5 min burst, Storm 1
o_DSP1	1.691	1.691	14.838	0.145	0.15	12.9	1.09	10% AEP, 30 min burst, Storm 5
O1117902								
O1117901	0.284	0.284						10% AEP, 1 hour burst, Storm 3
O1117900	0.117	0.117						10% AEP, 1 hour burst, Storm 3
W1117899								
W1117908	0.006	0.006						10% AEP, 20 min burst, Storm 8
O1117907	0.142	0.142						10% AEP, 20 min burst, Storm 8
O1117906	0.142	0.142						10% AEP, 20 min burst, Storm 8
O1117904	0.704	0.704						10% AEP, 20 min burst, Storm 8
OF112621	0.401	0.402	14.151	0.079	0.04	11.59	0.71	10% AEP, 1 hour burst, Storm 3
OF112622	0.994	0.993	14.151	0.1	0.09	11.99	0.99	10% AEP, 20 min burst, Storm 8
o_bas2	0.672	0.672	14.151	0.102	0.06	12.04	0.85	10% AEP, 1 hour burst, Storm 3
o_bas1	1.083	1.082	14.151	0.113	0.1	12.27	1.02	10% AEP, 20 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2_bas	5.03	791.6	0.672	0	0.672
Basin1_bas	4.1	821.7	1.083	0	1.083
Basin8185	4.84	671.6	0.401	0	0.401
Basin8185	4.06	751.3	0.994	0	0.994

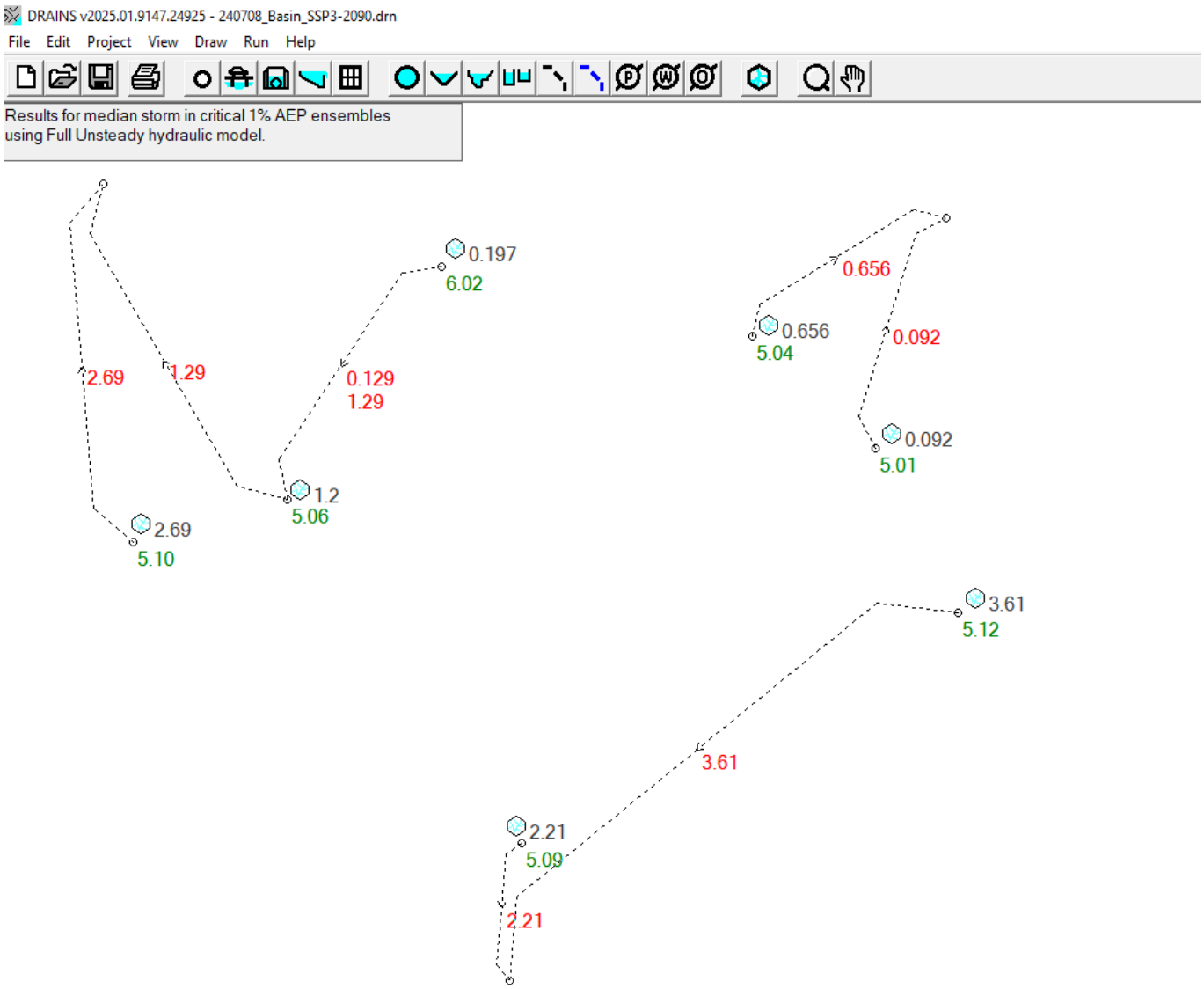
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage6
Run Log for DRAINS v2025.01.9147.24925 - 240327_Stage6.drn run at 13:59:41 on 18/8/2025.

No water upwelling from any pit.
Freeboard was adequate at all pits.

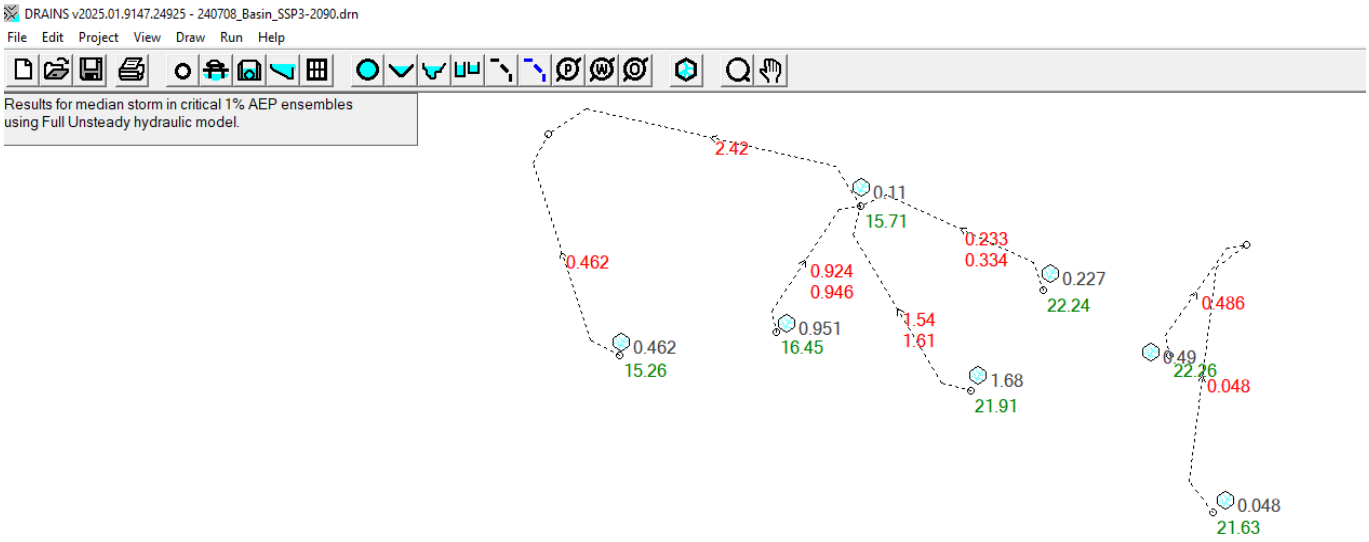
The maximum flow in these overflow routes is unsafe: oEx1A, oPr1D, oPr1D_bas, oPr1A, oPr1B, oPr1C, oPr3A, oPr1A_bas, oPr1B_bas, oPr1C_bas, oPr1G_bas

APPENDIX G: DRAINS – CLIMATE CHANGE SSP3 2090 SCENARIO RESULTS

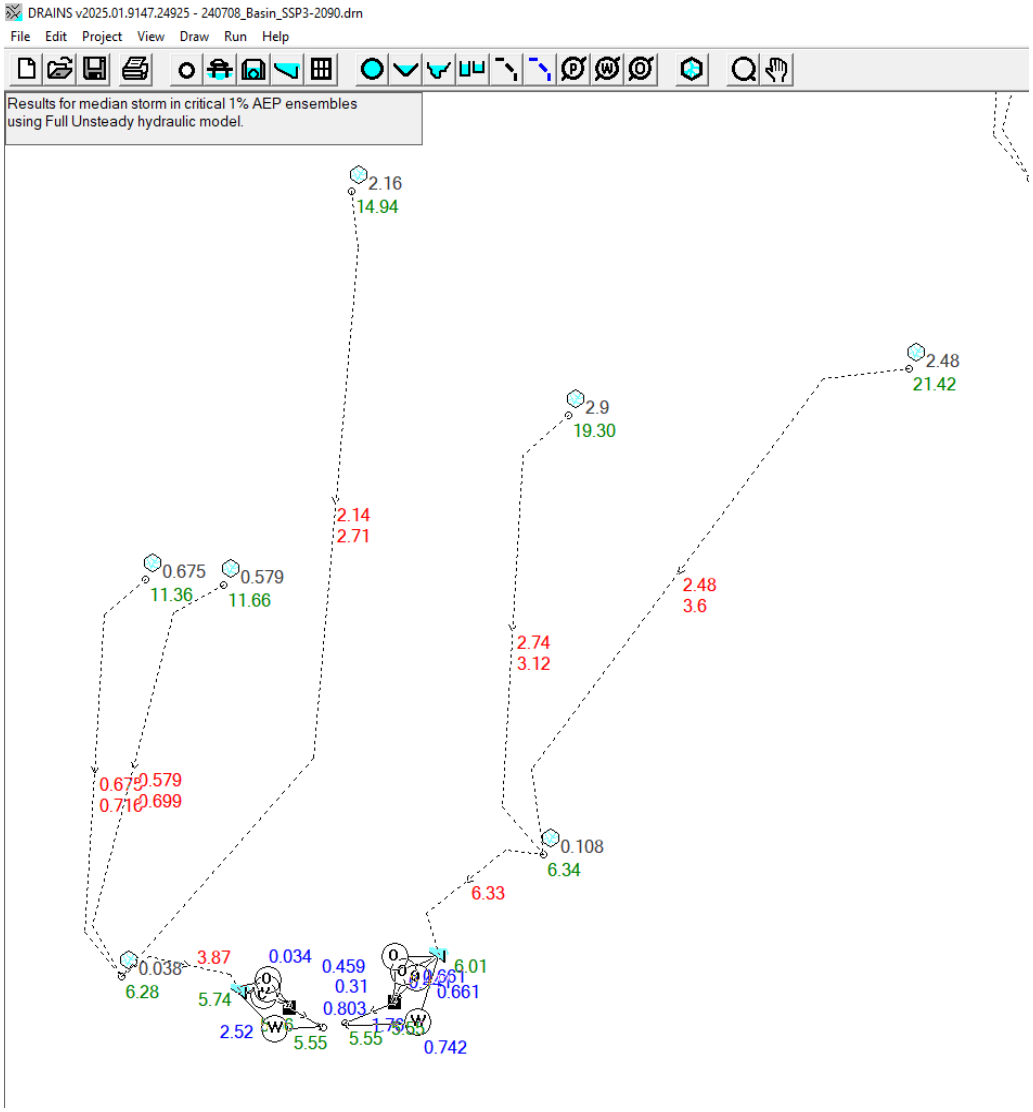
Pre Development



Post Development DSP2 and DSP3



Post Development DSP1 (with Basins 1 and 2)



APPENDIX H: MUSIC LINK SUMMARY RESULTS (LIVERPOOL COUNCIL)

MUSIC-*link* Report

Project Details		Company Details	
Project:	2 Bullecourt Avenue, Mlperra, NSW	**Company:**	Beveridge Williams
Report Export Date:	7/03/2025	**Contact:**	Gladys Hasan
Catchment Name:	Receiving 60	**Address:**	Western Sydney Office Level 4, LPC House, Suite 4.05, 3 Fordham Way, Oran Park, NSW 2570
Catchment Area:	19.639ha	**Phone:**	(02) 4625 5055
Impervious Area*:	70.9573298029431%	**Email:**	beveridgewilliams.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.30.0.13025 (5.30.0.13025)		
MUSIC-link data Version:	5.0		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	20.123%	Rainwater Tank Nodes	8	Urban_Roof Nodes	16
TSS	88.051%	Bioretention Nodes	4	Urban_Residential Nodes	8
TP	75.928%	Generic Treatment Nodes	7	Urban_SealedRoad Nodes	7
TN	62.173%			Urban_Mixed Nodes	10
GP	95.998%				

Comments

na

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	BRS 3_A	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS 3_A	High Flow Bypass	0	None	0.06 m³/s
Bioretention	BRS 3_A	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS 3_A	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS 3_A	TN Content of Filter Media	1	800	600
Bioretention	BRS 3_B	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS 3_B	High Flow Bypass	0	None	0.06 m³/s
Bioretention	BRS 3_B	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS 3_B	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS 3_B	TN Content of Filter Media	1	800	600
Bioretention	BRS1	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS1	High Flow Bypass	0	None	0.44 m³/s
Bioretention	BRS1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS1	TN Content of Filter Media	1	800	600
Bioretention	BRS2	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS2	High Flow Bypass	0	None	0.06 m³/s
Bioretention	BRS2	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS2	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS2	TN Content of Filter Media	1	800	600
Generic	Ecoceptor BRS1 East	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS1 West	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS2	High Flow Bypass	None	99	0.14 m³/s
Generic	Ecoceptor BRS3_A	High Flow Bypass	None	99	0.06 m³/s
Generic	Ecoceptor BRS3_B	High Flow Bypass	None	99	0.06 m³/s
Generic	Ecoceptor Pr2A	High Flow Bypass	None	99	0.06 m³/s
Generic	Ecoceptor Pr3E	High Flow Bypass	None	99	0.06 m³/s
Rainwater	Pr1A RWT	% Reuse Demand Met	None	None	33.795 %
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	35.161 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	35.876 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	37.653 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	40.462 %
Rainwater	Pr3C RWT	% Reuse Demand Met	None	None	33.811 %
Rainwater	Pr3D RWT	% Reuse Demand Met	None	None	33.795 %
Rainwater	Pr3E RWT	% Reuse Demand Met	None	None	33.795 %
Receiving	Receiving 60	Flow Reduction	None	None	20.123 %
Receiving	Receiving 60	GP Reduction	90	None	95.998 %

Node Type	Node Name	Parameter	Min	Max	Actual
Receiving	Receiving 60	TP Reduction	65	None	75.928 %
Receiving	Receiving 60	TSS Reduction	85	None	88.051 %

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr1A Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.003 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.003 ha
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.456 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.507 ha
Urban_Mixed	Pr1C Open Space	Impervious Area	None	None	0.046 ha
Urban_Mixed	Pr1C Open Space	Pervious Area	None	None	0.415 ha
Urban_Mixed	Pr1C Open Space	Total Area	None	None	0.461 ha
Urban_Mixed	Pr1D Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1D Open Space	Pervious Area	None	None	0.003 ha
Urban_Mixed	Pr1D Open Space	Total Area	None	None	0.003 ha
Urban_Mixed	Pr1G Open Space	Impervious Area	None	None	0.008 ha
Urban_Mixed	Pr1G Open Space	Pervious Area	None	None	0.069 ha
Urban_Mixed	Pr1G Open Space	Total Area	None	None	0.077 ha
Urban_Mixed	Pr2B Open Space	Impervious Area	None	None	0.126 ha
Urban_Mixed	Pr2B Open Space	Pervious Area	None	None	1.137 ha
Urban_Mixed	Pr2B Open Space	Total Area	None	None	1.263 ha
Urban_Mixed	Pr3A Open Space	Impervious Area	None	None	0.047 ha
Urban_Mixed	Pr3A Open Space	Pervious Area	None	None	0.424 ha
Urban_Mixed	Pr3A Open Space	Total Area	None	None	0.471 ha
Urban_Mixed	Pr3B Open Space	Impervious Area	None	None	0.075 ha
Urban_Mixed	Pr3B Open Space	Pervious Area	None	None	0.671 ha
Urban_Mixed	Pr3B Open Space	Total Area	None	None	0.746 ha
Urban_Mixed	Pr3C Open Space	Impervious Area	None	None	0.079 ha
Urban_Mixed	Pr3C Open Space	Pervious Area	None	None	0.713 ha
Urban_Mixed	Pr3C Open Space	Total Area	None	None	0.792 ha
Urban_Mixed	Pr3D Open Space	Impervious Area	None	None	0.004 ha
Urban_Mixed	Pr3D Open Space	Pervious Area	None	None	0.035 ha
Urban_Mixed	Pr3D Open Space	Total Area	None	None	0.039 ha
Urban_Residential	Pr1A Yard	Impervious Area	None	None	0.167 ha
Urban_Residential	Pr1A Yard	Pervious Area	None	None	0.323 ha
Urban_Residential	Pr1A Yard	Total Area	None	None	0.49 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.222 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.332 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.554 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.137 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.304 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.441 ha
Urban_Residential	Pr1E Yard	Impervious Area	None	None	0.026 ha

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.12 ha
Urban_Residential	Pr1E Yard	Total Area	None	None	0.146 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.066 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.139 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.205 ha
Urban_Residential	Pr3C Yard	Impervious Area	None	None	0.136 ha
Urban_Residential	Pr3C Yard	Pervious Area	None	None	0.13 ha
Urban_Residential	Pr3C Yard	Total Area	None	None	0.266 ha
Urban_Residential	Pr3D Yard	Impervious Area	None	None	0.026 ha
Urban_Residential	Pr3D Yard	Pervious Area	None	None	0.113 ha
Urban_Residential	Pr3D Yard	Total Area	None	None	0.139 ha
Urban_Residential	Pr3E Yard	Impervious Area	None	None	0.051 ha
Urban_Residential	Pr3E Yard	Pervious Area	None	None	0.054 ha
Urban_Residential	Pr3E Yard	Total Area	None	None	0.105 ha
Urban_Roof	Pr1A (Roof ex RWT)	Impervious Area	None	None	0.414 ha
Urban_Roof	Pr1A (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof ex RWT)	Total Area	None	None	0.414 ha
Urban_Roof	Pr1A (Roof to RWT)	Impervious Area	None	None	1.242 ha
Urban_Roof	Pr1A (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof to RWT)	Total Area	None	None	1.242 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	0.423 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	0.423 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	1.269 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	1.269 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.378 ha
Urban_Roof	Pr1D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.378 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	1.134 ha
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	1.134 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.162 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.162 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.486 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.486 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.18 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha

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MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.18 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.54 ha
Urban_Roof	Pr3C (Roof ex RWT)	Impervious Area	None	None	0.149 ha
Urban_Roof	Pr3C (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3C (Roof ex RWT)	Total Area	None	None	0.149 ha
Urban_Roof	Pr3C (Roof to RWT)	Impervious Area	None	None	0.446 ha
Urban_Roof	Pr3C (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3C (Roof to RWT)	Total Area	None	None	0.446 ha
Urban_Roof	Pr3D (Roof ex RWT)	Impervious Area	None	None	0.153 ha
Urban_Roof	Pr3D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3D (Roof ex RWT)	Total Area	None	None	0.153 ha
Urban_Roof	Pr3D (Roof to RWT)	Impervious Area	None	None	0.459 ha
Urban_Roof	Pr3D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3D (Roof to RWT)	Total Area	None	None	0.459 ha
Urban_Roof	Pr3E (Roof ex RWT)	Impervious Area	None	None	0.063 ha
Urban_Roof	Pr3E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3E (Roof ex RWT)	Total Area	None	None	0.063 ha
Urban_Roof	Pr3E (Roof to RWT)	Impervious Area	None	None	0.189 ha
Urban_Roof	Pr3E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3E (Roof to RWT)	Total Area	None	None	0.189 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	1.06 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	1.116 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	1.31 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.069 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	1.379 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.864 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.046 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.91 ha
Urban_SealedRoad	Pr2A Road	Impervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr2A Road	Pervious Area	None	None	0.003 ha
Urban_SealedRoad	Pr2A Road	Total Area	None	None	0.059 ha
Urban_SealedRoad	Pr3C Road	Impervious Area	None	None	0.965 ha
Urban_SealedRoad	Pr3C Road	Pervious Area	None	None	0.051 ha
Urban_SealedRoad	Pr3C Road	Total Area	None	None	1.016 ha
Urban_SealedRoad	Pr3D Road	Impervious Area	None	None	0.491 ha
Urban_SealedRoad	Pr3D Road	Pervious Area	None	None	0.026 ha
Urban_SealedRoad	Pr3D Road	Total Area	None	None	0.517 ha

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr3E Road	Impervious Area	None	None	0.235 ha
Urban_SealedRoad	Pr3E Road	Pervious Area	None	None	0.012 ha
Urban_SealedRoad	Pr3E Road	Total Area	None	None	0.247 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr2A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3C Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3E Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

LIVERPOOL CITY COUNCIL

music*link*

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 1	**Company:**	Beveridge Williams
Report Export Date:	11/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	0.8360445ha	**Phone:**	
Impervious Area*:	85.0496480749529%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	18.193%	Rainwater Tank Nodes	1	Urban_Roof Nodes	2
TSS	92.11%	Bioretention Nodes	1	Urban_Residential Nodes	1
TP	85.045%				
TN	73.794%				
GP	100%				

Comments

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	Temp BRS Stg1	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp BRS Stg1	High Flow Bypass	0	None	100 m^3/s
Bioretention	Temp BRS Stg1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp BRS Stg1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp BRS Stg1	TN Content of Filter Media	1	800	600
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Receiving	Receiving 60	Flow Reduction	None	None	18.193 %
Receiving	Receiving 60	GP Reduction	90	None	100 %
Receiving	Receiving 60	TN Reduction	45	None	73.794 %
Receiving	Receiving 60	TP Reduction	65	None	85.045 %
Receiving	Receiving 60	TSS Reduction	85	None	92.11 %
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.051 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.125 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.176 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.495 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.495 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.165 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.165 ha

Only certain parameters are reported when they pass validation

LIVERPOOL CITY COUNCIL

music link

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 2	**Company:**	Beveridge Williams
Report Export Date:	11/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	3.832488ha	**Phone:**	
Impervious Area*:	78.6938465560753%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	10.016%	Rainwater Tank Nodes	4	Urban_Roof Nodes	8
TSS	87.906%	Bioretention Nodes	1	Urban_Residential Nodes	4
TP	76.469%			Urban_SealedRoad Nodes	3
TN	52.402%			Urban_Mixed Nodes	2
GP	100%				

Comments

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	Temp BRS Stg1	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp BRS Stg1	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp BRS Stg1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp BRS Stg1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp BRS Stg1	TN Content of Filter Media	1	800	600
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Receiving	Receiving 60	Flow Reduction	None	None	10.016 %
Receiving	Receiving 60	GP Reduction	90	None	100 %
Receiving	Receiving 60	TN Reduction	45	None	52.402 %
Receiving	Receiving 60	TP Reduction	65	None	76.469 %
Receiving	Receiving 60	TSS Reduction	85	None	87.906 %
Urban_Mixed	Pr1A Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.001 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.001 ha
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.455 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.506 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.023 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.035 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.058 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.03 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.066 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.096 ha
Urban_Residential	Pr1E Yard	Impervious Area	None	None	0.013 ha
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.058 ha
Urban_Residential	Pr1E Yard	Total Area	None	None	0.07 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.065 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.137 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.202 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	0.04 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	0.04 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	0.014 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	0.014 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.324 ha

Node Type	Node Name (ex RWT)	Parameter Area	Min	Max	Actual

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.518 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.518 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.172 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.172 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	0.205 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.011 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	0.216 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	0.449 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.024 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	0.472 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.573 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.03 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.603 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 3	**Company:**	Beveridge Williams
Report Export Date:	8/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	6.0304774ha	**Phone:**	
Impervious Area*:	72.0032380852634%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	7.984%	Rainwater Tank Nodes	4	Urban_SealedRoad Nodes	5
TSS	85.286%	Bioretention Nodes	2	Urban_Residential Nodes	5
TP	77.709%	Generic Treatment Nodes	1	Urban_Roof Nodes	8
TN	57.173%			Urban_Mixed Nodes	4
GP	98.734%				

Comments

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	Temp BRS Stg1	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp BRS Stg1	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp BRS Stg1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp BRS Stg1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp BRS Stg1	TN Content of Filter Media	1	800	600
Bioretention	Temp_BRS_Stg3	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp_BRS_Stg3	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp_BRS_Stg3	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp_BRS_Stg3	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp_BRS_Stg3	TN Content of Filter Media	1	800	600
Generic	Ecoceptor BRS1 West 8000	High Flow Bypass	None	99	0.22 m³/s
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Receiving	Receiving 60	Flow Reduction	None	None	7.984 %
Receiving	Receiving 60	GP Reduction	90	None	98.734 %
Receiving	Receiving 60	TN Reduction	45	None	57.173 %
Receiving	Receiving 60	TP Reduction	65	None	77.709 %
Receiving	Receiving 60	TSS Reduction	85	None	85.286 %
Urban_Mixed	Pr1A Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.001 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.001 ha
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.455 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.506 ha
Urban_Mixed	Pr3B Open Space	Impervious Area	None	None	0.075 ha
Urban_Mixed	Pr3B Open Space	Pervious Area	None	None	0.671 ha
Urban_Mixed	Pr3B Open Space	Total Area	None	None	0.746 ha
Urban_Mixed	Pr3C Open Space	Impervious Area	None	None	0.003 ha
Urban_Mixed	Pr3C Open Space	Pervious Area	None	None	0.025 ha
Urban_Mixed	Pr3C Open Space	Total Area	None	None	0.027 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.041 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.017 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.058 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.016 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.079 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.096 ha

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.07 ha

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Residential	Pr1E Yard	Total Area	None	None	0.07 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.065 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.137 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.202 ha
Urban_Residential	Pr3C Yard	Impervious Area	None	None	0.558 ha
Urban_Residential	Pr3C Yard	Pervious Area	None	None	0.131 ha
Urban_Residential	Pr3C Yard	Total Area	None	None	0.689 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	0.04 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	0.04 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	0.014 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	0.014 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.518 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.518 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.172 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.172 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	0.261 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.014 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	0.275 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	0.449 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.024 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	0.472 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.573 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.03 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.603 ha

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr2A Road	Impervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr2A Road	Pervious Area	None	None	0.003 ha
Urban_SealedRoad	Pr2A Road	Total Area	None	None	0.059 ha
Urban_SealedRoad	Pr3C Road	Impervious Area	None	None	0.587 ha
Urban_SealedRoad	Pr3C Road	Pervious Area	None	None	0.031 ha
Urban_SealedRoad	Pr3C Road	Total Area	None	None	0.617 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr2A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3C Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

LIVERPOOL CITY COUNCIL

music link

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 4	**Company:**	Beveridge Williams
Report Export Date:	8/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	10.9510703ha	**Phone:**	
Impervious Area*:	75.4391030436541%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	9.973%	Rainwater Tank Nodes	5	Urban_SealedRoad Nodes	5
TSS	86.083%	Bioretention Nodes	3	Urban_Residential Nodes	6
TP	78.128%	Generic Treatment Nodes	3	Urban_Roof Nodes	10
TN	61.01%			Urban_Mixed Nodes	6
GP	98.835%				

Comments

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	BRS1	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS1	High Flow Bypass	0	None	0.5 m³/s
Bioretention	BRS1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS1	TN Content of Filter Media	1	800	600
Bioretention	BRS2	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS2	High Flow Bypass	0	None	0.22 m³/s
Bioretention	BRS2	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS2	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS2	TN Content of Filter Media	1	800	600
Bioretention	Temp_BRS_Stg3	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp_BRS_Stg3	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp_BRS_Stg3	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp_BRS_Stg3	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp_BRS_Stg3	TN Content of Filter Media	1	800	600
Generic	Ecoceptor BRS1 East 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS1 West 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS2 6000	High Flow Bypass	None	99	0.14 m³/s
Rainwater	Pr1A RWT	% Reuse Demand Met	None	None	18.422 %
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Receiving	Receiving 60	Flow Reduction	None	None	9.973 %
Receiving	Receiving 60	GP Reduction	90	None	98.835 %
Receiving	Receiving 60	TN Reduction	45	None	61.01 %
Receiving	Receiving 60	TP Reduction	65	None	78.128 %
Receiving	Receiving 60	TSS Reduction	85	None	86.083 %
Urban_Mixed	Pr1A Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.002 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.002 ha
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.457 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.508 ha
Urban_Mixed	Pr1C Open Space	Impervious Area	None	None	0.046 ha
Urban_Mixed	Pr1C Open Space	Pervious Area	None	None	0.415 ha
Urban_Mixed	Pr1C Open Space	Total Area	None	None	0.461 ha

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr1G Open Space	Pervious Area	None	None	0.069 ha
Urban_Mixed	Pr1G Open Space	Total Area	None	None	0.077 ha

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr3B Open Space	Impervious Area	None	None	0.075 ha
Urban_Mixed	Pr3B Open Space	Pervious Area	None	None	0.671 ha
Urban_Mixed	Pr3B Open Space	Total Area	None	None	0.746 ha
Urban_Mixed	Pr3C Open Space	Impervious Area	None	None	0.003 ha
Urban_Mixed	Pr3C Open Space	Pervious Area	None	None	0.025 ha
Urban_Mixed	Pr3C Open Space	Total Area	None	None	0.027 ha
Urban_Residential	Pr1A Yard	Impervious Area	None	None	0.155 ha
Urban_Residential	Pr1A Yard	Pervious Area	None	None	0.122 ha
Urban_Residential	Pr1A Yard	Total Area	None	None	0.277 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.245 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.265 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.511 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.24 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.118 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.358 ha
Urban_Residential	Pr1E Yard	Impervious Area	None	None	0.002 ha
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.119 ha
Urban_Residential	Pr1E Yard	Total Area	None	None	0.122 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.065 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.139 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.205 ha
Urban_Residential	Pr3C Yard	Impervious Area	None	None	0.714 ha
Urban_Residential	Pr3C Yard	Pervious Area	None	None	0.126 ha
Urban_Residential	Pr3C Yard	Total Area	None	None	0.84 ha
Urban_Roof	Pr1A (Roof ex RWT)	Impervious Area	None	None	0.392 ha
Urban_Roof	Pr1A (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof ex RWT)	Total Area	None	None	0.392 ha
Urban_Roof	Pr1A (Roof to RWT)	Impervious Area	None	None	0.13 ha
Urban_Roof	Pr1A (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof to RWT)	Total Area	None	None	0.13 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	0.945 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	0.945 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	0.315 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	0.315 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	0.108 ha

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.168 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.168 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.18 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.18 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	0.637 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.034 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	0.671 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	0.989 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.052 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	1.041 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.782 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.041 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.823 ha
Urban_SealedRoad	Pr2A Road	Impervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr2A Road	Pervious Area	None	None	0.003 ha
Urban_SealedRoad	Pr2A Road	Total Area	None	None	0.059 ha
Urban_SealedRoad	Pr3C Road	Impervious Area	None	None	0.587 ha
Urban_SealedRoad	Pr3C Road	Pervious Area	None	None	0.031 ha
Urban_SealedRoad	Pr3C Road	Total Area	None	None	0.617 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr2A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3C Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

LIVERPOOL CITY COUNCIL

music*link*

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 5	**Company:**	Beveridge Williams
Report Export Date:	8/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	13.0049761ha	**Phone:**	
Impervious Area*:	77.7528891652481%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	10.463%	Rainwater Tank Nodes	5	Urban_SealedRoad Nodes	5
TSS	84.899%	Bioretention Nodes	3	Urban_Residential Nodes	6
TP	76.477%	Generic Treatment Nodes	3	Urban_Roof Nodes	10
TN	59.941%			Urban_Mixed Nodes	6
GP	98.763%				

Comments

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	BRS1	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS1	High Flow Bypass	0	None	0.5 m³/s
Bioretention	BRS1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS1	TN Content of Filter Media	1	800	600
Bioretention	BRS2	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS2	High Flow Bypass	0	None	0.22 m³/s
Bioretention	BRS2	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS2	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS2	TN Content of Filter Media	1	800	600
Bioretention	Temp_BRS_Stg3	Exfiltration Rate	0	None	0 mm/h
Bioretention	Temp_BRS_Stg3	High Flow Bypass	0	None	100 m³/s
Bioretention	Temp_BRS_Stg3	Orthophosphate Content of Filter Media	0	55	30
Bioretention	Temp_BRS_Stg3	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	Temp_BRS_Stg3	TN Content of Filter Media	1	800	600
Generic	Ecoceptor BRS1 East 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS1 West 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS2 6000	High Flow Bypass	None	99	0.14 m³/s
Rainwater	Pr1A RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Receiving	Receiving 60	Flow Reduction	None	None	10.463 %
Receiving	Receiving 60	GP Reduction	90	None	98.763 %
Receiving	Receiving 60	TN Reduction	45	None	59.941 %
Receiving	Receiving 60	TP Reduction	65	None	76.477 %
Urban_Mixed	Pr1A Open Space	Impervious Area	None	None	0 ha
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.003 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.003 ha
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.457 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.508 ha
Urban_Mixed	Pr1C Open Space	Impervious Area	None	None	0.046 ha
Urban_Mixed	Pr1C Open Space	Pervious Area	None	None	0.415 ha
Urban_Mixed	Pr1C Open Space	Total Area	None	None	0.461 ha
Urban_Mixed	Pr1G Open Space	Impervious Area	None	None	0.008 ha

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr1G Open Space	Total Area	None	None	0.077 ha
Urban_Mixed	Pr3B Open Space	Impervious Area	None	None	0.075 ha

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr3B Open Space	Pervious Area	None	None	0.671 ha
Urban_Mixed	Pr3B Open Space	Total Area	None	None	0.746 ha
Urban_Mixed	Pr3C Open Space	Impervious Area	None	None	0.003 ha
Urban_Mixed	Pr3C Open Space	Pervious Area	None	None	0.025 ha
Urban_Mixed	Pr3C Open Space	Total Area	None	None	0.027 ha
Urban_Residential	Pr1A Yard	Impervious Area	None	None	0.201 ha
Urban_Residential	Pr1A Yard	Pervious Area	None	None	0.289 ha
Urban_Residential	Pr1A Yard	Total Area	None	None	0.49 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.245 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.265 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.511 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.24 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.118 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.358 ha
Urban_Residential	Pr1E Yard	Impervious Area	None	None	0.002 ha
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.119 ha
Urban_Residential	Pr1E Yard	Total Area	None	None	0.122 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.065 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.139 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.205 ha
Urban_Residential	Pr3C Yard	Impervious Area	None	None	0.714 ha
Urban_Residential	Pr3C Yard	Pervious Area	None	None	0.126 ha
Urban_Residential	Pr3C Yard	Total Area	None	None	0.84 ha
Urban_Roof	Pr1A (Roof ex RWT)	Impervious Area	None	None	1.242 ha
Urban_Roof	Pr1A (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof ex RWT)	Total Area	None	None	1.242 ha
Urban_Roof	Pr1A (Roof to RWT)	Impervious Area	None	None	0.414 ha
Urban_Roof	Pr1A (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof to RWT)	Total Area	None	None	0.414 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	0.945 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	0.945 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	0.315 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	0.315 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha

Only certain parameters are reported when they pass validation

NOTE: A successful self-validation check of your model does not constitute an approved model by Liverpool City Council
MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.168 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.168 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.18 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.18 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	1.06 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	1.116 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	1.199 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.063 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	1.262 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.782 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.041 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.823 ha
Urban_SealedRoad	Pr2A Road	Impervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr2A Road	Pervious Area	None	None	0.003 ha
Urban_SealedRoad	Pr2A Road	Total Area	None	None	0.059 ha
Urban_SealedRoad	Pr3C Road	Impervious Area	None	None	0.624 ha
Urban_SealedRoad	Pr3C Road	Pervious Area	None	None	0.033 ha
Urban_SealedRoad	Pr3C Road	Total Area	None	None	0.657 ha

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Receiving	Receiving 60	TSS Reduction	85	None	84.899 %
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr2A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3C Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

LIVERPOOL CITY COUNCIL

music link

MUSIC-*link* Report

Project Details		Company Details	
Project:	2301879 - Stage 6	**Company:**	Beveridge Williams
Report Export Date:	8/08/2025	**Contact:**	Paige Mandy
Catchment Name:	Receiving 60	**Address:**	
Catchment Area:	15.7374692ha	**Phone:**	
Impervious Area*:	77.0842656073316%	**Email:**	mandyp@bewill.com.au
Rainfall Station:			
Modelling Time-step:	Six minutes		
Modelling Period:	01/01/67 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	856.622mm		
Evapotranspiration:	1171.074mm		
MUSICX Version:	1.50.0.13577 (5.50.0.13577)		
MUSIC-link data Version:	5.1		
Study Area:	Liverpool City Council		
Scenario:	Liverpool 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:	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	11.906%	Rainwater Tank Nodes	7	Urban_Roof Nodes	14
TSS	85.978%	Bioretention Nodes	4	Urban_SealedRoad Nodes	7
TP	77.65%	Generic Treatment Nodes	5	Urban_Residential Nodes	7
TN	61.659%			Urban_Mixed Nodes	8
GP	98.507%				

Comments

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Bioretention	BRS 3_A	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS 3_A	High Flow Bypass	0	None	0.2 m³/s
Bioretention	BRS 3_A	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS 3_A	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS 3_A	TN Content of Filter Media	1	800	600
Bioretention	BRS 3_B	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS 3_B	High Flow Bypass	0	None	0.2 m³/s
Bioretention	BRS 3_B	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS 3_B	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS 3_B	TN Content of Filter Media	1	800	600
Bioretention	BRS1	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS1	High Flow Bypass	0	None	0.5 m³/s
Bioretention	BRS1	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS1	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS1	TN Content of Filter Media	1	800	600
Bioretention	BRS2	Exfiltration Rate	0	None	0 mm/h
Bioretention	BRS2	High Flow Bypass	0	None	0.22 m³/s
Bioretention	BRS2	Orthophosphate Content of Filter Media	0	55	30
Bioretention	BRS2	PET Scaling Factor	2.1	2.1	2.1 proportion
Bioretention	BRS2	TN Content of Filter Media	1	800	600
Generic	Ecoceptor BRS1 East 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS1 West 8000	High Flow Bypass	None	99	0.22 m³/s
Generic	Ecoceptor BRS2 6000	High Flow Bypass	None	99	0.14 m³/s
Generic	Pr3C Atlan Ecoceptor GPT 6000	High Flow Bypass	None	99	0.14 m³/s
Generic	Pr3D Atlan Ecoceptor GPT 6000	High Flow Bypass	None	99	0.14 m³/s
Rainwater	Pr1A RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1B RWT	% Reuse Demand Met	None	None	18.386 %
Rainwater	Pr1D RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1E RWT	% Reuse Demand Met	None	None	22.223 %
Rainwater	Pr1F RWT	% Reuse Demand Met	None	None	25.399 %
Rainwater	Pr3C RWT	% Reuse Demand Met	None	None	18.43 %
Rainwater	Pr3D RWT	% Reuse Demand Met	None	None	18.406 %
Receiving	Receiving 60	Flow Reduction	None	None	11.906 %
Receiving	Receiving 60	GP Reduction	90	None	98.507 %
Receiving	Receiving 60	TN Reduction	45	None	61.659 %
Receiving	Receiving 60	TP Reduction	65	None	77.65 %
Receiving	Receiving 60	TSS Reduction	85	None	85.978 %

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr1A Open Space	Pervious Area	None	None	0.003 ha
Urban_Mixed	Pr1A Open Space	Total Area	None	None	0.003 ha

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Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Mixed	Pr1B Open Space	Impervious Area	None	None	0.051 ha
Urban_Mixed	Pr1B Open Space	Pervious Area	None	None	0.457 ha
Urban_Mixed	Pr1B Open Space	Total Area	None	None	0.508 ha
Urban_Mixed	Pr1C Open Space	Impervious Area	None	None	0.046 ha
Urban_Mixed	Pr1C Open Space	Pervious Area	None	None	0.415 ha
Urban_Mixed	Pr1C Open Space	Total Area	None	None	0.461 ha
Urban_Mixed	Pr1G Open Space	Impervious Area	None	None	0.008 ha
Urban_Mixed	Pr1G Open Space	Pervious Area	None	None	0.069 ha
Urban_Mixed	Pr1G Open Space	Total Area	None	None	0.077 ha
Urban_Mixed	Pr3A Open Space	Impervious Area	None	None	0.045 ha
Urban_Mixed	Pr3A Open Space	Pervious Area	None	None	0.406 ha
Urban_Mixed	Pr3A Open Space	Total Area	None	None	0.452 ha
Urban_Mixed	Pr3B Open Space	Impervious Area	None	None	0.075 ha
Urban_Mixed	Pr3B Open Space	Pervious Area	None	None	0.671 ha
Urban_Mixed	Pr3B Open Space	Total Area	None	None	0.746 ha
Urban_Mixed	Pr3C Open Space	Impervious Area	None	None	0.004 ha
Urban_Mixed	Pr3C Open Space	Pervious Area	None	None	0.034 ha
Urban_Mixed	Pr3C Open Space	Total Area	None	None	0.038 ha
Urban_Mixed	Pr3D Open Space	Impervious Area	None	None	0.003 ha
Urban_Mixed	Pr3D Open Space	Pervious Area	None	None	0.028 ha
Urban_Mixed	Pr3D Open Space	Total Area	None	None	0.031 ha
Urban_Residential	Pr1A Yard	Impervious Area	None	None	0.232 ha
Urban_Residential	Pr1A Yard	Pervious Area	None	None	0.334 ha
Urban_Residential	Pr1A Yard	Total Area	None	None	0.566 ha
Urban_Residential	Pr1B Yard	Impervious Area	None	None	0.216 ha
Urban_Residential	Pr1B Yard	Pervious Area	None	None	0.338 ha
Urban_Residential	Pr1B Yard	Total Area	None	None	0.554 ha
Urban_Residential	Pr1D Yard	Impervious Area	None	None	0.24 ha
Urban_Residential	Pr1D Yard	Pervious Area	None	None	0.118 ha
Urban_Residential	Pr1D Yard	Total Area	None	None	0.358 ha
Urban_Residential	Pr1E Yard	Impervious Area	None	None	0.002 ha
Urban_Residential	Pr1E Yard	Pervious Area	None	None	0.119 ha
Urban_Residential	Pr1E Yard	Total Area	None	None	0.122 ha
Urban_Residential	Pr1F Yard	Impervious Area	None	None	0.065 ha
Urban_Residential	Pr1F Yard	Pervious Area	None	None	0.139 ha
Urban_Residential	Pr1F Yard	Total Area	None	None	0.205 ha
Urban_Residential	Pr3C Yard	Impervious Area	None	None	0.133 ha
Urban_Residential	Pr3C Yard	Pervious Area	None	None	0.128 ha
Urban_Residential	Pr3C Yard	Total Area	None	None	0.261 ha
Urban_Residential	Pr3D Yard	Impervious Area	None	None	0 ha

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MUSIC-*link* now in MUSICX by eWater – leading software for modelling stormwater solutions

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Residential	Pr3D Yard	Pervious Area	None	None	0.103 ha
Urban_Residential	Pr3D Yard	Total Area	None	None	0.103 ha
Urban_Roof	Pr1A (Roof ex RWT)	Impervious Area	None	None	1.242 ha
Urban_Roof	Pr1A (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof ex RWT)	Total Area	None	None	1.242 ha
Urban_Roof	Pr1A (Roof to RWT)	Impervious Area	None	None	0.414 ha
Urban_Roof	Pr1A (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1A (Roof to RWT)	Total Area	None	None	0.414 ha
Urban_Roof	Pr1B (Roof ex RWT)	Impervious Area	None	None	1.269 ha
Urban_Roof	Pr1B (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof ex RWT)	Total Area	None	None	1.269 ha
Urban_Roof	Pr1B (Roof to RWT)	Impervious Area	None	None	0.423 ha
Urban_Roof	Pr1B (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1B (Roof to RWT)	Total Area	None	None	0.423 ha
Urban_Roof	Pr1D (Roof ex RWT)	Impervious Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof ex RWT)	Total Area	None	None	0.324 ha
Urban_Roof	Pr1D (Roof to RWT)	Impervious Area	None	None	0.108 ha
Urban_Roof	Pr1D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1D (Roof to RWT)	Total Area	None	None	0.108 ha
Urban_Roof	Pr1E (Roof ex RWT)	Impervious Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof ex RWT)	Total Area	None	None	0.504 ha
Urban_Roof	Pr1E (Roof to RWT)	Impervious Area	None	None	0.168 ha
Urban_Roof	Pr1E (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1E (Roof to RWT)	Total Area	None	None	0.168 ha
Urban_Roof	Pr1F (Roof ex RWT)	Impervious Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof ex RWT)	Total Area	None	None	0.54 ha
Urban_Roof	Pr1F (Roof to RWT)	Impervious Area	None	None	0.18 ha
Urban_Roof	Pr1F (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr1F (Roof to RWT)	Total Area	None	None	0.18 ha
Urban_Roof	Pr3C (Roof ex RWT)	Impervious Area	None	None	0.432 ha
Urban_Roof	Pr3C (Roof ex RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3C (Roof ex RWT)	Total Area	None	None	0.432 ha
Urban_Roof	Pr3C (Roof to RWT)	Impervious Area	None	None	0.144 ha
Urban_Roof	Pr3C (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3C (Roof to RWT)	Total Area	None	None	0.144 ha
Urban_Roof	Pr3D (Roof ex RWT)	Impervious Area	None	None	0.486 ha
Urban_Roof	Pr3D (Roof ex RWT)	Pervious Area	None	None	0 ha

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Node Type	Node Name	Parameter	Min	Max	Actual
Urban_Roof	Pr3D (Roof ex RWT)	Total Area	None	None	0.486 ha
Urban_Roof	Pr3D (Roof to RWT)	Impervious Area	None	None	0.162 ha
Urban_Roof	Pr3D (Roof to RWT)	Pervious Area	None	None	0 ha
Urban_Roof	Pr3D (Roof to RWT)	Total Area	None	None	0.162 ha
Urban_SealedRoad	Pr1A Road	Impervious Area	None	None	1.06 ha
Urban_SealedRoad	Pr1A Road	Pervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr1A Road	Total Area	None	None	1.116 ha
Urban_SealedRoad	Pr1B Road	Impervious Area	None	None	1.309 ha
Urban_SealedRoad	Pr1B Road	Pervious Area	None	None	0.069 ha
Urban_SealedRoad	Pr1B Road	Total Area	None	None	1.378 ha
Urban_SealedRoad	Pr1D Road	Impervious Area	None	None	0.784 ha
Urban_SealedRoad	Pr1D Road	Pervious Area	None	None	0.041 ha
Urban_SealedRoad	Pr1D Road	Total Area	None	None	0.825 ha
Urban_SealedRoad	Pr2A Road	Impervious Area	None	None	0.056 ha
Urban_SealedRoad	Pr2A Road	Pervious Area	None	None	0.003 ha
Urban_SealedRoad	Pr2A Road	Total Area	None	None	0.059 ha
Urban_SealedRoad	Pr3C Road	Impervious Area	None	None	0.88 ha
Urban_SealedRoad	Pr3C Road	Pervious Area	None	None	0.046 ha
Urban_SealedRoad	Pr3C Road	Total Area	None	None	0.927 ha
Urban_SealedRoad	Pr3D Road	Impervious Area	None	None	0.491 ha
Urban_SealedRoad	Pr3D Road	Pervious Area	None	None	0.026 ha
Urban_SealedRoad	Pr3D Road	Total Area	None	None	0.517 ha
Urban_SealedRoad	Pr3E Road	Impervious Area	None	None	0.033 ha
Urban_SealedRoad	Pr3E Road	Pervious Area	None	None	0.002 ha
Urban_SealedRoad	Pr3E Road	Total Area	None	None	0.035 ha

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Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban_SealedRoad	Pr1A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1B Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr1D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr2A Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3C Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3D Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d
Urban_SealedRoad	Pr3E Road	Impervious Area Rainfall Threshold	1.5	1.5	0.3 mm/d

Only certain parameters are reported when they pass validation

APPENDIX I: MUSIC – STAGED CATCHMENT AND RWT PARAMETERS

Stage	No. Resi lots	Cummulative Sum
1	22	22
2	40	62
3	0	62
4	107	169
5	63	232
6	92	324

Parameter	Value	*unit*
Roof Area for lots within Catchment Pr1F	300	sqm
Roof Area of lots within Catchment Pr1D & Pr1E	240	sqm
Roof Area of lots remaining	180	sqm
Percentage of Roof Area contributing to Rainwater Tank (RWT)	75%	
Effective Impervious of Lot	85%	
Effective Impervious of Roof	100%	
Effective Impervious of Road Reserve	95%	
Effective Impervious of Open Space	10%	
RWT daily demand	0.47	kL/d
No. RWTs per lot	1	

											0.47			0.75			0.85								
No. Lots Cummulative Sum	Stage	Sub cat	No Lots	Lot Area	Open Space (Park)	Road	Commercial	Total	No. RWT	RWT daily demand (kL/d)	Single roof area (ha)	Roof Area	Roof to RWT	Roof ex RWT	Yard	Imp Area Yard	Imp% Yard	Roof ex RWT	Roof to RWT	Open Space	Road	Yard	IMP % Yard	No RWT	total daily demand
22	Stage 1	Pr1F	22	0.836045				0.836045	22	10.34	0.03	0.66	0.495	0.165	0.176045	0.050638	28.76422	0.495	0.165	0	0	0.176045	28.76422	22	10.34
62	Stage 2	Pr1A	0		0.001234	0.215827		0.21706	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.001234	0.215827	0	#DIV/0!	0	0
	Stage 2	Pr1B	3	0.111896	0.505841	0.472497		1.090234	3	1.41	0.018	0.054	0.0405	0.0135	0.057896	0.041112	71.00947	0.0405	0.0135	0.505841	0.472497	0.057896	71.00947	3	1.41
	Stage 2	Pr1C						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
	Stage 2	Pr1D	18	0.527654		0.603461		1.131115	18	8.46	0.024	0.432	0.324	0.108	0.095654	0.016506	17.25598	0.324	0.108	0	0.603461	0.095654	17.25598	18	8.46
	Stage 2	Pr1E	18	0.502336				0.502336	18	8.46	0.024	0.432	0.324	0.108	0.070336	-0.00501	-7.12934	0.324	0.108	0	0	0.070336	-7.12934	18	8.46
	Stage 2	Pr1F	23	0.891743				0.891743	23	10.81	0.03	0.69	0.5175	0.1725	0.201743	0.067981	33.697	0.5175	0.1725	0	0	0.201743	33.697	23	10.81
62	Stage 3	Pr1A	0	0.01084	0.001234	0.275034		0.287108	0	0	0.018	0	0	0	0.01084	0.009214	85	0	0	0.001234	0.275034	0.01084	85	0	0
	Stage 3	Pr1B	3	0.111896	0.505841	0.472497		1.090234	3	1.41	0.018	0.054	0.0405	0.0135	0.057896	0.041112	71.00947	0.0405	0.0135	0.505841	0.472497	0.057896	71.00947	3	1.41
	Stage 3	Pr1C						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
	Stage 3	Pr1D	18	0.527654		0.603461		1.131115	18	8.46	0.024	0.432	0.324	0.108	0.095654	0.016506	17.25598	0.324	0.108	0	0.603461	0.095654	17.25598	18	8.46
	Stage 3	Pr1E	18	0.502336				0.502336	18	8.46	0.024	0.432	0.324	0.108	0.070336	-0.00501	-7.12934	0.324	0.108	0	0	0.070336	-7.12934	18	8.46
	Stage 3	Pr1F	23	0.891743				0.891743	23	10.81	0.03	0.69	0.5175	0.1725	0.201743	0.067981	33.697	0.5175	0.1725	0	0	0.201743	33.697	23	10.81
	Stage 3	Pr1G						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
	Stage 3	Pr2A	0			0.059		0.059	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0.059	0	#DIV/0!	0	0
	Stage 3	PR3B			0.746			0.746		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.746	0	0	#DIV/0!	0	0
	Stage 3	Pr3C	0	0.840014	0.027314	0.617454		1.484782	0	0	0.018	0	0	0	0.840014	0.714012	85	0	0	0.027314	0.617454	0.840014	85	0	0
	Stage 3	Pr3D						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
	Stage 3	Pr3E						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
169	Stage 4	Pr1A	29	0.799264	0.00172	0.670606		1.47159	29	13.63	0.018	0.522	0.3915	0.1305	0.277264	0.157374	56.75972	0.3915	0.1305	0.00172	0.670606	0.277264	56.75972	29	13.63
	Stage 4	Pr1B	70	1.770524	0.507977	1.04122		3.31972	70	32.9	0.018	1.26	0.945	0.315	0.510524	0.244945	47.97919	0.945	0.315	0.507977	1.04122	0.510524	47.97919	70	32.9
	Stage 4	Pr1C	0		0.460856			0.460856	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.460856	0	0	#DIV/0!	0	0
	Stage 4	Pr1D	18	0.790296		0.823302		1.613598	18	8.46	0.024	0.432	0.324	0.108	0.358296	0.239752	66.91441	0.324	0.108	0	0.823302	0.358296	66.91441	18	8.46
	Stage 4	Pr1E	28	0.793923				0.793923	28	13.16	0.024	0.672	0.504	0.168	0.121923	0.002835	2.324937	0.504	0.168	0	0	0.121923	2.324937	28	13.16
	Stage 4	Pr1F	24	0.924602				0.924602	24	11.28	0.03	0.72	0.54	0.18	0.204602	0.065911	32.21449	0.54	0.18	0	0	0.204602	32.21449	24	11.28
	Stage 4	Pr1G	0		0.077			0.077	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.077	0	0	#DIV/0!	0	0
	Stage 4	Pr2A				0.059		0.059		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0.059	0	#DIV/0!	0	0
	Stage 4	PR3B			0.746			0.746		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.746	0	0	#DIV/0!	0	0
	Stage 4	Pr3C	0	0.840014	0.027314	0.617454		1.484782	0	0	0.018	0	0	0	0.840014	0.714012	85	0	0	0.027314	0.617454	0.840014	85	0	0
	Stage 4	Pr3D						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
	Stage 4	Pr3E						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
232	Stage 5	Pr1A	92	2.146	0.003	1.116		3.265	92	43.24	0.018	1.656	1.242	0.414	0.49	0.1681	34.30612	1.242	0.414	0.003	1.116	0.49	34.30612	92	43.24
	Stage 5	Pr1B	70	1.770524	0.507977	1.262381		3.540881	70	32.9	0.018	1.26	0.945	0.315	0.510524	0.244945	47.97919	0.945	0.315	0.507977	1.262381	0.510524	47.97919	70	32.9
	Stage 5	Pr1C	0		0.460856			0.460856	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.460856	0	0	#DIV/0!	0	0
	Stage 5	Pr1D	18	0.790296		0.823302		1.613598	18	8.46	0.024	0.432	0.324	0.108	0.358296	0.239752	66.91441	0.324	0.108	0	0.823302	0.358296	66.91441	18	8.46
	Stage 5	Pr1E	28	0.793923				0.793923	28	13.16	0.024	0.672	0.504	0.168	0.121923	0.002835	2.324937	0.504	0.168	0	0	0.121923	2.324937	28	13.16
	Stage 5	Pr1F	24	0.924602				0.924602	24	11.28	0.03	0.72	0.54	0.18	0.204602	0.065911	32.21449	0.54	0.18	0	0	0.204602	32.21449	24	11.28
	Stage 5	Pr1G	0		0.077			0.077	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.077	0	0	#DIV/0!	0	0
	Stage 5	Pr2A				0.059		0.059		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0.059	0	#DIV/0!	0	0
	Stage 5	PR3B			0.746			0.746		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.746	0	0	#DIV/0!	0	0
	Stage 5	Pr3C	0	0.840014	0.027314	0.656788		1.524116	0	0	0.018	0	0	0	0.840014	0.714012	85	0	0	0.027314	0.656788	0.840014	85	0	0
	Stage 5	Pr3D				0.000615		0.000615		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0.000615	0	#DIV/0!	0	0
	Stage 5	Pr3E						0		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0	0	#DIV/0!	0	0
324	Stage 6	Pr1A	92	2.221851	0.003	1.116		3.340851	92	43.24	0.018	1.656	1.242	0.414	0.565851	0.232573	41.10153	1.242	0.414	0.003	1.116	0.565851	41.10153	92	43.24
	Stage 6	Pr1B	94	2.246	0.507977	1.378023		4.132	94	44.18	0.018	1.692	1.269	0.423	0.554	0.2171	39.18773	1.269	0.423	0.507977	1.378023	0.554	39.18773	94	44.18
	Stage 6	Pr1C	0		0.460856			0.460856	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.460856	0	0	#DIV/0!	0	0
	Stage 6	Pr1D	18	0.790296		0.82539		1.615687	18	8.46	0.024	0.432	0.324	0.108	0.358296	0.239752	66.91441	0.324	0.108	0	0.82539	0.358296	66.91441	18	8.46
	Stage 6	Pr1E	28	0.793923				0.793923	28	13.16	0.024	0.672	0.504	0.168	0.121923	0.002835	2.324937	0.504	0.168	0	0	0.121923	2.324937	28	13.16
	Stage 6	Pr1F	24	0.924602				0.924602	24	11.28	0.03	0.72	0.54	0.18	0.204602	0.065911	32.21449	0.54	0.18	0	0	0.204602	32.21449	24	11.28
	Stage 6	Pr1G	0		0.077			0.077	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.077	0	0	#DIV/0!	0	0
	Stage 6	Pr2A	0			0.059		0.059	0	0	1.018	0	0	0	0	0	#DIV/0!	0	0	0	0.059	0	#DIV/0!	0	0
	Stage 6	Pr3A	0		0.450187	0.001471		0.451658	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.450187	0.001471	0	#DIV/0!	0	0
	Stage 6	PR3B			0.746			0.746		0	0.018	0	0	0	0	0	#DIV/0!	0	0	0.746	0	0	#DIV/0!	0	0
	Stage 6	Pr3C	32	0.836917	0.038162	0.926818	0.244373	2.04627	32	15.04	0.018	0.576	0.432	0.144	0.260917	0.135379	51.88602	0.432	0.144	0.038162	0.926818	0.260917	51.88602	32	15.04
	Stage 6	Pr3D	36	0.751	0.0309	0.517		1.2989	36	16.92	0.018	0.648	0.486	0.162	0.103	-0.00965	-9.36893	0.486	0.162	0.0309	0.517	0.103	-9.36893	36	16.92
	Stage 6	Pr3E	0			0.035097		0.035097	0	0	0.018	0	0	0	0	0	#DIV/0!	0	0	0	0.035097	0	#DIV/0!	0	0