Cleanaway

600 Woodstock Avenue Rooty Hill

CIVIL ENGINEERING SSDA REPORT

PREPARED FOR
Charter Hall
L20, No. 1 Martin Place
Sydney NSW 2000

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Civil Engineering SSDA Report

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
23.12.21	1	Draft Issue	H. Genc	J. Grinsell
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Contents

1. Introduction

Northrop Consulting Engineers Pty Ltd have been engaged by Charter Hall Pty to prepare Civil Engineering design documentation for a recycling facility at 600 Woodstock Avenue, Rooty Hill. This report has been prepared to accompany a State Significant Development Application (SSDA) submission for the proposed recycling facility.

The main civil engineering components that are explored in this report include:

- Sediment & Erosion Control;
- Stormwater Management and On-site Stormwater Detention;
- Stormwater Quality and;
- Water Conservation.

1.1 The Proposal

The proposed development consists of the construction and operation of a new recycling complex in Rooty Hill within the Blacktown Council LGA.

The scope of works of the proposed development is summarised below:

- Demolition of existing structures.
- Construction and operation of a purpose-built Materials Recycling Facility comprising a total of
- 7,572m² gross floor area, including:
    - Maximum building height of RL 57.83m.
    - Warehouse space: 6,732m²
    - Office space (across two levels) and amenities: 840m²
    - Capacity to process up to 120,000 tonnes per annum (TPA)
- Car parking provided on-site: 40 car spaces
- Hard and soft landscaping
- Building identification signage

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1.2 Site Description

The site is located at Woodstock Avenue, Rooty Hill, NSW 2766 and is formally described as Lot 67 DP804292 (refer to Figure 1 below). The site has an area of 1.97ha.

The site is located within the Blacktown City Council Local Government Area and is approximately 280m from the nearest Westlink M7 exit.

The site is bordered by Woodstock Avenue to the north, existing industrial developments to the east, and Kellogg Road to the west and south.

Figure 1 – Site Aerial Photograph (Source: Nearmap)

1.3 Secretary's Environmental Assessment Requirements

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), namely:

Table 1: SEARs Table

SEARS	Response
Key Issues:	
8. Soil and Water	
A surface and groundwater assessment that includes: 1. An assessment of potential surface and groundwater impacts associated with the proposed development, including potential impacts on watercourses, riparian areas, groundwater, and groundwater-dependent communities nearby 2. A detailed site water balance including a description of the water demands and breakdown of water supplies, and any water licensing requirements 3. Details of stormwater/wastewater management system including the capacity of onsite detention system(s), onsite sewage management and measures to treat, reuse or dispose of water 4. Description of the measures to minimise water use 5. Description of the proposed erosion and sediment controls during construction 6. Characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters and monitoring activities and methodologies).	1. Refer to Section 7.6 of *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP. 2. Refer to Section 2.4.2.4 of this report for rainwater tank demands and sizing. 3. Refer to Section 2.4.1.3 of this report for on-site stormwater detention tank and 2.4.2 for stormwater quality management. 4. Refer to Section 2.4.2.4 of this report for rainwater tank sizing to minimise the demand of non-potable water. 5. Refer to Section 2.3 of this report. 6. Refer to section 2.4.2 of this report for stormwater quality treatment. Refer to Section 7.6 of *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP for Groundwater Assessment Results.
10. Infrastructure Requirements	
1. Identification of any infrastructure upgrades required off-site to facilitate the proposed development, and describe any arrangements to ensure that the upgrades will be implemented in a timely manner and maintained	1. Refer to Section 3 of this report for existing infrastructure.
18. Development Contributions	
1. Including demonstration that satisfactory arrangements have been or would be made to provide, or contribute to the provision of, necessary local and regional infrastructure required to support the proposed development.	1. Refer to Section 2.4.2.1 for Voluntary Planning Contribution for Stormwater Quality.
BLACKTOWN CITY COUNCIL	
2. Planning Requirements	
e. A cut and fill plan, and details of any retaining walls are to be provided.	e. Refer to Civil Drawing DAC03.01 in Appendix A.
3. Engineering Requirements	

a. The proposed development is to address compliance with Blacktown City Council Engineering Guide to Development - 2005	a. Refer to Section 2.1 of this report.
4. Drainage Requirements	
a. The applicant is to provide an On-site Stormwater Detention (OSD) strategy in the EIS, this is to include: • Details of the proposed On-site stormwater detention required for the proposed development are to be provided. • The OSD design is to be as per Council's Water Sensitive Urban Design (WSUD) Standard Drawings and the 'OSD Deemed to Comply Spreadsheet' (available online). • An OSD catchment plan and OSD spreadsheet with bypasses (if any). • Evidence of compliance with Council's WSUD Developer Handbook for further design considerations.	• Refer to Civil Engineering Drawing DAC16.01-02 for On-site detention (OSD) tank details. • Refer to Appendix B for Summary of this site "OSD Deemed to Comply Spreadsheet" • Refer to Drawing DAC05.41 for Catchment plan. • Refer to Section 2.4.1.3 for OSD design.
b. Water Sensitive Urban Design (WSUD) strategy • The applicant is to nominate their strategy either an on-lot treatment or Voluntary Planning Agreement (VPA) is required for the proposed development site. • The on-lot treatment option is to be assessed using Blacktown Council's MUSIC Link. Refer to the WSUD Developer's Handbook for further design requirements. • Provide a MUSIC catchment plan and MUSIC model if the on-lot water treatment option is proposed. • The VPA option will enable the developer to enter into an agreement with Council by paying a contribution. The applicable contribution rate is $62,890/ha plus an administration fee of 1.5%, and is to be indexed in accordance with Council's policy on the indexing of Section 7.11 contributions. Please contact Catherine.Harris@blacktown.nsw.gov.au for rates and applications before submitting a DA. • In addition where a VPA is entered into, an approved gross pollutant trap (GPT) is required to meet the gross pollutant and total hydrocarbon pollutant retention targets through an oil baffle. The GPT is to be sized to treat 6-month flow which is 75% of 1yr flow. Use Rational method or DRAINS to calculate the 6month flow.	• Refer to Section 2.4.2 for Stormwater Quality treatment design. • The on-lot treatment option has been deemed unfeasible for this site. • Catherine Harris from Blacktown Council has been contacted for the application of the VPA. The VPA offer letter will be submitted once DA has been lodged, as it requires the DA number. • Refer to Section 2.4.2.1 for discussion of the VPA.
b. Water Conservation strategy Water conservation is required for the proposed development. This water conservation strategy is to include: • Details of the Rainwater tank required to meet the water conservation targets under Part J for the development. A minimum target of 80% reuse demand is to be achieved. • Details of the Non-potable water demand is to include landscape watering and toilet/urinal flushing. • The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) is generally used to assess the performance of the rainwater tank using the node water balance and an electronic copy of the MUSIC model needs to be provided to Council for assessment. • Refer to WSUD developers Handbook for further design requirements and usage rates. • The Model is to allow for a minimum usage rate of 0.1 kL/day/toilet or urinal and a minimum of 0.4 kL/m2/year for landscape watering (excluding turfed areas). • The Model can take into account where the development is used only 5days/wk, the toilet/urinal usage can be discounted by 5 days out of 7 days, 5/7. • Other internal usage may involve truck/bin washing or other industrial usage and specific data will need to be supplied to justify these reuse rates. • All calculations in the model (number of toilets etc.)/graphs/catchments and models are to be provided.	Refer to Section 2.4.2.4 of this report for the water conservation strategy and rainwater tank design.
d. Other Engineering/Drainage issues to be addressed in the Engineering/Drainage strategy include: • Investigate the swale to the southeast of the proposed development and the impact the proposed development has on it. Provide catchment plans and calculations showing the existing swale and any proposed changes. • A freeboard will apply of 300 mm above the 1% AEP 1 in 100 year swale flow to the adjacent industrial floors. Other alternatives can also be considered.	The existing swale is located in the adjacent property and is indicatively shown on the Civil Engineering plan DAC04.02. No changes to the existing swale are proposed.
6. Building Requirements	

d. The submission of a Stormwater drainage concept plan	Refer to Drawing DAC04.01 and DAC04.02.
NSW EPA	
e. **Water management**	
• Including fire water management. Details of the premises storm water system, including the location of discharge points, stormwater drain, pits, outlets and shut off valve or similar device which prevents water pollution leaving the premises.	Refer to Fire and Incident Management Report prepared by Core Engineering Group. The location of discharge points, stormwater drains, pits and outlets and shut off valve are provided in the Civil Engineering Drawings in Appendix A.
c. **Water Quality Impacts**	
The assessment should demonstrate that all practical options to avoid discharge have been investigated and implemented measures have been taken to reduce the level of contaminants in the discharge, so that any impact is reduced where a discharge is necessary.	
Applicants must: • Identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point; • Describe the nature and degree of impact that any discharge(s) will have on the receiving environment. This includes consideration of all pollutants that pose a risk of non-trivial harm to human health and the environment (this should also include intercepted saline groundwater or acidic runoff generated by acid sulphate soil where appropriate); • Demonstrate assessment against the ambient NSW Water Quality Objectives and environmental values for the receiving waters relevant to the infrastructure activity. This includes the indicators and associated trigger values or criteria for the identified environmental values (this information should be sourced from the ANZG (2018) criteria).	Refer to Section 2.4.2 for Stormwater Quality treatment design, in conjunction with Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW (dated September 2021), prepared by WSP for Groundwater and Environmental assessment.
Technical standards and requirements include: • Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DECC 2008) • Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Australian and New Zealand Governments and Australian State and territory governments,). • NSW Water Quality and River Flow Objectives • Using the ANZECC Guidelines and Water Quality Objectives in NSW (DEC 2006) • Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DEC, 2008), Stormwater Publications	Refer to Section 2.3 of this report for Sediment and Erosion Control, in conjunction with Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW (dated September 2021), prepared by WSP for Groundwater and Environmental assessment.
BLACKTOWN CITY COUNCIL	
2. Flooding	
• The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including: a. Flood prone land. b. Flood planning area, the area below the flood planning level. c. Hydraulic categorisation (floodways and flood storage areas). d. Flood Hazard.	Refer to Section 2.5 of this report for flooding information.

• The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event.	Refer to Section 2.5 of this report for flooding information.
• The EIS must model the effect of the proposed development (including fill) on the flood behaviour under current flood behaviour for a range of design events as identified above. This includes the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.	Refer to Section 2.5 of this report for flooding information.
• Modelling in the EIS must consider and document: a. Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies. b. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood. c. Impacts of the proposed development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories d. Relevant provisions of the NSW Floodplain Development Manual 2005.	Refer to Section 2.5 of this report for flooding information.
• The EIS must assess the impacts on the proposed development on flood behaviour, including: a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.0 b. Consistency with Council floodplain risk management plans. c. Consistency with any Rural Floodplain Management Plans. d. Compatibility with the flood hazard of the land. e. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land. f. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site. g. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses. h. Any impacts the proposed development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council. i. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council. j. Emergency management, evacuation and access, and contingency measures for the proposed development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES. k. Any impacts the proposed development may have on the social and economic costs to the community as consequence of flooding.	Refer to Section 2.5 of this report for flooding information.
3. Soil and Water	
• The EIS must map the following features relevant to water and soils including: a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map). b. Rivers, streams, wetlands, estuaries (as described in s.4.2 of the Biodiversity Assessment Method). c. Wetlands as described in s.4.2 of the Biodiversity Assessment Method. d. Groundwater. e. Groundwater dependent ecosystems. f. Proposed intake and discharge locations.	Refer to Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW (dated September 2021), prepared by WSP for Groundwater and Environmental assessment. The proposed stormwater discharge location is shown on the Civil Drawing DAC04.01, in Appendix A.
• The EIS must describe background conditions for any water resource likely to be affected by the development, including: a. Existing surface and groundwater. b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations. c. Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.	Refer to *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP for Groundwater and Environmental assessment.

d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government. e. The Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (OEH, 2017).	Refer to section 2.4 of this report for Stormwater Quantity and Quality Management.
• The EIS must assess the impacts of the development on water quality, including: a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction. b. Identification of proposed monitoring of water quality. c. Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan).	Refer to Section 2.4.2 of this report for Stormwater Quality. Management and the *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP for Groundwater.
• The EIS must assess the impact of the development on hydrology, including: a. Water balance including quantity, quality and source. b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas. c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems. d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches). e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water. f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options. g. Identification of proposed monitoring of hydrological attributes	Refer to section 2.4 of this report for Stormwater Quantity and Quality Management. Refer to *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP for Groundwater and Environmental assessment.
NSW Industry and Environment	
DPIE Water and NRAR	
The SEARS should include:	
• The identification of an adequate and secure water supply for the life of the project. This includes confirmation that water can be sourced from an appropriately authorised and reliable supply. This is also to include an assessment of the current market depth where water entitlement is required to be purchased.	The proposed site will connect to the existing water supply system as detailed by the Project Hydraulic Engineer.
• A detailed and consolidated site water balance.	Refer to Section 2.4 of this report.
• Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.	Refer to Section 2.4.2 of this report for surface water quality treatment. Refer to Section 6.3 of *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP.
• Proposed surface and groundwater monitoring activities and methodologies.	Refer to Section 2.4.2 of this report for surface water quality treatment. Refer to Section 6.3 of *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP.

• Consideration of relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).	Refer to *Environmental Due Diligence Assessment - Phase I and II - 600 Woodstock Avenue, Glendenning NSW* (dated September 2021), prepared by WSP.

2. Proposed Civil Works

2.1 Design Criteria and Methodology

The objectives of this report are to ensure that the proposed civil engineering design of the site meets the requirements stipulated in the following documents:

- Blacktown Development Control Plan (2015)
- Blacktown City Council Engineering Guide for Development (2005)
- Blacktown City Council WSUD developer handbook (2020)
- Blacktown City Council WSUD Inspection and maintenance guidelines (2019)
- Managing Urban Stormwater Soil & Construction (2004) by Landcom (The Blue Book)
- AS 3500:2018 (Plumbing and Drainage)

2.2 Site Topography

The site has an elevation range of approximately 5m, ranging from RL46m AHD in the northeast to RL 41m AHD in the southwest. A crest dissects the site such that the northern portion of the site falls (approx. 5%) from east to the northwest. The southern portion of the site falls (approx. 3%) from the north to the southeast corner.

2.3 Sediment and Erosion Control Measures

2.3.1 Sediment and Erosion Control

The objectives of the sediment and erosion control for the development site will be to ensure:

- Adequate sediment and erosion control measures are applied prior to the commencement of construction and are maintained throughout construction; and
- Construction site runoff is appropriately treated in accordance with the requirements of Blacktown City Council, prior to discharge.

Prior to any earthworks commencing on site, the sediment and erosion control will need to be provided during the construction phase of the development in accordance with the requirements of Blacktown City Council and The Blue Book.

2.3.2 Sediment Basin

Due to the size of the proposed development, a temporary sediment basin will be required to capture site runoff during construction. The construction of the basin may be undertaken in stages to enable maximum runoff capture assisted by diversion swales and direct runoff to the basin. The design parameters of this temporary sediment basin are summarised in Table 2 (below).

Calculations to determine the required basin size are to be based on available geotechnical information regarding soil types and using The Blue Book.

To ensure the sediment basin is working effectively it will need to be maintained throughout the construction works. Maintenance includes ensuring adequate settlement times or flocculation and pumping of clean water to reach the minimum storage volume at the lower level of the settling zone. The settling zone will be identified by pegs to clearly show the level at which design storage capacity is available.

The pumped water from the sediment basin can be reused for dust control during construction.

Overflow weirs are to be provided to control overflows for rainfall events more than the design criteria.

Table 2: Sediment Basin Design Summary

SEDIMENT BASIN CALCULATIONS SUMMARY	
PARAMETER	**ADOPTED VALUE**
Total Disturbed Area (ha)	1.97
Soil Texture Group	D
Design Rainfall Depth (Days)	5
Design Rainfall Depth (Percentile)	80%
x-Day, y-Percentile Rainfall Event (mm)	24.6
C_V	0.5
Settling Zone Volume (m^3)	242.3
Sediment Storage Volume (m^3)	121.15
Total Basin Volume (m^3)	363.46

2.3.3 Sediment and Erosion Control Measures

Prior to any earthworks commencing on site, sediment and erosion control measure shall be implemented generally in accordance with the engineering drawings, Council requirements, and The Blue Book. The measures are intended to be a minimum treatment only as the contractor will be required to modify and stage the sediment and erosion control measures to suit the construction program, sequencing, and techniques. These measures may include:

- A temporary site security/safety fence is to be constructed around the site, the site office area, and the proposed sediment basin.
- Sediment fencing provided downstream of disturbed areas, including any topsoil stockpiles, shown in Figure 2 (below).
- Dust control measures including covering stockpiles, installing fence hessian, and watering exposed areas.

- Placement of hay bales or mesh and gravel inlet filters around and along proposed catch drains and around stormwater inlets pits
- The construction of a temporary sediment basin as noted above.
- Stabilised site access at the construction vehicle entry/exits.
- Any stockpiled material, including topsoil, shall be located as far away as possible from any associated natural watercourses or temporary overland flow paths. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

Figure 2: Sediment Fence

2.4 Stormwater Management Strategy

2.4.1 Stormwater Quantity Management

Northrop has performed a desktop investigation to determine a conceptual stormwater management strategy for the proposed development scenario, and the stormwater management requirements for the development. These requirements have been derived from Blacktown City Council's Engineering Guide for Development (2005).

2.4.1.1 Major / Minor Drainage System

The major/minor approach to stormwater drainage is the recognised drainage concept for urban catchments within the Blacktown City Council (BCC) Local Government Area.

The minor drainage system is comprised of below ground pit and pipe network and is designed to control nuisance flooding and enable effective stormwater management for the site. Council requires the minor drainage system to be designed for the critical 5% Annual Exceedance Probability (AEP) storm with overland flow safely catering for the 1% AEP storm.

The major drainage system incorporates suitably designed overland flow paths and drainage to direct flows into the On-site Stormwater Detention (OSD) system for all events up to the critical 1% AEP storm event.

Overland flow paths are to be provided over all pipelines that are not designed to cater for this flow. The design of these overland flow paths must consider the velocity-depth hazard of 0.4m/s.

Please refer to Appendix A for a proposed concept stormwater layout for the development.

2.4.1.2 Modelling of Stormwater Quantity

The piped system and overland flow paths were designed using 12d Design Software.

Hydrological data was obtained from the Australian Rainfall and Runoff Data Hub and Australian Bureau of Meteorology website.

The hydrological model used is ILSAX, the following parameters were adopted:

Table 3: Stormwater Quantity modelling parameters.

PARAMETER	ADOPTED VALUE
Paved (impervious) area depression storage	1 mm
Supplementary area depression storage	1mm
Grassed (pervious) area depression storage	5mm
Soil type	3
Pervious retardance coefficient n*	0.013
Impervious retardance coefficient	0.3

The 12d model layout is shown below, which can be supplied upon request.

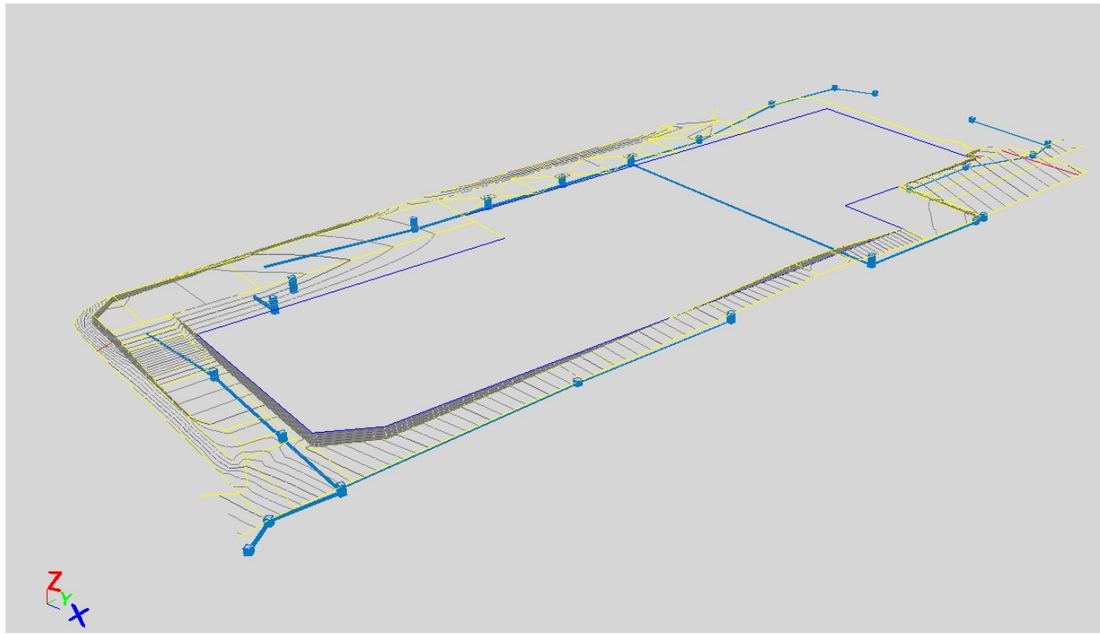

Figure 3: 12d model layout.

2.4.1.3 On-site Stormwater Detention

Part J of Blacktown City Council's Development Control Plan (2015) stipulates that On-site Stormwater Detention (OSD) must be provided in accordance with Blacktown City Council's Engineering Guide for Development (2005).

A map is provided in the Engineering Guide for Development and indicates that the development site is within a catchment area requiring OSD, as shown in Figure 4 below (Hawkesbury River Sub-Catchments Permanent OSD Required).

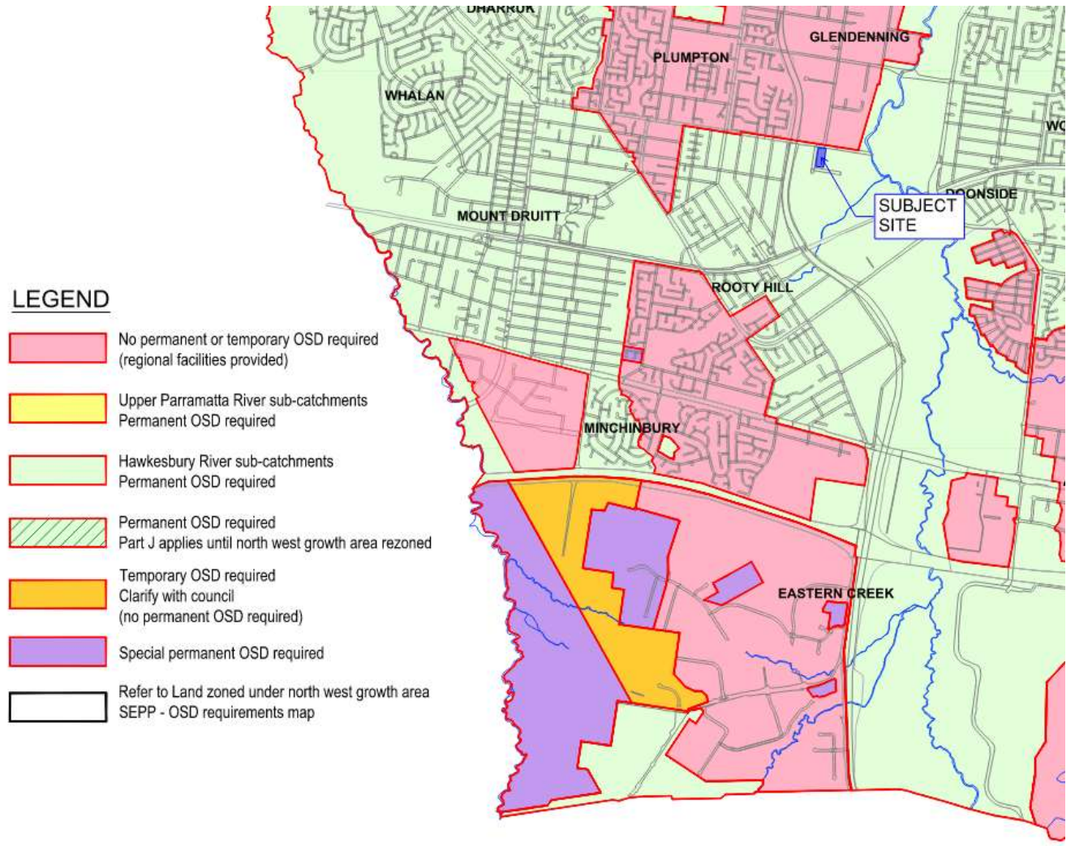

Figure 4: OSD Map (source: Blacktown City Council's Engineering Guide for Development (2005), appendix B)

Part J of the DCP specifies that the Deemed to Comply Tool must be used for the design of the OSD. Therefore, the Blacktown City Council – On-site Stormwater Detention Deemed to Comply Tool spreadsheet has been used to calculate the volume and discharge of the tank. A summary of the OSD tank's design parameters is provided in Table 4 (below). Refer to Appendix B for the On-site Stormwater Detention Deemed to comply spreadsheet.

Table 4: Summary of OSD Design Parameters

PARAMETER	ADOPTED VALUE
Total OSD Volume (m^3) (Below Emergency Overflow Weir)	869.57
OSD Volume (m^3) Below The 50% AEP Overflow Weir	591.15
Average RL of Base of Tank (m AHD)	40.28
RL of OSD Outlet Invert Level (m AHD)	39.82
RL of 100-Year ARI Overflow Weir (m AHD)	42.47
RL of 1.5-Year ARI Overflow Weir (m AHD)	41.72

Access grates have been provided such that the maximum reach from any point in the tank to the nearest grate is 6m. In the unlikely event that the outlet pipe blocks, these grates may allow water to surcharge.

Refer to Drawing DAC16.01 (Appendix A), which provides details of the proposed OSD tank.

Maintenance of the OSD is required in accordance with BCC's WSUD inspection and maintenance guidelines, part B, chapter 6.

2.4.1.4 Connection to Councils Drainage System

Typically, outflow pipes from stormwater drainage systems connect either directly to Council's stormwater infrastructure or utilise existing stormwater connections within the site.

Based on review of the survey provided by Boxall dated 16th of July of 2021 and site inspection, stormwater drainage pits are located at the kerb on the Woodstock and Kellogg frontages. The most feasible connection point for the proposed development would be the existing kerb inlet pit located east of the site on Kellogg Road. The proposed connection is shown in the stormwater management plan, as seen in drawing DAC04.01 (Appendix A).

2.4.2 Stormwater Quality Management

2.4.2.1 Voluntary Planning Agreement

Blacktown City Council has adopted a Voluntary Contributions Scheme. Part of this allows Developers to pay a contribution towards regional water quality treatment objectives in an effort to reduce the amount of on lot treatment, as part of a Voluntary Planning Agreement (VPA) between the two parties. The site is within the Voluntary Contributions Scheme Boundary, as seen in Figure 5. As such, a Voluntary Planning Agreement (VPA) may be negotiated with Council to offset water quality requirements off-site.

Section 3.2 of the Blacktown Council WSUD Developer Handbook (2020) stipulates that for businesses and industrial developments that meet the water quality obligations through a VPA or S7.11 contribution and which is larger than 2000 m^2, there is an obligation to have an on-site Gross Pollutant Trap (GPT) capable of trapping 90% of hydrocarbons and gross pollutants.

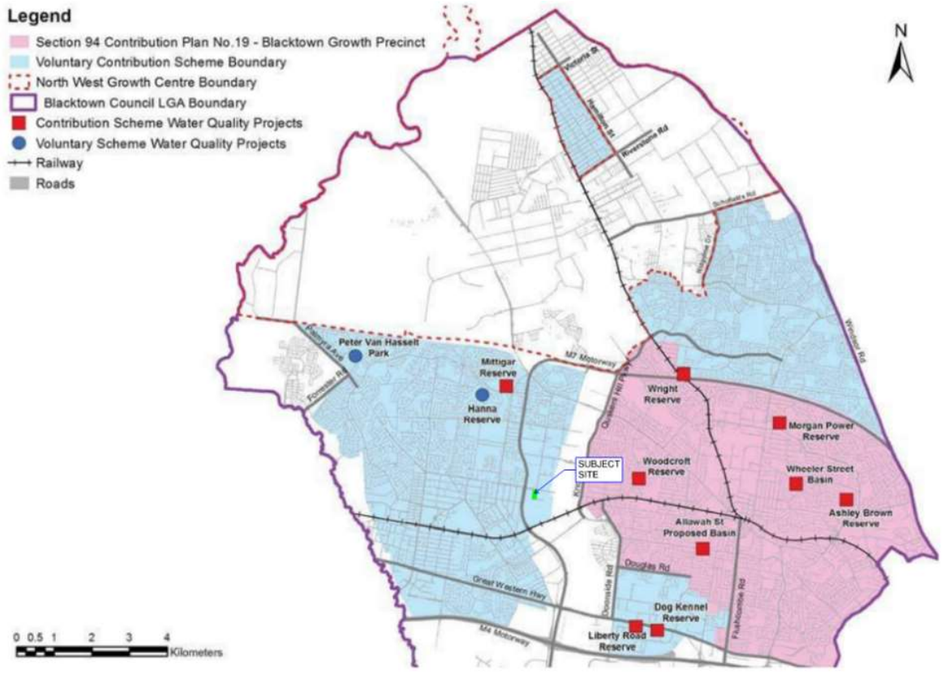

Figure 5: Voluntary Contributions Scheme Boundary Map (GHD, May 2020)

2.4.2.2 Gross Pollutant Trap

In addition to the VPA agreement with Blacktown Council, a Gross Pollutant Trap (GPT) has been designed. The GPT has been sized to treat 6-month flow, which has been considered as the 75% of 1 year flow as per BCC's advice.

- 1 year ARI flow = 105L/s
- 6-month ARI flow (75% of 1 year ARI flow) = 79L/s

A CDS Unit 1009 (Rocla) or approved equivalent is recommended for the proposed development, as it satisfies the requirement of Section 3.2 of the Blacktown Council WSUD Developer Handbook (2020). This GPT has been designed in accordance with the requirements of Blacktown City Council.

Maintenance of the GPT is required in accordance with BCC's WSUD inspection and maintenance guidelines, part B, chapter 7.

2.4.2.3 Water Quality modelling

The water quality modelling software MUSIC v6.3 was used to analyse the performance of the treatment train to ensure water conservation targets were being met.

Blacktown City Council's MUSIC link and BCC's source and treatment nodes were used in the model. Figure 6 shows the MUSIC model:

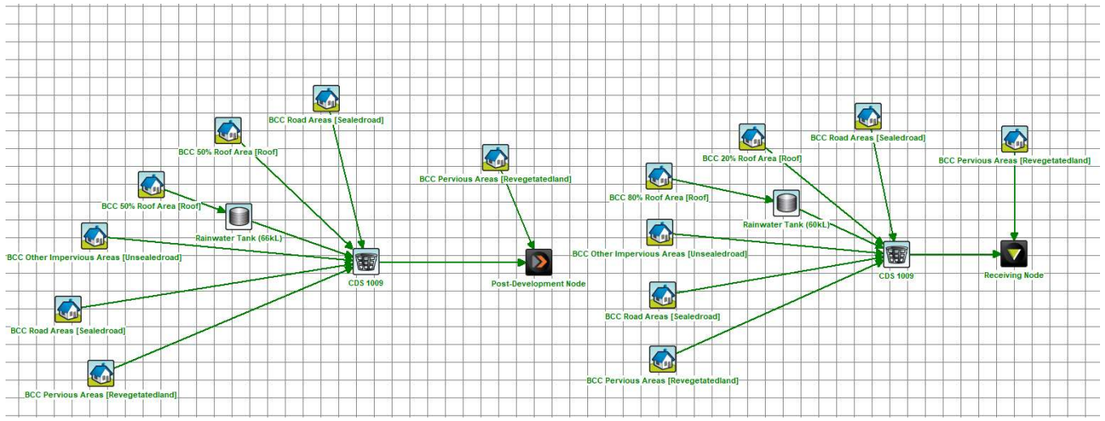

Figure 6: Post-development MUSIC model.

2.4.2.4 Rainwater Tank

Section 4.3 of Part J of the DCP specifies that industrial and business developments must supply 80% of their non-potable demand using non potable sources. Two options have been considered for the roof drainage connection to the rainwater tank.

- Option 1: the whole roof will be connected to the rainwater tank, sized to capture and convey the 1:100-year storm event.
- Option 2: 50% (eastern portion) of the roof will be connected to the rainwater tank, sized to capture and convey the 1:100-year storm event. In this scenario the western portion of the roof is to be connected to the OSD tank, the stormwater drainage lines will require to be upsized to accommodate additional flow.

The rainwater tank design parameters are summarised in Table 5 (below).

Table 5: Rainwater Tank Design Summary

DESIGN PARAMETER	ADOPTED VALUE	COMMENT
Re-use Demand (Annual)	720.86kL/yr	Irrigation includes 1802.14sqm of landscaped area, with an irrigation rate of 0.4kL/year/m^2.
Re-use Demand (Daily)	1.5kL/day	Includes a combined total of 21 toilets, urinals, and showers at a re-use rate of 0.1kL/day/toilet, which is then proportioned by 5/7 as the site is only occupied during the 5 weekdays of each week.

The rainwater tank results for both options are summarised in Table 6(below).

Table 6: Rainwater Tank results.

TANK SIZE	COMMENT	RE-USE DEMAND MET
60kL (Option 1)	Modelled as 54kL to account for 10% storage loss	80.87%
66kL (Option 2)	Modelled as 60kL to account for 10% storage loss	80.03%

Maintenance of the rainwater tank is required in accordance with BCC's WSUD Inspection and Maintenance Guidelines, Part B, Chapter 1.

2.5 Flooding

The proposed development does not require a detailed flood impact assessment as it is not located in a flood affected area, as shown in Council's Flood Map, which is shown in Figure 7 (below).

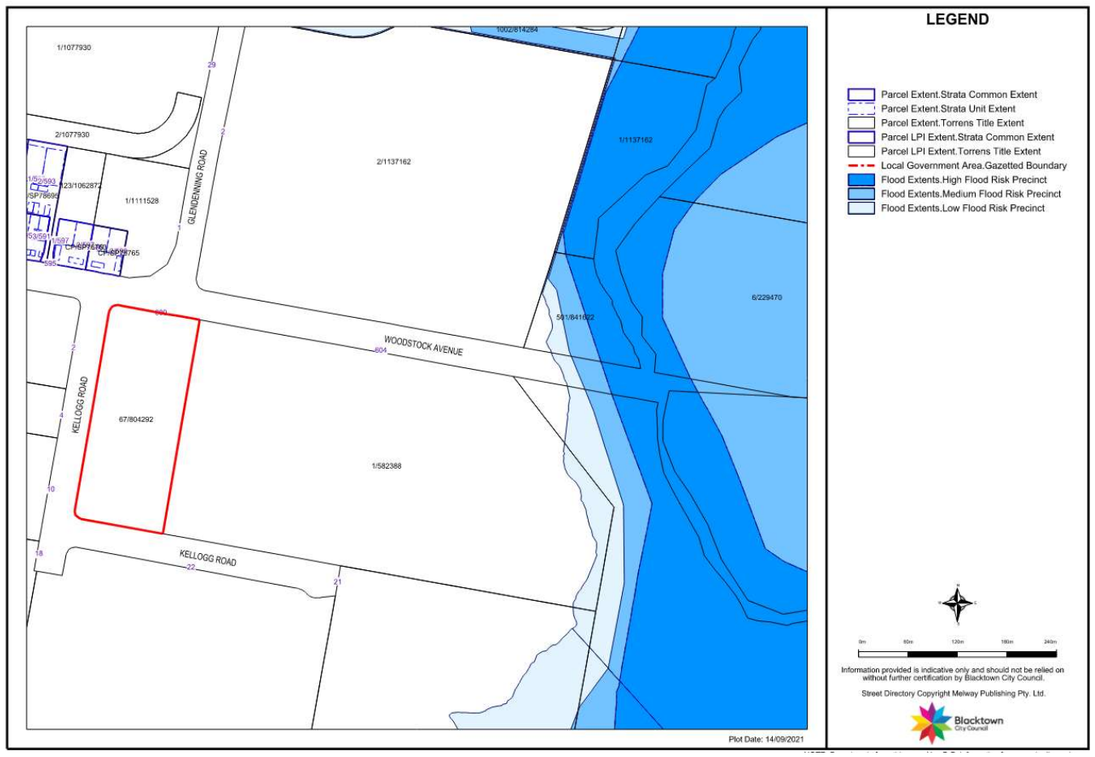

Figure 7: Council Flood Map (Source: Blacktown City Council Maps Online, 2021)

3. Existing Infrastructure

Based on limited survey information, publicly available information from Blacktown City Council, and Dial Before You Dig (DBYD), Northrop has undertaken a preliminary investigation of existing utility infrastructure in the vicinity of the proposed development site.

Water

- A Ø300mm cast iron cement lined (CICL) watermain is present within the verge on the western side of Kellogg Road and a Ø200 ductile iron cement lined (DICL) main is located on the southern side of Kellogg Road. A Ø150mm cast iron cement lined (CICL) is located on the northern side of Woodstock Ave. This is shown in Figure 8 (below).
- Experience indicates Sydney Water would prefer connection to the smaller watermain. Exact connection points will need to be established with Sydney Water.

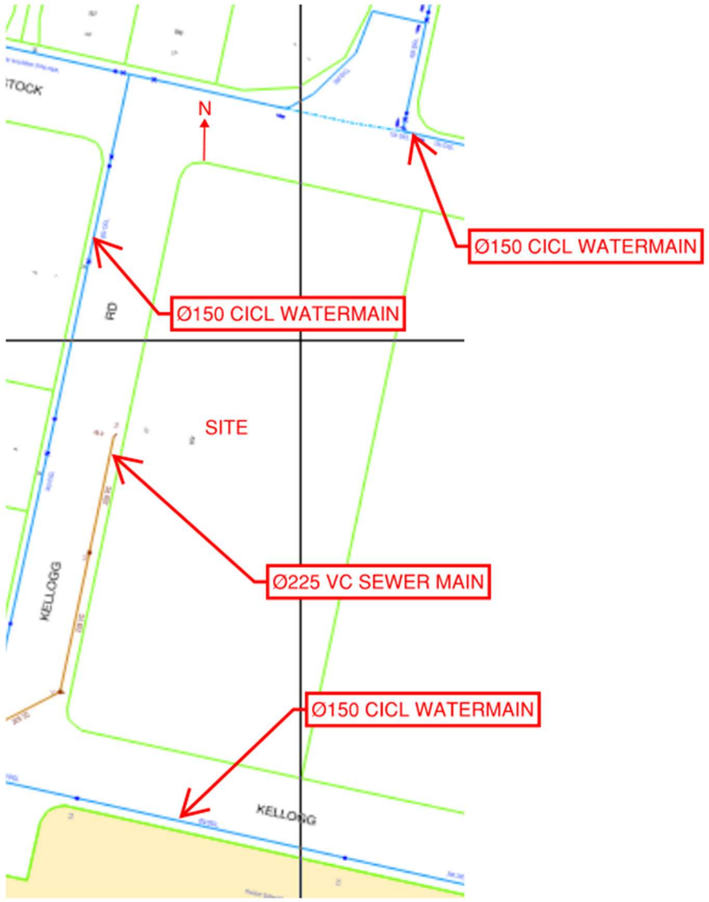

Figure 8: Water and Sewer Services (Source: Sydney Water DBYD,2021)

Sewer

- A Ø225 Vitrified Clay (VC) sewer main is located on the eastern side of Kellogg Rd with a stub end at a depth of 1.9m. This main appears to be of adequate size but it should be noted the southeastern portion of the site may not be able to drain to this existing connection point.

Gas

- A Ø10 1050 kPa gas main is located with the verge of the Woodstock Ave frontage and has and existing connection to the site. This is shown in Figure 9 (below).

Figure 9: Gas Services (Source: Jemena Gas DBYD, 2021)

Power

- Three Pad Mount (PM) electrical sub-stations are located adjacent to the northern boundary. The size of the sub stations could not be ascertained at this stage. Easement for right of way and allocation of land will be associated with the substations, supported covenants restricting land usage in this area. Refer to the title documents for specific burdens to the site due top easements for power supply.

  This is shown in Figure 10 (below).

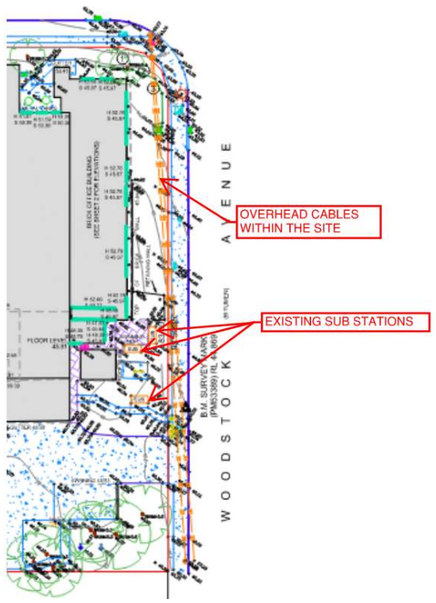

Figure 10: High Voltage Cabling Works Required (Source: Site survey, supplied by Boxall, 2021)

Communications

- NBN services are connected to the site via the northern boundary of Woodstock Avenue. This is shown in Figure 11 (below).

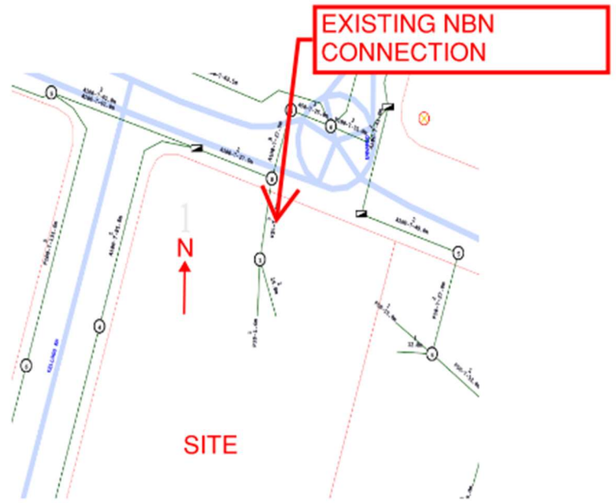

Figure 11: NBN Services (Source: NBN DBYD, 2021)

4. Fire Water Management

The Fire Incident Management Plan prepared by Core Engineering Group outlines the requirement of fire water to be stored on site in the event of a fire. To prevent contamination of downstream waters, Core Engineering Group have indicated that a total of 1,450m^3 of fire water is to be bunded on site. The following measures are proposed to store water in the event of a fire:

- The stormwater pit and pipe network and OSD tank will be used as storage for fire water. The last pit prior to discharge to Council's network and the OSD tank are to be fitted with a penstock valve. The penstock valve should be connected to the Fire Control Panel automated to close when fire event occurs. Fire water should be pumped and disposed of after a fire event. The Penstock valve should be manually opened and reset to fire control panel.
- The Mechanical Conveyor Sump is also to be used for firewater bunding within the building, including a series of pipes connected to the mechanical conveyor sump for each fire compartment. A high-level overflow pipe to the OSD tank is to be provided to interconnect the two storage areas.
- All doors' thresholds to be provided with 50mm bunding / transition to FFL to allow fire water to be directed to Mechanical Conveyor Sump.

The volumes provided and required are delineated in Table 7Table 7: Fire Water Storage Volumes (below).

Refer to Appendix C for sketch identifying fire water bunding areas and catchments.

Table 7: Fire Water Storage Volumes

ITEM	VOLUME	COMMENTS
Onsite Stormwater Detention Tank	890m^3	867m3 to top of weir in stormwater design calculations on cover sheet
Mechanical Conveyor Sump	567m^3	56.7m (L) x 5.0m (W) x 2.0m (D)
Total	1,457m^3	
Requirement	1,450m^3	Based on Fire Incident Management Plan

5. Conclusion

In summary, the civil engineering requirements for the proposed development are as follows:

- Sediment & Erosion Control – A sediment basin is required to effectively capture sediment laden site runoff during siteworks. Sediment and erosion control measures should be installed and maintained for the duration of the construction works.
- Stormwater Infrastructure – The stormwater design has considered the major/minor philosophy consistent with the requirements of Blacktown City Council for the below ground pit and pipe network inclusive of On-site Stormwater Detention.
- Water Quality and Conservation – Water Quality requirements will be achieved through the provision of a Gross Pollutant Trap, in accordance with the requirements of Blacktown City Council. A Rainwater Tank has been designed to achieve 80% of non-potable water reuse demands.

Appendix A – Civil Engineering Plans

600 WOODSTOCK AVENUE, GLENDENNING

CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

SOURCE : NEARMAP.COM.AU (©2021)

LOCALITY PLAN

CIVIL DRAWING SCHEDULE

DWG No.	DRAWING TITLE
DAC01.01	COVER SHEET, DRAWING SCHEDULE & LOCALITY PLAN
DAC01.11	SPECIFICATION NOTES
DAC01.21	GENERAL ARRANGEMENT PLAN
DAC02.01	CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN
DAC02.11	SEDIMENT AND SOIL EROSION CONTROL DETAILS
DAC03.01	BULK EARTHWORKS PLAN
DAC04.01	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
DAC04.02	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02
DAC05.11	STORMWATER LONGITUDINAL SECTIONS - SHEET 01
DAC05.12	STORMWATER LONGITUDINAL SECTIONS - SHEET 02
DAC05.13	STORMWATER LONGITUDINAL SECTIONS - SHEET 03
DAC05.14	STORMWATER LONGITUDINAL SECTIONS - SHEET 04
DAC05.31	STORMWATER DETAILS - SHEET 01
DAC05.32	STORMWATER DETAILS - SHEET 02
DAC05.41	STORMWATER CATCHMENT PLAN
DAC16.01	DETAILS - SHEET 01
DAC16.02	DETAILS - SHEET 02

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: Resource Recovery Design (Aust) Pty Ltd.

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SCALE 1:5000@ A1 — 0 50 100 150 200 250m

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PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — COVER SHEET, DRAWING SCHEDULE & LOCALITY PLAN

JOB NUMBER: 211274

DRAWING NUMBER: DAC01.01 REVISION: 02

DRAWING SHEET SIZE = A1

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL DEVELOPMENT GUIDELINES .THE AFOREMENTIONED GUIDELINES INCLUSIVE OF ALL SPECIFICATIONS TAKE PRECEDENCE OVER NOTES PROVIDED BELOW.

GENERAL NOTES

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DIMENSIONS ARE IN MILLIMETRES & ALL LEVELS ARE IN METRES, UNO (UNLESS NOTED OTHERWISE).

NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.

ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORK.

DETAIL SURVEY DATA WAS SUPPLIED BY BOXALL SURVEYORS DRAWING DATED 16.07.2021.

EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.

ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.

ALL STORMWATER MANAGEMENT MEASURES SHOWN ON THIS DRAWING HAVE BEEN PREPARED FOR DEVELOPMENT APPLICATION PURPOSES TO DEMONSTRATE FEASIBILITY. ALL MEASURES WILL BE SUBJECT TO DETAIL DESIGN AT THE CONSTRUCTION CERTIFICATE STAGE AND MAY BE SUBJECT TO VARIATION PROVIDED THAT THE DESIGN INTENT IS MAINTAINED.

STORMWATER DRAINAGE

1. ALL DRAINAGE LINES SHALL BE UPVC (CLASS SN4) SEWER GRADE DRAINAGE PIPE, U.N.O.
2. ALL DRAINAGE LINES SHALL BE LAID AT 1% MIN. FALL, UNO.
3. ALL LEVELS ARE AUSTRALIAN HEIGHT DATUM (AHD).
4. ALL DOWNPIPES GUTTERS TO BE DESIGNED IN ACCORDANCE WITH AS/NZS 3500.3.2 - 2003 'STORMWATER' DRAINAGE.
5. THE STORMWATER DRAINAGE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH AS/NZS 3500.3.2-2003 'STORMWATER' DRAINAGE.
6. ANY VARIATIONS TO THE NOMINATED LEVELS SHALL BE REFERRED TO ENGINEER IMMEDIATELY.
7. SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS & EMBANKMENTS, WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM.
8. ALL GRATES TO BE GALVANISED STEEL WITH HINGES AND CHILD PROOF LOCK.
9. ALL GRATES TO BE HEEL SAFE WITHIN AGED CARE DEVELOPMENTS.
10. THE STORMWATER DRAINAGE IS DESIGNED IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL DCP.

RAINWATER RE-USE

1. PROVIDE RAINWATER RE-USE SYSTEM TO SUPPLY WATER FOR TOILET FLUSHING AND IRRIGATION.
2. GUTTER GUARD TO BE INSTALLED ON ALL EAVES GUTTERS.
3. A PERMANENT SIGN IS TO BE LOCATED IN THE VICINITY OF THE TANK STATING THE WATER IS "NON POTABLE WATER" WITH APPROPRIATE HAZARD IDENTIFICATION.
4. PIPEWORK USED FOR RAINWATER SERVICES SHALL BE COLOURED LILAC IN ACCORDANCE WITH AS1345.
5. ALL VALVES AND APERTURES SHALL BE CLEARLY AND PERMANENTLY LABELLED WITH SAFETY SIGNS TO COMPLY WITH AS1319.
6. RAINWATER TANK RETICULATION SYSTEM AND MAINS WATER BYPASS ARRANGEMENT TO BE INSTALLED IN ACCORDANCE WITH AS/NZS 3500.1.2-2003 AND THE NSW CODE OF PRACTICE : PLUMBING AND DRAINING.
7. A FIRST FLUSH FILTRATION DEVICE IS TO BE PROVIDED AT RAINWATER TANK.

DESIGN SUMMARY

ON-SITE DETENTION:

DESIGN BASIS:
- PRESCRIBED RATE

SITE STORAGE REQUIREMENT BELOW EMERGENCY OVERFLOW WEIR = 896.578m^3

SITE STORAGE REQUIREMENT BELOW 50% AEP OVERFLOW WEIR = 591.15m^3

BYPASS AREA/PERCENTAGE = 1973m^2/10%

MAXIMUM 1% AEP DISCHARGE = 230.045L/s
MAXIMUM 50% AEP DISCHARGE = 63.354 L/s

ON-SITE DETENTION SUMMARY:
- BELOW GROUND BLOCK WORK TANK

RAINWATER RE-USE:

IN ACCORDANCE WITH COUNCIL REQUIREMENTS.
TWO OPTIONS HAVE BEEN CONSIDERED FOR THE ROOF DRAINAGE CONNECTION TO THE RAINWATER TANK.

OPTION 1: THE WHOLE ROOF WILL BE CONNECTED TO THE RAINWATER TANK SIZED TO CAPTURE AND CONVEY THE 1:100 YEAR STORM EVENT
TANK SIZE = 60KL. (CURRENT DESIGN)

OPTION 2: 50% (EASTERN PORTION) OF THE ROOF WILL BE CONNECTED TO THE RAINWATER TANK SIZED TO CAPTURE AND CONVEY THE 1:100 YEAR STORM EVENT
TANK SIZE = 66KL.

RAINWATER RE-USE TO BE USED FOR THE FOLLOWING;
- TOILET FLUSHING;
- LANDSCAPE IRRIGATION.

STORMWATER MANAGEMENT REQUIREMENTS HAVE BEEN CALCULATED IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL-DEVELOPMENT CONTROL PLAN 2015: PART J WATER MANAGEMENT.

WATER QUALITY:

TO MEET BLACKTOWN CITY COUNCIL'S WATER SENSITIVE URBAN DESIGN REQUIREMENTS, THE DEVELOPER WILL ENTER A VOLUNTARY PLANNING AGREEMENT WITH COUNCIL AND A GROSS POLLUTANT TRAP (GPT) MODEL "CDS 1009" OR APPROVED EQUIVALENT SHOULD BE PROVIDED.

CONCEPT SOIL & WATER MANAGEMENT

1. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT ORDINANCES AND REGULATIONS; NOTE IN PARTICULAR THE REQUIREMENTS OF LANDCOMS MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION' (THE 'BLUE BOOK'). THIS SOIL AND WATER MANAGEMENT PLAN DETAILS THE ACTIONS TO BE TAKEN FOR THE MANAGEMENT AND DEWATERING OF STORMWATER DURING CONSTRUCTION OF THE PROPOSED BUILDING.
2. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
3. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
4. INSTALL SEDIMENT FENCING AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.
5. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
6. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF CONSTRUCTION. REFER ARCHITECTS PLANS FOR TREES TO BE KEPT.
7. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ONSITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.
8. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.
9. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE).
10. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
11. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
12. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION & SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS & SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ ALL MAINTENANCE, CLEANING & BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.
14. GROUNDWATER SEEPAGE RATES AND QUALITY TO BE MONITORED AND TREATED IF REQUIRED DURING CONSTRUCTION IN ACCORDANCE WITH REQUIREMENTS OF SUPERVISING GEOTECHNICAL ENGINEER.

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR INFORMATION	AC		AC	18.01.2022
03	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT
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ARCHITECT
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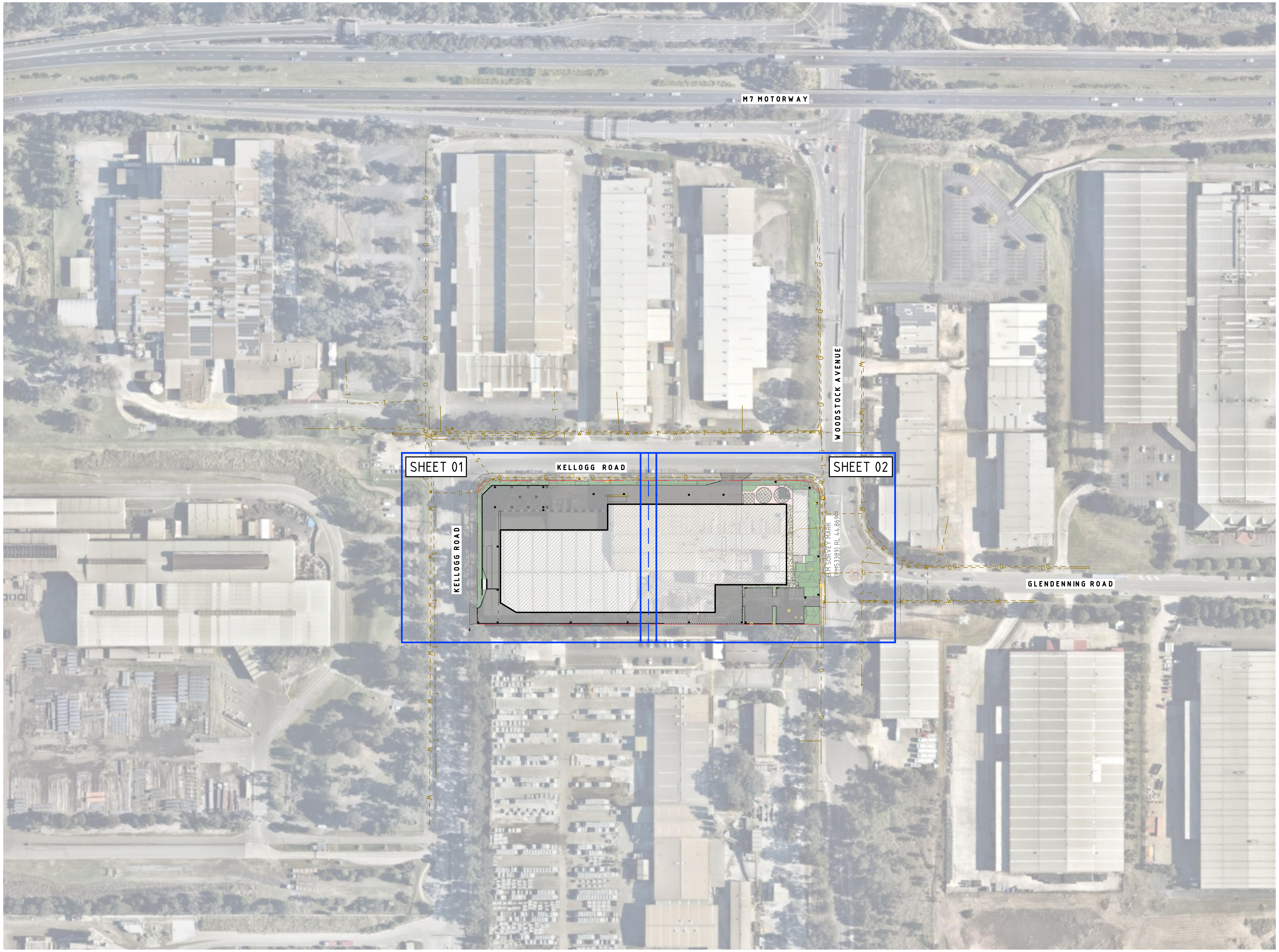
PROJECT
600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SPECIFICATION NOTES

JOB NUMBER **211274**
DRAWING NUMBER **DAC01.11**
REVISION **03**
DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- E — EXISTING ELECTRICITY
- T — EXISTING TELSTRA
- G — EXISTING GAS
- S — EXISTING SEWER
- SHEET EXTENTS

GENERAL NOTES:

1. SURVEY SUPPLIED BY:
   1.1. NAME: BOXALL SURVEYORS
   1.2. DATE: 16.07.2021
   1.3. REVISION: A
2. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.
3. NORTHROP TAKE NO RESPONSIBILITY FOR THE ACCURACY AND/OR USE OF THIS SURVEY AND ITS CONTENTS

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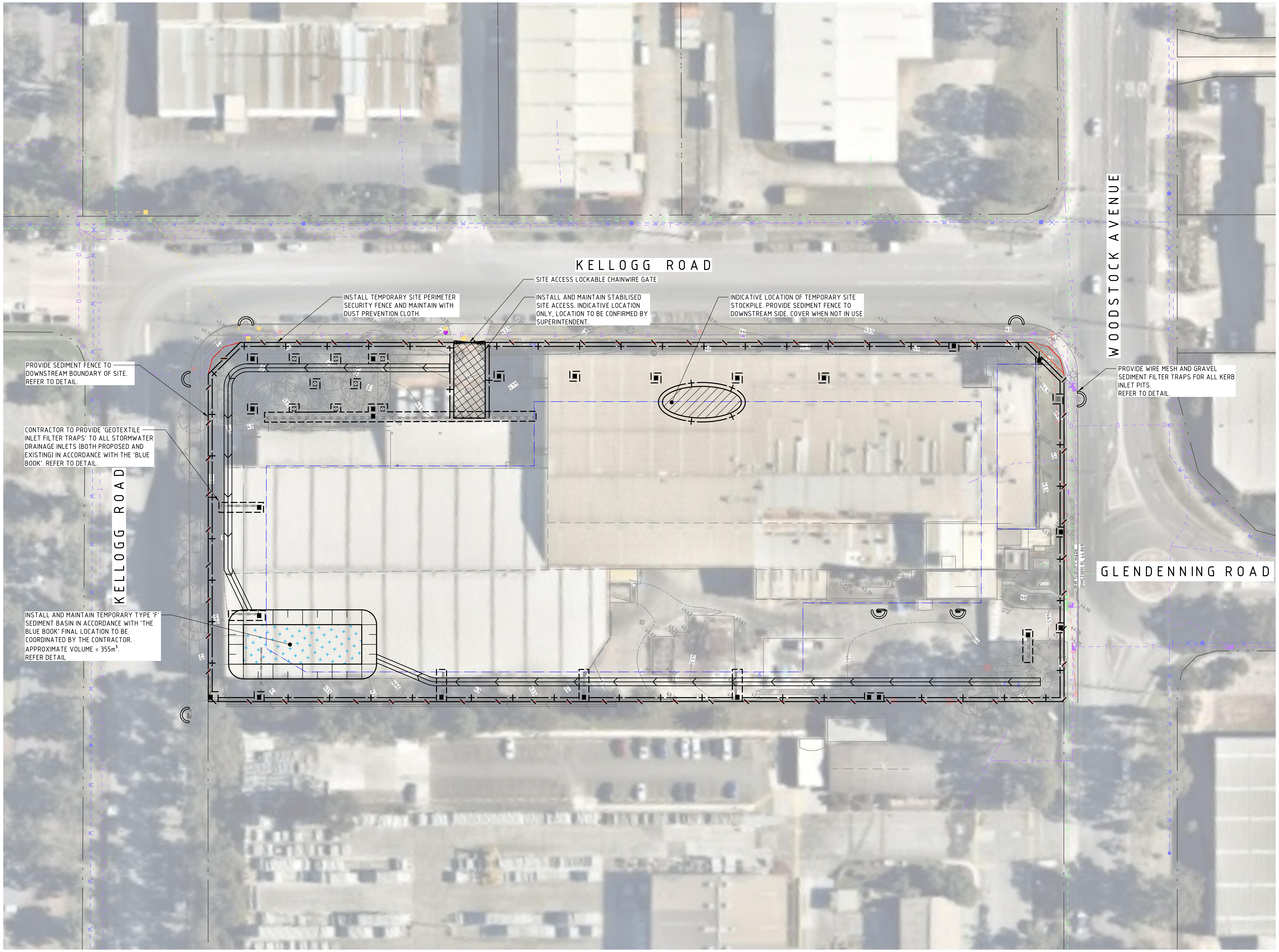
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — GENERAL ARRANGEMENT PLAN

JOB NUMBER: 211274

DRAWING NUMBER: DAC01.21 REVISION: 02

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- PROPOSED BUILDING FOOTPRINT
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- EXISTING ELECTRICITY
- EXISTING GAS
- EXISTING TELSTRA
- EXISTING OPTUS
- EXISTING WATER
- EXISTING SEWER
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- GEOTEXTILE INLET FILTER TRAP
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION CONTROL GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION WORKS.
4. CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
5. CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'

SEDIMENT BASIN CALCULATIONS

PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	1.91
SOIL TEXTURE GROUP	F
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	80
x-DAY, y-PERCENTILE RAINFALL EVENT	24.6
Cv	0.5
SETTLING ZONE VOLUME (m^3)	242.310
SEDIMENT STORAGE VOLUME (m^3)	121.155
TOTAL BASIN VOLUME (m^3)	363.465

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
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CLIENT: Charter Hall

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ARCHITECT: RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

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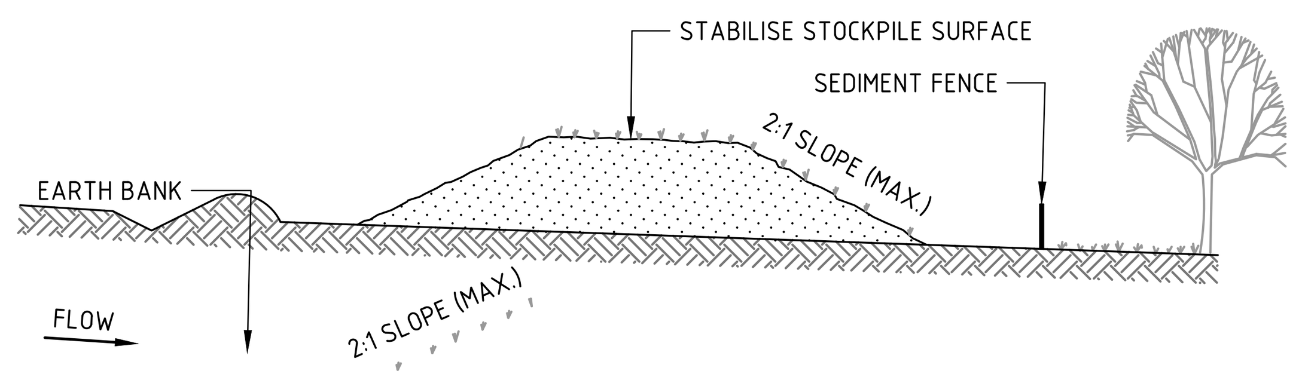
Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN

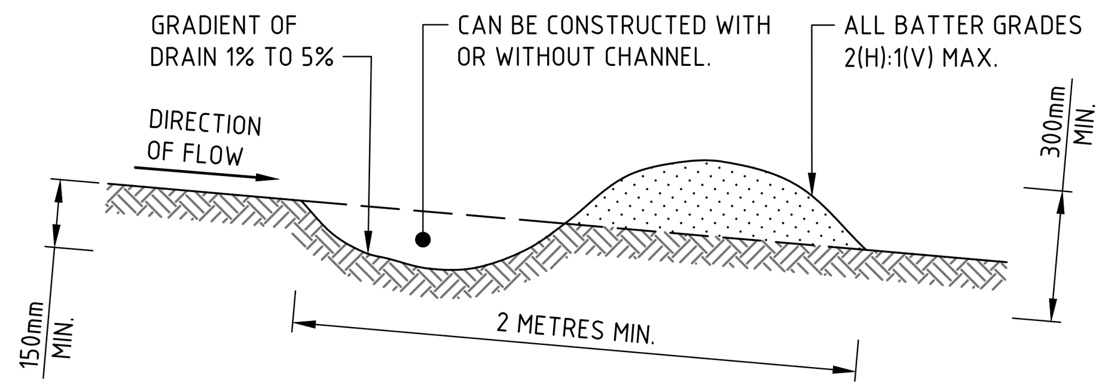
JOB NUMBER: 211274
DRAWING NUMBER: DAC02.01
REVISION: 02
DRAWING SHEET SIZE = A1



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

STOCKPILE

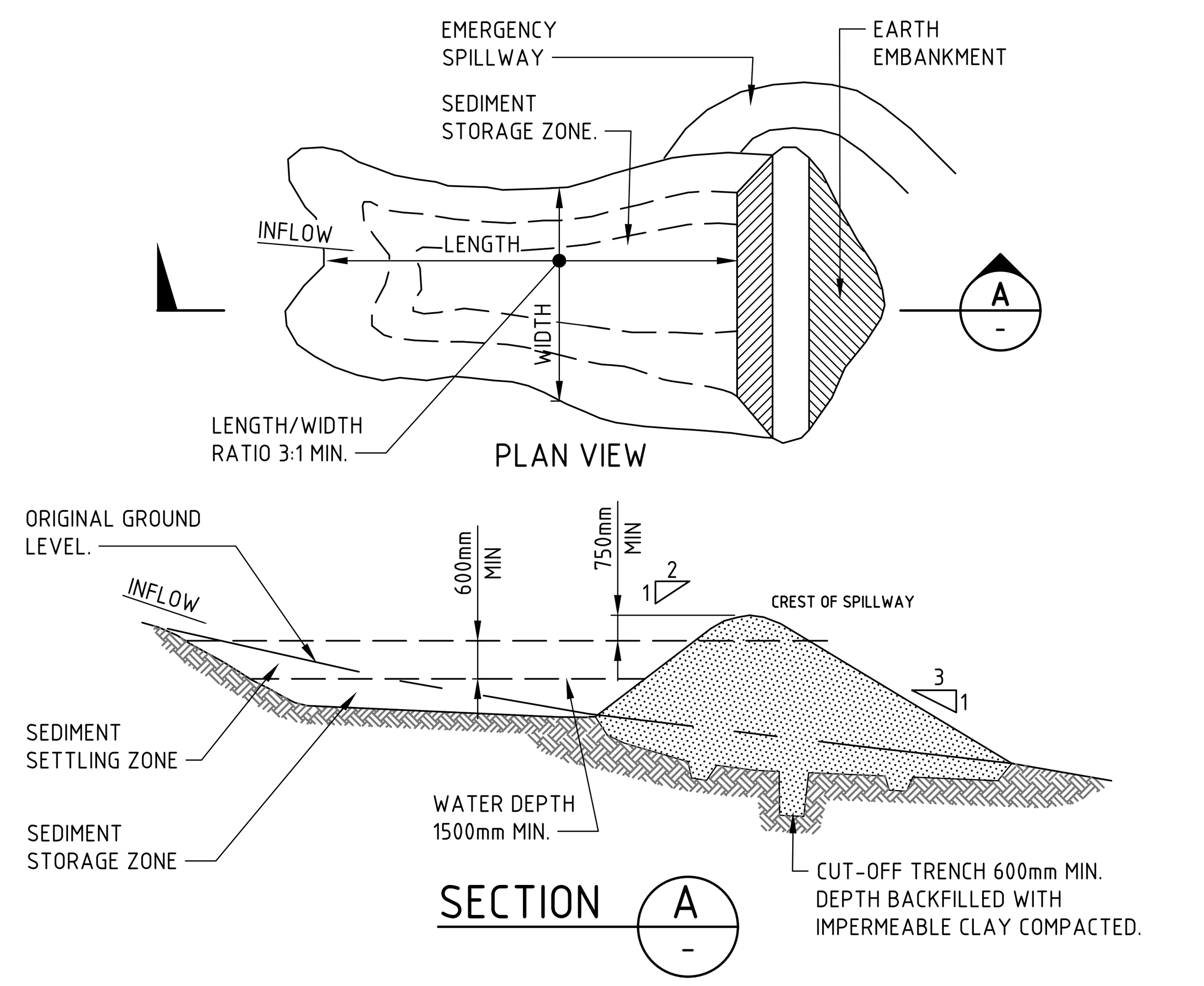


CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 AND 5 PERCENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

DRAINAGE SWALE

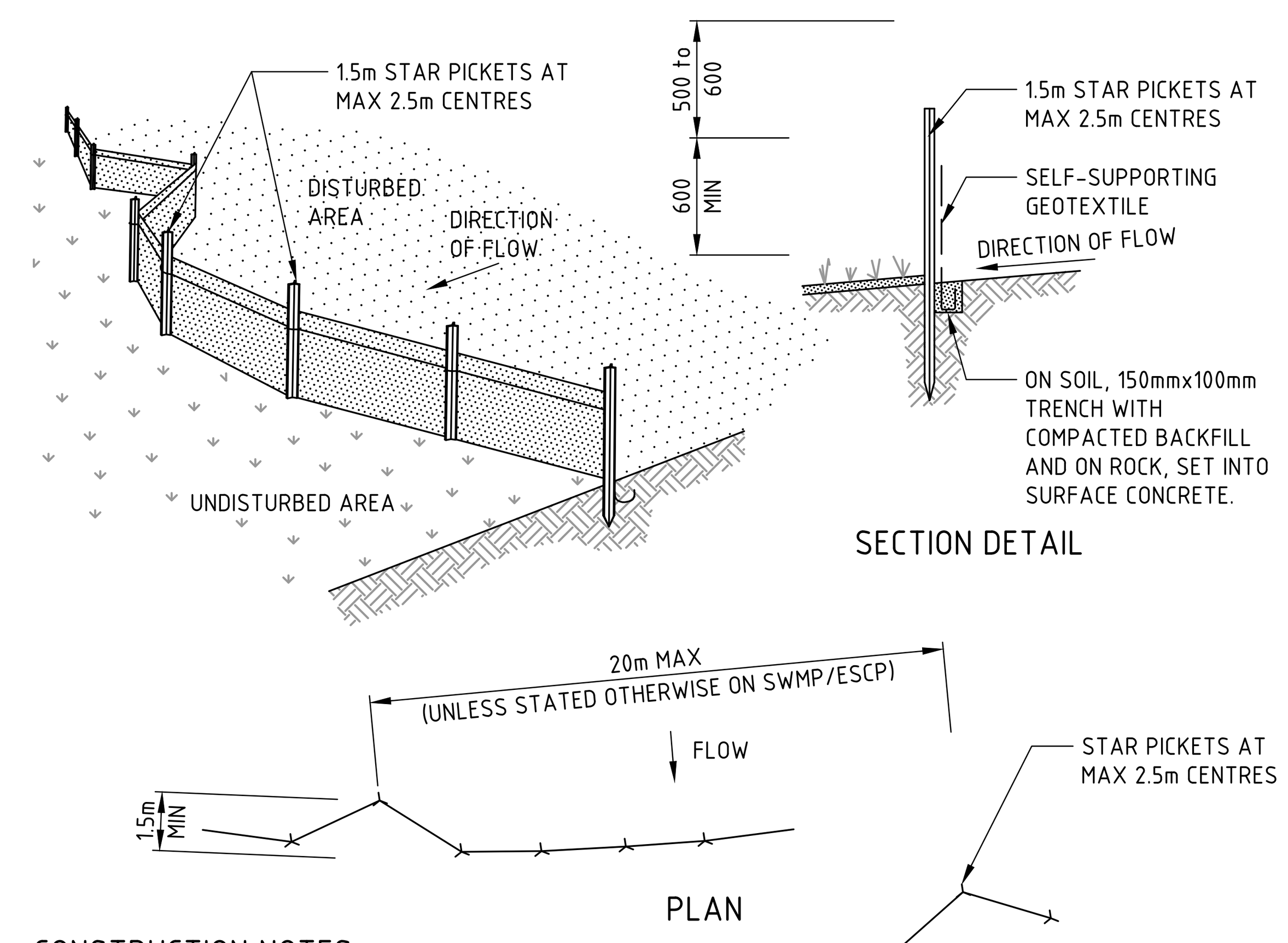


CONSTRUCTION NOTES

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. CONSTRUCT A CUT-OFF TRENCH 500mm DEEP AND 1200mm WIDE ALONG THE CENTRELINE OF THE EMBANKMENT EXTENDING TO A POINT ON THE GULLY WALL LEVEL WITH THE RISER CREST.
3. MAINTAIN THE TRENCH FREE OF WATER AND RECOMPACT THE MATERIALS WITH EQUIPMENT AS SPECIFIED IN THE SWMP TO 95 PER CENT STANDARD PROCTOR DENSITY.
4. SELECT FILL FOLLOWING THE SWMP THAT IS FREE OF ROOTS, WOOD, ROCK, LARGE STONE OR FOREIGN MATERIAL.
5. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING TO AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
6. SPREAD THE FILL IN 100mm TO 150mm LAYERS AND COMPACT IT AT OPTIMUM MOISTURE CONTENT FOLLOWING THE SWMP.
7. CONSTRUCT THE EMERGENCY SPILLWAY.
8. REHABILITATE THE STRUCTURE FOLLOWING THE SWMP.

(APPLIES TO 'TYPE D' AND 'TYPE F' SOILS ONLY)

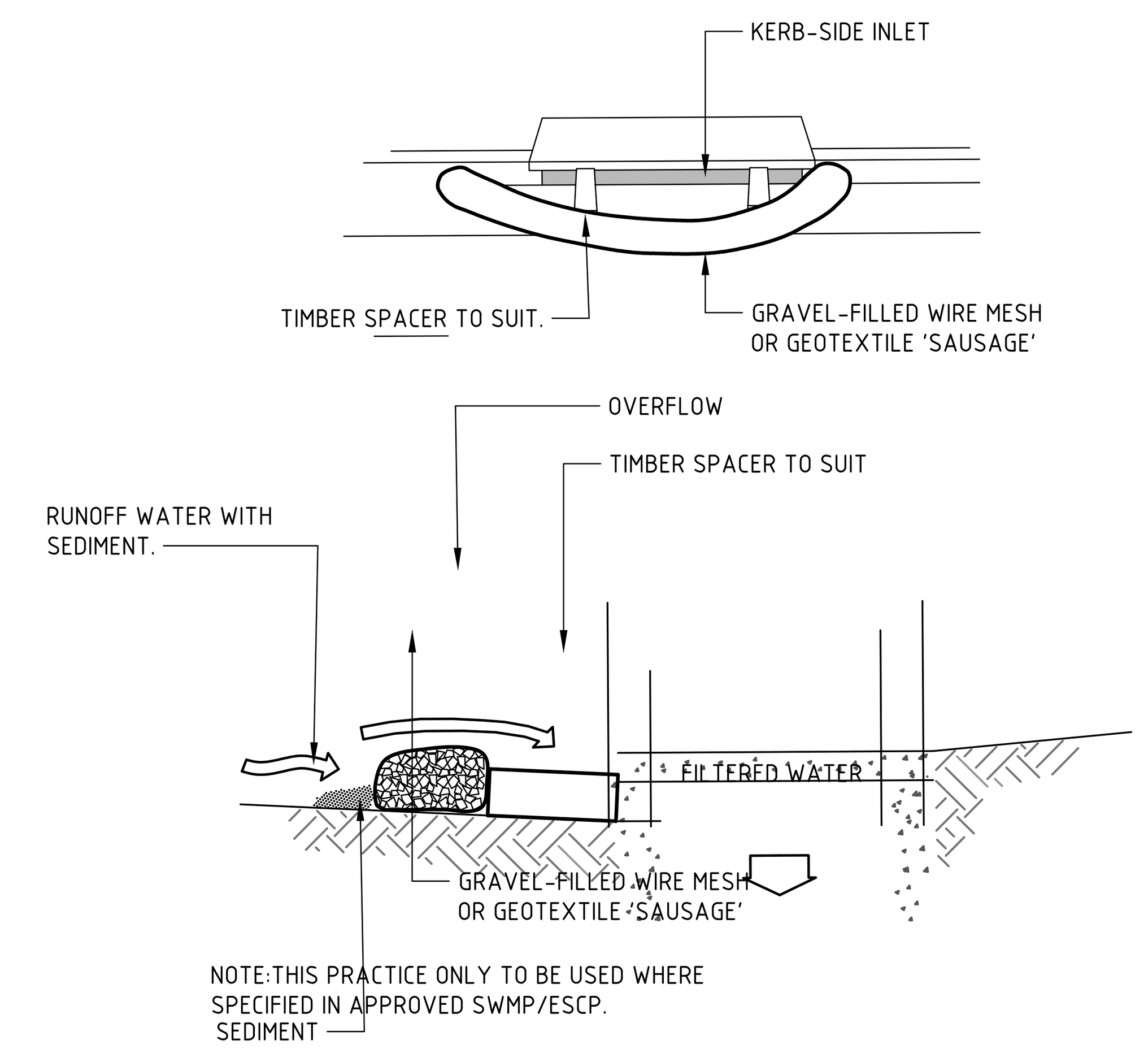
SEDIMENT BASIN



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE

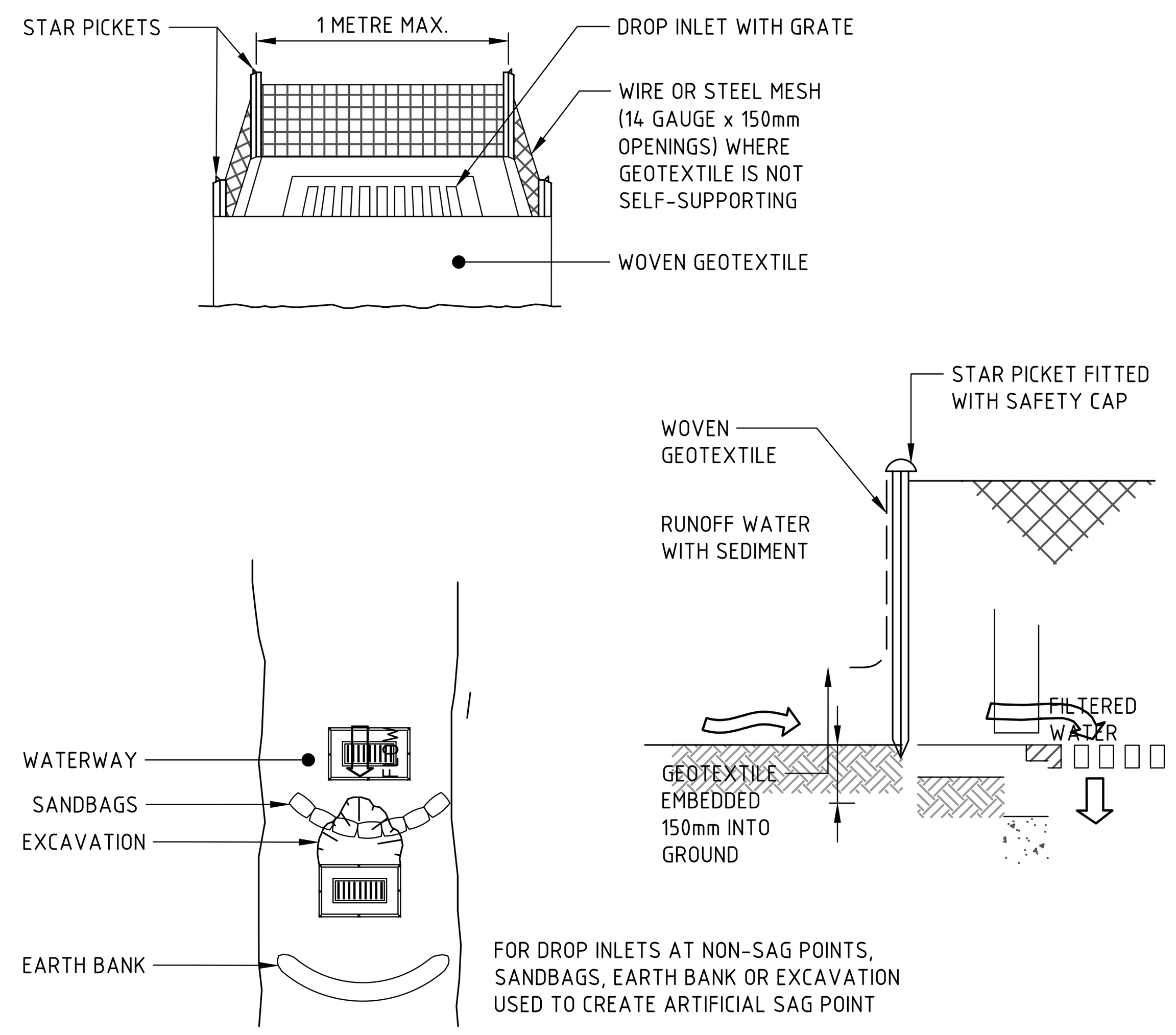


NOTE: THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN APPROVED SWMP/ESCP.

CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

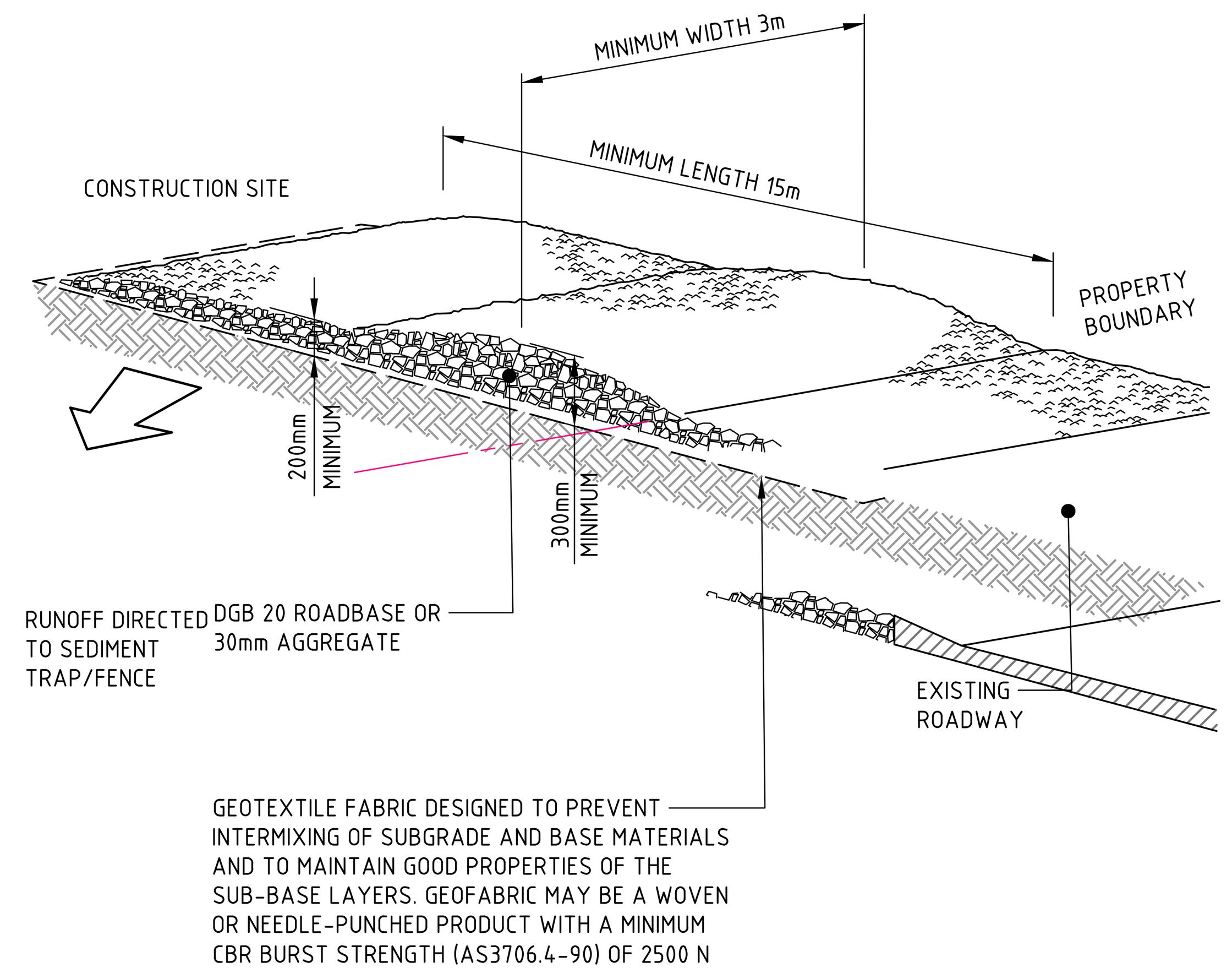
WIRE MESH AND GRAVEL SEDIMENT FILTER



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.

GEOTEXTILE INLET FILTER TRAPS



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

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NOT TO SCALE

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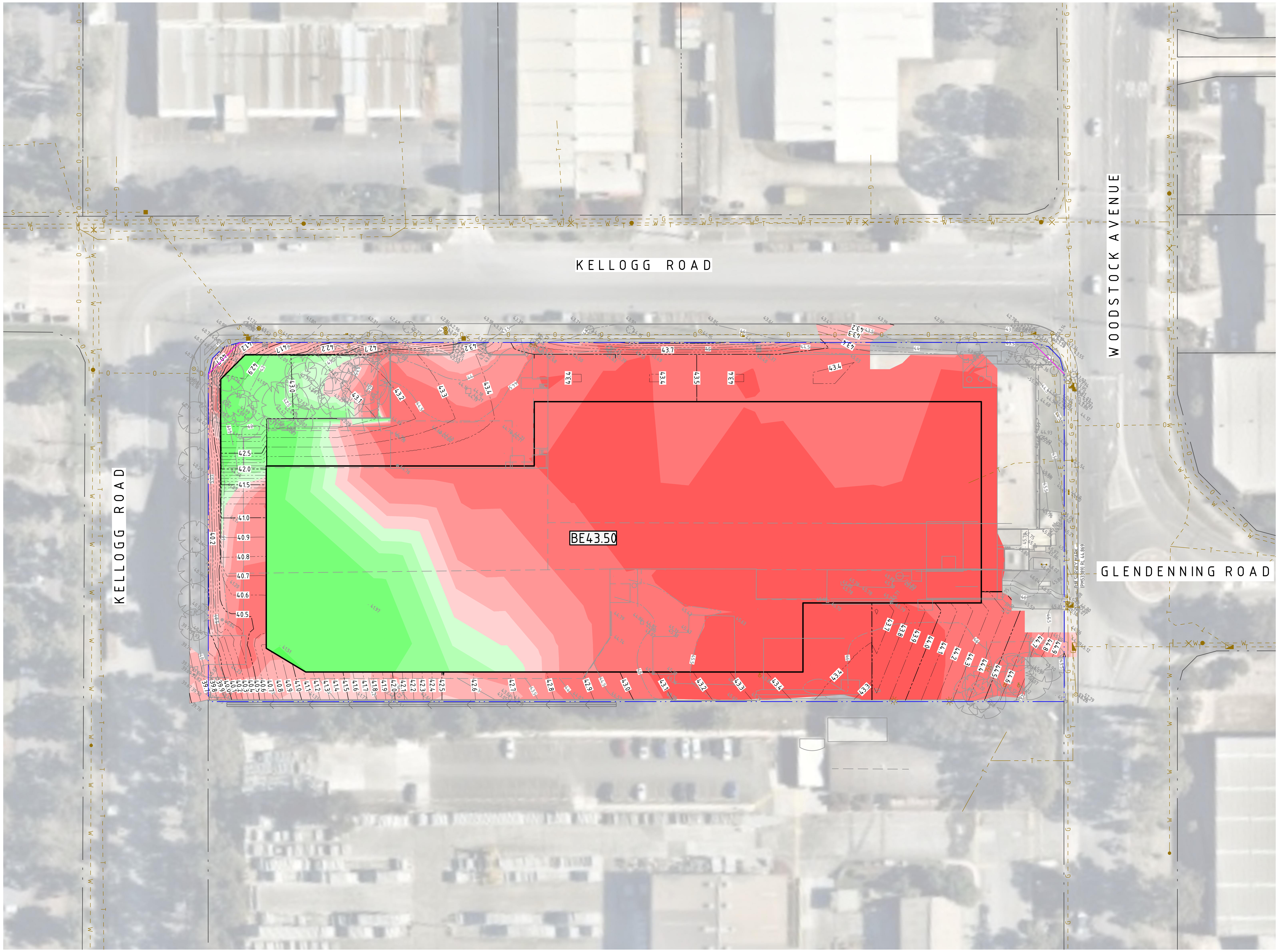
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
SEDIMENT AND SOIL EROSION CONTROL DETAILS

JOB NUMBER: 211274

DRAWING NUMBER: DAC02.11 REVISION: 02

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- BEXX.XX — BULK EARTHWORKS SPOT HEIGHT
- eRLXX.XX — EXISTING SPOT HEIGHT
- BEXX.XX — BULK EARTHWORKS PAD LEVEL
- X.X — DIRECTION OF GRADE
- BATTERS
- XX.XX — CONTOURS
- SHORING
- E — EXISTING ELECTRICITY
- G — EXISTING GAS
- T — EXISTING TELSTRA
- O — EXISTING OPTUS
- W — EXISTING WATER
- S — EXISTING SEWER

DEPTH OF CUT

- -5.0m TO -2.0m
- -2.0m TO -1.0m
- -1.0m TO -0.5m
- -0.5m TO -0.25m
- -0.25m TO -0.0m

DEPTH OF FILL

- 0.0m TO 0.25m
- 0.25m TO 0.5m
- 0.5m TO 1.0m
- 1.0m TO 2.0m
- 2.0m TO 5.0m

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR EARTHWORKS GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
4. STRIP EXISTING TOPSOIL IN CONSULTATION WITH THE GEOTECHNICAL ENGINEER / REPORT.
5. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
6. NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS; ie SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS AND THE LIKE. CONTRACTOR IS TO ALLOW FOR REMOVAL OF ALL EXCESS MATERIAL GENERATED BY THE WORKS.
7. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
8. BULK EARTHWORKS ARE BASED ON THE FOLLOWING DEPTHS FROM FINISHED SURFACE LEVELS;
   - 8.1. ASPHALT PAVEMENT 300mm
   - 8.2. RIDGE CONCRETE PAVEMENT 300mm
   - 8.3. BUILDING SLAB 300mm (REFER STRUCTURAL DWGS)
   - 8.4. FOOTPATH PAVEMENT 300mm
   - 8.5. LANDSCAPE AREA 300mm
9. APPROXIMATE BULK EARTHWORK VALUES AS FOLLOWS;
   - 9.1. CUT 23,940 cu.m
   - 9.2. FILL 2,835 cu.m
   - 9.3. BALANCE 21,105 cu.m
   - 9.4. NOTE: SITE STRIPPING VOLUMES HAVE NOT BEEN INCLUDED IN ABOVE CALCULATIONS.
10. TEMPORARY 1:2 SLOPES FOR EXCAVATIONS HAVE BEEN ADOPTED (UNO). CONTRACTOR TO CONFIRM ADEQUACY WITH GEOTECHNICAL ENGINEER.

VERIFIER: -
JOB MANAGER: -
DESIGNED: A. CARVALHAES
DRAWN: E. EAGER

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

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SCALE 1:500@ A1 — 0 5 10 15 20 25m

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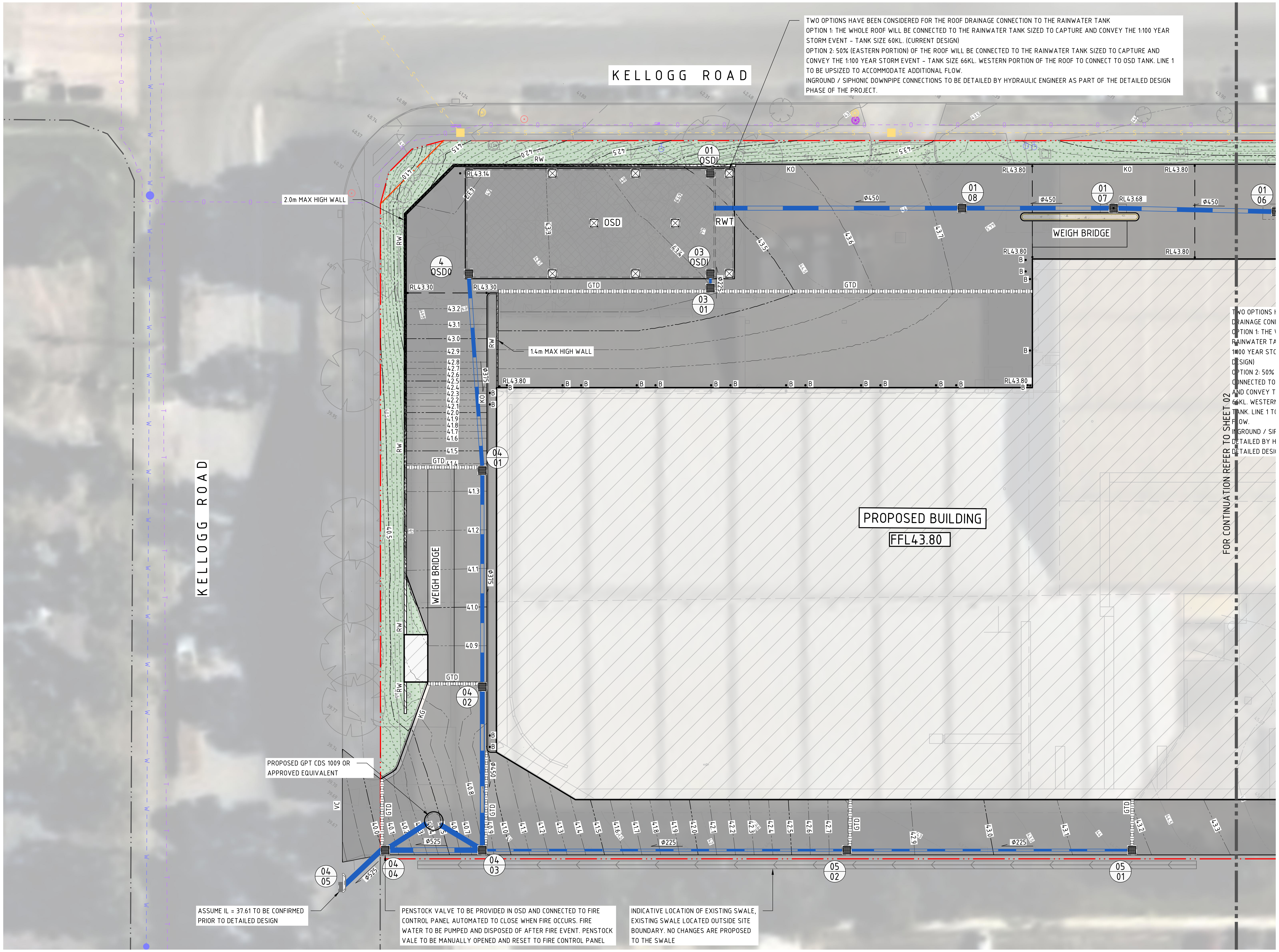
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — BULK EARTHWORKS PLAN

JOB NUMBER: 211274

DRAWING NUMBER: DAC03.01 — REVISION: 02

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- PROPOSED KERB
- KO — KERB ONLY
- KG — KERB AND GUTTER
- VC — VEHICULAR CROSSING
- KR — KERB RAMP
- WS — WHEEL STOP
- FFLXX.XX — PROPOSED FINISHED FLOOR LEVEL
- GRADE CREST
- EXISTING ELECTRICITY
- EXISTING GAS
- EXISTING TELSTRA
- EXISTING OPTUS
- EXISTING WATER
- EXISTING SEWER
- CONTOURS
- EXISTING CONTOURS
- EXISTING SWALE
- STORMWATER PIT TAG STRUCTURE No / LINE ID
- Ø150 — STORMWATER PIPE
- GTD — GRATED TRENCH DRAIN
- EXISTING DRAINAGE STRUCTURE
- NEW DRAINAGE STRUCTURE
- OSD — ON-SITE DETENTION TANK
- B — BOLLARD
- RETAINING WALL - TYPE 1
- TRAFFICABLE PAVEMENT
- FOOTPATH
- STRUCTURAL SLAB
- LANDSCAPING - MASS PLANTING (REFER LANDSCAPE ARCHITECTS DRAWINGS FOR DETAILS)

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
4. SUBSOIL DRAINAGE TO RETAINING WALLS, KERBS AND SWALE DRAINS NOT SHOWN FOR CLARITY - REFER RELEVANT DETAILS.
5. REFER 'STORMWATER PIT SCHEDULE' OR LONGSECTIONS FOR PIT INFORMATION.
6. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.
7. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.
8. CONTRACTOR TO ALLOW TO ADJUST AND LIAISE WITH RELEVANT SERVICE AUTHORITIES IN RELATION TO EXISTING SERVICE ADJUSTMENT AND MODIFICATIONS.
9. WHEEL STOPS TO BE INSTALLED TO ALL CAR SPACES AS SHOWN AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS. IF WHEEL STOPS ARE NOT SHOWN, ALLOW FOR WHEEL STOPS WHERE CAR SPACES ARE FRONTING A WALL
10. REFER 'RETAINING WALL ELEVATIONS' FOR RETAINING WALL INFORMATION.

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR INFORMATION	AC		AC	18.01.2022
03	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

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SCALE 1:250@ A1 0 2 4 6 8 10 12m

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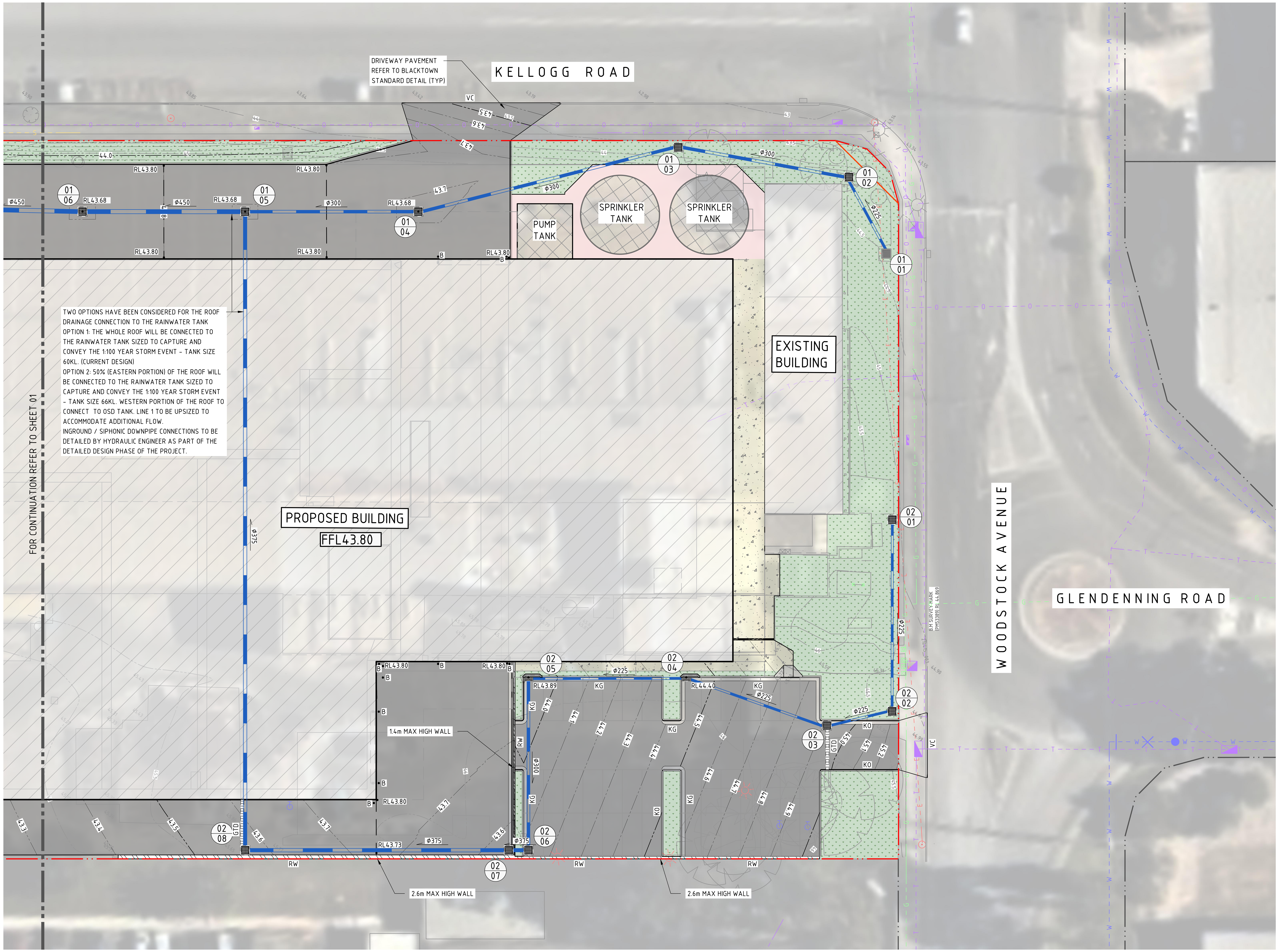
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01

JOB NUMBER: 211274

DRAWING NUMBER: DAC04.01 REVISION: 03

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- PROPOSED KERB
- KO — KERB ONLY
- KG — KERB AND GUTTER
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- GRADE CREST
- EXISTING ELECTRICITY
- EXISTING GAS
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GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
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5. REFER 'STORMWATER PIT SCHEDULE' OR LONGSECTIONS FOR PIT INFORMATION.
6. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.
7. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.
8. CONTRACTOR TO ALLOW TO ADJUST AND LIAISE WITH RELEVANT SERVICE AUTHORITIES IN RELATION TO EXISTING SERVICE ADJUSTMENT AND MODIFICATIONS.
9. WHEEL STOPS TO BE INSTALLED TO ALL CAR SPACES AS SHOWN AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS. IF WHEEL STOPS ARE NOT SHOWN, ALLOW FOR WHEEL STOPS WHERE CAR SPACES ARE FRONTING A WALL
10. REFER 'RETAINING WALL ELEVATIONS' FOR RETAINING WALL INFORMATION.

NOT FOR CONSTRUCTION

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: Resource Recovery Design (Aust) Pty Ltd.

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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m

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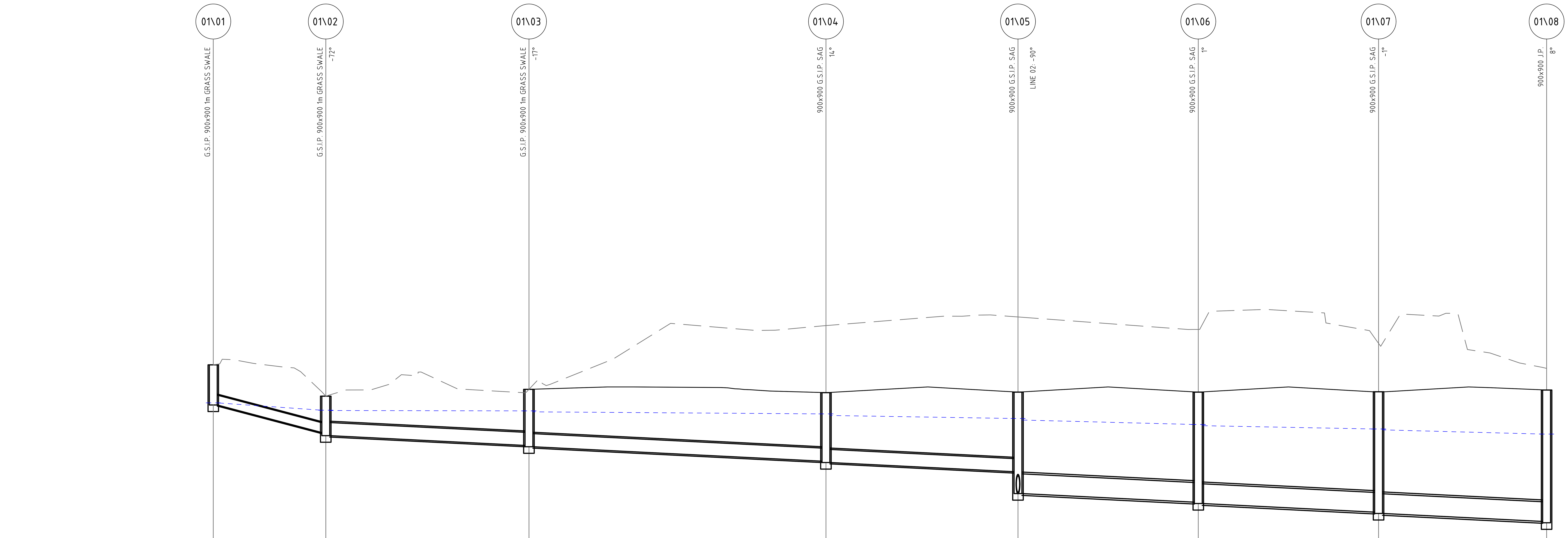
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02

JOB NUMBER: 211274
DRAWING NUMBER: DAC04.02
REVISION: 02
DRAWING SHEET SIZE = A1



	01\01–01\02	01\02–01\03	01\03–01\04	01\04–01\05	01\05–01\06	01\06–01\07	01\07–01\08
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	5.3%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
PIPE SIZE (mm)	225	300	300	300	450	450	450
MINIMUM COVER (m)	0.68	0.60	1.08	1.27	1.83	2.06	2.29
Vf - FULL PIPE VELOCITY (m/s)	Vf=1.37	Vf=0.50	Vf=0.54	Vf=0.79	Vf=0.98	Vf=1.09	Vf=1.20
Q - PIPE FLOW (L/s)	Q=10	Q=19	Q=38	Q=56	Q=157	Q=173	Q=190

DATUM RL 36.0

	01\01	01\02	01\03	01\04	01\05	01\06	01\07	01\08
H.G.L. (1% AEP)	43.436 43.436	43.268 43.268 43.261	43.253 43.253 43.231	43.184 43.184 43.148	43.079 43.079 43.044	42.942 42.942 42.915	42.839 42.839 42.819	42.723 42.723
FINISHED SURFACE	44.304	43.589	43.745	43.669	43.681	43.681	43.690	43.730
NATURAL SURFACE	44.304	43.589	43.745	45.202	45.399	45.114	44.796	44.224
PIPE INVERT LEVEL	43.388	42.757 42.686	42.463 42.433	42.103 42.073	41.862 41.363	41.166 41.136	40.939 40.909	40.726
DEPTH TO INVERT	0.917	0.831 0.902	1.282 1.312	1.566 1.596	1.819 2.318	2.515 2.545	2.750 2.780	3.004
CO-ORDINATED SETOUT	E300869.905 N6262253.737	E300857.126 N6262252.528	E300852.486 N6262229.797	E300855.389 N6262195.996	E300851.962 N6262174.319	E300848.734 N6262153.969	E300845.083 N6262133.692	E300842.082 N6262114.728
CHAINAGE	0.000	12.858	36.077	70.015	91.962	112.567	133.169	152.373

SCALE 1:250 HORIZ 1:50 VERT

LINE 01

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR SSDA	MM		AC	19.01.2022

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ARCHITECT: Resource Recovery Design (Aust) Pty Ltd.

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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m
SCALE 1:50@ A1 — 0.0 0.5 1.0 1.5 2.0 2.5m

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Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

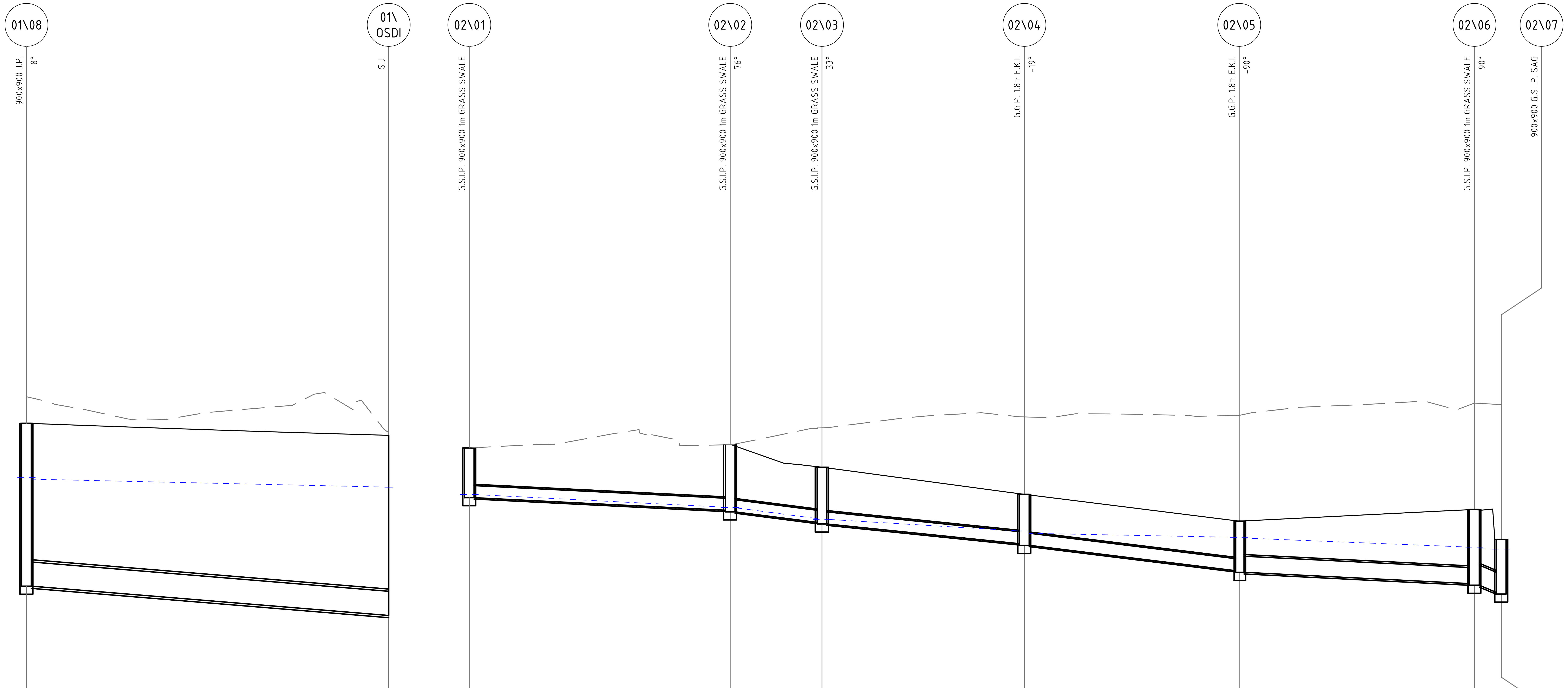
STORMWATER LONGITUDINAL SECTIONS - SHEET 01

JOB NUMBER: 211274

DRAWING NUMBER: DAC05.11

REVISION: 02

DRAWING SHEET SIZE = A1



	01\08 – 01\OSDI	02\01 – 02\02	02\02 – 02\03	02\03 – 02\04	02\04 – 02\05	02\05 – 02\06	02\06 – 02\07
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	1.6%	1.0%	2.6%	2.0%	2.5%	1.0%	8.4%
PIPE SIZE (mm)	450	225	225	225	225	300	375
MINIMUM COVER (m)	2.54	0.68	0.77	0.68	0.68	0.63	0.56
Vf - FULL PIPE VELOCITY (m/s)	Vf=1.20	Vf=0.77	Vf=1.30	Vf=1.35	Vf=1.05	Vf=1.19	Vf=1.80
Q - PIPE FLOW (L/s)	Q=190	Q=6	Q=15	Q=20	Q=30	Q=65	Q=64

DATUM RL: LINE 01 35.0; LINE 02 37.0

	01\08	01\OSDI
H.G.L. (1% AEP)	42.723 42.723 42.689	42.540 42.540 42.540
FINISHED SURFACE	43.730	43.504
NATURAL SURFACE	44.224	43.554
PIPE INVERT LEVEL	40.726 40.696	40.150 40.150
DEPTH TO INVERT	3.004 3.034	3.354 3.354
CO-ORDINATED SETOUT	E300842.082 N6262114.728	E300832.500 N6262082.393
CHAINAGE	152.373	186.099

SCALE 1:250 HORIZ

LINE 01

	02\01	02\02	02\03	02\04	02\05	02\06	02\07
H.G.L. (1% AEP)	44.403 44.403	44.166 44.161 44.157	43.954 43.941 43.941	43.724 43.724 43.680	43.606 43.606 43.592	43.423 43.423 43.390	43.387 43.387
FINISHED SURFACE	45.270	45.338	44.911	44.406	43.906	44.125	43.567
NATURAL SURFACE	45.270	45.338	45.657	45.848	45.877	46.106	46.078
PIPE INVERT LEVEL	44.343	44.110 44.080	43.884 43.854	43.486 43.456	42.983 42.953	42.743 42.713	42.578
DEPTH TO INVERT	0.926	1.228 1.258	1.027 1.057	0.920 0.950	0.923 0.953	1.382 1.412	0.989
CO-ORDINATED SETOUT	E300903.326 N6262249.228	E300927.302 N6262245.401	E300927.779 N6262236.939	E300918.972 N6262220.311	E300915.845 N6262200.557	E300937.476 N6262197.134	E300937.085 N6262194.665
CHAINAGE	0.000	24.292	32.838	51.679	71.679	93.579	96.079

LINE 02

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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02	ISSUED FOR SSDA	MM		AC	19.01.2022

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ARCHITECT
RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

SCALE 1:250@ A1 — 0 2 4 6 8 10 12m
SCALE 1:50@ A1 — 0.0 0.5 1.0 1.5 2.0 2.5m

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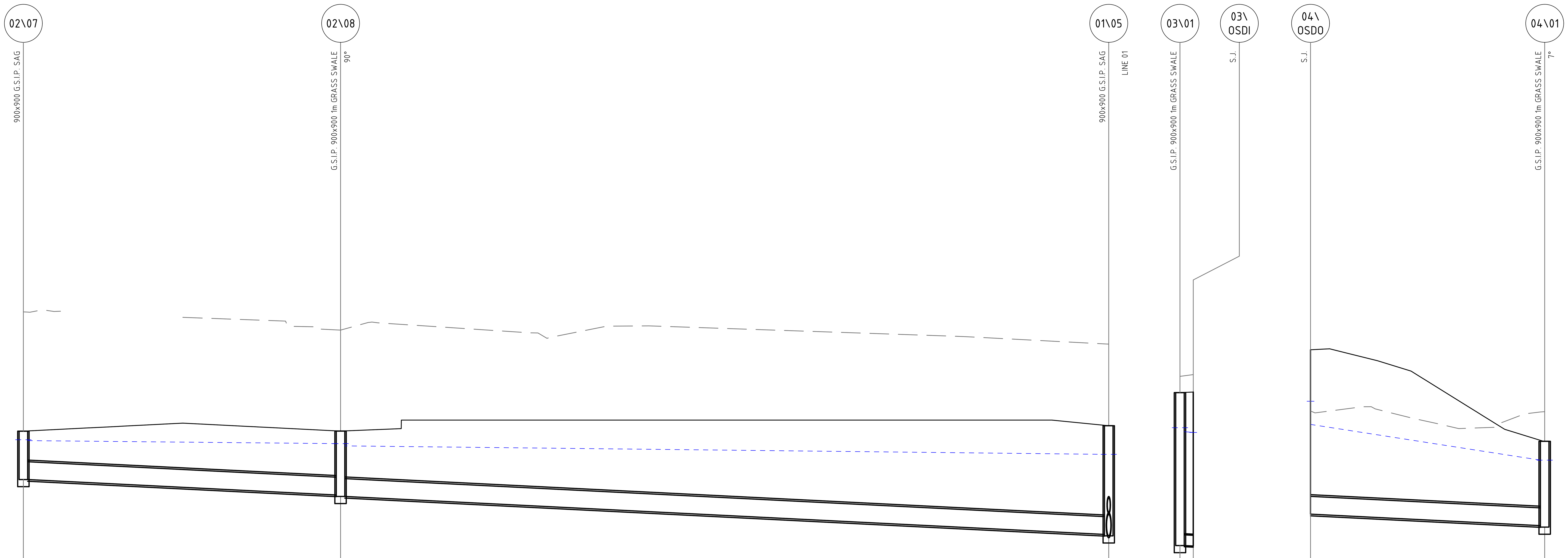
PROJECT
600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
STORMWATER LONGITUDINAL SECTIONS - SHEET 02

JOB NUMBER 211274
DRAWING NUMBER DAC05.12
REVISION 02
DRAWING SHEET SIZE = A1



	LINE 02: 02\07 – 02\08	LINE 02: 02\08 – 01\05	LINE 03: 03\01 – 03\OSDI	LINE 04: 04\OSDO – 04\01
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	1.0%	1.0%	1.0%	1.0%
PIPE SIZE (mm)	375	375	225	375
MINIMUM COVER (m)	0.61	0.97	2.97	1.39
Vf - FULL PIPE VELOCITY (m/s)	Vf=0.70	Vf=0.76	Vf=1.00	Vf=2.57
Q - PIPE FLOW (L/s)	Q=77	Q=84	Q=40	Q=284

DATUM RL 36.0 (LINE 02), 35.0 (LINE 03), 34.0 (LINE 04)

	02\07	02\08	01\05	03\01	03\OSDI	04\OSDO	04\01
H.G.L. (1% AEP)	43.387 43.387 / 43.368	43.305 43.305 / 43.257	43.079 43.079 / 43.044	42.640 / 42.556	42.540 42.540 / 42.540	42.196 / 41.709	40.957 40.957
FINISHED SURFACE	43.567	43.569	43.681	43.378	43.390	43.280	41.354
NATURAL SURFACE	46.078	45.694	45.399	43.720	43.757	41.992	41.975
PIPE INVERT LEVEL	42.578 / 42.548	42.223 / 42.193	41.393 / 41.363	40.160	40.150 / 40.150	39.820	39.578
DEPTH TO INVERT	0.989 / 1.019	1.345 / 1.375	2.288 / 2.318	3.219	3.240 / 3.240	3.460	1.776
CO-ORDINATED SETOUT	E300937.085 N6262194.665	E300931.864 N6262161.673	E300851.962 N6262174.319	E300846.801 N6262079.674	E300845.418 N6262079.893	E300840.775 N6262050.558	E300865.408 N6262049.495
CHAINAGE	96.079	129.481	210.377	0.000	1.400	0.000	24.658

SCALE 1:250 HORIZ

LINE 02

LINE 03

LINE 04

VERIFIER: -
JOB MANAGER: -
DESIGNED: A. CARVALHAES
DRAWN: E. EAGER

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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ARCHITECT
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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m
SCALE 1:50@ A1 — 0.0 0.5 1.0 1.5 2.0 2.5m

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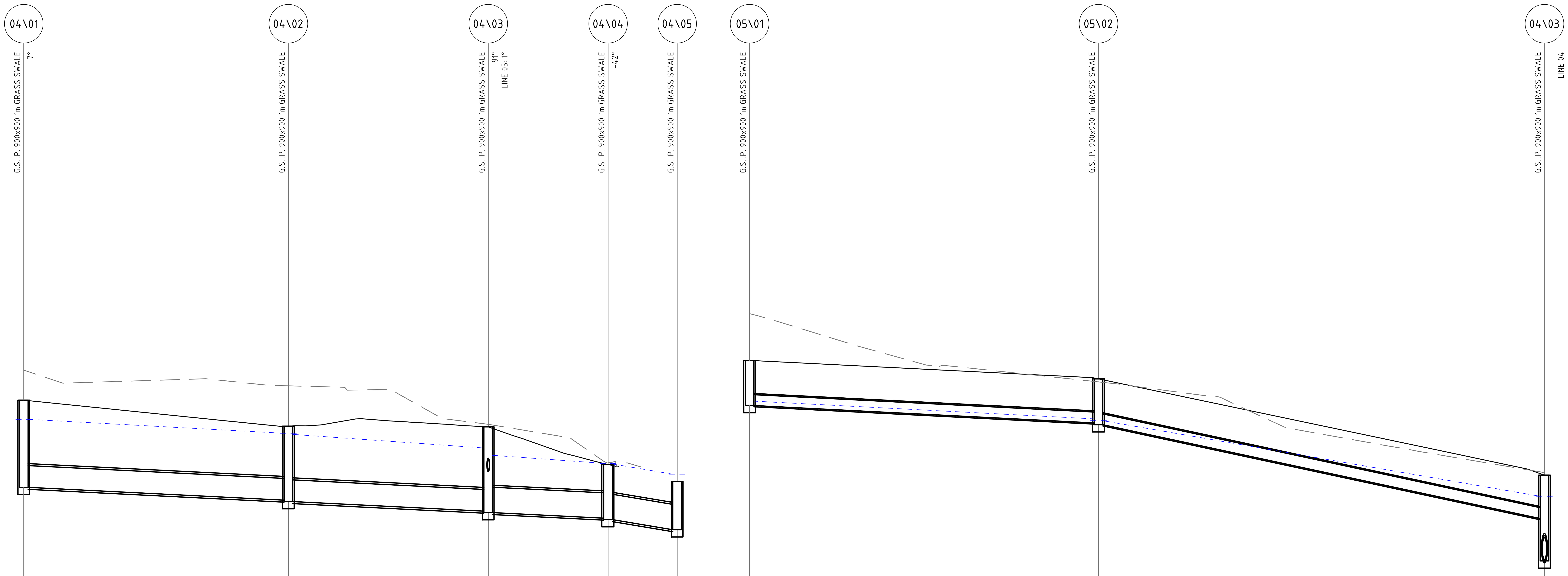
PROJECT
600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
STORMWATER LONGITUDINAL SECTIONS - SHEET 03

JOB NUMBER 211274
DRAWING NUMBER DAC05.13
REVISION 02
DRAWING SHEET SIZE = A1



LINE 04

	04\01 – 04\02	04\02 – 04\03	04\03 – 04\04	04\04 – 04\05
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	1.0%	1.0%	1.0%	3.3%
PIPE SIZE (mm)	450	450	525	525
MINIMUM COVER (m)	1.03	1.08	0.57	0.55
Vf - FULL PIPE VELOCITY (m/s)	Vf=1.86	Vf=1.96	Vf=1.65	Vf=1.52
Q - PIPE FLOW (L/s)	Q=297	Q=312	Q=358	Q=328

DATUM RL 33.0

	04\01	04\02	04\03	04\04	04\05
H.G.L. (1% AEP)	40.957 40.957 40.957	40.668 40.668 40.645	40.363 40.363 40.211	40.045 40.045 40.032	39.820 39.820 39.820
FINISHED SURFACE	41.354	40.815	40.801	40.021	39.670
NATURAL SURFACE	41.975	41.650	40.853	40.055	39.670
PIPE INVERT LEVEL	39.578 39.548	39.283 39.253	39.055 39.025	38.910 38.880	38.670 38.670
DEPTH TO INVERT	1.776 1.806	1.532 1.562	1.746 1.776	1.112 1.142	1.000 1.000
CO-ORDINATED SETOUT	E300865.408 N6262049.495	E300892.475 N6262045.211	E300912.921 N6262041.975	E300910.998 N6262029.826	E300914.760 N6262023.738
CHAINAGE	24.658	52.063	72.763	85.175	92.332

SCALE 1:250 HORIZ

LINE 05

	05\01 – 05\02	05\02 – 04\03
PIPE CLASS	RRJ2	RRJ2
PIPE GRADE (%)	1.0%	4.3%
PIPE SIZE (mm)	225	225
MINIMUM COVER (m)	0.68	0.68
Vf - FULL PIPE VELOCITY (m/s)	Vf=0.91	Vf=0.93
Q - PIPE FLOW (L/s)	Q=13	Q=27

DATUM RL 34.0

	05\01	05\02	04\03
H.G.L. (1% AEP)	42.337 42.333	41.966 41.928 41.928	40.363 40.363 40.211
FINISHED SURFACE	43.177	42.794	40.801
NATURAL SURFACE	44.145	42.732	40.853
PIPE INVERT LEVEL	42.242	41.882 41.845	39.902 39.025
DEPTH TO INVERT	0.936	0.912 0.950	0.899 1.776
CO-ORDINATED SETOUT	E300925.789 N6262123.286	E300920.141 N6262087.597	E300912.921 N6262041.975
CHAINAGE	0.000	36.133	82.323

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m
SCALE 1:50@ A1 — 0.0 0.5 1.0 1.5 2.0 2.5m

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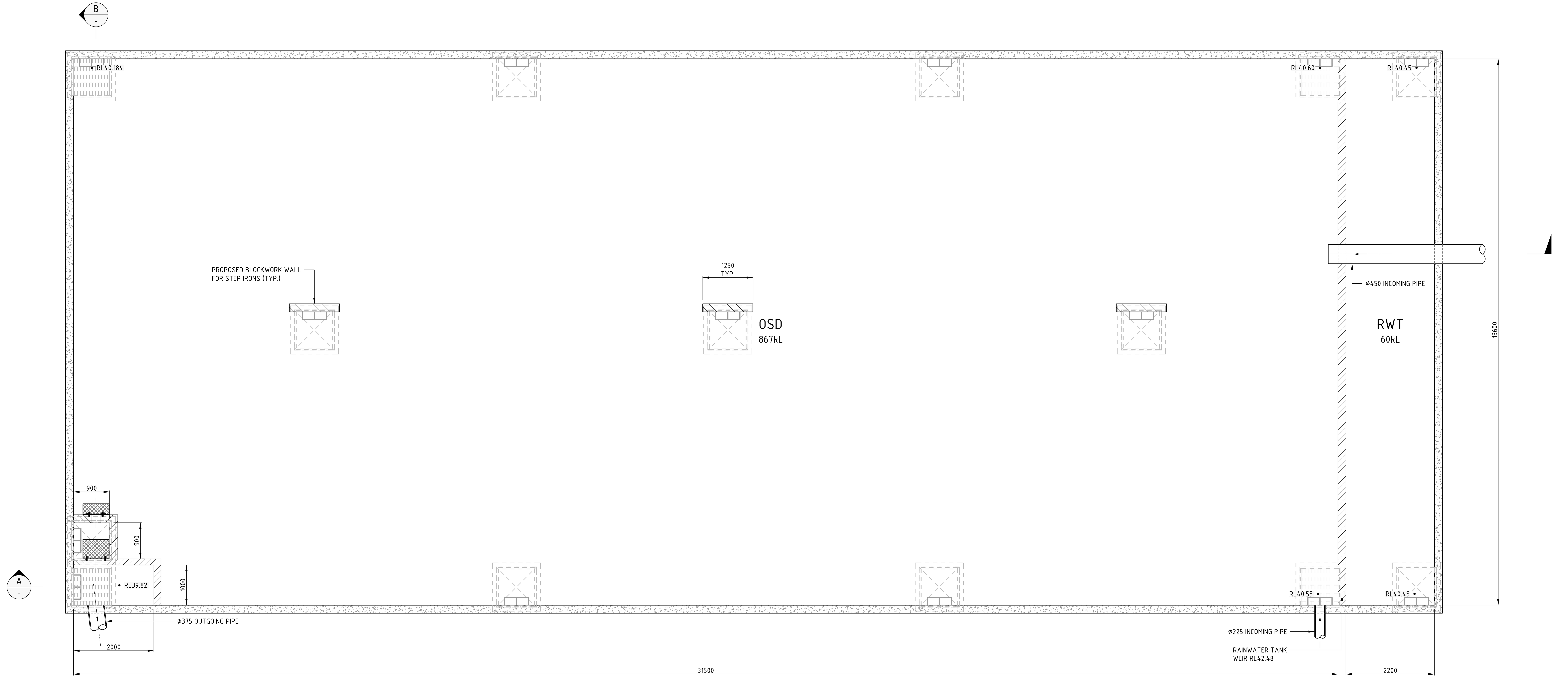
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

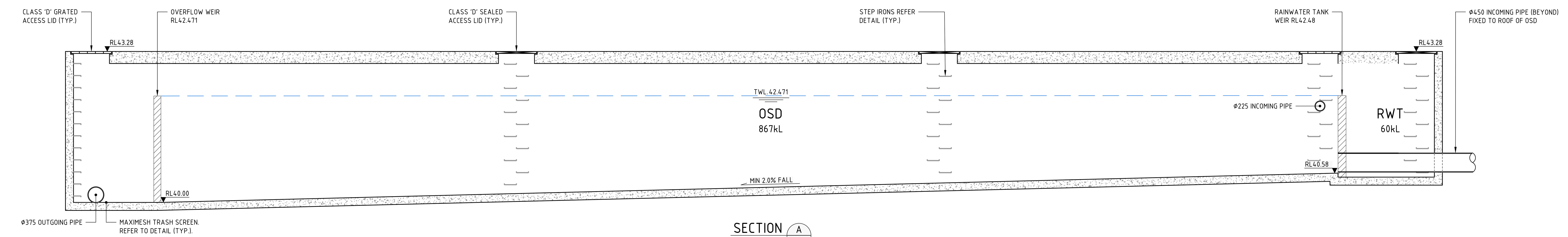
DRAWING TITLE: CIVIL ENGINEERING PACKAGE
STORMWATER LONGITUDINAL SECTIONS - SHEET 04

JOB NUMBER: 211274
DRAWING NUMBER: DAC05.14
REVISION: 02
DRAWING SHEET SIZE = A1



OSD BASE PLAN

SCALE 1:50



SECTION A

SCALE 1:50

DRAWN: E. EAGER
DESIGNED: A. CARVALHAES
JOB MANAGER: -
VERIFIER: -

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SCALE 1:50@ A1 — 0.0 0.5 1.0 1.5 2.0 2.5m

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PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

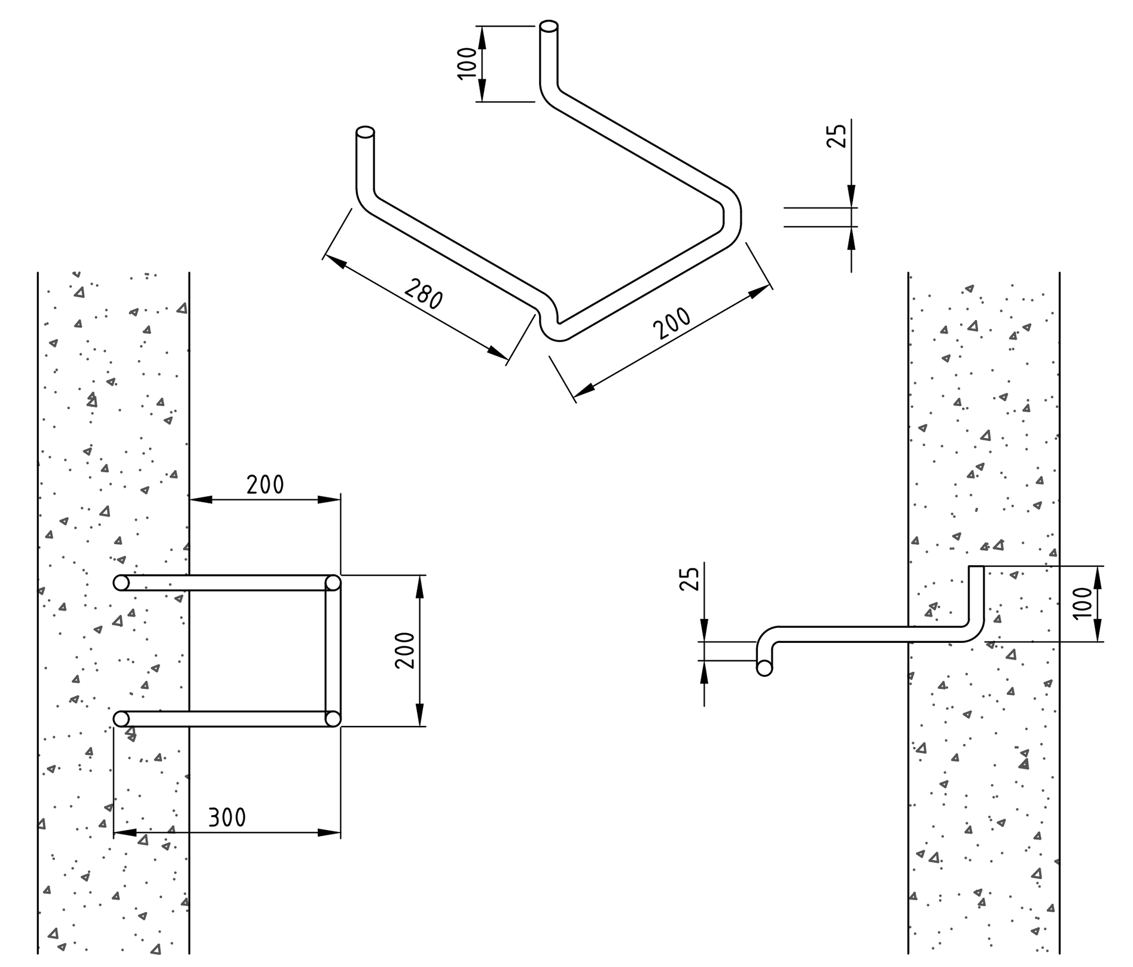
STORMWATER DETAILS - SHEET 01

JOB NUMBER: 211274

DRAWING NUMBER: DAC05.31

REVISION: 02

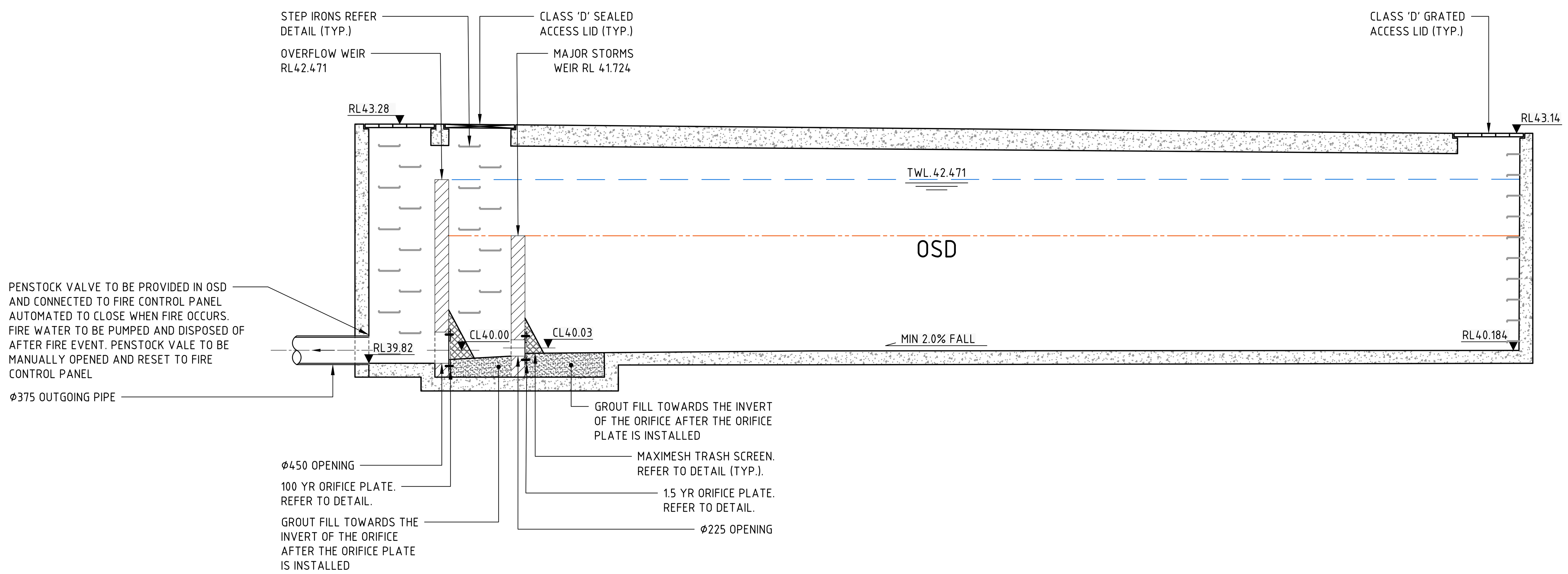
DRAWING SHEET SIZE = A1



STEP IRON DETAIL

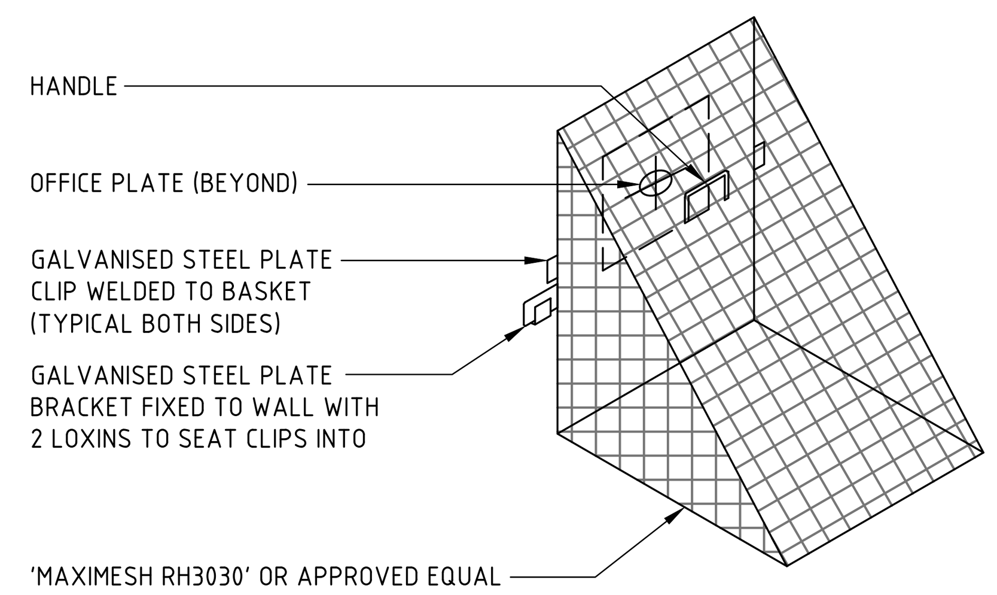
STEP IRON OF 20mm GALVANISED STEEL MADE TO SHAPE AND DIMENSIONS AS SHOWN, PLACED AT 300 CENTRES AND STAGGERED HORIZONTALLY FOR ALL PITS DEEPER THAN 1.2m. THE USE OF PROPRIETARY STEP IRONS ARE ACCEPTABLE PROVIDED THE PRODUCT IS IN ACCORDANCE WITH AUSTRALIAN STANDARDS

SCALE 1:10



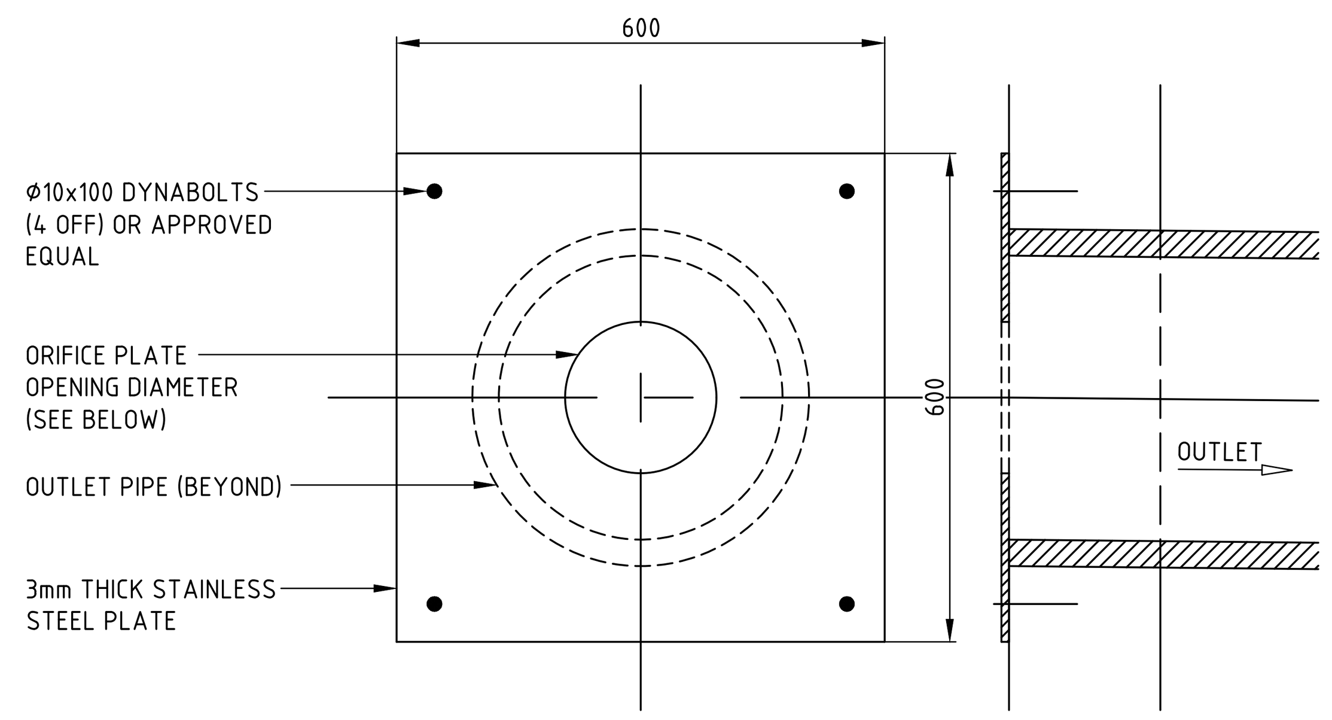
SECTION B

SCALE 1:50



TRASH SCREEN DETAIL

SCALE 1:10



ORIFICE PLATE DETAIL

1.5 YR ARI ORIFICE PLATE - Ø 151.5mm
100 YR ARI ORIFICE PLATE - Ø 263mm
SCALE 1:10

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

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SCALE 1:50 @ A1: 0.0 0.5 1.0 1.5 2.0 2.5m
SCALE 1:10 @ A1: 0.0 0.1 0.2 0.3 0.4 0.5m

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PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

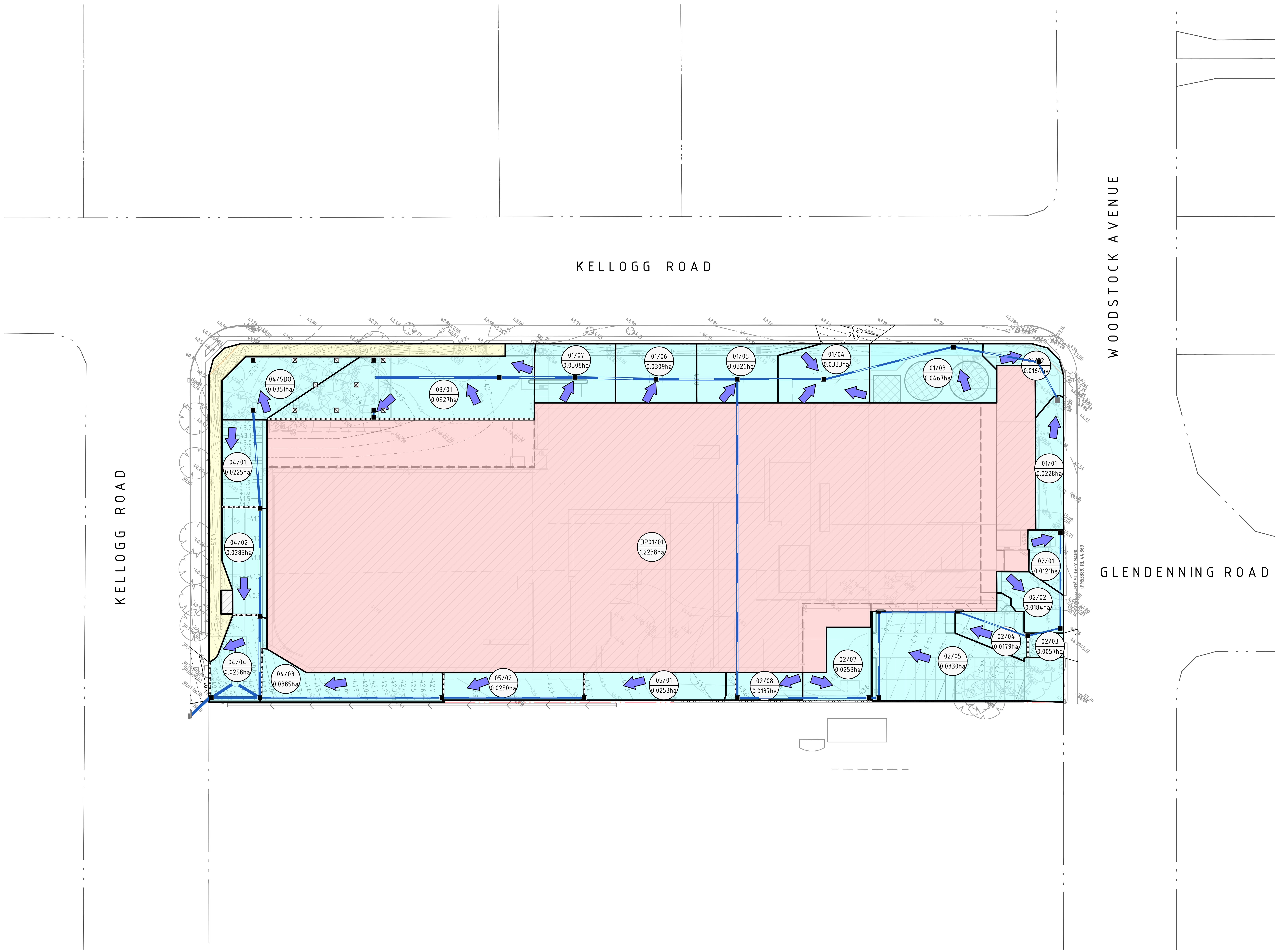
DRAWING TITLE: CIVIL ENGINEERING PACKAGE

STORMWATER DETAILS - SHEET 02

JOB NUMBER: 211274

DRAWING NUMBER: DAC05.32 REVISION: 02

DRAWING SHEET SIZE = A1



LEGEND

- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- CATCHMENT BOUNDARY
- GROUND CATCHMENT
- ROOF CATCHMENT
- BYPASS CATCHMENT
- OVERLAND FLOW
- STORMWATER PIT TAG / CATCHMENT AREA (ha)
- EXISTING DRAINAGE STRUCTURE
- NEW DRAINAGE STRUCTURE

GENERAL NOTES:

1. REFER TO CIVIL DRAWINGS/ STORMWATER REPORT / DRAINS FILE FOR HYDROLOGICAL AND HYDRAULIC CALCULATIONS.CATCHMENTS INDICATED AND THEIR CORRESPONDING PITS ARE THOSE WHICH HAVE BEEN USED FOR MODELING PURPOSES.
2. REFER HYDRAULIC ENGINEERS CALCULATIONS FOR ROOF DRAINAGE.

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

NOT FOR CONSTRUCTION

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SCALE 1:500@ A1 — 0 5 10 15 20 25m

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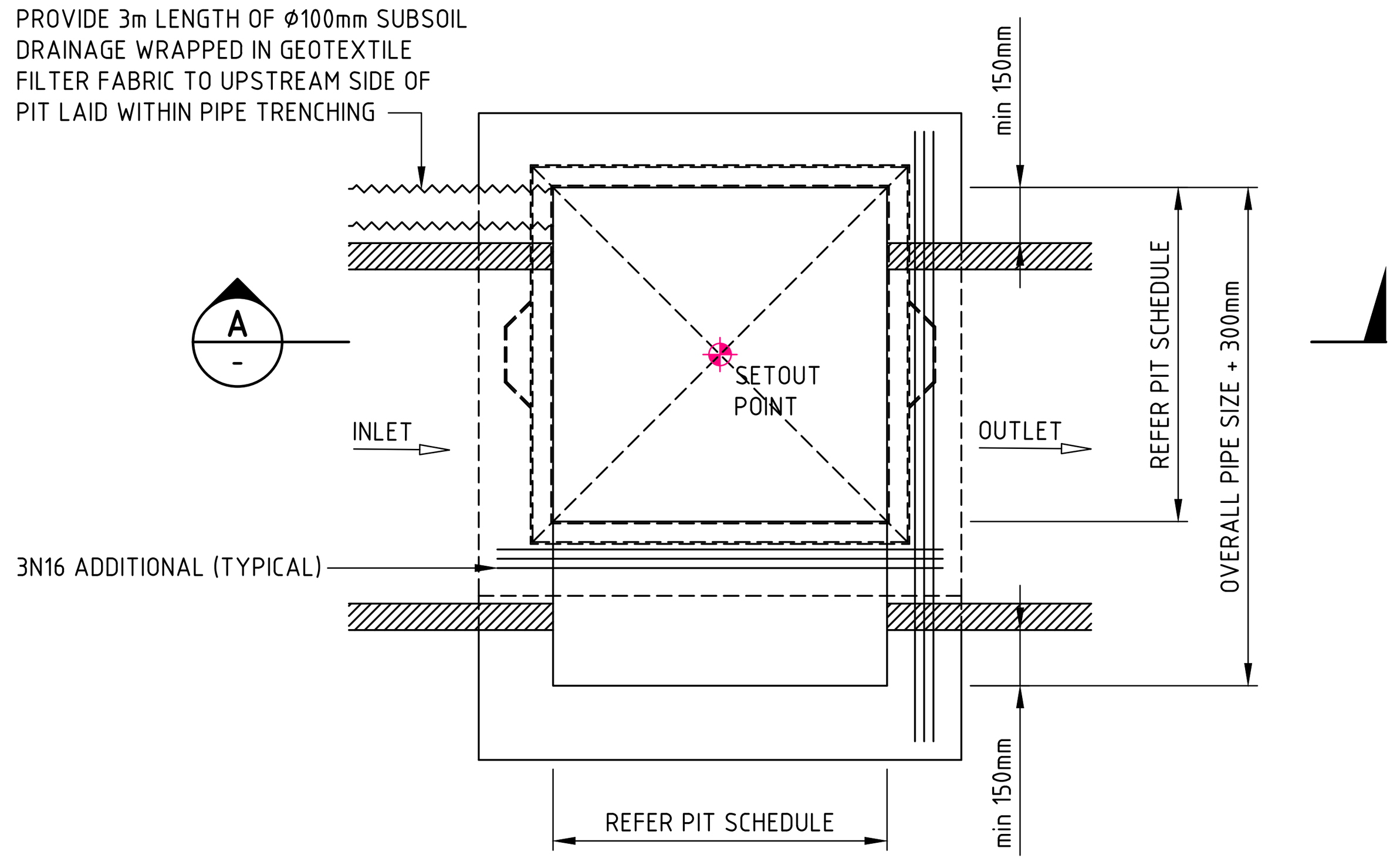
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — STORMWATER CATCHMENT PLAN

JOB NUMBER: 211274

DRAWING NUMBER: DAC05.41 REVISION: 02

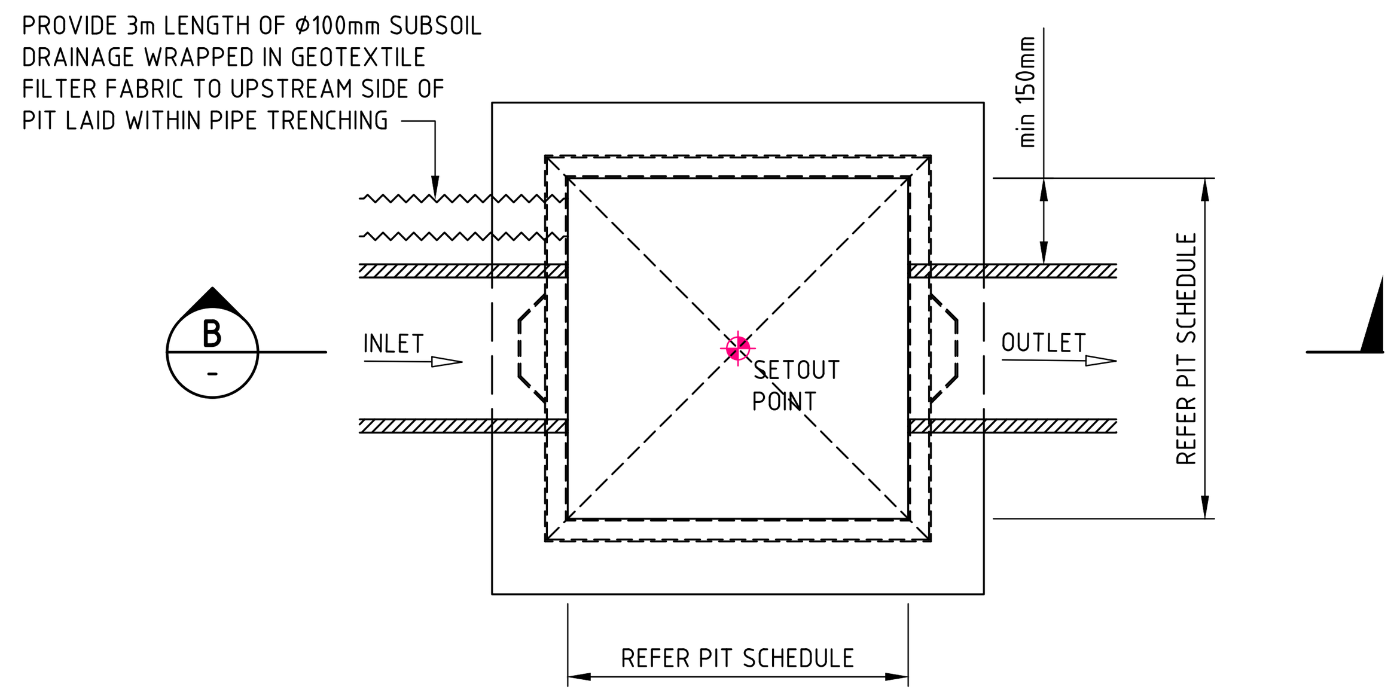
DRAWING SHEET SIZE = A1



PLAN PLAN

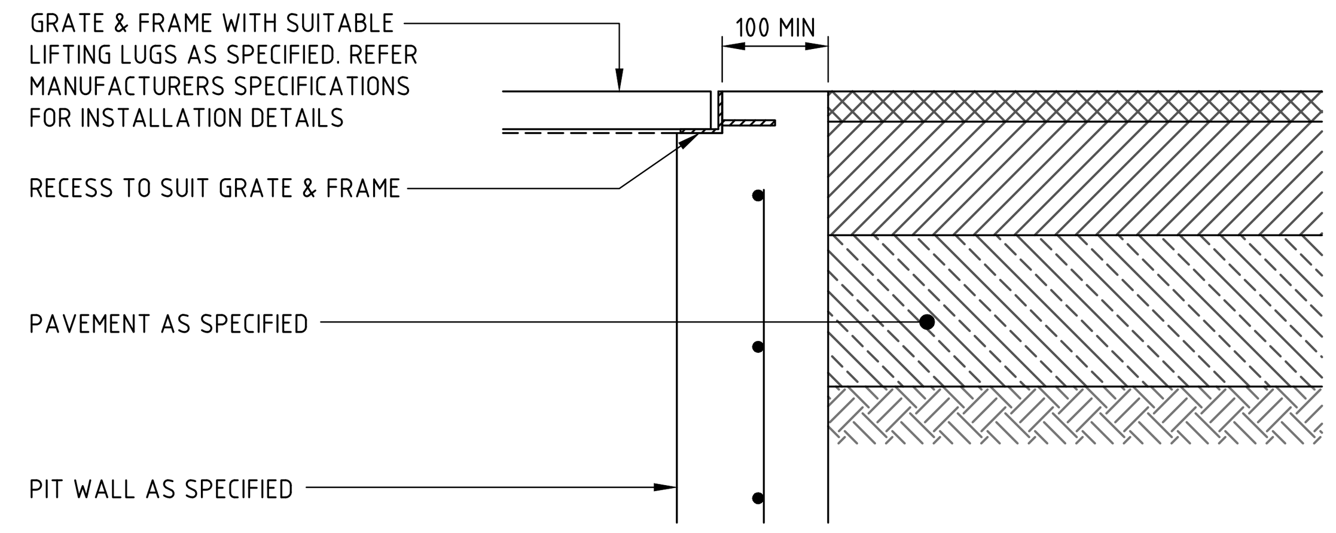
DRAINAGE PIT - EXTENDED CHAMBER

PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS > 1000mm DEPTH).
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT
SCALE 1:20



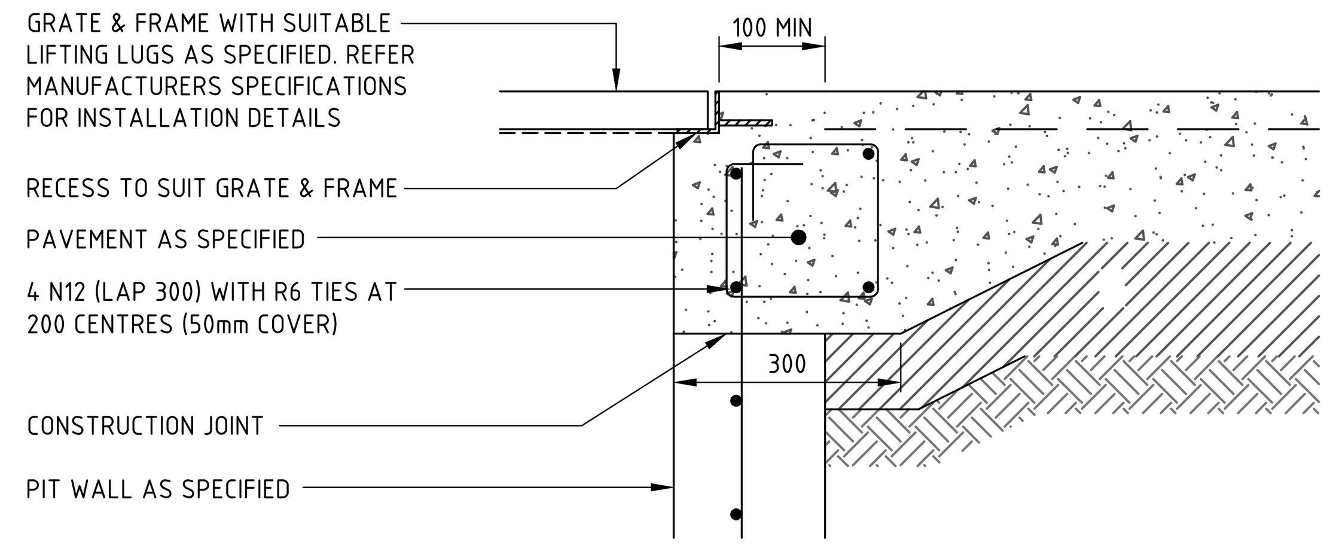
SURFACE INLET 'SIP' / JUNCTION PIT 'JP'

PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS > 1000mm DEPTH).
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT
SCALE 1:20



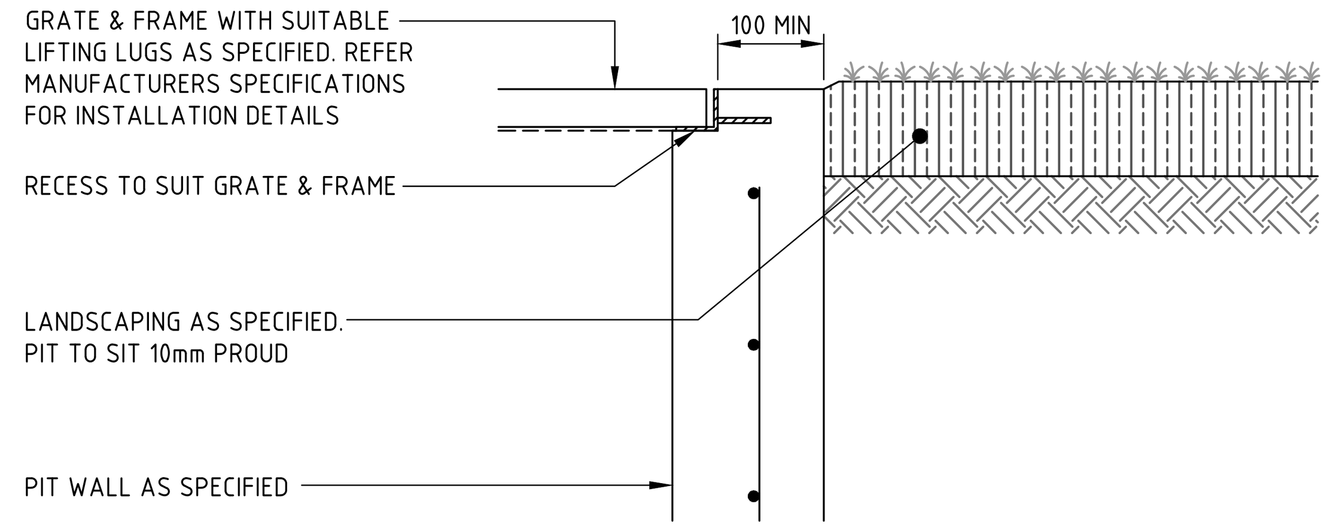
PIT INTERFACE - DETAIL 'A'

SCALE 1:10



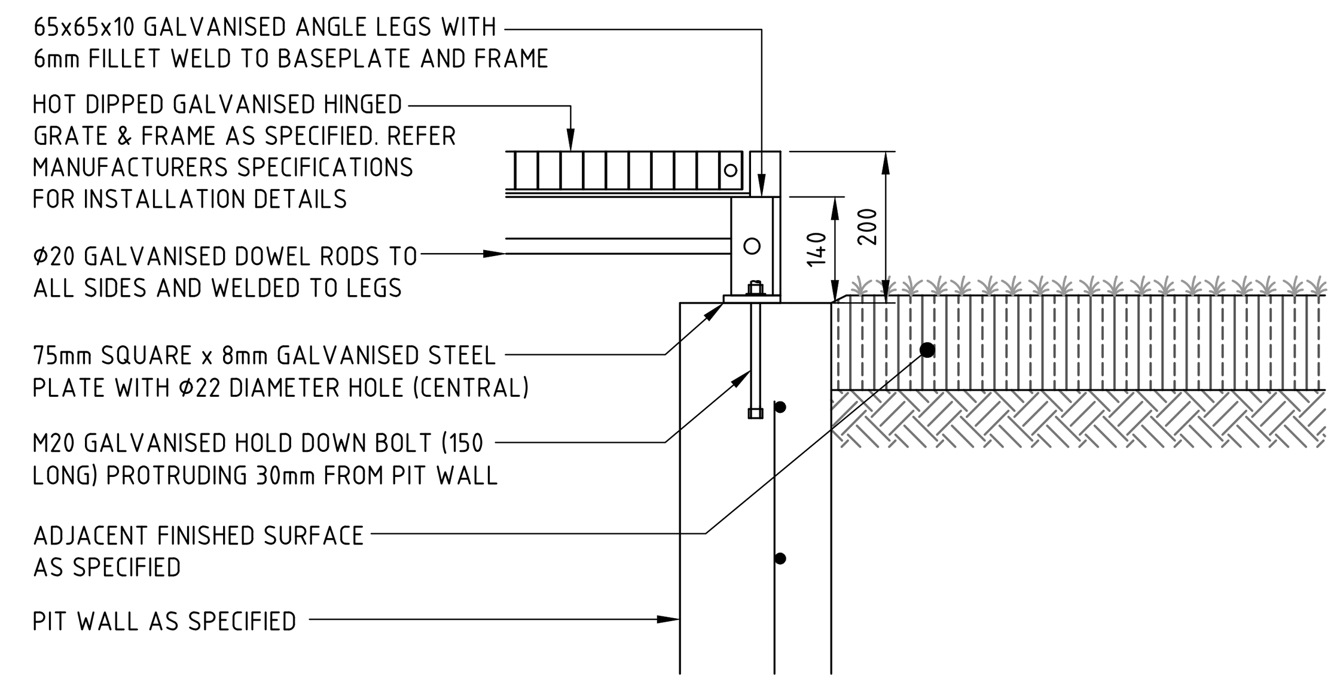
PIT INTERFACE - DETAIL 'B'

SCALE 1:10



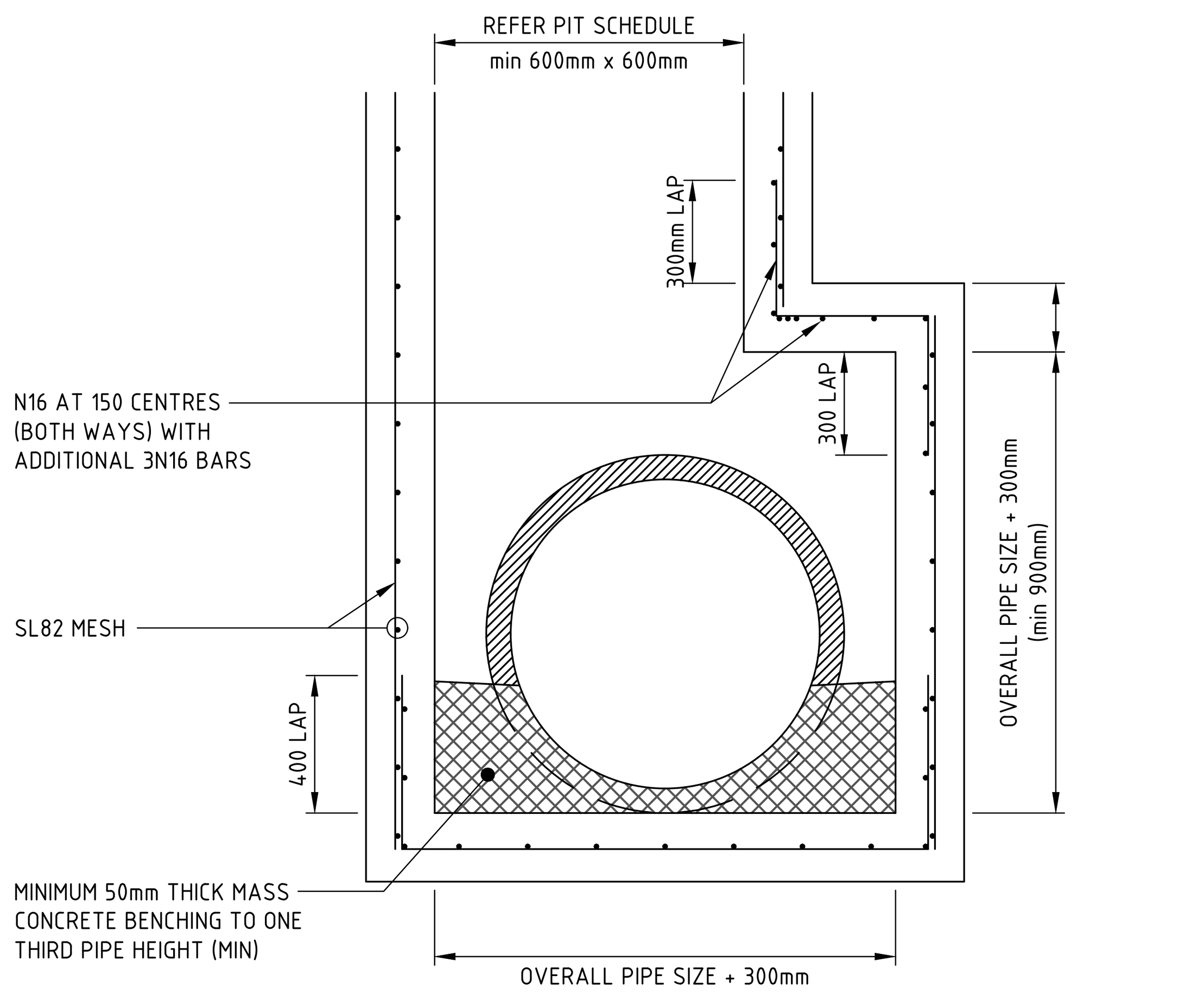
PIT INTERFACE - DETAIL 'D'

SCALE 1:10

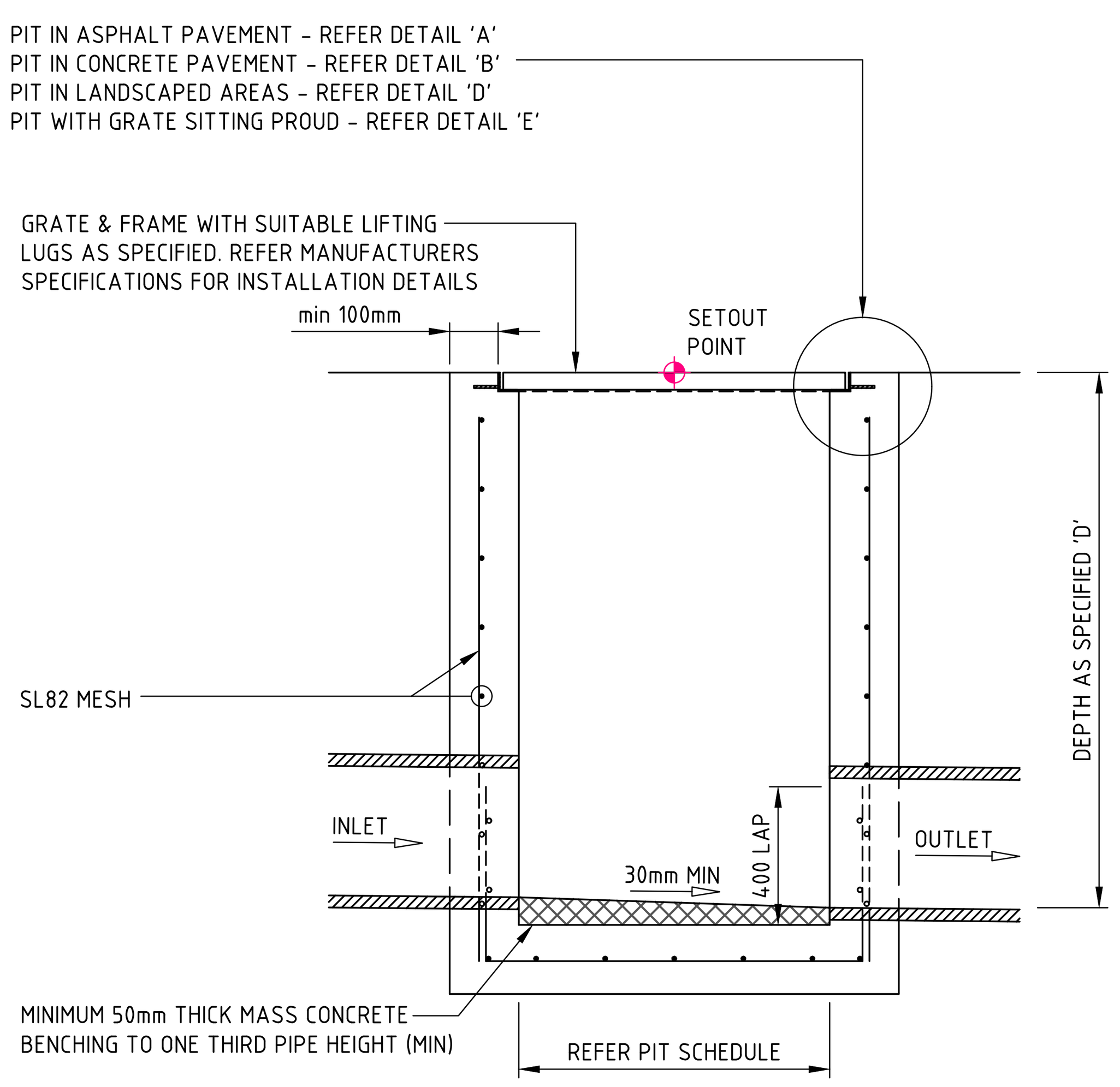


PIT INTERFACE - DETAIL 'E'

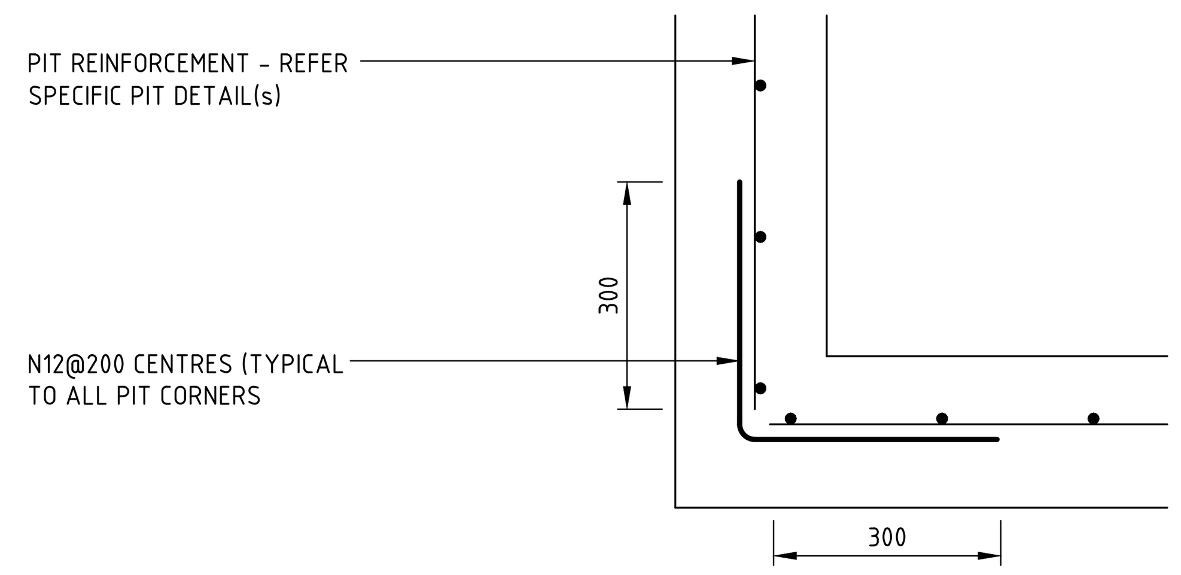
SCALE 1:10



SECTION A
SCALE 1:20

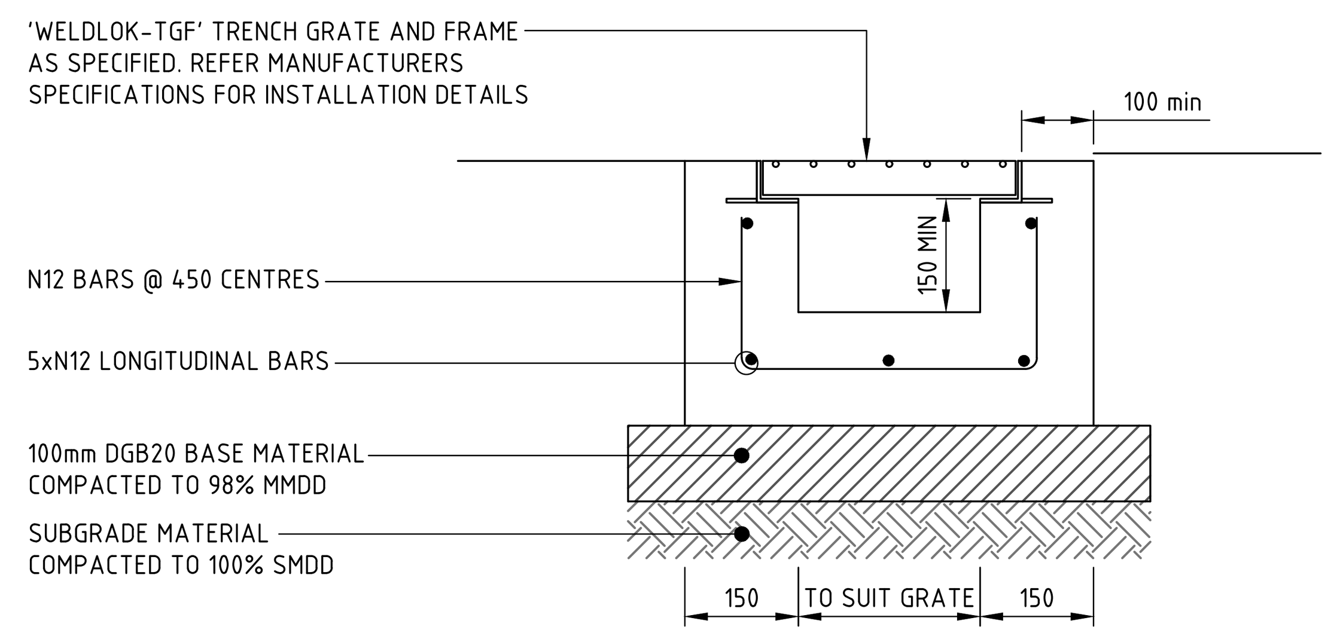


SECTION B
SCALE 1:20



PIT INTERFACE (PLAN VIEW)- DETAIL 'F'

APPLICABLE TO ALL STORMWATER DRAINAGE STRUCTURES
SCALE 1:10



GRATED TRENCH DRAIN 'GTD'

GRATED TRENCH DRAIN TO HAVE MINIMUM 150mm CLEARANCE AND 1% LONGITUDINAL FALL.
GRATE CLASS TO BE CLASS 'B' HEELSAFE IN PEDESTRIAN AREAS AND CLASS 'D' IN TRAFFICKED AREAS UNLESS NOTED OTHERWISE ON PLAN
SCALE 1:10

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR INFORMATION	AC		AC	18.01.2022
03	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: RESOURCE RECOVERY DESIGN (AUST) PTY LTD.

SCALE 1:20 @ A1 — 0.0 0.2 0.4 0.6 0.8 1.0m
SCALE 1:10 @ A1 — 0.0 0.1 0.2 0.3 0.4 0.5m

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK.
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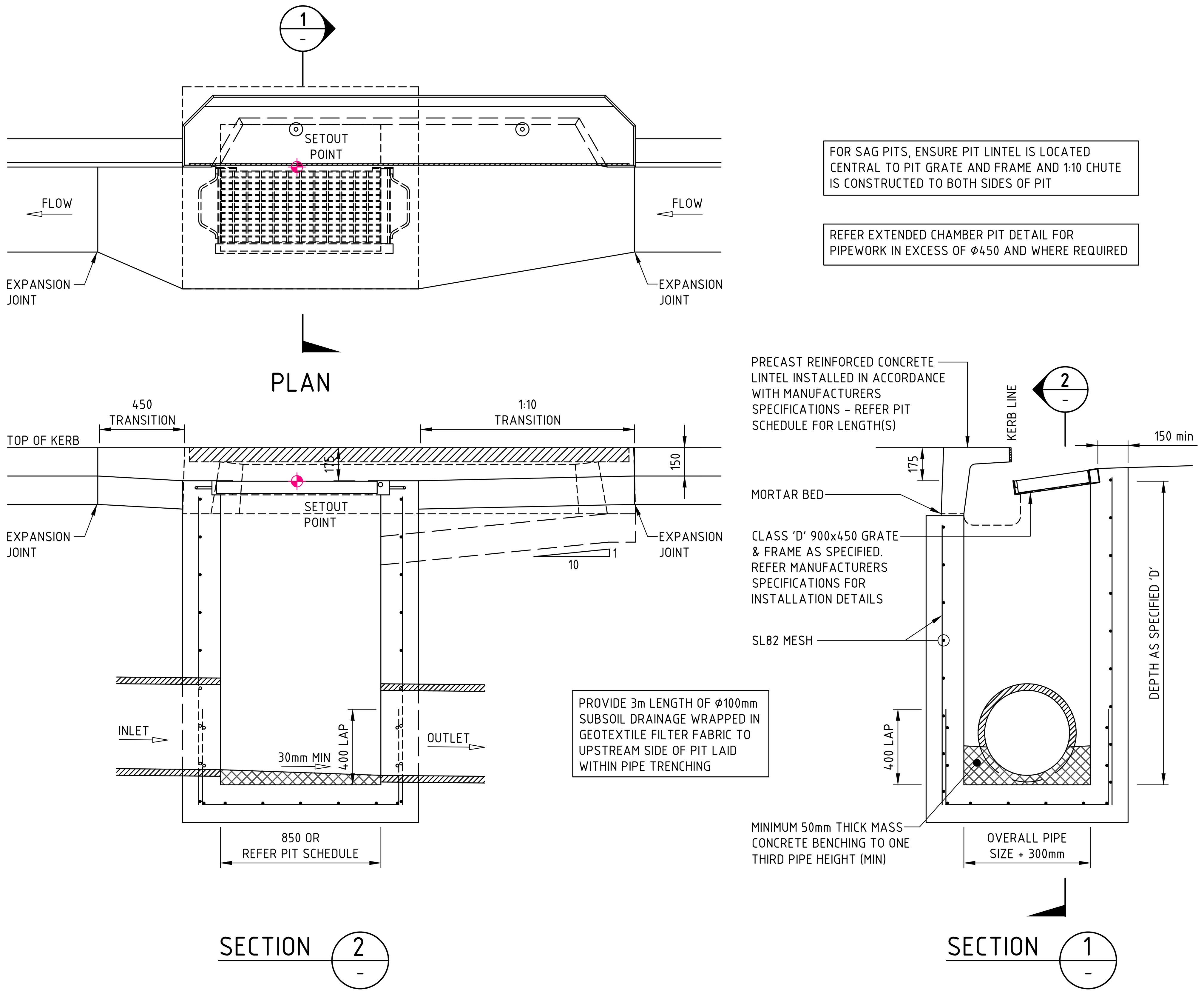
PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — DETAILS - SHEET 01

JOB NUMBER: 211274

DRAWING NUMBER: DAC16.01 REVISION: 03

DRAWING SHEET SIZE = A1



KERB INLET PIT 'KIP'

PIT STRUCTURE TO BE 200mm THICK UNLESS SHOWN OTHERWISE. DRILL AND EPOXY PLASTIC PROPRIETARY STEP IRONS IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS (PITS > 1000mm DEPTH).
REFER PIT INTERFACE DETAIL 'F' FOR CORNER REINFORCEMENT
SCALE 1:20

DRAWN: E. EAGER DESIGNED: A. CARVALHAES JOB MANAGER: - VERIFIER: -

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.2021
02	ISSUED FOR INFORMATION	AC		AC	18.01.2022
03	ISSUED FOR SSDA	MM		AC	19.01.2022

CLIENT: Charter Hall

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ARCHITECT: Resource Recovery Design (Aust) Pty Ltd.

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THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE

SCALE 1:20@ A1 — 0.0 0.2 0.4 0.6 0.8 1.0m

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PROJECT: 600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — DETAILS - SHEET 02

JOB NUMBER: 211274

DRAWING NUMBER: DAC16.02 REVISION: 03

DRAWING SHEET SIZE = A1

Appendix B – OSD Deemed to Comply Tool

Cleanav

Ref: 2 1 1 2 7 4

Site:	
Address 600 Woodstock Avenue Rooty Hill	
Site Area	19705 m²
Site Area NOT Draining to OSD	2578 m²
Bypass	13%
Reduced Levels (AHD):	
② RL of soffit (top) of tank	42.840
① Average RL of the base of the OSD Tank	40.280
③ RL of Emergency Overflow Weir	42.471
RL of 50% AEP Overflow Weir	41.724
⑤ RL of 50% AEP Orifice Center Line	40.030
⑥ RL of 1% AEP Orifice Center Line	40.000
⑦ RL of Invert of Discharge to Downstream Pit	38.690
⑧ RL of Obvert of pit outlet pipe	39.045
Minimum RL of Garage Floor	42.940
Minimum RL of Habitable Floor	43.040
OSD Volume:	
Required Storage BELOW the 50% AEP Overflow Weir	591.150
Required Storage BELOW Emergency Overflow Weir	896.578
Discharge Details:	
Using Filter Cartridges to manage Water Quality	No
Discharge Location	Drainage Pit
Length of Emergency Overflow Weir	3.000
Maximum 50% AEP Site Discharge	63.354
Maximum 50% AEP Orifice Discharge	63.354
Maximum 1% AEP Site Discharge	230.045
Maximum 1% AEP Orifice Discharge	230.045
Orifice Details:	
Number of 50% AEP Orifices	1.000
Number of 1% AEP Orifices	1.000
50% AEP Orifice Diameter (mm)	151.500
1% AEP Orifice Diameter (mm)	263.000

Notifications:

Access grates to be provided such that the maximum reach from any point in the tank to the nearest grate is 6m.

Appendix C – Fire Water Storage Sketch

FIRE WATER ON PAVEMENTS TO BE DIRECTED TO INGROUND STORMWATER PIT AND PIPE NETWORK AND STORED IN ON-SITE STORMWATER DETENTION TANK.

OSD TANK VOLUME = 890m³.

KELLOGG ROAD

SITE AREA BYPASSING FIRE WATER BUNDING

DRIVEWAY PAVEMENT REFER TO BLACKTOWN STANDARD DETAIL (TYP)

KELLOGG ROAD

2.0m MAX HIGH WALL

PENSTOCK VALVE TO BE PROVIDED IN STORMWATER PIT AND CONNECTED TO FIRE CONTROL PANEL AUTOMATED TO CLOSE WHEN FIRE EVENT OCCURS. FIRE WATER TO BE PUMPED AND DISPOSED OF AFTER FIRE EVENT.
PENSTOCK VALVE TO BE MANUALLY OPENED AND RESET TO FIRE CONTROL PANEL.

SITE AREA BYPASSING FIRE WATER BUNDING

OSD

RWT

WEIGH BRIDGE

PUMP TANK

SPRINKLER TANK

SPRINKLER TANK

EXISTING BUILDING

1.4m MAX HIGH WALL

KELLOGG ROAD

WEIGH BRIDGE

PROPOSED BUILDING
FFL43.80

ALL DOOR THRESHOLDS TO BE PROVIDED WITH 50mm BUNDING / TRANSITION TO FFL TO ALLOW FIRE WATER TO BE DIRECTED TO MECHANICAL CONVEYOR SUMP

FOR CONTINUATION REFER TO SHEET 02

PROPOSED BUILDING
FFL43.80

ALL DOOR THRESHOLDS TO BE PROVIDED WITH 50mm BUNDING / TRANSITION TO FFL TO ALLOW FIRE WATER TO BE DIRECTED TO MECHANICAL CONVEYOR SUMP

FIRE WATER TO BE DIRECTED TO MECHANICAL CONVEYOR SUMP. FIRE WATER TO BE PUMPED AND DISPOSED OF AFTER FIRE EVENT.

MECHANICAL CONVEYOR SUMP VOLUME 56.7m(L) x 5.0m(W) x 2.0m(D) = 567m³.

PROPOSED GPT CDS 1512 OR APPROVED EQUIVALENT

PENSTOCK VALVE TO BE PROVIDED IN STORMWATER PIT AND CONNECTED TO FIRE CONTROL PANEL AUTOMATED TO CLOSE WHEN FIRE EVENT OCCURS. FIRE WATER TO BE PUMPED AND DISPOSED OF AFTER FIRE EVENT.
PENSTOCK VALVE TO BE MANUALLY OPENED AND RESET TO FIRE CONTROL PANEL.

ASSUME IL = 38.3 TO BE CONFIRMED PRIOR TO DETAILED DESIGN

OSD TANK VOLUME = 890m³
MECHANICAL CONVEYOR SUMP = 567m³
TOTAL = 1,457m³
REQUIREMENT = 1,450m³

SITE AREA BYPASSING FIRE WATER BUNDING

1.4m MAX HIGH WALL

2.6m MAX HIGH WALL

2.6m MAX HIGH WALL

WOODSTOCK AVENUE

PROJECT:	600 WOODSTOCK AVE, ROOTY HILL
JOB NUMBER:	211274
TITLE:	FIRE WATER STORAGE SKETCH
PAGE No:	1/1
DATE:	18.01.22
DRAWN:	AC

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