CIVIL STORMWATER MANAGEMENT REPORT

Richmond Agricultural Centre

2 College Street, Richmond NSW

Ref: SY240854-00-CV-RP01
Rev: 2
Date: 26 May 2025

PREPARED FOR
Richard Crookes Constructions Pty Ltd
Level 14, 558 Pacific Highway
St Leonards NSW 2065

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Document Title:	Civil Report
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1. Introduction

1.1 General

This Civil Stormwater Management Report has been prepared by Northrop Engineers Pty Ltd on behalf of the Department of Education (DoE) (the Proponent) to assess the potential environmental impacts that could arise from the activities associated with the Richmond Agricultural Centre development at 2 College Street Richmond (Part Lot 2 DP1051798) (the site).

1.2 Site Description

The Site is located on 2 College Street, Richmond (Part Lot 2 DP 1051798). The site is located within the Hawkesbury City Council area and is zoned SP1 Special Activities (the SP1 zone) by the *Hawkesbury Local Environmental Plan 2012* (the LEP).

Figure 1 is a site plan showing the location of the proposed Richmond Agricultural Centre within its regional context. **Figure 2** is an aerial image of the site and its immediate surrounds

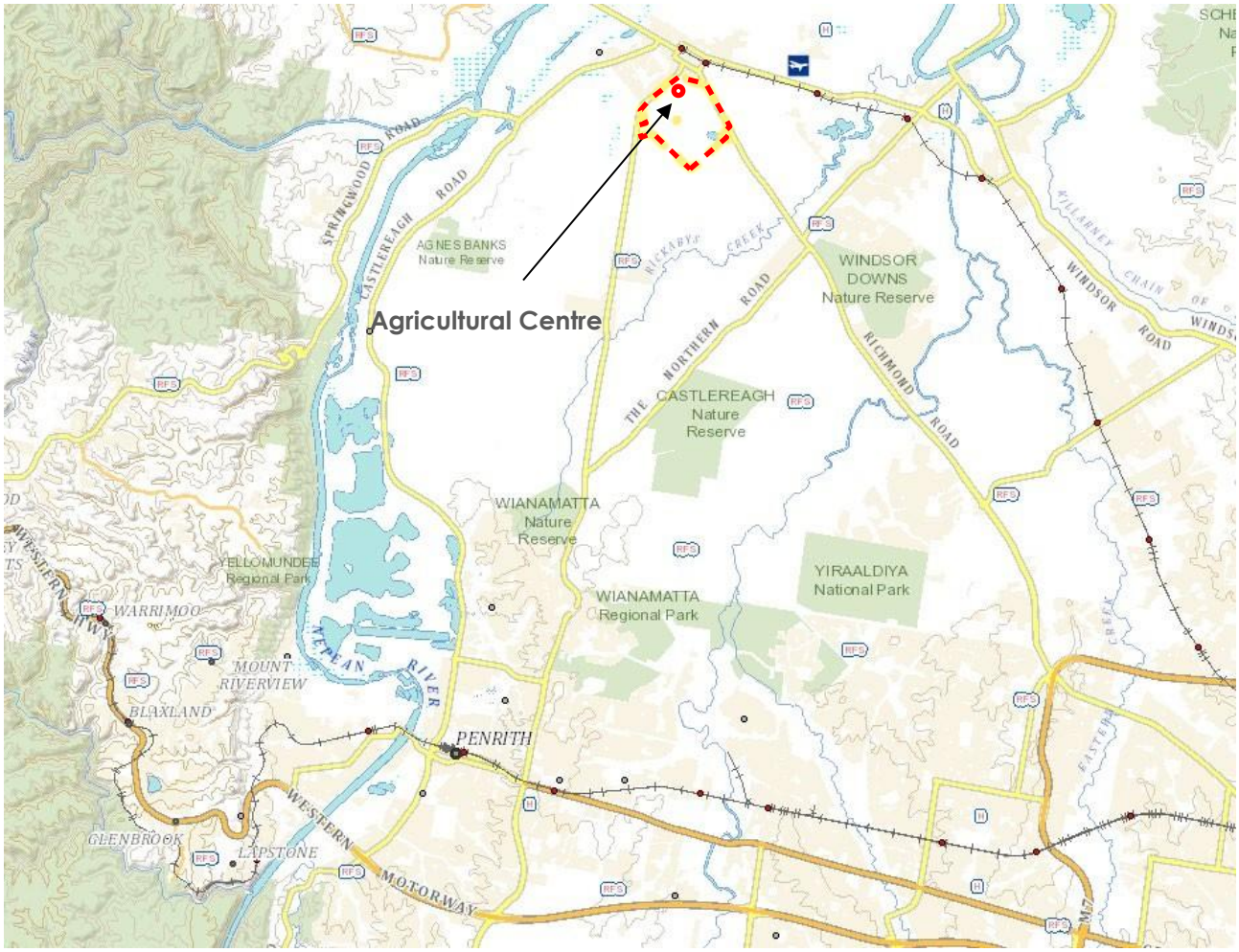

Figure 1: Location of the proposed Richmond Agricultural Centre (source: ePlanning Spatial Viewer).

Figure 2: Aerial image of the site showing the location of the proposed Richmond Agricultural Centre (source: Nearmap, dated 27 October 2024).

The boundary of the REF works is shown in **Figure 3** and comprises:

- Leased area: This is the area of land leased by the Department of Education from Western Sydney University (WSU) for the proposed Richmond Agricultural Centre. This area comprises 14.25 ha of land with frontage to College Drive of 480 meters. The future school site comprises existing agricultural land within the WSU campus bound by College Drive to the east, Londonderry Road to the west, WSU facilities to the south and vacant WSU agricultural land to the north.
- WSU Campus: This the area of land between the leased area and College Drive

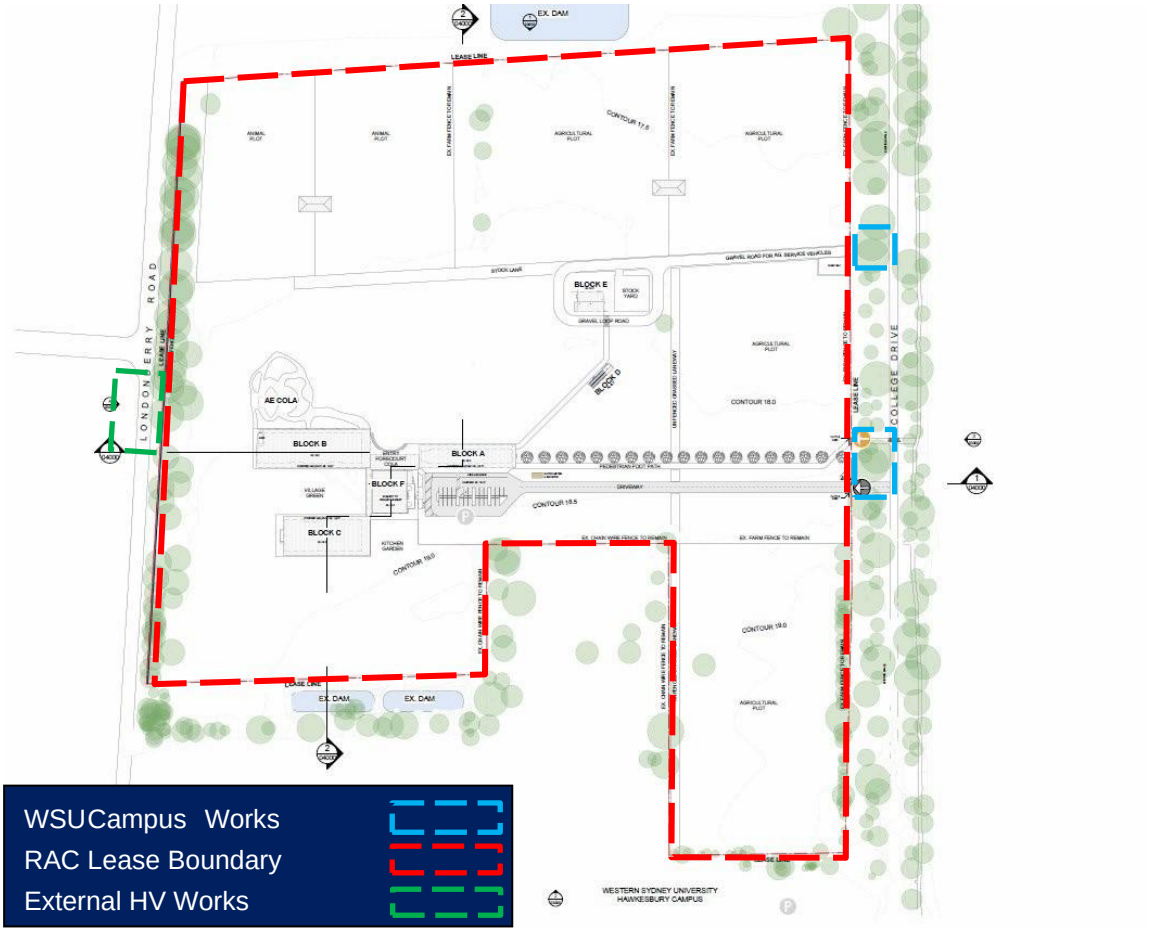

Figure 3: Extent of proposed works at Richmond Agricultural Centre (source: NBRS Architecture).

1.3 Project Description

This Civil Stormwater Management Report has been prepared by Northrop on behalf of the Department of Education (DoE) (the Proponent) to assess the potential environmental impacts that could arise from the activities associated with the Richmond Agricultural Centre development at 2 College Street Richmond (Part Lot 2 DP1051798) (the site).

The report has been prepared to outline the proposed management of stormwater for the Richmond Agricultural Centre.

This report accompanies a Review of Environmental Factors (REF) that seeks approval for the construction and operation of the agricultural centre which will provide facilities for a specialist agricultural curriculum at the site. The activities associated with establishing the Richmond Agricultural Centre involves the following works:

- The removal of trees and fencing
- Construction of a general learning hub
- Construction of a science hub
- Construction of a multipurpose hall
- Construction of an administration building
- Construction of canteen and amenities building
- Construction of a new parking area (including accessible spaces) driveway and kiss and drop facilities
- The provision of outdoor agricultural learning areas comprising:
    - Agricultural plots
    - Aboriginal enterprise
    - Agricultural shed and greenhouse
    - Animal plots with associated stock yard, animal shelters, troughs and stock lane
    - Gravel access road with wash bay
- Landscaping including new trees, entry forecourt, village green and kitchen garden
- Ancillary services and infrastructure upgrades including new substation and HV Works, sewer pump station, water booster, dual carriage vehicle access and pedestrian paths
- Wayfinding and school identification signage

For a detailed project description, please refer to the Review of Environmental Factors (REF) prepared by EPM Projects.

1.4 Referenced Documents

The following external documents have been used in reference to this report.

Documents	Description
EFSG – Education Facilities Guidelines	SINSW
Architectural Drawings	Prepared by NBRS
NCC 2022	National Construction Code of Australia 2022
HCC DCP	Hawkesbury Development Control Plan Appendix E – Civil Works Specification

1.5 Referenced Standards and Guidelines

All works shall be in accordance with the following standards unless noted otherwise:

1.5.1 Civil

Reference	Standard Title
NCC 2022	National Construction Code of Australia 2022
AS2890.1-2004	Parking Facilities Part 1: Off Street Car Parking
AS2890.2-2018	Parking Facilities Part 2: Off Street Commercial Vehicle Facilities
AS2890.6-2009	Parking Facilities Part 6: Parking Facilities Off Street parking for People with Disabilities
AS3500.3-2018	Plumbing and Drainage Part 3: Stormwater Drainage

2. Existing Authority Services and Connections

2.1 General

The following section outlines the requirements of existing stormwater on the site.

2.2 Applicable Planning Controls

The site is located within the Western Sydney University precinct part of Hawkesbury City Council's LGA. The site is relatively flat falling from First Ave to College Street. The site is boundary by rural roads, Londonderry Road to the west and College Drive to the East.

Figure 2.1: Mecone Mosaic Map

2.3 Civil

2.3.1 Existing Stormwater Infrastructure – (External) Legal Point of Discharge

The site is relevantly flat and does not have any existing stormwater infrastructure for connection. There is an existing stormwater culvert crossing College Drive, however there is no in-ground stormwater infrastructure on College Drive or Londonderry Drive for the school stormwater connection.

The current site stormwater runoff is uncontrolled sheet flow through the paddocks.

3. Site Conditions

3.1 General

The following section outlines items of the existing site which have implications on the development.

3.2 Civil

3.2.1 Site Topography

The existing site topography generally falls towards the north east to College Drive. The site is flat and therefore the existing stormwater runoff has a high time of concentration.

3.2.2 Access to Site

The main access to the school, both vehicular and pedestrian is on College Drive. There is also vehicular access to the carparking area, waste and delivery areas. These have been rationalized by the project team in consultation with a Traffic and Transport Engineer in developing the proposed layout.

3.2.3 Existing Stormwater Infrastructure (Internal)

There is no in-ground stormwater drainage pit and pipe network on site for connection of this new development.

3.2.4 Flooding

The site is not flood affected in the 1:100 AEP Flood based on the Hawkesbury – Nepean Flood Study, however the site is partially affected in the 1:200 AEP Flood and above, including the PMF. As part of this REF, the proposal is to locate the school above the 1:200 AEP Flood extents. Below is a screenshot of the 1:200 AEP Flood extents.

Refer Northrop's separate reports relating to Flood Emergency Response Strategy, and Flood Impact and Risk Assessment Report for further details.

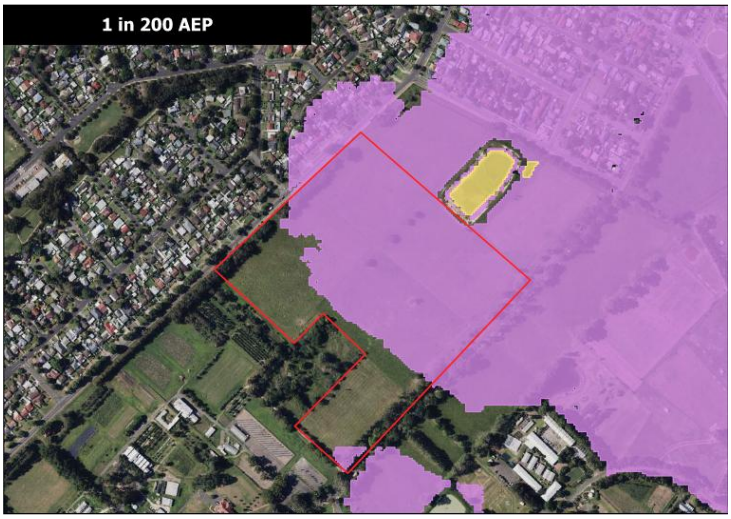

Figure 3.1 Flood Map 1:200 AEP Flood (Hawkesbury – Nepean River Flood Study)

4. Proposed New Works

4.1 Proposed Civil Works

The following section refer to works associated with the construction of the Richmond Agricultural Centre, Hawkesbury.

4.1.1 Pavements

For the purposes of schematic design, we will design the pavements with consideration to traffic loading specified in the Educational Facilities Guidelines and Standards (5 x 10^5 ESAs) and an assumed CBR 3%. Based on Geotechnical investigations, the existing subgrade CBR values range from 1.5% to 3% which is relatively low. As the internal driveway and carpark is provided on imported fill material, we have assumed the subgrade CBR of 3% would be achieved.

Should the existing subgrade achieve less than CBR 3, or compaction of the subgrade is not achievable, ground improvement may be required such as lime stabilisation or replacement with a select fill layer such as crushed sandstone.

4.1.2 Stormwater Management Strategy

A stormwater management plan for the development has been prepared by Northrop to satisfy the aims of the documents as stated above. The key elements of the stormwater management include:

- Stormwater Quantity Management
- Stormwater Quality Management

4.2 Stormwater Quantity Management

4.2.1 Major/Minor Design

The major/minor approach to stormwater drainage is the recognised drainage concept for catchments within the Hawkesbury City Council 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% AEP (~1 in 20-year ARI) event.

The major drainage system is inclusive of overland flow paths which are designed to control and convey flows in excess of the minor system capacity. Council requires the major drainage system to be designed for the critical 1% AEP (1 in 100-year ARI event).

As the site is relatively flat, we are proposing to capture the stormwater runoff through swales and high level culverts discharging the headwalls with scour protection downstream from the development.

4.2.2 On-Site Stormwater Detention (OSD)

Based, on outcomes from a Pre-Lodgement Advice Meeting with Council on 28th January 2025, we note that Council does not require OSD for this development based on the site being flood affected and also limitations with lack of Council's stormwater infrastructure for connection.

In addition, as the site is flat, we note that OSD is not achievable for this development. We note that rainwater tanks for non-potable uses are proposed to capture the new building roof runoff to limit the stormwater runoff discharge.

4.2.3 Stormwater Quality Management

4.2.3.1 Water Quality Objectives

Based, on outcomes from a Pre-Lodgement Advice Meeting with Council on 28th January 2025, we note that Council does not require MUSIC modelling in order to provide a treatment train for water quality measures for this development. This is due to the site being flat and therefore treatment is not feasible. We are proposing to manage the stormwater runoff through swales and discharging to headwalls on the site, which then sheet flows through the agricultural plots.

4.2.3.2 Rainwater Storage and Reuse

A rainwater tank/s has been included to capture all roof water. This water is used for irrigation and toilet flushing re-use where applicable. The overflow is connected to a piped system and discharges freely on site via a headwall and scour protection.

4.2.3.3 Swales

Swales run parallel to the proposed driveway, carpark and buildings to direct upstream overland flows around the development. These help to guide the runoff towards downstream of the development.

4.2.3.4 Stormwater Pit Inserts

For primary pollutant removal from the internal driveway and carpark, stormwater pits are proposed with Oceanguard inserts, supplied by Ocean Protect. These help alleviate Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN) and Gross Pollutants (GP)

5. Early and Enabling Works

5.1 Civil

5.1.1 Sediment and Soil Erosion Control

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

- Adequate erosion and sediment 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 Hawkesbury City Council's requirements.

As part of the works, the erosion and sedimentation control will be constructed in accordance with Council requirements and "Managing Urban Stormwater Soil & Construction" 2004 (Blue Book) prepared by Landcom, prior to any earthworks commencing on site.

5.1.2 Sediment Basin

A temporary sediment basin has been designed to capture site runoff during construction and has been located towards the north eastern side of the site, in the lowest point. The construction of the basin will be undertaken in stages to enable maximum runoff capture assisted by diversion swales and direct runoff to the basin.

Calculations have been undertaken to determine the concept design basin size have been based on available geotechnical information regarding soil types and through the use of the Soils and Construction Volume 1 Manual. The volume of the sediment basin is 273m^3, refer below for calculations.

To ensure the sediment basin is working effectively it will 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 in excess of the design criteria.

SEDIMENT BASIN CALCULATIONS	
PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	1.63
SOIL TEXTURE GROUP	D
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	80%
x-DAY, y-PERCENTILE RAINFALL EVENT (mm)	22.4
Cv	0.5
SETTLING ZONE VOLUME (m^3)	182.56
SEDIMENT STORAGE VOLUME (m^3)	91.28
TOTAL BASIN VOLUME REQUIRED (m^3)	273.84

5.1.3 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 Construction Certificate drawings and the “Blue Book”. The measures shown on the drawings are intended to be a minimum treatment only as the contractor will be required to modify and stage the erosion and sedimentation control measures to suit the construction program, sequencing and techniques. These measures will 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.

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; and

The construction of a temporary sediment basin as noted on the drawings;

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. Sediment fences shall be installed to the downstream side of stockpiles and any embankment formation. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

5.1.4 Wet Weather Management

In circumstances of heavy rain sufficient to affect site access and ground conditions the Site Manager and Site HSE Committee representative should complete a site inspection before work commences. The inspection needs to focus on.

- The suitability of pedestrian access to the amenities and into the construction work areas
- The suitability of access for plant and equipment
- The suitability of ground conditions for plant and equipment to operate
- Nominate the construction zones suitable for work to commence
- Actions to remediate those areas not suitable for work to commence (de-water; prepare ground conditions and access ways etc.)

It is noted that the storage of equipment during wet weather will be placed in areas to not prohibit or disrupt operation of the sediment and soil erosion control measures.

5.1.5 Bulk Earthworks

The proposed works will generally consist of earthworks cut and fill operations to form design levels of the proposed buildings and internal road. Filling is required due to the flat topography of the site, and therefore we are proposing to excavate a portion of the site in order to help mitigate some of the loss of flood storage requirement for the development.

Earthworks shall be undertaken in accordance with geotechnical advice with specific regard to temporary earthworks including batters etc.

6. Mitigation Measures

Below is a table identifying civil engineering mitigation measures.

Project Stage	Mitigation Measure	Relevant Section of Report
Design and Construction	Erosion and sedimentation control will be constructed in accordance with Council requirements and “Managing Urban Stormwater Soil & Construction” 2004 (Blue Book) prepared by Landcom, prior to any earthworks commencing on site.	Section 5.1.1
Design and Construction	A temporary sediment basin has been designed to capture site runoff during construction and has been located towards the north eastern side of the site	Section 5.1.2
Design and Construction	Erosion and Sediment control measures such as sediment fence, temporary swales, construction access is proposed during construction.	Section 5.1.3
Design and Construction	Wet weather management during heavy rainfalls needs to be monitored	Section 5.1.4
Design and Construction and Operation	Earthworks - Cut is proposed on the site in order to mitigate some of the loss of site’s flood storage. As such, it is not expected that the development will result in adverse flood impacts on surrounding properties nor additional inundation of the immediate downstream of the site.	Section 5.1.5
Design and Operation	Rainwater re-use tanks are proposed for irrigation and toilet flushing to reduce water demand and stormwater quantity from the development.	Section 4.2.3.2
Design and Operation	Stormwater Quality – Oceanguard inserts are proposed for pits for stormwater runoff from the driveway and carpark area.	Section 4.2.3.4

7. Appendix A – Civil REF Drawings

RICHMOND AGRICULTURAL CENTRE

COLLEGE DRIVE, RICHMOND, NSW 2753
CIVIL ENGINEERING PACKAGE

SOURCE : NEARMAP.COM.AU (©2024)

LOCALITY PLAN

CIVIL DRAWING SCHEDULE

DWG No.	DRAWING TITLE
RAC-NRE-ZZ-ZZ-DR-C-0000	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
RAC-NRE-ZZ-ZZ-DR-C-0001	SPECIFICATION NOTES - SHEET 01
RAC-NRE-ZZ-ZZ-DR-C-0002	SPECIFICATION NOTES - SHEET 02
RAC-NRE-ZZ-ZZ-DR-C-1101	SEDIMENT AND SOIL EROSION CONTROL PLAN
RAC-NRE-ZZ-ZZ-DR-C-2001	CUT AND FILL PLAN
RAC-NRE-ZZ-ZZ-DR-C-3001	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
RAC-NRE-ZZ-ZZ-DR-C-4001	STORMWATER LONGITUDINAL SECTIONS - SHEET 1
RAC-NRE-ZZ-ZZ-DR-C-4002	STORMWATER LONGITUDINAL SECTIONS - SHEET 2
RAC-NRE-ZZ-ZZ-DR-C-4201	STORMWATER CATCHMENT PLAN
RAC-NRE-ZZ-ZZ-DR-C-4301	STORMWATER PIT SCHEDULE
RAC-NRE-ZZ-ZZ-DR-C-6001	DETAILS - SHEET 01
RAC-NRE-ZZ-ZZ-DR-C-6002	DETAILS - SHEET 02
RAC-NRE-ZZ-ZZ-DR-C-6003	DETAILS - SHEET 03

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK.
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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT CONCEPT DESIGN	WD		NS	11.12.24
02	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
04	ISSUED FOR COORDINATION	WD		NS	24.03.25
05	ISSUED FOR REF	WD		NS	28.04.25

ARCHITECT
NBRS

BUILDER
RICHARD CROOKES CONSTRUCTIONS

CLIENT
NSW GOVERNMENT Education School Infrastructure

PROJECT
RICHMOND AGRICULTURAL CENTRE, COLLEGE ROAD, RICHMOND, NSW, 2753

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SCALE 1:4000@ A1 0 40 80 120 160 200m

DRAWING TITLE
CIVIL ENGINEERING PACKAGE COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 0000

REV
05

NOT FOR CONSTRUCTION

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH HAWKESBURY CITY COUNCIL DEVELOPMENT GUIDELINE, READ IN CONJUNCTION WITH THE NOTES PROVIDED BELOW. IF CONFLICT ARISE, HAWKESBURY CITY COUNCIL GUIDELINES AND SPECIFICATIONS TAKE PRECEDENCE. WHERE HAWKESBURY CITY COUNCIL GUIDELINES AND SPECIFICATIONS ARE SILENT, THE SPECIFICATION NOTES BLOW TAKE PRECEDENCE.

SURVEY

1. SURVEY SUPPLIED BY: CMS SURVEYORS PTY LTD
   1.1. REF. NUMBER: 22430detail
   1.2. DRAWING TITLE: BOUNDARY IDENTIFICATION AND DETAIL & LEVEL SURVEY OVER PART OF LOT 2 IN DP1051798 LONDONDERRY ROAD RICHMOND, NSW, 2753
   1.3. REVISION DATE: 19.09.24
   1.4. REVISION: 2
   1.3. GEOCENTRIC DATUM OF AUSTRALIA: MGA56; GDA2020
   1.4. SURVEYOR: LP/JM
   1.5. APPROVED: RM
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.

TREE PROTECTION

1. REFER TO LANDSCAPE / ARCHITECTS PLAN FOR TREES TO BE RETAINED AND PROTECTED.
2. ANY EXISTING/PROPOSED TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY;
   2.1. PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE.
   2.2. ENSURING THAT NOTHING IS NAILED TO ANY PART OF THE TREE.
   2.3. CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY. COUNCILS AND/OR INDEPENDENT ARBORISTS TO BE CONSULTED WHERE TREE ROOTS ARE TO BE REMOVED AND/OR CUT.

EXISTING SERVICES

1. 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.
2. CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.
3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AT THE CONTRACTORS EXPENSE.
4. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.
5. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT.
6. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS ARE NOT AFFECTED BY THE WORKS AND ARE MAINTAINED AND NOT DISRUPTED.
7. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.
8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
9. THE CONTRACTOR IS TO ALLOW TO POTHOLE ANY SERVICES WITHIN A PUBLIC RESERVE WITHIN THE EXTENT OF WORKS (E.G. STORMWATER CROSSINGS).

ACCESS AND SAFETY

1. THE CONTRACTOR SHALL COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.
2. THE CONTRACTOR SHALL PROVIDE TRAFFIC MANAGEMENT PLANS FOR THE PROPOSED WORKS COMPLETED BY A SUITABLY QUALIFIED PERSON AND APPROVED BY COUNCIL / REGULATORY AUTHORITY. WORK IS NOT TO COMMENCE ON SITE PRIOR TO APPROVAL OF TRAFFIC MANAGEMENT SCHEME.
3. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES ACCESS TO BUILDINGS ADJACENT THE WORKS IS NOT DISRUPTED.
4. WHERE NECESSARY THE CONTRACTOR SHALL PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.
5. THE CONTRACTOR SHALL ENSURE PUBLIC ACCESS EXTERNAL TO THE SITE IS IN ACCORDANCE WITH COUNCILS / AUTHORITY / SITE MANAGERS REQUIREMENTS.

SEDIMENT AND SOIL EROSION

1. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY. THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCILS AND OTHER REGULATORY AUTHORITY REQUIREMENTS AND MAKE PAYMENT OF ALL FEES.
2. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH STATUTORY REQUIREMENTS AND IN PARTICULAR THE 'BLUE BOOK' (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION), PRODUCED BY LANDCOM AND COUNCILS POLICIES. THESE MEASURES ARE TO BE INSPECTED AND MAINTAINED ON A DAILY BASIS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THE DRAWINGS AND ADHERE TO ALL REGULATORY AUTHORITY REQUIREMENTS.
4. THE CONTRACTOR SHALL INFORM ALL SUB CONTRACTORS OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM LANDS AND WATERWAYS.
5. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE;
   5.1. CONSTRUCT TEMPORARY STABILISED SITE ACCESS INCLUSIVE OF SHAKE DOWN / WASH PAD.
   5.2. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ADJACENT EACH OTHER, THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   5.3. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THE APPROVED PLANS.
6. UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
7. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE UNPROTECTED AREAS WILL BE STABILISED / KEPT MOIST (NOT WET) TO KEEP DUST UNDER CONTROL ENSURING CONFORMITY TO REGULATORY AUTHORITY REQUIREMENTS.
8. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
9. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT BEEN FILTERED OUT.
10. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
11. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING RAIN EVENTS.
12. RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. CONTRACTOR TO PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.
13. IF A TEMPORARY SEDIMENT BASIN IS REQUIRED, ENSURE SAFE BATTER SLOPES IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. MAINTAIN ADEQUATE STORAGE VOLUME IN ACCORDANCE WITH PLANS. TEMPORARY PUMP 'CLEAN FLOCCULATED' WATER TO AUTHORITIES STORMWATER SYSTEM. ENSURE WHOLE DISTURBED SITE RUN-OFF IS DIRECTED TO TEMPORARY SEDIMENT BASIN.

SEDIMENT BASIN MANAGEMENT

1. PRIOR TO ANY FORECAST WEATHER EVENT, LIKELY TO RESULT IN SEDIMENT LADEN RUNOFF ON THE SITE, ANY EXISTING DETENTION BASINS/TRAPS SHALL BE DEWATERED TO PROVIDE SUFFICIENT CAPACITY TO CAPTURE SEDIMENT LADEN WATER FROM THE SITE.
2. ANY SEDIMENT LADEN WATER CAPTURED ON-SITE MUST BE TREATED TO ENSURE IT WILL ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES PRIOR TO ITS RELEASE FROM SITE. A SAMPLE OF THE RELEASED TREATED WATER MUST BE KEPT ON-SITE IN A CLEAR CONTAINER WITH THE SAMPLE DATE RECORDED.
3. NO ALUMINIUM BASED PRODUCTS MAY BE USED TO TREAT TURBID WATER (FLOCCULATING/COAGULANTS) ON-SITE WITHOUT THE PRIOR WRITTEN PERMISSION FROM AN APPROPRIATE COUNCIL OFFICER. THE APPLICANT MUST HAVE DEMONSTRATED ABILITY TO USE SUCH PRODUCTS CORRECTLY AND WITHOUT ENVIRONMENTAL HARM PRIOR TO ANY APPROVAL.
4. THE CHEMICAL/AGENT (FLOCCULATING/COAGULANTS) USED IN TYPE D AND TYPE F BASINS TO TREAT TURBID WATER CAPTURED IN THE BASIN MUST BE APPLIED IN CONCENTRATIONS SUFFICIENT TO ACHIEVE COUNCIL'S WATER QUALITY OBJECTIVES (TSS < 50mg/L, TURBIDITY < 60 NTU, 6.5 < pH < 8.5) WITHIN THE 5-DAY RAINFALL DEPTH USED TO CALCULATE THE CAPACITY OF THE BASIN, AFTER A RAINFALL EVENT.
5. ALL MANUFACTURERS INSTRUCTIONS MUST BE FOLLOWED FOR THE USE OF ANY CHEMICALS/AGENTS USED ON-SITE, EXCEPT WHERE APPROVED BY THE RESPONSIBLE PERSON OR AN APPROPRIATE COUNCIL OFFICER.
6. SUFFICIENT QUANTITIES OF CHEMICALS/AGENTS TO TREAT TURBID WATER (FLOCCULATING/COAGULANTS) MUST BE PLACED SUCH THAT WATER ENTERING THE BASINS/SEDIMENT TRAP MIXES WITH THE CHEMICALS/AGENTS AND IS CARRIED INTO THE BASIN/TRAP.
7. ANY BASIN MUST BE DEWATERED AS SOON AS PRACTICAL, ONCE WATER CAPTURED IN THE BASIN ACHIEVES COUNCIL'S WATER QUALITY OBJECTIVES.
8. INSPECT THE SEDIMENT BASINS AFTER EACH RAINFALL EVENT AND/OR WEEKLY. ENSURE THAT ALL SEDIMENT IS REMOVED ONCE THE SEDIMENT STORAGE ZONE IS FULL. ENSURE THAT OUTLET AND EMERGENCY SPILLWAY WORKS ARE MAINTAINED IN A FULLY OPERATIONAL CONDITION AT ALL TIMES.
9.

SCOUR PROTECTION ROCK

1. ROCK USED IN THE SCOUR PROTECTION SHALL CONSIST OF MATERIAL WHICH COMPLIES WITH THESE NOTES AND THE DRAWINGS. THIS REQUIREMENT APPLIES TO BOTH IMPORTED ROCK AND IN-SITU ROCK WHICH IS RE-USED.
2. INDIVIDUAL ROCKS SHALL BE FREE FROM CRACKS, CLEAVAGE PLANES, SEAMS AND DEFECTS WHICH WOULD RESULT IN THE BREAKDOWN OF THE ROCK IN SERVICE.
3. ROCK UNITS SHALL BE EITHER SEDIMENTARY RACK ONLY OR IGNEOUS ROCK ONLY AND AS A MINIMUM, SHALL SATISFY THE FOLLOWING CRITERIA:
   - ROCK SHALL BE ROUGH AND ANGULAR
   - ROCK SHALL HAVE A MINIMUM DRY DENSITY OF 2200 kg/m
   - IGNEOUS ROCK SHALL HAVE NO MORE THAN 10% (BY VOLUME) OLIVINE MATERIAL AND SHALL EXHIBIT NO ZONES OF SECONDARY ALTERATION SUCH AS CHLORITISATION. SEDIMENTARY ROCK SHALL HAVE A MINIMUM SODIUM SULPHATE SOUNDNESS WEIGHT LOSS NOT EXCEEDING 25%
   - ROCK SHALL HAVE A SATURATED POINT LOAD STRENGTH INDEX (IS50) NO LESS THAN 5.0 MPa FOR IGNEOUS ROCK AND 1.5 MPa FOR SEDIMENTARY ROCK
   - THE RATIO OF THE MAXIMUM DIMENSION TO THE MINIMUM DIMENSION, MEASURED AT RIGHT ANGLES TO THE MAXIMUM DIMENSION SHALL NOT EXCEED 2.5
4. THE ROCK UNITS SHALL BE PLACED SUCH THAT THE SPECIFIED REQUIREMENTS FOR SIZE, FINISHED SIDE SLOPES, TOP AND TOE LEVELS AND DENSITY REQUIREMENTS, ARE SATISFIED. IN ADDITION, ROCKS SHALL BE WEDGED AND LOCKED TOGETHER SUCH THAT THEY ARE NOT FREE TO MOVE. ROCK UNITS SHALL NOT BE ROLLED OR DROPPED INTO POSITION, THEY SHALL BE PLACED.
5. THE METHOD OF ROCK PLACEMENT SHALL BE SUCH AS TO MINIMISE ITS BREAKDOWN ON HANDLING AND THE PRODUCTION OF FINES.
6. A NON-WOVEN GEOTEXTILE (BIDIM A64 OR EQUIVALENT) SHALL BE PLACED UNDERNEATH AND BEHIND ALL ROCK ARMOUR AND EXTEND 0.5m ABOVE THE EXTENT OF THE WORKS OR AS OTHERWISE SHOWN ON THE DRAWINGS. THE GEOTEXTILE IS TO BE LAID ON A NEATLY TRIMMED BATTER THAT IS FREE OF HOLLOWS OR SHARP OBJECTS.
7. GEOTEXTILE LAYERS SHALL EITHER OVERLAP ON ANOTHER BY 1000mm OR BE SEWN TOGETHER (WITH A NON-BIODEGRADABLE THREAD) WITH AN OVERLAP OF 100mm.
8. ROCK SUB-ARMOUR SHALL BE PLACED UPON THE GEOTEXTILE IN A LAYER NO LESS THAN 150mm THICK UNLESS NOTED OTHERWISE ON DRAWINGS.
9. ROCK ARMOUR SHALL BE SELECTIVELY HAND PLACED UPON THE SUB-ARMOUR TO ENSURE A SNUG FIT SUCH THAT INDIVIDUAL ROCKS ARE NOT TO MOVE. THE PLACING OF ANY ARMOUR ROCK SHALL BE COMPLETED IN SUCH A MANNER TO MINIMISE THE DISTURBANCE OR DISLODGEMENT OF THE SUB-ARMOUR.
10. THE ROCK ARMOUR SHALL BE NO LESS THAN 375mm THICK UNLESS NOTED OTHERWISE ON THE DRAWINGS.
11. THE ARMOUR ROCK AND SUB-ARMOUR ROCK SHALL BE PLACED TO THE CONSTRUCTION TOLERANCES SHOWN ON THE DRAWINGS.
12. AT LEAST FOURTEEN (14) DAYS PRIOR TO THE SUPPLY OF ANY ROCK, THE CONTRACTOR SHALL PROVIDE DOCUMENTATION TO DEMONSTRATE THAT THE ROCK TO BE SUPPLIED COMPLIES WITH THE REQUIREMENTS OF THE SPECIFICATION.

SITEWORKS

1. ALL WORKS TO BE IN ACCORDANCE WITH RELEVANT LOCAL COUNCIL / REGULATORY AUTHORITIES REQUIREMENTS, ALL SPECIFICATIONS AND AUSTRALIAN STANDARDS. CONFLICTS BETWEEN SAID DOCUMENTS SHALL BE REFERRED TO THE SUPERINTENDENT FOR DIRECTION.
2. THE CONTRACTOR IS TO REVIEW THE DRAWINGS PRIOR TO PRICING AND COMMENCEMENT AND REPORT ANY DISCREPANCIES TO NORTHROP
3. ANY PRODUCTS SPECIFIED OR USED TO BE VERIFIED BY THE CONTRACTOR AS BEING SAFE AND APPROPRIATE FOR USE. NORTHROP DO NOT TAKE ANY RESPONSIBILITY FOR THE USE OF UNSAFE PRODUCTS
4. THE CONTRACTOR IS TO DESIGN, OBTAIN APPROVALS AND CARRY OUT REQUIRED TEMPORARY TRAFFIC CONTROL PROCEDURES DURING CONSTRUCTION IN ACCORDANCE WITH ALL REGULATORY AUTHORITIES, INCLUSIVE OF LOCAL COUNCIL REGULATIONS AND REQUIREMENTS.
5. THE CONTRACTOR IS TO OBTAIN ALL AUTHORITY APPROVALS AS REQUIRED PRIOR TO COMMENCEMENT OF WORKS.
6. ON COMPLETION OF ANY TRENCHING WORKS, ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR AS DIRECTED BY THE SITE SUPERINTENDENT, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL, GRASSED AREAS AND ROAD PAVEMENTS.
7. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR PRIOR TO COMMENCEMENT OF WORKS.THE CONTRACTOR IS TO ENSURE THAT SURVEY BOUNDARIES ARE DERIVED FROM A CADASTRAL SURVEY RATHER THAN A DETAIL SURVEY.
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING LEVELS ONSITE PRIOR TO LODGMENT OF TENDER AND ONSITE WORKS. THE PRICE AS TENDERED SHALL BE INCLUSIVE OF ALL WORKS SHOWN ON THE TENDER PROJECT DRAWINGS. ADDITIONAL PAYMENTS FOR WORKS SHOWN ON THE TENDER PROJECT DRAWINGS WILL NOT BE APPROVED.
9. DO NOT OBTAIN DIMENSIONS BY SCALING DRAWINGS.
10. IN CASE OF DOUBT OR DISCREPANCY REFER TO SUPERINTENDENT FOR CLARIFICATION OR CONFIRMATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
11. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED. MAKE SMOOTH TRANSITION TO EXISTING FEATURES AND MAKE GOOD WHERE JOINED.
12. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.
13. ALL CIVIL ENGINEERING DESIGN HAS BEEN DOCUMENTED UNDER THE ASSUMPTION THAT ALL NECESSARY SITE CONTAMINATION REMEDIATION WORKS HAVE BEEN SATISFACTORILY COMPLETED (IF APPLICABLE) AND THAT THE SITE IS NOT AFFECTED BY ANY SOIL STRATA OR GROUNDWATER TABLE CONTAMINATION.
14. NOTES ON DETAILS PROVIDED TAKE PRECEDENCE OVER SPECIFICATION NOTES UNLESS IN CONTRADICTION WITH COUNCIL/AUTHORITY SPECIFICATIONS/DETAILS. CONTRACTOR TO CONSULT WITH NORTHROP FOR ANY DISCREPANCIES.
15. IF THE CONTRACTOR DISCOVERS HAZARDOUS/CONTAMINATED MATERIAL THE CONTRACTOR SHALL CONSULT WITH AN ENVIRONMENTAL SPECIALIST.
16. THE CONTRACTOR IS RESPONSIBLE FOR DEALING WITH COMMUNITY COMPLAINTS ASSOCIATED WITH THE WORKS UNDER THE CONTRACT AND TO COMPENSATE FOR/RECTIFY ANY DAMAGE REASONABLY CAUSED BY THE CONTRACTOR.
17. THE TERM 'MAKE GOOD' OR 'MAKE NEAT' IS IN REFERENCE TO THE SATISFACTION OF NORTHROP OR CERTIFYING ENGINEER. THE CONTRACTOR IS TO SEEK CLARIFICATION FROM NORTHROP OR THE CERTIFYING ENGINEER IF NECESSARY
18. TOLERANCES TO BE IN ACCORDANCE WITH COUNCIL/AUTHORITY REQUIREMENTS. IN ABSENCE OF COUNCIL/AUTHORITY SPECIFICATIONS

SERVICE TRENCHES

19. SAWCUT EXISTING SURFACES PRIOR TO EXCAVATION. BACKFILL ALL TRENCHES UNDER EXISTING ROADS, PAVEMENTS AND PATHS WITH STABILISED SAND 5% CEMENT OR DGS40 MATERIAL (5% CEMENT) COMPACTED IN 200mm THICK LAYERS TO 98% MMDD TO UNDERSIDE OF PAVEMENT.
20. BACKFILL ALL TRENCHES NOT UNDER ROADS, PAVEMENTS, PATHS AND BUILDINGS WITH APPROVED EXCAVATED OR IMPORTED MATERIAL COMPACTED TO 95% SMDD.

EARTHWORKS

1. AT THE COMMENCEMENT OF FILLING OPERATIONS FOR BULK EARTHWORKS A GEOTECHNICAL ENGINEER IS TO VISIT THE SITE & CONFIRM THE SUITABILITY OF THE METHODOLOGY OF ACHIEVING THE REQUIRED COMPACTION EARTHWORKS REQUIREMENTS.
2. STRIP TOPSOIL, VEGETABLE MATTER AND RUBBLE TO EXPOSE NATURALLY OCCURRING MATERIAL AND STOCKPILE ON SITE AS DIRECTED BY THE SUPERINTENDENT.
3. WHERE FILLING IS REQUIRED TO ACHIEVE DESIGN SUBGRADE, PROOF ROLL EXPOSED NATURAL SURFACE WITH A MINIMUM OF TEN PASSES OF A VIBRATING ROLLER (MINIMUM STATIC WEIGHT OF 10 TONNES) IN THE PRESENCE OF THE SUPERINTENDENT OR CERTIFYING ENGINEER.
4. THE CONTRACTOR IS TO ALLOW FOR A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO PROVIDE ADVICE AND CERTIFICATION OF ANY WORKS ASSOCIATED WITH TREATING OR MANAGING UNSUITABLE GROUND CONDITIONS THROUGHOUT THE CONTRACT (e.g. STABILITY OF EXCAVATIONS, POOR SUBGRADE, THE EXISTING QUARRY AREA etc).
5. ALL SOFT, WET OR UNSUITABLE MATERIAL IS TO BE REMOVED AS DIRECTED BY THE SUPERINTENDENT AND REPLACED WITH APPROVED MATERIAL SATISFYING THE REQUIREMENTS BELOW.
6. PROVIDE CERTIFICATES VERIFYING THE QUALITY OF IMPORTED MATERIAL FOR THE SUPERINTENDENTS APPROVAL.

EARTHWORKS (cont)

7. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 200mm THICK LAYERS (LOOSE) AND COMPACTED AT OPTIMUM MOISTURE CONTENT (+ OR - 2%) TO ACHIEVE A DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1289.2.1.1, AS1289.5.7.1 AND AS1289.5.8.8 OF NOT LESS THAN THE FOLLOWING STANDARD MINIMUM DRY DENSITY;

LOCATION	COMPACTION REQUIREMENT
LANDSCAPED AREAS	98% SMDD
ROADS	100% SMDD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)
PAVED AREAS	100% SMDD (IN ACCORDANCE WITH COUNCIL SPECIFICATIONS)

8. TESTING OF THE SUBGRADE SHALL BE CARRIED OUT BY AN APPROVED N.A.T.A. REGISTERED LABORATORY AT THE CONTRACTORS EXPENSE UNLESS AGREED DIFFERENTLY WITH THE PRINCIPAL.
9. ALLOW THE FOLLOWING COMPACTION TESTING BY N.A.T.A. REGISTERED LABORATORY FOR PLATFORMS AND FILL LAYERS IN ACCORDANCE WITH THE LATEST VERSION OF AS3798. (MINIMUM 3 TESTS PER LAYER) OR 1 TEST PER MATERIAL TYPE PER 2500sq.m OR 1 TEST.
10. WHERE TEST RESULTS ARE BELOW THE SPECIFIED COMPACTION, RECOMPACT (TYNING FIRST AS NECESSARY) AND RETEST UNTIL SPECIFIED COMPACTION STANDARDS ARE ACHIEVED, OTHERWISE SUBGRADE REPLACEMENT IS REQUIRED IF COMPACTION STANDARDS ARE NOT ACHIEVED.
11. ALLOW FOR EXCAVATION IN ALL MATERIALS AS FOUND U.N.O. NO ADDITIONAL PAYMENTS WILL BE MADE FOR EXCAVATION IN WET OR HARD GROUND.
12. WHERE THERE IS INSUFFICIENT EXCAVATED MATERIAL SUITABLE FOR FILLING OR SUBGRADE REPLACEMENT, THE CONTRACTOR IS TO ALLOW TO IMPORT FILL. IMPORTED FILL SHALL COMPLY WITH THE FOLLOWING;
    12.1. BE OF VIRGIN EXCAVATED NATURAL MATERIAL OR
    12.2. CONTRACTOR TO PROVIDE EVIDENCE IMPORT IS SUITABLE FOR USE
    12.3. PLASTICITY INDEX BETWEEN 2-15% AND CBR > 8
    12.4. FREE FROM ORGANIC AND PERISHABLE MATTER
    12.5. MAXIMUM SIZE 50mm, PASSING 75 MICRON SIEVE (<25%)
13. THE CONTRACTOR SHALL PROGRAM THE EARTHWORKS OPERATION SO THAT THE WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLERS MARKS AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL. ANY DAMAGE RESULTING FROM THE CONTRACTOR NOT OBSERVING THESE REQUIREMENTS SHALL BE RECTIFIED AT THEIR COST.
14. THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE AND MAINTAIN THE INTEGRITY OF ALL SERVICES, CONDUITS AND PIPES DURING CONSTRUCTION, SPECIFICALLY DURING THE BACKFILLING AND COMPACTION PROCEDURE. ANY AND ALL DAMAGE TO NEW OR EXISTING SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST.

DEEP EXCAVATIONS

15. PRIOR TO THE COMMENCEMENT OF EXCAVATION WORKS GREATER THAN 1.5m IN DEPTH, THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO DETERMINE THE STABILITY OF MATERIAL BEING EXCAVATED AND BENCHING REQUIREMENTS / MINIMUM BATTER SLOPES.
16. THE CONTRACTOR MUST PROVIDE THE SUPERINTENDENT AND OR THE DESIGN ENGINEER WITH A COPY OF THE GEOTECHNICAL ENGINEERS REPORT PRIOR TO PRACTICAL COMPLETION.
17. THE CONTRACTOR IS TO PROVIDE SAFETY BARRIERS, FENCING AND THE LIKE IN ACCORDANCE WITH OH&S AND REGULATORY AUTHORITY REQUIREMENTS AND TO ENSURE THE WORK SITE IS SAFE AT ALL TIMES.

PRECAST STORMWATER PITS

1. REFER MANUFACTURERS SPECIFICATIONS FOR INSTALLATION GUIDELINES.
2. PRECAST PIT TO BE PLACED ON MINIMUM 150mm THICK CONCRETE PAD AND BED MINIMUM 50mm WHILST CONCRETE IS STILL PARTIALLY WET.
3. ENSURE PENETRATION IS CORED THROUGH PIT FACE TO ALLOW CONNECTION AND IS NOT OVERSIZED.
4. ENSURE A SEALED FINISH AT PIPE CONNECTIONS BY HAND-APPLYING MINIMUM 150mm THICK CONCRETE AROUND PIPE AT THE EXTERNAL FACE OF THE PIT. ENSURE CONCRETE DOES NOT AFFECT THE INTEGRITY OF THE SUBSOIL DRAINAGE CONNECTED TO THE PIT.
5. ENSURE A SMOOTH SEALED FINISH AT PIPE CONNECTIONS BY HAND APPLYING CONCRETE AROUND THE PIPE ON THE INTERNAL FACE OF THE PIT TO FILL IN ANY VOIDS CREATED WHEN PENETRATION FOR THE PIPE WAS CORED.
6. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT.
7. ENSURE THE OUTLET PIPE IS CONNECTED AT THE INVERT LEVEL OF THE PIT TO DRAIN. ALTERNATIVELY FILL THE BASE OF THE PIT WITH MASS CONCRETE (MIN 50mm THICK) OR APPROVED GROUTING COMPOUND (LESS THAN 50mm THICK) TO DRAIN.
8. PROVIDE CONCRETE BENCHING TO SIDES OF PIT TO SUIT PIPE DIAMETER. HEIGHT TO MATCH MINIMUM 1/3 PIPE DIAMETER.

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .

NOT FOR CONSTRUCTION

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT CONCEPT DESIGN	WD		NS	11.12.24
02	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
04	ISSUED FOR COORDINATION	WD		NS	24.03.25
05	ISSUED FOR REF	WD		NS	28.04.25

ARCHITECT
NBRS

BUILDER
RICHARD CROOKES CONSTRUCTIONS

CLIENT
NSW GOVERNMENT Education School Infrastructure

PROJECT
RICHMOND AGRICULTURAL CENTRE, COLLEGE ROAD, RICHMOND, NSW, 2753

NORTHROP
Sydney
Level 11 345 George Street, Sydney NSW 2000
Ph (02) 9241 4188 Fax (02) 9241 4324
Email sydney@northrop.com.au ABN 81 094 433 100

DRAWING TITLE
CIVIL ENGINEERING PACKAGE SPECIFICATION NOTES - SHEET 01

JOB NUMBER
SY240854
DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 0001
REV
05

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH HAWKESBURY CITY COUNCIL DEVELOPMENT GUIDELINE, READ IN CONJUNCTION WITH THE NOTES PROVIDED BELOW. IF CONFLICT ARISE, HAWKESBURY CITY COUNCIL GUIDELINES AND SPECIFICATIONS TAKE PRECEDENCE. WHERE HAWKESBURY CITY COUNCIL GUIDELINES AND SPECIFICATIONS ARE SILENT, THE SPECIFICATION NOTES BLOW TAKE PRECEDENCE.

ENGINEERING CERTIFICATION

1. TO CERTIFY THE CONSTRUCTED CIVIL WORKS, A QUALIFIED EXPERIENCED ENGINEER IS TO VISIT THE SITE TO OBSERVE CONSTRUCTION TECHNIQUES AND VARIOUS ELEMENTS THAT MAY BE CONCEALED WHEN THE WORKS ARE COMPLETE.

2. THIS SPECIFICATION ALLOWS FOR CERTIFICATION OF WORKS CONTROLLED BY A PRIVATE CERTIFIER FOR LAND DEVELOPMENT WORKS. THIS SPECIFICATION DOES NOT COVER CERTIFICATION REQUIREMENTS FOR AUTHORITIES SUCH AS COUNCIL, TfNSW OR WATER NSW. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND PROVIDE ALL PROJECT SPECIFIC CONSTRUCTION COMPLIANCE (WORKS AS EXECUTED) INFORMATION TO THE SATISFACTION OF THE STAKEHOLDER / AUTHORITY. DISCREPANCIES BETWEEN THIS SPECIFICATION AND SPECIFICATIONS OF OTHER EXTERNAL STAKEHOLDERS / AUTHORITIES IS TO BE REPORTED TO THE SUPERINTENDENT FOR CLARIFICATION.

3. THE CONTRACTOR IS TO AGREE WITH THE ENGINEER AN APPROPRIATE SITE VISIT SCHEDULE AND FEE ARRANGEMENT PRIOR TO COMMENCEMENT OF THE WORKS. THE CONTRACTOR SHALL ENSURE THAT THE ENGINEER CAN SAFELY ACCESS ALL CIVIL ELEMENTS TO BE REVIEWED. SITE VISITS ARE CONDUCTED DURING NORMAL BUSINESS HOURS. WE REQUIRE TWO (2) WORKING DAY NOTICE FOR ANY SITE VISIT.

4. TO PROVIDE CERTIFICATION THE ENGINEER MUST VISIT THE SITE TO OBSERVE.
   - 4.1. PAVEMENTS (BY GEOTECHNICAL ENGINEER)
     - 4.1.1. POOR SUBGRADE CONDITIONS
     - 4.1.2. PROOF ROLLING OF SUB-GRADE
     - 4.1.3. PLACEMENT OF SUB-BASE COURSE, BASE COURSE AND WEARING COURSE.
     - 4.1.4. PLACEMENT OF STEEL REINFORCEMENT , DOWELS AND JOINT CRADLES PRIOR TO POURING OF CONCRETE
   - 4.2. EARTHWORKS (BY GEOTECHNICAL ENGINEER)
     - 4.2.1. TOPSOIL STRIP
     - 4.2.2. EARTHWORKS BATTER
     - 4.2.3. FILLING
   - 4.3. STORMWATER DRAINAGE
     - 4.3.1. DRAINAGE TRENCHES PRIOR TO BACKFILLING
     - 4.3.2. LEGAL POINT OF CONNECTION PRIOR TO BACKFILLING
     - 4.3.3. ANY OTHER DRAINAGE STRUCTURE THAT MAY BE CONCEALED DURING THE COURSE OF THE WORKS
   - 4.4. CONCRETE STRUCTURES
     - 4.4.1. PLACEMENT OF ANY STEEL REINFORCEMENT PRIOR TO CONSTRUCTION.

5. THE CONTRACTOR SHALL PROVIDE SURVEYED LEVELS, PREPARED BY A QUALIFIED SURVEYOR FOR SUBGRADE, SUB-BASE COURSE, BASE COURSE AND WEARING COURSE.

6. THE CONTRACTOR SHALL PROVIDE WORKS AS EXECUTED (WAE) DOCUMENTATION PREPARED BY A QUALIFIED PRACTISING SURVEYOR. THE WAE DRAWINGS SHALL CLEARLY SHOW, STORMWATER GRATE/ COVER LEVELS, STORMWATER PIT INVERT LEVELS AND CORRESPONDING INVERT LEVELS OF ANY INCOMING OR OUTGOING PIPES, DIAMETER OF ALL PIPES, DIMENSIONS AND VOLUME OF ON-SITE DETENTION FACILITIES, INVERT LEVELS OF ORIFICE PLATES, OVERFLOW WEIRS, BASE OF TANK FINISHED LEVELS OF PAVEMENTS. THE WAE SHALL SHOW WHERE THE SIZE OR ALIGNMENT OF CIVIL ENGINEERING ELEMENTS WHEN THEY DEVIATE FROM THE DESIGN DOCUMENTATION.

7. THE WAE DRAWINGS SHALL BE STAMPED WITH THE FOLLOWING STATEMENT "THESE WAE DRAWINGS HAVE BEEN PREPARED BY [COMPANY NAME] AND ARE A TRUE AND ACCURATE REPRESENTATION OF THE CONSTRUCTED WORKS". EACH DRAWING SHALL BE SIGNED AND DATED BY THE SURVEYOR WHO PREPARED THE DRAWINGS.

THESE WAE DRAWINGS HAVE BEEN PREPARED BY [COMPANY NAME} AND ARE A TRUE AND ACCURATE REPRESENTATION OF THE CONSTRUCTED WORKS.

SIGNED.. DATE..

NAME..

POSITION......................................

8. WAE SHALL BE PROVIDED IN BOTH AUTOCAD AND PDF FORMAT. NORTHROP CONSULTING ENGINEERS WILL PROVIDE ENGINEERING PLANS TO THE CONTRACTOR IN AUTOCAD FORMAT TO AID PREPARATION OF WAE DOCUMENTATION.

9. IF THE WORKS ARE SUBJECT TO APPROVAL BY THE UPPER PARRAMATTA RIVER CATCHMENT TRUST (UPRCT) THE CONTRACTOR IS TO ABIDE BY THE UPRCT APPROVAL CHECKLIST.

10. CONTRACTOR IS TO UNDERTAKE A CCTV INSPECTION OF ALL STORMWATER DRAINAGE PIPELINES AND PROVIDE TO THE ENGINEER FOR APPROVAL.

11. THE CONTRACTOR SHALL PROVIDE ALL RELEVANT TEST CERTIFICATES PROGRESSIVELY THROUGHOUT THE DURATION OF THE WORKS. ALL TEST CERTIFICATES SHALL BE PREPARED BY A NATA REGISTERED LABORATORY. TEST CERTIFICATES ARE REQUIRED FOR PROOF ROLLING, SUBGRADE COMPACTION, COMPACTION OF PAVEMENT LAYERS, COMPACTION OF FILLING OPERATIONS, CONCRETE SLUMP TEST, AND CONCRETE STRENGTH TESTS. THE CONTRACT SHALL PROVIDE ALL RELEVANT VALIDATIONS BY A GEOTECHNICAL ENGINEER FOR ALL IMPORTED FILL

12. EACH TEST CERTIFICATE WILL NOMINATE THE DATE AND TIME OF THE TEST AND PROVIDE A LOCATION OF WHERE THE TEST SAMPLE WAS TAKEN FROM.

13. THE CONTRACTOR SHALL ARRANGE FOR THE ENGINEER TO CONDUCT A FINAL VISIT TO REVIEW OF THE CONSTRUCTED WORKS. THIS WILL REVIEW WILL NOT TAKE PLACE UNTIL THE WAE DOCUMENTATION AND RELEVANT TEST CERTIFICATES HAVE BEEN RECEIVED.

14. IF DEFECTIVE OR INCOMPLETE WORK IS FOUND DURING THE FINAL INSPECTION ANOTHER INSPECTION MAY BE REQUIRED AT THE CONTRACTORS EXPENSE TO VERIFY THE RECTIFICATION WORKS HAVE BEEN COMPLETED.

STORMWATER DRAINAGE

1. ALL PIPES TO BE BLACKMAX OR SIMILAR CLASS SN8.

2. RCP USED TO CONNECT TO COUNCIL'S SYSTEM.

3. ALL STORMWATER PIPES EXTERNAL TO THE SITE ARE TO BE RCP IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL'S SPECIFICATION.

4. ALL PIPE ARE TO BE LAID AT 1.0% MIN GRADE U.N.O.

5. PROVIDE Truflow SPS (250mm) FLOOR WASTES TO UNDERCOVER AREAS AS SHOWN WITH Ø150 uPVC OUTLET PIPE TO NEAREST GSIP AT MIN. 1% GRADE

6. PROVIDE 100mm WIDE ACO GRATED DRAIN AT ALL DOORWAYS, 30mm BELOW FFL. CONNECT Ø100mm uPVC OUTLET PIPE TO NEAREST GSIP AS SHOWN. MIN. 300 COVER AND MIN 1% GRADE

7. COVERS
   - 7.1. USE HOT DIPPED GALVANISED COVERS AND GRATES COMPLYING WITH RELEVANT COUNCIL AND AUSTRALIAN STANDARDS.
   - 7.2. ALL COVERS AND GRATES TO BE POSITIONED IN A FRAME AND MANUFACTURED AS A UNIT.
   - 7.3. ALL COVERS AND GRATES TO BE FITTING WITH POSITIVE COVER LIFTING KEYS
   - 7.4. OBTAIN SUPERINTENDENTS APPROVAL FOR THE USE OF CAST IRON SOLID COVERS AND GRATES. CAST IRON SOLID COVERS (IF APPROVED) TO CONSIST OF CROSS-WEBBED, CELLULAR CONSTRUCTION WITH THE RIBS UPPERMOST TO ALLOW INFILLING WITH CONCRETE. INSTALL POSITIVE COVER LIFTING KEYS AND PLASTIC PLUGS.
   - 7.5. UNLESS DETAILED OR SPECIFIED OTHERWISE, COVERS AND GRATES TO BE CLASS 'D' IN VEHICULAR PAVEMENTS AND CLASS 'B' ELSEWHERE.
   - 7.6. ALL GRATED TRENCH DRAINS SHOULD BE 'CLASS D' CAST IRON WITHIN VEHICULAR PAVEMENTS AND CLASS 'B' HEEL SAFE WITHIN PEDESTRIAN PAVEMENTS.

8. ALL PIPE BENDS, JUNCTIONS, ETC ARE TO BE PROVIDED USING PURPOSE MADE FITTINGS OR STORMWATER PITS.

9. ALL CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND CEMENT RENDERED TO ENSURE A SMOOTH FINISH.

10. ENSURE PIPEWORK DOES NOT PROTRUDE BEYOND THE INSIDE FACE OF THE PIT WALL. PIPEWORK IS TO FINISH FLUSH WITH INTERNAL WALL (UNLESS OTHERWISE NOTED OR DETAILED). CONNECTION TO BE RENDERED AND MADE NEAT ON THE INSIDE FACE OF THE PIT

11. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.

12. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.

13. BEDDING SHALL BE U.N.O TYPE HS2 UNDER ROADS AND H2 UNDER GENERAL AREAS IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.

14. THE CONTRACTOR SHALL ENSURE AND PROTECT THE INTEGRITY OF ALL STORMWATER PIPES DURING CONSTRUCTION. ANY AND ALL DAMAGE TO THESE PIPES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AND AT NO EXTRA COST TO THE CONTRACT.

15. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER. REFER KERB DETAILS FOR CONFIRMATION.

16. SUBSOIL DRAINAGE

17. Ø100mm SUBSOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE FILTER SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT MIN 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATIONS;
   - 17.1. THE HIGH SIDE OF PROPOSED TRAFFICKED PAVEMENT AREAS.
   - 17.2. ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS.
   - 17.3. BEHIND RETAINING WALLS (IN ACCORDANCE WITH RETAINING WALL DETAILS).
   - 17.4. UPSTREAM OF STORMWATER PITS
   - 17.5. BENEATH FLEXIBLE PAVEMENT ALONG A SAG PROFILE
   - 17.6. ALL OTHER AREAS SHOWN ON DRAWINGS.
   - 17.7. CONTRACTOR IS TO MAKE ALLOWANCE IN BOTH TENDER AND CONSTRUCTION COSTING TO ALLOW FOR SUBSURFACE DRAINAGE BEHIND ALL RETAINING WALLS / ABOVE LOCATIONS AND TO MAKE CONNECTION TO STORMWATER SYSTEM.

18. WHERE SUBSOIL DRAINAGE PASSES BENEATH BUILDINGS / PAVED AREAS AND/OR PAVEMENTS. CONTRACTOR TO ENSURE Ø100mm CLASS 'SN8' uPVC DRAINAGE LINE IS USED AND THAT PROPRIETARY FITTINGS ARE USED TO RECONNECT SUBSOIL DRAINAGE LINE.

19. THE CONTRACTOR SHALL INSTALL INSPECTION OPENINGS / CLEAROUTS TO ALL SUBSOIL DRAINAGE LINES AND DOWNPIPE LINES AS SPECIFIED ON DRAWINGS AND IN ACCORDANCE WITH COUNCIL SPECIFICATIONS. HOWEVER AS A MINIMUM THEY ARE TO BE PLACED AT MAXIMUM 30m CENTRES AND AT ALL UPSTREAM ENDPOINTS.

20. PROVIDE 3.0m LENGTH OF Ø100 SUBSOIL DRAINAGE LINE WRAPPED IN NON-WOVEN GEOTEXTILE FILTER FABRIC TO THE UPSTREAM SIDE OF STORMWATER PITS, LAID IN STORMWATER PIPE TRENCHES AND CONNECTED TO DRAINAGE PIT.

21. IN AREAS WHERE DUMPED / HAND PLACED ROCK IS USED AS A MEANS OF SCOUR PROTECTION, CONTRACTOR IS TO EXCAVATE A MINIMUM OF 100mm FROM PROPOSED SURFACE, LEVEL AND COMPACT SUBGRADE AS SPECIFIED. ROCK TO THEN BE PLACED ON GEOTEXTILE FILTER FABRIC A34.

22. THE CONTRACTOR IS TO ENSURE THAT A MINIMUM 150mm CLEARANCE IS PROVIDED BETWEEN THE INTERNAL FACE OF PIPE AND ADJACENT INTERNAL PIT WALLS

23. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN 50mm CONCRETE BED (OR 75mm THICK BED OF 12mm BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. (E.G. CLEAN 5-12mm AGGREGATE)

PAVEMENTS

ALL PAVEMENT MATERIALS SHALL COMPLY WITH CURRENT TfNSW SPECIFICATIONS. PROVIDE MECHANICAL ANALYSIS FOR EACH BATCH OF PAVEMENT MATERIAL TO ENSURE CONFORMITY.

1. COMPACTION STANDARDS
   - BASE 98% MODIFIED MAXIMUM DRY DENSITY
   - SUBBASE 98% MODIFIED MAXIMUM DRY DENSITY
   - SUBGRADE 100% STANDARD MAXIMUM DRY DENSITY

2. THE CONTRACTOR SHALL CONFIRM THE DESIGN CBR WITH A MINIMUM OF 3 TESTS TAKEN AT SUBGRADE LEVEL. WHERE DISCREPANCY IS FOUND, CONTACT THE DESIGN ENGINEER.

3. ALLOW FOR COMPACTION TESTING BY A N.A.T.A. REGISTERED LABORATORY FOR BASE LAYER, SUBBASE LAYER AND SUBGRADE LAYER IN ACCORDANCE WITH THE LATEST VERSION OF AS3798 FOR PAVEMENTS (MINIMUM 2 TESTS PER LAYER). ALLOW FOR AT LEAST TWO SUCCESSFUL COMPACTION TESTS IN EACH LAYER.

4. MATCH NEW PAVEMENTS NEATLY AND FLUSH WITH EXISTING

5. AFTER BASE IS APPROVED, SWEEP CLEAN AND PRIME AT NOMINAL RATE OF 1.0L PER 1.0 sq.m.

6. PAVEMENT HOLD POINTS
   - 6.1. SUB-GRADE PROOF ROLL PRIOR TO SET-UP AND FORM FOR CONCRETE POUR.
   - 6.2. INSPECTION OF FORMWORK / STEEL PRIOR TO CONCRETE POUR.

LANDSCAPING

1. REFER TO DRAWINGS BY OTHERS FOR DETAILS OF PROPOSED LANDSCAPING TREATMENT.

2. IF NO LANDSCAPING PLANS EXIST OR PLANS DO NOT SPECIFY GENERAL SURFACE STABILISATION THEN ALL DISTURBED SURFACE TO BE TEMPORARILY STABILISED WITH HYDROMULCH UPON COMPLETION OF WORKS.

3D INFORMATION DISCLAIMER

PLEASE BE ADVISED 12D DESIGN FILE, IF SUPPLIED, IS DEEMED TO BE AN ACCURATE REFLECTION OF NORTHROP'S DESIGN AT THE TIME OF FINAL DESIGN DEVELOPMENT AND MAY NOT FULLY REFLECT THE DESIGN SURFACE AS PRESENTED. HOWEVER THIS INFORMATION SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO INCORPORATION IN THE CONSTRUCTION WORKS.

YOU ARE FURTHER ADVISED THAT ISSUED HARDCOPY/PDF PLANS AND DOCUMENTS TAKE PRECEDENCE OVER THE SUPPLIED ELECTRONIC INFORMATION AND ANY INCONSTANCIES SHOULD IMMEDIATELY BE REPORTED TO NORTHROP CONSULTING ENGINEERS FOR VERIFICATION PRIOR TO THEIR INCORPORATION IN THE WORKS.

NORTHROP CONSULTING ENGINEERS TAKES NO RESPONSIBILITY FOR USE OF NON-VERIFIED 3D DESIGN INFORMATION USED IN THE WORKS.

THE USE OF THE 3D MODEL INFORMATION SHALL CONSTITUTE ACKNOWLEDGMENT AND ACCEPTANCE OF THE ABOVE STATEMENTS BY THE RECIPIENT.

CONCRETE

1. CARRY OUT ALL CONCRETE WORK IN ACCORDANCE WITH AS3600 AND NATSPEC CONCRETE STANDARDS.

2. CONCRETE PROPERTIES AND COVER TO REINFORCING:

ELEMENT	CONCRETE STRENGTH f'c (MPa)	MAX. 56 DAY DRYING SHRINKAGE	COVER (mm)	
SLABS ON GROUND	32	650microns	TOP 40	BTM 40
TANK LID	40	700microns	TOP 40	BTM 40

MAXIMUM AGGREGATE SIZE = 20mm U.N.O.
SLUMP DURING PLACING = 75mm
EXPOSURE CLASSIFICATION = B1
NO ADMIXTURES SHALL BE USED IN CONCRETE MIX UNLESS APPROVED BY STRUCTURAL ENGINEER IN WRITING.

3. CONCRETE PROPERTIES FOR SLABS AND BEAMS SHALL BE VARIED FROM NORMAL CLASS AS FOLLOWS:
   - MINIMUM CEMENT CONTENT 250kg/cu.m.
   - PRIOR TO COMMENCEMENT CONCRETE SUPPLIER TO PROVIDE DRYING SHRINKAGE TEST

   RESULTS FROM PRODUCTION ASSESSMENT AS EVIDENCE THAT SPECIFIED DRYING SHRINKAGE LIMITS CAN BE ACHIEVED USING NORMAL MIX DESIGN.

4. SUBMIT FOR APPROVAL THE FOLLOWING TO THE STRUCTURAL ENGINEER:
   - CURING PROCEDURE (PVA MEMBRANES NOT PERMITTED)
   - STRIPPING PROCEDURE
   - DETAILS AND LOCATION OF CAST IN SERVICES
   - CONDUITS, PENETRATIONS AND CONSTRUCTION JOINT LOCATIONS

5. ALL CONCRETE MIXES SHALL BE DESIGNED BY A RECOGNISED TESTING LAB AND SUBMITTED FOR REVIEW BY THE STRUCTURAL ENGINEER.

6. ALL COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW.

7. PROJECT CONTROL TESTING SHALL BE CARRIED OUT ON ALL CONCRETE IN ACCORDANCE WITH AS1379. TEST CYLINDERS ARE TO BE KEPT ON SITE.

CONCRETE (cont.)

8. FOR TENDER PURPOSES ASSUME MINIMUM STRIPPING TIMES AND EXTENT OF BACK PROPPING AS PER AS3610-1995 SECTION 5.0 AND AS PER GENERAL NOTES FOR FORMWORK AND PROPPING.

9. FORMWORK FINISH CLASSIFICATION TO AS3600:

ELEMENT	CLASS
INGROUND FOOTINGS	5
RETAINING WALLS	5 EARTH FACE
RETAINING WALLS	3 EXPOSED FACE
COLUMNS	2
BEAMS AND SLABS	2

10. SURFACE FINISHES:
    - COLUMNS AND WALLS OFF FORM

11. COMPACT ALL CONCRETE INCLUDING FOOTINGS AND SLABS, USING MECHANICAL VIBRATORS.

12. PLACE CONCRETE CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS SHOWN ON PLAN. DO NOT BREAK OR INTERRUPT SUCCESSIVE POURS SUCH THAT COLD JOINTS OCCUR. ANY REVISIONS OR ADDITIONS TO CONSTRUCTION JOINTS SHOWN ON PLAN REQUIRE APPROVAL FROM THE STRUCTURAL ENGINEER.

13. CONCRETE PROFILES:
    - BEAM DEPTHS ARE WRITTEN FIRST AND INCLUDE THE SLAB THICKNESS.
    - SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
    - NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN SHOWN IN THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER.
    - PROVIDE DRIP GROOVES AT ALL EXPOSED EDGES, CHAMFERS, DRIP GROOVES, REGLETS ETC TO BE TO ARCHITECTS DETAILS.

14. ALL PENETRATIONS TO HAVE 2-N16 TRIMMER BARS TOP AND BOTTOM TO EACH FACE U.N.O. EXTEND TRIMMERS 600 BEYOND PENETRATION.

15. SETDOWNS OR FALLS IN FLOOR SURFACES ARE NOT PERMITTED UNLESS SHOWN ON DRAWINGS. MAINTAIN MINIMUM SLAB THICKNESS SHOWN ON PLAN WHERE FALLS OCCUR.

16. REINFORCEMENT GRADE AND NOTATION:

SYMBOL	BAR SHAPE	STRENGTH GRADE (MPa)	DUCTILITY CLASS	TO COMPLY WITH AUST. STANDARD
N	DEFORMED RIB BAR	500	NORMAL	AS4671
R	PLAIN ROUND BAR	250	NORMAL	AS4671
RL	RECTANGULAR MESH OF DEFORMED RIB BAR	500	LOW	AS4671
SL	SQUARE MESH OF DEFORMED RIB BAR	500	LOW	AS4671
L-TM	TRENCH MESH	500	LOW	AS4671

ALL REINFORCING BARS SHALL BE GRADE D500N TO AS4671 AND ALL MESH SHALL BE GRADE 500L TO AS4671 U.N.O. CLASS L REINFORCEMENT SHALL NOT BE USED U.N.O.

REINFORCEMENT LABELS:

N12-300
- SPACING (mm)
- BAR SIZE (mm)
- TYPE OF REINFORCEMENT

3-N28
- BAR SIZE (mm)
- TYPE OF REINFORCEMENT
- NUMBER OF BARS

SL92
- CENTRES AT 200mm
- BAR SIZE (mm)
- DUCTILITY CLASS
- SQUARE MESH

17. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY, AND NOT NECESSARILY IN TRUE PROJECTION. BARS SHOWN ARE INDICATIVE ONLY AND LENGTHS MAY VARY. BEAM ELEVATIONS TAKE PRECEDENCE OVER SECTIONS. SLAB PLANS TAKE PRECEDENCE OVER SECTIONS. REFER TO SECTIONS FOR EXTRA BARS THAT MAY BE REQUIRED.

18. USE ONLY ALL PLASTIC OR CONCRETE CHAIRS AT EXTERNAL SURFACES.

19. SITE BENDING OF REINFORCEMENT BARS SHALL BE DONE WITHOUT HEATING USING A RE-BENDING TOOL. THE BARS SHALL BE RE-BENT AGAINST A FLAT SURFACE OR A PIN WITH A DIAMETER NOT LESS THAN THE MINIMUM PIN SIZE PRESCRIBED IN AS3600-2001.

20. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN ON THE STRUCTURAL DRAWINGS OR IN POSITIONS OTHERWISE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. LAPS SHALL BE IN ACCORDANCE WITH AS3600 SECTION 13 AND NOT LESS THAN THE DEVELOPMENT LENGTH FOR EACH BAR.

21. FOR LAPS IN MESH REFER TO SLAB ON GROUND NOTES.

22. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS OR APPROVED BY THE STRUCTURAL ENGINEER

23. AT EXTERNALLY EXPOSED SURFACES NO METALLIC ITEMS INCLUDING FORM BOLTS, FORM SPACERS, METALLIC BAR CHAIRS AND TIE WIRE ARE TO BE PLACED IN THE COVER ZONE.

24. ALL REINFORCEMENT, ANCHOR BOLTS AND OTHER CONCRETE INSERTS SHALL BE WELL SECURED IN POSITION AND INSPECTED BY THE STRUCTURAL ENGINEER PRIOR TO PLACING CONCRETE.

25. HOLD DOWN BOLTS SHALL BE HOT DIPPED GALVANISED.

26. U.N.O, ALL MASONRY ANCHORS INTO CONCRETE SHALL BE RAMSET TRUBOLTS (LONGEST VERSION) OR APPROVED EQUIVALENT. BOLTS SHALL BE GALVANISED WHERE THEY ARE ADJOINING NON FERROUS OR PREPAINTED MEMBERS. PROVIDE STAINLESS STEEL BOLTS FOR ALL EXTERNAL CONDITIONS, OR WHERE EXPOSED TO THE WEATHER.

CONCRETE PAVEMENTS

1. THIS SECTION REFERS TO CIVIL CONCRETE WORKS AND DOES NOT INCLUDE STRUCTURAL ELEMENTS SUCH AS BUILDINGS, BELOW GROUND STRUCTURES OR RETAINING WALLS.

2. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

3. CONCRETE QUALITY AND REINFORCING COVER
   ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

ELEMENT	CONCRETE STRENGTH f'c (MPa)	SPECIFIED SLUMP	NOMINAL AGGREGATE SIZE	MAX. 56 DAY DRYING SHRINKAGE	COVER (mm)
KERBS AND PATHS	25	60	20	650microns	TOP 40
PITS AND VEHICULAR PAVEMENTS	32	80	20	650microns	TOP 40

4. CONCRETE PROPERTIES SHALL BE VARIED FROM NORMAL CLASS AS FOLLOWS
   - 4.1. MINIMUM CEMENT CONTENT 250 kg/m^3
   - 4.2. MAXIMUM 56 DAY SHRINKAGE STRAIN = AS NOMINATED ABOVE
   - 4.3. PRIOR TO COMMENCEMENT CONCRETE SUPPLIER TO PROVIDE DRYING SHRINKAGE TEST RESULTS FROM PRODUCTION ASSESSMENT AS EVIDENCE THAT SPECIFIED DRYING SHRINKAGE LIMITS CAN BE ACHIEVED USING NORMAL MIX DESIGN.

5. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS. PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.

6. CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL.

7. PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379. TEST CYLINDERS ARE TO BE KEPT ON SITE.

8. ALL COMPRESSIVE STRENGTH TEST REPORTS SHALL BE SUBMITTED TO THE CIVIL ENGINEER FOR REVIEW.

9. ALL CONCRETE IS TO BE CONTINUOUSLY CURED FOR A MINIMUM PERIOD OF 10 DAYS AFTER PLACING . CURING TO COMMENCE IMMEDIATELY AFTER FINISHING. SPRAY ON CURING COMPOUNDS TO COMPLY WITH AS3799.

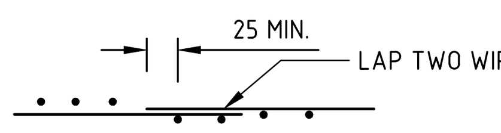
10. PLACE CONCRETE CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS SHOWN ON PLAN. DO NOT BREAK OR INTERRUPT SUCCESSIVE POURS SUCH THAT COLD JOINTS OCCUR. ANY REVISIONS OR ADDITIONS TO CONSTRUCTION JOINTS SHOWN ON PLAN REQUIRE APPROVAL FROM THE CIVIL ENGINEER.

11. FALLS IN SLAB AS SHOWN ON PLAN MAINTAIN MINIMUM SLAB THICKNESS AS SHOWN.

12. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY THE DESIGN ENGINEER.

13. THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS.

14. FABRIC SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING DETAIL:



FOLLOWING THE FABRIC SYMBOL SL IS THE REFERENCE NUMBER FOR FABRIC TO AS1304.

15. ALL PENETRATIONS TO HAVE 2/N12 TRIMMER BARS TOP AND BOTTOM TO EACH FACE U.N.O. EXTEND TRIMMERS 700 BEYOND PENETRATION. MAINTAIN 40mm COVER TOP AND BOTTOM.

16. FORMWORK CLASS SHALL BE IN ACCORDANCE WITH AS3600.

17. SURFACE FINISHES:

ELEMENT	FORMWORK CLASS
STORMWATER PIT	OFF FORM
PAVEMENTS	MACHINE FLOAT OR BROOM FINISH
KERBS	STEEL FLOAT OR TROWEL

AUTHORITY SPECIFICATIONS TAKE PRECEDENCE

18. REINFORCEMENT SYMBOLS:
    - N DENOTES GRADE 450 N BARS TO AS1302 GRADE N
    - R DENOTES 230 R HOT ROLLED PLAIN BARS TO AS1302
    - SL DENOTES HARD-DRAWN WIRE REINFORCING FABRIC TO AS1304

17 N 20 250
- NUMBER OF BARS IN GROUP
- BAR GRADE AND TYPE
- NOMINAL BAR SIZE IN mm
- SPACING IN mm THE FIGURE

CONCRETE CURING

19. THE CURING PROCESS FOR NEW CONCRETE IS TO INCORPORATE THE FOLLOWING ASPECTS, GENERALLY AS ORDERED;
    - 19.1. SPRAY CURING COMPOUND
    - 19.2. SAWCUT JOINTS AS LOCATED AND SPECIFIED AS SOON AS CURING PERMITS.

    COVER NEW PAVING WITH HESSIAN AND BLACK PLASTIC SHEETS TAPED AT JOINTS ON COMPLETION OF SAWCUTTING. NOTE COVERING IS TO EXTENT MIN 5m BEYOND PAVEMENT BEING CURED. OVER ADJOINING (EXISTING) PAVEMENT AREAS, MAINTAIN CURING AS SPECIFIED.

DRAWN: W. DODIC   DESIGNED: E.BRADLEY   JOB MANAGER: N. SUTHERLAND   VERIFIER: .

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT CONCEPT DESIGN	WD		NS	11.12.24
02	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
04	ISSUED FOR COORDINATION	WD		NS	24.03.25

ARCHITECT
NBRS

BUILDER
RICHARD CROOKES CONSTRUCTIONS

CLIENT
NSW GOVERNMENT Education School Infrastructure

PROJECT
RICHMOND AGRICULTURAL CENTRE,
COLLEGE ROAD,
RICHMOND, NSW, 2753

NORTHROP
Sydney
Level 11 345 George Street, Sydney NSW 2000
Ph (02) 9241 4188 Fax (02) 9241 4324
Email sydney@northrop.com.au ABN 81 094 433 100

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SPECIFICATION NOTES - SHEET 02

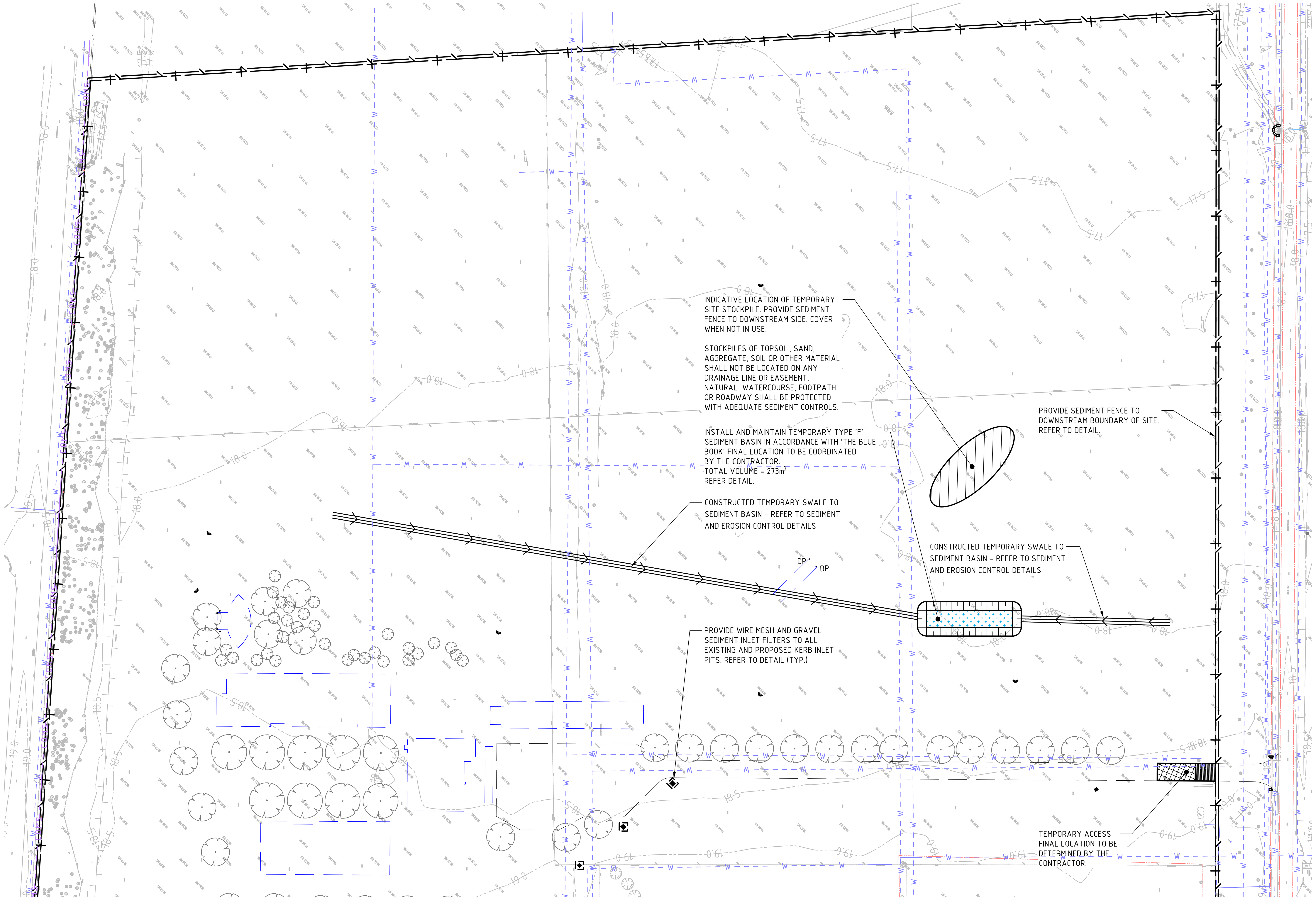
JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

NOT FOR CONSTRUCTION

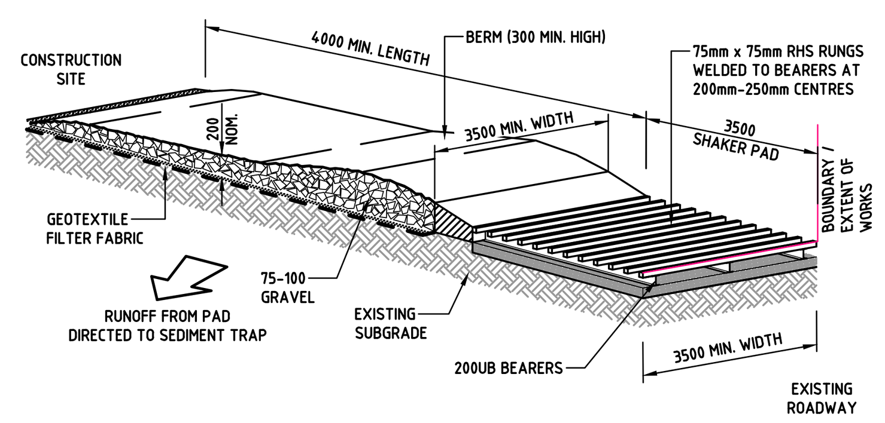
DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 0002

REV
04



LEGEND

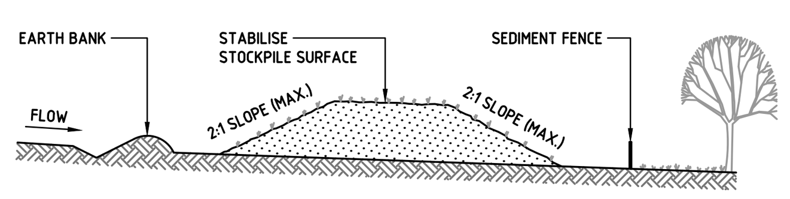
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- EASEMENT LINE
- REDUNDANT BOUNDARY LINE
- PROPOSED BUILDING FOOTPRINT
- PROPOSED CARPARK LAYOUT
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- GEOTEXTILE INLET FILTER TRAP
- SANDBAG SEDIMENT FILTER
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN
- TREE TO BE RETAINED



CONSTRUCTION NOTES

1. THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY,
   - THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT,
2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
3. INSTALL BARRIER ON EITHER SIDE OF SHAKER PAD. TO ENSURE VEHICLES ARE GUIDED ON TO THE PAD.
4. INVERT OF SHAKER PAD TO BE DRAINED VIA AGRICULTURAL PIPE WRAPPED IN GEOTEXTILE FABRIC.

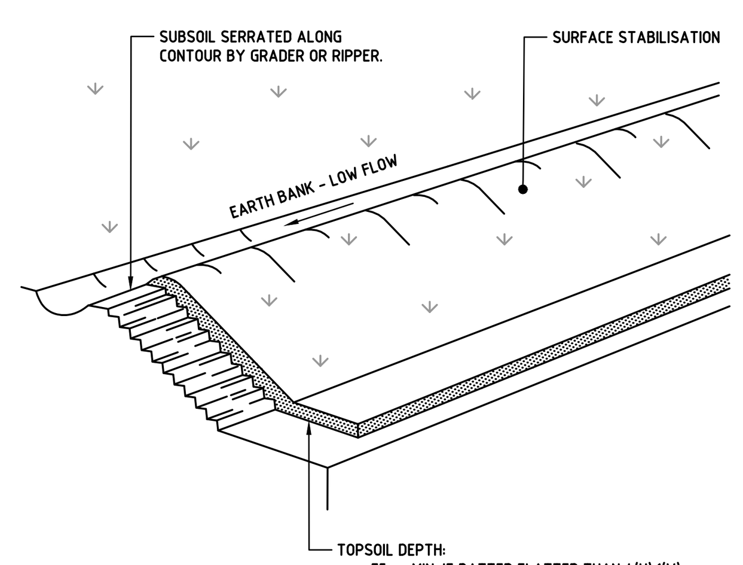
STABILISED SITE ACCESS



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

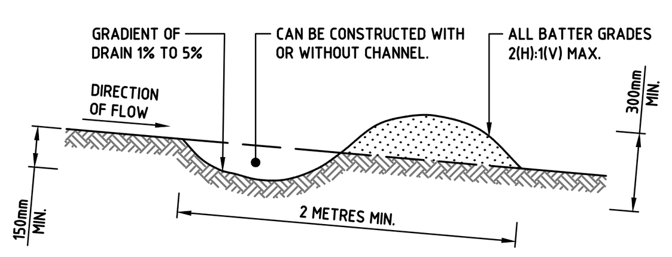


TOPSOIL DEPTH:
- 75mm MIN. IF BATTER FLATTER THAN 4(H):1(V)
- 40mm TO 60mm IF BATTER STEEPER THAN 4(H):1(V)
- SPECIALISED TECHNIQUES REQUIRED IF BATTER SLOPES STEEPER THAN 2(H):1(V)

CONSTRUCTION NOTES

1. SCARIFY THE GROUND SURFACE ALONG THE LINE OF THE CONTOUR TO A DEPTH OF 50mm TO 100mm TO BREAK UP ANY HARDSETTING SURFACES AND TO PROVIDE A GOOD BOND BETWEEN THE RESPREAD MATERIAL AND SUBSOIL.
2. ADD SOIL AMELIORANTS AS REQUIRED BY THE ESCP OR SWMP.
3. RIP TO A DEPTH OF 300mm IF COMPACTED LAYERS OCCUR.
4. WHERE POSSIBLE, REPLACE TOPSOIL TO A DEPTH OF 40 TO 60mm ON LANDS WHERE THE SLOPE EXCEEDS 4(H):1(V) AND TO AT LEAST 75mm ON LOWER GRADIENTS.

REPLACING TOPSOIL

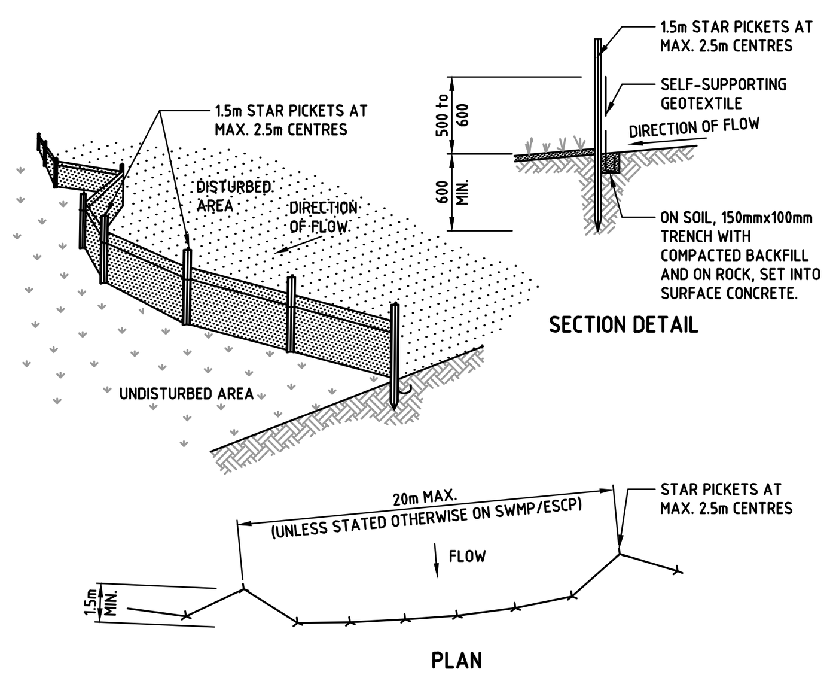


CONSTRUCTION NOTES

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 - LOW FLOW



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

NOT FOR CONSTRUCTION

SEDIMENT BASIN CALCULATIONS

PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	1.63
SOIL TEXTURE GROUP	D
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	80%
x-DAY, y-PERCENTILE RAINFALL EVENT (mm)	22.4
Cv	0.5
SETTLING ZONE VOLUME (m^3)	182.56
SEDIMENT STORAGE VOLUME (m^3)	91.28
TOTAL BASIN VOLUME REQUIRED (m^3)	273.84

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'.
6. ALL PITS OPEN TO ATMOSPHERE TO BE PROTECTED IN ACCORDANCE WITH THE 'BLUE BOOK'.

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	24.03.25

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BUILDER
RICHARD CROOKES CONSTRUCTIONS

CLIENT
NSW GOVERNMENT Education School Infrastructure

PROJECT
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SCALE 1:800@ A1 0 10 20 30 40m

DRAWING TITLE
CIVIL ENGINEERING PACKAGE SEDIMENT AND SOIL EROSION CONTROL PLAN

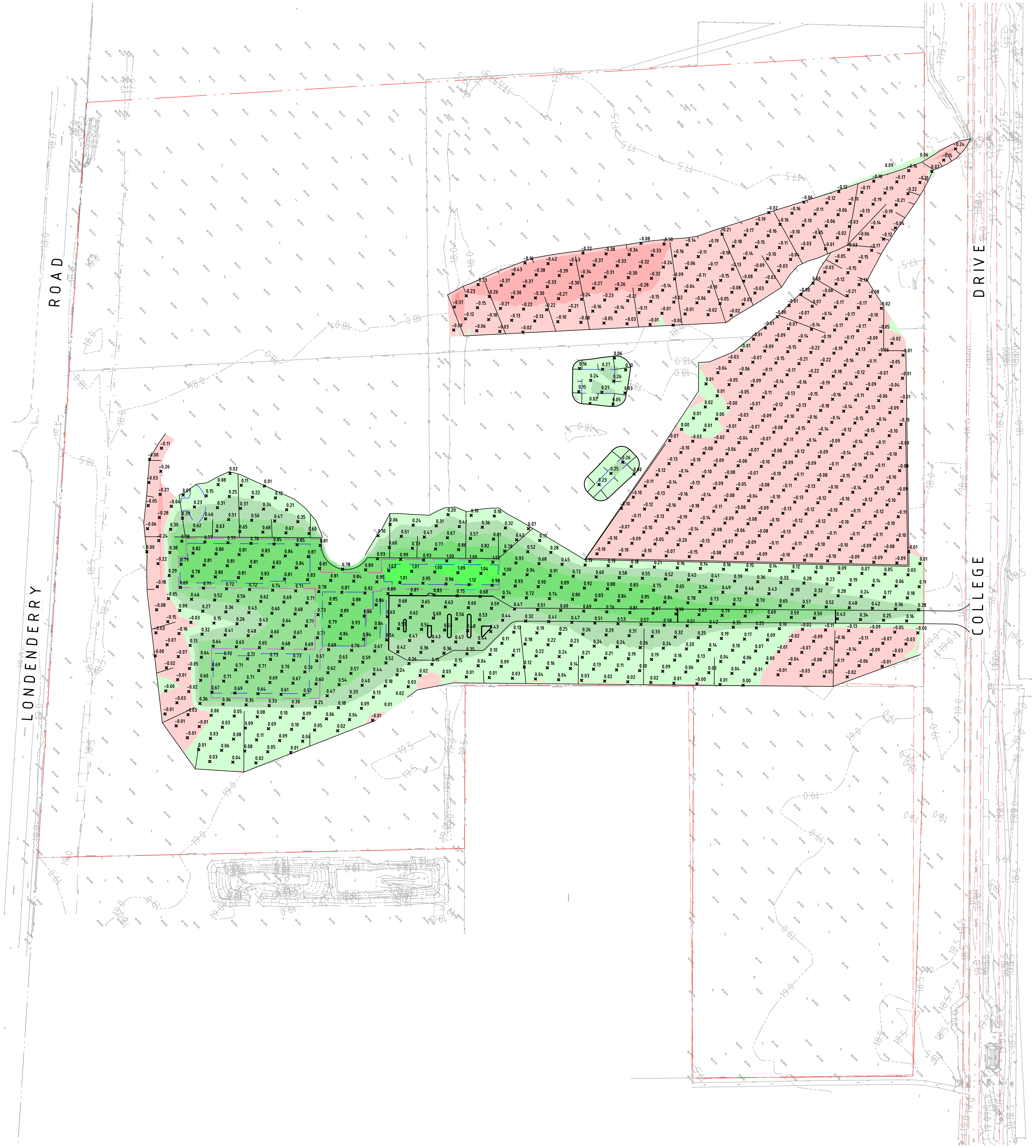
JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 1101

REV
01

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .



LEGEND

- EXISTING BOUNDARY LINE
- EASEMENT LINE
- PROPOSED BATTERS
- -0.05 CUT FILL DEPTH

DEPTH OF CUT

- - 0.57m 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 0.75m
- 0.75m TO 1.00m
- 0.75m TO 1.09m
- TREE TO BE RETAINED

CUT AND FILL CALCULATIONS

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
2. CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
3. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
4. 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.
5. 5. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
6. APPROXIMATE CUT AND FILL VALUES AS FOLLOWS;
   - 6.1. CUT 2806.5 m^3
   - 6.2. FILL 11245.9 m^3
   - 6.3. BALANCE 8439.4 m^3
   - 6.4. NOTE: NO SITE STRIPPING HAS BEEN ALLOWED FOR.

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
02	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	04.02.25
04	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
05	ISSUED FOR COORDINATION	WD		NS	24.03.25
06	ISSUED FOR REF	WD		NS	28.04.25

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DRAWING TITLE
CIVIL ENGINEERING PACKAGE
CUT AND FILL PLAN

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 2001

REV
06

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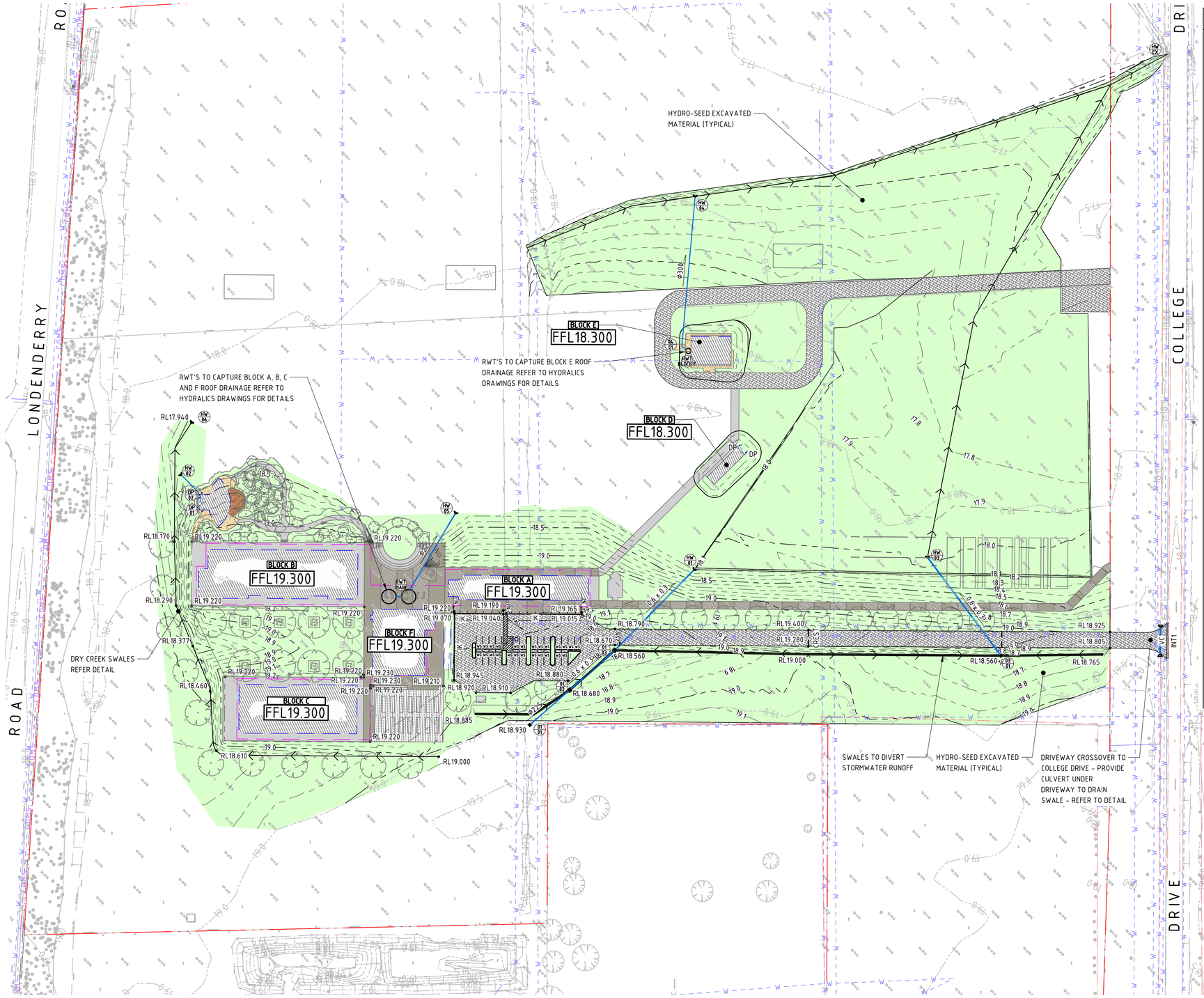

LEGEND

- PROPOSED BOUNDARY LINE
- ADJACENT BOUNDARY LINE
- EASEMENT LINE
- PROPOSED BUILDING FOOTPRINT
- PROPOSED BUILDING ROOF OUTLINE
- EXISTING SEWER
- EXISTING STORMWATER
- DIRECTION OF GRADE
- DIRECTION OF GRADE
- CONTOURS
- EXISTING CONTOURS
- EXISTING DRAINAGE STRUCTURE
- CONCRETE HEADWALL
- ROCK HEADWALL
- DOWN PIPE
- NEW DRAINAGE STRUCTURE
- STORMWATER PIPE
- STRUCTURE No / LINE ID STORMWATER PIT TAG
- DRAINAGE SWALE
- SAWCUT AND PAVEMENT INFILL
- WHEEL STOP
- CONCRETE PAVEMENT TYPE 1
- MULCH SOIL
- POROUS PAVING
- UNIT PAVERS
- DECOMPOSED GRANITE
- CONCRETE PAVEMENT TYPE 3
- LANDSCAPE

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
02	ISSUED FOR DRAFT CONCEPT DESIGN	WD		NS	11.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
04	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
05	ISSUED FOR COORDINATION	WD		NS	24.03.25
06	ISSUED FOR REF	WD		NS	28.04.25

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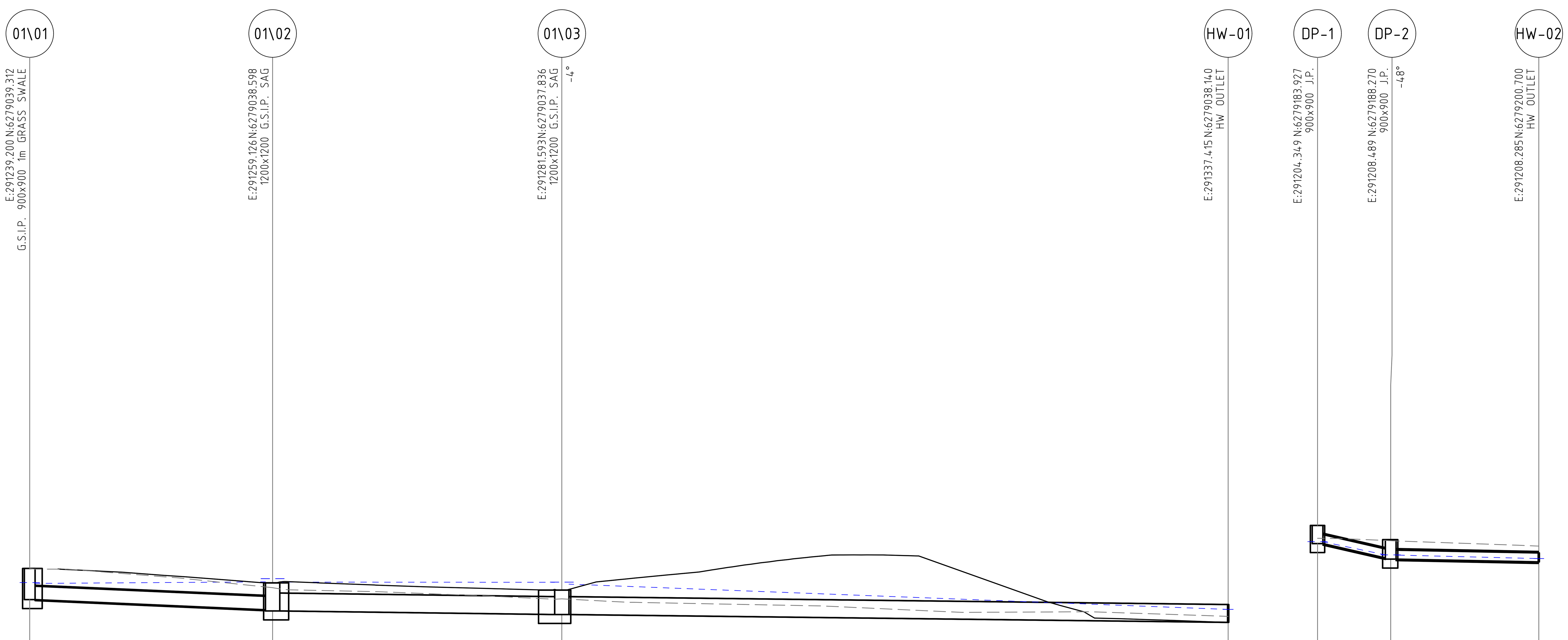
SCALE 1:800@ A1 0 10 20 30 40m

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

JOB NUMBER
SY240854
DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 3001
REV
06



LINE 01

	01\01 – 01\02	01\02 – 01\03	01\03 – HW-01
PIPE CLASS	SN10	RCBC	RCBC
PIPE GRADE (%)	0.9%	0.3%	0.2%
PIPE SIZE (mm)	225	600x300	600x300
MINIMUM COVER (m)	0.21	0.11	-0.14
Vf (MINOR) - FULL PIPE VELOCITY (m/s)	Vf=1.08	Vf=0.79	Vf=1.23
Q (MINOR) - PIPE FLOW (L/s)	Q=42	Q=113	Q=192

DATUM RL 11.0

	01\01	01\02	01\03	HW-01
H.G.L. 5% AEP	18.686 / 18.672	18.698 / 18.752 / 18.694	18.691 / 18.693 / 18.660	18.236 / 18.236 / 18.236
FINISHED SURFACE	18.923	18.680	18.560	18.119
NATURAL SURFACE	18.923	18.600	18.413	18.119
PIPE INVERT LEVEL	18.400	18.230 / 18.210	18.150 / 18.150	18.018 / 18.018
DEPTH TO INVERT	0.523	0.450 / 0.470	0.410 / 0.410	0.000 / 0.000
CHAINAGE	-23.313	-2.929	21.343	77.266

LINE 02

	DP-1 – DP-2	DP-2 – HW-02
PIPE CLASS	RRJ2	RRJ2
PIPE GRADE (%)	4.6%	0.4%
PIPE SIZE (mm)	150	150
MINIMUM COVER (m)	0.11	
Vf (MINOR) - FULL PIPE VELOCITY (m/s)	Vf=0.99	Vf=0.54
Q (MINOR) - PIPE FLOW (L/s)	Q=3	Q=4

DATUM RL 10.0

	DP-1	DP-2	HW-02
H.G.L. 5% AEP	18.373 / 18.371	18.151 / 18.151 / 18.148	18.089 / 18.089 / 18.089
FINISHED SURFACE	18.645	18.407	18.183
NATURAL SURFACE	18.430	18.389	18.298
PIPE INVERT LEVEL	18.340	18.100 / 18.080	18.033 / 18.033
DEPTH TO INVERT	0.305	0.307 / 0.327	0.000 / 0.000
CHAINAGE	0.000	6.138	18.570

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	28.04.25

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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

DRAWING TITLE
CIVIL ENGINEERING PACKAGE STORMWATER LONGITUDINAL SECTIONS - SHEET 1

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 4001

REV
01

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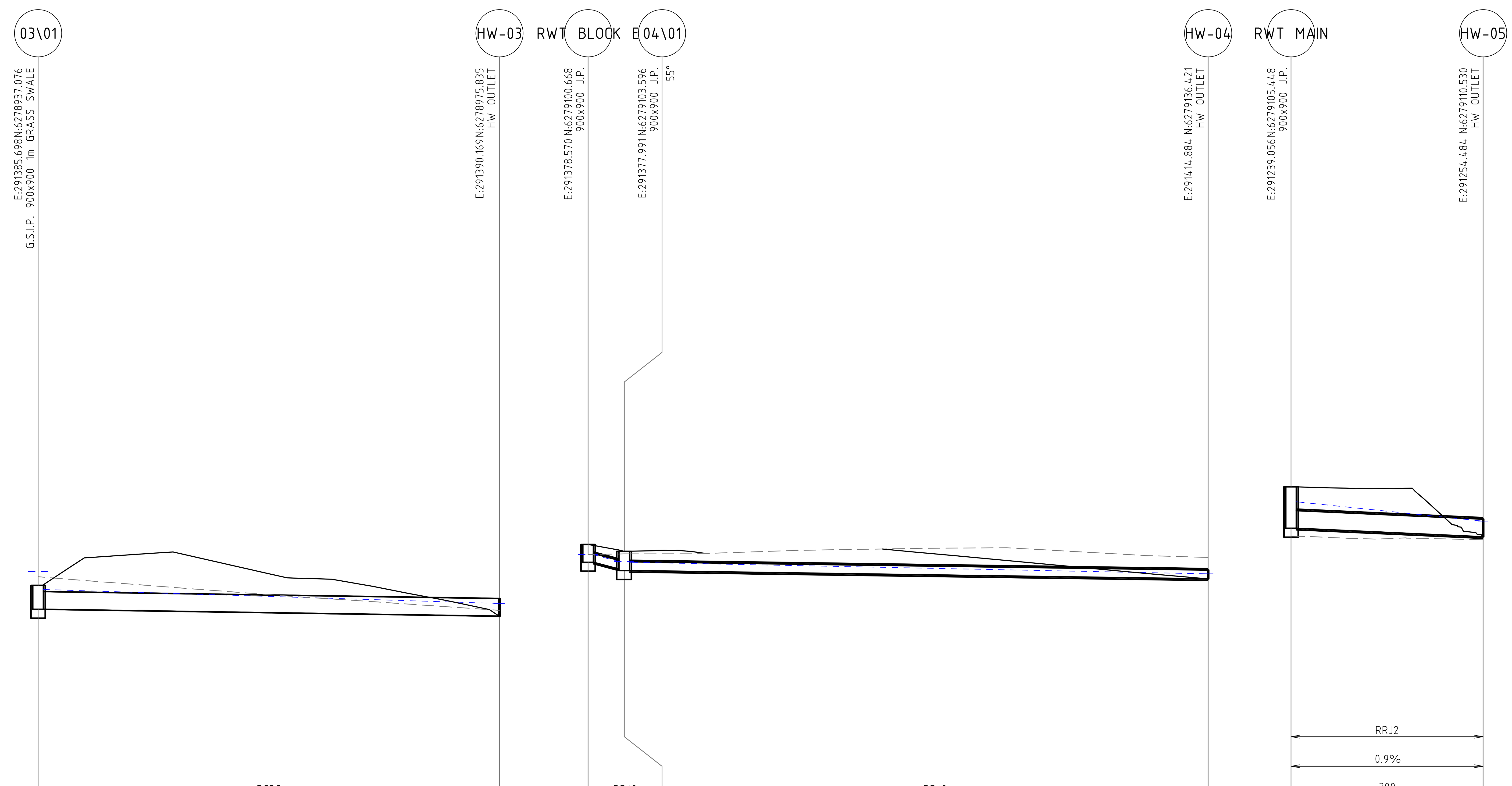

LINE 03

	03\01	HW-03
PIPE CLASS	RCBC	
PIPE GRADE (%)	0.3%	
PIPE SIZE (mm)	600x300	
MINIMUM COVER (m)	-0.36	
Vf (MINOR) - FULL PIPE VELOCITY (m/s)	Vf=1.22	
Q (MINOR) - PIPE FLOW (L/s)	Q=188	
DATUM RL	11.0	
H.G.L. 5% AEP	18.793 18.490	18.254 18.254 18.254
FINISHED SURFACE	18.560	18.038
NATURAL SURFACE	18.706	18.138
PIPE INVERT LEVEL	18.155	18.038 18.038
DEPTH TO INVERT	0.405	-0.000 -0.000
CHAINAGE	0.000	39.016

LINE 04

	RWT BLOCK E	04\01	HW-04
PIPE CLASS	RRJ2	RRJ2	
PIPE GRADE (%)	5.3%	0.3%	
PIPE SIZE (mm)	150	150	
MINIMUM COVER (m)	0.11	0.10	
Vf (MINOR) - FULL PIPE VELOCITY (m/s)	Vf=1.01	Vf=0.57	
Q (MINOR) - PIPE FLOW (L/s)	Q=9	Q=9	
DATUM RL	10.0		
H.G.L. 5% AEP	18.081 18.081	17.962 17.962 17.951	17.755 17.755 17.755
FINISHED SURFACE	18.100	18.136	17.819
NATURAL SURFACE	18.082	18.093	18.033
PIPE INVERT LEVEL	17.950	17.835 17.810	17.669 17.669
DEPTH TO INVERT	0.302	0.301 0.326	-0.000 -0.000
CHAINAGE	0.000	3.057	52.439

LINE 05

	RWT MAIN	HW-05
	RRJ2	
	0.9%	
	300	
	Vf=1.78	
	Q=122	
DATUM RL	11.0	
	19.308 18.974	18.647 18.647 18.647
FINISHED SURFACE	19.228	18.681
NATURAL SURFACE	18.394	18.332
PIPE INVERT LEVEL	18.525	18.381 18.381
DEPTH TO INVERT	0.703	0.000 0.000
CHAINAGE	0.000	16.244

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	28.04.25

ARCHITECT: NBRS

BUILDER: RICHARD CROOKES CONSTRUCTIONS

CLIENT: NSW GOVERNMENT Education School Infrastructure

PROJECT: RICHMOND AGRICULTURAL CENTRE, COLLEGE ROAD, RICHMOND, NSW, 2753

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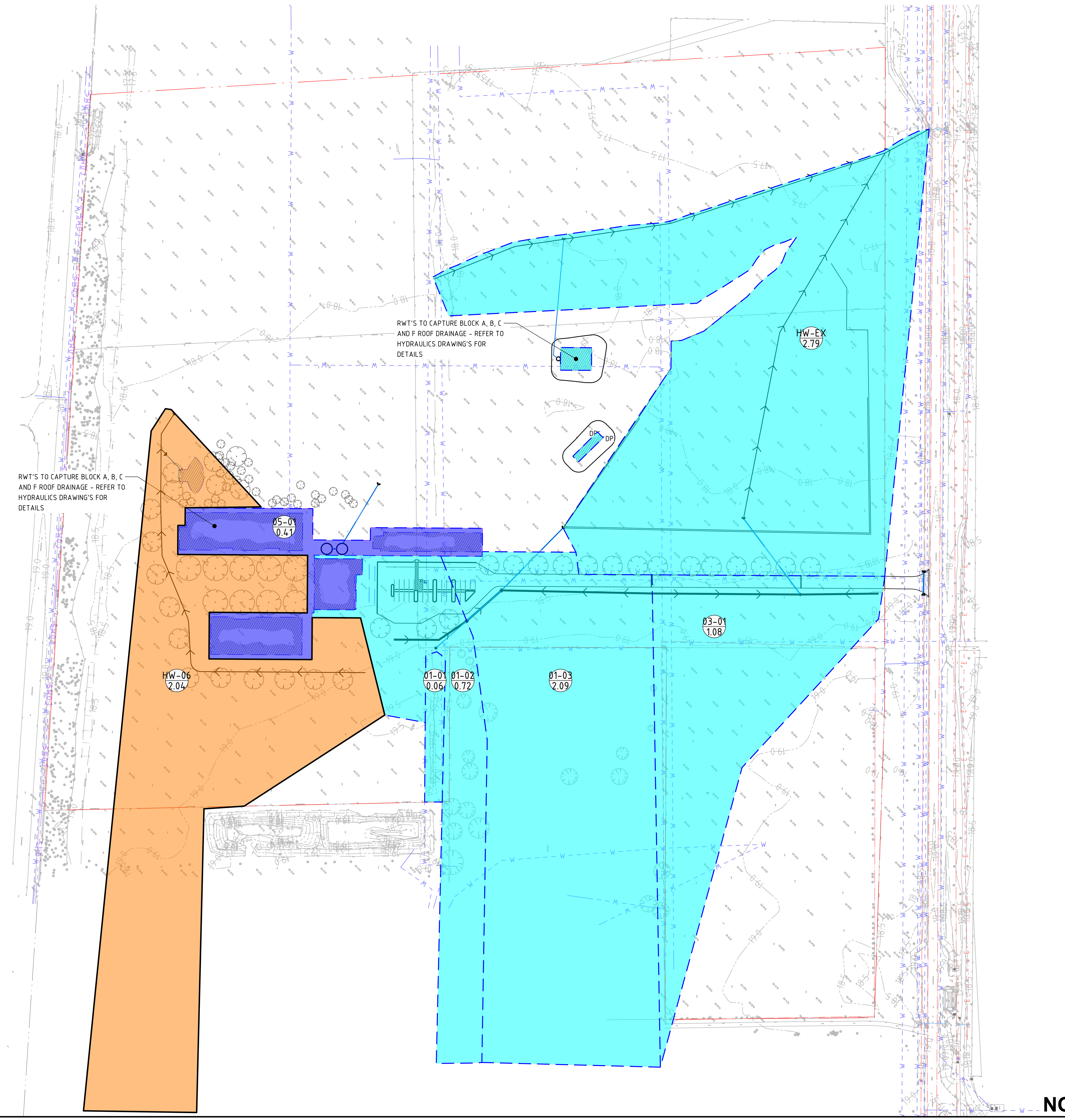
SCALE 1:250@ A1 0 2 4 6 8 10 12m
SCALE 1:50@ A1 0.0 0.5 1.0 1.5 2.0 2.5m

DRAWING TITLE: CIVIL ENGINEERING PACKAGE STORMWATER LONGITUDINAL SECTIONS - SHEET 2

JOB NUMBER: SY240854 DRAWING SHEET SIZE = A1

DRAWING NO: RAC-NRE-ZZ-ZZ-DR-C- 4002 REV: 01



LEGEND

(red dash-dot line)	PROPOSED BOUNDARY LINE
(black line)	CATCHMENT BOUNDARY
(blue dashed line)	CATCHMENT BOUNDARY BOUNDARY
01-01 / 0.010	LINE ID / STRUCTURE No. CATCHMENT AREA HA
XX.XX	CONTOURS
XX.XX	EXISTING CONTOURS
(cyan)	CATCHMENT AREA TO DRAIN OVERLAND TO EXISTING STORMWATER CULVERT - COLLEGE DRIVE . AREA 67623.87m²
(blue)	CATCHMENT DIRECTED TO RAIN WATER TANK. AREA 4143.43m²
(orange)	CATCHMENT THROUGH SWALES OVERLAND FLOW AREA 20496.57m²

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	28.04.25

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SCALE 1:1000 @ A1 0 10 20 30 40 50m

DRAWING TITLE
CIVIL ENGINEERING PACKAGE STORMWATER CATCHMENT PLAN

JOB NUMBER
SY240854
DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 4201

REV
01

STRUCTURE ID (LINE \ STRUCTURE)	STRUCTURE DESCRIPTION	GRATE AND FRAME SIZE	ACCESS COVER AND CLASS	DEPTH TO INVERT	EASTING	NORTHING	REMARKS
01 \ 01	SURFACE INLET PIT	900 x 900	GRATED FEELSAFE LOCKABLE, CLASS D	0.520	291239.199	6279039.312	
01 \ 02	SURFACE INLET PIT	1200 x 1200	GRATED FEELSAFE LOCKABLE, CLASS D	0.470	291259.126	6279038.597	FITTED WITH 'OCEAN GUARD'
01 \ 03	SURFACE INLET PIT	1200 x 1200	GRATED FEELSAFE LOCKABLE, CLASS D	0.410	291281.593	6279037.836	FITTED WITH 'OCEAN GUARD'
03 \ 01	SURFACE INLET PIT	900 x 900	GRATED FEELSAFE LOCKABLE, CLASS D	0.410	291385.697	6278937.076	FITTED WITH 'OCEAN GUARD'
04 \ 01	SURFACE INLET PIT	900 x 900	GRATED FEELSAFE LOCKABLE, CLASS D	0.330	291377.991	6279103.596	FITTED WITH 'OCEAN GUARD'
HW-01	HEADWALL OUTLET	-	-	-	291337.415	6279038.140	PROPOSED HEADWALL
HW-02	HEADWALL OUTLET	-	-	-	291208.284	6279200.700	PROPOSED HEADWALL
HW-03	HEADWALL OUTLET	-	-	-	291390.169	6278975.834	PROPOSED HEADWALL
HW-04	HEADWALL OUTLET	-	-	-	291414.884	6279136.420	PROPOSED HEADWALL
HW-05	HEADWALL OUTLET	-	-	-	291254.484	6279110.529	PROPOSED HEADWALL
RWT BLOCK E	-	-	-	-	291378.570	6279100.668	RAINWATER TANK TO HYDRAULICS DRAWINGS
RWT MAIN	-	-	-	-	291239.055	6279105.447	RAINWATER TANK TO HYDRAULICS DRAWINGS

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DRAWING TITLE

CIVIL ENGINEERING PACKAGE
STORMWATER PIT SCHEDULE

JOB NUMBER

SY240854

DRAWING SHEET SIZE = A1

DRAWING NO

RAC-NRE-ZZ-ZZ-DR-C- 4301

REV

01

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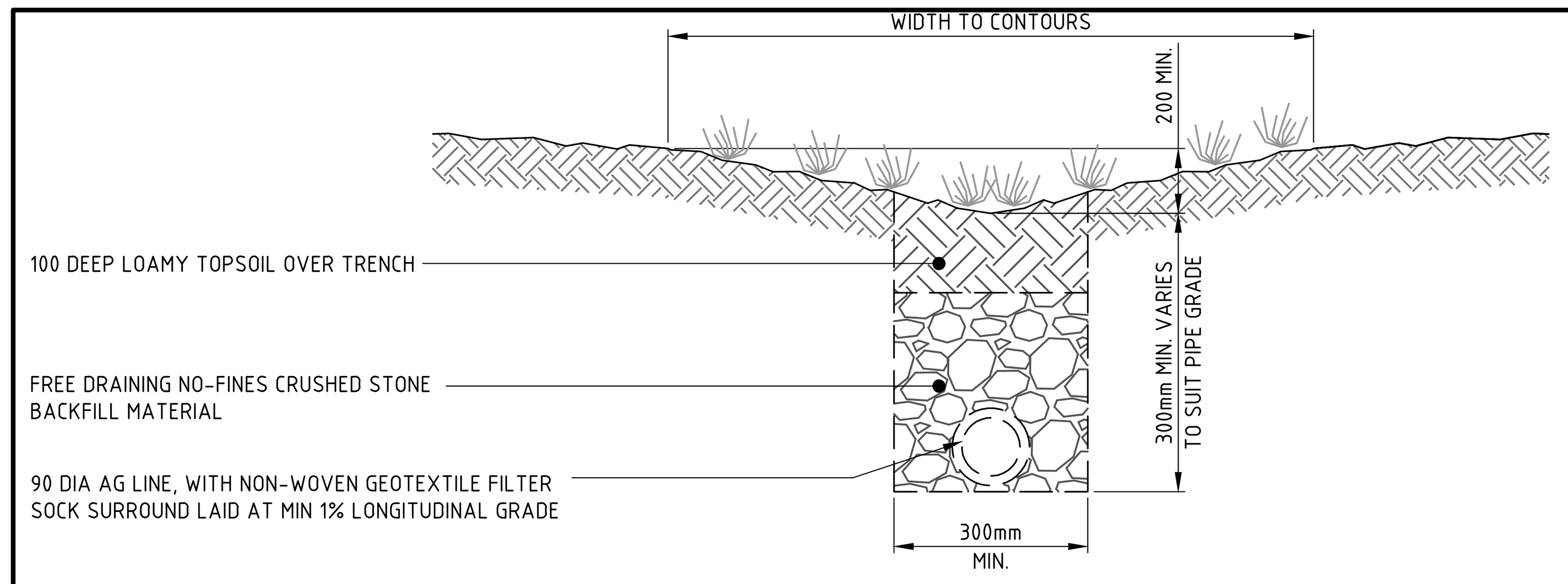
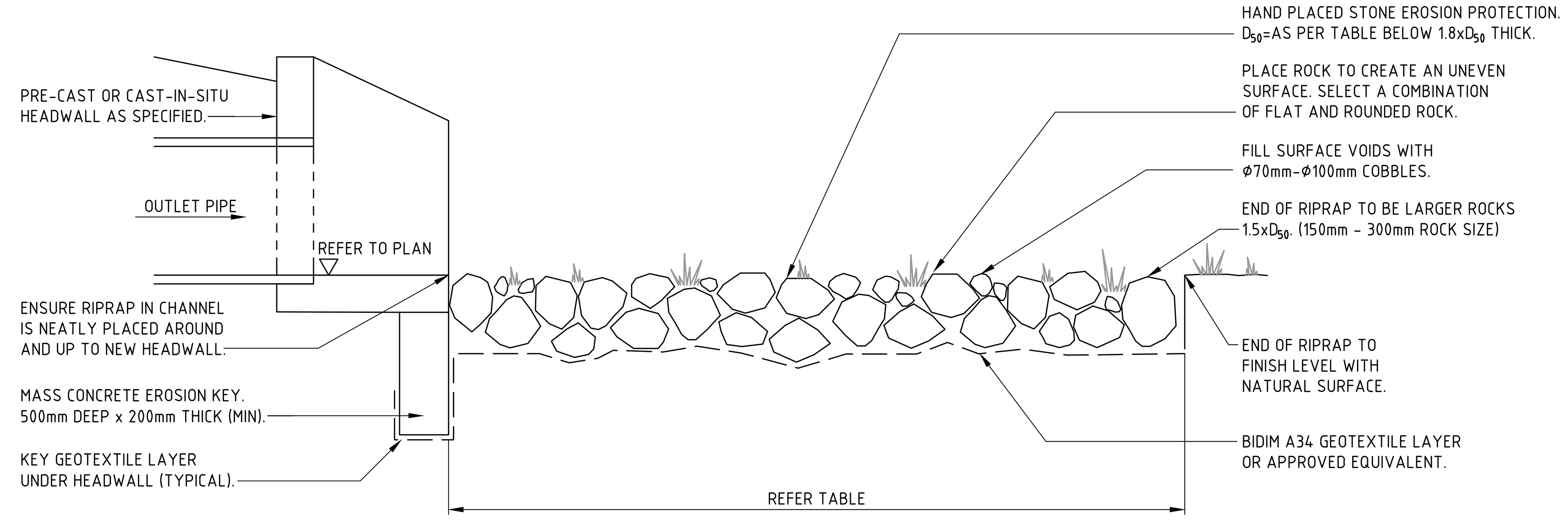


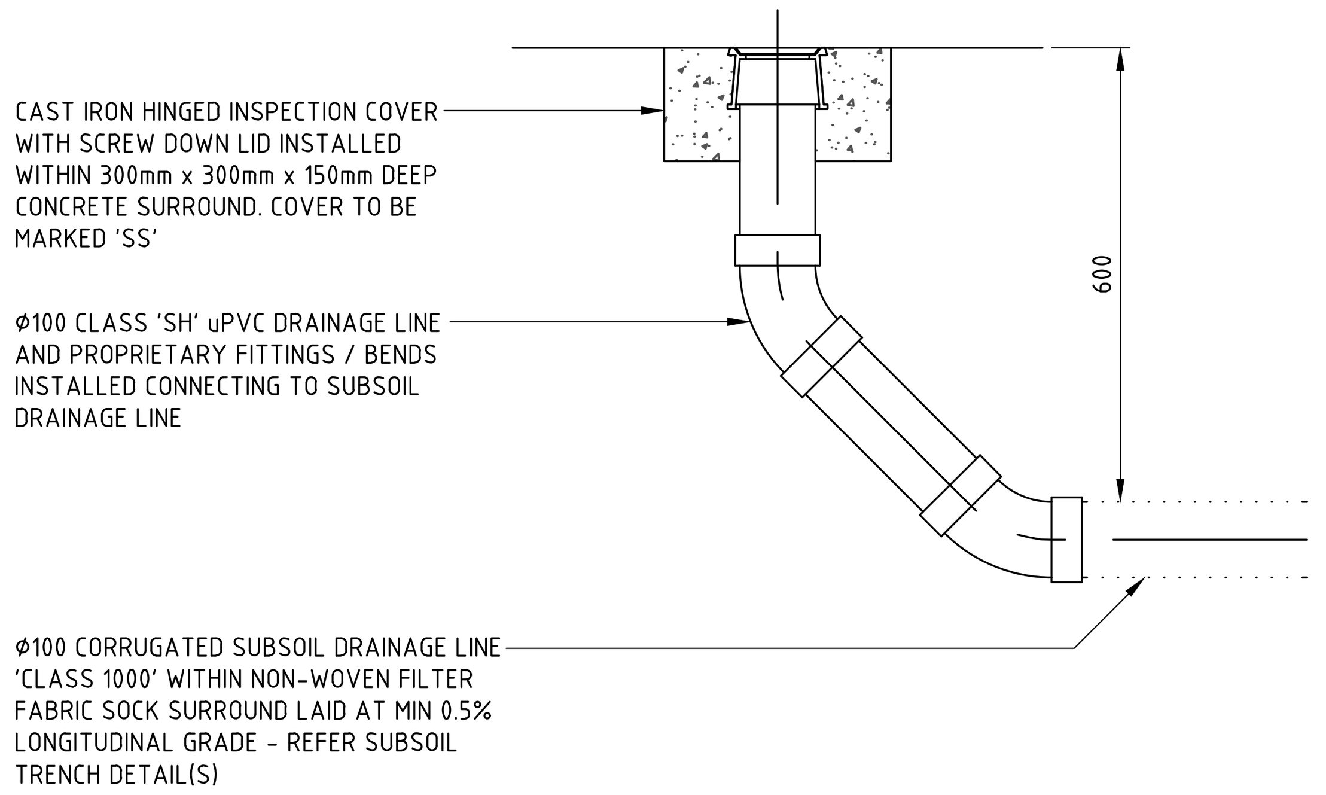
TYPICAL SWALE DETAIL WITH SUBSOIL DRAIN

NOTE: USED SEALED uPVC PIPE WHERE SUBSOIL DRAINAGE LINES CROSS BENEATH PAVEMENT AREAS



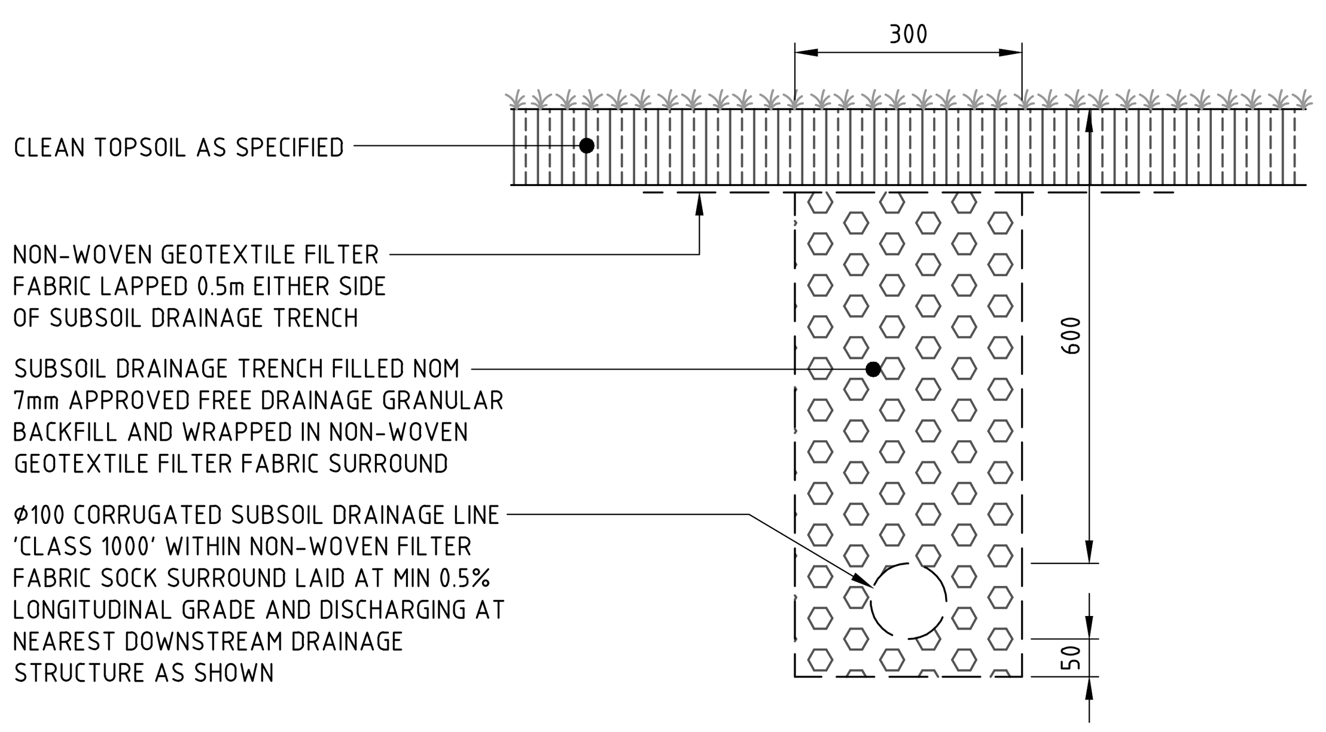
OUTLET HEADWALL RIPRAP SECTION

	MEAN ROCK SIZE (d50) (mm)	DESIGN LENGTH (m)	THICKNESS (m)	WIDTH (m)	SIZE DISTRIBUTION (d50/d90)
HW 1	100	3.00	0.18	1.7	0.67
HW 2	100	1.50	0.18	1.1	0.67
HW 3	100	3.00	0.18	1.7	0.67
HW 4	100	1.00	0.18	1.1	0.67
HW 5	200	1.50	0.36	1.1	0.67
HW 6	100	3.00	0.18	1.5	0.67
DP 1	100	1.00	0.18	1.1	0.67
DP 2	100	1.00	0.18	1.1	0.67



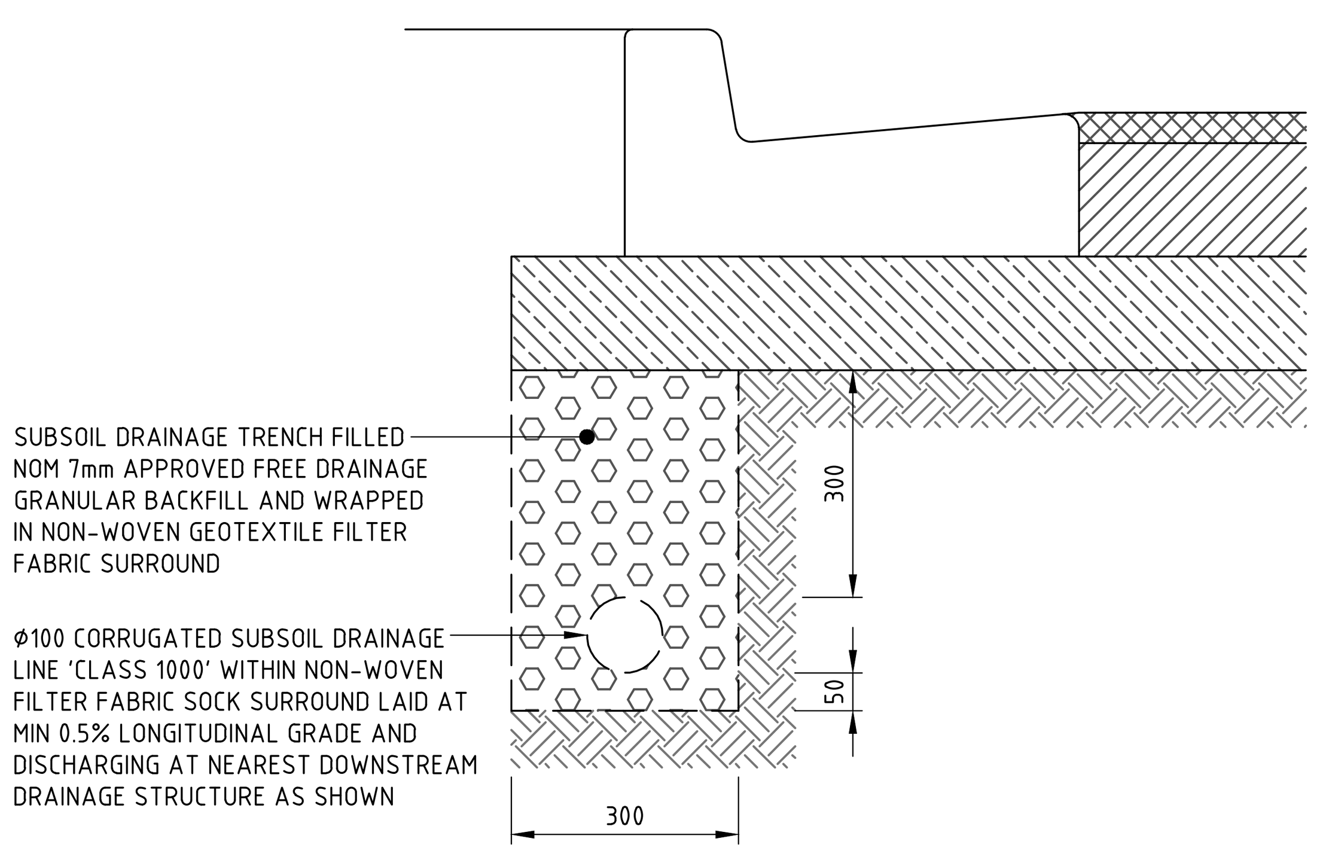
SUBSOIL DRAINAGE CLEAROUT 'CO'

CLEAROUT TO BE INSTALLED AT UPSTREAM POINTS ALONG SUBSOIL DRAINAGE LINES @ MAX 30m CENTRES AND DISCHARGING TO DRAINAGE STRUCTURES @ MAX 60m CENTRES.



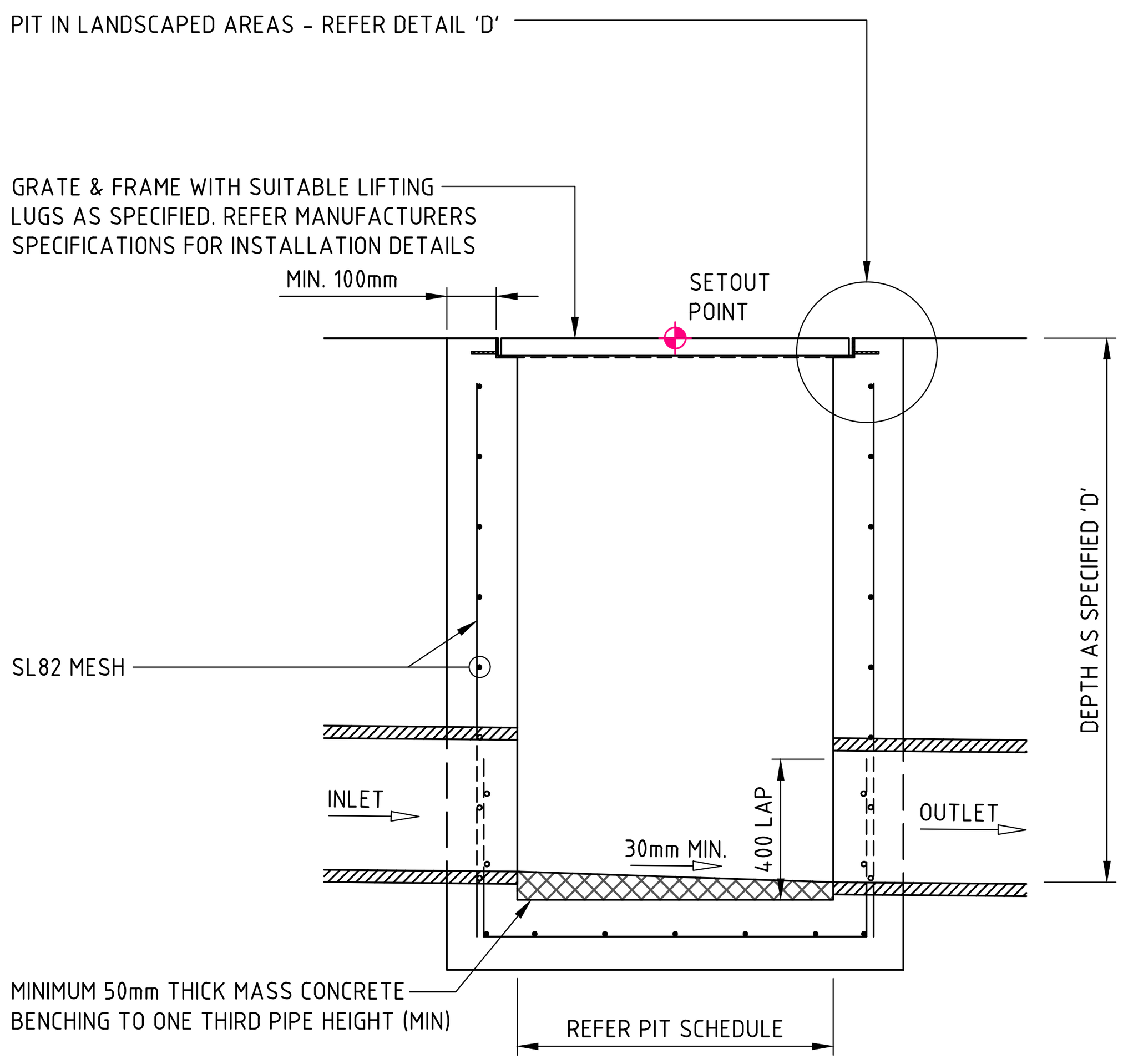
SUBSOIL DRAINAGE TRENCH - LANDSCAPING 'SSD'

CLEAROUT TO BE INSTALLED @ MAX 30m CENTRES AND DISCHARGING TO DRAINAGE STRUCTURES @ MAX 60m CENTRES.

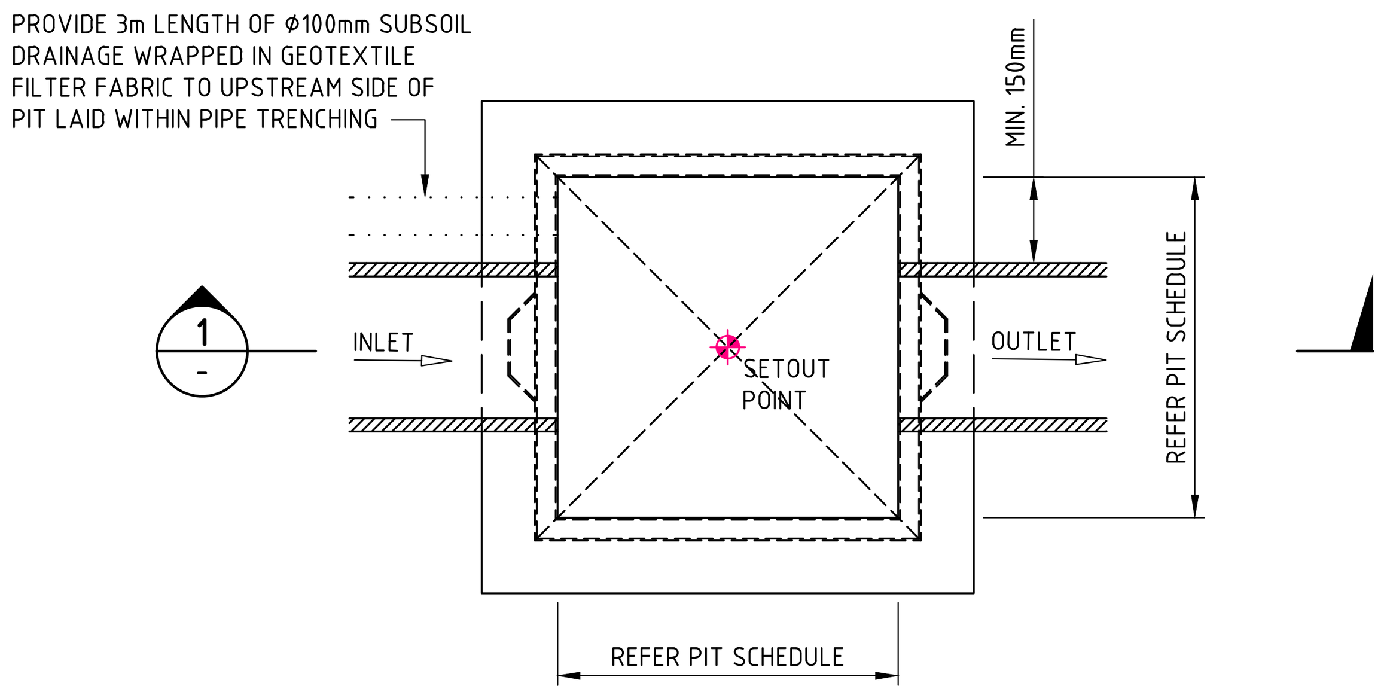


SUBSOIL DRAINAGE TRENCH 'SSD'

CLEAROUT TO BE INSTALLED @ MAX 30m CENTRES AND DISCHARGING TO DRAINAGE STRUCTURES @ MAX 60m CENTRES.

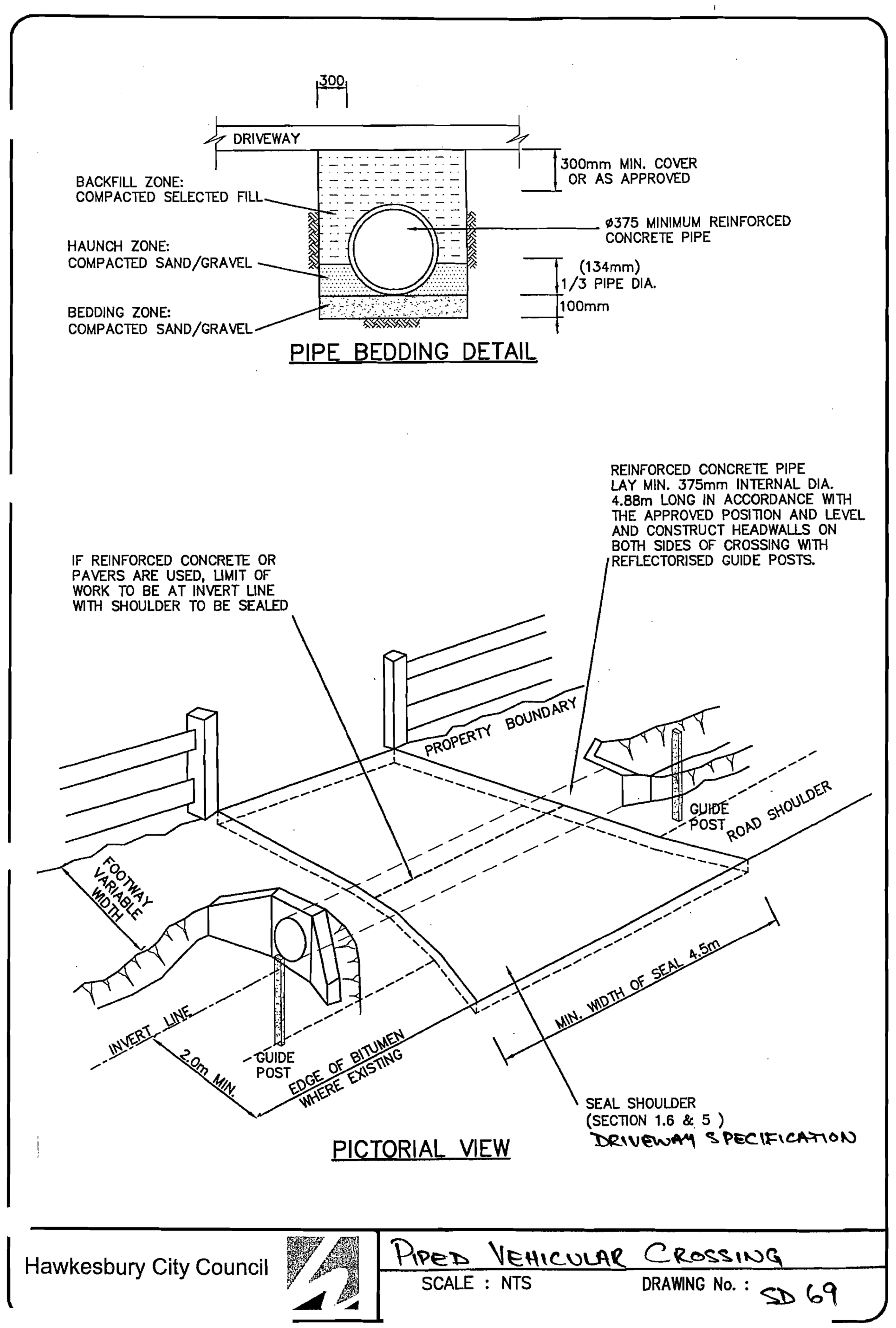


SECTION 1 / -



PLAN
SURFACE INLET PIT 'SIP'

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



DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER:

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT CONCEPT DESIGN	WD		NS	11.12.24
02	ISSUED FOR CONCEPT DESIGN	WD		NS	19.12.24
03	ISSUED FOR CONCEPT DESIGN	WD		NS	14.02.25
04	ISSUED FOR COORDINATION	WD		NS	24.03.25
05	ISSUED FOR REF	WD		NS	28.04.25

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SCALE VARIES

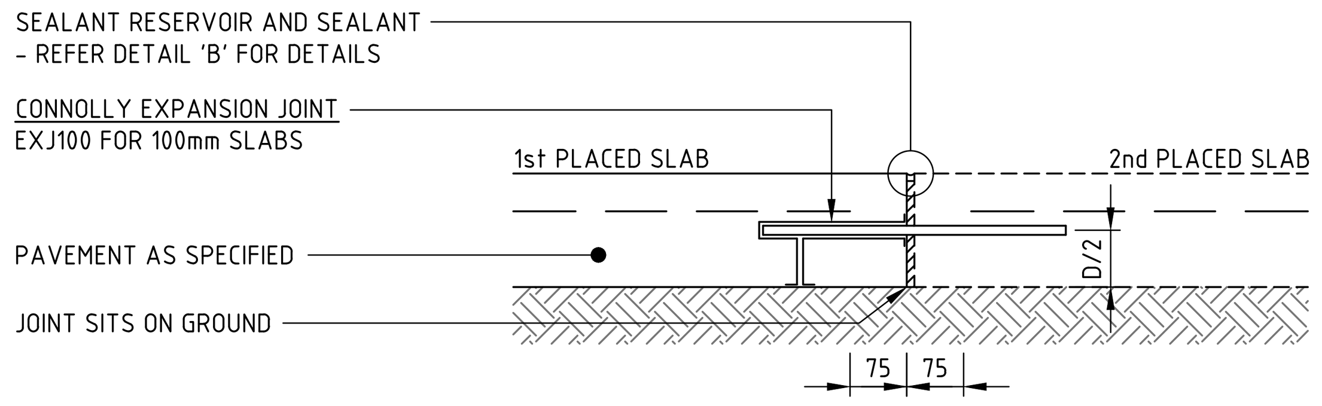
DRAWING TITLE
CIVIL ENGINEERING PACKAGE DETAILS - SHEET 01

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

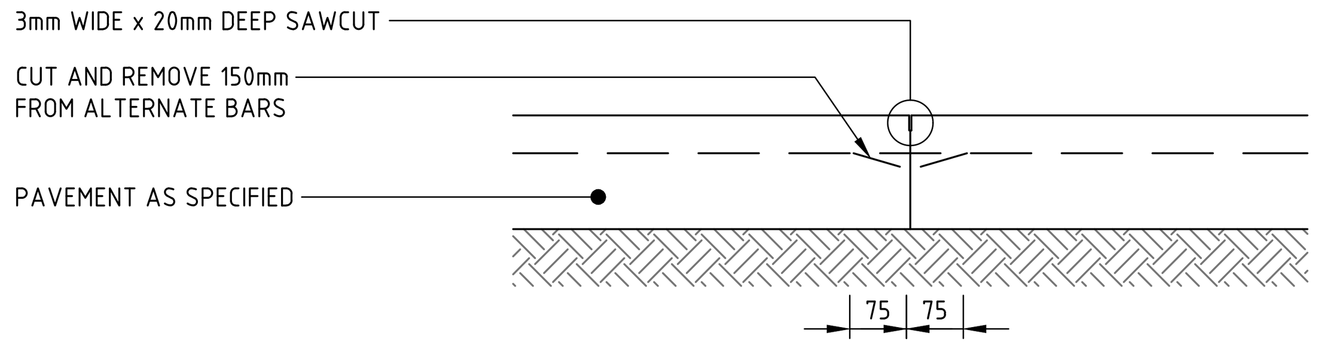
DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 6001

REV
05



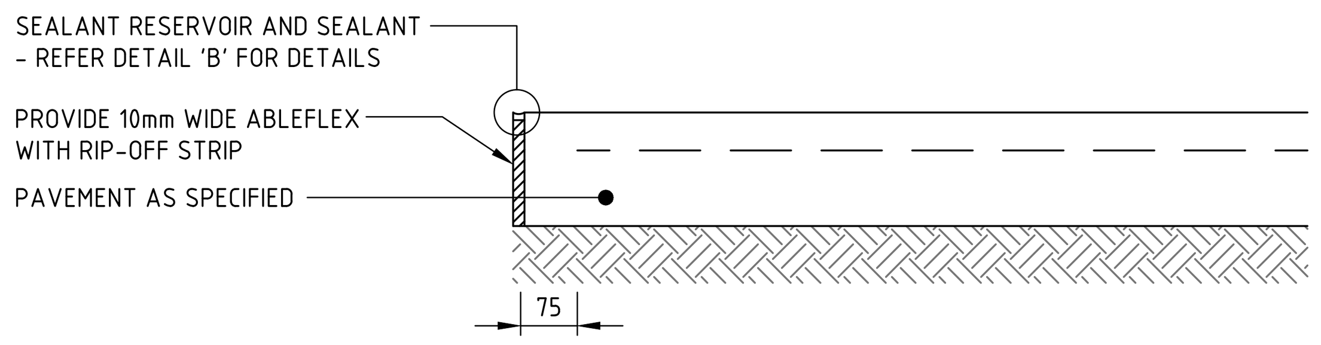
FOOTPATH EXPANSION JOINT 'EJ'

- TO ALSO BE USED AS A 'STOPWORK JOINT'
- MAXIMUM CONTINUOUS POUR NOT TO EXCEED 36m
- JOINT TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS
- REFER SPECIFICATION NOTES FOR JOINT SPACINGS (6m UNO)



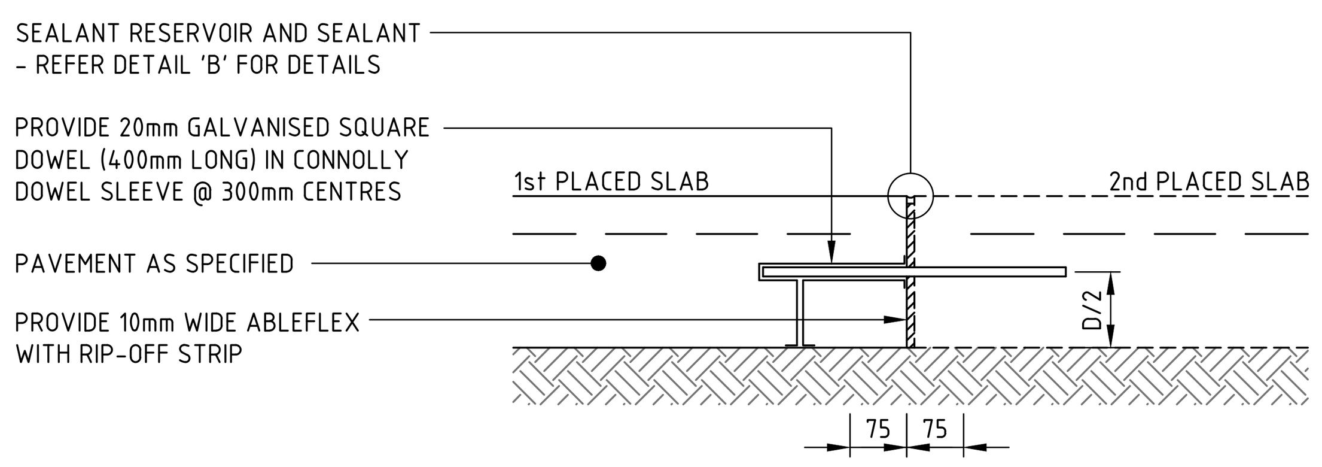
FOOTPATH SAWN / CONTRACTION JOINT 'SJ'

- JOINT TO BE SAWN AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY SAWING (MAX 24HRS)
- REFER SPECIFICATION NOTES FOR JOINT SPACINGS (2m UNO)



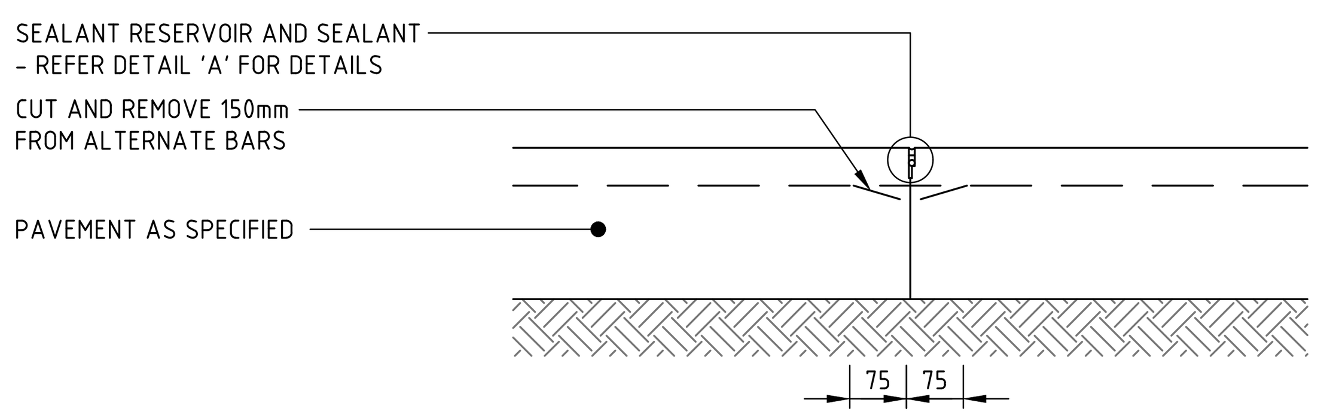
ISOLATION JOINT 'IJ'

- PROVIDE JOINT BETWEEN ALL NEW CONCRETE AND EXISTING STRUCTURES
- JOINT TO BE USED AGAINST ALL WALLS, FOOTINGS, COLUMNS, BACK OF KERB, SERVICE PITS, DRAINAGE PITS AND ALL SLAB PENETRATIONS



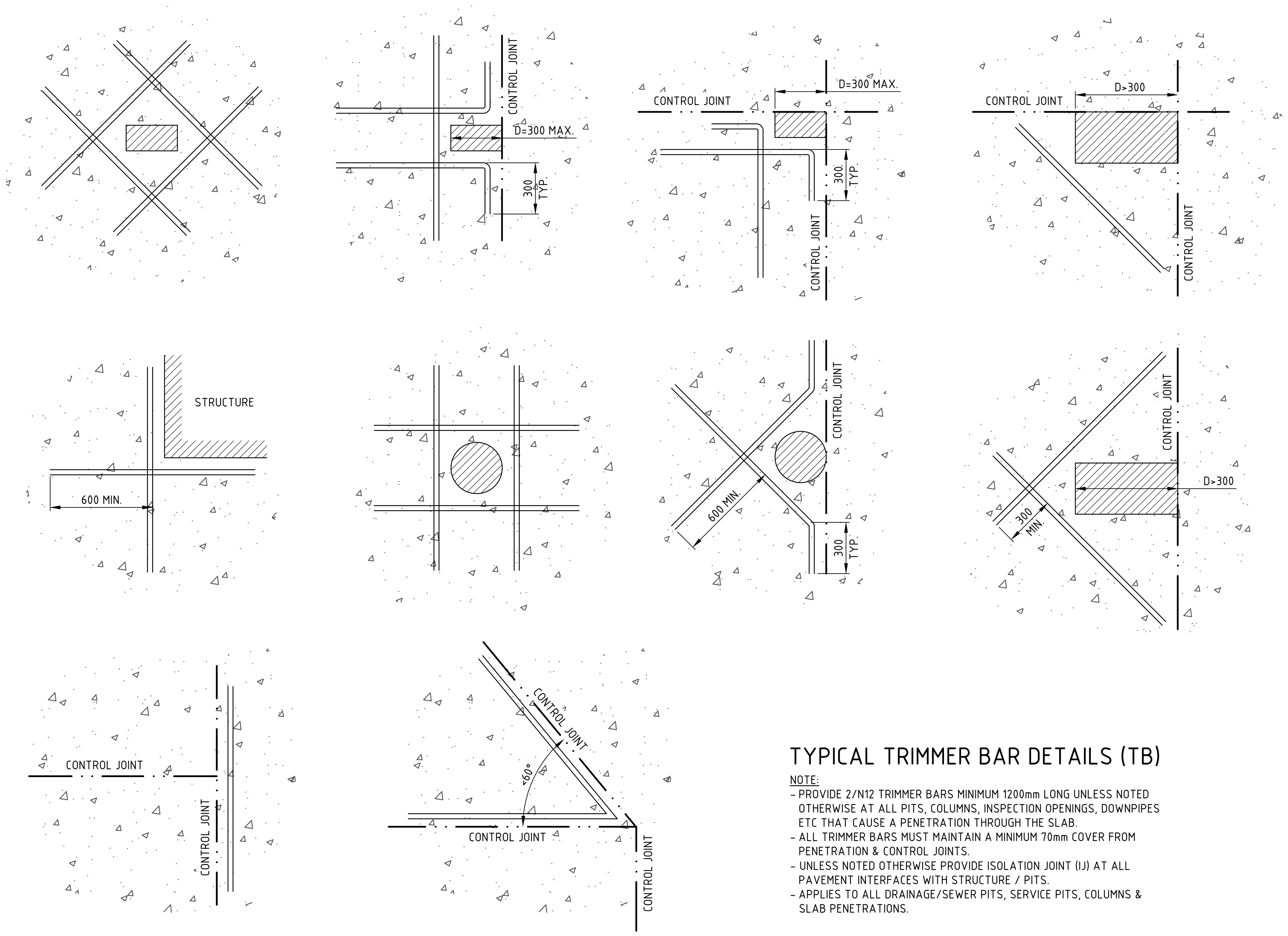
TRAFFICKED EXPANSION JOINT 'EJ'

- TO ALSO BE USED AS A 'STOPWORK JOINT'
- JOINT TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS
- REFER SPECIFICATION NOTES FOR JOINT SPACINGS (18m UNO)



TRAFFICKED SAWN / CONTRACTION JOINT 'SJ'

- JOINT TO BE SAWN AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY SAWING (MAX 24HRS)
- REFER SPECIFICATION NOTES FOR JOINT SPACINGS (6m UNO)



TYPICAL TRIMMER BAR DETAILS (TB)

NOTE:
- PROVIDE 2/N12 TRIMMER BARS MINIMUM 1200mm LONG UNLESS NOTED OTHERWISE AT ALL PITS, COLUMNS, INSPECTION OPENINGS, DOWNPIPES ETC THAT CAUSE A PENETRATION THROUGH THE SLAB.
- ALL TRIMMER BARS MUST MAINTAIN A MINIMUM 70mm COVER FROM PENETRATION & CONTROL JOINTS.
- UNLESS NOTED OTHERWISE PROVIDE ISOLATION JOINT (IJ) AT ALL PAVEMENT INTERFACES WITH STRUCTURE / PITS.
- APPLIES TO ALL DRAINAGE/SEWER PITS, SERVICE PITS, COLUMNS & SLAB PENETRATIONS.

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REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	28.04.25

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SCALE VARIES

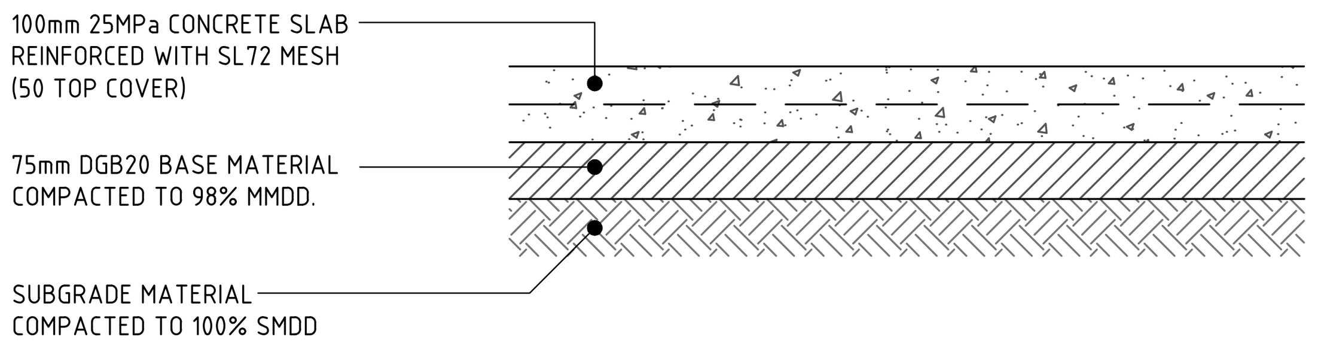
DRAWING TITLE
CIVIL ENGINEERING PACKAGE DETAILS - SHEET 02

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

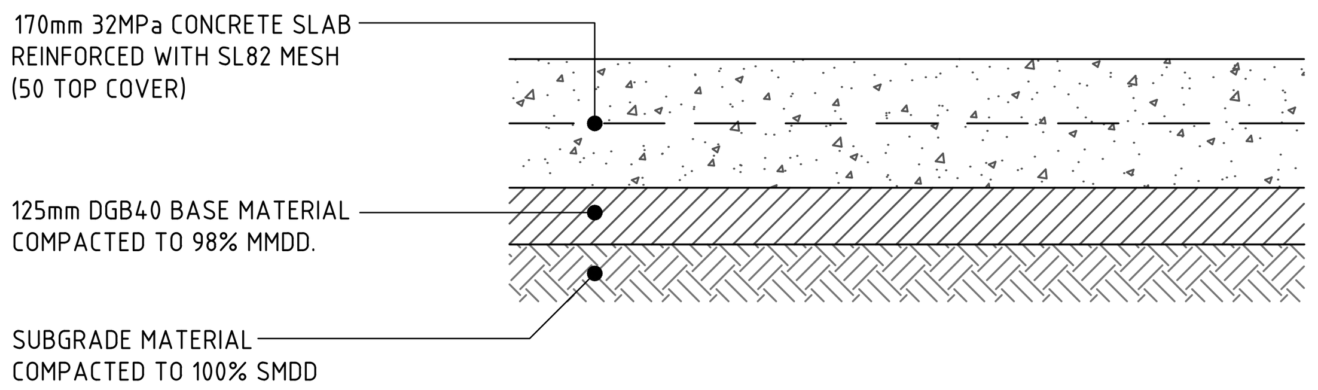
DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 6002

REV
01



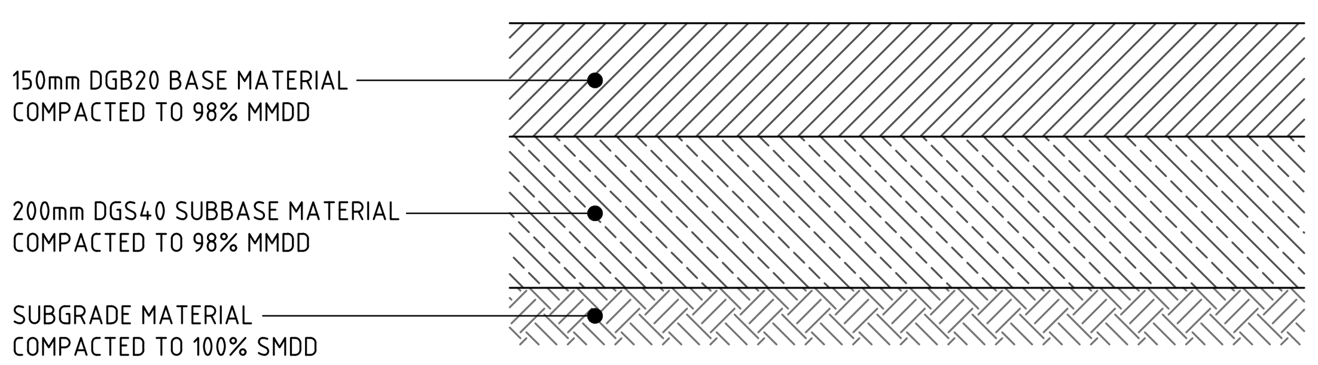
PAVEMENT TYPE '1' FOOTPATH

MIN CBR 3% (CONTRACTOR TO CONFIRM ONSITE).
CONTRACTOR TO ALLOW FOR JOINTS - REFER JOINT DETAILS



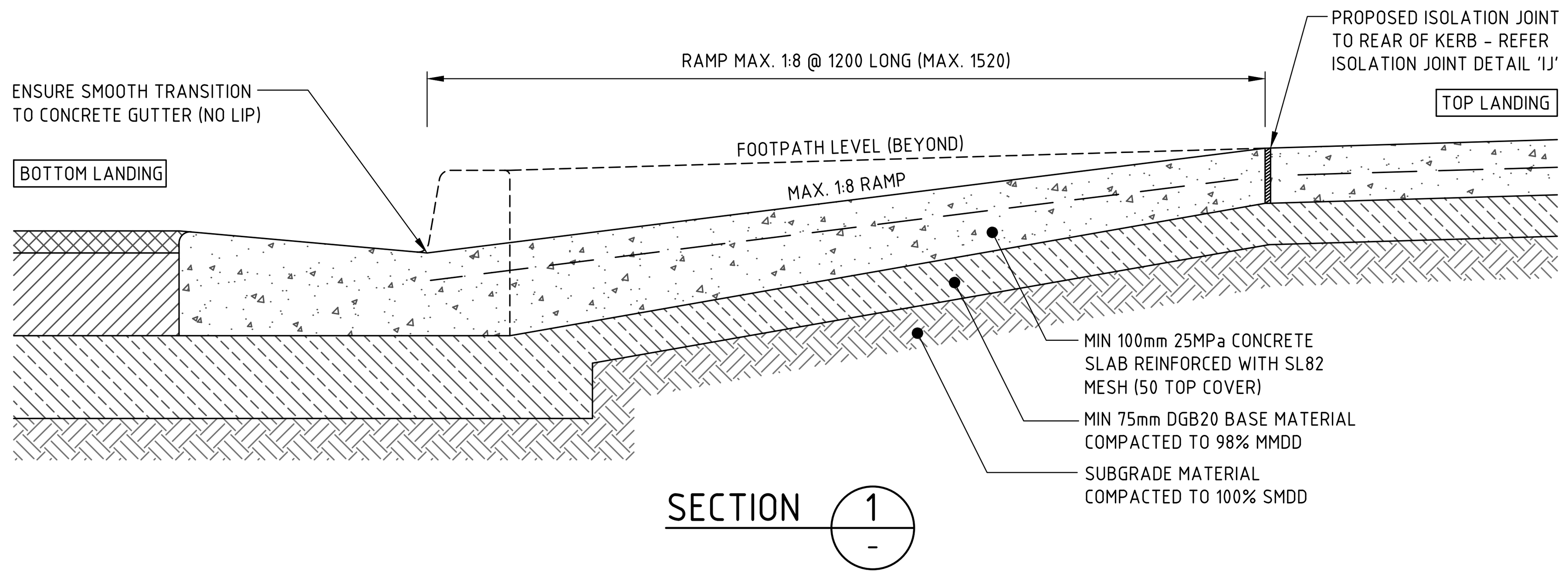
PAVEMENT TYPE '2' CARPARK AND DRIVEWAY

MIN CBR 3% (CONTRACTOR TO CONFIRM ONSITE).
CONTRACTOR TO ALLOW FOR JOINTS - REFER JOINT DETAILS

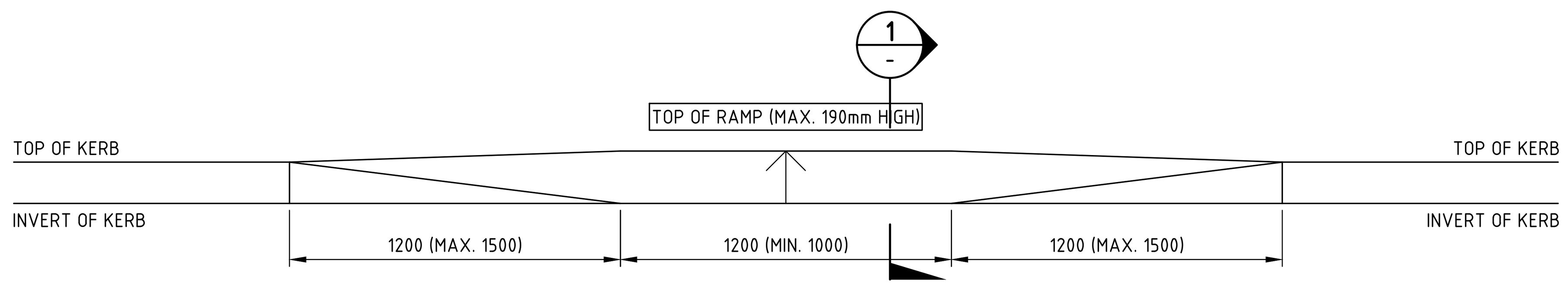


PAVEMENT TYPE '3' GRAVEL SERVICE DRIVEWAY

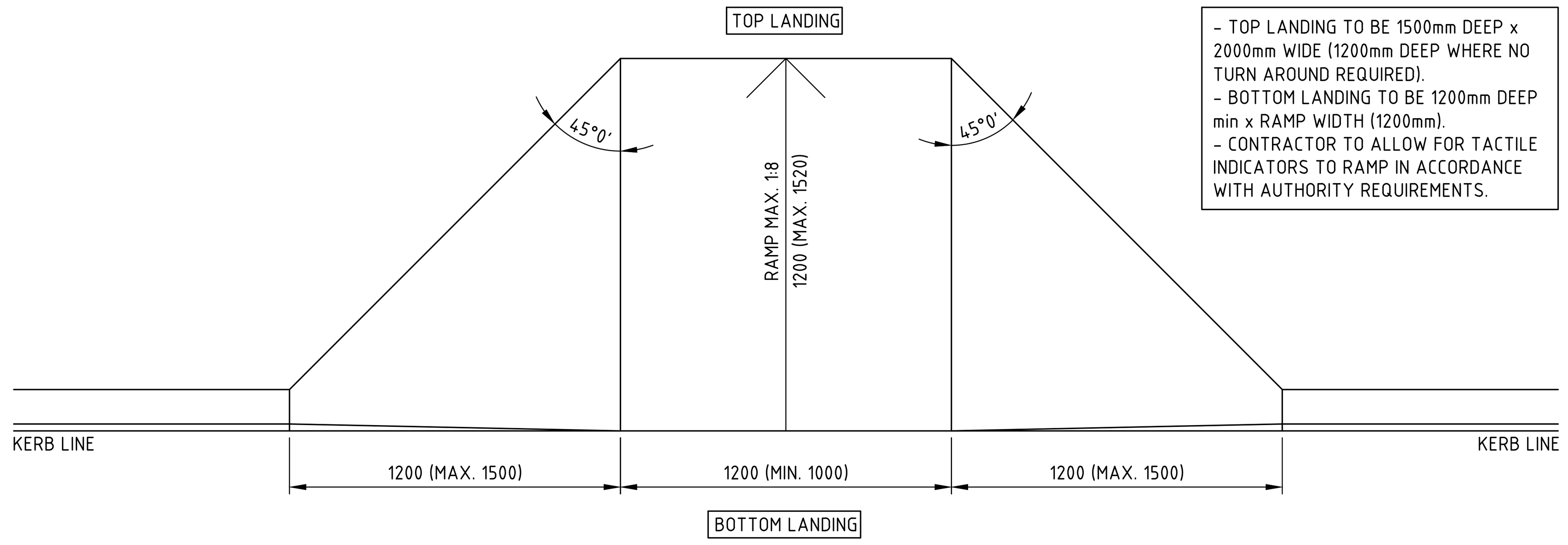
MIN CBR 3% (CONTRACTOR TO CONFIRM ONSITE)



SECTION 1 / -



ELEVATION



- TOP LANDING TO BE 1500mm DEEP x 2000mm WIDE (1200mm DEEP WHERE NO TURN AROUND REQUIRED).
- BOTTOM LANDING TO BE 1200mm DEEP min x RAMP WIDTH (1200mm).
- CONTRACTOR TO ALLOW FOR TACTILE INDICATORS TO RAMP IN ACCORDANCE WITH AUTHORITY REQUIREMENTS.

PLAN
KERB RAMP 'KR'

DRAWN: W. DODIC DESIGNED: E.BRADLEY JOB MANAGER: N. SUTHERLAND VERIFIER: .

REV	DESCRIPTION	ISS'D	VER'D	APP'D	DATE
01	ISSUED FOR COORDINATION	WD		NS	28.04.25

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SCALE VARIES

DRAWING TITLE
CIVIL ENGINEERING PACKAGE DETAILS - SHEET 03

JOB NUMBER
SY240854

DRAWING SHEET SIZE = A1

DRAWING NO
RAC-NRE-ZZ-ZZ-DR-C- 6003

REV
01

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