NORTHROP

CIVIL ENGINEERING REPORT: SITE BASED STORMWATER MANAGEMENT PLAN

Caddens Corner

68 & 80 O'CONNELL STREET KINGSWOOD NSW 2747

PREPARED FOR

HOLDMARK Property Group
Project Number SY222070-00
Rev: 02
Date: 20.03.2023

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01	08/03/2023	For Development Application	H.Genc	J.Carroll	J.Carroll
02	20/03/2023	For Development Application	H.Genc	J.Carroll	J.Carroll

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Glossary

Term	Definition
ADP	Area Development Plan
AEP	Annual Exceedance Probability
ARI	Average Recurrence Interval
ESR	Engineering Services Report
EY	Exceedances per year
IECA	International Erosion Control Association
kL	Kilolitres
MCU	Material Change of Use
ML	Megalitres
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
QUDM	Queensland Urban Drainage Manual
ROL	Reconfiguring of a Lot
SBSMP	Site Based Stormwater Management Plan
SPP	State Planning Policy
SQID	Stormwater Quality Improvement Device
WQO	Water Quality Object
WSUD	Water Sensitive Urban Design

Executive Summary

Northrop Consulting Engineers (Northrop) have been engaged by HOLDMARK Property Group to prepare a Site Based Stormwater Management Plan (SBSMP) for a Development Application submission to Penrith City Council (Council). The proposed Residential & Retail Development is located at 68-80 O'Connell Street Kingswood NSW 2747.

This SBSMP addresses the stormwater management strategy for the proposed development and demonstrates that the proposed development can be constructed and operated in accordance with all stormwater objectives required for the development. The primary outcomes of this SBSMP are as follows:

Lawful Point of Discharge

The existing lawful point of discharge (stormwater channel headwall) will be exchanged for an existing kerb inlet pit downstream of the headwall due to the proposed realignment of Corr Road, with most of the site flows being captured for stormwater quantity and quality treatment prior to discharge from the site. A small portion of the development will bypass the private stormwater infrastructure and discharge towards the existing stormwater channel; however, the combined site runoff achieves all stormwater quantity and quality objectives.

Stormwater Quantity

The stormwater quantity objective was to ensure post-development site generated peak discharge was no greater than the pre-development site generated peak discharge for all storm durations under the 1% AEP and 20% AEP storm events. Ultimately, the proposed stormwater network for the development satisfies this requirement.

All catchments conveying flow to the nominated point of discharge were considered and modelled in DRAINS. This includes upstream catchments and sub-catchments internal to site boundaries.

To achieve a non-worsening impact to the downstream point of discharge, the proposed development requires a total detention volume of 584m^3, which has been achieved via underground On-Site Stormwater Detention (OSD) tanks. Three new OSD tanks have been proposed to achieve this volume. All road catchments and catchments upstream of site will bypass OSD. Additionally, an existing 177kL detention tank which currently services the adjacent Woolworths carpark is proposed to replaced with a like-for-like tank. Given the proposal is increasing pervious area in this location, it's likely that the overall stormwater flow from the western catchment (previously the Woolworths carpark) will be less.

Stormwater Quality

Stormwater Quality Improvement Devices (SQIDs) have been proposed in the design to achieve the water quality objectives specified in Penrith City Council's WSUD Technical Guidelines, namely, the removal of gross pollutants, suspended solids, nitrogen and phosphorus. The proposed treatment train was modelling using MUSIC modelling software and includes the following SQIDs:

- 29x Ocean Protect OceanGuard 200 micron filter baskets
- 20x Ocean Protect Stormfilter 690 Psorb Cartridges
- 100m^2 total Media Filtration at tree pits
- 160kL total Rainwater Tank storage

Erosion and Sediment Control

Construction phase ESCP measures are to be implemented during construction in accordance with the relevant requirements. Of these measures, an 832m^3 sediment basin is included.

1. Introduction

Northrop Consulting Engineers (Northrop) have been engaged by HOLDMARK Property Group to develop a Site Based Stormwater Management Plan (SBSMP) in support of a Development Application submission to Penrith City Council (Council) and any nominated referral agency. The proposed Residential Community is located at 68 & 80 O'Connell Street Kingswood NSW 2747 (Lot 1/DP1268507 & Lot 2/DP1268507), the full site details are summarised in below. The proposed development will deliver a Residential Community at Caddens Corner.

Table 1: Property Details

Category	Description
Site Address	68 & 80 O'Connell Street Kingswood NSW 2747
Lot Title(s)	1/DP1268507 & 2/DP1268507
Total Site Area	5.3070ha
Proposed Land Use	Residential Community

This primary objectives of this SBSMP is to define the following:

- Legal point of discharge
- Stormwater Conveyance and Flood Management
- Stormwater Quantity management strategy
- Stormwater Quality management strategy
- Erosion and Sediment Control strategy.

1.1 Related Reports and Documents

This report is to be read in conjunction with the following reference documents:

- Civil Design Drawings by Northrop. Drawings No DAC0000 to DAC6103
- Flood Study Letter

2. Site Context and Existing Characteristics

The subject site located at 68 & 80 O'Connell Street Kingswood NSW 2747 is approximately rectangular in shape and spans across Lot 1 of DP 1268507 ('Lot 1') and Lot 2 of DP 1268507 ('Lot 2'). The total site area for the proposed development is approximately 5.3070ha. The site is located within the Penrith Local Government Area (LGA).

Within Lot 2, there exists a sealed road extending from Lot 3 of DP 1268507 ('Lot 3') into Lot 1, a stormwater channel that begins at the north-western end of the lot and extends into Lot, and a stormwater culvert (inlet & outlet) located at the centre of the lot. Within Lot 1 there currently exists a retail precinct with a dedicated on-grade customer parking lot at the eastern end of the lot.

An annotated aerial image of the site is shown below in Figure 1.

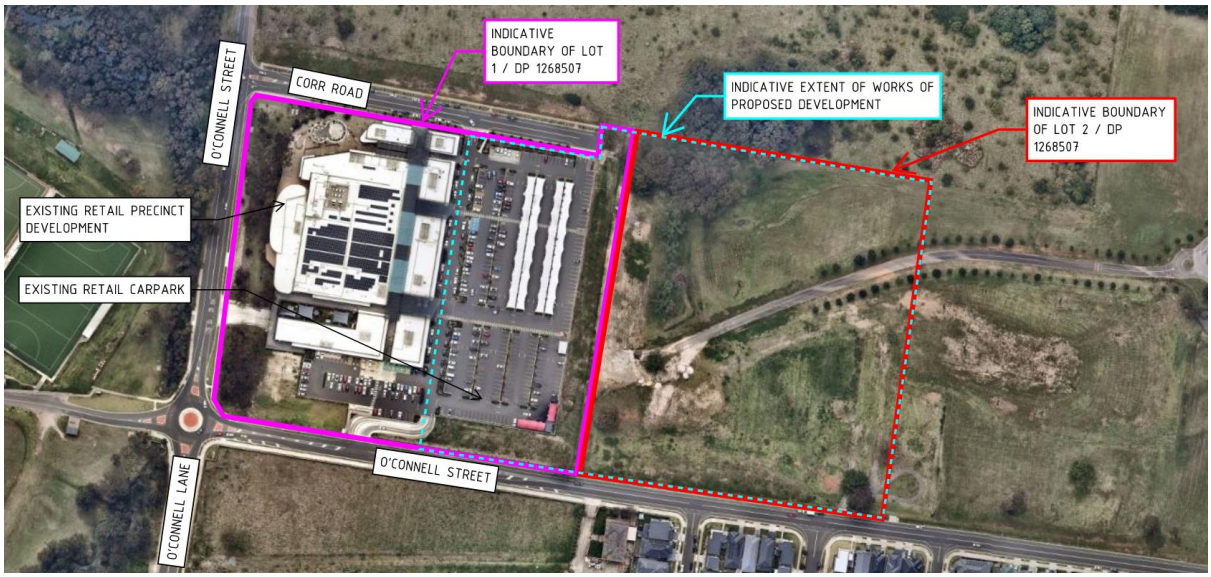


Figure 1: Site Locality (Source: Nearmap)

2.1 Existing Site Characteristics

Within Lot 2, the site generally falls North-west towards the existing stormwater channel seen in Figure 2, at an average slope of approximately 6.00%.

Within Lot 1, the existing retail on-grade carpark generals falls west at an average slope of approximately 2.00%. There also exists a batter along the shared boundary of Lot 1 and Lot 2, falling west toward Lot 1 at an average slope of approximately 30.00%.

The site is currently bound by:

- An existing retail precinct development to the west
- O'Connell Street (east-west) to the south
- Greenfield sites to the north
- Greenfield sites to the east

2.2 Existing Legal Point of Discharge

Based on site survey information prepared by Ramsay Surveyors (ref.: 8966) and the Approved for Construction civil engineering plans prepared by Wood & Grieve Engineers (ref.: 32763-4) for the adjacent retail precinct development (Development Consent: DA17/0995, Construction Certificate: CCX19/0047), the following existing stormwater infrastructure has been identified in the vicinity of the site:

- Stormwater culvert located at the centre of Lot 2, extending underneath the existing sealed road. This is shown in Figure 3.
- Stormwater channel located at the north-west end of Lot 2, adjoining a pit and pipe network (via a headwall) at Corr Road. This is shown in Figure 2.

The headwall forms the current legal point of discharge as it connects the existing stormwater channel to the pit and pipe network along Corr Road.

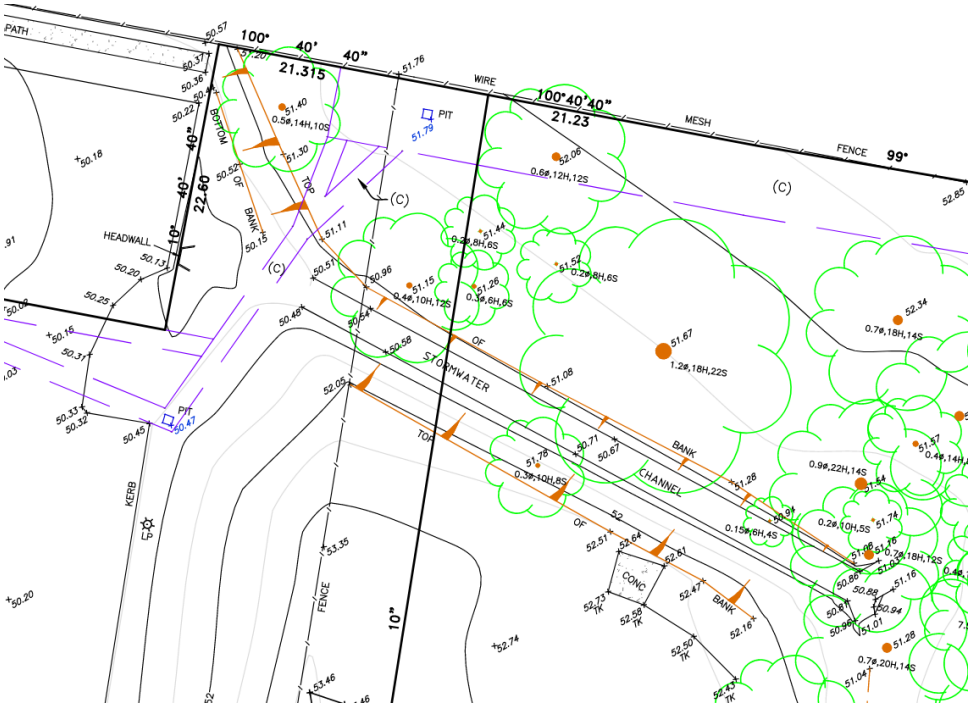


Figure 2: Existing Stormwater Channel (North-west) (Source: Ramsay Surveyors)

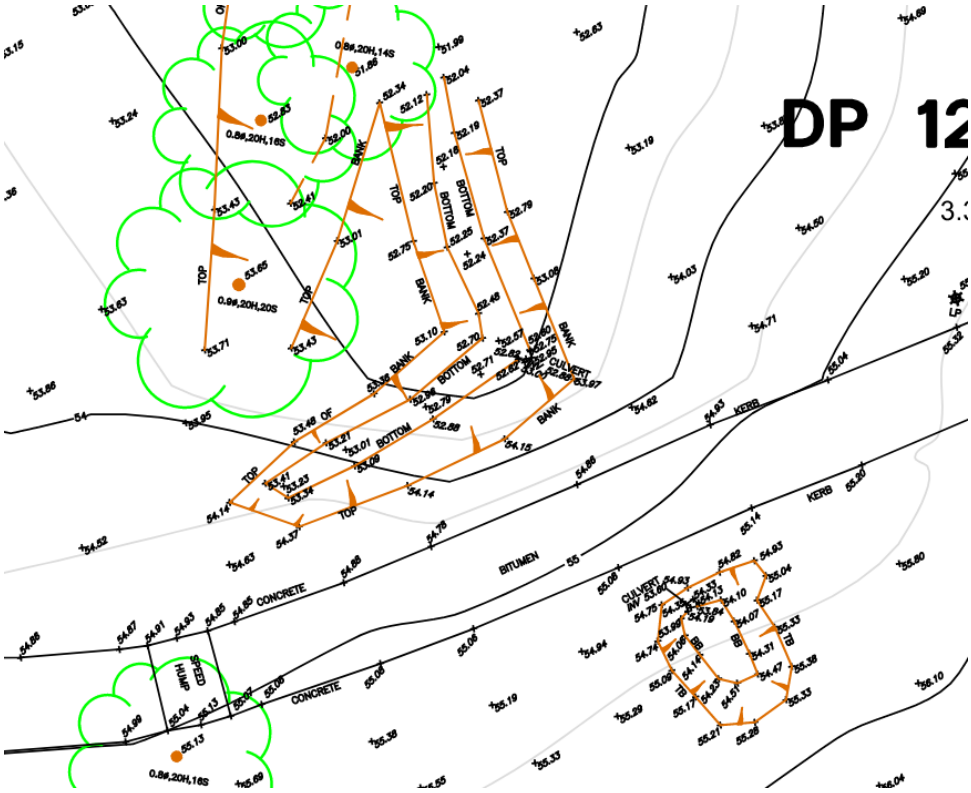


Figure 3: Existing Stormwater Culvert (Source: Ramsay Surveyors)

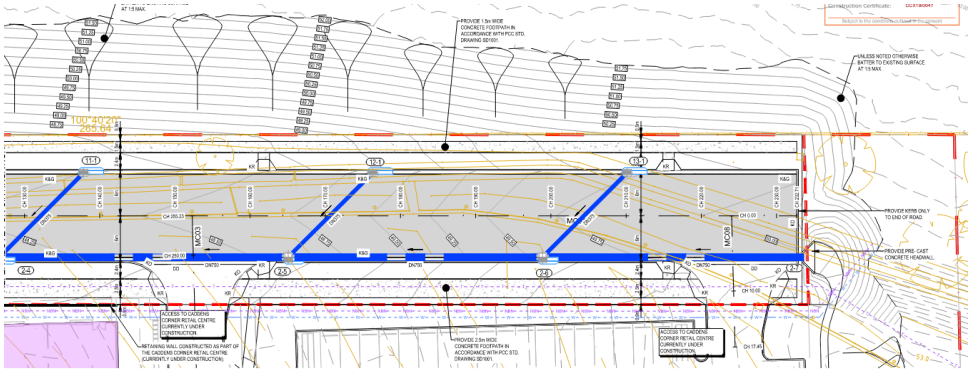


Figure 4: Pit & Pipe Network along Corr Road (Source: Wood & Grieve Engineers)

3. Proposed Development

The proposed development involves the construction of multiple multi-storey residential and retail buildings with associated landscape areas, below-ground carparking, and public road infrastructure.

The proposed architectural layout of the development prepared by Turner Architects is shown below in Figure 5. Refer to drawings prepared by Turner Architects for further information.

Figure 5: Proposed Site Plan (Source: Turner Architects)

4. Stormwater Management Objectives

4.1 Development Control Plan Objectives

Stormwater management for the proposed development has been designed in accordance with the following documents:

- *Penrith Development Control Plan 2014, Section E1 Caddens* ('DCP')
- Penrith City Council's Policy *Stormwater Drainage Guidelines for Building Developments* (dated 28 November 2016)
- Penrith City Council's *WSUD Technical Guidelines* (Version 3 – June 2015)
- Penrith City Council Development Control Plan 2014 (DCP)
- Plumbing and Drainage Code AS3500.3
- Australian Rainfall and Runoff Guidelines (ARR 2019)

Based on Council's DCP, Stormwater Management Policy and WSUD Technical Guidelines, the stormwater management objectives / requirements for the development are summarised below:

- Design an On-site Stormwater Detention (OSD) system to capture and control post-development site generated stormwater runoff flows such that the rate of stormwater runoff (both piped and overland) from the post-developed site does not exceed the rate of runoff from the pre-developed site, i.e., Permissible Site Discharge (PSD) for the following storm events:
    - All storm **durations for the 1% AEP and 20% AEP storm events.**
- The total are allowed to bypass the OSD system, which includes pervious and impervious areas, must not be greater than 15% of the total site area.
- Stormwater discharging from the site (post-development) must achieve the annual pollutant load reduction targets specified below in Table 2.

Table 2: Water Quality Objectives (Source: PCC's WSUD Technical Guidelines (Version 3 – June 2015))

Pollutant	Percent Reduction
Gross Pollutants (>5mm), GP	90%
Total Suspended Solids, TSS	80%
Total Phosphorous, TP	60%
Total Nitrogen, TN	45%

5. Stormwater Quantity Management

5.1 Stormwater Conveyance Management

The proposed stormwater management strategy aims to retain and supplement the stormwater management system currently servicing the site. The stormwater strategy proposed for the developed ensures generally the current catchment distribution towards the existing stormwater channel (legal point of discharge) will be maintained.

The proposed development will introduce sub-surface pit and pipe networks to capture site generated rainwater and stormwater runoff at each residential complex, which will be conveyed to On-Site Stormwater Detention (OSD) tanks. Following water quality treatment via proposed Stormwater Quality Improvement Devices (SQIDs), flows will be discharged to the chosen legal point of discharge, discussed in Section 5.2 of this report. Refer to Section 5.4 and Section 7 of this report for further information regarding OSD systems and SQID elements, respectively.

5.2 Proposed Legal Point of Discharge

Given the proposed realignment/extension of this road, the existing legal point of discharge is not feasible for the proposed development. Therefore, an existing stormwater pit downstream of the headwall at Corr Road has been selected as the lawful point of discharge for the proposed development.

Based on the Approved for Construction civil engineering plans prepared by Wood & Grieve Engineers (32763-4) and Work As Executed plans prepared by Frankham Engineering Surveys (ref.: 219076), the following details at this point are known:

- Pit name: 2-6 (as per drawing CI-NR-522-01 by Wood & Grieve Engineers) (refer Figure 4)
- Pit type: Grated Gully Pit, 2.4m Extended Kerb Inlet
- Inlet invert level = 47.33m AHD (as per WAE plans)
- Outlet invert level = 47.28m AHD (as per WAE plans)
- Inlet pipe diameter = 750mm (as per WAE plans)

5.3 Hydrological Modelling (DRAINS)

Hydrological modelling of the existing and developed site has been modelled using DRAINS software, with the integrated ILSAX hydrological model. The adopted model parameters are provided below in Table 3.

Table 3: ILSAX Hydrological Model Parameters

Parameter	Value
Hydrologic routing method	ILSAX
Soil Type	C
Antecedent Moisture Conditions	3
Paved Area Depression Storage	1mm
Supplementary Area Depression Storage	1mm
Grassed Area Depression Storage	5mm

IFD Data	2022 rainfall depths from ARR Data Hub using site coordinates
Time of Concentration	Kinematic Wave Equation using detailed catchment parameters

5.4 Tailwater Conditions

The tailwater conditions applied within the DRAINS model developed for the site have been derived from kerb inlet pit immediately downstream of Pit 2-6. Based on the Approved for Construction civil engineering plans prepared by Wood & Grieve Engineers (ref.: 32763-4) and Work As Executed plans prepared by Frankham Engineering Surveys (ref.: 219076), the following details at this point are known:

- Pit name: 2-5 (as per drawing CI-NR-522-01 by Wood & Grieve Engineers) (refer Figure 4)
- Pit type: Grated Gully Pit, 2.4m Extended Kerb Inlet
- Inlet pipe invert level = 46.79m AHD (as per WAE plans)
- Inlet pipe diameter = 750mm (as per WAE plans)
- Maximum HGL (100-yr ARI) = 48.58m AHD
  Maximum HGL (5-yr ARI) = 47.23m AHD

5.5 On-Site Detention (OSD) System Design

Three OSD systems have been designed to achieve the stormwater quantity management objectives listed in Section 4 of this report. The parameters corresponding to these tanks are summarised below in Table 4.

The OSD tanks have been sized to ensure post-development flows do not exceed pre-development flows for the entire catchment discharging at the current legal point of discharge, by controlling flows generated by separate sub-catchments discharging at the nominated point of discharge. These sub-catchments are shown in drawing DAC4201. The pre- and post-development flows are presented below in Table 5.

The existing OSD servicing the retail precinct carpark is to be replaced like-for-like (‘Western OSD’), replicating existing form and function to create no adverse impact to downstream point of discharge. Since the size of catchment contributing flows to the Western OSD has not been increased, the Western OSD and respective catchment have been excluded from the developed DRAINS modelling and pre-post development flow rate comparison. Generally, any existing stormwater systems currently draining to the removed OSD tank shall be diverted to the new OSD tank via a new pit and pipe system.

Engineering drawings in Appendix A provide more details on the tank arrangement and locality. The DRAINS model can be provided upon request.

Table 4: OSD Tank Parameters

OSD Parameters	Central Western OSD	Central Eastern OSD	Southern OSD	Western OSD
Minimum Required Storage Volume	195 m^3	167 m^3	222 m^3	177 m^3
Proposed Tank Base Area (min)	78 m^2	91 m^2	150 m^2	68 m^2
Max Water Depth	2590mm	1730mm	2208mm	2605mm

Table 5: Comparison of Pre and Post Development Flows

AEP (%)	Pre-developed Site Flow Rate (L/s)	Post-developed Site Flow Rate (L/s)
20 (Minor)	934	663
1 (Major)	3290	1940

6. Stormwater Quality Management - Construction Phase

6.1 Erosion and Sediment Control

Prior to construction commencing, it is the principal contractor's responsibility to ensure adequate erosion and sediment control measures are installed around the subject site to minimise disturbance and ensure the quality of runoff discharging from the site is of an acceptable standard.

An erosion and sediment control plan (ESCP) has been included in the Civil Engineering drawings in Appendix A. The ESCP has been prepared in accordance with Landcom's *Managing Urban Stormwater – Soils & Construction (2004)* (Blue Book). Erosion and sediment control techniques used for the site include:

- Sediment barriers to be installed on all entrances to stormwater inlet pits
- Construction entry and exit shakedown areas
- Sediment fences are to be installed on the downstream boundaries of the subject site
- Construction of temporary bunds at the top of all earthworks batters to ensure runoff is directed away from exposed batters
- Construction of temporary diversion drains to divert water to sediment basins and around any stockpiles
- Sediment fences to be installed on the downstream side of any stockpiles
- Stabilisation of all batters upon reaching the finished earthworks levels
- Dust control measures which include covering stockpiles, maintain site fences and watering exposed areas
- Sediment basin in accordance with the Blue Book

6.2 Sediment Basin

A basin has been sized to capture site runoff during construction and has been located towards the north-western portion of the site. A Type D basin has been adopted and has been sized in accordance with the Blue Book. Site soils were classified based on publicly available (online) geotechnical information.

To ensure the sediment basins are working effectively they are to be maintained throughout the construction works. Maintenance includes de-watering via pump 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 basins may be reused to irrigate areas of hydro-mulch and for dust control during construction.

Below is the concept sediment basin sizing table. Refer Appendix B for Sediment Basin Sizing Calculations.

Table 6: Concept Sediment Basin Volumes

Catchment Area (Ha)	Volume Required (m^3)	Volume Provided (m^3)
4.88	832	832

7. Stormwater Quality Management - Operational Phase

7.1 Proposed Stormwater Quality Improvement Devices (SQIDs)

During the operational phase of the development, is it proposed to construct the following stormwater quality improvement devices (SQIDs) to achieve the stormwater quality objectives summarised in Section 4 of this report:

- 29x Ocean Protect OceanGuard 200 micron filter baskets
- 20x Ocean Protect Stormfilter 690 Psorb Cartridges
- 100m^2 total Media Filtration at tree pits
- 140kL total Rainwater Tank storage

Ocean Protect OceanGuard (200 micron)

The OceanGuard 200 micron filter inserts will be used as a pre-treatment for stormwater runoff to capture litter and coarse sediment surface flows on the site.

The OceanGuard filter inserts consist of a steel frame and a cage. Within the cage a screening bag is attached to capture litter, debris, sediment, and other pollutants from stormwater flows. The mesh size of the screening bag proposed for each OceanGuard within the site is 200 micro-meters. The mesh size is small enough to capture heavy metals and hydrocarbons associated with solids in the stormwater flows.

It's proposed that these pit filters are to be provided in internal stormwater pits throughout the site.

7.1.1 Ocean Protect StormFilter 690 PSorb

The Stormfilter 690 Psorb cartridges will be installed in the OSD tanks (refer to Section 5.5).

The Ocean Protect StormFilter system is a passive stormwater filter that cleans stormwater through a patented passive filtration system, effectively removing pollutants to meet the most stringent regulatory requirements. The StormFilter stormwater treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain the most challenging pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals, and other common pollutants.

7.1.2 Media Filtration

Media filtration has been proposed at tree pits to slow and treat on-site (road) runoff. Stormwater runoff generated at the road is directed to tree pits via kerb and gutter and is filtered through a filter media layer (e.g. sandy loam) that treats stormwater through a combination of physical, chemical and biological processes as stormwater percolates downwards to a receiving underlying drainage.

The Media Filters proposed at tree pits were designed in accordance with the parameters recommended in PCC's *Technical Guidelines (Version 3 – June 2015)*, provided below in Table 7.

Table 7: Media Filtration Properties Summary

Parameter	Value
Extended Detention Depth (mm)	150
Surface Detention Area (m^2)	100
Minimum Filter Area (m^2)	100
Minimum Filter Media Depth (m)	0.5
Saturated Hydraulic Conductivity (mm/hour)	125

7.2 Stormwater Quality Modelling (MUSIC) Methodology

Stormwater quality modelling for the site was prepared using 'Model for Urban Stormwater Improvement Conceptualisation' (MUSIC) Version 6.3. The model has been built to assess the adequacy of the proposed SQIDs and to ensure that the quality of stormwater meets the WQOs for the proposed development. A diagrammatic layout of the MUSIC Model is presented below in Figure 6. A water quality treatment catchment plan is also provided below in Figure 7.

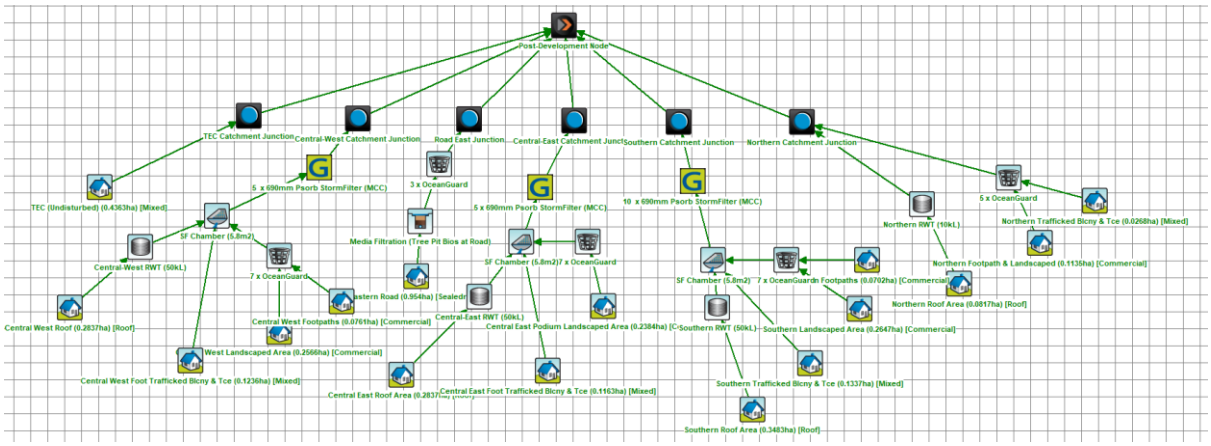


Figure 6: MUSIC Link and Node Diagram

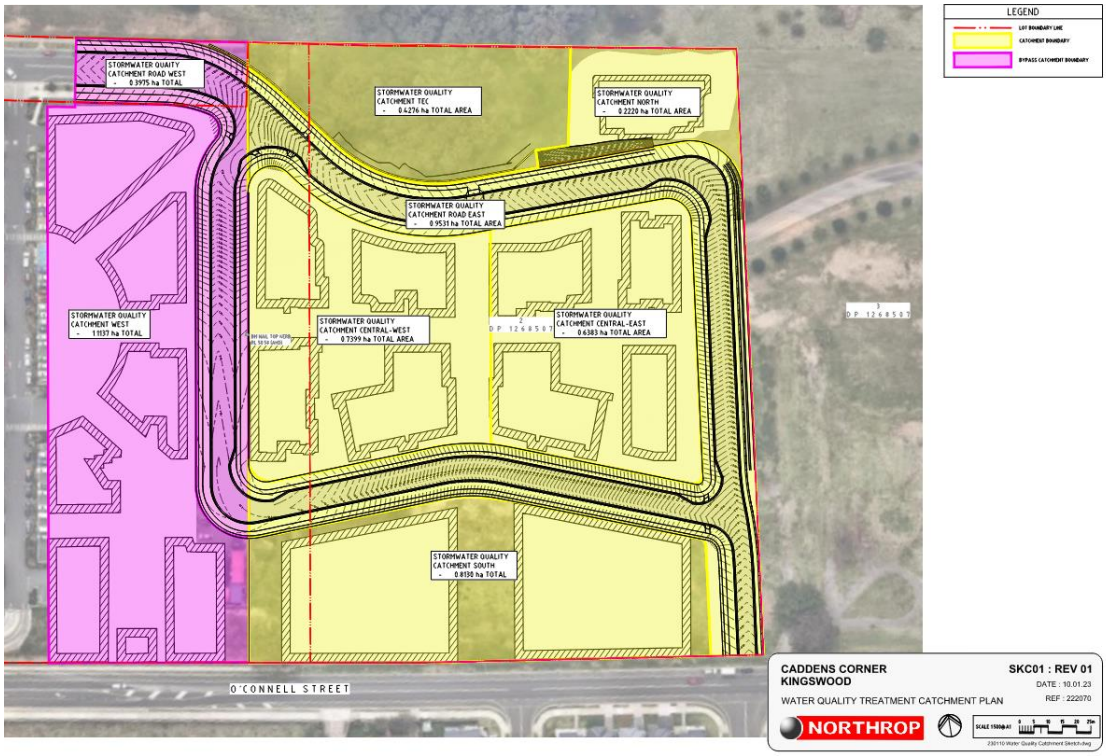


Figure 7: Water Quality Catchment Plan

For the purposes of MUSIC model analysis, the Penrith City Council (PCC) MUSIC-link was utilised, adopting the appropriate evapotranspiration and meteorological data, rainfall-runoff parameters, and source node parameters, in accordance with PCC's *WSUD Technical Guidelines (Version 3 – June 2015)*.

The western sub-catchment is proposed to bypass newly proposed water quality treatment on the basis that the proposed development within this portion of the site will generate less pollutant loads than the existing carpark. Refer to Figure 8 and

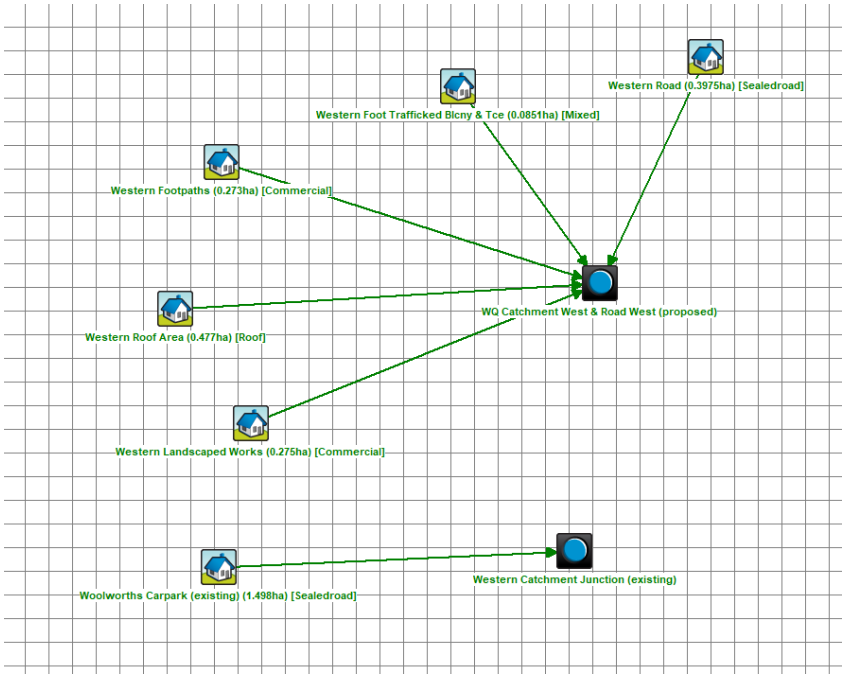


Figure 8: Diagrammatic Layout of Western Catchment (Existing & Proposed)

Table 8 for the diagrammatic layout of the corresponding MUSIC Model layout and results corresponding to this western sub-catchment, respectively.

All existing SQIDs downstream of the OSD tank conveying stormwater runoff generated at the retail precinct carpark are proposed to be maintained where feasible or otherwise replaced like-for-like, such that no adverse impacts are caused to the downstream point of discharge.

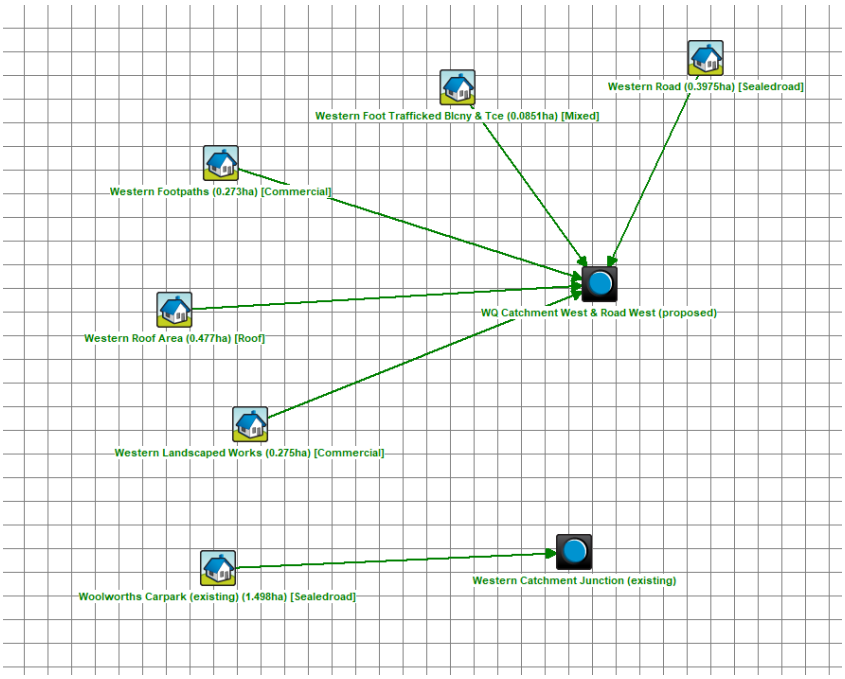


Figure 8: Diagrammatic Layout of Western Catchment (Existing & Proposed)

Table 8: Western Catchment Pollutant Loads (Pre-development & Post-development)

Pollutant Type	Pre-development	Post-development	% Reduction
Total Suspended Solids (kg/yr)	2870	1270	56
Total Phosphorus (kg/yr)	4.77	2.4	50
Total Nitrogen (kg/yr)	19.3	16.4	15
Gross Pollutants (kg/yr)	236	201	15

Table 9: MUSIC Model Results

Pollutant	Annual Loads (kg/yr)		% Reduction		Compliance
	Source	Residual	Actual	Target	
TSS	2860	425	85.2	85	OK
TP	5.36	1.57	70.8	60	OK
TN	35.9	17	52.8	45	OK
GP	422	1.87	99.6	95	OK

It's noted that the rainwater tanks provided were utilised to achieve the reduction targets in the table above. However, minimum demand in each tank was not met. Considering these tanks are already large (10kL, 30kL, 50kL and 50kL respectively), increasing these tank sizes to achieve demand was deemed impractical.

The MUSICLink report attached to this document reflects the achieved demands.

8. Conclusion

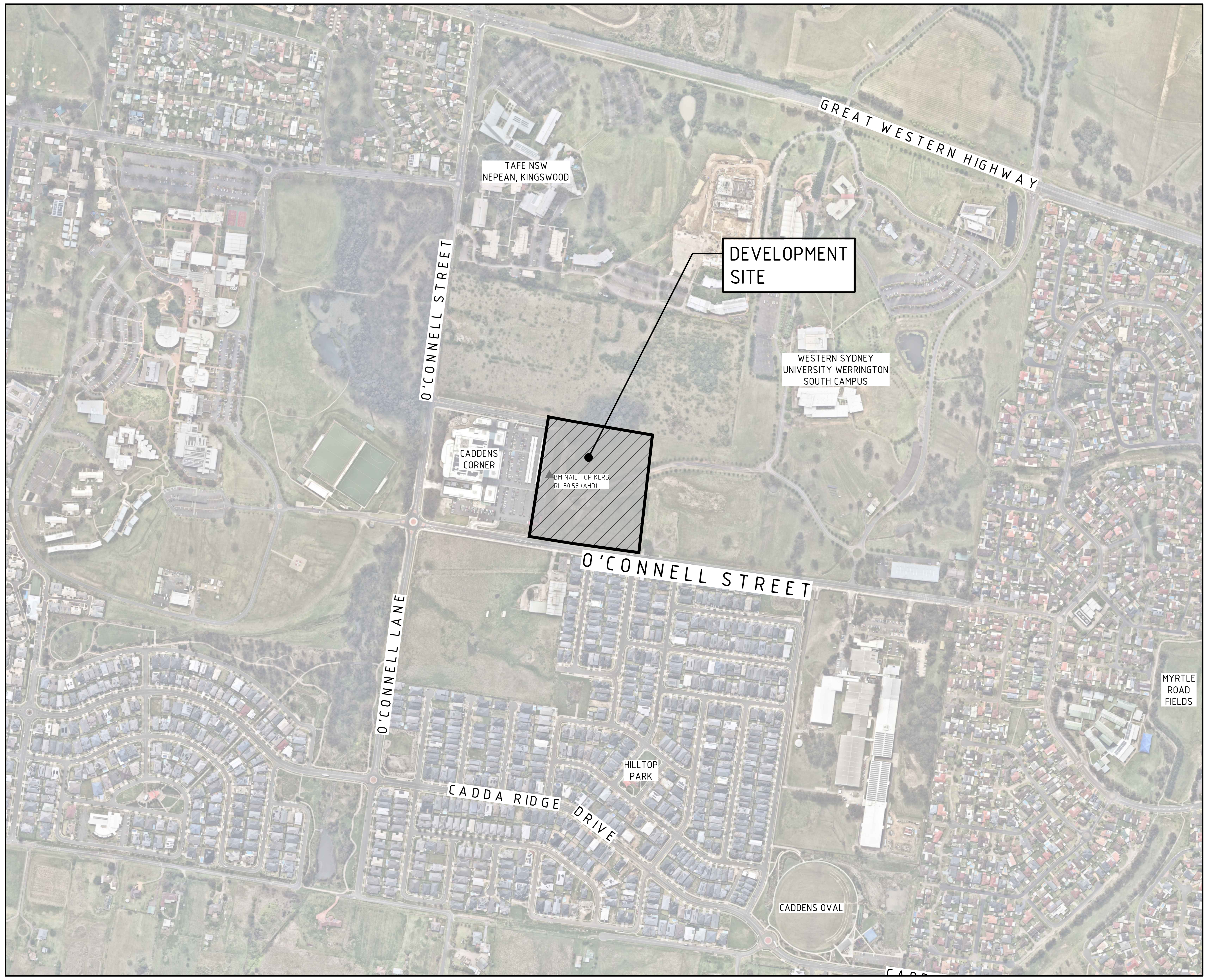
Northrop Consulting Engineers has prepared this SBSMP for the proposed Residential & Retail Development at 68-80 O'Connell Street Kingswood NSW 2747. Based on investigations, analyses, and designs, it has been demonstrated that the proposed development can be constructed and operated in accordance with all stormwater objectives listed in Section 4. The primary outcomes of this SBSMP are as follows:

- **Lawful Point of Discharge** - The existing lawful point of discharge (stormwater channel headwall) will be exchanged for an existing kerb inlet pit downstream of the headwall due to the proposed realignment of Corr Road, with most of the site flows being captured for stormwater quantity and quality treatment prior to discharge from the site. A small portion of the development will bypass the private stormwater infrastructure and discharge towards the existing stormwater channel; however, the combined site runoff achieves all stormwater quantity and quality objectives.
- **Stormwater Quantity** - To achieve a non-worsening impact to the downstream point of discharge for the 1% AEP and 20% AEP storm events, the proposed development requires a total detention volume of 578m^3, which has been achieved via underground On-Site Stormwater Detention (OSD) tanks. Three OSD tanks have been proposed to achieve this volume. All road catchments and catchments upstream of site will bypass OSD.
- **Stormwater Quality -** The proposed treatment train was modelling using MUSIC modelling software and includes the following SQIDs:
  - 29x Ocean Protect OceanGuard 200 micron filter baskets
  - 20x Ocean Protect Stormfilter 690 Psorb Cartridges
  - 100m^2 total Media Filtration at tree pits
  - 160kL total Rainwater Tank storage
- **Erosion and Sediment Control** - Construction phase ESCP measures are to be implemented during construction in accordance with the relevant requirements of the Blue Book. A 832m^3 sediment basin is proposed.

Appendix A – Civil Engineering Plans

CADDENS CORNER

O'CONNELL STREET, CADDENS
CIVIL ENGINEERING PACKAGE - DEVELOPMENT APPLICATION



SOURCE : NEARMAP.COM.AU (©2022)

LOCALITY PLAN

CIVIL DRAWING SCHEDULE

DWG No.	DRAWING TITLE
DAC0000	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
DAC0101	SPECIFICATION NOTES
DAC0201	GENERAL ARRANGEMENT PLAN
DAC1001	SEDIMENT AND SOIL EROSION CONTROL PLAN
DAC1101	SEDIMENT AND SOIL EROSION CONTROL DETAILS
DAC2001	BULK EARTHWORKS CUT AND FILL PLAN
DAC2101	BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 01
DAC2102	BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 02
DAC2103	BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 03
DAC2104	BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 04
DAC2105	BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 05
DAC3001	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
DAC3002	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02
DAC3003	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 03
DAC3004	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 04
DAC4000	ROAD TYPICAL SECTIONS
DAC4101	STORMWATER LONGITUDINAL SECTIONS - SHEET 01
DAC4102	STORMWATER LONGITUDINAL SECTIONS - SHEET 02
DAC4103	STORMWATER LONGITUDINAL SECTIONS - SHEET 03
DAC4104	STORMWATER LONGITUDINAL SECTIONS - SHEET 04
DAC4105	STORMWATER LONGITUDINAL SECTIONS - SHEET 05
DAC4106	STORMWATER LONGITUDINAL SECTIONS - SHEET 06
DAC4107	STORMWATER LONGITUDINAL SECTIONS - SHEET 07
DAC4108	STORMWATER LONGITUDINAL SECTIONS - SHEET 08
DAC4109	STORMWATER LONGITUDINAL SECTIONS - SHEET 09
DAC4201	STORMWATER CATCHMENT PLAN
DAC5001	ALIGNMENT CONTROL PLAN
DAC5101	ROAD LONGITUDINAL SECTIONS - SHEET 01
DAC5102	ROAD LONGITUDINAL SECTIONS - SHEET 02
DAC5103	ROAD LONGITUDINAL SECTIONS - SHEET 03
DAC5201	CROSS SECTIONS - SHEET 01
DAC5202	CROSS SECTIONS - SHEET 02
DAC5203	CROSS SECTIONS - SHEET 03
DAC5204	CROSS SECTIONS - SHEET 04
DAC5205	CROSS SECTIONS - SHEET 05
DAC6101	DETAILS - SHEET 01
DAC6102	DETAILS - SHEET 02
DAC6103	DETAILS - SHEET 03

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
HOLDMARK PROPERTY GROUP PTY LTD
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT
TURNER

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK.
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THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE

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

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

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

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC0000**
REVISION **02**
DRAWING SHEET SIZE = A1

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS TO BE CARRIED OUT IN ACCORDANCE WITH PENRITH 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: RAMASY SURVEYORS PTY LTD
REF. NUMBER: 8966
DRAWING TITLE: PLAN SHOWING DETAIL AND LEVELS OVER PART LOT 1 & LOT 2 IN DP 1268507 O'CONNELL STREET, CADDENS
REVISION DATE: 15.10.21
REVISION DESCRIPTION: BOUNDARIES UPDATED
GEOCENTRIC DATUM OF AUSTRALIA: 2020
SURVEY BY: MH
DRAWN BY: CSM

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 COUNCILS STORMWATER CODE.

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: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT: HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT: TURNER

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PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

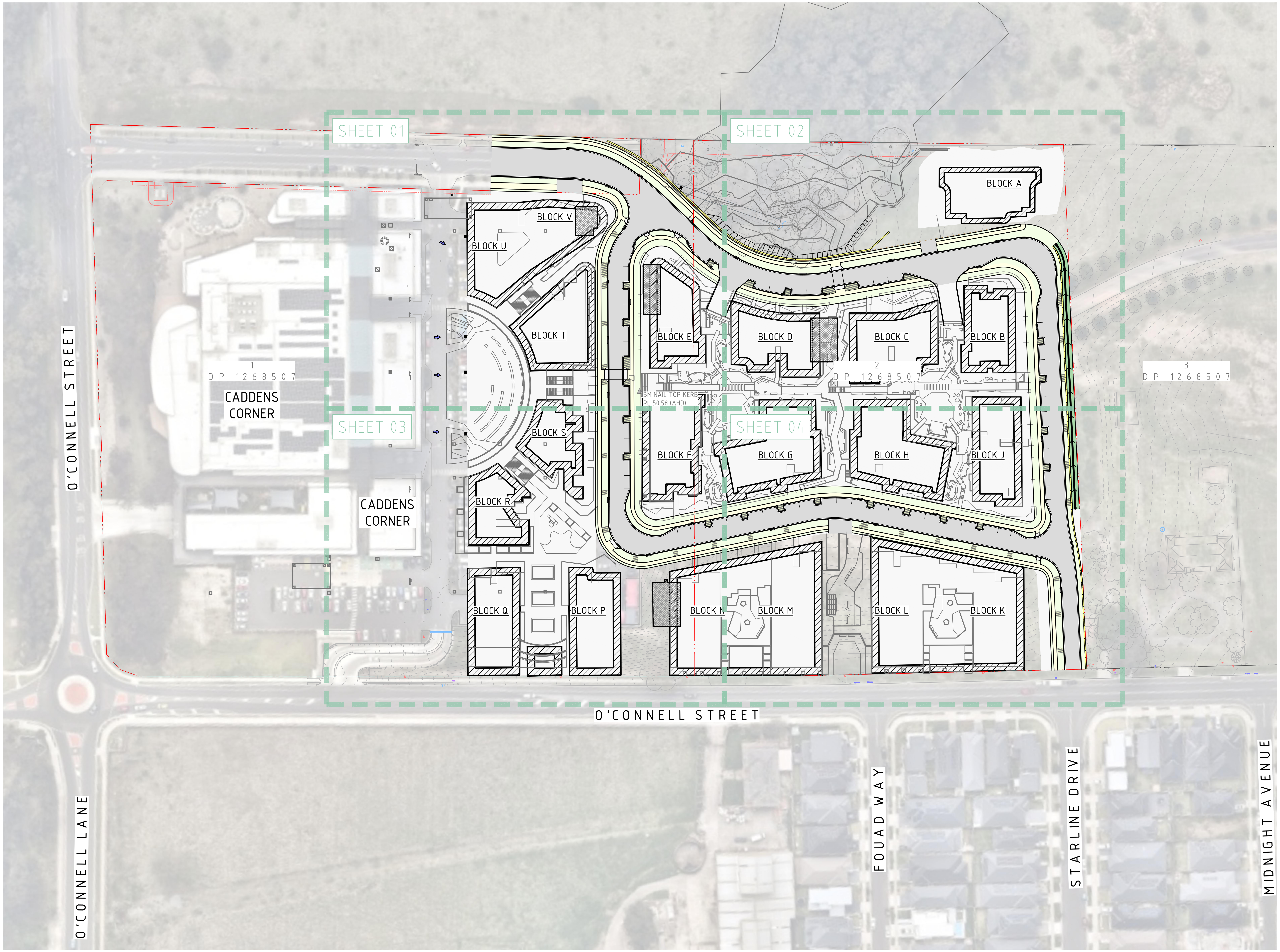
DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION SPECIFICATION NOTES

JOB NUMBER: SY222070

DRAWING NUMBER: DAC0101

REVISION: 01

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- EXISTING EASEMENT LINE
- EXISTING CONTOURS
- LIMIT OF WORKS (LIMIT OF WORKS)
- SHEET EXTENTS

GENERAL NOTES:

1. SURVEY SUPPLIED BY: RAMASY SURVEYORS PTY LTD
   - 1.1. REF. NUMBER: 8966
   - 1.2. DRAWING TITLE: PLAN SHOWING DETAIL AND LEVELS OVER PART LOT 1 & LOT 2 IN DP 1268507 O'CONNELL STREET, CADDENS
   - 1.3. REVISION DATE: 15.10.21
   - 1.4. REVISION DESCRIPTION: BOUNDARIES UPDATED
   - 1.5. GEOCENTRIC DATUM OF AUSTRALIA: 2020
   - 1.6. SURVEY BY: MH
   - 1.7. DRAWN BY: CSM
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

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

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CLIENT
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ARCHITECT
TURNER

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SCALE 1:800@ A1 — 0 10 20 30 40m

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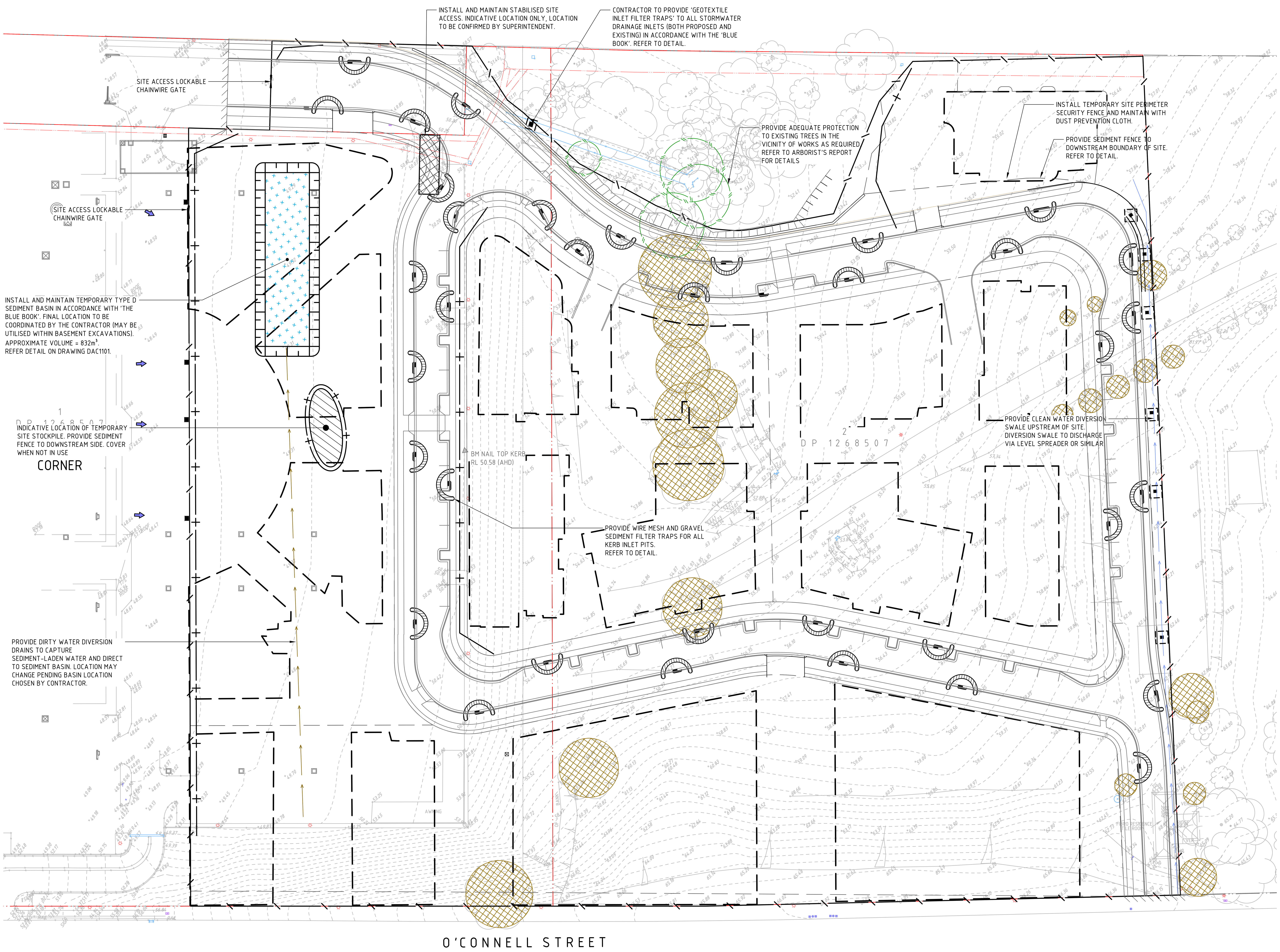
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
GENERAL ARRANGEMENT PLAN

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC0201**
REVISION **02**
DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- EXISTING EASEMENT LINE
- PROPOSED DESIGN LAYOUT
- PROPOSED BUILDING FOOTPRINT
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- GEOTEXTILE INLET FILTER TRAP
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN
- TREES TO BE RETAINED
- TREES TO BE REMOVED
- TREE PROTECTION

GENERAL NOTES:

1. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
2. 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.
3. CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
4. CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
5. ALL PITS OPEN TO ATMOSPHERE TO BE PROTECTED IN ACCORDANCE WITH THE 'BLUE BOOK'.

NOT FOR CONSTRUCTION

DRAWN: V. CHON   DESIGNED: J. CARROLL   JOB MANAGER: B. LAWRENCE   VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT: HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT: TURNER

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SCALE 1:500@ A1   0 5 10 15 20 25m

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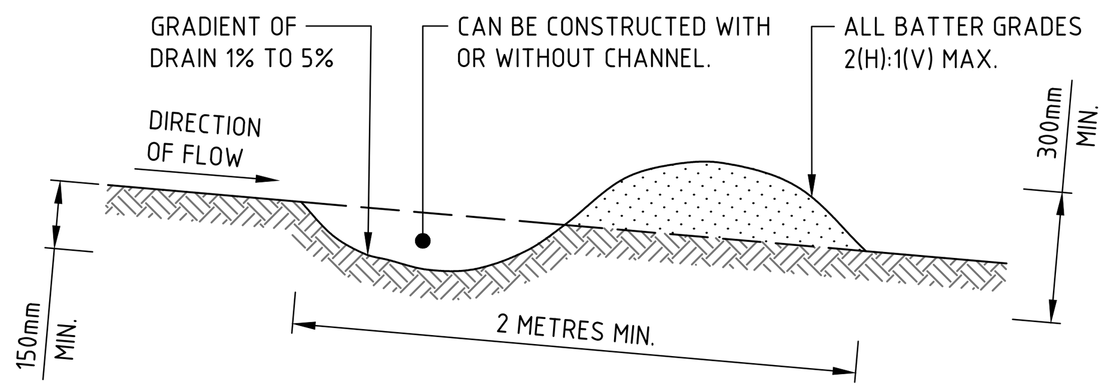
PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION
SEDIMENT AND SOIL EROSION CONTROL PLAN

JOB NUMBER: SY222070
DRAWING NUMBER: DAC1001   REVISION: 01
DRAWING SHEET SIZE = A1

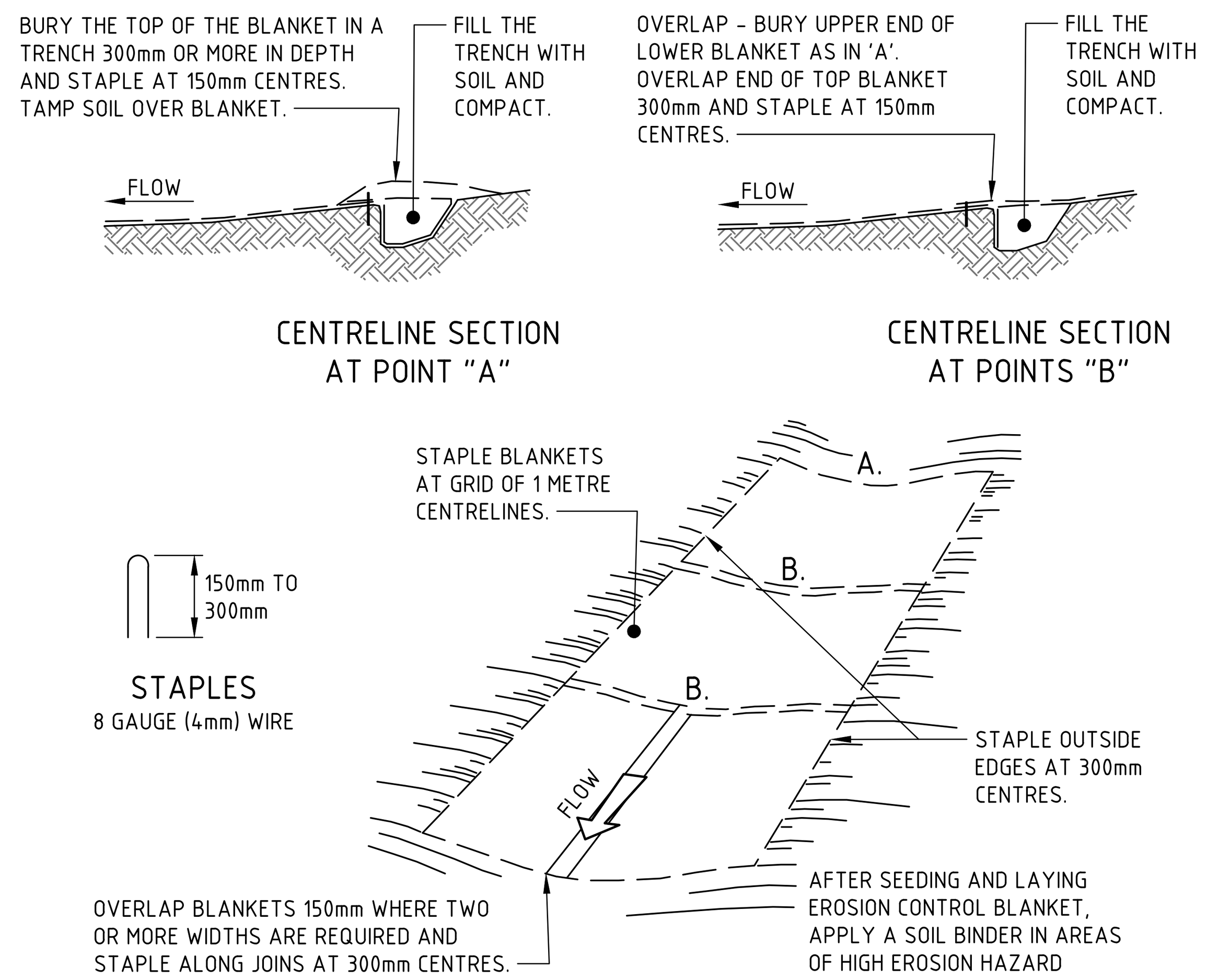


CONSTRUCTION NOTES

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.

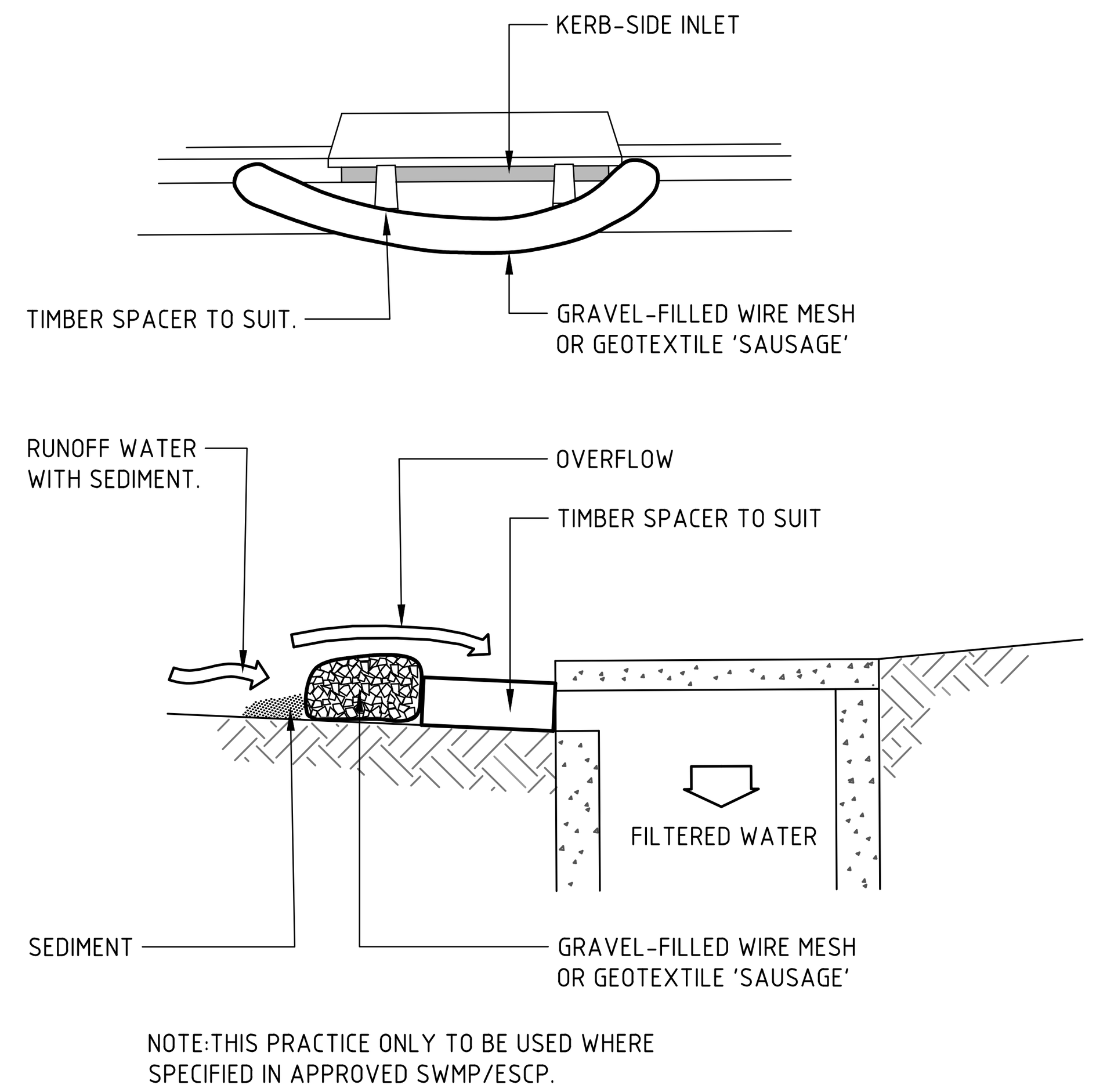
DRAINAGE SWALE - DIRTY



CONSTRUCTION NOTES

1. REMOVE ANY ROCKS, CLODS, STICKS OR GRASS FROM THE SURFACE BEFORE LAYING MATTING.
2. ENSURE THAT TOPSOIL IS AT LEAST 75mm DEEP.
3. COMPLETE FERTILISING AND SEEDING BEFORE LAYING THE MATTING.
4. ENSURE FABRIC WILL BE CONTINUOUSLY IN CONTACT WITH THE SOIL BY GRADING THE SURFACE CAREFULLY FIRST.
5. LAY THE FABRIC IN "SHINGLE-FASHION", WITH THE END OF EACH UPSTREAM ROLL OVERLAPPING THOSE DOWNSTREAM. ENSURE EACH ROLL IS ANCHORED PROPERLY AT ITS UPSLOPE END (STANDARD DRAWING 5-7B).
6. ENSURE THAT THE FULL WIDTH OF FLOW IN THE CHANNEL IS COVERED BY THE MATTING UP TO THE DESIGN STORM EVENT, USUALLY IN THE 10-YEAR ARI TIME OF CONCENTRATION STORM EVENT.
7. DIVERT WATER FROM THE STRUCTURE UNTIL VEGETATION IS STABILISED PROPERLY.

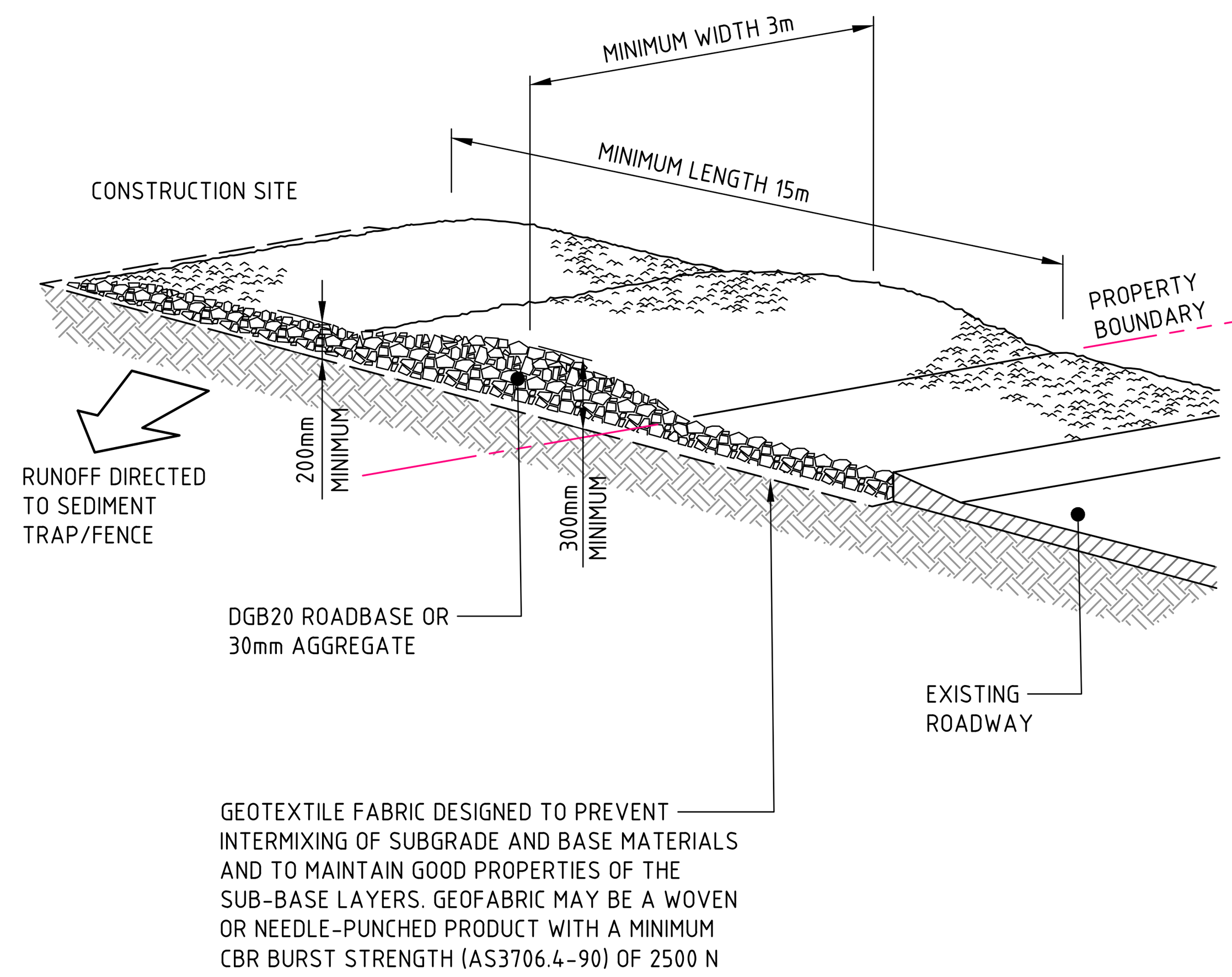
DRAINAGE SWALE - CLEAN



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.

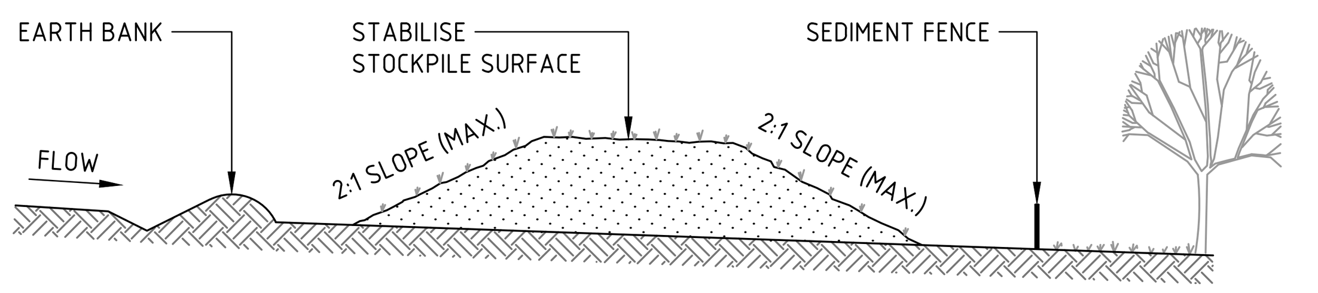
WIRE MESH AND GRAVEL SEDIMENT FILTER



CONSTRUCTION NOTES

1. 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.

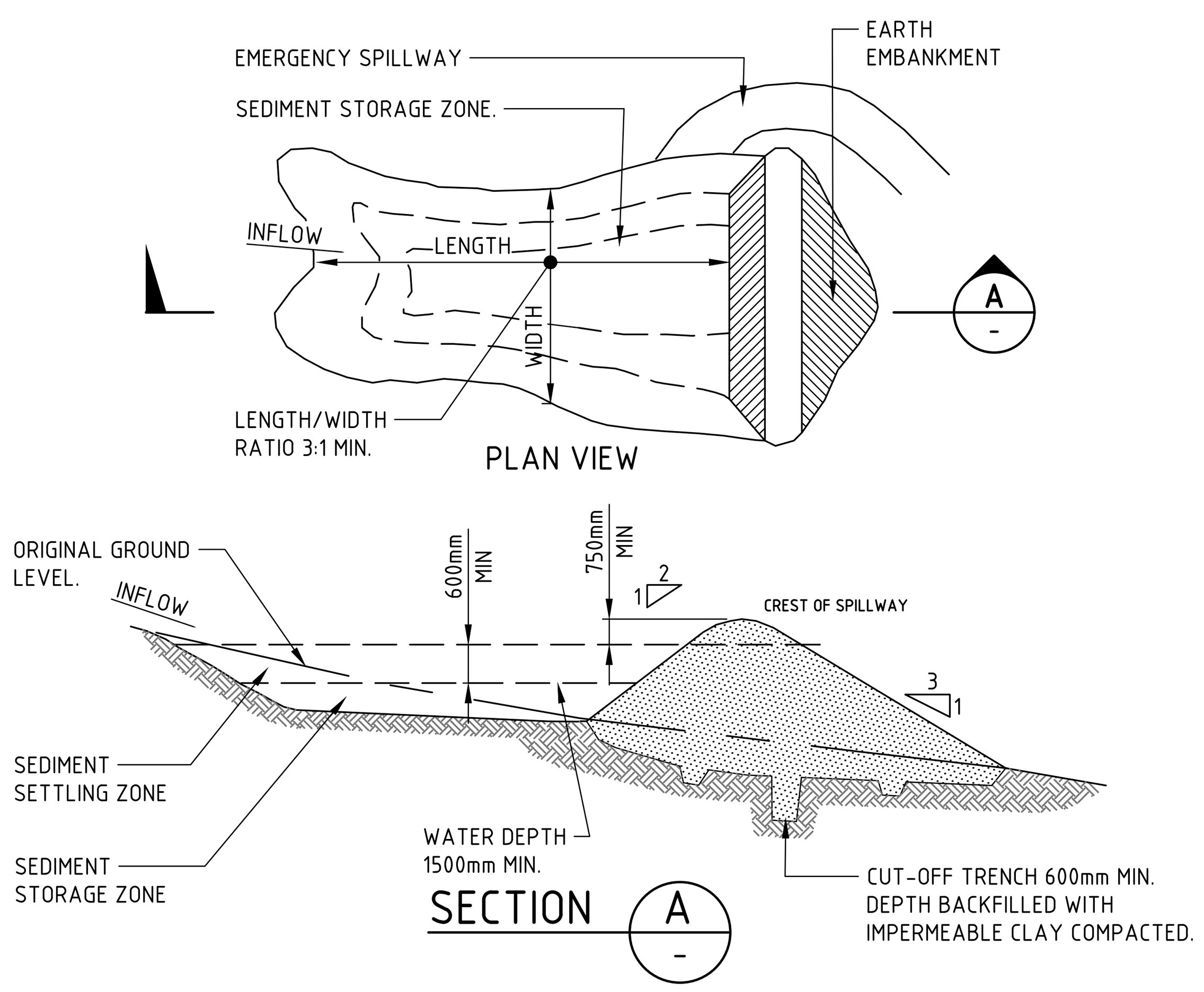
STABILISED SITE ACCESS



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

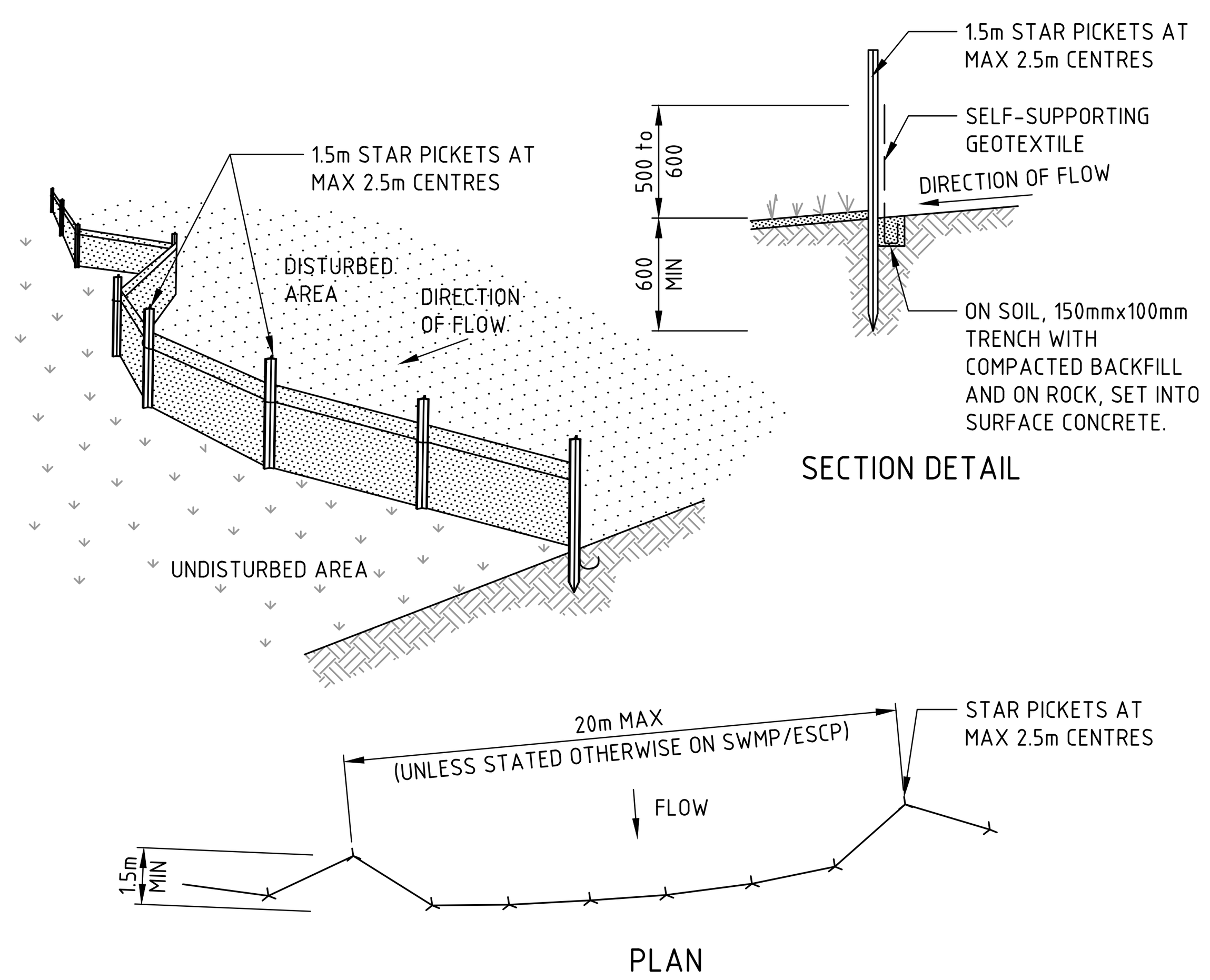


CONSTRUCTION NOTES

1. 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)

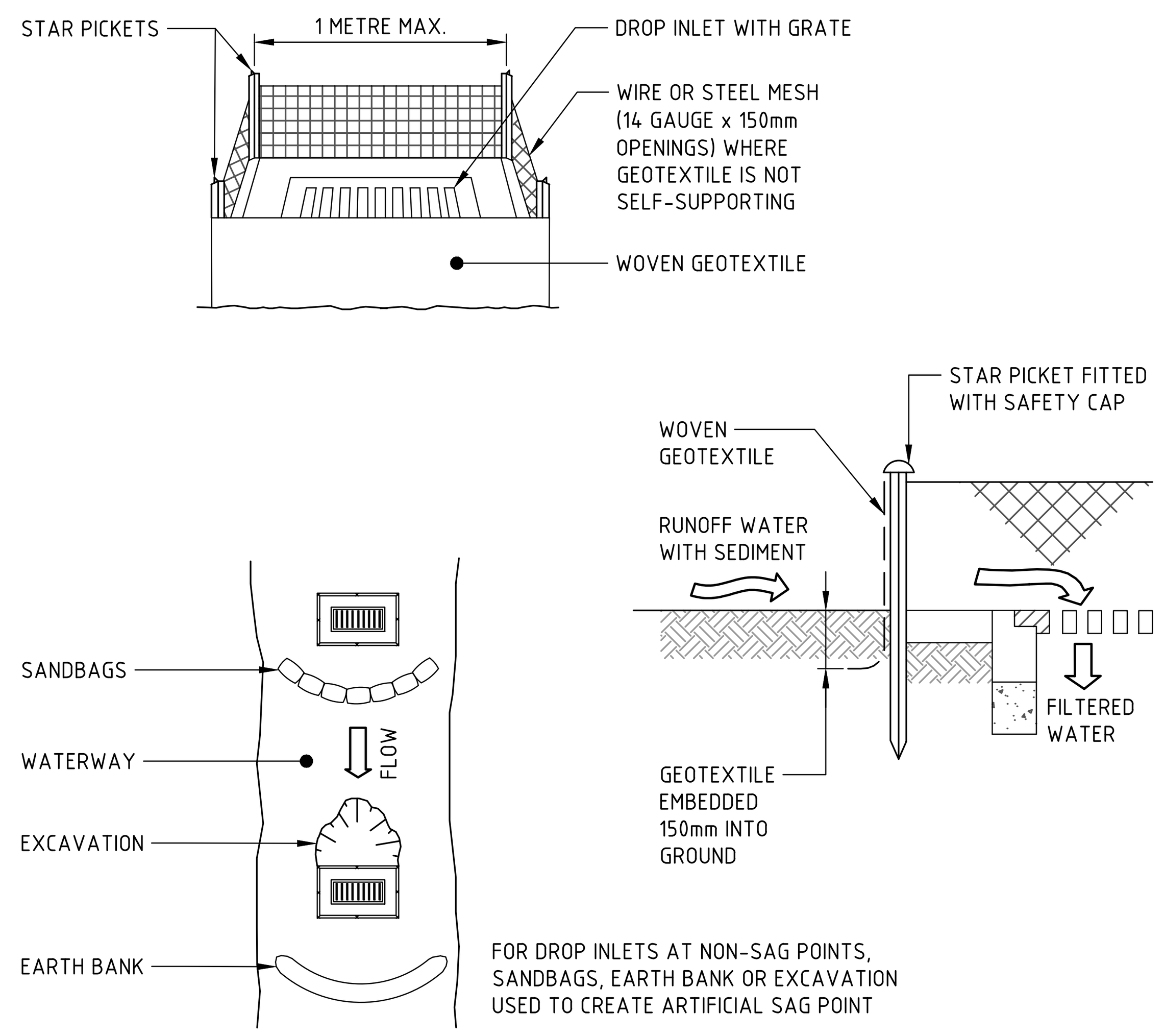
EARTH SEDIMENT BASIN - WET



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



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

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT: HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT: TURNER

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NOT TO SCALE

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

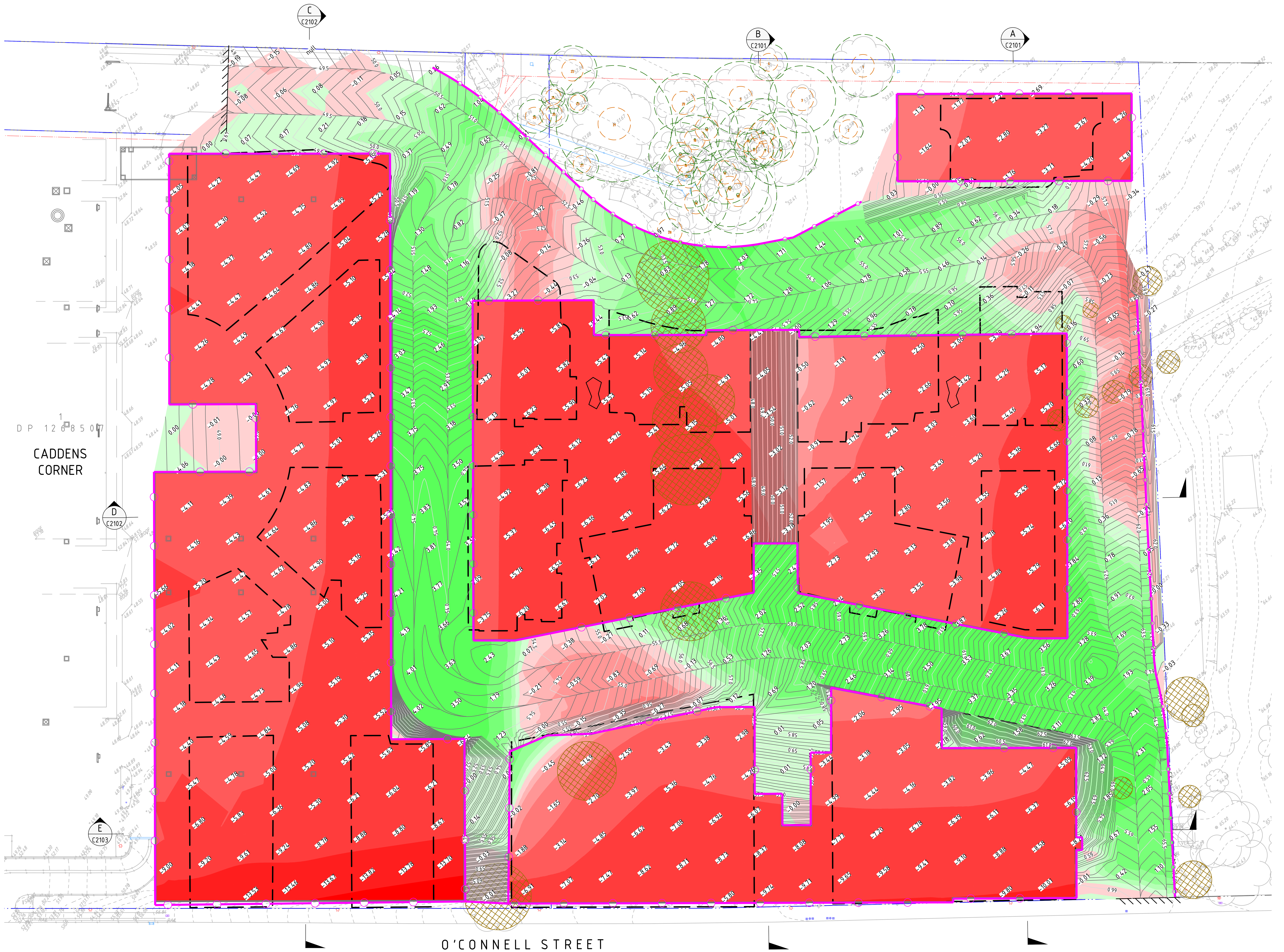
PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

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

JOB NUMBER: SY222070

DRAWING NUMBER: DAC1101 REVISION: 01

DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BUILDING FOOTPRINT
- PROPOSED SHORING / RETAINING WALL
- PROPOSED CONTOURS
- EXISTING CONTOURS

DEPTH OF CUT

- -999m TO -15.0m
- -15.0m TO -10.0m
- -10.0m TO -5.0m
- -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
- 5.0m TO 10.0m
- 10.0m TO 15.0m
- 15.0m TO 999m

- TREE TO BE REMOVED
- TREE TO BE RETAINED

GENERAL NOTES:

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. STRIP EXISTING TOPSOIL IN CONSULTATION WITH THE GEOTECHNICAL ENGINEER / REPORT. FOR THE PURPOSES OF EARTHWORKS CALCULATIONS A GROUND SLAB DEPTH OF 200mm HAS BEEN ASSUMED WHERE REQUIRED.
4. NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
5. 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.
6. THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
7. APPROXIMATE BULK EARTHWORK VALUES AS FOLLOWS;
   - 7.1. CUT 155,548 m^3
   - 7.2. FILL 22,701 m^3
   - 7.3. BALANCE 132,847 m^3 (EXCESS)
   - 7.4. NOTE: SITE STRIPPING VOLUMES HAVE NOT BEEN INCLUDED IN ABOVE CALCULATIONS.
8. TEMPORARY 1:1 SLOPES FOR EXCAVATIONS HAVE BEEN ADOPTED (UNO). CONTRACTOR TO CONFIRM ADEQUACY WITH GEOTECHNICAL ENGINEER. SHORING WALLS TO BE PROVIDED AT STEEPER SLOPES IN ACCORDANCE WITH STRUCTURAL ENGINEER'S DETAILS.

NOT FOR CONSTRUCTION

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

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ARCHITECT
TURNER

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SCALE 1:500@ A1 — 0 5 10 15 20 25m

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION
BULK EARTHWORKS CUT AND FILL PLAN

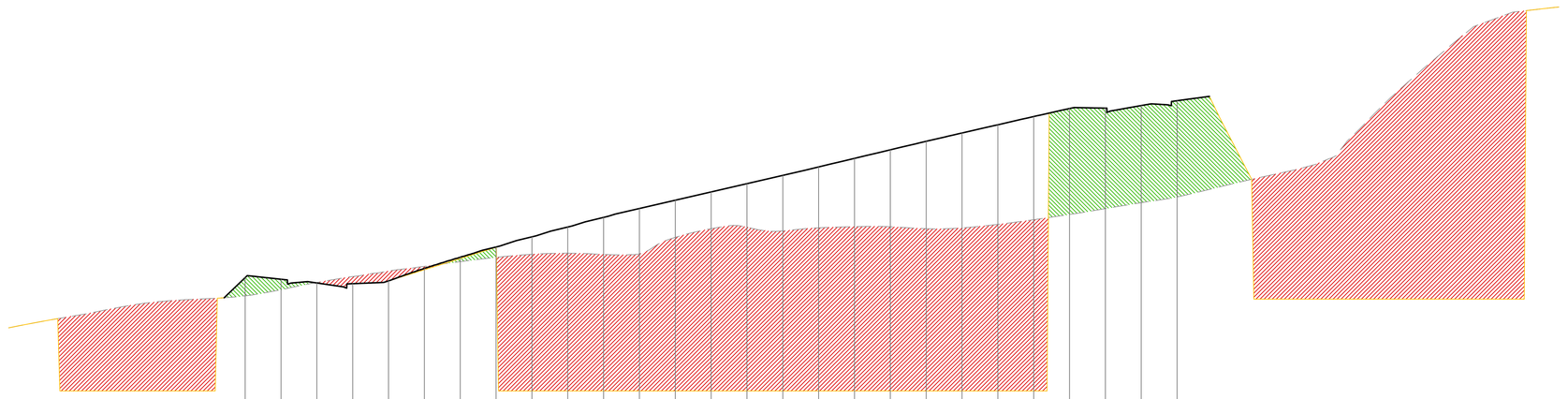
JOB NUMBER
SY222070

DRAWING NUMBER **DAC2001** REVISION **02**

DRAWING SHEET SIZE = A1

LEGEND

🟥	DENOTES BULK CUT AREA
🟩	DENOTES BULK FILL AREA



DATUM RL 50.0

FINISHED SURFACE LEVEL									56.75	56.693	56.563	56.538
BULK EARTHWORKS SURFACE			55.145	52.8	52.8	52.8	52.8	52.8	56.75	56.693	56.563	56.538
EXISTING SURFACE			55.145	55.37	55.598	55.823	55.954	56.02	56.115	56.327	56.582	56.789
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55

FINISHED SURFACE LEVEL	56.636	57.071	57.461	57.817	58.17	58.512	58.847	59.159	59.448	59.736	60.025	60.314
BULK EARTHWORKS SURFACE	56.634	57.024	57.414	57.806	52.8	52.8	52.8	52.8	52.8	52.8	52.8	52.8
EXISTING SURFACE	56.979	57.142	57.305	57.455	57.563	57.601	57.557	57.582	58.153	58.455	58.509	58.379
CHAINAGE	60	65	70	75	80	85	90	95	100	105	110	115

FINISHED SURFACE LEVEL	60.607	60.906	61.204	61.5	61.79	62.076	62.364	62.643	62.656	62.746	62.914	
BULK EARTHWORKS SURFACE	52.8	52.8	52.8	52.8	52.8	52.8	52.8	62.642	62.656	62.746	62.914	62.814
EXISTING SURFACE	58.486	58.526	58.523	58.455	58.483	58.606	58.768	58.95	59.154	59.359	59.559	59.854
CHAINAGE	120	125	130	135	140	145	150	155	160	165	170	175

FINISHED SURFACE LEVEL											
BULK EARTHWORKS SURFACE	60.372	56	56	56	56	56	56	56	66.091		
EXISTING SURFACE	60.152	60.427	60.768	61.82	63.068	64.172	65.219	65.833	66.091		
CHAINAGE	180	185	190	195	200	205	210	215	220	225	230

BULK EARTHWORKS SECTION A

HORIZONTAL SCALE 1:400@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

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ARCHITECT
TURNER

SCALE 1:100 @ A1 — 0 1 2 3 4 5m
SCALE 1:400@ A1 — 0 4 8 12 16 20m

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 01

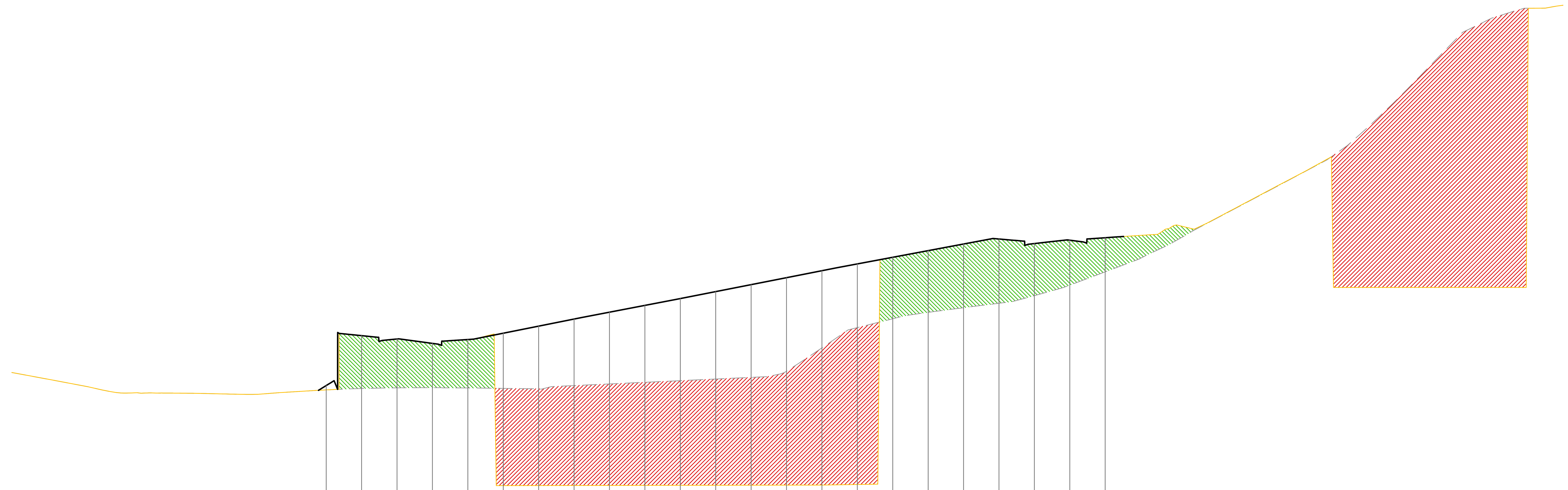
JOB NUMBER
SY222070

DRAWING NUMBER
DAC2101

REVISION
02

DRAWING SHEET SIZE = A1

LEGEND	
(red hatch)	DENOTES BULK CUT AREA
(green hatch)	DENOTES BULK FILL AREA



DATUM RL 47.0

CHAINAGE	FINISHED SURFACE LEVEL	BULK EARTHWORKS SURFACE	EXISTING SURFACE
0			
5			
10		52.796	52.796
15		52.561	52.561
20		52.307	52.307
25		52.28	52.28
30		52.27	52.27
35		52.247	52.247
40		52.228	52.228
45		52.314	52.314
50	52.54	52.386	52.386
55	54.3	54.3	52.436
60	54.182	54.182	52.458
65	54.026	54.026	52.464
70	54.163	54.163	52.454
75	54.385	49.01	52.44
80	54.635	49.012	52.425
85	54.885	49.014	52.539
90	55.127	49.016	52.597
95	55.367	49.018	52.655
100	55.608	49.02	52.712
105	55.853	49.022	52.77
110	56.099	49.025	52.828
115	56.344	49.027	53.047
120	56.59	49.029	53.869
125	56.829	49.05	54.583
130	57.064	57.067	54.895
135	57.298	57.297	55.121
140	57.532	57.534	55.283
145	57.709	57.709	55.442
150	57.548	57.548	55.712
155	57.666	57.666	56.082
160	57.753	57.753	56.55
165		57.836	57.029
170		58.2	57.652
175		58.351	58.341
180		59.012	59.001
185		59.674	59.663
190		60.341	60.326
195		56	61.184
200		56	62.341
205		56	63.593
210		56	64.881
215		56	65.533
220		65.848	65.848
225			
230			
231.585			

BULK EARTHWORKS SECTION B

HORIZONTAL SCALE 1:400@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:400 @ A1 0 4 8 12 16 20m

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

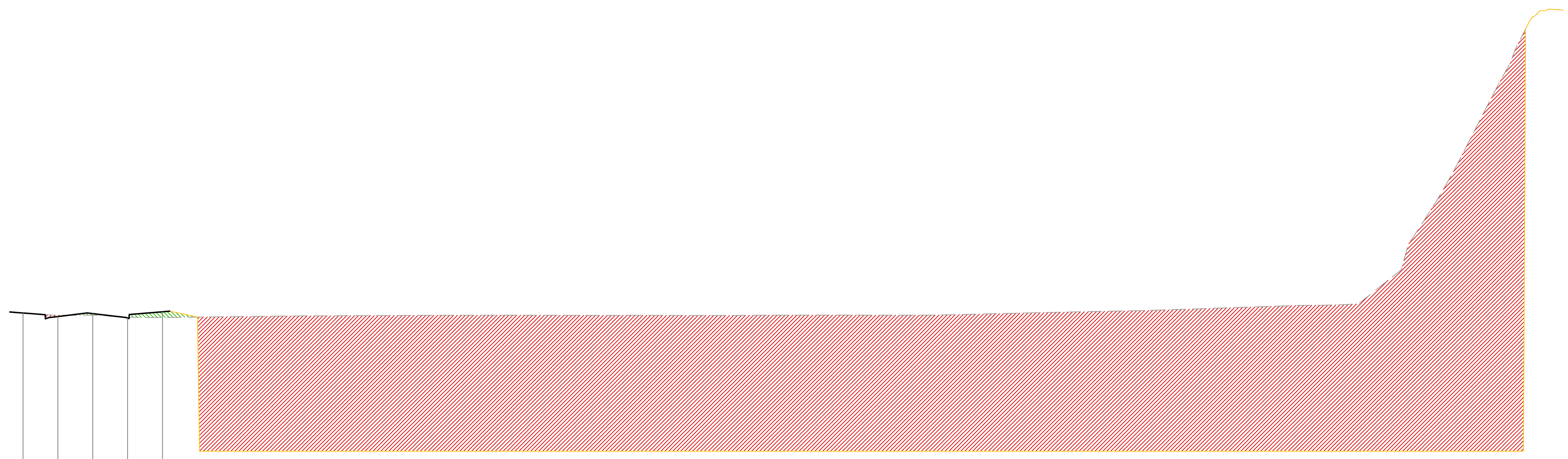
PROJECT
**CADDENS CORNER
O'CONNELL STREET, CADDENS**

DRAWING TITLE
**CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION**
BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 02

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC2102** REVISION **02**
DRAWING SHEET SIZE = A1

LEGEND

- DENOTES BULK CUT AREA
- DENOTES BULK FILL AREA



DATUM RL 42.0

CHAINAGE	FINISHED SURFACE LEVEL	BULK EARTHWORKS SURFACE	EXISTING SURFACE
0			
5			
10	49.554	49.554	
15	49.427	49.427	49.475
20	49.532	49.532	49.475
25	49.371	49.371	49.402
30	49.598	49.598	49.396
35		49.408	49.407
40		44.6	49.422
45		44.6	49.436
50		44.6	49.449
55		44.6	49.454
60		44.6	49.46
65		44.6	49.467
70		44.6	49.472
75		44.6	49.474
80		44.6	49.474
85		44.6	49.474
90		44.6	49.469
95		44.6	49.468
100		44.6	49.472
105		44.6	49.465
110		44.6	49.465
115		44.6	49.472
120		44.6	49.475
125		44.6	49.479
130		44.6	49.478
135		44.6	49.475
140		44.6	49.478
145		44.6	49.502
150		44.6	49.532
155		44.6	49.561
160		44.6	49.588
165		44.6	49.614
170		44.6	49.636
175		44.6	49.674
180		44.6	49.717
185		44.6	49.758
190		44.6	49.801
195		44.6	49.83
200		44.6	49.861
205		44.6	50.58
210		44.6	52.528
215		44.6	54.576
220		44.6	57
225		44.6	59.508
230		60.42	60.42
235			
237.253			

BULK EARTHWORKS SECTION C

HORIZONTAL SCALE 1:400@A1
VERTICAL SCALE 1:100@A1

VERIFIER:
JOB MANAGER: B. LAWRENCE
DESIGNED: J. CARROLL
DRAWN: V. CHON

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:400@ A1 — 0 4 8 12 16 20m

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

PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

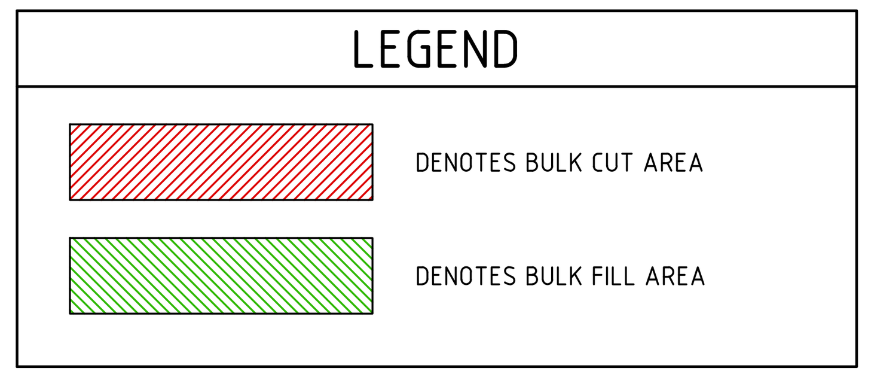
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 03

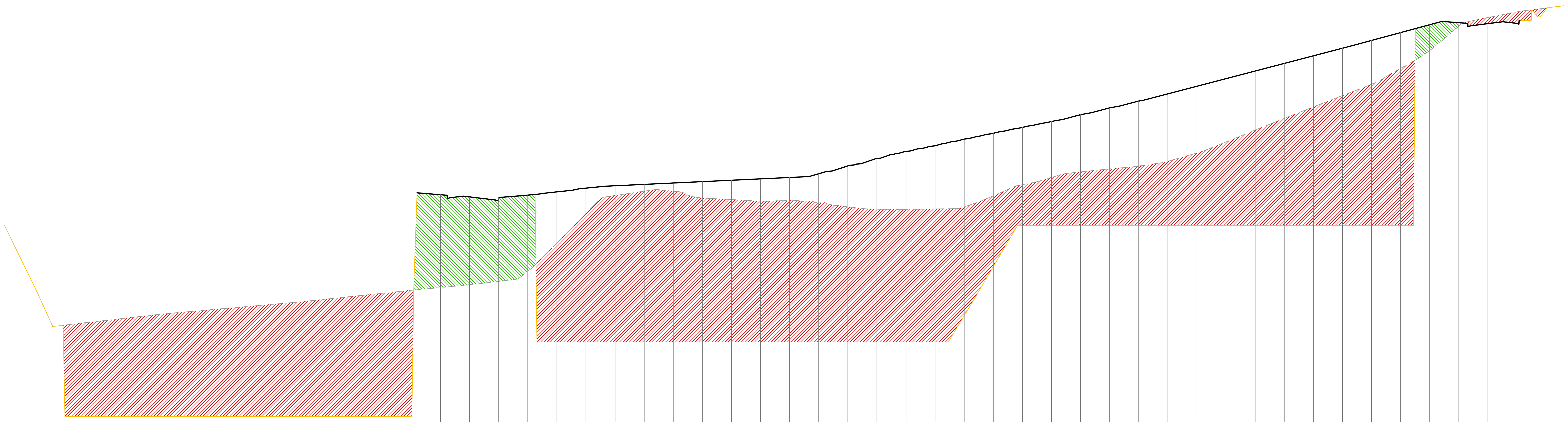
JOB NUMBER
SY222070

DRAWING NUMBER
DAC2103

REVISION
02

DRAWING SHEET SIZE = A1





DATUM RL 42.0

FINISHED SURFACE LEVEL														
BULK EARTHWORKS SURFACE	52.834	50.285	48.509	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
EXISTING SURFACE	52.834	50.285	48.509	48.653	48.794	48.936	49.06	49.17	49.279	49.389	49.499	49.628	49.758	49.888
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55	60	65

FINISHED SURFACE LEVEL		54.119	54.026	54.001	54.102	54.241	54.402	54.503	54.563	54.622	54.681	54.74	54.8	54.859
BULK EARTHWORKS SURFACE	44.6	54.119	54.026	54.001	54.102	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8	47.8
EXISTING SURFACE	50.016	50.133	50.258	50.4	50.832	52.033	53.312	54.086	54.272	54.272	53.983	53.913	53.848	53.87
CHAINAGE	70	75	80	85	90	95	100	105	110	115	120	125	130	135

FINISHED SURFACE LEVEL	55.021	55.356	55.678	55.982	56.222	56.508	56.757	57.01	57.262	57.557	57.85	58.141	58.45	58.777
BULK EARTHWORKS SURFACE	47.8	47.8	47.8	47.8	47.8	48.921	51.034	52.8	52.8	52.8	52.8	52.8	52.8	52.8
EXISTING SURFACE	53.769	53.594	53.497	53.491	53.508	53.596	54.072	54.551	54.864	55.1	55.228	55.354	55.558	55.914
CHAINAGE	140	145	150	155	160	165	170	175	180	185	190	195	200	205

FINISHED SURFACE LEVEL	59.104	59.43	59.757	60.084	60.411	60.745	61.082	61.42	61.507	61.466	61.472	
BULK EARTHWORKS SURFACE	52.8	52.8	52.8	52.8	52.8	52.8	52.8	61.42	61.507	61.466	61.472	62.084
EXISTING SURFACE	56.388	56.895	57.396	57.89	58.378	58.865	59.545	60.308	61.359	61.728	61.973	62.136
CHAINAGE	210	215	220	225	230	235	240	245	250	255	260	265

BULK EARTHWORKS SECTION D

HORIZONTAL SCALE 1:400@A1
VERTICAL SCALE 1:100@A1

VERIFIER:
JOB MANAGER: B. LAWRENCE
DESIGNED: J. CARROLL
DRAWN: V. CHON

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SCALE 1:400 @ A1 — 0 4 8 12 16 20m

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 04

JOB NUMBER
SY222070

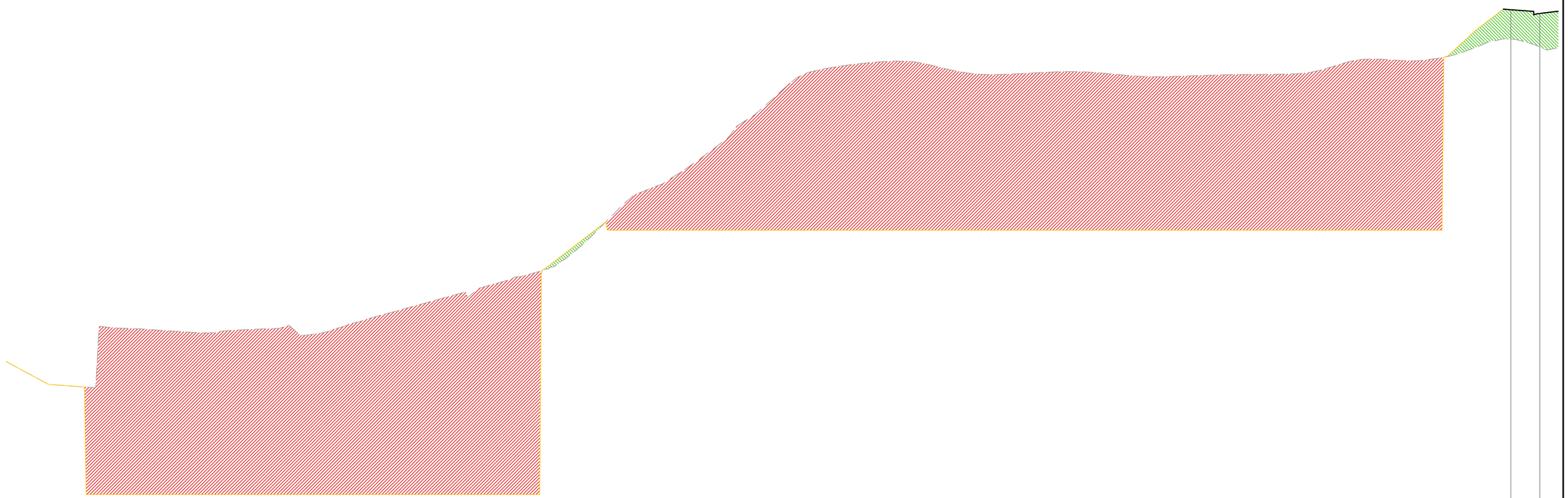
DRAWING NUMBER
DAC2104

REVISION
02

DRAWING SHEET SIZE = A1

LEGEND

🟥	DENOTES BULK CUT AREA
🟩	DENOTES BULK FILL AREA



DATUM RL 42.0

FINISHED SURFACE LEVEL														
BULK EARTHWORKS SURFACE		49.725	49.311	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6	44.6
EXISTING SURFACE		49.725	49.311	49.223	51.775	51.721	51.637	51.573	51.69	51.747	51.738	51.576	51.976	52.326
CHAINAGE	0	5	10	15	20	25	30	35	40	45	50	55	60	65

FINISHED SURFACE LEVEL														
BULK EARTHWORKS SURFACE	44.6	44.6	44.6	44.6	44.6	54.647	55.61	56	56	56	56	56	56	56
EXISTING SURFACE	52.671	53.016	53.11	53.705	54.052	54.439	55.409	56.634	57.64	58.22	59.048	60.002	61.069	62.193
CHAINAGE	70	75	80	85	90	95	100	105	110	115	120	125	130	135

FINISHED SURFACE LEVEL														
BULK EARTHWORKS SURFACE	56	56	56	56	56	56	56	56	56	56	56	56	56	56
EXISTING SURFACE	62.875	63.1	63.239	63.285	63.117	62.833	62.711	62.747	62.814	62.839	62.767	62.654	62.622	62.659
CHAINAGE	140	145	150	155	160	165	170	175	180	185	190	195	200	205

FINISHED SURFACE LEVEL											65.51	65.348
BULK EARTHWORKS SURFACE	56	56	56	56	56	56	56	56	63.714	64.826	65.51	65.348
EXISTING SURFACE	62.699	62.716	62.727	62.795	63.116	63.374	63.337	63.328	63.549	63.996	64.24	63.907
CHAINAGE	210	215	220	225	230	235	240	245	250	255	260	265

BULK EARTHWORKS SECTION E

HORIZONTAL SCALE 1:400@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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ARCHITECT
TURNER

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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:400@ A1 0 4 8 12 16 20m

NORTHROP
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Level 11 345 George Street, Sydney NSW 2000
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Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

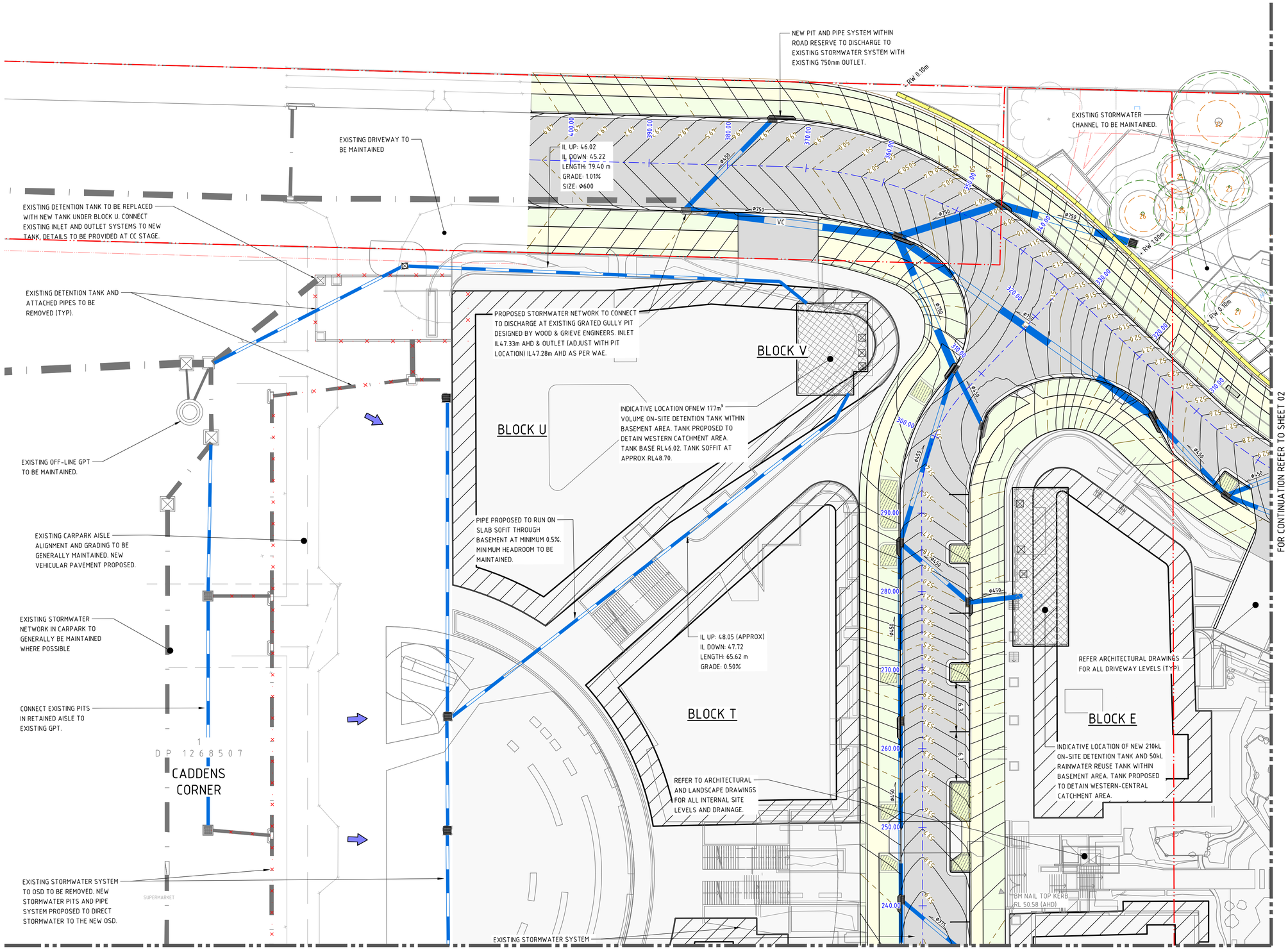
BULK EARTHWORKS CUT AND FILL SECTIONS - SHEET 05

JOB NUMBER
SY222070

DRAWING NUMBER
DAC2105

REVISION
02

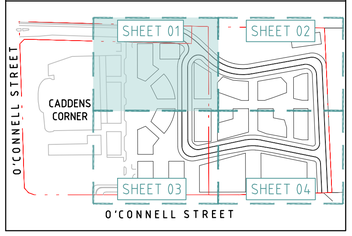
DRAWING SHEET SIZE = A1



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- EXISTING EASEMENT LINE
- EXISTING SERVICES (E, N B N, W, S)
- PROPOSED KERB
- EXISTING KERB
- FUTURE KERB
- SAWCUT AND PAVEMENT INFILL
- DD — DISH DRAIN
- KG — KERB AND GUTTER
- RKG — ROLL KERB AND GUTTER
- KR — KERB RAMP
- BATTERS
- PROPOSED CONTOURS
- EXISTING CONTOURS
- Φ150 — STORMWATER PIPE
- EXISTING STORMWATER PIPE
- EXISTING TO BE REMOVED
- DRAINAGE STRUCTURE WITH EXTENDED CHAMBER (NEW / EXTG)
- GRATED INLET PIT (NEW / EXTG)
- KERB INLET PIT (NEW / EXTG)
- JUNCTION PIT (NEW / EXTG)
- 1 / A — STORMWATER PIT TAG LINE ID / STRUCTURE No.
- OSD — ON SITE DETENTION TANK
- CONCRETE HEADWALL
- RIP RAP ENERGY DISSIPATER
- LIMIT OF WORKS — LIMIT OF WORKS
- PROPOSED RETAINING WALL
- GRASS SWALE
- ROAD PAVEMENT
- FOOTPATH PAVEMENT
- VERGE AND PERMANENT BATTER / LANDSCAPE AREAS
- PROPOSED BIO-RETENTION
- TREE TO BE REMOVED
- TREE TO BE RETAINED
- STRUCTURAL ROOT ZONE (SRZ) OF TREE TO BE RETAINED
- TREE PROTECTION ZONE (TPZ) OF TREE TO BE RETAINED

KEY PLAN



DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
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ARCHITECT
TURNER

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

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

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

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC3001**
REVISION **02**
DRAWING SHEET SIZE = A1

REFER TO LANDSCAPE DRAWINGS FOR WALKWAY DETAILS.

EXISTING STORMWATER CHANNEL TO BE MAINTAINED.

PROPOSED RETAINING WALL AND FOOTING ALIGNED TO GENERALLY AVOID ROOT STRUCTURES OF NEARBY RETAINED TREES.

BLOCK A

ROOF AREA TO BE DIRECTED TO PROPOSED 10kL STORMWATER TANK FOR LOCAL IRRIGATION AND REUSE AS REQUIRED.

RW 0.10m

RW 1.70m

RW 2.50m

RW 0.55m

VC

REFER ARCHITECTURAL DRAWINGS FOR ALL DRIVEWAY LEVELS (TYP).

BLOCK D

BLOCK C

BLOCK B

INDICATIVE LOCATION OF NEW 170kL ON-SITE DETENTION TANK + 50kL RAINWATER REUSE TANK IN BASEMENT AREA. TANK PROPOSED TO DETAIN EASTERN-CENTRAL CATCHMENT AREA.

SWALE TO GENERALLY DISCHARGE INTO STREET STORMWATER

PROVIDE GRASS SWALE TO DIRECT AND CAPTURE STORMWATER FROM UPSTREAM CATCHMENT.

PROPOSED RETAINING WALL

RW 0.30m

RW 0.10m

2 DP 1268507

3 DP 1268507

FOR CONTINUATION REFER TO SHEET 01

FOR CONTINUATION REFER TO SHEET 04

LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- EXISTING EASEMENT LINE
- EXISTING SERVICES (E, G, N B N, W, S)
- PROPOSED KERB
- EXISTING KERB
- FUTURE KERB
- SAWCUT AND PAVEMENT INFILL
- DD — DISH DRAIN
- KG — KERB AND GUTTER
- RKG — ROLL KERB AND GUTTER
- KR — KERB RAMP
- BATTERS
- XX.XX — PROPOSED CONTOURS
- XXXX — EXISTING CONTOURS
- Ø150 — STORMWATER PIPE
- EXISTING STORMWATER PIPE
- EXISTING TO BE REMOVED
- DRAINAGE STRUCTURE WITH EXTENDED CHAMBER (NEW / EXTG)
- GRATED INLET PIT (NEW / EXTG)
- KERB INLET PIT (NEW / EXTG)
- JUNCTION PIT (NEW / EXTG)
- 1 / A — STORMWATER PIT TAG LINE ID / STRUCTURE No.
- OSD — ON SITE DETENTION TANK
- CONCRETE HEADWALL
- RIP RAP ENERGY DISSIPATER
- LIMIT OF WORKS — LIMIT OF WORKS
- PROPOSED RETAINING WALL
- GRASS SWALE
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- FOOTPATH PAVEMENT
- VERGE AND PERMANENT BATTER / LANDSCAPE AREAS
- PROPOSED BIO-RETENTION
- TREE TO BE REMOVED
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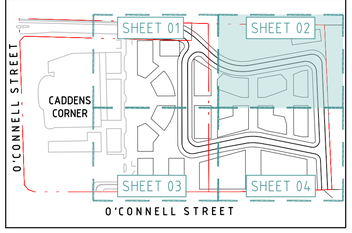
- STRUCTURAL ROOT ZONE (SRZ) OF TREE TO BE RETAINED
- TREE PROTECTION ZONE (TPZ) OF TREE TO BE RETAINED

KEY PLAN



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01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

DESIGNED: J. CARROLL
DRAWN: V. CHON
JOB MANAGER: B. LAWRENCE
VERIFIER:

CLIENT
HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT
TURNER

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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m

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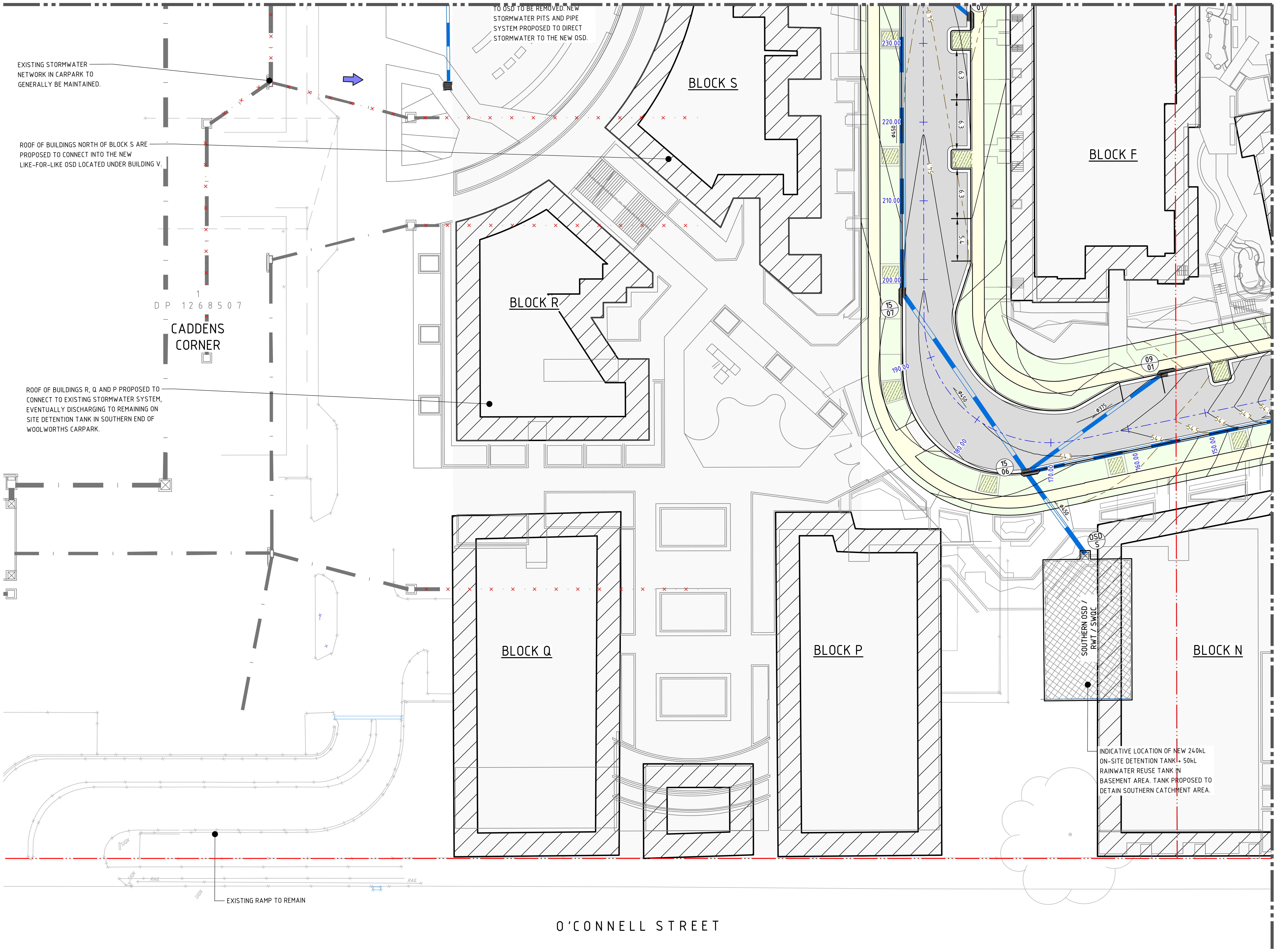
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

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

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC3002**
REVISION **02**
DRAWING SHEET SIZE = A1

FOR CONTINUATION REFER TO SHEET 01



FOR CONTINUATION REFER TO SHEET 04

LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- EXISTING EASEMENT LINE
- EXISTING SERVICES
- PROPOSED KERB
- EXISTING KERB
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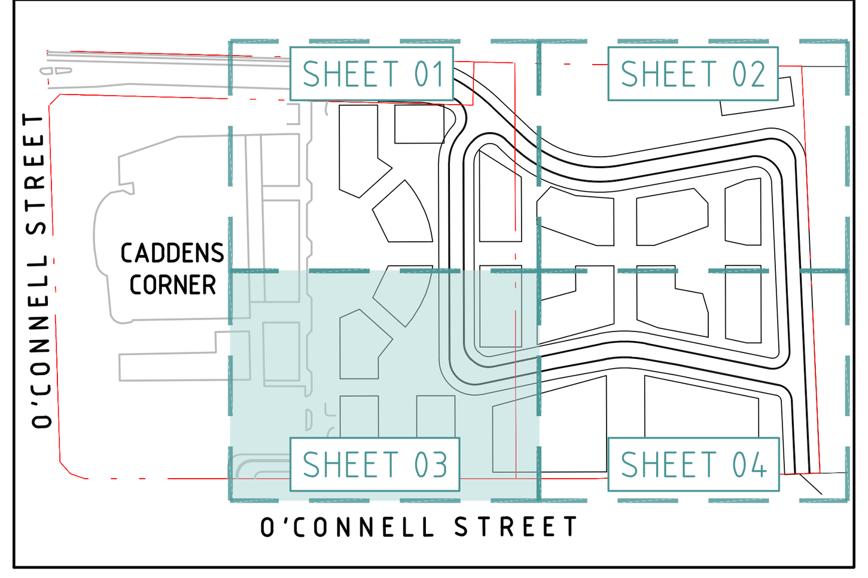
KEY PLAN



DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

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ARCHITECT: TURNER

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

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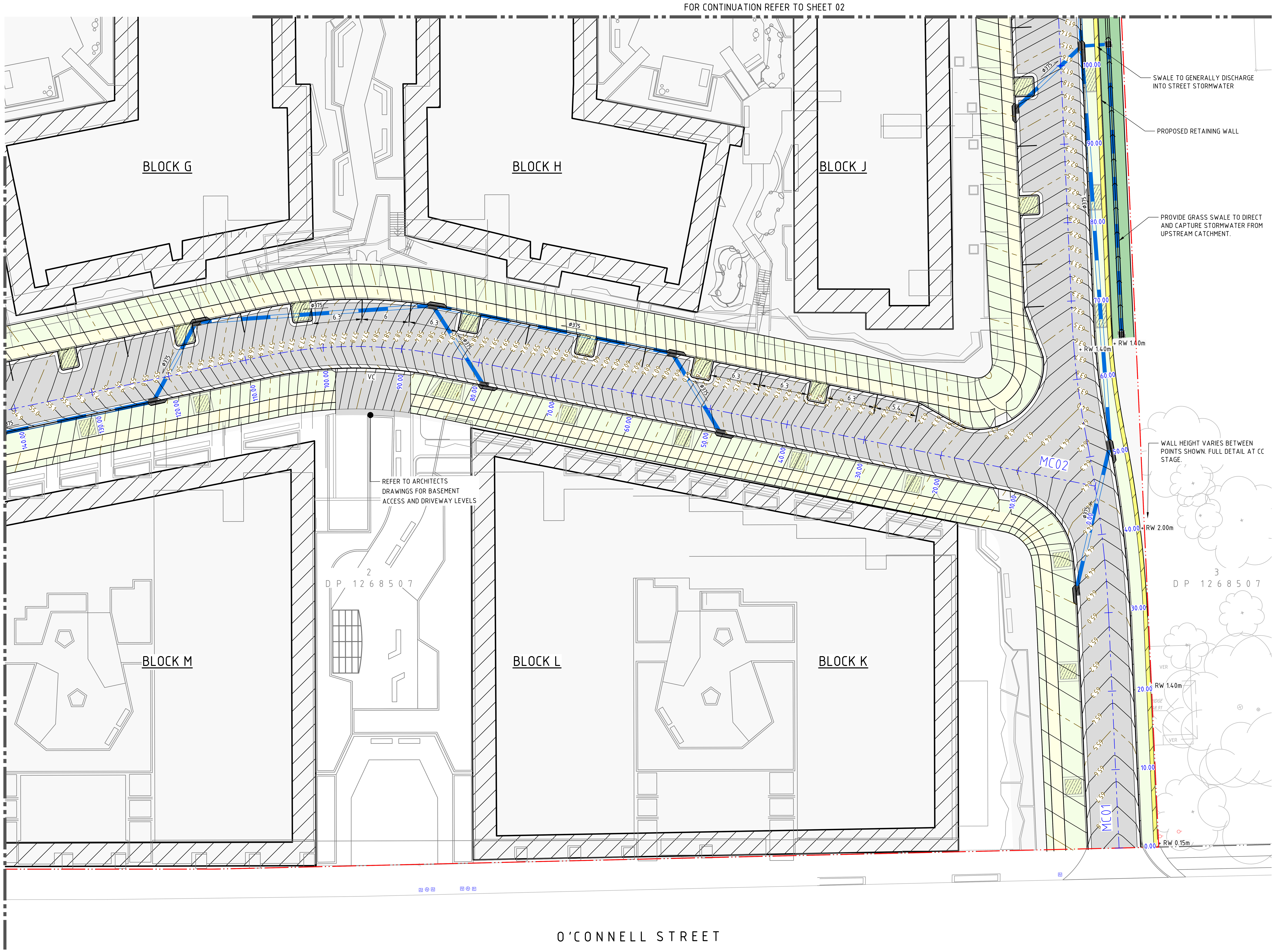
PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION — SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 03

JOB NUMBER: SY222070

DRAWING NUMBER: DAC3003 REVISION: 02

DRAWING SHEET SIZE = A1



LEGEND

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- EXISTING EASEMENT LINE
- EXISTING SERVICES
- PROPOSED KERB
- EXISTING KERB
- FUTURE KERB
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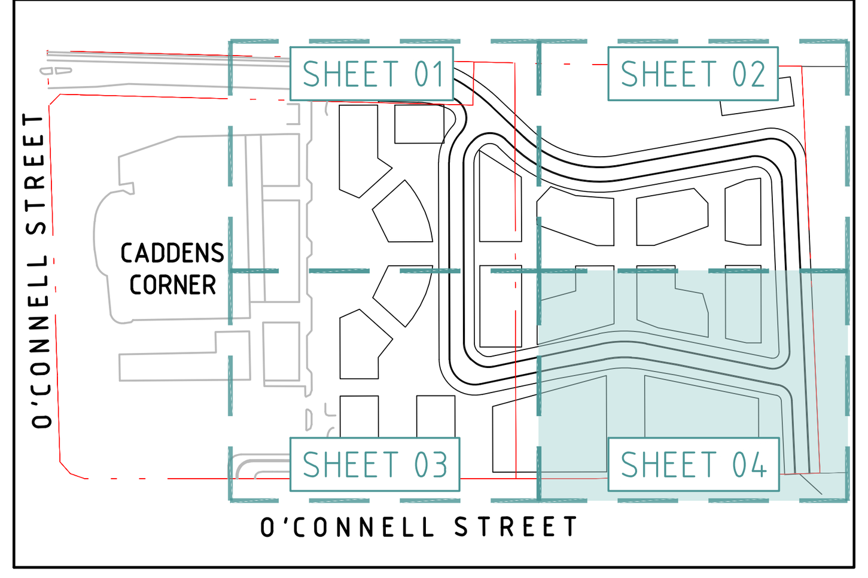
KEY PLAN



DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

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SCALE 1:250@ A1 — 0 2 4 6 8 10 12m

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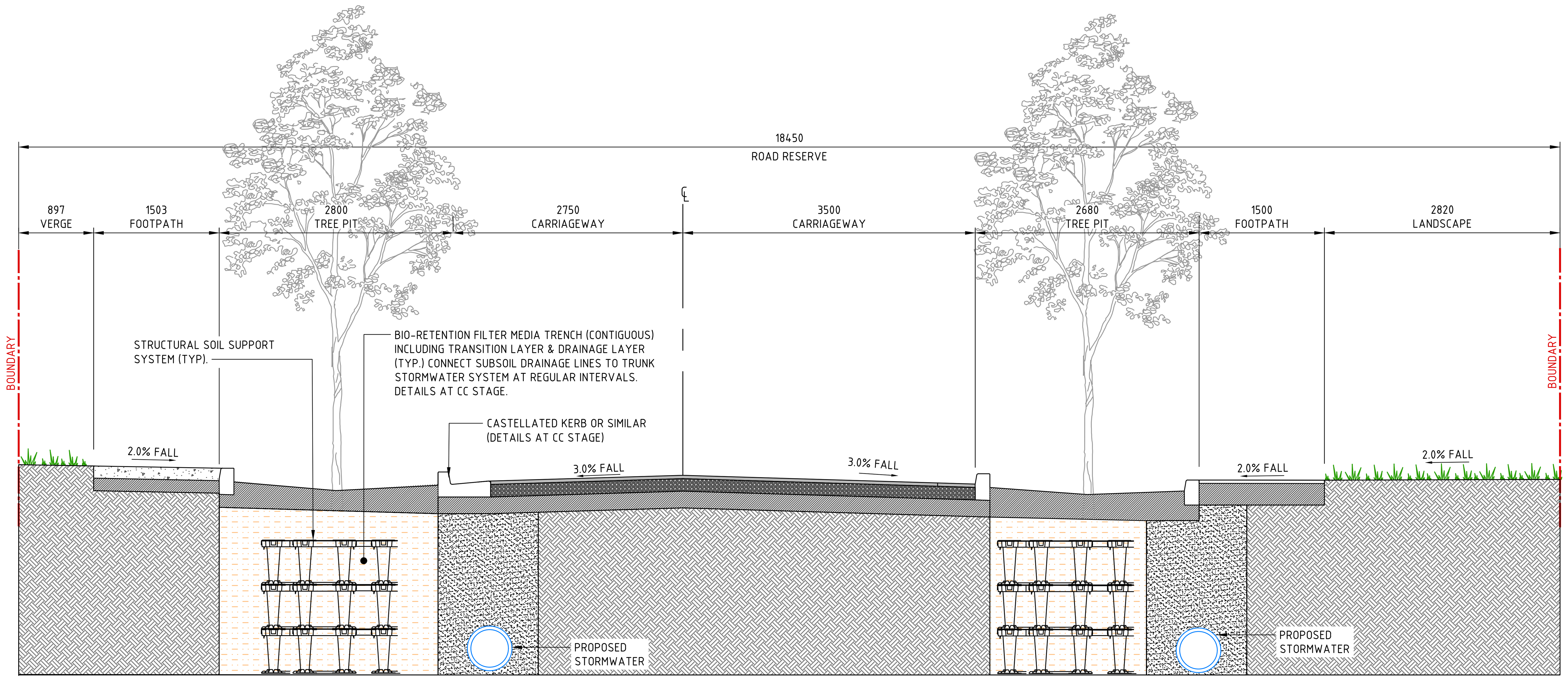
PROJECT
CADDENS CORNER O'CONNELL STREET, CADDENS

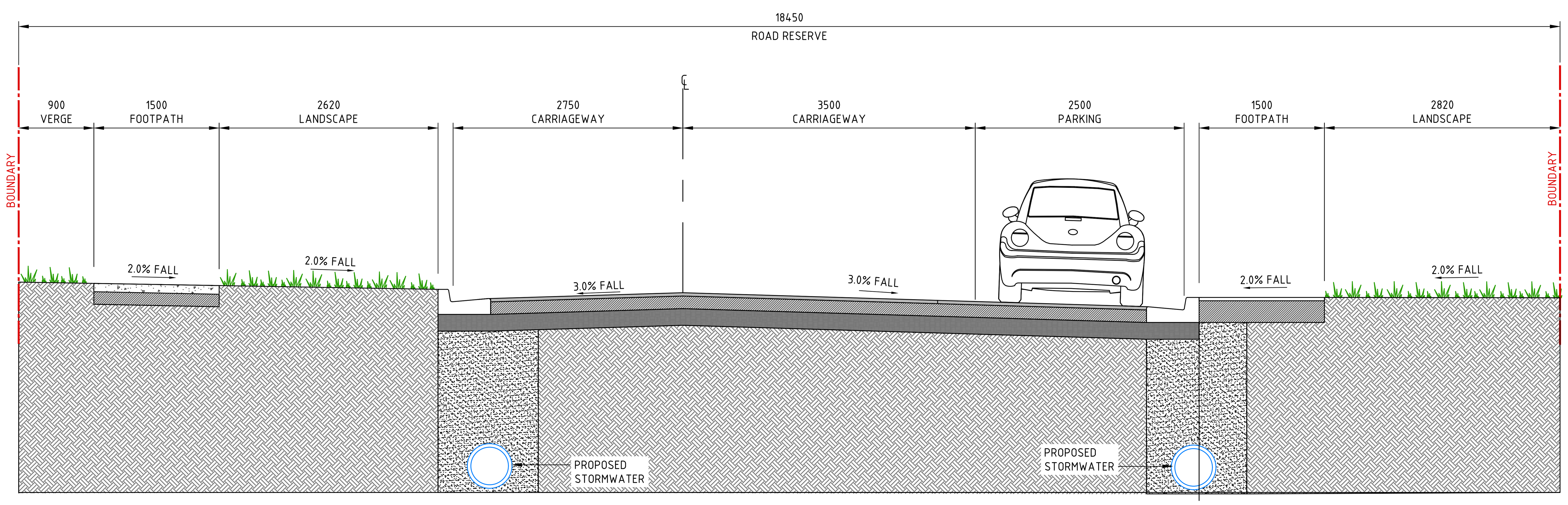
DRAWING TITLE
CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION
SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 04

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC3004** REVISION **02**
DRAWING SHEET SIZE = A1



TYPICAL ROAD SECTION - TREE PIT

SCALE 1:40



TYPICAL ROAD SECTION - PARKING

SCALE 1:40

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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ARCHITECT: TURNER

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SCALE 1:40@ A1 0.0 0.4 0.8 1.2 1.6 2.0m

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

PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION

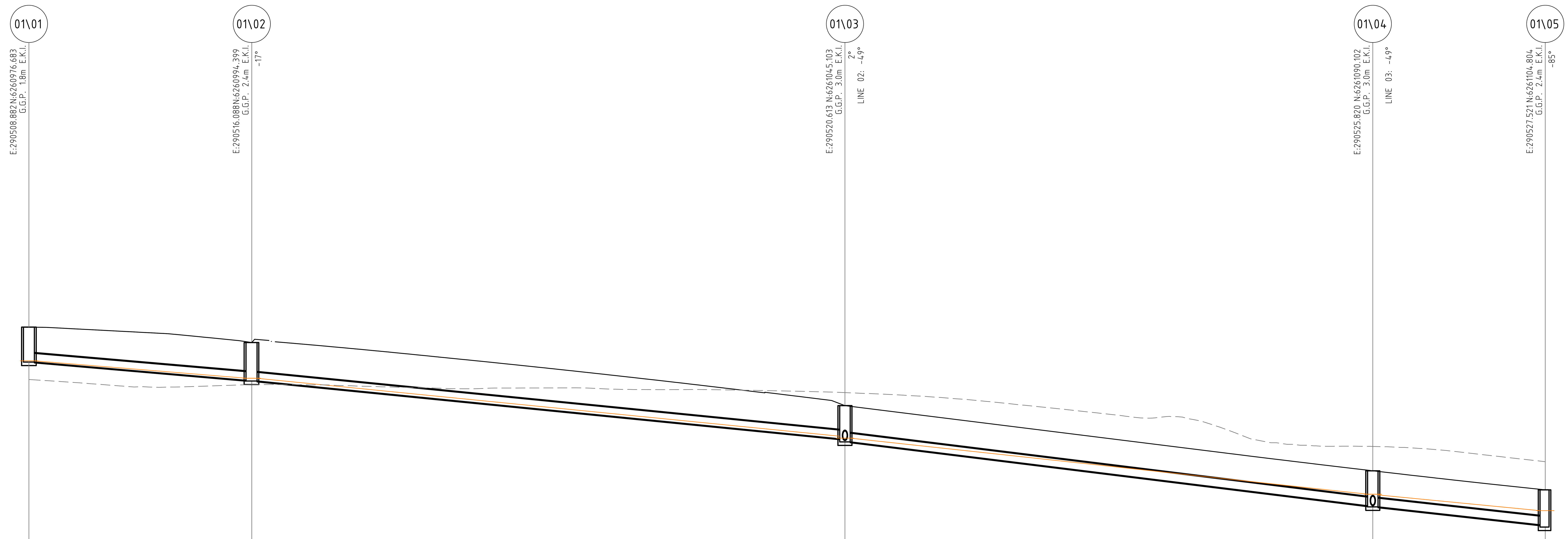
ROAD TYPICAL SECTIONS

JOB NUMBER: SY222070

DRAWING NUMBER: DAC4000

REVISION: 01

DRAWING SHEET SIZE = A1



	01\01 – 01\02	01\02 – 01\03	01\03 – 01\04	01\04 – 01\05
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	4.1%	4.9%	6.1%	5.2%
PIPE SIZE (mm)	375	375	375	375
MINIMUM COVER (m)	1.09	1.10	1.10	1.10
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.45	Vf=2.58	Vf=2.85	Vf=3.20
Q (MAJOR) - PIPE FLOW (L/s)	Q=15	Q=74	Q=172	Q=271

DATUM RL 44.0

	01\01	01\02	01\03	01\04	01\05
H.G.L. (MAJOR)	63.344 / 63.344	62.597 / 62.597 / 62.596	60.110 / 60.028 / 60.028	57.624 / 57.624 / 57.592	56.917 / 56.917
FINISHED SURFACE	64.792	64.130	61.422	58.628	57.810
NATURAL SURFACE	62.543	62.328	61.981	59.673	59.019
PIPE INVERT LEVEL	63.292	62.509 / 62.479	59.999 / 59.867	57.126 / 57.079	56.309
DEPTH TO INVERT	1.500	1.622 / 1.652	1.423 / 1.555	1.502 / 1.548	1.501
CHAINAGE	0.000	19.125	70.031	115.330	130.130

LINE 01

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

NOT FOR CONSTRUCTION

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DRAWN: V. CHON
DESIGNED: J. CARROLL
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VERIFIER:

CLIENT
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ARCHITECT
TURNER

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SCALE 1:100 @ A1 — 0 1 2 3 4 5m
SCALE 1:200 @ A1 — 0 2 4 6 8 10m

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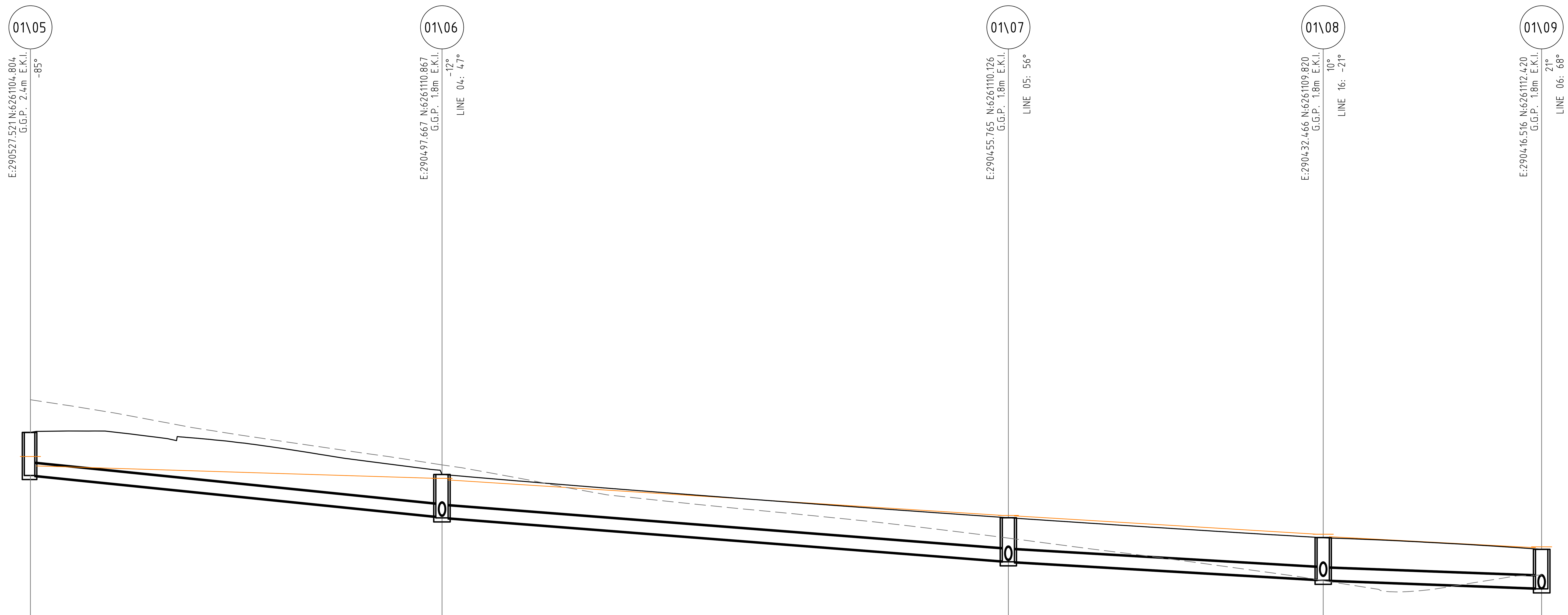
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
STORMWATER
LONGITUDINAL SECTIONS - SHEET 01

JOB NUMBER SY222070
DRAWING NUMBER DAC4101
REVISION 01
DRAWING SHEET SIZE = A1



	01\05 – 01\06	01\06 – 01\07	01\07 – 01\08	01\08 – 01\09
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	5.0%	3.8%	2.8%	1.8%
PIPE SIZE (mm)	450	450	450	450
MINIMUM COVER (m)	1.13	1.06	1.06	0.96
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=3.31	Vf=2.97	Vf=2.75	Vf=2.94
Q (MAJOR) - PIPE FLOW (L/s)	Q=329	Q=440	Q=438	Q=467

DATUM RL 39.0

	01\05	01\06	01\07	01\08	01\09
H.G.L. (MAJOR)	56.917 56.917 56.568	56.110 56.110 56.049	54.737 54.737 54.720	54.042 54.042 53.951	53.543 53.575
FINISHED SURFACE	57.810	56.254	54.651	53.918	53.482
NATURAL SURFACE	59.019	56.607	53.897	52.322	52.532
PIPE INVERT LEVEL	56.309 56.214	54.703 54.646	53.051 53.021	52.367 52.337	52.050
DEPTH TO INVERT	1.501 1.596	1.550 1.608	1.600 1.630	1.551 1.581	1.432
CHAINAGE	130.130	160.593	202.502	225.803	241.963

LINE 01

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

NOT FOR CONSTRUCTION

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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CLIENT: HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT: TURNER

SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:200 @ A1 0 2 4 6 8 10m

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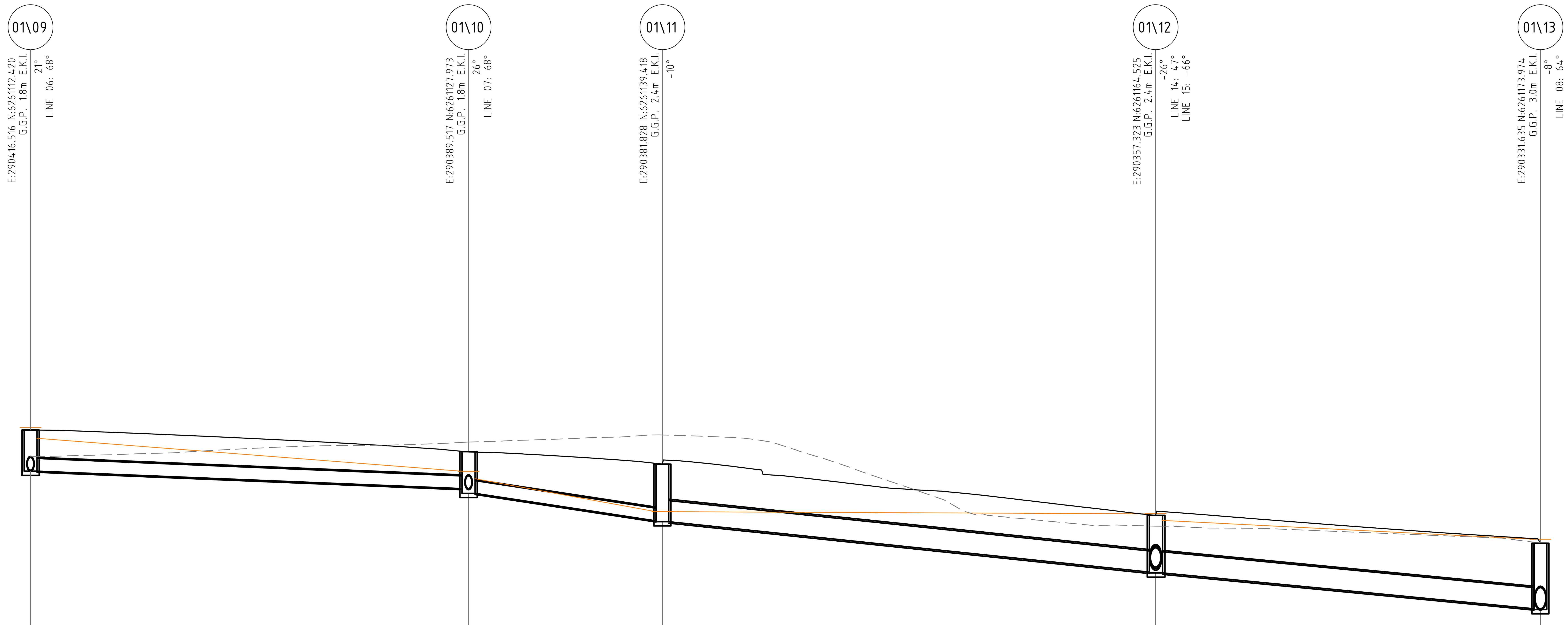
PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION
STORMWATER LONGITUDINAL SECTIONS - SHEET 02

JOB NUMBER: SY222070
DRAWING NUMBER: DAC4102
REVISION: 01
DRAWING SHEET SIZE = A1



	01\09 – 01\10	01\10 – 01\11	01\11 – 01\12	01\12 – 01\13
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	2.0%	7.1%	5.1%	4.6%
PIPE SIZE (mm)	450	450	750	750
MINIMUM COVER (m)	0.83	0.97	1.21	1.38
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=3.20	Vf=4.04	Vf=3.18	Vf=2.85
Q (MAJOR) - PIPE FLOW (L/s)	Q=508	Q=582	Q=627	Q=1257

DATUM RL 34.0

	01\09	01\10	01\11	01\12	01\13
H.G.L. (MAJOR)	53.543 53.575 / 53.188	52.016 52.016 / 51.750	50.579 50.579 / 50.579	50.503 50.506 / 50.270	49.598 49.598
FINISHED SURFACE	53.482	52.711	52.270	50.450	49.459
NATURAL SURFACE	52.532	53.054	53.304	50.065	49.487
PIPE INVERT LEVEL	52.050 / 52.020	51.399 / 51.230	50.252 / 50.222	48.431 / 48.401	47.129
DEPTH TO INVERT	1.432 / 1.462	1.312 / 1.481	2.018 / 2.048	2.018 / 2.048	2.330
CHAINAGE	241.963	273.122	286.910	321.993	349.364

LINE 01

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

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ARCHITECT
TURNER
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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:200 @ A1 0 2 4 6 8 10m

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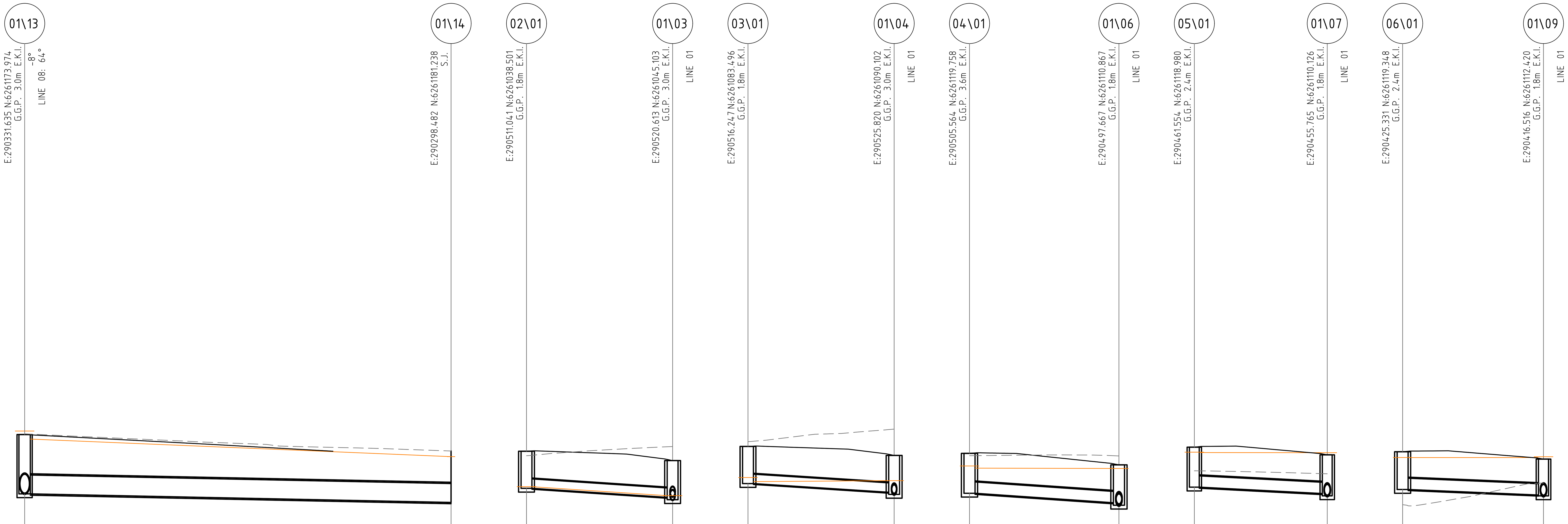
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
STORMWATER LONGITUDINAL SECTIONS - SHEET 03

JOB NUMBER SY222070
DRAWING NUMBER DAC4103
REVISION 01
DRAWING SHEET SIZE = A1



LINE 01

	01\13	01\14
PIPE CLASS	RRJ2	
PIPE GRADE (%)	1.0%	
PIPE SIZE (mm)	750	
MINIMUM COVER (m)	1.14	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=3.20	
Q (MAJOR) - PIPE FLOW (L/s)	Q=1414	
DATUM RL	32.0	
H.G.L. (MAJOR)	49.598 / 49.598 / 49.277	48.580 / 48.580 / 48.580
FINISHED SURFACE	49.459	48.804
NATURAL SURFACE	49.487	48.804
PIPE INVERT LEVEL	47.129 / 47.099	46.760 / 46.760
DEPTH TO INVERT	2.330 / 2.360	2.044 / 2.044
CHAINAGE	349.364	383.303

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

LINE 02

	02\01	01\03
PIPE CLASS	RRJ2	
PIPE GRADE (%)	3.1%	
PIPE SIZE (mm)	375	
MINIMUM COVER (m)	1.08	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.40	
Q (MAJOR) - PIPE FLOW (L/s)	Q=17	
DATUM RL	45.0	
H.G.L. (MAJOR)	60.385 / 60.383	60.028 / 60.028 / 60.028
FINISHED SURFACE	61.795	61.422
NATURAL SURFACE	61.616	61.981
PIPE INVERT LEVEL	60.320	59.960 / 59.867
DEPTH TO INVERT	1.476	1.462 / 1.555
CHAINAGE	0.000	11.628

LINE 03

	03\01	01\04
PIPE CLASS	RRJ2	
PIPE GRADE (%)	3.0%	
PIPE SIZE (mm)	375	
MINIMUM COVER (m)	1.08	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.42	
Q (MAJOR) - PIPE FLOW (L/s)	Q=26	
DATUM RL	42.0	
H.G.L. (MAJOR)	57.749 / 57.586	57.624 / 57.624 / 57.592
FINISHED SURFACE	58.986	58.628
NATURAL SURFACE	59.173	59.673
PIPE INVERT LEVEL	57.509	57.163 / 57.079
DEPTH TO INVERT	1.476	1.464 / 1.548
CHAINAGE	0.000	11.630

LINE 04

	04\01	01\06
PIPE CLASS	RRJ2	
PIPE GRADE (%)	3.2%	
PIPE SIZE (mm)	450	
MINIMUM COVER (m)	1.06	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.73	
Q (MAJOR) - PIPE FLOW (L/s)	Q=110	
DATUM RL	40.0	
H.G.L. (MAJOR)	56.208 / 56.123	56.110 / 56.110 / 56.049
FINISHED SURFACE	56.711	56.254
NATURAL SURFACE	56.617	56.607
PIPE INVERT LEVEL	55.123	54.747 / 54.646
DEPTH TO INVERT	1.588	1.507 / 1.608
CHAINAGE	0.000	11.892

LINE 05

	05\01	01\07
PIPE CLASS	RRJ2	
PIPE GRADE (%)	2.4%	
PIPE SIZE (mm)	450	
MINIMUM COVER (m)	1.08	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.14	
Q (MAJOR) - PIPE FLOW (L/s)	Q=50	
DATUM RL	38.0	
H.G.L. (MAJOR)	54.758 / 54.743	54.737 / 54.737 / 54.720
FINISHED SURFACE	54.956	54.651
NATURAL SURFACE	54.017	53.897
PIPE INVERT LEVEL	53.366	53.112 / 53.021
DEPTH TO INVERT	1.590	1.539 / 1.630
CHAINAGE	0.000	10.578

LINE 06

	06\01	01\09
PIPE CLASS	RRJ2	
PIPE GRADE (%)	1.9%	
PIPE SIZE (mm)	450	
MINIMUM COVER (m)	0.97	
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=0.83	
Q (MAJOR) - PIPE FLOW (L/s)	Q=26	
DATUM RL	37.0	
H.G.L. (MAJOR)	53.545 / 53.543	53.543 / 53.575 / 53.188
FINISHED SURFACE	53.773	53.482
NATURAL SURFACE	51.669	52.532
PIPE INVERT LEVEL	52.273	52.054 / 52.020
DEPTH TO INVERT	1.501	1.427 / 1.462
CHAINAGE	0.000	11.211

NOT FOR CONSTRUCTION

DRAWN: V. CHON | DESIGNED: J. CARROLL | JOB MANAGER: B. LAWRENCE | VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

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ARCHITECT: TURNER

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SCALE 1:200 @ A1 — 0 2 4 6 8 10m

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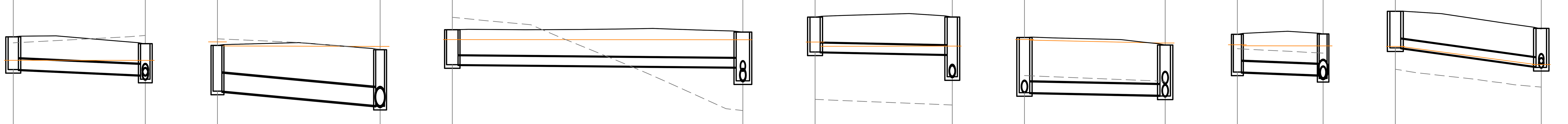
Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

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

JOB NUMBER: SY222070
DRAWING NUMBER: DAC4104
REVISION: 01
DRAWING SHEET SIZE = A1

07\01 — E:290400.239 N:6261130.304 G.G.P. 1.8m E.K.I.
01\10 — E:290389.517 N:6261127.973 G.G.P. 1.8m E.K.I. LINE 01
08\01 — E:290339.972 N:6261184.613 G.G.P. 3.0m E.K.I.
01\13 — E:290331.635 N:6261173.974 G.G.P. 3.0m E.K.I. LINE 01
09\01 — E:290364.706 N:6261026.537 G.G.P. 1.8m E.K.I.
15\06 — E:290342.411 N:6261017.251 G.G.P. 1.8m E.K.I. LINE 15
10\01 — E:290347.835 N:6261075.288 G.G.P. 1.8m E.K.I.
15\08 — E:290340.340 N:6261083.884 G.G.P. 1.8m E.K.I. LINE 15
11\01 — E:290354.890 N:6261119.734 G.G.P. 1.8m E.K.I. LINE 17; 43°
15\10 — E:290347.465 N:6261128.770 G.G.P. 1.8m E.K.I. LINE 15
12\01 — E:290363.114 N:6261144.674 G.G.P. 2.4m E.K.I. SAG
15\11 — E:290358.213 N:6261149.849 G.G.P. 1.8m E.K.I. LINE 15
13\01 — E:290438.669 N:6261014.545 G.G.P. 1.8m E.K.I.
15\03 — E:290433.810 N:6261025.662 G.G.P. 1.8m E.K.I. LINE 15



	LINE 07	LINE 08	LINE 09	LINE 10	LINE 11	LINE 12	LINE 13
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	2.1%	4.5%	0.4%	1.0%	0.9%	1.8%	6.5%
PIPE SIZE (mm)	450	750	375	375	450	450	375
MINIMUM COVER (m)	0.84	1.13	1.05	1.07	1.65	1.11	1.12
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.10	Vf=0.84	Vf=0.77	Vf=1.00	Vf=1.22	Vf=1.21	Vf=1.57
Q (MAJOR) - PIPE FLOW (L/s)	Q=17	Q=372	Q=-48	Q=43	Q=194	Q=69	Q=24
DATUM RL	36.0	33.0	37.0	36.0	35.0	34.0	41.0
H.G.L. (MAJOR)	52.017 52.017 / 52.016 52.016 51.750	49.786 49.616 / 49.598 49.598 49.277	53.882 53.880 / 53.875 53.875 53.790	52.780 52.601 / 52.610 52.610 52.540	51.885 51.859 / 51.739 51.739 51.274	50.665 50.622 / 50.618 50.618 50.527	57.597 57.595 / 56.840 56.840 56.838
FINISHED SURFACE	52.995 / 52.711	49.639 / 49.459	54.292 / 54.194	53.818 / 53.821	51.970 / 51.655	51.100 / 51.115	59.060 / 58.349
NATURAL SURFACE	52.746 / 53.054	49.913 / 49.487	54.810 / 50.925	50.391 / 50.155	50.382 / 50.142	50.507 / 50.317	56.645 / 55.901
PIPE INVERT LEVEL	51.633 / 51.400 51.230	47.733 / 47.129 47.099	52.836 / 52.727 52.162	52.365 / 52.257 51.333	49.670 / 49.559 49.529	49.529 / 49.401 49.262	57.536 / 56.752 56.722
DEPTH TO INVERT	1.362 / 1.311 1.481	1.906 / 2.330 2.360	1.456 / 1.467 2.032	1.453 / 1.564 2.487	2.300 / 2.096 2.126	1.571 / 1.714 1.853	1.524 / 1.598 1.628
CHAINAGE	0.000 / 10.973	0.000 / 13.517	0.000 / 24.152	0.000 / 11.405	0.000 / 11.696	0.000 / 7.127	0.000 / 12.132

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

NOT FOR CONSTRUCTION

DRAWN: V. CHON — DESIGNED: J. CARROLL — JOB MANAGER: B. LAWRENCE — VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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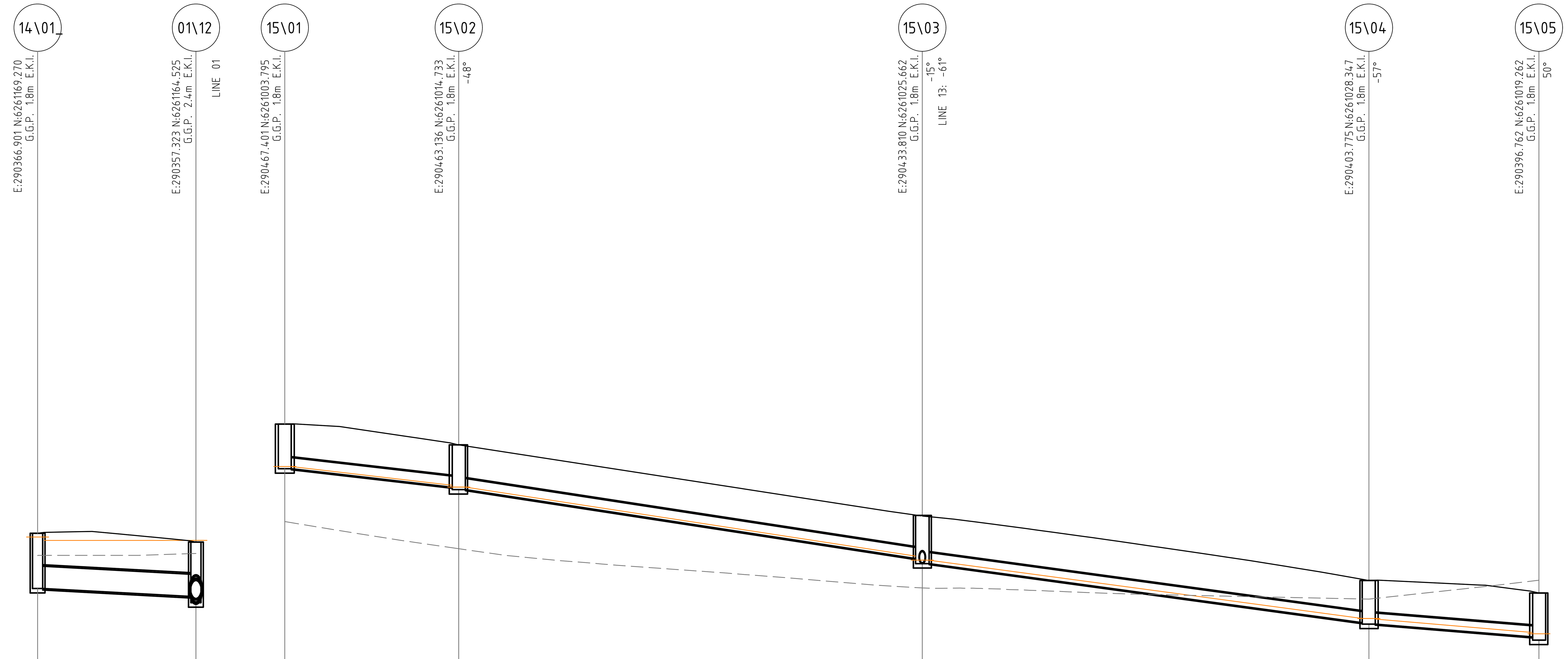
PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION — STORMWATER LONGITUDINAL SECTIONS - SHEET 05

JOB NUMBER: SY222070
DRAWING NUMBER: DAC4105
REVISION: 01
DRAWING SHEET SIZE = A1



LINE 14

	14\01 – 01\12
PIPE CLASS	RRJ2
PIPE GRADE (%)	2.5%
PIPE SIZE (mm)	750
MINIMUM COVER (m)	1.07
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.78
Q (MAJOR) - PIPE FLOW (L/s)	Q=314
DATUM RL	34.0

	14\01	01\12
H.G.L. (MAJOR)	50.618 50.503	50.503 50.506 50.270
FINISHED SURFACE	50.744	50.450
NATURAL SURFACE	49.995	50.065
PIPE INVERT LEVEL	48.883	48.613 48.401
DEPTH TO INVERT	1.861	1.837 2.048
CHAINAGE	0.000	10.689

LINE 15

	15\01 – 15\02	15\02 – 15\03	15\03 – 15\04	15\04 – 15\05
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	5.3%	7.4%	6.6%	3.8%
PIPE SIZE (mm)	375	375	375	375
MINIMUM COVER (m)	1.07	1.05	1.05	1.07
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.92	Vf=2.78	Vf=2.94	Vf=2.37
Q (MAJOR) - PIPE FLOW (L/s)	Q=28	Q=51	Q=95	Q=115
DATUM RL	41.0			

	15\01	15\02	15\03	15\04	15\05
H.G.L. (MAJOR)	59.998 59.995	59.364 59.302 59.302	56.974 56.840 56.838	54.870 54.870 54.849	54.398 54.355
FINISHED SURFACE	61.428	60.727	58.349	56.153	55.730
NATURAL SURFACE	58.140	57.225	55.901	55.524	56.162
PIPE INVERT LEVEL	59.923	59.297 59.218	56.891 56.722	54.729 54.681	54.248
DEPTH TO INVERT	1.506	1.429 1.508	1.458 1.628	1.424 1.472	1.482
CHAINAGE	0.000	11.740	43.036	73.191	84.667

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

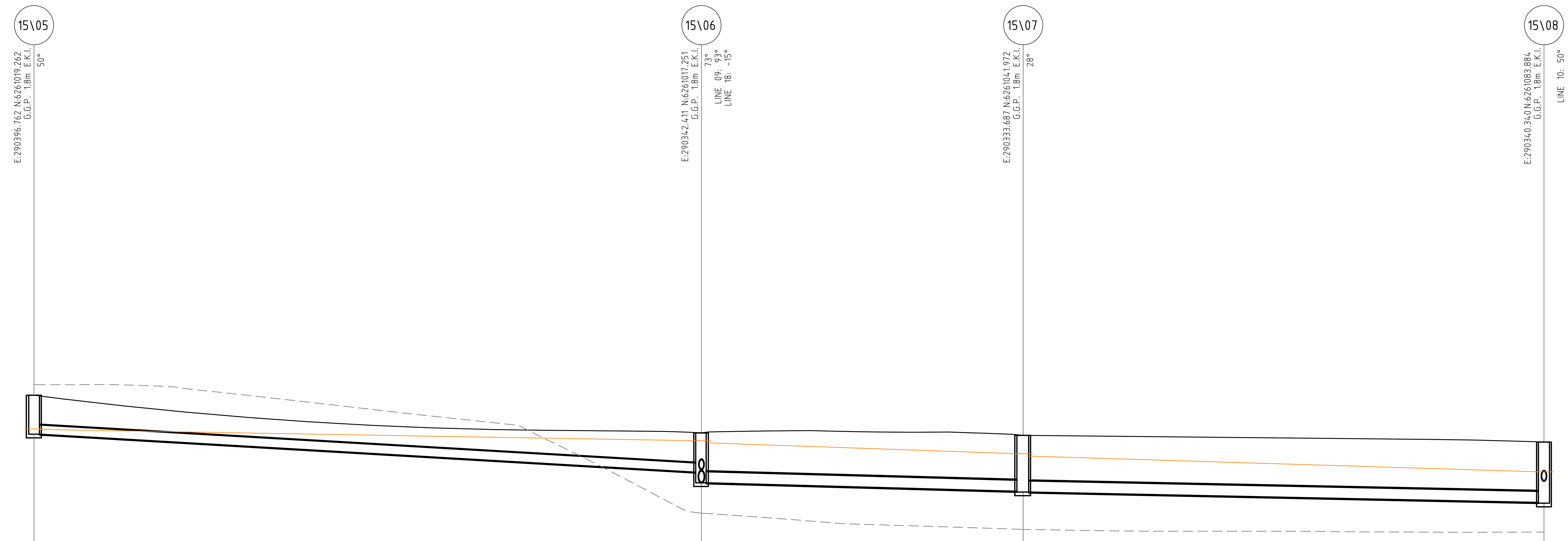
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
STORMWATER LONGITUDINAL SECTIONS - SHEET 06

JOB NUMBER
SY222070

DRAWING NUMBER
DAC4106

REVISION
01

DRAWING SHEET SIZE = A1



	15\05 – 15\06	15\06 – 15\07	15\07 – 15\08
PIPE CLASS	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	2.8%	1.3%	1.0%
PIPE SIZE (mm)	375	450	450
MINIMUM COVER (m)	0.73	1.57	1.81
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=2.51	Vf=2.03	Vf=1.97
Q (MAJOR) - PIPE FLOW (L/s)	Q=143	Q=298	Q=313

DATUM RL 37.0

	15\05	15\06	15\07	15\08
H.G.L. (MAJOR)	54.398 / 54.355 / 54.336	53.875 / 53.875 / 53.790	53.347 / 53.347 / 53.251	52.610 / 52.610
FINISHED SURFACE	55.730	54.194	54.095	53.821
NATURAL SURFACE	56.162	50.925	50.263	50.155
PIPE INVERT LEVEL	54.248 / 54.141	52.594 / 52.162	51.817 / 51.787	51.363
DEPTH TO INVERT	1.482 / 1.589	1.600 / 2.032	2.278 / 2.308	2.457
CHAINAGE	84.667	139.055	165.271	207.708

LINE 15

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
STORMWATER LONGITUDINAL SECTIONS - SHEET 07

JOB NUMBER
SY222070

DRAWING NUMBER
DAC4107

REVISION
01

DRAWING SHEET SIZE = A1

15\08 — E:290340.340 N:6261083.884 G.G.P. 1.8m E.K.I. LINE 10: 50°

15\09 — E:290343.900 N:6261106.312 G.G.P. 2.4m E.K.I.

15\10 — E:290347.465 N:6261128.770 G.G.P. 1.8m E.K.I. 18° LINE 11: 66°

15\11 — E:290358.213 N:6261149.849 G.G.P. 1.8m E.K.I. -30° LINE 12: 40°

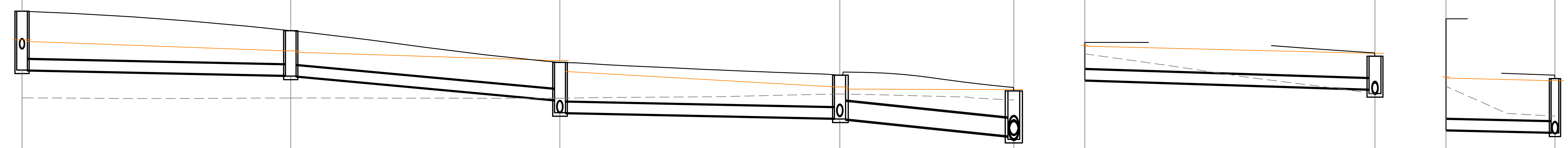
01\12 — E:290357.323 N:6261164.525 G.G.P. 2.4m E.K.I. LINE 01

OSD CENTRAL EAST — E:290453.539 N:6261097.281 S.J.

01\08 — E:290432.466 N:6261109.820 G.G.P. 1.8m E.K.I. LINE 01

OSD CENTRAL WEST — E:290364.023 N:6261118.556 S.J.

11\01 — E:290354.890 N:6261119.734 G.G.P. 1.8m E.K.I. LINE 11



LINE 15

	15\08 – 15\09	15\09 – 15\10	15\10 – 15\11	15\11 – 01\12
PIPE CLASS	RRJ2	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)	1.0%	4.4%	1.0%	4.9%
PIPE SIZE (mm)	450	450	450	750
MINIMUM COVER (m)	1.42	1.11	1.35	1.18
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=2.15	Vf=3.46	Vf=3.02	Vf=3.49
Q (MAJOR) - PIPE FLOW (L/s)	Q=342	Q=347	Q=480	Q=544

DATUM RL 35.0

	15\08	15\09	15\10	15\11	01\12
H.G.L. (MAJOR)	52.610 52.610 52.540	52.146 52.146 52.085	51.739 51.739 51.274	50.618 50.618 50.527	50.503 50.506 50.270
FINISHED SURFACE	53.821	52.996	51.655	51.115	50.450
NATURAL SURFACE	50.155	50.150	50.142	50.317	50.065
PIPE INVERT LEVEL	51.363 51.333	51.106 51.076	50.070 49.529	49.292 49.262	48.544 48.401
DEPTH TO INVERT	2.457 2.487	1.890 1.920	1.586 2.126	1.823 1.853	1.906 2.048
CHAINAGE	207.708	230.416	253.156	276.816	291.520

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

LINE 16

	OSD CENTRAL EAST – 01\08
PIPE CLASS	RRJ2
PIPE GRADE (%)	1.6%
PIPE SIZE (mm)	450
MINIMUM COVER (m)	1.06
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.71
Q (MAJOR) - PIPE FLOW (L/s)	Q=193

DATUM RL 37.0

	OSD CENTRAL EAST	01\08
H.G.L. (MAJOR)	54.378 54.345	54.042 54.042 53.951
FINISHED SURFACE	54.500	53.918
NATURAL SURFACE	54.019	52.322
PIPE INVERT LEVEL	52.908	52.522 52.337
DEPTH TO INVERT	1.592	1.397 1.581
CHAINAGE	0.000	24.521

LINE 17

	OSD CENTRAL WEST – 11\01
PIPE CLASS	RRJ2
PIPE GRADE (%)	1.1%
PIPE SIZE (mm)	450
MINIMUM COVER (m)	1.93
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.24
Q (MAJOR) - PIPE FLOW (L/s)	Q=181

DATUM RL 36.0

	OSD CENTRAL WEST	11\01
H.G.L. (MAJOR)	52.040 51.996	51.885 51.885 51.859
FINISHED SURFACE	54.500	51.970
NATURAL SURFACE	51.643	50.382
PIPE INVERT LEVEL	49.800	49.700 49.670
DEPTH TO INVERT	4.700	2.270 2.300
CHAINAGE	0.000	9.209

NOT FOR CONSTRUCTION

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT: HOLDMARK PROPERTY GROUP PTY LTD

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ARCHITECT: TURNER

SCALE 1:100 @ A1: 0 1 2 3 4 5m
SCALE 1:200 @ A1: 0 2 4 6 8 10m

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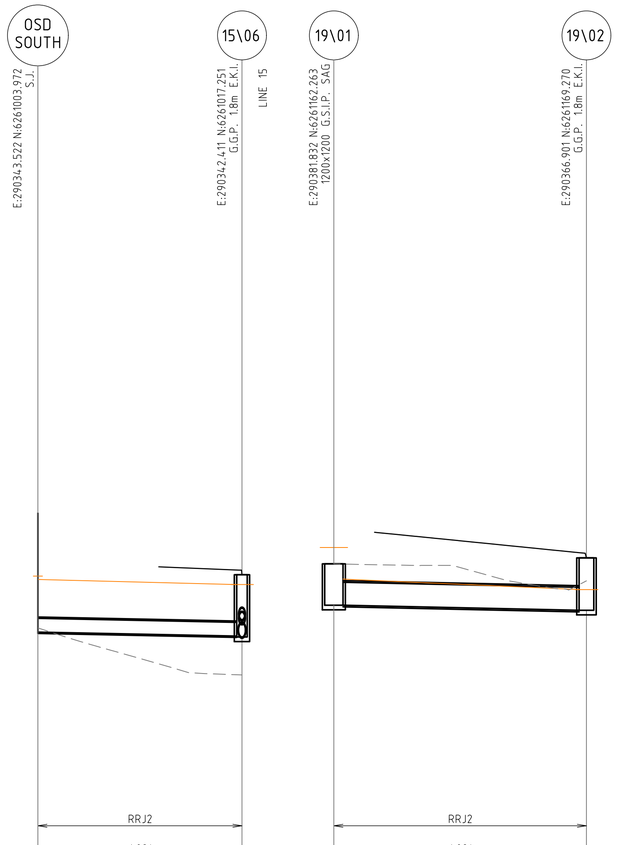
Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION
STORMWATER LONGITUDINAL SECTIONS - SHEET 08

JOB NUMBER: SY222070
DRAWING NUMBER: DAC4108
REVISION: 01
DRAWING SHEET SIZE = A1



	LINE 18	LINE 19
PIPE CLASS	RRJ2	RRJ2
PIPE GRADE (%)	1.0%	1.0%
PIPE SIZE (mm)	450	750
MINIMUM COVER (m)	1.66	1.08
Vf (MAJOR) - FULL PIPE VELOCITY (m/s)	Vf=1.87	Vf=2.95
Q (MAJOR) - PIPE FLOW (L/s)	Q=284	Q=1276

	OSD SOUTH	15\06	19\01	19\02
DATUM RL	38.0		34.0	
H.G.L. (MAJOR)	54.150 54.040	53.875 53.875 53.790	51.083 50.053	49.710 49.710 49.710
FINISHED SURFACE	56.200	54.194	50.551	50.744
NATURAL SURFACE	52.460	50.925	50.551	49.995
PIPE INVERT LEVEL	52.292 52.322	52.192 52.162	49.199	49.034 49.034
DEPTH TO INVERT	3.878	2.002 2.032	1.352	1.710 1.710
CHAINAGE	0.000	13.325	0.000	16.493

HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:100@A1

LINE 18

LINE 19

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:200@ A1 0 2 4 6 8 10m

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

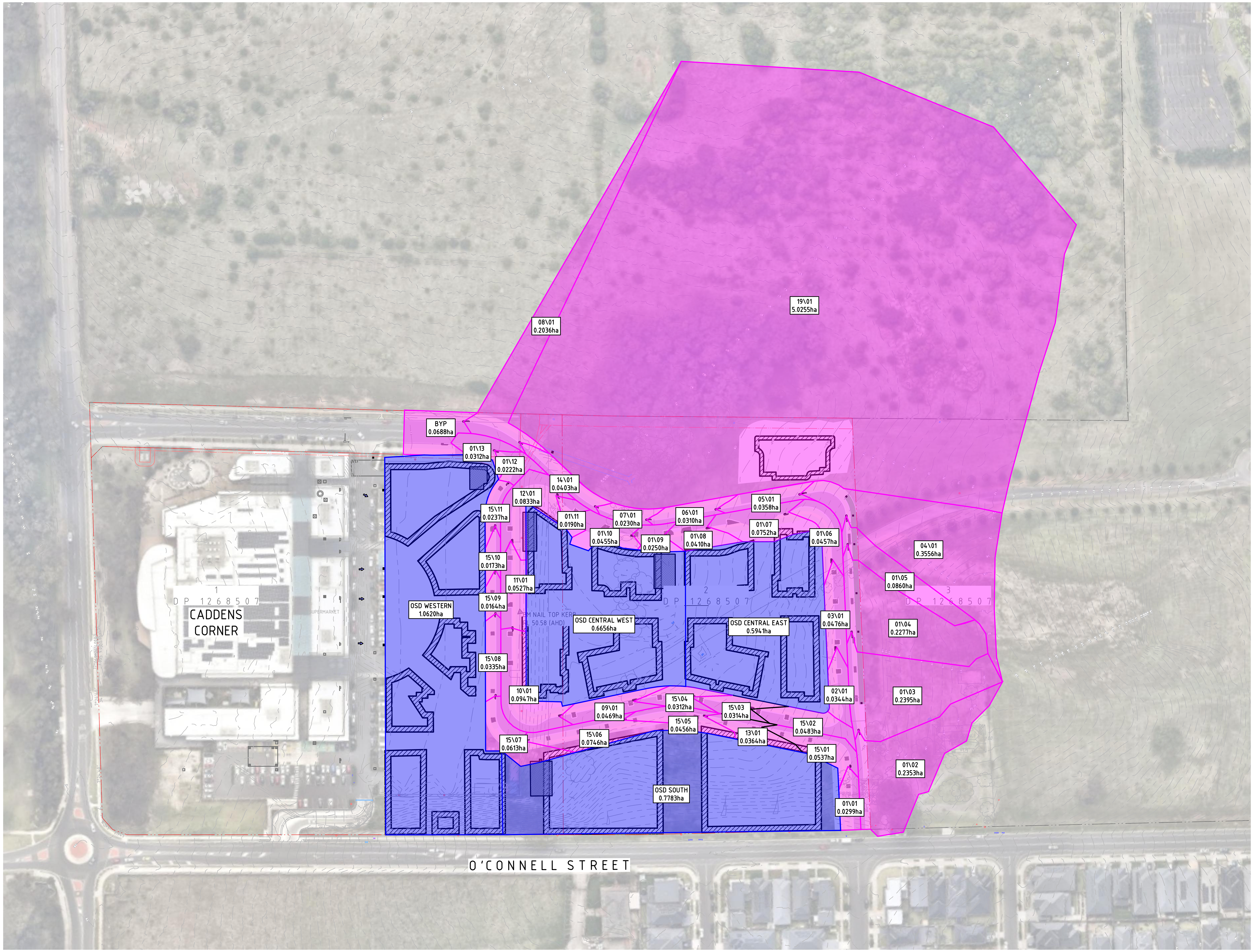
STORMWATER LONGITUDINAL
SECTIONS - SHEET 09

JOB NUMBER
SY222070

DRAWING NUMBER
DAC4109

REVISION
01

DRAWING SHEET SIZE = A1



LEGEND

- LOT BOUNDARY LINE
- CATCHMENT BOUNDARY
- OSD BYPASS CATCHMENT BOUNDARY
- EXISTING DRAINAGE STRUCTURE
- NEW DRAINAGE STRUCTURE
- OSD — ON-SITE DETENTION TANK

STORMWATER SUMMARY

STORMWATER QUANTITY

- STORMWATER QUANTITY MODELLING WAS PERFORMED USING SOFTWARE 'DRAINS' FOR STORMWATER EVENTS FROM THE 20% AEP (MINOR EVENT) TO THE 1% AEP (MAJOR EVENT).
- A TOTAL OF 584kL DETENTION STORAGE WAS DETERMINED TO RESTRICT POST-DEVELOPED FLOWS TO PRE-DEVELOPED FLOWS FOR THE EVENTS MENTIONED ABOVE. THIS DOES NOT INCLUDE THE LIKE-FOR-LIKE DETENTION OF THE WESTERN CATCHMENT.
- DETENTION STORAGE/TANKS TO BE PROVIDED AT BASEMENT-LEVEL OR BELOW GROUND AT LANDSCAPED AREAS.
- ALL ROAD AND UPSTREAM CATCHMENTS TO BYPASS OSD.

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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ARCHITECT: **TURNER**

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SCALE 1:1000 @ A1 — 0 10 20 30 40 50m

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PROJECT: **CADDENS CORNER O'CONNELL STREET, CADDENS**

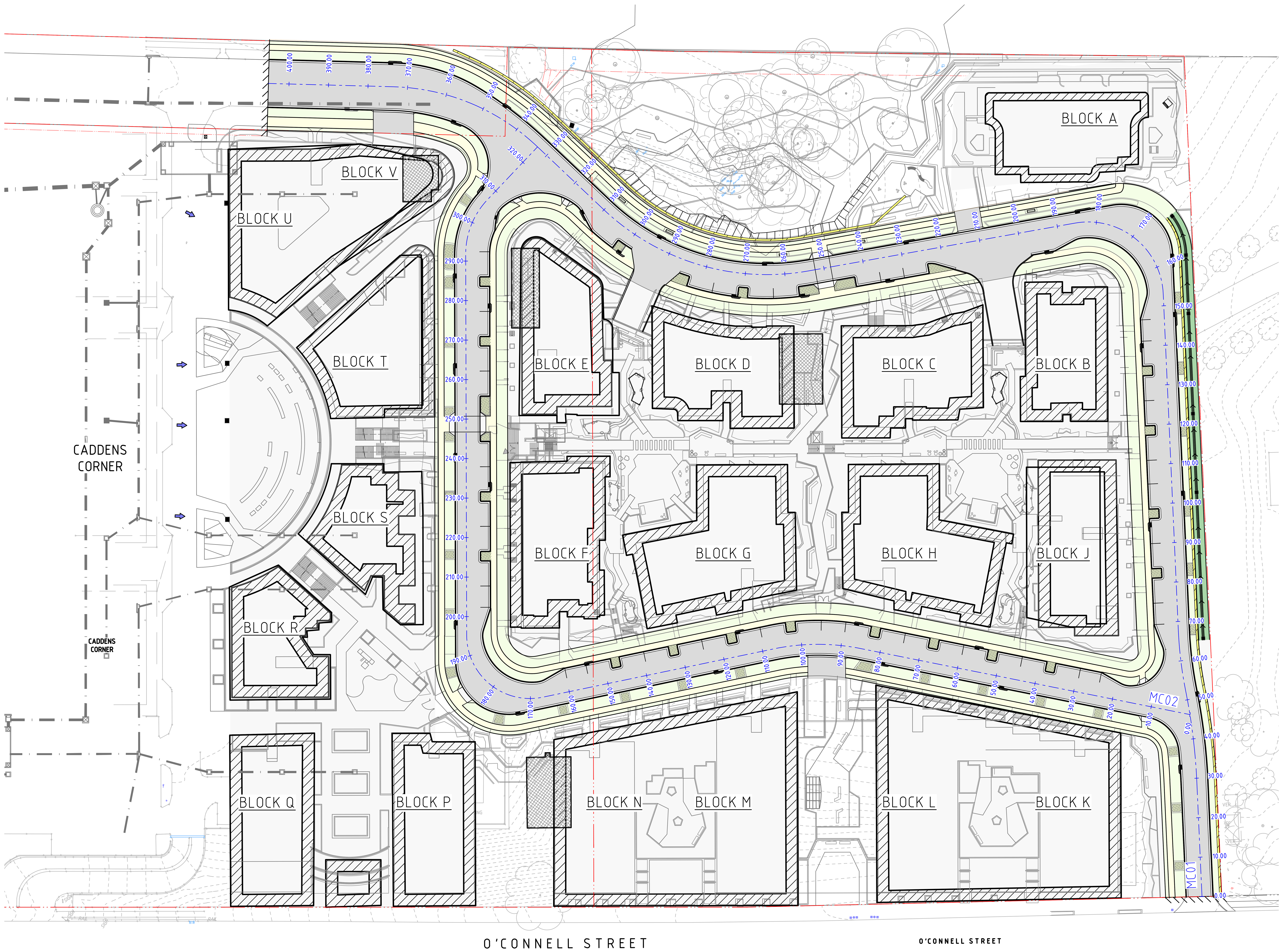
DRAWING TITLE: **CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION**

STORMWATER CATCHMENT PLAN

JOB NUMBER: **SY222070**

DRAWING NUMBER: **DAC4201** REVISION: **01**

DRAWING SHEET SIZE = A1



LEGEND

	EXISTING BOUNDARY LINE
	SITE BOUNDARY LINE
	EXISTING EASEMENT LINE
MC01	ROAD CONTROL LINE
20.00	ROAD CONTROL LINE CHAINAGES
	LIMIT OF WORKS

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:500@ A1 0 5 10 15 20 25m

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PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

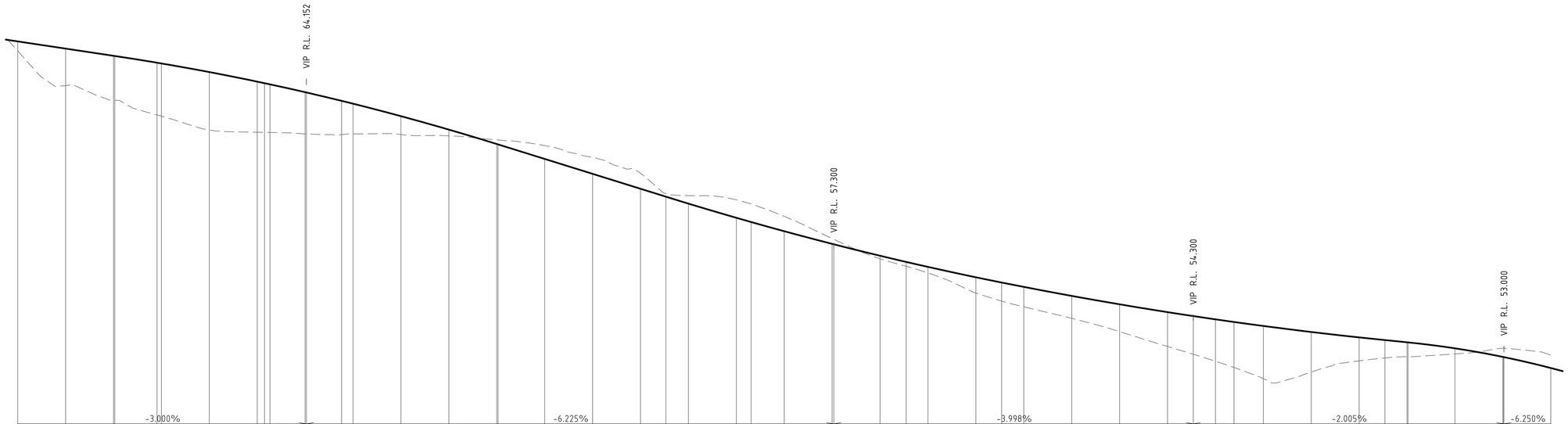
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
ALIGNMENT CONTROL PLAN

JOB NUMBER
SY222070

DRAWING NUMBER
DAC5001

REVISION
01

DRAWING SHEET SIZE = A1



FINISHED SURFACE	65.96	65.66	65.36	65.352	65.072	65.041	64.681	64.282	64.218	64.169	63.842	63.83	63.48
EXISTING SURFACE	66.012	64.126	63.634	63.618	63.03	62.978	62.382	62.182	62.176	62.17	62.125	62.123	62.07
CHAINAGE	0.000	10.000	20.000	20.261	29.083	30.000	40.000	50.000	51.516	52.656	60.000	60.261	67.611

FINISHED SURFACE	63.361	62.841	62.28	61.678	61.662	61.056	60.433	59.811	59.481	59.192	58.6	58.424	58.04
EXISTING SURFACE	62.068	62.115	62.036	61.896	61.891	61.699	61.22	60.631	59.986	59.537	59.453	59.322	58.863
CHAINAGE	70.000	80.000	90.000	100.000	100.261	110.000	120.000	130.000	135.296	140.000	150.000	153.088	160.000

FINISHED SURFACE	57.512	57.495	57.016	56.759	56.551	56.119	55.899	55.717	55.341	54.99	54.664	54.499	54.363
EXISTING SURFACE	57.972	57.941	57.063	56.714	56.462	55.681	55.278	55.008	54.53	54.004	53.383	53.058	52.775
CHAINAGE	170.000	170.337	180.000	185.458	190.000	200.000	205.378	210.000	220.000	230.000	240.000	245.378	250.000

FINISHED SURFACE	54.253	54.087	53.836	53.609	53.498	53.405	53.401	53.154	52.797	52.795	52.788	52.333
EXISTING SURFACE	52.528	52.092	51.99	52.566	52.704	52.786	52.79	52.886	53.094	53.095	53.102	53.015
CHAINAGE	253.879	260.000	270.000	280.000	285.378	290.000	290.220	300.000	310.000	310.049	310.220	320.000

LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON
DESIGNED: J. CARROLL
JOB MANAGER: B. LAWRENCE
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
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

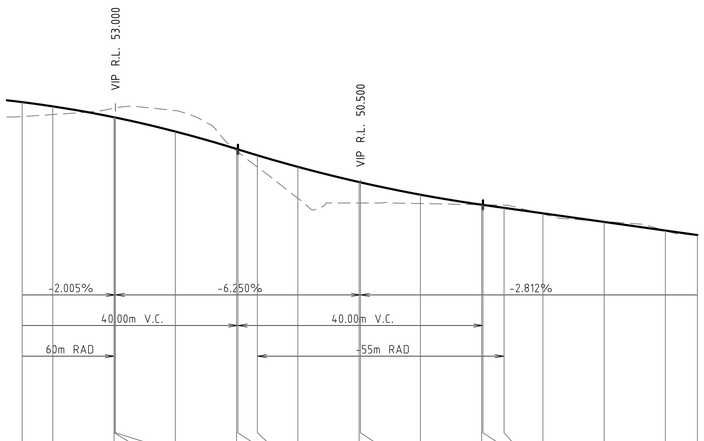
ROAD LONGITUDINAL SECTIONS - SHEET 01

JOB NUMBER
SY222070

DRAWING NUMBER
DAC5101

REVISION
02

DRAWING SHEET SIZE = A1



DRAWN: V. CHON   DESIGNED: J. CARROLL   JOB MANAGER: B. LAWRENCE   VERIFIER:

FINISHED SURFACE	53.293	53.154	52.797	52.795	52.788	52.333	51.764	51.75	51.556	51.18
EXISTING SURFACE	52.819	52.886	53.094	53.095	53.102	53.015	51.706	51.669	51.176	50.155
CHAINAGE	295.000	300.000	310.000	310.049	310.220	320.000	330.000	330.220	333.399	340.000

FINISHED SURFACE	50.682	50.672	50.27	49.944	49.938	49.841	49.662	49.381	49.1	48.953
EXISTING SURFACE	50	50	49.983	49.943	49.942	49.928	49.64	49.396	49.095	48.953
CHAINAGE	350.000	350.220	360.000	370.000	370.220	373.668	380.000	390.000	400.000	405.220

LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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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
CADDENS CORNER
O'CONNELL STREET, CADDENS

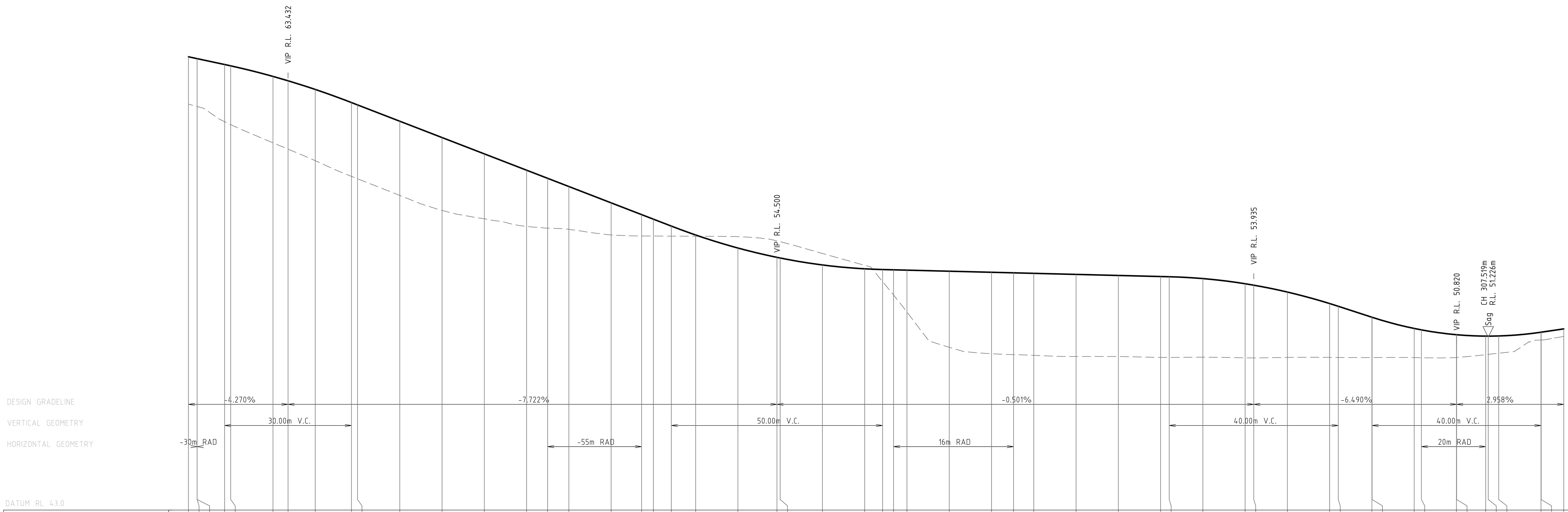
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION

ROAD LONGITUDINAL
SECTIONS - SHEET 02

JOB NUMBER
SY222070

DRAWING NUMBER **DAC5102**
REVISION **02**

DRAWING SHEET SIZE = A1



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0.000	64.438	62.199
2.044	64.351	62.087
2.045	64.351	62.087
8.559	64.073	61.369
10.000	64.01	61.232
20.000	63.509	60.368
23.559	63.303	60.07
30.000	62.893	59.524
38.559	62.274	58.782
40.000	62.163	58.669
50.000	61.39	57.881
60.000	60.618	57.172
70.000	59.846	56.776
80.000	59.074	56.413
84.971	58.69	56.335
90.000	58.302	56.276
100.000	57.529	56.01
107.208	56.973	55.963
110.000	56.757	55.961
114.233	56.43	55.957
120.000	56.009	55.952
130.000	55.392	55.932
139.233	54.951	55.73
140.000	54.92	55.693
150.000	54.592	55.136
160.000	54.409	54.577
164.233	54.375	53.801
166.826	54.362	53.171
170.000	54.346	52.366
180.000	54.296	50.696
190.000	54.246	50.394
195.218	54.22	50.351
200.000	54.196	50.318
210.000	54.146	50.264
220.000	54.095	50.261
230.000	54.045	50.221
232.044	54.035	50.22
240.000	53.948	50.23
250.000	53.704	50.2
252.044	53.636	50.196
260.000	53.31	50.22
270.000	52.767	50.221
272.044	52.637	50.218
280.000	52.121	50.214
280.044	52.118	50.214
290.000	51.589	50.213
291.700	51.522	50.205
300.000	51.293	50.216
300.044	51.292	50.216
306.921	51.227	50.349
307.519	51.226	50.363
310.000	51.234	50.417
320.000	51.41	51.042
320.044	51.412	51.042
325.386	51.57	51.213

LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

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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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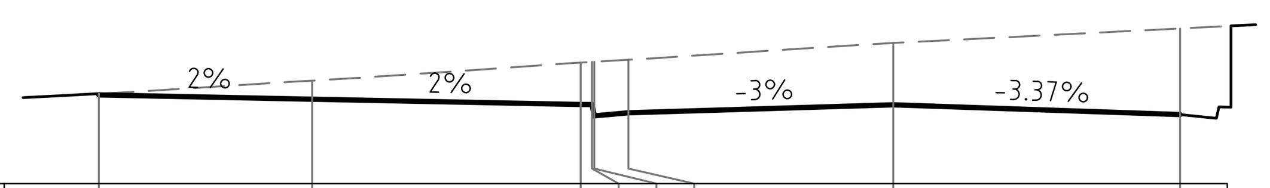
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
ROAD LONGITUDINAL SECTIONS - SHEET 03

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC5103**
REVISION **02**
DRAWING SHEET SIZE = A1

LEGEND	
(solid line)	FINISHED SURFACE
(dashed line)	EXISTING SURFACE

Centreline Data
X = 290523.253
Y = 6261102.667
Z = 58.043

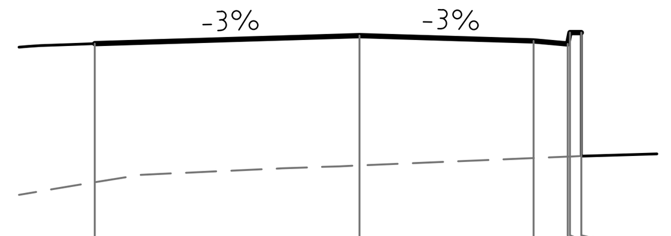


DATUM RL 57.0

FINISHED SURFACE	58.176	58.119	58.048	58.048	57.898	57.938	58.043	57.916
EXISTING SURFACE	58.192	58.365	58.604	58.613	58.615	58.641	58.863	59.055
OFFSET	-10.500	-7.680	-4.130	-3.980	-3.950	-3.500	0.000	3.791

CHAINAGE 160.000

Centreline Data
X = 290513.301
Y = 6261003.311
Z = 63.842

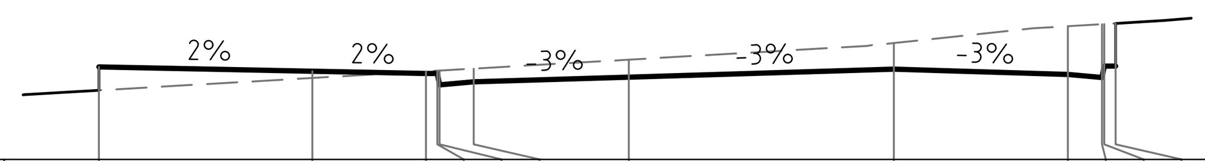


DATUM RL 61.0

FINISHED SURFACE	63.737	63.842	63.773	63.733	63.883	63.883
EXISTING SURFACE	61.903	62.125	62.223	62.242	62.243	62.249
OFFSET	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 60.000

Centreline Data
X = 290522.207
Y = 6261082.807
Z = 59.192

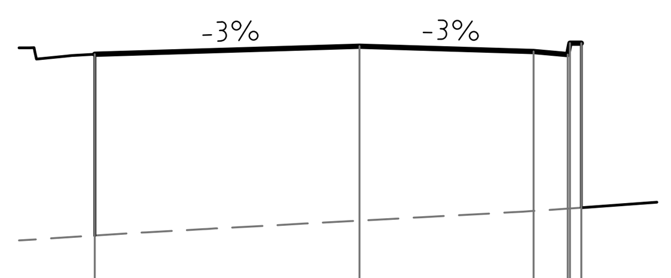


DATUM RL 58.0

FINISHED SURFACE	59.222	59.166	59.136	59.136	58.986	59.026	59.087	59.192	59.123	59.083	59.233	59.233
EXISTING SURFACE	58.913	59.076	59.163	59.172	59.173	59.200	59.318	59.537	59.760	59.786	59.788	59.797
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 140.000

Centreline Data
X = 290513.276
Y = 6260983.316
Z = 64.681



DATUM RL 61.0

FINISHED SURFACE	64.576	64.681	64.612	64.572	64.722	64.722
EXISTING SURFACE	62.184	62.382	62.509	62.539	62.542	62.553
OFFSET	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 40.000

Centreline Data
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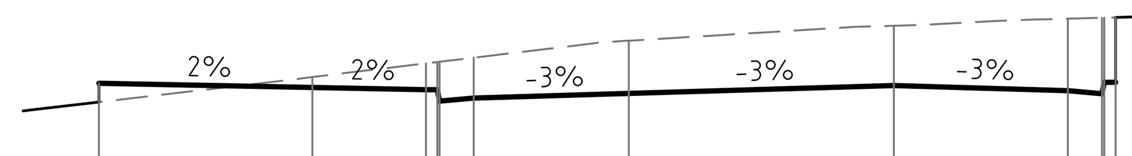
Y = 6261062.939
Z = 60.433

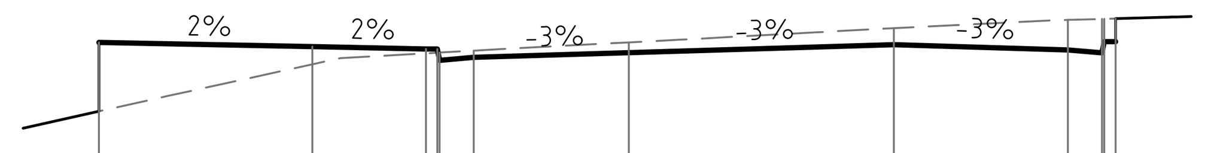


DATUM RL 59.0

FINISHED SURFACE	60.463	60.407	60.377	60.377	60.227	60.267	60.328	60.433	60.364	60.324	60.474	60.474
EXISTING SURFACE	60.215	60.544	60.725	60.743	60.746	60.800	61.024	61.220	61.313	61.325	61.326	61.330
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 120.000

Centreline Data
X = 290517.610
Y = 6261043.072
Z = 61.678

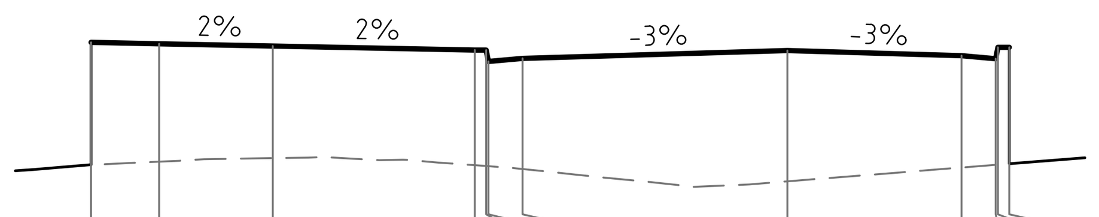


DATUM RL 60.0

FINISHED SURFACE	61.708	61.652	61.622	61.622	61.472	61.512	61.573	61.678	61.609	61.569	61.719	61.719
EXISTING SURFACE	60.797	61.419	61.564	61.572	61.574	61.599	61.709	61.896	62.006	62.018	62.019	62.023
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 100.000

Centreline Data
X = 290511.373
Y = 6260963.413
Z = 65.360

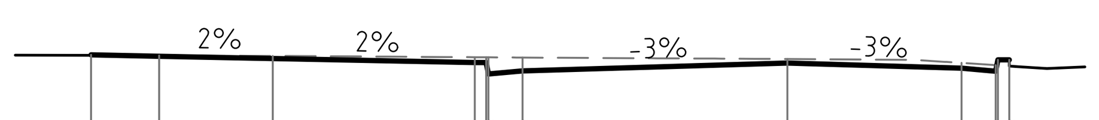


DATUM RL 63.0

FINISHED SURFACE	65.466	65.448	65.418	65.365	65.365	65.215	65.255	65.360	65.291	65.251	65.401	65.401
EXISTING SURFACE	63.852	63.894	63.940	63.847	63.836	63.834	63.798	63.634	63.817	63.852	63.855	63.867
OFFSET	-9.200	-8.300	-6.800	-4.130	-3.980	-3.950	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 20.000

Centreline Data
X = 290509.074
Y = 6260943.545
Z = 65.960

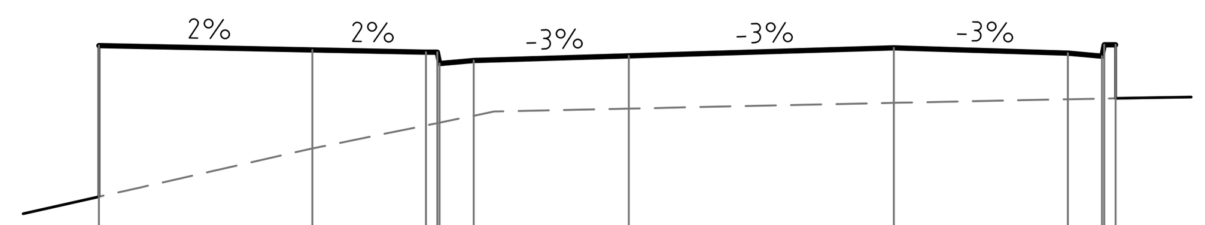


DATUM RL 65.0

FINISHED SURFACE	66.066	66.048	66.018	65.965	65.965	65.815	65.855	65.960	65.891	65.851	66.001	66.001
EXISTING SURFACE	66.061	66.058	66.053	66.036	66.035	66.035	66.032	66.012	65.961	65.931	65.929	65.919
OFFSET	-9.200	-8.300	-6.800	-4.130	-3.980	-3.950	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 0.000

Centreline Data
X = 290515.311
Y = 6261023.204
Z = 62.841

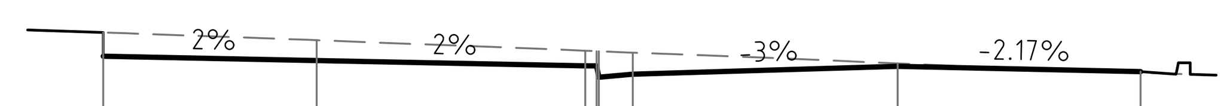


DATUM RL 60.0

FINISHED SURFACE	62.871	62.814	62.784	62.784	62.634	62.674	62.736	62.841	62.772	62.732	62.882	62.882
EXISTING SURFACE	60.875	61.512	61.817	61.847	61.853	61.945	62.039	62.115	62.162	62.170	62.171	62.174
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930

CHAINAGE 80.000

Centreline Data
X = 290509.898
Y = 6261116.306
Z = 57.026



DATUM RL 56.0

FINISHED SURFACE	57.158	57.102	57.031	57.031	56.881	56.921	57.026	56.956
EXISTING SURFACE	57.471	57.370	57.231	57.225	57.224	57.205	57.063	56.940
OFFSET	-10.500	-7.680	-4.130	-3.980	-3.950	-3.500	0.000	3.210

CHAINAGE 180.000

HORIZONTAL SCALE 1:100@A1
VERTICAL SCALE 1:100@A1

VERIFIER:
JOB MANAGER: B. LAWRENCE
DESIGNED: J. CARROLL
DRAWN: V. CHON

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
HOLDMARK PROPERTY GROUP PTY LTD
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT
TURNER

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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:100 @ A1 0 1 2 3 4 5m

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

PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
CROSS SECTIONS - SHEET 01

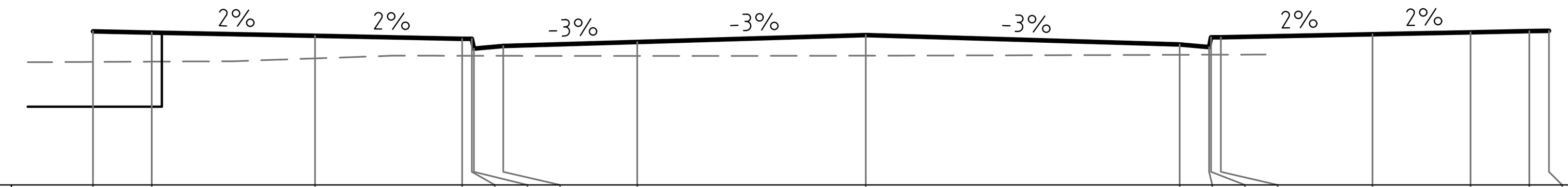
JOB NUMBER
SY222070
DRAWING NUMBER
DAC5201
REVISION
02
DRAWING SHEET SIZE = A1

LEGEND

FINISHED SURFACE

EXISTING SURFACE

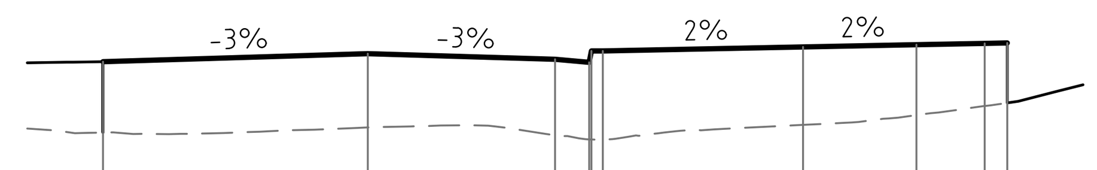
Centreline Data
X = 290352.638
Y = 6261174.400
Z = 50.298
DATUM RL 48.0



FINISHED SURFACE	50.355	50.337	50.287	50.242	50.242	50.092	50.132	50.193	50.298	50.154	50.114	50.264	50.264	50.311	50.341	50.359	50.365
EXISTING SURFACE	49.887	49.891	49.941	49.981	49.981	49.981	49.980	49.979	49.983	49.996	49.997	49.997	49.998				
OFFSET	-11.830	-10.930	-8.430	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	4.804	5.254	5.284	5.434	7.757	9.257	10.157	10.457

CHAINAGE 360.000

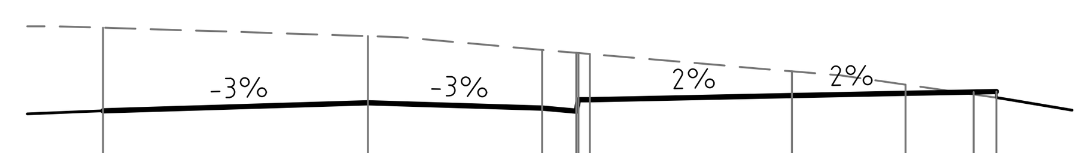
Centreline Data
X = 290368.864
Y = 6261162.898
Z = 51.129
DATUM RL 49.0



FINISHED SURFACE	51.024	51.129	51.055	51.015	51.165	51.165	51.218	51.248	51.266	51.272
EXISTING SURFACE	50.087	50.155	50.052	49.997	49.996	49.995	50.189	50.317	50.438	50.479
OFFSET	-3.500	0.000	2.474	2.924	2.954	3.104	5.749	7.249	8.149	8.449

CHAINAGE 340.000

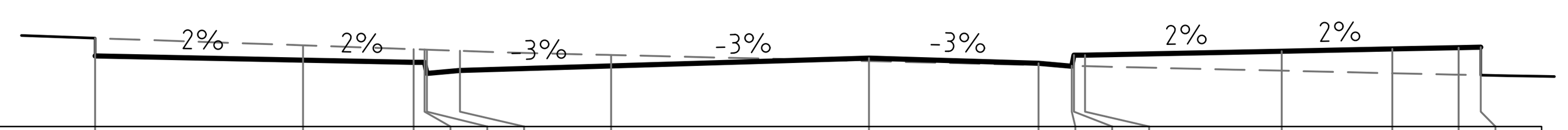
Centreline Data
X = 290381.309
Y = 6261147.257
Z = 52.137
DATUM RL 51.0



FINISHED SURFACE	52.032	52.137	52.068	52.028	52.178	52.178	52.232	52.262	52.280	52.286
EXISTING SURFACE	53.126	53.015	52.834	52.796	52.793	52.781	52.552	52.376	52.247	52.204
OFFSET	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300

CHAINAGE 320.000

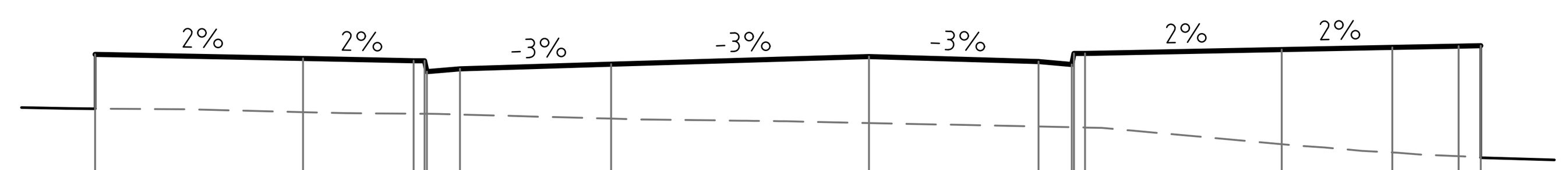
Centreline Data
X = 290394.088
Y = 6261131.910
Z = 52.926
DATUM RL 52.0



FINISHED SURFACE	52.956	52.900	52.870	52.870	52.720	52.760	52.821	52.926	52.857	52.817	52.967	52.967	53.021	53.051	53.069	53.075
EXISTING SURFACE	53.197	53.101	53.048	53.043	53.042	53.026	52.969	52.886	52.833	52.822	52.822	52.818	52.757	52.721	52.701	52.695
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300

CHAINAGE 300.000

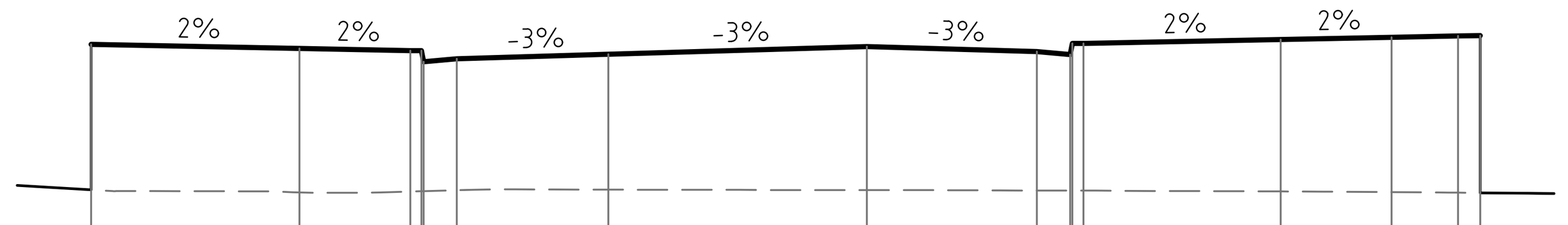
Centreline Data
X = 290410.693
Y = 6261120.928
Z = 53.471
DATUM RL 51.0



FINISHED SURFACE	53.501	53.445	53.415	53.415	53.265	53.305	53.366	53.471	53.402	53.362	53.512	53.512	53.566	53.596	53.614	53.620
EXISTING SURFACE	52.761	52.714	52.693	52.692	52.691	52.682	52.626	52.566	52.518	52.509	52.508	52.505	52.278	52.166	52.115	52.094
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300

CHAINAGE 280.000

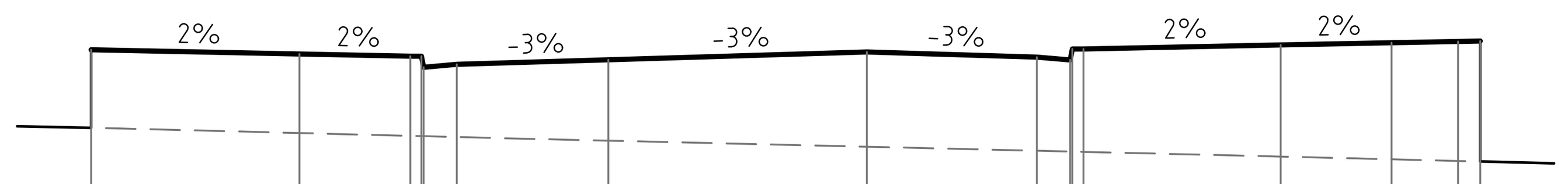
Centreline Data
X = 290429.976
Y = 6261115.983
Z = 54.034
DATUM RL 51.0



FINISHED SURFACE	54.064	54.007	53.977	53.977	53.827	53.867	53.929	54.034	53.965	53.925	54.075	54.075	54.128	54.158	54.176	54.182
EXISTING SURFACE	52.096	52.060	52.072	52.076	52.077	52.090	52.098	52.092	52.086	52.086	52.086	52.085	52.074	52.065	52.058	52.055
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300

CHAINAGE 260.000

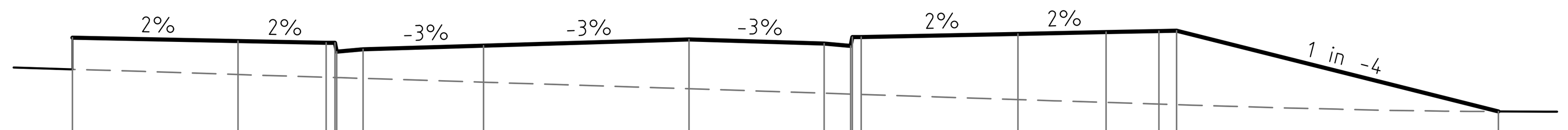
Centreline Data
X = 290449.968
Y = 6261116.025
Z = 54.665
DATUM RL 52.0



FINISHED SURFACE	54.695	54.639	54.609	54.609	54.459	54.499	54.560	54.665	54.596	54.556	54.706	54.706	54.760	54.790	54.808	54.814
EXISTING SURFACE	53.638	53.568	53.530	53.526	53.526	53.514	53.465	53.383	53.329	53.318	53.317	53.314	53.250	53.213	53.191	53.183
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300

CHAINAGE 240.000

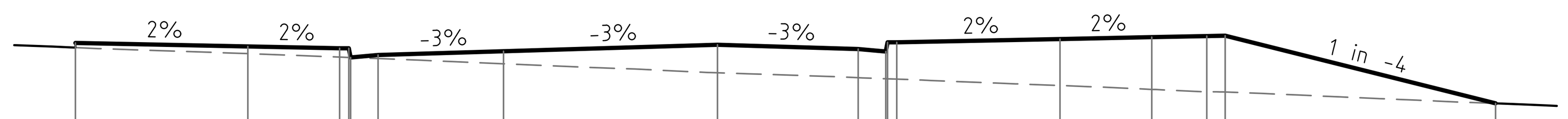
Centreline Data
X = 290469.965
Y = 6261116.378
Z = 55.366
DATUM RL 53.0



FINISHED SURFACE	55.396	55.340	55.310	55.310	55.160	55.200	55.261	55.366	55.297	55.257	55.407	55.407	55.461	55.491	55.509	55.515	54.145
EXISTING SURFACE	54.859	54.772	54.725	54.721	54.720	54.706	54.641	54.530	54.455	54.440	54.439	54.434	54.346	54.298	54.270	54.260	54.145
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300	13.780

CHAINAGE 220.000

Centreline Data
X = 290489.962
Y = 6261116.732
Z = 56.139
DATUM RL 54.0



FINISHED SURFACE	56.169	56.112	56.082	56.082	55.932	55.972	56.034	56.139	56.070	56.030	56.180	56.180	56.233	56.263	56.281	56.287	55.181
EXISTING SURFACE	56.093	55.995	55.938	55.932	55.931	55.914	55.828	55.681	55.601	55.584	55.583	55.577	55.474	55.410	55.370	55.367	55.181
OFFSET	-10.500	-7.680	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	2.300	2.750	2.780	2.930	5.600	7.100	8.000	8.300	12.722

CHAINAGE 200.000

HORIZONTAL SCALE 1:100@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON DESIGNED: J. CARROLL JOB MANAGER: B. LAWRENCE VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
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ARCHITECT
TURNER

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SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:100 @ A1 0 1 2 3 4 5m

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

PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

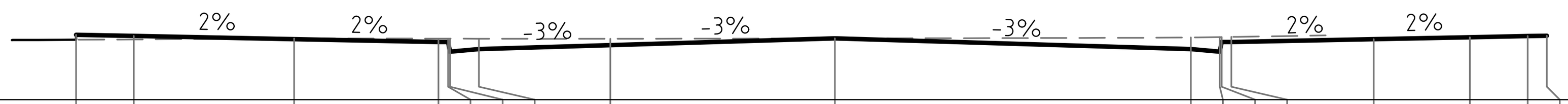
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
CROSS SECTIONS - SHEET 02

JOB NUMBER SY222070
DRAWING NUMBER DAC5202
REVISION 02
DRAWING SHEET SIZE = A1

LEGEND	
———	FINISHED SURFACE
— — —	EXISTING SURFACE

Centreline Data
X = 290308.652
Y = 6261184.412
Z = 48.953

DATUM RL 48.0

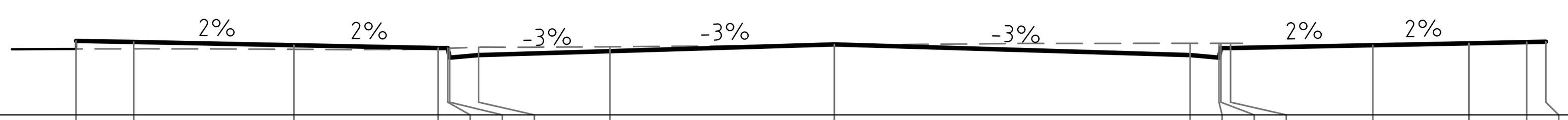


FINISHED SURFACE	49.010	48.992	48.942	48.897	48.897	48.747	48.787	48.848	48.953	48.787	48.747	48.897	48.897	48.941	48.971	48.989	48.995
EXISTING SURFACE	48.932	48.937	48.951	48.950	48.949	48.949	48.948	48.947	48.953	48.968	48.974	48.974	48.976				
OFFSET	-11.830	-10.930	-8.430	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	5.550	6.000	6.030	6.180	8.400	9.900	10.800	11.100

CHAINAGE 405.220

Centreline Data
X = 290313.781
Y = 6261183.445
Z = 49.105

DATUM RL 48.0

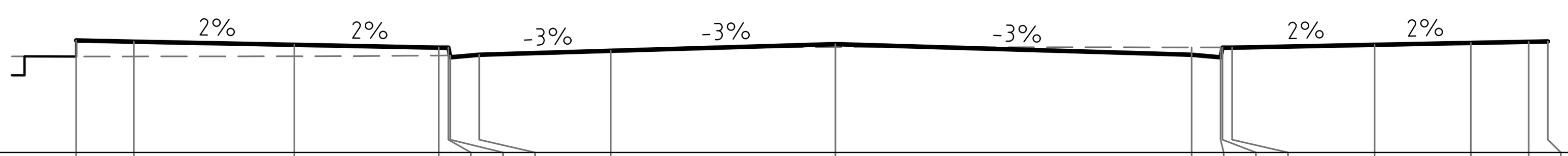


FINISHED SURFACE	49.161	49.143	49.093	49.048	49.048	48.898	48.938	49.000	49.105	48.938	48.898	49.048	49.048	49.093	49.123	49.141	49.147
EXISTING SURFACE	49.034	49.036	49.028	49.041	49.046	49.046	49.060	49.069	49.095	49.121	49.121	49.121	49.121				
OFFSET	-11.830	-10.930	-8.430	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	5.550	6.000	6.030	6.180	8.400	9.900	10.800	11.100

CHAINAGE 400.000

Centreline Data
X = 290333.435
Y = 6261179.740
Z = 49.685

DATUM RL 48.0



FINISHED SURFACE	49.742	49.724	49.674	49.629	49.629	49.479	49.519	49.580	49.685	49.519	49.479	49.629	49.629	49.673	49.703	49.721	49.727
EXISTING SURFACE	49.493	49.493	49.497	49.508	49.509	49.509	49.514	49.561	49.640	49.634	49.633						
OFFSET	-11.830	-10.930	-8.430	-6.180	-6.030	-6.000	-5.550	-3.500	0.000	5.550	6.000	6.030	6.180	8.400	9.900	10.800	11.100

CHAINAGE 380.000

HORIZONTAL SCALE 1:100@A1
VERTICAL SCALE 1:100@A1

DRAWN: V. CHON   DESIGNED: J. CARROLL   JOB MANAGER: B. LAWRENCE   VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	AF		JC	22.12.22
02	ISSUED FOR DA APPROVAL	UM		JC	08.03.23

CLIENT
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ARCHITECT
TURNER

SCALE 1:100 @ A1 0 1 2 3 4 5m
SCALE 1:100 @ A1 0 1 2 3 4 5m

NORTHROP
Sydney
Level 11 345 George Street, Sydney NSW 2000
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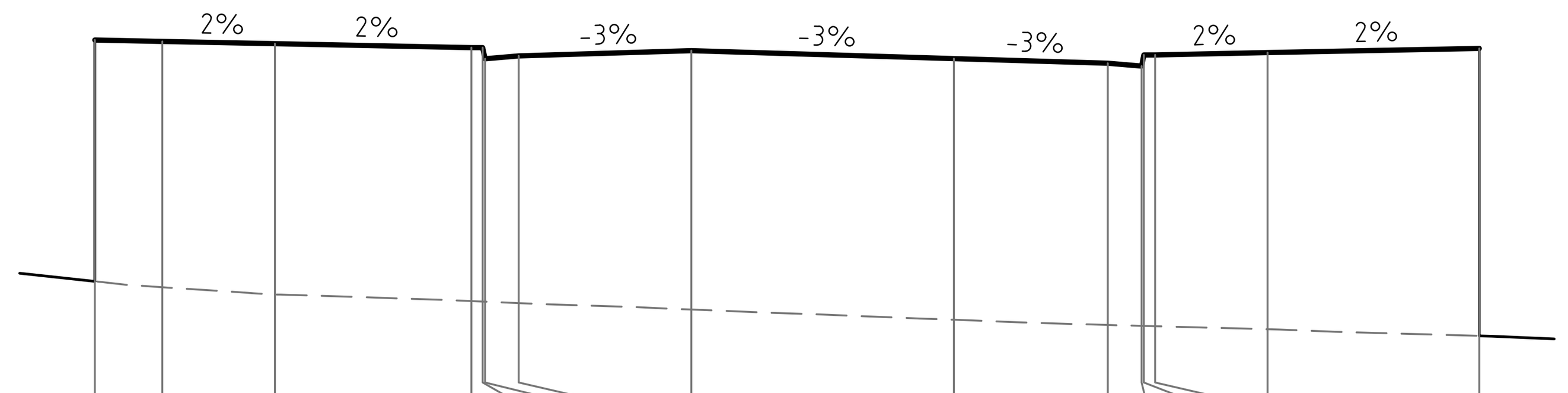
Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
CROSS SECTIONS - SHEET 03

JOB NUMBER
SY222070
DRAWING NUMBER
DAC5203
REVISION
02
DRAWING SHEET SIZE = A1

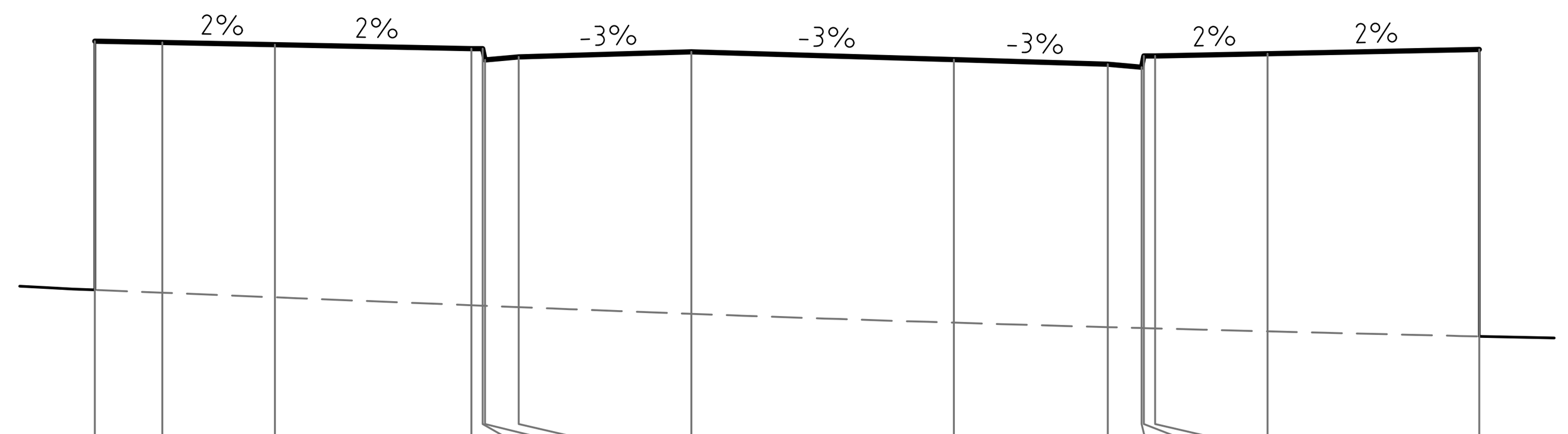


Centreline Data
X = 290457.215
Y = 6261010.543
Z = 60.618

DATUM RL 56.0

FINISHED SURFACE	60.760	60.742	60.712	60.659	60.659	60.509	60.549	60.618	60.513	60.452	60.412	60.562	60.562	60.592	60.648
EXISTING SURFACE	57.547	57.469	57.373	57.284	57.278	57.276	57.257	57.172	57.036	56.967	56.954	56.954	56.949	56.910	56.821
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 60.000

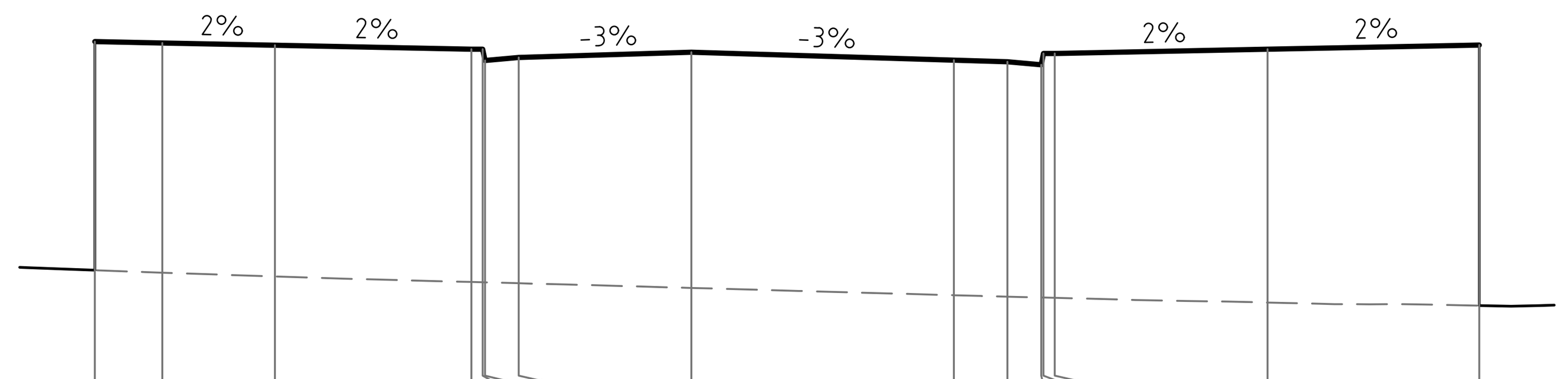


Centreline Data
X = 290475.947
Y = 6261003.534
Z = 62.163

DATUM RL 57.0

FINISHED SURFACE	62.304	62.286	62.256	62.204	62.204	62.054	62.094	62.163	62.058	61.996	61.956	62.106	62.106	62.136	62.192
EXISTING SURFACE	58.988	58.951	58.889	58.783	58.777	58.776	58.758	58.669	58.552	58.492	58.480	58.479	58.475	58.436	58.368
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 40.000

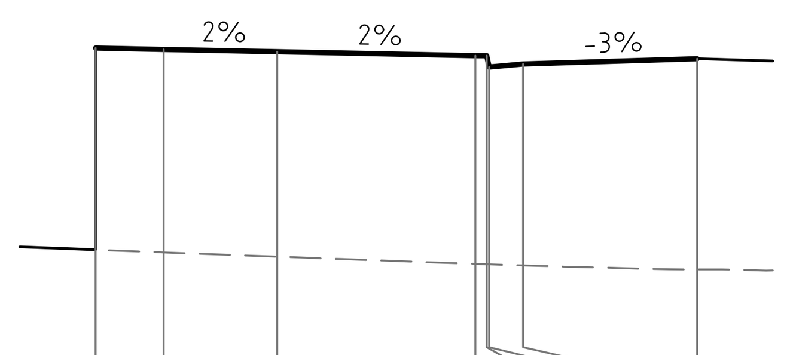


Centreline Data
X = 290494.679
Y = 6260996.526
Z = 63.509

DATUM RL 59.0

FINISHED SURFACE	63.650	63.632	63.602	63.550	63.550	63.400	63.440	63.509	63.404	63.382	63.342	63.492	63.492	63.549	63.606
EXISTING SURFACE	60.605	60.572	60.521	60.448	60.444	60.443	60.431	60.368	60.272	60.253	60.242	60.241	60.237	60.174	60.133
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	4.213	4.663	4.693	4.843	7.680	10.500

CHAINAGE 20.000

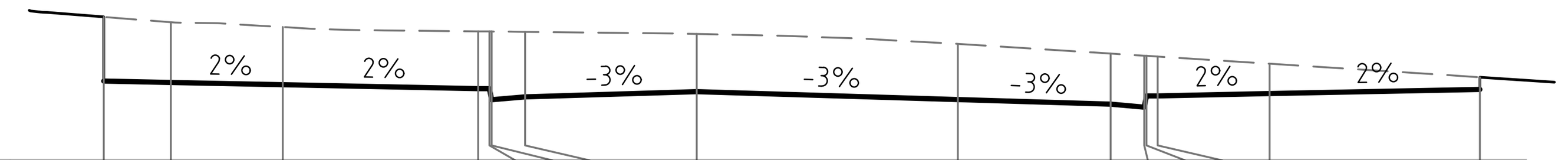


Centreline Data
X = 290503.977
Y = 6260993.047
Z = 64.007

DATUM RL 60.0

FINISHED SURFACE	64.148	64.130	64.100	64.048	64.048	63.898	63.938	64.007
EXISTING SURFACE	61.485	61.451	61.395	61.300	61.295	61.294	61.279	61.225
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000

CHAINAGE 10.072

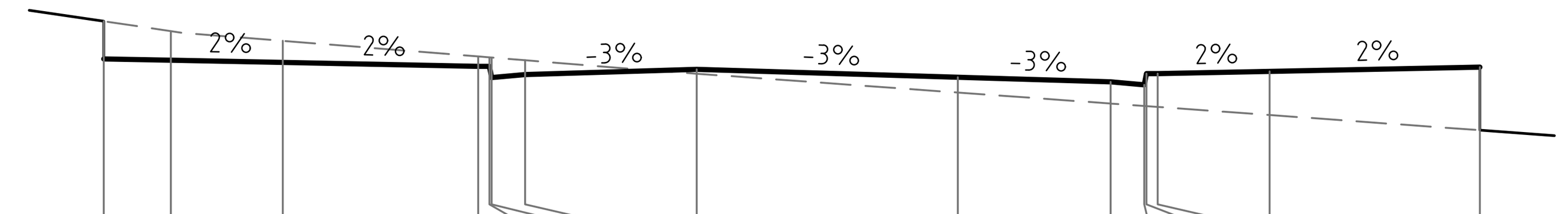


Centreline Data
X = 290379.253
Y = 6261021.204
Z = 54.920

DATUM RL 54.0

FINISHED SURFACE	55.062	55.044	55.014	54.961	54.961	54.811	54.851	54.920	54.815	54.754	54.714	54.864	54.864	54.894	54.950
EXISTING SURFACE	55.921	55.849	55.785	55.727	55.726	55.726	55.721	55.693	55.560	55.430	55.402	55.400	55.390	55.295	55.113
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 140.000

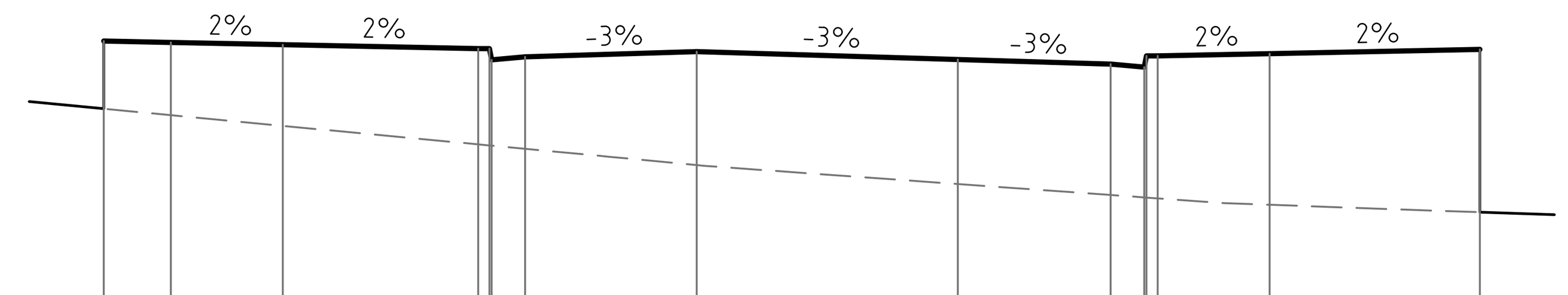


Centreline Data
X = 290399.231
Y = 6261022.130
Z = 56.009

DATUM RL 54.0

FINISHED SURFACE	56.151	56.133	56.103	56.050	56.050	55.900	55.940	56.009	55.904	55.843	55.803	55.953	55.953	55.983	56.039
EXISTING SURFACE	56.655	56.522	56.392	56.183	56.171	56.168	56.132	55.952	55.699	55.552	55.519	55.517	55.506	55.398	55.194
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 120.000

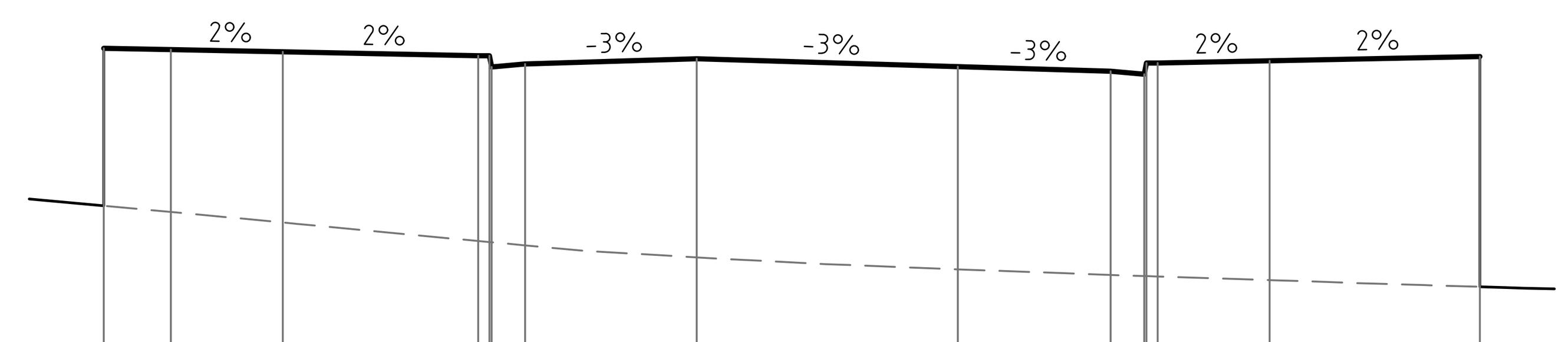


Centreline Data
X = 290419.211
Y = 6261022.583
Z = 57.529

DATUM RL 54.0

FINISHED SURFACE	57.671	57.653	57.623	57.570	57.570	57.420	57.460	57.529	57.424	57.363	57.323	57.473	57.473	57.503	57.559
EXISTING SURFACE	56.765	56.679	56.536	56.288	56.274	56.271	56.228	56.010	55.757	55.610	55.577	55.575	55.564	55.479	55.379
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 100.000



Centreline Data
X = 290438.483
Y = 6261017.551
Z = 59.074

DATUM RL 55.0

FINISHED SURFACE	59.215	59.197	59.167	59.115	59.115	58.965	59.005	59.074	58.969	58.907	58.867	59.017	59.017	59.047	59.104
EXISTING SURFACE	57.104	57.022	56.880	56.632	56.618	56.615	56.574	56.413	56.252	56.177	56.162	56.161	56.156	56.108	56.018
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 80.000

HORIZONTAL SCALE 1:100@A1
VERTICAL SCALE 1:100@A1

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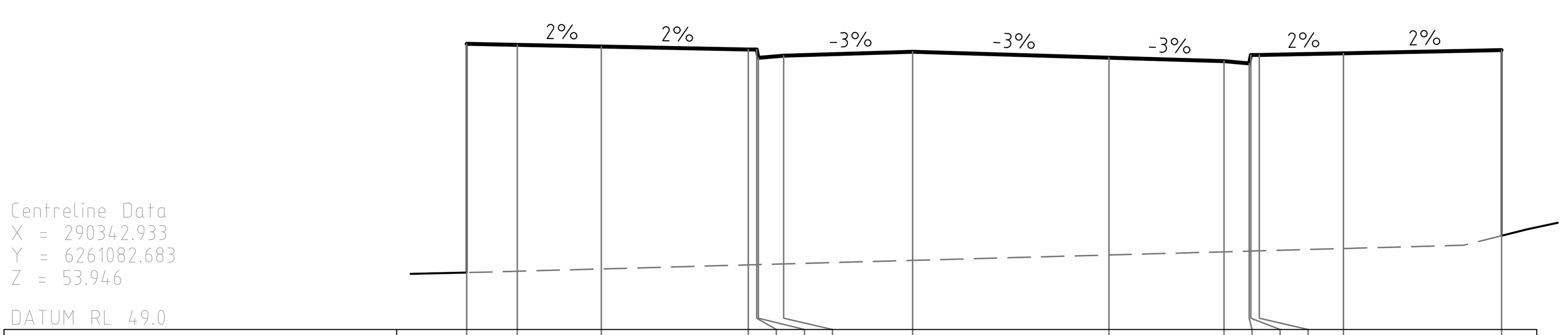
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
CROSS SECTIONS - SHEET 04

JOB NUMBER
SY222070
DRAWING NUMBER
DAC5204
REVISION
02
DRAWING SHEET SIZE = A1

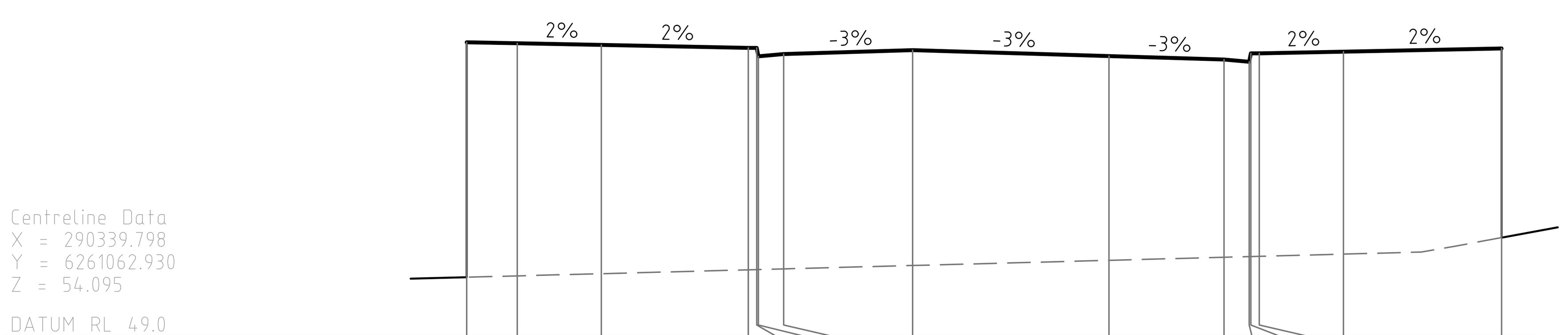
LEGEND

——— (solid line)	FINISHED SURFACE
– – – (dashed line)	EXISTING SURFACE



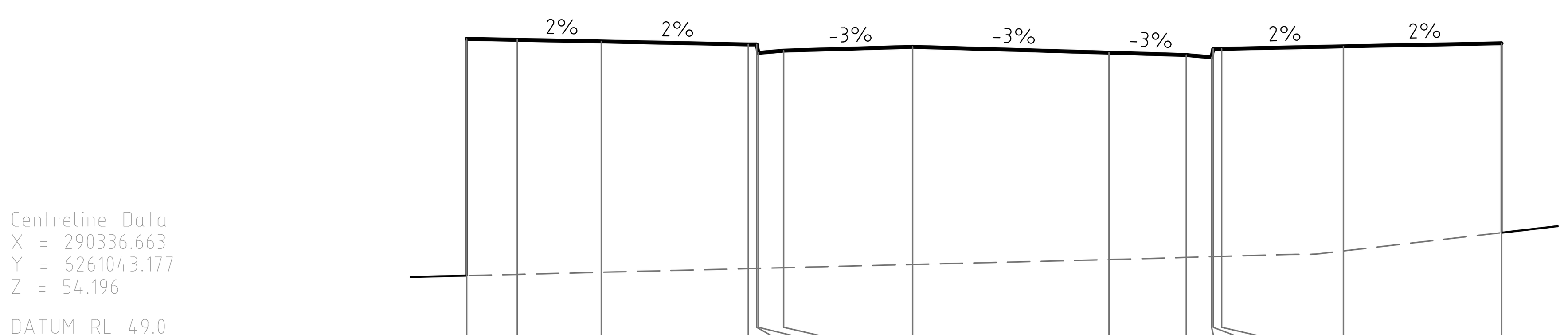
FINISHED SURFACE	54.088	54.070	54.040	53.987	53.987	53.837	53.877	53.946	53.841	53.780	53.740	53.890	53.890	53.920	53.976
EXISTING SURFACE	50.013	50.037	50.078	50.150	50.154	50.155	50.167	50.230	50.327	50.383	50.395	50.396	50.400	50.441	50.670
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 240.000



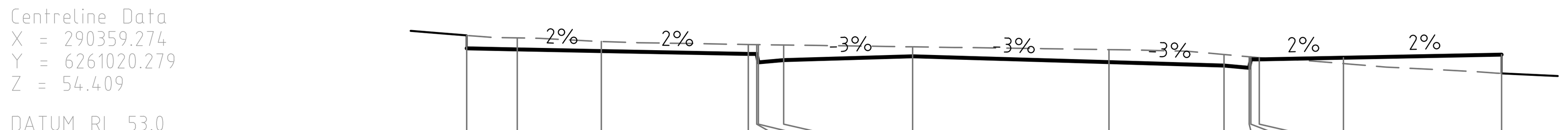
FINISHED SURFACE	54.237	54.219	54.189	54.136	54.136	53.986	54.026	54.095	53.990	53.929	53.889	54.039	54.039	54.069	54.125
EXISTING SURFACE	50.052	50.076	50.115	50.184	50.188	50.188	50.200	50.261	50.353	50.407	50.419	50.420	50.424	50.463	50.757
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 220.000



FINISHED SURFACE	54.337	54.319	54.289	54.237	54.237	54.087	54.127	54.196	54.091	54.049	54.009	54.159	54.159	54.203	54.259
EXISTING SURFACE	50.120	50.142	50.180	50.245	50.249	50.249	50.261	50.318	50.405	50.444	50.457	50.458	50.462	50.559	50.885
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	4.878	5.328	5.358	5.508	7.680	10.500

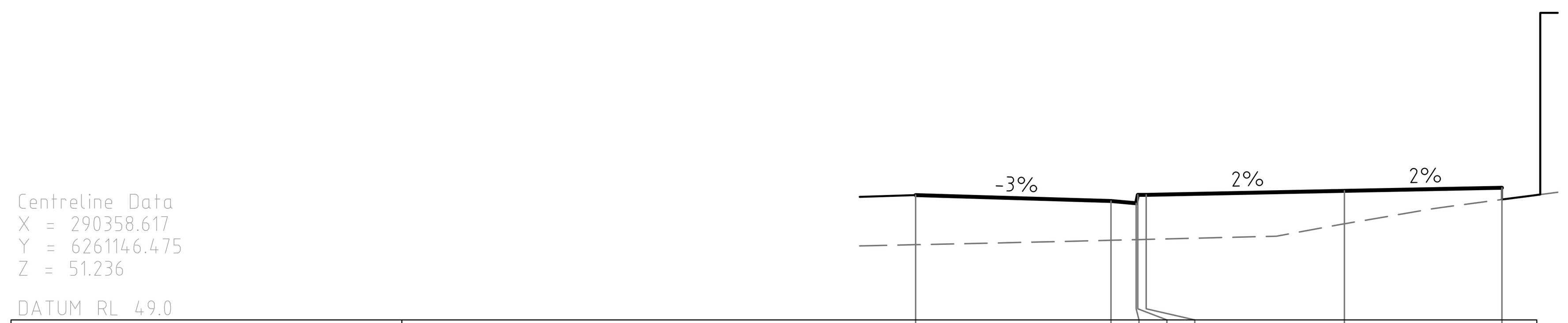
CHAINAGE 200.000



FINISHED SURFACE	54.550	54.532	54.502	54.450	54.450	54.300	54.340	54.409	54.304	54.242	54.202	54.352	54.352	54.382	54.439
EXISTING SURFACE	54.780	54.737	54.672	54.619	54.616	54.616	54.609	54.577	54.527	54.440	54.400	54.398	54.384	54.279	54.104
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

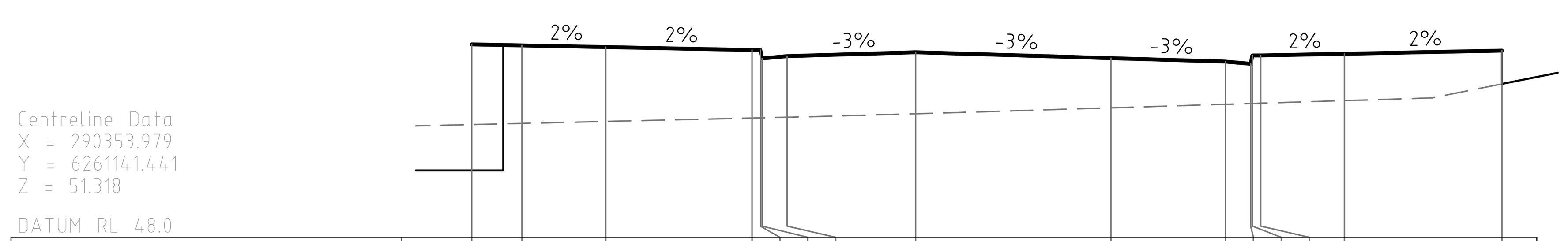
CHAINAGE 160.000

HORIZONTAL SCALE 1:100@A1
VERTICAL SCALE 1:100@A1



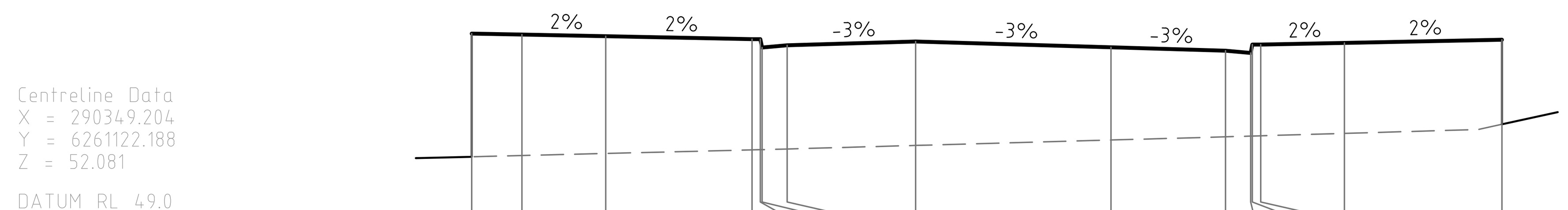
FINISHED SURFACE	51.236	51.131	51.091	51.241	51.241	51.312	51.368
EXISTING SURFACE	50.348	50.427	50.438	50.439	50.443	50.722	51.157
OFFSET	0.000	3.500	3.950	3.980	4.130	7.680	10.500

CHAINAGE 306.879



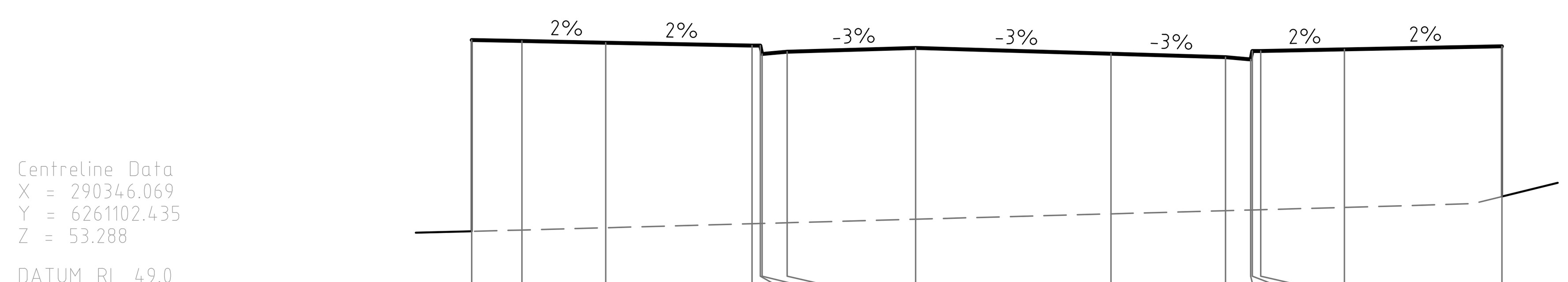
FINISHED SURFACE	51.460	51.442	51.412	51.359	51.359	51.209	51.249	51.318	51.213	51.152	51.112	51.262	51.262	51.292	51.348
EXISTING SURFACE	50.022	50.043	50.078	50.139	50.143	50.144	50.154	50.216	50.323	50.386	50.400	50.401	50.405	50.452	50.750
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 300.000



FINISHED SURFACE	52.222	52.204	52.174	52.122	52.122	51.972	52.012	52.081	51.976	51.914	51.874	52.024	52.024	52.054	52.110
EXISTING SURFACE	50.011	50.033	50.070	50.134	50.138	50.138	50.150	50.214	50.311	50.369	50.382	50.383	50.387	50.431	50.593
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 280.000



FINISHED SURFACE	53.429	53.411	53.381	53.329	53.329	53.179	53.219	53.288	53.183	53.121	53.081	53.231	53.231	53.261	53.318
EXISTING SURFACE	50.004	50.026	50.067	50.139	50.143	50.144	50.157	50.220	50.316	50.373	50.385	50.386	50.390	50.431	50.626
OFFSET	-7.950	-7.050	-5.550	-2.930	-2.780	-2.750	-2.300	0.000	3.500	5.550	6.000	6.030	6.180	7.680	10.500

CHAINAGE 260.000

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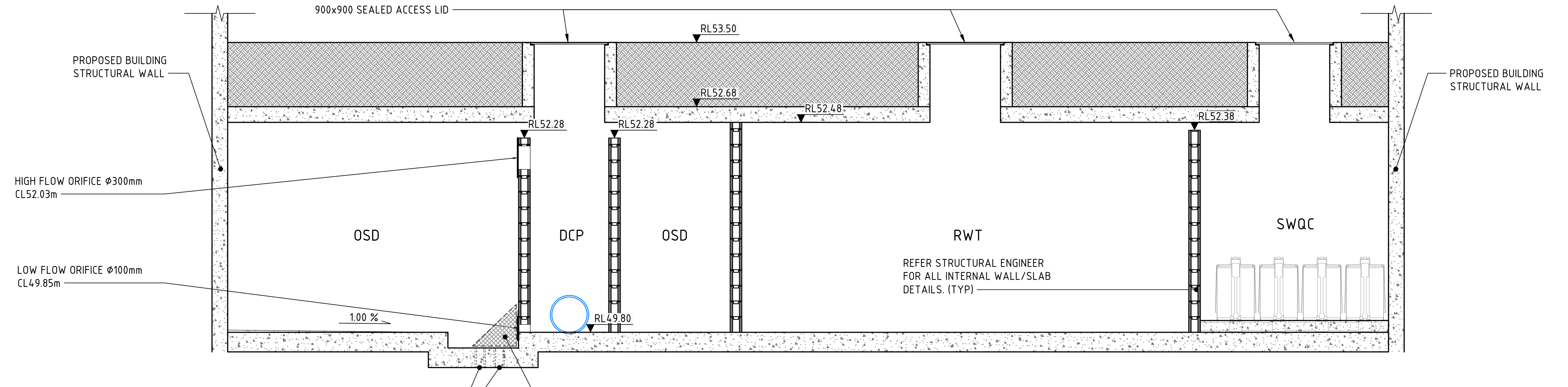
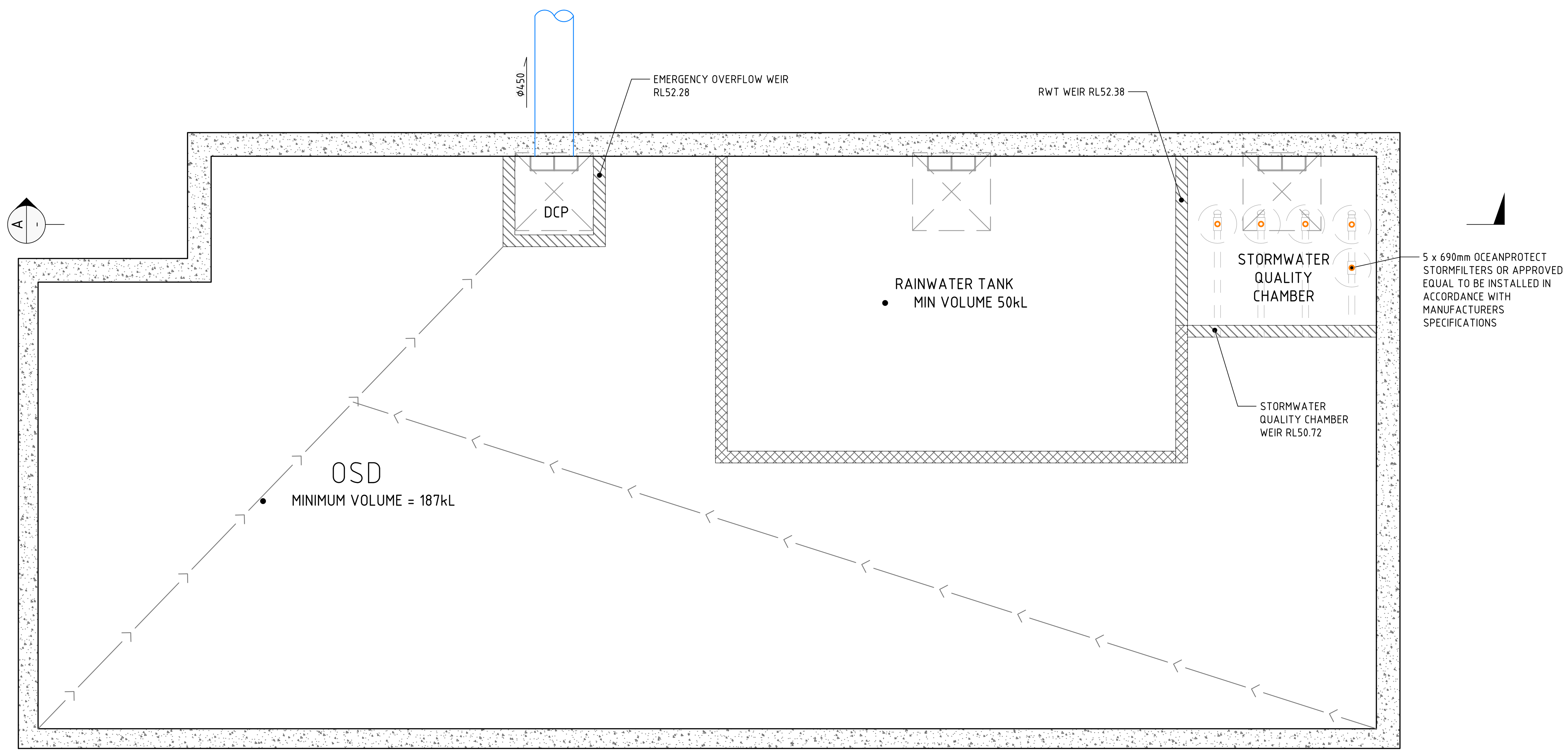
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
CROSS SECTIONS - SHEET 05

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC5205**
REVISION **02**
DRAWING SHEET SIZE = A1



SECTION A
SCALE 1:40



OSD CW PLAN - INDICATIVE LAYOUT

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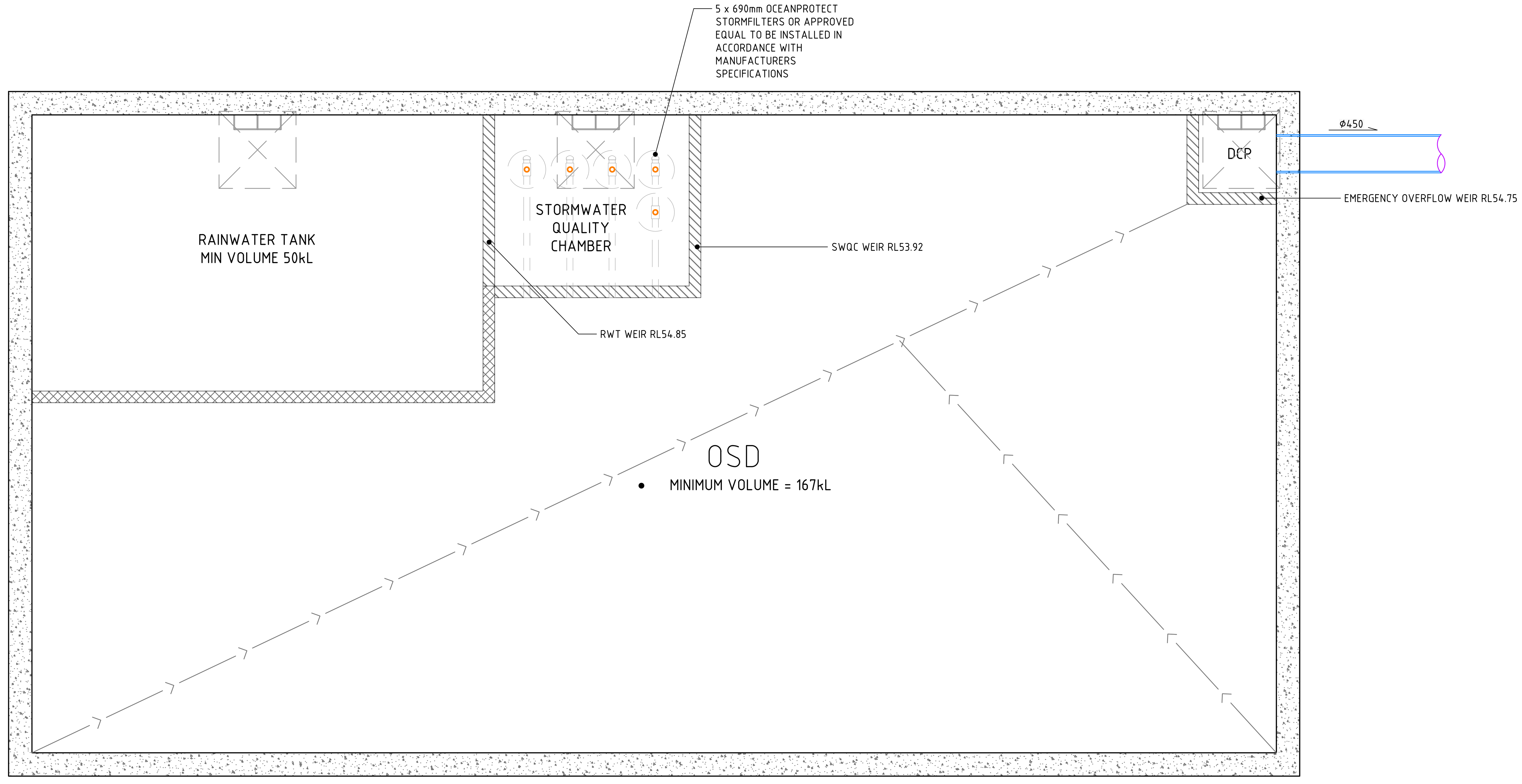
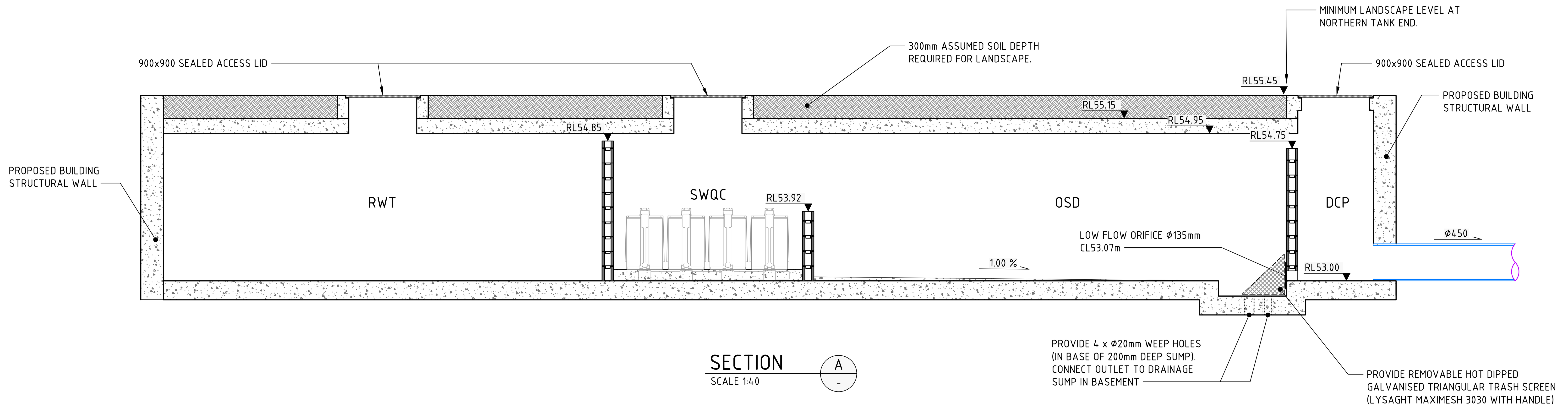
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
DETAILS - SHEET 01

JOB NUMBER **SY222070**
DRAWING NUMBER **DAC6101** REVISION **02**
DRAWING SHEET SIZE = A1



OSD CE PLAN - INDICATIVE LAYOUT



SECTION A
SCALE 1:40

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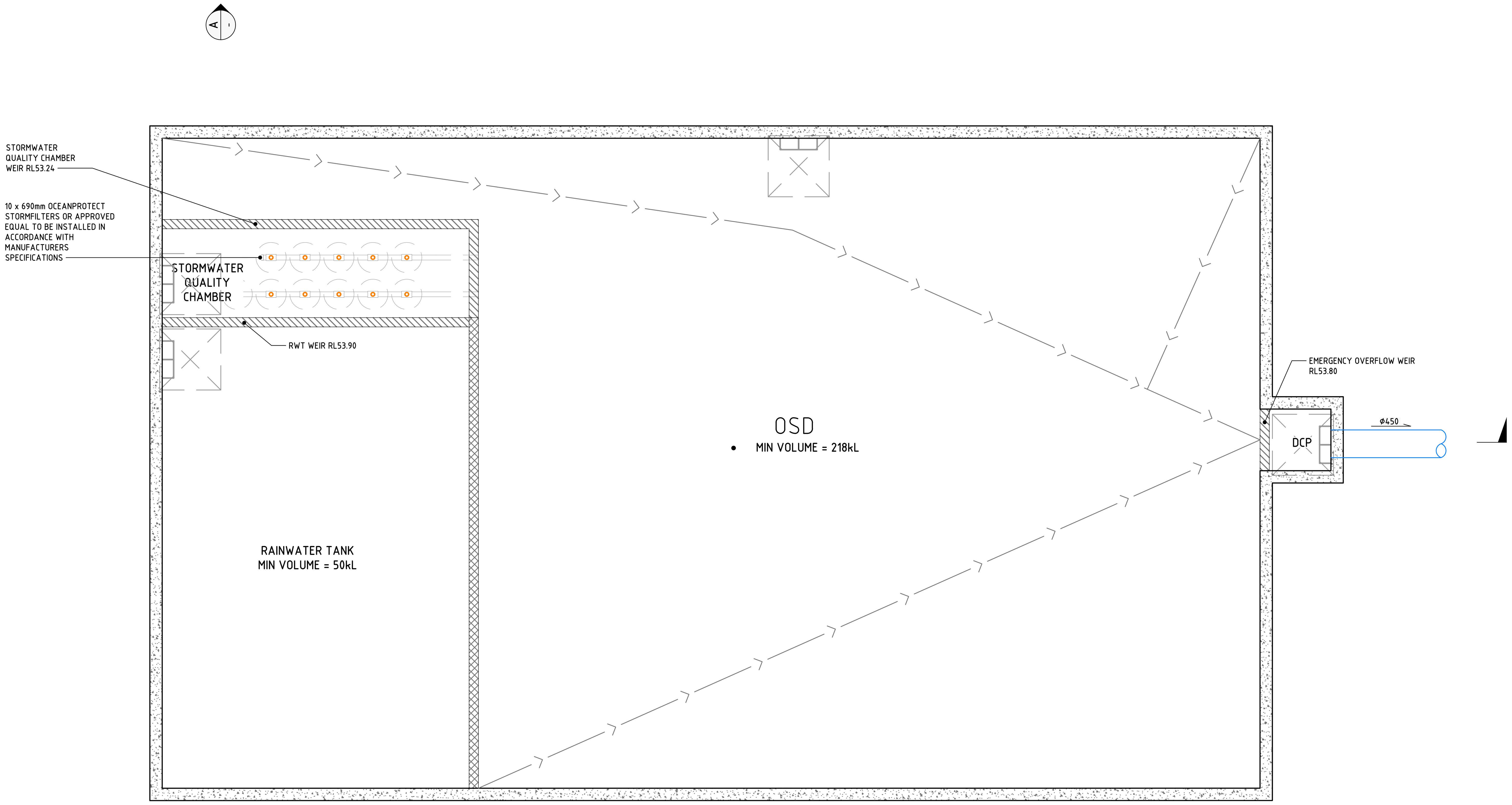
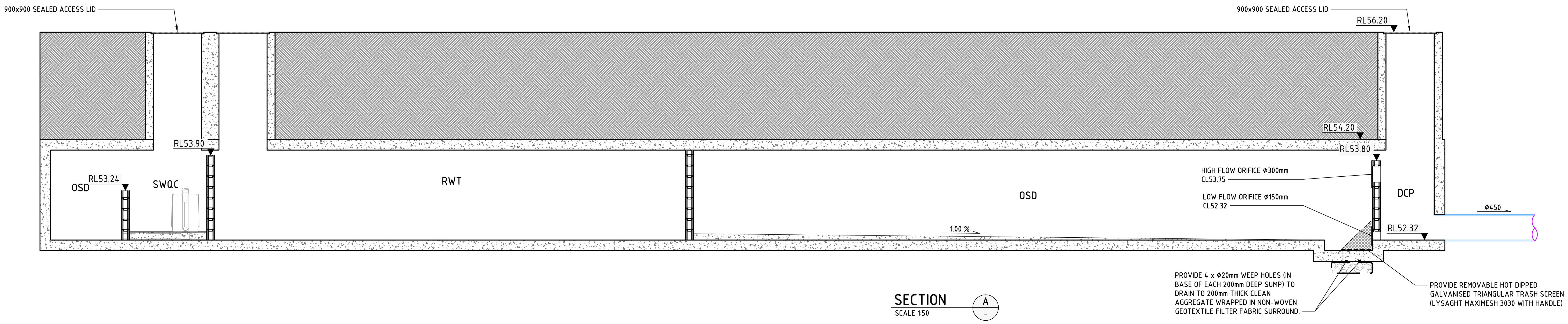
PROJECT
CADDENS CORNER
O'CONNELL STREET, CADDENS

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
DEVELOPMENT APPLICATION
DETAILS - SHEET 02

JOB NUMBER SY222070
DRAWING NUMBER DAC6102
REVISION 02
DRAWING SHEET SIZE = A1



OSD SOUTH PLAN - INDICATIVE LAYOUT



SECTION (A)
SCALE 1:50

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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PROJECT: CADDENS CORNER O'CONNELL STREET, CADDENS

DRAWING TITLE: CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION DETAILS - SHEET 03

JOB NUMBER: SY222070

DRAWING NUMBER: DAC6103 REVISION: 01

DRAWING SHEET SIZE = A1

Appendix B – Sediment Basin Sizing Calculations

1. Erosion Hazard and Sediment Basins

Site Name: Caddens Corner

Site Location: O'Connell Street, Kingswood

Precinct/Stage: N/A

Other Details: For Development Application Approval

Site area	Sub-catchment or Name of Structure						Notes
	Type D Sed						
Total catchment area (ha)	4.88						
Disturbed catchment area (ha)	4.88						

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D						From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)							Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D						Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5						See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80						
x-day, y-percentile rainfall event (mm)	27.4						
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)	9.53						

RUSLE Factors

Rainfall erosivity (*R*-factor)	2030						Auto-filled from above
Soil erodibility (*K*-factor)	0.075						RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	300						
Slope gradient (%)	4.5						
Length/gradient (*LS*-factor)	2.18						
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2	2	2	2	2	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.42						See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	431						
Soil Loss Class	4						See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	332						Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	270						See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	562						See Sections 6.3.4(i) for calculations

Sediment basin total volume (m^3)	832						

Appendix C – Flood Letter

Level 11, 345 George Street
Sydney NSW 2000
02 9241 4188
sydney@northrop.com.au
ABN 81 094 433 100

Ref: SY222070-00-CV-LE1-1
08 March 2023

Marvin Huang

HOLDMARK Property Group Pty Ltd
Suite 2/2-4 Giffnock Avenue
Macquarie Park NSW 2113

Dear Marvin,

Re: Caddens Corner – Flood Desktop Study

Northrop Consulting Engineers have undertaken a flood study for the proposed residential development at Caddens Corner, 68-80 O'Connell Street, Kingswood NSW 2747 (Lots 1 and 2, DP 1268507). As part of this flood study, relevant flood data was investigated with reference to the following resources:

- Penrith Development Control Plan 2014 (DCP)
- College, Orth and Werrington Creeks Catchment Overland Flow Flood Study 2017
- College, Orth and Werrington Creek Catchment Flood Risk Management Study and Plan 2021

It should be noted that the flood studies utilised do not account for the new Woolworths development to the proposed site's west (referenced DA17/0995 and CCX19/0047). The Woolworth's development included a new piped system to replace a portion of the existing channel to the site's north, and redirected sheet flow from the site's east via a swale system.
The proposed development proposes a similar approach by capturing off-site flows and directing into the Woolworth's pipe system. Flows from the north to be captured by the existing creek and directed into the Woolworth's pipe system via a new pit and pipe. Flows from the east are proposed to captured and conveyed within the road reserve and street stormwater network. Modelling of this approach suggests 1% AEP flows from the east are wholly contained within the roadway.

The existing studies indicate that a portion of the development site lies within the Flood Planning Area (see attached drawings). As such, the following information was gathered to identify the flood levels, classifications and hazards, and associated site-specific planning controls identified in the DCP.

The gathered information is summarised in the table below.

	Description
1% AEP Flood Level	The maximum 1% AEP flood level is estimated at **RL 53.00m AHD**, as specified by "Figure 20.1: Peak Floodwater Levels for the 1% AEP Flood" of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)*.

PMF Flood Level	The maximum PMF flood level is estimated at **RL 55.00m AHD**, as specified by "Figure 23.1: Peak Floodwater Levels for the PMF " of the of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)*.
1% Flood Hazard Category	"Figure 34.1: Flood Hazard for the 1% AEP Flood" of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)* specifies the flood hazard category for the 1% AEP case. The maximum hazard category on the development site is "H5 – Unsafe for people and vehicles" at the northern end of the site within the existing channel. The existing scenario maximum hazard category within the proposed building footprint is an isolated area of "H3 – Unsafe for vehicles, children and elderly." These flows arise from the existing creek which is to be infilled. We note the new development proposes to capture and convey upstream flows from the east through the street network, bypassing the existing creek. The modeling completed by Northrop Engineers suggest flows are contained within the road reserve and Velocity Depth ratios are below 0.4. As such, it is not expected that the development will be within a flood hazard zone following construction.
PMF Flood Hazard Level	"Figure 37.1: Flood Hazard for the PMF" of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)* specifies the flood hazard levels for the PMF. The maximum hazard category on the lot is "H6 – Unsafe for people and vehicles. All buildings vulnerable to failure" at the northern end of the lot within the existing channel (outside the development footprint). The existing scenario maximum hazard category within the proposed building footprint is "H4 – unsafe for people and vehicles." These flows arise from areas of the existing creek to be infilled. We note the new development proposes to capture and convey upstream flows from the east through the street network and bypassing this creek. The modeling completed by Northrop Engineers suggest flows are contained within the road reserve and velocity-depth ratios are below 0.4. As such, it is not expected that the development will be within a flood hazard zone.
Hydraulic Category 1% AEP	"Figure 39.1: Hydraulic Categories for the 1% AEP Flood" of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)* specifies the hydraulic categorisation for the 1% AEP case. The existing channel to the site's north is classified as "**Floodway"**, with a portion of the building footprint site within the "**Flood Storage" and "Flood Fringe"** zones (i.e. within the existing channel). However, the

	new development proposes to capture and convey upstream flows from the east through the street network, bypassing the existing creek. Additionally, modeling completed by Northrop Engineers suggest 1% AEP flows from the east are contained within the road reserve. As such, it's expected that the flood zonings above are not applicable to this development.
Hydraulic Category PMF Event	"Figure 42.1: Hydraulic Categories for the PMF Flood" of the *College, Orth and Werrington Creek Catchment Flood Risk Management Study – Final Report; Volume 2 of 2: Figures (October 2021)* specifies the hydraulic categorisation for the PMF case. The existing channel, which extends partially into the development site is classified as **"Floodway"** during the PMF event. However, flows from the east are proposed to bypass the creek following development, and are expected to be contained within the road reserve.
Minimum Habitable Level	"Section 3.5 Flood Planning" of "Part C3 Water Management" of the Penrith Development Control Plan 2014 stipulates a 0.5m freeboard is to be applied to the 1% AEP (100-year ARI) flood event level. Given the 1% AEP flood level is 53.00m, the estimated minimum habitable level is **RL 53.50m AHD** within the flood planning zone.

In summary, the proposed development lies over the top end of an existing channel classified as 'flood fringe' and 'flood storage' in the 1% AEP event (as reported in the referenced flood studies) for the pre-developed site. The proposed development proposes to capture off-site flows from the east and direct to the point of discharge via the road network and associated stormwater system. Modelling suggests 1% flows through the site are wholly maintained within the road reserve. Existing flows from the north are to generally maintain their existing flow path before being captured by the stormwater system and directed into the existing Woolworth's culvert. Considering this approach, the development is expected to be situated outside the flood affected area following construction.

Additionally to the above, the flows from the developed site are restricted via on-site detention tanks (refer the attached Stormwater Report). Flows generated are considerably lower than the pre-developed scenario. As such, it's expected less stormwater will discharge form the site post-development. Therefore, it is not expected that the existing channel flows and flood levels will be increased due to the proposed development.

Yours faithfully,

Jamie Carroll
Civil Engineer
BEng (Civil) BBus GradIEAust

Appendix D – MUSICLink Report

PENRITH
CITY COUNCIL

music*link*

MUSIC-*link* Report

Project Details		Company Details	
Project:	Caddens Corner	**Company:**	Northrop Consulting Engineers
Report Export Date:	7/03/2023	**Contact:**	Jamie Carroll
Catchment Name:	SY222070_DA_MUSIC_HG	**Address:**	345 George Street, Sydney, NSW 2000
Catchment Area:	3.809ha	**Phone:**	0423 399 559
Impervious Area*:	65.20%	**Email:**	jcarroll@northrop.com.au
Rainfall Station:	67113 PENRITH		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1999 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	691mm		
Evapotranspiration:	1158mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Penrith		
Scenario:	Penrith Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: Post-Development Node	Reduction
Flow	22%
TSS	85.2%
TP	70.8%
TN	52.8%
GP	99.6%

Treatment Nodes

Node Type	Number
Media Filtration Node	1
Rain Water Tank Node	4
Sedimentation Basin Node	3
Generic Node	3
GPT Node	5

Source Nodes

Node Type	Number
Urban Source Node	22

Comments

Reuse demands not met - high volumes of demand cannot sustainably be provided for such a development (already large reuse volumes).

OceanProtect proprietary product utilised for the SF Chambers resulting in failed results.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	3 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.06
GPT	5 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.1
GPT	7 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.14
GPT	7 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.14
GPT	7 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.14
Post	Post-Development Node	% Load Reduction	None	None	22
Post	Post-Development Node	GP % Load Reduction	90	None	99.6
Post	Post-Development Node	TN % Load Reduction	45	None	52.8
Post	Post-Development Node	TP % Load Reduction	60	None	70.8
Post	Post-Development Node	TSS % Load Reduction	85	None	85.2
Sedimentation	SF Chamber (5.8m2)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (5.8m2)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Chamber (5.8m2)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Central East Foot Trafficked Blcny & Tce (0.1163ha)	Area Impervious (ha)	None	None	0.116
Urban	Central East Foot Trafficked Blcny & Tce (0.1163ha)	Area Pervious (ha)	None	None	0
Urban	Central East Foot Trafficked Blcny & Tce (0.1163ha)	Total Area (ha)	None	None	0.116
Urban	Central East Podium Landscaped Area (0.2384ha)	Area Impervious (ha)	None	None	0
Urban	Central East Podium Landscaped Area (0.2384ha)	Area Pervious (ha)	None	None	0.238
Urban	Central East Podium Landscaped Area (0.2384ha)	Total Area (ha)	None	None	0.238
Urban	Central East Roof Area (0.2837ha)	Area Impervious (ha)	None	None	0.284
Urban	Central East Roof Area (0.2837ha)	Area Pervious (ha)	None	None	0
Urban	Central East Roof Area (0.2837ha)	Total Area (ha)	None	None	0.284
Urban	Central West Foot Trafficked Blcny & Tce (0.1236ha)	Area Impervious (ha)	None	None	0.124
Urban	Central West Foot Trafficked Blcny & Tce (0.1236ha)	Area Pervious (ha)	None	None	0
Urban	Central West Foot Trafficked Blcny & Tce (0.1236ha)	Total Area (ha)	None	None	0.124
Urban	Central West Footpaths (0.0761ha)	Area Impervious (ha)	None	None	0.076
Urban	Central West Footpaths (0.0761ha)	Area Pervious (ha)	None	None	0
Urban	Central West Footpaths (0.0761ha)	Total Area (ha)	None	None	0.076
Urban	Central West Landscaped Area (0.2566ha)	Area Impervious (ha)	None	None	0
Urban	Central West Landscaped Area (0.2566ha)	Area Pervious (ha)	None	None	0.257
Urban	Central West Landscaped Area (0.2566ha)	Total Area (ha)	None	None	0.257
Urban	Central West Roof (0.2837ha)	Area Impervious (ha)	None	None	0.284
Urban	Central West Roof (0.2837ha)	Area Pervious (ha)	None	None	0
Urban	Central West Roof (0.2837ha)	Total Area (ha)	None	None	0.284
Urban	Eastern Road (0.954ha)	Area Impervious (ha)	None	None	0.858
Urban	Eastern Road (0.954ha)	Area Pervious (ha)	None	None	0.095
Urban	Eastern Road (0.954ha)	Total Area (ha)	None	None	0.954
Urban	Northern Footpath & Landscaped (0.1135ha)	Area Impervious (ha)	None	None	0.079
Urban	Northern Footpath & Landscaped (0.1135ha)	Area Pervious (ha)	None	None	0.034
Urban	Northern Footpath & Landscaped (0.1135ha)	Total Area (ha)	None	None	0.114

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	Northern Roof Area (0.0817ha)	Area Impervious (ha)	None	None	0.082
Urban	Northern Roof Area (0.0817ha)	Area Pervious (ha)	None	None	0
Urban	Northern Roof Area (0.0817ha)	Total Area (ha)	None	None	0.082
Urban	Northern Trafficked Blcny & Toe (0.0268ha)	Area Impervious (ha)	None	None	0.027
Urban	Northern Trafficked Blcny & Toe (0.0268ha)	Area Pervious (ha)	None	None	0
Urban	Northern Trafficked Blcny & Toe (0.0268ha)	Total Area (ha)	None	None	0.027
Urban	Southern Footpaths (0.0702ha)	Area Impervious (ha)	None	None	0.07
Urban	Southern Footpaths (0.0702ha)	Area Pervious (ha)	None	None	0
Urban	Southern Footpaths (0.0702ha)	Total Area (ha)	None	None	0.07
Urban	Southern Landscaped Area (0.2647ha)	Area Impervious (ha)	None	None	0.000
Urban	Southern Landscaped Area (0.2647ha)	Area Pervious (ha)	None	None	0.264
Urban	Southern Landscaped Area (0.2647ha)	Total Area (ha)	None	None	0.265
Urban	Southern Roof Area (0.3483ha)	Area Impervious (ha)	None	None	0.348
Urban	Southern Roof Area (0.3483ha)	Area Pervious (ha)	None	None	0
Urban	Southern Roof Area (0.3483ha)	Total Area (ha)	None	None	0.348
Urban	Southern Trafficked Blcny & Toe (0.1337ha)	Area Impervious (ha)	None	None	0.134
Urban	Southern Trafficked Blcny & Toe (0.1337ha)	Area Pervious (ha)	None	None	0
Urban	Southern Trafficked Blcny & Toe (0.1337ha)	Total Area (ha)	None	None	0.134
Urban	TEC (Undisturbed) (0.4363ha)	Area Impervious (ha)	None	None	0
Urban	TEC (Undisturbed) (0.4363ha)	Area Pervious (ha)	None	None	0.436
Urban	TEC (Undisturbed) (0.4363ha)	Total Area (ha)	None	None	0.436
Urban	Western Foot Trafficked Blcny & Toe (0.0851ha)	Area Impervious (ha)	None	None	0.085
Urban	Western Foot Trafficked Blcny & Toe (0.0851ha)	Area Pervious (ha)	None	None	0
Urban	Western Foot Trafficked Blcny & Toe (0.0851ha)	Total Area (ha)	None	None	0.085
Urban	Western Footpaths (0.273ha)	Area Impervious (ha)	None	None	0.273
Urban	Western Footpaths (0.273ha)	Area Pervious (ha)	None	None	0
Urban	Western Footpaths (0.273ha)	Total Area (ha)	None	None	0.273
Urban	Western Landscaped Works (0.275ha)	Area Impervious (ha)	None	None	0
Urban	Western Landscaped Works (0.275ha)	Area Pervious (ha)	None	None	0.275
Urban	Western Landscaped Works (0.275ha)	Total Area (ha)	None	None	0.275
Urban	Western Road (0.3975ha)	Area Impervious (ha)	None	None	0.359
Urban	Western Road (0.3975ha)	Area Pervious (ha)	None	None	0.038
Urban	Western Road (0.3975ha)	Total Area (ha)	None	None	0.398
Urban	Western Roof Area (0.477ha)	Area Impervious (ha)	None	None	0.477
Urban	Western Roof Area (0.477ha)	Area Pervious (ha)	None	None	0
Urban	Western Roof Area (0.477ha)	Total Area (ha)	None	None	0.477
Urban	Woolworths Carpark (existing) (1.498ha)	Area Impervious (ha)	None	None	1.353
Urban	Woolworths Carpark (existing) (1.498ha)	Area Pervious (ha)	None	None	0.144
Urban	Woolworths Carpark (existing) (1.498ha)	Total Area (ha)	None	None	1.498

Only certain parameters are reported when they pass validation