NORTHROP

SSDA STORMWATER REPORT

Alexandria Health Centre

28-32 Bourke Road, Alexandria NSW 2015

PREPARED FOR
Centuria
Level 41, 2 Chifley Square
Sydney NSW 2000

Ref: SY230695

Rev: 3
Date: 08.12.23

Stormwater Report

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
04.10.23	1	Issued for Draft SSDA	S. Sarkis	S.Sarkis
14.11.23	2	Issued for Information	S. Sarkis	A.Carvalhaes
08.12.23	3	Issued for SSDA	S. Sarkis	A.Carvalhaes

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1. Introduction

Northrop Consulting Engineers Pty Ltd have been engaged by Johnstaff Projects (NSW) Pty Ltd on behalf of Centuria to prepare Civil Engineering Drawings for Alexandria Health Centre works at 28-32 Bourke Road.

The application seeks consent for the following in accordance with the Concept SSDA approval:

- Site establishment including earthworks.
- Construction of the Alexandria Health Centre:
  - Total GFA of 11,436sqm
  - Maximum FSR of 3.85:1
  - Maximum height of 34.95m, Max RL. 45.4
- Ancillary development including:
  - Car parking – 77 car parking spaces distributed across basement, ground, and ground mezzanine levels.
  - Utility infrastructure and services connections.
  - Building identification signage and wayfinding signage.
  - Stormwater management
  - Landscaping
- Laneway for vehicle and pedestrian access along with western boundary of the site
- Operation of the Alexandria Health Centre as a mental health hospital and medical centre with ancillary uses.

This report covers the works shown in the Northrop Drawing Package required for the development of the site including:

- Sediment and Erosion Control
- Stormwater Drainage
- Stormwater Quality

1.1 Related Reports and Documents

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

- Detailed Site Survey prepared by LTS Lockley dated 20th July 2022 (see Appendix A)
- Architectural Plans prepared by Warren and Mahoney Architects dated 19th October 2023
- Civil Engineering Drawings prepared by Northrop Consulting Engineers (see Appendix B)

1.2 SEARs Requirements

This Civil Stormwater Management Report addresses the following relevant Secretary's Environmental Assessment Requirements (SEARs) set out in Table 1 below.

Table 1: Secretary's Environmental Assessment Requirements relevant to this Report

Item	SEARs Requirement	Relevant Section of Report
14	**Stormwater and Wastewater:** Provide an overarching Integrated Water Management Plan for the concept development that:	All
	• is prepared in consultation with the local council and any other relevant drainage or water authority.	Section 2.1 Section 2.2 Section 2.3 Section 2.6 Section 2.7.1
	• details the proposed drainage design for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and the nominated discharge points.	Section 2.4 Section 2.6.2 Section 2.7.3 Section 2.8.2
	• demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.	Section 3 Section 2.6.2 Section 2.7.3
	Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.	Section 2.4

1.3 Site Description and Proposed works

The subject site is located at Alexandria and falls within the City of Sydney Local Government Area (LGA). The proposed works will take place within the area that is occupied by an existing commercial building. See Figure 1 for site location.

Figure 1: Site Aerial Image (Source: Nearmaps)

The site covers an area of approximately 2965m^2 whereby the building footprint incapsulates the entire site boundary. The site neighbours commercial buildings along its western, southern and eastern sides and is bound by Bourke Road along its northern side.

1.4 Project Description

The proposed development consists of 3 levels (to be confirmed) of carparking and 8 levels of commercial space for medical/hospital functionality. Refer to architectural plans for further detailing of floor plans. The architectural ground floor and roof plans are shown below:

Figure 2: Architectural Site Plan (Ground Floor)

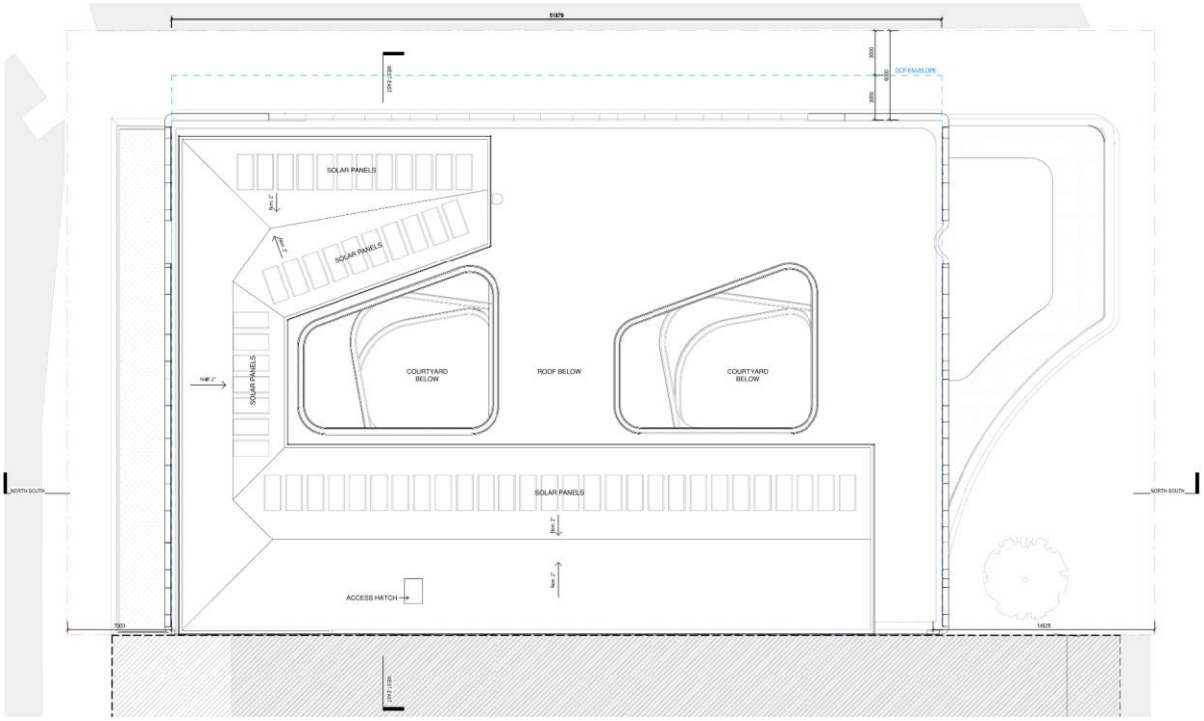


Figure 3: Architectural Site Plan (Roof)

2. Civil Engineering Design

2.1 Design Criteria & Methodology

The Civil Engineering design has considered a number of relevant documents and reports applicable to the proposed development. The objectives of this report are to ensure the proposed stormwater management of the site meets the requirements of the following documents:

- Sydney Development Control Plan (2012)
- City of Sydney Stormwater Drainage Manual (2017)
- Sydney Water Onsite Stormwater Detention Policy (2021)
- Managing Urban Stormwater Soil & Construction (2004) by Landcom (The Blue Book)
- AS/NZS 3500.3:2021 (Plumbing and Drainage)

2.2 Sediment and Erosion Control

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

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

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

2.2.1 Sediment Basin

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

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

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

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

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

Table 2: Sediment Basin Sizing Values

Parameter	Adopted value
Total Disturbed Area (ha)	0.572
Soil Texture Group	C
3-month ARI Flow (m^3/s)	0.043
Particle Size (mm)	0.05 (Silt/Fine Sand)
Area Factor	635
Settling Zone Height (m)	0.6
Settling Sone Volume (m^3)	16.383
Sediment Storage Volume (m^3)	16.383
Total Basin Volume Required (m^3)	32.766

2.2.2 Sediment and Erosion Control Measures

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

- A temporary site security/safety fence is to be constructed around the site and the site office area.
- Sediment fencing provided downstream of disturbed areas, including any topsoil stockpiles.
- Dust control measures including covering stockpiles, installing fence hessian, and watering exposed areas.
- Placement of hay bales or mesh and gravel inlet filters around and along proposed catch drains and around stormwater inlets pits
- Any stockpiled material, including topsoil, shall be located as far away as possible from any associated natural watercourses or temporary overland flow paths. All stockpiles and embankment formations shall be stabilised by hydroseeding or hydro mulching on formation.

Figure 4: Sediment Fence

2.3 Stormwater Infrastructure and modelling

The objectives of this investigation include:

- Management of 'minor' flows using piped systems for at least the 5% AEP
- Management of 'major' flows using dedicated overland flow paths for the 1% AEP
- OSD design as per Section 2.3 from Sydney Water Onsite Stormwater Detention Policy (2021)

The proposed stormwater system was modelled using DRAINS ILSAX Hydrological Model. The following parameters were adopted:

- Major Storm = 1% AEP
- Minor Storm = 5% AEP
- Soil Type = 3
- Paved (Impervious) Area Depression Storage = 1mm
- Supplementary Area Depression Storage = 1mm
- Grassed (Pervious) Area Depression Storage = 5mm
- Sag pit Blocking Factor = 0.5
- On Grade Pit Blocking Factor = 0.2

The DRAINS Model Layout is shown below. The DRAINS model can be provided for assessment upon request.

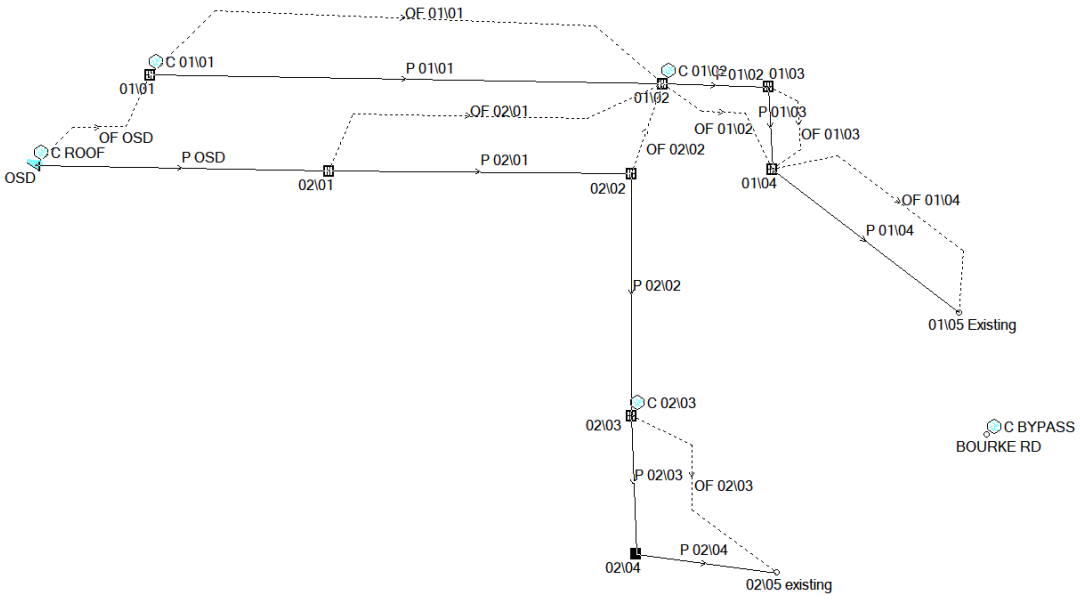


Figure 5: DRAINS Model Layout

2.4 Legal Point of Discharge

The legal point of discharge will be a proposed connection to council's existing kerb inlet pit located at the frontage of lot 24A on Bourke Road. The stormwater pit's surface level has been surveyed at RL8.00m but its invert levels and outlet information are to be determined before finalising this design. Additionally, proposed kerb inlet pits must be constructed along Bourke Road to allow the connection of the proposed stormwater system for the development to the existing kerb inlet pit.

2.5 Flooding

According to the flood assessment titled "28-32 Bourke Road Alexandria, Civil Engineering Flood Report" prepared by Enstruct and dated 2nd of March 2023; the site is subject to flooding. The flood maps demonstrate that Bourke Road is flooded to a maximum flood level of RL8.80m for the 1% AEP flood event and RL10.40m for the Probable Maximum Flood (PMF) event. Figures 6 and 7 show the 1% AEP and PMF, which demonstrates that the site is subject to flooding in these storm events.

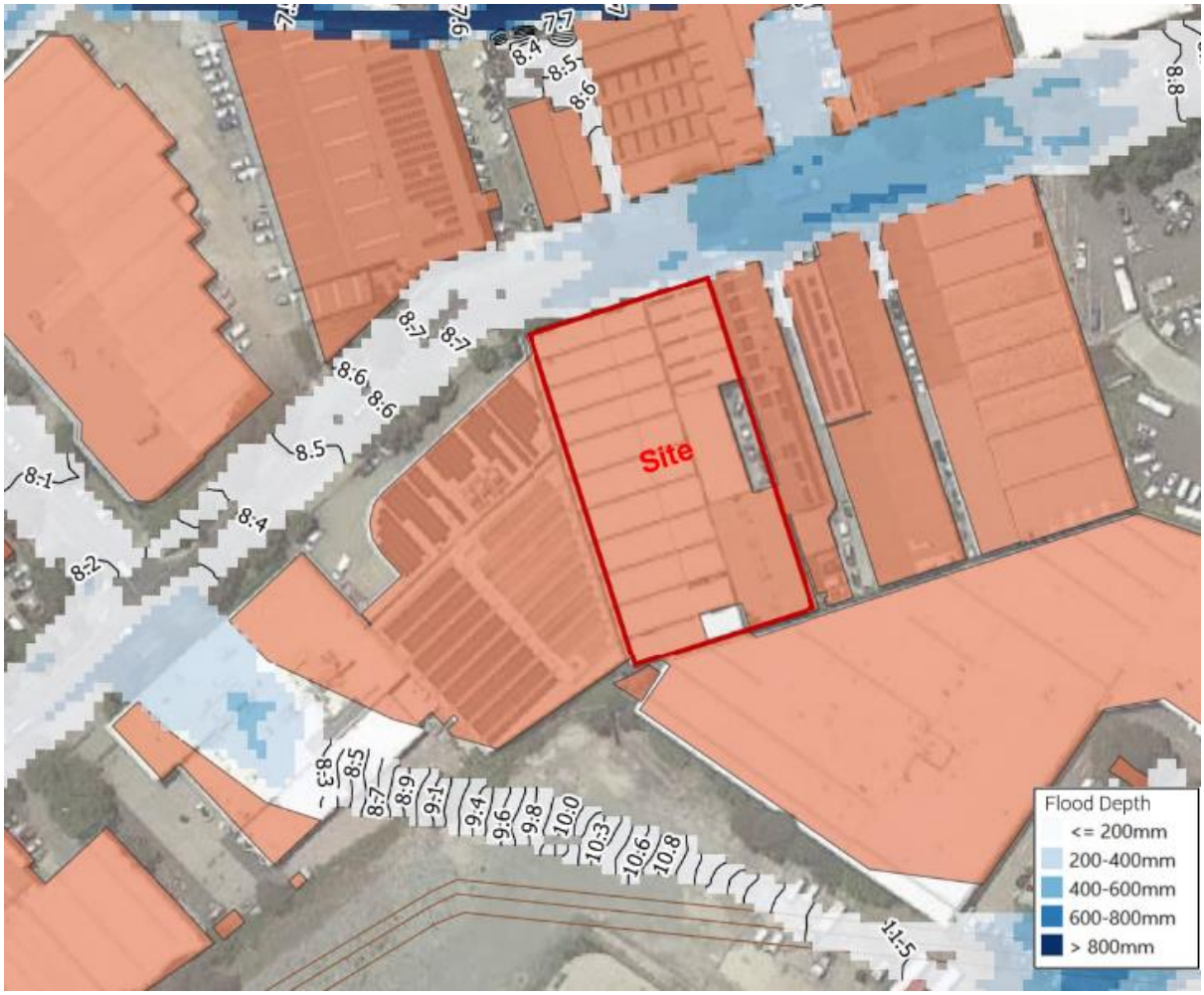


Figure 6: 1% AEP Flood Map (source: "28-32 Bourke Road Alexandria, Civil Engineering Flood Report")

Figure 7: PMF Flood Map (source: "28-32 Bourke Road Alexandria, Civil Engineering Flood Report")

2.6 On-site Stormwater Detention

2.6.1 OSD Requirements

In the City of Sydney Council Local Government Area, requirements for On-site Stormwater Detention are determined by Sydney Water, as noted in Section 5 of the Stormwater Drainage Manual. Sydney Water have also produced an Onsite Stormwater Detention Policy (2021) which states that "The OSD system must be site-specific and off-set the stormwater run-off coming from the development. It must consider the:

- size and impact of the development
- average rainfall intensities at the development location
- capacity of stormwater assets (trunk drainage system) it's connecting to flood risks from other nearby developments.

The OSD system must be able to store the run-off caused by a storm event up to the 100-year Average Recurrence Interval (ARI) for that site and discharge the run-off at a controlled rate which downstream stormwater assets can handle."

2.6.2 OSD Design

To determine the required storage capacity and discharge rate for the development, Sydney Water was contacted by Northrop Consulting Engineers. In response, Sydney Water confirmed that a storage capacity of 46m^3 and a permissible site discharge of 110L/s must be demonstrated by the proposed stormwater system. This correspondence between Sydney Water and Northrop Consulting Engineers can be seen in Appendix C.

The proposed OSD tank has been designed in accordance with advice from Sydney Water with an effective volume of 57m^3 and an internal storage height of 0.99m. The flows are controlled up to the 1% AEP storm event by a Ø185mm orifice which discharges to a Ø375mm RCP outlet. The post-development flows during the 1% AEP storm event are shown below in Table 3. The details of the OSD tank are presented in the Civil Engineering Drawings prepared by Northrop in Appendix B.

Table 3: Post-Development Flows

	20% AEP Flows	5% AEP Flows	1% AEP Flows
Total Flow	74 L/s	92 L/s	109 L/s

2.7 Stormwater Quality

2.7.1 Stormwater Quality Requirements

According to Section 3.7.3 from the City of Sydney Development Control Plan 2012, “Development of a site greater than 1,000sqm must undertake a stormwater quality assessment to demonstrate that the development will achieve the post-development pollutant load standards indicated below:

- reduce the baseline annual pollutant load for litter and vegetation larger than 5mm by 90%;
- reduce the baseline annual pollutant load for total suspended solids by 85%;
- reduce the baseline annual pollutant load for total phosphorous by 65%; and
- reduce the baseline annual pollutant load for total nitrogen by 45%.”

2.7.2 Proposed Stormwater Quality Treatment System

The stormwater pollutant load reduction and water conservation objectives will be met by the use of a rainwater tank and stormwater treatment devices such as filters and pit baskets.

2.7.3 Modelling of Stormwater Quality

Stormwater treatment was modelled using Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software v 6.3.0.

The stormwater quality treatment parameters are included below:

- 5 x Ocean Guard Pit Inserts
- Rainwater Tank (20kL)
- Storm Filter Chamber (4.0m^2)
- Precast Storm Filter Pit (1200x1200)
- 11 x Psorb Storm Filters (690mm)

MUSIC Model Layout and pollutant removal performance is shown below.

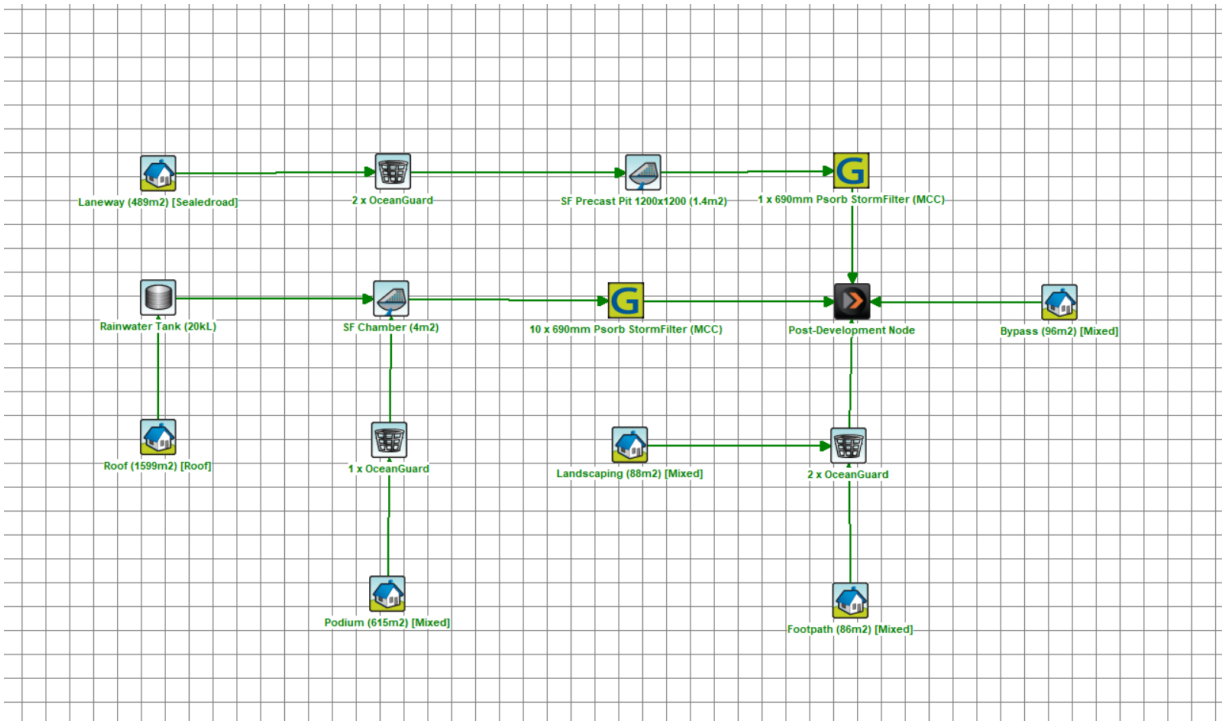


Figure 8: MUSIC Model Layout

Table 4: MUSIC Model Results

Item	Target Reduction Removal Rate (%)	% Reduction
Total Suspended Solids	85	88.4
Total Phosphorus	65	75.5
Total Nitrogen	45	62.2
Gross Pollutants	90	96.5

As shown above, the stormwater treatment targets appropriate for the site will be met by the treatment measures provided. The pollutant removal performance as calculated by MUSIC modelling meets the City of Sydney targets.

2.8 Water Conservation

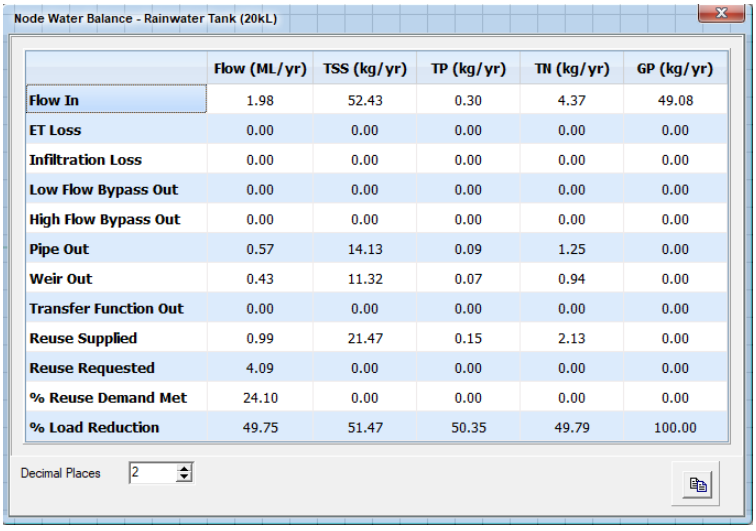
2.8.1 Water Conservation Requirements

According to Section 3.6.2 from the City of Sydney Development Control Plan 2012, rainwater tanks are to comply with the following design condition:

- "Generally, rainwater tanks are to be installed for all non-residential developments, including major alterations and additions that have access to a roof form from which rainwater can be feasibly collected and plumbed to appropriate end uses."

2.8.2 Rainwater Tank Specification

According to the Architectural drawings, the site includes 174m^2 of landscaping which will require irrigation. Assuming the rate of 0.4kL/year/m^2, the annual demand is 69.6kL/year. Similarly, the rainwater tank will need to achieve the demand of toilet flushing for a total of 110 toilets. Assuming the rate of 0.1kL/day/toilet, the daily demand is 11.0kL/day. The roof area available for rainwater reuse is 1599m^2. A 20kL tank has been designed to capture the roof area and achieves a reuse demand met value of 24.10%. Refer to Figure 9 for the rainwater tank performance values.



	Flow (ML/yr)	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)	GP (kg/yr)
Flow In	1.98	52.43	0.30	4.37	49.08
ET Loss	0.00	0.00	0.00	0.00	0.00
Infiltration Loss	0.00	0.00	0.00	0.00	0.00
Low Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
High Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
Pipe Out	0.57	14.13	0.09	1.25	0.00
Weir Out	0.43	11.32	0.07	0.94	0.00
Transfer Function Out	0.00	0.00	0.00	0.00	0.00
Reuse Supplied	0.99	21.47	0.15	2.13	0.00
Reuse Requested	4.09	0.00	0.00	0.00	0.00
% Reuse Demand Met	24.10	0.00	0.00	0.00	0.00
% Load Reduction	49.75	51.47	50.35	49.79	100.00

Figure 9: Rainwater Tank Node Water Balance

3. Conditions of Consent

Northrop Consulting Engineers have reviewed the Conditions of Consent under SSD 38600121 and provided comments for the following:

B8. Future development applications(s) must address the following:

(b) The concept grading for the laneways must be in accordance with the requirements of the City's Interim Floodplain Management Policy (regarding impact on the new development and the adjacent buildings), Public Domain Manual, Sydney Streets Technical Specifications & Standard Drawings and the SDCP's public domain design for the entire precinct.

Laneway levels have been designed in accordance with grading plan from "Civil Engineering Flood Report" provided by Enstruct (dated 02/03/2023).

B32. Future development application(s) must include a Stormwater Concept Design and stormwater management plan prepared by a suitably qualified and experienced Civil Engineer (who is included in the National Professional Engineers Register, administered by the Institution of Engineers Australia). The Stormwater Concept Design must include:

(a) a certified stormwater drainage design complying with Council's Sydney Streets Technical Specifications, Part A4 Stormwater Drainage Design;

The proposed stormwater concept design and stormwater management plan generally complies with Council's, "Sydney Streets Technical Specifications, Part A4 Stormwater Drainage Design".

(b) Council's Sydney Streets Technical Specifications, Standard Drawings;

The proposed stormwater concept design and stormwater management plan generally complies with Council's, "Sydney Streets Technical Specifications, Standard Drawings".

(c) Council's Sydney Streets Technical Specifications, Part B10: Stormwater Drainage Construction;

Works conducted by the contractor are to be in accordance with Council's, "Sydney Streets Technical Specifications, Part B10: Stormwater Drainage Construction", document during the construction phase.

(d) Council's Stormwater Drainage Manual; and

The proposed stormwater concept design and stormwater management plan generally complies with Council's, "Stormwater Drainage Manual".

(e) all relevant Australian Standards.

The proposed stormwater concept design and stormwater management plan generally complies with AS/NZS 3500.3:2021.

B33. Future development application(s) must comply with the requirements of Sydney Water with regard to the on-site detention (OSD) of stormwater and include evidence of Sydney Water's requirements.
Where an OSD is not required by Sydney Water, requirements from Council must be addressed and evidence of Council's requirements must be included in future application(s)

On-site detention is required for this development and Section 2.6.2 of this report outlines compliance with Sydney Water's on-site detention (OSD) requirements.

B34. Future development application(s) must include a MUSIC Link report and a stormwater quality assessment report prepared by a suitably qualified practicing civil engineer (NER) demonstrating compliance with Council's targets and parameters. The report must include a response to all stormwater quality improvement devices' structural integrity, treatment train and their treatment properties and must align with the MUSIC Link report.

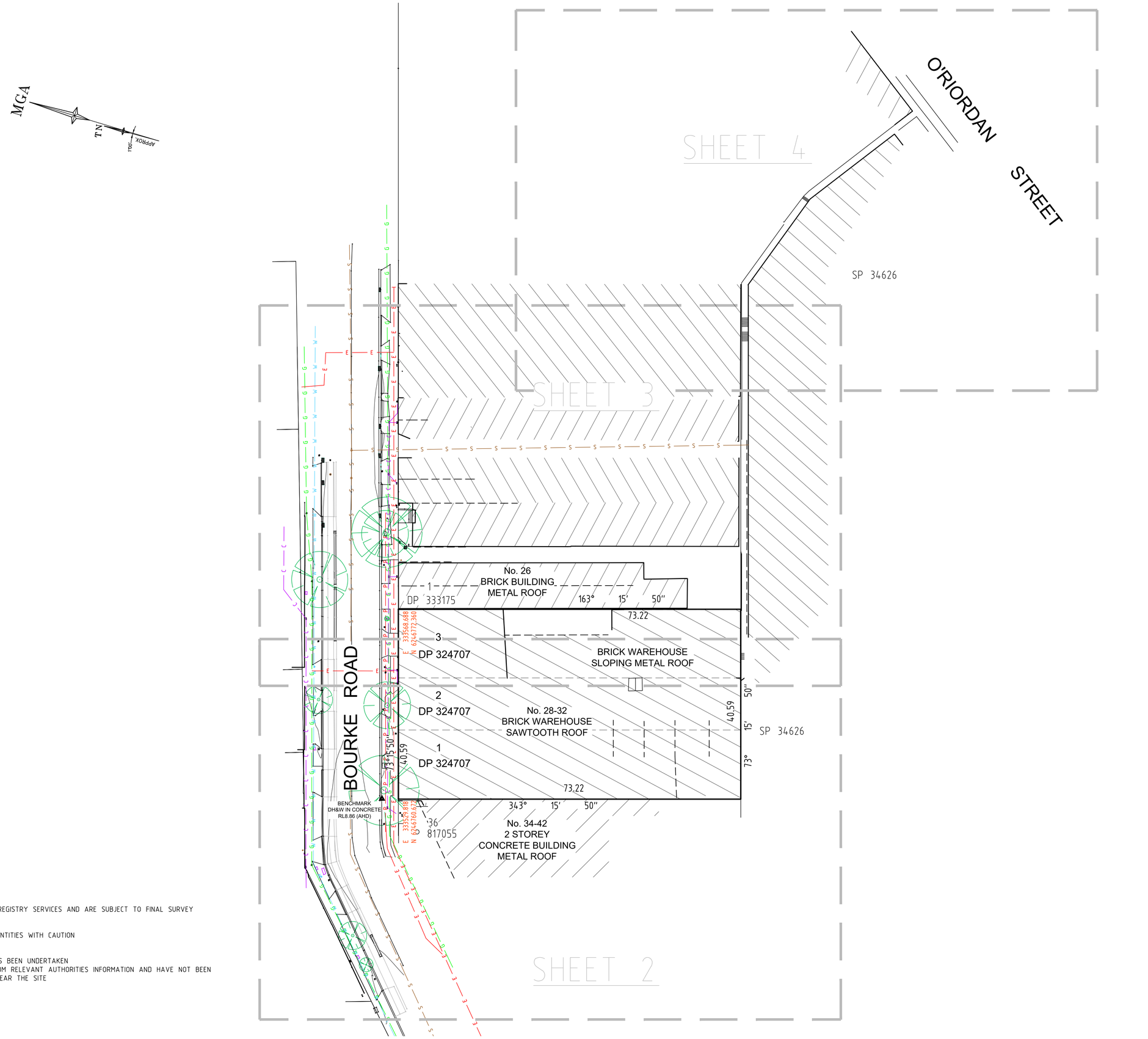
The MUSIC Link report has been included for reference in Appendix D. The MUSIC link report demonstrates compliance with Council's targets and parameters that have been outlined in section 2.7.1 of this report. The contents of a stormwater quality assessment report are outlined throughout section 2.7 of this report.

4. Conclusion

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

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

Appendix A – Survey



LEGEND

BENCH MARK	▲
COMMS PIT	COM
ELECTRIC LIGHT POLE	ELP
STREET SIGN	SS
HYDRANT	HYD
WATER METER	WM
GAS VALVE	GAS
PIT WITH METAL LID	MLID
BOLLARD	BOL
GRATED INLET PIT	GIP
KERB INLET PIT	KIP
STOP VALVE	SV
SEWER INSPECTION POINT	SIP
SEWER MANHOLE	SMH
GATE	
VEHICLE CROSSING	(VC)
GAS (DBYD)	G
COMMUNICATIONS (DBYD)	C
WATER (DBYD)	W
SEWER (DBYD)	S
ELECTRICITY (OVERHEAD)	P

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2. ALL AREAS AND DIMENSIONS HAVE BEEN COMPILED FROM PLANS MADE AVAILABLE BY NSW LAND REGISTRY SERVICES AND ARE SUBJECT TO FINAL SURVEY
3. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **SSM24974** R.L. **8.337** (A.H.D.) IN BOURKE ROAD
4. CONTOUR INTERVAL **0.5 m**
5. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
6. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
7. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
8. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
9. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
10. 8/4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
11. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

DIAL BEFORE YOU DIG www.1100.com.au

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SCALE 1:400 @ A1

Revision	Date	Description	Reference
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E	00/00/00	–	00

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D	00/00/00	–	00
C	20/07/22	MGA COORDINATES ADDED	002
B	13/05/22	ADDITIONAL DETAIL ADDED	002
A	08/03/22	ADDITIONAL DETAIL ADDED	001

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THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:
Registered Surveyor NSW ID: 8650

Client JOHNSTAFF

Drawing title
PLAN OF DETAIL AND LEVELS OVER LOTS 1,2&3 IN DP324707 KNOWN AS 28-32 BOURKE ROAD, ALEXANDRIA

datum AHD
site Area 2972m²
LGA SYDNEY
scale 1:400 @A1
reference number 51596 001DT
date of survey 02/12/2021
SHEET 1 OF 4

BOURKE ROAD

No. 28-32
BRICK WAREHOUSE
SAWTOOTH ROOF

No. 34-42
2 STOREY
CONCRETE BUILDING
METAL ROOF

AWNING

RAMP

PARAPET 15.77

PARAPET 18.57

RIDGE 14.65

RIDGE 14.50

RIDGE 16.33

RIDGE 16.19

DRIVEWAY

GRASS

CONCRETE

FENCE

METAL

GATE

DRAIN

W-BDY (0.02)

ADJ W-BDY (0.05)

BENCHMARK
DH&W IN CONCRETE
RL8.86 (AHD)
E 333529.818
N 6246760.672

BOUNDARY INACCESSIBLE

BOUNDARY INACCESSIBLE

73.22

343° 15′ 50″

73° 15′ 50″

40.59

73° 15′ 50″

40.59

SP 34626

MGA

TN

APPROX 10.0°

1 DP 324707

2 DP 324707

3 DP 324707

36 DP 817055

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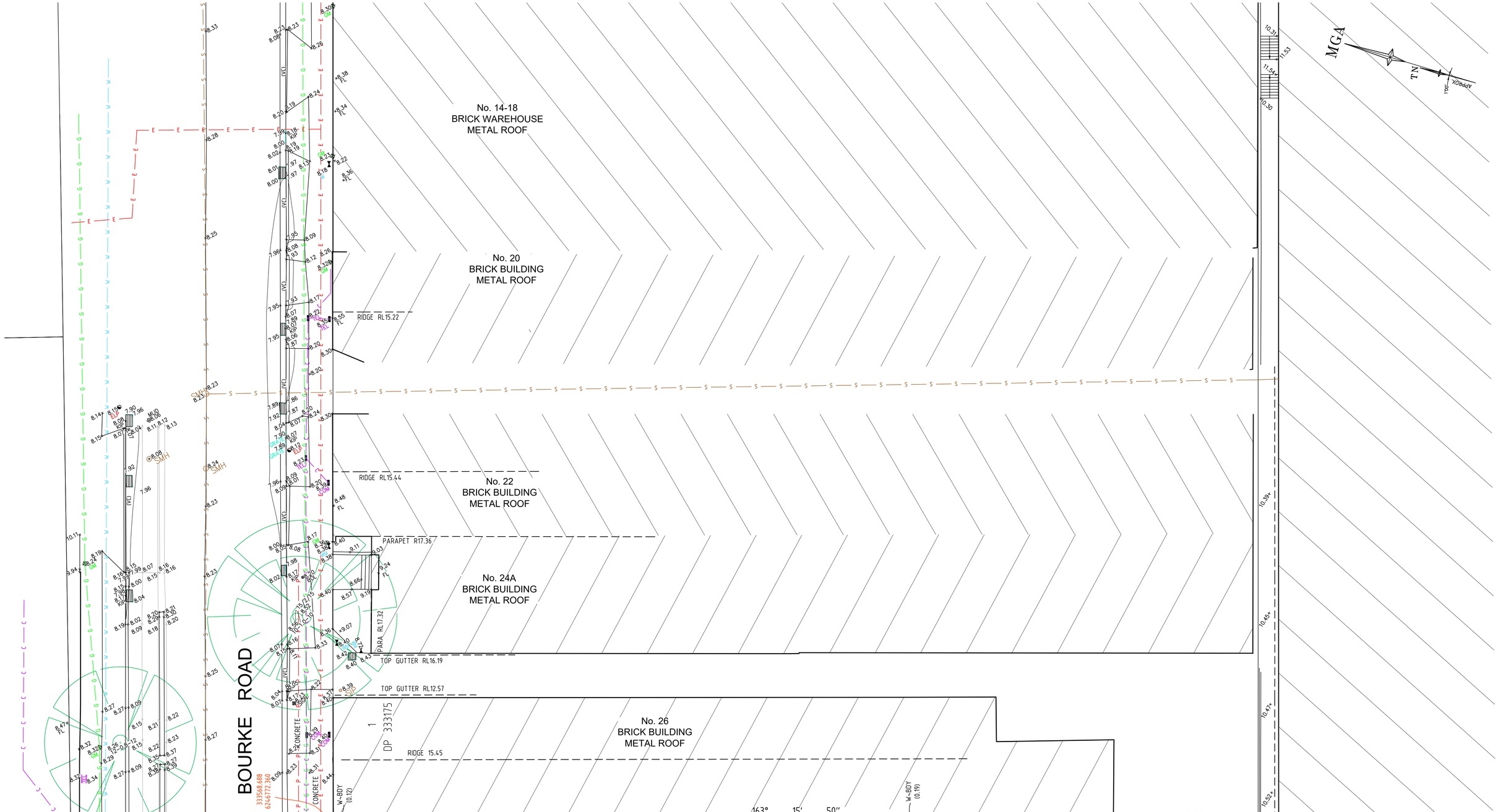
datum AHD
site Area 2972m²
LGA SYDNEY

reference number 51596 001DT
scale 1:150 @A1
date of survey 02/12/2021
SHEET 2 OF 4



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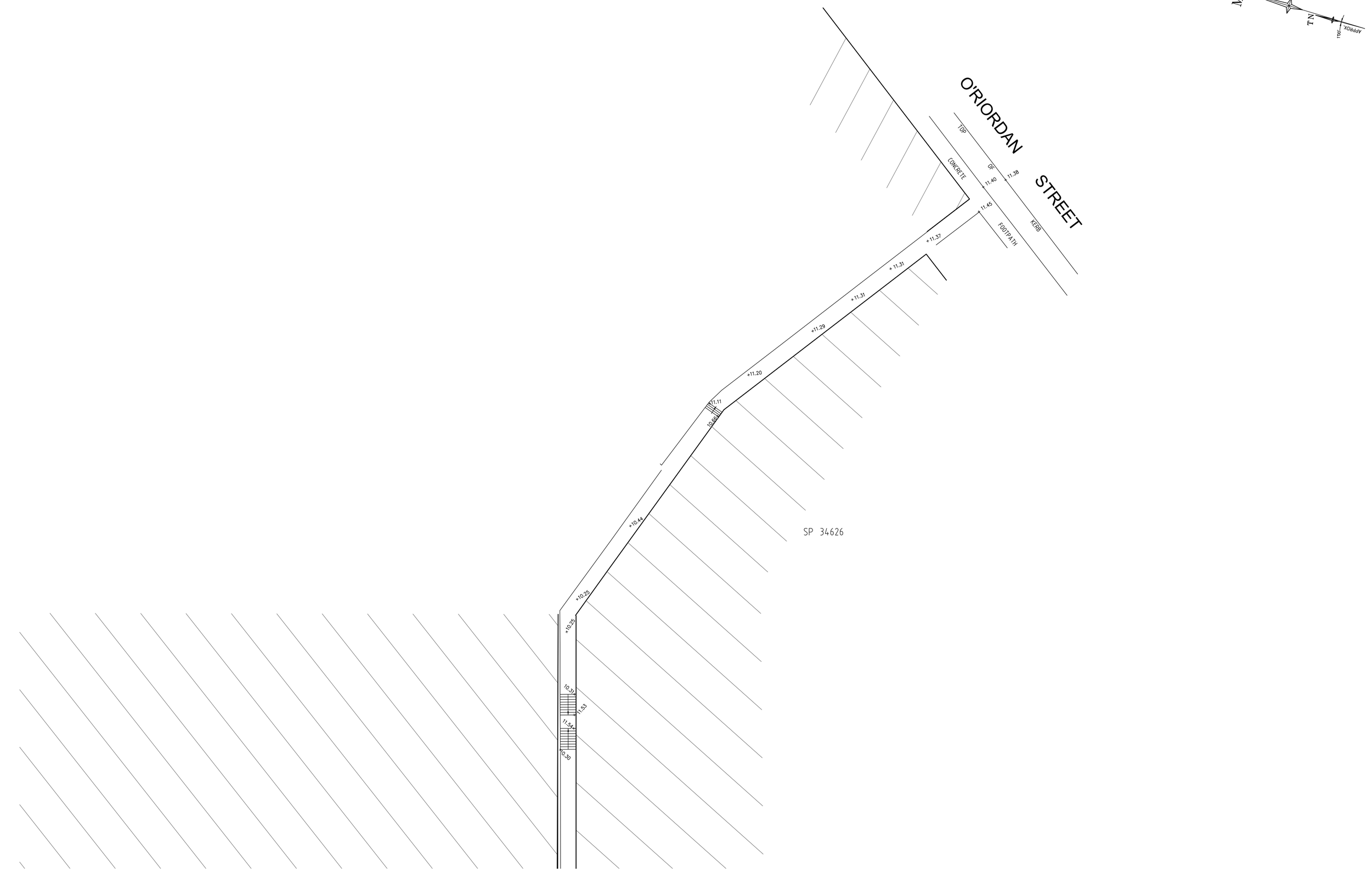
SHEET OF	3 4



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H	00/00/00	–	00
G	00/00/00	–	00
F	00/00/00	–	00
E	00/00/00	–	00

Revision	Date	Description	Reference
D	00/00/00	–	00
C	20/07/22	MGA COORDINATES ADDED	002
B	13/05/22	ADDITIONAL DETAIL ADDED	002
A	08/03/22	ADDITIONAL DETAIL ADDED	001

LTS CONFIDENCE TOGETHER
www.ltsl.com.au | P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

Registered Surveyor NSW ID: 8650

Client JOHNSTAFF

Drawing title

PLAN OF DETAIL AND LEVELS OVER LOTS 1,2&3 IN DP324707 KNOWN AS 28-32 BOURKE ROAD, ALEXANDRIA

datum AHD

site Area 2972m²

LGA SYDNEY

reference number 51596 001DT

scale 1:150 @A1

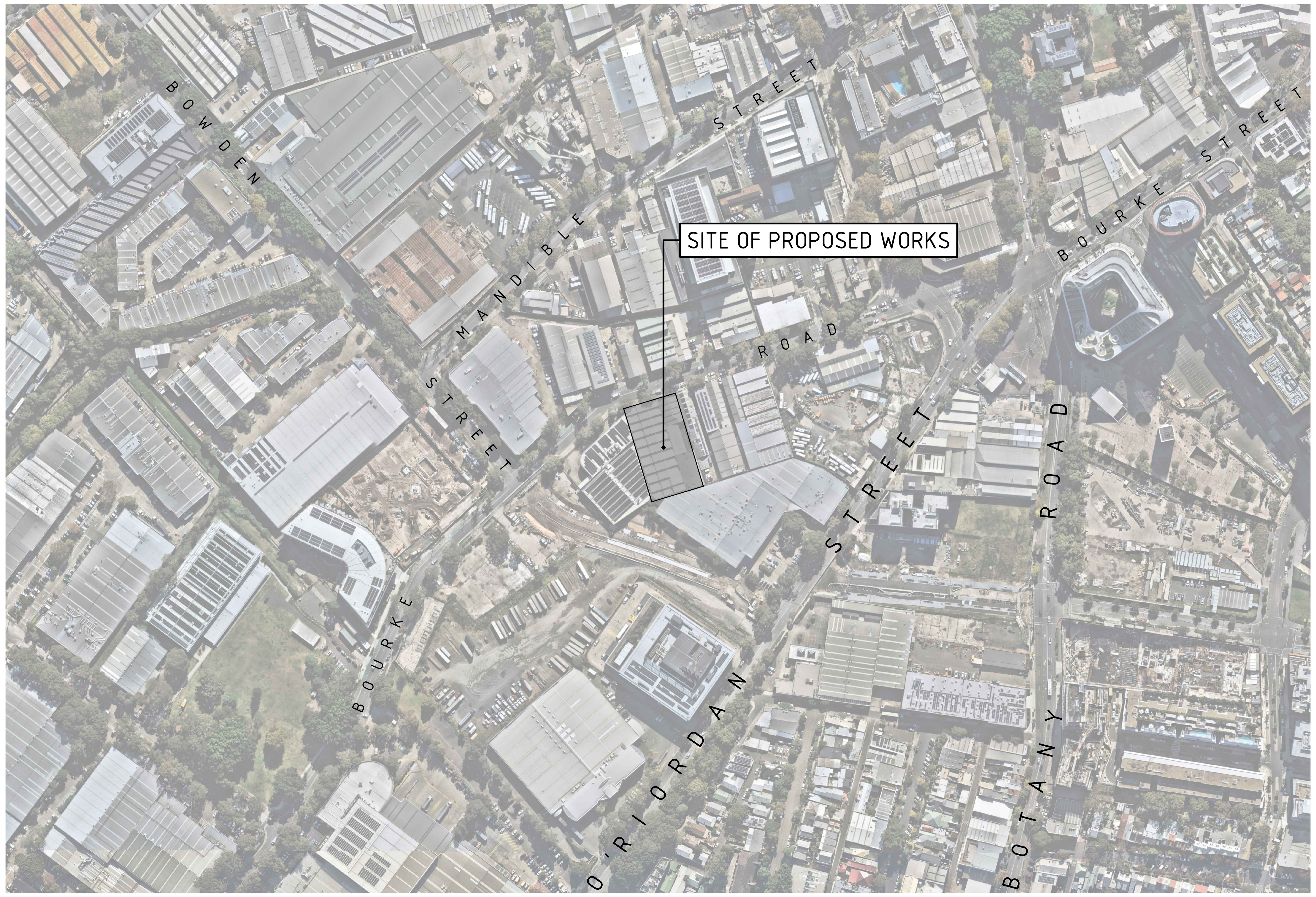
date of survey 02/12/2021

SHEET 4 OF 4

Appendix B – Civil Engineering Drawings

ALEXANDRIA HEALTH CENTRE

CIVIL ENGINEERING PACKAGE
STATE SIGNIFICANT DEVELOPMENT APPLICATION



LOCALITY PLAN

SOURCE: NEARMAPS 2023

CIVIL DRAWING SCHEDULE

DWG No.	DRAWING TITLE
C000	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
C001	SPECIFICATION NOTES - SHEET 01
C100	SEDIMENT AND SOIL EROSION CONTROL PLAN
C101	SEDIMENT AND SOIL EROSION CONTROL DETAILS
C300	SITEWORKS AND STORMWATER MANAGEMENT PLAN
C310	NEW ROAD PLAN (MC01) AND PROFILE
C410	STORMWATER MANAGEMENT DETAILS - SHEET 01
C411	STORMWATER MANAGEMENT DETAILS - SHEET 02
C412	STORMWATER MANAGEMENT DETAILS - SHEET 03

DRAWN: M. MAI DESIGNED: A. CARVALHAES JOB MANAGER: A. CARVALHAES VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: WARREN AND MAHONEY®

ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK.
NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.
THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE

SCALE 1:2500@ A1 — 0 20 40 60 80 100 120m

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

PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

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

JOB NUMBER: 230695
DRAWING NUMBER: C000
REVISION: 03
DRAWING SHEET SIZE = A1

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

SURVEY

1. SURVEY SUPPLIED BY: LTS
   - 1.1. REF. NUMBER: 51596 001DT
   - 1.2. DRAWING TITLE: PLAN OF DETAIL AND LEVELS OVER LOTS 1, 2 & 3 IN DP324707 KNOWN AS 28-32 BOURKE ROAD, ALEXANDRIA
   - 1.3. REVISION DATE: 08.03.2022
   - 1.4. REVISION NUMBER: A
   - 1.3. GEOCENTRIC DATUM OF AUSTRALIA: GDA2020
   - 1.4. SURVEYOR: N/A
   - 1.5. APPROVED: N/A
2. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.
3. NORTHROP TAKE NO RESPONSIBILITY FOR THE ACCURACY AND/OR USE OF THIS SURVEY AND ITS CONTENTS.

EXISTING SERVICES

1. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.
2. CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.
3. THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT AT THE CONTRACTORS EXPENSE.
4. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.
5. THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT.
6. THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS ARE NOT AFFECTED BY THE WORKS AND ARE MAINTAINED AND NOT DISRUPTED.
7. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.
8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
9. THE CONTRACTOR IS TO ALLOW TO POTHOLE ANY SERVICES WITHIN A PUBLIC RESERVE WITHIN THE EXTENT OF WORKS (E.G. STORMWATER CROSSINGS).

ACCESS AND SAFETY

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

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.

SITEWORKS

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

SERVICE TRENCHES

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

SEDIMENT AND SOIL EROSION

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

SEDIMENT BASIN MANAGEMENT

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

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 SYDNEY DEVELOPMENT CONTROL PLAN 2012: SECTION 3.7 WATER AND FLOOD MANAGEMENT.

RAINWATER RE-USE

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

DESIGN SUMMARY

CATCHMENT CALCULATIONS:

	PRE-DEVELOPMENT	POST-DEVELOPMENT
TOTAL AREA	$2965m^2$	$2965m^2$
IMPERVIOUS AREA	$2965m^2$ (100%)	$2874m^2$ (97%)
PERVIOUS AREA	$0m^2$ (0%)	$91m^2$ (3%)

ON-SITE DETENTION:

DESIGN BASIS:

PERMITTED SITE DISCHARGE = 110L/s
SITE STORAGE REQUIREMENT = $46m^3$

1% AEP POST-DEVELOPMENT SITE DISCHARGE = 109L/s
5% AEP POST-DEVELOPMENT SITE DISCHARGE = 92L/s
20% AEP POST-DEVELOPMENT SITE DISCHARGE = 74L/s

ON-SITE DETENTION SUMMARY:

ON-SITE DETENTION STORAGE PROVIDED = $57m^3$

BELOW GROUND BLOCK WORK TANK

1% AEP TOP WATER LEVEL = RL9.76
OVERFLOW LEVEL = RL10.20
ORIFICE CENTERLINE = RL8.893
ORIFICE DIAMETER = Ø185mm

RAINWATER RE-USE:

RAINWATER RE-USE STORAGE PROVIDED = 20kL

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

STORMWATER MANAGEMENT REQUIREMENTS HAVE BEEN CALCULATED IN ACCORDANCE WITH SYDNEY DEVELOPMENT CONTROL PLAN 2012: SECTION 3.7 WATER AND FLOOD MANAGEMENT.

WATER QUALITY TREATMENT DEVICES:

- 'OCEANGUARD' PIT BASKET INSERTS
- 'STORMFILTER' CARTRIDGES
- 'STORMFILTER' PRECAST PIT
- RAINWATER RE-USE TANK

MUSIC MODEL SUMMARY (REFER NORTHROP REPORT FOR FURTHER DETAILS).

TREATMENT STANDARDS:

POLLUTANT	REDUCTION STANDARDS	REDUCTION ACHIEVED
GROSS POLLUTANTS	85%	88.4%
TOTAL SUSPENDED SOLIDS	65%	75.5%
TOTAL PHOSPHORUS	45%	62.2%
TOTAL NITROGEN	90%	96.5%

STORMWATER TREATMENT HAS BEEN DESIGNED IN ACCORDANCE WITH CITY OF SYDNEY DEVELOPMENT CONTROL PLAN 2012 (DCP) SECTION 3.7.3 STORMWATER QUALITY

DRAWN: M. MAI   DESIGNED: A. CARVALHAES   JOB MANAGER: A. CARVALHAES   VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
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04	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: WARREN AND MAHONEY®

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

PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA

STATE SIGNIFICANT DEVELOPMENT APPLICATION

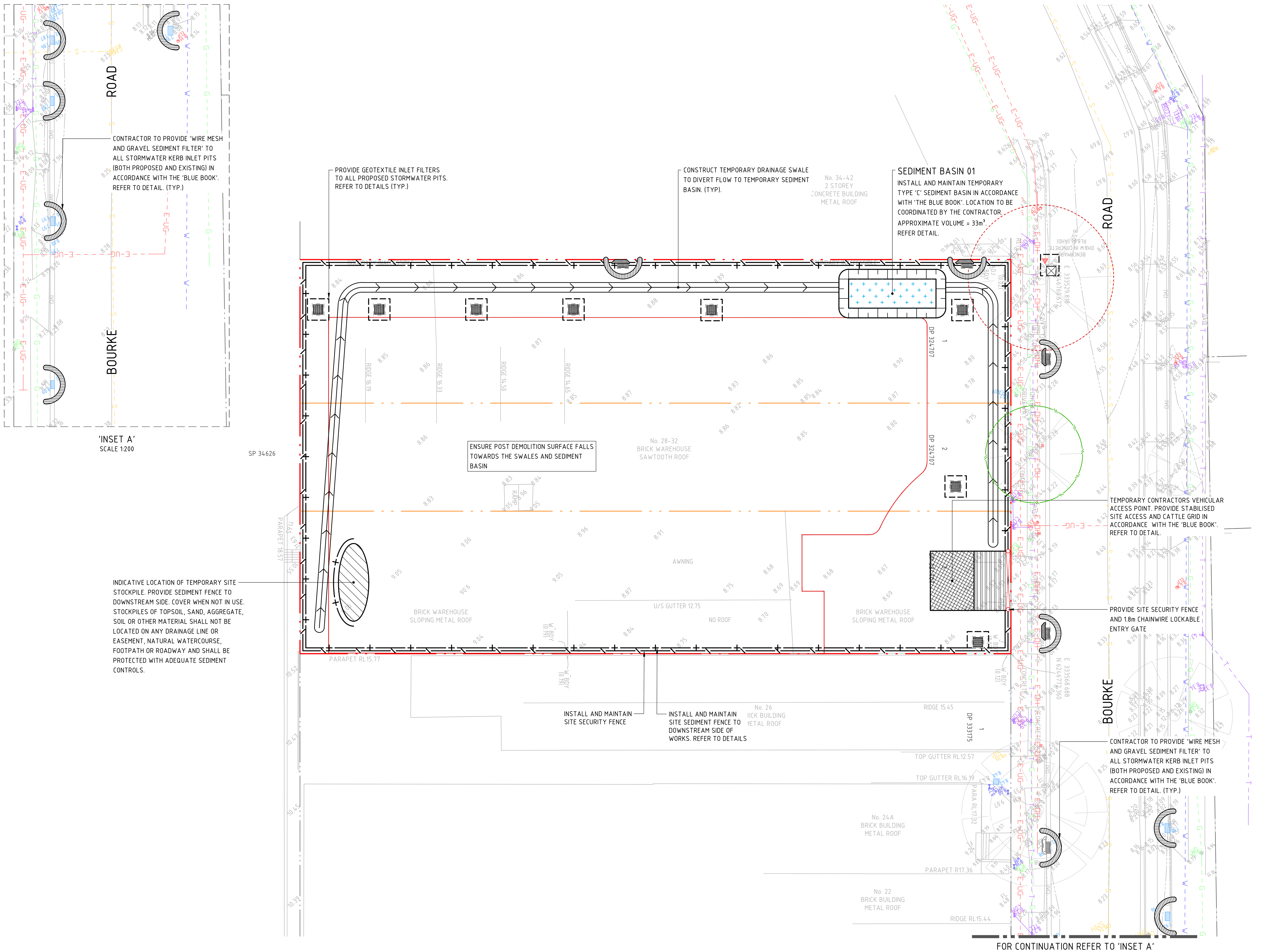
DRAWING TITLE: CIVIL ENGINEERING PACKAGE

SPECIFICATION NOTES - SHEET 01

JOB NUMBER: 230695

DRAWING NUMBER: C001   REVISION: 04

DRAWING SHEET SIZE = A1



LEGEND

- LOT BOUNDARY
- INTERNAL BOUNDARY
- ADJACENT LOT BOUNDARY
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING TELSTRA
- EXISTING GAS
- EXISTING SEWER
- EXISTING WATER
- EXISTING STORMWATER
- BUILDING FOOTPRINT
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- SECURITY GATE
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- GEOTEXTILE INLET FILTER TRAP
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN
- TREE PROTECTION
- TREE TO BE REMOVED

SEDIMENT BASIN 01 CALCULATIONS

PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	0.572
SOIL TEXTURE GROUP	C
3-MONTH ARI FLOW (m^3/S)	0.043
PARTICLE SIZE (mm)	0.05 (SILT/FINE SAND)
AREA FACTOR	635
SETTLING ZONE HEIGHT (m)	0.6
VOLUME SETTLING ZONE (m^3)	16.383
VOLUME SEDIMENT STORAGE (m^3)	16.383
TOTAL BASIN VOLUME (m^3)	32.766

GENERAL NOTES:

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

NOT FOR CONSTRUCTION

DRAWN: M. MAI
DESIGNED: A. CARVALHAES
JOB MANAGER: A. CARVALHAES
VERIFIER:

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT
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ARCHITECT
WARREN AND MAHONEY®

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SCALE 1:200@ A1 — 0 2 4 6 8 10m

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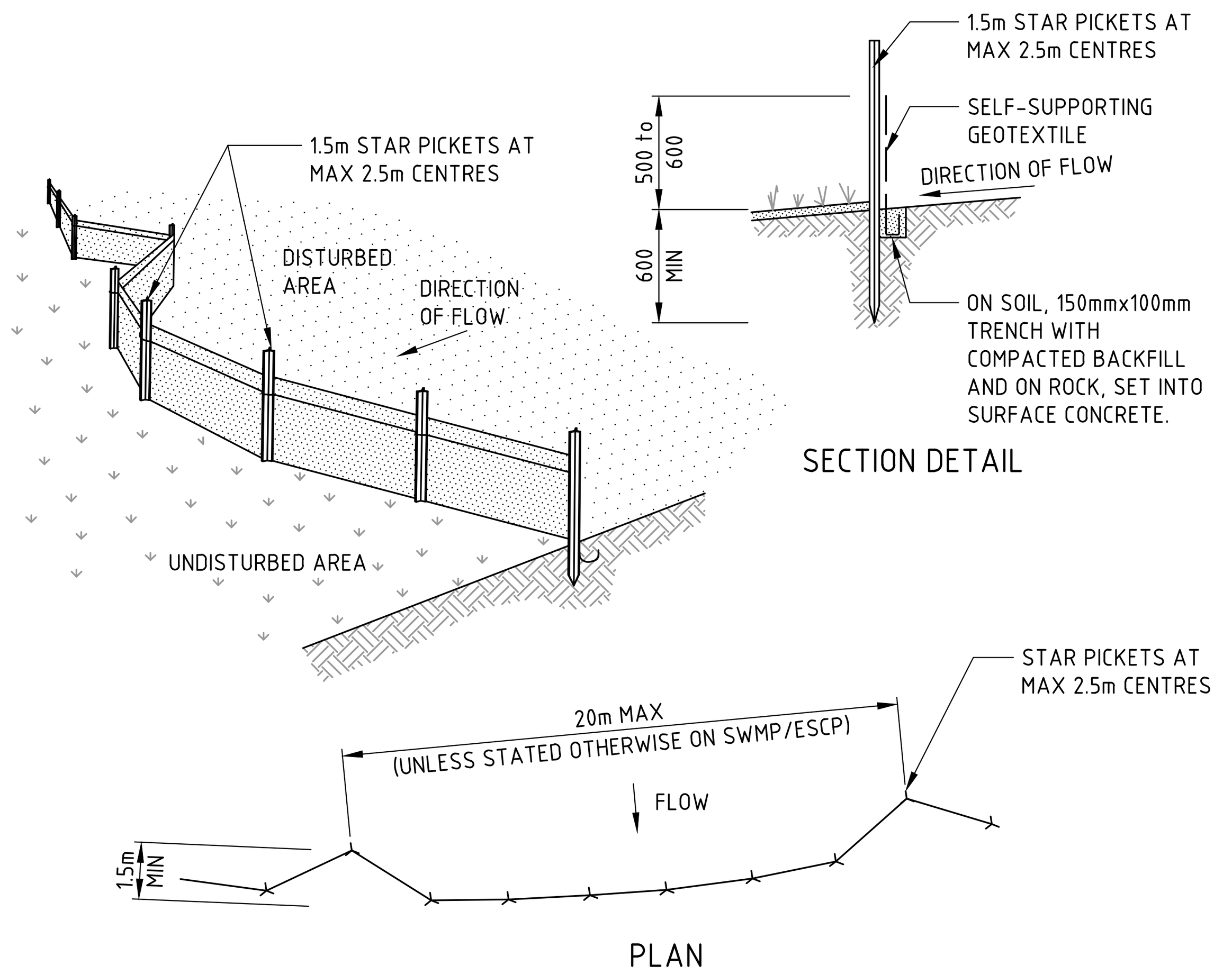
PROJECT
ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
SEDIMENT AND SOIL EROSION CONTROL PLAN

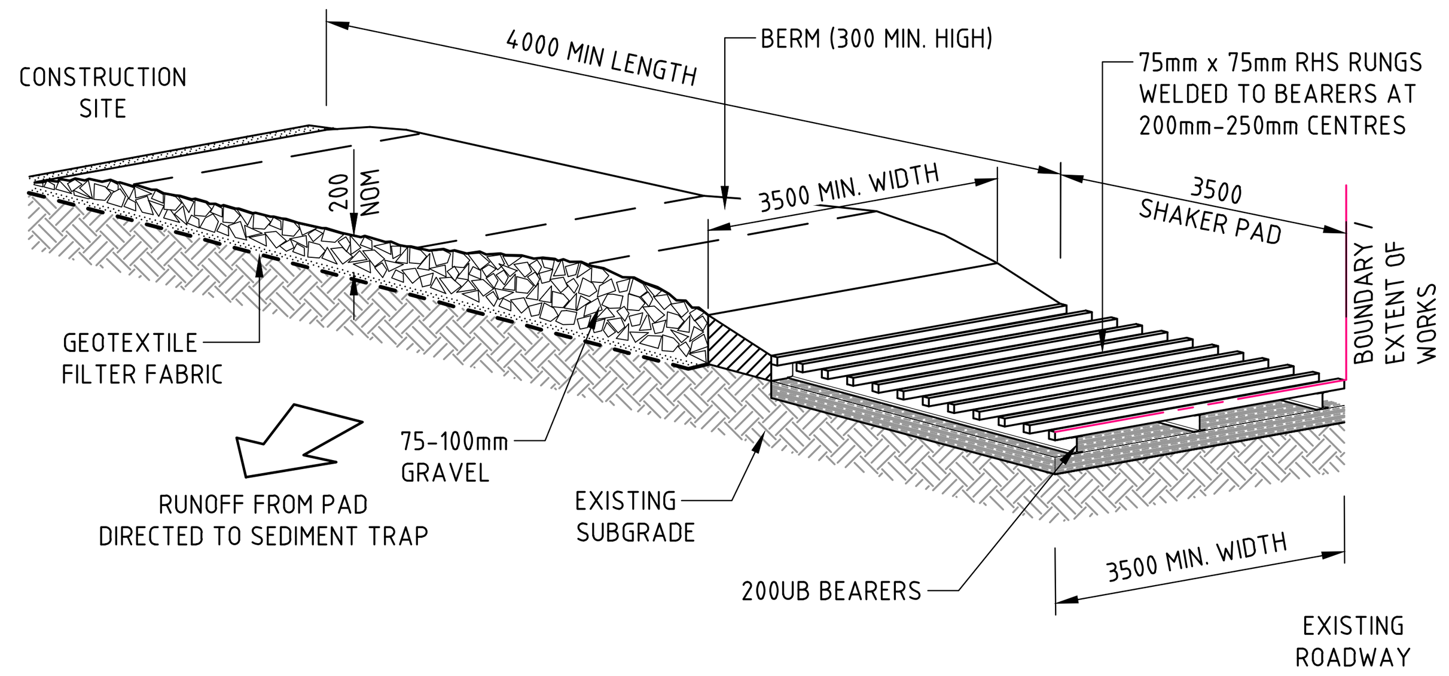
JOB NUMBER 230695
DRAWING NUMBER C100
REVISION 03
DRAWING SHEET SIZE = A1



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.

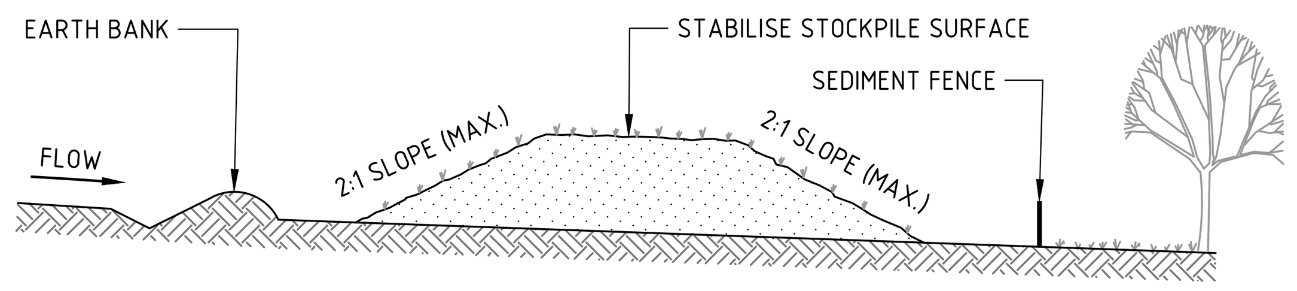
SEDIMENT FENCE



CONSTRUCTION NOTES

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

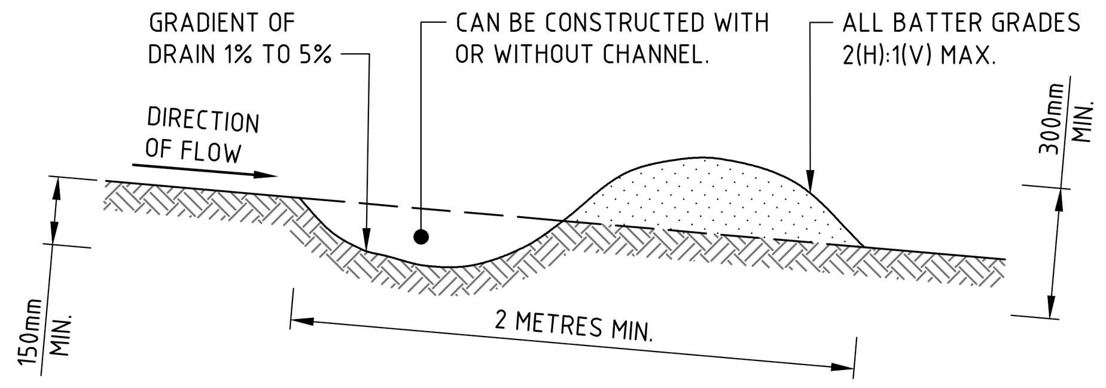
STABILISED SITE ACCESS



CONSTRUCTION NOTES

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

STOCKPILE

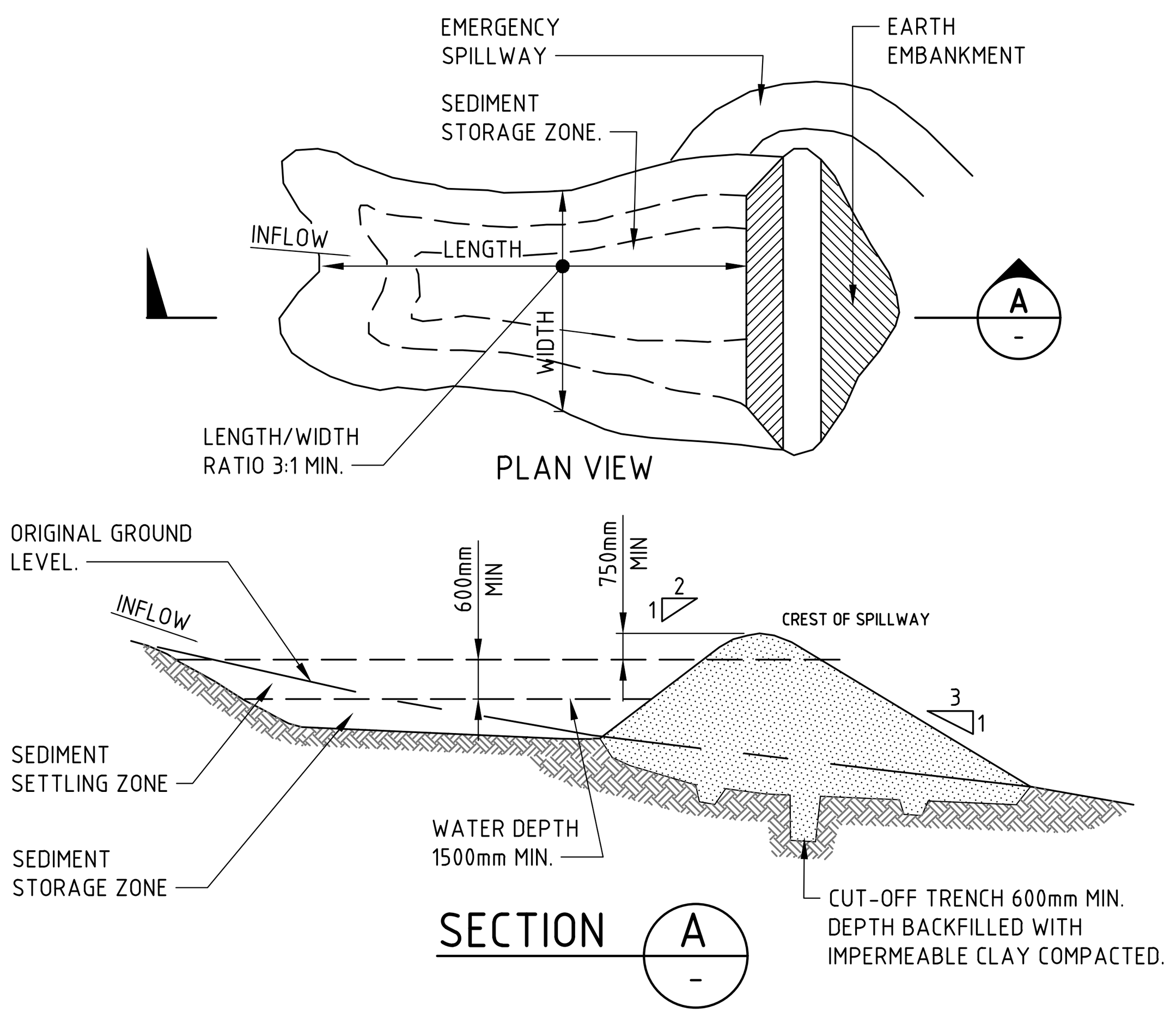


CONSTRUCTION NOTES

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.

TEMPORARY DRAINAGE SWALE

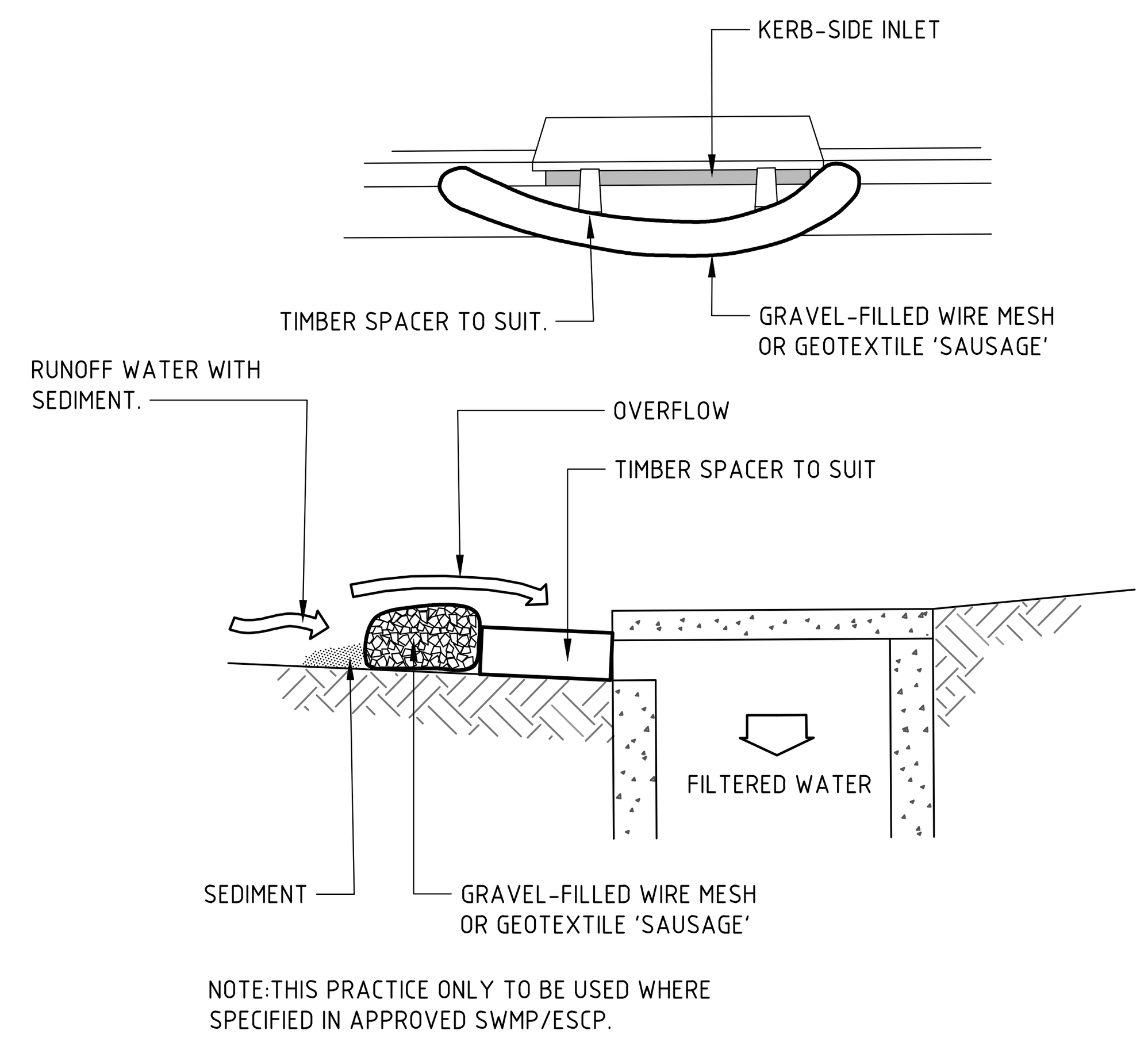


CONSTRUCTION NOTES

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

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

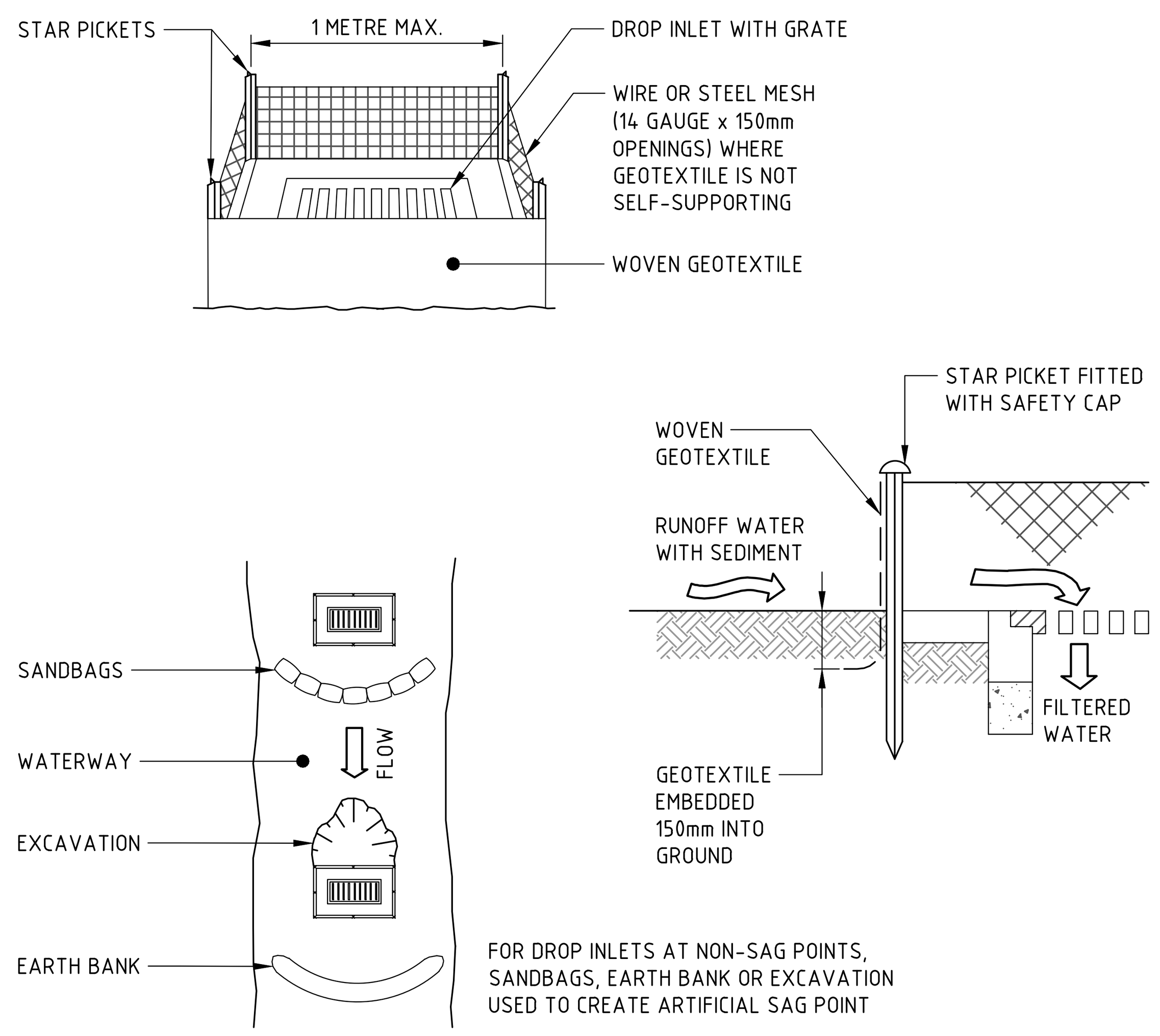
SEDIMENT BASIN



CONSTRUCTION NOTES

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

WIRE MESH AND GRAVEL SEDIMENT FILTER



CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER TRAPS

DRAWN: M. MAI
DESIGNED: A. CARVALHAES
JOB MANAGER: A. CARVALHAES
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

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ARCHITECT: WARREN AND MAHONEY®

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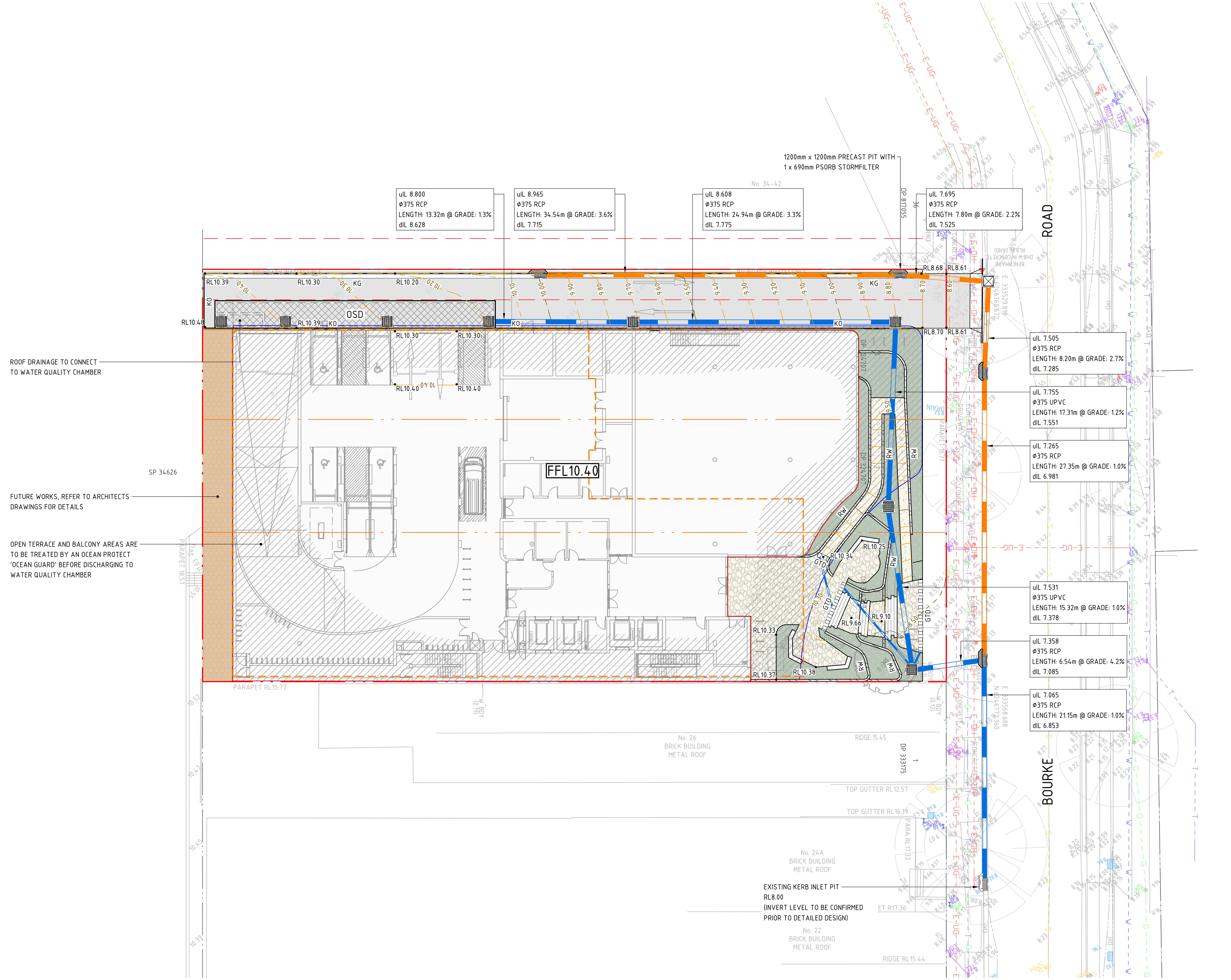
PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

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

JOB NUMBER: 230695
DRAWING NUMBER: C101
REVISION: 03
DRAWING SHEET SIZE = A1



LEGEND

— · · —	LOT BOUNDARY
— · · —	INTERNAL BOUNDARY
— · · —	ADJACENT LOT BOUNDARY
— E-OH —	EXISTING ELECTRICITY (OVERHEAD)
— E-UG —	EXISTING ELECTRICITY (UNDERGROUND)
— T —	EXISTING TELSTRA
— G —	EXISTING GAS
— S —	EXISTING SEWER
— W —	EXISTING WATER
	EXISTING STORMWATER
	BUILDING FOOTPRINT
	BUILDING OVER
	BASEMENT EXTENT
XX.XX	EXISTING CONTOURS
XX.XX	DESIGN CONTOURS
FFLXX.XX	PROPOSED FINISHED FLOOR LEVEL
• RLXX.XX	PROPOSED SPOT HEIGHT
KO	KERB ONLY
KG	KERB AND GUTTER
	STORMWATER PIPE
	STORMWATER PIPE (PUBLIC DOMAIN)
	GRATED INLET PIT
	KERB INLET PIT
	EXISTING KERB INLET PIT
GTD	GRATED TRENCH DRAIN
RW	RETAINING WALL
	RIGID ROAD PAVEMENT
	CONCRETE FOOTPATH
	UNIT PAVING - REFER LANDSCAPE ARCHITECTS DRAWINGS
	LANDSCAPING
	FUTURE WORKS

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
3. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).
4. SUBSOIL DRAINAGE TO RETAINING WALLS, KERBS AND SWALE DRAINS NOT SHOWN FOR CLARITY - REFER RELEVANT DETAILS.
5. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.
6. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.
7. CONTRACTOR TO ALLOW TO ADJUST AND LIAISE WITH RELEVANT SERVICE AUTHORITIES IN RELATION TO EXISTING SERVICE ADJUSTMENT AND MODIFICATIONS.
8. CONTRACTOR TO INSTALL OCEAN PROTECT 'OCEAN GUARD' PIT INSERTS TO ALL GRATED INLET PITS.

DRAWN: M. MAI DESIGNED: A. CARVALHAES JOB MANAGER: A. CARVALHAES VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

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SCALE 1:200@ A1 — 0 2 4 6 8 10m

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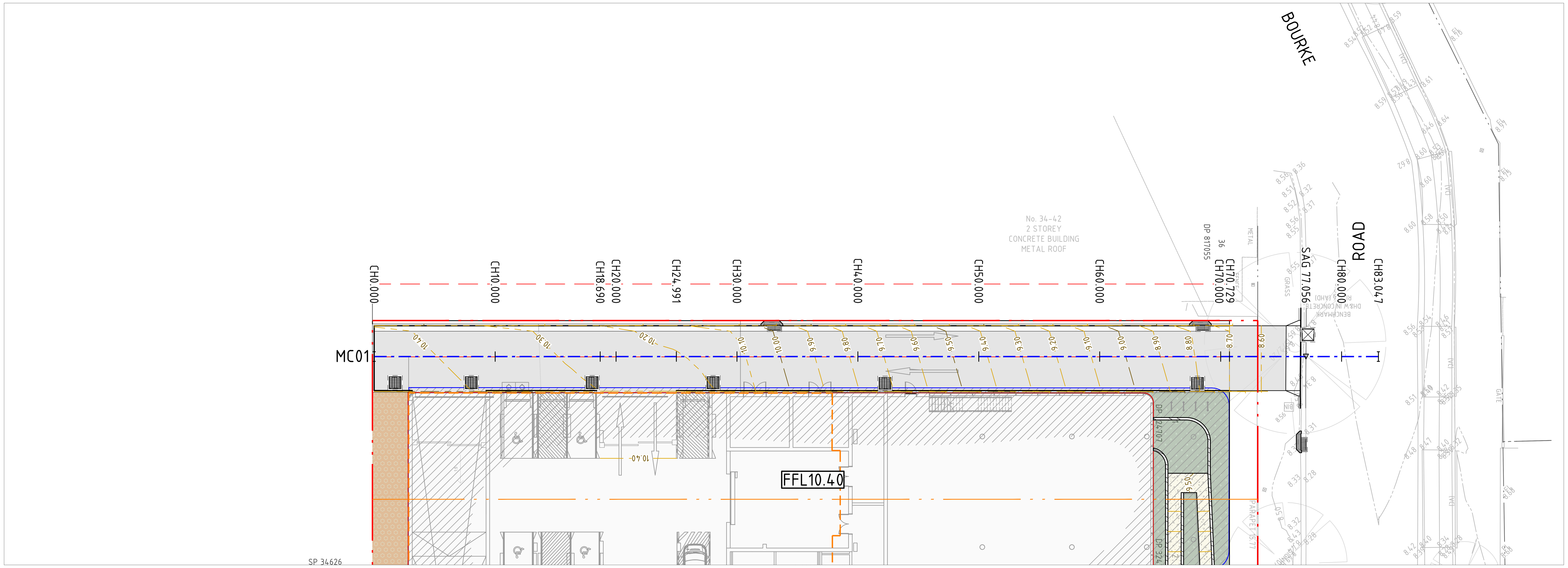
PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
SITEWORKS AND STORMWATER MANAGEMENT PLAN

JOB NUMBER: 230695
DRAWING NUMBER: C300
REVISION: 03
DRAWING SHEET SIZE = A1



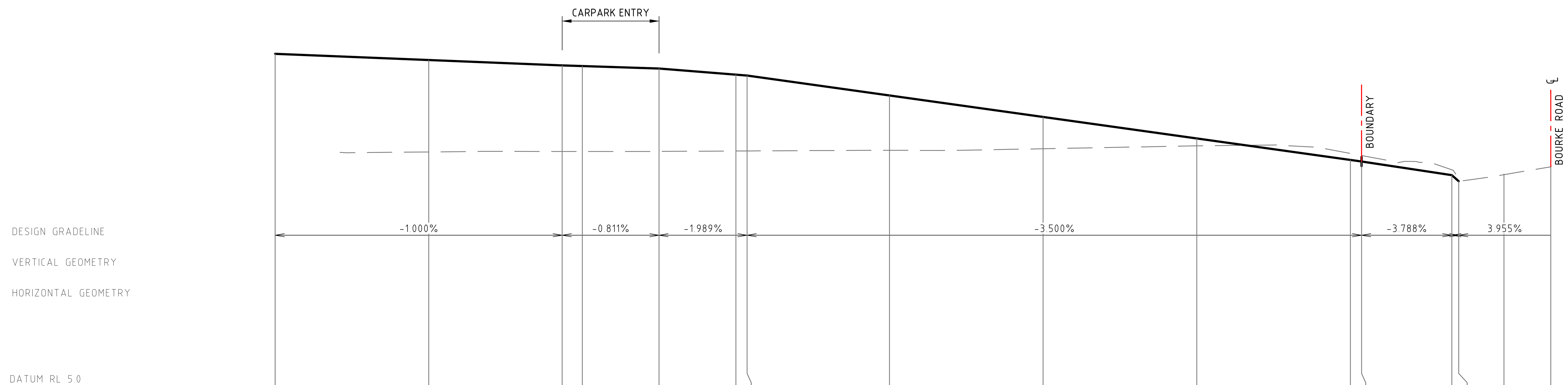
PLAN
SCALE 1:200

LEGEND

(line)	LOT BOUNDARY
(line)	INTERNAL BOUNDARY
(line)	ADJACENT LOT BOUNDARY
XX.XX	EXISTING CONTOURS
XX.XX	DESIGN CONTOURS
FFLXX.XX	PROPOSED FINISHED FLOOR LEVEL

ALIGNMENT CONTROL LEGEND

MC01	CONTROL LINE
CH0.000	CHAINAGE
SAG 0.000	SAG POINT



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0.000	10.452	
10.000	10.352	8.856
18.690	10.265	8.864
20.000	10.255	8.863
24.991	10.214	8.865
30.000	10.114	8.871
30.729	10.1	8.872
40.000	9.776	8.883
50.000	9.426	8.908
60.000	9.076	8.955
70.000	8.726	8.832
70.729	8.7	8.798
76.606	8.477	8.566
77.056	8.377	8.377
80.000		8.486
83.047		8.614

LONGITUDINAL SECTION ALONG NEW ROAD (MC01)
HORIZONTAL SCALE 1:200@A1
VERTICAL SCALE 1:50@A1

DRAWN: M. MAI
DESIGNED: A. CARVALHAES
JOB MANAGER: A. CARVALHAES
VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	MM		TB	08.12.23

CLIENT: Centuria

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ARCHITECT: WARREN AND MAHONEY®

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SCALE 1:200@A1 0 2 4 6 8 10m
SCALE 1:50@A1 0.0 0.5 1.0 1.5 2.0 2.5m

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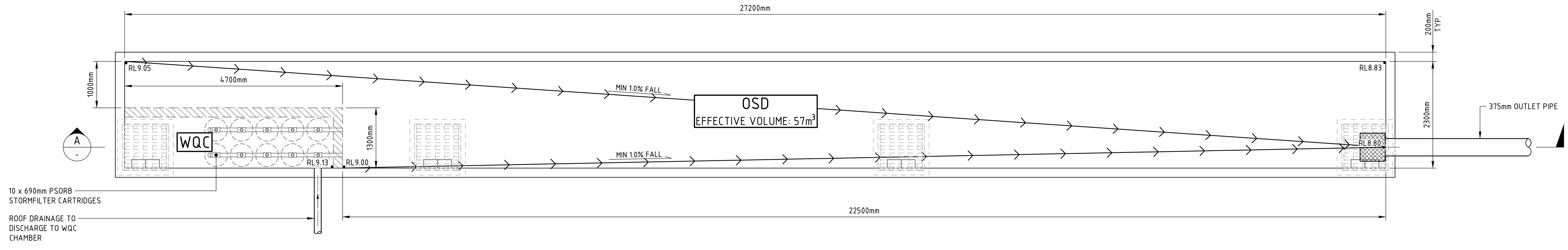
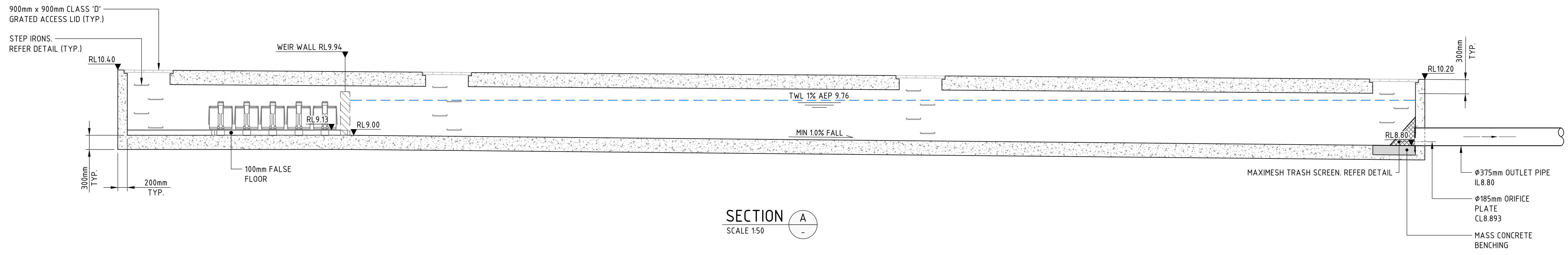
PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

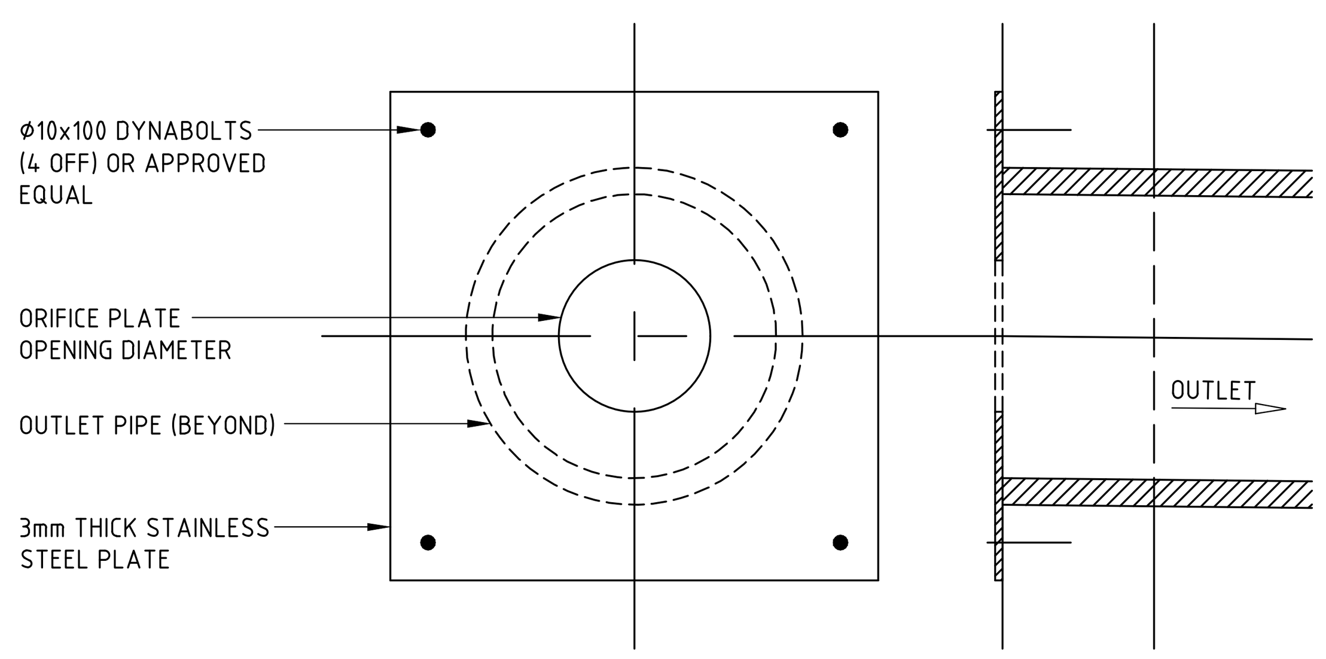
DRAWING TITLE: CIVIL ENGINEERING PACKAGE
NEW ROAD (MC01) PLAN AND PROFILE

JOB NUMBER: 230695
DRAWING NUMBER: C310
REVISION: 01
DRAWING SHEET SIZE = A1

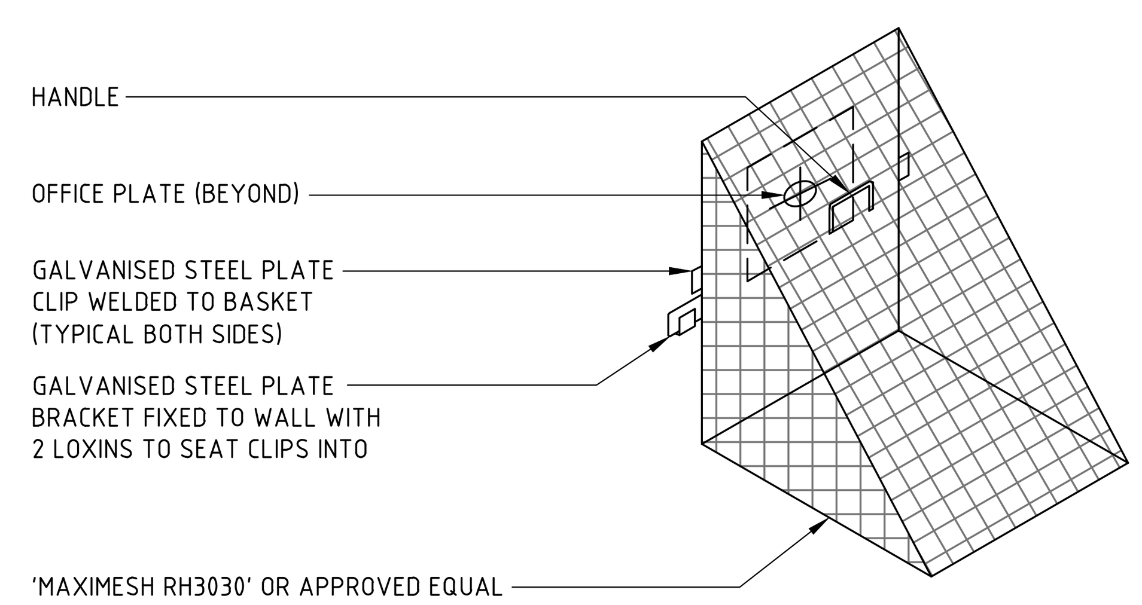




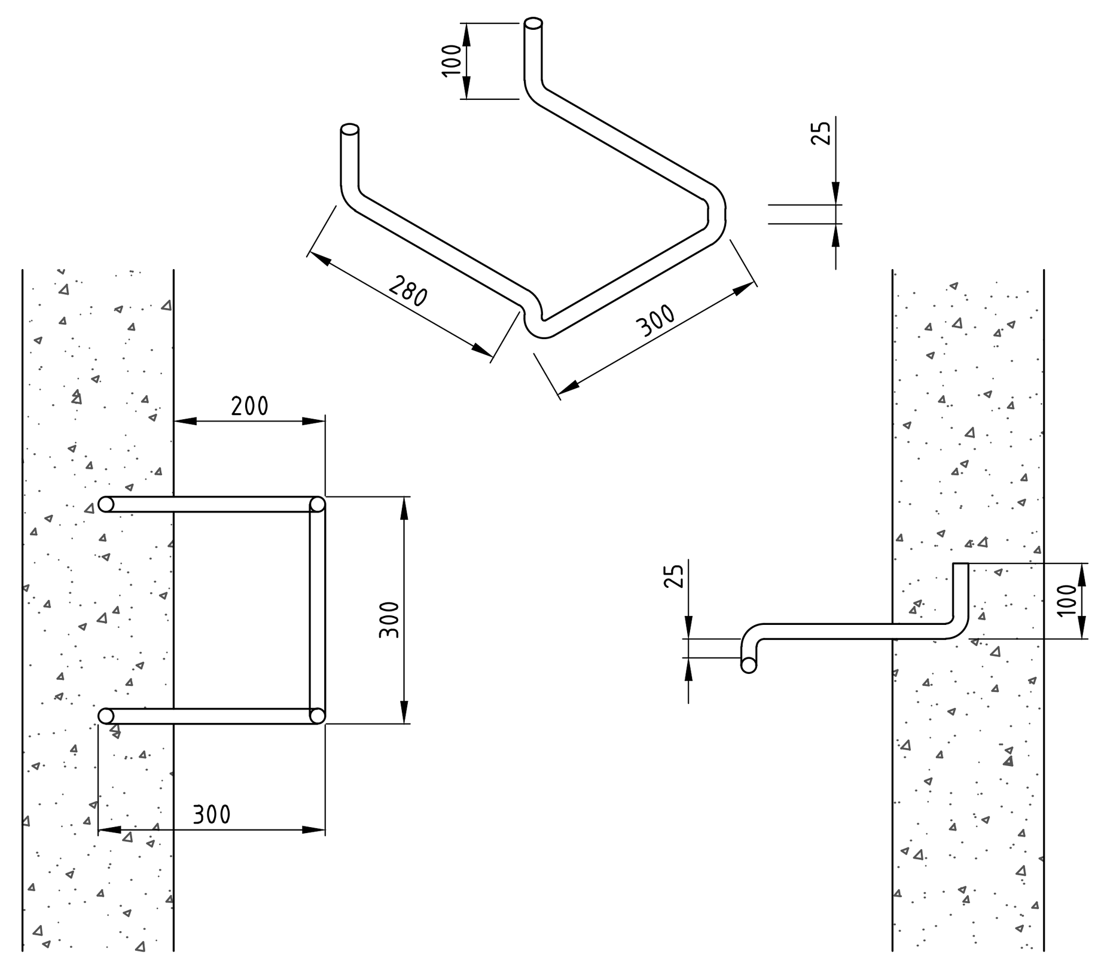
SECTION A
SCALE 1:50



ORIFICE PLATE DETAIL
• ORIFICE PLATE - ⌀185mm
SCALE 1:10



TRASH SCREEN DETAIL
SCALE 1:10



STEP IRON DETAIL
STEP IRON OF 20mm GALVANISED STEEL MADE TO SHAPE AND DIMENSIONS AS SHOWN, PLACED AT 300 CENTRES AND STAGGERED HORIZONTALLY FOR ALL PITS DEEPER THAN 1.0m. THE USE OF PROPRIETARY STEP IRONS ARE ACCEPTABLE PROVIDED THE PRODUCT IS IN ACCORDANCE WITH AUSTRALIAN STANDARDS
SCALE 1:10

DRAWN: M. MAI DESIGNED: A. CARVALHAES JOB MANAGER: A. CARVALHAES VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

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ARCHITECT: WARREN AND MAHONEY®

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

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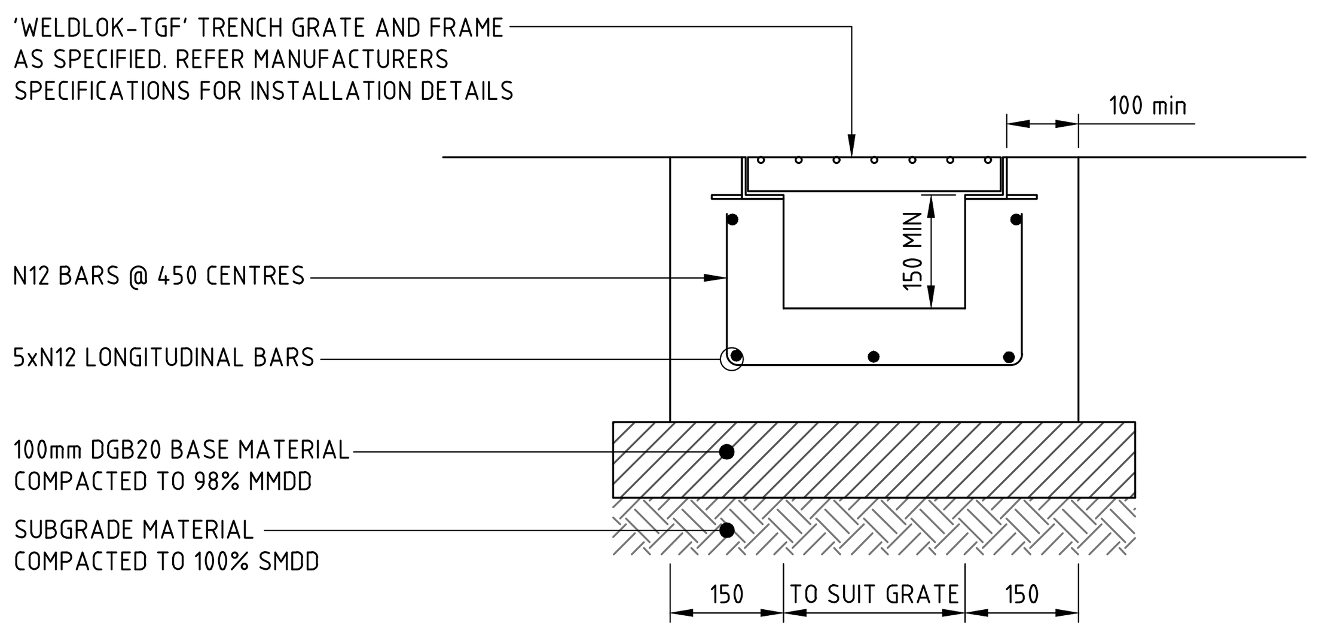
PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA
STATE SIGNIFICANT DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
STORMWATER MANAGEMENT DETAILS - SHEET 01

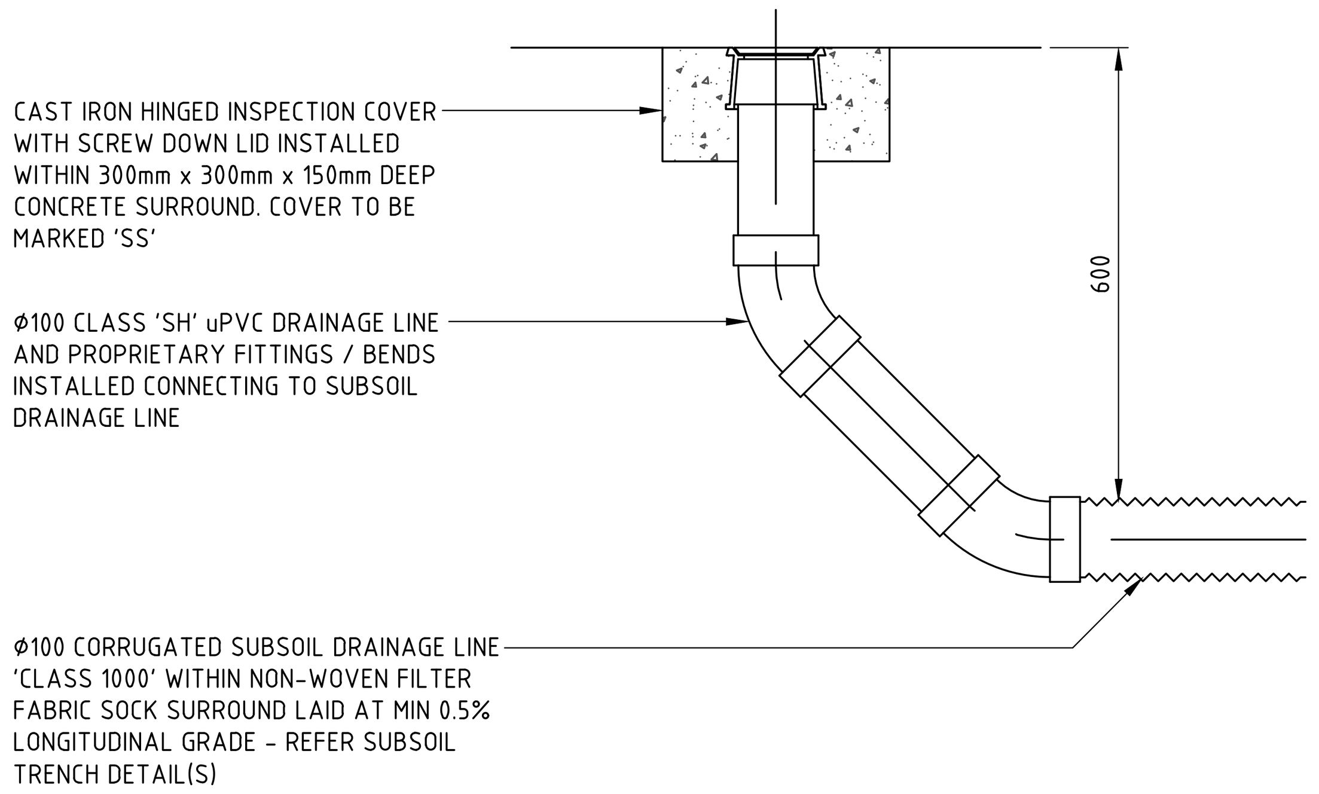
JOB NUMBER: 230695
DRAWING NUMBER: C410
REVISION: 03
DRAWING SHEET SIZE = A1



GRATED TRENCH DRAIN 'GTD'

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

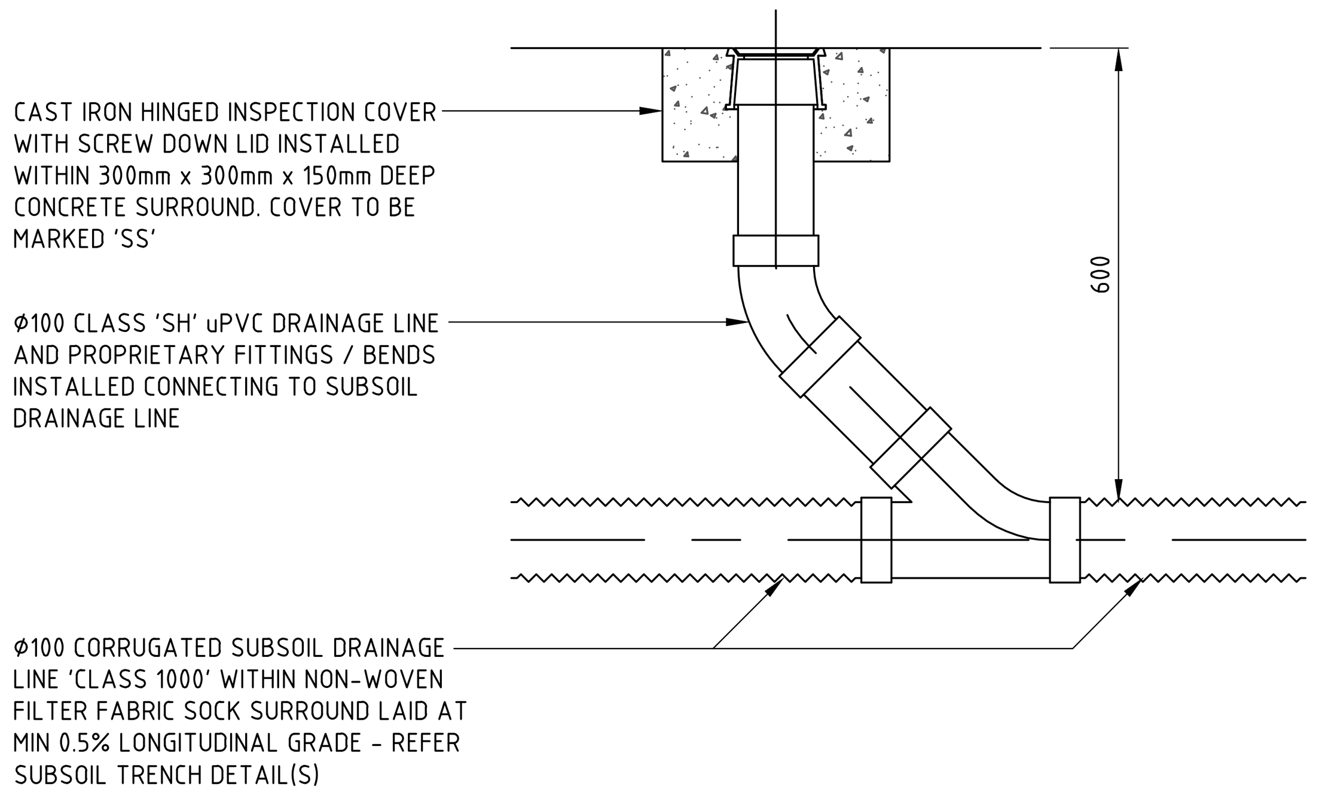
SCALE 1:10



SUBSOIL DRAINAGE CLEAROUT 'CO'

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

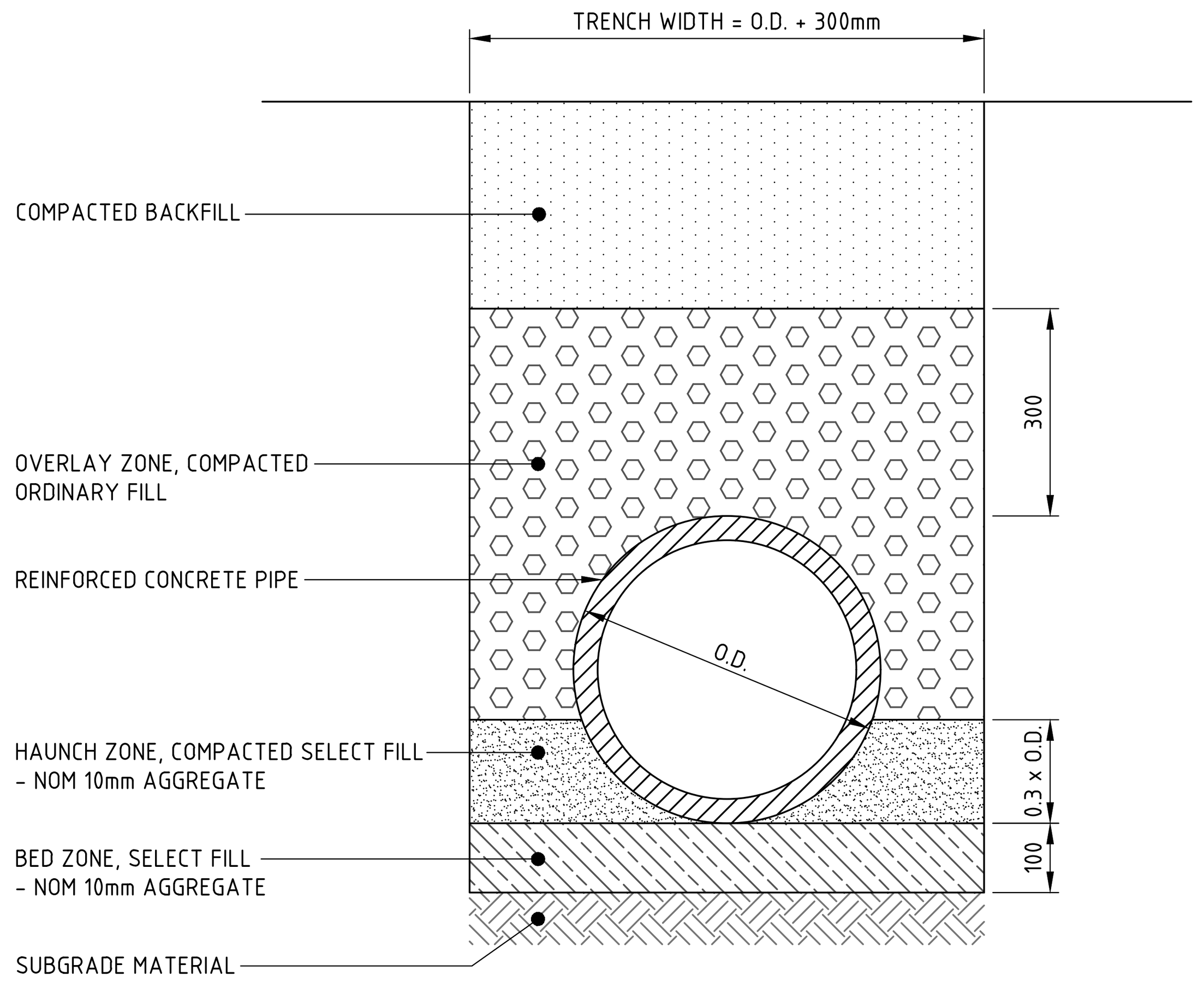
SCALE 1:10



SUBSOIL DRAINAGE CLEAROUT 'CO'

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

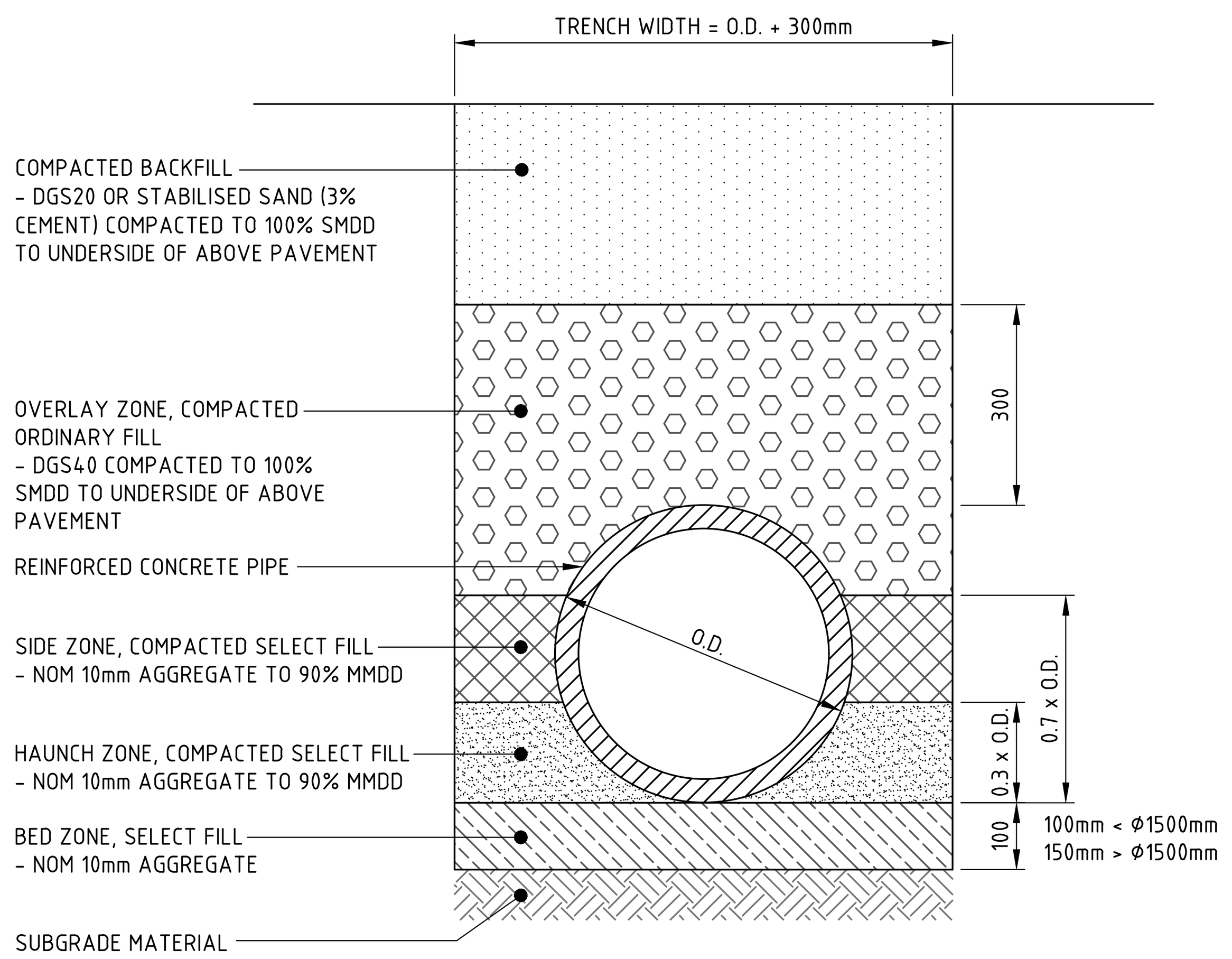
SCALE 1:10



TYPICAL PIPE TRENCH - GENERAL AREAS

1. TRENCH WIDTH MAY NEED TO BE INCREASED SUBJECT TO ACHIEVING COMPACTION. ENSURE MINIMUM 300mm CLEARANCE BETWEEN, WHEN USING MULTIPLE PIPES TO ACHIEVE ADEQUATE COMPACTION.
2. MINIMUM PIPE COVER NOT UNDER ROADS TO BE 300mm U.N.O.
3. THE CONTRACTOR SHALL ENSURE THAT SHORING OF TRENCHES IS INSTALLED AS REQUIRED BY STATUTORY REQUIREMENTS.
4. ENSURE BACKFILLING COMPACTION MEETS THE FOLLOWING STANDARDS;
   - 4.1. TRENCHES UNDER PAVED AREAS / BUILDING - 100% SMDD
   - 4.2. TRENCHES NOT UNDER PAVEMENTS - 95% SMDD

SCALE 1:10



TYPICAL PIPE TRENCH - UNDER ROADS

1. TRENCH WIDTH MAY NEED TO BE INCREASED SUBJECT TO ACHIEVING COMPACTION. ENSURE MINIMUM 300mm CLEARANCE BETWEEN, WHEN USING MULTIPLE PIPES TO ACHIEVE ADEQUATE COMPACTION.
2. MINIMUM PIPE COVER UNDER ROADS TO BE 600mm U.N.O. FOR CLASS '2' PIPES.
3. THE CONTRACTOR SHALL ENSURE THAT SHORING OF TRENCHES IS INSTALLED AS REQUIRED BY STATUTORY REQUIREMENTS.
4. ENSURE BACKFILLING COMPACTION MEETS THE FOLLOWING STANDARDS;
   - 4.1. TRENCHES UNDER PAVED AREAS / BUILDING - 100% SMDD

SCALE 1:10

DRAWN: M. MAI   DESIGNED: A. CARVALHAES   JOB MANAGER: A. CARVALHAES   VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

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ARCHITECT: WARREN AND MAHONEY®

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

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

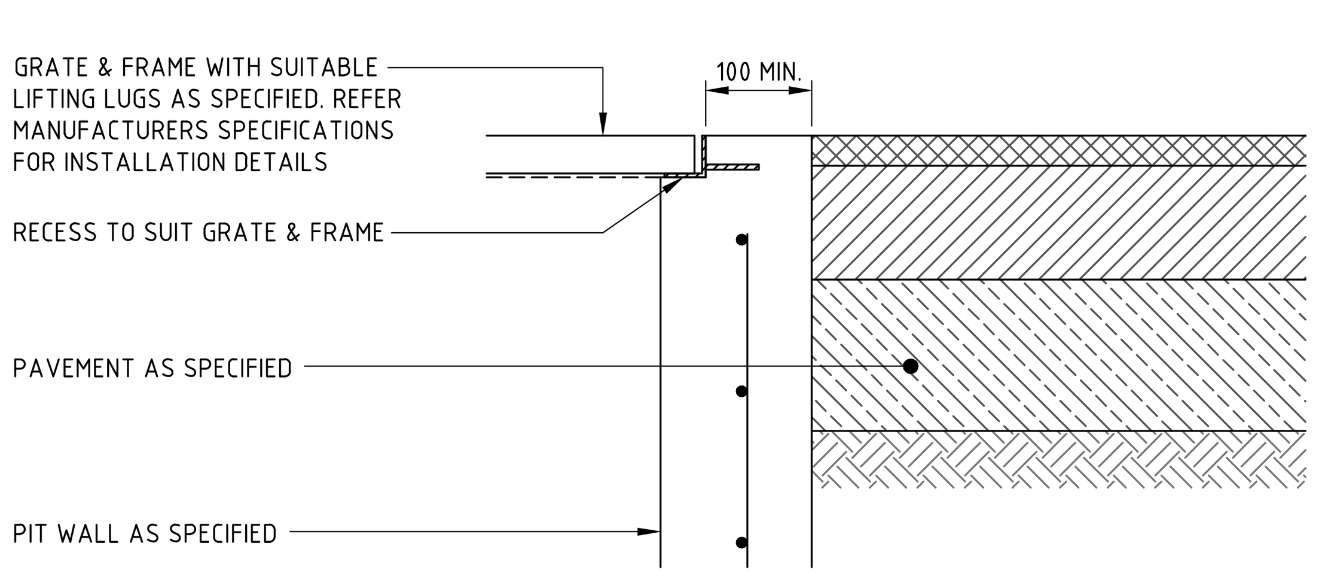
PROJECT: ALEXANDRIA HEALTH CARE, 28-32 BOURKE ROAD, ALEXANDRIA — STATE SIGNIFICANT DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — STORMWATER MANAGEMENT DETAILS - SHEET 02

JOB NUMBER: 230695

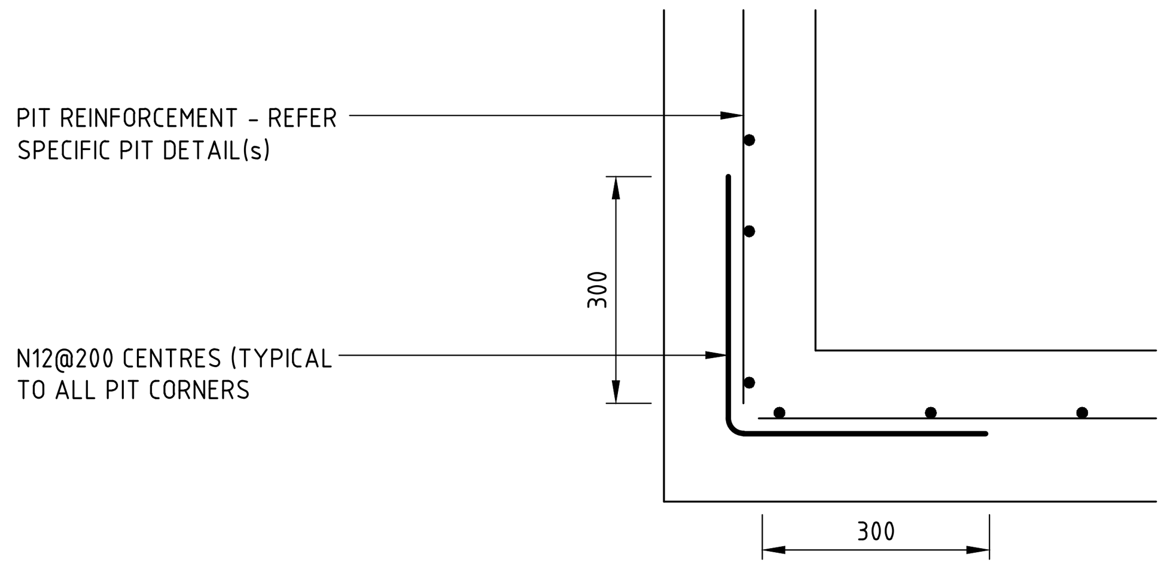
DRAWING NUMBER: C411   REVISION: 03

DRAWING SHEET SIZE = A1



PIT INTERFACE - DETAIL 'A'

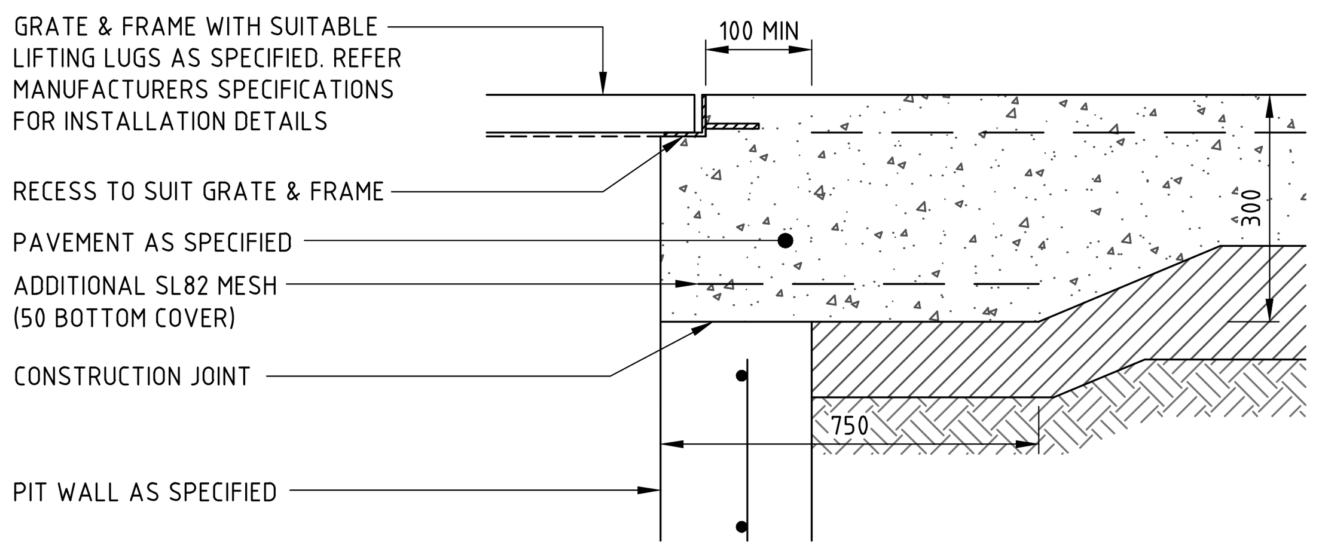
SCALE 1:10



PIT INTERFACE (PLAN VIEW)

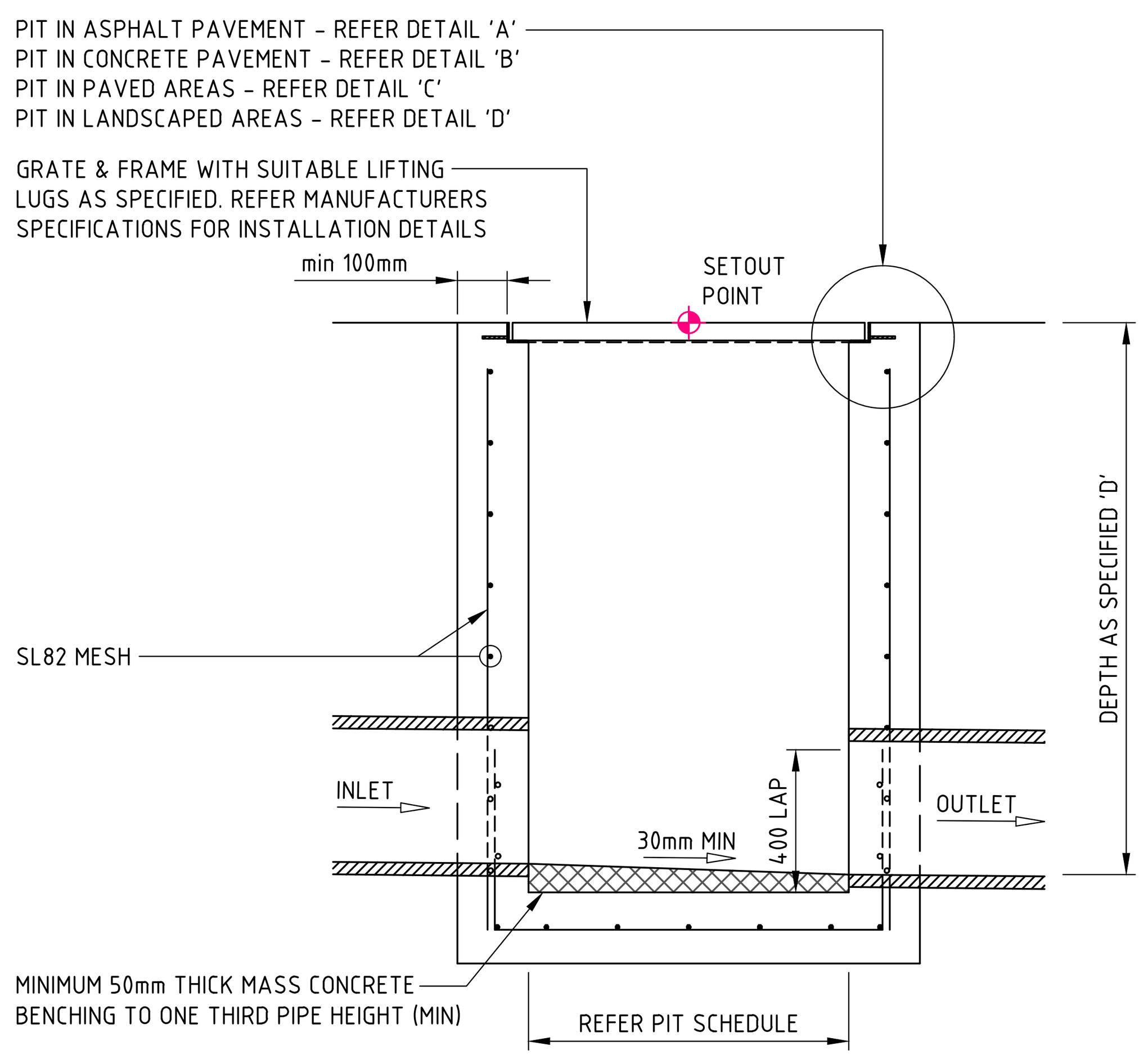
APPLICABLE TO ALL STORMWATER DRAINAGE STRUCTURES

SCALE 1:10



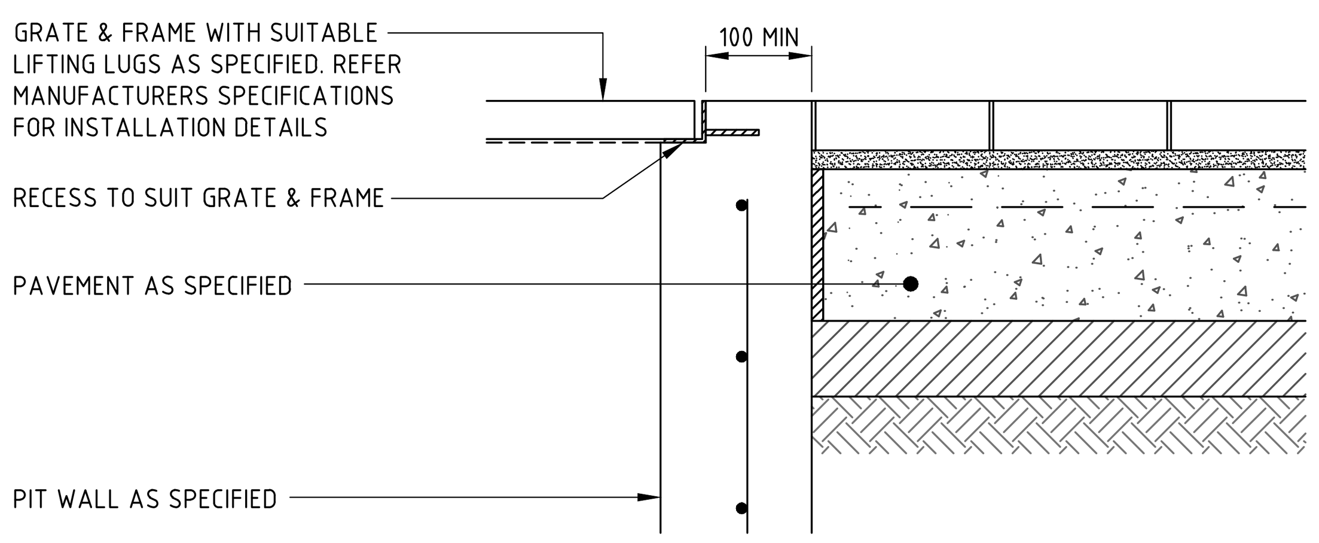
PIT INTERFACE - DETAIL 'B'

SCALE 1:10



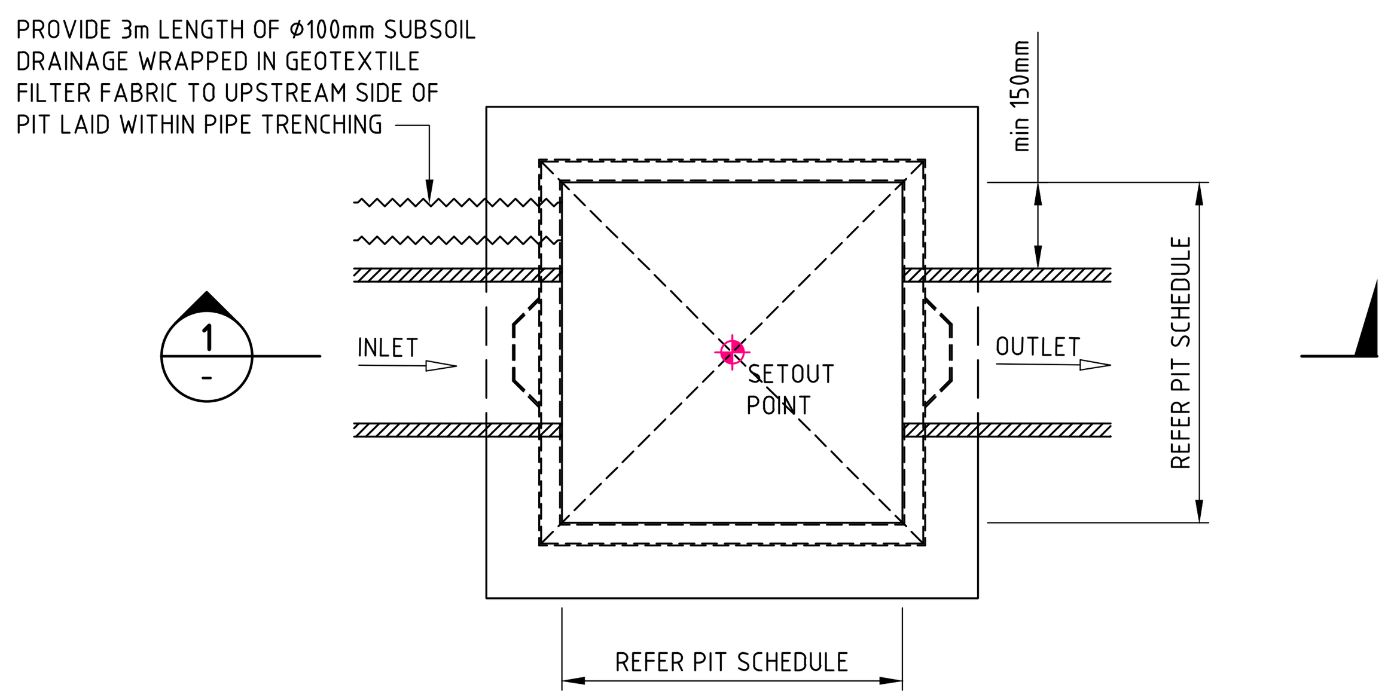
SECTION 1/-

SCALE 1:20



PIT INTERFACE - DETAIL 'C'

SCALE 1:10

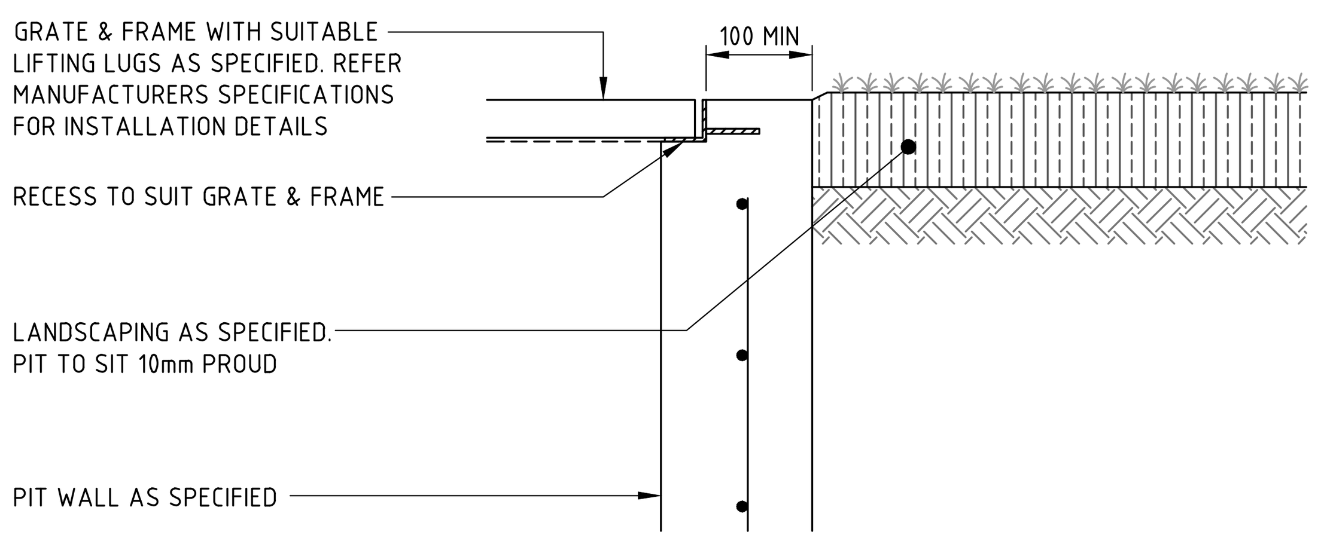


PLAN

SURFACE INLET 'SIP' / JUNCTION PIT 'JP'

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

SCALE 1:20



PIT INTERFACE - DETAIL 'D'

SCALE 1:10

DRAWN: M. MAI DESIGNED: A. CARVALHAES JOB MANAGER: A. CARVALHAES VERIFIER:

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR DRAFT SSDA	MM		SS	04.10.23
02	ISSUED FOR INFORMATION	MM		SS	07.11.23
03	ISSUED FOR SSDA	MM		TB	08.12.23

CLIENT: Centuria

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ARCHITECT: WARREN AND MAHONEY®

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

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

PROJECT: ALEXANDRIA HEALTH CARE
28-32 BOURKE ROAD, ALEXANDRIA

STATE SIGNIFICANT DEVELOPMENT APPLICATION

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

STORMWATER MANAGEMENT DETAILS - SHEET 03

JOB NUMBER: 230695

DRAWING NUMBER: C412 REVISION: 03

DRAWING SHEET SIZE = A1

Appendix C – Sydney Water Correspondence by Northrop Consulting Engineers

Sarkis Sarkis

From: Stormwater <Stormwater@sydneywater.com.au>
Sent: Monday, 30 October 2023 12:09 PM
To: Sarkis Sarkis
Cc: Aline Carvalhaes
Subject: RE: [External] Request for Sydney Water Advice - 28-32 Bourke Road Alexandria

Sarkis,

The On Site Detention requirements for the 2,972 square meters site at 28-32 Bourke Road Alexandria, are as follows:

- On Site Detention 46 cubic meters
- Permissible Site Discharge 110 L/s

The approval for the On Site Detention would only be given as part of the Section 73 application for this development. The On Site Detention is to be designed according to the above values and submitted to Sydney Water for approval with the Section 73 application. The following details are to be included in your submission for On Site Detention approval:

- Location of the On Site Detention in relation to the development
- Location of the On Site Detention in relation to overall stormwater network of the property
- Plan and Elevation of the On Site Detention tank with all dimensions
- Orifice plate calculation

Best Regards

Planning and Technical
Business Development
Sydney Water, Level 13, 1 Smith Street, Parramatta NSW 2150

From: Sarkis Sarkis <SSarkis@northrop.com.au>
Sent: Thursday, 28 September 2023 3:35 PM

To: Stormwater <Stormwater@sydneywater.com.au>
Cc: Aline Carvalhaes <ACarvalhaes@northrop.com.au>
Subject: [External] Request for Sydney Water Advice

Hi,

I'm assisting with the design of a redevelopment project. Can you please advise on the Permissible Site Discharge (PSD) and Site Storage Requirement (SSR).

The site description is as follows:

- Address: 28-32 Bourke Road Alexandria NSW
- Area: 2972 sqm
- % Impervious in Pre-Development: 100%
- % Impervious in Post-Development: 94%

Kind regards,

Sarkis Sarkis
Graduate Civil Engineer

Northrop Consulting Engineers Pty Ltd
T 02 9241 4188
D 02 9156 3109
Level 15, 6 Hassall Street, Parramatta NSW 2150
www.northrop.com.au

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Appendix D – MUSIC Link Report

MUSIC-*link* Report

Project Details		Company Details	
Project:	Alexandria Health Centre	**Company:**	Northrop Consulting Engineers
Report Export Date:	7/12/2023	**Contact:**	Sarkis Sarkis
Catchment Name:	23.12.07 - MUSIC Model v2	**Address:**	Level 15, 6 Hassall Street, Parramatta NSW 2150
Catchment Area:	0.299ha	**Phone:**	02 9156 3109
Impervious Area*:	96.98%	**Email:**	ssarkis@northrop.com.au
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1982 - 31/12/1986 11:54:00 PM		
Mean Annual Rainfall:	1278mm		
Evapotranspiration:	1265mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	City of Sydney Sandy Soil		
Scenario:	City of Sydney 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	27.6%
TSS	88.4%
TP	75.5%
TN	62.2%
GP	96.5%

Treatment Nodes

Node Type	Number
Rain Water Tank Node	1
Sedimentation Basin Node	2
Generic Node	2
GPT Node	3

Source Nodes

Node Type	Number
Urban Source Node	6

Comments

N/A

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	2 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.04
GPT	2 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.04
Post	Post-Development Node	% Load Reduction	None	None	27.6
Post	Post-Development Node	GP % Load Reduction	90	None	96.5
Post	Post-Development Node	TN % Load Reduction	45	None	62.2
Post	Post-Development Node	TP % Load Reduction	65	None	75.5
Post	Post-Development Node	TSS % Load Reduction	85	None	88.4
Rain	Rainwater Tank (20kL)	% Reuse Demand Met	None	None	24.10
Sedimentation	SF Chamber (4m2)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (4m2)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Chamber (4m2)	Extended detention depth (m)	0.25	1	0.77
Sedimentation	SF Chamber (4m2)	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	% Reuse Demand Met	None	None	0
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Extended detention depth (m)	0.25	1	0.77
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Bypass (96m2)	Area Impervious (ha)	None	None	0.01
Urban	Bypass (96m2)	Area Pervious (ha)	None	None	0
Urban	Bypass (96m2)	Total Area (ha)	None	None	0.01
Urban	Footpath (86m2)	Area Impervious (ha)	None	None	0.009
Urban	Footpath (86m2)	Area Pervious (ha)	None	None	0
Urban	Footpath (86m2)	Total Area (ha)	None	None	0.009
Urban	Landscaping (88m2)	Area Impervious (ha)	None	None	0
Urban	Landscaping (88m2)	Area Pervious (ha)	None	None	0.009
Urban	Landscaping (88m2)	Total Area (ha)	None	None	0.009
Urban	Laneway (489m2)	Area Impervious (ha)	None	None	0.049
Urban	Laneway (489m2)	Area Pervious (ha)	None	None	0
Urban	Laneway (489m2)	Total Area (ha)	None	None	0.049
Urban	Podium (615m2)	Area Impervious (ha)	None	None	0.062
Urban	Podium (615m2)	Area Pervious (ha)	None	None	0
Urban	Podium (615m2)	Total Area (ha)	None	None	0.062
Urban	Roof (1599m2)	Area Impervious (ha)	None	None	0.16
Urban	Roof (1599m2)	Area Pervious (ha)	None	None	0
Urban	Roof (1599m2)	Total Area (ha)	None	None	0.16

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Chamber (4m2)	Notional Detention Time (hrs)	8	12	0.0409
Sedimentation	SF Chamber (4m2)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (4m2)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (4m2)	Total Suspended Solids - k (m/yr)	8000	8000	1
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Notional Detention Time (hrs)	8	12	0.218
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Precast Pit 1200x1200 (1.4m2)	Total Suspended Solids - k (m/yr)	8000	8000	1

Only certain parameters are reported when they pass validation