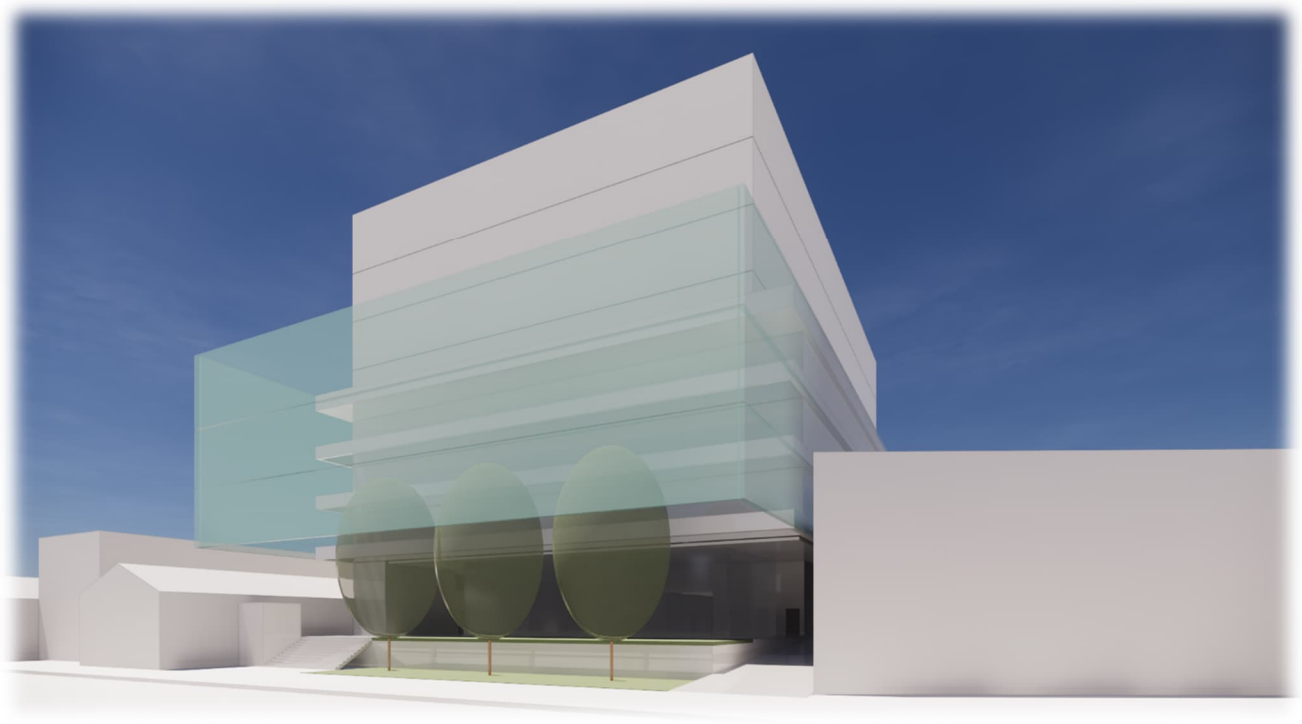
28-32 BOURKE ROAD, ALEXANDRIA

CIVIL ENGINEERING DRAFT SSDA REPORT



Prepared for: Alexandria Property Development

Prepared by: enstruct group pty ltd

July 2022

28-32 BOURKE ROAD, ALEXANDRIA

CIVIL ENGINEERING SSDA REPORT

ISSUE AUTHORISATION

PROJECT: Alexandria Health Centre

Project No: 6691

Rev	Date	Purpose of Issue / Nature of Revision	Prepared by	Reviewed by	Issue Authorised by
A	06/05/2022	DRAFT ISSUE	ALA	TAH	
B	3/06/2022	Issue for SSDA	ALA	TAH	TAH
C	5/07/2022	Issue for SSDA	ALA	TAH	TAH

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Executive Summary

This Civil Engineering report has been prepared by enstruct Group for the proposed “Alexandria Health Centre” comprising medical centre uses and anchored by a mental health hospital, located at 28-32 Bourke Road, Alexandria (the site).

This report has been prepared to address various aspects of civil design, including: Stormwater discharge quality and quantity, flood planning, and construction phase stormwater management. The report responds to the SEARs Requirements

This report concludes that the proposed development is suitable and warrants approval subject to the implementation of the following mitigation measures:

- Erosion and sediment control measures during the construction phase;
- Stormwater quality treatment and detention through the use of rainwater capture and re-use, on-site stormwater detention, and proprietary stormwater filters; and
- Adopting flood planning levels consistent with the City of Sydney Interim Floodplain Management Policy.

Following the implementation of the above mitigation measures, the proposed development at 28-32 Bourke Road, Alexandria will be acceptable / appropriate with regards to civil engineering.

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1 Introduction

This Civil Engineering report has been prepared by enstruct to for a the proposed "Alexandria Health Centre" development located at 28-32 Bourke Road, Alexandria (the site).

1.1 Site Description

The land to which this flood management report relates to is known as 28-32 Bourke Road, Sydney. The site is situated on the southern side of Bourke Road.

The site occupies two land allotments and is legally described as follows:

- Lot 1-3 DP324707.

The site has a regular rectangular shape allotment with a frontage to Bourke Road of approximately 40.6 metres and an overall depth of approximately 73 metres, yielding a total site area of approximately 2,965 sqm.

Bourke Road forms a low point east the subject site and is a two-way and two lane carriage way road.

A Location Plan including the site is provided in Figure 1

Figure 1 Location Plan (Source: Six Maps)

The site is currently occupied by a single storey rendered industrial building focusing on car tyre repairs. There are two driveways along the northern western boundary of the site.

The surface level is approximately 8.41 mAHD on the Bourke Road frontage.

1.2 SEARs Reporting

Item	SEARs Requirement	Relevant Section of Report
13	Stormwater and Wastewater • Provide an overarching Integrated Water Management Plan for the concept development that:	Refer to Section 4
	o is prepared in consultation with the local council and any other relevant drainage or water authority.	Sections 4.3 and 4.4
	o 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.	Sections 4.2, 4.3 and 4.4
	o demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.	Sections 4.3 and 4.4
14	Flooding Risk	Refer to Section 5
	• Provide a flood impact and risk assessment prepared in accordance with the NSW Floodplain Development Manual, and existing councils and government studies and guidance.is prepared in consultation with the local council and any other relevant drainage or water authority.	Section 5.1
	• Identify flood behaviour, flood constraints and risks on the site and on the surroundings, including the potential impacts of climate change for the full range of events (i.e. up to and including the probable maximum flood (PMF)).	Sections 5.1 and 5.2
	• Assess the impacts of the concept development, including any changes to flood behaviour and risk, impacts of flooding on the development and on the existing and the future community and for the full range of events.	Section 5.1
	• Propose management measures required to minimise the impacts of flooding on the development and minimise flood risks to the community, including emergency management measures to consider access and evacuation issues during significant flood events, including the PMF.	Section 5.3

2 *Proposed Development*

Development consent is sought for a concept proposal for the 'Alexandria Health Centre' comprising medical centre uses and anchored by a mental health hospital. Specifically, the application seeks concept approval for:

- In principle arrangements for the demolition of existing structures on the site and excavation to accommodate a single level of basement car parking (partially below ground level).
- A building envelope to a maximum height of 45 m (RL 53.41) (including architectural roof features and building plant). The podium will have a maximum height of RL 28.41.
- A maximum gross floor area of 11,442.20 sqm, which equates to a maximum FSR of 3.85:1. The total FSR will comprise a base FSR of 2:1, a community infrastructure bonus FSR of 1.5:1 and a 10% design excellence bonus FSR (subject to a competitive design alternatives process).
- Indicative use of the building as follows:
  - Mental health hospital at levels 5-7.
  - Medical centre uses at levels 1-4; and
  - Ground level reception/lobby and pharmacy.
- Principles for future vehicular ingress and egress from Bourke Road along the site's western frontage.
- Subject to agreement on a public benefit offer submitted with this application, the proposal includes the indicative dedication of the following land to Council as envisaged by the Draft Sydney Development Control Plan 2012 – Southern Enterprise Area Amendment (Draft DCP):
  - A 2.4m wide strip of land along the site's frontage to Bourke Road for the purpose of footpath widening
  - A 3m wide lane along the site's western boundary contributing towards a 6m wide lane (it is noted that the concept proposal will allocate an additional 3 m strip of land within the site along the western boundary to enable two-way vehicle movement into and out of the site).
  - A 3m wide lane along the site's southern boundary, contributing towards a 9m wide lane.

Figure 2 Proposed Basement and Ground Floor Plan (Source: NBRS Architecture)

3 *City of Sydney proposed laneways*

A network of laneways is proposed between Bourke Road, O'Riordan Street and the future Ashmore Connector. The following extract from the North Alexandria Urban Design Study (Figure 3) includes laneways on the south and east boundaries of the site.

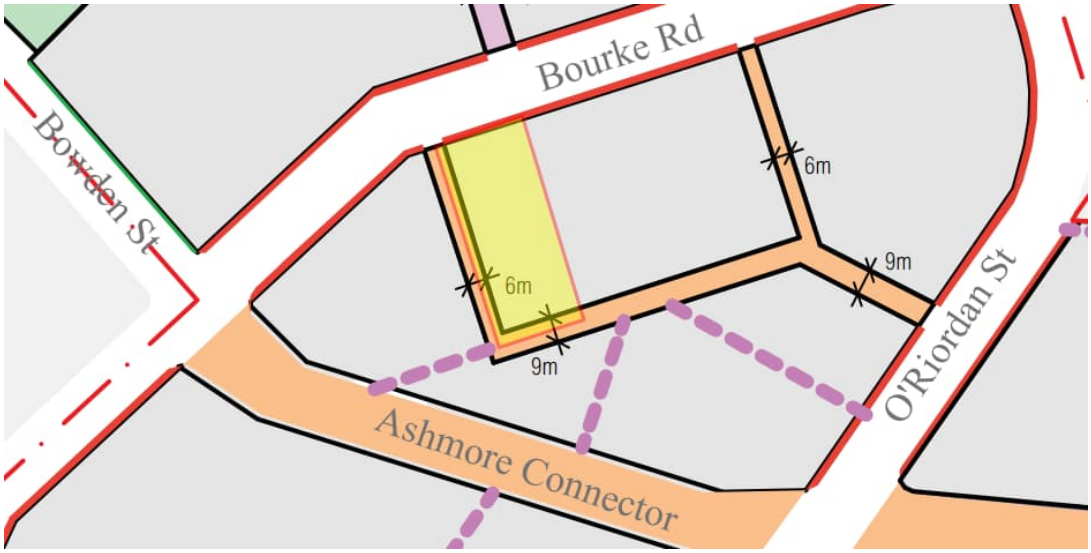

Figure 3 Proposed laneway network

As part of the proposed development, 3m along the west and south boundaries will be dedicated to Council.

4 Stormwater Drainage

4.1 Existing Stormwater Drainage

A site investigation revealed a number of outlets along the kerb of Bourke Road to the stormwater pits along the road. Dial Before You Dig data shows the nearest stormwater pits are east of the site on Bourke Road

Figure 4 Existing stormwater network on Bourke Road (DBYD)

4.2 Discharge Point

The existing stormwater from the site currently discharges to Bourke Street kerb and flows east along Bourke Road into the storm water pits on the kerbside outside of 24 Bourke Road.

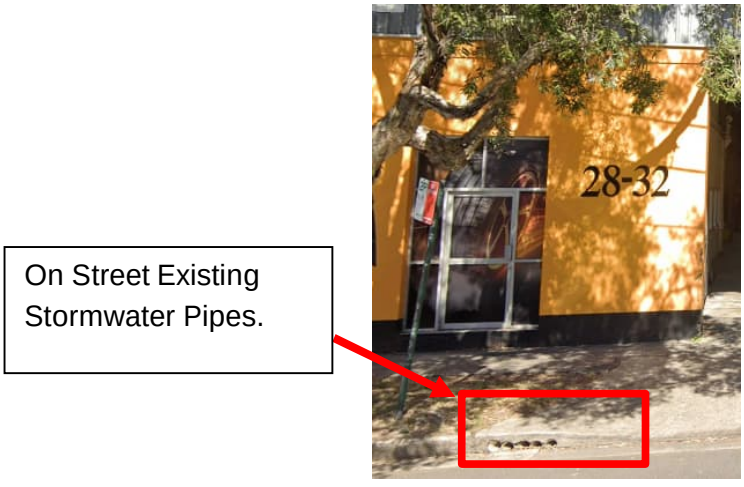

Figure 5 Stormwater Pipe Discharge (28-32 Bourke Road)

4.3 *Onsite Stormwater Detention (OSD)*

Sydney Water was contacted to provide the OSD requirements for the site. In response, Sydney Water (Jaya Jeyadevan, 24/03/2022) has confirmed that OSD is required on the site with a storage capacity of at least 46 cubic metres with permissible discharge of 110 L/s. Email correspondence has been included in Appendix A. The civil design includes a 50m^3 OSD tank to allow for freeboard and stormwater quality filters within the tank.

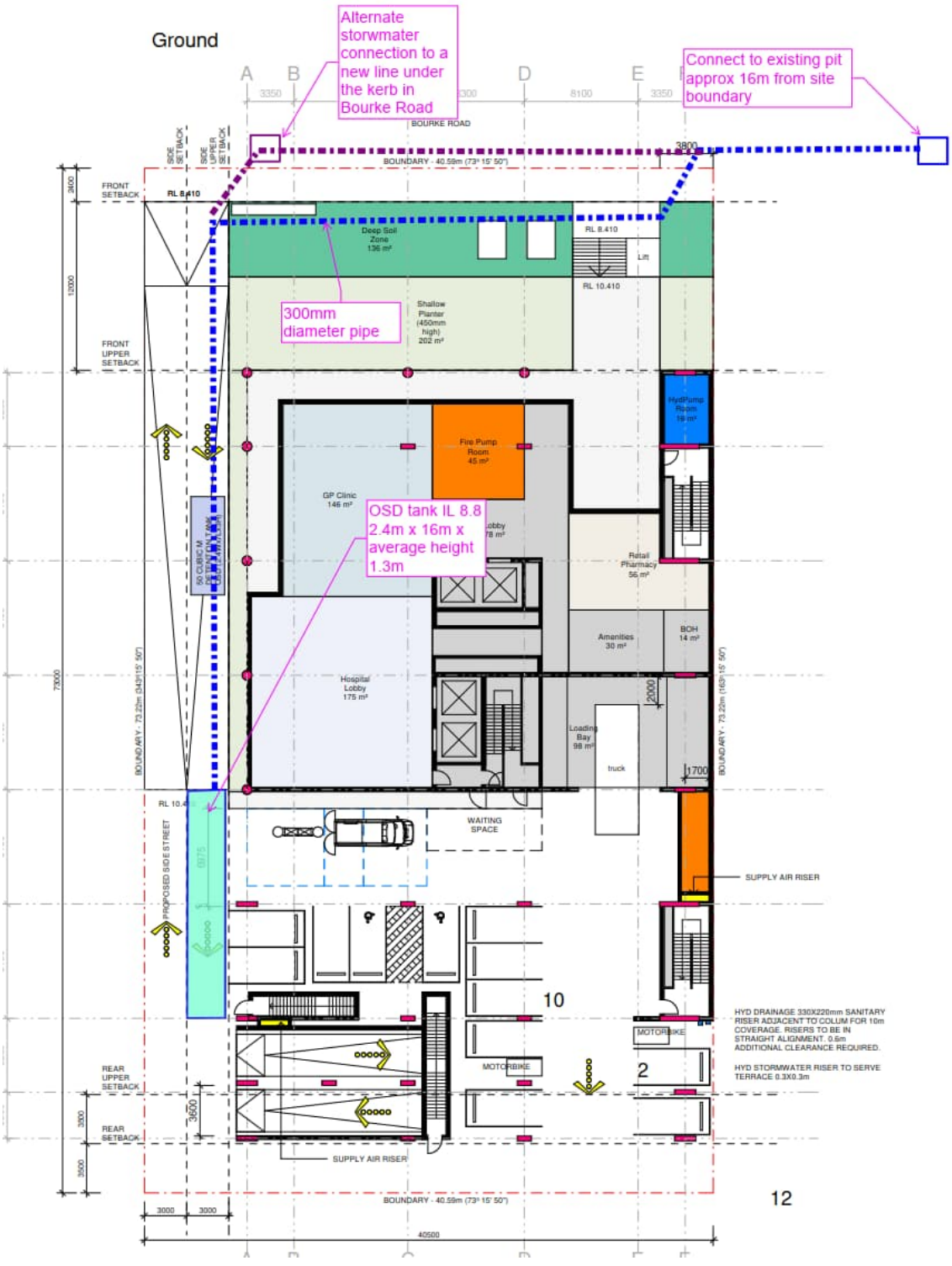

Figure 6 Stormwater management plan

The OSD tank may be co-located with the proposed rainwater tank, with an internal weir separating the storages. This arrangement will be coordinated as the design progresses.

4.4 Water Sensitive Urban Design (WSUD)

To ensure compliance with the City of Sydney Council, the subject site must meet with compliance with 3.7.2 - Drainage and Stormwater Management, 3.7.3 – Storm Quality, 3.7.4 – Additional provisions for private hospital building.

Under the City of Sydney Development Control Plan 2012 (DCP) section 3.7.3 (1), a site with an area greater than 1,000sqm is to be designed to reduce annual pollutant from litter and vegetation, total suspended solids and finally reduction of total phosphorus and nitrogen pollutant levels. A MUSIC model has been prepared in order to demonstrate a satisfactory design for stormwater quality.

The proposed development includes roof water capture and re-use. A rainwater tank may provide the air conditioning cooling towers and landscape irrigation uses. In addition, the OSD tanks will be fitted with 8 filter cartridges devices which are actively used to reduce the levels of pollutants within the rainwater tank overflow prior to discharge to from the site. The capture and re-use of rainwater will reduce volume of stormwater and associated pollutants that are discharged from the site. Table 1 highlights the list of results from the MUSIC-link report (Appendix C).

Table 1 Pollutant Reduction Targets

Pollutant	DCP Target Requirement	MUSIC Model Results
Gross Pollutants (GP)	90%	~99%
Total Suspended Solids (TSS)	85%	86%
Total Phosphorus (TP)	65%	81.5%
Total Nitrogen (TN)	45%	71.1%

Table 1, demonstrates the DCP target have been met and exceeding the required level of reduction for GP, TSS, TP and TN. The MUSIC model will be refined as the design progresses.

Stormwater discharge will be via a new connection to the stormwater pit outside of 24 Bourke Road

5 Flood Planning

5.1 Flood Conditions and Requirements

Enstruct has obtained a copy of TUFLOW model from the Alexandra Canal Model Conversion 2020 by WMAwater Pty Ltd under a data access agreement with Council.

The site is located near a sag point on Bourke Road and is located in a high flood risk zone with major overland flow expected at or near the site. After investigating the Council flood model results, it was found the 1% AEP flood level at the site was at 8.8 mAHD, while the Probable Maximum Flood (PMF) level varies from 10.3 mAHD to 10.4 mAHD.

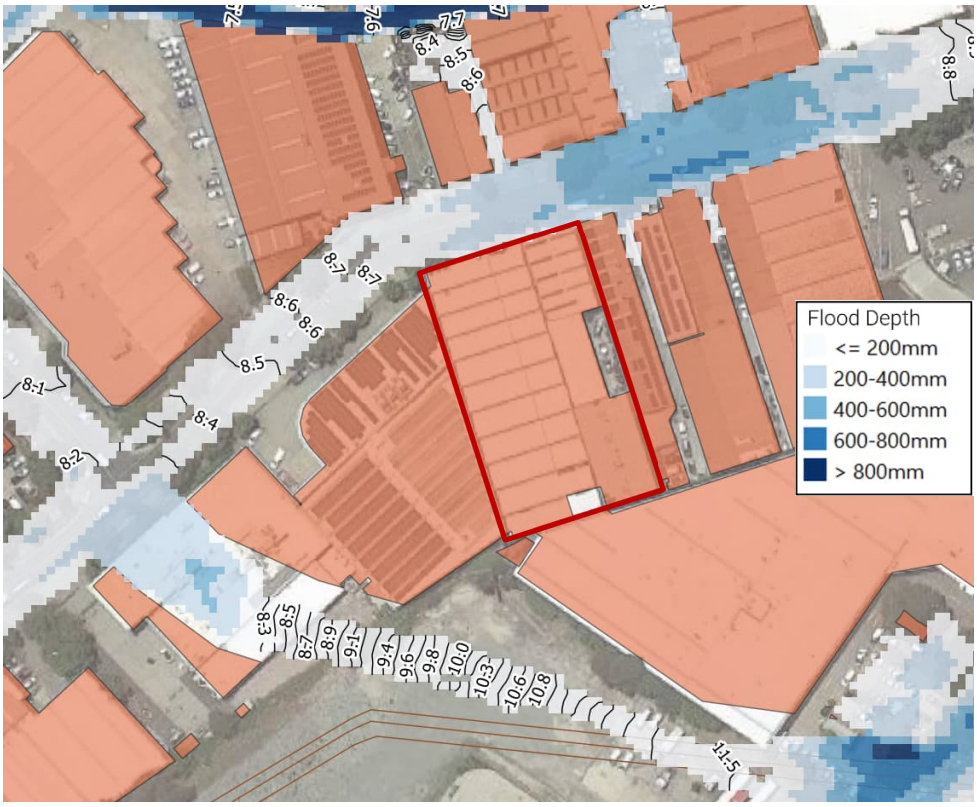

Figure 7 1% AEP Flood Map

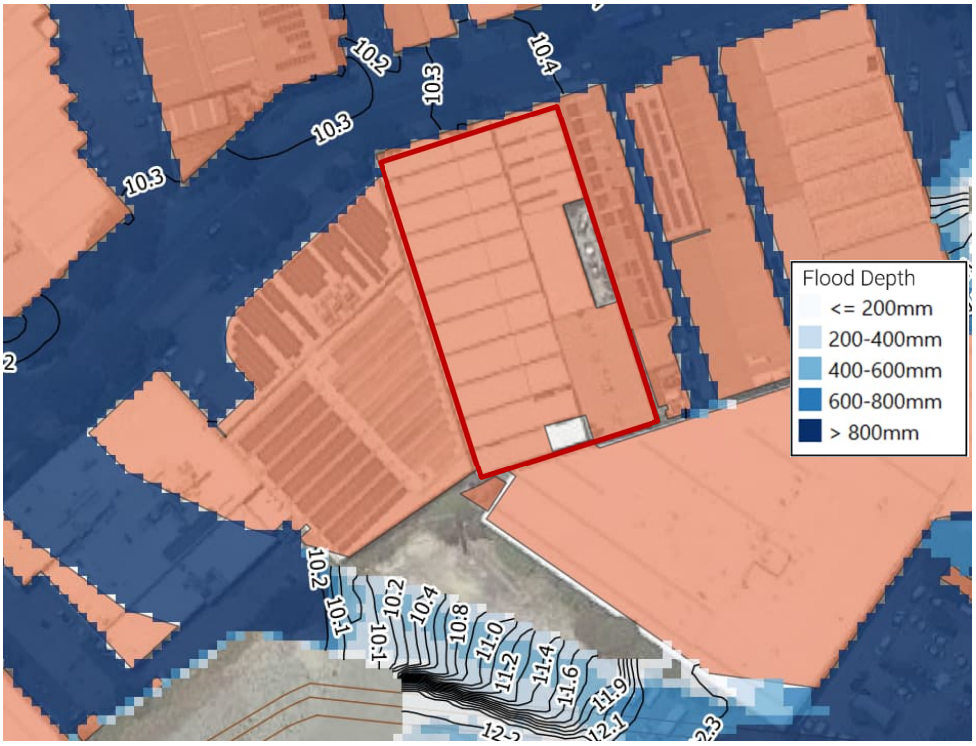

Figure 8 Probable Maximum Flood Map

Given the proposed use of the site is a hospital, the building is classified as a critical facility within the City of Sydney Interim Floodplain Management Policy and hence all habitable floor levels require to be at least at the PMF level (10.4mAHD). This is generally in line with the NSW Floodplain Development Manual.

The development is proposed to have a basement level. All entrance levels to the basement including the vehicle ramp, stairwells, ventilation, lifts, etc will be designed to be protected from flooding during a PMF event.

5.2 Climate Change

The proposed development has adopted flood planning levels based on the PMF as required by Council's flood policy. Climate change is not considered when determining PMF, so there are no changes to the site planning in this respect.

While climate change impact has not been included in the provided flood model, the 500-year storm event provides an approximation for a future climate scenario with increased rainfall intensity. During a 500-year storm event, the flood level on Bourke Road is 8.90mAHD, 100mm higher than the 100-year flood level.

The site is resilient to increased rainfall intensity due to climate change given the flood planning level for the site is based on the PMF level.

5.3 Flood Emergency Response

Many streets in Alexandria, including Bourke Road and O'Riordan Street, are flood affected during a 1% AEP storm event. Any attempted evacuation from the site during a flood event will be hampered by flooded road and hazardous conditions.

Furthermore, given the site use as a hospital facility, site users (patients) are likely to be less mobile and require assistance should the site be evacuated.

During a major flood event, the recommended flood evacuation strategy will follow a “shelter in place” system. All habitable floors are above the PMF level. The critical duration storm event is 90 minutes, and therefore flood waters are expected to recede below peak flood levels in a matter of hours, causing a minor inconvenience to site occupants.

6 *Sediment and Erosion Control*

The erosion and sediment control measures adopted for the development during the construction phase will be designed in accordance with Council guidelines and Soils and Construction – Managing Urban Stormwater – Landcom.

As the development involves excavation, a sediment and erosion control plan outlining how sediment and contaminants from construction will be contained and managed has been prepared for the site works, and is included as Appendix B. The plan includes measures such as location of site boundaries, grades and direction of ground fall for overland flow, and specific erosion and sediment controls such as fences surrounding disturbed areas and sandbags around constructed pits.

The contractor will take into account the site works staging including the preferred site access points, site shed locations and temporary stockpile locations in developing and implementing these requirements but will be ultimately responsible for managing temporary stormwater and sediment and erosion control during construction.

Erosion and sediment control will also be further addressed during design development and construction of this development.

7 Conclusion

The site at 28-32 Bourke Road requires a 46 cubic metre on-site detention with a maximum permissible flow of 110 L/s as per Sydney Water advice. Stormwater quality improvement will be achieved through rainwater capture and re-use, and stormwater filter cartridges in the OSD tank. Construction phase stormwater quality will be managed with a sediment and erosion control plan. Furthermore, 28-32 Bourke Road satisfies compliance with the Sydney DCP 2012 3.7.2 - Drainage and Stormwater Management and 3.7.3 – Stormwater Quality.

The site is flood affected and hence multiple measures such as ensuring all habitable floors and all basement entries are at least at the PMF level (10.40mAHD) to satisfy the Flood planning levels based on the City of Sydney flood model.

Following the implementation of the above mitigation measures, the proposed private hospital at 28-32 Bourke Road will be acceptable / appropriate with regards to civil engineering.

APPENDIX A

Sydney Water Correspondence

From: Stormwater <Stormwater@sydneywater.com.au>
Sent: Thursday, 24 March 2022 2:15 PM
To: Tim Henderson
Subject: RE: [External] 28-32 Bourke Rd, Alexandria requirements

Tim,

The On Site Detention requirements for the 2,972 square meters site at 28-32 Bourke Rd, 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

Jeya Jeyadevan
Senior Capability Assessor
Business Development

Mobile 0409 318 827
jeya.jeyadevan@sydneywater.com.au

Level 13, 1 Smith Street
Parramatta NSW 2150

From: Tim Henderson <tim.henderson@enstruct.com.au>
Sent: Monday, 21 March 2022 11:58 AM
To: Stormwater <Stormwater@sydneywater.com.au>
Subject: [External] 28-32 Bourke Rd, Alexandria requirements

Good Morning,

Enstruct are engaged as civil engineers on a proposed development at 28-32 Bourke Road Alexandria.

The existing site is approximately 2,972 m2, and 100% impervious.

The proposed development will have a setback with deep planting, resulting in a developed impervious fraction of approximately 92%.

Can you please let me know if Sydney Water have any stormwater detention or stormwater quality requirements for the site.

Regards,
Tim

Tim Henderson
Associate

enstruct group pty ltd
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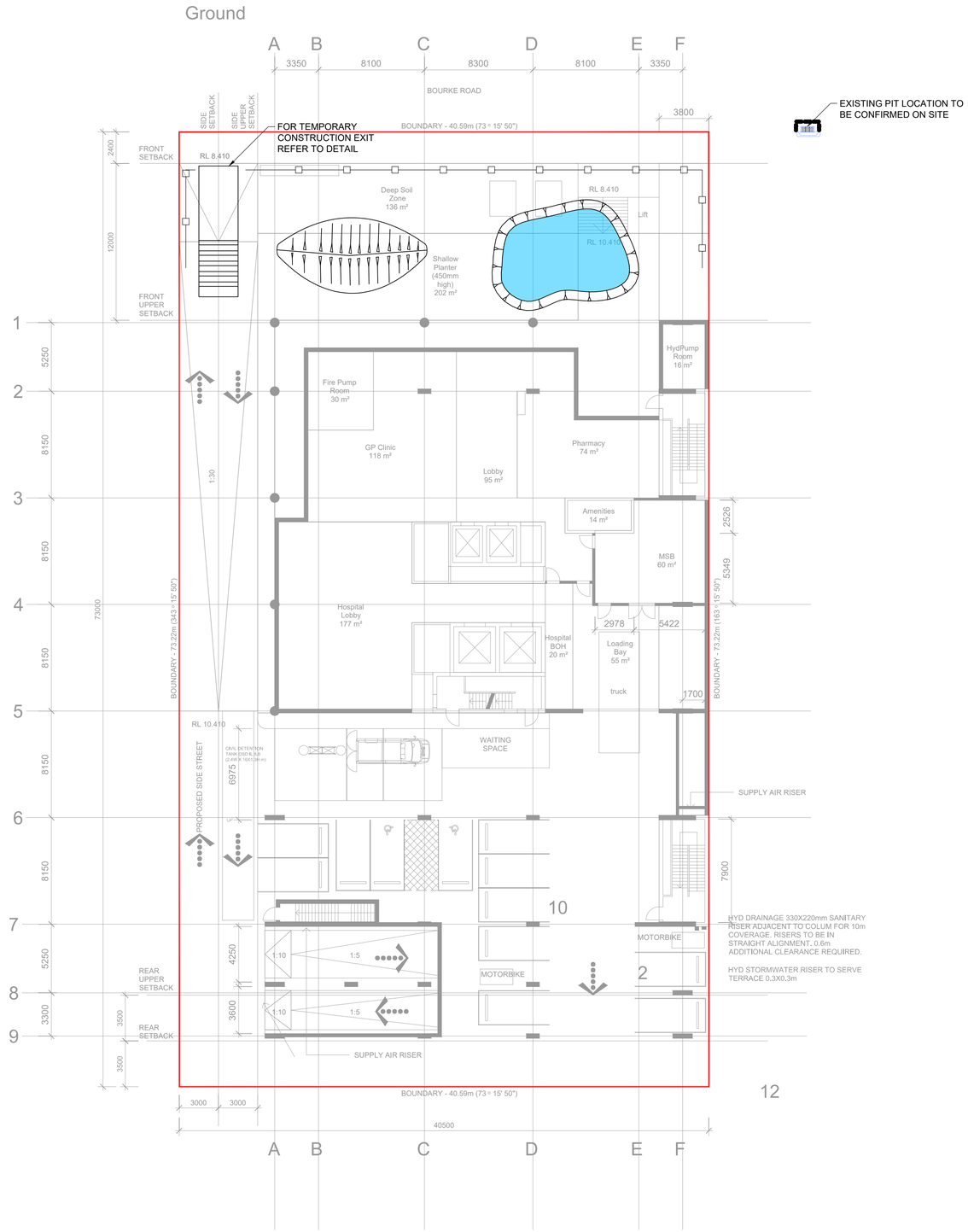
tim.henderson@enstruct.com.au

APPENDIX B

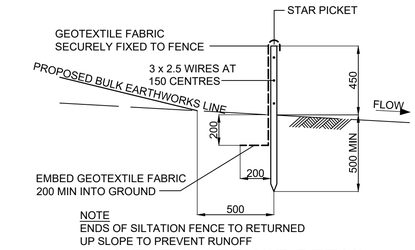
Erosion and Sediment Control Plan



TO BE PRINTED IN FULL COLOUR

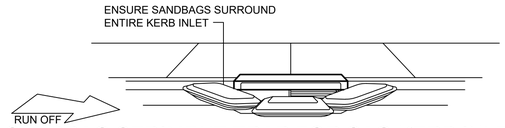
EROSION AND SEDIMENT CONTROL LEGEND

- Property boundary
- Siltation fence, with star pickets at max 2.5m centres (typ)
- Stockpile
- Sandbag sediment trap
- Proposed sediment basin



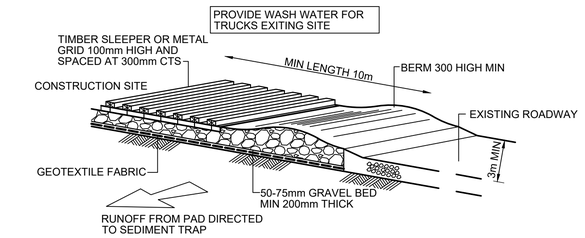
SILTATION FENCE DETAIL

SCALE 1:20



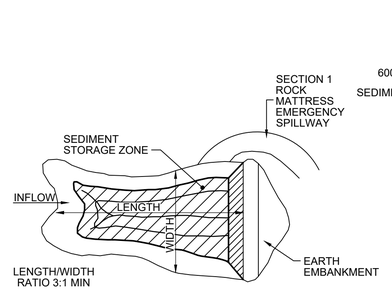
SANDBAG SEDIMENT TRAP FOR SAG KERB INLET PITS

NTS



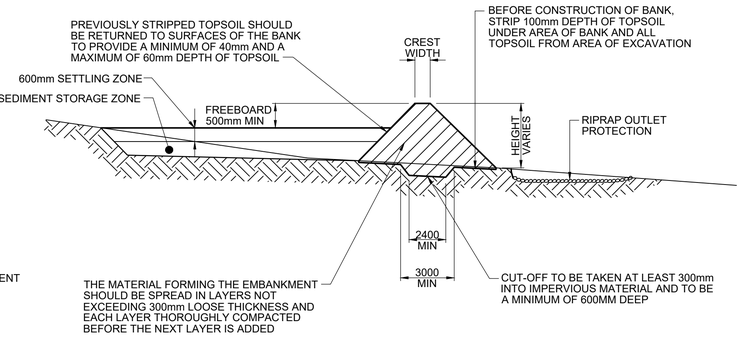
TEMPORARY CONSTRUCTION VEHICLE EXIT

NTS



PLAN

NTS



CROSS SECTION

NTS

SEDIMENT BASIN (TYPICAL) CROSS SECTION

NOT FOR CONSTRUCTION

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
   (A) Local authority requirements,
   (B) EPA - Pollution control manual for urban stormwater,
   (C) LANDCOM NSW - Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
   The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed.
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct temporary construction entry/exit and divert runoff to suitable control systems.
1.3. Construct measures to divert upstream flows into existing stormwater system.
1.4. Construct sedimentation traps/basin including outlet control and overflow.
1.5. Construct turf lined swales.
1.6. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

rev	date	description	drn	ch'k
01	03/06/22	ISSUE FOR SSDA	BEJ	TAH

rev	date	description	drn	ch'k

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project: ALEXANDRIA HEALTH CENTRE

28-32 BOURKE ROAD ALEXANDRIA

drawing title: SEDIMENT AND EROSION CONTROL PLAN

status:

scale at A1	drawn	checked	approved
1:200	BEJ	TAH	TAH

project no.	sheet	rev.
6691	6691-CV-0101	01

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APPENDIX C

Music Link Report

MUSIC-*link* Report

Project Details		Company Details	
Project:	28-32 Bourke Road	**Company:**	enstruct
Report Export Date:	6/05/2022	**Contact:**	Tim Henderson
Catchment Name:	6691 MUSIC	**Address:**	
Catchment Area:	0.3ha	**Phone:**	02 8904 1444
Impervious Area*:	100%	**Email:**	tim.henderson@enstruct.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 Loam 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		Treatment Nodes		Source Nodes	
Node: Receiving Node	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	44.8%	Rain Water Tank Node	1	Urban Source Node	1
TSS	86%	Detention Basin Node	1		
TP	81.5%	Generic Node	1		
TN	71.1%				
GP	100%				

Comments

draft SSDA

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Detention	Detention Basin	% Reuse Demand Met	None	None	0
Rain	Rainwater Tank	% Reuse Demand Met	None	None	91.24
Receiving	Receiving Node	% Load Reduction	None	None	44.8
Receiving	Receiving Node	GP % Load Reduction	90	None	100
Receiving	Receiving Node	TN % Load Reduction	45	None	71.1
Receiving	Receiving Node	TP % Load Reduction	65	None	81.5
Receiving	Receiving Node	TSS % Load Reduction	85	None	86
Urban	Roof	Area Impervious (ha)	None	None	0.3
Urban	Roof	Area Pervious (ha)	None	None	0
Urban	Roof	Total Area (ha)	None	None	0.3

Only certain parameters are reported when they pass validation