CME Building

Integrated Water Management Plan

Transport for NSW

08 November 2022

→ **The Power of Commitment**

Project name		Chief Mechanical Engineer's Building Base Building Services					
Document title		CME Building | Integrated Water Management Plan					
Project number		12581717					
File name		IWCM Plan_CME_GHD_Rev0.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S4	0	B Dehestani	P. Parker	Paul Parker	A. Whipps	*On File	8.11.2022
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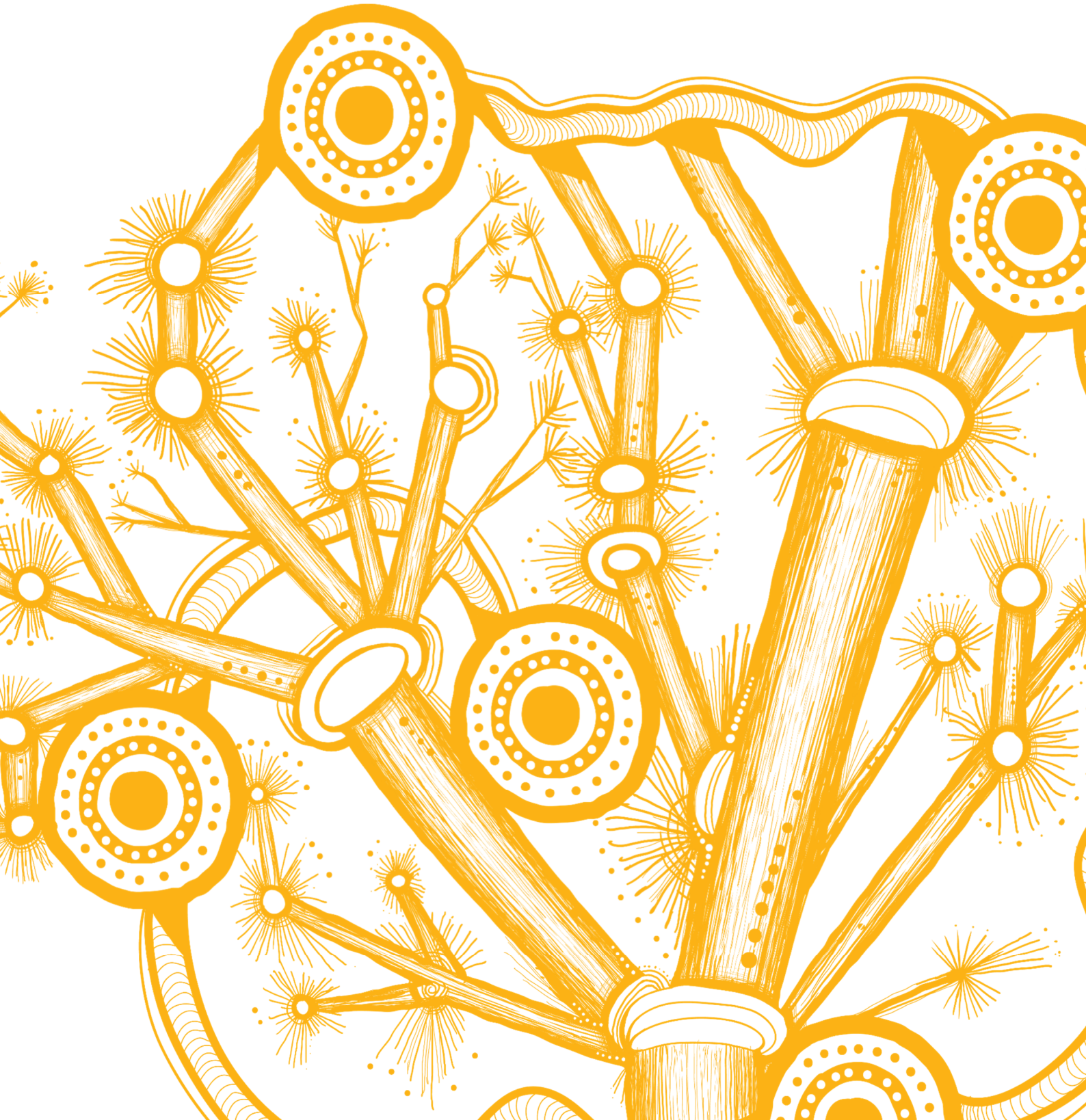
Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.



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1. Introduction

1.1 Purpose of this report

This report details the concept design proposals for the engineering services and supports State Significant Development (SSD) Development Application (DA) No. SSD-39971796 for the heritage conservation and adaptive reuse of the former Chief Mechanical Engineer's Building (CME Building) in North Eveleigh, which is submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Transport for NSW is the proponent for the SSDA.
This report covers the development of the Integrated water management plan

1.2 Scope and limitations

This report: has been prepared by GHD for Transport for NSW and may only be used and relied on by Transport for NSW for the purpose agreed between GHD and Transport for NSW as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Transport for NSW arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.3 Background

1.3.1 Site Description

The site comprises the former CME Building (**Figure 1**) and immediate surrounds (**Figure 2**). The site is identified as 505 Wilson Street, and forms part of Lot 5 in Deposited Plan 1175706.

Originally constructed in 1887 and subsequently extended to keep pace with the expansion of the NSW railways and demand for engineering services, the CME Building is of State heritage significance. The CME Building is listed on the NSW Heritage Register (SHR No. 5014147) and Transport for NSW's s170 Register. The statement of significance provided on the NSW Heritage Inventory outlines the significance of the site:

> *The building is a very fine late Victorian railways office on a scale above all other such structures in the State. The building reflects the importance of the railway engineers in the development of the State and its closeness to the Eveleigh workshops (mainly under the control of the Mechanical Branch) indicates the confidence in railway construction. The building is in a style not often seen in Sydney and is a rare survivor. More often this form of building is in evidence in the country where the pressure of development is less. It is an important element in the town and streetscape of Wilson St, Redfern, particularly to close proximity to the railway workshops.*

The CME Building is located within the Redfern North Eveleigh Precinct (**Figure 3**). The Redfern North Eveleigh Precinct is located within the wider Redfern-Waterloo Authority Sites SSP. The Redfern North Eveleigh Precinct is 10 hectares of land owned by Transport Asset Holding Entity (TAHE) at the southern edge of Redfern Station, located between the rail corridor and Wilson Street.

The Redfern North Eveleigh Precinct, including the CME Building, is the subject of an approved Part 3A Concept Plan (MP08_0015) which continues to apply to the land pursuant to Schedule 2 of *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*. TfNSW is currently preparing a SSP Study for the Paint Shop Sub-Precinct within the wider Redfern North Eveleigh Precinct, which was exhibited between 26 July and 25 August 2022. It is noted that the SSP Study indicates that the Concept Approval would be surrendered should rezoning of the Paint Shop Precinct occur.

Figure 1 - Chief Mechanical Engineer's Building (existing), viewed from Wilson Street Source: Metromap

Figure 2 – Aerial showing extent of works
Source: Nearmap/Ethos Urban

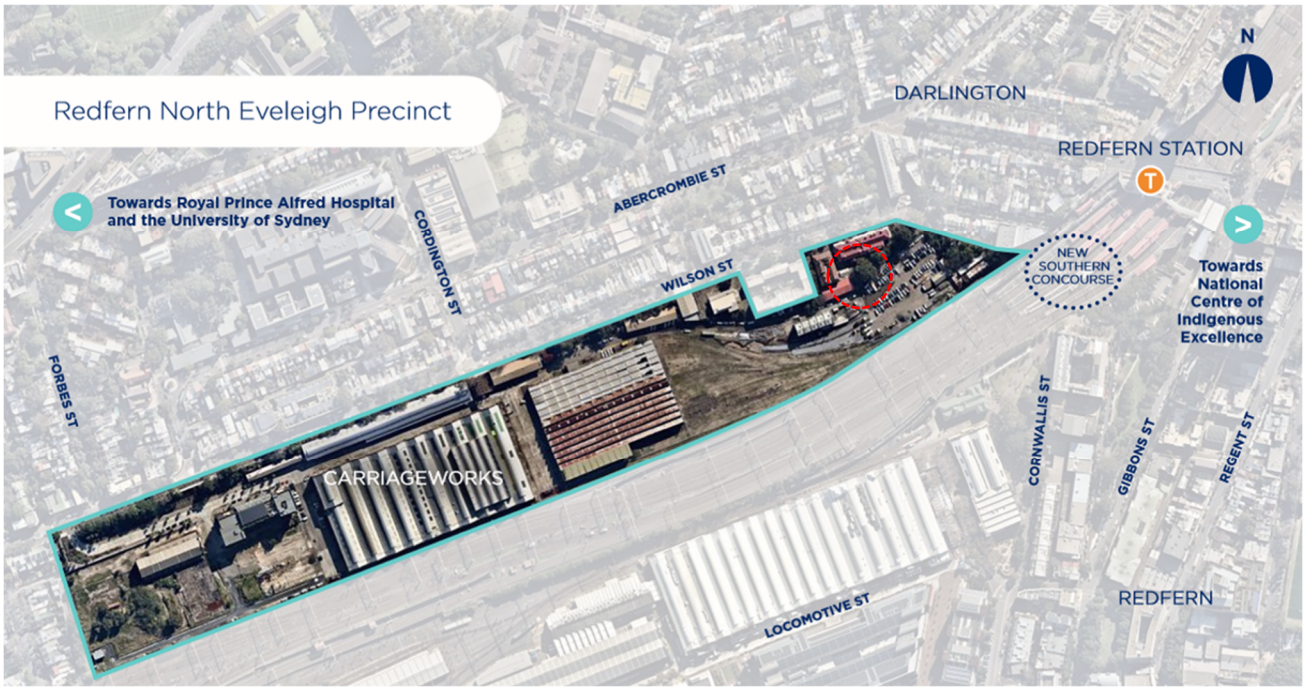


Figure 3 - Redfern North Eveleigh Precinct (CME Building outlined in red)

Source: TfNSW

1.3.2 Overview of Proposed Development

The application seeks consent for the heritage conservation and adaptive reuse of the CME Building, which includes:

- Internal and external heritage conservation works to make the building suitable for adaptive reuse, including painting, repairs and refurbishment of the existing building (primarily internally) and installation of services to support future usage for offices or the like.
- Building upgrades to ensure compliance with the Building Code of Australia, including accessibility and fire safety requirements.
- Removal of any hazardous building materials; and
- Minor landscaping works.

No significant additions (except those necessary to facilitate suitable access and fire egress) or substantive demolition of external heritage fabric is envisaged as part of the project. Internal changes comprise the removal of some internal walls and alterations to building fabric to create suitable spaces and compliant paths of travel.

1.3.3 Assessment Requirements

The Department of Planning and Environment have issued Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as follows:

– Item 14 Stormwater and Wastewater

1.4 Assumptions

This concept design report is based on the following:

– Services brief for the CME Building excluding the provision of an external electric vehicle charging station and removal of the requirement to demolish the services to the toilet block

– Concept drawings prepared by the Architect and Landscape consultant

2. Compliance Framework

The site is the subject of State Significant Development Application number SSD-39971795. The requirements for that application are set out in the Planning Secretary's Environmental Assessment Requirements (SEARS). Condition 14 sets out the requirements for Stormwater and Wastewater. The Condition is reproduced below

"14. Stormwater and Wastewater

– *Provide an Integrated Water Management Plan for the development that: is prepared in consultation with the local council and any other relevant drainage or water authority.*
  - *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.*
  - *demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties.*

– *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, the local council or other drainage or water authority."*

2.1.1 Local Council requirements

The site is located within the City of Sydney Council area and subject to the City of Sydney Development Control Plan (DCP), particularly Section 3 General Provisions. Section 3.7 of the sets out the requirements for water and flood management. The relevant section of the DCP is reproduced below

"Water and Flood Management

Terms used in this section are consistent with the NSW Floodplain Development Manual 2005.

Objectives

(a) Ensure an integrated approach to water management across the City through the use of water sensitive urban design principles.

(b) Encourage sustainable water use practices.

(c) Assist in the management of stormwater to minimise flooding and reduce the effects of stormwater pollution on receiving waterways.

(d) Ensure that development manages and mitigates flood risk and does not exacerbate the potential for flood damage or hazard to existing development and to the public domain.

(e) Ensure that development above the flood planning level as defined in the Sydney LEP 2012 will minimise the impact of stormwater and flooding on other developments and the public domain both during the event and after the event.

(f) Ensure that flood risk management addresses public safety and protection from flooding."

As there is a separate requirement in the SEARS regarding flooding requiring its own separate report, this report does address any of the flooding requirements of the City of Sydney DCP. Accordingly, the IWM report will address the stormwater pollution portion of item C of the Objectives. Section 3.7.3 of the DCP sets out City of Sydney Requirements for Stormwater quality. The section is reproduced below

"3.7.3 Stormwater quality

(1) 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:

(a) reduce the baseline annual pollutant load for litter and vegetation larger than 5mm by 90%.

(b) reduce the baseline annual pollutant load for total suspended solids by 85%.

(c) reduce the baseline annual pollutant load for total phosphorous by 65%; and

(d) reduce the baseline annual pollutant load for total nitrogen by 45%.

(2) The stormwater quality assessment is to be prepared by a suitably qualified engineer with experience in water sensitive urban design (WSUD) and include:

(a) modelling of pollutant load standards with an industry standard water quality model.

(b) the design of WSUD measures used to achieve the post-development pollutant load standards; and

(c) maintenance schedules of any proposed WSUD measure that requires maintenance or full replacement including the likely recycling or disposal location of any wastes that may be generated.

(3) Development on a site with an area less than 1,000sqm is to be designed so that the fl ow of pollutants from the site due to stormwater is reduced."

2.1.2 Sydney Water Corporation requirements

Sydney Water Corporation (SWC) is the authority for the stormwater network for the site. SWC have been consulted to provide their requirements for stormwater including requirements regarding On-site Detention. In response to a request to advise the requirements, SWC provided the following:

The *"Way you are describing the development, you need to provide the On-Site Detention, even though it is very difficult to make a firm decision without DA approval.*
You have mentioned that you are going to upgrade the existing stormwater system. In general, if you are required to replace the existing external stormwater pipes or upgrading the external stormwater pipes then you need to provide On Site Detention based on the highest catchment area that is flowing through these new stormwater pipes.
As a rule of thumb, you can use the following parameters if pre and post impervious areas are same:

- *On Site Detention - 20 cubic meters per 1,000 square meters*
- *Permissible site discharge - 30 L/s per 1,000 square meters."*

3. Assessment and Findings

3.1 Catchment Context

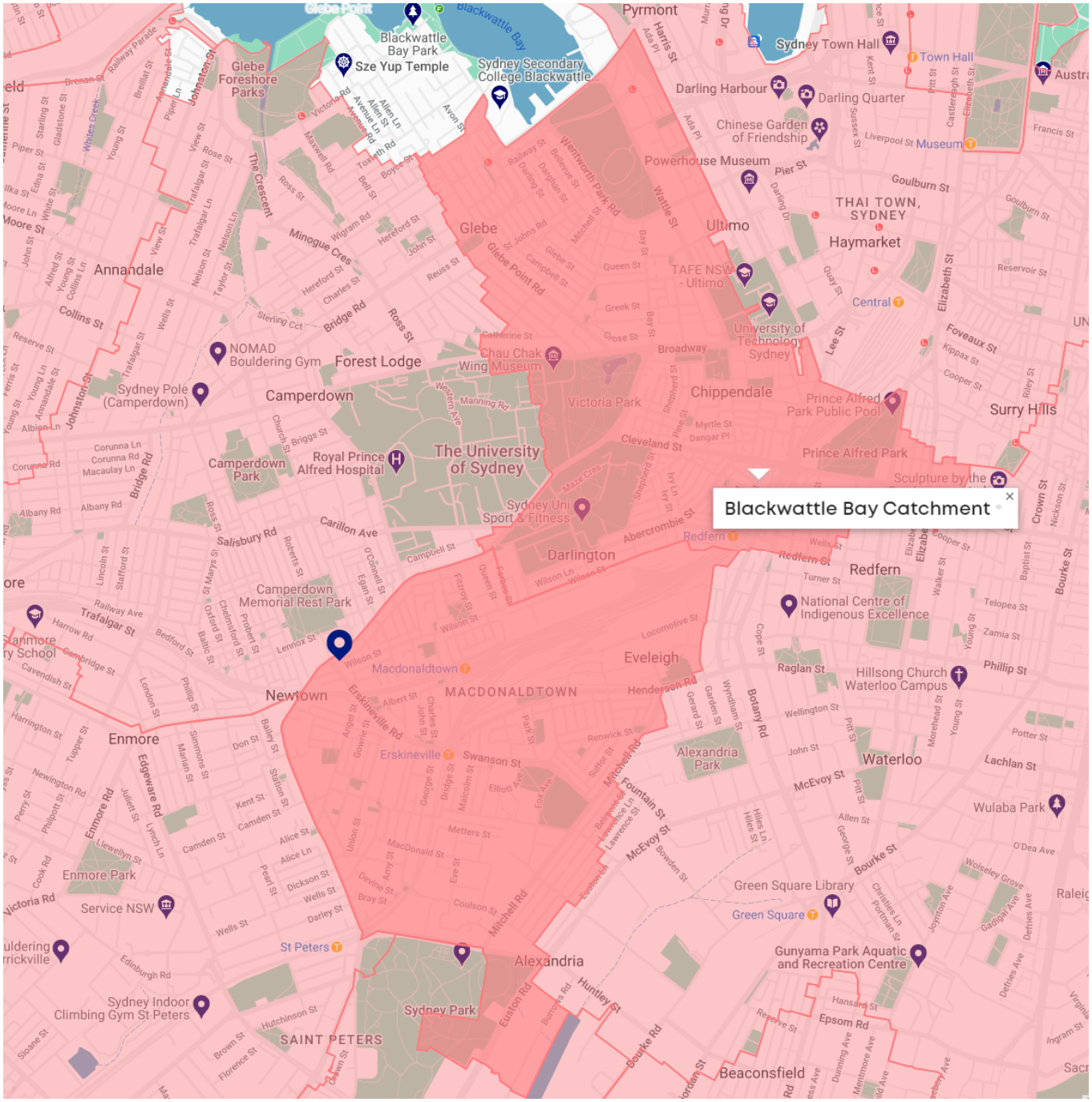


Figure 4 *Sydney Water Catchment Map (Sydney Water, 2022)*

The site is identified in SWC records as being located within the Munni Street Catchment draining to Alexandra Canal. However, the topographical survey for the site does not support this. The site slopes towards Wilson Street. Wilson Street is situated at the top of the Blackwattle Bay Catchment as depicted in Figure 4. In reality the site straddles the boundary of the two catchments.

3.2 Existing Environment

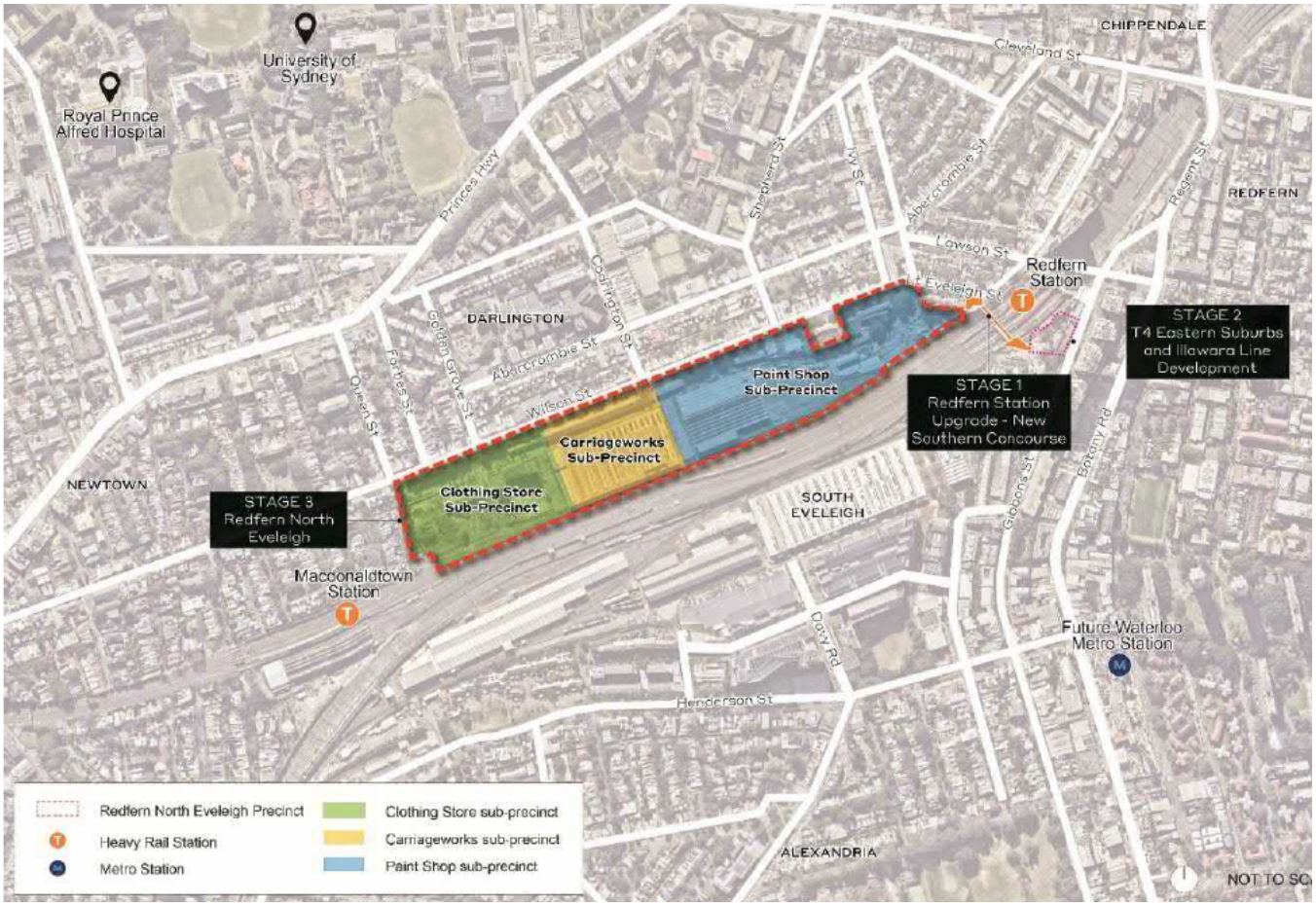


Figure 5 Existing Surrounds (Redfern North Eveleigh and Sub-Precincts)

The site is situated at 505 Wilson Street Redfern. Sydney Water records identify the site as being located within the Munni Street Catchment which drains to the Alexandra Canal. The site generally falls from the Southwest to the Northeast, with site levels ranging from RL 29.0 mAHD in the southwest to RL 28.0 mAHD on Wilson Street on the North-East corner.

The site is predominantly impervious with the existing building and surrounding hardstand making up much of the site. There is some grass and trees along the street frontage and in the eastern corner making up approximately 15% of the site area.

The site has been the subject of industrial development for many years. The entire surrounds are fully developed, with the area transitioning through redevelopment from the previous use of industrial towards a commercial precinct.

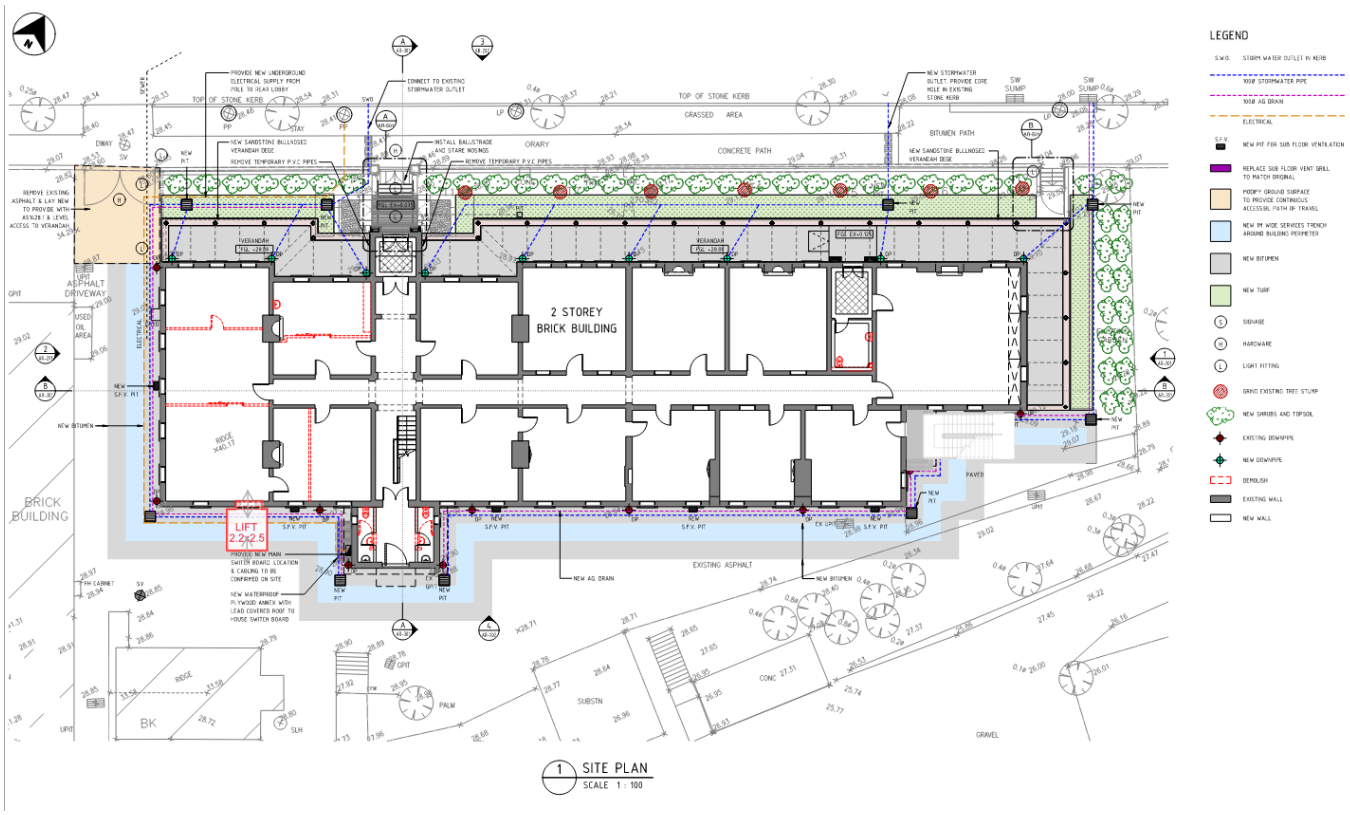


Figure 6 Existing Surrounding Elevation

3.3 Existing Infrastructure Requirements and Utilities

3.3.1 Existing Stormwater Services

The existing stormwater services appear to direct stormwater towards the rear of the property. This correlates with the SWC assessment that the site is situated within the Munni Street Catchment.

The existing stormwater network downstream of the site boundary is no longer functional as the pipe is cracked and filled with debris as depicted in the notes on Figure 7.

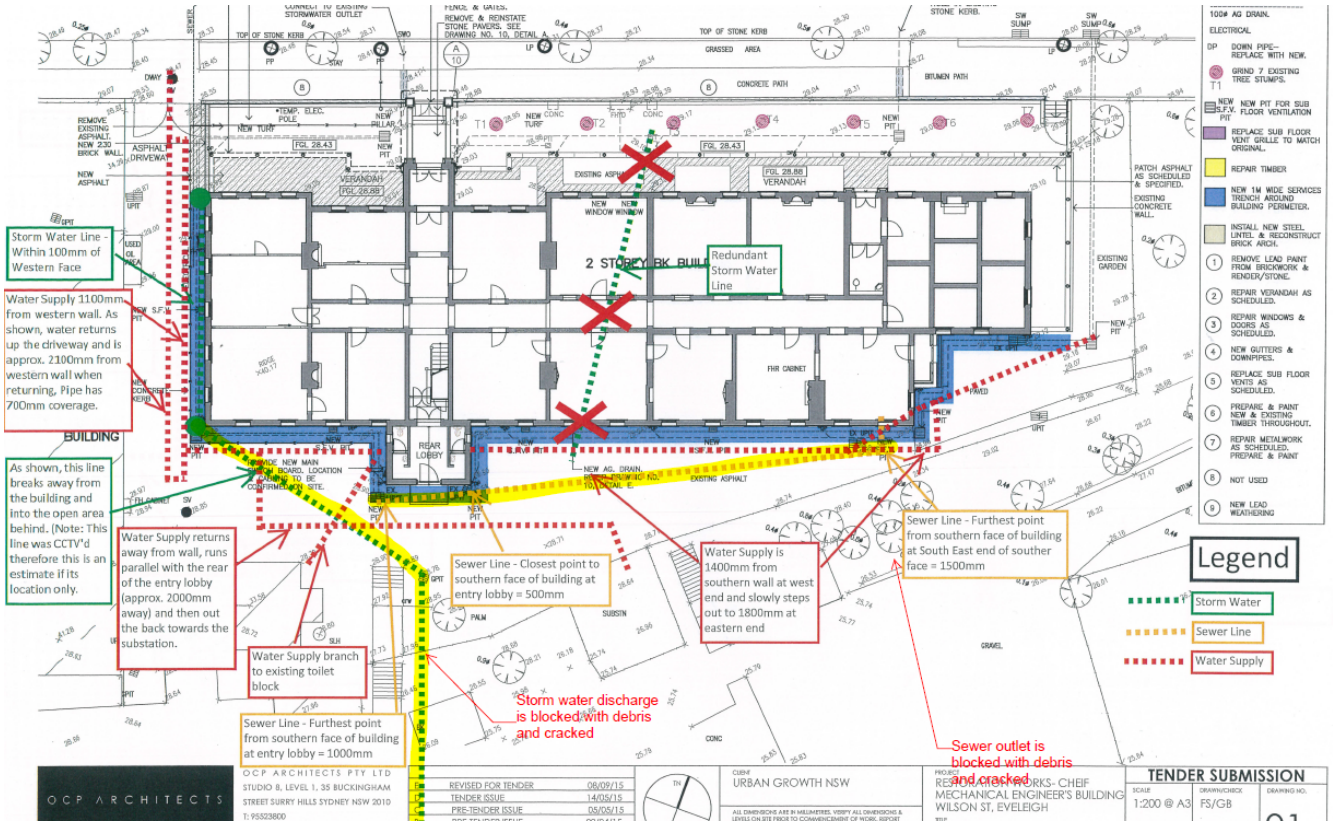


Figure 7 Hydraulic Investigation plans

The following describes the notes from the plumber of the two attempts undertaken to inspect the exsting stormater system.

Storm water CCTV inpsection notes – 26.8.2022

Upon CCTV inspection of the storm water pipe work between the S/E downpipe which leads to the main storm water pit at the rear of the property, we found that the in-ground pipe material was vitreous clay. The pipe itself was holding water at the base of the downpipe, and there was a slight break in the pipe 1m downstream from the base of the downpipe, as we could see loose pieces of vitreous clay lying on the bottom of the pipe. As the camera passed the debris, the pipe was clear and in relatively good condition until it got within 2m of the main storm water pit. The camera was unable to proceed due to mud and debris blocking the pipe. The main storm water pit itself was also full of mud and debris, due to a lack of maintenance over previous years.

Storm water CCTV inpsection notes - 7.9.2022

On 7 September 2022, we returned with a water jetter to clean out the main storm water pit and clear any inlet or outlet pipe work that had blockages. Once the main pit was cleaned, we found the outlet of the pit and used the CCTV camera to inspect its condition. The first 6m of pipe work was made of PVC, which then adapted to vitreous clay. The pipe had a series of roots and debris in it. We then used the water jet to clear the pipe. After 30mins of jetting, the water jet wouldn't get any further then 7m downstream from the main pit outlet. We then used the camera again to inspect the pipe and found that the pipe was dislodged or collapsed at 7m in.

For this reason and because the finalised lot falls to Wilson Street, it is proposed to discharge to Wilson Street via a new pit and pipe network.

3.3.2 Surrounding Stormwater Infrastructure

There are two existing stormwater pits located in Wilson Street at the low point at the eastern end of the development as depicted in Figure 8..

Figure 8 Council Stormwater Network

Source: Metromap

3.3.3 Stormwater Infrastructure Upgrades

It is not proposed to undertake any upgrades to the existing stormwater network external to the site. The intent is to replace the internal network, including provision of water quality control measures and On-Site Detention with connection to the existing external stormwater network.

4. Stormwater Strategy

4.1 Proposed Site Stormwater Drainage

It is proposed to provide a new stormwater pit and pipe network for the existing building. This shall entail connection of the existing downpipes to a new network. The network will drain through a new below ground rainwater tank. Overflow from the rainwater tank will be conveyed to a below ground On-Site Stormwater Detention (OSD) tank and then discharge to the Wilson Street kerb inlet pit.

Water quality requirements will be addressed through the inclusion of rainwater tank and stormfilter cartridges inside the OSD tank.

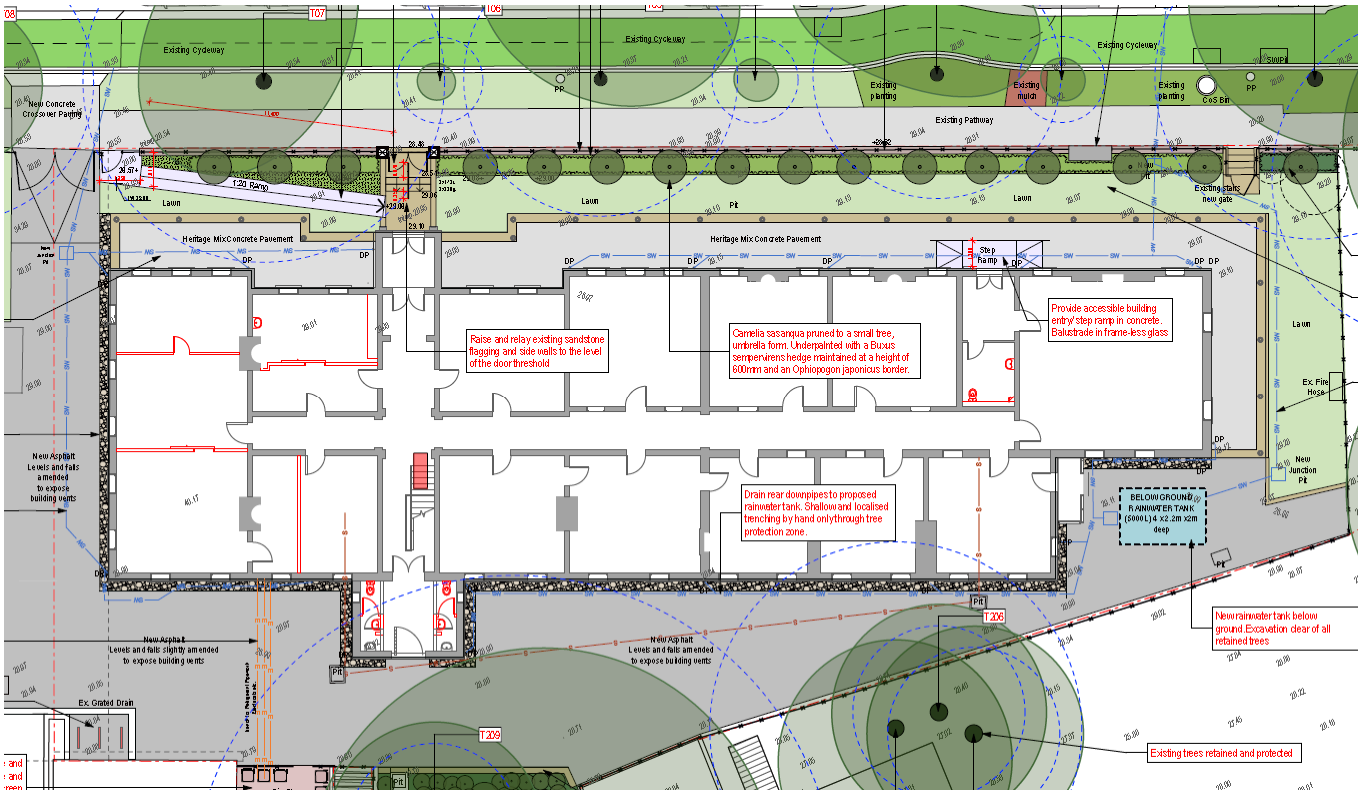


Figure 9 *Site Stormwater and Grading Plan*

4.2 Proposed Stormwater Discharge Connections

The proposed site stormwater is to drain to the eastern most kerb inlet pit in Wilson Street via new stormwater pipe connection.

4.3 Stormwater Quality

4.3.1 Water Quality Modelling

Table 1 Water Quality Targets

Contaminant	Required minimum % reductions
Gross Pollutants / litter greater than 5mm	>95%
Total Suspended solids (TSS)	>85%
Total Phosphorus (TP)	>65%
Total Nitrogen (TN)	>45%

4.3.2 Stormwater Quality Management Scheme

The proposed management scheme consists of the following elements:

– litter baskets within the surface inlet pits within the development for removal of litter and gross pollutants
– rainwater tank for landscape irrigation
– StormFilter® cartridges within the OSD tank.
– Pit Baskets (ocean Guard®)

4.3.3 Rainwater Tank

The design has allowed for a proposed rainwater tank below ground with a submersible pump for rainwater reuse. The tank is sized for minimum 10KL. Not all downpipes connect to the rainwater tank and hence it has not been included in the MUSIC model.

The intended reuse will be for outdoor irrigation. There is no intention to plumb rainwater into the existing building for use in toilet flushing.

4.3.4 StormFilter® Cartridges

The Stormwater Management StormFilter® cleans stormwater through a patented passive filtration system, effectively removing pollutants to meet the most stringent regulatory requirements.

The StormFilter® stormwater treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain the most challenging pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals, and other common pollutants.

It is proposed to install 3no. 690Psorb StormFilter cartridges into a quarantined chamber within the required OSD tank. All discharge from the site must be directed to the water quality chamber for treatment of frequent rainfall events. Flows from larger, less frequent rainfall events will discharge into the main OSD tank when the capacity of the water quality quarantine chamber is full.

The StormFilter Chamber size must be a minimum of $3m^2$ with a 900mm square access cover located over the cartridges to enable maintenance. The weir height within the chamber must be 870mm above the base of the OSD tank, which is 770mm above the false floor of the StormFilter chamber. The weir must be no less than 1.6 .m long with a minimum height of 100mm to ensure no water surcharges out of the top of the chamber.

4.3.5 Pit Baskets (OceanGuard®)

The OceanGuard® technology is a gully pit insert / basket designed to capture pollution that runs into stormwater drains. It can be installed within new and existing stormwater pits.

The system is designed to remove gross pollutants, total suspended solids and attached pollutants. It is proposed to use it as part of the treatment train.

The filtration bag, filtration cage and flow diverter work together to maximise the flow treated and pollutants captured. This efficient hydraulic design ultimately results in captured pollutants being retained in a dry state.

All surface inlet pits within the site will require Pit baskets to be installed.

4.3.6 Model

A MUSIC model has been developed for the site adopting the elements noted above.

The model was setup utilising the City of Sydney template file with clay soil selected. Whilst the site was originally developed as an industrial area, it now forms part of a commercial area with industrial applications no longer occurring at the site. Accordingly, the site has been modelled as commercial within MUSIC.

The site was estimated to be 85% impervious. This impervious percentage includes both roof catchment and hard ground surfaces. 60% of the impervious portion of the site was allocated as roof catchment and 40% as asphalt pavement. The remaining 15% of the site area has been allocated as pervious ground. Within the model all the surface runoff is directed through OceanGuard pit baskets. All stormwater runoff including roof discharge then passes through the StormFilter within the OSD tank.

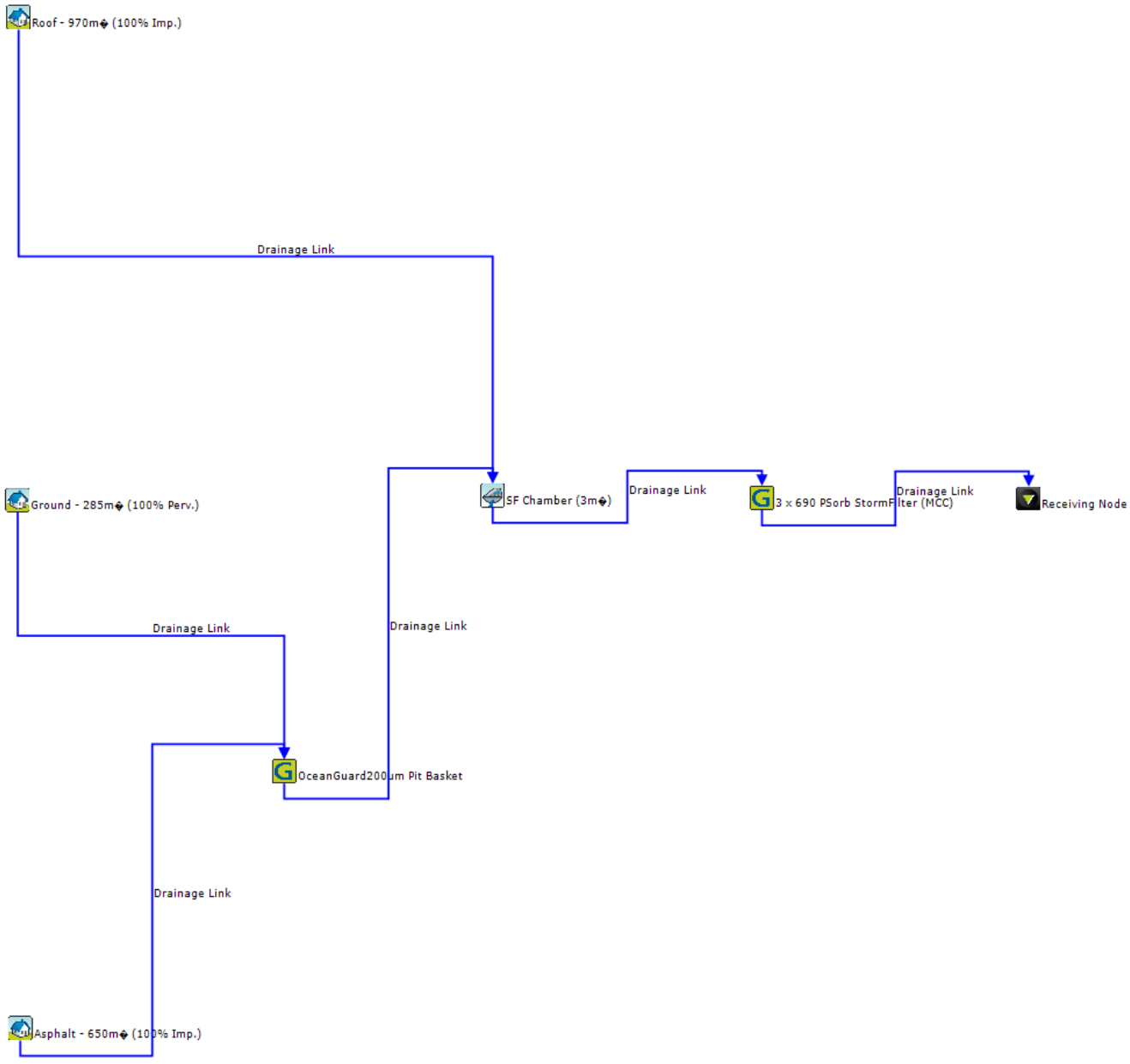


Figure 10 MUSIC Model

4.3.7 Model Results

The results of the MUSIC model demonstrate that all targets are met by the proposed solution.

Table 2 Water quality targets and results compared

Contaminant	Required minimum % reductions	Achieved % reductions
Gross Pollutants / litter greater than 5mm	>95%	100%
Total Suspended solids (TSS)	>85%	90%
Total Phosphorus (TP)	>65%	69%
Total Nitrogen (TN)	>45%	45.1%

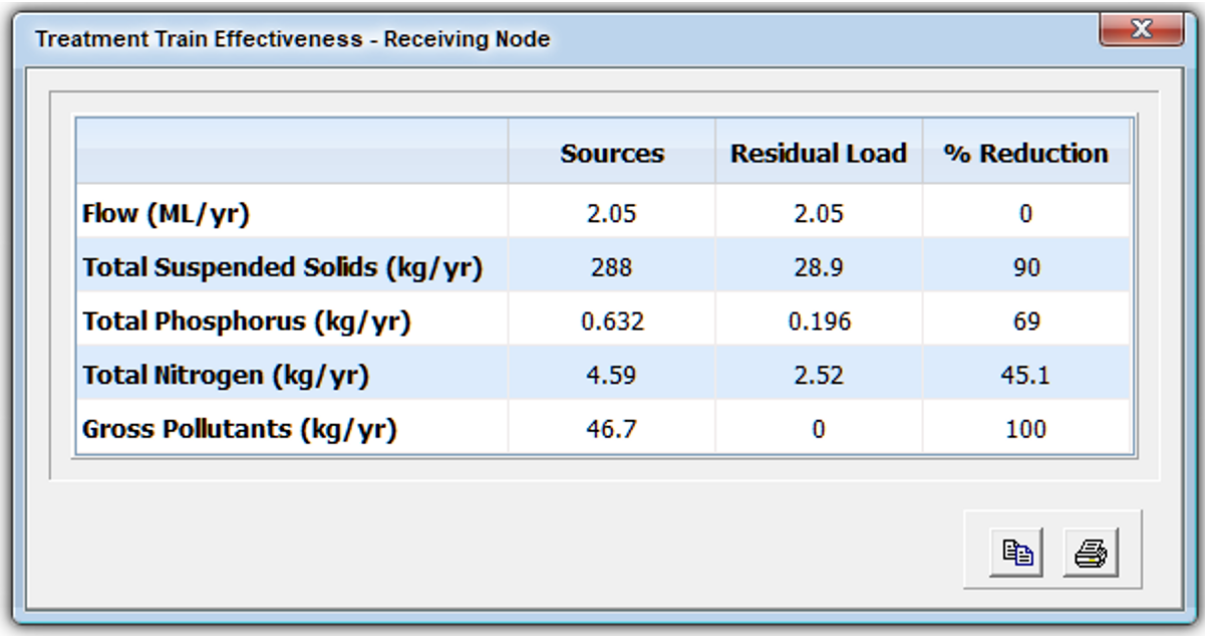


Figure 11 Treatment Train Effectiveness from MUSIC

5. Stormwater Quantity

SWC provided advice stating that because the site is having upgraded stormwater undertaken as part of the development, OSD would be required. SWC have advised that an initial requirement for OSD should be based on the following:

- Site Storage Requirement (SSR) - 20 cubic meters per 1,000 square meters
- Permissible Site Discharge (PSD)- 30 L/s per 1,000 square meters.

The site area is 1,910 m^2 and hence the required SSR is 38.2m^3 and the PSD is 57.3 l/s.

To meet this requirement, it is proposed to construct a below ground detention tank with an internal height of 1.2m and an area of not less than 32m^2. It is proposed to make the tank 7m long x 5m wide which comfortably accommodates the required volume. An access hatch of minimum 900mm square must be provided into the main OSD chamber and must be located over the orifice plate at the outlet.

In order to achieve the PSD with a maximum head of 1.2m above the centreline of the outlet, an orifice with a diameter of 157mm must be installed. The discharge pipe from the OSD to the Kerb inlet pit in Wilson Street should be a 300dia pipe to ensure that the orifice is not constrained by the capacity of the discharge pipe.

6. Conclusion

This IWM has been prepared to demonstrate how the requirements of Condition 14 of the SEAR's have been met. The report demonstrates that the requirements of both City of Sydney and SWC can be met for water quality and stormwater quantity. If the stormwater system is designed and constructed in accordance with this report, the system shall meet the requirements

Appendices

Appendix A

Site Survey

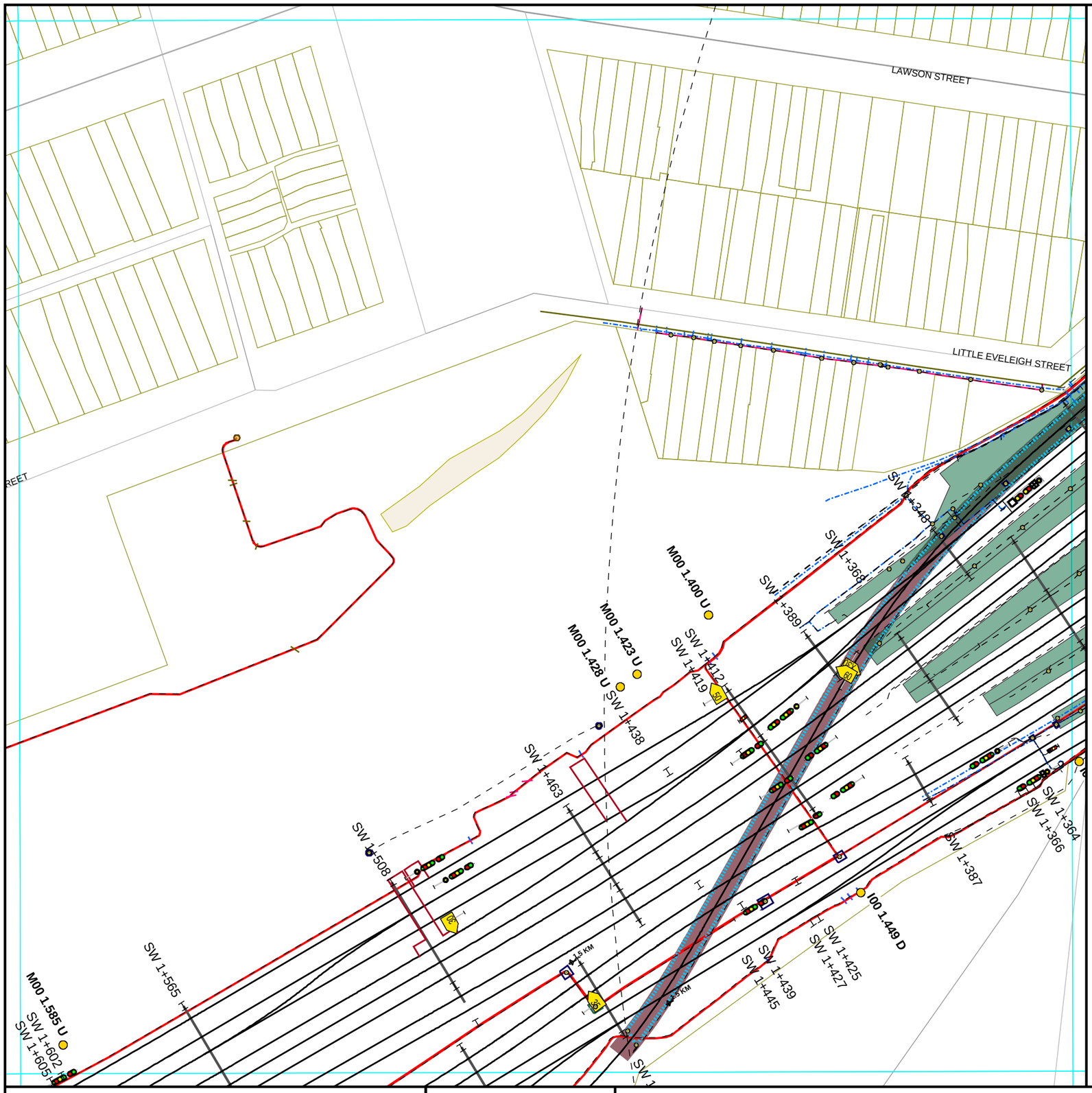
SURVEYOR	PLAN OF PROPOSED SUBDIVISION OF LOT 5 IN DP1175706	L.G.A.: SYDNEY	REGISTERED
Name: GREGORY JAMES GEARIN		Locality: REDFERN	
Date: DRAFT 2022		Reduction Ratio: 1: 200	
Reference: PR142881-2-DP1		Lengths are in metres	

10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 Table of mm

(Cad Ref: PR142881-2-DP1-001.dwg)

Appendix B

Underground Services Survey



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SYDNEY TRAINS Dial Before You Dig Service Search

PLOTTED DATE: 24/07/2015

This plan is to be read in conjunction with Sydney Trains' Dial Before you Dig Terms & Conditions.

- Platform.Boundary
- Access Gate.Location
- Embankment.Boundary
- External Agency Service Crossing.Centreline - aerial
- External Agency Service Crossing.Centreline - underground
- Kilometre Post.Location
- Tunnel Section.Coverage Under
- HV Cable.11kV Location
- HV Cable.2.2 kV Location
- Pole.In Use Location
- DC Cable.Location 1500V positive
- OHW Portal Leg.Location
- OHW Structure.Centreline
- OHW Structure.Location
- Mounting Post.Location
- Track Segment.Centreline Active
- Drainage.Centreline
- Drainage.Boundary
- Pipeline.Centreline
- Pit.Location
- Pit.Pit Access Lid
- Pit.Pit Outline
- Trench/Tunnel/Trough.Location
- UBD Map Grid.Coverage
- Road Segment.Arterial Road Centreline
- Road Segment.Centreline
- Road Segment.Distributor Road Centreline
- Road Segment.Local Road Centreline
- Road Segment.Urban Service Lane Centreline
- Lot.Coverage Standard
- Easement.Coverage Current

The precision of the location of the services on this plan varies depending on the source and method of capture.
This plan should be used as a guide only.
This plan shows only Sydney Trains electrical cables and tunnels located outside of the rail corridor.
Contact for further information:
Sydney Trains External Interface Manager Ph. 9847 8914
Airport Line Maintainance Manager Ph. 9669 8602

Exposure of or suspected damage to Sydney Trains' services must be reported immediately to Electrical Systems Operations
Ph. 9379 4911 or 1800 060 015

Transport Sydney Trains
WhereInfo ... ais
PRODUCED BY SYDNEY TRAINS GIS FROM MAPPED DATA

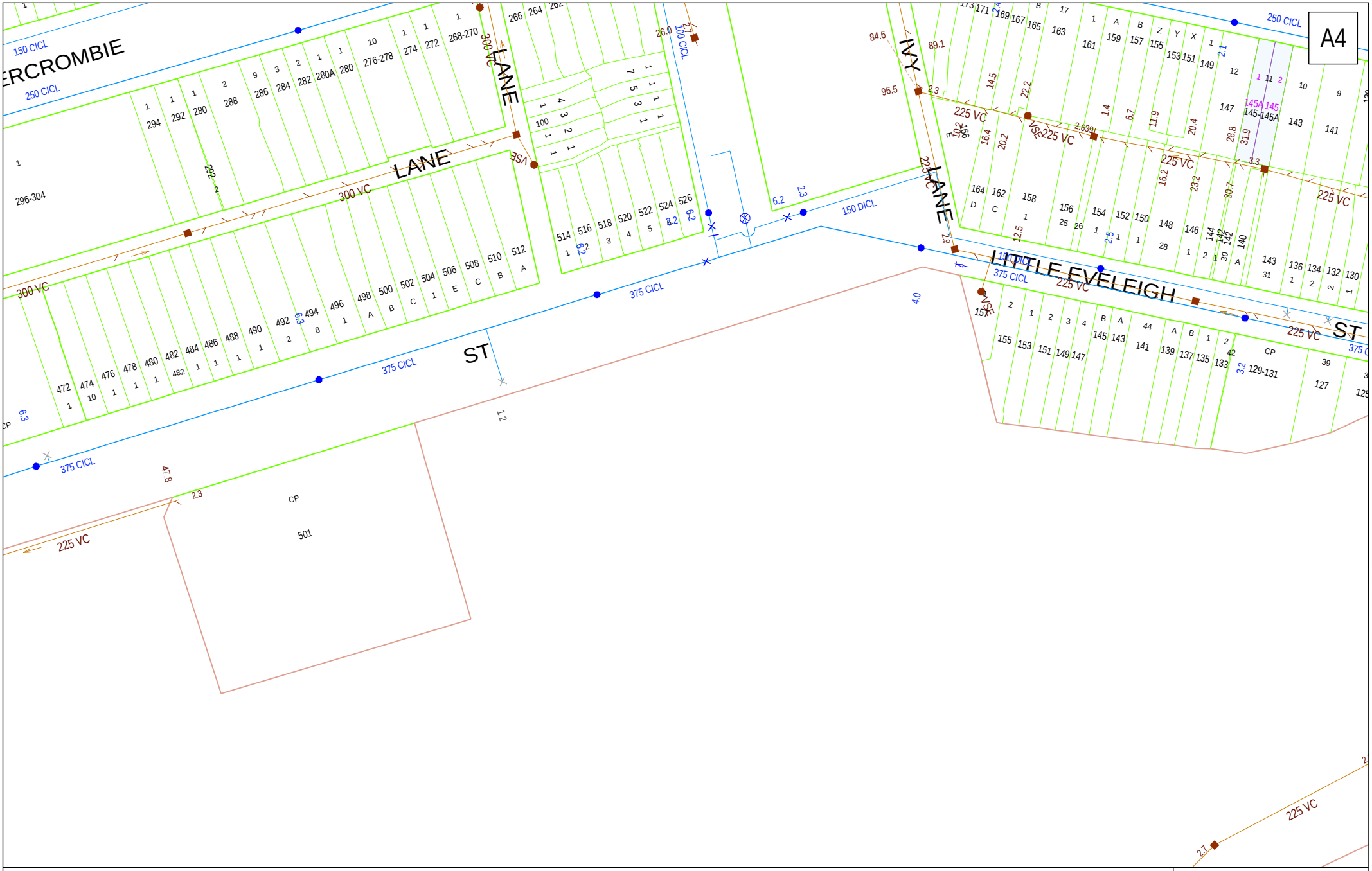
UBD: Sydney 255 Q4

SYDNEY TRAINS HIGH VOLTAGE ELECTRICAL SERVICES SEARCH

N

PLOTTED DATE: 24/07/2015

PLOTTED BY: dgrimshaw



DBYD Address:
505 Wilson Street
Eveleigh NSW 2015

DBYD Job No: 12831212

DBYD Sequence No: 63856490

SYDNEY WATER CORPORATION

Scale: 1:1000

Date of Production: 23/08/2017

Plan 1 of 1

N

0m 5m 10m 15m 20m

Appendix C

Council Stormwater Network

Map 1

Sequence No: 63856483

505 Wilson Street Eveleigh

LEGEND:

- Affected DBYD Work Area

Survey Infrastructure

- Permanent Mark
- Trigonometrical Station
- State Survey Mark
- Miscellaneous Mark
- Cadastral Reference Mark

Stormwater

- Stormwater Gross Pollutant Traps
- Stormwater Structures
- Stormwater Conduit
- Stormwater Raingardens

Electrical

- Lightning Points
- Smart Poles

Electrical Services

- Main Switch Board
- Distribution Board
- Special Small Service
- Electrical Pit
- Supply Feature
- Other

Electrical Conduits & Cables

- Underground
- Building
- Aerial

N

0 0.01km

Appendix D

Sydney Water Correspondence

Paul Parker

From: Stormwater <Stormwater@sydneywater.com.au>
Sent: Wednesday, 19 October 2022 11:05 AM
To: Paul Parker
Subject: RE: [External] 505 Wilson Street, Redfern SSD-39971796

Paul,

Way you are describing the development, you need to provide the On Site Detention, even though it is very difficult to make a firm decision without DA approval.

You have mentioned that you are going to upgrade the existing stormwater system. In general if you are required to replace the existing external stormwater pipes or upgrading the external stormwater pipes then you need to provide On Site Detention based on the highest catchment area that is flowing through these new stormwater pipes.

As a rule of thumb, you can use the following parameters if pre and post impervious areas are same:

- On Site Detention - 20 cubic meters per 1,000 square meters
- Permissible site discharge - 30 L/s per 1,000 square meters.

Best Regards

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

Sydney WATER

From: Paul Parker <Paul.Parker@ghd.com>
Sent: Friday, 14 October 2022 8:55 AM

To: Stormwater <Stormwater@sydneywater.com.au>
Subject: RE: [External] 505 Wilson Street, Redfern SSD-39971796

Hi there,
Further to the email below, I provide additional information in relation to my request to advise if Sydney Water require OSD as part of the proposed development.

Please note there is no approved DA at this stage. The project requires an Environmental Impact Statement which must be prepared to address the item in the attached SEARS. Item 14 in the SEARS requires an Integrated Water Management Plan to be prepared in consultation with any relevant drainage authority. Sydney Water is the drainage authority for the subject site and hence I seek advice on what the OSD requirements if any, there will be for the proposed development.

Please find attached preliminary architectural plans showing that the proposal is in the main internal modifications to the existing heritage building. There is no new roof area proposed, not an increase in impervious area external to the building. The intention is to upgrade the existing stormwater system on-site for connection generally in the same discharge points. Please note that a rainwater tank (below ground) is proposed for collection and reuse of roof water discharge.

Please let me know if further information is required in order to determine OSD requirements.

Paul Parker | A GHD Principal
BE(civil)(Hons) MEM MBA MIEAust CPEng
Team Lead – Design Management and Operations
Building Engineering

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From: Stormwater <Stormwater@sydneywater.com.au>
Sent: Wednesday, 14 September 2022 2:41 PM
To: Paul Parker <Paul.Parker@ghd.com>
Subject: RE: [External] 505 Wilson Street, Redfern SSD-39971796

Paul,

It is very difficult to provide OSD requirements without providing us the copy of the approved DA and the set of architectural drawings which you submitted to consent authority in order to obtain the DA approval.

In general if your proposed works are inside the buildings without replacing roof and using the existing drainage system and existing stormwater connection then On Site Detention is not required.

If you are replacing any of the existing roof of the buildings or extend the existing building or adding additional floors to the existing buildings or replacing the existing external drainage system or making new stormwater connections or proposing additional stormwater discharge points then On Site Detention is required.

Best Regards

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

Sydney WATER

From: Paul Parker <Paul.Parker@ghd.com>
Sent: Wednesday, 14 September 2022 9:41 AM
To: Stormwater <Stormwater@sydneywater.com.au>
Subject: [External] 505 Wilson Street, Redfern SSD-39971796

HI,
I am currently working on a development at 505 Wilson Street, Redfern within the TfNSW train yards located within the Munni Street Catchment. I would like to confirm what if any OSD requirements Sydney Water require for development of the site. Please note that development relates to the refurbishment and change of use of the building rather than demolition and rebuild.

Paul Parker | A GHD Principal
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Appendix E

MUSIC-link Report

MUSIC-*link* Report

Project Details		Company Details	
Project:	505 Wilson St, REDFERN	**Company:**	GHD
Report Export Date:	24/10/2022	**Contact:**	Paul Parker
Catchment Name:	505 Wilson St	**Address:**	Level 2, 20 Smith Street Parramatta NSW 2150 Australia
Catchment Area:	0.191ha	**Phone:**	02 8898 8821
Impervious Area*:	84.81%	**Email:**	Paul.Parker@ghd.com
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 Clay 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: Receiving Node	Reduction
Flow	-0.00137%
TSS	89.6%
TP	68.5%
TN	45%
GP	100%

Treatment Nodes

Node Type	Number
Sedimentation Basin Node	1
Generic Node	1
GPT Node	1

Source Nodes

Node Type	Number
Urban Source Node	3

Comments

- The 'SF Chamber' node has been modified to represent the below ground filtration chamber. Default 'K' values have been manually adjusted to 1 in order to eliminate any performance from the actual tank, which would already be accounted for in the Filter Generic Node Target Elements/Transfer Functions. This must be adjusted for any proprietary filter using this method of modelling. Not doing this would represent a duplication of the chamber attenuation effect. (For any questions, please Contact Ocean Protect on 1300 354 722).

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	OceanGuard200um Pit Basket	Hi-flow bypass rate (cum/sec)	None	99	0.02
Receiving	Receiving Node	% Load Reduction	None	None	-0.00
Receiving	Receiving Node	GP % Load Reduction	90	None	100
Receiving	Receiving Node	TN % Load Reduction	45	None	45
Receiving	Receiving Node	TP % Load Reduction	65	None	68.5
Receiving	Receiving Node	TSS % Load Reduction	85	None	89.6
Sedimentation	SF Chamber (3m&#65533;)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (3m&#65533;)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Chamber (3m&#65533;)	Extended detention depth (m)	0.25	1	0.77
Sedimentation	SF Chamber (3m&#65533;)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Asphalt - 650m&#65533; (100% Imp.)	Area Impervious (ha)	None	None	0.065
Urban	Asphalt - 650m&#65533; (100% Imp.)	Area Pervious (ha)	None	None	0
Urban	Asphalt - 650m&#65533; (100% Imp.)	Total Area (ha)	None	None	0.065
Urban	Ground - 285m&#65533; (100% Perv.)	Area Impervious (ha)	None	None	0
Urban	Ground - 285m&#65533; (100% Perv.)	Area Pervious (ha)	None	None	0.029
Urban	Ground - 285m&#65533; (100% Perv.)	Total Area (ha)	None	None	0.029
Urban	Roof - 970m&#65533; (100% Imp.)	Area Impervious (ha)	None	None	0.097
Urban	Roof - 970m&#65533; (100% Imp.)	Area Pervious (ha)	None	None	0
Urban	Roof - 970m&#65533; (100% Imp.)	Total Area (ha)	None	None	0.097

Only certain parameters are reported when they pass validation

Failing Parameters

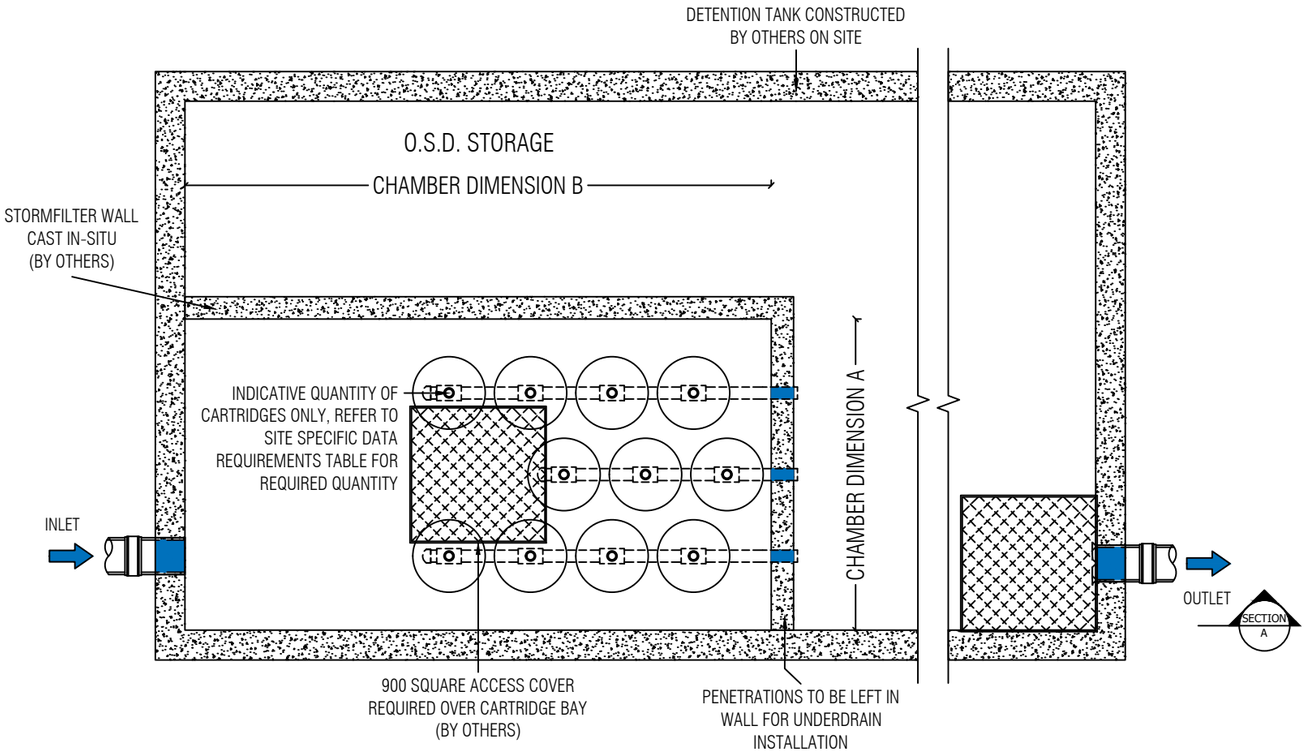
Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Chamber (3m)	Notional Detention Time (hrs)	8	12	0.156
Sedimentation	SF Chamber (3m)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (3m)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (3m)	Total Suspended Solids - k (m/yr)	8000	8000	1

Only certain parameters are reported when they pass validation

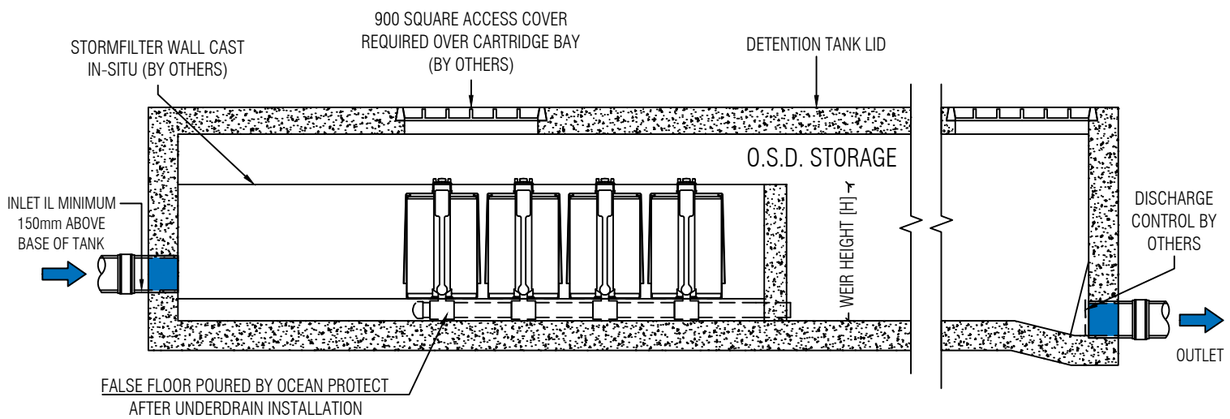
Appendix F

StormFilter® details

NOT FOR CONSTRUCTION



PLAN LAYOUT

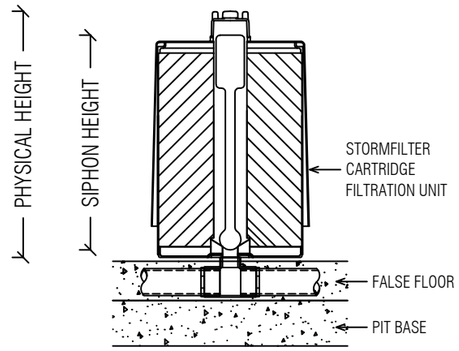


SECTION A

STORMFILTER DESIGN TABLE

- STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED.
- THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CERTIFYING ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWING(S).
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 178mm.

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL WEIR HEIGHT [**H**] (mm)	920	690	540
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.6	1.1	0.7
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.9	0.46	0.39



STORMFILTER CARTRIDGE DETAIL

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	[ ]
NUMBER OF CARTRIDGES REQ'D	[ ]
SIPHON HEIGHT (310 / 460 / 690)	[ ]
MEDIA TYPE (ZPG / PSORB)	[ ]
WATER QUALITY FLOW RATE (L/S)	[ ]
DIMENSION A	[ ]
DIMENSION B	[ ]

TOTAL CARTRIDGE BAY AREA (A x B) TO MATCH AREA REQUIRED BY MUSIC MODELLING OR COUNCIL SPECIFIC REQUIREMENTS

GENERAL NOTES

1. INLET AND OUTLET PIPES TO BE IN ACCORDANCE WITH APPROVED PLANS.
2. A HIGH FLOW BYPASS ARRANGEMENT OR DISSIPATION STRUCTURE MAY BE REQUIRED TO MINIMISE RE-SUSPENSION OF SOLIDS OR ANY SIGNIFICANT INERTIAL FORCES ON THE CARTRIDGES.
3. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE. REFER TO OPERATION AND MAINTENANCE MANUAL FOR GUIDELINES AND ACCESS REQUIREMENTS.
4. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
5. THE INVERT LEVEL OF THE INLET PIPE MUST BE GREATER THAN THE RL OF THE FALSE FLOOR WITHIN THE CARTRIDGE CHAMBER.
6. CONCRETE STRUCTURE AND ACCESS COVERS DESIGNED AND PROVIDED BY OTHERS. ACCESS COVERS TO BE A MINIMUM 900 X 900 ABOVE CARTRIDGES. OH&S REGARDING ACCESS COVERS AND TANK ACCESS TO BE ASSESSED BY OTHERS ON SITE.
7. THE STRUCTURE THICKNESSES SHOWN ARE FOR REPRESENTATIONAL PURPOSES.
8. DRAWINGS NOT TO SCALE.

INSTALLATION NOTES

1. UNDERDRAIN AND FALSE FLOOR INSTALLED BY OCEAN PROTECT.

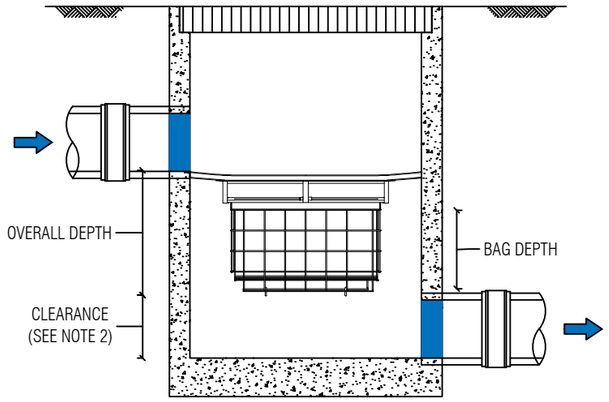
OCEAN PROTECT
PHONE: 1300 354 722
www.oceanprotect.com.au

OCEAN PROTECT
STORMFILTER SYSTEM
DETENTION TANK ARRANGEMENT
SPECIFICATION DRAWING

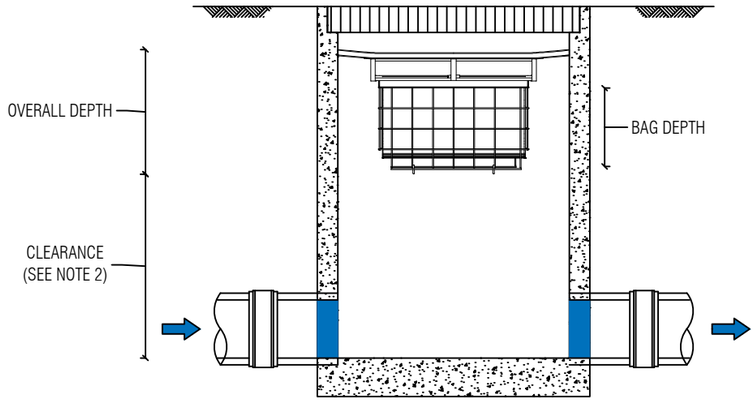
LAST MODIFIED: 07-03-19

Appendix G

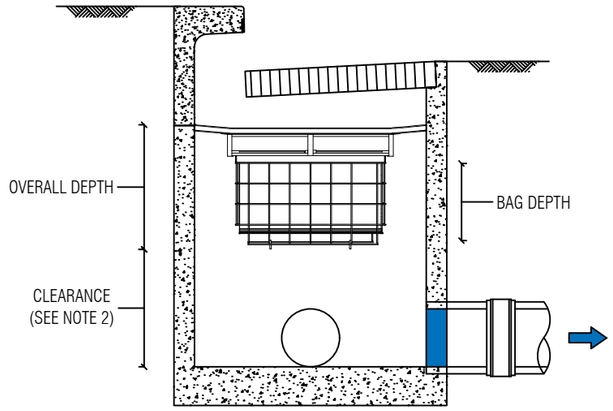
OceanGuard® details



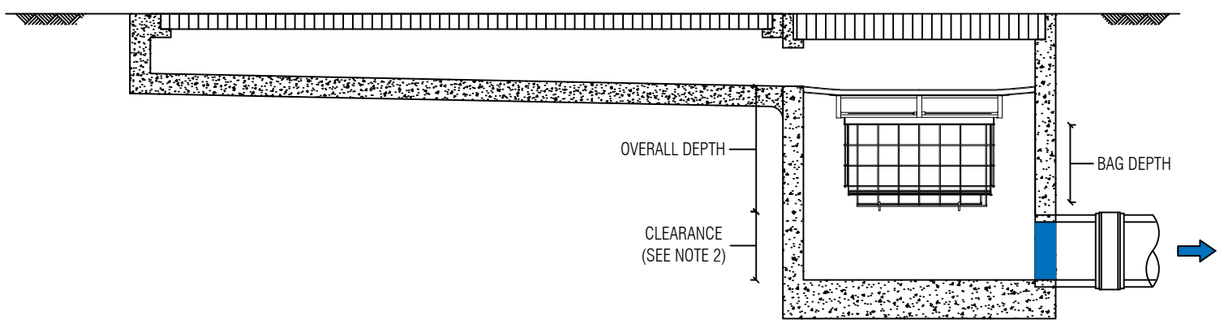
PIPE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION

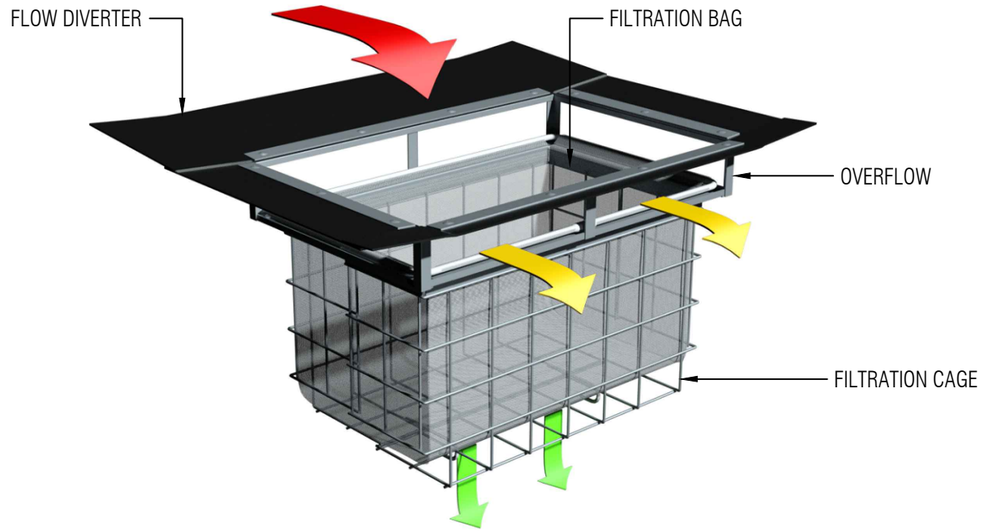


GRATED STRIP DRAIN CONFIGURATION

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

		DEPTH ID		
		1	2	3
PLAN ID	S	■		
	M	■	■	
	L	■	■	■
	XL	■	■	■



GENERAL NOTES

1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
3. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES:- 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING AND A COARSE BAG FOR TARGETING GROSS POLLUTANTS.
4. DRAWINGS NOT TO SCALE.

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OCEANGUARD
TYPCIAL ARRANGEMENTS
SPECIFICATION DRAWING

LAST MODIFIED: 15-10-19

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