TTW Structural Civil Traffic Façade

State Significant SSDA Report

Western Sydney Cricket NSW

Prepared for Cox Architecture / 31 October 2019

191180

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1.0 Executive Summary

1.1 Project Introduction

This report supports a State Significant Development Application (SSDA) submitted to the Minister for Planning and Public Spaces, pursuant to Part 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This SSDA seeks consent for the design, construction and operation of a new Cricket NSW Centre of Excellence at Wilson Park, within Sydney Olympic Park.

The Cricket NSW Centre of Excellence will comprise a state-of-the-art, dedicated, year-round cricket, training and administration facility that services both regional and metropolitan cricketers, as well as providing facilities for community use to support sport, social, health and educational programs.

1.2 Background

Given the redevelopment and closure of Sydney Football Stadium and its associated cricket training facilities, Cricket NSW decided to relocate its facilities to Sydney Olympic Park. The Wilson Park site has therefore been selected as the appropriate location for the development.

Wilson Park is a former gasworks site, today being used predominantly as playing fields with mature trees generally located around the peripheries. The site has a landfill leachate treatment plant located to its north-east, sharing the same boundary with the site.

1.3 Site Description

The site is located at Wilson Park, in the suburb of Sydney Olympic Park, within the Parramatta Local Government Area (LGA) and is situated at the north western corner of the Sydney Olympic Park (SOP) precinct.

The site is located in proximity to a number of regionally significant facilities and amenities including the Olympic Park Railway Station, ANZ Stadium, Qudos Bank Arena and Sydney Showground, which are all approximately 2.5km south east of the site. Further to this, the site is located approximately 2km west of Wentworth Point.

The site's locational context is shown in **Figure 1** below.

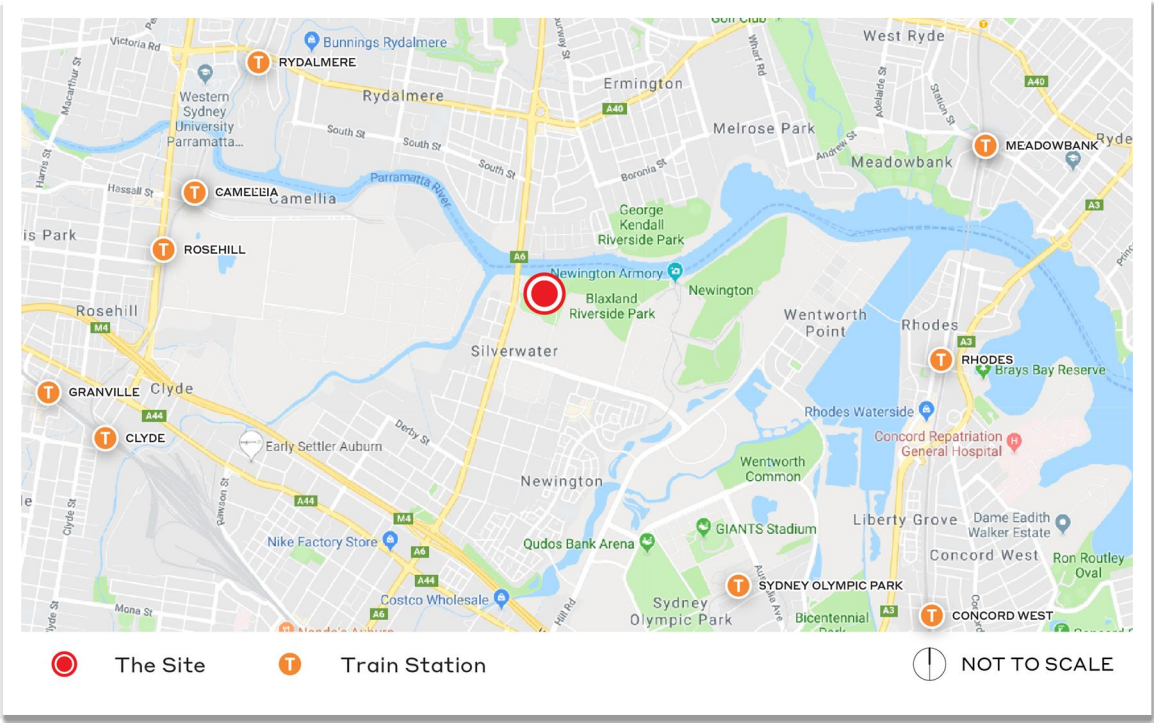

Figure 1 **Locational context**

The site is irregular in shape and comprises a single allotment of land with an area of 121,082m2 and a leased area where development will occur with a site area of 65,767m2. The site is currently owned by the Sydney Olympic Park Authority (SOPA) and it is legally described as Lot C in DP 421320. The site is bounded by the Parramatta River to the north, Silverwater correctional facility to the east, industrial lands to the south and Silverwater Road to the west. An aerial image of the site is shown in **Figure 2**.

Figure 2 Site aerial

1.4 Overview of Proposed Development

The proposal relates to a development application to facilitate the development of a Cricket Centre of Excellence for Cricket NSW at the Wilson Park site. Specifically, the works that are proposed for the DA include:

- A two storey cricket centre, including an internal atrium, gymnasium, community facilities, sports science and sports medicine facilities and business offices;
- An International Cricket Council compliant oval 136m long x 144m wide (16,040m2)(Oval 1) and associated seating;
- A second oval (Oval 2) that complies with the Cricket Australia community guidelines for community club cricket (with a minimum diameter of 100m (6365m2);
- Outdoor practice nets, 71 wickets with a minimum of 30m run ups;
- A double height (10.7m) indoor training facility with 15 wickets;
- A single storey shed for machinery and storage;
- Associated car parking, landscaping and public domain works; and
- Extension and augmentation of services and infrastructure as required.

1.5 Planning Approvals Strategy

The site is located with the Sydney Olympic Park precinct, which is identified as a State Significant site in Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011*. As the proposed development will have a capital investment exceeding $10 million, it is declared to be State Significant Development (SSD) for the purposes of the EP&A Act, with the Minister for Planning and Public Spaces the consent authority for the project.

This SSDA seeks approval for the detailed scope development described in **Section 1.4** above.
The Department of Planning, Industry and Environment provided the Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development on 23 July 2019. This report has been prepared having regard to the SEARs as relevant.

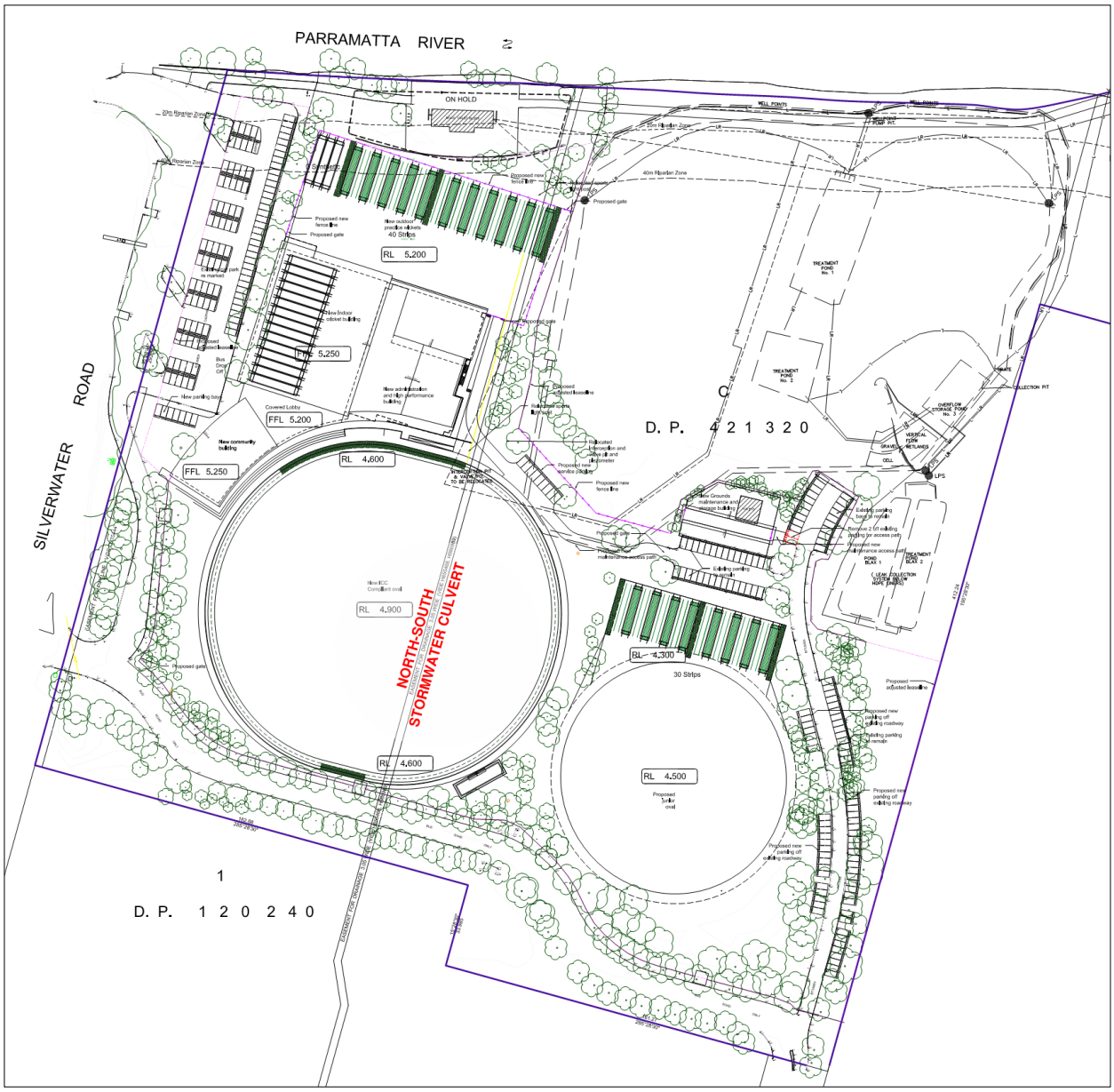

Figure 3 **Cricket NSW Site Layout by Cox Architecture**

1.6 SEARS Requirements

The following requirements have been addressed in this report:

SSD 10354 Sears 13 – Water, Flooding and Drainage

- The EIS shall identify provision of an adequate and secure water supply for the life of the project, including any water licensing requirements or other approvals required under the Water Act 1912 or Water Management Act 2000

TTW Response: Refer LCI Consultants (Hydraulic Engineers)

- The EIS shall identify a detailed and consolidated site water balance

TTW Response: Refer LCI Consultants (Hydraulic Engineers)

- The EIS shall identify impacts on surface waters and groundwater levels, flow paths, stormwater, related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, groundwater dependent ecosystems, any existing Council and inter-allotment drainage easements and measures to reduce and mitigate these impacts in relation to both water quality and quantity

TTW Response: Refer to section 5 of this report and attached drawings C01-P2, C02-P2, C05-P3, C06-P3, C07-P3, C20-P1 & C21 P1 in Appendix A.

- The EIS shall identify proposed surface and groundwater monitoring activities and methodologies

TTW Response: Refer Douglas Partners (Geotechnical Engineers)

- The EIS shall identify any potential impacts in relation to the NSW Aquifer Interference Policy, Guidelines for Controlled Activities on Waterfront Land and relevant Water Sharing Plans

TTW Response: Refer Douglas Partners (Geotechnical Engineers)

- The EIS shall identify any geotechnical issues (including contamination and acid sulfate soils) associated with the construction of the development

TTW Response: Refer Douglas Partners (Geotechnical Engineers)

- The EIS shall identify drainage associated with the proposed works, including stormwater and drainage infrastructure

TTW Response: Refer to section 4 of this report and attached drawings C01-P2, C02-P2, C05-P3, C06-P3, C07-P3, C20-P1 & C21 P1 in Appendix A.

- The EIS shall identify any flood risk in accordance with the guideline contained in the NSW Floodplain Development Manual 2005, including potential effects of climate change, sea level rise and an increase in rainfall intensity

TTW Response: Refer to section 3 of this report and Appendix B.

- The EIS shall identify potential effects of coastal processes and hazards (within the meaning of the Coastal Management Act 2016), including sea level rise and climate change both on and arising from the proposed development

TTW Response: Refer to section 4.2 of this report. There is no significant change due to the development.

- The EIS shall identify opportunities for the use of integrated water cycle management practices and principles to optimise opportunities for sustainable water supply, wastewater and stormwater management across the development.

TTW Response: TTW has assessed the water quality performance with MUSIC and the water quality units specified. The water quality produced meets Council's requirements. LCI Consultants have designed roof water re-use.

SSD 10354 Sears 18 – Sediment, Erosion and Dust Controls

- The EIS shall identify measures and procedures to minimise and manage the generations and off-site transmission of sediment, dust and particles

TTW Response: Refer to section 5.3 of this report and drawings C01& C02 and civil specifications for sediment control.

2.0 Civil and Stormwater Design

Taylor Thomson Whitting (NSW) has been engaged by Cox Architecture to provide civil engineering and stormwater drainage management systems designs for the New Western Sydney Cricket NSW Development in Sydney Olympic Park.

This report covers the civil infrastructure and stormwater aspects relevant to the site based on information known at the time of report production.

Civil and stormwater design has been undertaken based on the site layout plans as developed by the site architect (Cox Architecture) and the design team, and incorporates the following design principles:

- Civil works and roadworks, including vehicular accesses and carparks, emergency vehicle access, loading docks, and pedestrian pathways have been designed to provide clearly defined, efficient and functional traffic and pedestrian movements on the site, for all anticipated users.
- Earthworks designs have been undertaken in coordination with the Contractor, architect and structural engineer, and take into account the landform and existing site materials, design of structure and footings, and to minimise earthworks cut and fill on the site.
- Stormwater has been designed to ensure that the requirements of the local Council (Parramatta Council) are met, that stormwater discharges from the site are not changed or detrimental to the surrounding areas, and that the site is accessible in minor and major rainfall events and is operational in extreme rainfall events.

This report details the proposed civil and stormwater design for the proposed development of the New Cricket NSW, during both construction stage and operation phases.

The proposed development is in accordance with the architectural drawings prepared by Cox Architecture.

The areas in the below plans have been assessed and are included within this report.

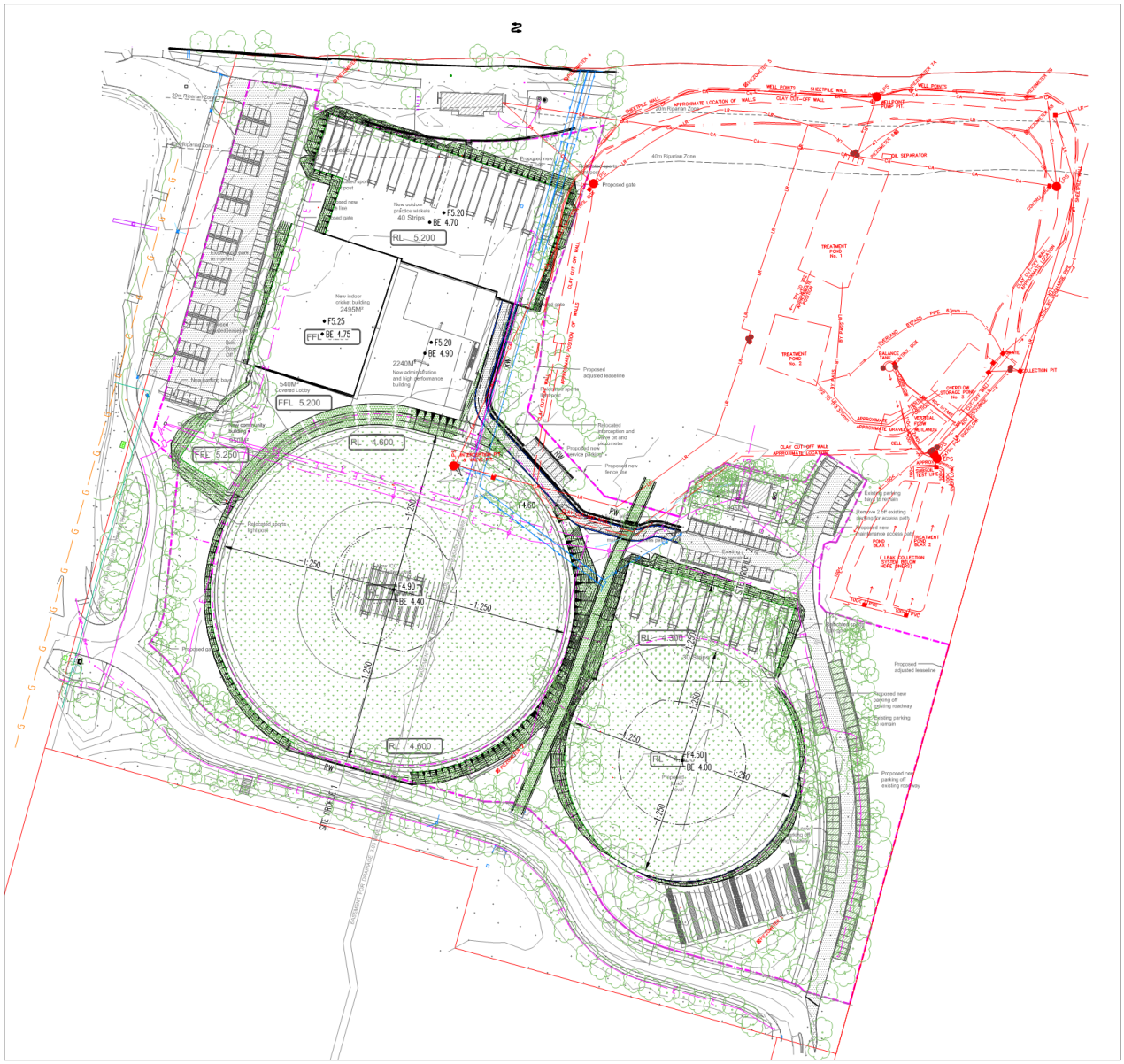

Figure 4 Site Plan

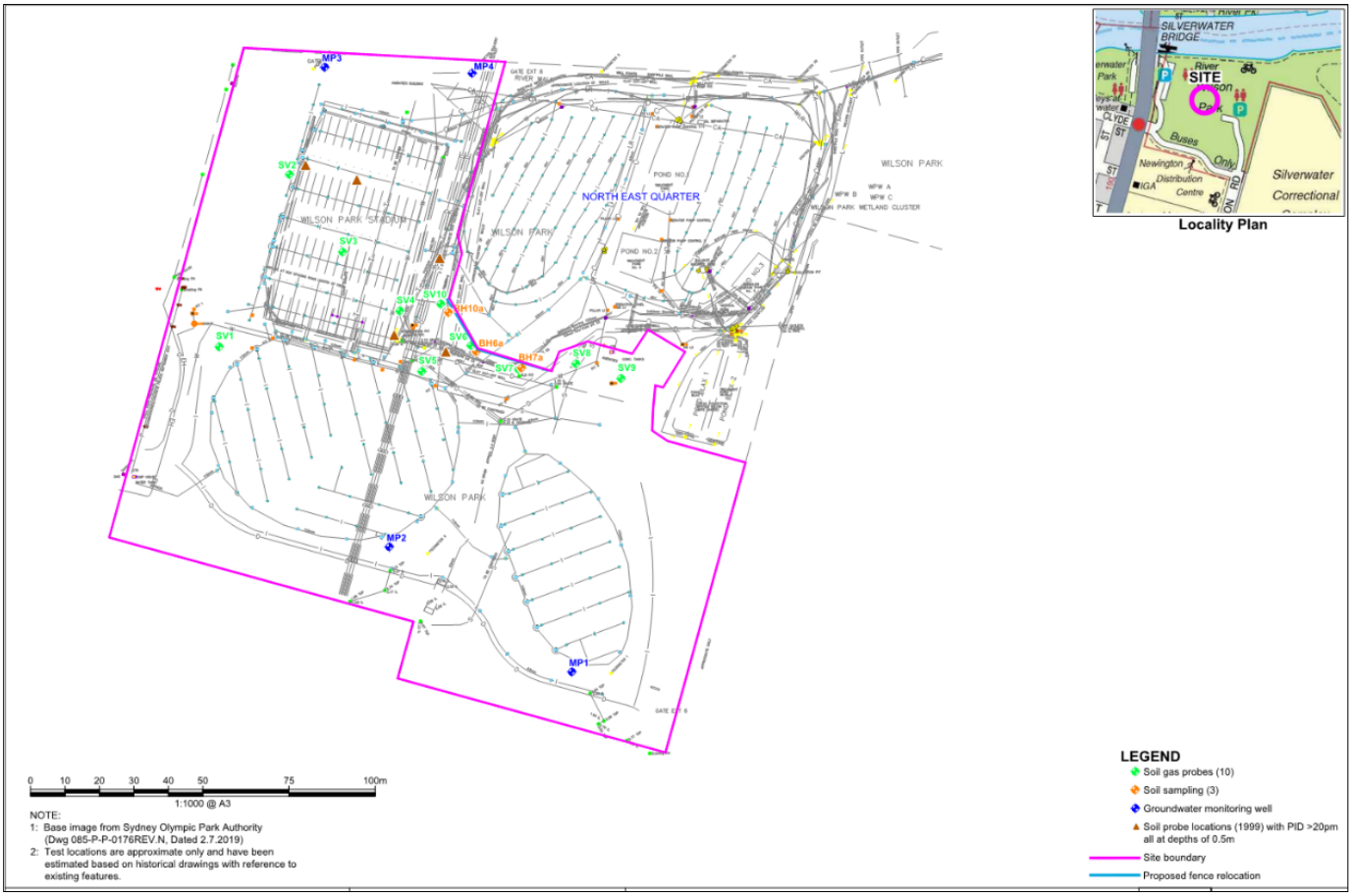

Figure 5 **Test Location Plan by Douglas Partners**

Refer Douglas Partners Report on preliminary site investigation dated April 2019 for investigation and recommendations.

3.0 Flood Impact Assessment

As part of the State Significant Infrastructure Application, an assessment of flood impacts was undertaken. Refer to Flood Impact Assessment Report by TTW in Appendix B. The flood study assumes the North South stormwater culvert is blocked as it was at the time of this report. The upstream conditions will improve once this culvert has been cleaned out. The proposed development does not worsen the existing flood condition.

4.0 Stormwater

Parramatta City Council's Development Control Plan (DCP), Parramatta's Development engineering design guidelines and Parramatta's stormwater disposal policy define the requirements for the control, treatment and discharge of stormwater from development sites within the Council area. These documents, along with relevant Australian Standards, and industry guides have been used as the basis for the design of the proposed stormwater system.

The stormwater culvert running North South the site is recommended to be cleaned out to protect the upstream catchment.

4.1 Authority Requirements

Conveyance

Parramatta City Council require the following design principals, and that stormwater drainage systems shall be designed to achieve the following goals:

- All developments are required to demonstrate that stormwater runoff from the site is collected and conveyed to a legal point of discharge without adversely impacting adjoining or downstream properties in accordance with these guidelines.

TTW Response: Refer to the stormwater plan drawing C06

- All systems shall be designed with consideration to the major/minor system design principle in Australian Rainfall & Runoff allowing for overflows of the piped system and flows in excess of the piped system capacity to be discharged in a controlled manner in the same direction as the pipe to a legal point of discharge.

TTW Response: An overland flow channel is proposed. Refer to attached drawing C06 in Appendix A.

- On site detention is required for all multi-unit residential development, including dual occupancies, all commercial development and all community focused facilities, such as places of worship, community centres, childcare centres and the like, unless it can be demonstrated that OSD will increase flooding of that site. In these circumstances alternate stormwater management is to be considered in line with WSUD principles and Section 3.3.6 of Parramatta Development Control Plan 2011.

TTW Response: No On-site detention is proposed as the OSD will increase flooding.

- When discharge to a suitable natural waterway or creek is allowed by Council, the waterway is to be protected against erosion at the point of discharge with the provision of an outfall apron and energy dissipation structure. Stabilising a small length of the waterway in vicinity of the outlet is not acceptable.

TTW Response: The proposed stormwater system is connected to the existing stormwater system, which discharges to an existing outlet to a natural waterway.

- Sub-soil drainage systems are to be designed and constructed as per Section 6 of AS3500.3. Subsoil drains shall be connected to the site drainage system and disposed of in a manner that will not have any adverse impact on adjacent properties.

TTW Response: All subsoil drainage is connected to the proposed stormwater system. Refer to attached drawing C06 in Appendix A.

- All developments, where the site is to be disturbed, shall include details of Erosion and Sedimentation Control measures designed in accordance with the Soil and Water Management for Urban Development – NSW Department of Housing.

TTW Response: This is addressed in section 5.3 of this report. Refer to attached drawing C02 in Appendix A.

- All developments are to consider the potential for adverse effects on stormwater drainage on adjoining properties.

TTW Response: The development does not increase upstream flood conditions due to the new overland flow channel and the cleaning out the North South stormwater culvert. Refer to attached drawing C06 in Appendix A.

- In the Parramatta Local Government Area, all developments will be required to implement the principles of Water Sensitive Urban Design (WSUD). All development must consider the WSUD measures to achieve water quality and quantity targets.

TTW Response: WSUD measures are implemented in the stormwater design and reduction targets are met. Refer to attached drawing C06 in Appendix A and MUSIC-Link Report in Appendix C.

The following table summarises Parramatta City Council's requirements for stormwater conveyance systems for the proposed development:

DRAINAGE COMPONENT	CONVEYANCE	DESIGN PARAMTER	* DESIGN REQUIREMNT
Formalised Drainage	Piped Drainage	Minor Drainage System	5 year ARI (18.13% AEP)
	Overland flow path	Major Drainage System	100 year ARI (1% AEP)
	Outlet to natural watercourse	Minor Drainage System	20 year ARI (5% AEP)
Tailwater	Discharge to receiving waters	Major Drainage System	Flood level of creek during pipe design ARI event
Open Channels	Overland	Freeboard	500mm from top of channel
Swales	Overland	Velocity x Depth	<0.4

Table 1 Council Requirements

*Latest ARR 2016 uses AEP (Annual Exceedance Probability) rather than ARI (a return period).

The proposed minor drainage system is designed for the 5% AEP and the proposed major system is designed for the 1% AEP in accordance with Council's DCP and ARR.

4.2 Climate Change

Increases in rainfall intensity up to 30% in accordance with DECC guidelines 2007 will be allowed for with the minor drainage system designed to ensure no overland flow occurs. The major drainage system has been assessed as part of the flood impact assessment report and includes climate change assessment. All major drainage systems have allowed for the current 1% AEP, with unrestricted overflows diverted away from buildings if capacity in exceeded. Climate change sensitivity has been addressed in the flood report.

All overland flow paths for greater rainfall events have been designed with free unrestricted outlets and increases in rainfall intensity and more extreme rainfall events are factored into this design.

There is no significant additional effect by the development when climate change is applied. The flood increase is less than 150mm. Refer to table 2 in Appendix B.

4.3 Stormwater Conveyance Design

The proposed design of the stormwater system for the development includes both minor and major stormwater conveyance systems, consisting of conventional pit and pit drainage networks. Stormwater is

captured, detained, treated and discharged to the existing 2 x 2500mm stormwater culverts draining to Parramatta River. Refer to attached drawing C06 in Appendix A of this report.

A traditional pit and pipe network of surface inlet pits and concrete stormwater pipes is proposed.

The roof drainage proposed is a syphonic downpipe system. Energy break pits will be incorporated into the stormwater network by the Hydraulics consultants prior to discharge to the stormwater network to reduce discharge velocities/energy conveyance into the remaining stormwater network.

5.0 Water Quality Treatment

5.1 Authority Requirements

Parramatta City Council requires that the quality of stormwater runoff from new developments minimise potential adverse effects generated from the development on the downstream environment. This includes treating water runoff prior to its discharge to remove pollutants. Council's Load Reduction targets are shown in the table below.

Pollutant	Load Reduction Target	Proposed System Reduction
Total Suspended Solids	85%	85%
Total Phosphorus	60%	70.8%
Total Nitrogen	45%	45.9%
Gross Pollutants (>5mm)	90%	100%

Table 2 Water Quality Treatment Requirements

5.2 Water Quality Treatment Design

Water quality treatment devices and water sensitive urban design features will be incorporated into the stormwater network to provide the required reduction in pollutant and nutrient loads. Primary filtration devices such as ocean guards will be used in pits, which then drain to storm filter devices prior to discharging into Parramatta River. Typical treatment chain is as below.

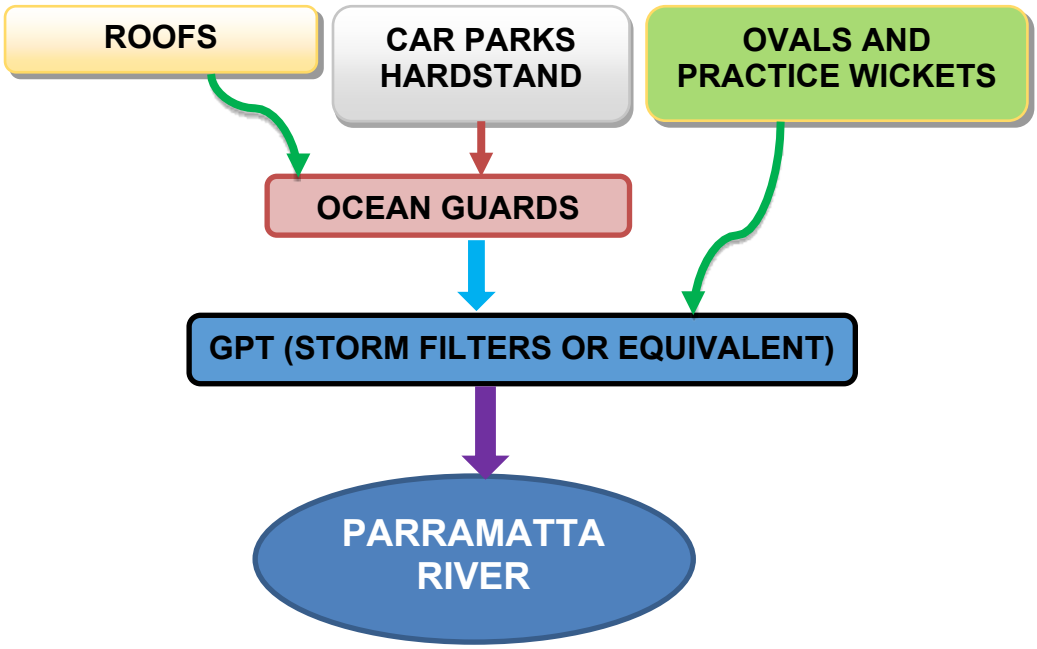

Figure 5 Proposed Water Quality Treatment Chain

5.3 Sediment, Erosion and Dust Controls

Council and Department of a soil and erosion control plan in accordance with NSW Department of Housing Managing Urban Stormwater, 3rd Edition, August 1998, Soils and Construction “Blue Book” has been prepared as shown in the attached drawing C02 in Appendix A.

The Soil and Water Management Plan has been based on providing Sediment basins on the downslope side of each section of the development due to the presence of potentially dispersive soils on the site (as evidenced in the Douglas Partners Geotechnical Report). A series of catch drains will convey sediment laden runoff from disturbed areas during the construction phase to these sediment basins. Sediment basins have been sized to cater for the 7 day rainfall depth event, allowing sufficient time after rainfall events to treat and remove sediment from captured water prior to discharge to local watercourses.

Dust suppression and erosion controls to minimise erosion from construction vehicles/traffic and wind, will include vehicle wash downs, utilisation of water carts to supress dust during construction activities, and ongoing dust monitoring of the site. Further controls such as locating material stockpiles away from sensitive areas, staging construction works to minimise extent of disturbed surfaces, early revegetation of completed surfaces, and imposing speed limits on all site vehicles will further reduce dust generation and impacts.

6.0 Stormwater Discharge to Council Stormwater and Local Watercourses

The site is adjacent to Parramatta River and the existing stormwater system discharges to Parramatta River via existing 2 x 2500mm culverts. The proposed stormwater drainage connects to the existing stormwater system as shown in the attached drawing C06 in Appendix A.

7.0 Roads and Pavements

The proposed development will provide for entry and exit to the site for staff and visitors to the oval, along with emergency services access and delivery. Carparks will be provided for both staff and visitors on both the eastern and north eastern side at the commencement of oval operations.

Pavements have been designed based on a 20 year design life in accordance with AustRoads Guide to Road Design, Volume 4, and will include asphalt surfaced flexible pavements for roads, carparks, and loading docks. All pavement surfacing in Asphalt will be designed for a 7 year surfacing life.

	Design Traffic for 20 year life	Pavement Thickness	Pavement Surfacing
Entry Roads, Single Truck	$1x10^5$ ESA's	50mm AC10 120mm DGB20 220mm DGS40	AC14HD
Carparks and Light Duty Roads	$1x10^4$ ESA's	40mm AC10 120mm DGB20 160mmDGS40	AC10

Table 3 Pavement Design Parameters

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD in its capacity as trustee for the TAYLOR THOMSON WHITTING NSW TRUST

LARA ELSAHILI
Civil Engineer

Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD in its capacity as trustee for the TAYLOR THOMSON WHITTING NSW TRUST

STEPHEN BRAIN
Technical Director

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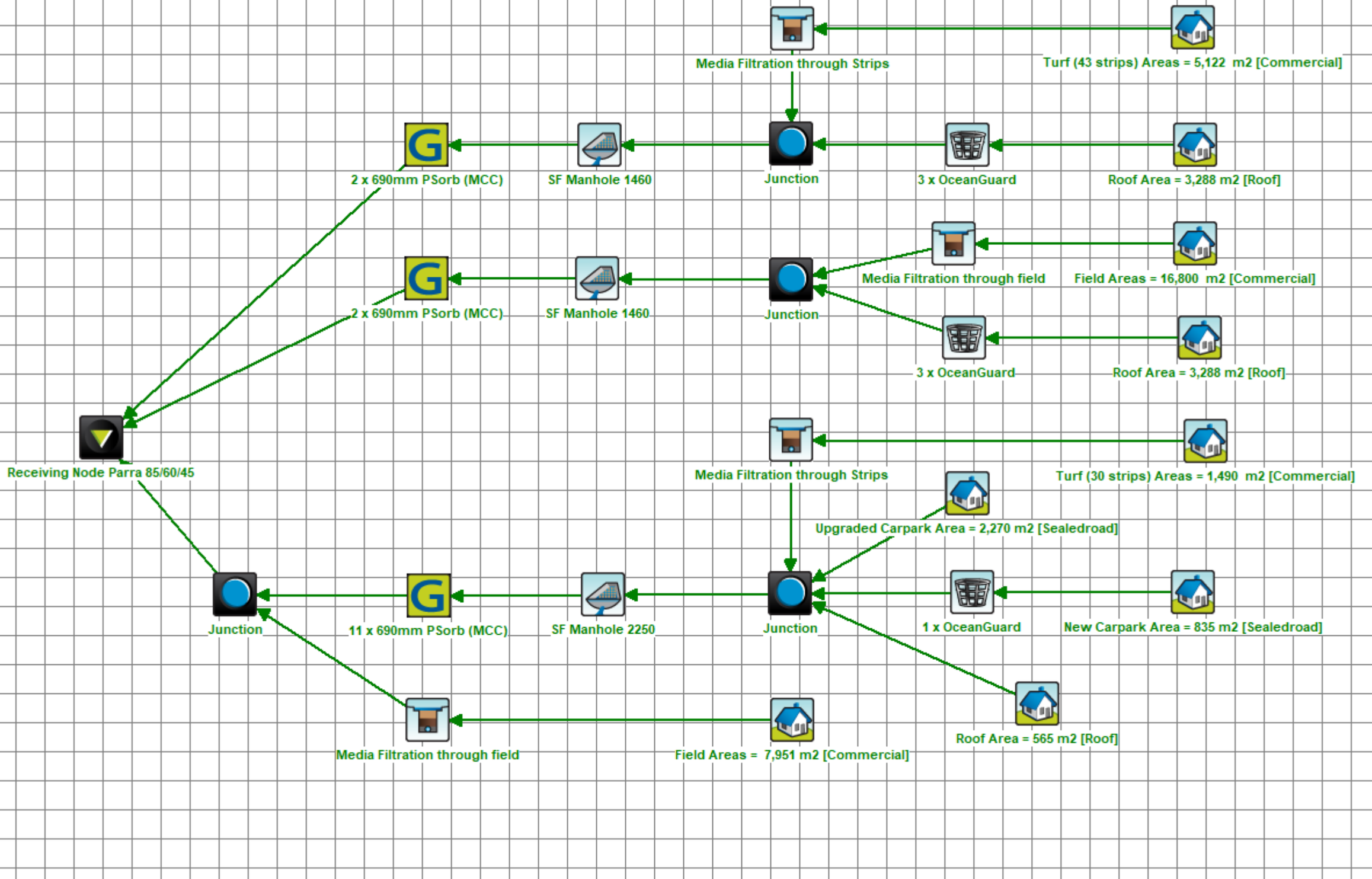
Appendix A

MUSIC-Link Report


Media Filtration through Strips
Turf (43 strips) Areas = 5,122 m2 [Commercial]
2 x 690mm PSorb (MCC)
SF Manhole 1460
Junction
3 x OceanGuard
Roof Area = 3,288 m2 [Roof]
Media Filtration through field
Field Areas = 16,800 m2 [Commercial]
2 x 690mm PSorb (MCC)
SF Manhole 1460
Junction
3 x OceanGuard
Roof Area = 3,288 m2 [Roof]
Receiving Node Parra 85/60/45
Media Filtration through Strips
Turf (30 strips) Areas = 1,490 m2 [Commercial]
Upgraded Carpark Area = 2,270 m2 [Sealedroad]
Junction
11 x 690mm PSorb (MCC)
SF Manhole 2250
Junction
1 x OceanGuard
New Carpark Area = 835 m2 [Sealedroad]
Roof Area = 565 m2 [Roof]
Media Filtration through field
Field Areas = 7,951 m2 [Commercial]

PARRAMATTA CITY COUNCIL

MUSIC-*link* Report

Project Details		Company Details	
Project:	191180 Cricket NSW	**Company:**	TTW
Report Export Date:	27/09/2019	**Contact:**	Lara Elsahili
Catchment Name:	190927_Cricket_191180_A	**Address:**	48 Chandos Street, St Leonards
Catchment Area:	4.161ha	**Phone:**	029439 7288
Impervious Area*:	24.63%	**Email:**	lara.elsahili@ttw.com.au
Rainfall Station:	67035 LIVERPOOL(WHITLAM		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1967 - 31/12/1976 11:54:00 PM		
Mean Annual Rainfall:	857mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.2.1		
MUSIC-link data Version:	6.22		
Study Area:	Parramatta		
Scenario:	Parramatta 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 Parra 85/60/45	Reduction
Flow	-1.92%
TSS	85%
TP	70.8%
TN	45.9%
GP	100%

Treatment Nodes

Node Type	Number
Media Filtration Node	4
Sedimentation Basin Node	3
GPT Node	3
Generic Node	3

Source Nodes

Node Type	Number
Urban Source Node	9

Comments

To meet the notional time between 8 and 12 hours, the outlet pipe wshould be under 5mm which is unrealistic.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	3 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.06
GPT	1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.02
GPT	3 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.06
Receiving	Receiving Node Parra 85/60/45	% Load Reduction	None	None	-1.92
Receiving	Receiving Node Parra 85/60/45	GP % Load Reduction	90	None	100
Receiving	Receiving Node Parra 85/60/45	TN % Load Reduction	45	None	45.9
Receiving	Receiving Node Parra 85/60/45	TP % Load Reduction	60	None	70.8
Receiving	Receiving Node Parra 85/60/45	TSS % Load Reduction	85	None	85
Sedimentation	SF Manhole 1460	% Reuse Demand Met	None	None	0
Sedimentation	SF Manhole 1460	% Reuse Demand Met	None	None	0
Sedimentation	SF Manhole 1460	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Manhole 1460	High Flow Bypass Out (ML/yr)	None	None	0
Sedimentation	SF Manhole 2250	% Reuse Demand Met	None	None	0
Sedimentation	SF Manhole 2250	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Field Areas = 7_951 m2	Area Impervious (ha)	None	None	0
Urban	Field Areas = 7_951 m2	Area Pervious (ha)	None	None	0.795
Urban	Field Areas = 7_951 m2	Total Area (ha)	None	None	0.795
Urban	Field Areas = 16_800 m2	Area Impervious (ha)	None	None	0
Urban	Field Areas = 16_800 m2	Area Pervious (ha)	None	None	1.68
Urban	Field Areas = 16_800 m2	Total Area (ha)	None	None	1.68
Urban	New Carpark Area = 835 m2	Area Impervious (ha)	None	None	0.084
Urban	New Carpark Area = 835 m2	Area Pervious (ha)	None	None	0
Urban	New Carpark Area = 835 m2	Total Area (ha)	None	None	0.084
Urban	Roof Area = 3_288 m2	Area Impervious (ha)	None	None	0.329
Urban	Roof Area = 3_288 m2	Area Impervious (ha)	None	None	0.329
Urban	Roof Area = 3_288 m2	Area Pervious (ha)	None	None	0
Urban	Roof Area = 3_288 m2	Area Pervious (ha)	None	None	0
Urban	Roof Area = 3_288 m2	Total Area (ha)	None	None	0.329
Urban	Roof Area = 3_288 m2	Total Area (ha)	None	None	0.329
Urban	Roof Area = 565 m2	Area Impervious (ha)	None	None	0.056
Urban	Roof Area = 565 m2	Area Pervious (ha)	None	None	0
Urban	Roof Area = 565 m2	Total Area (ha)	None	None	0.056
Urban	Turf (30 strips) Areas = 1_490 m2	Area Impervious (ha)	None	None	0
Urban	Turf (30 strips) Areas = 1_490 m2	Area Pervious (ha)	None	None	0.149
Urban	Turf (30 strips) Areas = 1_490 m2	Total Area (ha)	None	None	0.149
Urban	Turf (43 strips) Areas = 5_122 m2	Area Impervious (ha)	None	None	0
Urban	Turf (43 strips) Areas = 5_122 m2	Area Pervious (ha)	None	None	0.512
Urban	Turf (43 strips) Areas = 5_122 m2	Total Area (ha)	None	None	0.512
Urban	Upgraded Carpark Area = 2_270 m2	Area Impervious (ha)	None	None	0.227
Urban	Upgraded Carpark Area = 2_270 m2	Area Pervious (ha)	None	None	0

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	Upgraded Carpark Area = 2_270 m2	Total Area (ha)	None	None	0.227

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Manhole 1460	Notional Detention Time (hrs)	8	12	0.00697
Sedimentation	SF Manhole 1460	Notional Detention Time (hrs)	8	12	0.035
Sedimentation	SF Manhole 2250	Notional Detention Time (hrs)	8	12	0.0342

Only certain parameters are reported when they pass validation