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164 Main Beach Road, Pinkenba

STORMWATER MANAGEMENT REPORT

Client: Little Resources Pty Ltd

Project No: P24-012

REPORT CONTROL SHEET

W.S.A. Ref:	P24-012
Project Name:	164 Main Beach Road, Pinkenba
Report Title:	Stormwater Management Report
Report Author:	Kym Wilkinson

Revision / Checking			
Rev No	**Date**	**Written By**	**Reviewed By**
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Authorised by:  Digitally signed by Steven Wilkinson Date: 2026.04.15 15:17:37+10'00'

RPEQ No: 7549

This document has been approved by the following appropriately qualified and experienced professional civil engineer:

Steven Wilkinson
Registered Professional Engineer of Queensland No. 7549

Downloadable Files:
MUSIC: P24-012 Main Beach Rd V2.sqz

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Little Resources Pty Ltd and is subject to and issued in accordance with Little Resources Pty Ltd's instruction to Wilkinson Shaw Associates (WSA). The content of this report was based on previous information, surveys and/or studies supplied as listed below:

- Site layout is based on FM-005 Rev FM.3 dated 04/ 12/2024 "Overall Site Feasibility master Plan" provided by Lens Arc
- Contour and Detail Plan as provided by Vision Surveys dated 24/05/2024 (Drawing No 2447-CD-01 Rev A)

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1.0 Introduction

Wilkinson Shaw & Associates has prepared this report to support the Development Application for a Material Change of Use for a Recycling Facility on the parcel of land described below.

Table 1: Property Particulars

Property Address	164 Main Beach Road Pinkenba QLD 4008
Property Description	Lot 501 on M3321
Registered Site Area	20,234 m^2
Council	Brisbane City Council

Figure 1: Site Location

1.1 Scope of Report

The purpose of this Stormwater Management Plan is to evaluate the potential risks to stormwater quantity and quality due to the proposed development. An engineering solution that complies with the necessary state and local government policies will be formulated.

2.0 Site Description

2.1 Location

The proposed development is located on an existing vacant allotment at 164 Main Beach Road, Pinkenba, described as Lot 501 on M3321. The site is approximately 2ha and is within the boundaries of Brisbane City Council.

2.2 Existing and Proposed Land Use

The site is currently zoned as Industry Investigation. Filling was undertaken numerous years ago to create a level hardstand area. The site is currently vacant. A recent aerial image from NearMap of the site can be seen in Figure 2.

Figure 2: Current Land Use (NearMap 29.05.24)

The proposed development will see the construction of a large industrial building and associated pavement and parking areas.

2.3 Topography and Site Drainage

Detailed survey of the site shows that the site has been levelled as a hardstand with a gradient of approximately 0.5%. It is assumed that any surface runoff would be sheet flow and drain to all of the

road frontages. The existing earthworks incorporate steep temporary batters that raise the pad to a level of approximately 3.6m, which is above the 1% AEP Stormtide flood level of 2.5m

3.0 Lawful Point of Discharge

With the release of the latest version of QUDM the determination of whether a property has a lawful point of discharge at a particular location has been altered. The criteria for determining a lawful point of discharge are:

(i) Will the proposed development alter the site's stormwater discharge characteristics in a manner that may substantially damage a third-party property?

- If not, then no further steps are required to obtain tenure for a lawful point of discharge (assuming any pervious changes were lawful).
- If there is a reasonable risk of such damage, then consider issue (ii) or (iii).

(ii) Is the location of the discharge from the development site under the lawful control of the local government or other statutory authority from whom permission to discharge has been received? This will include a park, watercourse, drainage or road reserve, stormwater registered drainage easement, or land held by local government (including freehold land).

- If so, then no further steps are required to obtain tenure for a lawful point of discharge.
- If not, then consider issue (iii). A land owner or regulator may require that the developer obtain an authority to discharge as described in (iii) in order for the stormwater to ultimately flow to a location described in (ii).

(iii) An authority to discharge over affected properties will be necessary. In descending order of certainty, an authority may be in the form of:

- Dedication of a drainage reserve or park
- A registered easement for stormwater discharge/works
- Written discharge approval.

The lawful point of discharge has been identified for the site as being the existing stormwater infrastructure in Main Beach Road.

4.0 Opportunities and Constraints

4.1 Site Opportunities

The site opportunities regarding stormwater management are discussed briefly below.

- The site is elevated from the surrounding road network therefore allowing adequate capture and cover for stormwater;
- Time of concentrations in the development can be minimised by using low gradients of the constructed pavements;
- As this is an industrial development Council will not have to maintain any stormwater quantity or quality devices internal to the site.

4.2 Site Constraints

Constraints identified for the site regarding stormwater management include:

- The development will contribute to increase flows and may negatively impact downstream catchments unless appropriately managed;
- Currently there is no internal site drainage.

This stormwater management strategy has been developed to ensure that these site constraints can be managed while taking advantage of the opportunities identified.

5.0 Stormwater Quality Management in the Operational Phase

5.1 State Planning Policy Assessment

An assessment has been undertaken to determine if the State Planning Policy is triggered for the State Interest of Water. Table 2 below is used to determine if a proposed development requires compliance with the State Planning Policy (SPP). If all responses in Table 2 are "No", then compliance with the SPP is not required and best practice may be adopted.

Table 2: State Planning Policy Triggers

	Triggers	Response
1	A material change of use for urban purposes that involves premises 2500 m^2 or greater in size and;	Yes
a	Will result in six or more dwellings; or	
b	Will result in an impervious area greater than 25 per cent of the net developable area; or	
2	Reconfiguring a lot for urban purposes that involves premises 2500m^2 or greater in size **and** will result in six or more lots; or	No
3	Operational works for an urban purpose involve disturbing a land area 2500m^2 or greater in size.	Yes (future)

As this development has triggered a compliance area, stormwater quality will need to be addressed as part of the application. As such a stormwater quality will be undertaken in accordance with Best Management Practices.

5.2 Objectives

The pollutants that are likely to be observed during the operation phase are listed below:

- Litter
- Sediment
- Nutrients (N & P)
- Pathogens/Faecal coli forms (bacteria & viruses)
- Hydrocarbons (oil & grease) – (associated with car park facilities)
- Heavy Metals (assoc. with fine sediment)
- Surfactants

To effectively manage stormwater quality, treatment devices target the removal of suspended sediments and nutrients. The design objectives for the operational phase of the development are identified in Table 4 in accordance with the State Planning Policy.

Table 3: Stormwater Quality Objectives

Minimum Reductions in Mean Annual Loads (%)			
Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)	Gross Pollutants
80	60	45	90

5.3 Modelling of the Development (MUSIC)

Best Management Practice (BMP) was adopted to select management alternatives for the project's construction phase. This was undertaken as the pollutants of concern during the construction phase are not easily modelled due to the site-specific nature of pollutant sources. These pollutant sources vary throughout the construction phase and are largely dependent upon site management practices and the activities being undertaken at the time. This approach enabled a quantitative assessment of stormwater runoff quality during construction to be considered.

The proposed development has been modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) to access the predicted future discharge of key pollutants from the site. MUSIC provides estimates of stormwater pollution generation and removal rates based on the performance of management devices used in parallel or series to form a treatment train.

5.3.1 Meteorological Data

To create a MUSIC model, you have to select the relevant time step for the meteorological data. An appropriate time step must have been chosen by taking into consideration the size of the catchment and the size of the treatment nodes. The selection of the time step is, therefore based on the size of the smallest source node and treatment nodes within the entire catchment using a simple three-step process as outlined by the MUSIC User Guide:

- Calculate or estimate the time of concentration (tc) of the smallest sub-catchment within the model,
- Calculate or estimate the shortest expected detention time of proposed treatment measures,
- Select a time step which is equal to or smaller than the smaller of 1 and 2.

The time step used in the MUSIC modelling program was: Brisbane Aero 6 minutes 1980 – 1989.

5.3.2 Source Nodes

The second step in creating a MUSIC model is to define Source Nodes or sub-catchments. Source nodes for modelling were defined in accordance with Water by Design (2010) MUSIC Modelling Guidelines.

Each MUSIC Source Node requires the definition of Soil Properties within a catchment. These values along with the rainfall data determine the runoff generation from a catchment. The soil parameters shown in the Table 4 have been adopted in accordance with Music Modelling Guidelines Version 1.0.

Table 4: Recommended MUSIC Runoff Generation Parameters

Parameters (SEQ)	Commercial and Industrial
Rainfall Threshold (mm)	1
Soil Capacity (mm)	18
Initial Storage (%)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient a	243
Infiltration Capacity Exponent b	0.6
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Baseflow Rate (%)	31
Daily Deep Seepage Rate (%)	0

5.3.2.1 Source Node Assumptions

In preparing the model, the following assumptions have been made.

- The roof area is 10,014m^2.
- Bunded areas draining to a first flush system:
    - Open air plant area is 1,860m^2.
    - 100 percent impervious pavement of 1,110m^2.
- Remaining ground areas are 97 percent impervious.

5.3.3 Pollution Concentration

MUSIC generates pollutant concentrations for both the storm flow and base flow components of runoff generated from the rainfall runoff model. The pollutant concentration parameters shown in the Table 5 have been used in the modelling. These have been adopted from Music Modelling Guidelines Version 1.0.

Table 5: Music Base and Storm Flow Concentration Parameters

Flow Type	Surface Type	TSS (Log_{10}mg/L)		P(Log_{10}mg/L)		N(Log_{10}mg/L)	
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Industrial							
Baseflow parameter	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Roads	0.78	0.45	-1.11	0.48	0.14	0.20
	Ground level	0.78	0.45	-1.11	0.48	0.14	0.20
Stormflow parameter	Roof	1.30	0.44	-0.89	0.36	0.25	0.32
	Roads	2.43	0.44	-0.30	0.36	0.25	0.32
	Ground level	1.92	0.44	-0.59	0.36	0.25	0.32

5.3.4 Treatment Nodes

Once base level pollutant concentrations have been modelled this can be compared against the WQOs to select and model the appropriate treatment options. Music models the performance of seven stormwater quality devices in addition to a generic treatment device. The types of devices that can be modelled are:

- Vegetated Swales
- Bioretention Systems
- Buffer Strips
- Constructed Wetlands
- Ponds
- Gross Pollutant Traps
- Sediment Basins
- Infiltration Systems

- Rainwater tanks

The generic node is used for modelling the performance of other treatment measures (including non-structural measures such as community education) that are not included in the default set.

The treatment nodes modelled are designed in accordance with the "MUSIC Modelling Guidelines" and "MUSIC User Guide Version 3" and manufactures specification.

5.4 Proposed Treatment Train

A simple treatment train has been used in this development. The first 10mm of runoff is to be captured and stored for reuse in a combination of above-ground and underground storage vessels. Flow that exceeds the first flush will then be collected and discharged to a privately owned bioretention basin. The bio-retention basin is a vegetated region where stormwater runoff is filtered through a filter media layout into an underlying drainage system. The vegetation selected within the basin helps to reduce the nutrient loads that enter the basin effectively. Appendix A of Healthy Waterways' Water Sensitive Urban Design Technical Guidelines for South East Queensland provides guidance on the selection of appropriate plants within the system.

5.4.1 Treatment Devices Details

5.4.1.1 Storage tanks and Reuse.

A total of 363.8kL of runoff storage has been adopted for the development. This will be separated between aboveground and underground storage that will be pumped into a liquid waste treatment plant that can utilise 250 kL of water a day.

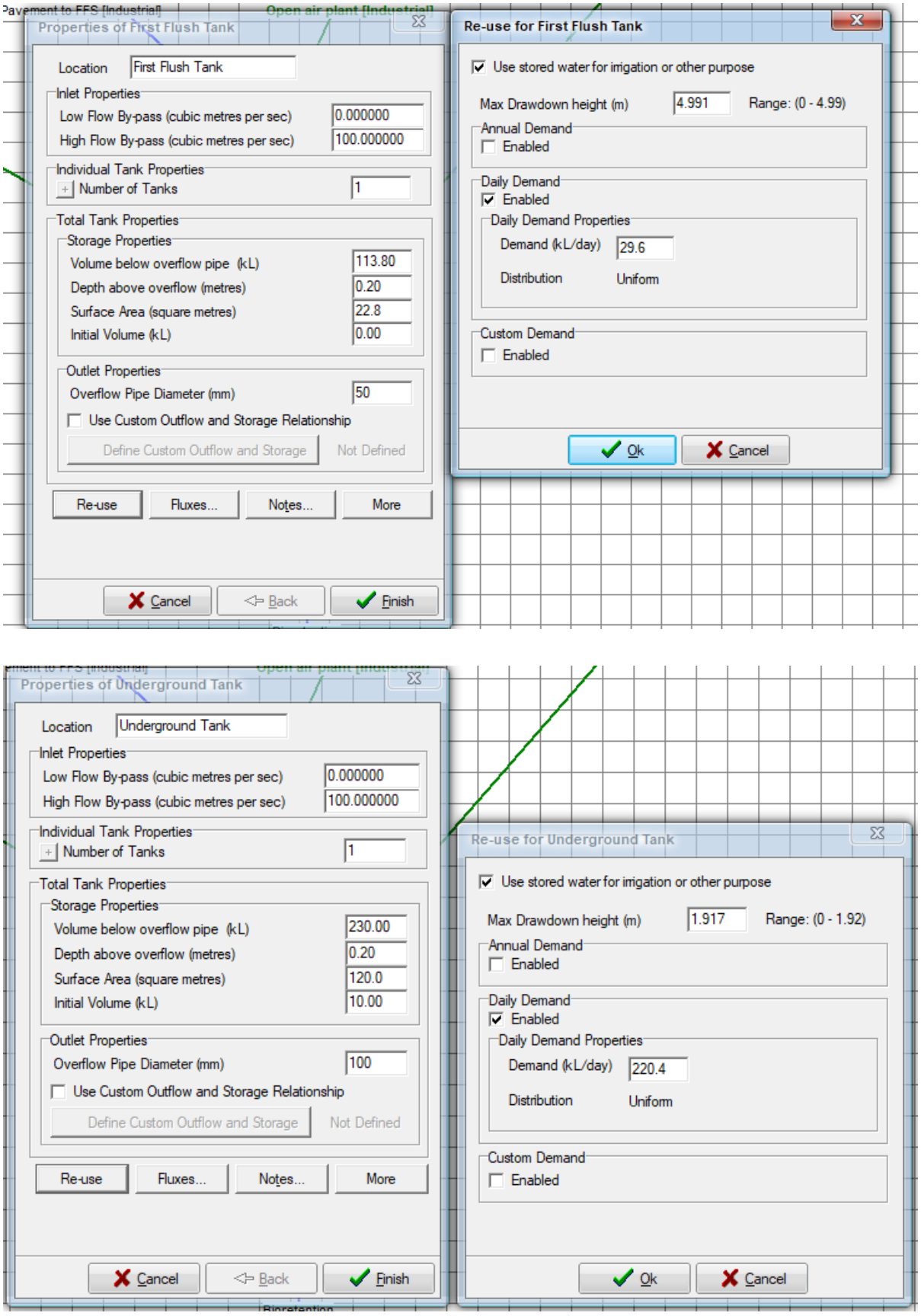

Figure 3: Conceptual storage and reuse tank volumes.

5.4.1.2 Bioretention Basin

The fundamental principle behind the bio-retention basin is that the soil properties facilitate the removal of pollutants by passing the water through a fine filter medium, reducing the concentrations of TSS, TP and TN.

The bio-retention basin has been designed specifically in accordance with the Bio-retention Technical Design Guidelines (2014). The engineering drawings in Appendix 1 of this report present details of the location and standard design of the proposed treatment device areas.

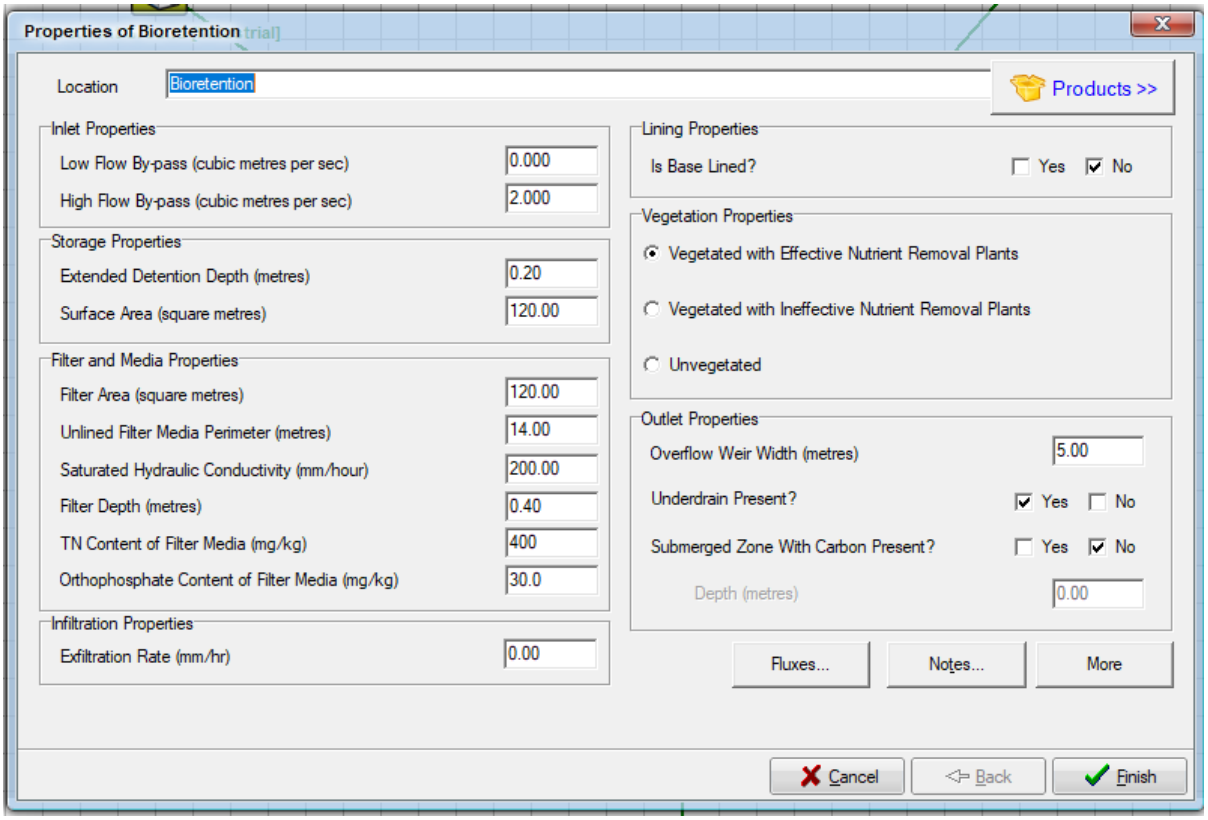

Figure 4: Bioretention Basin Properties

5.5 MUSIC Layout and Results

A diagrammatical view of the model is shown in Figure 5. The expectant loads of pollutants within the stormwater system have been modelled for the developed site without mitigation and with stormwater quality devices based on the model parameter outlined previously, which are shown in Table 6. This table also shows the Reduction Targets and Target Loads for the development.

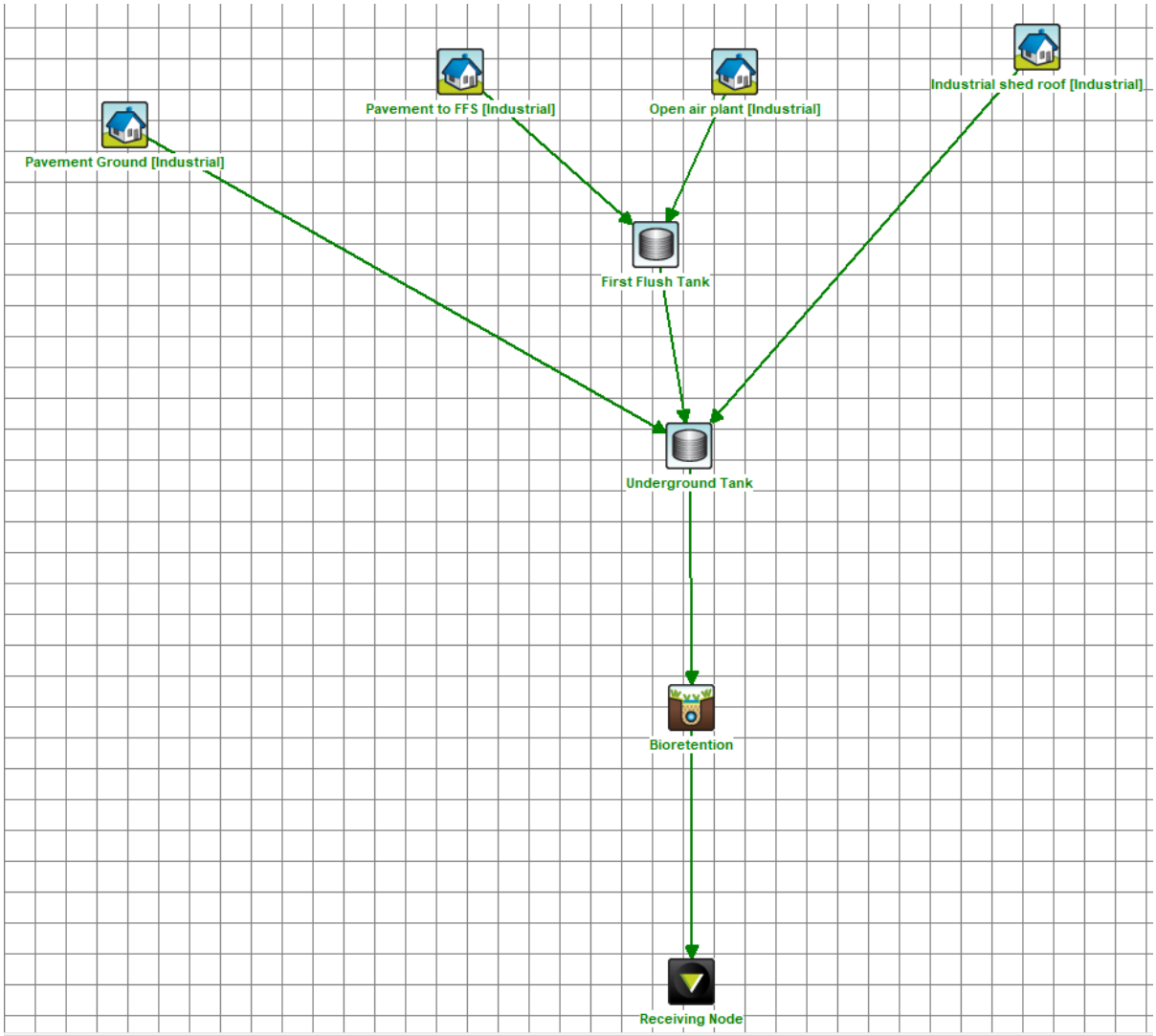

Figure 5: Treatment Train

Table 6: Water Quality Outflows

Pollutant	Unmitigated Load in Kg/year	Mitigated Load in Kg/year	SEQ Water Quality Percentage Reduction Targets	Removal Efficiency Achieved
Suspended Solids	5,030	710	80	85.9
Total Phosphorous	9.39	1.79	60	80.9
Total Nitrogen	48.9	15.0	45	69.3
Gross Pollutants	495	0	90	100

It can be seen that the loads for the mitigated developed case from the MUSIC modelling process have reduced the loads significantly and meet the water quality objectives outlined by Brisbane City Council. A copy of the MUSIC report is contained in Appendix 2 and the modelling files can be downloaded from the link on the report control sheet.

6.0 Hydrological Assessment

The following subsections detail the discharges generated from the site in both the current and proposed developed state. The following sections detail how the requirement of no actionable nuisance can be achieved for the development without providing stormwater detention in additional to the proposed stormwater retention.

6.1 Stormwater Runoff

Peak discharges for the site were calculated using the Rational Method in both the current and developed conditions. The discharge location for these calculations is the existing stormwater gully at the development frontage. The Rational Method calculations were undertaken in accordance with the Brisbane City Council Planning Scheme and the Queensland Urban Drainage Manual (QUDM2017) for a range of storm events. The site is currently a gravel hardstand, which is considered 100% impervious.

In determining the peak probable runoff from the site, a study of the current and proposed allotment conditions were undertaken. The following observations and assumptions were made:

- The impervious area of the existing allotments is 100.0
- The future development will have a fraction impervious of 0.97.

As shown in Table 7, the peak discharge from the changes is negligible. As such the development will not require any stormwater quality treatment.

Table 7: Expected Stormwater Runoff.

Annual Exceedance Probability	Peak Discharge (m^3/s)		Change in Peak Discharge	
	Existing	Developed	m^3/s	%
1EY	0.466	0.464	-0.002	-0.5
0.5EY	0.621	0.618	-0.003	-0.5
0.2EY	0.868	0.863	-0.004	-0.5
10%	1.056	1.050	-0.005	-0.5
5%	1.273	1.267	-0.006	-0.5
2%	1.577	1.580	0.003	0.2

7.0 Trunk Stormwater

Trunk stormwater works have been identified adjacent to the site. Should these works not be completed under A006163832, then they will need to be undertaken by the applicant. The conceptual design of these works is shown in Appendix 1.

8.0 Flooding

The proposed use, Recycling Facility, is considered a Class 7 Building and as such under the Coastal Hazard Overlay Code the Building floor level and vehicular access and manoeuvring areas are considered Category C and D with Table 8.2.6.3.D of the Coastal Hazard Overlay Code. The proposed finished floor level of the building is 3.60m which is well above the 3.1m, being the 1% AEP level at 2100 and the circulation areas are also above the 2% AEP of 2.2m. The development is therefore compatible with the Coastal Hazard Overlay for Flooding. The flood levels as determined from Council's Floodwise Reporting are shown in Figure 6 below.

Likelihood / Description	Level (mAHD)	Source
20%	1.9	Stormtide (Moreton Bay)
5%	2.1	Stormtide (Moreton Bay)
2%	2.2	Stormtide (Moreton Bay)
1%	1.8	River (Brisbane River)
1%	2.5	Stormtide (Moreton Bay)
0.2%	2.3	River (Brisbane River)
January 2011	1.1	River (Brisbane River)
Defined Flood Level (DFL)	1.9	River (Brisbane River)
Residential Flood Level (RFL)	1.8	River (Brisbane River)
Minimum Habitable Floor Level (dwelling house)	N/A*	

Figure 6: Flood Levels

9.0 Conclusion

This report shows that stormwater can be managed effectively for the site analysed without the need to upgrade the stormwater network. It is the opinion Wilkinson Shaw & Associates that the proposed stormwater quantity and quality management proposed are suitable for a development of this scale.

This report addresses the proposed development of 164 Main Beach Road, Pinkenba described as Lot 501 on M3321. The following points summaries the findings:

- The development would see a negligible change in stormwater discharge. This minor change to the flow regime would NOT cause an actionable nuisance in the local area and therefore stormwater detention is not required.

- The development will adopt a combination of stormwater harvesting and reuse in conjunction with bioretention to meet the stormwater quality objectives.

- External stormwater trunk works may need to be undertaken by the applicant should the development associated with A006163832 not proceed prior to this application.

Wilkinson Shaw & Associates believes that the proposed stormwater quantity and quality management are suitable for a development of this scale. Accordingly, it is recommended that Brisbane City Council issue Development Approval conditions.

Qualifications

1. In preparing this document, including all relevant calculations, modelling and drawings, Wilkinson Shaw & Associates (WSA) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.

2. WSA has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and documents are as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.

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   (ii) WSA considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.

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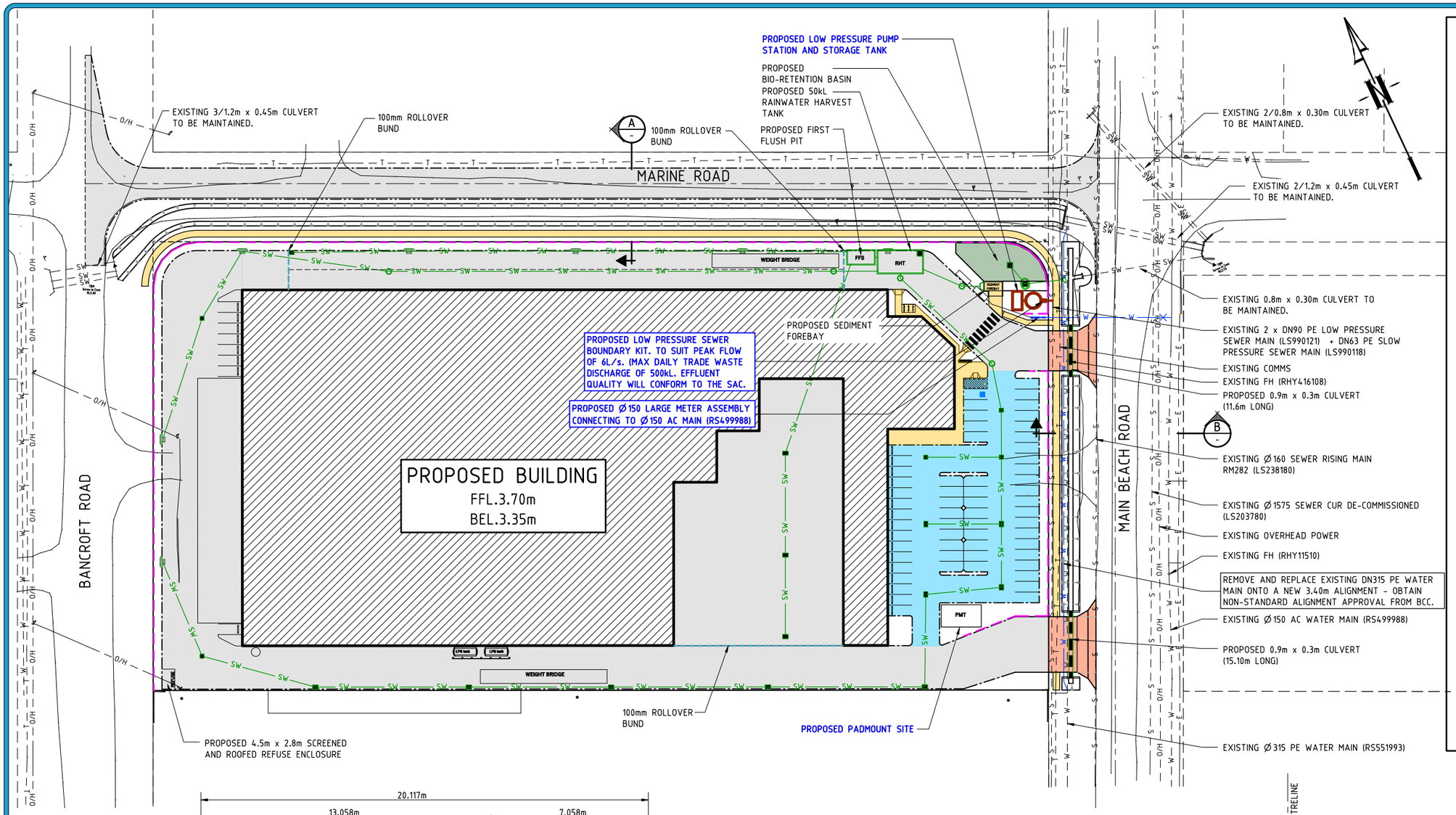
5. This document is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this report, calculations and drawings.

6. If any claim or demand is made by any person against WSA based on detriment sustained or alleged to have been sustained as a result of reliance upon the report, drawings, calculations or information therein, WSA will rely upon this provision as a defence to any such claim or demand.

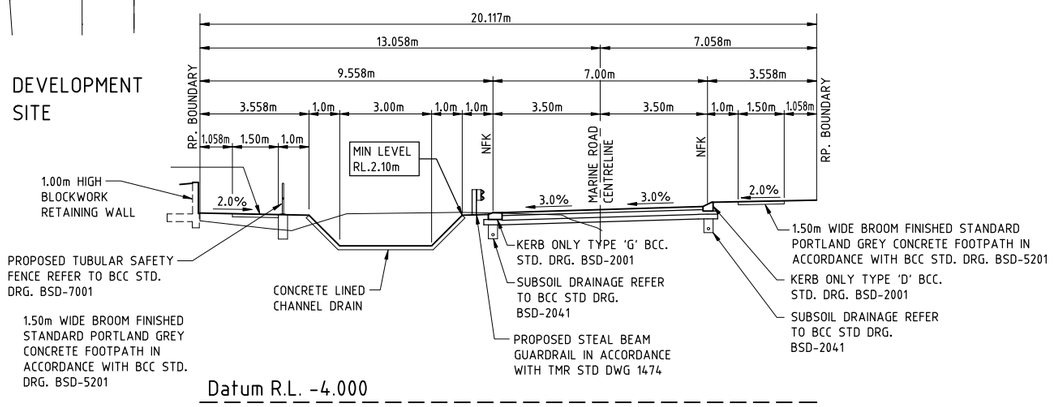
7. This report does not provide legal advice.

Appendix 1 ~ Engineering Drawings



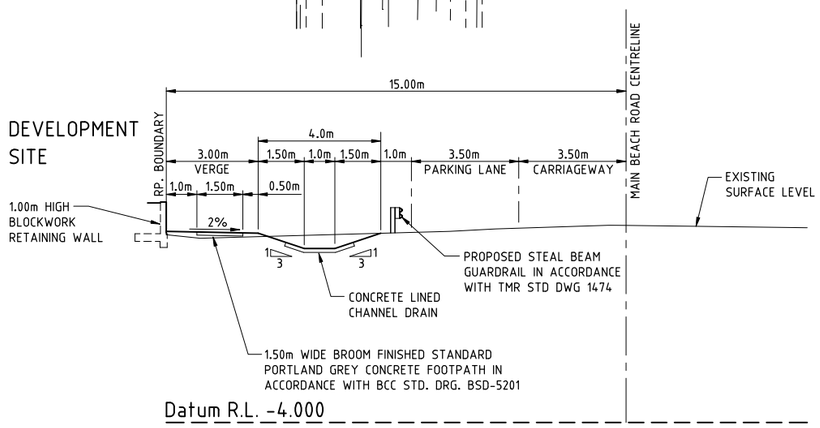
SERVICES LEGEND

	NEW	EXISTING
GRAVITY SEWER	S	S
SEWER RISING MAIN	RM	RM
SEWER HOUSE DRAIN	HD	HD
DRINKING WATER MAIN	W	W
WATER SERVICE CONDUIT	WS	WS
WATER FIREMAIN	FM	FM
WATER SERVICE CONDUIT (WITH SERVICE SIZE SHOWN)	DN32 PE	
ENCASING/ ENVELOPER PIPE	W	
STORMWATER DRAINAGE		SW
R/W SUBSOIL DRAINAGE		
COMMS CONDUIT	CC	
ELECTRICAL CONDUIT	EC	
GAS MAIN	G	G
ELECTRICAL U/G	E	E
ELECTRICAL O/H	O/H	O/H
TELECOMMUNICATION	T	T
LIGHT POLE	E LP	E LP
ELECTRICITY/ POWER POLE	O/H EP	O/H EP
STORMWATER GULLY		SW
PIT (TELECOM/ELEC)	T E	T E
NOMINAL KERB FACE		
RETAINING WALL CONCRETE SLEEPER		
KERB ADAPTOR 175x75 RHS GALV. REFER TO BSD-8114	KA	
ELECTRICAL PILLAR		
STREET LIGHTING LOCATION		
WATER METER LOCATION		



TYPICAL MARINE ROAD CROSS SECTION
SCALE 1:100

SECTION A -



TYPICAL MAIN BEACH ROAD CROSS SECTION
SCALE 1:100

SECTION B -

DIAL BEFORE YOU DIG www.1100.com.au

NOTE:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. POT HOLING HAS NOT BEEN UNDERTAKEN. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY ALL EXISTING SERVICE LOCATIONS AND DEPTHS. THE CONTRACTOR SHALL, PRIOR TO COMMENCEMENT OF CONSTRUCTION, NOTIFY THE SUPERINTENDENT OF ANY DISCREPANCIES OF SERVICE LOCATIONS AND DEPTHS.

0 5 15 25m
SCALE 1:500 AT ORIGINAL A1 SIZE

ISSUED FOR APPROVAL

REV	BY	CKD	DATE	DESCRIPTION
B	PBK	KLW	15.04.26	ROOF AREA, BUND AREA AND FFS AMENDED
A	PBK	KLW	17.09.25	ISSUED FOR APPROVAL

NOT FOR CONSTRUCTION

ISO 9001

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WEB: www.wilkinsonshaw.com.au

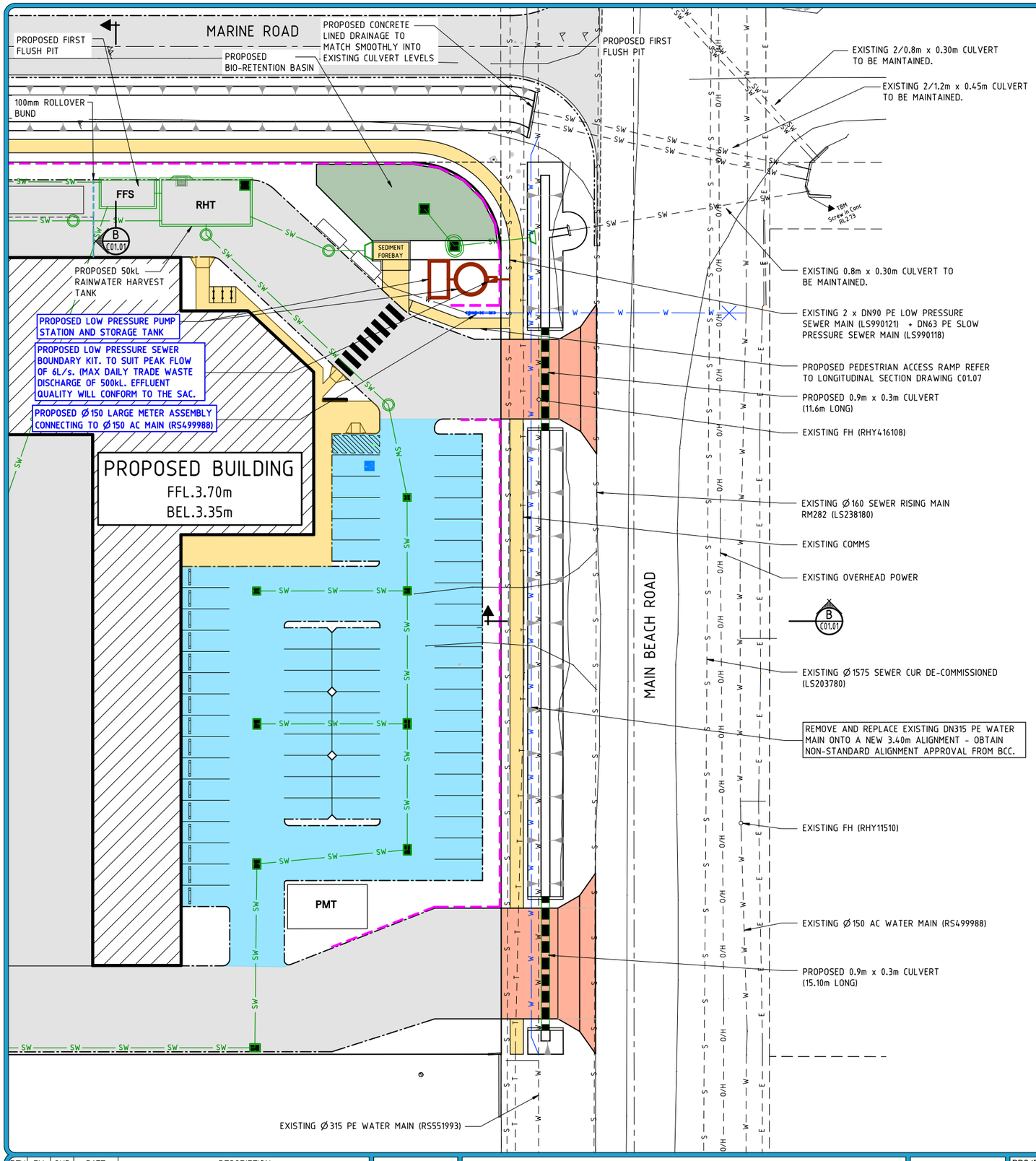
40+ YEARS SINCE 1984

PROJECT: INDUSTRIAL BUILDING
164 MAIN BEACH ROAD
PINKENBA QLD

DRAWING SHEET TITLE: CONCEPTUAL COMBINED SERVICE PLAN

CLIENT: LITTLE RESOURCES PTY. LTD.
SURVEYOR: VISION SURVEYS
LOT DESCRIPTION: LOT 501 ON M3321
COUNCIL REF: A006676436

DRAWING NO. P24-012-DA-C01.01
SCALE 1:500
REVISION B
DATUM A.H.D.



SERVICES LEGEND

	NEW	EXISTING
GRAVITY SEWER	S	S
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R/W SUBSOIL DRAINAGE	> >	> >
COMMS CONDUIT	CC	
ELECTRICAL CONDUIT	EC	
GAS MAIN	G	G
ELECTRICAL U/G	E	E
ELECTRICAL O/H	O/H	O/H
TELECOMMUNICATION	T	T
LIGHT POLE	E LP	E LP
ELECTRICITY/ POWER POLE	O/H EP	O/H EP
STORMWATER GULLY		SW
PIT (TELECOM/ELEC)	T E	T E
NOMINAL KERB FACE		
RETAINING WALL CONCRETE SLEEPER		
KERB ADAPTOR 175x75 RHS GALV. REFER TO BSD-8114	KA	
ELECTRICAL PILLAR		
STREET LIGHTING LOCATION		
WATER METER LOCATION		

NOTE:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. POT HOLING HAS NOT BEEN UNDERTAKEN. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY ALL EXISTING SERVICE LOCATIONS AND DEPTHS.
THE CONTRACTOR SHALL, PRIOR TO COMMENCEMENT OF CONSTRUCTION, NOTIFY THE SUPERINTENDENT OF ANY DISCREPANCIES OF SERVICE LOCATIONS AND DEPTHS.

DIAL BEFORE YOU DIG www.1100.com.au

0 2.50 7.50 12.5m
SCALE 1:250 AT ORIGINAL A1 SIZE

ISSUED FOR APPROVAL

REV	BY	CKD	DATE	DESCRIPTION
B	PBK	KLW	15.04.26	ROOF AREA, BUND AREA AND FFS AMENDED
A	PBK	KLW	17.09.25	ISSUED FOR APPROVAL

NOT FOR CONSTRUCTION

ISO 9001

WILKINSON SHAW & ASSOCIATES consulting engineers
WSA
WILKINSON SHAW & ASSOCIATES PTY LTD
ABN: 29 104 860 497
OFFICE: 182 PINE ROAD (WEST), RICHLANDS QLD 4077
MAIL: PO BOX 583 INALA QLD 4077
PHONE: (07) 3555 9888
EMAIL: office@wilkinsonshaw.com.au
WEB: www.wilkinsonshaw.com.au

40+ YEARS SINCE 1984

PROJECT: INDUSTRIAL BUILDING
164 MAIN BEACH ROAD
PINKENBA QLD

DRAWING SHEET TITLE: CONCEPTUAL COMBINED SERVICE DETAIL

CLIENT: LITTLE RESOURCES PTY. LTD.
SURVEYOR: VISION SURVEYS
LOT DESCRIPTION: LOT 501 ON M3321
COUNCIL REF: A006676436

DRAWING NO. P24-012-DA-C01.02
SCALE 1:250
REVISION B
DATUM A.H.D.

Appendix 2 ~ MUSIC Report

Source nodes
Location,Industrial shed roof,Pavement Ground,Open air plant,Pavement to FFS
ID,1,2,6,7
Node Type,UrbanSourceNode,UrbanSourceNode,UrbanSourceNode,UrbanSourceNode
Zoning Surface Type,Industrial,Industrial,Industrial,Industrial
Total Area (ha),1.014,0.713,0.186,0.11
Area Impervious (ha),1.014,0.691503582089552,0.18039223880597,0.11
Area Pervious (ha),0,0.0214964179104478,0.00560776119402986,0
Field Capacity (mm),80,80,80,80
Pervious Area Infiltration Capacity coefficient - a,243,243,243,243
Pervious Area Infiltration Capacity exponent - b,0.6,0.6,0.6,0.6
Impervious Area Rainfall Threshold (mm/day),1,1,1,1
Pervious Area Soil Storage Capacity (mm),18,18,18,18
Pervious Area Soil Initial Storage (% of Capacity),10,10,10,10
Groundwater Initial Depth (mm),50,50,50,50
Groundwater Daily Recharge Rate (%),0,0,0,0
Groundwater Daily Baseflow Rate (%),31,31,31,31
Groundwater Daily Deep Seepage Rate (%),0,0,0,0
Stormflow Total Suspended Solids Mean (log mg/L),1.3,2.43,2.43,2.43
Stormflow Total Suspended Solids Standard Deviation (log mg/L),0.44,0.44,0.44,0.44
Stormflow Total Suspended Solids Estimation
Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Suspended Solids Serial Correlation,0,0,0,0
Stormflow Total Phosphorus Mean (log mg/L),-0.89,-0.3,-0.3,-0.3
Stormflow Total Phosphorus Standard Deviation (log mg/L),0.36,0.36,0.36,0.36
Stormflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Phosphorus Serial Correlation,0,0,0,0
Stormflow Total Nitrogen Mean (log mg/L),0.25,0.25,0.25,0.25
Stormflow Total Nitrogen Standard Deviation (log mg/L),0.32,0.32,0.32,0.32
Stormflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Stormflow Total Nitrogen Serial Correlation,0,0,0,0
Baseflow Total Suspended Solids Mean (log mg/L),0.78,0.78,0.78,0.78
Baseflow Total Suspended Solids Standard Deviation (log mg/L),0.45,0.45,0.45,0.45
Baseflow Total Suspended Solids Estimation
Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Suspended Solids Serial Correlation,0,0,0,0
Baseflow Total Phosphorus Mean (log mg/L),-1.11,-1.11,-1.11,-1.11
Baseflow Total Phosphorus Standard Deviation (log mg/L),0.48,0.48,0.48,0.48
Baseflow Total Phosphorus Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Phosphorus Serial Correlation,0,0,0,0
Baseflow Total Nitrogen Mean (log mg/L),0.14,0.14,0.14,0.14
Baseflow Total Nitrogen Standard Deviation (log mg/L),0.2,0.2,0.2,0.2
Baseflow Total Nitrogen Estimation Method,Stochastic,Stochastic,Stochastic,Stochastic
Baseflow Total Nitrogen Serial Correlation,0,0,0,0
Flow based constituent generation - enabled,Off,Off,Off,Off
Flow based constituent generation - flow file, , , ,
Flow based constituent generation - base flow column, , , ,
Flow based constituent generation - pervious flow column, , , ,

Flow based constituent generation - impervious flow column, , , ,
Flow based constituent generation - unit, , , ,
OUT - Mean Annual Flow (ML/yr),10.7,7.40,1.93,1.16
OUT - TSS Mean Annual Load (kg/yr),353,3.30E3,856,514
OUT - TP Mean Annual Load (kg/yr),1.94,5.24,1.38,0.830
OUT - TN Mean Annual Load (kg/yr),24.6,17.0,4.45,2.76
OUT - Gross Pollutant Mean Annual Load (kg/yr),250,173,45.2,27.1
Rain In (ML/yr),11.6625,8.20056,2.13928,1.26516
ET Loss (ML/yr),1.00057,0.804364,0.209836,0.108543
Deep Seepage Loss (ML/yr),0,0,0,0
Baseflow Out (ML/yr),0,0,0,0
Imp. Stormflow Out (ML/yr),10.6619,7.2721,1.89707,1.15662
Perv. Stormflow Out (ML/yr),0,0.124237,0.0324095,0
Total Stormflow Out (ML/yr),10.6619,7.39634,1.92948,1.15662
Total Outflow (ML/yr),10.6619,7.39634,1.92948,1.15662
Change in Soil Storage (ML/yr),0,-0.0001407,-3.67E-5,0
TSS Baseflow Out (kg/yr),0,0,0,0
TSS Total Stormflow Out (kg/yr),352.768,3302.06,856.325,514.442
TSS Total Outflow (kg/yr),352.768,3302.06,856.325,514.442
TP Baseflow Out (kg/yr),0,0,0,0
TP Total Stormflow Out (kg/yr),1.93994,5.23762,1.37943,0.830498
TP Total Outflow (kg/yr),1.93994,5.23762,1.37943,0.830498
TN Baseflow Out (kg/yr),0,0,0,0
TN Total Stormflow Out (kg/yr),24.5695,17.043,4.45363,2.75869
TN Total Outflow (kg/yr),24.5695,17.043,4.45363,2.75869
GP Total Outflow (kg/yr),249.613,173.19,45.1802,27.0784

No Imported Data Source nodes

USTM treatment nodes
Location,Underground Tank,Bioretention,First Flush Tank
ID,3,5,8
Node Type,RainWaterTankNode,BioRetentionNodeV4,RainWaterTankNode
Lo-flow bypass rate (cum/sec),0,0,0
Hi-flow bypass rate (cum/sec),100,2,100
Inlet pond volume,0, ,0
Area (sqm),120,120,22.8
Initial Volume (m^3),10, ,0
Extended detention depth (m),0.2,0.2,0.2
Number of Rainwater tanks,1, ,1
Permanent Pool Volume (cubic metres),230, ,113.8
Proportion vegetated,0, ,0
Equivalent Pipe Diameter (mm),100, ,50
Overflow weir width (m),10,5,10
Notional Detention Time (hrs),0.640, ,0.486
Orifice Discharge Coefficient,0.6, ,0.6
Weir Coefficient,1.7,1.7,1.7
Number of CSTR Cells,2,3,2
Total Suspended Solids - k (m/yr),400,8000,400
Total Suspended Solids - C* (mg/L),12,20,12

Total Suspended Solids - C** (mg/L),12, ,12
Total Phosphorus - k (m/yr),300,6000,300
Total Phosphorus - C* (mg/L),0.13,0.13,0.13
Total Phosphorus - C** (mg/L),0.13, ,0.13
Total Nitrogen - k (m/yr),40,500,40
Total Nitrogen - C* (mg/L),1.4,1.4,1.4
Total Nitrogen - C** (mg/L),1.4, ,1.4
Threshold Hydraulic Loading for C** (m/yr),0, ,0
Horizontal Flow Coefficient, ,3,
Reuse Enabled,On,Off,On
Max drawdown height (m),1.91666666666667, ,4.99122807017544
Annual Demand Enabled,Off,Off,Off
Annual Demand Value (ML/year), , ,
Annual Demand Distribution, , ,
Annual Demand Monthly Distribution: Jan, , ,
Annual Demand Monthly Distribution: Feb, , ,
Annual Demand Monthly Distribution: Mar, , ,
Annual Demand Monthly Distribution: Apr, , ,
Annual Demand Monthly Distribution: May, , ,
Annual Demand Monthly Distribution: Jun, , ,
Annual Demand Monthly Distribution: Jul, , ,
Annual Demand Monthly Distribution: Aug, , ,
Annual Demand Monthly Distribution: Sep, , ,
Annual Demand Monthly Distribution: Oct, , ,
Annual Demand Monthly Distribution: Nov, , ,
Annual Demand Monthly Distribution: Dec, , ,
Daily Demand Enabled,On,Off,On
Daily Demand Value (ML/day),0.2204, ,0.0296
Custom Demand Enabled,Off,Off,Off
Custom Demand Time Series File, , ,
Custom Demand Time Series Units, , ,
Filter area (sqm), ,120,
Filter perimeter (m), ,14,
Filter depth (m), ,0.4,
Filter Median Particle Diameter (mm), , ,
Saturated Hydraulic Conductivity (mm/hr), ,200,
Infiltration Media Porosity, ,0.35,
Length (m), , ,
Bed slope, , ,
Base Width (m), , ,
Top width (m), , ,
Vegetation height (m), , ,
Vegetation Type, ,Vegetated with Effective Nutrient Removal Plants,
Total Nitrogen Content in Filter (mg/kg), ,400,
Orthophosphate Content in Filter (mg/kg), ,30,
Is Base Lined?, ,No,
Is Underdrain Present?, ,Yes,
Is Submerged Zone Present?, ,No,
Submerged Zone Depth (m), , ,
B for Media Soil Texture,-9999,13,-9999

Proportion of upstream impervious area treated, , ,
Exfiltration Rate (mm/hr),0,0,0
Evaporative Loss as % of PET,0,100,0
Depth in metres below the drain pipe, , ,
TSS A Coefficient, , ,
TSS B Coefficient, , ,
TP A Coefficient, , ,
TP B Coefficient, , ,
TN A Coefficient, , ,
TN B Coefficient, , ,
Sfc, ,0.37,
S*, ,0.22,
Sw, ,0.11,
Sh, ,0.05,
Emax (m/day), ,0.008,
Ew (m/day), ,0.001,
IN - Mean Annual Flow (ML/yr),18.9,8.41,3.09
IN - TSS Mean Annual Load (kg/yr),3.99E3,1.70E3,1.37E3
IN - TP Mean Annual Load (kg/yr),7.72,3.43,2.21
IN - TN Mean Annual Load (kg/yr),43.5,19.2,7.21
IN - Gross Pollutant Mean Annual Load (kg/yr),423,0.00,72.3
OUT - Mean Annual Flow (ML/yr),8.41,8.29,0.824
OUT - TSS Mean Annual Load (kg/yr),1.70E3,710,333
OUT - TP Mean Annual Load (kg/yr),3.43,1.79,0.542
OUT - TN Mean Annual Load (kg/yr),19.2,15.0,1.90
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00,0.00,0.00
Flow In (ML/yr),18.881,8.40905,3.08621
ET Loss (ML/yr),0,0.115997,0
Infiltration Loss (ML/yr),0,0,0
Low Flow Bypass Out (ML/yr),0,0,0
High Flow Bypass Out (ML/yr),0,0,0
Orifice / Filter Out (ML/yr),2.74642,3.1942,0.331355
Weir Out (ML/yr),5.66262,5.09801,0.492482
Transfer Function Out (ML/yr),0,0,0
Reuse Supplied (ML/yr),10.4634,0,2.2643
Reuse Requested (ML/yr),80.2877,0,10.7416
% Reuse Demand Met,13.0324,0,21.0797
% Load Reduction,55.463,1.38942,73.3059
TSS Flow In (kg/yr),3988.33,1699.74,1370.77
TSS ET Loss (kg/yr),0,0,0
TSS Infiltration Loss (kg/yr),0,0,0
TSS Low Flow Bypass Out (kg/yr),0,0,0
TSS High Flow Bypass Out (kg/yr),0,0,0
TSS Orifice / Filter Out (kg/yr),522.95,12.7958,131.425
TSS Weir Out (kg/yr),1176.8,696.948,202.071
TSS Transfer Function Out (kg/yr),0,0,0
TSS Reuse Supplied (kg/yr),1383.4,0,540.498
TSS Reuse Requested (kg/yr),0,0,0
TSS % Reuse Demand Met,0,0,0
TSS % Load Reduction,57.3819,58.2441,75.6709

TP Flow In (kg/yr),7.71993,3.43421,2.20993
TP ET Loss (kg/yr),0,0,0
TP Infiltration Loss (kg/yr),0,0,0
TP Low Flow Bypass Out (kg/yr),0,0,0
TP High Flow Bypass Out (kg/yr),0,0,0
TP Orifice / Filter Out (kg/yr),1.07807,0.120804,0.216838
TP Weir Out (kg/yr),2.35615,1.66892,0.325534
TP Transfer Function Out (kg/yr),0,0,0
TP Reuse Supplied (kg/yr),3.26667,0,1.0899
TP Reuse Requested (kg/yr),0,0,0
TP % Reuse Demand Met,0,0,0
TP % Load Reduction,55.5149,47.8856,75.4575
TN Flow In (kg/yr),43.5081,19.1841,7.21232
TN ET Loss (kg/yr),0,0,0
TN Infiltration Loss (kg/yr),0,0,0
TN Low Flow Bypass Out (kg/yr),0,0,0
TN High Flow Bypass Out (kg/yr),0,0,0
TN Orifice / Filter Out (kg/yr),6.23925,3.58678,0.760759
TN Weir Out (kg/yr),12.9448,11.389,1.13478
TN Transfer Function Out (kg/yr),0,0,0
TN Reuse Supplied (kg/yr),23.539,0,5.10941
TN Reuse Requested (kg/yr),0,0,0
TN % Reuse Demand Met,0,0,0
TN % Load Reduction,55.9069,21.9369,73.718
GP Flow In (kg/yr),422.804,0,72.2585
GP ET Loss (kg/yr),0,0,0
GP Infiltration Loss (kg/yr),0,0,0
GP Low Flow Bypass Out (kg/yr),0,0,0
GP High Flow Bypass Out (kg/yr),0,0,0
GP Orifice / Filter Out (kg/yr),0,0,0
GP Weir Out (kg/yr),0,0,0
GP Transfer Function Out (kg/yr),0,0,0
GP Reuse Supplied (kg/yr),0,0,0
GP Reuse Requested (kg/yr),0,0,0
GP % Reuse Demand Met,0,0,0
GP % Load Reduction,100,100,100
PET Scaling Factor, ,2.1,

No Generic treatment nodes

Other nodes
Location,Receiving Node
ID,4
Node Type,ReceivingNode
IN - Mean Annual Flow (ML/yr),8.29
IN - TSS Mean Annual Load (kg/yr),710
IN - TP Mean Annual Load (kg/yr),1.79
IN - TN Mean Annual Load (kg/yr),15.0
IN - Gross Pollutant Mean Annual Load (kg/yr),0.00
OUT - Mean Annual Flow (ML/yr),8.29

OUT - TSS Mean Annual Load (kg/yr),710
OUT - TP Mean Annual Load (kg/yr),1.79
OUT - TN Mean Annual Load (kg/yr),15.0
OUT - Gross Pollutant Mean Annual Load (kg/yr),0.00
% Load Reduction,60.8
TSS % Load Reduction,85.9
TN % Load Reduction,69.3
TP % Load Reduction,80.9
GP % Load Reduction,100

Links
Location,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link,Drainage Link
Source node ID,2,1,3,5,7,6,8
Target node ID,3,3,5,4,8,8,3
Muskingum-Cunge Routing,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed,Not Routed
Muskingum K, , , , , , ,
Muskingum theta, , , , , , ,
IN - Mean Annual Flow (ML/yr),7.40,10.7,8.41,8.29,1.16,1.93,0.824
IN - TSS Mean Annual Load (kg/yr),3.30E3,353,1.70E3,710,514,856,333
IN - TP Mean Annual Load (kg/yr),5.24,1.94,3.43,1.79,0.830,1.38,0.542
IN - TN Mean Annual Load (kg/yr),17.0,24.6,19.2,15.0,2.76,4.45,1.90
IN - Gross Pollutant Mean Annual Load (kg/yr),173,250,0.00,0.00,27.1,45.2,0.00
OUT - Mean Annual Flow (ML/yr),7.40,10.7,8.41,8.29,1.16,1.93,0.824
OUT - TSS Mean Annual Load (kg/yr),3.30E3,353,1.70E3,710,514,856,333
OUT - TP Mean Annual Load (kg/yr),5.24,1.94,3.43,1.79,0.830,1.38,0.542
OUT - TN Mean Annual Load (kg/yr),17.0,24.6,19.2,15.0,2.76,4.45,1.90
OUT - Gross Pollutant Mean Annual Load (kg/yr),173,250,0.00,0.00,27.1,45.2,0.00

Catchment Details
Catchment Name,P24-012 Main Beach Rd V2
Timestep,6 Minutes
Start Date,1/01/1980
End Date,31/12/1989 11:54:00 PM
Rainfall Station, 40223 BRISBANE
ET Station,User-defined monthly PET
Mean Annual Rainfall (mm), 1155
Mean Annual ET (mm), 1539

Appendix 3 ~ Rational Method Calculations

Rational Method Peak Flow Calculation

Job No: **P24-012**
Job Type: **MCU**
Address: **164 Main Beach Road, Pinkenba**
Council: **Brisbane**

WSA WILKINSON SHAW & ASSOCIATES consulting engineers
Experience. Precision. Excellence.

IFD Data: Latitude -27.3833 | Longitude 153.143 | Data Obtained 28-May-24 | Soil info for Zero C_{10}: Light cover low permeability

$^1I_{10}$ 67 mm/hr | Minor Storm: 0.5EY | Major Storm: 2%

Notes: This caluations sheet examines the change in flow due to the proposed development to the existing stormwater infrastructure at the corner of Main Beach and Marine Roads.

Pre-Development

Time of Concentration

Standard Inlet Time
Standard Inlet Time mins

Sheet Flow (Friends Equation)
Sheet Flow length (L) 60 m
Ground Cover Type Paved Surface
roughness (n) 0.015
Fall of NSL 1.8 m
Slope o Surface 3 %
total **5.0** mins

Concentrated Flow
Flow distance m
Fall of NSL m
mins
Surface type miltiplier
Total **0** mins

Pipe Flow
Flow distance m
velocity m/s
mins **0** min

Total t_c **5.0** mins

Runoff Volume Calculations

Name	Area (m2)	t_c	f_i	C_{10}
Site	20000		1.0	0.899998
				0
				0
				0
				0
				0
				0
Total	20000	5.0		0.900

AEP	Frequency factor (F_y)	C_y ($F^y.C_{10}$)	I_y	Q_y (m^3/s)
3 mth				0.233
1EY	0.8	0.720	117	0.466
0.5EY	0.85	0.765	146	0.621
0.2EY	0.95	0.855	183	0.868
10%	1	0.900	211	1.056
5%	1.05	0.945	242	1.273
2%	1.15	1.000	284	1.577

Post-Development

Time of Concentration

Standard Inlet Time
Standard Inlet Time 5 mins

Sheet Flow (Friends Equation)
Sheet Flow length (L) m
Ground Cover Type Densely Grassed Surface
roughness (n) 0.06
Fall of NSL m
Slope o Surface 0 %
total **0.0** mins

Concentrated Flow
Flow distance
velocity
mins
Surface type miltiplier
Total **0** mins

Pipe Flow
Flow distance m
velocity m/s
mins **0** min

Total t_c **5.0** mins

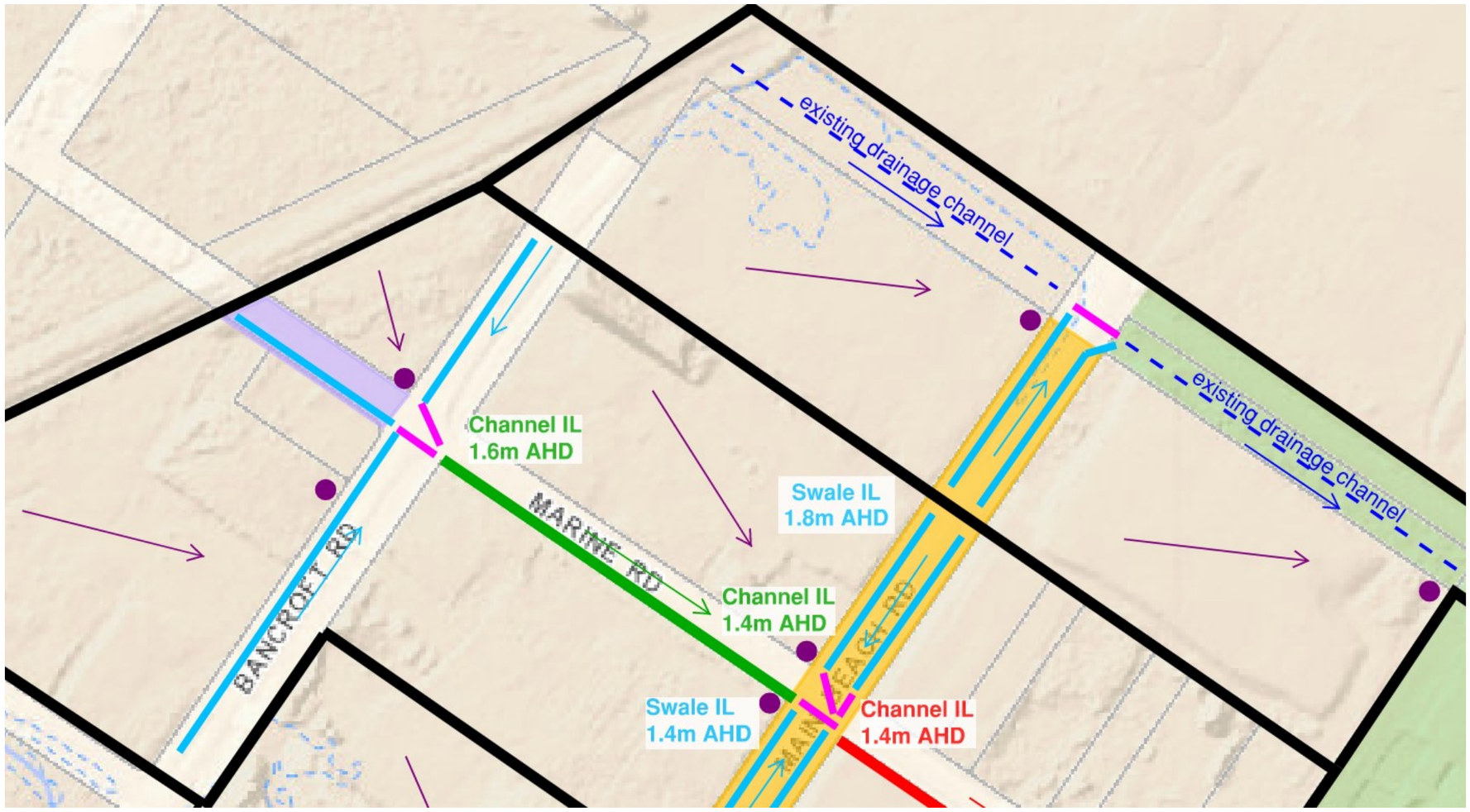
Runoff Volume Calculations

Name	Area (m2)	t_c	f_i	C_{10}
Site	20000		0.97	0.894
				0
				0
				0
				0
				0
				0
Total	20000	5.0		0.894

AEP	Frequency factor (F_y)	C_y ($F^y.C_{10}$)	I_y	Q_y (m^3/s)
3 mth				0.232
1EY	0.8	0.715	117	0.464
0.5EY	0.85	0.760	146	0.618
0.2EY	0.95	0.849	183	0.863
10%	1	0.894	211	1.050
5%	1.05	0.939	243	1.267
2%	1.15	1.000	284	1.580

Appendix 4 ~ Stormwater Trunk Works

A006163832/SW1
MYRTLETOWN CONCEPT ROAD AND DRAINAGE PLAN
Revision 2.2 – October 2018



- Catchment boundary
- Swale - Concrete Lined
- Roadside Channel - Concrete Lined (5m wide)
- Marine Road Channel - Concrete Lined (8m wide)
- Park Channel (18m wide)
- Concrete Channel (20m wide)
- Stormwater culverts
- Property stormwater discharge point

1. ALL ROADS HAVE NO LONGITUDINAL GRADE.

2. ALL ROADS HAVE A MINIMUM LEVEL OF 2.1m AHD (at the road shoulder).

- Minor Road
- Major Road
- No carriageway required. Road reserve to be turfed.

Received

23/01/2023

BCC DS

PLANS AND DOCUMENTS
referred to in the
APPROVAL

Dated: **17/07/2023**

A006163832/SW2

Roadside Channel (20m road reserve)

(No road widening required)

Verge width, road pavement and stormwater channel alignment to be determined at operational works stage.

Appendix 5 ~ Floodwise Report

FloodWise Property Report

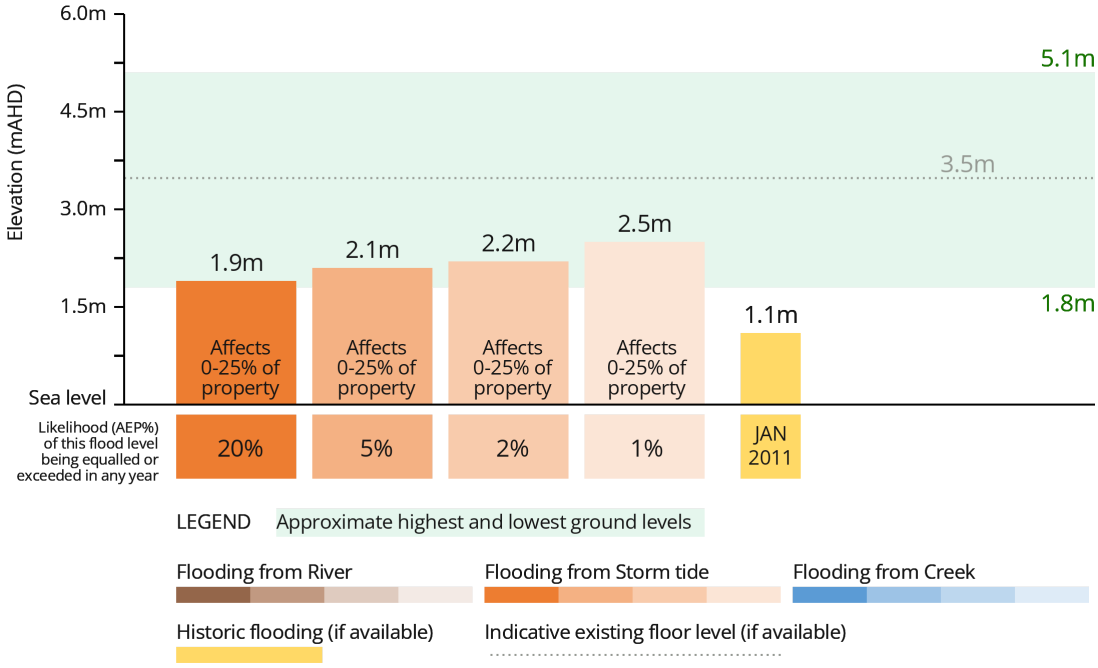
164 MAIN BEACH RD, PINKENBA 4008
Lot 501 on M3321

Dedicated to a better Brisbane

THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report **provides technical flood planning information** including estimated flood levels, habitable floor level requirements and more. **This report uses the adopted flood planning information in Brisbane City Plan 2014**, that guides how land in Brisbane is used and developed for the future. Find out more about planning and building. To understand how to be **resilient and prepare for floods**, visit Council's Be Prepared webpage. Find more information about how to read a FloodWise Property Report.

Graph showing only the highest source/type of flooding for 1%, 2%, 5% and 20% likelihoods. Also shows historic flood levels. Other flood types and levels may be present and will be listed in the Flood Planning Information table below. This graph does not include overland flow flooding. If applicable, overland flow information is shown in the Planning and Development Information section below.
NOTE: See Useful Definitions section to explain terminology.



Combined 1% AEP for river, creek and storm tide flood extent (if applicable) from the adopted Brisbane City Plan 2014.
Read more about Brisbane City Plan 2014.

Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at **brisbane.qld.gov.au/beprepared**
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies **000** Police/fire/ambulance (mobiles **000** and **112**)

State Emergency Service (SES) **132 500**
Energex **13 19 62**
Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about planning and building in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Property Information Summary

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

Property Summary	Level (mAHD) / Comment	Data Quality Code
Minimum ground level	1.8	C
Maximum ground level	5.1	C
Indicative existing floor level	3.5	C
Source of highest flooding	Storm tide	

Flood Planning Information

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning and Development Information section below for further information.

Note this table does not include overland flow. If overland flow is applicable to this property, refer to the Flood Planning and Development section below for further information.

Likelihood / Description	Level (mAHD)	Source
20%	1.9	Stormtide (Moreton Bay)
5%	2.1	Stormtide (Moreton Bay)
2%	2.2	Stormtide (Moreton Bay)
1%	1.8	River (Brisbane River)
1%	2.5	Stormtide (Moreton Bay)
0.2%	2.3	River (Brisbane River)
January 2011	1.1	River (Brisbane River)
Defined Flood Level (DFL)	1.9	River (Brisbane River)
Residential Flood Level (RFL)	1.8	River (Brisbane River)
Minimum Habitable Floor Level (dwelling house)	N/A*	

* Council may not have this data available. Customers are recommended to engage a Registered Professional Engineer of QLD (RPEQ) for further advice. For information on seeking Planning Advice, please visit www.brisbane.qld.gov.au/planning-and-building.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in **Council's planning scheme**.

Flood planning areas (FPA)		
River	**Creek / waterway**	**Overland flow**
FPA5		Not Applicable

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review **Council's Flood Planning Provisions**.

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's **planning scheme**.

Coastal hazard overlay sub-categories
Erosion prone area - coastal erosion
Erosion prone area - permanent inundation due to sea level rise at 2100
High storm-tide inundation area
Medium storm-tide inundation area

Note: Where land is identified within one for more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags
Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site. For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of Brisbane City Plan 2014 Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. **Find more information here**.

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally induding bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan 2014.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building (exduding apartments). The data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit **Brisbane City Council's Flood Information Hub**

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes indude:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The Brisbane City Plan 2014 (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disdaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.

Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.