Stormwater Management Plan

Document no: IA335900-JAC-BDC-SW-RPT-0001
Revision: A

Stockland
Stockland – Brooklyn

Brooklyn Data Centre (BDC)

Stormwater Management Plan

Client name:	Stockland		
Project name:	Brooklyn Data Centre (BDC)		
Client reference:	Stockland – Brooklyn	**Project no:**	IA335900
Document no:	IA335900-JAC-BDC-SW-RPT-0001	**Project manager:**	Tanay Swarupam
Revision:	A	**Prepared by:**	Patrick Collins
Date:	20/05/2026	**File name:**	IA335900-JAC-BDC-SW-RPT-0001

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
A	20/05/2026	For Planning Submission	P.Collins	H.Yang	L.Tan	C.Suttor

Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

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1. Introduction

1.1 Project Background

This report has been prepared by Jacobs on behalf of *Stockland Development Pty Ltd* in support of the planning permit application relating to the land at 413 Francis St Brooklyn (**the Site**). This application seeks approval for the Stage 1 portion of the land use and development (shown in image below) for a data centre (**the Project**) as shown in Figure 1-1.

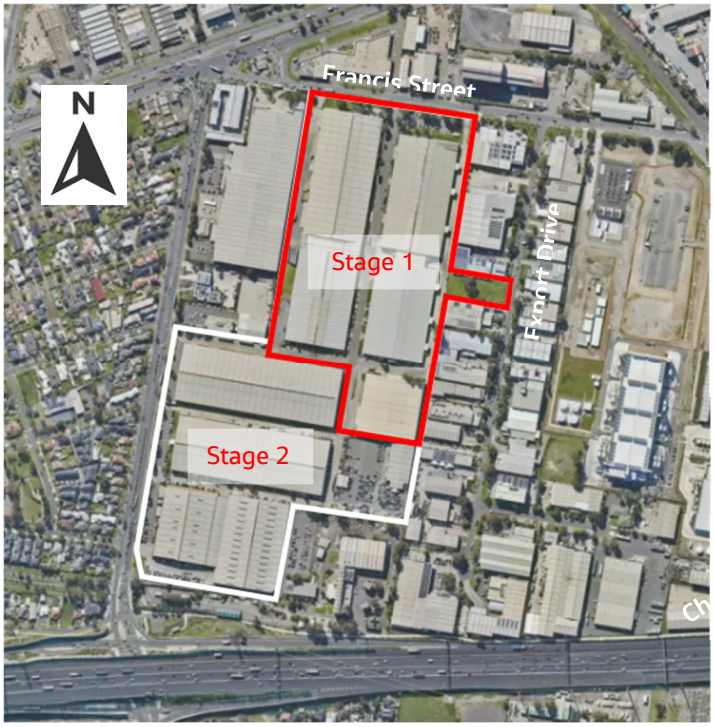

Figure 1-1: Location of Proposed Project

The Project seeks the staged use and development of a two-storey data centre (250MVA ultimate power capacity) pursuant to the Industrial 1 & 3 Zones. To facilitate these works, the existing warehouse buildings and associated hard stand/car parking area are to be removed. Early works approval will be sought to undertake bulk earthworks across the Site, including the preparation of leveling of the Site to allow AusNet to deliver the substation (utility installation). It is noted that substation area will be subject to separate planning approvals and the use and development associated with the substation will be subject to a separate approval prepared by AusNet.

This application meets the relevant eligibility criteria to be considered under the Development Facilitation Program where the Minister for Planning will be the Responsible Authority pursuant to Clause 53.22 of the Planning Scheme.

In particular, the Project seeks permission for the staged delivery of two, two-storey data centre buildings, generally comprising the following buildings and works:

- Bulk earthworks for site preparation and leveling (early works approval sought);
- Construction of two-storey data centre buildings with a building height of 18.3 metres, with an additional 7.2 metres of building services for plant and chiller equipment (combined maximum height of circa 25.5 metres);

- The buildings comprise a total gross floor area of circa 75,000 square metres across the two storey data halls and ancillary offices, with additional associated major plant open structures (housing generators and chillers);
- Vehicle ingress and egress is proposed centrally along the Site's frontage to Francis St, with circa 110 car parking spaces provided at the frontage of the two data centre buildings;
- Removal of some vegetation to accommodate the functional parameters of the proposed data centre and substation development;
- Additional landscaping provided in the front setback of the building, scattered throughout the Site and to the office entry of each building, providing an improved landscape response; and
- Provision of required utilities, including diesel generator back up power system, associated fuel storage systems, fire pump and associated water tanks.

The proposed data centre seeks to provide much needed AI integration, data, content and cloud services to address the emerging demand for cloud computing services.

The Project's design has been shaped by technical assessments and stakeholder feedback, ensuring a balanced approach to development. The Project seeks to provide a strategic response to the existing and emerging character through provision of an improved built form and landscape response.

1.2 Purpose of this Document

The purpose of this document is to capture the initial Stormwater Management Plan for pre-application to ultimately support the planning application for the proposed Brooklyn Data Centre. The document outlines how stormwater quality and quantity objectives outlined in Clause 53.18 in the Victorian Planning Provisions. Refer Figure 1-2 for proposed site plan.

Figure 1-2: Proposed Site Plan

2. Site Catchment and Hydrology

Below summarises the pre and post development conditions. There is an overall decrease in impervious with the new Project.

a) Pre Development Condition:

- Roof catchment: 66,330m^2
- Roading/carpark/loading dock/ container hardstand catchment: 31,590m^2
- Landscape: 12,553m^2

b) Post Development Condition:

- Roof catchment: 49,873m^2. This clean catchment generates significant runoff volume.
- Hardstand catchment (impervious) including roading, carparks, loading dock, generator yard, fuel yard, fire pump house and substation catchment: 29,085m^2; and
- Landscape: 31,515m^2

Based on the above, the proposed post-development site will not result in an increase in pre-development flows due to the reduction in overall roof and hardstand areas proposed, therefore, no onsite detention is required for attenuation purposes. It is assumed the current Legal Point of Discharge (LPoD) is to be retained with further modelling anticipated during the Planning Application to determine the feasibility of the existing LPoD.

It is proposed the site wide stormwater reticulation is based on a gravity system. The finished floor levels for the respective building have been assigned to accommodate the loading dock to achieve gravity flow from these areas.

2.1 Flood

Flood extents have been extracted from VicPlan maps and show the 1% Annual Exceedance Probability (AEP) flood extent on Francis Road encroaches into the northern end of the proposed site, refer to Figure 2-1 for extents. Flood level advice provided from Melbourne Water, as part of the Stormwater Management Strategy (prepared by *DPM Consulting Group, February 2024*), states that the 1% AEP flood level within the site range from 18.52m Australia Height Datum (AHD) to the north western corner and 18.02m AHD in the north east corner. Additionally, the Stormwater Management Strategy assessed the Overland Flow Paths (OLFP) have been assessed to follow the natural contours with the OLFP directed towards Francis Road.

The proposed building Finished Floor Levels (FFL) and surrounding carpark levels are well above the above mentioned flood levels expected. The FFL of 20.10m and 21.90m AHD for Building 1 and Building 2 respectively, both exceed the flood level.

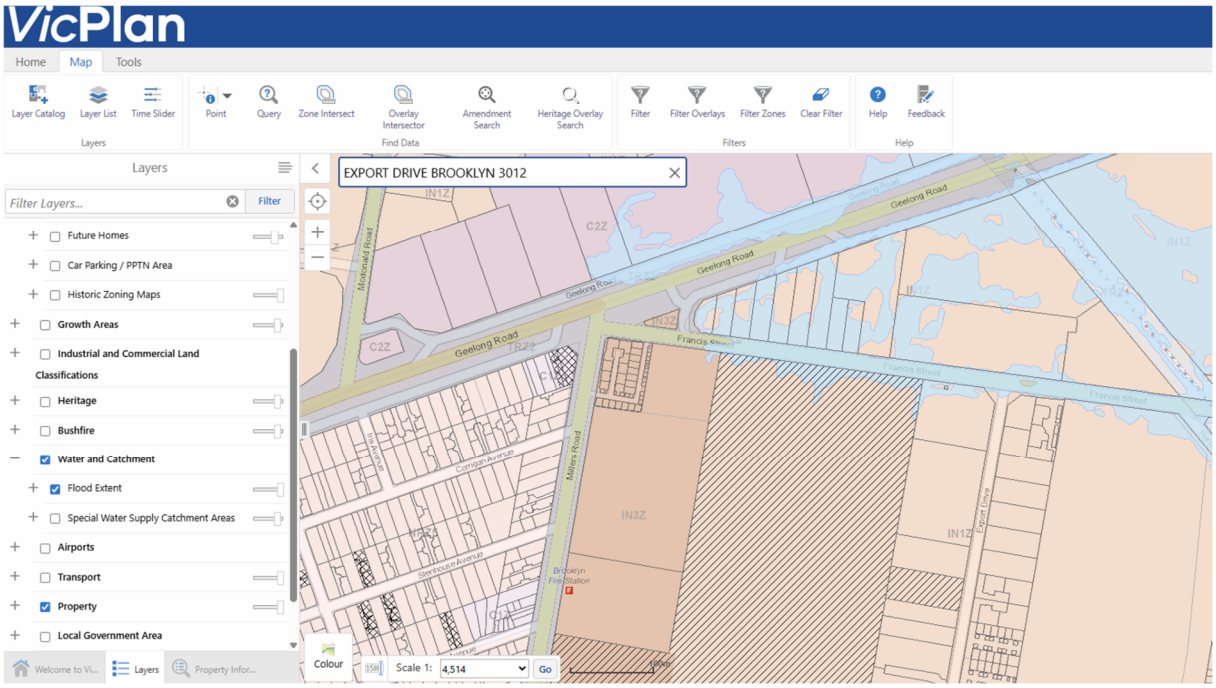

Figure 2-1. 1% AEP flood extent on Francis Road (VicPlan maps)

3. Legal Point of Discharge

The legal point of discharge (LPOD) for the site is understood to be via the existing open stormwater culvert drainage channel, which ultimately discharges to the existing Council stormwater network within Francis Road (refer to Figure 3-1 indicating the assumed area of LPOD from the stormwater design for the existing site). Topographical survey of the existing site has been undertaken and used to identify the invert level for the adjacent open channel, with a preliminary level of approximately 16.21 mRL adopted for planning-stage design.

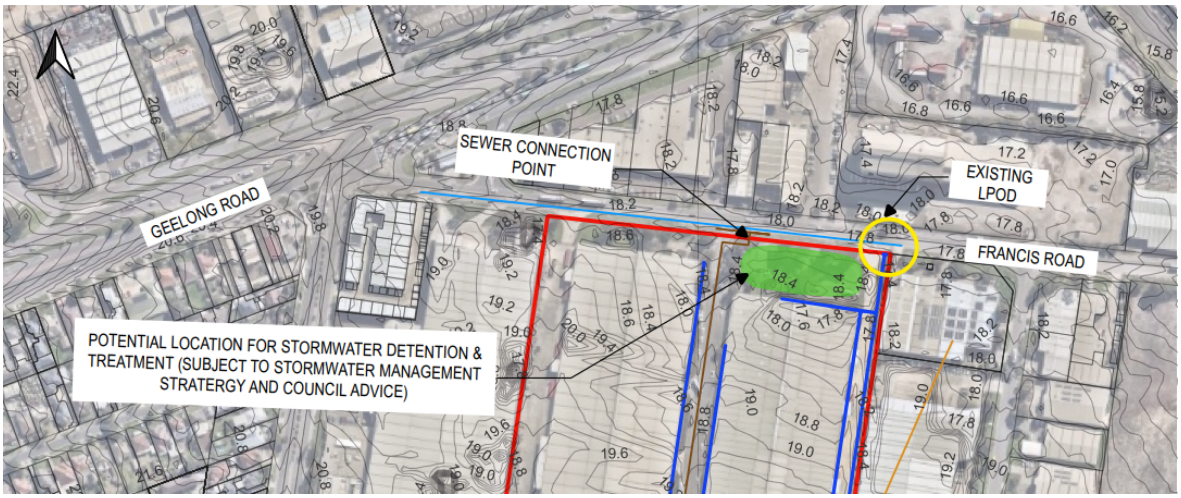

Figure 3-1: Stormwater existing LPOD for existing site (source:DPM Preliminary Drainage Assessment Plan)

As noted in the DPM Stormwater Management Strategy (Feb 2024), an application for the Legal Point of Discharge (LPoD) was submitted to Hobsons Bay City Council; however, Council could not confirm the precise location, size, level, or connection arrangement of the outfall within Francis Road. In the absence of verified authority information, this report adopts an assumed LPoD location at the north-east corner of the site, with potential connection to the Melbourne Water drainage pipeline located on the southern side of Francis Road.

For the purposes of this planning-stage assessment, the LPoD invert has been temporarily assumed based on the lowest point of the adjacent open channel. Final LPoD details, including the confirmed location, connection arrangement, and governing invert level, will be verified with Hobsons Bay City Council and Melbourne Water prior to detailed stormwater design.

The internal stormwater drainage system will ultimately be designed to connect to the confirmed LPoD as specified by the relevant authority, ensuring that runoff from the site is appropriately conveyed without adverse impacts on the surrounding road reserve or public drainage assets. Appropriate stormwater treatment and attenuation measures will be incorporated as part of the final stormwater management design.

4. Water Quality Strategy – Water Sensitive Urban Design (WSUD)

4.1 Aim of WSUD Design

The aim of the WSUD measures is to treat stormwater pollutants for compliance with the water quality objectives as prescribed in the Best Practice Management Guidelines (CSIRO, Melbourne Water 1999) as follows in Table 4-1. The BPEMG targets are also followed by respective Council.

Table 4-1: Stormwater Quality Performance Objectives

Pollutant	Receiving water objective	Current best practice performance objective
Post construction phase:		
Total suspended solids (TSS)	Comply with SEPP (eg. not exceed the 90th percentile of 80 mg/L) (1)	80% removal of the typical urban annual load
Total phosphorus (TP)	Comply with SEPP (eg. base flow concentration not to exceed 0.08 mg/L) (2)	45% removal of the typical urban annual load
Total nitrogen (TN)	Comply with SEPP (eg. base flow concentration not to exceed 0.9 mg/L) (2)	45% removal of the typical urban annual load
Litter	Comply with SEPP (eg. no litter in waterways) (1)	70% reduction of typical urban annual load (3)
Flows	Maintain flows at pre-urbanisation levels	Maintain discharges for the 1.5 ARI*event at pre-development levels
Notes: 1 An example using SEPP (Waters of Victoria1988), general surface waters segment. 2 SEPP schedule F7-Yarra Catchment-urban waterways for the Yarra River main stream. 3 Litter is defined as anthropogenic material larger than five millimetres.		

Abbreviation: SEPP- State Environmental Planning Policy

4.2 MUSIC Modelling

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) is software used to simulate rainfall, runoff, and pollutant generation, enabling assessment of urban stormwater impacts for this site development.

The WSUD measures were modelled using MUSIC X.

4.3 Nominated Catchment area

All the pervious and impervious areas are estimated based on land uses in Figure 1-2 and summarised in the table below:

Table 4-2: Summary of Impervious (Hard Surface) and Pervious (Soft Surface)

Land Use Type	Area (m2)
Hard Surface (impervious)	
Roof-1	24796
External Concrete Surface-1	1226
Car Park-1	792
Footpath-1	776
Roof-2	24796
External Concrete Surface-2	1226
Car Park-2	706
Footpath-2	776
Road	17152
Substation	6200
Total Impervious Area	78958
Soft Surface (Pervious)	
Open space (Landscape/Grass)	31515
Total Pervious Area	31515
Total Area (m2)	110473

4.4 MUSIC Schematic and Catchment Plan

MUSIC schematic showing various WSUD Measures in Figure 4-1 below:

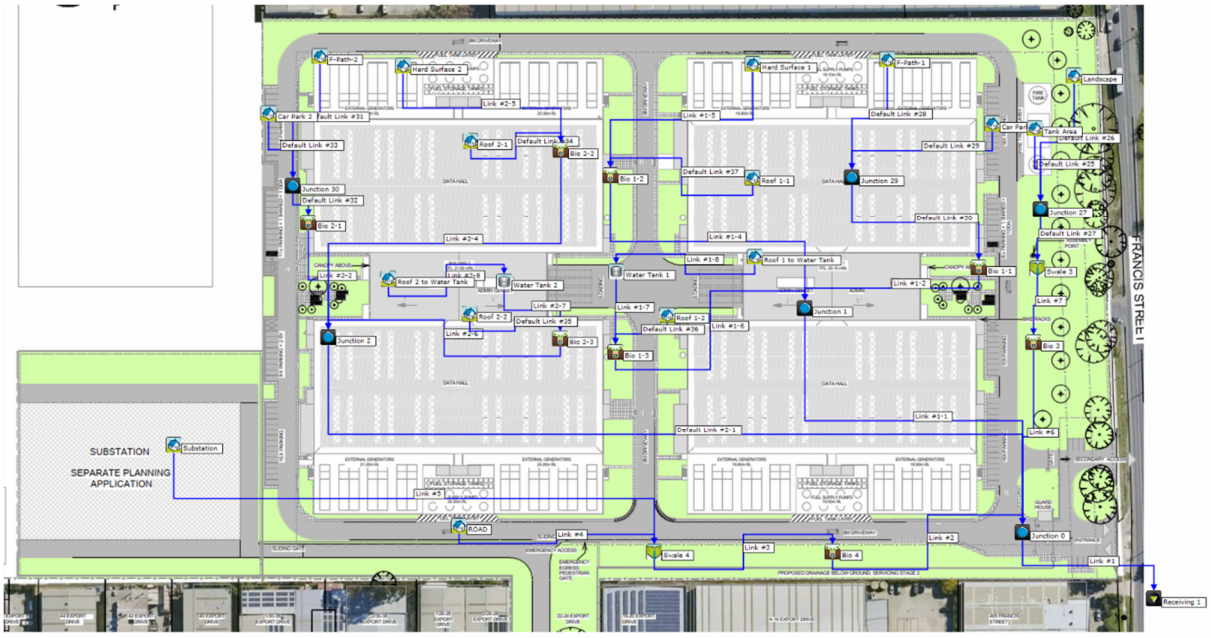

Figure 4-1: MUSIC Schematic and Catchment Plan

4.5 Catchment Area and WSUD Measures

The proposed WSUD strategy is summarised in the table below: The location of each measure is aligned with drainage line and accessible for maintenance.

Table 4-3: Catchment Area and Type of WSUD Measures

WSUD Label	WSUD	Configuration	Catchment Area to Treatment (ha)
Roof 1 to Water Tank Roof 1-2	Water tank and Bioretention	15,000 L Water tank and 40m^2 Bioretention	0.24 1.1198
Hard Surface 1 Roof 1-1	Bioretention	50.0m^2 Bioretention	0.1226 1.1198
Carpark 1 Footpath 1	Bioretention	25m^2 Bioretention	0.0792 0.0776
Roof 2 to Water Tank Roof 2-2	Water tank and Bioretention	15,000 L Water tank and 40m^2 Bioretention	0.24 1.1198
Hard Surface 2 Roof 2-1	Bioretention	50.0m^2 Bioretention	0.1226 1.1198
Carpark 2 Footpath 2	Bioretention	25m^2 Bioretention	0.0706 0.0776

Road Substation	Grassed swale and Bioretention	150m Swale and 70m^2 Bioretention	1.7152 0.62
Landscape Other	Grassed swale and Bioretention	50m Swale and 50m^2 Bioretention	3.1515 0.0512

Total of RWT is 30KL, Grassed Swale 200m, and Bioretention 350m^2

The typical conceptual design of each WSUD measure is in the figures below:

Figure 4-2: 15,000L above ground rain water tank example

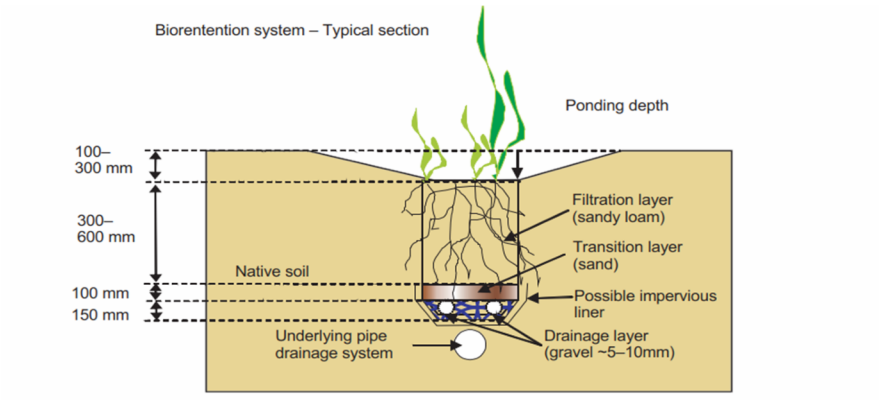

Figure 4-3: Typical bioretention detail

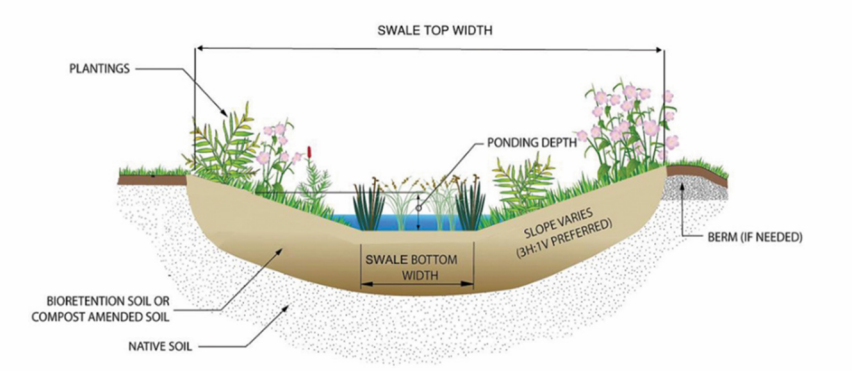

Figure 4-4: Typical grassed swale detail

Further investigation will be undertaken to assess the use of alternative treatment products such as OceanGuard or Atlan Ecoceptor, subject to approval from Melbourne Water and the relevant council.

4.6 MUSIC Modelling Results

The results of the model run are summarised in the table below.

Table 4-4: BPEMG Water Quality Target and Achievement

Pollutant	BPEMG Target (%)	Achieved (%)	Remarks
TSS	80	87.74	Compliant
TP	45	50.28	Compliant
TN	45	45.06	Compliant
GP	70	100.00	Compliant

The above results indicate the water quality strategy based on the proposed WSUD measures achieve the BPEMG requirement.

5. Water Quantity - On-site Detention (OSD)

The proposed data centre will be air-cooled therefore the overall potential to re-use rainwater is considered negligible. Rainwater harvesting and reuse as grey water for sanitary purposes will be implemented, however will not have contributed significantly to water quantity management. A 15,000L rainwater tank is proposed for each building to serve this purpose.

The objective of water quantity management is to manage the peak flows from the post-development site, as a result of the large roof and hardstand areas required for the Project. As mentioned in Section 2, the post-development roof and hardstand areas are less than the pre-development state, therefore, no increase in flows are expected. As a result, no onsite detention tanks are required for attenuation purposes. This was also identified as part of the Stormwater Management Strategy (prepared by *DPM Consulting Group, February 2024)*.

6. Fuel & Generator Risk Management

As the site contains high-risk spill equipment, appropriate management is required to isolate any spills from the stormwater network. The fuel storage location and configuration will be a bulk diesel fuel storage system, centralised to 4 no. locations across the site, to service the adjacent 4 no. data halls by supplying the associated 28 no. generator sets. The following measures will be implemented:

- Self-bunded tanks – double-skinned tank allows for tank interstitial space leak containment and detection for rapid notification of issues.
- Oil water separators (SPEL Puraceptor or approved equivalent) are required to ensure spill is contained and isolated from entering the stormwater network. These will apply to each of the fuel storage yards and the substation. The sizing of the tanks is based on 110% of an 18,000L fuel delivery vehicle, therefore minimum required volume is 19,800L.

7. Conclusion

The proposed stormwater infrastructure will connect into the new internal gravity drainage network across the Site, discharging toward the existing Legal Point of Discharge (LPoD) at the northeastern corner. Final confirmation of the LPoD location, level, and connection arrangement will be undertaken with Hobsons Bay City Council and Melbourne Water during detailed design.

Given that the post-development roof and hardstand areas are *less* than the pre-development condition, no increase in stormwater flows is expected from the Site. As a result, on-site detention is not required for flow attenuation, consistent with the findings of the Stormwater Management Strategy (DPM, Feb 2024).

Water Sensitive Urban Design (WSUD) measures have been incorporated throughout the Site to ensure compliance with the Best Practice Environmental Management Guidelines (BPEMG). These include bioretention systems, grassed swales, and 15,000-litre rainwater tanks for each building. MUSIC X modelling confirms that the proposed WSUD treatments achieve all pollutant reduction targets for TSS, TP, TN and gross pollutants.

The proposed Finished Floor Levels (FFL) for both data centre buildings and associated carparking areas are set well above the 1% AEP flood levels identified by Melbourne Water, ensuring that the development remains resilient to overland flow and broader regional flooding. No flooding impacts are expected within the Site.

Bulk diesel storage is proposed in four locations to service the generator systems. Each fuel yard will include self-bunded tanks and a dedicated SPEL Puraceptor (or approved equivalent) oil-water separator sized to 110% of an 18,000-litre tanker delivery, ensuring spill containment and preventing contaminants from entering the stormwater system.

Overall, the proposed stormwater, WSUD, flooding and risk-management measures demonstrate that the development can meet all regulatory requirements and will not adversely impact downstream drainage infrastructure or the surrounding environment.

Appendix A Proposed Stormwater Plan

F

ADVERTISED PLAN

29-45 MILLERS ROAD

11-27 MILLERS ROAD COMMERCIAL BUILDING

OIL WATER SEPARATOR

OIL WATER SEPARATOR

8M DRIVEWAY

FUEL TANK LAYBY

FUEL SUPPLY PUMPS 20.50m RL

FUEL STORAGE TANKS

EXTERNAL GENERATORS 21.40m RL

EXTERNAL GENERATORS 20.30m RL

FUEL SUPPLY PUMPS 19.10m RL

FUEL STORAGE TANKS

EXTERNAL GENERATORS 19.80m RL

EXTERNAL GENERATORS 19.00 mRL

13 X PARKING

11 x PARKING + 1 SHARED + 1 DDA

9 X PARKING + 2 EV

15 X PARKING

16X PARKING

FIRE TRUCK LAYBY

FIRE TANK

FIRE PUMP RM

FIRE TANK

8 X PARKING + 1 SHARED + DDA

10X PARKING

16X PARKING

15000L ABOVE GROUND RAINWATER TANK TO SERVICE BUILDING

15000L ABOVE GROUND RAINWATER TANK TO SERVICE BUILDING

DATA HALL

DATA HALL

LOADING DOCK CHANNEL DRAIN

LOADING DOCK CHANNEL DRAIN

CANOPY ABOVE

BUILDING 2 FFL: 21.90 mRL

LIFT

SW CONNECTION FROM LPOD (IL = 16.21) TO BUILDING 2 LOADING DOCK. LENGTH 370m AT 1:200 GRADIENT. APPROXIMATE INVERT LEVEL AT LOADING DOCK = 18.05

LOADING

LOADING

SW CONNECTION FROM LPOD (IL = 16.21) TO BUILDING 1 LOADING DOCK. LENGTH 363m AT 1:200 GRADIENT. APPROXIMATE INVERT LEVEL AT LOADING DOCK = 18.03

BUILDING 1 FFL: 20.10 mRL

LIFT

CANOPY ABOVE

ASSEMBLY POINT

BIKE RACKS

FRANCIS STREET

SUBSTATION

SEPARATE PLANNING APPLICATION

EXTERNAL GENERATORS 21.20m RL

EXTERNAL GENERATORS 20.20m RL

FUEL STORAGE TANKS

FUEL SUPPLY PUMPS 20.30m RL

EXTERNAL GENERATORS 19.80m RL

EXTERNAL GENERATORS 18.80m RL

FUEL STORAGE TANKS

FUEL SUPPLY PUMPS 19.00m RL

FUEL TANK LAYBY

FUEL TANK LAYBY

8M DRIVEWAY

8M DRIVEWAY

GATE

SECONDARY ACCESS

GUARD HOUSE

GATE

ENTRANCE

SLIDING GATE

SLIDING GATE

EMERGENCY ACCESS

EMERGENCY EGRESS PEDESTRIAN GATE

OIL WATER SEPARATOR

OIL WATER SEPARATOR

OIL WATER SEPARATOR

PROPOSED DRAINAGE BELOW GROUND, SERVICING STAGE 2

LPOD INVERT LEVEL: 16.21mRL

STREET

16 EXPORT DRIVE

44 EXPORT DRIVE

42 EXPORT DRIVE

40 EXPORT DRIVE

1/30-38 EXPORT DRIVE

2/30-38 EXPORT DRIVE

1/26-28 EXPORT DRIVE

2/26-28 EXPORT DRIVE

22-24 EXPORT DRIVE

18-20 EXPORT DRIVE

4-16 EXPORT DRIVE

EXPORT DRIVE

EMERGENCY ACCESS

DRAWING TO BE PRINTED IN COLOUR

- STORMWATER PIPE NETWORK
- SWALE
- STORMWATER PIT
- BIORETENTION DEVICE
- OIL WATER SEPERATOR
- RAINWATER TANK

NOTES:

1. LOCATION OF SERVICES ARE INDICATIVE

NOTES:

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REV	DATE	DESCRIPTION
A	20/05/26	FOR PLANNING SUBMISSION

KEY PLAN

CLIENT

Stockland

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PROJECT

BROOKLYN DATA CENTRE

BUILDING NAME

413 FRANCIS STREET
BROOKLYN

TITLE

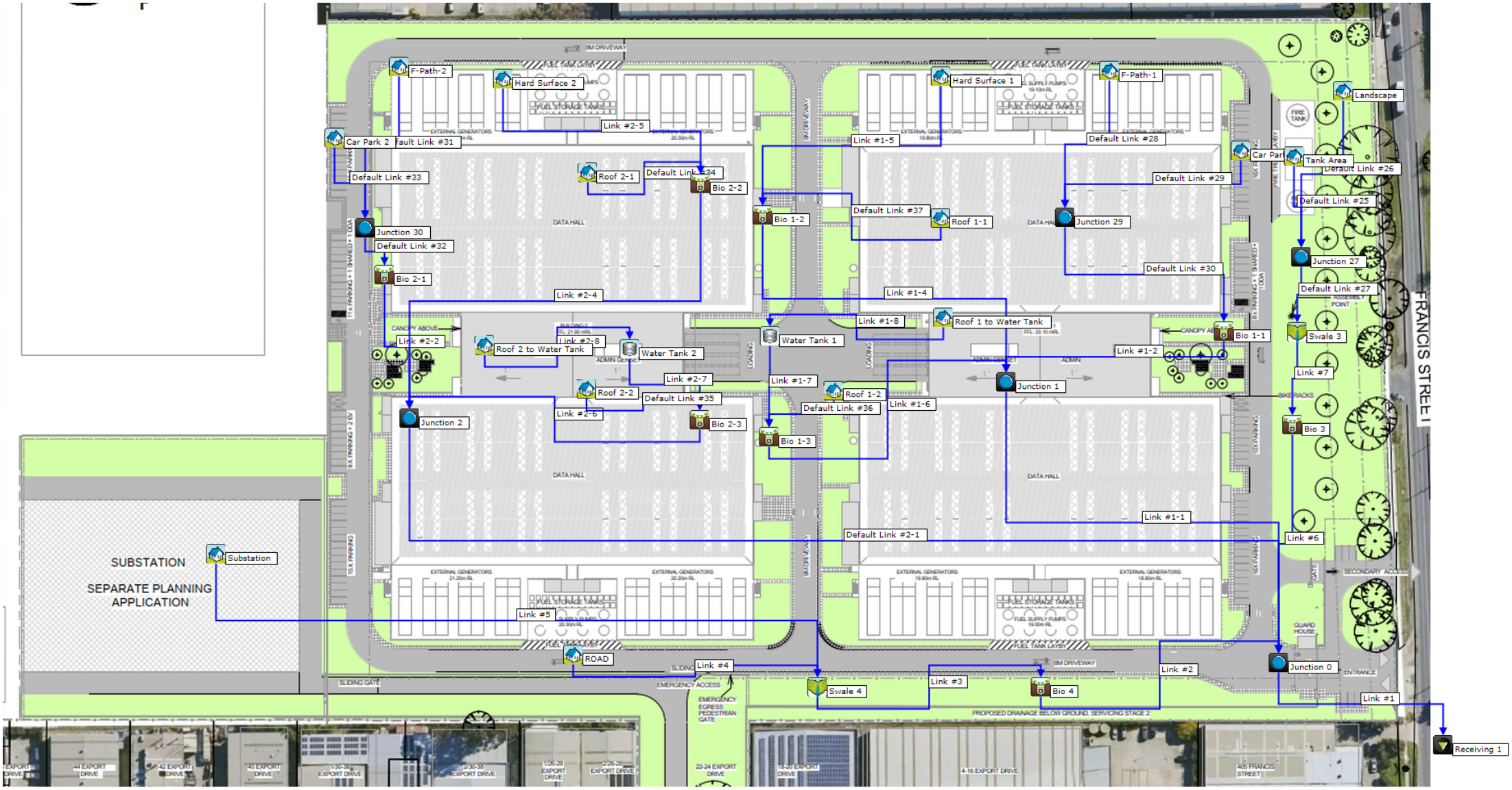
STORMWATER PLAN

DRAWING STATUS

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
PC	PC		
DESIGNED	DESIGN REVIEW	DATE	DATE
PC	LT		
SCALE	SHEET SIZE	INTERNAL PROJECT No.	
1:500	A0	IA355900	
DRAWING No.			REV
C103			A

26/11/2025 11:43:37 AM

Appendix B Music Model Schematic and Catchment Plan



MUSIC MODEL SCHEMATIC AND CATCHMENT PLAN

ADVERTISED PLAN