

ADDENDUM TO THE STORMWATER DESIGN DEVELOPMENT REPORT SSD 7709 Mod1

JN & JR HIGH-BAY WAREHOUSES MOOREBANK LOGISTIC PARK PRECINCT WEST MOOREBANK NSW

Prepared For:

**Woolworths c/- Tactical Group
Level 15, 124 Walker Street
NORTH SYDNEY NSW 2060**

Prepared by:

**Costin Roe Consulting
Level 1, 8 Windmill Street
WALSH BAY NSW 2000**

Rev: B

DOCUMENT VERIFICATION

Project Title	JN & JR Distribution Facilities
Document Title	Addendum to the Stormwater Design Development Report SSD 7709
Project No.	Co13455.16
Description	Addendum to the Stormwater Design Development Report SSD 7709 Mod1
Client Contact	Woolworths, c /- Tactical – Mr Nathan Cairney

	Name	Signature
Prepared by	Daniel Soliman & Mark Wilson	
Checked by	Mark Wilson	
Issued by	Mark Wilson	
File Name	13455.16-11b.rpt	

Document History

Date	Revision	Issued to	No. Copies
22 Mar. 2021	A	Tactical – Mr Nathan Cairney	PDF
09 Sep 2022	B	Tactical – Mr Nathan Cairney	PDF

TABLE OF CONTENTS

A	INTRODUCTION	3
B	DEVELOPMENT SITE	4
B.1	Proposed Development	4
B.2	MPW Precinct Description	5
C	WATER CYCLE MANAGEMENT & WATER SENSITIVE URBAN DESIGN (WSUD)	8
C.1	Water Cycle Management & WSUD Key Areas and Objectives	8
C.2	MPW Infrastructure Drainage	11
C.3	Proposed Site Drainage	14
C.4	External Catchments and Flooding	14
C.5	Site Discharge	14
D	STORMWATER QUANTITY MANAGEMENT	15
E	STORMWATER QUALITY CONTROLS	17
E.1	Stormwater Management Objectives	17
E.2	Precinct Stormwater Treatment System	17
E.3	Stormwater Harvesting	20
E.3.1	Internal Base Water Demand	20
E.3.2	External Base Water Demand	20
E.3.3	Rainwater Tank Sizing	21
E.4	Stream Erosion Index	21
F	CONCLUSION	22
G	REFERENCES	23

A INTRODUCTION

Costin Roe Consulting Pty Ltd has been commissioned by Tactical Group on behalf of Woolworths to prepare this *Addendum* to the *Stormwater Design Development Report* (ASDDR) to form part of the post approval requirements for a Modification to State Significant Development SSD_7709 to NSW Department of Planning, Industry and Environment (DPIE) for two proposed 'Facility for Automated Consolidation of Store Ready Pallets of Goods'.

This ASDDR provides confirmation that the SSD_7709 Mod1 Proposal stormwater system meets the requirements and principles set out in the approved *Stormwater Design Development Report* (SDDR). The ASDDR confirms the following design principles and operational requirements of the stormwater management for the proposed facility:

- Management of stormwater quantity
- Management of stormwater quality; and
- Flooding Considerations.

The consent authority is the DPIE. The proposed facilities are located within the *Moorebank Intermodal Precinct West* precinct (MPW Precinct), originally approved under SSD_7709, dated 11 November 2019. The Mod1 approval was granted by DPIE on 24 December 2020.

The engineering design for this project and included in this report has been completed and coordinated with the MPW Precinct wide Stormwater Management Strategy and Water Sensitive Urban Design (WSUD) requirements as detailed in the approved SDDR (refer Costin Roe Consulting report **Co13455.07-02a.rpt**) required of SSD 7709 conditions of consent (CoC) **B4, B5, B6** and associated conditions to **CoC B28**. Reference to **Annexure B** should be made for confirmation of compliance with the conditions of consent.

Revision B of this ASDDR incorporates the drainage engineering aspects of the JNDC warehouse expansion.

B DEVELOPMENT SITE

B.1 Proposed Development

The proposed development comprises two sites with automated facilities known as *Janus Regional* (JR) and *Janus National* (JN). Both sites are adjacent and situated with the central third of the MPW Precinct, with JR to the north and JN to the south. The site's comprise land areas of 14.5 Ha for JR, and 11.5 Ha for JN. The proposed Warehouse and Distribution Facility will comprise State-of-the-Art automated racking and retrieval systems, to enhance the operational efficiencies of the future end-user involved. By utilising automated racking systems, this will allow palletised goods to reach consumer stores in a streamlined process, ultimately improving the end-to-end operational processes for the end-user.

Both developments include a large steel framed building which includes low-bay and high-bay components, office space, truck circulation and loading areas, truck parking and passenger vehicle parking.

Access to the facilities is provided on the west of the site from The MPW Precinct western ring road for truck and passenger vehicles. Connectivity to The MPW Precinct container straddle carrier roadways is present on the east of the site.

The general layout is shown on **Figure B.1** below, which includes the construction of the JNDC warehouse expansion. Connectivity and integration between JR and JN facilities is expected, and this has been considered within the design.

The floor level for both JR and JN buildings have been nominated as RL 17.0m AHD.

The site is located within The MPW Precinct Catchment 6, and stormwater is managed through the precinct *Stormwater Management Basin 6*, as set out in the SDDR, and described in following sections of this ASDDR. A description of the overall MPW Precinct and how this development interacts with the overall precinct is included in **Sections B.2**, and further described in subsequent sections of this report.

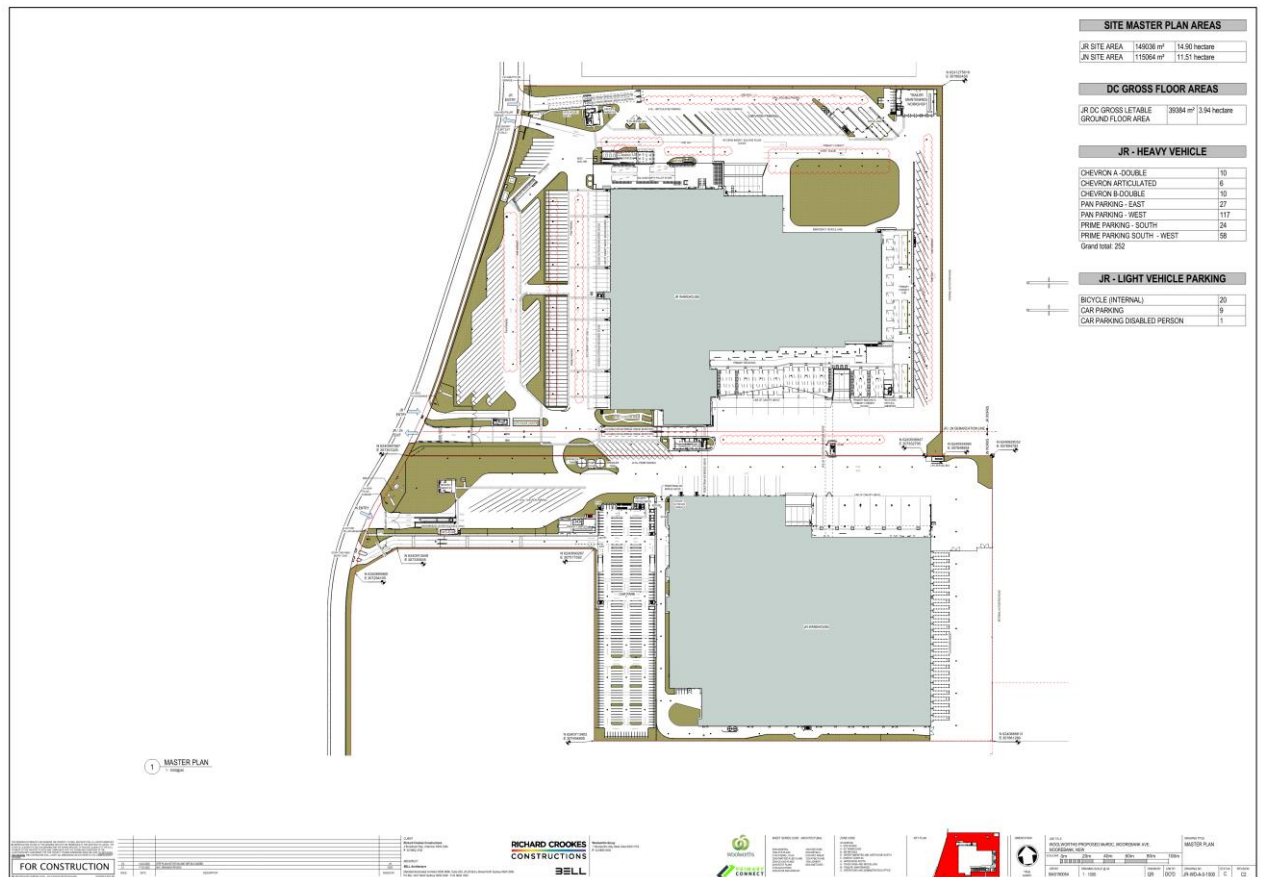


Figure B.1. JN and JR Development Layout (Bell Architects)

B.2 MPW Precinct Description

The JN & JR Developments are located within the MPW Precinct is located within the 243 Ha Moorebank Logistics Park (MLP) development. The MPW Precinct development footprint is irregular in shape being bounded by the Georges River on the west, M5 Motorway on the north (and existing ABB Facility), Moorebank Avenue and MPE on the east, and undeveloped crown land to the south. Also, on the eastern extent is Basin 10 (being constructed on the western side of Moorebank Avenue as part of MPE works) and the interstate intermodal terminal and rail sidings.

Access to the MPW Precinct is via Moorebank Avenue and the Moorebank Avenue interchange with the M5 Motorway.

The MPW Precinct is noted to be located within Liverpool City Council Local Government Area. The development area is shown as **Figure B.2**.

The MPW Precinct is noted to comprise relatively flat topography. The highest level is RL 17.8m AHD located at the south-east corner of the site. The lowest level is RL 3.0m AHD adjacent to Georges River. Generally, the levels over the site fall between a range of RL 13.5m AHD to RL 7.5m AHD. Site grading is flat to undulating, as noted, however generally falls from east to west at grades of 0.5% to 1%.

It is noted that Moorebank Avenue reaches levels of RL 25.2m AHD at the East Hills Railway Line crossing and associated bridge abutment approach at the southern end of the MPW Precinct development footprint.

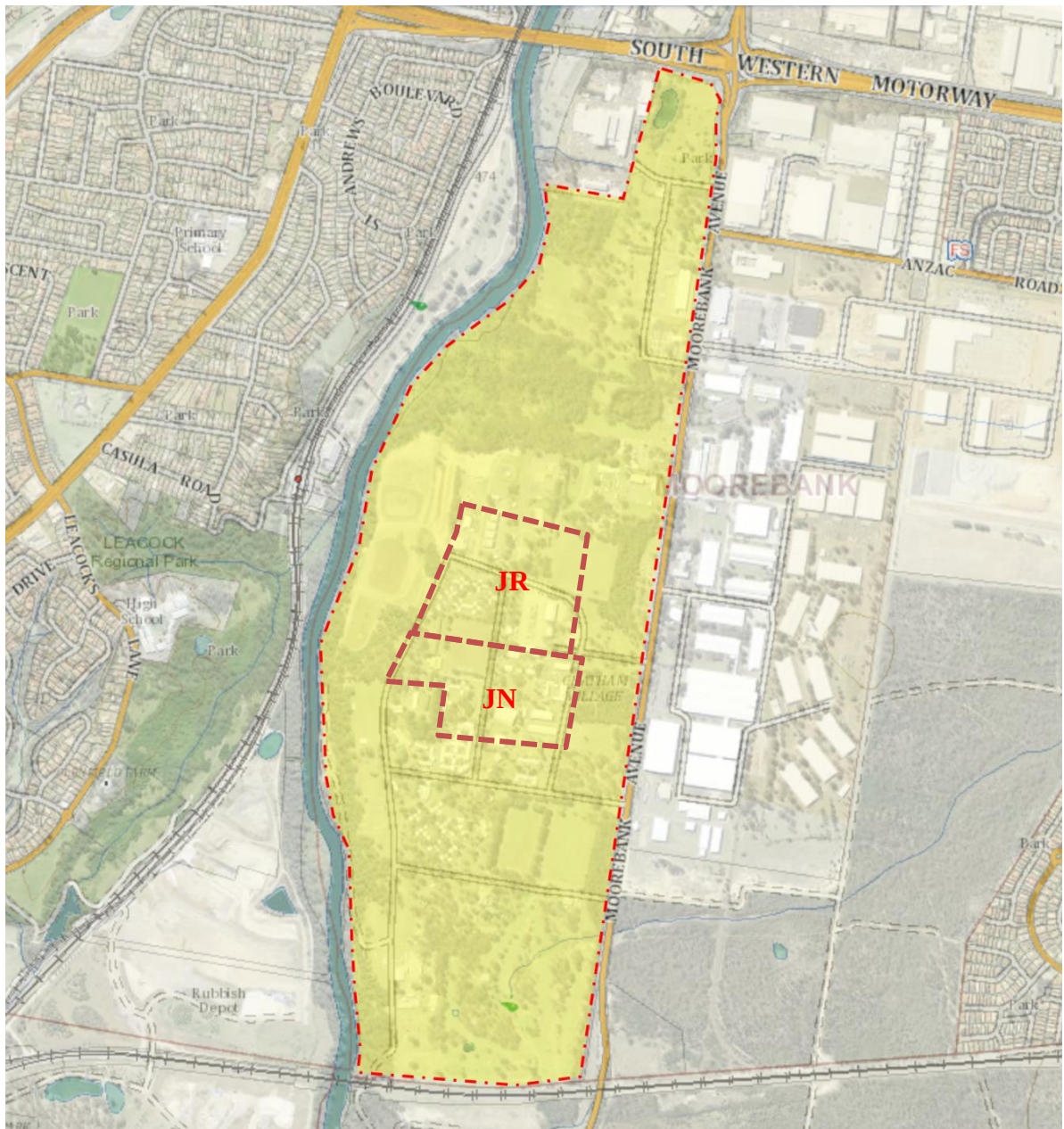


Figure B.2. MPW Precinct Locality Plan + Approximate JR & JN Site

The MPW Precinct comprises five (5) key existing drainage catchments. Four of the five drainage catchments (totalling 121.2 Ha) drain in a westerly direction and directly to The Georges River. The fifth catchment (24.82 Ha), located at the south-east of the development area, drains south-east across Moorebank Avenue to Anzac Creek. The proposed Mod2 facility for this submission is located within Catchment and Management Basin 6.

Reference to Arcadis *Figure 5-1: Existing Site Conditions (EIS Appendix R – Stormwater & Flooding Environmental Assessment)* confirm existing site conditions.

Further discussion relating to catchments and existing drainage, in relation to the current development, is made in **Section C.2** of this report.

The MLP development will consist of the construction and operation of an IMEX terminal and an interstate terminal with capacity to transport up to 1.05 million TEU (twenty-foot equivalent units) a year of import-export freight and another 0.5 million TEU of interstate freight per year.

Moorebank Logistics Park will have related logistics activities including 850,000 square metres of high specification warehousing, as well as auxiliary services including retail and service offerings.

A rail connection to the Southern Sydney Freight Line (SSFL) will be built that has direct access to the park, with the M5 and M7 arterial roads minutes away providing a complete supply chain solution driving savings in time and costs for onsite tenants.

The approved MPW development proposes the construction of six (6) industrial warehouse buildings over the development area of which this current development is located within the middle third. The approved use for the warehouse buildings is for distribution and logistics type use as defined in the *Environmental Impact Statement (EIS)* approved under the MPW SSD 16-7709 Development Consent. This submission is noted to be a modification to the approved use under SSD7709.

C WATER CYCLE MANAGEMENT & WATER SENSITIVE URBAN DESIGN (WSUD)

C.1 Water Cycle Management & WSUD Key Areas and Objectives

Water Cycle Management (WCM) is a holistic approach that addresses competing demands placed on a region's water resources, whilst optimising the social and economic benefits of development in addition to enhancing and protecting the environmental values of receiving waters.

A Water Cycle Management Strategy (WCMS) has been prepared for The MPW Precinct and included in the SDDR (refer Costin Roe Consulting report *Co13455.07-02.rpt*) as approved by the Secretary as part of the post approval documentation required under the SSD 7709. The SDDR provides the guiding principles for WCM across the precinct which includes establishing water management targets and identifying management measures required for future building developments to meet these targets. This report as noted is to form an addendum to the approved SDDR.

The design presented for the JN and JR facilities has been completed with consideration to the overall MPW Precinct WCMS as set out in the SDDR. We provide a summary of the key measures set out in the SDDR, and how this development has been completed with consideration to the key WCM elements which are included in **Table C.1** following. An assessment was undertaken by our office to confirm that the stormwater system requirements (as set out in this report) are being met as part of the JNDC Expansion (ref: *Co13455.16-22.ltr*, Dated: 14 Dec 2021). This letter is provided in **Annexure D** of this report.

The following key WSUD considerations, specific to stormwater, have been included in the MPW Precinct design and integrated with the current facility application:

- *Stormwater Quantity Management (Refer **Section 4**)*
- *Stormwater Quality Management (Refer **Section 5**)*
- *Flood Management & Large Rainfall Events*
- *Water Demand Reduction/ Rainwater Reuse*

Element	Target	Reference
Water Quantity	Maintaining or improving the volume of stormwater flows to from this site. <i>“it will be necessary to demonstrate that there will be no increase in runoff from the site as a result of the development for the 1 in 1-year ARI and the 1 in 100-year ARI storm events”.</i>	DPE CoC Liverpool Council - Stormwater Management Policy
Stream Erosion Index	A stream erosion index between 3.5-5.0 has been targeted to manage frequent flows resulting from the development.	Best Practice
Water Quality	Load-based pollution reduction targets based on an untreated urbanised catchment: Gross Pollutants 90% Total Suspended Solids 85% Total Phosphorus 60% Total Nitrogen 45% Total Hydrocarbons 90%	Council DCP DPE
Flooding	Buildings and roads set 500mm above 1% AEP. No affectation to upstream downstream or adjoining properties as a result of development Local overland flow paths to achieve 150mm freeboard to building floor levels	Council DCP. NSW Floodplain Development Manual. Council DCP CoC
Water Supply	Reduce Demand on non-potable water uses.	Council DCP DPE
Erosion and Sediment Control	Appropriate erosion and sedimentation control measures must be described in the environmental assessment for all stages of construction to mitigate potential impacts to receiving waters. Refer separate Construction Soil and Water Management Plan (CSWMP) by Costin Roe Consulting, Ref: Co13455.03.rpt and Addendum Construction Soil and Water Management Plan (ACSWMP) by Costin Roe Consulting, Ref: Co13455.16-12.ltr	Landcom Blue Book DPE

Table C.1. MPW Precinct WCM/ WSUD Targets

A summary of how each of the WCM objectives will be achieved are described below. Reference to the relevant sections of the report should be made for further and technical details relating to the WCM measures. We also confirm the distinction between overall precinct measures and specific measures included for this development.

A brief summary of the management objectives is described below:

- *Stormwater Quantity Management (Refer Section D)*

The intent of this criterion is to reduce the impact of urban development on existing drainage system by limiting post-development discharge within the receiving waters to the pre-development peak, and to ensure no affectation of upstream, downstream or adjacent properties.

Attenuation of stormwater runoff from the MPW Precinct development is proposed to be managed via a series of open detention basins provided in strategic locations for each of The MPW Precinct catchments. These detention systems are proposed to be in use during the operational phase of the site's development. As per the consent conditions the objective is to attenuate stormwater flow from the development to pre-developed flows, and to ensure no affectation to upstream, downstream and adjoining properties as a result of the development.

Sizing of the basin systems has been completed using DRAINS modelling software in accordance with the Liverpool City Council Policy for the 1 in 1-year ARI to 1 in 100-year ARI storms for various durations. The modelling accounts for the drainage system provided for the adjacent sites.

The proposed automated facility is noted to drain to and be managed by Stormwater Management Basin 6, which is located to the south-west of this development site. No additional measures relating to water quantity are required for the JN/JR Development.

Refer to **Section D** of the document for a more detailed description of The MPW Precinct detention system (Basin 6).

- *Stream Erosion Index Assessment (Refer Section D)*

The intent of this criterion is to reduce the impact of urban development on existing drainage system by limiting the duration of post-development discharge to a range of 3.5-5. This assists with the impact of frequent flows to receiving waters.

Stream erosion management is generally achieved through The MPW Precinct stormwater management basins and no additional measures relating to stream erosion are required for the JN/JR Development.

- *Stormwater Quality Management*

There is a need to target pollutants that are present in stormwater runoff to minimise the adverse impact these pollutants could have on downstream receiving waters during warehouse operations.

Water quality, and pollution reduction objective shown in **Table C.1**, are achieved through a treatment train of proprietary gross pollutant traps and natural bio-retention systems provided as part of the MPW Precinct system. Reference to **Section E** of this document should be made for detailed Stormwater Quality modelling and measures.

The proposed automated facility is noted to drain to and be managed by Stormwater Management Basin 6. No additional measures relating to water quality are required for the JN/JR Development.

- *Flood Management and Large Rainfall Events*

The proposed development considered flooding and large rainfall events, both from the adjacent Georges River, and from site generated runoff.

The following measures have been incorporated in the design:

- All buildings are sited 500mm above the 1% AEP design flood level of the Georges River.
- Flood storage compensation has been provided where filling in localised pre-developed flood affected areas occurs;
- Stormwater detention measures have been included to manage pre and post development runoff as discussed above and in **Section D**; and
- Overland flow paths to manage runoff in large storm events have been made including achieving at least 150mm freeboard to building levels from the flow paths.

- *Water Demand Reduction/ Rainwater Reuse*

Rainwater reuse measures will be provided as part of the proposed facility. As set out in the SDDR, the requirement is to reduce demand on water for non-potable uses for toilet flushing and irrigation. The target is to reduce demand on non-potable water uses by 50% via reuse applications. Refer **Section E.3**.

C.2 MPW Infrastructure Drainage

As per general engineering practice, and with reference to LCC guidelines, the stormwater drainage system for the MPW Precinct comprises a minor and major system to safely and efficiently convey collected stormwater run-off from the development. Drainage connection points are provided for all development lots in the precinct including for the current automated facility.

The minor system is to consist of a piped drainage system which has been designed to accommodate the 5% AEP or 1 in 20-year ARI storm event (Q20). The major system has been designed to cater for storms up to and including the 1% AEP or 1 in 100-year ARI storm event (Q100). The major system employs the use of defined overland flow paths to safely convey excess run-off from the site to the two discharge points allowing for 350mm of freeboard to building levels. Further consideration of overland flow for events greater than 1% AEP, or in the event of blockage has been made in the design as required of **CoC B5** and **B9**. This includes ensuring a minimum 150mm freeboard is maintained for events greater than 1% AEP, or in the event of blockage.

The overall stormwater management objectives, including catchment breakdown, water quality objectives and water quantity discharge rates, are consistent with the approved Arcadis MPW Flooding and Stormwater Assessment and all of the CoC's as set out in the **SDDR** and **Annexure B**.

As noted, this development is included within Catchment 6 and managed by Management Basin 6 (to be constructed as part of MPW Precinct infrastructure works). A summary of the main stormwater measures for the MPW development, with reference catchment plans **PIWW-COS-CV-DWG-0420 & 421**, and layout plans **PIWW-COS-CV-DWG-0401 to 0411**, for Catchment 6, is provided for information as follows:

Catchment/ Outlet 6

- Pre-development catchment of 44.13 Ha.
- Post developed catchment of 58.90 Ha proposed to be conveyed to *Outlet 6*.
- Water quantity will be managed by an above ground basin. The basin attenuates peak stormwater runoff from the post-developed catchment to pre-developed catchment for the 1 in 1-year ARI event and the 1 in 100-year ARI event with a maximum active storage in the 1 in 100-year ARI event of 39,790m³.
- The open basin has been designed with the provision of 1V:4H batter slopes.
- Primary water quality will be managed by a Vortech style gross pollutant trap (Rocla CDS or approved equivalent) which treats hydrocarbons/ oil and grease, gross pollutants, sediments, some nutrients and litter.
- Tertiary water quality will be managed via a 5,900m² minimum bio-retention system. This system will further target hydrocarbons, fine sediments and nutrients. The minimum bio-retention media area is based on 1% of the contributing 58.9 Ha post development catchment and has been separated into six cells of less than 1000m² as required of the **CoC**.
- The basin outlet to The Georges River has been designed in accordance with NSW Office of Water Guidelines for Riparian Corridors comprising naturalised systems integrated into the existing riverbanks as required of the CoC.



C.3 Proposed Site Drainage

Drainage for the proposed facility will comprise piped drainage system which has been designed to accommodate the 5% AEP or 1 in 20-year ARI storm event (Q20). This results in the piped system being able to convey all stormwater runoff up to and including the 5% AEP event. The major system through new paved areas has been designed to cater for storms up to and including the 1% AEP or 1 in 100-year ARI storm event (Q100). The major system employs the use of defined overland flow paths to safely convey excess runoff from the site to the two discharge points allowing for 350mm of freeboard.

The proposed discharge point is located on the western side of the facility, to trunk drainage in the western ring road.

As noted throughout the report this site drains to MPW Precinct Basin 6, and management of Stormwater Quantity and Quality are performed through MPW Precinct measures set out in the SSDR.

Refer drawing **Co13455.16-MOD-C03** for details pertaining to the drainage layout, management basins and systems and **Figures C.1 & C.2** which shows the proposed Basin 6 location and contributing catchment.

C.4 External Catchments and Flooding

MPW is not affected by any overland flow paths or external catchments. As such no allowance for conveyance of upstream catchments is required in this SWMP.

The proposed building floor level is noted to be RL 17.0m (+/-0.5m). The 1% AEP level of The Georges River is noted to be approximately RL 11.5m AHD and the PMF is 13.9m in the vicinity of the development site (per *Table 4-1 of Arcadis Stormwater and Flooding* report included in the SSD7709 EIS). The proposed development site can be seen to be higher than both the PMF and 1% AEP + 0.5m freeboard level hence meets all flood planning requirements relating to the Georges River.

C.5 Site Discharge

As part of the MPW Precinct Infrastructure design, drainage connections to infrastructure systems has been included for each development site.

For this site, connection of drainage to infrastructure is made on the western boundary to trunk infrastructure in the western precinct perimeter road, which is then directed to the precinct drainage systems as described above.

D STORMWATER QUANTITY MANAGEMENT

Water quantity management (stormwater detention) is provided for the MPW Precinct to limit the runoff discharged from the development per SSD7709 **CoC B12(a) & B12(b)**. The **CoC** requires post-development runoff to meet pre-development runoff for the 1 in 1-year ARI storm and the 1 in 100-year ARI storm events

Attenuation of stormwater runoff from the MPW Precinct is proposed to be managed via a series of water quantity management systems throughout the precinct. These will be formed as one of five open basins provided in strategic locations for each of the MPW Precinct catchments.

As noted throughout this report, the JN and JR facilities drain to and are managed by MPW Stormwater Management Basin 6 (**Figures C.1 & C.2**), as defined in the SDDR.

Basin 6 provides approximately 38,900m³ of active storage to limit the pre and post development runoff noted above and required of the CoC. The general layout and typical sections of Basin 6 have also been provided for information in **Figures D.1 and D.2** following.

Sizing of the MPW Precinct basins has been completed using DRAINS modelling software in accordance with the LCC Stormwater Detention Technical Handbook for the 1 in 1-year ARI to 1 in 100-year ARI storms for various durations. The modelling accounts for the drainage system provided for the adjacent sites and an assessment of the required drainage attenuation storage requirement has been completed and documented in the SDDR.

No changes to or additional stormwater quantity management measures are necessary for individual development lots within the MPW Precinct and as such none are proposed or required for the JN/JR Facilities. The ASDDR Compliance letter provided in **Annexure D** confirms the water quantity management objectives are met as a result of the proposed JNDC expansion.

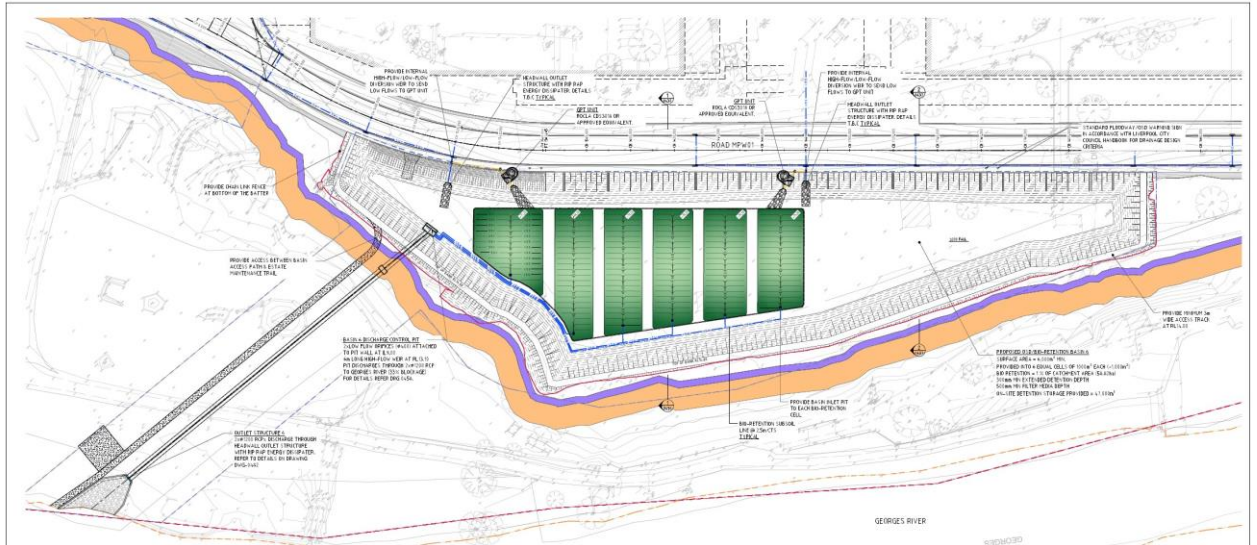


Figure D.1. Basin 6 Layout Plan (Source: Costin Roe Consulting SDDR 2019)

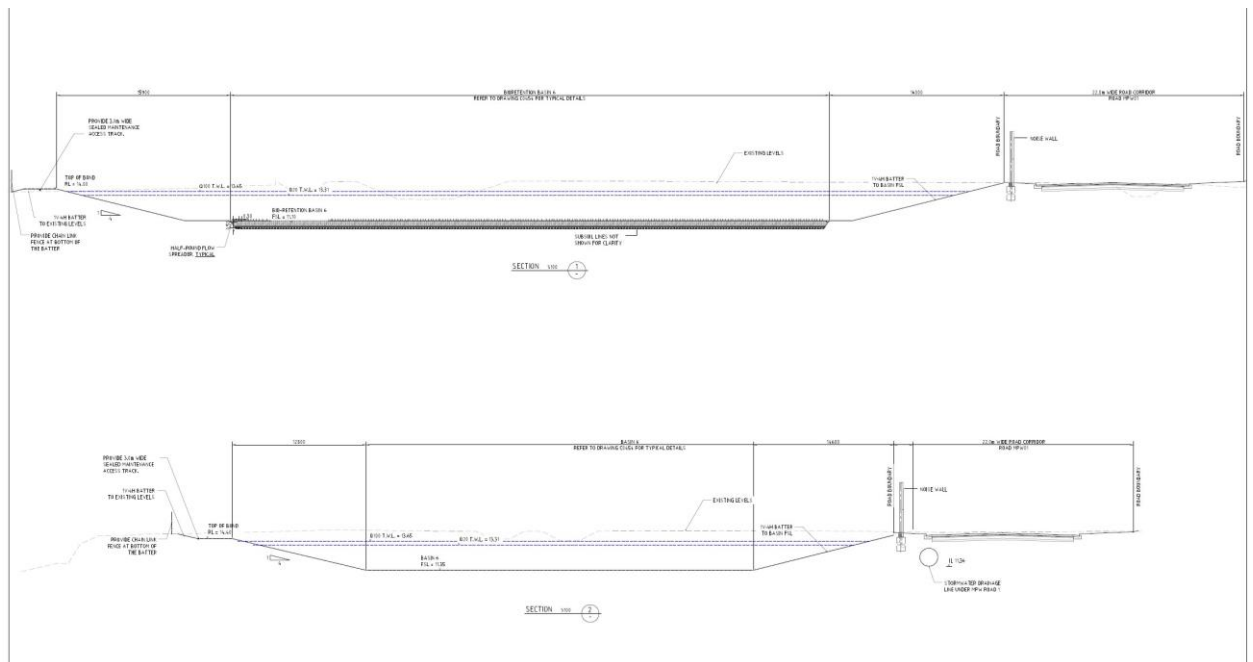


Figure D.2. Basin 6 Typical Sections (Source: Costin Roe Consulting SDDR 2019)

E STORMWATER QUALITY CONTROLS

E.1 Stormwater Management Objectives

There is a need to provide design which incorporates the principles of Water Sensitive Urban Design (WSUD) and to target pollutants that may be present in the stormwater so as to minimise the potential adverse impact these pollutants may have on receiving waters and to also meet the requirements specified by the Liverpool City Council and **CoC B14 to CoC B19**.

Stormwater quality will comprise a treatment train which meets the percentage-based pollution reduction objectives as per the consent condition, noting these reductions are greater than those required of Liverpool City Council DCP which require lesser reduction of Total Suspended Solids (80%) and Total Phosphorus (45%).

The water quality objectives for the **entire precinct development** are presented in terms of annual percentage pollutant reductions on a developed catchment per SSD7709 **CoC B14**:

Gross Pollutants	90%
Total Suspended Solids	85%
Total Phosphorus	65%
Total Nitrogen	45%
Total Hydrocarbons	90%

Water quality for the catchment will require provision of a treatment train including gross pollutant traps to surface drainage systems and filtration systems for final water polishing. Water quality measures will need to be provided for the whole of catchment in accordance with this document and the approved MPW stormwater management strategy.

It is noted that all stormwater quality management systems are completed at a precinct level, as set out in the SDDR (Refer **Figures C.1 & C.2**), as such no water quality management measures are proposed or required for this development.

It is noted that although no specific water quality measures are required as part of the development, due to the change in surface area types between the approved SDDR Masterplan and the Mod1 masterplan (noting that overall impervious areas are consistent), revised MUSIC modelling has been completed. With reference to **Annexure C**, and **Section E.2**, it has been confirmed that the approved MPW Precinct system meets the required pollution reduction objectives for the JN and JR Developments. The ASDDR Compliance letter provided in **Annexure D** confirms the water quality management objectives are met as a result of the proposed JNDC expansion.

E.2 Precinct Stormwater Treatment System

As part of the precinct system, extensive water management systems are proposed including a minimum bio-retention treatment area of 1% of the total catchment as further described in **Section E.3** below.

In order to meet the required pollution objectives, roof, hardstand, car parking, roads, other paved areas and landscaping areas are required to provide primary treatment by a Stormwater

Treatment Measure (STM's). The STM's are to be sized according to the whole catchment area of the contributing catchment (including this development site).

Components of the treatment train for the precinct development (as set out in the SDDR) comprise the following elements:

- Primary treatment to roofs, parking, truck hardstand and loading areas, and connecting roads is to be performed by Vortech type gross pollutant traps (GPT). The specified system is the Rocla CDS (or approved equivalent) and these have been designed to treat a minimum 6-month ARI flow, and are located upstream of the *Basin 6 Stormwater Management Basin*;
- Tertiary treatment is to be provided via estate-servicing bio-retention system located within the either dual-purpose open detention and bio-retention basins or bio-retention systems. As discussed previously the bio-retention systems have been designed with measures to enable these to remain effective whilst being located within the detention system. Measures include limiting depths of water in the 1% AEP event, providing flow spreaders, bypass high flows around bio-retention elements, limit cell size to 1000m² and maintain flow velocity to less than 0.4m/s. The specified bio-retention systems have been sized through MUSIC, and achieve the prescribed minimum area of 1% of the contributing catchment area being treated in the system;
- A portion of the roof will also be treated via rainwater reuse and settlement within building rainwater tanks. It is noted that we have not included rainwater reuse in the MUSIC model.
- Hydrocarbon removal to be achieved through treatment within the GPT and further within the bio-retention system.

Design of the bio-retention filtration area and GPT sizing required to meet the requirements of load-based pollution reduction objectives, has been based on MUSIC modelling and included in the SDDR. As noted in **Section E.1** revised MUSIC modelling has been completed. With reference to detailed modelling in **Annexure C**, and **Figures E.1 & E.2**, it has been confirmed that the approved MPW Precinct system meets the required pollution reduction objectives for the JN and JR Developments.

Reference also to **Figures D.1 and D.2** should be made for general configuration of Basin 6 and bio-retention elements.

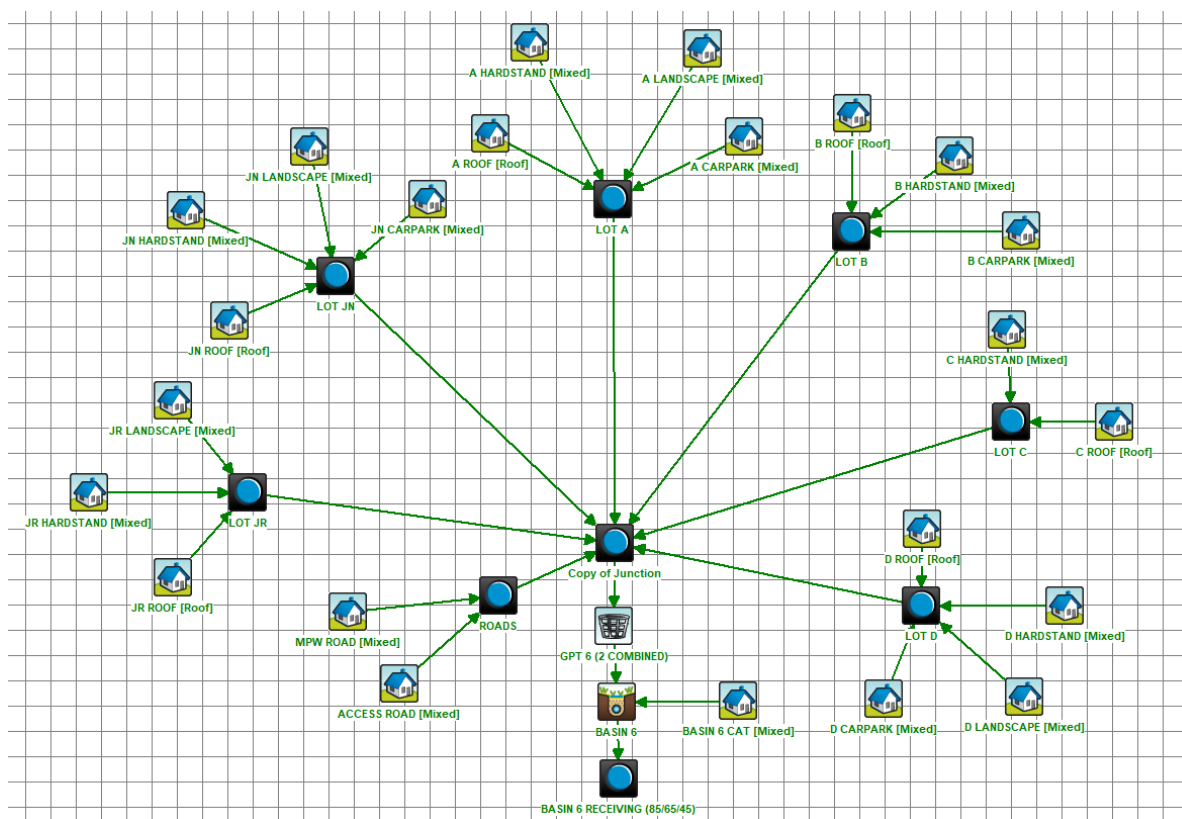


Figure E.1. MUSIC Model Layout

	Sources	Residual Load	% Reduction
Flow (ML/yr)	389	375	3.5
Total Suspended Solids (kg/yr)	66600	7880	88.2
Total Phosphorus (kg/yr)	135	38.6	71.3
Total Nitrogen (kg/yr)	882	401	54.5
Gross Pollutants (kg/yr)	9890	0	100

Figure E.2. MUSIC Model Results

E.3 Stormwater Harvesting

Stormwater harvesting refers to the collection of stormwater from the developments internal stormwater drainage system for re-use in non-potable applications. Stormwater from the stormwater drainage system can be classified as either rainwater where the flow is from roof areas, or stormwater where the flow is from all areas of the development.

For the purposes of this development, we refer to a rainwater harvesting system, where benefits of collected stormwater from roof areas over a stormwater harvesting system can be made as rainwater is generally less polluted than stormwater drainage.

Rainwater harvesting is proposed for this development with re-use for non-potable applications. Internal uses include such applications as toilet flushing while external applications will be used for irrigation. The aim is to reduce the potable water demand for the development by a minimum of 50% per the indicative outcomes for large storage projects *Table 2.1* of the Stormwater Trust Department of Environment & Conservation NSW document “*Managing Urban Stormwater – Harvesting and Reuse*”.

In general terms the rainwater harvesting system will be an in-line tank for the collection and storage of rainwater. At times when the rainwater storage tank is full rainwater can pass through the tank and continue to be discharged via gravity into the stormwater drainage system. Rainwater from the storage tank will be pumped for distribution throughout the development in a dedicated non-potable water reticulation system.

Rainwater tanks have been designed, using MUSIC software to balance the supply and demand, based on the below base water demands to provide 50% reduction in non-potable water demand.

E.3.1 Internal Base Water Demand

Indoor water demand has been based an allowance of 0.1kL/day/ toilet or urinal. No allowance is required for disable toilets. It is noted that for this assessment, the masterplan office configurations are being considered for rainwater reuse demand. It should be noted that these tanks will need to be appropriately sized during the detailed design phase of these developments.

The above rates result in the following internal non-potable demand:

JR	25 Toilets	2.5kL/day
JN	10 Toilets	1.0kL/day

The final number of toilets & subsequent re-use for the development shall be confirmed during detailed design.

E.3.2 External Base Water Demand

The external base water demand has been based on an allowance of 0.3kL/year/m² as PET-Rain for subsurface irrigation.

The above regime for the landscaped area for the site gives the following yearly outdoor water demand:

JR Irrigated Area (0.3kL/year/m ²)	15,500m ²	4,650 kL/year
JN Irrigated Area (0.3kL/year/m ²)	12,500m ²	3,750 kL/year

E.3.3 Rainwater Tank Sizing

The use of rainwater reduces the mains water demand and the amount of stormwater runoff. By collecting the rainwater run-off from roof areas, rainwater tanks provide a valuable water source suitable for flushing toilets and landscape irrigation.

Rainwater tanks have been designed, using MUSIC software to balance the supply and demand, based on the calculated base water demands and proposed roof catchment areas. Allowances in the MUSIC model have been made for high flow bypass which will be managed by a dual high flow (225mm downpipe) and low flow (100mm downpipe) roofwater collection configuration along a portion of the southern elevation of the warehouse. The final configuration, including the arrangement of downpipes shall be sized and confirmed by the hydraulic engineering consultant during the detailed design of individual warehouses.

Building	Roof Catchment (m ²)	Highflow Bypass (l/s)	Tank Size in MUSIC (kL)	Predicted Demand Reduction (%)	Estimated Tank (kL)
JR	12,280	100	110	50.00	110
JN	10,390	100	80	50.00	80

Table 5.4. Rainwater Reuse Requirements

The MUSIC model, results summarised in **Table 5.4**, predicts that the targeted demand reduction (50% reduction in non-potable water demand) will be met for the developments.

We note that the final configuration and sizing of the rainwater tanks is subject to detail design considerations and optimum site utilisation.

E.4 Stream Erosion Index

A Stream Erosion Index (SEI) assessment have been completed for the MPW Precinct, in accordance with the methodology set out in the Draft NSW MUSIC Modelling Guide (Aug 2010). The assessment is targeting the post development duration of stream forming flows to be between 3.5-5.0 times the pre-development duration of stream forming flows.

As discussed in earlier sections of this report, the proposed site forms part of *Catchment 6* and drains to *Stormwater Management Basin 6*. The SEI for the *Catchment 6* development area has been calculated at 3.2 per **Table 5.4** of the **SDDR**. This can be seen to be below the maximum allowable target of 5.0, hence the requirements of the SEI assessment have been met. Given there is no discernible change to the overall impervious areas as a result of the JN/JR development there is no change to the SEI or updated modelling necessary.

F CONCLUSION

This *ASDDR* and associated concept civil engineering drawings have been prepared for Woolworths for the construction of two automated facilities within the Moorebank Logistic Park development Moorebank Precinct West Development site.

This report provides information to confirm the stormwater management and civil engineering for the development has been completed in accordance with accepted design and policy, and in accordance with the requirements and management measures defined in the *SDDR* approved under State Significant Development Application SSD 7709.

A civil engineering strategy for the project has been developed which provides a best practice solution within the constraints of the existing landform and proposed precinct layout and ultimate constructed arrangement. Within this design a stormwater management strategy, which integrates WSUD and WCM measures set out in SSD 7709, has been developed to consistent with the precinct masterplan requirements and *SDDR*.

The proposed building development considers the infrastructure and site servicing designs completed and submitted as part of separate development approvals to DP&E including earthworks and erosion and sediment controls.

We recommend the strategy set out in this concept plan are adopted as part of future detailed design documents for the facility.

G REFERENCES

- Development Control Plan (2014), Liverpool City Council
- Design Specification Series D1-D9, Liverpool City Council
- Water Sensitive Urban Design – Technical Guidelines for Western Sydney (May 2004), URS Australia Pty Ltd
- Managing Urban Stormwater, Soils and Construction (1998) – The Blue Book, Landcom
- Managing Urban Stormwater: Soils and Construction – Installation of Services, Volume 2A (OEH 2008)
- Managing Urban Stormwater: Soils and Construction – Main Road Construction, Volume 2D (OEH 2008)
- Managing Urban Stormwater: Harvesting and Reuse – 2006 (NSW DEC)
- Managing Urban Stormwater: Source Control – 1998 (NSW EPA)
- Managing Urban Stormwater: Treatment Techniques – 1997 (NSW EPA)
- Rock Sizing for Multi-Pipe & Culvert Outlets (2017), Catchment & Creeks Pty Ltd.

Annexure A

DRAWINGS BY COSTIN ROE CONSULTING

JANUS NATIONAL & JANUS REGIONAL

MOOREBANK AVENUE, MOOREBANK, NSW

STORMWATER DESIGN DEVELOPMENT REPORT MODIFICATION

DRAWING LIST

DRAWING NO.	DRAWING TITLE
C013455.16-MOD-C01	DRAWING LIST AND GENERAL NOTES
C013455.16-MOD-C02	MOOREBANK WESTERN PRECINCT ESTATE CATCHMENT PLAN
C013455.16-MOD-C03	SDDR MOD STORMWATER MASTERPLAN
C013455.16-MOD-C04	OSD BASIN 6 MUSIC CATCHMENT PLAN

GENERAL NOTES:

- G1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- G2 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
- G3 ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS. ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
- G4 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
- G5 UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
- G6 ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

STORMWATER DRAINAGE NOTES:

1. ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500.3: PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE.
2. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
3. ALL FINISHED PAVEMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS.
4. PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
5. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
6. ALL STORMWATER PIPES, UNDER ESTATE ROADS & ITV/AGV PAVEMENTS, Ø375 OR GREATER SHALL BE CLASS 4 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
7. ALL STORMWATER PIPES, UNDER WAREHOUSE PAVEMENTS, Ø375 OR GREATER SHALL BE CLASS 2 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
8. ALL PIPES UP TO AND INCLUDING Ø300 TO BE uPVC GRADE SN8 UNO.
9. PIPE CLASS NOMINATED ARE FOR IN-SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
10. ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F'c 25 MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
11. ALL CONCRETE PITS IN ESTATE ROADS & CONTAINER AREAS SHALL BE CAST IN-SITU PITS REINFORCED USING N16-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F'c 25 MPa.
12. IN ADDITION TO ITEM 10 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
13. IN ADDITION TO ITEM 11 ABOVE, ALL CONCRETE PITS GREATER THAN 2000mm DEEP IN ESTATE ROADS & CONTAINER AREAS SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 250mm.
14. PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EDGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
15. CONCRETE PIPES UNDER, OR WITHIN THE ZONE OF INFLUENCE OF PAVED AREAS SHALL BE LAID USING HS2/HS3 TYPE SUPPORT, AS A MINIMUM, IN ACCORDANCE WITH AS 3725. AGGREGATE BACKFILL SHALL NOT BE USED FOR PIPE BEDDING AND OR HAUNCH/SIDE SUPPORT.
16. WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED Ø100 uPVC TO EACH SIDE OF PIPE.
17. ALL SUBSOIL DRAINAGE LINES SHALL BE Ø100 SLOTTED uPVC WITH APPROVED FILTER WRAP LAID IN 300mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOIL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOIL LINES TO ALL PAVEMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN. SUBSOILS UNDER CONTAINER AREAS TO BE GRADE SN10 & BACKFILLED WITH NO-FINES CONCRETE.
18. ALL PIPE GRADES 1 IN 100 MINIMUM UNO.
19. PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
20. MIN. 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AND PEDESTRIAN AREAS.
21. PIT COVERS IN SHUTTLE ROAD PAVEMENT SHALL BE CLASS G 'EXTRA HEAVY DUTY'; PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY'; THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' UNO.
22. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
23. DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTOR TO MATCH DP SIZE U.N.O. ON PLAN. PROVIDE CLEANING EYE AT GROUND LEVEL.
24. PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND DO NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.



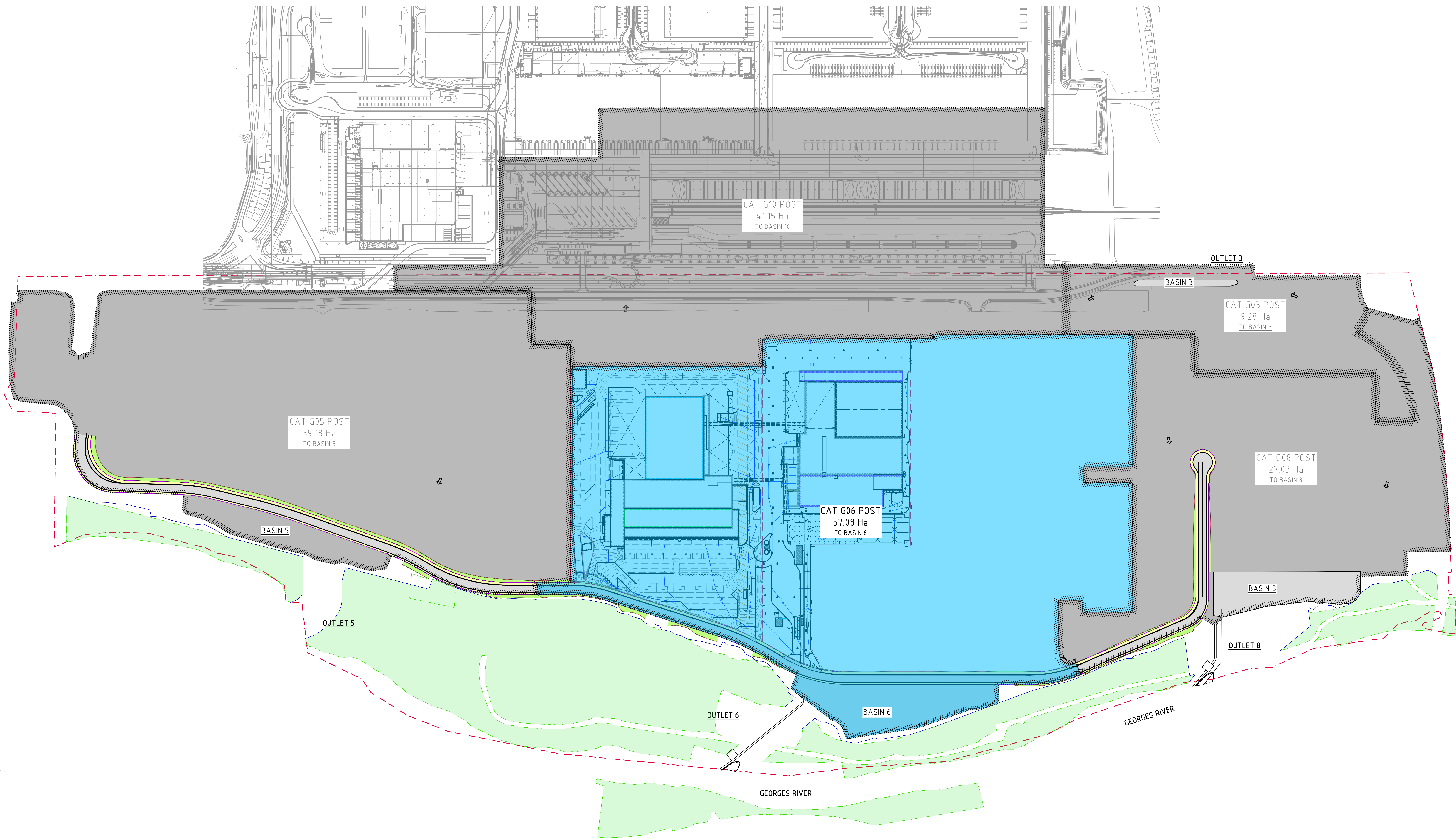
FOR APPROVAL

ISSUED FOR INFORMATION			16.03.21			A			AMENDMENTS			DATE			ISSUE		
AMENDMENTS			DATE			ISSUE			DATE			ISSUE			DATE		
AMENDMENTS			DATE			ISSUE			DATE			ISSUE			DATE		

DEVELOPER		ARCHITECT		CLIENT		PROJECT		COSTIN ROE CONSULTING PTY LTD.		DRAWING TITLE	
						JANUS NATIONAL & REGIONAL MOOREBANK PRECINCT WEST MOOREBANK, NSW				DRAWING LIST AND GENERAL NOTES	
C013455.16-MOD-C01		C013455.16-MOD-C01		C013455.16-MOD-C01		C013455.16-MOD-C01		C013455.16-MOD-C01		C013455.16-MOD-C01	

PRECISION	COMMUNICATION	ACCOUNTABILITY
-----------	---------------	----------------

ISSUE	A
-------	---



LEGEND:
LEVELS DATUM IS AHD.
EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY "115804500 REV.22" BY "CARDNO" DATED 12/10/2017.

- MPW SITE BOUNDARY
- OPERATIONAL BOUNDARY
- CATCHMENT AREA
- FLOW DIRECTION
- BIO-BANKING AREA

STORMWATER CATCHMENT PLAN - POST DEVELOPMENT
1:1000 SCALE

FOR APPROVALS

10m 0 10 20 30 40 50 60 70 80 90 100m
SCALE 1:1000 AT A0 SIZE SHEET

ISSUED FOR APPROVALS	09.09.22	B
ISSUED FOR APPROVALS	16.03.21	A
AMENDMENTS	DATE	ISSUE

DEVELOPER


ARCHITECT
REID CAMPBELL Architecture, Interiors, Project Management 40-42 Old Street, Sydney, NSW 2000 Tel: 61 2 9551 9511 Email: reidcampbell@reidcampbell.com Fax: 61 2 9551 9511 Web: www.reidcampbell.com

CLIENT

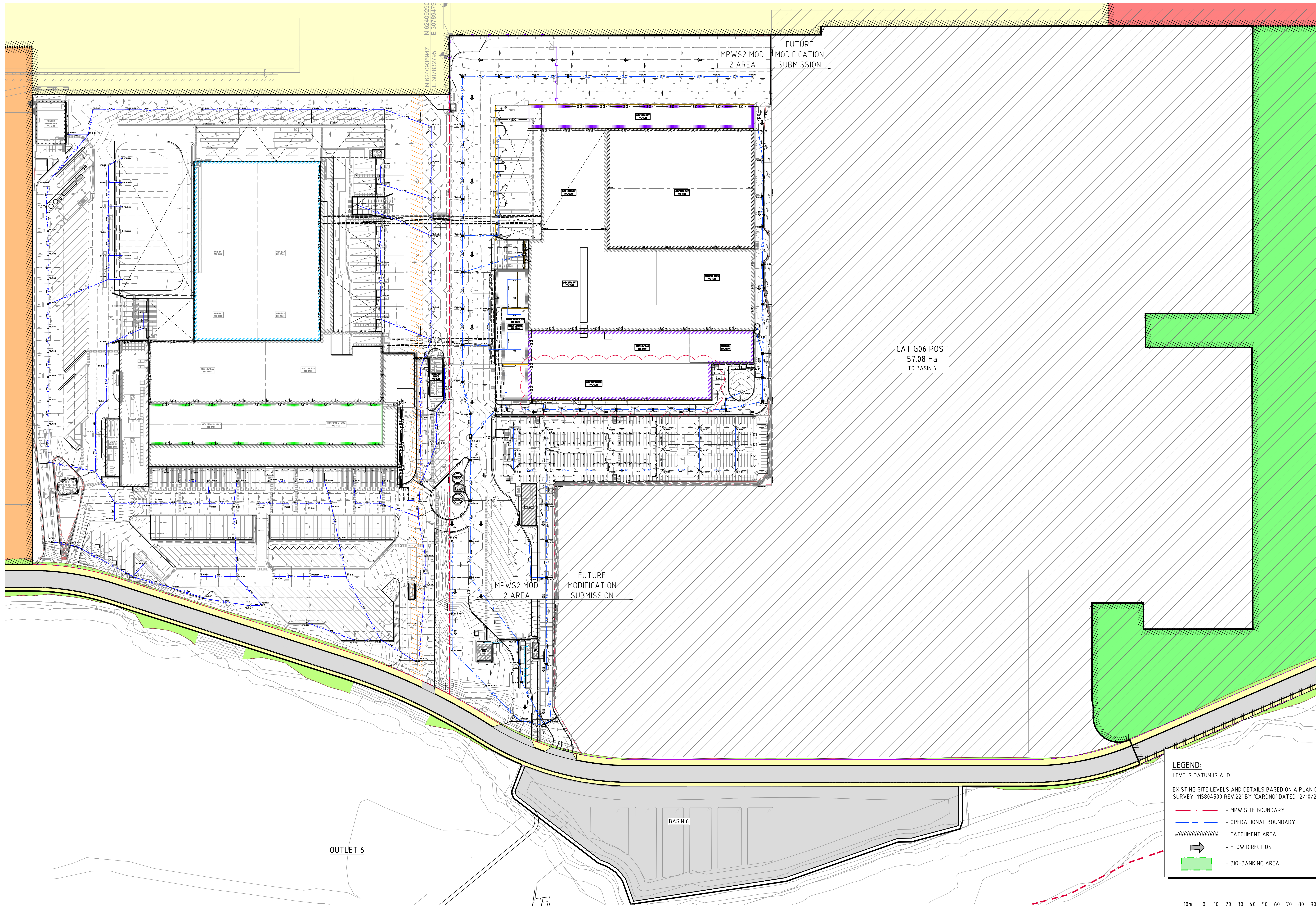

PROJECT
JANUS NATIONAL & REGIONAL MOOREBANK PRECINCT WEST MOOREBANK, NSW

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
DS	DM	NOV 19	PLW	A0	AS SHOWN	C013455.16-MOD-C02

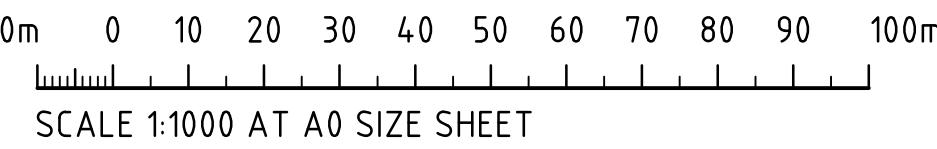
Costin Roe Consulting Pty Ltd. Consulting Engineers Level 1, 8 Windmill Street Wahah Bay, Sydney NSW 2000 Tel: (02) 9251-7699 Fax: (02) 9241-3731 email: mail@costinroe.com.au ©

Costin Roe Consulting
PRECISION COMMUNICATION ACCOUNTABILITY

DRAWING TITLE
MOOREBANK WESTERN PRECINCT ESTATE CATCHMENT OKAN
DRAWING No.
C013455.16-MOD-C02
ISSUE
B



- LEGEND:**
LEVELS DATUM IS AHD.
- EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY '115804500 REV.22' BY 'CARDNO' DATED 12/10/2017.
- MPW SITE BOUNDARY
 - OPERATIONAL BOUNDARY
 - CATCHMENT AREA
 - FLOW DIRECTION
 - BIO-BANKING AREA



STORMWATER CATCHMENT PLAN - POST DEVELOPMENT
1:1000 SCALE

FOR APPROVALS

ISSUED FOR APPROVALS			09.09.22			B						DEVELOPER						ARCHITECT						CLIENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ISSUED FOR APPROVALS			16.03.21			A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</		

SUB-CATCHMENTS - MUSIC		
NO.	CATCHMENT AREA (Ha)	
CAT 6-JR-ROOF	6.416	
CAT 6-JR-LANDSCAPE	1.052	
CAT 6-JR-HARDSTAND	7.068	
CAT 6-JR-CARPARK	-	
CAT 6-JN-ROOF	5.017	
CAT 6-JN-LANDSCAPE	1.551	
CAT 6-JN-HARDSTAND	3.995	
CAT 6-JN-CARPARK	1.372	
CAT 6-A-ROOF	5.206	
CAT 6-A-LANDSCAPE	0.289	
CAT 6-A-HARDSTAND	3.057	
CAT 6-A-CARPARK	1.077	
CAT 6-B-ROOF	2.764	
CAT 6-B-LANDSCAPE	-	
CAT 6-B-HARDSTAND	0.666	
CAT 6-B-CARPARK	0.077	
CAT 6-C-ROOF	2.689	
CAT 6-C-LANDSCAPE	-	
CAT 6-C-HARDSTAND	0.731	
CAT 6-C-CARPARK	-	
CAT 6-D-ROOF	5.246	
CAT 6-D-LANDSCAPE	1.044	
CAT 6-D-HARDSTAND	2.219	
CAT 6-D-CARPARK	0.168	
CAT 6-MPW ROAD	2.249	
CAT 6-ACCESS ROAD	0.891	
CAT 6-BASIN	2.434	

LEGEND:	
	- HARDSTAND (100% IMPERVIOUS)
	- ROAD/CARPARK (90% IMPERVIOUS)
	- WAREHOUSE/OFFICE ROOF (100% IMPERVIOUS)
	- LANDSCAPE (100% PERVIOUS)
	- BASIN (100% PERVIOUS)
	- PORTION OF ROOF TO RAINWATER TANK



Annexure B

CONSENT COMPLIANCE MATRIX

CoC	Response
B4	<u>Revised Stormwater System Design</u> <i>Prior to the commencement of construction, the Applicant must submit a Stormwater Design Development Report and Revised Stormwater System Design Drawings and supporting documentation to the Planning Secretary for approval.</i> <u>Response</u> This document forms an addendum to the approved SDDR, associated revised stormwater drawings and supporting documents. Refer to Annexure A should be made for a full set of the proposed design drawings associated with the ASDDR, Sections A through F of this ASDDR, and Sections 1 through 9 of the SDDR for supporting documentation. This ASDDR is to be read in conjunction with the approved SDDR.
B5	<i>The Stormwater Design Development Report must document how WSUD principles outlined in Condition B9 have been incorporated into the design and operation of the development.</i> <u>Response</u> WSUD principles for the JN and JR Facilities are noted to be consistent with the approved SDDR and MPW stormwater drainage system. Relevant WSUD principles have been incorporated into the design and operation of the development as required of CoC B5 and CoC B9. Reference to Sections C, D and E of this ASDDR and detailed responses set out for CoC B9 should be made for confirmation of how WSUD principles have been integrated in the design.
B6	<i>To ensure the site will be developed in an integrated manner and that the whole development will comply with the conditions of this consent, submission of the Stormwater Design Development Report and Revised Stormwater System Design Drawings and supporting documentation required by Condition B4 cannot be staged.</i> <u>Response</u> The design, report and proposed stormwater management documentation is noted to not be staged per the requirements of the CoC and approved Mod1.
B7	<u>Stormwater Design Independent Peer Review</u> <i>An Independent Peer Review report must be submitted with the Stormwater Design Development Report and Revised Stormwater System Design Drawings and supporting documentation</i> <u>Response</u>

CoC	Response
	A peer review has been undertaken by <i>AT&L Consulting Engineers (AT&L)</i> . Refer separate conformance letter by AT&L.
B8 <i>Item (a)</i>	<i>The review must:</i> <i>include a review of the numerical models used to develop the revised stormwater design;</i> <u>Response</u> The peer review undertaken by <i>AT&L Consulting Engineers</i> includes assessment of numerical modelling. The model reviews include the DRAINS hydrologic and hydraulic model (for inground drainage and overland flow) and MUSIC modelling (for water quality and WSUD requirements).
B8 <i>Item (b)</i>	<i>be undertaken by a technical expert, approved by the Planning Secretary, with over 15 years of experience in stormwater, flooding and water quality in NSW, including Water Sensitive Urban Design (WSUD), and not previously involved in preparation of drainage, flooding or hydrological designs or assessments for either MPW or MPE, or construction of either MPW or MPE; and</i> <u>Response</u> The peer review has been undertaken by AT&L under direction of Mr Anthony McLandsborough (Director) and Mr Andrew Tweedie (Associate Director). Both of these civil engineers have more than 15-years-experience in stormwater, flooding and water quality in NSW, including Water Sensitive Urban Design (WSUD), and have not been previously involved in design, assessment or construction of MPW or MPE. AT&L completed the peer review of the SDDR, and the appointment of AT&L for the SDDR review was approved by the DPIE in their letter dated 10 February 2020.
B8 <i>Item (b)</i>	<i>include an assessment of the Revised Stormwater System Design Drawings and supporting documentation against all relevant conditions, stating whether the condition has been satisfied, and comments justifying the position.</i> <u>Response</u> The peer review undertaken by AT&L Consulting Engineers includes an assessment of the Revised Stormwater System Design Drawings (as relevant to the JN & JR Development) and supporting documentation against all relevant conditions. The review confirms and justifies the relevant conditions have been satisfied.

CoC	Response
B9	Water Sensitive Urban Design (WSUD) <i>The revised stormwater system design, to be detailed in the Stormwater Design Development Report and Revised Stormwater System Design Drawings and supporting documentation, must be consistent with the objectives and principles set out in the NSW Office of Water's Guidelines for Controlled Activities and incorporate water sensitive urban design principles outlined in relevant Council policies, plans, guidelines and specifications and RMS's Water Sensitive Urban Design Guideline 2017, including:</i> <u>Response</u> The stormwater management strategy for the JN and JR Facilities in this ASDDR has been completed in accordance with the approved MPW precinct strategy, as set out in the approved SDDR and supporting drawings and documentations. There are no works within 40m of the Georges River associated with the JN and JR Facilities, hence no requirements associated with the <i>NSW Office of Water's Guidelines for Controlled Activities</i>. Reference to the approved SDDR Section 3.6 and drawings PIWW-COS-CV-DWG-0481-486 should be made for details of stormwater outlets to Georges River and waterfront requirements. WSUD elements, consistent with the approved SDDR, have been integrated into the design where practical. Measures noted in the ASDDR have been made as set out per the objectives included in SDDR Section 3 and ASDDR Section C, and confirmed per measures set out in Sections D & E of the ASDDR. Elements include frequent flow management via a (Stream Erosion Index assessment), stormwater quantity management, stormwater quality management (through a treatment train of proprietary and natural stormwater quality improvement devices including gross pollutant traps, bio-retention systems, buffer zones, sediment forebays), and rainwater reuse for each buildings non-potable water uses (including toilet flushing and landscape watering) remain consistent with the approval.
B9 Item (a)	<i>treating stormwater as a resource;</i> <u>Response</u> Consideration to treating stormwater as a resource has been made through the use of rainwater reuse with the objective of reducing demand on potable water through non-potable uses including toilet flushing, landscaping irrigation, wash areas and similar non-potable reuse. The demand reduction adopted for the development is 50% in accordance with <i>Table 2.1</i> of the Stormwater Trust Department of Environment & Conservation NSW document "<i>Managing Urban Stormwater – Harvesting</i>

CoC	Response
	<i>and Reuse”</i> . Reference to Section E.7 should be made for details pertaining to rainwater reuse and harvesting.
<i>B9 Item (b)</i>	<i>mimicking natural processes in the control of stormwater;</i> <u>Response</u> Control of stormwater quantity for the JN and JR Facilities is noted to be managed by MPW precinct Basin 6. The stormwater management system, set out in the SDDR, has been approved to mimic natural processes prior to discharge from the site to receiving waters. The MPW detention systems manage water quantity such that post-development flows, increased through increased impervious surfaces, are limited to pre-development flows. Further a stream erosion assessment has been completed to ensure that the duration of stream forming flows is within acceptable ranges of 3.5-5.0 with a stretch target of 1. Further, stormwater quality is managed through natural bio-retention systems which treat pollutants in runoff such as sediments and nutrients. Refer Sections 3, 4 and 5 of the SDDR for details. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B9 Item (c)</i>	<i>integrating drainage infrastructure and landscaping;</i> <u>Response</u> Drainage infrastructure and landscaping has been integrated where practical on the JN and JR Development site. Key stormwater management systems are noted to be external to the subject area of the ASDDR. Within the development boundary, landscaping features front the site and are integrated into the development footprint and drainage elements. Refer drawings in Annexure A.
<i>B9 Item (d)</i>	<i>managing water in a sustainable manner through considering the complete water cycle; and</i> <u>Response</u> Consideration of the complete water cycle has been made in the design and details pertaining to water cycle management and are consistent between the SDDR and ASDDR. Refer to Section 3, and associated Sections 4 and 5 of the SDDR and Section C, and associated Sections D and E of the ASDDR.
<i>B9 Item (e)</i>	<i>considered design, construction and maintenance to minimise impacts on the natural water cycle.</i> <u>Response</u>

CoC	Response
	Consideration of the design construction and maintenance for the JN and JR facility, has been made consistent with the SDDR. Details pertaining to water cycle management can be found in Section 3, and associated Sections 4 and 5 of the SDDR and Section C, and associated Sections D and E of the ASDDR. Further, during construction, a SWMP and associated soil and erosion controls will be implemented by the contractor. Refer to the contractors CEMP and separate CSWMP report by Costin Roe Consulting, Co13455.07-03.rpt, and the Addendum to the CSWMP specific to the JN/JR Facilities.
<i>B10</i>	<i>The Applicant must submit revised drawings and supporting documentation to the Planning Secretary for approval, in accordance with the design principles and design criteria listed in Conditions B11 to B22.</i> <u>Response</u> This ASDDR and revised stormwater drawings confirm how the criteria listed in CoC B11 to B22 have been met as outlined below.
<i>B11</i>	<u>Piped Stormwater Drainage and Overland Flow Paths</u> <i>The stormwater system must be designed to:</i>
<i>B11 Item (a)</i>	<i>convey flows up to and including the 10% AEP event within the formal piped drainage system, with flows from the 10% AEP to the 1% AEP event conveyed in controlled overland flow paths; and</i> <u>Response</u> The design of the inground drainage system has been based on a 5% AEP event (refer Section E.3). The adopted 5% AEP provides a better operational outcome for the proponent and is more consistent with industry practice for industrial and intermodal facilities. The lower AEP will provide a higher level of service for the users of the facility resulting in less probability of nuisance flooding or ponding within roadways and gutters. We confirm the flows greater than the 5% AEP and up to the 1% AEP have been allowed for in controlled overland flow paths. These generally align with roadways or other dedicated flow paths between buildings. All 1% AEP flow paths are directed toward respective detention systems. Refer Section E.3 and drawings in Annexure A.
<i>B11 Item (b)</i>	<i>provide adequate overland flow paths in the event of stormwater system blockages and flows in excess of the 1% ARI rainfall event.</i> <u>Response</u>

CoC	Response
	We confirm that consideration to overland flow paths for storms greater than the 1% AEP have been allowed for in the design in controlled overland flow paths. These paths align with the dedicated flow paths provided for the 1% AEP event noted in response Item (a) above. Refer Section E.3 and drawings in Annexure A.
B12	<u>On-site Detention</u> <i>On-site detention (OSD) must attenuate peak flows from the development such that both the:</i>
B12 Item (a)	<i>1 in 1-year ARI event post development peak discharge rate is equivalent to the pre-development (un-developed catchment) 1 in 1-year ARI event; and</i> <u>Response</u> We confirm the 1 in 1-year ARI event post development peak discharge rate is equivalent to the pre-development (un-developed catchment) 1 in 1-year ARI event as confirmed in Section 4 of the SDDR and Section D of the ASDDR. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
B12 Item (b)	<i>1 in 100-year ARI event post development peak discharge rate is equivalent to the pre-development (un-developed catchment) 1 in 100-year ARI event.</i> <u>Response</u> We confirm the 1 in 100-year ARI event post development peak discharge rate is equivalent to the pre-development (un-developed catchment) 1 in 100-year ARI event as confirmed in Section 4 of this SDDR and Section D of the ASDDR. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
B13	<i>OSD basins must:</i>
B13 Item (a)	<i>be visually unobtrusive and sit within the final landform and landscaping</i> <u>Response</u> There are no basins required for the JN/JR Facilities. Refer to SDDR for confirmation of the OSD basins being unobtrusive, fitting into natural topography and landscaping. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.

CoC	Response
<i>B13</i> <i>Item (b)</i>	<i>ensure public safety by incorporation of 'safety by design' principles;</i> <u>Response</u> There are no basins required for the JN/JR Facilities. Refer to SDDR for confirmation of the OSD basins being designed safely. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B13</i> <i>Item (c)</i>	<i>have all sides with a maximum batter slope of 1V:4H.</i> <u>Response</u> There are no basins required for the JN/JR Facilities. Refer to SDDR for confirmation of the OSD basins being designed with batter slopes of all basins adopted maximum batter slopes of 1V:4H. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B14</i>	<u>Stormwater Quality</u> <i>All stormwater quality elements are to be modelled in MUSIC as per the NSW MUSIC Modelling Guide.</i> <u>Response</u> Stormwater quality elements have been modelled in MUSIC as per the NSW MUSIC Modelling Guide. Refer Section E and Annexure C of this report for details of updated MUSIC modelling and confirmation of achieving required water quality objectives. It is noted that updated modelling has been completed due to the change in surface area types, though noting that overall impervious areas remain consistent between the SDDR and ASDDR.
<i>B15</i>	<i>The stormwater quality infrastructure must comprise rainwater tanks, gross pollutant traps and biofiltration/ bioretention systems designed to meet the following criteria compared to a base case if there were no treatment systems in place:</i> <i>(a) reduce the average annual load of total nitrogen by 45%;</i> <i>(b) reduce the average annual load of total phosphorus by 65%; and</i> <i>(c) reduce the average annual load of total suspended solids by 85%.</i> <u>Response</u> We confirm the pollution reduction objectives noted in CoC B15 (a) to (c) have been met as confirmed in Section E.5 and Annexure C of this ASDDR.

CoC	Response
<i>B16 (a)-(c)</i>	<i>All stormwater quality elements must be installed upstream of OSD basins, unless it can be demonstrated to the satisfaction of the Secretary that biofiltration/ bioretention systems within the OSD basins:</i> <i>(a) will not suffer damage from design flows;</i> <i>(b) can be maintained to achieve the water quality criteria; and</i> <i>(c) will have adequate solar access ensuring that all bioretention systems are exposed to sunlight at midday on the winter solstice. This assessment is to include surrounding features of OSD basins, including but not limited to actual building heights and full mature height and size of proposed trees, as per the landscape plans.</i> <u>Response</u> There are no additional water quality elements, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B17</i>	<i>The area of biofiltration/ bioretention systems is to be at least 1% of the catchment draining to the system, to ensure there is no short-circuiting of the system.</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B18</i>	<i>Bioretention systems which are greater than 1,000 m² in area, are to be divided into cells with no individual cell greater than 1,000 m².</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B19</i>	<i>All filter media used in stormwater treatment measures must:</i>

CoC	Response
<i>B19 Item (a)</i>	<i>be loamy sand with an appropriately high permeability under compaction and must be free of rubbish, deleterious material, toxicants, declared plants and local weeds, and must not be hydrophobic;</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B19 Item (b)</i>	<i>have an hydraulic conductivity = 100-300 mm/hr, as measured using the ASTM F1815-06 method;</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B19 Item (c)</i>	<i>have an organic matter content less than 5% (w/w); and</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B19 Item (d)</i>	<i>be provided adequate solar access, considering the design and orientation of OSD basins.</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to OSD basins. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B20</i>	Stormwater Outlet Structures

CoC	Response
	<i>Discharge of stormwater from the development must not cause scour/ erosion of the banks or bed, or pollution of the Georges River or Anzac Creek.</i> Note: Pollution of waters as defined under section 120 of the POEO Act. <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B21	<i>Outlet structures for the discharge of site stormwater drainage to the Georges River, Anzac Creek, external drainage or natural drainage lines must be constructed of natural materials to minimise erosion, facilitate natural geomorphic processes and include vegetation as necessary (gabion baskets and gabion mattresses are not acceptable).</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B22	<i>Outlet structures must ensure habitat connectivity and wildlife movement is maintained along the Georges River riparian corridor.</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B23	<u>Stormwater System Design Drawings</u> <i>The Revised Stormwater System Design Drawings and supporting information to be submitted under Condition B4 must include the details specified in Conditions B24 to B28.</i> <u>Response</u>

CoC	Response
	Refer to Annexure A of this ASDDR for engineering design drawings which include the details specified in CoC B24 to B28 relating to the JN/JR Development. Refer to Appendix A of the SDDR should be made pertaining to overall precinct information.
B24	<i>Drawings must show:</i>
B24 Item (a)	<i>all information on a drainage catchment plans and a schedule of stormwater drainage elements (pipelines and structures). Drainage drawing documentation is to be in accordance with the requirements detailed in Liverpool Council's Development Design Specification "D5 – Stormwater drainage design" clauses D5.22 and D5.24;</i> <u>Response</u> Refer to Annexure A for engineering design drawings which include the details specified noted in the CoC above. Drawings show confirmation of the catchments being consistent between the SDDR and ASDDR. We confirm proposed public infrastructure has been designed in accordance with Liverpool City Council's <i>Development Design Specification "D5 – Stormwater drainage design" clauses D5.22 and D5.24.</i>
B24 Item (b)	<i>location and width of controlled overland flow paths;</i> <u>Response</u> Refer to drawings in Annexure A for engineering design drawings which include the details specified noted in the CoC above, as they relate to the ASDDR and the JN/JR development.
B24 Item (c)	<i>maximum design flow levels to AHD;</i> <u>Response</u> Refer to drawings in Annexure A for engineering design drawings which include the details specified noted in the CoC above, as they relate to the ASDDR and the JN/JR development.
B24 Item (d)	<i>maintenance access to each on OSD basin; and</i> <u>Response</u> Refer to the approved SDDR and drawing PIWW-COS-CV-DWG-0481 & 0483 for engineering design drawings which include the details specified noted in the CoC above.
B24	<i>the integration with MPE Stage 1 and MPE Stage 2 stormwater infrastructure including:</i>

CoC	Response
Item (e)	
	(i) stormwater infrastructure on the MPW site that is intended to convey (pipes or overland flow paths) or treat or detain stormwater from MPE Stage 1 and MPE Stage 2, and/ or <u>Response</u> Refer to the approved SDDR. No systems relating to MPE are required nor included in documentation, including in this ASDDR and associated documentation.
	(ii) drawings demonstrating that stormwater detention and treatment infrastructure has been provided for and approved under MPE Stage 1 and MPE Stage 2 for western draining MPE catchments <u>Response</u> Refer to the approved SDDR.
B25	All stormwater quality elements are to be detailed in the drawings including:
B25 Item (a)	general arrangement plans at 1:500 and detailed plans as required at 1:200, showing system layout with key features including pipe arrangement with pipe sizes, diversion structure, high flow bypass, pre-treatment system, inlets, outlets, underdrainage, and maintenance vehicular access. The plans must show how the bioretention system will achieve separate cells of a maximum area of 1000 m² with flow splitting; <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to bio-retention elements. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
B25 Item (b)	long and cross sections showing key features and levels including liner (base level of bioretention system), submerged zone level, drainage layer, transition layer, filter surface level, extended detention level, bund/ embankment level, and level of detention storage; <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation

CoC	Response
	of the water quality elements and arrangements in relation to bio-retention elements. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B25</i> <i>Item (c)</i>	<i>pipe long sections, including invert levels, pipe sizes;</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to bio-retention elements. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B25</i> <i>Item (d)</i>	<i>details of key structures including diversion, pre-treatment system (make/model), inlets, outlets;</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to bio-retention elements. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
<i>B25</i> <i>Item (e)</i>	<i>landscape plan including plant species;</i> <u>Response</u> Drawings have been coordinated with Ground Ink Landscape Architecture drawings. Refer to Ground Ink Landscape Architecture for landscape plans and plant species specification included in Appendix I.
<i>B25</i> <i>Item (f)</i>	<i>specification of filter media; and</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to bio-retention elements. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.

CoC	Response
B25 Item (g)	<i>shadow diagrams, including surrounding features of OSD basins, actual building heights and full size of proposed trees, as per the landscape plans.</i> <u>Response</u> There are no additional water quality element, or changes to water quality elements, required for the JN/JR Facilities. Refer to SDDR for confirmation of the water quality elements and arrangements in relation to bio-retention elements, basins and shadow diagrams. There are no changes to the approved MPW Precinct Basin 6 or the SDDR required for the JN and JR Facilities.
B26	<i>Stormwater outlet drawings must show:</i>
B26 Item (a)	<i>material type, size, thickness, with accompanying hydraulic calculations demonstrating the achievement of relevant stability thresholds;</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B26 Item (b)	<i>design arrangement including longitudinal sections, cross sections and typical arrangements;</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B26 Item (c)	<i>typical arrangements including details of any liners, keying into bed/ banks and filter material; and</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.

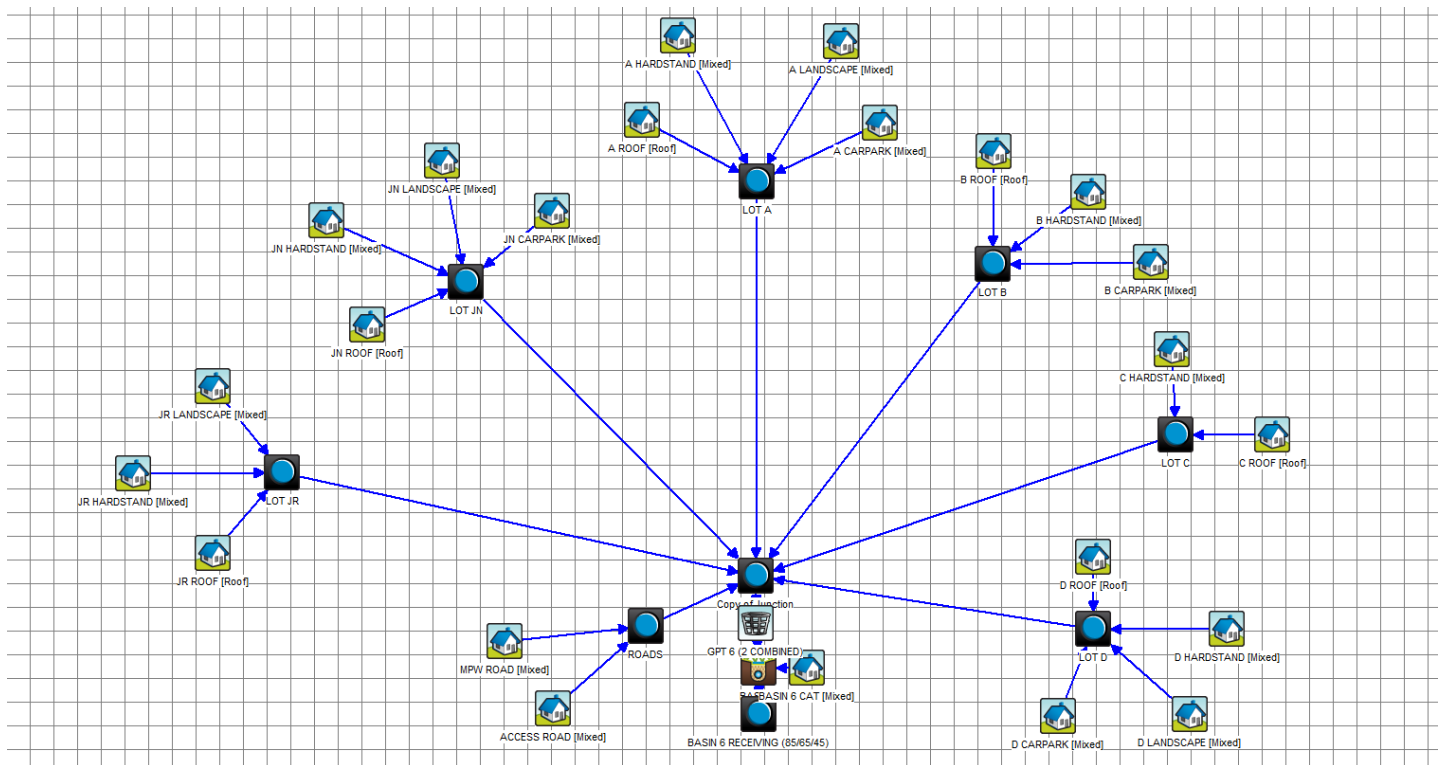
CoC	Response
B26 Item (d)	<i>the tie in with the receiving water normal water level and/ or seasonal low flow levels</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B27	<u>Stormwater System Design Supporting Documentation</u> <i>As part of the supporting documentation required under Condition B4, the Applicant must document the sequence of construction, including interim drainage solutions, for:</i>
B27 Item (a)	<i>the drainage line from MPE to the Georges River;</i> <u>Response</u> Refer to the approved SDDR for details of the proposed construction of the east-west culvert from MPE to Georges River. There are no changes to the approved East-west culvert or the SDDR required for the JN and JR Facilities.
B27 Item (b)	<i>the northern portion of MPW, including infilling, OSD basins, transition of sedimentation basins to OSD basins; and</i> <u>Response</u> Reference to Section 5.8 of the separate CSWMP by Costin Roe Consulting (ref: Co13455-07-03.rpt) and Addendum to the CSWMP.
B27 Item (c)	<i>the southern portion of MPW, including infilling, OSD basins, transition of sedimentation basins to OSD basins.</i> <u>Response</u> Reference to Section 5.8 of the separate CSWMP by Costin Roe Consulting (ref: Co13455-07-03.rpt) and Addendum to the CSWMP.
B28	<i>As part of the supporting documentation required under Condition B4, outlet structure investigations and design inputs must be submitted to the Planning Secretary, including:</i>
B28 Item (a)	<i>subsurface/ geotechnical assessment identifying underlying foundation conditions;</i>

CoC	Response
	<u>Response</u> Geotechnical assessments have been completed by Golders and PSM Geotechnical Engineering Consultants. <i>Section 3</i> of the Golders Geotechnical Spec (ref: 1416224-016-R-Rev 3) provides guidance on the properties on the underlying soils. Refer to Appendix K of the approved SDDR for Geotechnical Investigations completed.
B28 Item (b)	<i>hydraulic modelling;</i> <u>Response</u> Reference to Sections D and E of this ASDDR document should be made pertaining to hydraulic assessments.
B28 Item (c)	<i>hydraulic calculations for stormwater outlet structures demonstrating achievement of relevant stability thresholds; and</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B28 Item (d)	<i>design specifications including schedule of drainage elements (e.g. rock sizes, and structures).</i> <u>Response</u> There are no outlets to the Georges River required for the JN/JR Facilities. Refer to SDDR for confirmation of the outlet arrangement and requirements relating to outlets. There are no changes to the approved MPW Precinct outlet or the SDDR required for the JN and JR Facilities.
B34	<i>Conversion of construction stage erosion and sediment control infrastructure into permanent stormwater quality or on-site detention infrastructure must only occur once the civil works (roads and drainage) have been completed for the associated site sub-catchment.</i> <u>Response</u> Requirements relating to conversion of construction stage erosion and sediment control infrastructure into permanent stormwater quality or on-site detention infrastructure are addressed in Section 5.8 & 6.4 of the Construction Soil and Water Management Plan (CSWMP) included in Appendix F of the CEMP.

CoC	Response
<i>B35</i>	<i>Where construction of sediment basins and stormwater outlet works (including clearing, scour protection/ erosion control) are to be undertaken outside the site on Crown land (being the banks and bed of the Georges River), design those works must be prepared with the input of an aquatic ecologist, and evidence of DPI (Crown Lands) approval is to be provided to the Planning Secretary prior to commencement of construction. Details of finished works are to be submitted to DPI (Crown Lands) for information.</i> <u>Response</u> There are no works required on Crown Land associated with the JN/JR Development. Refer to the approved SDDR and associated CEMP.
<i>B45</i>	<i>The design of fill batters must ensure stability, mitigate visual impacts, provide for maintenance activities and demonstrate that there are no impacts on adjacent lands, including bio-diversity offset areas and the riparian corridor.</i> <u>Response</u> The design of short-term construction batters has been completed with maximum slopes of 1v:2h as defined in PSM Geotechnical report. The design of operational batters has been made such that the maximum adopted slope for batters is 1v:4h. No works are proposed to occur outside the project boundary, hence there are no impacts on adjacent lands relating to the JN/JR Development.

ANNEXURE C

REVISED MUSIC MODELLING



ANNEXURE D
ASDDR COMPLIANCE LETTER
Co13455.16-22.ltr – Dated 14 December 2021

14 December 2021

Tactical Group
Attention: Mr Nathan Cairney
304/147 King Street
SYDNEY NSW 2000

Dear Sir

**Re: Moorebank Precinct West – Moorebank Avenue, Moorebank
Woolworths Moorebank National Distribution Centre (MoNDC)
Proposed Warehouse Expansion – ASDDR Compliance Letter**

Costin Roe Consulting Pty Ltd has been commissioned by Tactical Group, on behalf of Woolworths, to prepare this *Addendum to the Stormwater Design Development Report Compliance Letter* for the proposed warehouse expansion at the Moorebank National Distribution Centre (MoNDC, formerly Janus National) within the Moorebank Intermodal Precinct West.

This *ASDDR Compliance Letter* provides confirmation that the stormwater system requirements detailed in the approved **SSD_7709 Mod1** submission (*refer CRC ASDDR ref: Co13455.16-11.rpt, dated: 22 Mar 2021*) contained in **Enclosure C** of this letter are still being met as a part of the proposed expansion works outlined above. The proposed building amendments are documented in **Enclosure A** of this letter. The alterations to the approved stormwater drainage design are documented in **Enclosure B** of this letter.

We confirm that the following design principles and operational requirements of the stormwater management are still being met by the development in accordance with the relevant sections of the approved **SSD_7709** consolidated consent:

- **ASDDR Section C** - Flood Management & Large Rainfall Events:
- **ASDDR Section D** - Management of stormwater quantity:
- **ASDDR Section E** - Management of stormwater quality:
- **ASDDR Section E** - Water Demand Reduction/Rainwater Reuse:

We also confirm that the overall stormwater management objectives, including catchment breakdown, water quality objectives and water quantity discharge rates, are consistent with the approved Arcadis MPW Flooding and Stormwater Assessment and all of the CoC's as set out in **Annexure B** of the approved ASDDR.

This letter is noted to comprise a confirmation of compliance to the approved **ASDDR**. This letter provides confirmation to how the required CoC have been met in relation to the SSD7709 consolidated consent.

We trust the information contained herein meets your current requirements, please contact the below if clarification of any points are required.

Yours faithfully,

COSTIN ROE CONSULTING PTY LTD

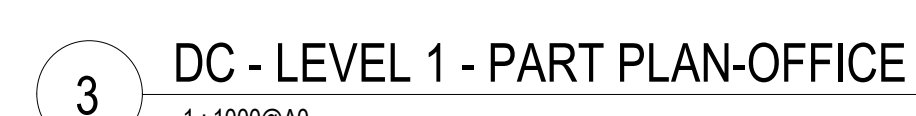
A handwritten signature in black ink, appearing to read 'D. Soliman', written over a light blue grid background.

DANIEL SOLIMAN MIEAust

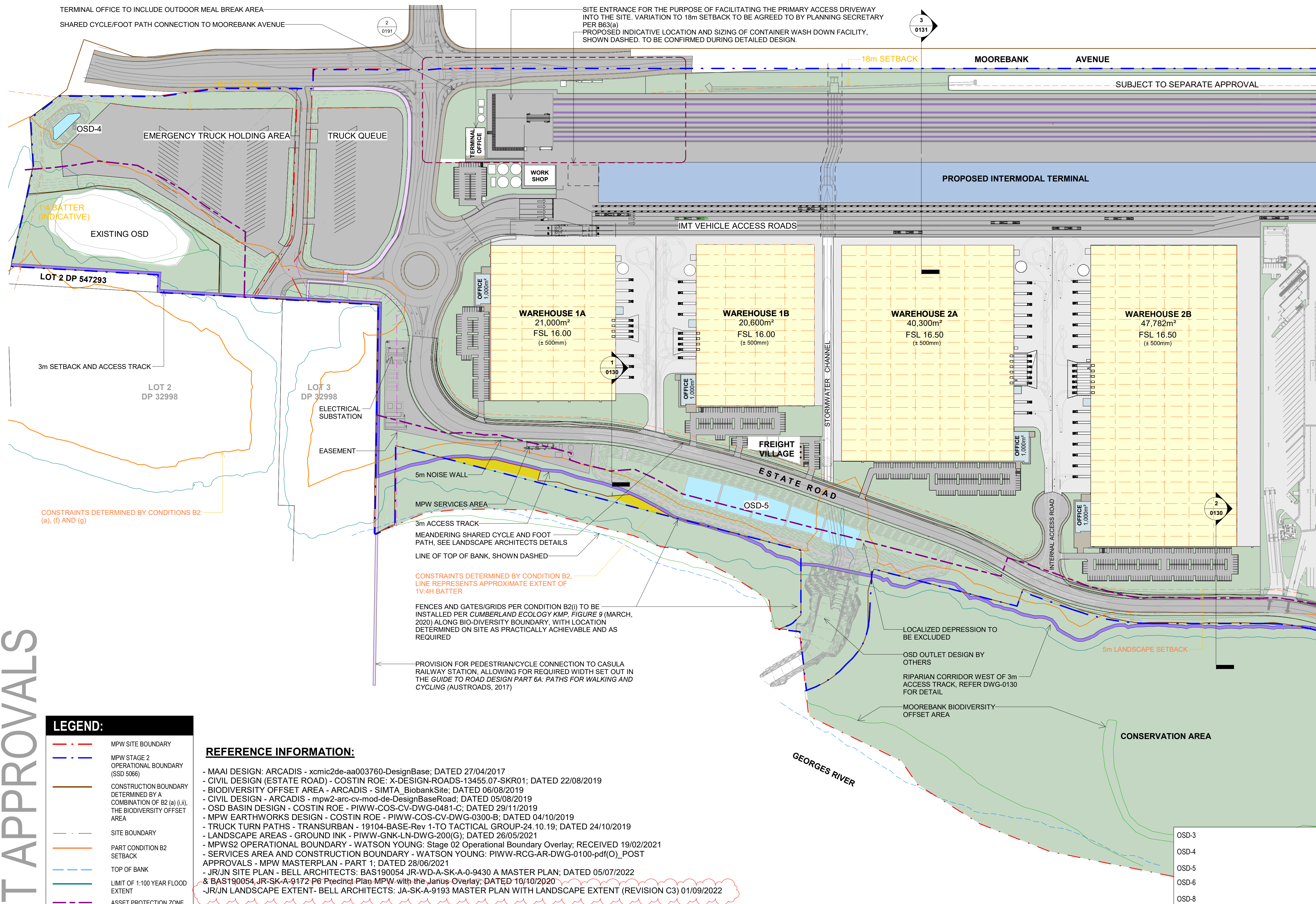
Senior Design Engineer

Encl. 1. BELL Architecture Warehouse Extension Plan
2. Proposed MoNDC Expansion Drainage Design Alterations

	DC AMENITIES	
	DC END OF TRIP FACILITIES: (INCLUDING TOILETS, SHOWERS, LOCKERS)	
	JR SOFT LANDSCAPE AREA:	13,121m ²
	JR HARD LANDSCAPE AREA:	911m ²
	JN SOFT LANDSCAPE AREA:	10,579m ²
	JN HARD LANDSCAPE AREA:	5,761m ²
	JR EXPANSION ZONE:	5,986m ²
	CONCRETE PAVEMENT: HEAVY DUTY. REINFORCED CONCRETE SLAB, AS PER THE STRUCTURAL AND CIVIL ENGINEER'S DESIGN.	
-	JR HARDSTAND EXTENT:	69,690m ²
-	JN HARDSTAND EXTENT:	37,948m ²
	CAR PARK PAVEMENT: BITUMINOUS CONCRETE PAVEMENT, AS PER THE CIVIL ENGINEER'S DETAILS.	
-	JN DRIVEWAY EXTENT:	2,405m ²
-	JN CARPARK LEVEL 1:	6,520m ²
	UNIT PAVERS, PERMEABLE: SELECTION: BEST BRICKS AND PAVERS - BIO PAVER 60 COLOUR CHARCOAL	
-	UNIT PAVERS:	5,051m ²



POST APPROVALS



DEVELOPMENT SCHEDULE			
SITE 1A			
WAREHOUSE AREA		42,280m ²	
BUILDING AREA (GFA)			
WAREHOUSE		21,000m ²	
OFFICE (2 LEVEL)		1,000m ²	
SOFT LANDSCAPING		8,690m ²	
HARD LANDSCAPING		760m ²	
PROPOSED CAR PARKING		97 SPACES	
PROPOSED BICYCLE PARKING		10 SPACES	
SITE 1B			
WAREHOUSE AREA		36,890m ²	
BUILDING AREA (GFA)			
WAREHOUSE		20,600m ²	
OFFICE (2 LEVEL)		1,000m ²	
SOFT LANDSCAPING		3,590m ²	
HARD LANDSCAPING		270m ²	
PROPOSED CAR PARKING		94 SPACES	
PROPOSED BICYCLE PARKING		10 SPACES	
SITE 2A			
WAREHOUSE AREA		68,350m ²	
BUILDING AREA (GFA)			
WAREHOUSE		40,300m ²	
OFFICE (2 LEVEL)		1,000m ²	
SOFT LANDSCAPING		10,140m ²	
HARD LANDSCAPING		800m ²	
PROPOSED CAR PARKING		164 SPACES	
PROPOSED BICYCLE PARKING		16 SPACES	
SITE 2B			
WAREHOUSE AREA		80,330m ²	
BUILDING AREA (GFA)			
WAREHOUSE		47,782m ²	
OFFICE (2 LEVEL)		1,000m ²	
SOFT LANDSCAPING		5,593m ²	
HARD LANDSCAPING		1,035m ²	
PROPOSED CAR PARKING		205 SPACES	
PROPOSED BICYCLE PARKING		23 SPACES	
SITE 3A (JR)			
WAREHOUSE AREA		149,031m ²	
BUILDING AREA (GFA)			
WAREHOUSE		39,384m ²	
SOFT LANDSCAPING		13,121m ²	
HARD LANDSCAPING		911m ²	
PROPOSED CAR PARKING		10 SPACES	
PROPOSED BICYCLE PARKING		20 SPACES	
SITE 3B (JN)			
WAREHOUSE AREA		115,064m ²	
BUILDING AREA (GFA)			
WAREHOUSE		45,934m ²	
SOFT LANDSCAPING		10,579m ²	
HARD LANDSCAPING		5,761m ²	
PROPOSED CAR PARKING		789 SPACES	
PROPOSED BICYCLE PARKING		41 SPACES	
FREIGHT VILLAGE			
SITE AREA		3180m ²	
BUILDING AREA (GFA)		800m ²	
SOFT LANDSCAPING		900m ²	
HARD LANDSCAPING		440m ²	
PROPOSED CAR PARKING		23 SPACES	
PROPOSED BICYCLE PARKING		3 SPACES	
Drawn	Checked	Print Date	Scale @ A1
AG	JF	21/09/2022 10:47:18 AM	1:2000
Project Number			Issue
19311			Q
Drawing Number			

[illegible]

Notes	Project
ALL AREAS & DIMENSIONS ARE APPROXIMATE AND ARE TO BE VERIFIED BY A REGISTERED LAND SURVEYOR	MOOREBANK LOGISTICS PARK
	Project Address MOOREBANK AVENUE, MOOREBANK NSW

Owner / Developer



SIMTA | SYDNEY
INTERMODAL
TERMINAL
ALLIANCE

Client

The QUBE logo consists of a dark gray square with the word "QUBE" in a bold, yellow, sans-serif font positioned at the bottom left of the square.

Architect

**watson
young**

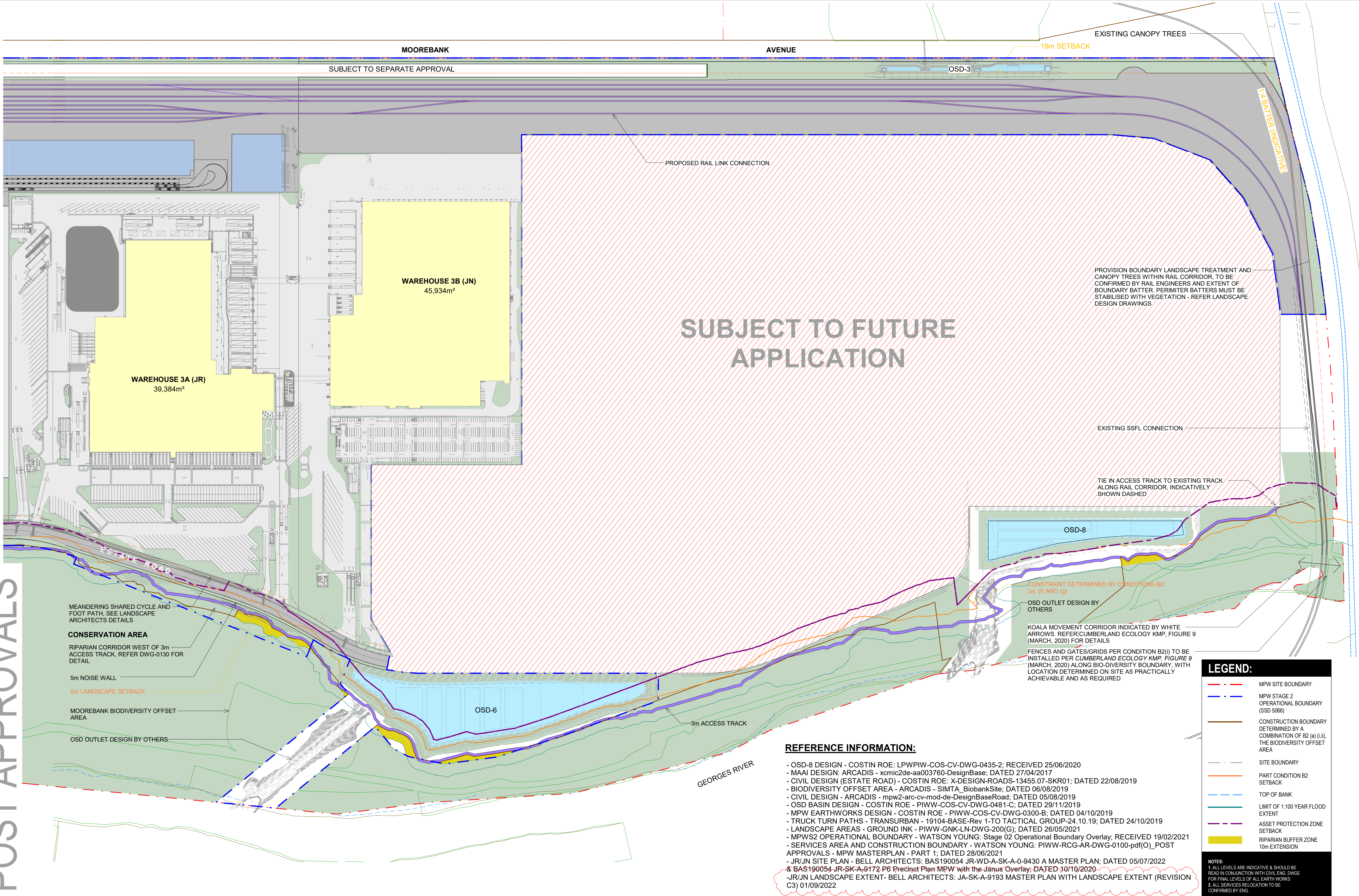
Watson Young Architects P/L Melbourne | Perth | Sydney 03 9516 8555 ACN: 111398700
8 Gratton Street Prahan VIC 3181 info@watsonyoung.com.au watsonyoung.com.au
© Watson Young Architects. This drawing is protected by copyright.

OSD-3	2,910m ²
OSD-4	1,480m ²
OSD-5	17,130m ²
OSD-6	22,910m ²
OSD-8	12,770m ²
WAREHOUSE SITE AREA (INCL. OSD-5 TOTAL AREA)	512,255m²
WAREHOUSE AREA SOFT LANDSCAPING	52,613m ²
WAREHOUSE AREA HARD LANDSCAPING	9,977m ²
OSD-5 LANDSCAPE AREA	17,075m ²
TOTAL LANDSCAPING PERCENTAGE	15.55%

Drawing Title

**POST APPROVALS - MPW
MASTERPLAN - PART 1**

POST APPROVALS



REFERENCE INFORMATION:

- OSD-8 DESIGN - COSTIN ROE: LPWPIW-COS-CV-DWG-0435-2; RECEIVED 25/06/2020
- MAAI DESIGN: ARCADIS - xcmic2de-aa003760-DesignBase; DATED 27/04/2017
- CIVIL DESIGN (ESTATE ROAD) - COSTIN ROE: X-DESIGN-ROADS-13455.07-SKR01; DATED 22/08/2019
- BIODIVERSITY OFFSET AREA - ARCADIS - SIMTA_BiobankSite; DATED 06/08/2019
- CIVIL DESIGN - ARCADIS - mpw2-arc-cv-mod-de-DesignBaseRoad; DATED 05/08/2019
- OSD BASIN DESIGN - COSTIN ROE - PIWW-COS-CV-DWG-0481-C; DATED 29/11/2019
- MPW EARTHWORKS DESIGN - COSTIN ROE - PIWW-COS-CV-DWG-0300-B; DATED 04/10/2019
- TRUCK TURN PATHS - TRANSURBAN - 19104-BASE-Rev 1-TO TACTICAL GROUP-24.10.19; DATED 24/10/2019
- LANDSCAPE AREAS - GROUND INK - PIWW-GNK-LN-DWG-200(G); DATED 26/05/2021
- MPWS2 OPERATIONAL BOUNDARY - WATSON YOUNG: Stage 02 Operational Boundary Overlay; RECEIVED 19/02/2021
- SERVICES AREA AND CONSTRUCTION BOUNDARY - WATSON YOUNG: PIWW-RCG-AR-DWG-0100-pdf(O)_POST APPROVALS - MPW MASTERPLAN - PART 1; DATED 28/06/2021
- JR/JN SITE PLAN - BELL ARCHITECTS: BAS190054 JR-WD-A-SK-A-0-9430 A MASTER PLAN; DATED 05/07/2022
- BAS190054 JR-SK-A-9172 P6 Precinct Plan MPW with the Janus Overlay; DATED 10/10/2020
- JR/JN LANDSCAPE EXTENT- BELL ARCHITECTS: JA-SK-A-9193 MASTER PLAN WITH LANDSCAPE EXTENT (REVISION C3) 01/09/2022

LEGEND:

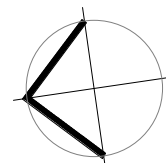
- MPW SITE BOUNDARY
- MPW STAGE 2 OPERATIONAL BOUNDARY (SSD 5066)
- CONSTRUCTION BOUNDARY DETERMINED BY A COMBINATION OF B2 (a) (i, ii), THE BIODIVERSITY OFFSET AREA
- SITE BOUNDARY
- PART CONDITION B2 SETBACK
- TOP OF BANK
- LIMIT OF 1:100 YEAR FLOOD EXTENT
- ASSET PROTECTION ZONE SETBACK
- RIPARIAN BUFFER ZONE 10m EXTENSION

NOTES:
1. ALL LEVELS ARE INDICATIVE & SHOULD BE READ IN CONJUNCTION WITH CIVIL ENG. DWGS FOR FINAL LEVELS OF ALL EARTHWORKS
2. ALL SERVICES RELOCATION TO BE CONFIRMED BY ENG.

BUILDER TO CONFIRM ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY PART OF THE WORKS.
FIGURED DIMENSIONS TAKE PRECEDENCE. DO NOT SCALE FROM THE DRAWING.
ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS, SCHEDULES AND PROJECT ENGINEERS DRAWINGS.
THE MASTERPLAN ARCHITECT IS TO BE CONSULTED REGARDING ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF ANY PART OF THE WORKS.
ALL WORK IS TO CONFORM TO RELEVANT CURRENT AUSTRALIAN STANDARDS AND ALL OTHER APPLICABLE CODES ALONG WITH ANY LOCAL AUTHORITIES REQUIREMENTS & REGULATIONS

Issue	Description	Date	DR	CH
C	ISSUED BY REID CAMBELL	-	-	-
D	ISSUED BY REID CAMBELL	-	-	-
E	ISSUED BY REID CAMBELL	-	-	-
F	ISSUED BY REID CAMBELL	-	-	-
G	ISSUED BY REID CAMBELL	-	-	-
H	ISSUED BY REID CAMBELL	-	-	-
I	ISSUED BY REID CAMBELL	-	-	-
J	ISSUED BY REID CAMBELL	-	-	-
K	ISSUED BY REID CAMBELL	-	-	-
L	UPDATE FOR REVIEW, NOT ISSUED	04.03.2021	JF	AG
M	Woolworths SSD 7759 Mod 01 update	11.08.2021	JF	AG
N	Woolworths SSD 7759-PA-133	07.07.2022	AG	AG
O	Woolworths SSD 7759-PA-133 Landscaping update	21.09.2022	AG	AG

North



Notes
ALL DIMENSIONS ARE APPROXIMATE AND ARE TO BE VERIFIED BY A REGISTERED LAND SURVEYOR

Project
MOOREBANK LOGISTICS PARK
Project Address
MOOREBANK AVENUE, MOOREBANK NSW

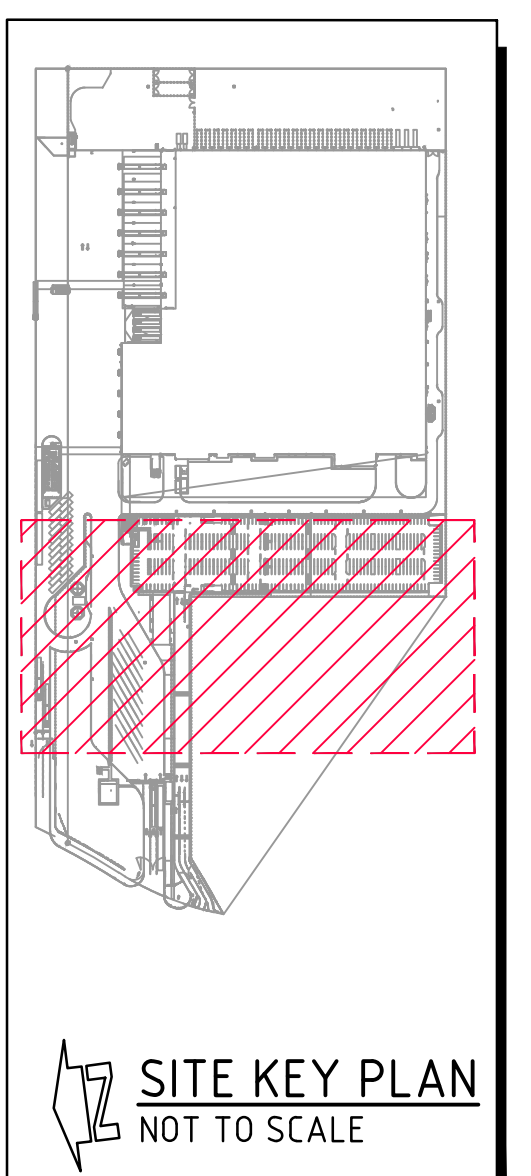
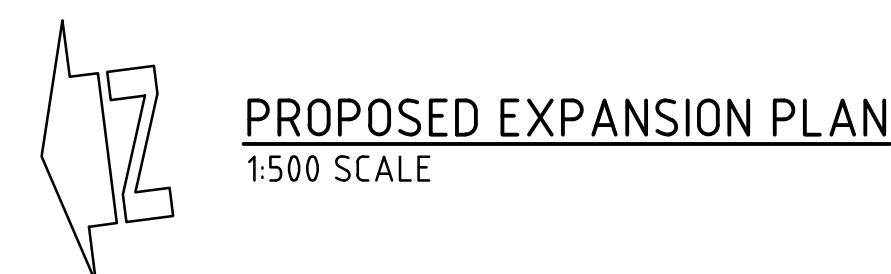
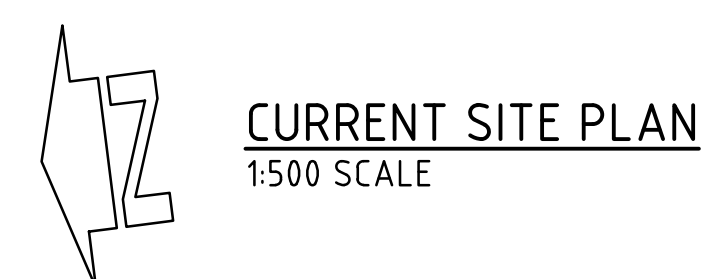
Owner / Developer
SIMTA SYDNEY INTERMODAL TERMINAL ALLIANCE

Client
QUBE

Architect
watson young
Watson Young Architects Pty Ltd Melbourne | Perth | Sydney 03 9516 6555 ACN: 111398700
8 Gratian Street Prahran VIC 3181 info@watsonyoung.com.au www.watsonyoung.com.au
© Watson Young Architects. This drawing is protected by copyright.

Drawing Title
POST APPROVALS - MPW MASTERPLAN - PART 2

Drawn Checked Print Date Scale @ A1
AG JF 21/09/2022 10:47:28 AM 2000
Project Number Issue
19311 O
Drawing Number
PIWW-RCG-AR-DWG-0101



5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SIZE SHEET

DRAWING No	IN-WD-CV-SK-1008	ISSUE	A
------------	------------------	-------	---

[illegible]

DEVELOPER	
-----------	---

ARCHITECT

BELL

CLIENT

RICHARD CROOKES
CONSTRUCTIONS

PROJECT JANUS NATIONAL MOOREBANK PRECINCT WEST MOOREBANK, NSW							 CONSULT AUSTRALIA	
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:		

Costin Roe Consulting Pty Ltd
Consulting Engineers ACS 902 050 440
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE		
MoNDC WAREHOUSE EXPANSION CURRENT AND PROPOSED CIVIL ENGINEERING CONCEPT		
DRAWING No	IN-WD-CV-SK-1008	ISSUE A