200 Aldington Road Industrial Estate, Kemps Creek, Lot 200 DP1285691

Stormwater Management Report SSDA 10479 MOD 2 (Stage 1) & SSD-61212208 LOT J (Stage 2)

CLIENT / STOCKLAND FIFE KEMPS CREEK PTY LTD

DATE / 30/07/2024

CODE/ 19 – 609 A

Commercial in Confidence

Document Registration

Issue	Description	Date	Author	Checked	Approved
01	DRAFT FOR REVIEW	28-06-24	Tim Michel/Debbie Fransen	☒	☒
02	FINAL DRAFT	13-07-24	Tim Michel/Debbie Fransen	☒	☒
03	FINAL	30/07/24	Tim Michel/Debbie Fransen	☒	☒
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				☐	☐

Abbreviations

AEP	Annual Exceedance Probability
BAPS	Bochasanwasi Akshar Purushottam Sanstha ('BAPS') temple (adjoining site)
CEMP	Construction Environmental Management Plan
CPESC	Certified Professional in Erosion and Sediment Control
DCP	Mamre Road Precinct Development Control Plan 2021
EMM	EMM Consulting Pty Ltd
ESCP	Erosion and Sediment Control Plan
GPT	Gross Pollutant Trap
MOD 1	SSD-10479 Modification 1
MOD 2	SSD-10479 Modification 2
MRP	Mamre Road Precinct
OSD	On Site Detention
PCC	Penrith City Council
SSD	State Significant Development
SSDA	State Significant Development Application
WSUD	Water Sensitive Urban Design

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1. Introduction

This report has been prepared on behalf of Stockland Fife Kemps Creek (SFKC) to support:

- Modification 2 (as amended) of SSD-10479 for Stage 1 of the development known as 200 Aldington Road Industrial Estate located in, Kemps Creek; and
- The additional SSD application for on lot development of the following SSD-61212208 LOT J (Stage 2)

The Estate is located to the east of Aldington Road and is legally described as Lot 200 DP 1285691, a consolidation of the former 7 lots, with an area of approximately 72.11 hectares (ha) within the Penrith City Council Local Government Area (LGA).

This is a stand-alone report that is based on the Stormwater Management Report prepared in June 2023 to address conditions 27, 29 and 31 of the SSD-10479 and updates the management methods to account for the additional stage of development now proposed.

1.1. Description of Proposed Modification 2 (as amended)

A second modification (Modification 2 as amended) has been prepared for lodgement with the Department of Planning, Housing and Infrastructure (DPHI) relating primarily to the tenant-specific requirements for Lot J under SSD-61212208. As part of the staged development of the Kemps Creek Industrial Estate, SFKC is seeking to construct a warehouse and distribution centre on Lot J which will be known as **Stage 2** development. The development is a bespoke warehouse and distribution centre that comprises three discrete buildings linked by internal circulation roads, carparking and hardstand storage, and surrounded by perimeter landscaping.

The proposed changes under Modification 2 as amended can be summarised as:

1. Amendments to the Concept Approval under Modification 2 As Amended
    a. To amend the proposed Subdivision Plan for Lot 200 in DP 1285691 and Concept Master plan to:
        i. Amalgamate Lot E and H to create Lot E; and
        ii. Amalgamate Lot I and K to create Lot K.
    b. Minor reduction to the RL level of both concept building envelopes on Lot K;
    c. Revisions to the general arrangement of the future development on Lot J, including updates to the built form, vehicular access, parking, landscaping and hardstand for the Estate.

2. Amendments to Stage 1 under Modification 2 as amended
    a. Consequential boundary adjustment to recognise:
        i. Amalgamation Lot E and H to create Lot E; and
        ii. Amalgamation Lot I and K to create Lot K.
    b. Temporary turning head at the eastern end of Road 01 adjusted to sit within Lot O (as opposed to Lot K);
    c. To temporarily utilise Lot M as a component of the Estate stormwater management solution to support the development of Lot J under SSD-61212208.

1.2. Description of SSD-61212208 Stage 2 works Lot J

The works proposed on Lot J form Stage 2 of the 200 Aldington Road Estate development are part of a separate SSD application and include:

- Stormwater works on Lot J
- Construction of a warehouse and distribution centre on Lot J;

Stormwater Management Measures for Lot J

- The construction phase stormwater targets for Lot J will be achieved through implementation of the Erosion and Sediment Control measures within the ESCP for Lot J and will be within the boundaries of Lot J. A separate ESCP report and drawings has been prepared for Lot J on lot development and building phases. The ESCP for Lot J will be part of the CEMP for Lot J.
- The operational phase stormwater management targets in the interim scenario, prior to the operation of the MRP Stormwater Scheme, will be achieved through the measures identified in this stormwater management report, and these measures will be completed as part of Stage 1 works (SSD 10479 MOD 2). The temporary / interim stormwater management measures are located outside of the boundary of Lot J, but within the Estate boundaries.

1.3. Stormwater Management Strategy

This report demonstrates the stormwater management strategies proposed for this development are in accordance with the Mamre Road Precinct Development Control Plan and demonstrates the operational phase stormwater quality and flow targets are achieved for the development site. This report has been prepared in accordance with the Technical Guidance for Achieving Wianamatta-South Creek stormwater management targets.

The changes to stormwater arising from Modification 2 as amended can be summarised as follows:

- Revisions to the design of stormwater detention basin A (located within Lot L) to facilitate the proposed boundary adjustments and to optimise the basin design and stormwater pipe network;
- Revision to Basin B (located within Lot D) to align with layout endorsed by Sydney Water during post SSDA condition of consent approval, noting there is no change to the extent/footprint of basin B.
- Inclusion within Civil drawing set of the naturalised trunk drainage channel (located within Lot G) to align with layout endorsed by Sydney Water during post SSDA condition of consent approval, with minor changes to the approved design that were submitted as part of MOD1 to accommodate the change in road and pad levels adjoining the channel.
- Associated amendments to the stormwater layout to align to the proposed boundary adjustments and road layouts.

The change to the stormwater resulting from the addition of Stage 2 on Lot J, results in the need to include interim operational stormwater management measures associated with the additional runoff from the development of this lot. The interim method of managing stormwater from Lot F has been revised to utilise the existing infrastructure/pond layout and to remove the on-site rainwater tank in response to feedback from authorities.

The proposed interim operational stormwater management infrastructure is located on undeveloped Lot M, N, O and B and C and includes:

- interim sediment pond (in basin A);
- storage pond in Lot M;
- interim usage of Basin B pond 1 as a sediment pond;
- Interim usage of Basin B pond 2 as a storage pond;
- irrigation of undeveloped lots.

2. Site Description

The development, known as 200 Aldington Road Industrial Estate includes a single consolidated lot, Lot 200 DP1285691 formerly 7 lots, with an area of approximately 72 hectares (ha) in Aldington Road, Kemps Creek. The site, highlighted red in Figure 1, falls within the extent of the *State Environmental Planning Policy (Industry and Employment) 2021* ("I&E SEPP") which includes the Mamre Road Precinct.

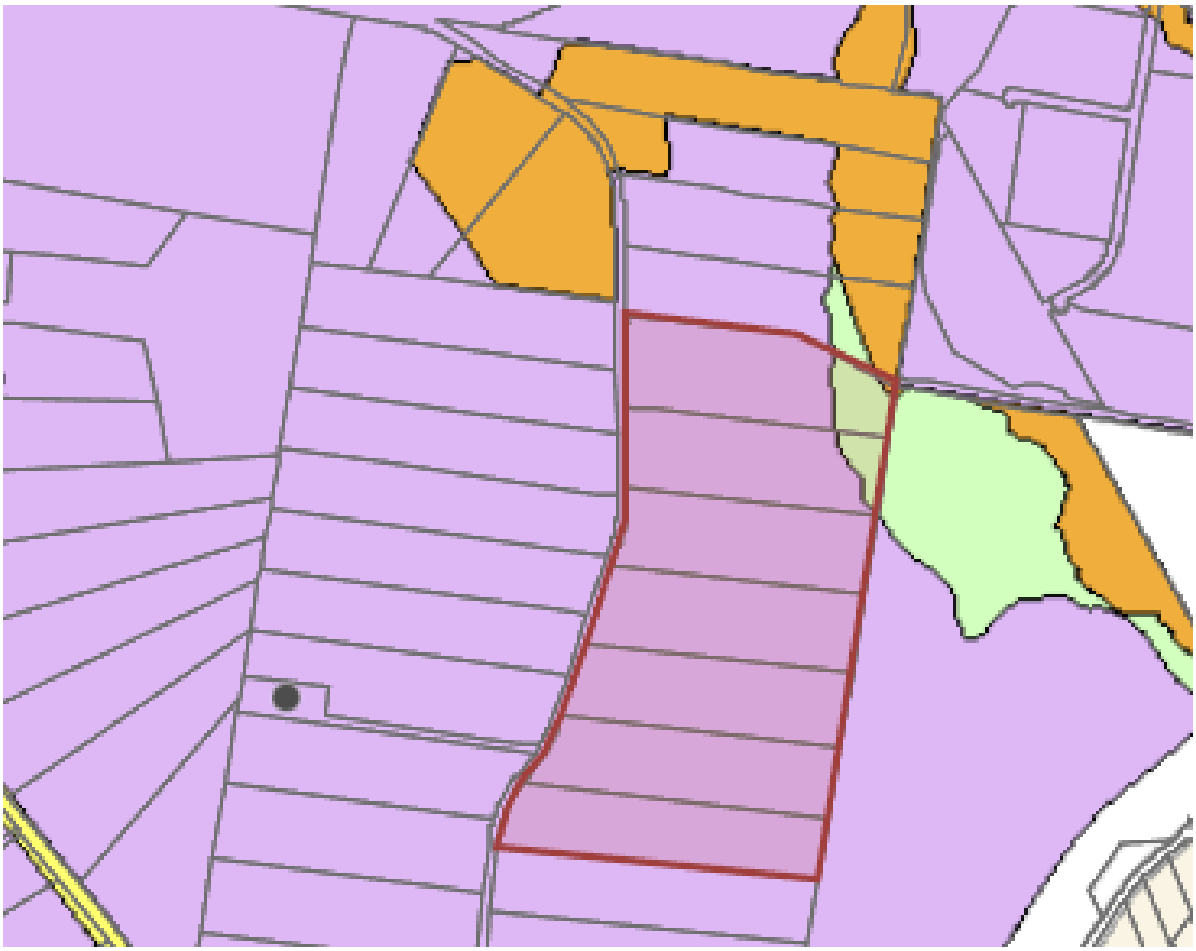

Figure 1 – Site Location

The site is bordered by Aldington Road to the west and existing rural lots to the north, east and south, some of which are subject to Development Applications. Refer to Figure 2 below for aerial image.

Figure 2 – Site Location (aerial image)

2.1. Existing Waterways and Vegetation

The site has been rezoned as IN1 land and comprises various land uses. Including RE2 and C2, with the north-eastern portion designated as non-developable. A 1st order watercourse, categorized as a tributary of Ropes Creek within the South Creek catchment, is located in the north-eastern corner. This watercourse flows in a roughly northerly direction.

2.1.1. Environmental Assessment (Narla) and Bio certification Letter (Ecological Aus)

conducted an environmental assessment that evaluates the potential environmental impacts of the proposed development and provides recommendations for mitigation and management strategies. The details of the assessment can be found in the EIS.

Ecological Aus provided details on bio certification that identified the site is certified urban capable under the Cumberland Plain Conservation Plan (CPCP). This certification concludes that development can proceed without further State or Commonwealth biodiversity approvals.

2.1.2. Farms Dams and Aquatic Habitat

Following the issue of SSDA in May 2023 the farm dams identified as 1-8 in the Riparian Assessment (Ecological, 2022) have been dewatered in accordance with the Dewatering Management Plan in the Construction Environmental Management Plan (CEMP).

2.1.3. DPI Mapping and Watercourses

The Department of Primary Industries (DPI) mapping identified two unnamed watercourses within the study area. The first watercourse, categorized as a 1st order tributary of Kemps Creek, is situated in the southern section of the site. However, no distinctive features of a waterway, such as defined bed and banks or geomorphic characteristics, were observed along the entire length of this mapped watercourse within the site. The second watercourse, also a 1st order tributary, is located in the north-eastern corner of the site. This watercourse originates upstream of the development area and flows in a roughly northerly direction.

Modification 2 as amended does not include construction of basins identified in the MRP scheme in Lot D, however the design allows for construction of these basins as part of future development, subject to a future modification application/approval.

Figure 3 Waterways – Stream order (Extract from Riparian Report, Eco Logical)

2.2. Geology and Soils

The geological composition of the area consists off Triassic age Bringelly Shale from the Wianamatta Group. The formation comprises shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone and some minor coal bands. In the north-eastern corner of the project, there are Quaternary age fluvial sediments primarily consisting of fine-grained sands, silts and clays.

The majority of the site's soils are classified as non-saline to slightly saline, with only ten samples identified as moderately saline and one as very saline, as reported by ADE. Furthermore, the soils pose no significant aggression to concrete and steel. Management controls including preparation of a Salinity Management Plan have been adopted to mitigate potential impacts of the development.

2.3. Groundwater

Groundwater was observed during investigations by Douglas Partners (2019a) in Pit 4 and Pit 11 at depths of 2.5 m (RL59.1 AHD) and 3 m (RL61 AHD), respectively. Both pits are located in the north-eastern portion of the site, adjacent to the tributary to Ropes Creek (as shown in Figure 4). It is noted that the pits and boreholes were immediately backfilled following excavation, which precluded longer term monitoring of groundwater levels. Groundwater levels are affected by factors such as soil permeability and weather conditions and can therefore vary with time.

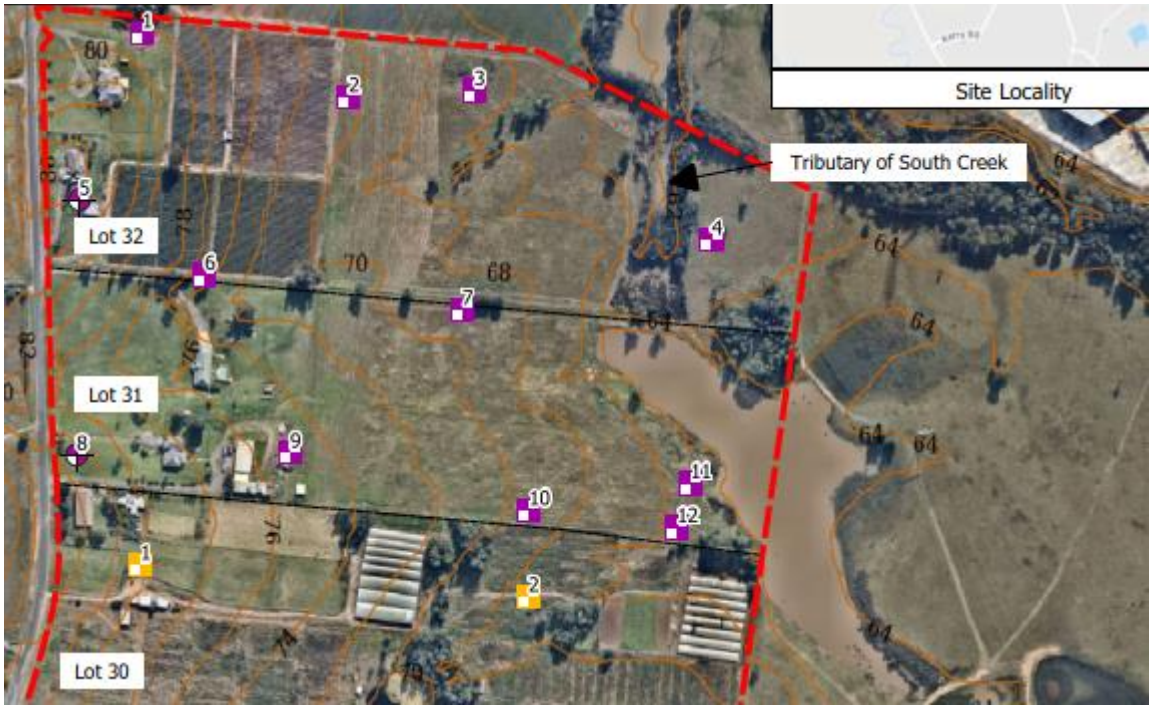

Figure 4 Test Pit locations (Extract from Geotechnical and Groundwater Summary Report, DP, 2019)

2.4. Predevelopment Catchment Delineation

Catchment delineation of the Site under pre-development conditions is presented in Figure 5**.**

Figure 5: Catchment delineation under pre-development conditions

Pre development the site consisted of four catchments and an external catchment west of Aldington Road that runs on to the site. Catchment 1 discharges to the south, Catchment 3 discharges to the west, Catchment 2, 4 and 5 discharge to the northeast. A summary of the internal catchments under pre-development conditions is presented in Table 1.

Table 1: Internal and external catchments under pre-development conditions

Catchment ID	Area (ha)	Description / Discharge Location
EXISTING CAT 1	19.675	Rural residential lots discharge to the neighbouring property in the south.
EXISTING CAT 2	43.162	Rural residential lots discharge to Ropes Creek by way of an unnamed tributary.
EXISTING CAT 3	5.614	Rural residential lots discharge to the west under Aldington Road.
EXISTING CAT 4	3.663	The riparian corridor in the north-eastern portion of the site no development is proposed in this area.
EXISTING CAT 5	3.669	An external catchment flows along the TransGrid easement to the south of the future northern road (within private property).
Total	72.113	Total Area excludes external catchment CAT 5

2.5. Indicative Trunk Drainage Paths

There is no change in MOD 2 to the proposed trunk drainage path within the estate, located in Lot G, as shown in Figure 6.

The MRP Integrated Stormwater Scheme Plan proposes trunk drainage paths to the north and east of Lot D. The construction of these channels in accordance with the Sydney Water scheme guidelines is dependent on adjacent landowners to the north and east of the site as these channels cross boundaries with adjacent landowners. It is anticipated these issues will be resolved with stakeholders to enable construction of the scheme plan infrastructure within the site however this would be subject to a separate planning application/approval process.

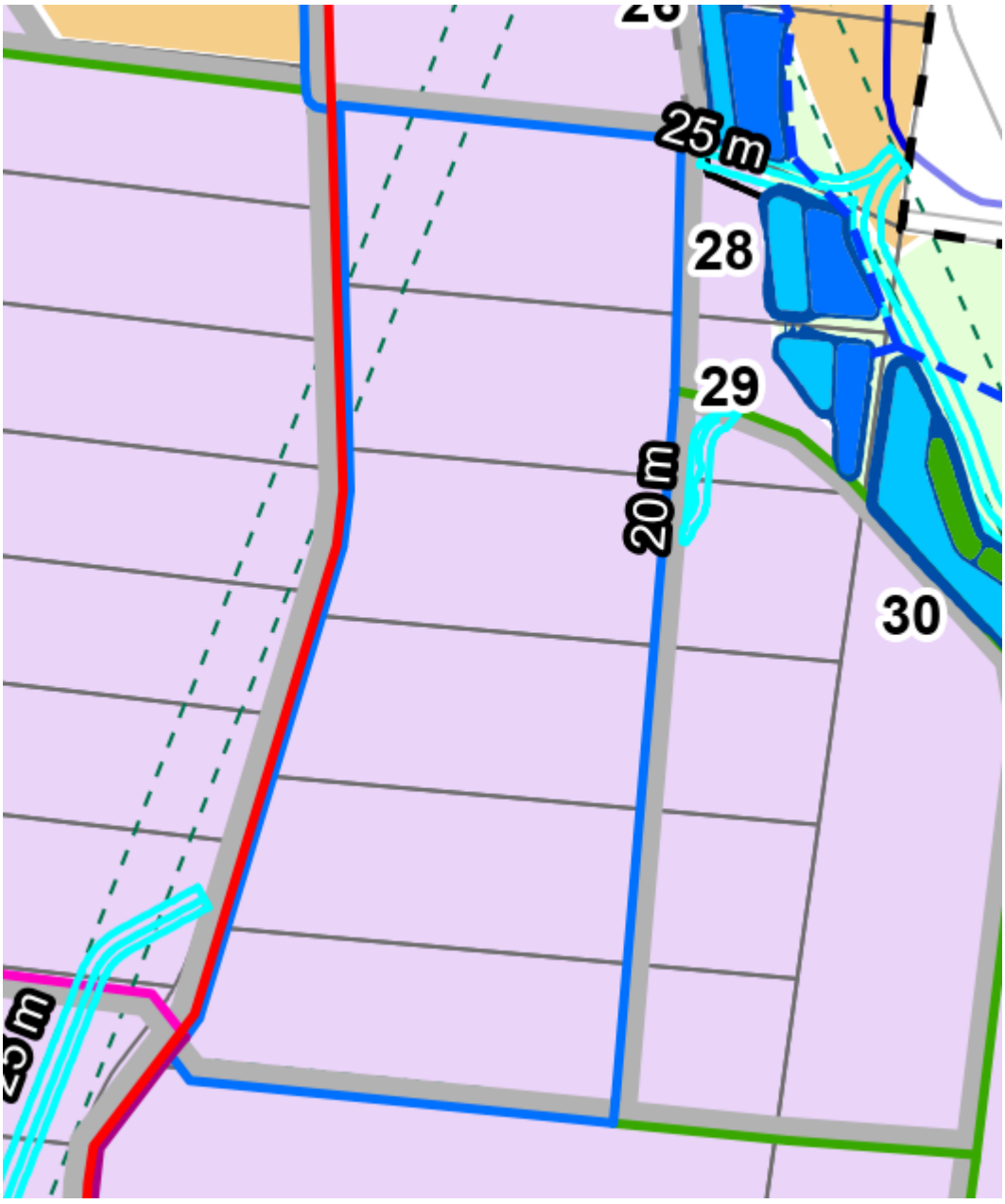

Figure 6: Extract of Mamre Road Precinct Integrated Stormwater Scheme Plan (SWC May 2024)

3. Proposed Development

The proposed development comprises a warehouse and logistics estate at Lot 200 DP 1285691, Kemps Creek.

Consent has been granted under SSD-10479 for the Concept and Stage 1 development. This MOD2 application seeks to modify the existing consent, to be as shown in Figure 7 for Concept. This Concept development is subject to future development approvals for each of the buildings that are not within Stage 1. This report includes the proposed addition of Stage 2 Lot J, which is subject to a separate SSDA application however is also considered within this report to evaluate the cumulative impact of the development of stage 1 and 2.

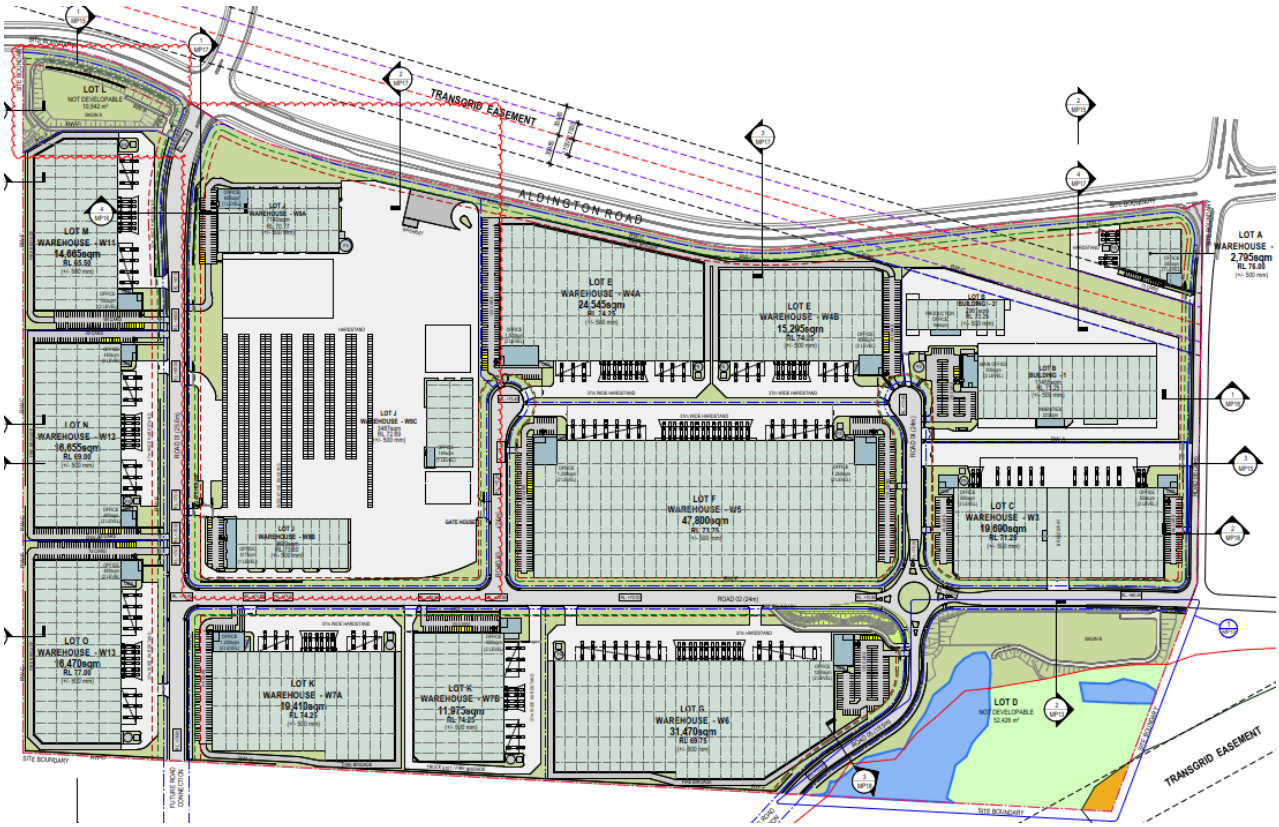

Figure 7: 200 Aldington Road Industrial Estate Concept Master Plan

3.1. Stage 1 Development

The proposed Stage 1 Development incorporates two key components:

1. Estate works across the site.

2. Development of Warehouse on Lot F (as per MOD 1), including on-lot works, infrastructure and landscaping.

The proposed Stage 1 works are detailed below in Table 2.

Table 2: Proposed Stage 1 Works

Element	Description
Estate Works	**Site Preparation & Earthworks** ▪ Construction of sediment basins. ▪ Bulk earthworks, including cut and fill, road grading and boxing, benching and stabilisation (batters and/or retaining walls). **Road Infrastructure** ▪ Staged construction of internal estate road network and connection to Aldington Road for primary site access. **Stormwater Infrastructure** ▪ Staged construction of stormwater drainage, stormwater quality improvement and runoff volume reduction infrastructure. ▪ Construction of two on-site stormwater detention (OSD) basins. One at the northern end of the estate and the other at the southern end of the estate. ▪ Installation of runoff volume reducing measures including irrigation. ▪ Sediment pond within Basin A (interim stormwater measure) ▪ Storage/harvesting pond on Lot M (interim stormwater measure) ▪ Storage pond within Basin B (interim stormwater measure) ▪ Irrigation on undeveloped lots **Utilities and Services** ▪ Construction of utility service infrastructure to provide water, sewer, electricity, and telecommunications services within the site.
Stage 1 – Development (Lot F)	**On Lot Works** ▪ On-lot earthworks to establish site grading and final building pad for Warehouse. ▪ On-lot stormwater, utility infrastructure and services connection. ▪ Site-specific landscaping, signage, and public domain works such as footpaths, street trees and internal site landscaping. ▪ Construction of Lot F (7.37 ha) comprising 4.91ha of roof area consisting of a warehouse and offices, 1.73ha of hardstand and 0.73ha of landscape.

3.2. Stage 2 Development of Lot J (SSDA 61212208)

The proposed Stage 2 Development incorporates key components described in Table 3.

Table 3: Proposed Stage 2 Works

Element	Description
Stage 2 – Development (Lot J)	**On Lot Works** ▪ On-lot earthworks to establish site grading and final building pad for Warehouses. ▪ On-lot stormwater, utility infrastructure and services connection. ▪ Site-specific landscaping, signage, and internal footpaths and landscaping. ▪ Construction of Lot J (12.93ha) comprising 1.84 ha of roof area (W9A,B, C), including offices, gate houses and washbay, hardstand and carparking of 9.15ha.

A plan showing the extent of works under Stage 1 and 2 is presented in Figure 8. This stormwater management plan addresses these works.

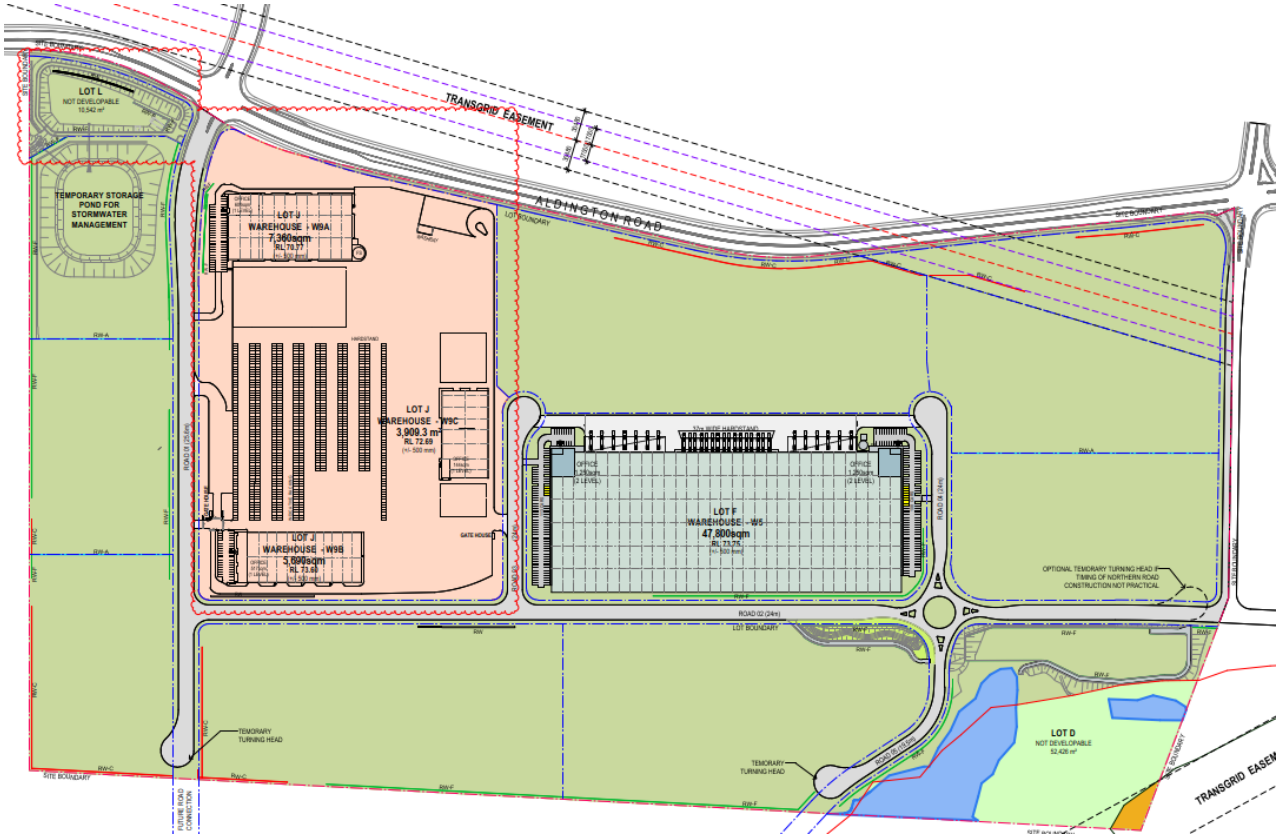

Figure 8: Stage 1 & 2 Estate Works Plan

3.3. Post development Catchment Delineation

Catchment delineation of the site under post-development conditions is presented in Figure 9.

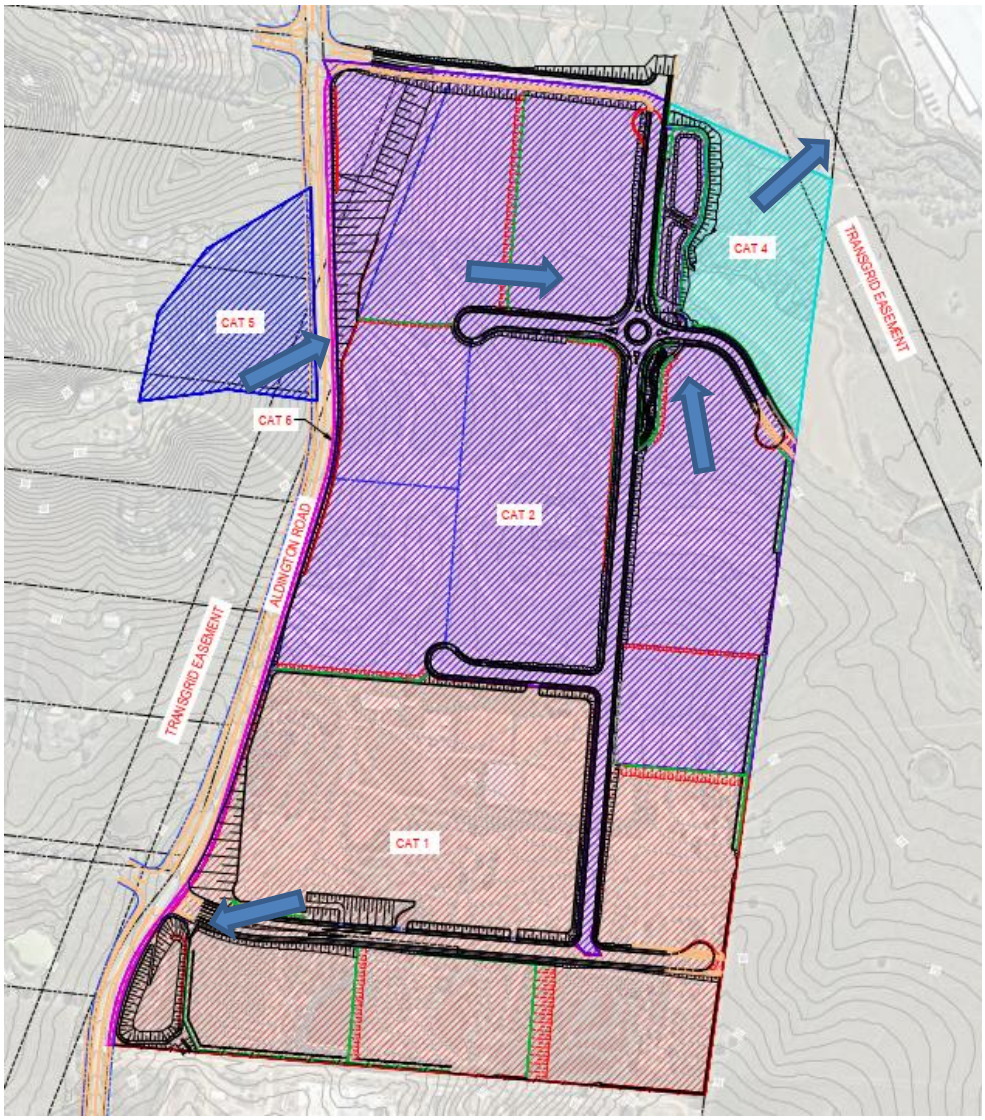

Figure 9: Catchment delineation under post-development conditions

The development site is split into three catchments and an external catchment that runs on to the site. Catchment 1 discharges to the south, Catchment 6 discharges to Aldington Road (land to be dedicated to PCC as road, as part of the Aldington Road Upgrade works), Catchment 2, 4 and 5 discharge to the northeast. A summary of the internal catchments under pre-development conditions is presented in Table 4.

Table 4: Internal and external catchments under post-development conditions

Catchment ID	Area (ha)	Description / Discharge Location
CAT 1	27.890	Road 01 and Lots J - O conveyed to Basin A which outlets to a culvert and channel on the southern property.
CAT 2	39.385	Roads 02 – Road 05, 50% of Future Northern Road, trunk drainage and Lots A – Within this catchment there is a split between discharge via the trunk drainage channel (and in future wetland 30) and discharge to Basin B which outlets to wetland 28 and 29 and future trunk drainage channel.
CAT 3	-	Formerly catchment 3 in predevelopment. No longer considered an independent catchment.
CAT 4	4.178	The riparian corridor in the north-eastern portion of the site. This is the site of proposed wetlands and ponds to be designed and constructed in general accordance with the Sydney Water MRP SWS.
CAT 5	3.669	An external catchment flows along TransGrid easement to south of northern road (within private property). Discharges north of basin B to an outlet where it can flow overland to enter the waterway in the north-east. Eventually this will be a natural trunk drainage channel, anticipated to be constructed in conjunction with wetland /pond 28 and 29 once design is agreed and land to the north is incorporated (subject to separate DA) .
CAT 6	0.652	Land to be dedicated to PCC for the widening of Aldington Road.
Total	72.113	Total Area excludes external catchment CAT 5

Internal catchments within the Site will be directed via a network of proposed stormwater drainage infrastructure towards estate-based stormwater management measures, consisting of:

- The sediment basins and ponds will treat low flows prior to reuse (irrigation) and / or discharge from the Site.
- Two On site detention basins (OSD) (Basin A and Basin B) are designed to attenuate peak flows as required by the Mamre Road Precinct DCP. These basins are designed for the Concept Development, with development of all developable lots. Further details of the proposed basins are outlined in Section 5.2.5.

Alternative bypass routes have been provided for external catchments.

The catchments contributing to each the Sydney Water proposed wetlands is depicted in Figure 10, an extract from SKC194 (Appendix B), where blue catchment contributes to wetland 30. MOD 2 has a catchment area contributing to Basin 30 of 20.56Ha. This is consistent with SSD10479 Condition of Consent B14 which specifies 20.98Ha. The split between wetlands 28 and 29 is made with structures located within Basin B.

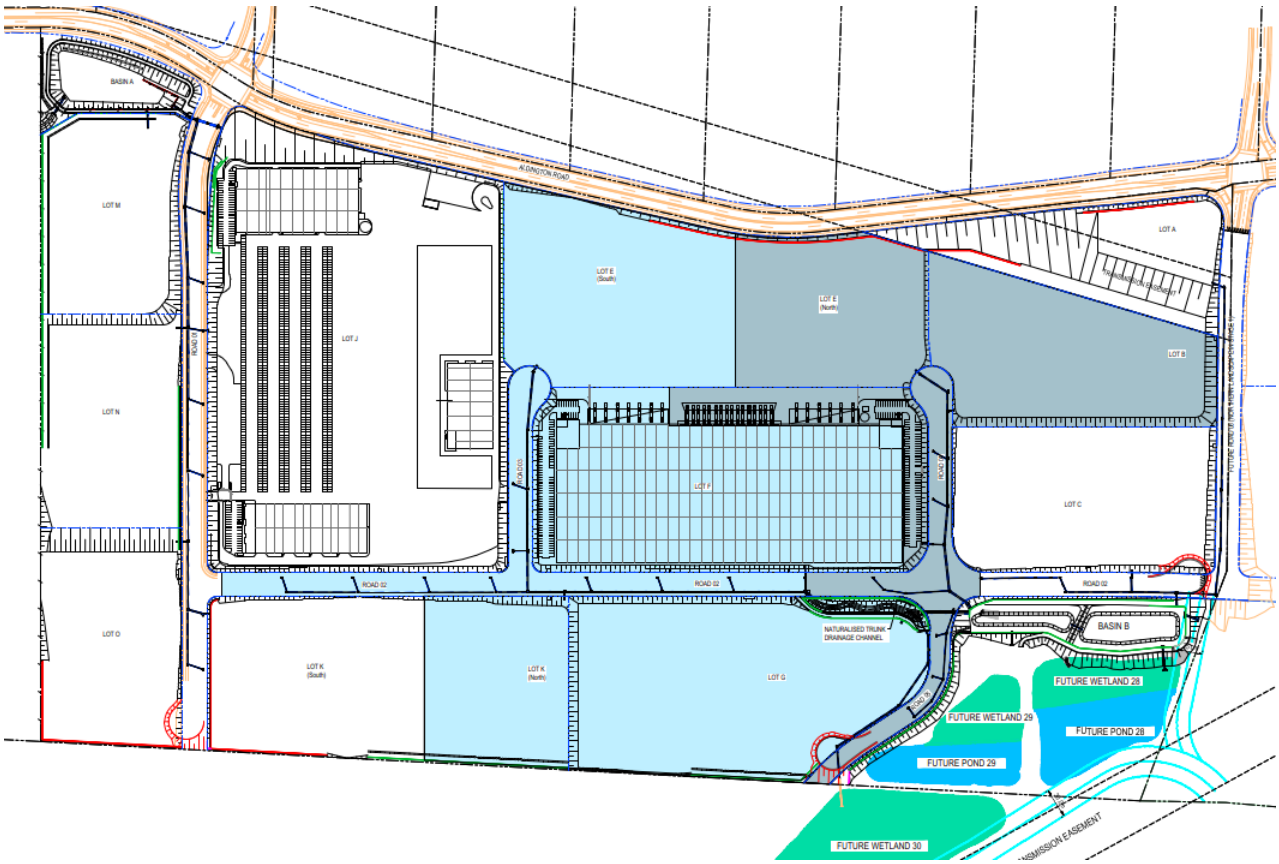

Figure 10: MOD 2 Post Development Catchment Contributions to Basin 30 (extract of SKC194)

3.4. Water Sources and Demands

There are no changes to water sources and demands proposed in MOD 2.

3.5. Connection to Sydney Water Future Stormwater Infrastructure

3.5.1. Treatable flows to future wetlands

The ultimate stormwater management solution for the site is to connect to the Sydney Water MRP SSP.

MOD 2 proposes no changes to the alignment or pipe connections associated with the trunk drainage in Lot G and retains the invert level of the connections to Basins 28, 29 and 30. The location of the future discharge to Basin 28 and 29 aligned to tie into the concept design prepared for the future basins (not included in this modification).

The layout and configuration of the stormwater discharges from Basin B were amended post SSD approval to achieve the conditions of consent, an approval process which required Sydney Water and DPE approval. Specifically, the Trunk Drainage condition B14, which specifies treatable flows to wetlands within the future MRP SSP (Figure 11 and SKC194). Refer to Table 5 for an extract of the requirements.

Table 5: EDD levels for identified wetlands

Total Catchment Area to Wetland	Local Catchment Area to Wetland	Local – Total Catchment Ratio	Wetland ref #	EDD level (mAHD)	Treatable flow rate (m^3/s)	Proportional reduction in treatable flow rate (m^3/s)	Location of discharge
33.55	21.14	0.67	28	63.48	1.501	1.0[1]	Basin B
9.56	9.56	1.00	29	64.21	0.581	0.58	Basin B
75.96	20.98	0.28	30	64.61	4.722[2]	1.30	Low flow pipe from trunk drainage channel

1. SW Basin Details and Scheme 25/01/23 identifies the catchment area for wetlands 28 + 29 as 43.11ha, note some of this is from other sites. 9.53ha is sent to Wetland 29, via Basin B and the remainder 10ha goes to Wetland 28.

2. Treatable flow rate for the full 75.96 Ha catchment area contributing to Wetland 30 (based on SW Basin Details and Scheme 25/01/23).

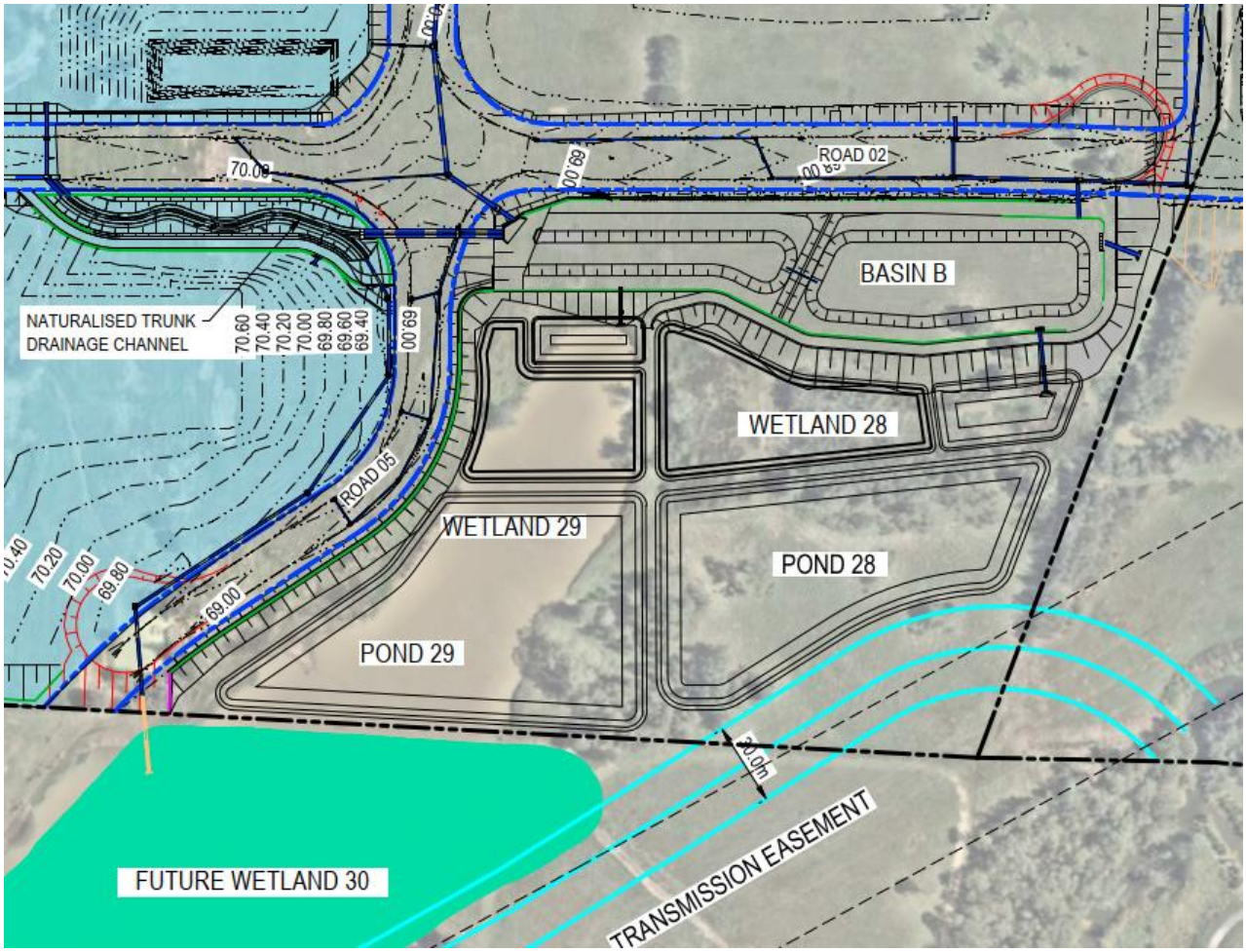

Figure 11 Concept layout of Sydney Water MRP Stormwater Scheme basins 28, 29 and 30

3.5.2. Basin 28 and Basin 29

The Basin B outlet design has been developed to provide connection to future stormwater infrastructure, to enable the diversion of necessary flows to Basins 28 and 29 (Figure 11 and drawing C1124) for treatment by Sydney Water and ensure that the wetlands receive adequate flows above the EDD for effective treatment and ecological health.

To accomplish this, Basin B (Figure 12 and C1087) has been divided into two separate but interconnected systems using an internal weir. This division allows for the creation of sufficient driving head or pressure difference between the two systems. The driving head is essential to meet the flow rates required by Sydney Water. By managing the

flow through the interconnected systems, the outlets can generate the necessary head to direct the stormwater flows to Wetland 28 and Wetland 29.

The maximum flow rate to Wetland 28 and Wetland 29 is 1.060 m^3/s and 0.356 m^3/s respectively. These flow rates are lower than the treatable flow rate nominated in Condition B14 of the conditions of consent due to the Penrith City Council flow attenuation requirements. The remainder of the flows attenuated within Basin B are conveyed to the future natural trunk drainage channel to the north. Refer to Section 5.2.5 for addition information regarding the attenuation of flows in Basin B.

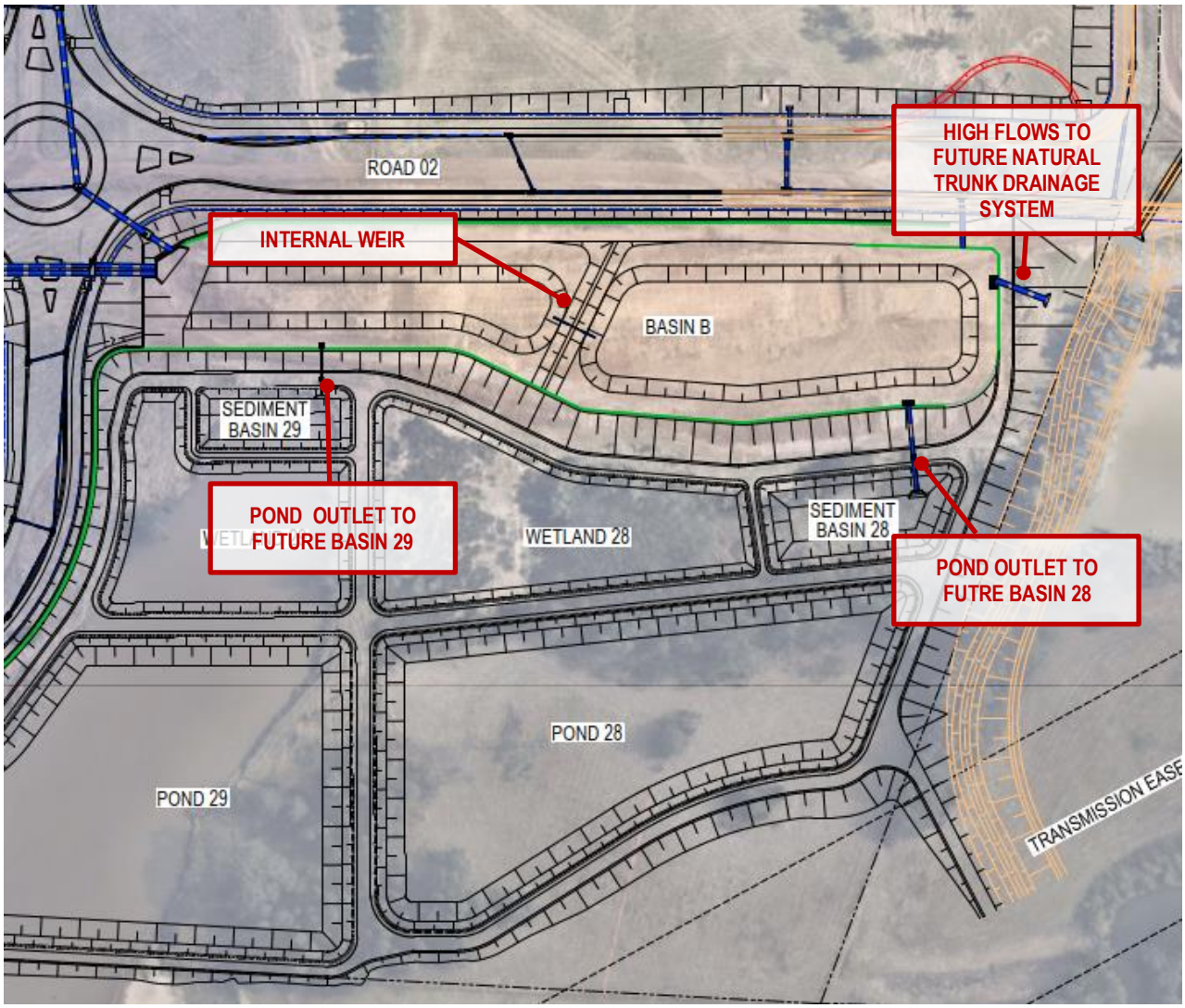

Figure 12: Wetland 28 and 29 Diversion system (based on concept basin design).

3.5.3. Wetland 30

A low flow diversion pipe has been designed to redirect low flows to Sydney Water Wetland 30 in the future. During the interim period (prior to construction of basin 30, by others), this low flow diversion pipe will be capped at the upstream end with a non-return flap valve to prevent water from entering the system. This temporary measure ensures that all flows are directed towards the OSD Basin (Basin B) located on Lot D.

Once the construction of Wetland 30 is completed, the cap on the low flow diversion pipe will be removed to allow 1.50 m^3/s to enter the Wetland in the 1EY. Additionally, a cap will be retrofitted to the high flow structure connected to the OSD Basin B. This modification will allow water to be diverted to the low flow pipe, enabling the desired functioning of the proposed Wetland 30. Refer Figure 13 for further information.

The detail of this design is included in Appendix B.

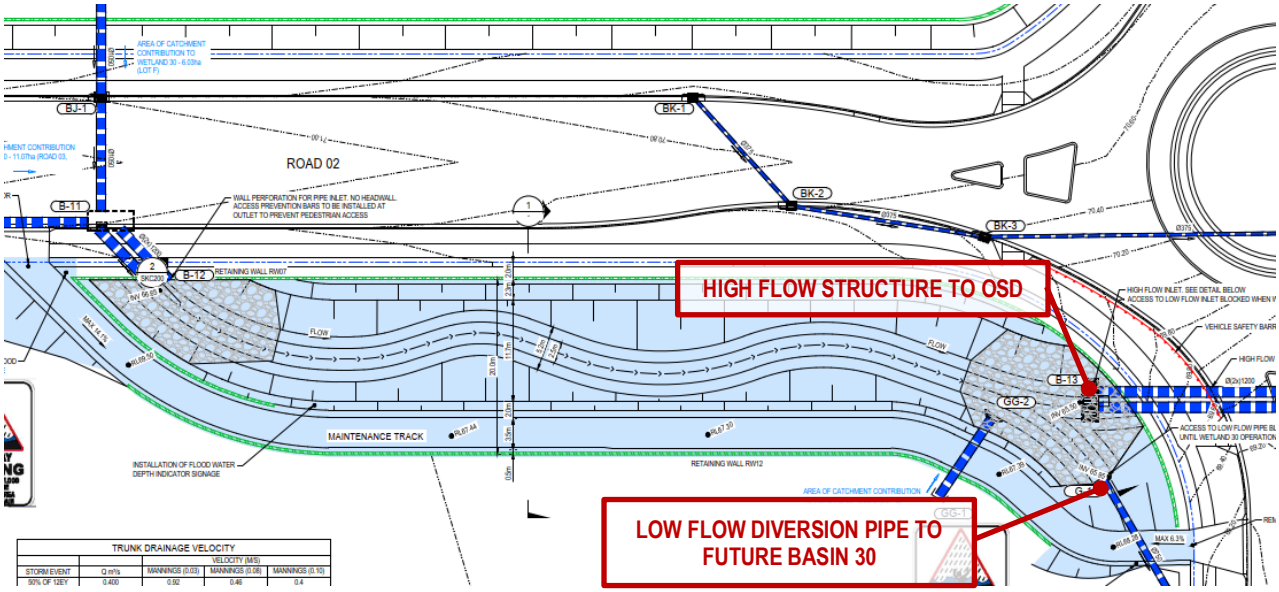

Figure 13: Diversion system to Basin 30 (refer 19-609 C1151 for details).

4. Stormwater Targets

The Mamre Road Precinct DCP establishes the construction and operational phase stormwater quality and quantity (flow) targets for the Site. This Stormwater Management Report addresses operational phase targets only. Construction phase targets are addressed in the separate Erosion and Sediment Control Plan prepared by the CPESC for the Site (from EMM consultants). There is a separate ESCP for each of the on-lot developments, prepared by a CPESC at AT&L. These ESCPs address construction phase water management requirements for the on-lot runoff prior to completion of building works and full stabilisation of the lots.

For the operational phase targets there are two options available for stormwater quality and two options available for stormwater flow. Stormwater quality targets for Option 1 (annual load reduction) and Option 2 (allowable loads) are summarised in **Table 6**.

Table 6: Operational phase stormwater quality targets – Options 1 and 2

Parameter	Option 1 Target (reduction in mean annual load from unmitigated development)	Option 2 Target (allowable mean annual load from development)
Gross pollutants (anthropogenic litter >5mm and coarse sediment >1mm)	90%	< 16 kg/ha/yr
Total suspended solids (TSS)	90%	< 80 kg/ha/yr
Total phosphorus (TP)	80%	< 0.3 kg/ha/yr
Total nitrogen (TN)	65%	< 3.5 kg/ha/yr

Stormwater quantity (flow) targets for Option 1 (mean annual runoff volume) and Option 2 (flow percentiles) are summarised in **Table 7**.

Table 7: Operational phase stormwater quantity (flow) targets – Options 1 and 2

Parameter	Option 1 Target (MARV)	Option 2 Target (flow percentiles)
Mean annual runoff volume (MARV)	≤ 2 ML/ha/yr at the point of discharge to the local waterway	n/a
95%ile flow (L/ha/day at the point of discharge to the local waterway)	n/a	3000 – 15000
90%ile flow (L/ha/day at the point of discharge to the local waterway)	1000 – 5000	1000 – 5000
75%ile flow (L/ha/day at the point of discharge to the local waterway)	n/a	100 – 1000
50%ile flow (L/ha/day at the point of discharge to the local waterway)	5 – 100	5 – 100
10%ile flow (L/ha/day at the point of discharge to the local waterway)	0	n/a
Cease to flow	n/a	Between 10% to 30% of the time

The Mamre Road Precinct DCP requires On site detention (OSD) be provided to ensure no increase in 50% and 1% AEP peak storm flows at the Precinct boundary or at Mamre Road culverts. OSD design is to compensate for any local roads and/or areas within the development site that does not drain to OSD.

5. Water Sensitive Urban Design Strategy

The Water Sensitive Urban Design (WSUD) Strategy for the development incorporates a series of management measures to address stormwater quality, quantity (peak flow attenuation) and flow volume.

5.1. Strategy Overview

This WSUD Strategy has been developed for Stage 1 and 2. The key elements of this Strategy are presented on 19-609-SKC228 and satisfy the stormwater quality, quantity (peak flow) and flow volume controls presented in Section 4.

5.1.1. Stormwater Quality and Flow Management Measures

The proposed measures to address the operational stormwater quality and flow targets for Stage 1-2 are summarised in **Table 8**.

The interim strategies are applicable during the period that the MRP Stormwater Scheme is not constructed whilst the ultimate strategies are to be implemented once the MRP Stormwater Scheme is constructed. There are elements of the ultimate strategy proposed to be constructed as part of Stage 1 and 2 within modification 2.

Table 8: Summary of measures to address stormwater quality and flow management targets for Development Stages 1 -2

Measure	**Stage 1 and 2** (refer to drawing 19-609-SKC228)
	INTERIM – BEFORE MRP STORMWATER SCHEME IS OPERATIONAL
Stormwater harvesting ponds and irrigation of undeveloped lots	▪ Northern Catchment - Stormwater harvesting pond in northern catchment integrated into OSD Basin B with irrigation area on undeveloped Lots. The storage pond area is below the depth of the OSD. ▪ Southern Catchment - Stormwater harvesting pond in undeveloped Lot M for irrigation on undeveloped Lots.
GPT	▪ GPT on Lot J, and F **(Interim and ultimate)**
Sediment pond	▪ To remove sediment prior to discharge to pond • In Southern Catchment - within Basin A • In Northern Catchment – within pond 1 of Basin B
OSD	▪ Basins downstream of development lots to satisfy the stormwater quantity targets and mitigate peak flows up to the 1% AEP. Identified as Basin A and Basin B **(interim and ultimate)**

5.1.2. Stormwater Quantity Management Measures

Two detention basins are proposed within the Estate to satisfy the stormwater quantity targets for the Site. The OSD is required in the interim (pre MRP Stormwater Scheme) and ultimate scenario (post MRP Stormwater Scheme) and will be permanent.

A summary of onsite detention (OSD) information is provided in **Table 9**.

Table 9: Summary of onsite detention measures.

Basin Name	**Base Area (m^2)**	**Top Area (m^2)**	**Basin Depth (m)**	**Volume (m^3)**
Basin A (southern catchment)	892 (Sloped base)	6,500	2.05	11,433
Basin B (northern catchment)	8,500	10,500	1.0	8,220

Further details of these basins are provided in **Section 5.2.5.**

5.2. Proposed Water Management Measures

A general description of the proposed stormwater treatment train components is presented in the following sections. Some of these measures are interim and temporary and only required until the Sydney Water MRP Stormwater Scheme is operational. The exception is onsite detention (OSD) which is required in the interim and ultimate scenario, as OSD is not included in the MRP Stormwater Scheme. The MUSIC node catchments and proposed stormwater management measures are shown in Figure 14 and appended SKC0228.

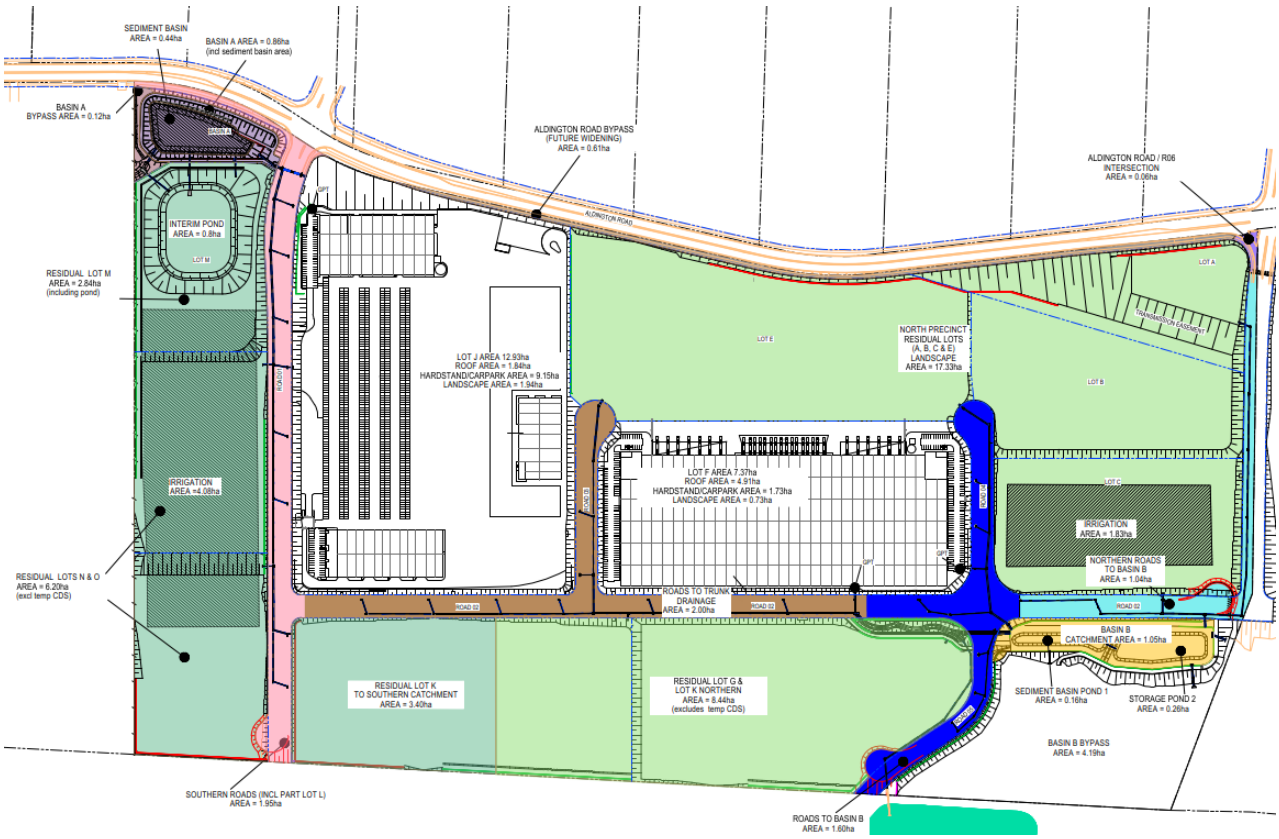

Figure 14 Interim Stormwater management Measures (extract SKC228)

5.2.1. GPTs

The Sydney Water MRP SWS Scheme Optimisation Summary released December 2023 which states GPTs should be on lot, rather than upstream of wetlands. The following changes have been made since the SSDA submission to address this change in guidance :

- A GPT has been allowed for on Lot J and F to reduce gross pollutants from the on-lot development. The details of GPTs will be refined during detailed design. These are not shown in the music model and are additional to the other treatment provided.

5.2.2. Interim Sediment Basin

To manage the quality of runoff generated existing basins are utilised to trap sediment prior to discharge to the storage ponds.

In the **northern catchment** pond 1 within Basin B will be utilised as a sediment basin prior to discharge into pond 2 which is utilised as storage.

In the **southern catchment** as sediment basin is provided in Basin A which has been configured to trap sediment prior to discharge to the pond (on undeveloped land in Lot M). This is achieved through a high-level inlet to allow for the sediment basin build up below. Low flows are directed to the storage pond. The moderate and high flows outlets from Basin A continue to operate as in the ultimate design.

The cover blocking the low flow discharge will be removed in the ultimate design (when the MRP Stormwater Scheme is operational). A connection is provided between Basin A and the storage pond on undeveloped land to the east (Lot M), for storage prior to reuse/irrigation. The connection to the pond will be closed once the interim solution is no longer required. Noting this interim design provides for only stage 1 and 2 development there is sufficient OSD storage above the level of the sediment pond within Basin A.

The volume below the extended detention depth is excluded from OSD volumes.

5.2.3. Interim Storage Ponds for Stormwater Harvesting and Reuse

Storage ponds can capture and store large quantities of stormwater runoff, while also being relatively easy to maintain. Key parameters adopted for the storage pond areas, is summarised below in **Table 10**. These ponds will only be required as an interim measure to satisfy the stormwater flow volume targets, until the Mamre Road Precinct Integrated Stormwater Management Scheme is operational.

Northern Catchment

In the northern catchment an area below the base level of the OSD provided in Basin B (pond 2), will be used to store stormwater for irrigation, thereby reducing runoff volume from the site.

Southern Catchment

In the southern catchment a pond will be constructed on undeveloped land within Lot M to store water for irrigation to reduce runoff volume from the site.

Table 10: Storage /Harvesting Pond parameters for Stage 1 & 2

Parameter	Northern Catchment Storage Pond 2 within Basin B	Southern Catchment Storage Pond within (Lot M)
Inflow from:	Lot A, B, C, E, G and northern K (undeveloped), Lot F (developed)	Lot M, N, O, southern Lot K (undeveloped) Lot J (developed)
Surface area (m^2)	3,240	8,000
Permanent pool volume (m^3)	2,630	13,360
Exfiltration rate (mm/hr)	0	0
Evaporation loss (% of PET)	100	100
Extended detention depth (m)	0.30	0.30
Outlet (equivalent pipe diameter)	300	150
Reuse Rate (mm/ha/yr)	600 [2]	600 [2]
Adopted reuse (m^3/yr)	11,000 [1]	24,500[1]
Area required for irrigation (ha)	1.83 (in northern catchment)	4.08 (In southern catchment)

[1] Applied to undeveloped area

[2] Applied as Monthly Pattern as per MUSIC Modelling Toolkit, not at 50% as full undeveloped area can be irrigated.

5.2.4. Reuse

The ponds and associated irrigation systems will incorporate a series of measures to demonstrate ongoing compliance with the stormwater flow controls and to mitigate potential risks associated with stormwater harvesting and reuse. The design and operation of these systems will comply with the principles and guidance outlined in the *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2); Stormwater harvesting and reuse* (Australian Government, 2009). As a minimum it is expected that the system will incorporate the following:

- A power supply and pump system to transfer water from the pond to the irrigation area.
- Stormwater treatment measures, which may include further filtration or other means. Any required treatment would be subject to detailed design, as well as consideration of the water reuse purpose and exposure, i.e. irrigation. The irrigated area will be fenced to prevent access by the public/contractors on adjacent sites and a buffer area, thus limiting exposure to irrigation water.
- Multi-channel irrigation controllers including inputs for flow meters, moisture sensors and weather stations may form part of the irrigation system to control, monitor and record irrigation system operation. It is expected that the controller would be a readily available "off-the-shelf" product and would be implemented and operated by the developer.

A concept irrigation design from Basin B has been prepared and is appended, a similar design will be utilised for irrigation from the temporary pond proposed in undeveloped Lot M.

5.2.5. On-site Stormwater Detention (OSD) Design Parameters

OSD is required within the development to mitigate post developed flows to pre-developed flow rates for design storm events between the 50% AEP event and the 1% AEP event. Two OSDs are proposed service the full concept master plan development.

The following constraints have been applied to ensure consistency with the technical guidance requirements:

- On-site stormwater detention is designed in accordance with the relevant approval or consent authority requirements.
- Extended detention volume for the treatment system is not included in on-site detention volume (i.e. is assumed to be full, prior to the storm event).
- On-site detention volume is not part of the extended detention of the WSUD measure (i.e. on-site detention volume is not considered in the MUSIC modelling for the WSUD measure).

Key parameters adopted for the OSD are summarised below in Table 11.

Table 11: OSD Basin parameters

Parameter	**Southern catchment Basin A MOD 1**	**Southern catchment Basin A MOD 2**	**Northern catchment Basin B SSDA (no change in MOD 2)**
Inflow from:	Lot J, K, M, N, O	Lot J, K (part), M, N, O	Lot A, B, C, G, H, K (part)
Base Surface area (m^2)	4,770	892 (Tapered base)	8,500
Top Surface area (m^2)	5,000	6,500	10,500
Depth (m)	2.21	2.05	1.0
Volume (m^3)	11,019	11,433	8,220

Parameter	Southern catchment Basin A MOD 1	Southern catchment Basin A MOD 2	Northern catchment Basin B SSDA (no change in MOD 2)
Outlet Interim	Trunk Drainage Channel (south) via BAPS	Trunk Drainage Channel (south) via BAPS	Existing retained farm dams
Outlet Ultimate	Trunk Drainage Channel (south) via BAPS	Trunk Drainage Channel (south) via BAPS	Natural Trunk Drainage Channel (north), Basin 28, 29

6. Performance Assessment

6.1. Hydrological and Hydraulic Modelling

DRAINS modelling software has been used to calculate the Hydraulic Grade Line (HGL) of the proposed estate-wide stormwater network, including pits, pipes, overland flow paths and detention basin. DRAINS is a software package used for designing and analysing urban stormwater drainage systems and catchments. It is widely accepted by Council's across NSW as the basis for stormwater design and has been confirmed by Penrith City Council as the preferred stormwater software analysis package. Refer to Table 12 for the following hydrological parameters adopted to establish predevelopment and post development flow rates.

Table 12: DRAINS hydrological parameters

Parameter	Units
Initial Loss (Pervious) (mm) [1]	37.1
Continuing Loss (Pervious) (mm) [1]	0.94
Initial Loss (Impervious) (mm) [1]	1
Continuing Loss (Impervious) (mm) [1]	0
Impervious area depression storage (mm) [2]	1
Supplementary area depression storage (mm) [2]	1
Pervious area depression storage (mm) [2]	5
Soil Type (1 to 4) [3]	3

[1] IL-CL methodology values used for establishing predevelopment flow rates. [2] ILSAX methodology values used for establishing post development flow rates. [3] Values are based on Hortons Losses from DRAINS and is typical for similar catchments.

Refer to Figure 15 for the DRAINS hydraulic setup configuration.

Figure 15: DRAINS Hydraulic Setup

6.2. Proposed Site Stormwater Drainage

The proposed drainage network within the Site has been designed to safely convey major and minor flows prior to the estate Onsite Stormwater Detention (OSD) basins and eventually discharging to the north-eastern creek and Sydney Water natural trunk drainage to the south. The following criteria have been adopted for the proposed drainage system:

- Major system (pit and pipe network, overland flow paths and channels): 1% AEP
- Minor system (pit and pipe network): minimum 5% AEP and 1% AEP for trapped catchments.

Lot F On-lot stormwater runoff has two discharge points to the Estate drainage network, this is based on the catchments specified in conditions of consent to ensure discharge to the allocated stormwater scheme basins (by Sydney Water), discussed in Chapter 3 of this report.

The following stormwater drainage pipes and culverts shall be used:

- Under estate roads – rubber ring jointed steel reinforced concrete (375mm diameter and larger) or reinforced concrete box culverts (RCBC).
- On-lot pipes within the buildings – rubber ring jointed uPVC with manufactured bends and fittings.
- On-lot pipes in-ground and external to the buildings – rubber ring jointed steel reinforced concrete (375mm diameter and larger) and uPVC pipes (<375mm diameter).

Stormwater drainage from the roof and through the building will be designed by the building hydraulic engineer. Detailed design drawings of the building hydraulics will be made available during submission of documents for Construction Certificate approval.

A summary of the key hydrological and hydraulic design parameters adopted in DRAINS to develop a major and minor system drainage design for the proposed development are as follows:

- Minor system (pit and pipe) drainage has been designed to accommodate the 5% AEP storm event.

- The combined pit and pipe drainage and overland flow paths have been designed to accommodate the 1% AEP storm event.
- Where trapped low points are unavoidable and potential for flooding private property is a concern, an overland flow path capable of carrying the total 1% AEP storm event has been provided. Alternatively, the pipe and inlet system has been upgraded to accommodate the 1% AEP storm event.
- Rainfall intensities have been adopted using the Bureau of Meteorology Design Rainfall Data System (2019).
- The width of flow in the gutter does not exceed 2.5 metres and pits are spaced no further than 75 metres apart.
- Velocity x depth product shall not exceed 0.4 m^2/s for all storms up to and including the 1% AEP event.
- Bypass from any pit on grade shall not exceed 15% of the total flow at the pit for the design minor storm event.
- Blockage factors of 20% and 50% shall be adopted for on-grade and sag pits respectively.
- A hydraulic grade line HGL design method shall be adopted for all road pipe drainage design.
- Pipelines in roadways shall have a minimum diameter of 375mm.
- A desirable minimum grade of 1% for all pipelines is preferred for self-cleansing under low flow velocities. An absolute minimum grade of 0.5% has been adopted.
- Where minimum cover cannot be achieved due to physical constraints the pipe class shall be suitably increased.
- All pipes in trafficable areas will be Reinforced Concrete Pipes (RCP) or Fibre Reinforced Cement (FRC) equivalent.
- Pipes discharging to an overland flow path shall adopt a minimum tailwater level equivalent to respective overland flow level.
- Pit Loss coefficients have been calculated in accordance with the Hare Charts as documented in the Queensland Urban Drainage Manual.
- A minimum 150mm freeboard has been maintained between pit HGL and pit surface levels for the minor design storm event (5% AEP).

6.3. Stormwater Quality Modelling

6.3.1. MUSIC Model Parameters

A MUSIC model of the proposed stormwater management strategy has been created to simulate post-development mean annual loads and treatment train effectiveness. MUSIC model parameters including rainfall and evaporation, rainfall-runoff and source node pollutant generation are consistent with the parameters adopted in the *MUSIC Modelling Toolkit – Wianamatta* (NSW DPIE, 2022).

6.3.2. Modelling

The stage 1 & 2 proposal has been modelled to demonstrate the pollutant concentration and flow targets of the Mamre Road Precinct DCP are achieved. Refer to Appendix A for catchment summary tables and MUSIC model.

6.4. Performance Against Stormwater Targets

6.4.1. Stormwater Quality

MUSIC model results presented as mean annual loads at the receiving node for southern catchment and northern Catchment are presented in Table 13.

Table 13: Summary of MUSIC modelling results against stormwater quality targets Option 2 – Mean Annual Load

		SSDA 10479 MOD 2 Stage 1 (Civil Infrastructure and Lot F) & SSD 61212208 Stage 2 (Lot J)	
Parameter	**Allowable (kg/ha/yr)**	**Southern Catchment (kg/ha/yr)**	**Northern Catchment (kg/ha/yr)**
Total Suspended Solids	**80**	43.86	70.84
Total Phosphorous	**0.3**	0.21	0.23
Total Nitrogen	**3.5**	2.45	2.42
Gross Pollutants	**16**	0.62	0.00

The MUSIC model results presenting allowable mean annual loads demonstrate the proposed stormwater management measures will satisfy the Mamre Road DCP Option 2 allowable loads stormwater quality controls.

6.4.2. Stormwater Quantity

The assessment of the performance of stormwater detention for the Estate has been undertaken at two locations, Basin A and Basin B, Post Development of:

- Concept master plan - the development of roads and all lots as per concept master plan.

A summary of the hydraulic results is provided in Table 14 for Basin A and Table 15 for Basin B.

Table 14: Pre-development and post-development flows at discharge point Basin A

Design Storm Event	Pre-Development Peak Flow [2] (m^3/s)	Post Concept MP Development Peak Flow [1] (m^3/s)	Complies (Y/N)
50% AEP	0.79	0.79	Y
20% AEP	1.30	1.16	Y
10% AEP	1.98	1.70	Y
5% AEP	2.52	1.96	Y
2% AEP	3.84	3.22	Y
1% AEP	4.99	4.55	Y

[1] Concept Master plan Development of all lots and roads. [2] Predevelopment flow rates updated as part of the precinct wide Sydney Water hydrology requirements utilising RAFTS methodology. [Note] The peak flow rate is selected in accordance with the ARR2019 ensemble storm method i.e. it is selected from a range of critical storm duration of each storm event from 5 minute to 6 hour duration.

Table 15: Pre-development and post-development flows at discharge point Basin B

Design Storm Event	Pre-Development Peak Flow (m^3/s) [2]	Post Concept MP Development Peak Flow [1] (m^3/s)	Complies (Y/N)
50% AEP	1.36	2.26	N [3]
20% AEP	2.52	2.45	Y
10% AEP	3.46	2.74	Y
5% AEP	4.55	3.10	Y
2% AEP	6.25	4.42	Y
1% AEP	7.92	6.63	Y

[1] Concept Master plan - Development of all lots and roads.

[2] Predevelopment flow rates updated as part of the precinct wide Sydney Water hydrology requirements utilising RAFTS methodology. [Note] The peak flow rate is selected in accordance with the ARR2019 ensemble storm method i.e. it is selected from a range of critical storm duration of each storm event from 5 minute to 6 hour duration.

[3] Non compliance is due to Sydney Water target flow requirement to Basins/Wetlands 28,29 and 30

The DRAINS model results demonstrate that the post-development peak flow rates to be less than or equal to pre-development peak flow rates for a range of storm events between (and including) the 50% AEP and 1% AEP design events. Therefore, the stormwater drainage system and detention basins as proposed will satisfy the development controls relating to stormwater detention.

6.4.3. Stormwater Quantity (Flow Duration Targets)

MUSIC model results demonstrating performance of the proposed stormwater management measures against the stormwater flow targets for Stage 1 and 2 are presented in **Figure 16** and **Figure 17**. The results shown are an extract from the MUSIC modelling Toolkit provided by DPIE and confirm compliance with DCP Option 1 (Mean Annual Runoff Volume approach) for the proposed Stage 1 and Stage 2 development scenarios.

ENTER DEVELOPMENT AREA (in cell F2)		
Development Area	28.27	ha (i.e. the total catchment areas used in MUSIC)

Stormwater Quantity (flow) Targets Option 2- flow percentiles			
Indices	Result	Comply	Target
95%ile	29,559	No	3000 to 15000 L/ha/day
90%ile	4,711	Yes	1000 to 5000 L/ha/day
75%ile	141	Yes	100 to 1000 L/ha/day
50%ile	18	Yes	5 to 100 L/ha/day
Cease to Flow	17%	Yes	10-30%

Stormwater Quantity (flow) Targets Option 1 - MARV			
Indices	Result	Comply	Target
MARV (ML/ha/yr)	1.79	Yes	≤ 2
90%ile	4,711	Yes	1000 to 5000 L/ha/day
50%ile	18	Yes	5 to 100 L/ha/day
10%ile	0	Yes	0 L/ha/day

Figure 16: Flow duration targets for Stage 1 & 2 (southern catchment)

ENTER DEVELOPMENT AREA (in cell F2)		
Development Area	43.69	ha (i.e. the total catchment areas used in MUSIC)

Stormwater Quantity (flow) Targets Option 2- flow percentiles			
Indices	Result	Comply	Target
95%ile	19,240	No	3000 to 15000 L/ha/day
90%ile	4,937	Yes	1000 to 5000 L/ha/day
75%ile	77	No	100 to 1000 L/ha/day
50%ile	12	Yes	5 to 100 L/ha/day
Cease to Flow	11%	Yes	10-30%

Stormwater Quantity (flow) Targets Option 1 - MARV			
Indices	Result	Comply	Target
MARV (ML/ha/yr)	1.43	Yes	≤ 2
90%ile	4,937	Yes	1000 to 5000 L/ha/day
50%ile	12	Yes	5 to 100 L/ha/day
10%ile	0	Yes	0 L/ha/day

Figure 17: Flow duration targets for Stage 1 & 2 (northern catchment)

The results presented above demonstrate the proposed stormwater management measures to be implemented for the Stage 1 & 2 development satisfy the DCP stormwater flow targets for discharges from southern catchment and northern catchments.

7. Maintenance and Operations

The interim water management strategy elements will remain in private ownership and shared assets will be maintained under the community title through the community association. This includes Lot D (Basin B) and temporary irrigation on undeveloped lots. On lot components including GPTs will be maintained by the tenant of each lot. The cost of operating the WMS is estimated in Table 16. A draft WSUD Maintenance Plan is provided in Appendix C.

In the ultimate scenario when the MRP Stormwater Scheme is operational the on lot GPTs would continue to be maintained and operated by tenants.

OSD basins have not been included in the costs as they are a business as usual cost not a WSUD specific cost. The irrigation of the landscape areas on developed lots is also not considered a WSUD cost and is therefore not included.

Table 16:Whole of life cost (Stage 1 and 2 Development)

WSUD feature	Capital cost $	Asset Life	Operational & Maintenance cost / annum $	Renewal cost $/ 30 years
CONSTRUCTION				
Sediment ponds during construction Type B Basins	2,500,000	1-5 years	1,500,000	N/A
OPERATIONAL (Stage 1 & 2)				
GPT (Lot J)	500,000	30 years	40,000	100,000
GPT (Lot F)	300,000	30 years	40,000	100,000
Temporary Sediment basin (within Basin A and Pond 1 (Basin B)	10,000	10 years	5,000	N/A
Temporary Harvesting pond (Lot M) and pond 2 (Basin B)	50,000	5-10 years	0	N/A
Temporary Irrigation (undeveloped land)	100,000	10 years	50,000	N/A
OPERATIONAL Total	$960,000		$135,000	$200,000

8. Compliance Protocol

Ongoing compliance of the stormwater management system, with the MRP DCP waterway health objectives and targets, will be achieved through a program of inspection, monitoring, and analysis. This will be detailed within a subsequent revision of the Stormwater Management Plan that will be submitted within the Operational Environmental Management Plan, required by condition E6 prior to operation of the development.

AT&L propose the following process for identifying and managing non-compliances with the Mamre Road Precinct DCP Integrated Water Cycle Management (IWCM) controls:

1) **Non-compliance identification:** Regular inspections and monitoring of the stormwater management system should be conducted to identify any potential non-compliances. This can involve visual assessments, data collection, and analysis of performance indicators.
2) **Review regulatory requirements**: The operator of the system is to familiarise themselves with the specific IWCM controls outlined in the regulatory framework. This may include local ordinances, stormwater management guidelines, or environmental protection regulations.
3) **Document non-compliances:** Once a non-compliance is identified, carefully document the details, including the specific control(s) not met, location, and associated concerns or issues. Capture photographs, measurements, and any other relevant data to provide comprehensive documentation.
4) **Investigate the root causes:** Conduct a thorough investigation to determine the underlying causes of the non-compliance. This may involve reviewing design plans, construction records, maintenance logs, and historical performance data. Consider factors such as inadequate infrastructure, improper maintenance, or unforeseen external factors.
5) **Assess impacts:** Evaluate the potential impacts of the non-compliance on water quality, ecosystem health, flood risk, or other relevant factors. Consider both immediate and long-term consequences, as well as potential risks to human health and the environment.
6) **Develop corrective action plan:** Based on the investigation findings, develop a comprehensive corrective action plan. This should outline specific measures to address the non-compliance and bring the stormwater management system into compliance with the IWCM controls. Consider the feasibility, cost-effectiveness, and potential long-term benefits of each proposed action.
7) **Implement corrective actions:** Execute the corrective actions as outlined in the plan. This may involve repairs, upgrades, maintenance activities, or changes in operational procedures. Ensure that the actions are implemented by qualified personnel adhering to best practices and relevant safety guidelines.
8) **Post-implementation assessment:** After implementing the corrective actions, conduct post-assessments to verify the effectiveness of the measures taken. This may include performance monitoring, water quality testing, or hydraulic modelling to evaluate the system's compliance with the IWCM controls.
9) **Reporting and communication:** Prepare a detailed report summarizing the non-compliances, investigation findings, corrective actions taken, and post-implementation results. Communicate the outcomes to relevant stakeholders.
10) **Ongoing monitoring and maintenance:** Establish a regular monitoring and maintenance program to ensure continued compliance with IWCM controls. This should include periodic inspections, data collection, and maintenance activities to prevent future non-compliances.

9. Conclusion

During construction phase the water quality targets will be achieved by following the Erosion and Sediment Control Plans (ESCPs) prepared by a CPESC for each stage of development.

The stormwater management strategies described within this report demonstrate that the requirements of the MRP DCP are achieved for the stages proposed and are consistent with the conditions of consent.

MUSIC modelling demonstrates the following:

- In the northern catchment the developed Lot F and remainder of the runoff is direct to Basin B, where in the interim pond 1 acts as a sedimentation pond and pond 2 provides storage. The water in pond 1 will be utilised for residual lot irrigation and this is sufficient to meet the flow duration curves and pollutant load reductions for the stage 1 & 2 development specified in Section 4.
- In the southern catchment the developed Lot J and remainder of the runoff is directed to the temporary sediment pond within Basin B then the storage/harvesting pond within Lot M and utilised for residual lot irrigation which is shown to be sufficient to meet the flow duration curves and pollutant load reductions for the stage 1 & 2 development specified in Section 4.

The stormwater management scheme includes both ultimate and interim measures before the MRP Stormwater Scheme is operational.

DRAINS modelling demonstrates the following:

- Onsite detention Basins A and B ensure the 50% AEP to 1% AEP storm events flow rates are not greater than the predevelopment flow rates.
- The distribution of flows to Basin/Wetland 28, 29 and ultimately wetland 30 is as required by the consent conditions.
- The natural trunk drainage channel and low flow pipe within Lot G as required by the conditions of consent and the requirements of the Sydney Water Guidelines.

APPENDIX A – MUSIC MODEL

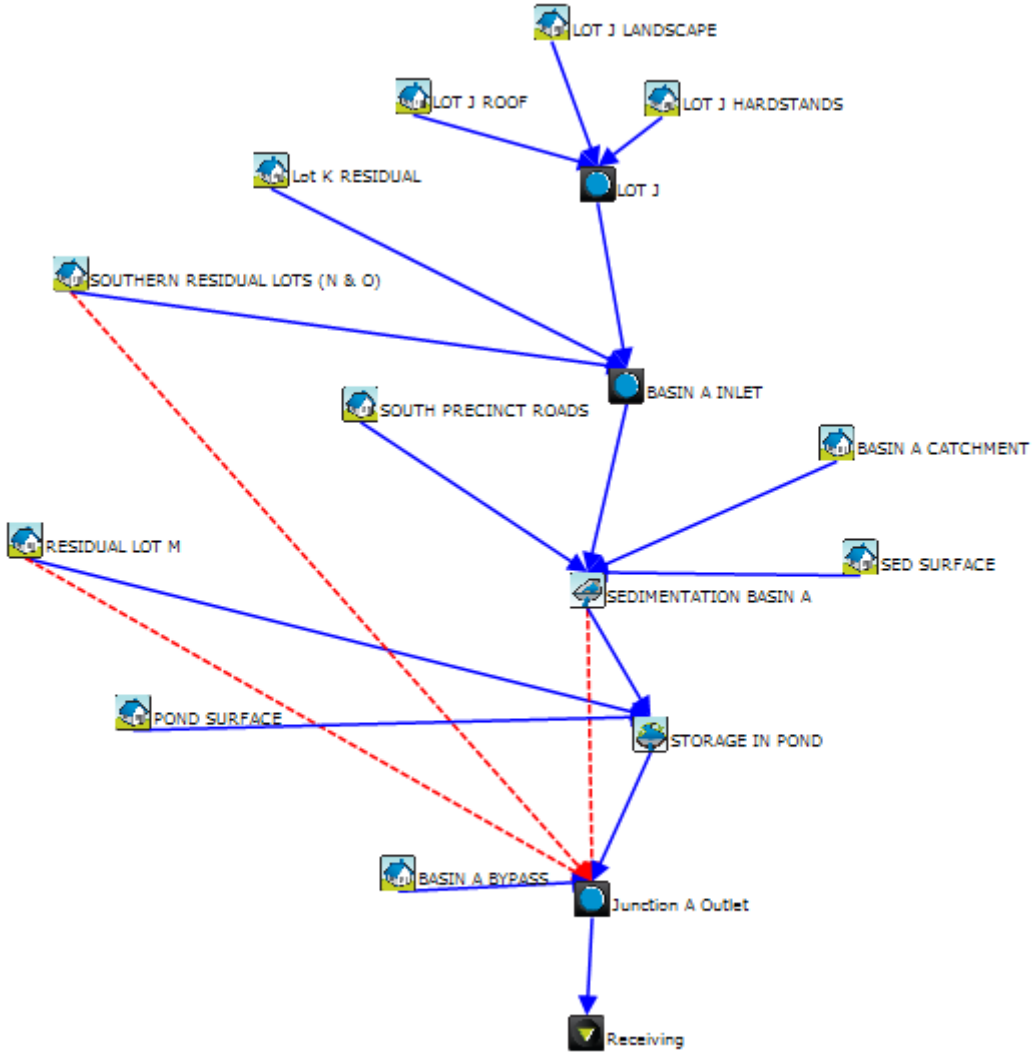

Figure 18 Music Model Southern Catchment – Stage 1 & 2

Table 17: Summary of MUSIC model and treatment paths – Southern Catchment

Node	Area (ha)	Catchment Type	Node Imperviousness (%)	Treatment Path
SOUTHERN RESIDUAL LOTS	**12.44**	**Landscape**	**0**	
LOT N & O	6.20			Sedimentation Basin →storage
LOT K	3.40			Sedimentation Basin →storage
LOT M	2.84			storage
BASIN A CATCHMENT	0.86	Landscape	20	Sedimentation basin →storage
BASIN A BYPASS	0.12	Landscape	70	No treatment
SOUTH ROADS (incl. part of Lot L)	**1.95**	**Road**	**80**	**Sedimentation basin →storage**
DEVELOPED LOT J	**12.93**	**Varies as below**		
LOT J ROOF	1.84	Roof	100	Sedimentation Basin →storage
LOT J HARDSTANDS	9.15	Road	100	Sedimentation Basin →storage
LOT J LANDSCAPE	1.94	Landscape	0	Sedimentation Basin →storage
SOUTHERN CATCHMENT	**28.27**			

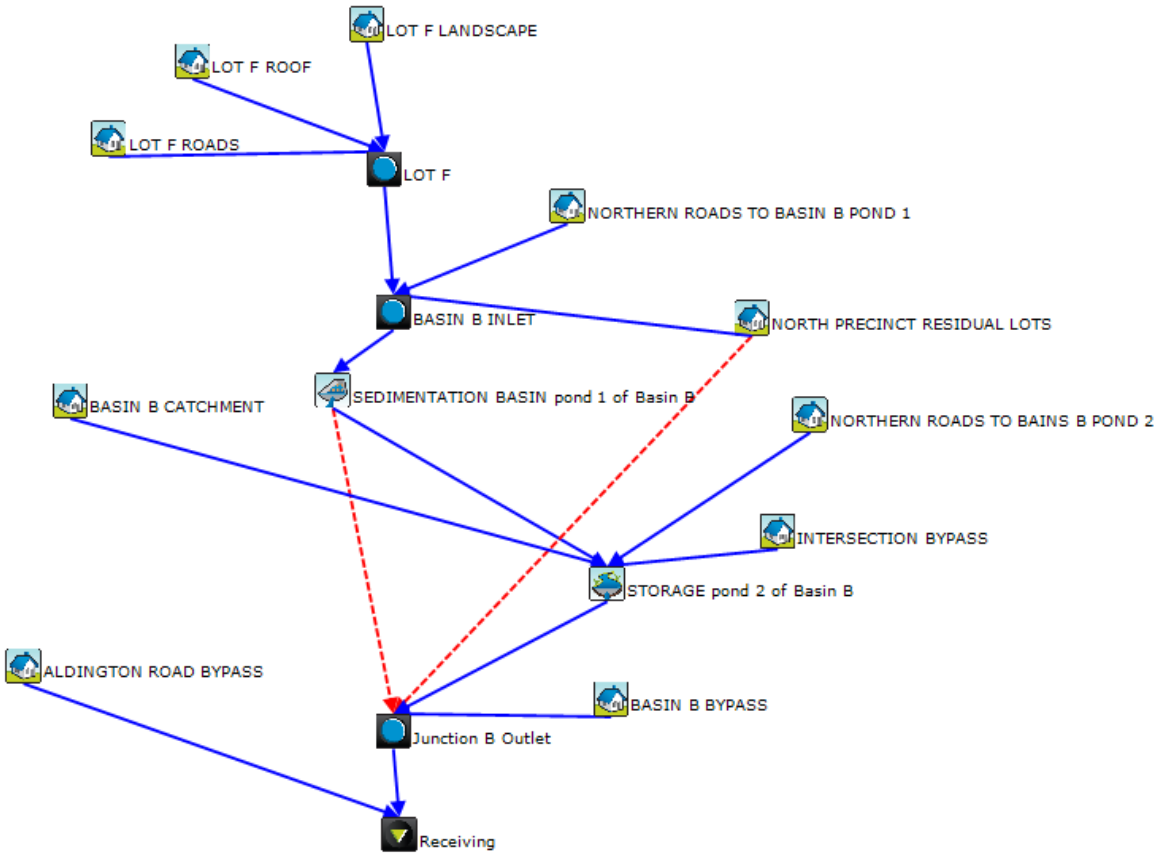

Figure 19 Music Model Northern Catchment – Stage 1 & 2

Table 18: Summary of MUSIC model and treatment paths – Northern Catchment

Node	Area (ha)	Catchment Type	Node Imperviousness (%)	Treatment Path
NORTH PRECINCT RESIDUAL LOTS	**25.77**	**Landscape**	**0**	
NORTH PRECINCT RESIDUAL LOTS (A, B, C & E (NORTH)) **Excludes temp CDS on Lot C**	13.23	Landscape	0	Basin B pond 1 (sedimentation) pond 2 (storage)
RESIDUAL LOT G and LOT K (NORTH) excludes temp CDS on Lot G	8.44	Landscape	0	
RESIDUAL LOT E (SOUTH)	4.10	Landscape	0	
TOTAL NORTHERN ROADS	**4.65**	**Road**	**80**	**Varies as below**
NORTHERN ROADS TO BASIN B (02 & half R06)	1.04	Road	80	Basin B Pond 2 (storage)
ROADS TO BASIN B (R05 /R04)	1.60	Road	80	Basin B pond 1 (sedimentation) pond 2 (storage)
ROADS TO TRUNK DRAINAGE	2.00	Road	80	Basin B pond 1 (sedimentation) pond 2 (storage)
DEVELOPED LOT F	**7.37**	**Varies**		
LOT F LANDSCAPE	0.731	Landscape	0	Basin B pond 1 (sedimentation) pond 2 (storage)
LOT F ROOF	4.91	Roof	100	
LOT F ROADS	1.73	Road	100	
OTHER				
ALDINGTON ROAD/R06 INTERSECTION	0.06	Road	100	Basin B (storage)
ALDINGTON ROAD BYPASS (future widening - majority verge)	0.61	Landscape/Road	5	No treatment (part of PCC Aldington Road upgrade)
LOT D	**5.24**	**Landscape**	**Varies**	**As below**
BASIN B CATCHMENT	1.05	Landscape	37	Basin B pond 1 (sedimentation) pond 2 (storage)
BASIN B BYPASS	4.19	Landscape	0	No treatment
NORTHERN CATCHMENT	**43.69**			

APPENDIX B – SITE LAYOUT

Civil Plans

Stormwater basin and trunk drainage plans
19-609 – C1085 to 1090

19-609 - C1085 Basin A Detail Plan
19-609 – C1086 Basin A Sections
19-609 – C1087 Basin B Detail Plan Sheet 1
19-609 – C1088 Basin B Detail Plan Sheet 2
19-609 – C1089 Basin B Sections
19-609 – C1090 Basin B Details
19-609 – C1091 Interim Stormwater Management Basin Plan
19-609 – C1092 Interim Stormwater Management Basin Details

19-609 –C1151 – Naturalised trunk drainage channel plan & Section
19-609 –C1152 – Low flow diversion pipe plan
19-609 –C1153 – Naturalised Trunk Drainage channel section

Sketches
19-609-SKC 228 200 Aldington Road SWMP MOD 2 and stage 1 & 2
19-609-SKC 194 - Post development catchment contributions to wetland 30

Irrigation plans by Aquadec

ALDINGTON ROAD

63.5

64

62

CATCH DRAIN

F62.77
F62.68
F62.39
F62.31
IL59.56
F62.31
F62.24
IL59.25
F62.05
Ø1200
IL59.05
F62.17
IL58.85
F62.05
F62.13
IL59.19

1 IN 3
5.0%
3.0%
1 IN 3
1 IN 3
0.5m
3.0m
0.5m
4.0%
3.0%
F65.23
F65.13
IL60.00
3.0m
11.6%
MAX 1 IN 3
IL60.13
F65.29
F65.46
F65.33
4.0%
RIP RAP OUTLET PROTECTION
1 IN 12.5
IL60.03
F65.37
1 IN 12.5
IL61.44
Ø1650
4.0%
F65.44
F65.70
IL61.78
Ø1650
Ø1500

1 IN 4
0.5m
3.0m
0.5m
1 IN 4
3.0%
10%

1.0% MIN CROSS FALL

BASIN A
100yr ARI TWL 62.00
DETENTION VOLUME = 11,433m³

RETAINING WALL RW39
ACCESS TRACK
0.5m

LOT M

ROAD 01

1
C1086

2
C1086

LEGEND

- SCOUR PROTECTION
- TURF LANDSCAPING
- MAINTENANCE TRACK
- MAINTENANCE DRIVEWAY
- REINFORCED CONCRETE WEIR/SPILLWAY

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 5 10 15 20m

1 : 250 @ A1 1 : 500 @ A3

Status
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 250	Drawn	JS
		Designed	JH
Height Datum	AHD	Checked	DF
Grid	GDA2020	Approved	LB

Client
19-609-C1085.dwg

Stockland

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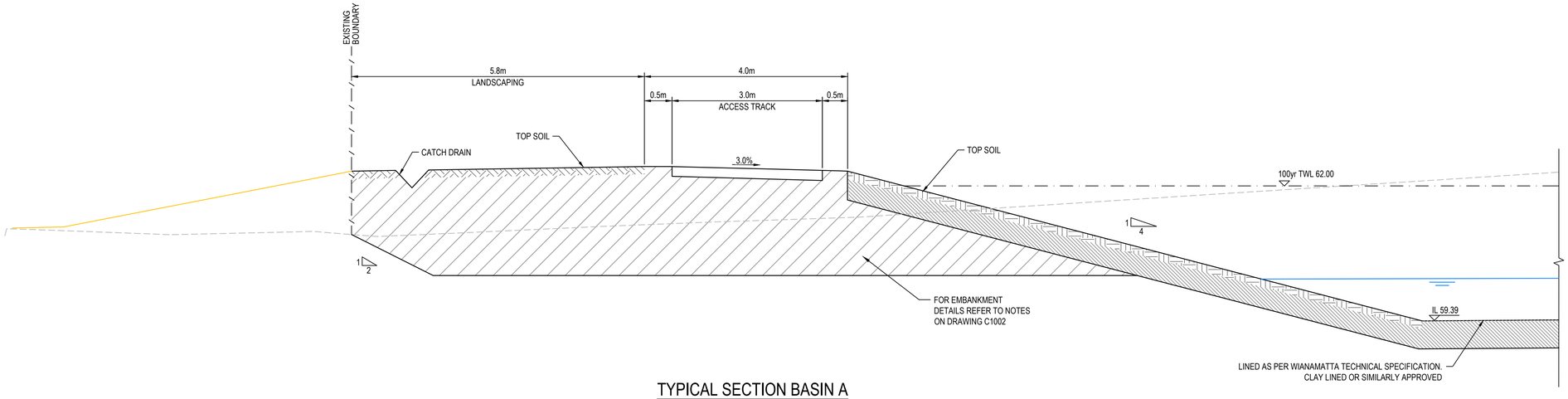
Project
PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title
BASIN A
DETAIL PLAN

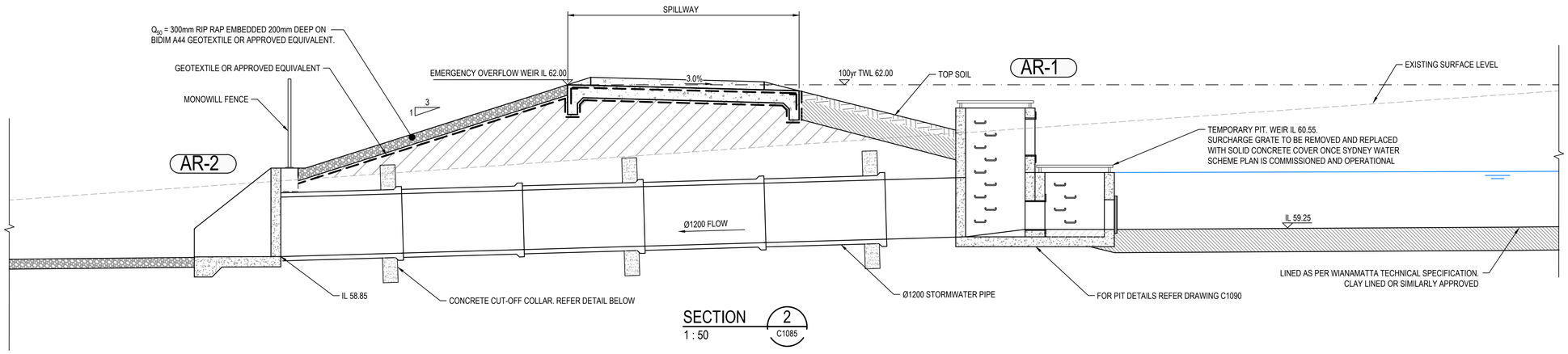
Drawing No.	Project No.	Issue
19-609-C1085	19-609	C

100mm on Original

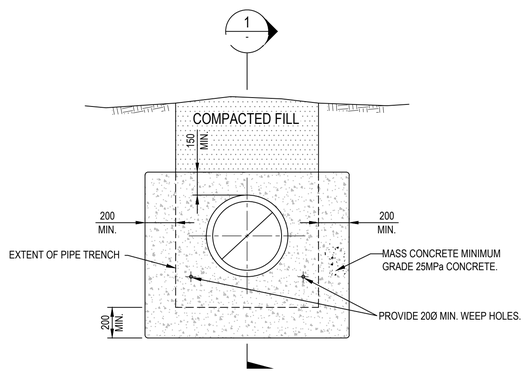


TYPICAL SECTION BASIN A

SECTION 1 / C1085
1 : 50

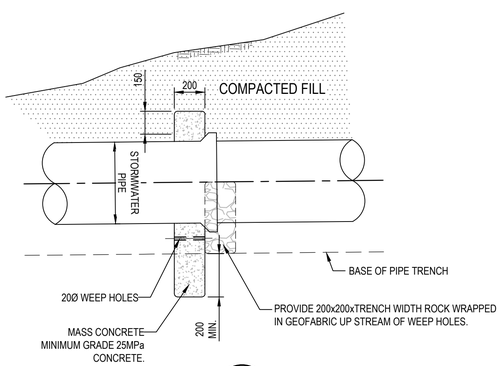


SECTION 2 / C1085
1 : 50



CONCRETE CUT-OFF COLLAR DETAIL

SCALE 1 : 20



SECTION 1 / -
SCALE 1 : 20

NOTE: COLLAR TO BE PLACED @ EVERY 3rd PIPE JOINT

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 1 2 3 4m
1 : 50 @ A1 1 : 100 @ A3

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 50	Drawn JS	
		Designed JH	
Height Datum	AHD	Checked DF	
Grid	GDA2020	Approved LB	

Client

19-609-C1086.dwg

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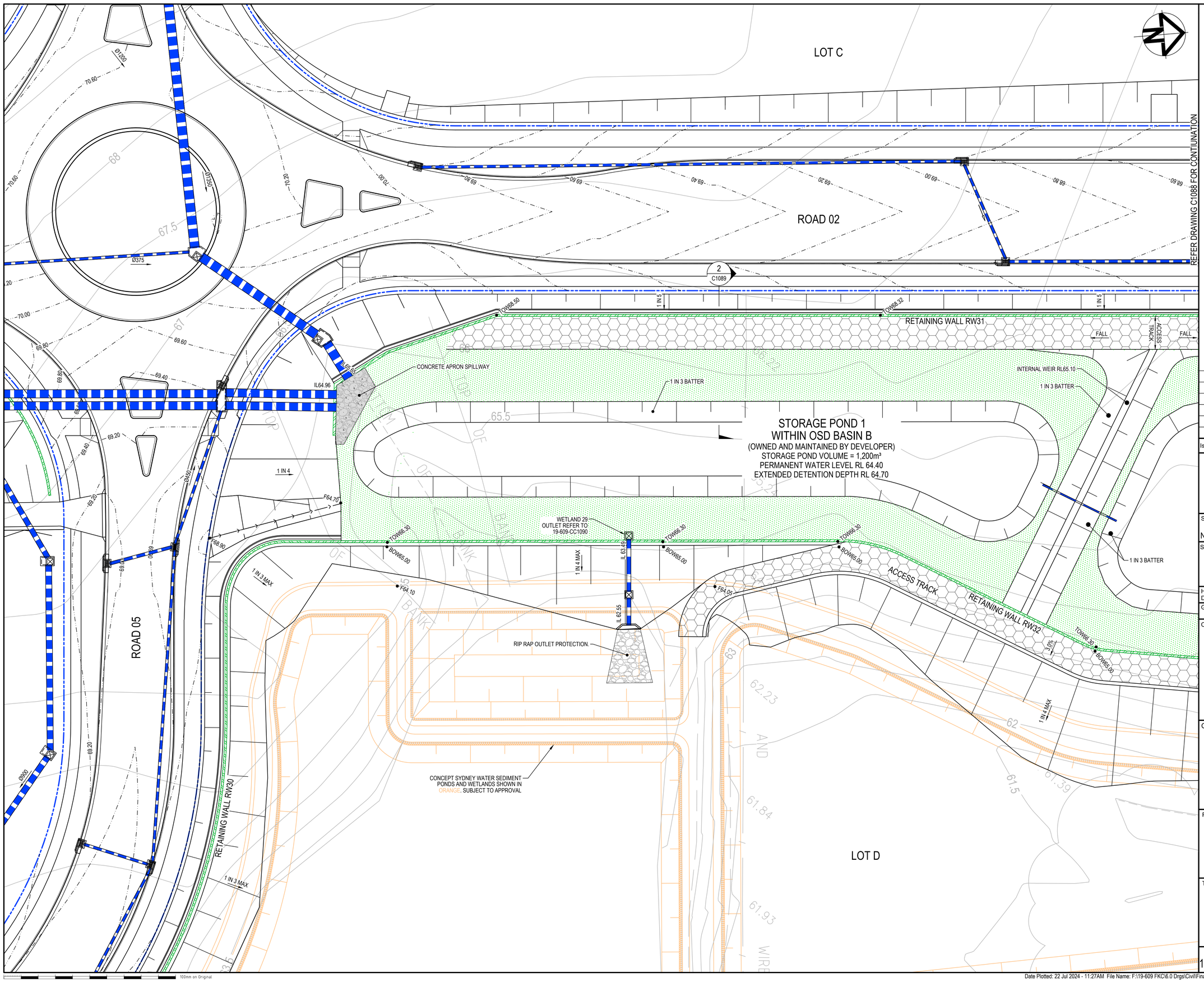
Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title

BASIN A SECTIONS

Drawing No.	Project No.	Issue
19-609-C1086	19-609	C



LEGEND

- SCOUR PROTECTION
- TURF LANDSCAPING
- MAINTENANCE TRACK
- MAINTENANCE DRIVEWAY
- REINFORCED CONCRETE WEIR/SPILLWAY

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 5 10 15 20m

1 : 250 @ A1 1 : 500 @ A3

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 250	Drawn	JS
		Designed	JH
Height Datum	AHD	Checked	DF
Grid	GDA2020	Approved	LB

Client

19-609-C1087.dwg

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Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title

BASIN B
DETAIL PLAN
SHEET 1

Drawing No.	Project No.	Issue
19-609-C1087	19-609	C

100mm on Original

Date Plotted: 22 Jul 2024 - 11:27AM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Final\SSDA\1000_Infrastructure Package MOD2\19-609-C1087.dwg V1

LOT C

REFER DRAWING C1087 FOR CONTINUATION

ROAD 02

RETAINING WALL RW31

ACCESS TRACK

FALL

1 IN 5

1 IN 3 BATTER

TOW67.86

TOW67.69

FE64.40

12.5%

FE68.85

FE68.67

3.0%

TOW68.38

FE68.38

FE68.28

1 IN 3

RIP RAP ENERGY DISSIPATER

IL 62.18

TOW67.00

IL 62.00

RIP RAP OUTLET PROTECTION

3.5m

0.5m

1 IN 3

STORAGE POND 2
WITHIN OSD BASIN B
(OWNED AND MAINTAINED BY DEVELOPER)
STORAGE POND VOLUME = 2,630m³
PERMANENT WATER LEVEL RL 64.40
EXTENDED DETENTION DEPTH RL 64.70

GRASS PADDOCK

1
C1089

TOW66.30

FE65.48

FE65.38

3.0%

EMERGENCY SPILLWAY
RL66.00
LENGTH 12m

EMERGENCY CONCRETE APRON SPILLWAY

RIP RAP OUTLET PROTECTION

WETLAND 28
OUTLET REFER TO
19-609-C1090

RETAINING WALL RW32

BOW65.00

FE65.75

IL 63.18

1 IN 4 MAX

CONCEPT SYDNEY WATER SEDIMENT PONDS AND WETLANDS SHOWN IN ORANGE, SUBJECT TO APPROVAL

CREEK

LOT D

68.40

68.20

68.80

IL 63.98

100mm on Original

LEGEND

- SCOUR PROTECTION
- TURF LANDSCAPING
- MAINTENANCE TRACK
- MAINTENANCE DRIVEWAY
- REINFORCED CONCRETE WEIR/SPILLWAY

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 5 10 15 20m

1 : 250 @ A1 1 : 500 @ A3

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 250	Drawn JS	
		Designed JH	
Height Datum	AHD	Checked DF	
Grid	GDA2020	Approved LB	

Client: 19-609-C1088.dwg

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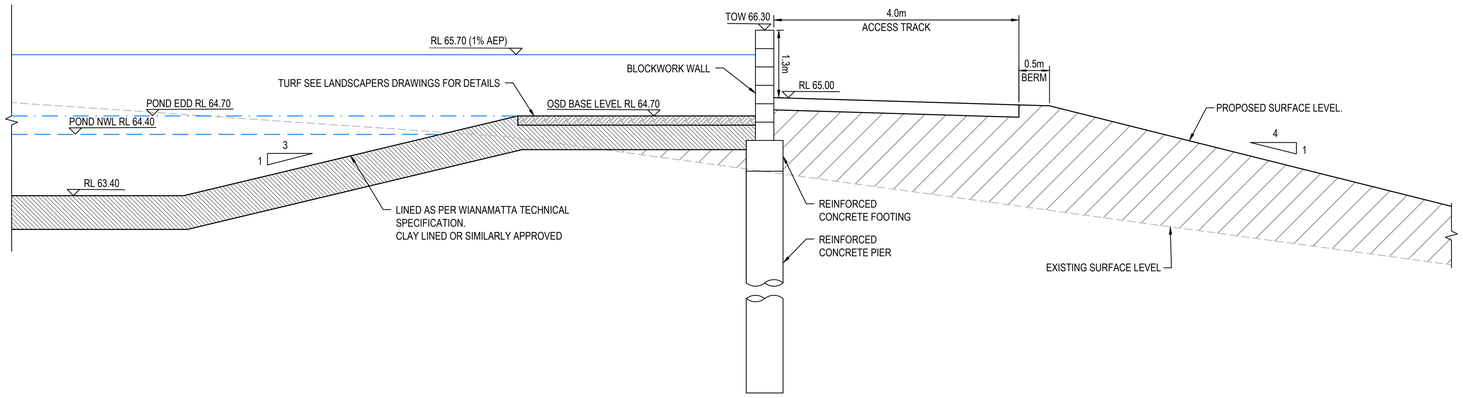
Project
PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title
BASIN B
DETAIL PLAN
SHEET 2

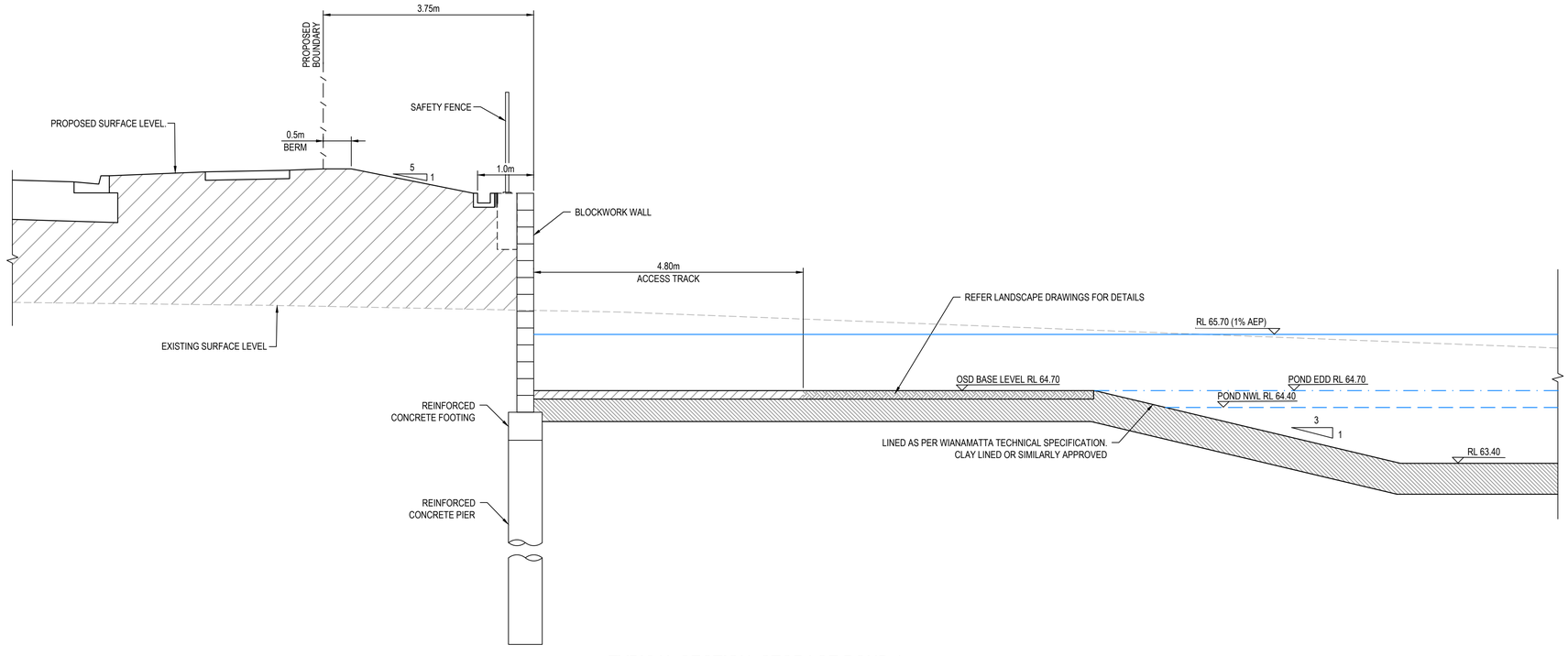
Drawing No.	Project No.	Issue
19-609-C1088	19-609	C

Date Plotted: 22 Jul 2024 - 11:28AM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Final\SSDA\1000_Infrastructure Package MOD2\19-609-C1088.dwg V1



TYPICAL SECTION STORAGE POND 2
BASIN B

SECTION 1 (C1088)
1 : 50



TYPICAL SECTION STORAGE POND 1
BASIN B

SECTION 2 (C1087)
1 : 50

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 1 2 3 4m
1 : 50 @ A1 1 : 100 @ A3

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 50	Drawn	JS
		Designed	JH
Height Datum	AHD	Checked	DF
Grid	GDA2020	Approved	LB

Client: 19-609-C1089.dwg

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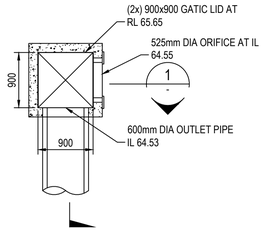
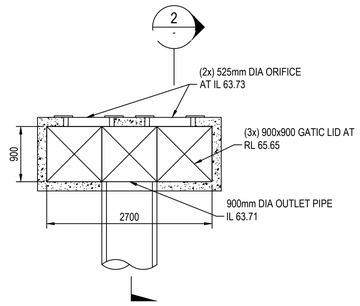
Project
PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title
BASIN B
SECTIONS

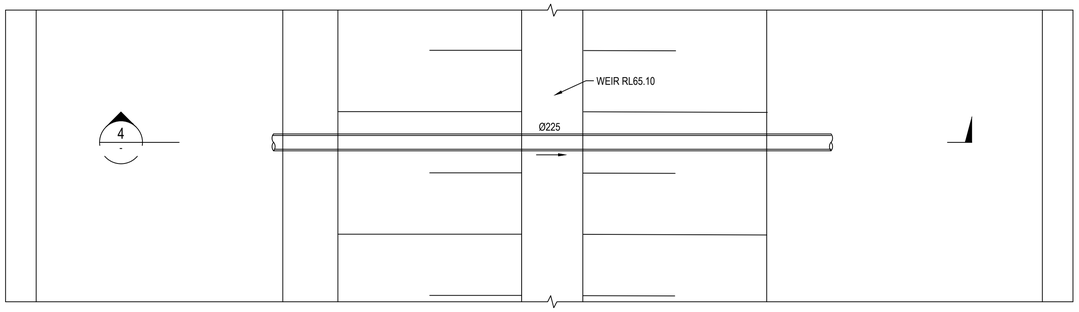
Drawing No.	Project No.	Issue
19-609-C1089	19-609	C



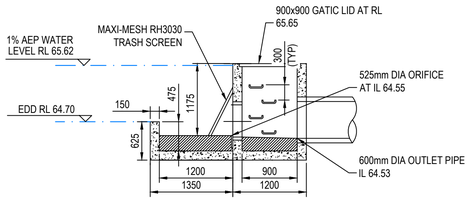
WETLAND 29 OUTLET PLAN



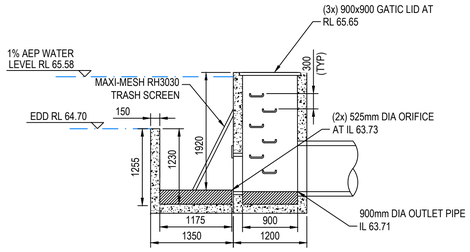
WETLAND 28 OUTLET



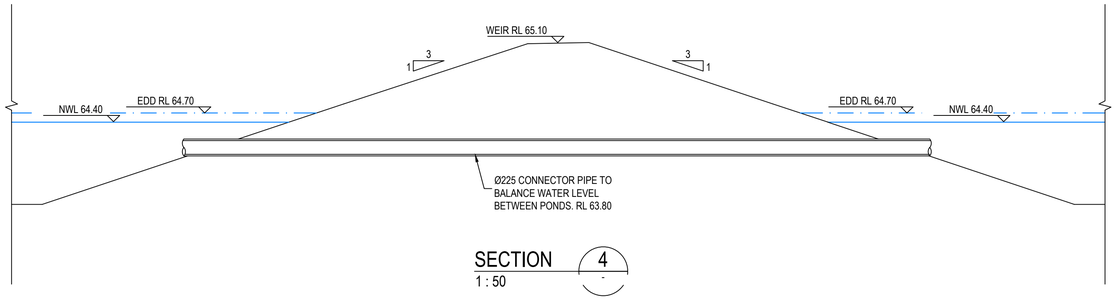
POND OVERFLOW PIT PLAN



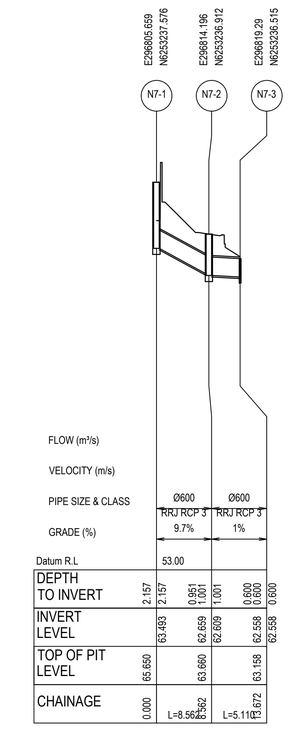
SECTION 1
1 : 50



SECTION 2
1 : 50

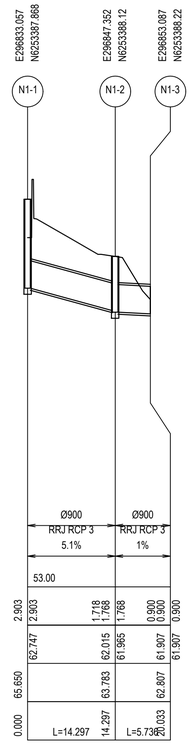


SECTION 4
1 : 50

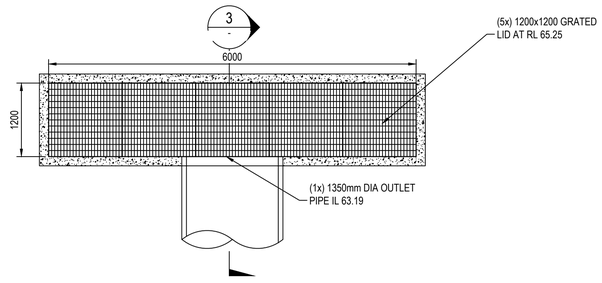


NOTE:
SYDNEY WATER SPECIFIED EDD 64.21 (WETLAND 29)

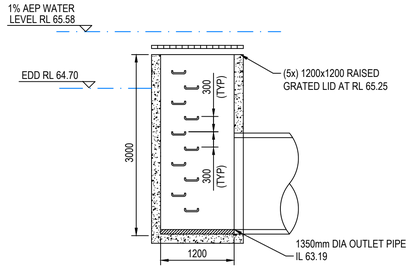
LOW FLOW DIVERSION TO FUTURE WETLAND 29
1:500(H) 1:100(V)



LOW FLOW DIVERSION TO FUTURE WETLAND 28
1:500(H) 1:100(V)



WATERCOURSE OUTLET



SECTION 3
1 : 50

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 1 2 3 4m

1 : 50 @ A1 1 : 100 @ A3

Status
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 50	Drawn JS	
		Designed JH	
Height Datum	AHD	Checked DF	
Grid	GDA2020	Approved LB	

Client

19-609-C1090.dwg

Stockland

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Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

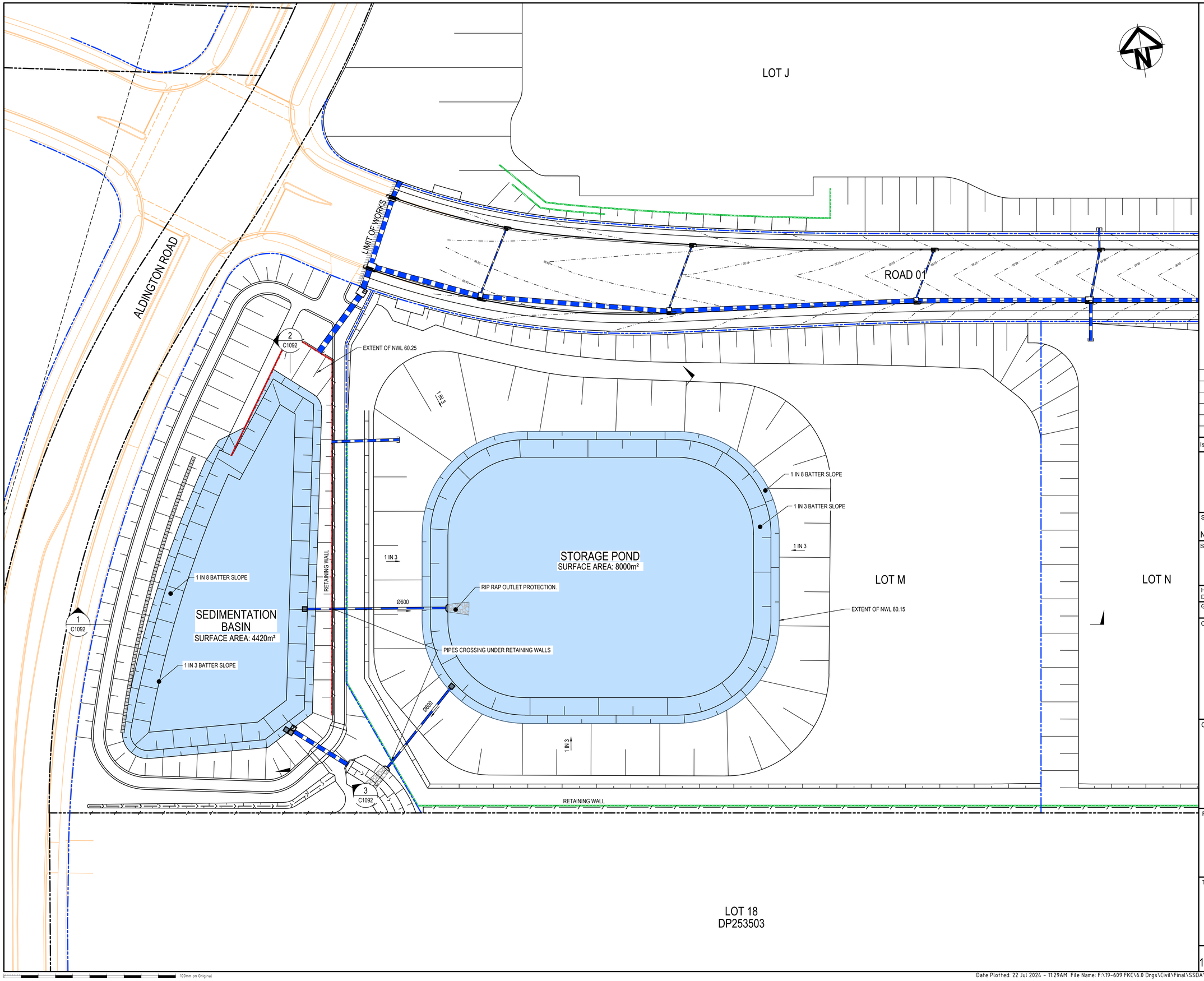
Title

BASIN B DETAILS

Drawing No.	Project No.	Issue
19-609-C1090	19-609	C

100mm on Original

Date Plotted: 22 Jul 2024 - 11:28AM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Final\SSDA\1000_Infrastructure Package MOD2\19-609-C1090.dwg V1



Issue	Description	Date
D	ISSUED FOR APPROVAL	22-07-24
C	ISSUED FOR INFORMATION	22-05-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 10 20 30 40m

1 : 500 @ A1 1 : 1000 @ A3

Status
PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500	Drawn JS	
		Designed JH	
Height Datum	AHD	Checked DF	
Grid	GDA2020	Approved LB	

Client

19-609-C1091.dwg

Stockland

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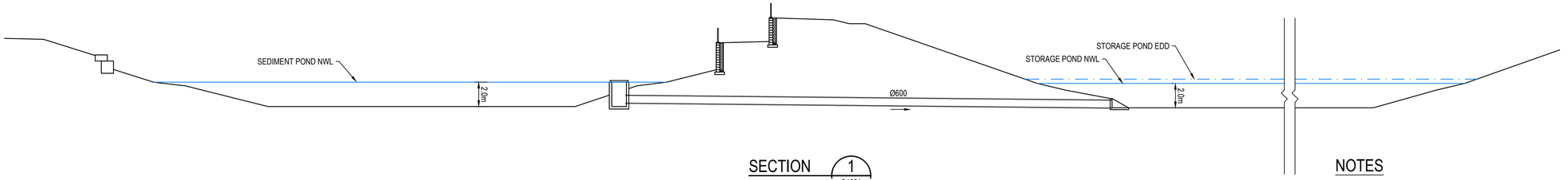
Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title

INTERIM STORMWATER TREATMENT BASINS PLAN

Drawing No.	Project No.	Issue
19-609-C1091	19-609	D



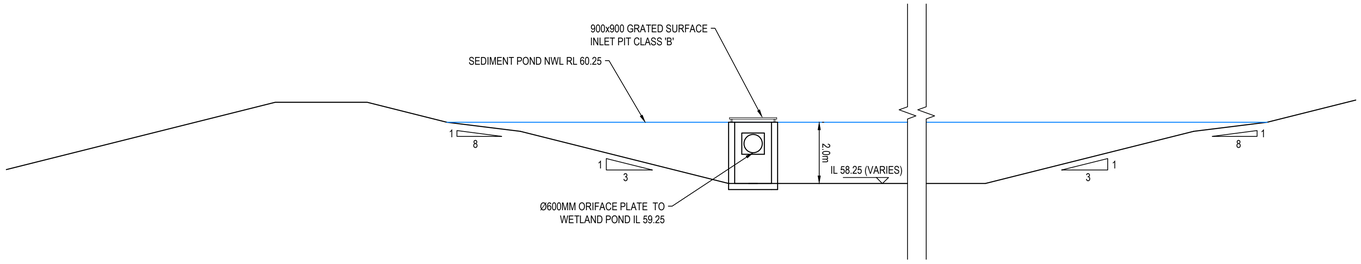
SECTION 1 / C1091

INTERIM STORMWATER TREATMENT BASINS

SCALE 1:200

NOTES

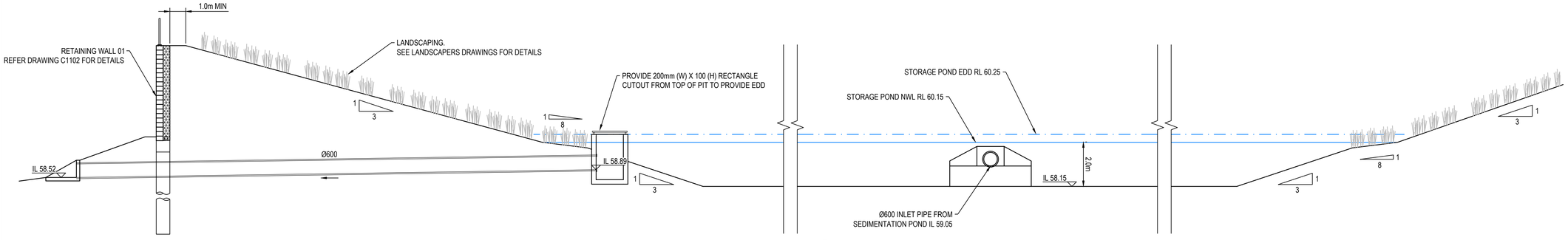
1. EITHER AN IN-SITU CLAY LINER, HOPE LINER OR GEOSYNTHETIC CLAY LINER TO BE INSTALLED SUBJECT TO LOCAL CONDITIONS. LINER SELECTION TO BE DETERMINED FOLLOWING GEOTECHNICAL INVESTIGATION.
2. SANDSTONE LOG TO BE INSTALLED TO PROVIDE NEAR VERTICAL EDGE AND MINIMISE WADING BIRD HABITAT AT POND EDGE. ALTERNATIVE OPTIONS TO SANDSTONE LOGS MAY BE CONSIDERED.
3. REFER TO PLANTING SCHEDULE FOR PLANTING REQUIREMENTS
4. NWL = NORMAL WATER LEVEL
5. EDD = EXTENDED DETENTION DEPTH
6. TWL = TOP WATER LEVEL



SECTION 2 / C1091
1 : 100

SEDIMENTATION POND WITHIN BASIN A

SCALE 1:100



SECTION 3 / C1091
1 : 100

STORAGE POND TYPICAL SECTION

SCALE 1:100

Issue	Description	Date
D	ISSUED FOR APPROVAL	22-07-24
C	ISSUED FOR INFORMATION	22-05-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

0 2 4 6 8 10m
1 : 100 @ A1 1 : 200 @ A3

0 5 10 15 20m
1 : 200 @ A1 1 : 400 @ A3

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 100 1 : 200	Drawn	JS
		Designed	JH
Height Datum	AHD	Checked	DF
Grid	GDA2020	Approved	LB

Client

19-609-C1092.dwg

Stockland

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info@atl.net.au

Project

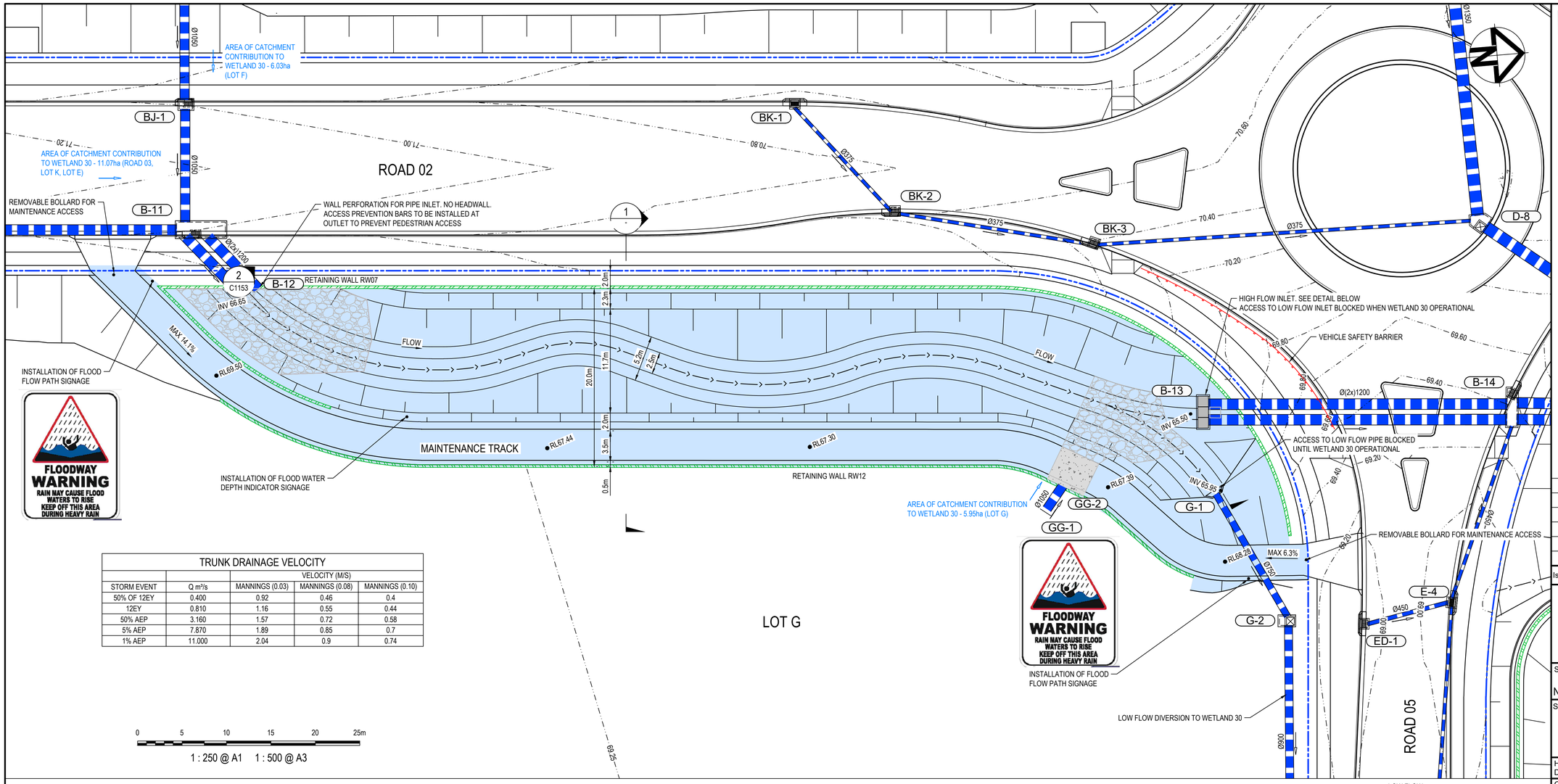
PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON
SSD10479 MOD2

Title

INTERIM STORMWATER TREATMENT BASINS DETAILS

Drawing No.	Project No.	Issue
19-609-C1092	19-609	D

100mm on Original



TRUNK DRAINAGE VELOCITY

		VELOCITY (M/S)		
STORM EVENT	Q m³/s	MANNINGS (0.03)	MANNINGS (0.08)	MANNINGS (0.10)
50% OF 12EY	0.400	0.92	0.46	0.4
12EY	0.810	1.16	0.55	0.44
50% AEP	3.160	1.57	0.72	0.58
5% AEP	7.870	1.89	0.85	0.7
1% AEP	11.000	2.04	0.9	0.74

0 5 10 15 20 25m

1 : 250 @ A1 1 : 500 @ A3

LEGEND

- PROPOSED BOUNDARY
- 65.0 PROPOSED CONTOUR
- PROPOSED KERB AND GUTTER
- 375Ø PROPOSED STORMWATER PIPE WITH SIZE
- PROPOSED KERB INLET PIT
- PROPOSED HEADWALL
- AA-1 PROPOSED STORMWATER PIT NUMBER
- PROPOSED RETAINING WALL
- AREA OF CHANNEL WITH RETAINING WALL = 2664m²

NOTES

1. ALL NATURALISED TRUNK DRAINAGE IS LINED WITH AN IMPERMEABLE LINER AND COMPACTED TO A SUITABLE DEPTH AND TOPSOILED (AS44119) TO LIMIT INFILTRATION TO SOILS
2. MAINTENANCE TRACK MATERIAL - ROAD BASE FOR LIGHT VEHICLE ACCESS

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

Status: PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 50 1 : 100 1 : 250	Drawn	JS
		Designed	JH
Height Datum	AHD	Checked	DF
Grid	GDA2020	Approved	LB

Client

19-609-C1151.dwg

Stockland

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Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON

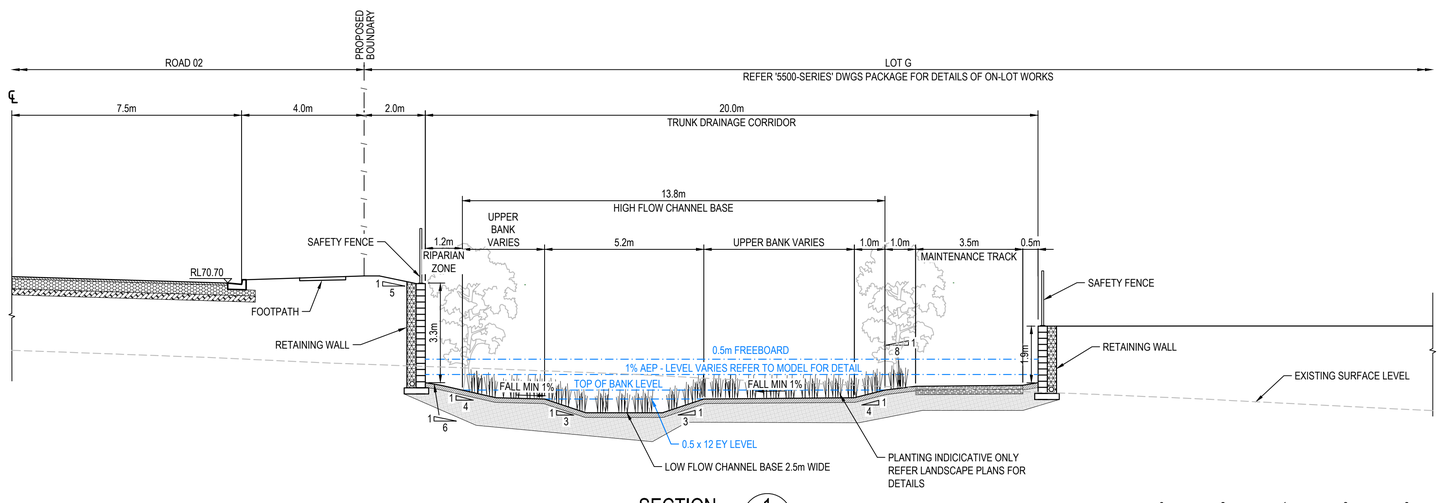
Title

NATURALISED TRUNK DRAINAGE CHANNEL PLAN & SECTION

Drawing No.	Project No.	Issue
19-609-C1151	19-609	C

NATURALISED TRUNK DRAINAGE CHANNEL PLAN

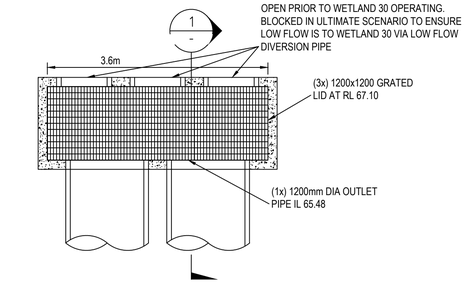
SCALE 1:250



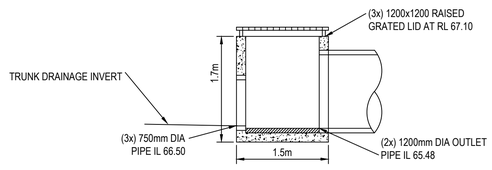
SECTION 1 — 1 : 100

0 2 4 6 8 10m

1 : 100 @ A1 1 : 200 @ A3



HIGHFLOW INLET FROM TRUNK DRAINAGE



SECTION 1 — 1 : 50

ROAD 05

LOW FLOW DIVERSION PIPE TO WETLAND 30.
NON RETURN VALVE TO BE INSTALLED TO DIVERT FLOWS B-13. TO BE KEPT IN PLACE UNTIL WETLAND 30 IS OPERATIONAL.

LOW FLOW DIVERSION TO WETLAND 30

MAINTENANCE TRACK

PIPE OUTLET BLOCKED UNTIL FUTURE CONNECTION WITH WETLAND 30

FUTURE EXTENSION IN ORANGE TO BE CONSTRUCTED TOGETHER WITH WETLAND 30

FOR CONTINUATION SEE INSERT A

FOR CONTINUATION SEE ABOVE

PROPOSED WETLAND 30
(BY SYDNEY WATER)

INTERIM EXTENT

ULTIMATE EXTENT

INSERT A

0 5 10 15 20 25m

1 : 250 @ A1 1 : 500 @ A3

LEGEND

- PROPOSED BOUNDARY
- 65.0 PROPOSED CONTOUR
- PROPOSED KERB AND GUTTER
- 375Ø PROPOSED STORMWATER PIPE WITH SIZE
- PROPOSED KERB INLET PIT
- PROPOSED HEADWALL
- AA-1 PROPOSED STORMWATER PIT NUMBER
- PROPOSED RETAINING WALL
- PROPOSED MRPSWS LAYOUTS PROVIDED BY SYDNEY WATER (JUNE 2023-12D DESIGN)

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: 1 :250

Drawn: JS
Designed: JH
Checked: DF
Approved: LB

Height Datum: AHD
Grid: GDA2020

Client

19-609-C1152.dwg

Stockland

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Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON

Title

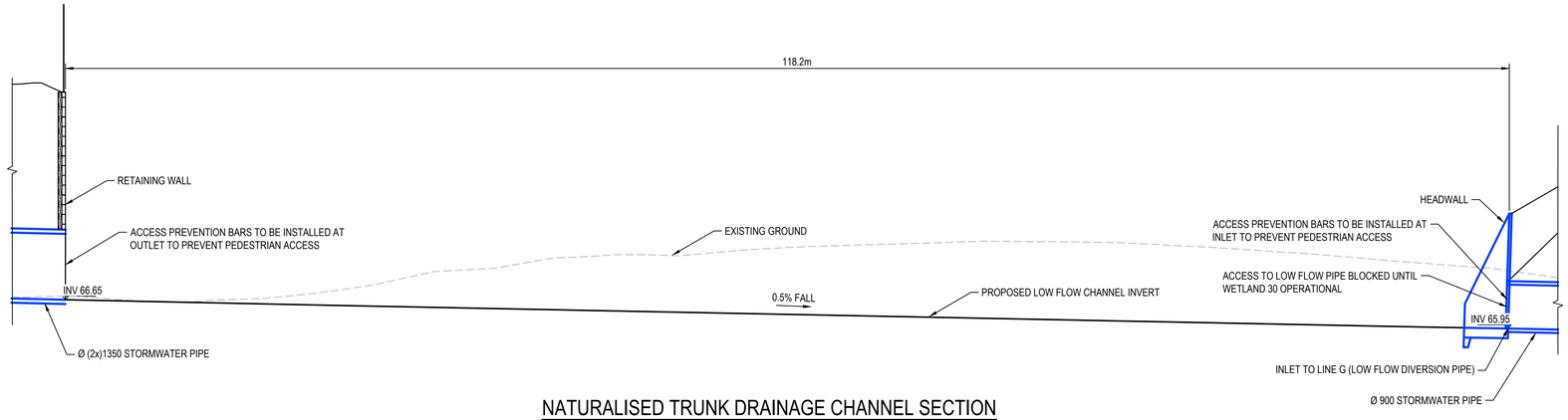
LOW FLOW DIVERSION PIPE PLAN

Drawing No.	Project No.	Issue
19-609-C1152	19-609	C

100mm on Original

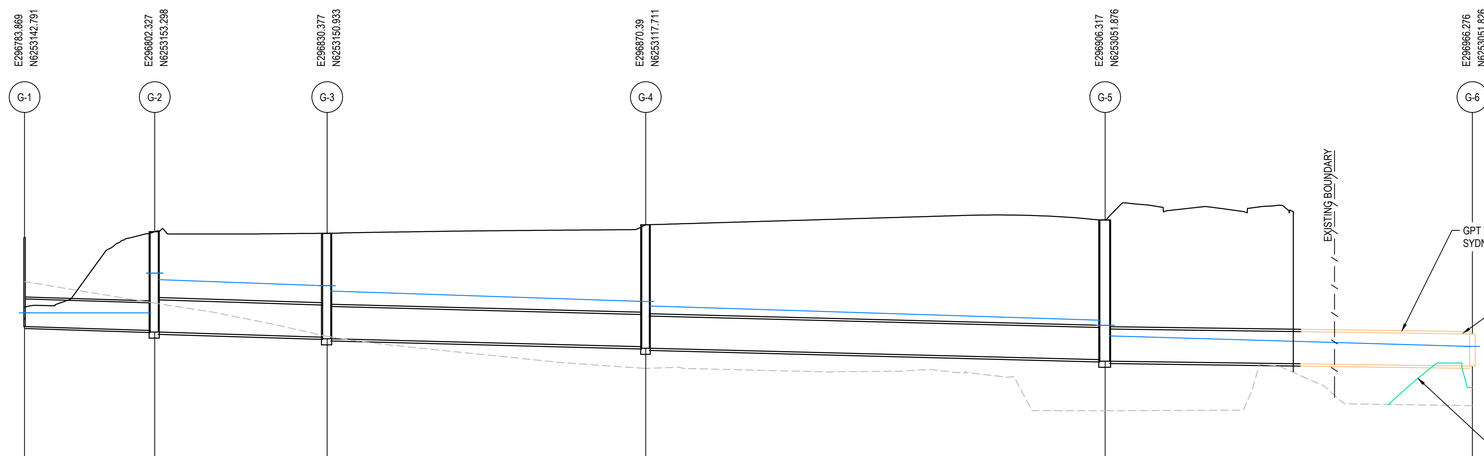
Date Plotted: 22 Jul 2024 - 11:33AM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Final\SSDA\1000_Infrastructure Package MOD2\19-609-C1152.dwg

V1



NATURALISED TRUNK DRAINAGE CHANNEL SECTION

1:1000(H) 1:250(V)



	G-1	G-2	G-3	G-4	G-5	G-6
	E296783.869 N6253142.791	E296802.327 N6253153.298	E296830.377 N6253150.933	E296870.39 N6253117.711	E296966.317 N6253051.876	E296966.276 N6253051.826
	HEADWALL	900 x 900 GATIC LID	900 x 900 GATIC LID	900 x 900 GATIC LID	900 x 900 GATIC LID	
FLOW (m³/s)	1.3	1.3	1.3	1.3	1.3	
VELOCITY (m/s)	2.1	2.1	2	2.1	2.2	
PIPE SIZE & CLASS	Ø900 RRJ RCP 3	Ø1050 RRJ RCP 3	Ø1050 RRJ RCP 3	Ø1050 RRJ RCP 3	Ø1050 RRJ RCP 3	
GRADE (%)	0.6%	0.6%	0.5%	0.5%	0.5%	
Datum R.L	50.00					
DEPTH TO INVERT	2.904	2.904 3.227	3.277 3.392	3.442 3.977	4.027 4.560	4.610 1.050
						1.050
H.G.L. LEVEL	66.400	66.400 66.694	67.480 67.282	67.282 66.769	67.108 66.157	65.946 65.302
					65.992	65.302
INVERT LEVEL	65.950	65.822	65.772 65.604	65.554 65.294	65.244 64.869	64.819 64.519
						64.519
TOP OF PIT LEVEL	68.853	69.049	68.995	69.271	69.429	65.569
EXISTING SURFACE LEVEL	67.420	66.717	65.629	64.584	63.200	63.369
CHAINAGE	0.000	L=21.238 21.238	L=28.150 49.388	L=52.007 101.395	L=75.000 176.395	L=59.959 236.354

NOTE:
SYDNEY WATER SPECIFIED EDD 64.61 (WETLAND 30)

LOW FLOW DIVERSION TO FUTURE WETLAND 30
LINE G

1:500(H) 1:100(V)

0 5 10 15 20 25m

1 : 250 @ A1 1 : 500 @ A3

0 20 40 60 80 100m

1 : 1000 @ A1 1 : 2000 @ A3

Issue	Description	Date
C	ISSUED FOR APPROVAL	22-07-24
B	ISSUED FOR APPROVAL	18-01-24
A	ISSUED FOR APPROVAL	21-12-23

Status: PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1: 250 V 1 : 1000 H	Drawn JS	
		Designed JH	
Height Datum	AHD	Checked DF	
Grid	GDA2020	Approved LB	

Client: 19-609-C1153.dwg

Stockland

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Project: PROPOSED INDUSTRIAL DEVELOPMENT 200 ALDINGTON SSD10479 MOD2

Title: NATURALISED TRUNK DRAINAGE CHANNEL SECTION

Drawing No.	Project No.	Issue
19-609-C1153	19-609	C

100mm on Original

SEDIMENT BASIN
AREA = 0.44ha

BASIN A AREA = 0.86ha
(incl sediment basin area)

BASIN A
BYPASS AREA = 0.12ha

BASIN A

INTERIM POND
AREA = 0.8ha

LOT M

RESIDUAL LOT M
AREA = 2.84ha
(including pond)

ROAD 01

GPT

ALDINGTON ROAD BYPASS
(FUTURE WIDENING)
AREA = 0.61ha

ALDINGTON ROAD

ALDINGTON ROAD / R06
INTERSECTION
AREA = 0.06ha

LOT A

TRANSMISSION EASEMENT

LOT E

NORTH PRECINCT
RESIDUAL LOTS
(A, B, C & E)
LANDSCAPE
AREA = 17.33ha

LOT B

LOT J AREA 12.93ha
ROOF AREA = 1.84ha
HARDSTAND/CARPARK AREA = 9.15ha
LANDSCAPE AREA = 1.94ha

IRRIGATION
AREA =4.08ha

ROAD 03

LOT F AREA 7.37ha
ROOF AREA = 4.91ha
HARDSTAND/CARPARK AREA = 1.73ha
LANDSCAPE AREA = 0.73ha

ROAD 04

LOT C

IRRIGATION
AREA = 1.83ha

RESIDUAL LOTS N & O
AREA = 6.20ha
(excl temp CDS)

GPT

GPT

NORTHERN ROADS
TO BASIN B
AREA = 1.04ha

ROADS TO TRUNK
DRAINAGE
AREA = 2.00ha

ROAD 02

ROAD 02

ROAD 02

BASIN B
CATCHMENT AREA = 1.05ha

SEDIMENT BASIN POND 1
AREA = 0.16ha

STORAGE POND 2
AREA = 0.26ha

RESIDUAL LOT K
TO SOUTHERN CATCHMENT
AREA = 3.40ha

RESIDUAL LOT G &
LOT K NORTHERN
AREA = 8.44ha
(excludes temp CDS)

ROAD 05

BASIN B BYPASS
AREA = 4.19ha

SOUTHERN ROADS (INCL PART LOT L)
AREA = 1.95ha

ROADS TO BASIN B
AREA = 1.60ha

FUTURE WETLAND 30

LEGEND

EXISTING
- EXISTING BOUNDARY
- EXISTING EASEMENT

PROPOSED
- PROPOSED BOUNDARY
- PROPOSED EASEMENT
- EXTERNAL FUTURE WORKS

TOTAL SITE AREA: 72.15 ha

SOUTHERN CATCHMENT TOTAL AREA: 28.33 ha
- SOUTHERN RESIDUAL LOTS AREA: 12.44 ha
- TOTAL LOT L (BASIN A EXCL. AREA DRAINING TO ROAD) AREA: 0.98 ha
- SOUTHERN ROADS AREA: 1.95 ha
- DEVELOPED LOT J AREA: 12.93 ha

NORTHERN CATCHMENT TOTAL AREA: 43.69 ha
- NORTHERN RESIDUAL LOTS AREA: 25.77 ha
- TOTAL NORTHERN ROADS AREA: 4.65 ha
- TOTAL LOT D AREA: 5.24 ha
- DEVELOPED LOT F AREA: 7.37 ha

OTHER
- ALDINGTON ROAD BYPASS AREA: 0.61 ha
- ALDINGTON ROAD / R06 INTERSECTION AREA: 0.06 ha

Issue	Description	Date
P5	MOD 2 AMENDED INCL BASIN A	24-07-24
P4	MOD 2 AMENDED	27-06-24
P3	FOR INFORMATION	19-01-24
P2	FOR INFORMATION	17-12-23
P1	FOR INFORMATION	19-10-23

0 50 100 150m

1 : 2000 @ A1

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: 1 : 2000

Drawn: NT
Designed: DF
Checked: DF
Approved:

Height Datum: AHD

Grid: GDA2020

Client: Stockland / FIFECAPITAL

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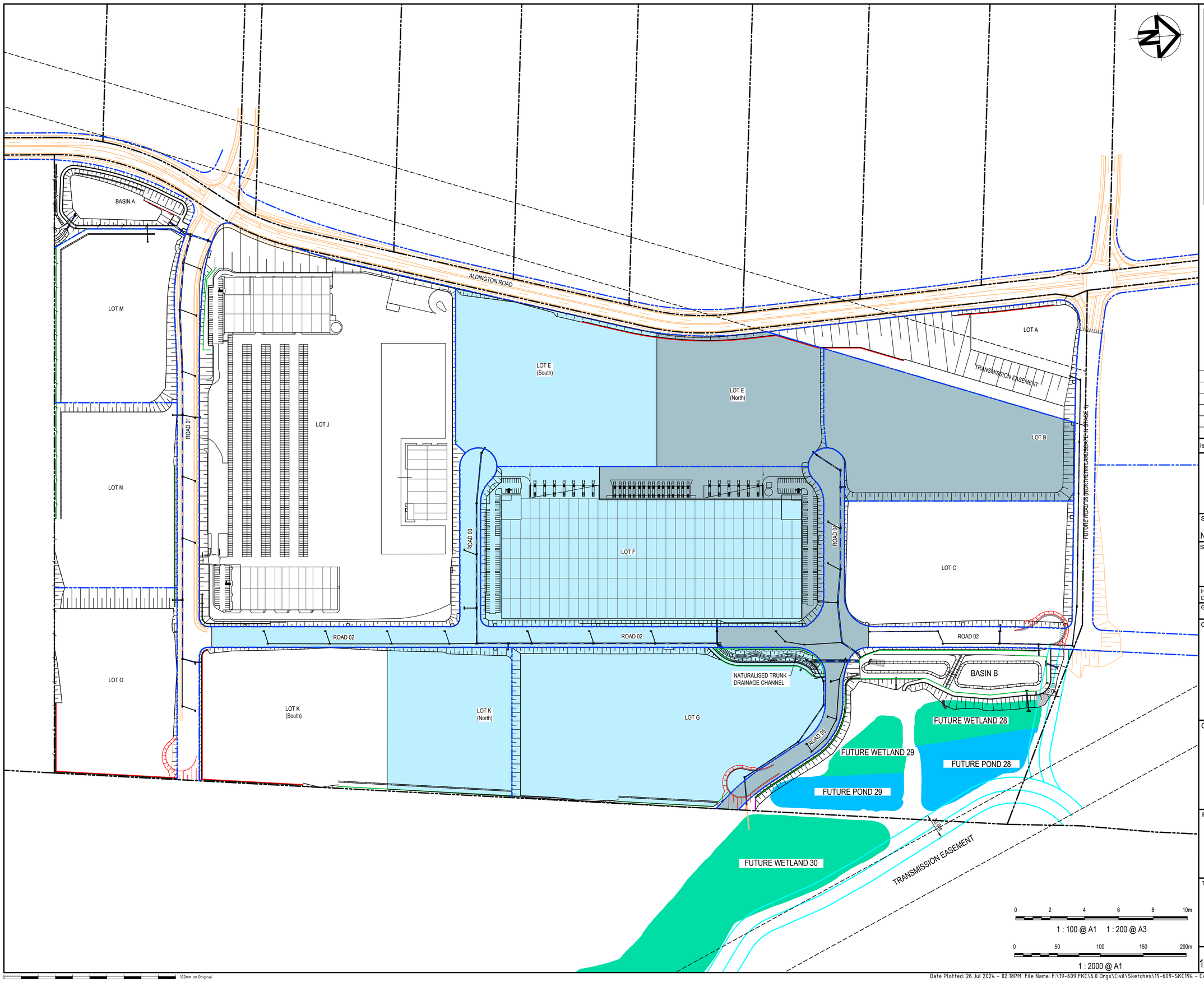
Project
200 ALDINGTON ROAD INDUSTRIAL DEVELOPMENT
SSDA10479 MOD 2

Title
STORMWATER MANAGEMENT AND CATCHMENT PLAN
MOD2 STAGE 1 & 2

Drawing No.	Project No.	Issue
19-609-SKC228	19-609	P5

100mm on Original

Date Plotted: 29 Jul 2024 - 10:31PM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Sketches\19-609-SKC228 - 200 SWMP & CATCHMENT MOD2.dwg



LEGEND

EXISTING

- EXISTING BOUNDARY
- EXISTING EASEMENT
- 60.0 EXISTING CONTOUR

PROPOSED

- PROPOSED BOUNDARY
- PROPOSED EASEMENT
- -70.25- PROPOSED CONTOUR
- EXTERNAL FUTURE WORKS
- CATCHMENT AREA BASIN 29 (9.59 Ha)
- CATCHMENT AREA BASIN 30 (20.56 Ha)
- FUTURE WETLAND
- INDICATIVE FUTURE TRUNK DRAINAGE AS PER SYDNEY WATER SCHEME PLAN

Issue	Description	Date
P6	MOD 2 AMENDED FOR APPROVAL	26-07-24
P5	FOR APPROVAL	14-12-23
P4	FOR APPROVAL	06-07-23
P3	FOR APPROVAL	05-06-23
P2	AMENDED AS PER SYDNEY WATER REQUEST	16-03-23
P1	FOR INFORMATION	10-03-22

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 2000 1:500	Drawn	NT
		Designed	DF
Height Datum	AHD	Checked	AM
Grid	GDA2020	Approved	

Client: Stockland / FIFECAPITAL

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Project

PROPOSED INDUSTRIAL DEVELOPMENT
200 ALDINGTON ROAD
KEMPS CREEK

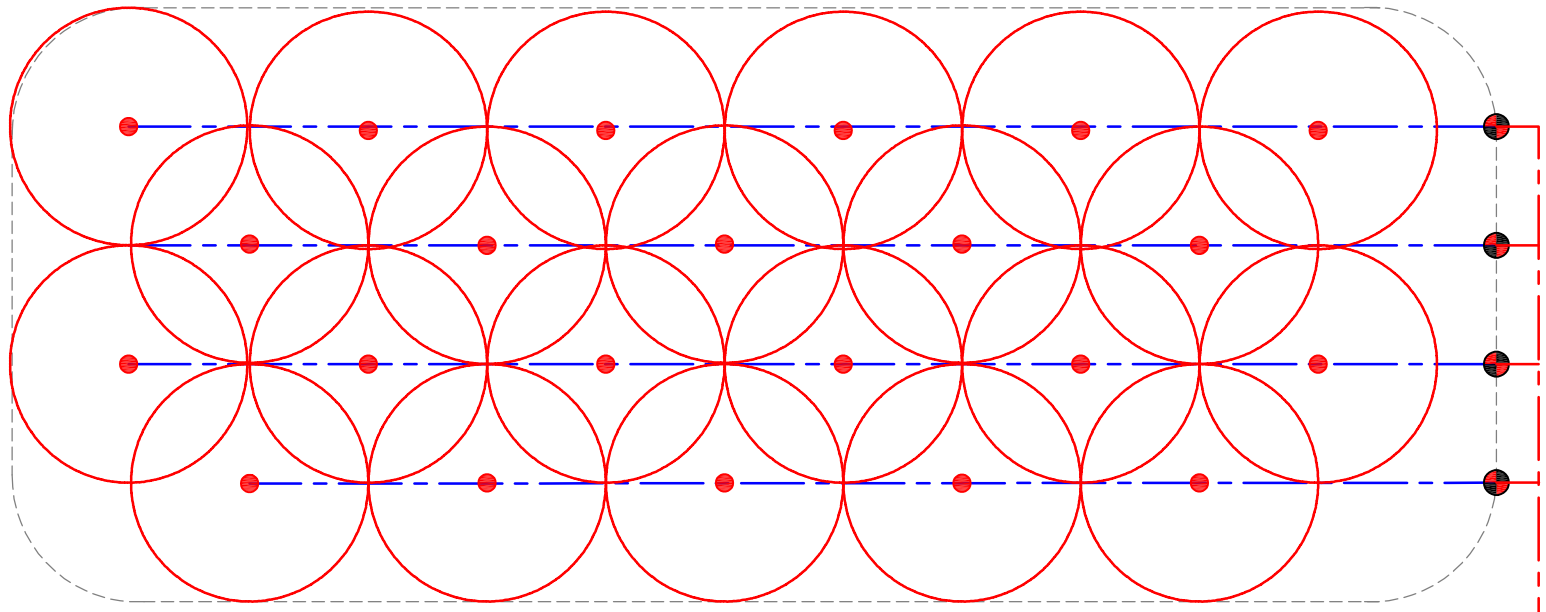
Title

POST DEVELOPMENT CATCHMENT CONTRIBUTIONS TO FUTURE BASIN 29 & 30 MOD 2 AMENDED

Drawing No.	Project No.	Issue
19-609-SKC194	19-609	P6

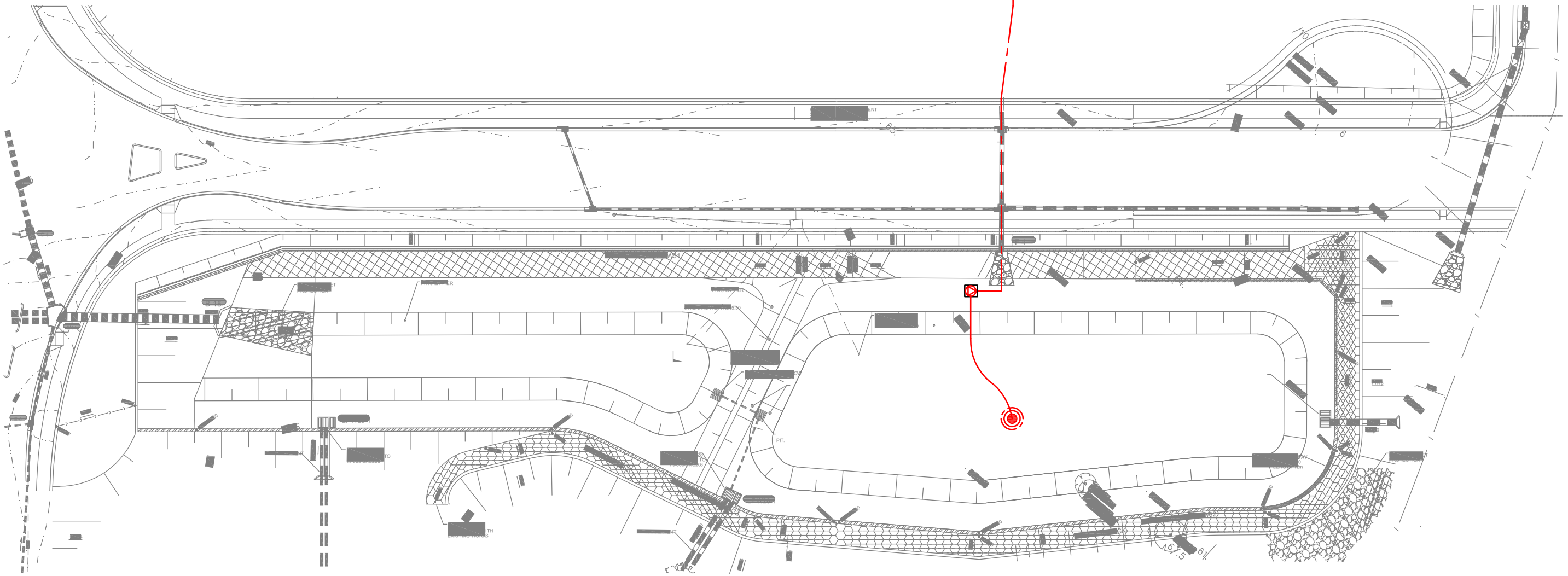
100mm on Original

Date Plotted: 26 Jul 2024 - 02:18PM File Name: F:\19-609 FKC\6.0 Drgs\Civil\Sketches\19-609-SKC194 - CATCHMENT CONTRIBUTIONS TO BASIN 29 & 30 MOD2.dwg



LEGEND

- CONTROL VALVE 50MM
- IMPACT SPRINKLER ON RISER 12 MTR RADIUS 0.40 LTRS/SEC
- IRRIGATION MAINLINE 75MM PE
- IRRIGATION LATERAL 50MM PE
- IRRIGATION PUMP 2.4 LTRS/SEC @ 600KPA
- FLOATING SUCTION 75MM PE 2.0 LTRS/SEC @ 600KPA
- IRRIGATION ZONE



Aquadec Commercial Irrigation

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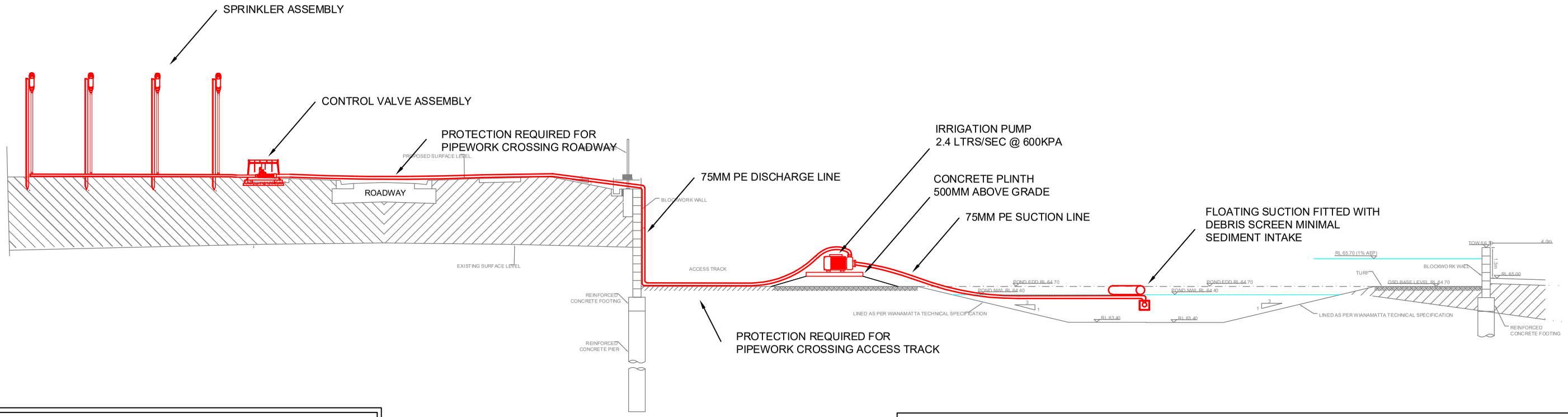
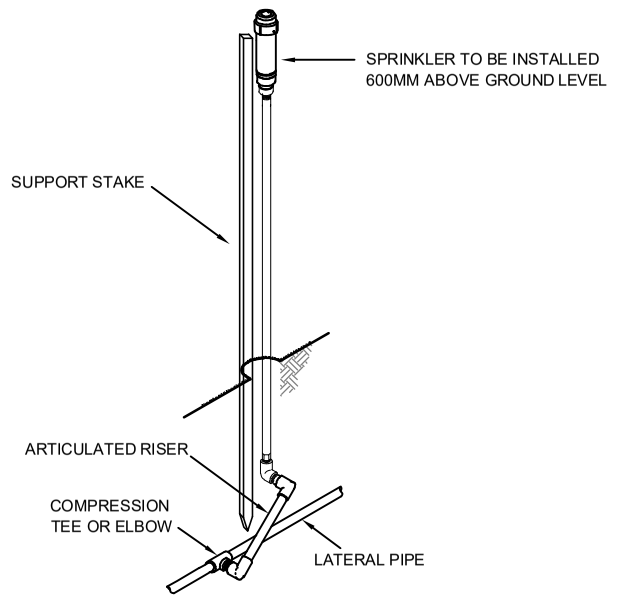
E: info@aquadec.com.au
W: aquadec.com.au
P: 02 4647 4670
ACN: 075 518 277

PROJECT 200 ALDINGTON RD KEMPS CREEK			STORAGE PONDS IRRIGATION SCHEMATIC DRAWING
DRAWN BY: DFR	FILE No: IRR01	DATE: 13.07.2023	
DESIGN BY: DFR		SCALE: NTS	

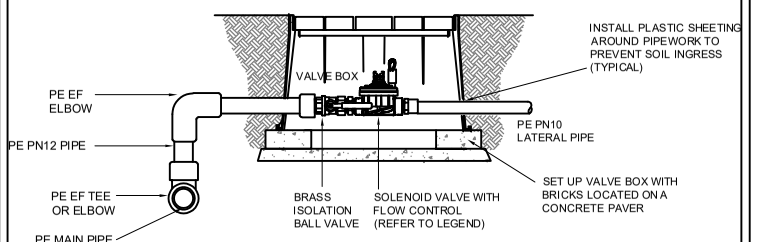
SECTIONAL DETAIL



SPRINKLER TYPICAL INSTALLATION DETAIL



VALVE BOX ASSEMBLY TYPICAL INSTALLATION DETAIL



NOTES:

IRRIGATION PUMP - MANUAL OPERATION/AUTOMATIC VIA LEVEL FLOAT IN POND
NOMINAL DUTY - 2.4 LTRS/SEC @ 600KPA

VOLUME PUMPED
8640 LTRS PER HOUR
207,360 LTRS PER 24 HOURS

FLOATING SUCTION DRAWS WATER FROM TOP 300MM OF POND DRAWING CLEANEST WATER

PE POLY LAID ABOVE GROUND
PIPEWORK TO BE PN12.5

VALVE ASSEMBLY TO BE MOUNTED ABOVE GROUND - FITTED IN 1419 SERIES VALVE BOX
NOTE: VALVES TO BE DIRTY WATER COMPATIBLE

SPRINKLER ASSEMBLY NOMINAL FLOW 0.4 LTRS/SECOND @ 350KPA
SPRINKLER MOUNTED ON 600MM X 25MM RISER
SUPPORTED X 50MM SQUARE X 900MM HARDWOOD STAKE
NOTE: NOZZLES SIZED TO ALLOW PASSING OF SUSPENDED SOLIDS UP TO 2.0MM
SPRINKLERS FITTED WITH DEBRIS SCREENS

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ACN: 075 518 277

PROJECT 200 ALDINGTON RD KEMPS CREEK			STORAGE PONDS IRRIGATION SECTIONAL DETAIL
DRAWN BY: DFR	FILE No: IRR02	DATE: 13.07.2023	
DESIGN BY: DFR		SCALE: NTS	

APPENDIX C - WSUD MAINTENANCE PLAN (DRAFT)

The Water management Strategy elements within the site will remain in private ownership. The shared assets will be maintained under the community title through the community association. This includes Lot D and Lot L.

These are draft plans that will need to be updated prior to operation based on final construction details and the maintenance plans should be regularly reviewed and updated as needed, especially if there are changes in regulations, controls or site conditions.

Table C1: Lot J and Lot F GPT maintenance plan

GPT maintenance plan **Location: 200 Aldington Road** **Lot F / Lot J** **SSDA 10479 and SSD 61212208**			
Inspection Items	**Frequency**	**Action required**	**Action taken & date**

Visual inspection	3-6 months
	* or after heavy rain
		▪ Inspect
		  ▸ Components
		  ▸ Inlet
		  ▸ Outlet
		  ▸ separation screen
		  ▸ diversion chamber
		▪ Empty filter/bag in accordance with manufacturer instructions
		▪ Record quantity of debris removed and sediment in sump
		▪ Dispose of debris appropriately
		▪ Repair if damaged	

Full dewater and clean	12 months	▪ Full sump pump out, jet screen and sump ▪ Clean behind screen ▪ Visual inspection of vortex separation screen ▪ If sediment has built up in diversion chamber Remove sediment	

Operation and Maintenance Manuals are available for most GPTs, the example used is the SPEL Vortceptor which contains full details and an example of inspection & Maintenance Log. 1370-SPEL-Vortceptor-HH.pdf

Table C2: Sediment Basin maintenance plan

Sediment Basin (interim) Maintenance Plan **Location: 200 Aldington Road** **Lot L (within Basin A)** **Lot D (within Basin B (pond 1)**			
Inspection	**Frequency**	**Action required**	**Action taken & date**
Visual Inspection	Monthly	Inspect condition of the basin, Inspect inlet and outlet structures, Inspect erosion control measures, Assess integrity of berms and liners Measure and record sediment levels	
Sediment Removal	At 25% -50% capacity	Remove sediment taking precautions to not damage structures or liner Dispose of sediment appropriately - in accordance with plan	

Table C3: Irrigation maintenance plan

Landscape Irrigation maintenance plan **Location: 200 Aldington Road** **Residual land Lot M, N, O, A.** **SSDA 10479**			
Inspection Items	**Frequency**	**Action required**	**Action taken & date**
Irrigation nozzles	12 months	Inspect nozzles Remove and replace damaged nozzles	
Irrigation network	6 months	Check for sign of leaks	
Irrigation Controller	3 months	Check for faults Follow manufacturers instructions	

APPENDIX D – DESIGNER DETAILS

Designer Information

Name: Tim Michel

Title: Associate – Civil Engineer

Qualification: BE (Civil) BA DipEngPrac CPEng NER (Civil & Environmental)

CPESC N: 11555

AT&L Contact number. 02 9439 1777

APPENDIX E – PCC CHECKLIST

Water Sensitive Urban Design
Development Application Checklist

Site/ Project Name	200 ALDINGTON ROAD INDUSTRIAL ESTATE		
Lot and DP Number:	LOT 200 DP1285691	**DA Number:**	SSD10479

	Information Required with DA Submission:	**Y**	**N**
1	Has a Water Sensitive Urban Design Strategy been submitted as part of the development application?	Y	
2	Is a BASIX Certificate required? If so, Yes - Attach certificate with DA		N
3	Has the digital version of MUSIC and report on the MUSIC model using data prescribed outlined in Council's Technical Guideline been attached? Have stormwater quality retention criteria (TSS 85%, TP 60%, and TN 45%) and water quantity / drainage requirements been met and documented in the WSUD Strategy? If relevant, have the Water Conservation, Quantity and quantity targets been achieved?	Y	
4	Does WSUD Strategy contain the following information? • Review of the **WSUD principles** and ensure that these are considered throughout development of the WSUD strategy. • Confirmation of the **WSUD objectives** that are relevant to the development application. • Confirmation of the **WSUD targets** for potable water conservation, stormwater quality management and stormwater quality management that are relevant to the development application. • Complete a **site analysis** to evaluate the site characteristics that potentially will impact on the feasibility of WSUD for the site. • **WSUD measures** that would be appropriate for the development considering the development scale, site characteristics, stormwater quality management function and stormwater quantity management function. • A **preliminary WSUD strategy** that positions the selected WSUD measures in appropriate locations and arranges the measures in an appropriate series. • **Numerical modelling** utilising MUSIC software to evaluate appropriate sizes of the WSUD measures. • **Concept designs** of the WSUD measures. • **WSUD strategy report** that summarises the methodology and WSUD outcomes, and provide this with the development application for the site.	Y	
5	Have the conceptual plans of the proposed stormwater treatment measures been included on the plans? (Detailed engineering plans will be required for the construction certificate)	Y	

6	Has a Draft Operation and Maintenance Plan which includes details on the following been provided? • Site description (area, imperviousness, land use, annual rainfall, topography etc) • Site access description • Likely pollutant types, sources and estimated loads • Locations, types and descriptions of measures proposed • Operation and maintenance responsibility (council, developer or owner) • Inspection methods • Maintenance methods (frequency, equipment and personnel requirements including Work Health and Safety requirements) • Landscape and weed control requirements • Operation and maintenance costs • Waste management and disposal options, and • Reporting.	Y	

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