

STORMWATER MANAGEMENT PLAN

OAKBURN PROCESSING PLANT



mpn consulting

Prepared By:

MPN CONSULTING PTY LTD

Level 5

39 Sherwood Road

Toowong

Queensland

4066 • Australia

REVISION STATUS

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Client: Baiada Poultry Pty Ltd
Site Address: Oxley Highway, Oakburn, New South Wales
Report Title: Stormwater Management Report

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Draft	31/07/2018	Matthew Hendle	Lachlan Stephenson	Lachlan Stephenson
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EXECUTIVE SUMMARY

This report has been commissioned by Baiada Poultry Pty Ltd for the Development Application for the proposed extension to the Oakburn Processing Plant at Oxley Highway, Oakburn.

This report addresses the following Engineering aspects of the proposed development:

- Topography
- Flooding
- Stormwater quality management
- Stormwater quantity management
- Erosion and sediment control

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1 PURPOSE

This Stormwater Management Plan has been prepared to support the Development Application for the proposed extension to the Oakburn Processing Plant.

2 INTRODUCTION

2.1 Project Description

Stage 1 of the development, which was recently completed, included the construction of a new protein recovery plant to replace the old plant, which was destroyed by fire.

The current proposal includes the construction of a new processing plant to the South of the Stage 1 building along with new car parking, loading docks, access roads and a wastewater treatment plant.

The proposed development is depicted on the architectural plans prepared by Baiada Poultry Pty Ltd attached in Appendix 1, with excerpt below.

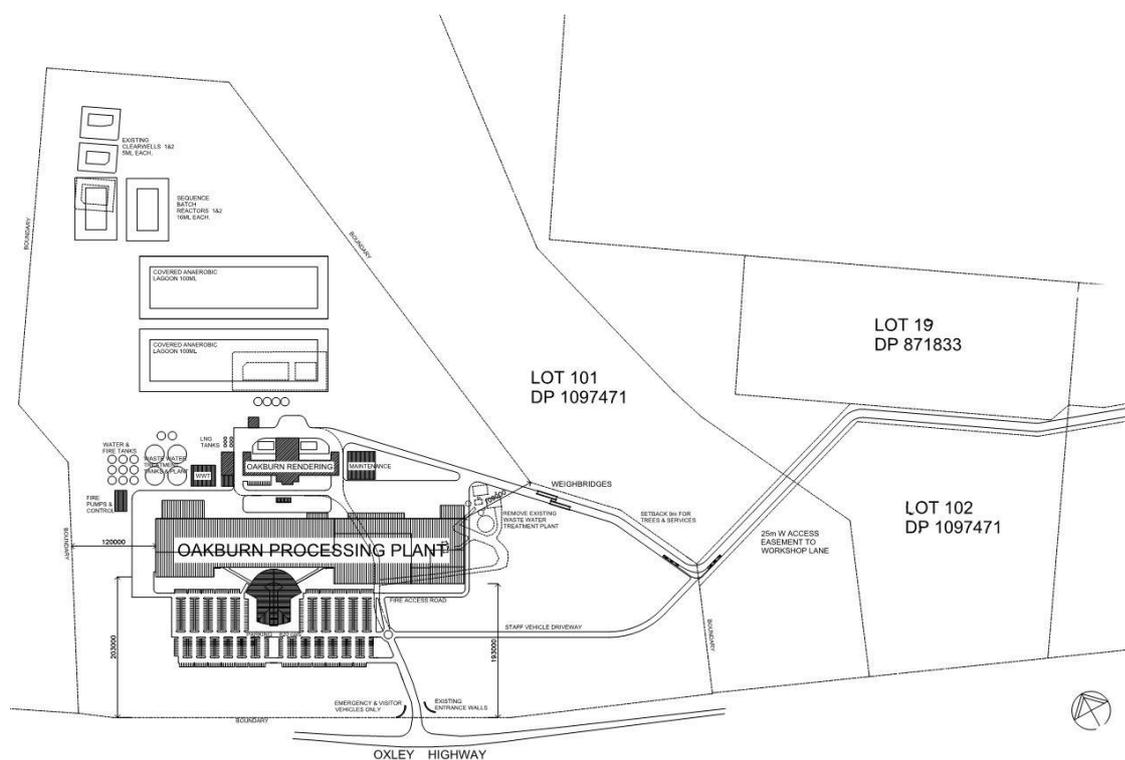


Figure 1 – Proposed Development

3 SITE CHARACTERISTICS

3.1 Site Location

The site is located at Oxley Highway, Oakburn on land described as Lot 100 on DP 1097471.

The site is bounded by Oxley Highway to the South-West, Boltens Creek to the North-West and undeveloped rural land to the North and East.



Figure 2 – Site Location

3.2 Topography and Existing Site Drainage

The site currently contains a protein recovery plant and a series of smaller buildings and a wastewater treatment plant which was constructed as part of Stage 1 of the development.

The site generally falls away from the centre of the site's South Western boundary to the West towards Boltons Creek and to the North and East towards an existing overland flow path.

Stormwater runoff from the site discharges as overland sheet flow across the West, North and East boundaries of the site.

There is an existing detention basin which was constructed as part of Stage 1 to treat and detain the stormwater runoff from the development.

No external catchments appear to flow through the site.

4 SITE DATA

Site data has been obtained from the following sources of information:

- As constructed plans
- New South Wales Environmental Protection Authority (EPA)
- Tamworth Regional Council
- Satellite imagery
- Relevant reports
- Discussions with relevant authorities
- DBYD
- Survey plans

5 STORMWATER

5.1 Flooding

Current flood mapping in the area indicates the site is not subject to flooding from any sources.

5.2 Site Based Stormwater Management Plan

The aim of the Stormwater Management Plan outlined below is to:

- Prevent or minimise adverse social or environmental impacts from stormwater runoff originating from the proposed development.
- Achieve acceptable levels of stormwater runoff quality and quantity.

The Stormwater Management Plan aims to identify Stormwater Quantity and Quality Best Management Practice for the site and demonstrate that water quantity and quality impacts will be minimised in receiving waters.

The Stormwater Management Plan outlines the site in two sections, the operational phase and the construction phase. The operational phase addresses treatment of contaminated runoff from the developed site by natural methods before discharging into receiving waters whilst the construction phase of the Stormwater Management Plan addresses erosion and sediment control to prevent contamination of water sources by stormwater runoff during construction of the site.

5.3 Operational Phase

5.3.1 Proposed Site Drainage

The site has been split into two main sub-catchments – a West and East catchment, identified as Catchments A and B, respectively. There are also three other sub-catchments including the undeveloped land and access roads in the Eastern half of the site, the undeveloped land on the Southern side of the site and the clearwells and sequence batch reactors, identified as Catchments C, D and E, respectively. The catchment locations and extents are shown on MPN Plans 7679-SKC.01-SKC.03 attached in Appendix 2, with excerpt below.

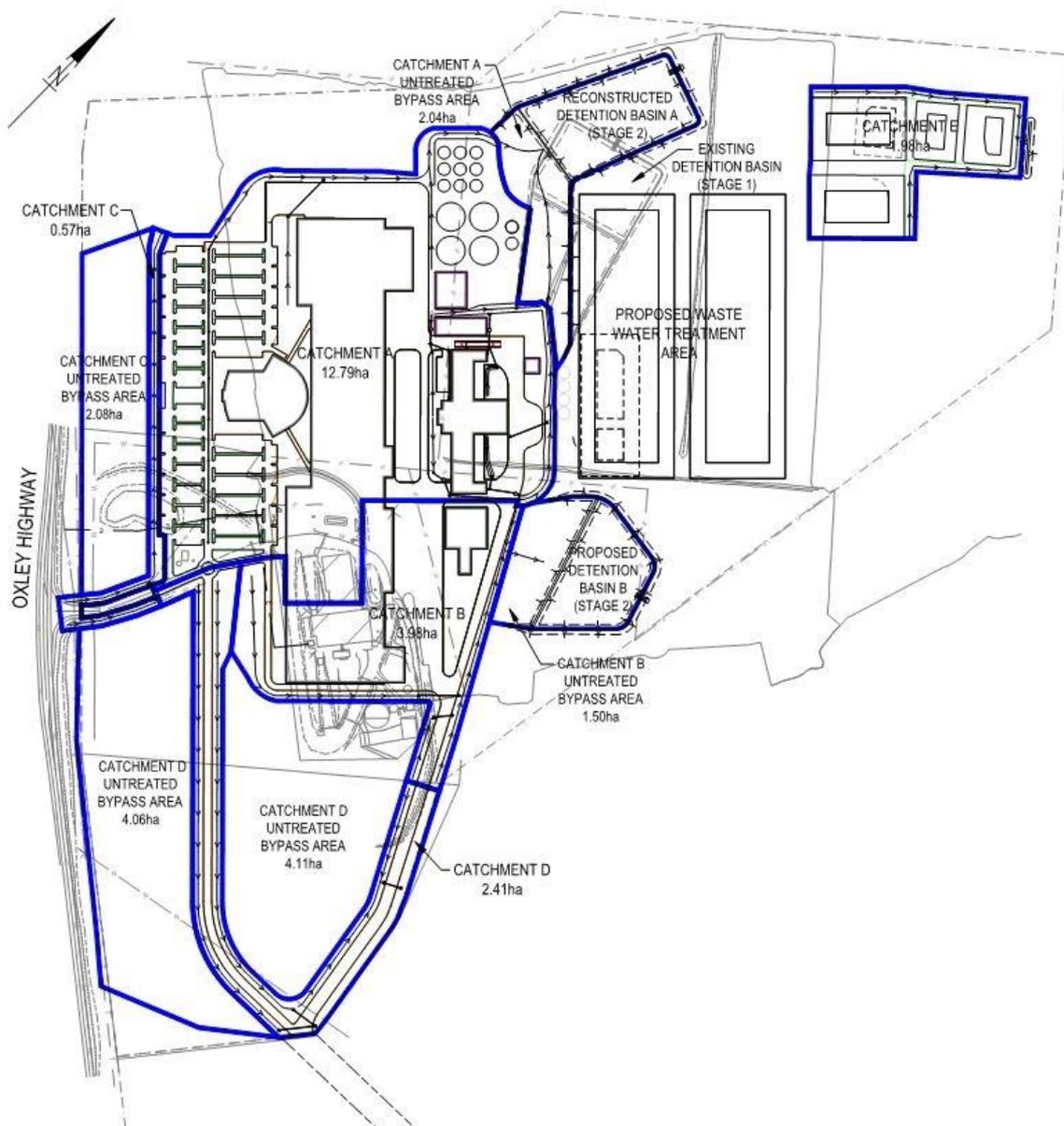


Figure 3 – Proposed Site Catchments

Stormwater runoff from each of the main sub-catchments will be collected and conveyed in a new internal stormwater pit, pipe and open channel network, prior to discharge to two separate treatment/detention basins. Stormwater will discharge from the basins via overland flow across the site boundaries as per existing condition. Litter baskets will also be fitted to the new field inlet pits to capture gross pollutants.

The existing detention basin constructed as part of the previous stage of the development will be removed and reconstructed to the North West of its current position (Basin A). The Eastern basin (Basin B) will be located near the centre of the Eastern boundary of the site.

Stormwater runoff from each of the other sub-catchments will be collected in grassed swales prior to discharge across the site boundaries via overland flow as per existing condition.

The proposed site stormwater infrastructure is shown on MPN Plans 7679-SKC.01-SKC.03 attached in Appendix 3.

5.3.2 Stormwater Quantity Management Strategy

For the management of stormwater quantity for the proposed development, a DRAINs computer model was used to calculate the stormwater runoff quantity for the existing and post-development conditions.

In order to limit the site stormwater discharge, stormwater runoff from Catchments A and B will be detained in two separate above ground basins. The basins will be over-sized to cater for the areas which will bypass detention (Catchments C, D and E). The location and configuration of the two basins are shown on MPN Plans 7679-SKC.01-SKC.03 attached in Appendix 3. The properties of the basins are listed in Table 1 below.

Parameter	Detention Basin A	Detention Basin B
Storage (incl. Freeboard)	7,770m ³	2,500m ³
Outlet (V-Notch Weir)	2.60m Width @ RL 380.10 1.15m High	2.26m Width @ RL 383.19 1.13m High
Invert Level	RL 378.80	RL 382.15
Q100 Water Level	RL 379.79	RL 382.98
Top of Bund (min)	RL 380.10	RL 383.28
Freeboard	0.31m	0.30m

Table 1 – Detention Basin Properties

Runoff flows for the Annual Recurrence Intervals from 5 to 100 years and durations of 5 minutes to 2 hours were calculated to ensure that peak runoff flows from the proposed development would not exceed peak runoff flows from the existing site. The most critical stormwater events for the site's catchment are compared in Table 2 below.

ARI	Existing Discharge From Site (m ³ /sec)	Proposed Discharge From Site (m ³ /sec)
5	2.32	2.11
10	3.13	2.64
20	4.19	3.37
50	5.50	4.20
100	6.64	5.01

Table 2 – Existing and Proposed Peak Flows with Detention

5.3.3 Stormwater Quality Management Strategy

In order to reduce overall post-development pollutant loads and concentrations being discharged from the site, treatment solutions have been provided to remove hydrocarbons, suspended solids and nutrients prior to being discharged from site.

5.3.3.1 Potential Pollutants Generated

The pollutants that could be potentially generated as a result of the development use are as follows:

- Litter
- Sediment
- Nutrients (Nitrogen and Phosphorous)
- Hydrocarbons (oils and grease)
- Surfactants
- Pathogens/Faecal Coliforms (bacteria and viruses)

The MUSIC computer modelling program developed by the Co-operative Research Centre for Catchment Hydrology was used to predict the performance of the proposed stormwater treatment train.

At this stage the pollutants modelled in MUSIC are Total Suspended Solids (TSS), Total Phosphorous (TP) and Total Nitrogen (TN).

5.3.3.2 Rainfall

The rainfall data used in the model was based on the Bureau of Meteorology data from rainfall station 55054 Tamworth Airport. The model was run from 16 August 1958 to 31 December 1992. The modelling time step was 6 minutes.

5.3.3.3 Rainfall Runoff Properties

The rainfall runoff properties listed in Table 3 below were adopted for the MUSIC modelling undertaken for the development.

PARAMETER	VALUE		
	Roof	Road	Ground Level
Rainfall Threshold (mm)	0.3	1.5	1.5
Soil Storage Capacity (mm)	100	100	100
Initial Storage (% of capacity)	25	25	25
Field Capacity (mm)	87	87	87
Infiltration Capacity Co-efficient a	250	250	250
Infiltration Capacity Co-efficient b	1.3	1.3	1.3
Initial Depth (mm)	10	10	10
Daily Recharge Rate (%)	60	60	60
Daily Base Flow Rate (%)	45	45	45
Deep Seepage (%)	0	0	0

Table 3 - MUSIC Rainfall Runoff Parameters

5.3.3.4 Pollutant Export Parameters

The adopted Pollutant Export Parameters for each source node type are presented in Table 4 below.

Runoff pollutant concentrations are generated stochastically from the defined mean and standard deviation.

		Log10 TSS (mg/L)		Log10 TP (mg/L)		Log10 TN (mg/L)	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Roof	Mean	0	1.30	0	-0.89	0	0.30
	Std. Dev.	0	0.32	0	0.25	0	0.19
Roads	Mean	0	2.43	0	-0.30	0	0.34
	Std. Dev.	0	0.32	0	0.25	0	0.19
Ground Level	Mean	1.20	3.00	-0.85	-0.30	0.11	0.34
	Std. Dev.	0.17	0.32	0.19	0.25	0.12	0.19

Table 4 – Pollutant Export Parameters

5.3.3.5 Water Quality Objectives

In the absence of specific Water Quality Objectives from Tamworth Regional Council, the industry standard pollutant reduction targets listed in Table 5 below have been adopted.

WATER QUALITY OBJECTIVES				
Total Suspended Solids (TSS) % Reduction	Total Nitrogen (TN) % Reduction	Total Phosphorous (TP) % Reduction	Litter/ Gross Pollutants % Reduction	Oils/ Grease
85	45	65	90	No visible films or odours

Table 5 – Water Quality Objectives

5.3.3.6 Treatment Plan

In order to achieve the pollutant load reduction targets for the development, it is proposed to use mechanical and natural treatment methods to treat the runoff prior to discharge from the site.

Stormwater runoff from Catchments A and B will be treated by GPTs prior to discharging via swales to the detention basins.

Stormwater runoff from catchments C, D and E will be treated by swales.

The treatment plan for the site is depicted on MPN Plans 7679-SKC.01-SKC.03, attached in Appendix 3, with MUSIC excerpt shown below.

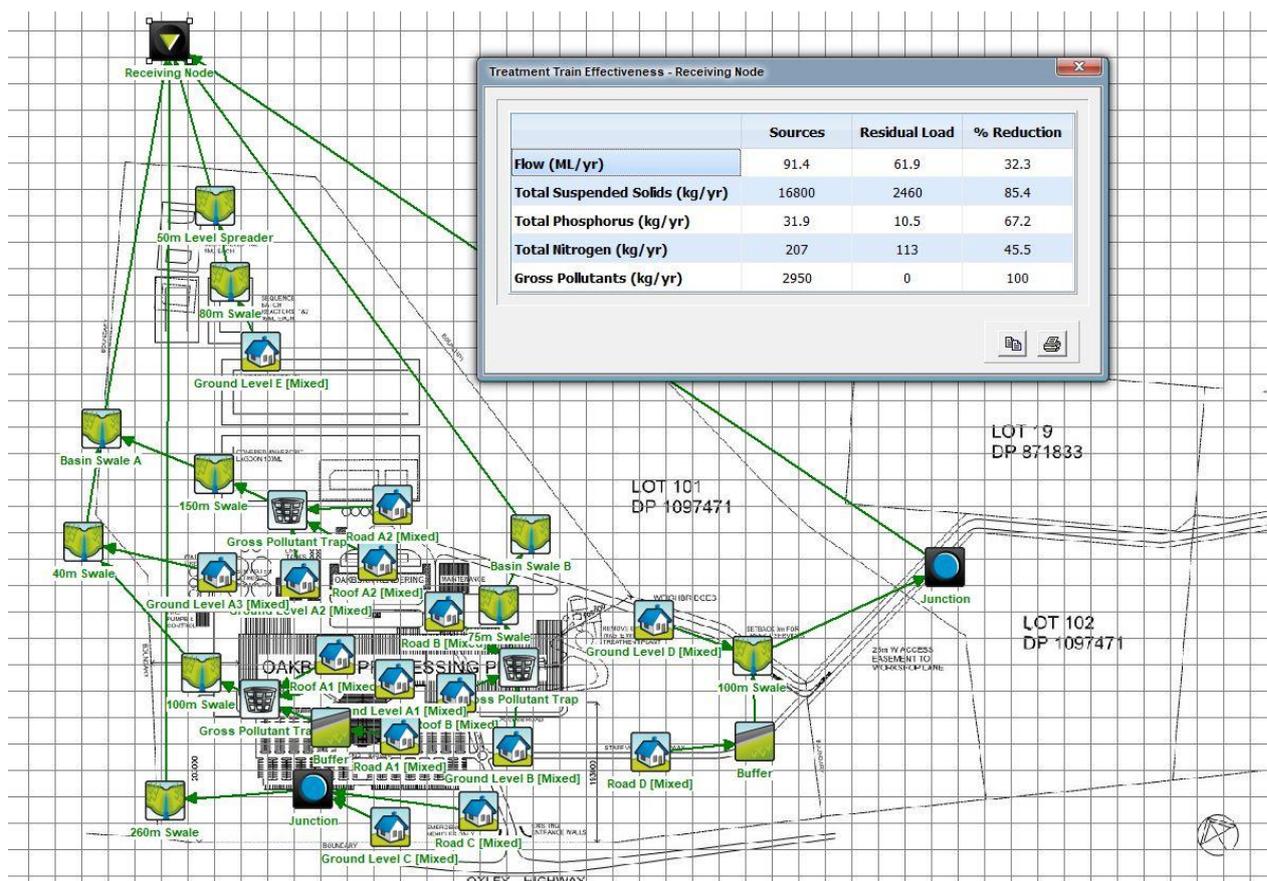


Figure 4 – Treatment Plan

5.3.3.7 MUSIC Results

The resulting percentage-based load reductions at the site outlet is shown in Table 6 below, together with the Water Quality Objectives for the receiving waters.

	Sources	Residual Load	% Reduction	Target %
Total Suspended Solids (kg/yr)	16,800	2,460	85.4	85
Total Phosphorous (kg/yr)	31.9	10.5	67.2	65
Total Nitrogen (kg/yr)	207	113	45.5	45
Gross Pollutants (kg/yr)	2,950	0	100	90

Table 6 – Percentage Based Load Reduction Results

5.3.3.8 POD Pollutant Reduction

5.3.3.8.1 Litter

Rubbish bins will be located within the development buildings and car parks for use by staff and visitors. As a result of this and with the installation of the GPTs and swales, levels of litter exiting the site via stormwater are expected to be negligible.

5.3.3.8.2 Sediment

The TSS outflow is identified in Table 6 above. As can be seen the pollutant load reduction achieves the Water Quality Objectives. The TSS level is therefore considered acceptable.

5.3.3.8.3 Nitrogen and Phosphorous

The TN and TP loads are identified in the above Table 6. As can be seen the TN and TP loads leaving the site achieve the Water Quality Objectives. Significant reductions in Nitrogen and Phosphorous have been achieved. The Nitrogen and Phosphorous residual loads are therefore considered acceptable.

5.3.3.8.4 Hydrocarbons

Hydrocarbons will be digested and processed by soil microorganisms within the swales and attachment to vegetation where biological breakdown of the hydrocarbons can occur. Hydrocarbons will also be captured within the GPTs.

5.3.3.8.5 Surfactants

If car or truck washing occurs on site it will be within a bunded area where surfactants will be captured and treated prior to discharging into the stormwater network.

5.3.3.8.6 Heavy Metals

Heavy metals in stormwater runoff generally become attached to fine sediment. The swales will remove the majority of this fine sediment. The removal of the fine sediment should effectively remove most of the heavy metals in the runoff.

5.3.3.8.7 Pathogen/ Faecal Coliforms

Domestic animals within the development will be under the control of their owners at all times and the owners will be expected to clean up after them.

5.3.3.9 Proposed Stormwater Quality Treatment Devices

5.3.3.9.1 Locations

The location of the proposed stormwater quality treatment devices is shown on MPN Plans 7679-SKC.01-SKC.03, attached in Appendix 3.

5.3.3.9.2 Device and Size

The device type and sizes are shown on MPN Plan 7679-SKC.01-SKC.03, attached in Appendix 3.

5.3.4 Construction Phase (Sediment and Erosion Control)

5.3.4.1 Intent of Erosion and Sediment Control Management Plan

To prevent stormwater contamination (of watercourses) and the release of contaminated stormwater and wastewater by ensuring compliance with the Protection of the Environment Operations Act 1997.

5.3.4.2 Implementation Strategy

Establish control measures and best practice approaches to prevent stormwater contamination and minimise the risk and adverse effects of erosion and sedimentation. All Erosion and Sediment Control measures must be designed, constructed and maintained in a manner that is commensurate with the site's erosion risk.

5.3.4.3 Erosion and Sediment Control Measures

- Obtain a license or approval to operate activities that are classed as environmental relevant activities (i.e. they have the potential to cause environmental harm).
- Implement and maintain appropriate control measures to prevent sediment laden wastewater and other potential pollutants such as oil, paint and wet concrete from entering the stormwater system via stormwater drains and gullies. The control measures which must be considered to be adopted are:

- Limitation of site access during construction to minimise disruption to traffic. Install a temporary construction entry/ exit sediment trap at all site accesses to minimise mud and sediment from the site being tracked onto public road, particularly during wet weather or when the site is muddy.
- Install and maintain appropriate sediment fences around construction areas.
- Divert clean stormwater runoff, using catch drains, around construction areas to existing or new stormwater drainage system.
- Install sandbags and other pollution containment devices around stormwater drains and any other locations where required to prevent sediment entering the trunk stormwater system.
- Cover open earth/ soil areas progressively (with concrete slabs and pavements or mulch) to minimise areas of bare earth/ soil.
- Any stockpiles of excavated soil and demolition/ construction waste must be located where risk of erosion and sedimentation is minimal, and must be protected from wind and water erosion.
- Implement and maintain appropriate control measures such as catch drains and sediment fences to prevent ponding of stormwater or discharge of stormwater from the site to adjacent properties.
- Provision of spill/ pollution control equipment that is readily accessible to clean up spills and leaks.
- Ensure spill/ pollution control measures are available and maintained in working condition.
- Sediment contained by the sediment control devices such as sandbags, sediment fences and containment bunds must be frequently removed and placed in a controlled area.
- Implement an inspection schedule for any spill or leaks of any potential polluting areas or activities.

5.3.4.4 Erosion and Sediment Control Management Goals

- Licenses, approvals, permits and inspection reports are in order.
- Sediment or pollution control devices such as sandbags, sediment fences and containment bunds are in place, maintained and effective.
- Spill/ pollution control equipment is readily accessible at designated locations.
- No accumulated sediment is contained by the sediment control devices such as hay bales, sediment fences and containment bunds.
- No sediment exceeding a depth of 300mm in the pollution control devices (e.g. silt trap).

5.3.4.5 Erosion and Sediment Control Implementation Program

- Licenses, permits or approvals for each environmentally relevant activity must be obtained prior to the commencement of the particular activity.
- Appropriate control measures such as sediment fences, temporary construction entry/ exit sediment traps, pollution containment devices (e.g. sandbags), stormwater diversion and administrative controls must be installed and established prior to commencement of the earthworks and construction activities.
- Pollution control devices such as spill control equipment must be inspected on a regular basis (at least weekly).
- Other sediment and pollution control equipment such as containment bunds, hay bales and sediment fences must be inspected on a regular basis (at least daily).
- Inspection for any leaks, spills or potential contaminating activity must be performed on a regular basis (at least daily).

- Remove accumulated sediment or other contaminants from sediment/ pollution control devices on a regular basis.
- All erosion and sediment control measures must be inspected within 24 hours of expected rain and within 18 hours of a rainfall event.

5.3.4.6 Responsible Person or Organisation

The contractor shall be responsible for the implementation and maintenance of the Erosion and Sediment Control Measures.

5.3.4.7 Reporting/ Review

Records such as licenses, approvals, permits and inspection reports must be reviewed on a regular basis (e.g. at least monthly) to ensure that legal compliance is met, complaints are reviewed and systems are working to prevent contamination.

5.3.4.8 Corrective Actions

- Perform clean-up of any spills immediately.
- Any mud or sediment which is tracked onto public roads is to be immediately removed using dry clean-up methods (i.e. shovel and broom).
- Remove or relocate any stockpiles of waste where there is a reasonable risk of erosion and sedimentation.
- Replace or repair sediment or pollution control devices if they are not maintained in good working condition.

6 CONCLUSION

This Stormwater Management Plan demonstrates that under the proposed concept plan, stormwater quality and quantity treatment is achievable to the levels required by Tamworth Regional Council and Industry Best Management Practice.

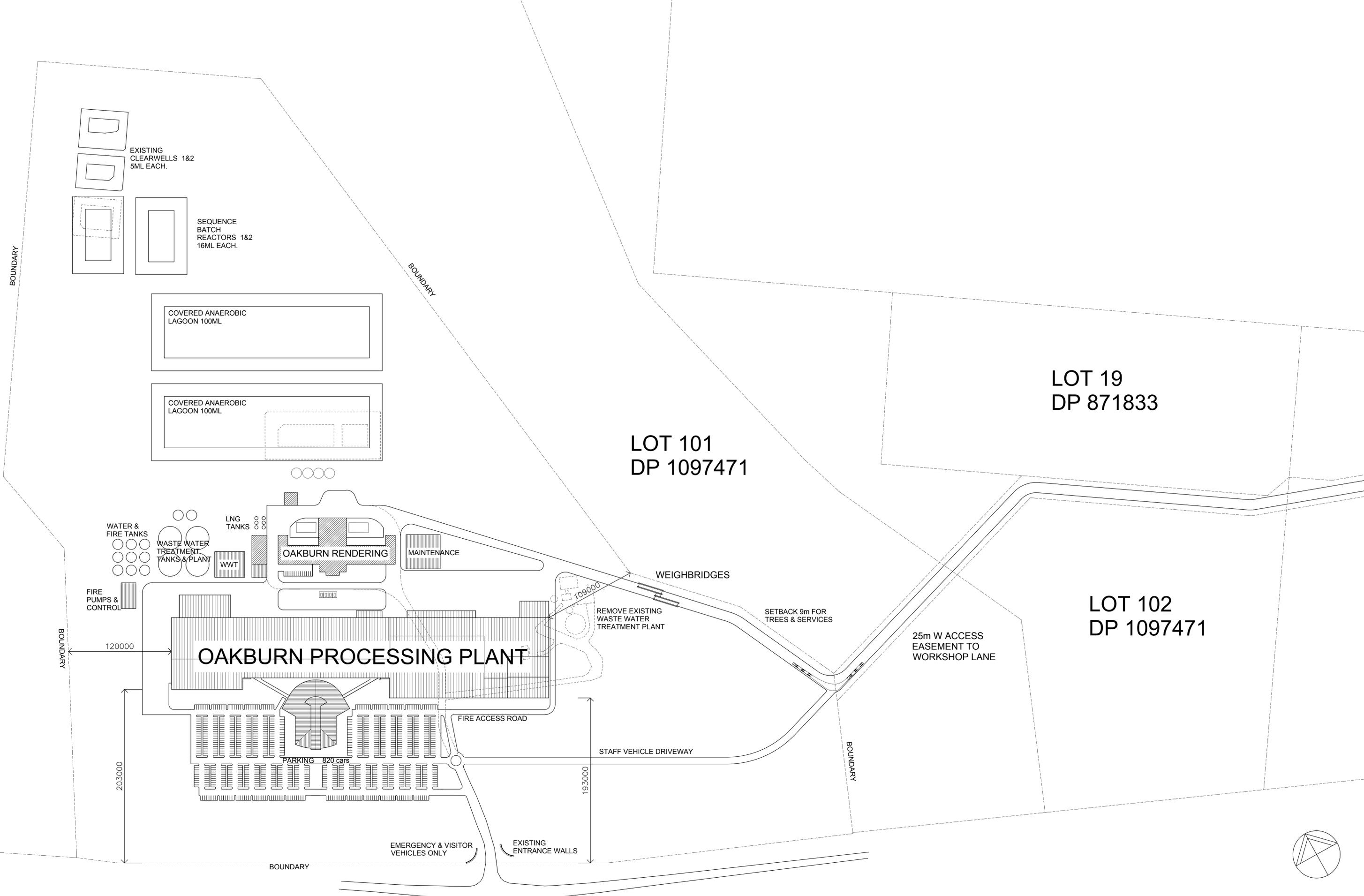
7 LIMITATIONS OF REPORT

MPN have prepared this report for the proposed extension to the Oakburn Processing Plant in accordance with MPN's proposal to Baiada Poultry Pty Ltd. This report is provided for the exclusive use of Baiada Poultry Pty Ltd for this specific project and its requirements. It should not be used or relied upon by a third party and MPN accept no responsibility for the use of this report by any party other than Baiada Poultry Pty Ltd.

3 June 2019

mpn consulting

**Appendix 1
Architectural Plans**

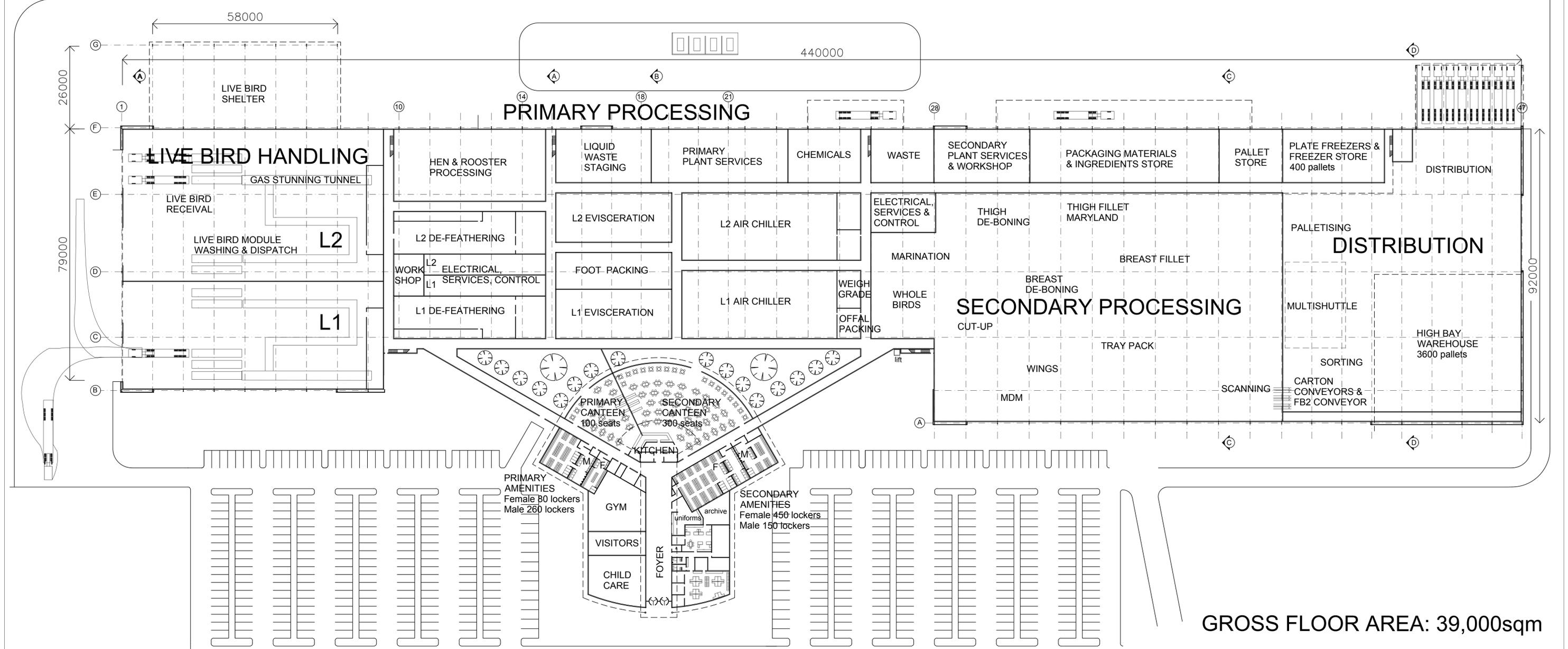
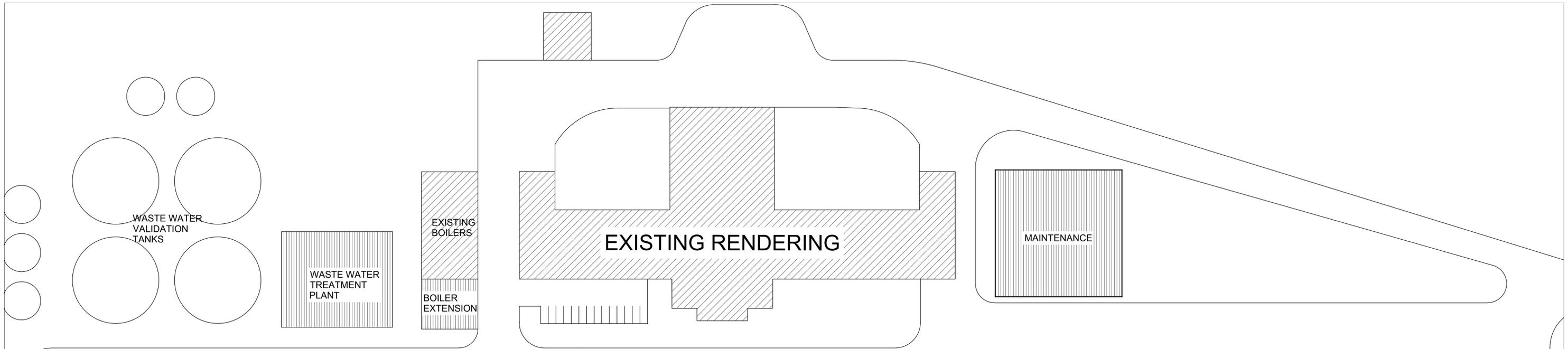


**OAKBURN PROCESSING PLANT
SITE PLAN - Lot 100 DP1097471**

SCALE: 1:4000 @ A3

0m 100m

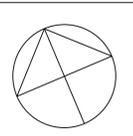
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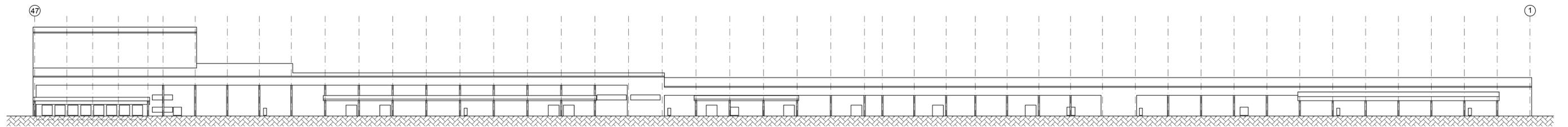
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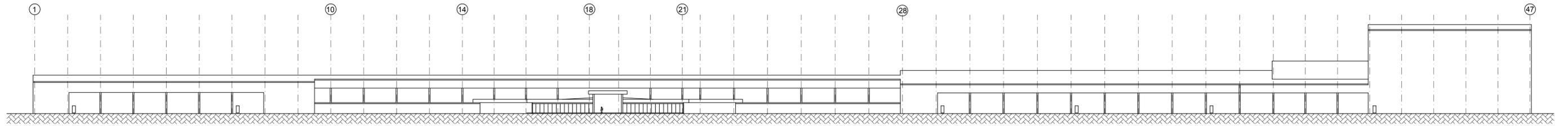
BAIADA POULTRY
OAKBURN PROCESSING PLANT
PROCESSING FLOOR PLAN



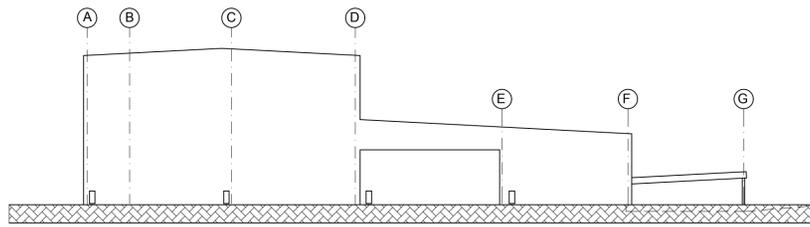
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 SCALE 1:600 A1
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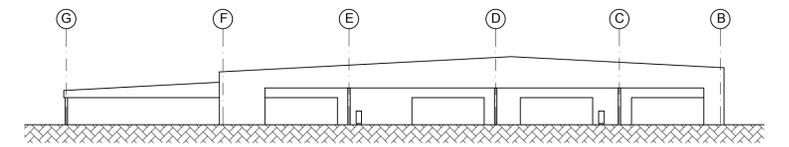
NORTH ELEVATION SCALE: 1:600 @ A1



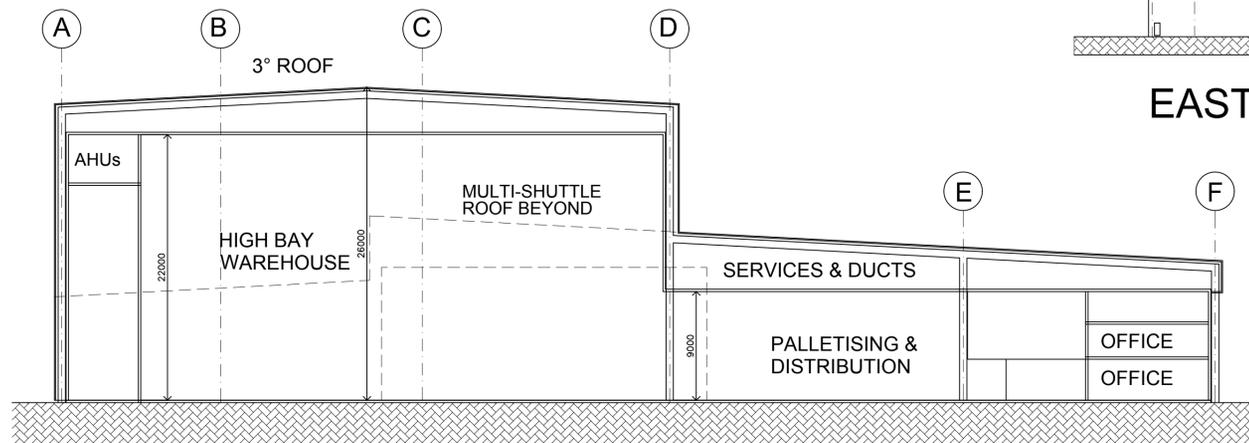
SOUTH ELEVATION SCALE: 1:600 @ A1



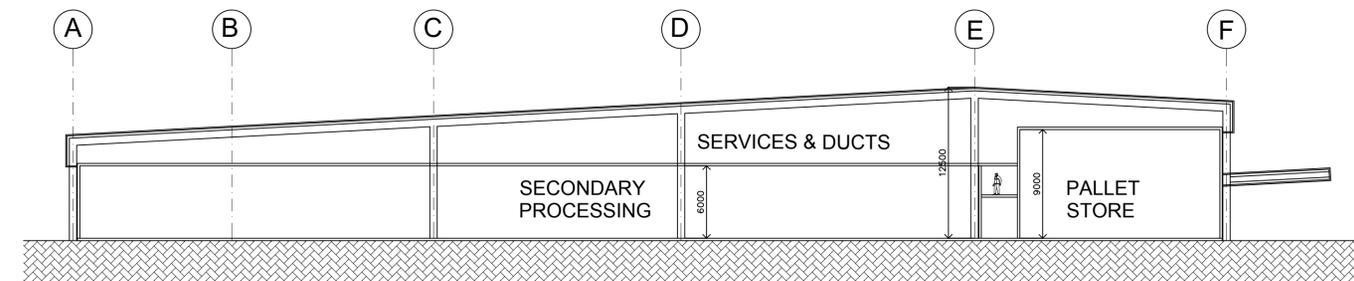
EAST ELEVATION SCALE: 1:600 @ A1



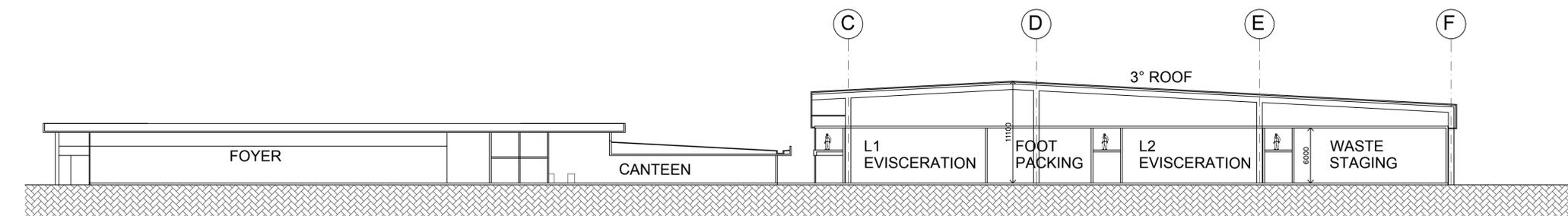
WEST ELEVATION SCALE: 1:600 @ A1



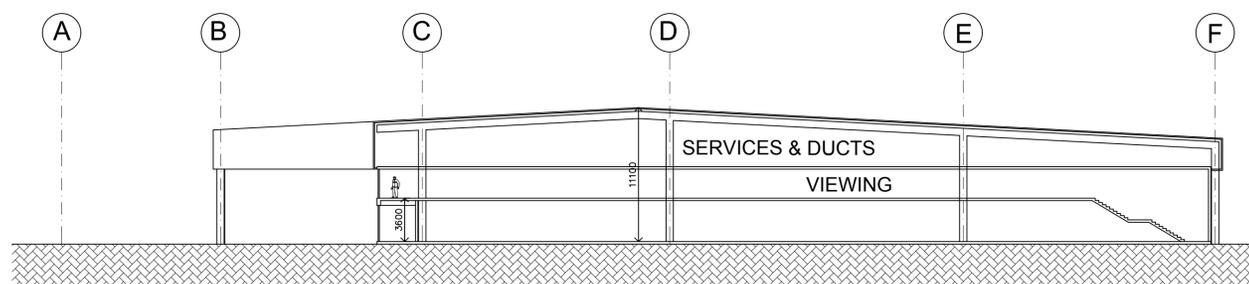
SECTION D SCALE: 1:300 @ A1



SECTION C SCALE: 1:300 @ A1



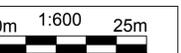
SECTION B SCALE: 1:300 @ A1



SECTION A SCALE: 1:300 @ A1

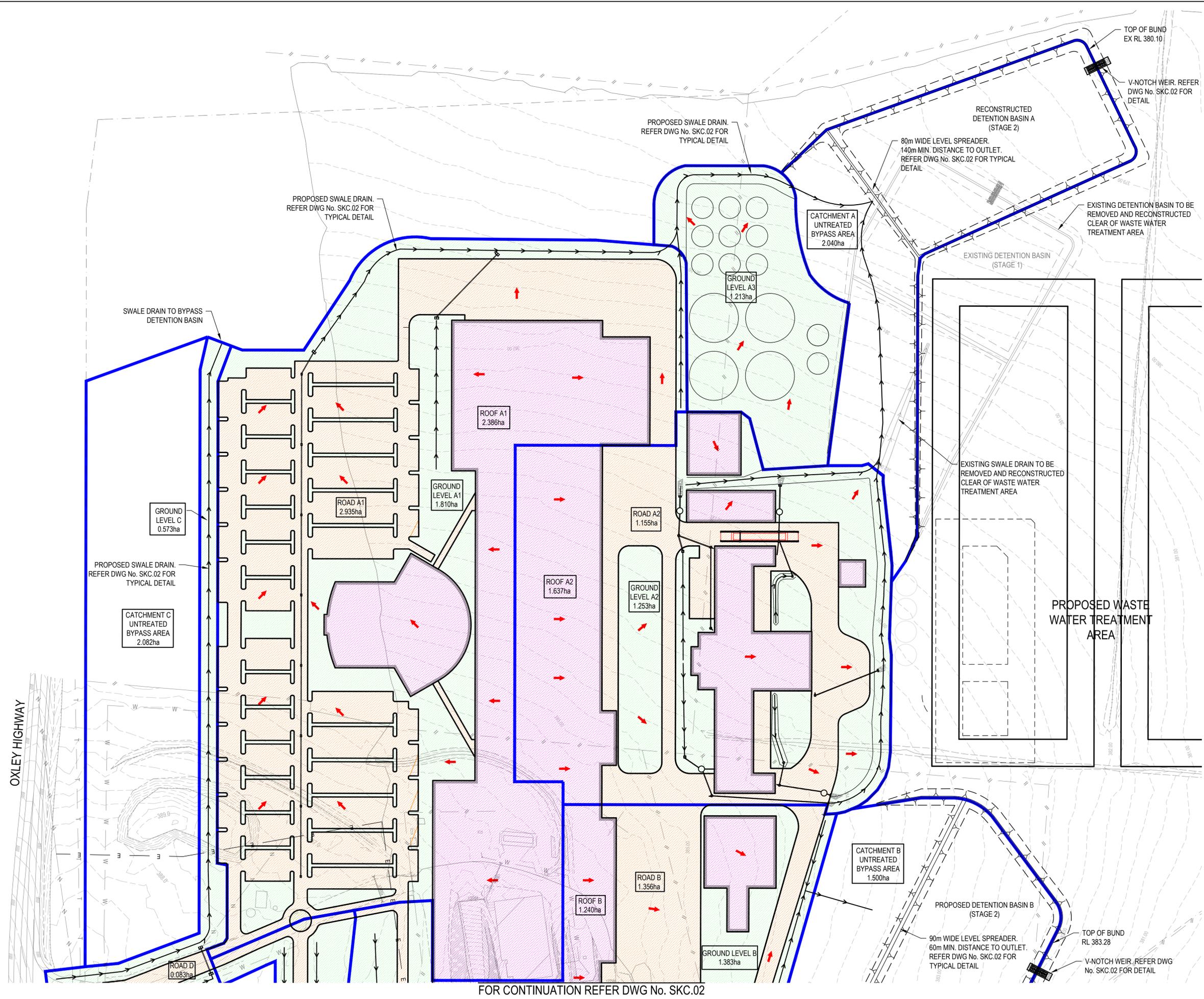


**BAIADA POULTRY
OAKBURN PROCESSING PLANT
SECTIONS & ELEVATIONS**



SCALE AS NOTED

181218_OPP 3.0_DWGS

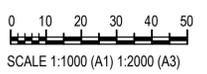


LEGEND

- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED FLOW DIRECTION
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA

FOR CONTINUATION REFER DWG No. SKC.03

NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.



D	03.06.19	ISSUE FOR APPROVAL	KC	MH
C	29.04.19	ISSUE FOR APPROVAL	KC	MH
B	22.01.19	ISSUE FOR APPROVAL	KC	MH
A	31.07.18	ISSUE FOR APPROVAL	ND	MH
ISSUE DATE	AMENDMENT	BY	APP	

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mpn consulting
MPN Consulting Pty Ltd
ABN 59 082 191 799
39 Sherwood Road, Toowong, Qld. 4066
P: 61 7 3335 4555
F: 61 7 3371 3196
E: solutions@mpnc.net.au

CLIENT: **PSA CONSULTING AUSTRALIA**

OAKBURN PROTEIN RECOVERY PLANT

Oxley Highway
TAMWORTH, NSW, 2340

**STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 1**

DESIGN: ND	DRAWN: ND	SCALE: AS SHOWN
CHKD:	APPRD:	DATE:

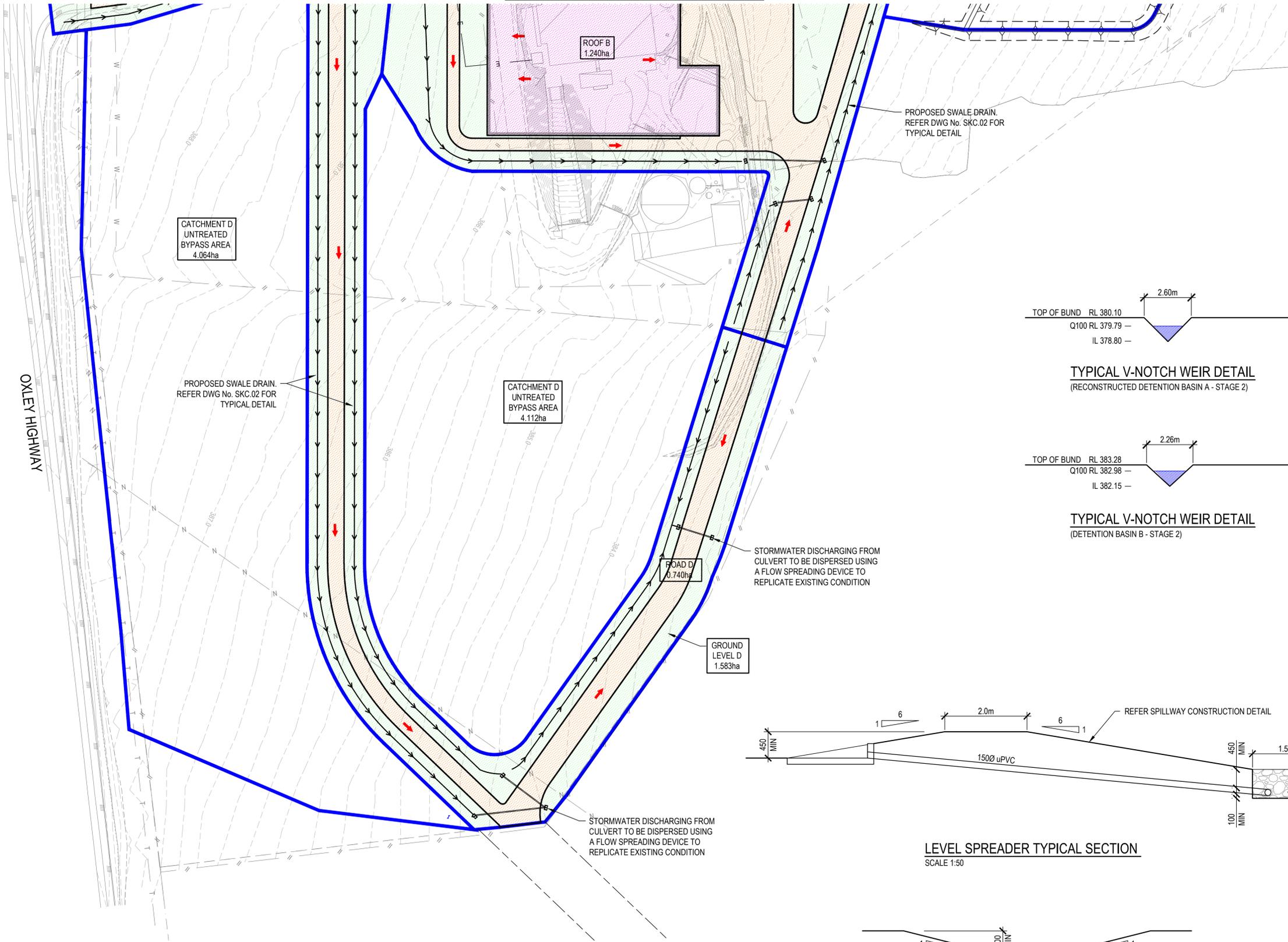
mpn JOB	DRAWING No.	REV
7679	SKC.01	D

FOR APPROVAL

NOT FOR CONSTRUCTION

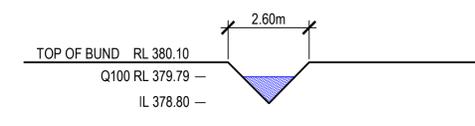
FOR CONTINUATION REFER DWG No. SKC.02

FOR CONTINUATION REFER DWG No. SKC.01

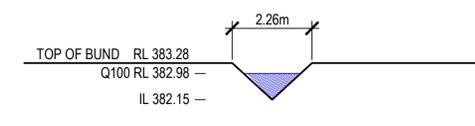


LEGEND

- PROPOSED BUILDING
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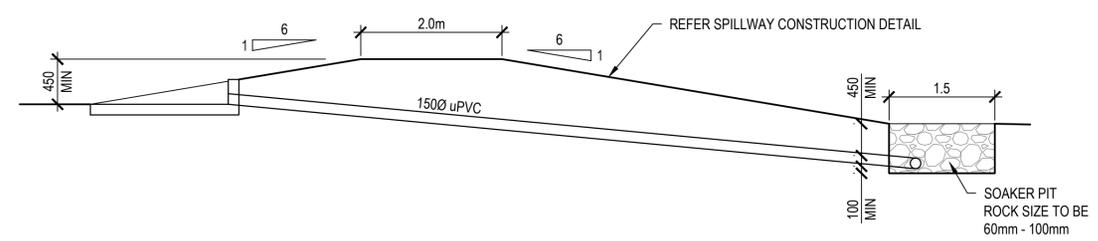
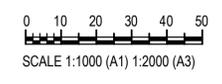


TYPICAL V-NOTCH WEIR DETAIL
(RECONSTRUCTED DETENTION BASIN A - STAGE 2)

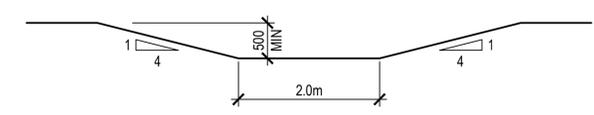


TYPICAL V-NOTCH WEIR DETAIL
(DETENTION BASIN B - STAGE 2)

NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.



LEVEL SPREADER TYPICAL SECTION
SCALE 1:50



SWALE DRAIN TYPICAL SECTION
SCALE 1:50

ISSUE	DATE	AMENDMENT	BY	APP
D	03.06.19	ISSUE FOR APPROVAL	KC	MH
C	29.04.19	ISSUE FOR APPROVAL	KC	MH
B	22.01.19	ISSUE FOR APPROVAL	KC	MH
A	31.07.18	ISSUE FOR APPROVAL	ND	MH

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MPN Consulting Pty Ltd
ABN 59 062 191 799
 39 Sherwood Road, Toowoomba, Qld. 4306
 P: 61 7 3335 4555
 F: 61 7 3371 3196
 E: solutions@mpnc.net.au

CLIENT: **PSA CONSULTING AUSTRALIA**

OAKBURN PROTEIN RECOVERY PLANT

OXLEY HIGHWAY
TAMWORTH, NSW, 2340

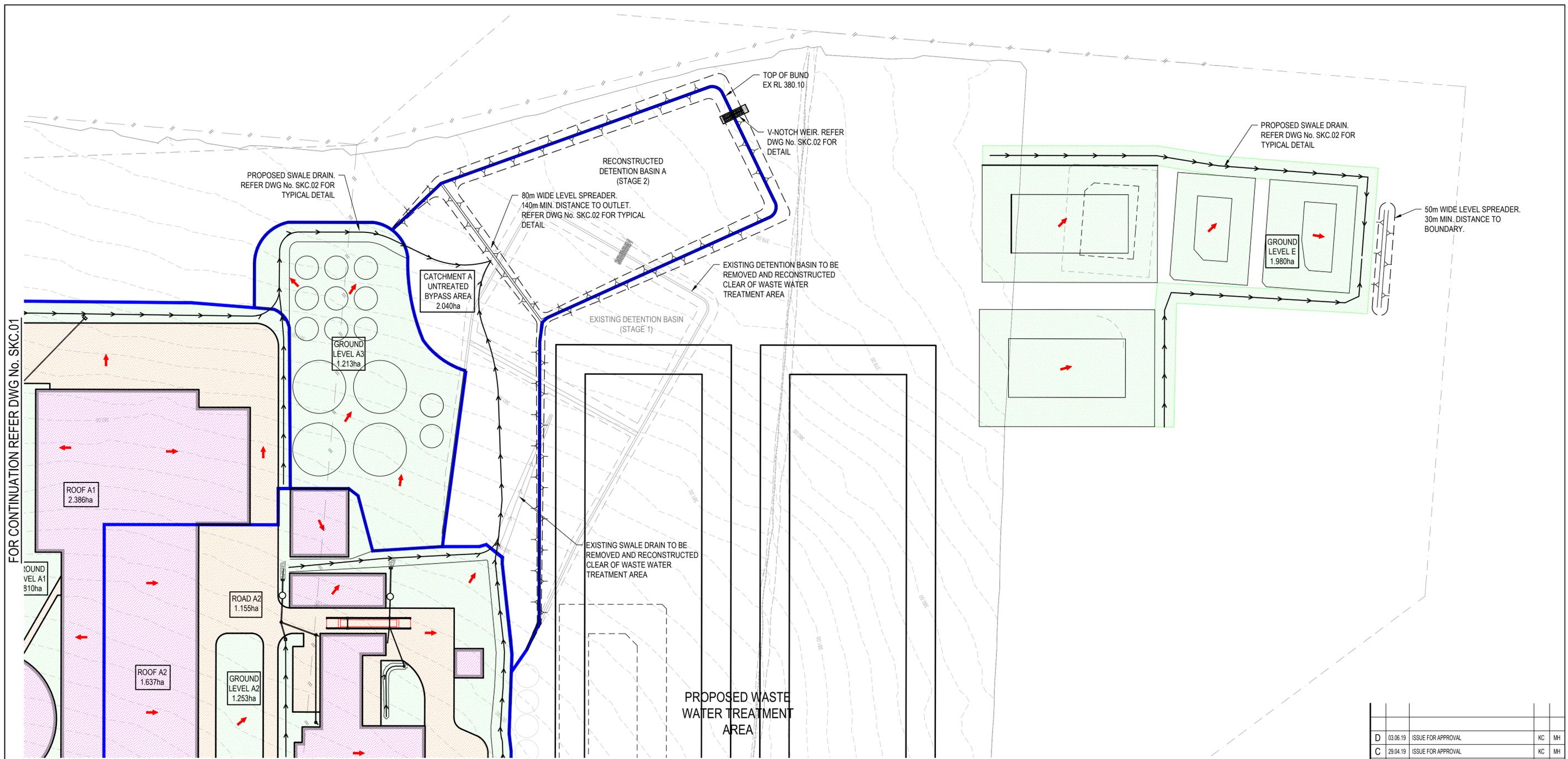
STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 2

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CHKD:	APPRD:	DATE:

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7679	SKC.02	D

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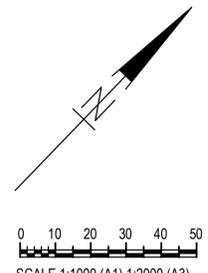
NOT FOR CONSTRUCTION



FOR CONTINUATION REFER DWG No. SKC.01

LEGEND

- PROPOSED BUILDING
- PROPOSED CONCRETE
- PROPOSED BARRIER KERB
- PROPOSED KERB AND CHANNEL
- PROPOSED STORM WATER MAIN
- PROPOSED TOP OF BATTER
- PROPOSED TOE OF BATTER
- PROPOSED CATCHMENT BOUNDARY
- PROPOSED SWALE DRAIN
- PROPOSED FLOW DIRECTION
- PROPOSED ROOF AREA
- PROPOSED HARDSTAND AREA
- PROPOSED GROUND LEVEL AREA



NOTE:
LITTER BASKETS TO BE FITTED TO FIELD INLETS LOCATED IN THE CAR PARK AREAS.

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MPN Consulting Pty Ltd

 39 Sherwood Road, Toowong, Qld. 4066
 P: 61 7 3335 4555
 F: 61 7 3371 3196
 E: solutions@mpnc.net.au

CLIENT:

OAKBURN PROTEIN RECOVERY PLANT

Oxley Highway
TAMWORTH, NSW, 2340

**STORMWATER CATCHMENT PLAN
STAGE 2 - SHEET 3**

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