STORMWATER MANAGEMENT PLAN

PROPOSED POULTRY FARM EXTENSION
75 TILLEY ROAD – BROMELTON

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20 December 2022

REVISION STATUS

MPN Reference No:	9559
Client:	PSA Consulting
Site Address:	75 Tilley Road, Bromelton
Report Title:	Stormwater Management Plan

DOCUMENT CONTROL

Version	Date	Author	Reviewer	Approved	RPEQ
DRAFT	14/10/2022	Peter Derrington	Lachlan Stephenson	LS	16903
Issue A	20/12/2022	Peter Derrington	Lachlan Stephenson		16903

EXECUTIVE SUMMARY

This report has been commissioned by PSA Consulting in support of the Development Application for the proposed poultry farm extension for the existing farm located at 75 Tilley Road, Bromelton.

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 commissioned by PSA Consulting in support of the Development Application for the proposed extensions to the existing poultry farm at 75 Tilley Road, Bromelton.

2 INTRODUCTION

2.1 Project Description

The current proposal involves the construction of four new poultry sheds with associated, hardstand vehicle access paths, detention basins and grassed swales. A new composting area will also be constructed with an access track from the sheds.

The development will include a new overland flow channel to provide stormwater treatment and conveyance to Allan Creek.

The development layout is depicted on the plans prepared by Urban Engineering Solutions attached in Appendix 1, with excerpt below.

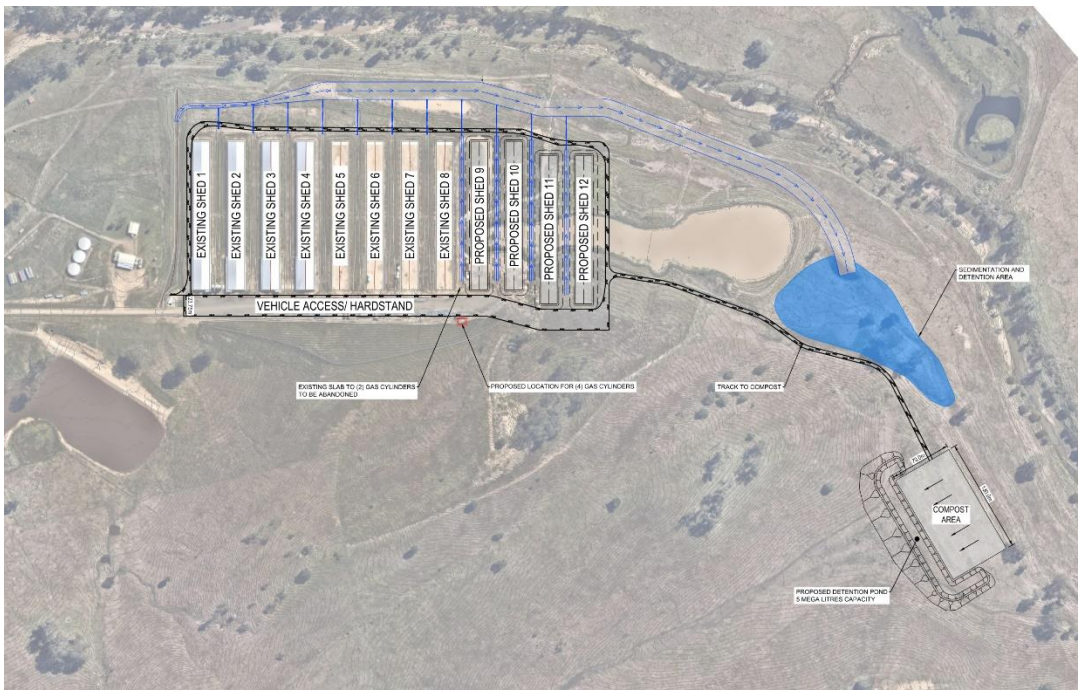

Figure 1 – Proposed Development

3 SITE CHARACTERISTICS

3.1 Site location

The site is located at 75 Tilley Road and is formally known as Lot 50 on SP179833.

The site is bounded by Allan Creek to the north and west, the interstate trainline to the east and Tilley Road to the south.

Aerial imagery of the site is presented in Figure 2 below.

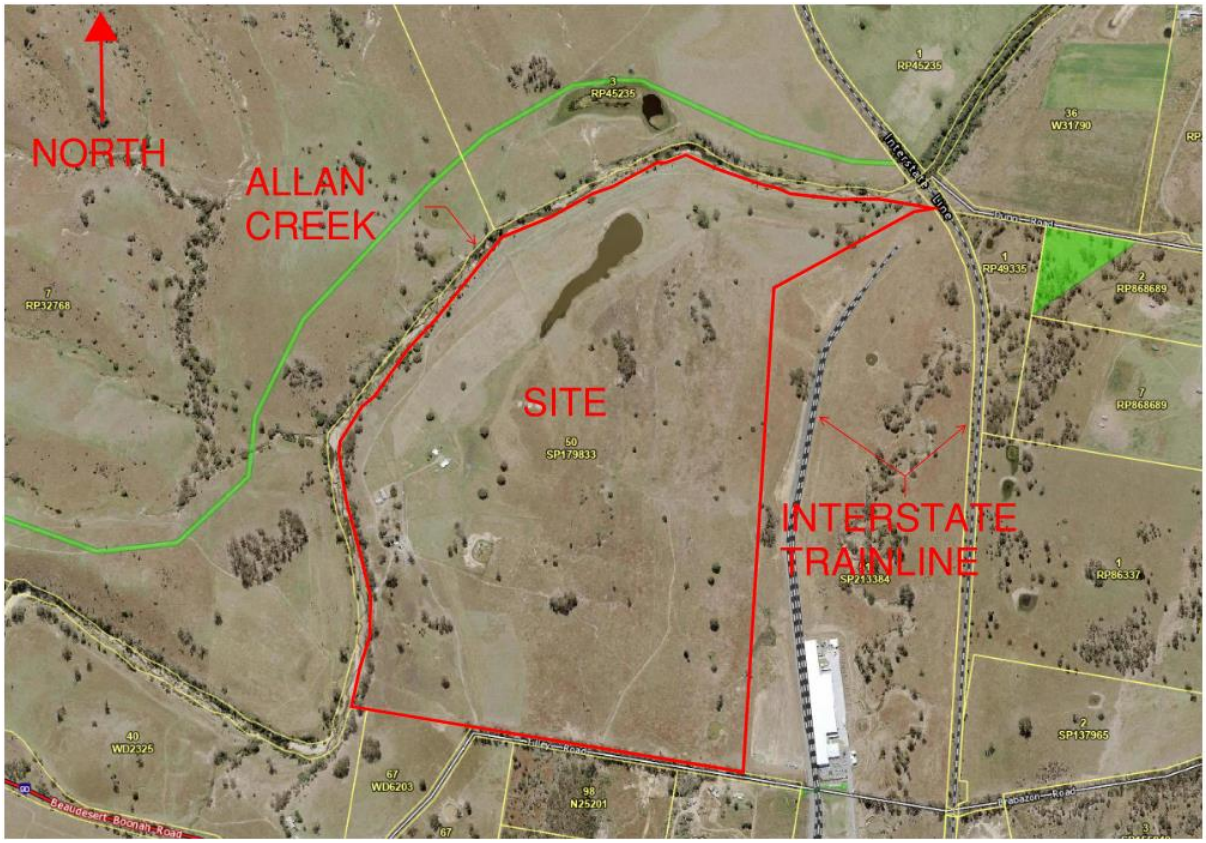

Figure 2 – Site Location

3.2 Topography and Existing Site Drainage

The site contains an existing poultry farm with eight sheds, farm dams, internal access tracks, and multiple ancillary structures including silos and a caretaker's residence.

The site has a high RL of approximately 90m AHD at a crest located centrally within the site and a low RL of approximately 50m AHD at Allan Creek.

Stormwater runoff from the site falls from the crest in the middle of the site towards the existing farm dams and Allan Creek.

4 SITE DATA

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

- Bureau of Meteorology
- Before You Dig Australia (BYDA)
- Discussions with relevant authorities
- Relevant reports
- Satellite imagery
- Scenic Rim Regional Council

5 STORMWATER

5.1 Flooding

Based on a review of the Scenic Rim Council's flood mapping the proposed development site is not impacted by flooding. An extract of the Council's flood mapping and approximate shed location is presented below in Figure 3. It is also noted that the farm shed levels are at approximately 54.6m AHD which is some three meters higher than the overland flow path and Allan Creek.

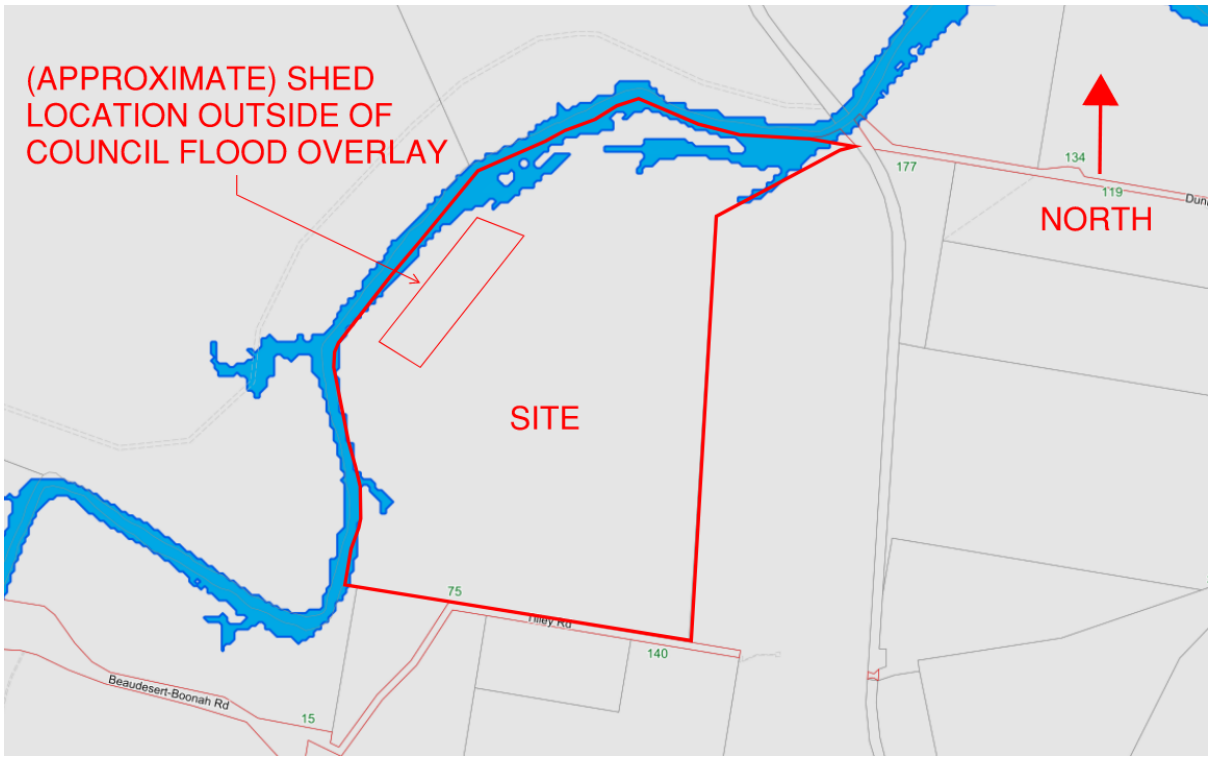

Figure 3 – Council Flood Mapping Extract

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 Quality and Quantity Best Management Practice for the site and demonstrate that water quality and quantity 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 Lawful Point of Discharge

The lawful point of discharge for the development is Allan Creek.

5.3.2 Proposed Site Drainage

Stormwater and roofwater runoff from the existing and proposed farm sheds will drain via vegetated filter strips into a new grassed overland flow channel running along the northern end of the sheds. The channel will treat the stormwater runoff and provide some detention.

The overland flow channel will discharge into a new detention basin constructed to the east of the existing farm dam located just east of the existing sheds. Detained flows will outlet from the basin into Allan Creek at flow rates no greater than the pre-development peak discharge in any design storm event.

The grassed overland flow channel along with the vegetated filter strips will prevent the majority of pollutants from the development from entering Allan Creek.

Stormwater runoff from the composting area will be detained by constructing a bund. Detained water will discharge into Allan Creek. The detention area will prevent most pollutants from directly entering Allan Creek.

A cut-off bund will be constructed west of the proposed compost pad to divert the upstream catchment around the compost area. The cut-off bund will prevent the upstream stormwater runoff from washing the compost material into Allan Creek.

The swales and cut-off bund have been designed to convey the 100-year ARI storm event with 300mm freeboard, ensuring they will not be overtopped in the design storm events.

The proposed site stormwater infrastructure is shown on the plans prepared by Urban Engineering Solutions attached in Appendix 1.

5.3.3 Stormwater Quantity Management Strategy

A DRAINS computer model was used to calculate the stormwater runoff for the existing site and the post development conditions. Runoff flows for the Annual Recurrence Intervals from 1 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.

In order to limit the site stormwater discharge, stormwater runoff from the development will be detained in two separate detention basins. Captured stormwater may also back up into the overland flow channel which will provide further detention volume. The stormwater basins will discharge into Allan Creek at a controlled rate via level spreader to ensure the peak post-development flow rates are no greater than the pre-development peak volumes.

Refer to Table 1 below for the existing and proposed mitigated peak discharge from the development.

The locations, properties and configurations of the stormwater infrastructure are detailed on the plans prepared by Urban Engineering Solutions attached in Appendix 1.

ARI Year	Existing Peak Discharge From Site (m^3/sec)	Proposed Mitigated Peak Discharge From Site (m^3/sec)
1	0.424	0.396
2	0.818	0.654
5	1.330	0.992
10	1.680	1.200
20	2.100	1.800
50	2.660	2.470
100	3.100	3.070

Table 1 – Existing and Developed Peak (with Detention) Flows

The western detention basin servicing the farm sheds has parameters as detailed in Table 2 below.

Design Parameter	Value
Max detention volume (incl. freeboard) (m^3)	4,460
Max water level (100 year ARI) (m)	48.79
Max water level (20 year ARI) (m)	48.70
Detention base level (m AHD)	48.00
Bund level (m AHD)	49.10
Freeboard in Q100 (m)	0.31
Outlet arrangement	3 x 600mm dia RCP (IL 48.00)
Emergency Weir	15m wide weir (IL 48.65)

Table 2 – Western Detention Basin Properties

The eastern detention basin servicing the compost pad has parameters as detailed in Table 3 below.

Design Parameter	Value
Max detention volume (incl. freeboard) (m^3)	413.00
Max water level (100 year ARI) (m)	49.57
Max water level (20 year ARI) (m)	49.48
Detention base level (m AHD)	49.00
Bund level (m AHD)	49.9
Freeboard in Q100 (m)	0.33
Outlet arrangement	525mm dia RCP (IL 49.00)
Emergency Weir	5.5m wide weir (IL 49.55)

Table 3 – Eastern Detention Basin Properties

5.3.4 Stormwater Quality Management Strategy

Stormwater runoff from the new farm sheds will be treated by vegetated filter strips and the new overland flow channel which will be lined with grass. The treated flows will be conveyed to the detention basin where pollutants will have further opportunity to settle, minimising the volume of harmful pollutants entering Allan Creek.

Stormwater runoff from the compost pad will be treated similarly to ensure no adverse impact on the water quality in Allan Creek.

5.4 Construction Phase (Sediment and Erosion Control)

5.4.1 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 Environmental Protection Act 1994 and Environmental Protection (Water) Policy 2009.

5.4.2 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.

5.4.3 Erosion and Sediment Control Measures

- Obtain a licence 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 leaden 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:
    - Limit 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 sediment 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.

5.4.4 Erosion 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).

5.4.5 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.

5.4.6 Responsible Person Or Organisation

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

5.4.7 Reporting / Review

Records such as licences, 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.

5.4.8 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 State Planning Policy July 2017.

The lawful point of discharge for the site is Allan Creek which bounds the site to the north and west.

The proposed development generally comprises four new poultry sheds and a compost pad. Stormwater and roofwater runoff from the two components will be detained in separate stormwater detention basins.

Stormwater and roofwater runoff from the farm sheds will drain into vegetated filter strips for water quality treatment before entering a new overland flow channel. The channel will further treat the stormwater and roofwater runoff and convey outlet into a detention basin. Detained flows will outlet into Allan Creek at flow rates no greater than the peak pre-development discharge rates.

Stormwater runoff from the upstream catchment which currently runs through the proposed compost area will be diverted by the construction of a new cut-off bund. The bund will be constructed to convey the 100 year ARI rainfall event with sufficient freeboard to ensure that the compost materials are not washed directly into Allan Creek.

The proposed development envelope is located outside of the Scenic Rim's flood hazard mapping overlay.

7 LIMITATIONS OF REPORT

MPN have prepared this report for the proposed poultry farm extension at 75 Tilley Road, Bromelton in accordance with MPN's proposal to PSA Consulting. This report is provided for the exclusive use of PSA Consulting 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 PSA Consulting.

Appendix 1
Urban Engineering Solutions Plans

POULTRY FARM - 75 TILLEY RD, BROMELTON

FOR ALLANS CREEK POULTRY FARM

LOCALITY PLAN

GOOGLE MAP

DRAWING INDEX	
SHEET NUMBER	SHEET TITLE
OVERALL	
DA-AA-000	LOCALITY PLAN AND DRAWING LIST
DA-AA-100	LAYOUT PLAN
DA-AA-110	SITE PLAN SHEET 1
DA-AA-111	SITE PLAN SHEET 2
BULK EARTHWORKS	
DA-BE-100	LAYOUT PLAN
DA-BE-200	SECTIONS
ROADWORKS	
DA-RW-100	LAYOUT PLAN
DA-RW-700	VEHICLE TURN PATHS
STORMWATER	
DA-SD-100	CATCHMENT LAYOUT PLAN

RP DESCRIPTION

LOT 50 ON SP179833

URBAN ENGINEERING SOLUTIONS PTY. LTD.
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TELEPHONE: 0488 998 776

FOR APPROVAL

Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
P1	PRELIMINARY ISSUE	Q.T.	15.07.22

DO NOT SCALE FROM DRAWING

Client: ALLANS CREEK POULTRY

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Drawn	Q.T.
Designed	D.P.
Passed	RPEQ 4892
Checked	RPEQ 4892

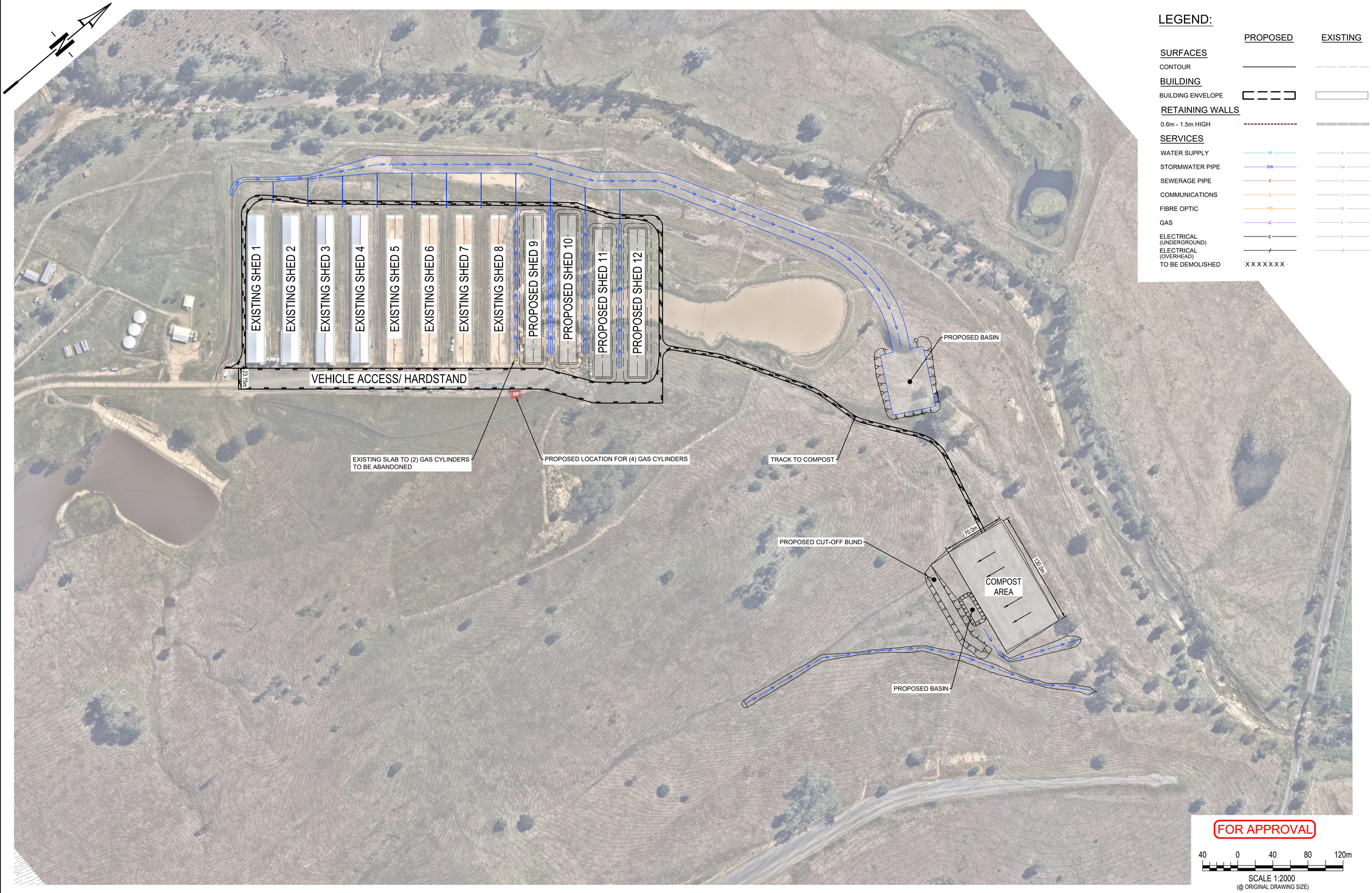
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: OVERALL
LOCALITY PLAN AND DRAWING LIST

Drawing Number: C0284-DA-AA-000

Print Scale: A1

Rev: A



Rev	Description		Date
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Drawn	Q.T.	
Designed	D.P.	
Passed		RPEQ 4802
Checked		RPEQ 4802

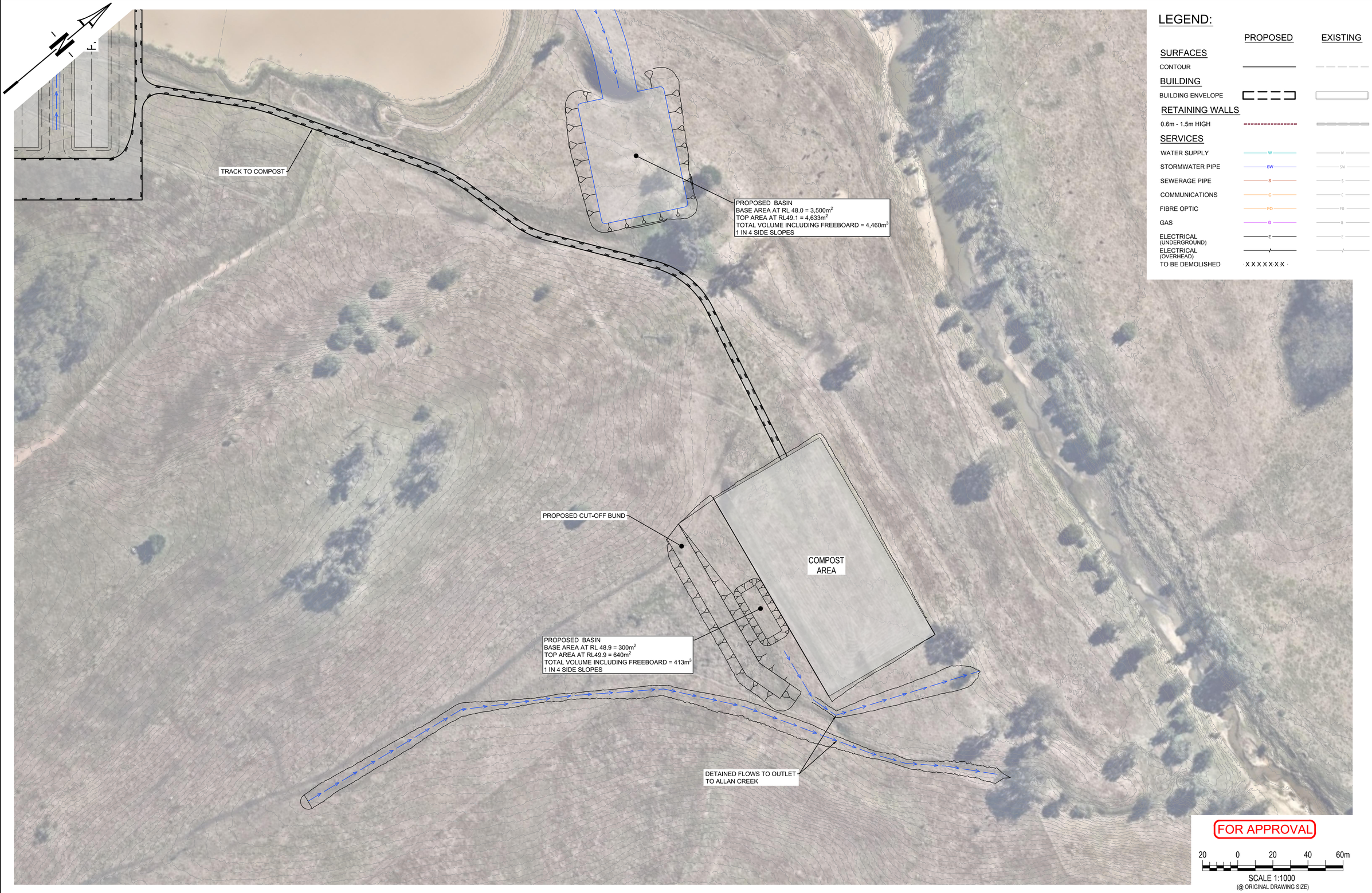
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: OVERALL LAYOUT PLAN

Drawing Number: C0284-DA-AA-100

Print Scale: A1

Rev: A



LEGEND:

	PROPOSED	EXISTING
SURFACES		
CONTOUR	———	- - - -
BUILDING		
BUILDING ENVELOPE	⊏ ⊐	▭
RETAINING WALLS		
0.6m - 1.5m HIGH	- - - -	- - - -
SERVICES		
WATER SUPPLY	W	W
STORMWATER PIPE	SW	SW
SEWERAGE PIPE	S	S
COMMUNICATIONS	C	C
FIBRE OPTIC	FO	FO
GAS	G	G
ELECTRICAL (UNDERGROUND)	E	E
ELECTRICAL (OVERHEAD)	-/-	-/-
TO BE DEMOLISHED	X X X X X X X	

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20 0 20 40 60m

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Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
P1	PRELIMINARY ISSUE	Q.T.	15.07.22

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Drawn	Q.T.
Designed	D.P.
Passed	RPEQ 4802
Checked	RPEQ 4802

Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

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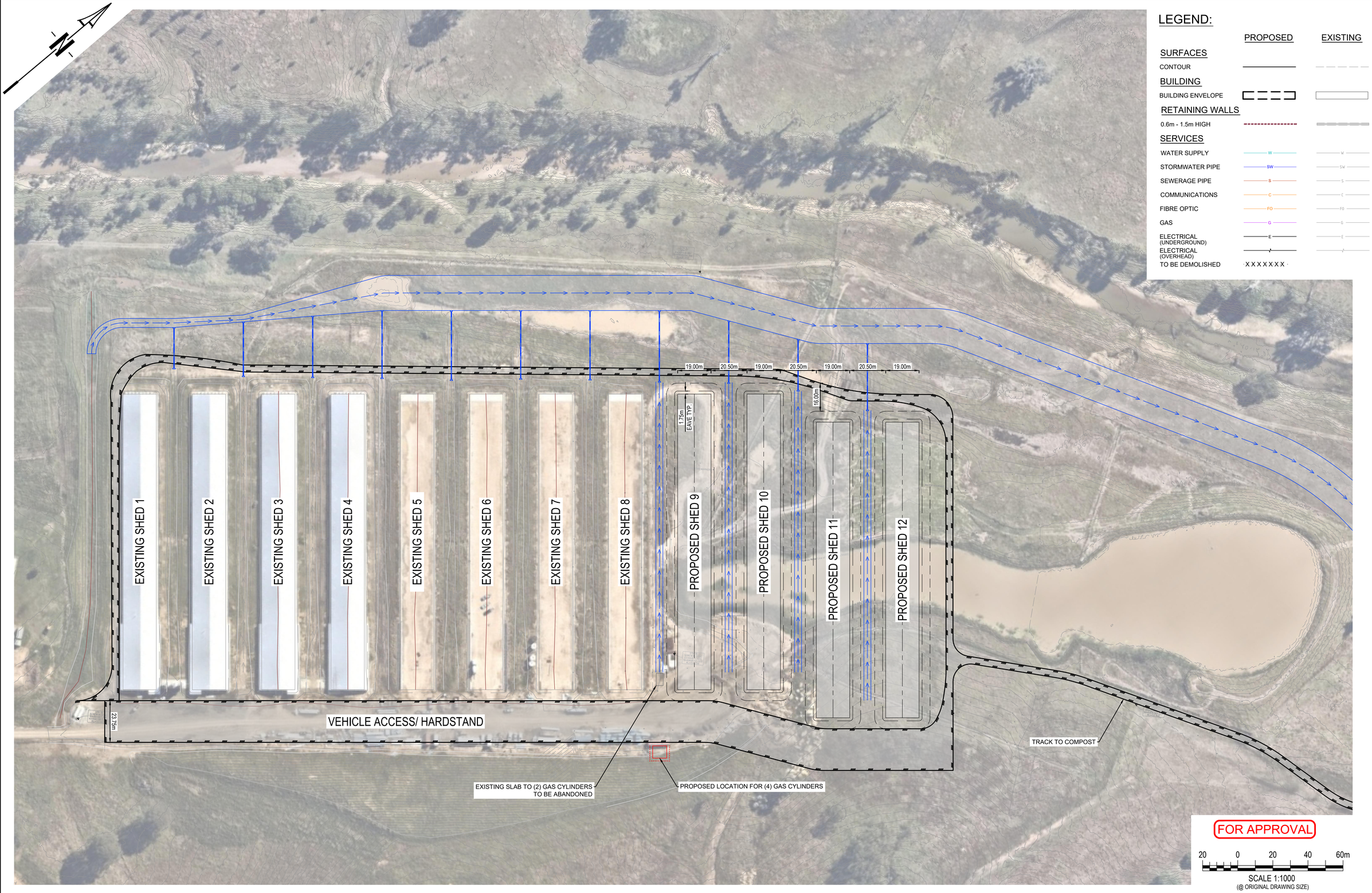

Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
P1	PRELIMINARY ISSUE	Q.T.	15.07.22

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Designed	D.P.
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Checked	RPEQ 4802

Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: OVERALL SITE PLAN SHEET 1

Drawing Number: C0284-DA-AA-110

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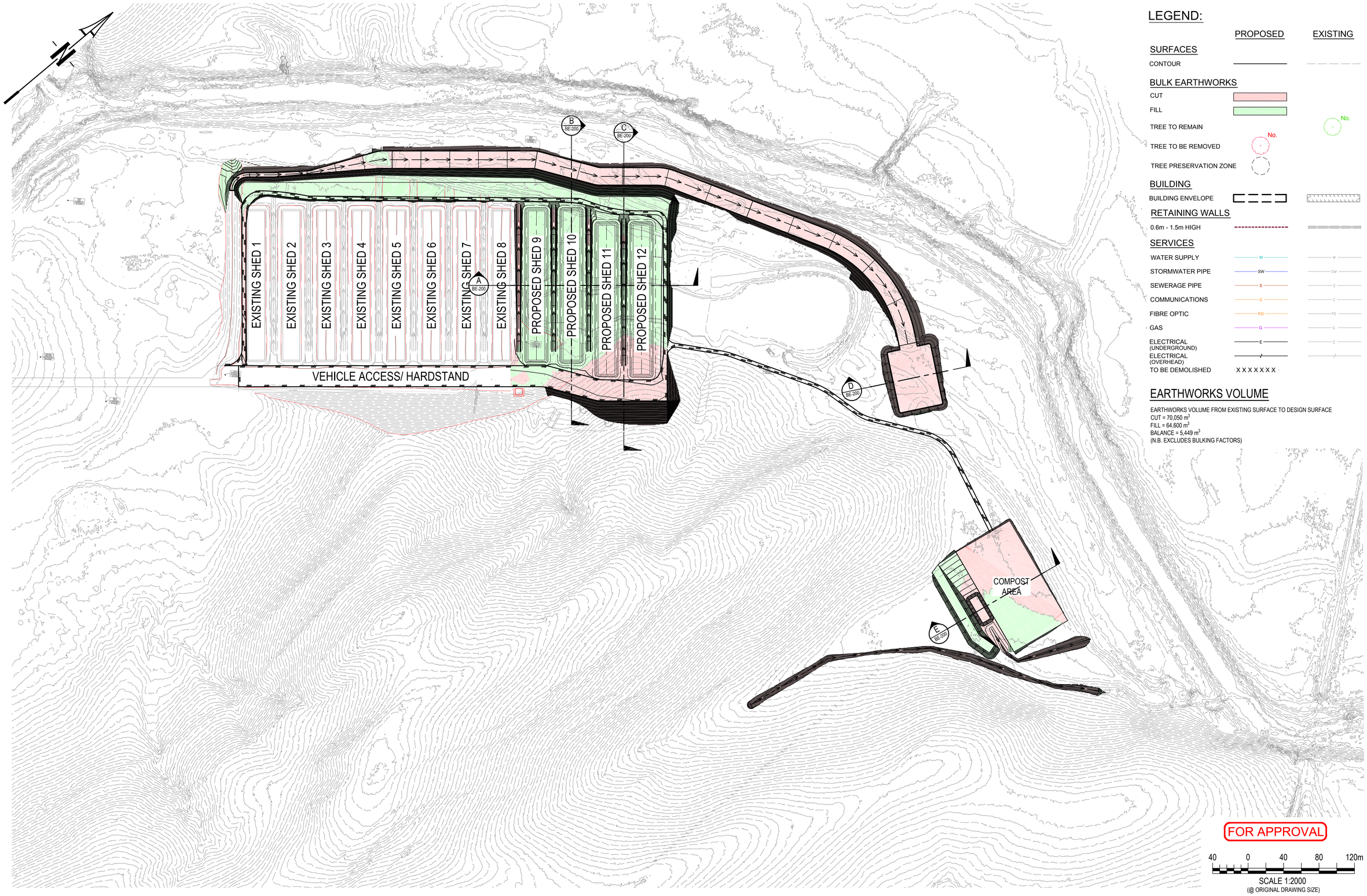
Rev: A



LEGEND:

	PROPOSED	EXISTING
SURFACES		
CONTOUR	———	— — — —
BULK EARTHWORKS		
CUT		
FILL		
TREE TO REMAIN		No.
TREE TO BE REMOVED	No.	
TREE PRESERVATION ZONE		
BUILDING		
BUILDING ENVELOPE		
RETAINING WALLS		
0.6m - 1.5m HIGH		
SERVICES		
WATER SUPPLY	W	W
STORMWATER PIPE	SW	SW
SEWERAGE PIPE	S	S
COMMUNICATIONS	C	C
FIBRE OPTIC	FO	FO
GAS	G	G
ELECTRICAL (UNDERGROUND)	E	E
ELECTRICAL (OVERHEAD)	V	V
TO BE DEMOLISHED	X X X X X X X	

EARTHWORKS VOLUME

EARTHWORKS VOLUME FROM EXISTING SURFACE TO DESIGN SURFACE
CUT = 70,050 m^3
FILL = 64,600 m^3
BALANCE = 5,449 m^3
(N.B. EXCLUDES BULKING FACTORS)

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40 0 40 80 120m
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(@ ORIGINAL DRAWING SIZE)

Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
P1	PRELIMINARY ISSUE	Q.T.	15.07.22

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Drawn	Q.T.
Designed	D.P.
Passed	RPEQ 4802
Checked	RPEQ 4802

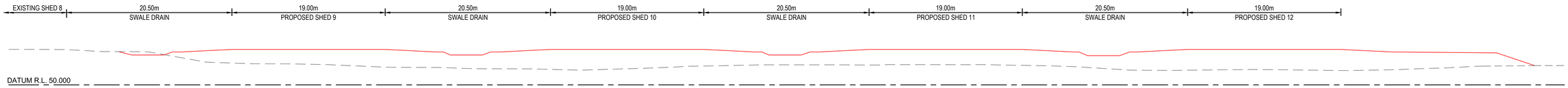
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: BULK EARTHWORKS LAYOUT PLAN

Drawing Number: C0284-DA-BE-100

Print Scale: A1

Rev: A



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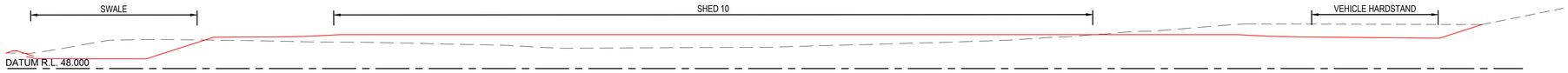

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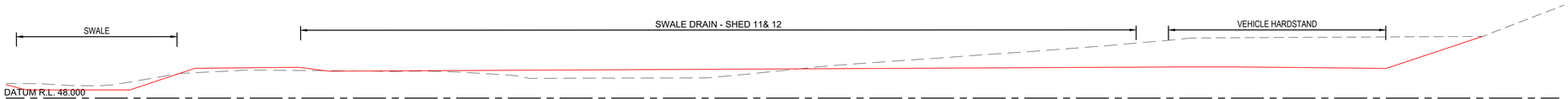

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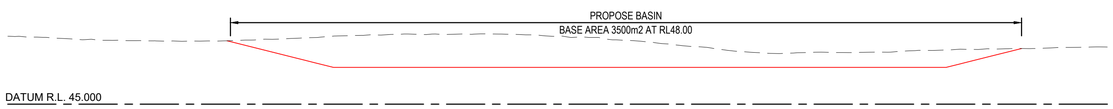
NOTE:

STRUCTURAL SLAB DESIGNS ARE NOT AVAILABLE. ALL EXCAVATION TO ACHIEVE BULK EARTHWORKS LEVELS ARE BELOW THE DESIGNED SLAB LEVEL.



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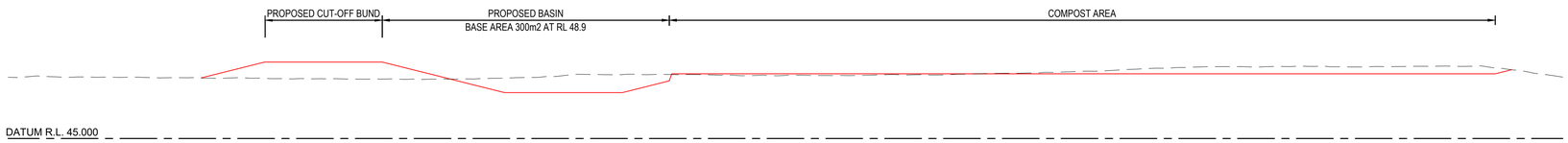

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Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
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Designed	D.P.
Passed	RPEQ 4802
Checked	RPEQ 4802

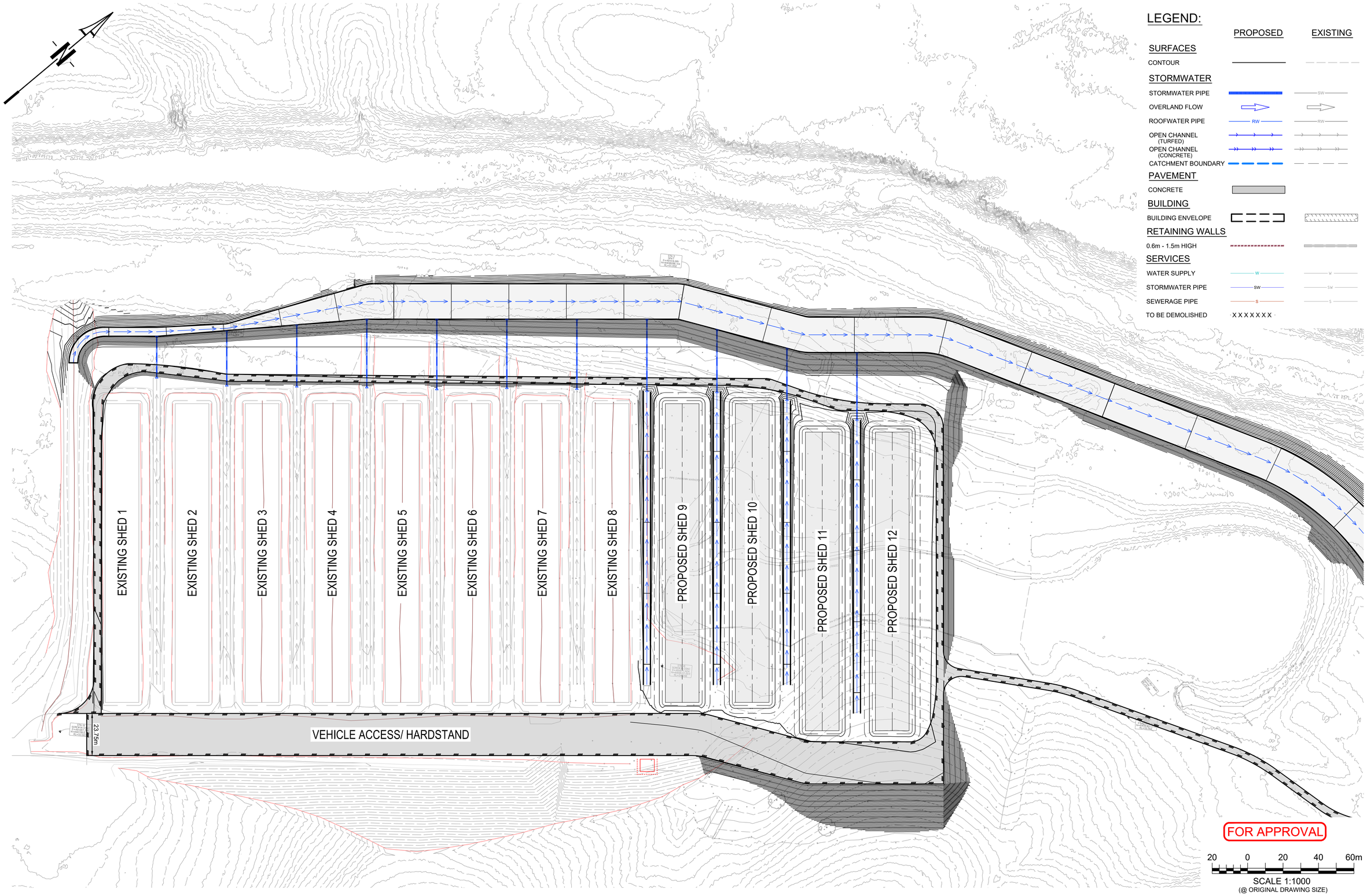
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: BULK EARTHWORKS SECTIONS

Drawing Number: C0284-DA-BE-200

Print Scale: A1

Rev: A



Rev	Description		Date
A	ISSUED FOR APPROVAL	Q.T.	28.07.22
P1	PRELIMINARY ISSUE	Q.T.	15.07.22

DO NOT SCALE FROM DRAWING

Client: ALLANS CREEK POULTRY

URBAN ENGINEERING SOLUTIONS
CIVIL ENGINEERING DESIGN AND DOCUMENTATION
SUBDIVISIONS — INDUSTRIAL — COMMERCIAL — TOURISM
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Drawn	Q.T.
Designed	D.P.
Passed	RPEQ 4802
Checked	RPEQ 4802

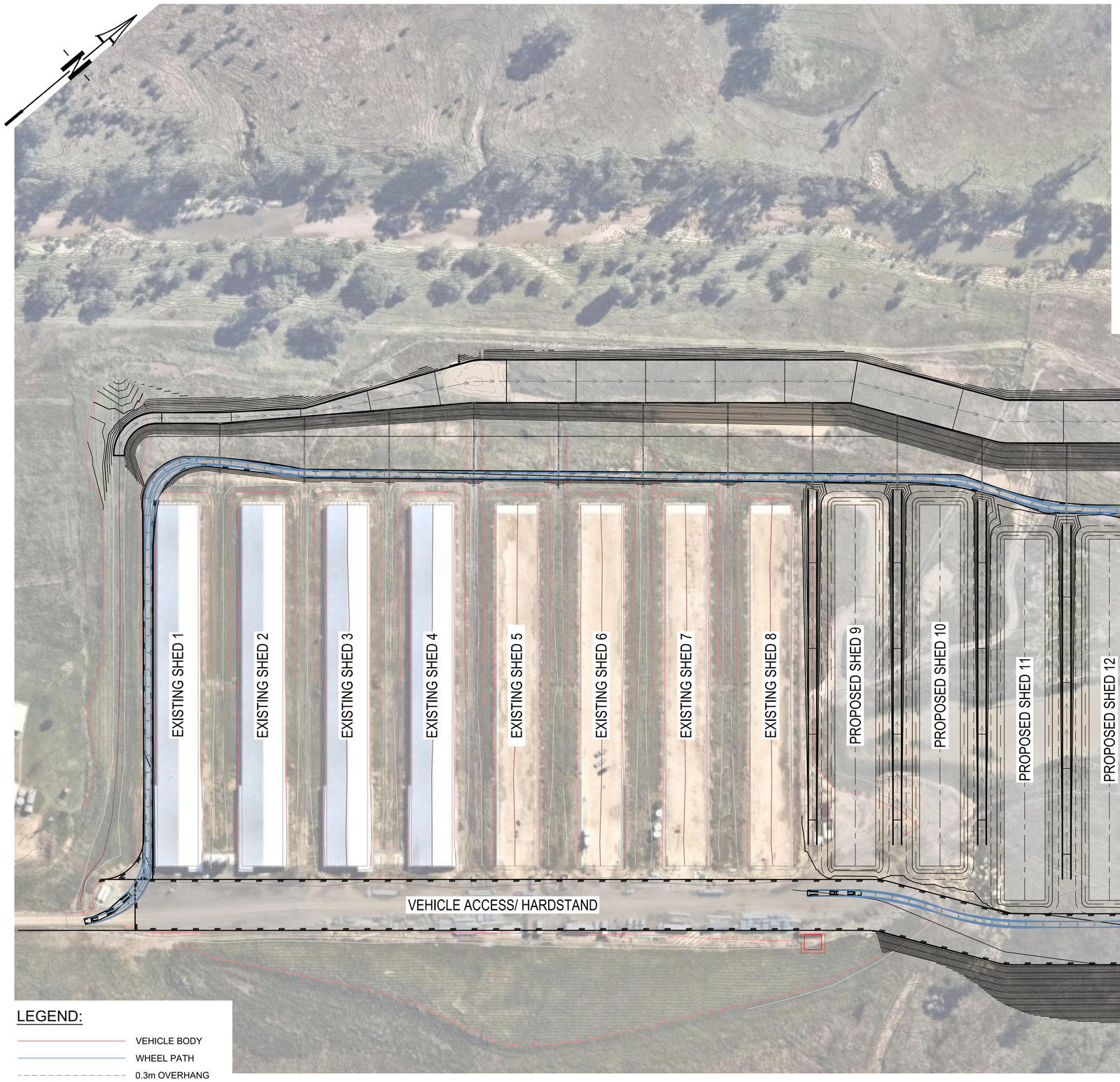
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

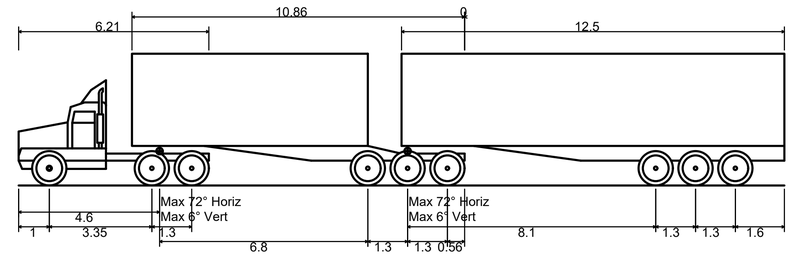
Title: ROADWORKS LAYOUT PLAN

Drawing Number: C0284-DA-RW-100

Print Scale: A1

Rev: A





B-DOUBLE (25.0m)

OVERALL LENGTH	25.000m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MIN BODY GROUND CLEARANCE	0.540m
TRACK WIDTH	2.500m
LOCK-TO-LOCK TIME	6.00s
KERB TO KERB TURNING RADIUS	15.000m

LEGEND:

- VEHICLE BODY
- WHEEL PATH
- 0.3m OVERHANG

FOR APPROVAL

20 0 20 40 60m

SCALE 1:1000
(@ ORIGINAL DRAWING SIZE)

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Client: ALLANS CREEK POULTRY

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Drawn	Q.T.	
Designed	D.P.	
Passed		RPEQ 4802
Checked		RPEQ 4802

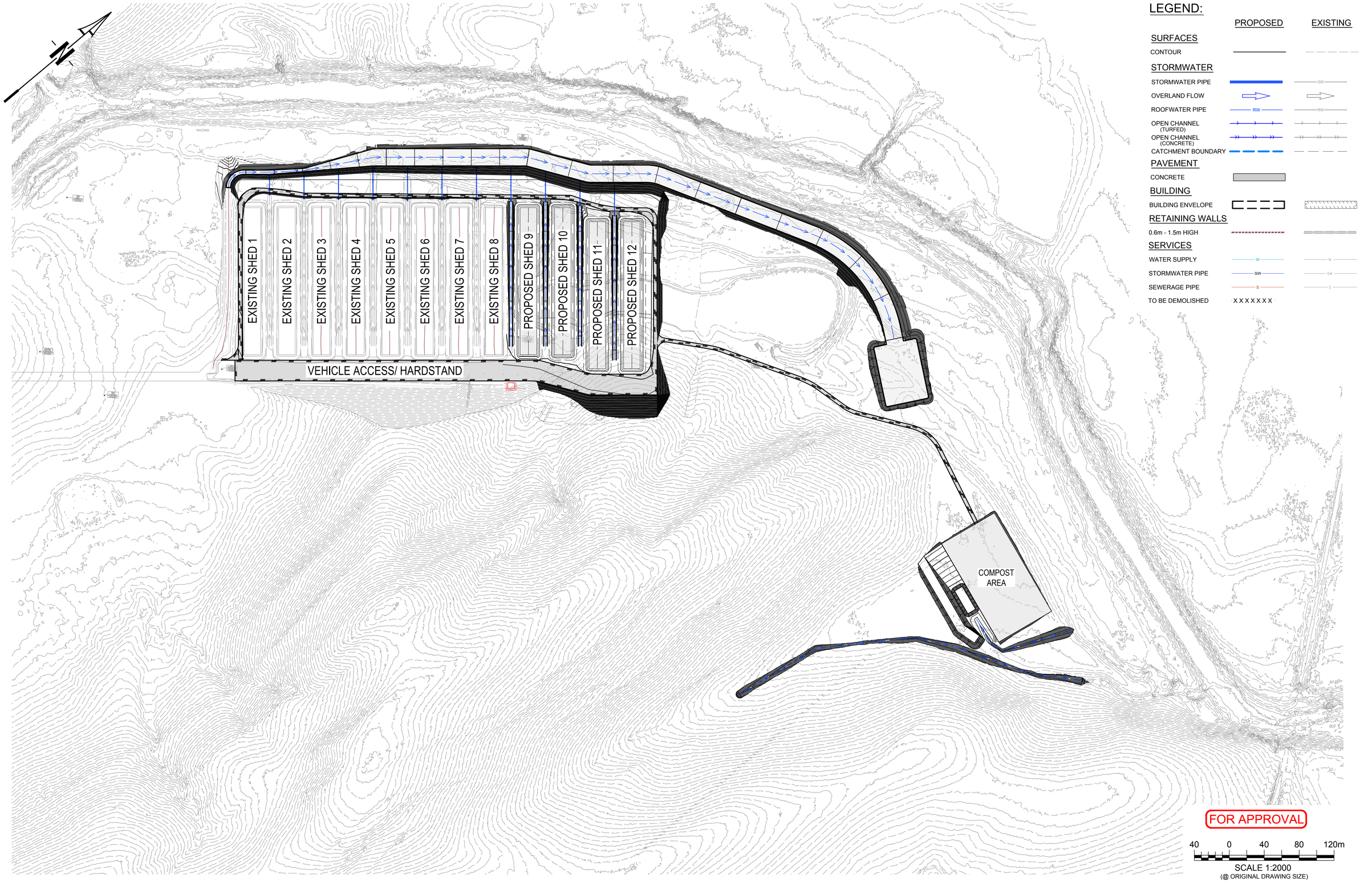
Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: ROADWORKS
VEHICLE TURN PATHS

Drawing Number: C0284-DA-RW-700

Print Scale: A1

Rev: A



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Drawn	Q.T.
Designed	D.P.
Passed	RPEQ 4802
Checked	RPEQ 4802

Project: POULTRY FARM - 75 TILLEY RD, BROMELTON

Title: STORMWATER CATCHMENT LAYOUT PLAN

Drawing Number: C0284-DA-SD-100

Print Scale: A1

Rev: A