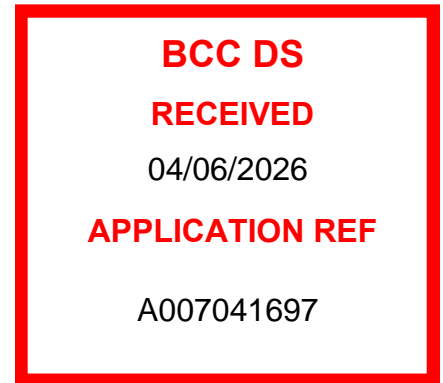


CONCEPT STORMWATER MANAGEMENT PLAN

107 LYTTON ROAD
BULIMBA, QLD 4171

PREPARED FOR
CHRIS METCALF

MAY 2026





Brendan Nielsen

Director & Principal Engineer

Qualifications:

BEng (Civil/Structural), MEng (Construction Engineering), GCert (Advanced Engineering), CPEng (Civil, Structural, Construction, Leadership & Management), IntPE(Aus), APEC Engineer, NER, RPEng (Civil, Structural, Leadership & Management), PEng, RPEQ (Civil, Structural, Leadership & Management), RPEV (Civil & Structural), BIE VIC (Civil & Structural), BIE ACT (Structural), NSW Professional Engineer (Civil & Structural), NSW Design Practitioner (Civil, Structural, Drainage & Façade), NSW Principal Design Practitioner

On behalf of J.C. Engineers Pty.Ltd.



J.C. Engineers Pty. Ltd. Project No. D205

If you have any queries regarding this report, please contact Brandon Ferrigno

Revision	Date	Description	Author	Rev.	App.
A	4 th May 2026	DRAFT FOR COMMENTS	JR	ST	BN
B	29 th May 2026	FINAL	JR	ST	BN

COPYRIGHT: This document is and shall remain the property of J.C. Engineers Pty. Ltd. and shall not be copied in whole or in part. The unauthorised use of this document in any form is prohibited.

Table of Contents

List of Tables	4
List of Figures	4
1 Introduction	5
1.1 Governing standards and relevant documents	5
2 Site characteristics	6
2.1 Location.....	6
2.2 Existing property overview	7
2.3 Proposed property overview	8
2.4 Catchment analysis	9
2.5 Catchment Areas.....	9
2.6 Hydrologic Analysis	10
2.6.1 Methodology	10
2.6.2 Pre-Development Hydrology	10
2.6.3 Post-Development Hydrology	11
2.7 Stormwater Management Plan.....	11
2.7.1 Roofwater Tank	12
2.7.1.1 Roof Catchment Parameters.....	12
2.7.1.2 Peak Flow Calculation (Rational Method).....	13
2.7.1.3 Runoff Volume	13
2.7.1.4 Required Tank Capacity	13
2.8 Stormwater Conveyance.....	13
2.9 Surface Drainage (Grassed Swale)	14
2.10 Lawful point of discharge.....	14
3 Conclusion and recommendations	14
3.1 Conclusion.....	14
3.2 Recommendation.....	15

List of Tables

Table 1: Pre-development catchment surface areas	9
Table 2: Post-development catchment surface areas.....	10
Table 3: Hydrological Parameters for Roof Runoff Calculation.....	12
Table 4: Calculated Roof Runoff and Required Roofwater Tank Storage Capacity.....	13

List of Figures

Figure 1: Site locality plan showing the subject property at 107 Lytton Road, Bulimba, QLD 4171 (outlined in white). Image sourced from Queensland Globe on 29 April 2026.	6
Figure 2: Existing site conditions at 107 Lytton Road, Bulimba, showing aerial imagery with 1 m LiDAR contour mapping sourced from Queensland Globe (accessed 04 May 2026).	7
Figure 3: Proposed Site Layout – 107 Lytton Road, Bulimba, QLD 4171 (Source: J.C. Engineers, Sheet 5 of 7, Drawing D205_C_REV B_20260529).....	8
Figure 4: Pre-development and post-development stormwater catchment areas for the site at 107 Lytton Road, Bulimba, extracted from J.C. Engineers Civil Drawing D205_C_REV B_20260529.	9
Figure 5: Stormwater Management Plan (Extracted from J.C.E. Civil Drawing D205_C_REV B_20260529, Sheet 7 of 7)	12

1 Introduction

This report has been developed to assess the stormwater catchment characteristics and stormwater management requirements for the proposed residential development at 107 Lytton Road, Bulimba, QLD 4171.

The purpose of this report is to evaluate the potential impacts of the proposed development on stormwater quantity and drainage behaviour across the site. The report outlines the stormwater management measures proposed to ensure that runoff generated from the development is safely captured, conveyed, and discharged without causing adverse impacts to neighbouring properties or downstream infrastructure.

The proposed development consists of a residential dwelling and associated site works, including roof areas, driveway access, and landscaped areas. These works will introduce additional impervious surfaces which may increase the volume and rate of stormwater runoff compared with existing site conditions.

This Stormwater Management Plan (SWMP) has been prepared to:

- Assess the existing drainage characteristics of the site
- Estimate pre-development and post-development stormwater runoff
- Identify the lawful point of discharge for the property
- Demonstrate that stormwater generated by the development will be adequately managed in accordance with relevant engineering guidelines and council requirements

The stormwater management strategy for the site incorporates appropriate drainage infrastructure and surface water management measures to ensure that post-development stormwater discharge does not adversely affect downstream drainage conditions.

1.1 Governing standards and relevant documents

The stormwater assessment and drainage design have been undertaken with reference to the following standards, guidelines, and project documentation:

- Brisbane City Council Standard Drawings
- Brisbane City Plan 2014
- BCC Reference Specifications for Engineering Work – S160 Drainage
- Australian Standard 3500.3:2025 – Plumbing and Drainage: Stormwater Drainage
- Queensland Urban Drainage Manual (QUDM)
- Australian Rainfall and Runoff (ARR2019).
- Bureau of Meteorology (BoM) Intensity–Frequency–Duration (IFD) Rainfall Data.
- Civil Drawings – J.C. Engineers, Drawing Set D205_C_REV A_20260505, Rev A, dated 05 May 2026.

2 Site characteristics

2.1 Location

The proposed development is located at 107 Lytton Road, Bulimba, QLD 4171, within the Brisbane City Council local government area. The site has direct frontage to Lytton Road and is located within an established low-density residential area. The existing land use comprises a detached residential dwelling and associated site works.

Topographic information indicates the site is generally gently sloping toward Lytton Road, with surface runoff naturally draining from the site toward the road frontage in accordance with the existing ground levels. Stormwater runoff from the site historically discharges toward the road corridor and associated municipal drainage infrastructure. These existing drainage characteristics have been considered in the development of the proposed stormwater management strategy.

The proposed development consists of a residential dwelling and associated site works, including roof areas and driveway access. These works introduce additional impervious surfaces which will increase stormwater runoff compared with existing site conditions. Appropriate stormwater management measures have therefore been incorporated to capture, convey, and safely discharge stormwater from the site to the lawful point of discharge.



Figure 1: Site locality plan showing the subject property at 107 Lytton Road, Bulimba, QLD 4171 (outlined in white). Image sourced from Queensland Globe on 29 April 2026.

2.2 Existing property overview

The subject site at 107 Lytton Road, Bulimba QLD 4171 is an existing residential allotment located within the Brisbane City Council local government area. The site has direct frontage to Lytton Road and is situated within an established low-density residential area characterised predominantly by detached dwellings on individual allotments. The existing allotment has an area of approximately 636 m² and currently contains a detached dwelling and associated residential improvements, including roofed structures, driveway access, and landscaped areas. The site is currently serviced by urban infrastructure typical of the locality, including road access, stormwater drainage, and utility services.

Topographic contours derived from LiDAR elevation data indicate that the site gently toward Lytton Road. Existing ground levels range approximately from RL 12 m from the rear portion to RL 6 m toward the road frontage of the site, indicating a noticeable fall across the property. The LiDAR contours and surrounding site context are illustrated in Figure 2, which shows aerial imagery overlaid with 1 m interval LiDAR contour mapping obtained from Queensland Globe.

The site presently comprises a combination of permeable surfaces, including grassed and landscaped areas, and impervious surfaces associated with the existing dwelling footprint and driveway. Stormwater runoff from impervious areas is currently directed toward the road frontage, while runoff from permeable areas drains in accordance with the existing landform.

Vehicular access to the site is presently provided via an existing driveway connection to Lytton Road, which serves as the sole frontage and access point for the allotment. The surrounding lots exhibit similar access arrangements and drainage patterns consistent with the local residential context. These existing site characteristics have been considered in the development of the proposed stormwater management strategy.

The existing site conditions, including landform, drainage behaviour, access arrangements, and built form, inform the proposed reconfiguration of the lot into two residential allotments. These characteristics have been considered in the subdivision design to ensure that the proposed allotments respond appropriately to the site's natural slope, maintain lawful stormwater discharge to the street drainage system, and are capable of accommodating compliant residential development consistent with the planning framework.

Existing Site Conditions

107 Lytton Road, Bulimba, QLD 4171

27°26'58"S 153°3'57"E



27°27'5\"/>

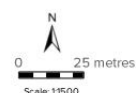
27°26'58\"/>

27°27'5\"/>

A product of
 Queensland Globe



Legend located on next page



Printed at: A4

Print date: 4/5/2026

Not suitable for accurate measurement.
 Projection: Web Mercator EPSG 102100 (3857)

For more information, visit
<https://qldglobe.information.qld.gov.au/help-info/Contact-us.html>

Includes material © State of Queensland 2026. You are responsible for ensuring that the map is suitable for your purposes. The State of Queensland makes no representation or warranties in relation to the map contents and disclaims all liability.

If imagery is displayed, imagery includes material © CNES reproduced under license from Airbus D.S. all rights reserved © 2025 © Earth-1, all rights reserved, © Planet Labs PBC, 2025



Department of Natural Resources and Mines,
 Manufacturing, and Regional and Rural Development

Figure 2: Existing site conditions at 107 Lytton Road, Bulimba, showing aerial imagery with 1 m LiDAR contour mapping sourced from Queensland Globe (accessed 04 May 2026).

2.3 Proposed property overview

The proposed development at 107 Lytton Road, Bulimba QLD 4171 comprises the creation of two residential lots and associated external works contained entirely within the existing lot boundary. The site layout has been designed to respond to the natural topography of the land while maintaining appropriate setbacks to all property boundaries. Vehicle access is provided via a proposed driveway from Lytton Road servicing Lot 2. Proposed surface levels and site grading have been configured to direct stormwater runoff away from building footprints and toward the proposed drainage infrastructure and lawful point of discharge, in accordance with relevant design standards. The overall site arrangement is illustrated on Figure 3 – Proposed Site Layout.



Figure 3: Proposed Site Layout – 107 Lytton Road, Bulimba, QLD 4171 (Source: J.C. Engineers, Sheet 5 of 7, Drawing D205_C_REV B_20260529).

2.4 Catchment analysis

The subject site, located at 107 Lytton Road, Bulimba QLD 4171, forms part of a proposed residential redevelopment. The site is regular in shape and exhibits a consistent slope across the allotment, with surface runoff generally following the existing ground contours toward Lytton Road.

Under pre-development conditions, the site comprises a combination of pervious surfaces (including natural ground) and impervious surfaces (including the existing dwelling and driveway). Under post-development conditions, the site is proposed to be subdivided into two residential lots. A driveway is proposed to service Lot 2 only, providing vehicle access from Lytton Road, while for Lot 1, it is assumed that the existing driveway will be retained. A building envelope for each lot was also specified in the layout.

The pre-development and post-development catchment conditions are illustrated in Figure 4.



Figure 4: Pre-development and post-development stormwater catchment areas for the site at 107 Lytton Road, Bulimba, extracted from J.C. Engineers Civil Drawing D205_C_REV B_20260529.

2.5 Catchment Areas

Based on the catchment plan, the total site catchment area is approximately 636 m².

Table 1: Pre-development catchment surface areas

Surface Type	Area
Pervious Area	490.35 m ²
Impervious Area Roof	128.04 m ²
Impervious Area Others	17.61 m ²
Total Catchment Area	636.00 m ²

Table 2: Post-development catchment surface areas

Surface Type	Area
Pervious Area	293.77 m ²
Impervious Area Roof/ Pad	270.00 m ²
Impervious Area Others	72.23 m ²
Total Catchment Area	636.00 m ²

2.6 Hydrologic Analysis

2.6.1 Methodology

Peak stormwater runoff from the site was estimated using the Rational Method, which is commonly applied for small urban catchments. The Rational Method estimates peak discharge based on rainfall intensity, catchment area, and runoff characteristics of the surface.

The method is expressed as:

$$Q = \frac{C \times I \times A}{360}$$

where:

- Q = peak discharge (m³/s)
- C = runoff coefficient representing surface characteristics
- I = rainfall intensity (mm/hr) for the relevant storm duration and recurrence interval
- A = catchment area (ha)

For residential drainage design, stormwater infrastructure has been assessed for the minor drainage system in accordance with QUDM recommendations for small urban catchments. Peak flow estimation using the Rational Method is considered appropriate for catchments smaller than 20 ha and is commonly adopted for residential lot scale drainage design.

Rainfall intensities were derived from Australian Rainfall and Runoff (ARR2019) data for the Bulimba area. Runoff coefficients were selected in accordance with the Queensland Urban Drainage Manual (QUDM) based on the land cover conditions of the site.

The time of concentration (tc) was determined in accordance with AS/NZS 3500.3 Section 5.4.4, which considers the travel time of runoff across the catchment.

2.6.2 Pre-Development Hydrology

Under existing conditions, the site consists of pervious and impervious areas (roof and others). Based on the catchment analysis, the total catchment area of the site is approximately 636m² (0.0636 ha).

Due to the existing dwelling and driveway of the area, some of the overland flow will be absorbed by the remaining pervious area and the existing stormwater drainage. For hydrologic analysis, the catchment was therefore considered to represent light cover bushland conditions.

Using the Rational Method, peak discharge values were calculated for relevant storm events. The results indicate that the existing peak discharge rates are approximately:

- Q10 = 23.29 L/s
- Q20 = 28.03 L/s
- Q100 = 41.33 L/s

These values represent the baseline runoff conditions of the developed site and provide the reference for assessing the impact of the proposed development on stormwater runoff. Detailed pre-development calculations are provided in Appendix A.

2.6.3 Post-Development Hydrology

Following development, the introduction of impervious surfaces, including the considered residential roof/pad area and associated driveway areas, will increase the potential for surface runoff across the site.

The post-development catchment consists of approximately:

- 270.00 m² roof/pad area
- 72.23 m² of other impervious surfaces (e.g., driveway)
- 293.77 m² of pervious surfaces

The increase in impervious area reduces infiltration and results in a higher proportion of rainfall contributing directly to surface runoff.

Peak discharge rates were therefore recalculated using the Rational Method with runoff coefficients appropriate for both impervious and pervious surfaces within the site. The resulting peak discharges for the developed condition are approximately:

- Q10 = 26.92 L/s
- Q20 = 32.38 L/s
- Q100 = 47.90 L/s

While the subdivision of the lot into two results in an increase in peak runoff relative to existing conditions, the overall catchment area remains very small (approximately 0.0636 ha). The proposed stormwater management strategy disperses runoff through a swale into the stormwater pipe system then into the road, thereby replicating the natural drainage behaviour of the site. Due to the residential development in the surrounding area, no unacceptable flooding impacts are anticipated within the property and the road where drainage will be discharging.

These results demonstrate an increase in peak runoff compared with existing conditions due to the subdivision of the lots, which increases impervious areas. Consequently, appropriate stormwater management measures are required to control and manage runoff from the developed site.

Detailed post-development hydrologic calculations are provided in Appendix A.

2.7 Stormwater Management Plan

The proposed stormwater management system has been designed to safely collect, convey, and discharge stormwater runoff generated by the proposed development, while maintaining the existing natural drainage patterns of the site where practicable. The system incorporates a grassed swale to manage surface runoff, which discharges to an underground stormwater pipe system. The underground system conveys flows to a lawful point of discharge via a kerb adaptor at the downstream end. A roof water tank has also been considered based on the building envelope. However, as the roof layout has not been provided, only runoff from the roof water tank has been included in the design. This flow will discharge into the stormwater pipe network.

The proposed system includes the following key components:

- A roof drainage system discharging from the rainwater tank into the stormwater pipe network.
- A grassed swale for surface runoff management
- A stormwater pipe system with kerb adaptor at the downstream discharge point

The layout of the proposed stormwater management system is shown on Figure 5 – Stormwater Management Plan.



Figure 5: Stormwater Management Plan (Extracted from J.C.E. Civil Drawing D205_C_REV B_20260529, Sheet 7 of 7)

2.7.1 Roofwater Tank

A roof water tank is proposed to capture roof runoff for rainwater reuse for the building envelope on Lot 1 and 2, while also providing incidental attenuation of peak flows prior to discharge to the natural stormwater system

2.7.1.1 Roof Catchment Parameters

Table 3: Hydrological Parameters for Roof Runoff Calculation

Parameter	Value
Roof Area (A)	135.0 m ²
Runoff Coefficient (C)	0.9
Rainfall Intensity (i)	236.4 mm/hr
Time of Concentration (tc)	5 minutes

2.7.1.2 Peak Flow Calculation (Rational Method)

The peak stormwater runoff from the roof catchment is calculated using the Rational Method:

$$Q = (C \times i \times A) / 360$$

Where:

Q = peak discharge (m³/s)

C = runoff coefficient

i = rainfall intensity (mm/hr)

A = catchment area (ha)

Substituting the design parameters:

$$Q = (0.9 \times 236.4 \times 0.0135) / 360$$

$$Q = 0.00798 \text{ m}^3/\text{s}$$

$$Q = 7.98 \text{ L/s}$$

Therefore, the peak roof runoff for the 1% AEP (Q100) storm event is **7.98 L/s**.

2.7.1.3 Runoff Volume

$$V = Q \times t$$

Where:

V = runoff volume (m³)

Q = peak discharge (m³/s)

t = storm duration (seconds)

Substituting the values:

$$Q = 0.00798 \text{ m}^3/\text{s}$$

$$t = 5 \text{ minutes} = 300 \text{ seconds}$$

$$V = 0.00798 \times 300$$

$$V = 2.39 \text{ m}^3$$

Therefore, the required detention storage volume for the roof runoff is approximately 2.39 m³.

2.7.1.4 Required Tank Capacity

Table 4: Calculated Roof Runoff and Required Roofwater Tank Storage Capacity

Parameter	Value
Peak Roof Flow (Q100)	7.98 L/s
Storage Volume	2.39 m ³

A standard 6,000L rainwater tank is proposed which exceeds the calculated minimum storage requirement of approximately 2.39m³. This provides additional buffering capacity and aligns with typical residential rainwater tank sizing.

2.8 Stormwater Conveyance

Runoff generated from the impervious roof and building pad areas, together with a portion of the pervious surfaces, will be collected and conveyed by the proposed stormwater drainage system.

Proposed stormwater infrastructure includes:

- Ø150 mm stormwater pipe
- Minimum pipe grade: 2.0%
- Stormwater pits with grate cover

Surface runoff will be initially conveyed via a grassed swale, which has been designed to manage minor storm events up to the 10-year ARI. The swale discharges into the underground stormwater pipe system, which provides downstream conveyance to the lawful point of discharge.

During storm events exceeding the 10-year ARI, surcharge of the underground system and overflow from the swale is anticipated. In these events, flows will safely discharge to the surrounding ground surface and be conveyed via overland flow paths in accordance with the site's natural drainage patterns, ensuring no adverse impact to buildings or adjoining properties.

2.9 Surface Drainage (Grassed Swale)

Surface runoff across the site will be managed via a proposed grassed swale located along the lower portion of the building footprint. The swale forms an integral component of the site's surface drainage system and has been designed to manage minor storm events up to the 10-year ARI.

The grassed swale provides the following functions:

- conveyance of surface runoff toward the stormwater drainage system
- reduction of flow velocity to minimise erosion control
- temporary storage and distribution of runoff prior to discharge
- promotion of infiltration within vegetated areas
- maintenance of the site's natural drainage characteristics

The swale will be formed with mild longitudinal grades and stabilised with appropriate vegetation to minimise erosion and support infiltration, consistent with the existing site conditions. Runoff collected within the swale will discharge to the underground stormwater pipe system at designated inlet locations.

2.10 Lawful point of discharge

In accordance with Section 3.9 of the Queensland Urban Drainage Manual (QUDM), stormwater runoff from the site must be discharged to a lawful point of discharge. A lawful point of discharge may include a constructed drainage system, natural watercourse, inter-allotment drainage path, or another location where stormwater can be safely conveyed without causing nuisance or damage to adjoining properties.

The subject site naturally drains toward the northern boundary, where runoff is directed toward Lytton Road and subsequently conveyed to the existing public stormwater drainage system. The proposed development maintains this existing drainage behaviour and does not alter the overall direction of overland flow from the site.

Stormwater generated by the proposed development will be collected and conveyed via the on-site surface and underground stormwater drainage system and discharged via kerb adaptors located along the northern boundary of the property. Discharged flows will enter the road reserve and be conveyed to the existing public stormwater drainage infrastructure. Accordingly, the proposed discharge arrangement is considered consistent with the intent of the QUDM lawful point of discharge requirements.

During construction, appropriate erosion and sediment control measures will be implemented in accordance with best-practice guidelines to prevent sediment transport from the site. Temporary measures may include sediment fences, stabilised construction access, and progressive surface stabilisation, as required for the duration of construction activities.

3 Conclusion and recommendations

3.1 Conclusion

This report has assessed the stormwater management requirements for the proposed development at 107 Lytton Road, Bulimba, QLD 4171.

A detailed catchment analysis was undertaken to quantify pre-development and post-development drainage conditions for the site. Peak stormwater runoff was estimated using the Rational Method, in accordance with Australian Rainfall and Runoff (ARR 2019) and the Queensland Urban Drainage Manual (QUDM). The assessment

considered the increase in impervious surfaces associated with the proposed subdivision of the site into two residential lots.

The proposed stormwater management strategy incorporates a combination of surface drainage and underground stormwater conveyance designed to manage runoff generated by the development. Surface runoff is collected and conveyed via a grassed swale, which has been designed for minor storm events up to the 10-year ARI. The swale discharges into an underground stormwater pipe system, which conveys flows to the lawful point of discharge at Lytton Road via kerb adaptors.

The proposed drainage system maintains the existing natural drainage direction and overland flow paths toward the northern boundary of the site and ultimately to the public stormwater drainage network. During storm events exceeding the capacity of the minor drainage system, surcharge and overland flow will occur in a controlled manner consistent with the site's natural topography, without adverse impacts to buildings or adjoining properties.

Based on the assessment undertaken, the proposed stormwater management system is considered adequate to safely collect, convey, and discharge stormwater runoff generated by the development and to manage the increase in impervious area associated with the subdivision.

Overall, the proposed stormwater management approach is considered consistent with the intent and requirements of QUDM, ARR 2019, AS/NZS 3500.3, and the relevant Brisbane City Council planning and engineering standards for residential development.

3.2 Recommendation

The following recommendations are provided to ensure the effective implementation, performance, and operation of the proposed stormwater management system:

- The proposed stormwater infrastructure should be constructed in accordance with the civil design drawings and Stormwater Management Plan.
- The proposed grassed swale is to be formed to the specified alignment and grades, stabilised with appropriate vegetation, and maintained in good condition to ensure effective conveyance of surface runoff for minor storm events up to the 10-year ARI and to minimise erosion.
- The underground stormwater pipe system, including Ø150 mm stormwater pipes and grated pits, is to be installed at the nominated grades to ensure adequate drainage performance and connection to the lawful point of discharge.
- Site grading is to be undertaken such that stormwater runoff is directed away from building footprints and toward the designated swale and stormwater collection points, maintaining the site's natural drainage patterns.
- Once the detailed building design and final roof footprint are confirmed, the stormwater drainage system is to be reviewed and, if necessary, redesigned to incorporate the roof water drainage system, including roof catchment areas, gutters, downpipes, and any required detention or flow control measures, in accordance with AS/NZS 3500.3, QUDM, and ARR 2019.
- Overland flow paths for events exceeding the minor drainage capacity are to be preserved to ensure that surcharge and overflow are conveyed safely across the site without adverse impacts to buildings, adjoining properties, or downstream infrastructure.
- Discharge to Lytton Road via kerb adaptors at the northern boundary is to be constructed in accordance with Brisbane City Council requirements, ensuring flows are safely conveyed to the existing public stormwater drainage system.
- During construction, appropriate erosion and sediment control measures are to be implemented in accordance with best-practice guidelines to prevent sediment export from the site. Measures may include sediment fences, stabilised site access points, and progressive stabilisation of disturbed areas.

Implementation of the above measures will ensure that stormwater runoff generated by the proposed development is safely collected, conveyed, and discharged, while minimising potential impacts on surrounding properties and downstream drainage networks.

Appendix A – Hydrologic Calculations

Pre-Development Hydrology (Rational Method)

Job No. : D205
 Project Name : Stormwater Quantity Analysis
 Location : 107 Lytton Road, Bulimba, QLD 4171
 Council : Brisbane City Council
 Date : 29 May, 2026



1. Existing Catchment Parameters

The time of concentration (t_c) was determined as per AS3500.3 Section 5.4.4

Catchment Classification: **Urban** (limits C_y to 1 for Urban catchments as per QUDM 4.5)

Pre-Development Catchment	Subcatchments			Overall Catchment	
	Pervious(Lots Area)	Impervious - Roof	Impervious - Other	Impervious	Pervious
Area (sqm)	490.35	128.04	17.61	145.65	490.35
Area (ha)	0.0490	0.0128	0.0018	0.0146	0.0490
Time of concentration, t_c (min)	10	5	5	10	5
Fraction impervious, f_i	0.00	1.00	1.00		-
t_{10}			64.8		
C_{10}		0.90	0.90		0.75
Land Classification (if $f_i = 0$)	Light Cover Bushland - Low				
C_{10} (when $f_i = 0$)	0.70				
				Total Area	636.00

2. Pre-Development Discharge Calculations

Catchment runoff rates were derived using the Rational Method in accordance with QUDM Section 4.3.

$$Q_y = \frac{C_y \cdot t_y \cdot A}{360}$$

Using the data above, pre-developed discharge rates were summarised in the table below.

ROOF AND IMPERVIOUS CATCHMENTS: Q100

$T_c = 5.00$ mins

EY	AEP (%)	AEP (1 in x)	ARI	F_y	C_y	t_y	Pre-Dev't Discharge	
						mm/hr	m^3/s	L/s
1	63.21	1.58	1	0.80	0.5966415	113.00	0.0027	2.73
0.5	39.35	2.54	2	0.85	0.6339316	141.60	0.0036	3.63
0.2	18.13	5.52	5	0.95	0.7085118	177.60	0.0051	5.09
0.11	10	10	9.49	1.00	0.7458019	206.40	0.0062	6.23
0.05	5	20	19.5	1.05	0.7830920	236.40	0.0075	7.49
0.02	2	50	50	1.15	0.8576722	277.20	0.0096	9.62
0.01	1	100	100	1.20	0.8949623	307.20	0.0111	11.12

PERVIOUS CATCHMENTS: Q100

$T_c = 10.00$ mins

EY	AEP (%)	AEP (1 in x)	ARI	F_y	C_y	t_y	Pre-Dev't Discharge	
						mm/hr	m^3/s	L/s
1	63.21	1.58	1	0.80	0.5966415	93.00	0.0076	7.56
0.5	39.35	2.54	2	0.85	0.6339316	117.00	0.0101	10.10
0.2	18.13	5.52	5	0.95	0.7085118	145.80	0.0141	14.07
0.11	10	10	9.49	1.00	0.7458019	168.00	0.0171	17.07
0.05	5	20	19.5	1.05	0.7830920	192.60	0.0205	20.54
0.02	2	50	50	1.15	0.8576722	223.80	0.0261	26.14
0.01	1	100	100	1.20	0.8949623	247.80	0.0302	30.21

Q10	23.29
Q20	28.03
Q100	41.33
Combined	41.33

Post-Development Hydrology (Rational Method)

Job No. : D205
 Project Name : Stormwater Quantity Analysis
 Location : 107 Lytton Road, Bulimba, QLD 4171
 Council : Brisbane City Council
 Date : 29 May, 2026



1. Post-Development Catchment Parameters

The time of concentration (t_c) was determined as per AS3500.3 Section 5.4.4

Catchment Classification: **Urban** (limits C_y to 1 for Urban catchments as per QUDM 4.5)

Pre-Development Catchment	Subcatchments			Overall Catchment	
	Pervious(Lots Area)	Impervious - Roof	Impervious - Other	Impervious Catchments	Pervious catchment
Area (sqm)	293.77	270.00	72.23	342.23	293.77
Area (ha)	0.0294	0.0270	0.0072	0.0342	0.0294
Time of concentration, t_c (min)	10	5	5	15	5
Fraction impervious, f_i	0.00	1.00	1.00	-	
t_{10}	64.8				
C_{10}	0.00	0.90	0.90	0.81	
Land Classification (if $f_i = 0$)	Light Cover Bushland - Low				
C_{10} (when $f_i = 0$)	0.70	N/A	N/A		
				Total area (sq m)	636.00

2. Post-Development Discharge Calculations

Catchment runoff rates were derived using the Rational Method in accordance with QUDM Section 4.3.

$$Q_y = \frac{C_y \cdot I_y \cdot A}{360}$$

Using the data above, pre-developed discharge rates were summarised in the table below.

ROOF AND IMPERVIOUS CATCHMENTS: Q100

$T_c = 5.00$ mins

EY	AEP (%)	AEP (1 in x)	ARI	F_y	C_y	t_{10}		
						mm/hr	m^3/s	L/s
1	63.21	1.58	1	0.80	0.646096	113.00	0.0069	6.94
0.5	39.35	2.54	2	0.85	0.686477	141.60	0.0092	9.24
0.2	18.13	5.52	5	0.95	0.767239	177.60	0.0130	12.95
0.11	10	10	9.49	1.00	0.807619	206.40	0.0158	15.85
0.05	5	20	19.5	1.05	0.848000	236.40	0.0191	19.06
0.02	2	50	50	1.15	0.928762	277.20	0.0245	24.47
0.01	1	100	100	1.20	0.969143	307.20	0.0283	28.30

PERVIOUS CATCHMENTS: Q100

$T_c = 10.00$ mins

EY	AEP (%)	AEP (1 in x)	ARI	F_y	C_y	t_{10}		
						mm/hr	m^3/s	L/s
1	63.21	1.58	1	0.80	0.646096	93.00	0.0049	4.90
0.5	39.35	2.54	2	0.85	0.686477	117.00	0.0066	6.55
0.2	18.13	5.52	5	0.95	0.767239	145.80	0.0091	9.13
0.11	10	10	9.49	1.00	0.807619	168.00	0.0111	11.07
0.05	5	20	19.5	1.05	0.848000	192.60	0.0133	13.33
0.02	2	50	50	1.15	0.928762	223.80	0.0170	16.96
0.01	1	100	100	1.20	0.969143	247.80	0.0196	19.60

Q10	26.92
Q20	32.38
Q100	47.90
Combined	47.90

Appendix B – Rainfall Intensity Data

IFD Design Rainfall Depth (mm)

Issued: 28-Apr-26

Location Label:

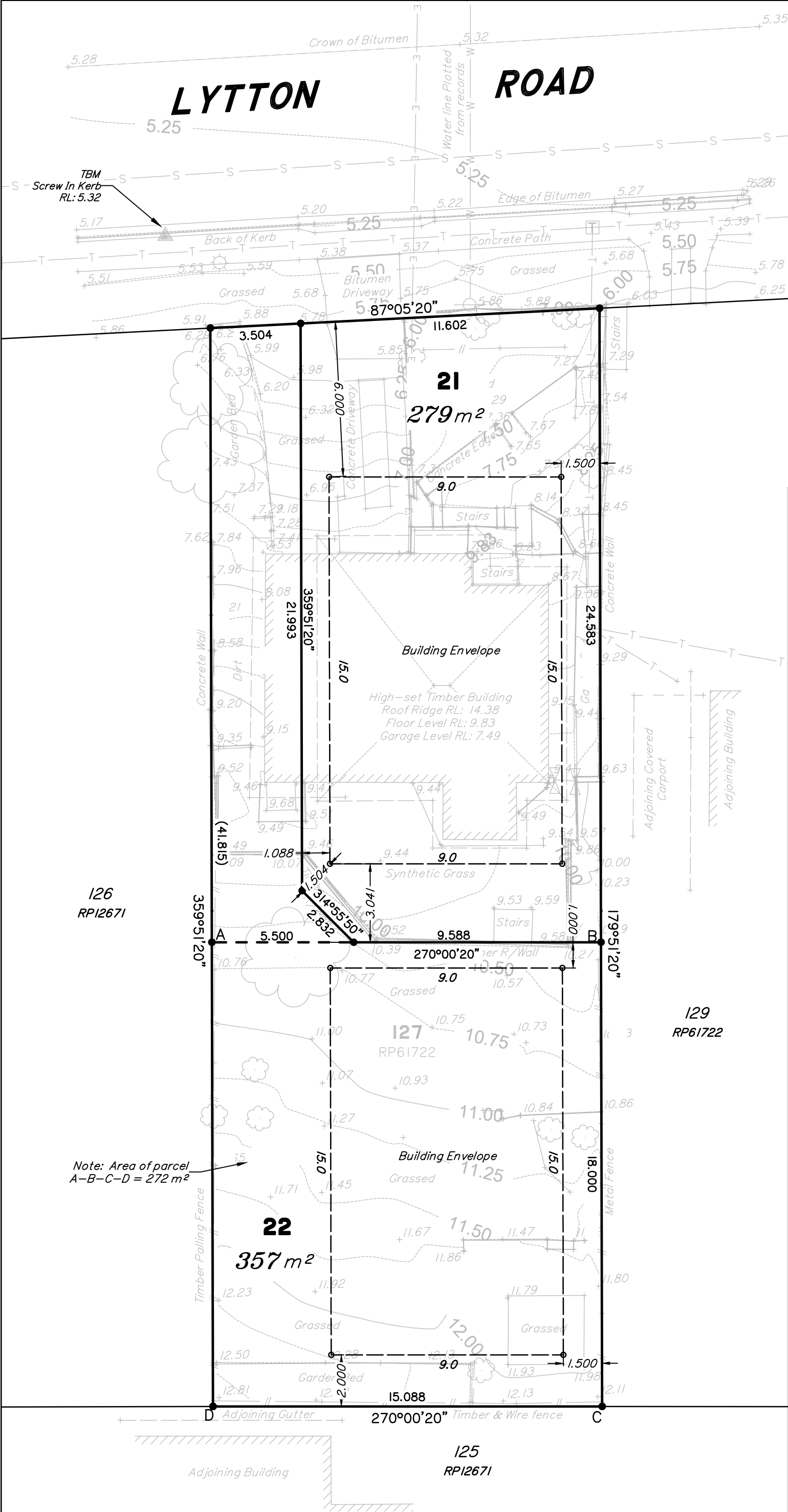
Requested Latitude -27.4503 Longitude 153.0674

Nearest gri Latitude 27.4625 (S) Longitude 153.0625 (E)

Duration	Duration in	Annual Exceedance Probability (AEP)						
		63.20%	50%	20%	10%	5%	2%	1%
1 min	1	2.65	2.99	4.07	4.8	5.5	6.43	7.13
2 min	2	4.39	4.97	6.83	8.11	9.37	11.1	12.4
3 min	3	6.18	7	9.59	11.4	13.1	15.4	17.2
4 min	4	7.87	8.91	12.2	14.4	16.6	19.4	21.6
5 min	5	9.42	10.7	14.5	17.2	19.7	23.1	25.6
10 min	10	15.5	17.5	23.8	28	32.1	37.3	41.3
15 min	15	19.7	22.3	30.3	35.6	40.8	47.5	52.5
20 min	20	22.9	25.9	35.2	41.4	47.4	55.3	61.2
25 min	25	25.4	28.7	39.1	46	52.8	61.6	68.3
30 min	30	27.4	31	42.3	49.9	57.2	66.9	74.2
45 min	45	32	36.2	49.5	58.5	67.3	79.1	88.1
1 hour	60	35.2	39.9	54.7	64.8	74.8	88.1	98.4
1.5 hour	90	40	45.3	62.3	74	85.8	102	114
2 hour	120	43.6	49.4	68	81.1	94.2	112	126
3 hour	180	49.2	55.7	77.1	92.2	107	128	145
4.5 hour	270	55.7	63.2	87.7	105	123	148	168
6 hour	360	61	69.3	96.6	116	136	164	187
9 hour	540	69.8	79.6	112	135	159	192	219
12 hour	720	77.1	88.1	124	151	178	216	247
18 hour	1080	89	102	146	178	210	257	294
24 hour	1440	98.4	114	164	200	238	291	334
30 hour	1800	106	123	179	219	261	320	369
36 hour	2160	113	131	191	236	281	346	400
48 hour	2880	124	144	213	263	315	389	451
72 hour	4320	138	162	242	300	361	450	522
96 hour	5760	148	173	260	323	390	486	566
120 hour	7200	154	181	270	336	406	506	591
144 hour	8640	158	185	276	343	414	515	602
168 hour	10080	161	188	278	345	415	516	604

Appendix C – Survey and Proposed Plan

LYTTON ROAD



Note: Area of parcel A-B-C-D = 272 m²

East Coast Surveys (Aust)
 Pty Ltd. ACN 111 434 005
Cadastral Surveyors Town Planners & Subdivision Consultants



Ph: (07) 3823 1029
 info@eastcoastsurveys.com.au
 7B Natasha Street, Capalaba, QLD 4157
 P.O Box 168, Capalaba, QLD 4157

The areas and dimensions on this plan are approximate only and are subject to Local Government Approval and final survey.

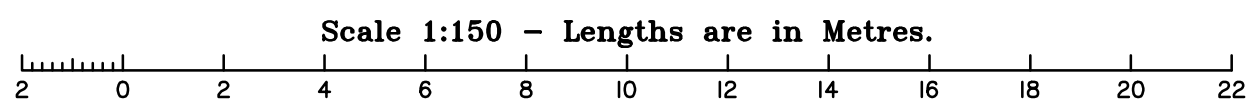
Subdivision Proposal Plan
Lot 127 on RP61722
 107 Lytton Road
 Bulimba
Local Authority Brisbane City C.
Meridian RP61722
Level Datum AHD Der
RL 7.425 OPM 15237
Contour Intervals 0.25m

Client: Chris Metcalf
 Surveyed By J.G. Drawn By J.G.
 Date 28/04/2026 Date 01/05/2026
 Checked By A.S. Authorized By A.S.
 Date 05/05/2026 Date 05/05/2026

Rev	Notes	Date	Initials
A-1-A	Original Issue	05/05/26	J.G.
A-1-B	Lot Reconfiguration	06/05/26	JG
A-1-C	Lot Reconfiguration & Add building envelope	08/05/26	JG

Plan of Proposed lots 21 & 22
Cancelling Lot 127 on RP61722

Our Ref. 11502 ROL **Rev A-1-C**
Original Size A3
Scale 1: 150 **Sheet 1 of 1**



Appendix D – Concept Civil Design Drawings



J.C. Engineers Pty. Ltd.
 ABN: 32 616 356 908

Website: www.jcengineers.com.au
 Email: info@jcengineers.com.au

Project

CONCEPT STORMWATER MANAGEMENT PLAN

107 LYTTON ROAD, BULIMBA, QLD 4171

JOB NO.
D205

CLIENT
CHRIS METCALF

PROJECT DESIGNER
J.C. ENGINEERS

- REFERENCES:
- BRISBANE CITY COUNCIL STANDARD DRAWINGS
 - BRISBANE CITY PLAN 2014
 - BCC REFERENCE SPECIFICATIONS FOR ENGINEERING WORK-S160 DRAINAGE
 - AUSTRALIAN STANDARD 3500.1-2025-"PLUMBING AND DRAINAGE - WATER SERVICES"
 - AUSTRALIAN STANDARD 3500.2-2025-"PLUMBING AND DRAINAGE - SANITARY PLUMBING AND DRAINAGE"
 - AUSTRALIAN STANDARD 3500.3-2025-"PLUMBING AND DRAINAGE - STORMWATER DRAINAGE"
 - AUSTRALIAN STANDARD 3996-2019-"ACCESS COVERS AND GRATES"
 - QUDM - QUEENSLAND URBAN DRAINAGE MANUAL



DRAWING LIST			
SHEET	NAME	ISSUE DATE	REV
C0001	TITLE SHEET	29/05/2026	B
C0002	GENERAL NOTES	29/05/2026	B
C0003	SAFETY IN DESIGN	29/05/2026	B
C0004	EXISTING SITE PLAN	29/05/2026	B
C0005	PROPOSED SITE PLAN	29/05/2026	B
C0006	CATCHMENT AREAS	29/05/2026	B
C0007	STORMWATER MANAGEMENT PLAN AND DETAIL	29/05/2026	B



LOCALITY PLAN
N.T.S.

GENERAL:

- ALL CONSTRUCTION MATERIALS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITIES STANDARD DRAWINGS & SPECIFICATIONS AND COMPLETED TO THE SATISFACTION OF THE SUPERINTENDENT AND LOCAL AUTHORITY.
- UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
- THE LOCATION AND LEVEL OF ALL EXISTING SERVICES SHALL BE VERIFIED BEFORE CONSTRUCTION COMMENCES AND NOTWITHSTANDING THE INFORMATION SHOWN ON THE DRAWINGS, THE DESIGN OF CONSTRUCTION MAY BE ALTERED TO SUIT BY THE SUPERINTENDENT.
- ALL CONNECTIONS TO EXISTING SEWERS AND WATER MAINS ARE TO BE CONSTRUCTED BY THE LOCAL AUTHORITIES OR AN APPROVED CONTRACTOR. THE CONTRACTOR IS TO ALLOW IN HIS CONTRACT SUM FOR THE COST OF ANY PROPOSED CONNECTIONS.
- ALL SEWERS ARE TO BE 150mm DIA. UPVC CLASS SN8 RUBBER RING JOINTED AND PROPERTY CONNECTIONS ARE TO BE 100mm DIA. UPVC CLASS SN6 UNLESS NOTED OTHERWISE.
- THE PAVEMENT DEPTHS SHOWN ARE PRELIMINARY ONLY AND ARE TO BE VERIFIED FOLLOWING SUB-SOIL TESTS OF THE SUB-GRADE MATERIAL.
- ALL ROOFWATER CONNECTIONS FROM KERB ADAPTERS ARE TO BE 100mm DIA. CLASS SN8 AT A MIN GRADE OF 1.0% UNLESS SHOWN OTHERWISE. ROOFWATER CONNECTIONS FROM FIELD INLETS OR GULLY PITS ARE TO BE 150mm DIA. CLASS SN6 AT A MIN GRADE OF 1.0% UNLESS OTHERWISE NOTED.
- ALL UPVC STORMWATER DRAINAGE PIPES ARE TO BE SEWER CLASS SN8 AND ALL R.C. AND F.R.C. PIPES ARE TO BE CLASS 2 RUBBER RING JOINTED UP TO AND INCLUDING 600mm DIA. . PIPES OVER 600mm DIA. ARE TO BE CLASS 2 AND ARE TO HAVE AN EXTERNAL RUBBER BAND JOINT GROUTED INTERNALLY.
- WATER PIPES SHALL BE:
 - PVC-M WATER PIPES ARE TO BE SERIES 2 PN16 SN10 R.R.J.
 - D.I.C.L. WATER PIPES ARE TO BE PN35 WITH ALL FITTINGS TO BE FUSION BONDED POLYMERIC COATED.
 - PE WATER PIPES ARE TO BE PN16 SDR11 PE100. DN25 AND DN35 WATER SERVICES SHALL BE PE80B.
- ALL "AS CONSTRUCTED" INFORMATION IS TO BE RECORDED AS REQUIRED BY THE LOCAL AUTHORITY AND SUBMITTED TO THE SUPERINTENDENT IMMEDIATELY AFTER COMPLETION OF THE WORKS.
- ALL ALLOTMENTS ARE TO BE GRADED AT A MINIMUM GRADE OF 1 IN 150

ROOFWATER DRAINAGE:

- ALL LEVELS TO AHD. DIMENSIONS IN METRES UNO.
- ALL LIAISON WITH LOCAL, STATE AND STATUTORY AUTHORITIES IS THE CONTRACTORS RESPONSIBILITY.
- WORKS NOT SPECIFICALLY REFERRED TO, ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE LOCAL AUTHORITY.
- THE LOCATION OF EXISTING SERVICES IS FOR THE CONTRACTORS INFORMATION ONLY.
- THE LOCATION OF SERVICES WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
- ALL ROOFWATER DRAINAGE PIPES TO BE UPVC CLASS SN8 WITH RUBBER RING JOINTS. ROOFWATER PIPES TO BE LOCATED 500mm FROM BOUNDARY, AND MINIMUM COVER TO BE 500mm (UNLESS SHOWN OTHERWISE).
- KERB ADAPTORS TO BE PROVIDED IN KERB & CHANNEL AT LOW SIDE OF PROPERTIES WHICH DRAIN TO ROADWAY IN ACC WITH IPWEA STD DRG R-0081.
- ROOFWATER INSPECTION PITS AS PER IPWEA STD DWG NO. D-0110 REV A, AND OF THE FOLLOWING DIAMETERS:

DEPTH TO INVERT UP TO 750mm MAX	-600mm DIA. MIN.
DEPTH TO INVERT 750mm TO 1000mm	-750 DIA.
DEPTH TO INVERT GREATER THAN 1000mm	-1050 DIA.
- PIT FINISHED SURFACE LEVELS SHOWN ARE INDICATIVE ONLY-ALL PIT TOPS SHALL BE COMPLETED AFTER FINAL TRIMMING OF SURROUNDING EARTHWORKS AND SHALL BE 25 - 50mm ABOVE FINISHED SURFACE LEVEL.
- ROOFWATER PITS TO BE 500mm FROM SIDE, FRONT OR REAR BOUNDARIES UNLESS SHOWN OTHERWISE.
- ALL ROOFWATER HOUSE CONNECTIONS TO BE 100mm uPVC CLASS SN10 WITH AN I.O. AND CAP.
- ENSURE ROOFWATER PIPE IS EXTENDED UNDER FOOTPATH TO KERB ADAPTOR.

STORMWATER DRAINAGE:

- ALL LEVELS TO AHD. DIMENSIONS IN METRES UNO.
- ALL LIAISON WITH LOCAL, STATE & STATUTORY AUTHORITIES IS THE CONTRACTOR'S RESPONSIBILITY.
- WORKS NOT SPECIFICALLY REFERRED TO, ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD DRAWINGS AND SPECIFICATIONS OF THE LOCAL AUTHORITY.
- THE LOCATION OF EXISTING SERVICES IS FOR THE CONTRACTORS INFORMATION ONLY.
- THE LOCATION OF SERVICES WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
- PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR WILL PROVIDE SEDIMENT AND EROSION PROTECTION INCLUDING PROVISION OF SILT TRAPS AND FENCES TO MINIMISE DEPOSITION OF MATERIAL DOWNSTREAM OF THE PROPERTY.
- AT COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL ARRANGE FOR AN INDEPENDENT LICENSED SURVEYOR TO CARRY OUT A "WORKS AS CONSTRUCTED" SURVEY AND SUBMIT THE DETAIL PLAN TO THE SUPERINTENDENT.
- ANY DAMAGE CAUSED TO THE EXISTING SERVICES WILL BE MADE GOOD AT THE CONTRACTORS EXPENSE.
- THE LOCATION OF TEMPORARY DRAINS, DAMS AND SUMPS ARE TO BE AGREED WITH THE SUPERINTENDENT.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY DRAINAGE DURING CONSTRUCTION OF BULK EARTHWORKS.
- THE SITE IS TO BE LEFT NEAT AND TIDY AT THE COMPLETION OF THE WORKS, ALL RUBBISH AND DEBRIS SHALL BE REMOVED AND DISPOSED OF TO THE LOCAL AUTHORITY REQUIREMENTS AND SATISFACTION.
- CONSTRUCTION WORK UNDERTAKEN BY THE CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE WORKPLACE, HEALTH AND SAFETY ACT AND IN PARTICULAR PART 13 OF THE WORKPLACE, HEALTH AND SAFETY REGULATIONS - EXCAVATIONS, TRENCHES, CAISSONS, COFFERDAMS AND TUNNELS (REGULATIONS 125 TO 131 INCLUSIVE).
- ALL STORMWATER DRAINAGE PIPES SHALL BE RUBBER RING JOINTED CLASS "2" REINFORCED CONCRETE (RCP) PIPES U.N.O. (FRC PIPES SHALL NOT BE USED).
- ALL TRENCHES UNDER THE ROAD SHALL BE BACKFILLED IN LAYERS NOT EXCEEDING 150mm COMPACTED THICKNESS. COMPACT TO NOT LESS THAN 95% MAXIMUM DRY DENSITY BY MODIFIED COMPACTION TEST (AS 1289). ELSEWHERE 95% MAXIMUM DRY DENSITY STANDARD COMPACTION TEST.
- ALL STORMWATER MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH I.P.W.E.A. STANDARD DETAILS 01050 TO 01500 DRG. NO. DS-010 TO DS-021.
- ALL STORMWATER DRAINAGE GULLIES SHALL BE 'KERB INLET - LIP IN LINE' ACCORDANCE WITH I.P.W.E.A. STANDARD DRAWING No. DS-061 TO DS-063.
- ALL STORMWATER DRAINAGE FIELD INLETS SHALL BE IN ACCORDANCE WITH I.P.W.E.A. STD DRG DS-050.
- ALL INLETS AND OUTLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH T.M.R. STANDARD DRAWING No. 1243 & 1304.
- ROOFWATER KERB ADAPTORS AND 100 x 75 RHS (GALV.) DRAIN LINE TO BE INSTALLED IN ACCORDANCE WITH I.P.W.E.A. STD DRG RS-081 IN LOCATIONS ADJACENT TO PATHWAYS THE RHS PIPELINE SHALL EXTEND FROM THE KERB ADAPTOR UNDER THE PATHWAY TO PROPERTY BOUNDARY.
- EXCAVATION BEDDING AND BACKFILL SHALL BE COMPLETED IN ACCORDANCE L.C.C. STD DRG RS-170.
- ALL CHAMBERS AND MANHOLES ARE TO BE CAST INSITU. ONLY MANHOLE LIDS AND GULLY LINTELS PERMITTED TO BE PRECAST.

B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN
REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED



Scale

COPYRIGHT AND REPRODUCTION
 This document is Confidential and remains the property of J.C. Engineers Pty. Ltd. Accordingly, copies of this document must not be distributed to third parties without their prior written consent. A third party receiving a copy of this document should not place any reliance upon it and J.C. Engineers Pty. Ltd. disclaims all responsibility and liability to such party. This document may not be altered mimicked or reproduced without written approval from J.C. Engineers Pty. Ltd.

Client		CHRIS METCALF			
Project Address		107 LYTTON ROAD, BULIMBA, QLD 4171			
Drawn		ENGINEERING CERTIFICATION			
Eng. Area	Name	Signature	No.	Date	
CIVIL	BRENDAN NIELSEN	<i>Brendan Nielsen</i>	18317	29/05/2026	
Designated					
JR					

Project Details

CONCEPT STORMWATER MANAGEMENT PLAN

GENERAL NOTES

Job No.	D205
Sheet	SHEET 2 OF 7
Drawing No.	D205_C_C0002
REV	B

SAFETY IN DESIGN
THIS DESIGN IS IN ACCORDANCE WITH THE CURRENT SAFE WORK AUSTRALIA ACT, REGULATIONS, PRIORITY CODES OF PRACTICE STATE BY STATE SAFETY IN DESIGN.

SD1. A RISK MANAGEMENT PROCESS HAS BEEN APPLIED.
THIS RISK MANAGEMENT PROCESS IS A SYSTEMATIC WAY OF MAKING THE WORKPLACE AS SAFE AS REASONABLY POSSIBLE. IT SHALL BE USED AS PART OF THE DESIGN PROCESS WHICH INVOLVES THE FOLLOWING 5 STEPS

1. IDENTIFY THE LIKELIHOOD OF ANY HAZARD OR RISK ASSOCIATED WITH THE STRUCTURE OCCURRING.
2. ASSESS THE DEGREE OF HARM THAT MIGHT RESULT FROM THE HAZARD AND / OR RISK
3. GATHER KNOWLEDGE ABOUT THE HAZARD AND / OR RISK
4. IDENTIFY THE AVAILABILITY AND SUITABILITY OF WAYS TO ELIMINATE OR MINIMISE THE RISK BY DESIGNING CONTROL MEASURES.
5. REVIEW THE CONTROL MEASURES AND THE COST ASSOCIATED WITH ELIMINATING OR MINIMISING THE RISK, INCLUDING WHETHER THE COST IS GROSSLY DISPROPORTIONATE TO THE RISK.

THE ARCHITECT AND THE CLIENT ARE TO ADVISE J.C. ENGINEERS CONSULTING OF ANY KNOWLEDGE OF POTENTIAL HAZARDS IDENTIFIED THAT MAY AFFECT THE DESIGN. CONSIDERATION HAS BEEN GIVEN TO:

- THE INTENDED PURPOSE OF THIS STRUCTURE.
- THE DESIGN OF THIS STRUCTURE.
- MATERIALS TO BE USED.
- POSSIBLE METHOD OF CONSTRUCTION, MAINTENANCE, OPERATION, DEMOLITION OR DISMANTLING AND DISPOSAL.
- WHAT LEGISLATION, CODES OF PRACTICE AND STANDARDS NEED TO BE CONSIDERED AND COMPLIED WITH.
- MATTERS OF WORKPLACE HEALTH AND SAFETY IMPACTED BY THIS DESIGN SHALL CONFORM TO CURRENT SAFE WORK AUSTRALIA SAFE DESIGN OF STRUCTURES
- THE CONTRACTOR SHOULD ENSURE THAT ALL PROFESSIONAL DESIGN SERVICES ENGAGED FOR THIS CONTRACT SHALL COMPLY WITH SAFE WORK AUSTRALIA.

THIS STRUCTURE HAS BEEN DESIGNED TO ELIMINATE HAZARDS TO HEALTH AND SAFETY WHEREVER POSSIBLE. WHERE THIS HAS NOT BEEN POSSIBLE, THE RISK TO HEALTH AND SAFETY OF PERSONS HAS BEEN MINIMISED TO BE REASONABLY PRACTICABLE FOR THE DESIGNED LIFE OF THE PROJECT.

SD2. WORK HEALTH AND SAFETY.
THE CONTRACTOR SHALL ENSURE THE CONSTRUCTION OF THIS PROJECT IS CARRIED OUT UNDER WORK HEALTH AND SAFETY COORDINATION PLAN AND ANY OTHER APPLICABLE "SAFETY IN THE WORKPLACE LEGISLATION" COMPLIANT WITH AUSTRALIAN REQUIREMENTS STATE BY STATE IN WHICH THE WORK IS CARRIED OUT.

SD3. IDENTIFY HAZARDS.
THE CONTRACTOR SHALL MAKE EVERY EFFORT TO ENSURE ALL PERSONS WHO MAY ENTER THE CONSTRUCTION SITE WHICH INCLUDES WORKERS AND NON WORKERS ALIKE, ARE MADE AWARE OF THE RISK OF HAZARDS AND POTENTIAL HAZARDS WHICH MAY INCLUDE, BUT ARE NOT LIMITED TO IN GROUND HOLES OR OBSTACLES, TEMPORARY CONSTRUCTION WORKS AND OVERHEAD ACTIVITIES, NOISE AND WELDING FLASHES. ANY SUCH HAZARD SHALL BE ISOLATED AND CLEARLY IDENTIFIED WITH HIGH VISIBILITY OFFICIAL SIGNAGE AND HIGH VISIBILITY BARRICADES. THE CORRECT LEVEL OF TRAINING SHALL BE MANDATORY BEFORE ANY PERSON ENTERS THE CONSTRUCTION AREA. ALL PERSON SHALL WEAR THE APPROPRIATE SAFETY PROTECTION APPAREL SUPPLIED BY THE CONTRACTOR BEFORE ENTERING THE SITE. A QUALIFIED GUIDE SHALL ACCOMPANY ALL NEW CONSTRUCTION WORKERS DURING THEIR INITIATION AND ALL SITE VISITORS WHILE ON SITE.

SD4. EXISTING SERVICES
THIS DESIGN HAS TAKEN INTO ACCOUNT EXISTING SERVICES AS IDENTIFIED ON DRAWINGS SUPPLIED. THE SUB-CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS WHEN WORKING WITH EXISTING SERVICES AND INSTALLING NEW SERVICES. THIS INCLUDES PERSONAL SAFETY AND THE SAFETY OF OTHERS. THESE WORKS SHALL INCLUDE, BUT ARE NOT LIMITED TO

- WORKING WITH EXISTING SERVICES.
- WORKING IN AREAS OF HIGH VOLTAGE ELECTRICAL CABLES.
- WORKING WITH MACHINERY IN AREAS OF HIGH VOLTAGE CABLES: USING MOBILE CRANES, TOWER CRANES ETC.
- WORKING IN AREAS OF UNDERGROUND SERVICES INCLUDING: SEWER, WATER, FIRE, GAS AND ELECTRICAL CABLES.
- DEEP EXCAVATIONS, UNSTABLE GROUND AND ROCK EXCAVATIONS AND TENSIONING SYSTEMS.
- HIGH PRESSURE GAS.
- TOXIC WASTE.
- CONTAMINATED SOIL.
- DEMOLITION WORKS WHERE SERVICES ARE EXPOSED.
- POWER CABLES AND OVERHEAD CABLES.
- ASBESTOS OR ANY FIBROUS MATERIALS.
- FIRE HYDRANTS ETC.
- WORKING OVER / UNDER THOROUGHFARES-TRAFFIC AND / OR PEDESTRIAN.

SD5. BEFORE YOU DIG AUSTRALIA.
THE CONTRACTOR SHALL ENSURE THE SUB-CONTRACTOR OBTAINS "BEFORE YOU DIG AUSTRALIA" INFORMATION AND IDENTIFIES AREAS OF EXISTING UNDERGROUND SERVICES PRIOR TO EXCAVATION.

SD6. PRIOR TO EXCAVATION.
PRIOR TO COMMENCING ANY EXCAVATION WORKS ON SITE, THE CONTRACTOR IS TO IDENTIFY AND LOCATE ANY IN GROUND SERVICES VIA AN ULTRASONIC UNDERGROUND SURVEY. ENSURE AREAS OF HIGH RISK HAVE BEEN IDENTIFIED ON THE DRAWINGS AND ARE CLEARLY MARKED WITH AN APPROPRIATE DANGER SYMBOL EXAMPLES AS FOLLOWS DEEP EXCAVATION, HIGH VOLTAGE, UNDERGROUND SERVICES, CONTAMINATED SOIL, ETC.

SD7. STABILITY OF THE STRUCTURE.
TEMPORARY MEASURES WILL NEED TO BE TAKEN DURING CONSTRUCTION AND DEMOLITION TO ENSURE THE STABILITY OF THE STRUCTURE IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR'S ERECTION DESIGN ENGINEER TO TAKE ALL MEASURES NECESSARY TO MAINTAIN STRUCTURAL INTEGRITY DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION. ATTENTION IS DRAWN TO THE NEED TO PROVIDE TEMPORARY SUPPORT TO BUT NOT LIMITED TO

- SOIL AND ROCK EXCAVATION.
- FORMWORK TO FACILITATE CONCRETE PLACEMENT.
- STRUCTURAL STEEL FRAMEWORK.
- BRICK OR CONCRETE BLOCKWORK.
- PRECAST CONCRETE ELEMENTS.
- TIMBER FRAMEWORK.
- STATIC OR OPERATING PLANT AND EQUIPMENT.
- STORED MATERIALS.

SD8. SPECIALIST CONTRACTOR.
ACTIVITIES REQUIRED TO BE CARRIED OUT DURING THE CONSTRUCTION WHICH ARE NOT CONSIDERED TO BE NORMAL BUILDING PRACTICE AND THEREFORE MAY REQUIRE ENGAGEMENT OF A SPECIALIST CONTRACTOR, INCLUDE BUT ARE NOT LIMITED TO.

SD9. BUILDING CODE REQUIREMENT.
THE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE DESIGN INTENT OF THE BUILDING CODE OF AUSTRALIA AS APPLIED STATE BY STATE.

SD10. BUILDING OPERATION AND MAINTENANCE.
MUST BE CARRIED OUT IN ACCORDANCE WITH THE DESIGN INTENT OF THE BUILDING CODE OF AUSTRALIA AS APPLIED STATE BY STATE. OPERATION, CLEANING AND MAINTENANCE OF THE BUILDING MAY REQUIRE, BUT NOT LIMITED TO ITEMS INVOLVING

- ACCESS USING WORK PLATFORMS, STEPS, FALL ARREST SYSTEMS & LADDERS.
- WORKING AT HEIGHT.
- INCLUSION OF BMU IN ROOF LAYOUT
- USE OF HAZARDOUS MATERIAL / CHEMICALS.
- LIFTING OF MATERIALS.
- ACCESS AND WORKING IN CONFINED SPACES.
- SUFFICIENT WORK SPACE.
- OPERATION AND MAINTENANCE MANUALS.
- USE OF HEAVY EQUIPMENT.
- WORKING ON SMOOTH / SLIPPERY SURFACES.
- WORKING ADJACENT TO VEHICULAR / FORKLIFT TRAFFIC.
- WORKING NEAR TRAFFIC OR MOVING FREIGHT CARRIERS.

SD11. DESIGN OUT RISK.
METHODS USED TO DESIGN OUT OCCUPATIONAL RISKS RELATED TO THE CONSTRUCTION, OCCUPATION OR DEMOLITION OF THIS STRUCTURE INCLUDES:

- OFF-SITE PREFABRICATION OF CONSTRUCTION ELEMENTS.
- USE OF BOLTED STEEL SITE CONNECTIONS TO AVOID ON-SITE WELDING.

SD12. DECONSTRUCTION.
AT THE END OF THE LIFE OF THIS STRUCTURE, ENGAGE SUITABLY QUALIFIED DEMOLITION ENGINEERS TO ASSIST WITH ITS DECONSTRUCTION.

LIKELIHOOD DESCRIPTION
ALMOST CERTAIN - VERY LIKELY. THE EVENT IS EXPECTED TO OCCUR IN MOST CIRCUMSTANCES OR OCCURS DAILY.
LIKELY - THERE IS A STRONG PROBABILITY THAT AN EVENT WILL OCCUR. CAN OCCUR ONCE EVERY WEEK.
POSSIBLE - THE EVENT MIGHT POSSIBLY OCCUR AT SOME TIME. OCCURS ONCE EVERY 1 TO 2 YEARS.
UNLIKELY - NOT EXPECTED BUT THERE IS A SLIGHT POSSIBILITY IT MAY OCCUR AT SOME TIME. OCCURS EVERY 2 TO 3 YEARS.
VERY UNLIKELY - BUT MAY OCCUR IN EXCEPTIONAL CIRCUMSTANCES.

HIERARCHY CONTROLS
1. ELIMINATION.
2. SUBSTITUTION.
3. ISOLATION.
4. ENGINEERING.
5. ADMINISTRATION.
6. PPE (PERSONAL PROTECTIVE EQUIPMENT)

CONSEQUENCE DESCRIPTION
CONSEQUENCE IS THE EXPECTED OUTCOME OF AN EVENT OR SITUATION EITHER ACTUAL OR POTENTIAL IN TERMS OF HEALTH AND SAFETY, IT INCLUDES THE DEGREE OF HARM THAT COULD BE CAUSED TO PEOPLE EXPOSED TO THE HAZARD, THE POTENTIAL SEVERITY OF INJURIES OR ILL HEALTH AND AN ESTIMATED COST OF RETURNING THINGS TO NORMAL. A WIDE VARIETY OF CONSEQUENCES COULD OCCUR WHEN CERTAIN EVENTS HAPPEN - FOR EXAMPLE, A SLIP ON A FLOOR COULD LEAD TO A SIMPLE FALL AND BRUISE, OR IT COULD LEAD TO A FATALITY IF A FRACTURED SKULL IS INVOLVED. THE CONSEQUENCE USED IN A RISK ASSESSMENT SHOULD BE THE MOST REASONABLE WORST-CASE EVENT THAT WE EXPECT TO OCCUR, HOWEVER CARE SHOULD BE EXERCISED TO AVOID USING CONSEQUENCES THAT ARE UNREALISTIC OR EXTREME.

		RISK MATRIX				
		INSIGNIFICANT	MINOR	MODERATE	MAJOR	EXTREME
LIKELIHOOD		A	B	C	D	E
ALMOST CERTAIN	5	MODERATE	MODERATE	SIGNIFICANT	EXTREME	EXTREME
LIKELY	4	LOW	MODERATE	SIGNIFICANT	SIGNIFICANT	EXTREME
POSSIBLE	3	LOW	LOW	MODERATE	SIGNIFICANT	EXTREME
UNLIKELY	2	NEGLIGIBLE	LOW	MODERATE	MODERATE	SIGNIFICANT
VERY UNLIKELY	1	NEGLIGIBLE	NEGLIGIBLE	LOW	MODERATE	MODERATE
		NEGLIGIBLE	LOW	MODERATE	SIGNIFICANT	EXTREME
		RISK ACCEPTABLE		RISK ACCEPTABLE WITH STRICT CONTROL MEASURES		RISK UNACCEPTABLE

RISK DEFINITION		
RISK LEVEL	INJURY TYPE	REQUIRED ACTION
NEGLIGIBLE	NUISANCE VALUE, NO INJURIES ANTICIPATED UNDER NORMAL CIRCUMSTANCES.	UNLIKELY TO GENERATE INTO A MORE SIGNIFICANT ISSUE.
LOW RISK	CUTS, LACERATIONS, MINOR SPRAINS AND STRAINS. FIRST AID TREATMENT REQUIRED. NO LOST TIME WITH THE EXCEPTION OF FIRST AID TREATMENT AND REPORTING TIME.	RISK AT THIS LEVEL MAY BE TREATED THROUGH THE USE OF ROUTINE PROCEDURES / PROCESSES. MAY GENERATE INTO A MORE SIGNIFICANT ISSUE IF NOT ADDRESSED.
MODERATE	VISIT TO DOCTOR OR MEDICAL FACILITY REQUIRED, EG FOR A SIMPLE FRACTURE INVOLVES LOST TIME HOWEVER FULL RECOVERY FROM INJURIES IS ANTICIPATED. INVOLVED WORKER MAY REQUIRE TEMPORARY MODIFICATION TO DUTIES OR SHORT TERM RESTRICTED DUTIES.	REQUIRED ALLOCATION OF RESPONSIBILITIES. CONTROL MEASURES TO BE MONITORED REGULARLY UNTIL RISK IS ELIMINATED OR RISK LEVEL IS CONSIDERED ACCEPTABLE.
SIGNIFICANT	MAY INVOLVE MULTIPLE VICTIMS. EXAMPLES OF INJURIES MAY INCLUDE COMPLICATED OR MULTIPLE FRACTURES. LOSS OF FINGER, NOISE INDUCED HEARING LOSS OR RESIDUAL BACK INJURY. SPECIALIST MEDICAL TREATMENT REQUIRED, POSSIBLY INCLUDING SHORT TERM HOSPITALIZATION. MULTIPLE INJURIES WITH POSSIBLE CHRONIC OR LONG TERM EFFECTS OF MODERATE NATURE. INVOLVED WORKER REQUIRES MODIFICATION TO DUTIES, POSSIBLY OVER A LONG PERIOD. EG, WORKER UNABLE TO LIFT ITEMS DUE TO BACK INJURY.	REQUIRES ESCALATION AND IMMEDIATE CORRECTIVE ACTION, INCLUDING ALLOCATION OF RESPONSIBILITY. CONTROL MEASURES TO BE MONITORED REGULARLY UNTIL RISK IS ELIMINATED OR RISK LEVEL IS CONSIDERED ACCEPTABLE. INVOLVED WORKER REQUIRED MODIFICATION TO DUTIES, POSSIBLY OVER A LONG PERIOD.
EXTREME	FATALITY OR PERMANENT DISABILITY INVOLVING ONE OR MORE PERSONS. EXTENSIVE INJURIES WITH SIGNIFICANT RESIDUAL DISABILITY, EG LOSS OF ONE OR MORE LIMBS. SERIOUS CHRONIC, LONG TERM EFFECTS - EG SILICOSIS, ASBESTOSIS, CANCER, EXTENSIVE ORGAN DYSFUNCTION.	EXTREME RISK - CONSIDERED UNACCEPTABLE. CORRECTIVE ACTION INCLUDES ALLOCATION OF RESPONSIBILITY TO REDUCE RISK TO AN ACCEPTABLE LEVEL. CONTROL MEASURES TO BE MONITORED AND REPORTED UNTIL RISK IS ELIMINATED OR RISK LEVEL IS REDUCED TO AN ACCEPTABLE LEVEL.

SAFETY RISK REGISTER									
PROJECT SPECIFY SAFETY IN DESIGN SOLUTIONS									
BUILDING / DESIGN ELEMENT	SAFETY CONCERNS	RISK PHASE	INITIAL RISK			RISK MITIGATION STRATEGY	RESIDUAL RISK		
			C	L	RISK		C	L	RISK
TRIP, SLIP, FALL	SLIPPERY, UNEVEN OR UNORGANISED AREAS	CONSTRUCTION	C	3	LOW	PRE-WORK BRIEFING, PLAN PATH FOR TRAVEL DO NOT RUN, GOOD HOUSEKEEPING	B	2	LOW
NOISE	EXCESSIVE NOISE FROM PLANT & EQUIPMENT	CONSTRUCTION	C	4	SIGNIFICANT	PRE-WORK BRIEFING, PLANT & EQUIPMENT TO BE FITTED WITH NOISE MUFFLERS. CORRECT PPE. LIMIT EXPOSURE TIME.	B	3	LOW
LADDERS	FALL FROM HEIGHTS	CONSTRUCTION	E	4	EXTREME	ALWAYS USE 3 POINTS OF CONTACT. USE CORRECT LADDER FOR THE TASK. DO NOT OVERREACH.	C	3	MODERATE
SLIP RATINGS FOR FLOOR	SLIP RATINGS TO ENSURE UNSAFE AREAS ARE AVOIDED	CONSTRUCTION & POST CONSTRUCTION	E	4	SIGNIFICANT	ENSURE ALLOCATED MATERIALS & INSTALLATION IS AS PROPOSED AND AS PER REQUIRED RATING.	C	3	MODERATE
MANUAL HANDLING OF HEAVY MATERIALS / EQUIPMENT	LIFTING, PULLING, TWISTING, BEDDINGS OVERREACHING & STRENUOUS MOVEMENTS	CONSTRUCTION	C	4	SIGNIFICANT	PRE-WORK BRIEFING, MANUAL & HANDLING TRAINING INDUCTION, TEAM LIFTING, LIFT WITHIN CAPACITY.	B	3	LOW
WORKING ENVIRONMENT	PRESENCE OF SYRINGE NEEDLES ON SITE	CONSTRUCTION	C	3	MODERATE	SITE INSPECTION PRIOR TO COMMENCING WORKS. DISPOSE NEEDLES TO SHARPS CONTAINER. TRAIN PERSONNEL TO REMOVE SHARPS PPE.	B	2	LOW
TRANSPORT / VEHICLES ENTERING SITE	COLLISION WITH PEDESTRIANS, VEHICLE OR PLANT	CONSTRUCTION	C	3	MODERATE	DEVELOP VEHICLE MANAGEMENT PLAN, ALL STAFF TO BE INDUCTED, OBEY SPEED LIMITS, RULES & SIGNS.	B	2	LOW
SITE PERSONNEL	DRUG, ALCOHOL OR FATIGUE WORKER NOT FIT FOR WORK	CONSTRUCTION	B	3	MODERATE	SITE DRUG & ALCOHOL POLICY, SITE SAFETY RULES, FATIGUE MANAGEMENT PROCEDURE.	B	2	LOW
CRIME	RISK OF UNSURVEYED AREAS WHICH COULD LEAD TO AN UNSAFE ENVIRONMENT	CONSTRUCTION	C	3	MODERATE	ESTABLISH EQUIPMENT MONITOR, DO NOT STACK MATERIALS ON SUSPENDED FLOORS. SEEK ADVICE FROM STRUCTURAL ENGINEER ON ALLOWANCE.	B	3	LOW
FALL THROUGH LARGE PENETRATIONS	WORKERS MAY FALL THROUGH WALL OR FLOOR PENETRATIONS	CONSTRUCTION	D	3	SIGNIFICANT	PROVIDE TEMPORARY FALL PROTECTION AND TRAIN WORKERS.	D	2	MODERATE
FALL OF OBJECTS FROM HEIGHTS	RISK OF OBJECTS FALLING FROM ELEVATED AREAS	CONSTRUCTION	D	4	SIGNIFICANT	INCLINATION TO PERIMETER. INSTALL KICKBOARDS, OR TOEBOARDS. INSTALL AWNING ABOVE LOWER LEVEL FOR PROTECTION.	B	2	LOW
EXCAVATED MATERIALS	EXCAVATED SOIL & WATER PUMPED OUT MAY CONTAIN HAZARDOUS CONTAMINANTS	CONSTRUCTION	D	3	SIGNIFICANT	OBTAIN GEOTECHNICAL ADVICE, MONITOR SOIL & DISPOSE OF IN ACCORDANCE WITH REGULATIONS.	C	2	MODERATE
EXISTING IN-GROUND SERVICES	DAMAGE TO EXISTING SERVICES DURING EXCAVATION OR PILING ETC	CONSTRUCTION	D	3	SIGNIFICANT	DIAL BEFORE YOU DIG. SURVEY TO LOCATE SERVICES. MARK OUT SERVICES ON GROUND BEFORE PROCEEDING.	B	2	LOW
DEMOLITION WORKS	DEMOLITION WITHOUT STRUCTURAL ENGINEER APPROVAL	CONSTRUCTION	D	3	SIGNIFICANT	OBTAIN STRUCTURAL ENGINEER APPROVAL & SIGN OFF.	B	2	LOW
TEMPORARY LATERAL SUPPORT	LATERALLY SUPPORT STRUCTURAL ELEMENTS DURING INSTALLATION. NO SUPPORT MAY LEAD TO COLLAPSE	CONSTRUCTION	D	2	MODERATE	INDICATE CRITICAL ASPECTS ON STRUCTURAL DRAWINGS BUILDER TO DESIGN ADEQUATE TEMPORARY SUPPORT.	B	2	LOW
TEMPORARY VERTICAL SUPPORT	VERTICALLY SUPPORT STRUCTURAL ELEMENTS DURING INSTALLATION. NO SUPPORT MAY LEAD TO COLLAPSE	CONSTRUCTION	D	2	MODERATE	ENGINEER TO INDICATE PROPPING LOCATIONS TO EXISTING STRUCTURAL BUILDER TO DESIGN ADEQUATE TEMPORARY SUPPORT.	B	2	LOW
SLABS SUPPORTED BY UPSTANDS OR WALLS ACTING AS BEAMS	FAILURE TO SUPPORT THE SLABS UNTIL SUPPORTING ELEMENT HAS SUFFICIENT STRENGTH CAN RESULT IN DAMAGE TO STRUCTURE OR INJURY TO WORKERS	CONSTRUCTION	E	4	SIGNIFICANT	INDICATE SPECIAL SITUATION ON STRUCTURAL PLANS. REVIEW REQUIREMENTS WITH CONSTRUCTION STAFF.	D	1	MODERATE
REMOVAL OF TEMPORARY PROPPING	REMOVAL OF PROPPING WITHOUT STRUCTURAL ENGINEER APPROVAL CAN CAUSE COLLAPSE	CONSTRUCTION	D	2	MODERATE	ESTABLISH SAFE WORK METHOD STATEMENT.	B	2	LOW
WORKING ON OR NEAR LIVE ELECTRICAL SERVICES	PERSON OR PLANT CONTACT WITH LIVE WIRES	CONSTRUCTION & POST CONSTRUCTION	E	3	EXTREME	PROTECTION OFFICER ON-SITE. PLANT MUST HAVE HEIGHT & SLEWING RESTRICTIONS. WORKERS TRAINED TO SAFEWORK REQUIREMENTS.	C	2	MODERATE
COLLAPSE OF EXCAVATION	INSTALL BATTERS TO GEOTECHNICAL ADVICE. ADJACENT TO TOP OF BATTER RESTRICT HEAVY LOADING	CONSTRUCTION	C	3	MODERATE	OBTAIN GEOTECHNICAL ADVICE FOR SAFE BATTERS, STABILITY DURING WORKS.	B	2	LOW
MATERIAL SECTION	DAMAGE, DETERIORATION OF SELECTED MATERIALS DURING THE LIFE SPAN OF THE PROJECT	POST CONSTRUCTION	C	2	MODERATE	USE ONLY SPECIFIED MATERIALS. MAKE SURE MATERIALS ARE APPROPRIATE FOR ENVIRONMENTAL CONDITIONS.	B	2	LOW
PROTECTIVE COATINGS	PROTECTIVE COATINGS ARE NOT SUITABLE FOR EXPOSURE CONDITIONS. HIGH TOXIC EMISSIONS DURING APPLICATION	CONSTRUCTION & POST CONSTRUCTION	C	3	MODERATE	USE ONLY SPECIFIED MATERIALS. PROVIDE A MAINTENANCE REGIME, MAINTENANCE SCHEDULE SET OUT. APPLY IN VENTILATED SPACE. DEFECT INSPECTION.	B	2	LOW
FIRE	FIRE TRANSFER THROUGH STRUCTURE	CONSTRUCTION & POST CONSTRUCTION	E	2	SIGNIFICANT	DESIGN STRUCTURAL ELEMENTS FOR LEGISLATED, APPROPRIATE & RECOMMENDED FIRE RESISTANCE LEVELS.	C	2	MODERATE
SURROUNDING PROPERTY DAMAGE	SETTLEMENT OF ASSETS ADJACENT TO PROPERTY BOUNDARIES	POST CONSTRUCTION	D	3	SIGNIFICANT	INSTALL DEFLECTION MONITORS, ENGAGE GEOTECHNICAL ENGINEER TO ACCESS MOVEMENTS BASED ON CONSTRUCTION STAGING & SEQUENCING.	C	2	MODERATE
CORING PENETRATIONS	CONTRACTORS CORING PENETRATIONS ON SITE WITHOUT STRUCTURAL ENGINEER APPROVAL CAN CAUSE STRUCTURAL FAILURE & DAMAGE	CONSTRUCTION	B	3	LOW	ESTABLISH SAFE WORK METHOD STATEMENT.	B	2	LOW
MAINTENANCE OF ROOF STRUCTURES	INSUFFICIENT PROTECTION FOR STAFF TO ACCESS PLANTROOM AND PV CELL AREAS	CONSTRUCTION & POST CONSTRUCTION	B	3	LOW	PROTECTION MEASURES TAKEN SO STAFF CAN SAFELY ACCESS AREAS THROUGH THE USE OF BALUSTRADES, SAFETY LINES & ANCHOR POINTS.	A	2	NEGLIGIBLE

B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN
REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED

Scale

JCE PLAN • DESIGN ENGINEER • EXECUTE

www.jcengineers.com.au
info@jcengineers.com.au

COPYRIGHT AND REPRODUCTION
This document is Confidential and remains the property of J.C. Engineers Pty. Ltd. Accordingly, copies of this document must not be distributed to third parties without their prior written consent. A third party receiving a copy of this document should not place any reliance upon it and J.C. Engineers Pty. Ltd. disclaims all responsibility and liability to such party. This document may not be altered mimicked or reproduced without written approval from J.C. Engineers Pty. Ltd.

Client **CHRIS METCALF**

Project Address **107 LYTTON ROAD, BULIMBA, QLD 4171**

Drawn **JR**

Eng. Area	Name	Signature	No.	Date
CIVIL	BRENDAN NIELSEN	<i>Brendan Nielsen</i>	18317	29/05/2026

Designed **JR**

Project Details

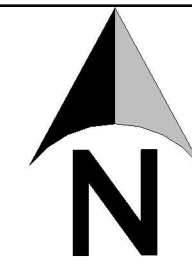
CONCEPT STORMWATER MANAGEMENT PLAN

SAFETY IN DESIGN

Job No. **D205**

Sheet **SHEET 3 OF 7**

Drawing No. **D205_C_C0003** REV **B**



- NOTE:**
- ELEVATION AND CONTOUR DATA RETRIEVED FROM QUEENSLAND GLOBE ARE INFORMATIVE; FOR ACCURATE CONTOUR DATA, A CONTOUR SURVEY PLAN IS REQUIRED.
 - BOUNDARY LINES RETRIEVED FROM DIGITAL CADASTRAL DATABASE (DCDB) ARE INFORMATIVE; FOR ACCURATE LOCATION OF BOUNDARY LINES, A CADASTRAL SURVEY PLAN IS REQUIRED.
 - EXISTING INFRASTRUCTURE RETRIEVED FROM QUEENSLAND URBAN UTILITIES; FOR ACCURATE INFO ON THE LOCATION OF EXISTING INFRASTRUCTURE, A DETAILED SURVEY DATA IS REQUIRED.

- LEGEND:**
- PROPERTY BOUNDARY
 - PROPERTY BOUNDARY OTHERS
 - EXISTING MINOR CONTOURS 0.25m INTERVALS
 - EXISTING MAJOR CONTOURS 1.00m INTERVALS
 - EXISTING DWELLING
 - EXISTING DWELLING OTHERS
 - EXISTING FOOT PATH
 - EXISTING DRIVEWAY
 - EXISTING ELECTRICAL POWER LINE
 - EXISTING ELECTRICAL LIGHT POLE
 - EXISTING TELCO LINE
 - EXISTING WATER RETICULATION MAIN
 - EXISTING TREES

EXISTING SITE PLAN
SCALE 1 : 100

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN

www.jcengineers.com.au
info@jcengineers.com.au

COPYRIGHT AND REPRODUCTION
 This document is Confidential and remains the property of J.C. Engineers Pty. Ltd. Accordingly, copies of this document must not be distributed to third parties without their prior written consent. A third party receiving a copy of this document should not place any reliance upon it and J.C. Engineers Pty. Ltd. disclaims all responsibility and liability to such party. This document may not be altered, mimicked or reproduced without written approval from J.C. Engineers Pty. Ltd.

Client CHRIS METCALF
Project Address 107 LYTTON ROAD, BULIMBA, QLD 4171

Scale 1 : 100

Drawn JR
Designed JR

Eng. Area	Name	Signature	No.	Date
CIVIL	BRENDAN NIELSEN		18317	29/05/2026

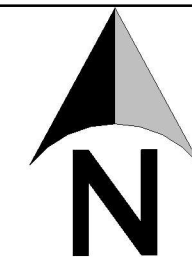
Project Details

CONCEPT STORMWATER MANAGEMENT PLAN

EXISTING SITE PLAN

Job No. D205
Sheet SHEET 4 OF 7
Drawing No. D205_C_C0004
REV B

29/05/2026 10:19:03 PM



SUBDIVISION MEMORANDUM	
LOT NUMBER	LOT AREA
1	279.00m ²
2	357.00m ²

- NOTE:
- ELEVATION AND CONTOUR DATA RETRIEVED FROM QUEENSLAND GLOBE ARE INFORMATIVE; FOR ACCURATE CONTOUR DATA, A CONTOUR SURVEY PLAN IS REQUIRED.
 - BOUNDARY LINES RETRIEVED FROM DIGITAL CADASTRAL DATABASE (DCDB) ARE INFORMATIVE; FOR ACCURATE LOCATION OF BOUNDARY LINES, A CADASTRAL SURVEY PLAN IS REQUIRED.
 - EXISTING INFRASTRUCTURE RETRIEVED FROM QUEENSLAND URBAN UTILITIES; FOR ACCURATE INFO ON THE LOCATION OF EXISTING INFRASTRUCTURE, A DETAILED SURVEY DATA IS REQUIRED.

LEGEND:

	PROPERTY BOUNDARY
	PROPERTY BOUNDARY OTHERS
	EXISTING MINOR CONTOURS 0.25m INTERVAL
	EXISTING MAJOR CONTOURS 1.00m INTERVAL
	EXISTING DWELLING
	EXISTING DWELLING OTHERS
	EXISTING FOOT PATH
	EXISTING DRIVEWAY
	EXISTING ELECTRICAL POWER LINE
	EXISTING ELECTRICAL LIGHT POLE
	EXISTING TELCO LINE
	EXISTING WATER RETICULATION MAIN
	BUILDING ENVELOPE
	PROPOSED DRIVEWAY

PROPOSED SITE PLAN
SCALE 1 : 100

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN

JCE PLAN • DESIGN
ENGINEER • EXECUTE

www.jcengineers.com.au
info@jcengineers.com.au

COPYRIGHT AND REPRODUCTION
This document is Confidential and remains the property of J.C. Engineers Pty. Ltd. Accordingly, copies of this document must not be distributed to third parties without their prior written consent. A third party receiving a copy of this document should not place any reliance upon it and J.C. Engineers Pty. Ltd. disclaims all responsibility and liability to such party. This document may not be altered mimicked or reproduced without written approval from J.C. Engineers Pty. Ltd.

Scale

1 : 100

Client **CHRIS METCALF**

Project Address **107 LYTTON ROAD, BULIMBA, QLD 4171**

Drawn **JR**

Designed **JR**

Eng. Area	Name	Signature	No.	Date
CIVIL	BRENDAN NIELSEN		18317	29/05/2026

Project Details

CONCEPT STORMWATER MANAGEMENT PLAN

PROPOSED SITE PLAN

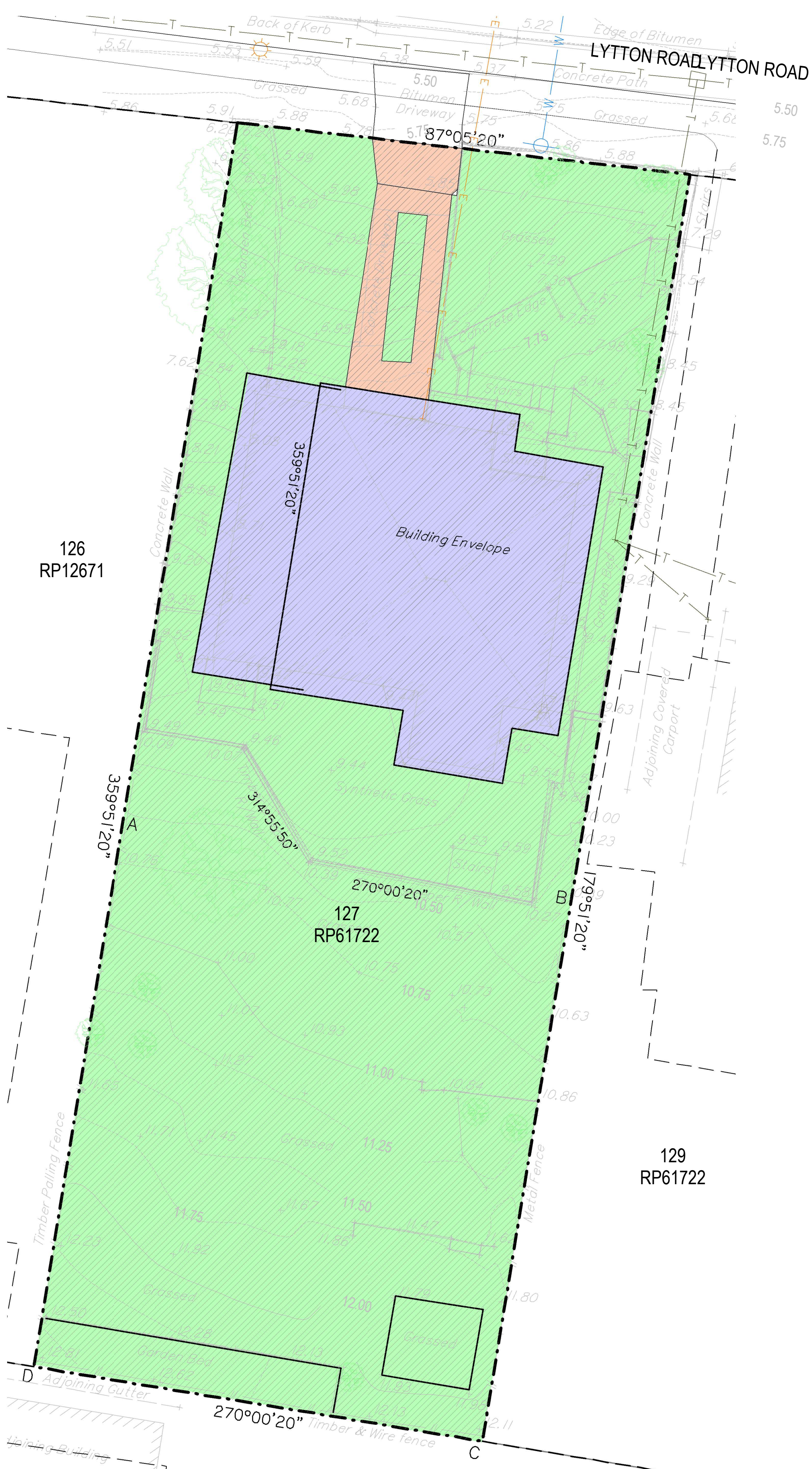
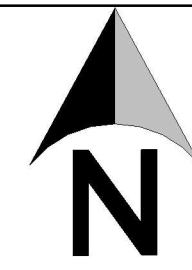
Job No. **D205**

Sheet **SHEET 5 OF 7**

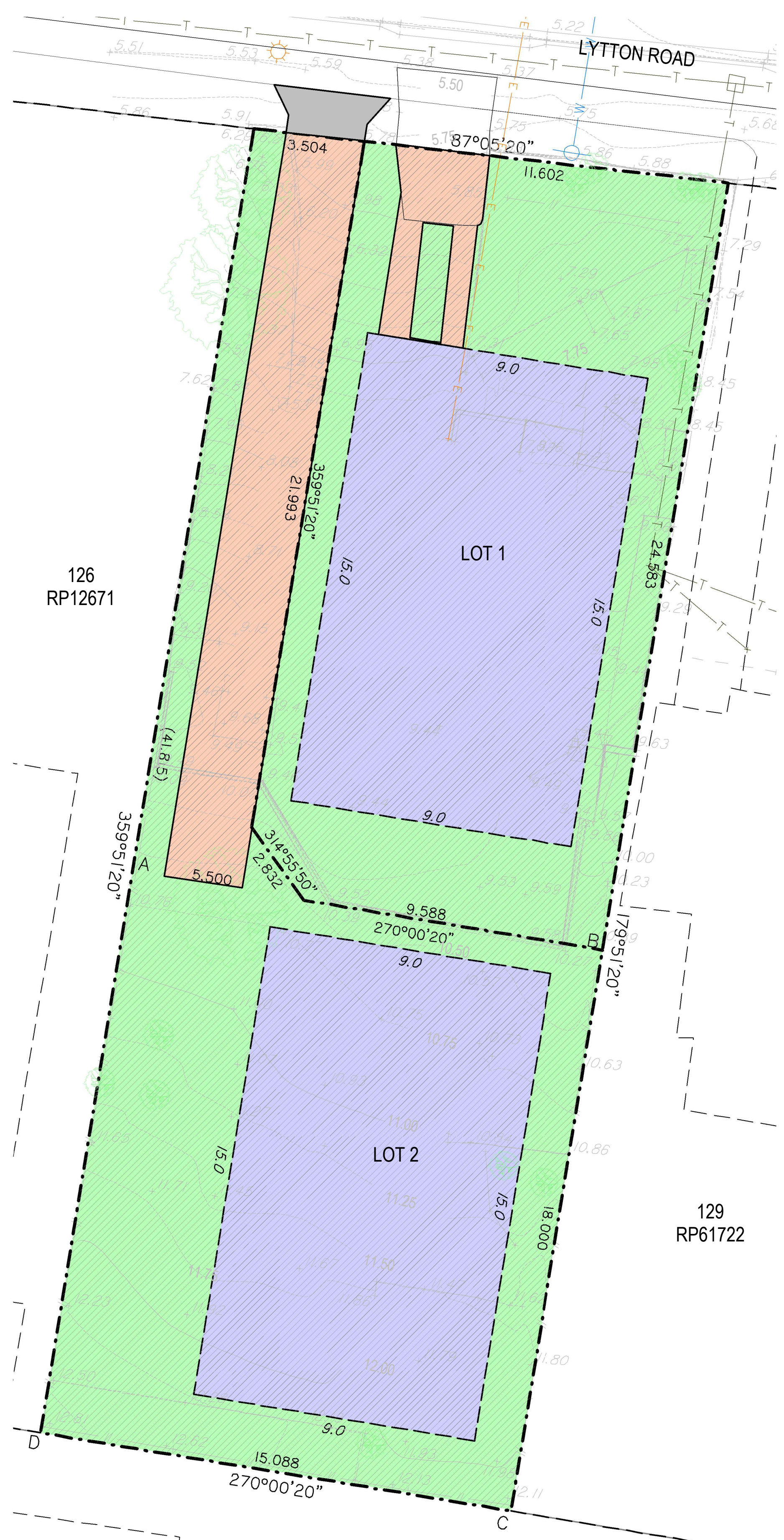
Drawing No. **D205_C_C0005**

REV **B**

29/05/2026 10:19:06 PM



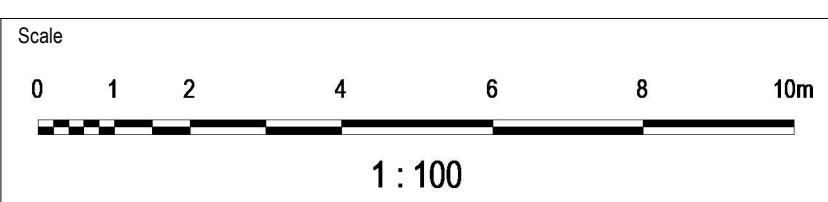
PRE DEVELOPMENT CATCHMENT AREA
SCALE 1 : 100



POST DEVELOPMENT CATCHMENT PLAN
SCALE 1 : 100

- LEGEND:**
- PROPERTY BOUNDARY
 - PROPERTY BOUNDARY OTHERS
 - EXISTING MINOR CONTOURS 0.25m INTERVALS
 - EXISTING MAJOR CONTOURS 1.00m INTERVALS
 - EXISTING DWELLING
 - EXISTING DWELLING OTHERS
 - EXISTING FOOT PATH
 - EXISTING DRIVEWAY
 - EXISTING ELECTRICAL POWER LINE
 - EXISTING ELECTRICAL LIGHT POLE
 - EXISTING TELCO LINE
 - EXISTING WATER RETICULATION MAIN
 - BUILDING ENVELOPE
 - PROPOSED DRIVEWAY
- PRE DEVELOPMENT CATCHMENT AREA**
- PERVIOUS AREA - 490.35m²
 - IMPERVIOUS AREA ROOF - 128.04m²
 - IMPERVIOUS AREA OTHERS- 17.61m²
- POST DEVELOPMENT CATCHMENT AREA**
- PERVIOUS AREA - 293.77m²
 - IMPERVIOUS AREA ROOF / PAD - 270.00m²
 - IMPERVIOUS AREA OTHERS - 72.23m²

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN



Client		CHRIS METCALF			
Project Address		107 LYTTON ROAD, BULIMBA, QLD 4171			
Drawn	Eng. Area	Name	Signature	No.	Date
JR	CIVIL	BRENDAN NIELSEN	<i>Brendan Nielsen</i>	18317	29/05/2026
Designed					
JR					

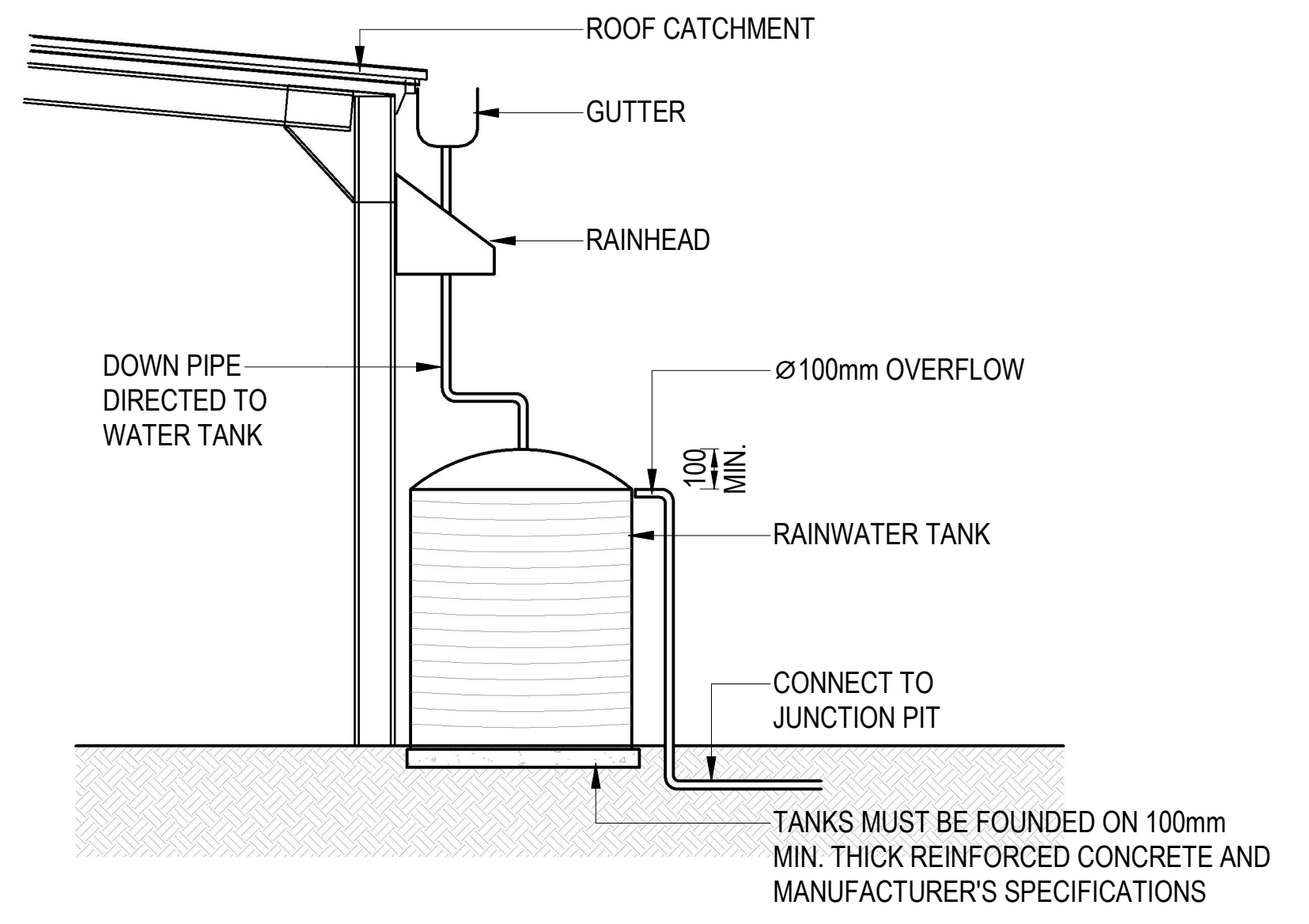
Project Details
CONCEPT STORMWATER MANAGEMENT PLAN
CATCHMENT AREAS

Job No.	D205
Sheet	SHEET 6 OF 7
Drawing No.	D205_C_C0006
REV	B

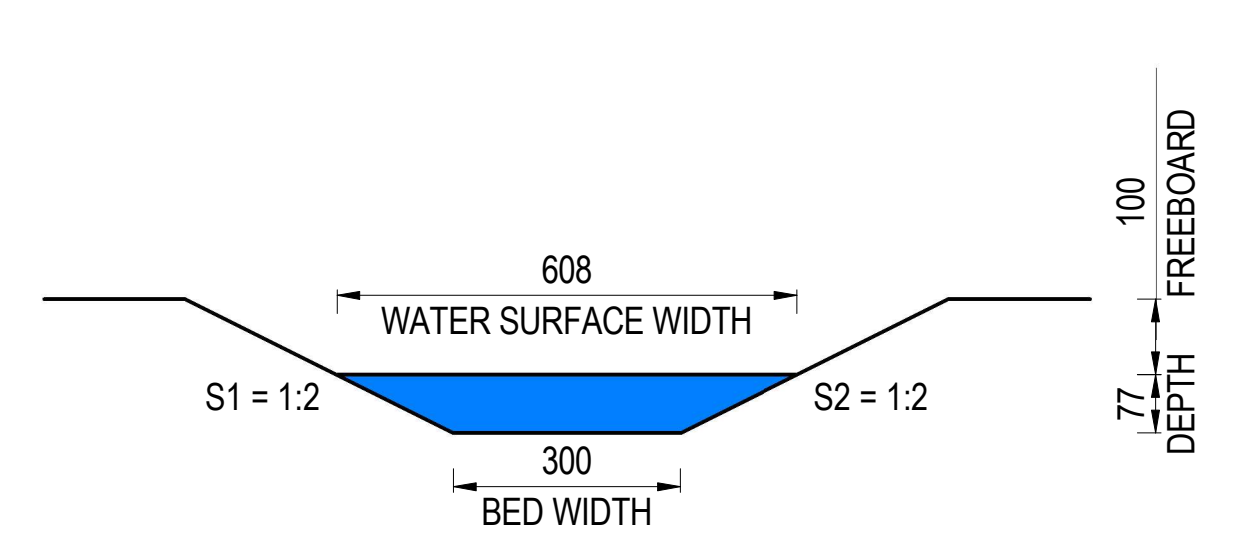
29/05/2026 10:19:09 PM



STORMWATER MANAGEMENT PLAN
SCALE 1 : 100

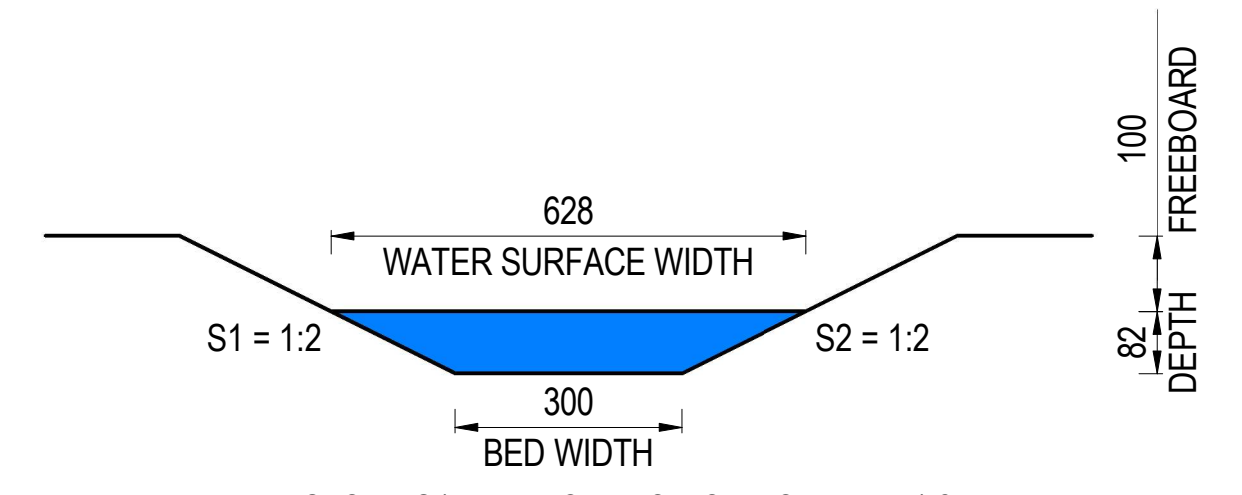


TYPICAL ROOFWATER TANK DETAIL



- SLOPE S1, VERTICAL TO HORIZONTAL = 1:2
- SLOPE S2, VERTICAL TO HORIZONTAL = 1:2
- BED SLOPE = 1:100
- BED WIDTH = 300mm
- WATER SURFACE WIDTH = 608mm
- DEPTH = 77mm
- MANNINGS = 0.025
- FLOW VELOCITY = 0.57m/s
- FLOW = 19.92L/s

SWALE 1 DETAIL



- SLOPE S1, VERTICAL TO HORIZONTAL = 1:2
- SLOPE S2, VERTICAL TO HORIZONTAL = 1:2
- BED SLOPE = 1:100
- BED WIDTH = 300mm
- WATER SURFACE WIDTH = 628mm
- DEPTH = 82mm
- MANNINGS = 0.025
- FLOW VELOCITY = 0.59m/s
- FLOW = 22.51L/s

SWALE 2 DETAIL

- NOTE:
1. STORMWATER DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH BRISBANE CITY COUNCIL STANDARD DRAWINGS BSD-8000 SERIES - STORMWATER DRAINAGE AND WATER QUALITY, AND BRISBANE CITY COUNCIL S160 - DRAINAGE.
 2. GRATES SHALL BE DESIGNED IN ACCORDANCE WITH AS 3996 AND SHALL BE MINIMUM CLASS D IN TRAFFICABLE AREAS. INSTALL GRATE FLUSH TO FINISHED SURFACE LEVELS.
 3. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 4. STORMWATER PIPE UNDER DRIVEWAY SHALL BE INSTALLED WITH A MINIMUM 600mm COVER TO TOP OF PIPE AND CONSTRUCTED IN ACCORDANCE WITH AS/NZS 3500.3 AND BRISBANE CITY COUNCIL REQUIREMENTS. PROVIDE CLASSIFIED BEDDING AND COMPACTED BACKFILL SUITABLE FOR VEHICULAR LOADS.

- LEGEND:
- PROPERTY BOUNDARY
 - PROPERTY BOUNDARY OTHERS
 - EXISTING MINOR CONTOURS 0.25m INTERVALS
 - EXISTING MAJOR CONTOURS 1.00m INTERVALS
 - EXISTING DWELLING
 - EXISTING DWELLING OTHERS
 - EXISTING FOOT PATH
 - EXISTING DRIVEWAY
 - EXISTING ELECTRICAL POWER LINE
 - EXISTING ELECTRICAL LIGHT POLE
 - EXISTING TELCO LINE
 - EXISTING WATER RETICULATION MAIN
 - BUILDING ENVELOPE
 - PROPOSED DRIVEWAY
 - PROPOSED SWALE
 - PROPOSED STORMWATER LINE uPVC
 - HEADWALL WITH ROCK SCOUR PROTECTION
 - PROPOSED 600 x 600mm STORMWATER PIT WITH GRATE COVER
 - PROPOSED KERB ADAPTOR

REV	DESCRIPTION	DATE	DRAWN	CHECKED	APPROVED
B	FINAL	29/05/2026	JR	ST	BN
A	DRAFT FOR COMMENTS	05/05/2026	JR	ST	BN

JCE PLAN • DESIGN
ENGINEER • EXECUTE

www.jcengineers.com.au
info@jcengineers.com.au

COPYRIGHT AND REPRODUCTION
This document is Confidential and remains the property of J.C. Engineers Pty. Ltd. Accordingly, copies of this document must not be distributed to third parties without their prior written consent. A third party receiving a copy of this document should not place any reliance upon it and J.C. Engineers Pty. Ltd. disclaims all responsibility and liability to such party. This document may not be altered, mimicked or reproduced without written approval from J.C. Engineers Pty. Ltd.

Client: **CHRIS METCALF**

Project Address: **107 LYTTON ROAD, BULIMBA, QLD 4171**

Drawn: **JR**

Designed: **JR**

Eng. Area	Name	Signature	No.	Date
CIVIL	BRENDAN NIELSEN	<i>Brendan Nielsen</i>	18317	29/05/2026

Project Details

CONCEPT STORMWATER MANAGEMENT PLAN

STORMWATER MANAGEMENT PLAN AND DETAIL

Job No. **D205**

Sheet **SHEET 7 OF 7**

Drawing No. **D205_C_C0007**

REV **B**

29/05/2026 10:19:13 PM