



Westera Partners Pty Ltd

ABN 52 097 417 975

[Brisbane Office](#)

P 07 3852 4333

westerapartners.com.au



STORMWATER MANAGEMENT REPORT

PROPOSED SUBDIVISION DEVELOPMENT AT 288 Albany Creek Road, Bridgeman Downs

FOR: Kenny Jap Properties P/L

Contact: Liam Donald

Email: liam.d@dtsgld.com.au

Our Ref: B25-083



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Client Contact: Kenny Jap Properties P/L
Project Name: Proposed Subdivision Development for Lot 33 SP310960
Westera Partners Ref: B25-083

Westera Partners Contact: Steven Tika
Phone: 07 3852 4333
Email: stevet@westerapartners.com.au

Certified for Issue by: Sam Ide
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A	N. Decharat	S. Ide	18/05/2026

This report has been prepared for Kenny Jap Properties P/L for the purpose of accompanying a development application to Brisbane City Council. This report must only be used by Kenny Jap Properties P/L for this purpose and must not be used or relied upon by any other person for any other purpose.

The assessment, conclusions or recommendations in this report are based on conditions encountered and information received at the time of preparing the report and may not be relied upon as site conditions or operations vary over time.



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1 INTRODUCTION

Westera Partners Pty Ltd has been commissioned by Kenny Jap Properties P/L to prepare a Stormwater Management Report to accompany a development application for a proposed residential development.

The proposal involves the subdivision of one lot into 25 residential lots, a drainage reserve lot and an open space lot, including the construction of a new road from Albany Creek Road.

This report documents how stormwater runoff will be managed on-site in accordance with the Brisbane City Council's (BCC) requirements.

2 SITE DESCRIPTION

2.1 Location and Land Use

The proposed development site is located at 288 Albany Creek Road, Bridgeman Downs; also known as Lot 33 on SP310960.

The proposed development area is approximately 2.8716Ha and is currently occupied by a dwelling and ancillary structures. The site currently generally falls from west to east, towards the Cabbage Tree Creek. The average grade across the site is approximately 5%.

The site is bound by Cabbage Tree Creek to the east, rural property to the west and south, and Albany Creek Road to the north. Refer to Figure 1 for an indicative site location and Appendix C for detailed site survey information.



Figure 1 – Indicative Site Location (Nearmap, 2026)

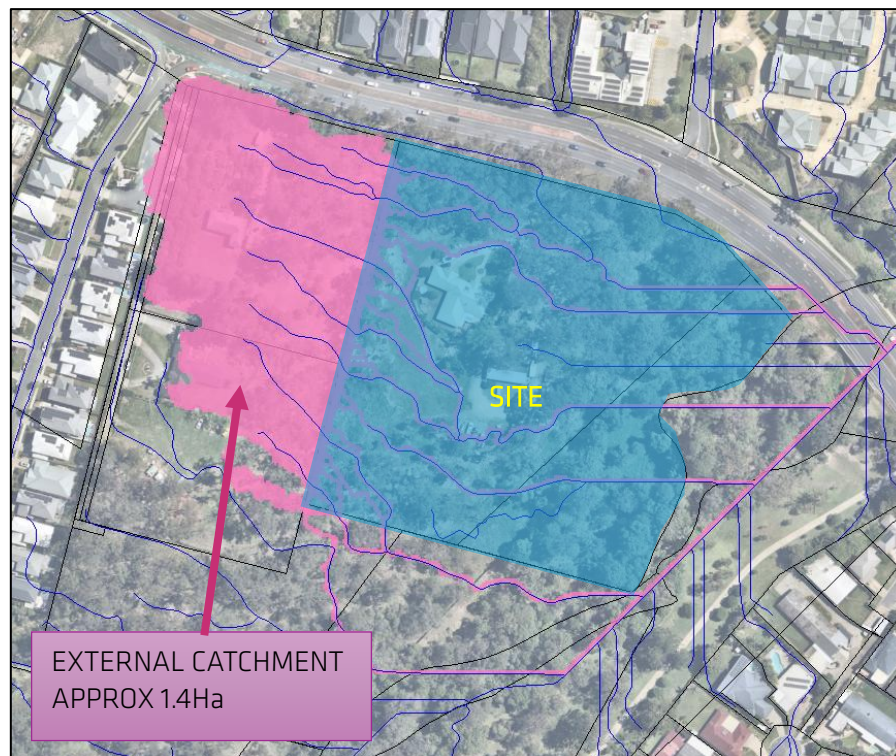


Figure 3 - External Catchment

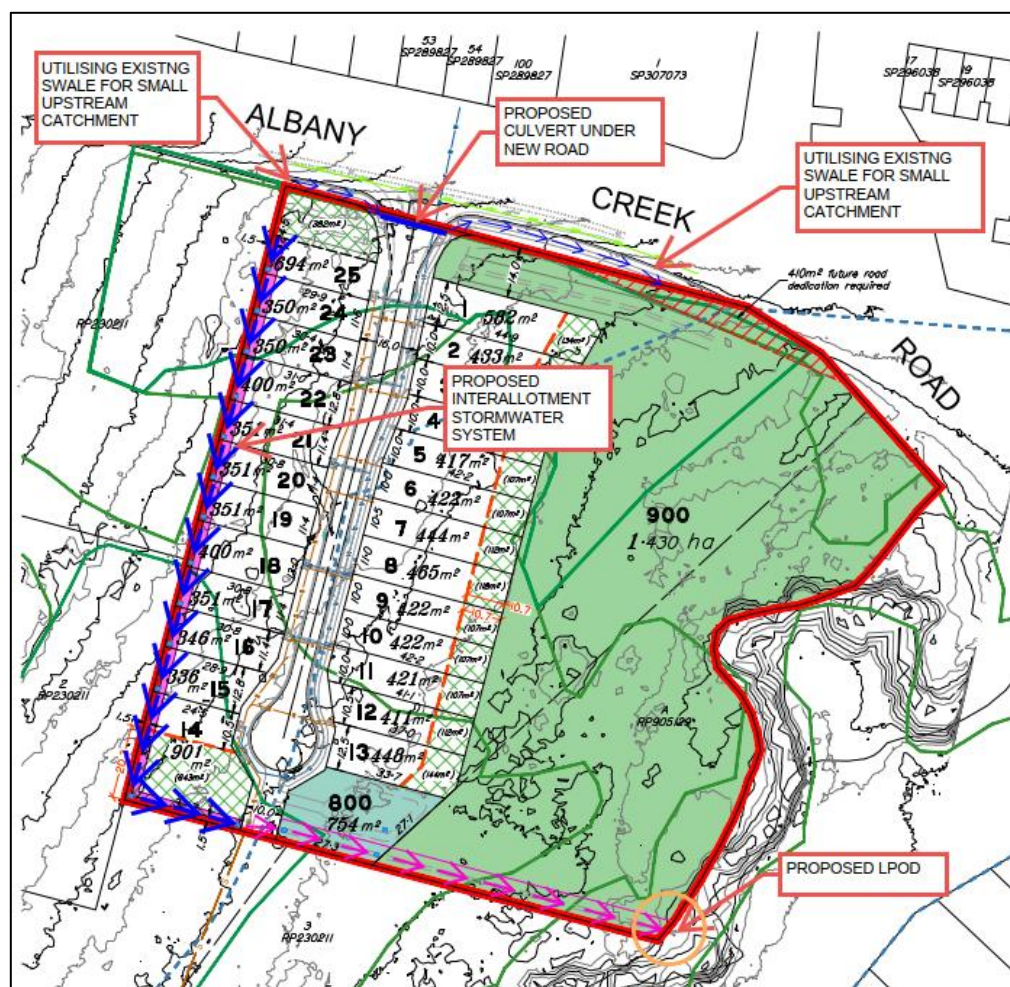


Figure 4 - Proposed External Catchment Conveyance

2.4 Flooding

The Brisbane City Council (BCC) Creek Flooding map overlay indicates that the proposed development site is subject to flooding from the nearby Cabbage Tree Creek and is located within a flood-prone area. Refer to Appendix D for the BCC Floodwise Property Report.

Note that the proposed lots will be filled to comply with the Brisbane City Council Planning Scheme – Flood Overlay to ensure that the flood-affected area is habitable. Refer to the Flood Report by Water Technology for assessment against the flood overlay code.

3 STORMWATER QUANTITY MANAGEMENT

Brisbane City Council Infrastructure Design Planning Scheme Policy – Stormwater drainage Clause 7.5.2 provides several criteria indicating when stormwater detention is not required/undesirable, as follows:

- The site is located at the bottom one-third of the catchment.
- The site discharges directly into the lower catchments of creeks or major drains.

As the development site meets the above criteria, stormwater quantity management is not required.

4 STORM WATER QUALITY MANAGEMENT

4.1 Operational Phase

The proposed development must address the State Planning Policy (SPP 2017) as the development site area exceeds 2,500m². The development shall ensure that the environmental values of receiving water downstream of the development are maintained or enhanced during the construction and operation of the development in accordance with the State Legislation and Local Government requirements. The stormwater quality management proposed for the development is required to achieve the following pollutant load reduction objectives in accordance with the SPP requirements of south-east Queensland:

- 80% reduction in Total Suspended Solids (TSS)
- 60% reduction in Total Phosphorous (TP)
- 45% reduction in Total Nitrogen (TN)
- 90% reduction in Gross Pollutants (GP)

Pollutants typically generated during the operational phase of the development include:

- Litter/gross pollutants
- Sediment (Total Suspended Solids – TSS)
- Nutrients (Total Nitrogen and Total Phosphorus – TN & TP)
- Hydrocarbons (oil and grease); and
- Heavy metals

In order to meet these pollutant reduction targets, stormwater treatment measures are required. These treatment measures are detailed in the preliminary engineering drawings in Appendix B and are summarised as follows:

- Bioretention basin – A bioretention basin is proposed to facilitate the removal of pollutants by passing the stormwater through a vegetated filter media with a minimum of 200m² filter area. This will act as the final treatment of the internal stormwater network prior to discharging to the watercourse.

4.2 MUSIC Model

MUSICX was used to prepare a MUSIC model of the proposed treatment train to demonstrate the performance of the treatment measures. Pluviograph data was taken for a 6-minute time step over 10 years, sourced from Bureau of Meteorology data. The developed site catchment details from the MUSIC model are outlined in Table 1 below.

Table 1 – Catchment Summary / Treatment Details

Catchment	Area (Ha)	%Effective Impervious
Road to Bio Basin	0.2775	100
Roof (assume 250m ² per lot) to Bio Basin	0.6500	100
Ground to Bio Basin	0.2028	0
Basin lot to Bio Basin	0.0750	20
Ground Bypass	0.2122	0

The layout for the MUSIC model, including the treatment train effectiveness, is detailed in Figure 5:

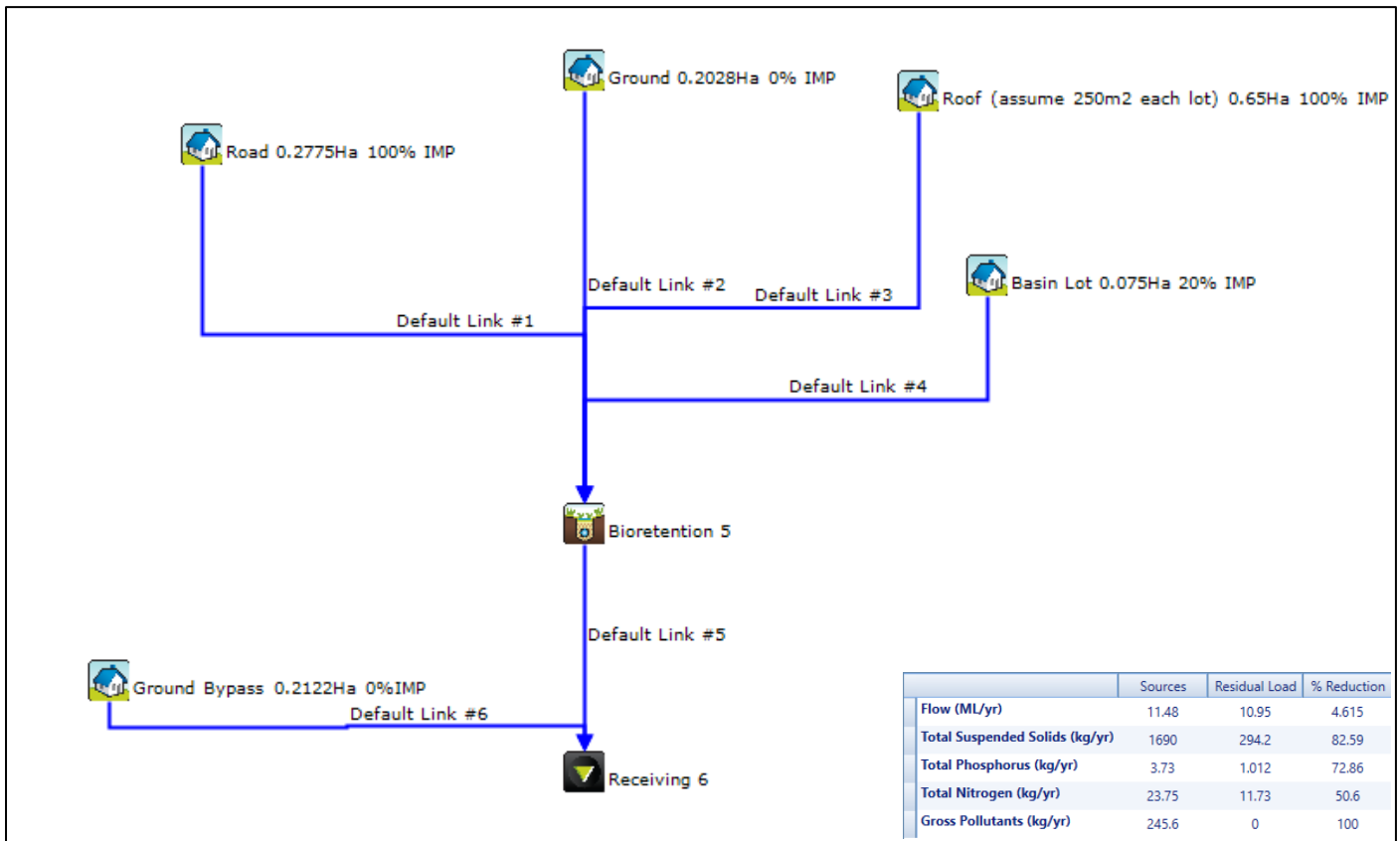


Figure 5 – MUSIC model and results

The developed site treatment train effectiveness without external catchment is outlined in Table 2.

Table 2 – Treatment train effectiveness

Modelled Parameters	Source Nodes	Residual Load	%Reduction
Flow (ML/yr)	11.48	10.95	4.615
Total Suspended Solids (kg/yr)	1690	294.2	82.59
Total Phosphorus (kg/yr)	3.73	1.012	72.86
Total Nitrogen (kg/yr)	23.75	11.73	50.6
Gross Pollutants (kg/yr)	245.6	0	100

Based on the MUSIC modelling, the proposed treatment train achieves the required pollutant load reduction objectives for TSS, TP, TN, and GP. Therefore, this model is considered acceptable for the development.

4.3 Construction Phase

Management of stormwater runoff during construction and the implementation of an erosion & sediment control program is necessary to avoid impacts to receiving waters from pollutants typically generated during the construction phase. Typical pollutants are described in Table 3 below:

Table 3 – Pollutants Typically Generated During the Construction Phase

Pollutant	Sources
Litter (Gross Pollutants)	Paper, construction packaging, food packaging, cement bags.
Sediment	Unprotected exposed soils and stockpiles during earthworks and building.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment.
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, wash waters.
pH altering substances	Acid sulphate soils, cement slurry and wash waters.

In addition to the degradation of receiving waters, impacts of inadequate erosion and sediment control downstream from the site include:

- traffic safety problems;
- blocked drains;
- local flooding problems;
- aesthetic pollution of drainage paths; and
- damage to local ecosystems.

4.3.1 Design Objectives

Management of stormwater runoff during construction should be undertaken in accordance with Appendix 2 of the SPP (July 2017). The SPP outlines the design objectives for construction phase stormwater management. These are presented in Table 4, Table 5, and Table 6.

Table 4 – SPP Appendix 2: Part 1 Construction Phase – Stormwater Management Design Objectives

Issue	Desired Outcomes
Drainage Control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion Control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised using methods which will achieve effective short-term stabilisation.
Sediment Control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 metres must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).
Litter, Hydrocarbons and other contaminants	1. Remove gross pollutants and litter. 2. Avoid the release of oil or visible sheen to released waters. 3. Dispose of waste containing contaminants at authorised facilities.
Waterway Stability and flood flow management	1. Where measures are required to meet post-construction waterway stability objectives, these are either installed prior to land disturbance and are integrated with erosion and sediment controls, or equivalent alternative measures are implemented during construction. 2. Earthworks and the implementation of erosion and sediment controls are undertaken in ways which ensure flooding characteristics (including stormwater quantity characteristics) external to the development site are not worsened

during construction for all events up to and including the 1 in 100 year ARI (1% AEP).

Table 5 – SPP Appendix 2: Part 2 Construction Phase – Stormwater Management Design Objectives for Temporary Drainage Works

Temporary Drainage Works	Anticipated Operation Design Life and Minimum Design Storm Event		
	<12 Months	12-24 Months	>24 Months
Drainage Structure	1 in 2 year ARI/39% AEP	1 in 5 year ARI/18% AEP	1 in 10 year ARI/10% AEP
Where located immediately up-slope of an occupied property that would be adversely affected by the failure or overtopping of the structure	1 in 10 year ARI/10% AEP		
Culvert Crossing	1 in 1 year ARI/63% AEP		

Table 6 – SPP Appendix 2: Part 3 Construction Phase – Stormwater Management Design Objectives for Emergency Spillways on Temporary Sediment Basins

Drainage Structure	Anticipated Operation Design Life and Minimum Design Storm Event		
	<3 Months	3-12 Months	>12 Months
Emergency spillways on temporary sediment basins	1 in 10 year ARI/10% AEP	1 in 20 year ARI/5% AEP	1 in 50 year ARI/2% AEP

Best practice erosion and sediment controls must be installed to minimise the discharge of sediment laden runoff during construction and to achieve the objectives outlined in Table 4-6. This is discussed in the following section.

4.3.2 Erosion and Sediment Control

Management of stormwater runoff during construction is necessary to avoid pollution of downstream waterways from sediment and gross pollutant loading. Impacts of inadequate erosion and sediment control downstream from the site include:

- traffic safety problems;
- blocked drains;
- local flooding problems;
- aesthetic pollution of drainage paths; and
- damage to local ecosystems.

Best practice erosion and sediment controls must be installed to minimise the discharge of sediment laden runoff during construction. Erosion and sediment control plans shall be developed during detailed design phase and must be continually maintained and amended as required to minimise environmental harm.

Erosion and sediment control plans are based on three sets of control measures:

- drainage control;
- erosion control; and
- sediment control.

These control measures must be maintained in an effective operational condition. Sediment disposal from the site is to occur to the satisfaction of Brisbane City Council. Defects in erosion and sediment control devices, such as sediment fences, are to be inspected and documented. Upon Inspection, the Contractor is to determine whether the device should be replaced or repaired. Documentation is to include how the damage was caused and what measures can be implemented to reduce the possibility of repeat occurrences. Any damage to either permanent or temporary water quality control structures or devices is to be immediately rectified at the contractor's expense.

The effectiveness of the erosion and sediment control devices can be monitored by visual audits. All ESC measures are to be inspected:

- at least daily (when work is occurring on site) or weekly (when work is not occurring on site);
- within 24 hours of expected rain; and
- within 18 hours of a rainfall event (i.e. an event of sufficient intensity and duration to mobilise sediment on site).

Drainage paths are to be inspected to ensure the sediment fences are not being bypassed as a result of soil erosion.

Sediment laden runoff shall be prevented from entering neighbouring properties. This shall be achieved by landscaping disturbed areas immediately and prior to a rainfall event.

The proposed development has scored a 25 on the IECA erosion hazard assessment with no trigger score values exceeded (refer to Appendix A for details). Further details of proposed on site erosion and sediment control measures will be required at the detailed design phase of the development.

4.3.3 Maintenance and Monitoring Requirements

Periodic maintenance and monitoring of stormwater devices proposed in this report is crucial to ensure effective operation and design life.

Inspect field inlet grates, pits and underground pipes for blockage or damage at least 6 monthly or after significant rainfall event. The filter baskets shall be inspected and maintained preferably by the manufacturer to avoid damage to units and to ensure adequate cleaning and record keeping. For the first 12 months routine inspections of filter baskets shall be carried out monthly with routine clean out at alternate months. Results of the initial 12 months maintenance program shall be used to determine future maintenance intervals. Refer manufactures maintenance and monitoring methodology for specific details.

Maintenance of ESC measures must occur in accordance with Table 7.

Table 7 – ESC maintenance requirements

ESC Measure	Maintenance Trigger	Timeframe for Completion of Maintenance
Sediment basins	When settled sediment exceeds the volume of the sediment storage zone	Within 7 days of the inspection.
Other ESC measures	The capacity of ESC measures falls below 75%.	By the end of the day.

Sediment accumulation on ESC devices is to be removed and disposed of to the satisfaction of **Brisbane City Council**.

5 CONCLUSION

This SWMP outlines how stormwater runoff from the site will be managed in order to not adversely impact the receiving environment.

The proposed lawful point of discharge shall be via a minor flow pipe system with a major flow overland flow channel to the Cabbage Tree Creek.

The external catchment is proposed to be conveyed around the development site via an interallotment stormwater system including pits and pipes for the minor event and a drainage channel for the major event, subject to detailed design to ensure the minor and major systems comply with Chapter 7 Stormwater Drainage of the BCC Infrastructure Design Planning Scheme Policy (IDPSP).

The stormwater detention is not required for the site as the site is at the lower end of a major catchment.

Stormwater quality treatment is proposed to be managed on-site to achieve the water quality objectives through primary treatment from a bioretention basin. MUSIC modelling has been undertaken to demonstrate that runoff from the development site achieves the water quality pollution load reduction targets of the State Planning Policy.

The site is impacted by flooding. Note that the proposed lots will be filled to comply with the Brisbane City Council Planning Scheme – Flood Overlay to ensure that the flood-affected area is habitable. Refer to the Flood Report by Water Technology for assessment against the flood overlay code.

Further refinement of the proposed stormwater quality measures is recommended at the detailed design phase.

By implementing the proposed stormwater management system and providing adequate maintenance, the downstream environment and neighbouring properties will not experience any adverse deterioration of water quality as a result of the proposed development.



6 APPENDICES

Appendix A – Erosion Hazard Assessment

Erosion Hazard Assessment Form

Condition	Points	Score	Trigger value
AVERAGE SLOPE OF DISTURBANCE AREA [1] - not more than 3% [3% : 33H:1V] - more than 3% but not more than 5% [5% = 20H:1V] - more than 5% but not more than 10% [10% = 10H:1V] - more than 10% but not more than 15% [15% : 6.7H:1V] - more than 15%	0 1 2 4 6	1	4
SOIL CLASSIFICATION GROUP (AS1726) [2] - GW, GP, GM, GC - SW, SP, OL, OH - SM, SC, MH, CH - ML, CL, or if <i>imported fill</i> is used, or if soils are untested	0 1 2 3	3	
EMERSON (DISPERSION) CLASS NUMBER [3] - Class 4, 6, 7, or 8 - Class 5 - Class 3, (default value if soils are untested) - Class 1 or 2	0 2 4 6	4	6
DURATION OF SOIL DISTURBANCE [4] - not more than 1 month - more than 1 month but not more than 4 months - more than 4 months but not more than 6 months - more than 6 months	0 2 4 6	6	6
AREA OF DISTURBANCE [5] - not more than 1000 m² - more than 1000 m² but not more than 5000 m² - more than 5000 m² but not more than 1 ha - more than 1 ha but not more than 4 ha - more than 4 ha	0 1 2 4 6	1	4
WATERWAY DISTURBANCE [6] - No disturbance to a watercourse, open drain or channel - Involves disturbance to a constructed open drain or channel - Involves disturbance to a natural watercourse	0 1 2	2	2
REHABILITATION METHOD [7] Percentage of area (relative to total disturbance) revegetated by seeding without light mulching (i.e. worst-case revegetation method). - not more than 1% - more than 1% but not more than 5% - more than 5% but not more than 10% - more than 10%	0 1 2 4	0	
RECEIVING WATERS [8] - Saline waters only - Freshwater body (e.g. creek or freshwater lake or river)	0 2	2	
SUBSOIL EXPOSURE [9] - No subsoil exposure except of service trenches - Subsoils are likely to be exposed	0 2	2	
EXTERNAL CATCHMENTS [10] - No external catchment - External catchment diverted around the soil disturbance - External catchment not diverted around the soil disturbance	0 1 2	1	
ROAD CONSTRUCTION [11] - No road construction - Involves road construction works	0 2	2	
pH OF SOILS TO BE REVEGETATED [12] - more than pH 5.5 but less than pH 8 - other pH values, or if soils are untested	0 1	1	
Total Score ^[13]		25	

Explanatory notes

Requirements: Specific issues or actions required by the proponent.

Warnings: Issues that should be considered by the proponent.

Comments: General information relating to the topic.

[1] **REQUIREMENTS:**

For sites with an average slope of proposed land disturbance greater than 10%, a preliminary ESCP must be submitted to the regulatory authority for approval during planning negotiations.

Proponents must demonstrate that adequate erosion and sediment control measures can be implemented on-site to effectively protect downstream environmental values.

If site or financial constraints suggest that it is not reasonable or practicable for the prescribed water quality objectives to be achieved for the proposal, then the proponent must demonstrate that alternative designs or construction techniques (e.g. pole homes, suspended slab) cannot reasonably be implemented on the site.

WARNINGS:

Steep sites usually require more stringent drainage and erosion controls than flatter grade sites.

COMMENTS:

The steeper the land, the greater the need for adequate drainage controls to prevent soil and mulch from being washed from the site.

[2] **REQUIREMENTS:**

If the actual soil K-factor is known from soil testing, then the Score shall be determined from Table 1.

If a preliminary ESCP is required during planning negotiations, then it must be demonstrated that adequate space is available for the construction and operation of any major sediment traps, including the provision for any sediment basins and their associated embankments and spillways. It must also be demonstrated that all reasonable and practicable measures can be taken to divert the maximum quantity of sediment-laden runoff (up to the specified design storm) to these sediment traps throughout the construction phase and until the contributing catchment is adequately stabilised against erosion.

WARNINGS:

The higher the point score, the greater the need to protect the soil from raindrop impact and thus the greater the need for effective erosion control measures. A point score of 2 or greater will require a greater emphasis to be placed on revegetation techniques that do not expose the soil to direct rainfall contact during vegetation establishment, e.g. turfing and *Hydromulching*.

COMMENTS:

Table 2 provides an *indication* of soil conditions likely to be associated with a particular Soil group based on a statistical analysis of soil testing across NSW. This table provides only an initial estimate of the likely soil conditions.

The left-hand-side of the table provides an indication of the type of sediment basin that will be required (Type C, F or D). The right-hand-side of the table provides an indication of the likely erodibility of the soil based on the Revised Universal Soil Loss Equation (RUSLE) K-factor.

Table 3 provides some general comments on the erosion potential of the various soil groups.

Table 1 – Score if soil K-factor is known

	RUSLE soil erodibility K-factor			
	K < 0.02	0.02<K<0.04	0.04<K<0.06	K > 0.06
Score	0	1	2	3

Table 2 – Statistical analysis of NSW soil data ^[1]

Unified Soil Class System	Likely sediment basin classification (%)			Probable soil erodibility K-factor (%) ^[2]			
	Dry	Wet		Low	Moderate	High	Very High
	Type C	Type F	Type D	K < 0.02	0.02<K<0.04	0.04<K<0.06	K > 0.06
GM	30	58	12	12	51	26	12
GC	42	33	25	13	71	17	0
SW	40	48	12	49	39	12	0
SP	53	32	15	76	18	5	1
SM	21	67	12	26	48	25	1
SC	26	50	24	16	64	18	2
ML	5	63	32	4	35	45	16
CL	9	51	39	12	56	19	13
OL	2	80	18	34	61	5	1
MH	12	41	48	15	19	41	25
CH	5	44	51	39	43	11	7

Notes: [1] Analysis of soil data presented in Landcom (2004).

[2] Soil erodibility based on Revised Universal Soil Loss Equation (RUSLE) K-factor.

Unified Soil Classification System (USCS)

- GW Well graded gravels, gravel-sand mixtures, little or no fines
- GP Poorly graded gravels, gravel-sand mixture, little or no fines
- GM Silty gravels, poorly graded gravel-sand-silt mixtures
- GC Clayey gravels, poorly graded gravel-sand-clay mixtures
- SW Well graded sands, gravelly sands, little or no fines
- SP Poorly graded sands, gravelly sands, little or no fines
- SM Silty sands, poorly graded sand-silt mixtures
- SC Clayey sands, poorly graded sand-clay mixtures
- ML Inorganic silts & very fine sands, rock flour, silty or clayey fine sands with slight plasticity
- CL Inorganic clays, low–medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
- OL Organic silts and organic silt-clays of low plasticity
- MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
- CH Inorganic clays of high plasticity, fat clays
- OH Organic clays of medium to high plasticity

Table 3 – Typical properties of various soil groups ^[1]

Soil Groups	Typical properties ^[2]
GW, GP	Low erodibility potential.
GM, GC	- Low to medium erodibility potential. - May create turbid runoff if disturbed as a result of the release of silt and clay particles.
SW, SP	Low to medium erodibility potential.
SM, SC	- Medium erodibility potential. - May create turbid runoff if disturbed as a result of the release of silt and clay particles.
MH, CH	- Highly variable (low to high) erodibility potential. - Will generally create turbid runoff if disturbed.
ML, CL	- High erodibility potential. - Tendency to be dispersive. - May create some turbidity in runoff if disturbed.

Note: [1] After Soil Services & NSW DLWC (1998).

[2] Any soil can represent a high erosion risk if the binding clays or silts are unstable.

Table 4 provides **general** guidelines on the suitability of various soil groups to various engineering applications.

Table 4 – Engineering suitability based on Unified Soil Classification ^[1]

Unified Soil Class	USC Group	Embankments		Fill	Slope stability	Untreated roads
		Water retaining	Non water retaining			
Well graded gravels	GW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded gravel	GP	Unsuitable	Average	Excellent	Average	Unsuitable
Silty gravels	GM	Unsuitable	Average	Good	Average	Average
Clayey gravels	GC	Suitable	Average	Good	Average	Excellent
Well graded sands	SW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded sands	SP	Unsuitable	Average	Good	Average	Unsuitable
Silty sands	SM	Suitable ^[2]	Average	Average	Average	Poor
Clayey sands	SC	Suitable	Average	Average	Average	Good
Inorganic silts	ML	Unsuitable	Poor	Average	Poor	Unsuitable
Inorganic clays	CL	Suitable ^[2]	Good	Average	Good	Poor
Organic silts	OL	Unsuitable	Unsuitable	Poor	Unsuitable	Unsuitable
Inorganic silts	MH	Unsuitable	Poor	Poor	Poor	Unsuitable
Inorganic clays	CH	Suitable ^[2]	Average	Unsuitable	Average	Unsuitable
Organic clays	OH	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Highly organic soils	Pt	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable

Notes: [1] Modified from Hazelton & Murphy (1992)

[2] Suitable only after modifications to soil such as compaction and/or erosion protection

- [3] If the soils have not been tested for Emerson Class, then adopt a score of 4.

REQUIREMENTS:

Works proposed on sites containing Emerson Class 1 or 2 soils have a very high pollution potential and must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

WARNINGS:

Class 3 and 5 soils disturbed by cut and fill operations or construction traffic are highly likely to discolour stormwater (i.e. cause turbid runoff). Chemical stabilisation will likely be required if these soils are placed immediately adjacent to a retaining wall. Any disturbed Class 1, 2, 3 and 5 soils that are to be revegetated must be covered with a non-dispersive topsoil as soon as possible (unless otherwise agreed by the regulatory authority).

Class 1 and 2 soils are highly likely to discolour (pollute) stormwater if exposed to rainfall or flowing water. Treatment of these soils with gypsum (or other suitable substance) will most likely be required. These soils should not be placed directly behind a retaining wall unless it has been adequately treated (stabilised) or covered with a non-dispersible soil.

- [4] The duration of disturbance refers to the total duration of soil exposure to rainfall up until a time when there is at least 70% coverage of all areas of soil.

REQUIREMENTS:

All land developments with an expected soil disturbance period greater than 6 months must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

COMMENTS:

Construction periods greater than 3 months will generally experience at least some significant storm events, independent of the time of year that the construction (soil disturbance) occurs.

- [5] **REQUIREMENTS:**

Development proposals with an expected soil disturbance in excess of 1ha must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

The area of disturbance refers to the total area of soil exposed to rainfall or dust-producing winds either as a result of:

- (a) the removal of ground cover vegetation, mulch or sealed surfaces;
- (b) past land management practices;
- (c) natural conditions.

WARNINGS:

A *Sediment Basin* will usually be required if the disturbed area exceeds 0.25ha (2500m²) within any sub-catchment (i.e. land flowing to one outlet point).

COMMENTS:

For soil disturbances greater than 0.25ha, the revegetation phase should be staged to minimise the duration for which soils are exposed to wind, rain and concentrated runoff.

[6] REQUIREMENTS:

All developments that involve earthworks or construction within a natural watercourse (whether that watercourse is in a natural or modified condition) must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

Permits and/or licences may be required from the State Government, including possible submission of the ESCP to the relevant Government department.

[7] REQUIREMENTS:

No areas of soil disturbance shall be left exposed to rainfall or dust-producing winds at the end of a development without an adequate degree of protection and/or an appropriate action plan for the establishment of at least 70% cover.

COMMENTS:

Grass seeding without the application of a light mulch cover is considered the least favourable revegetation technique. A light mulch cover is required to protect the soil from raindrop impact, excessive temperature fluctuations, and the loss of essential soil moisture.

[8] COMMENTS:

All receiving waters can be adversely affected by unnatural quantities of sediment-laden runoff. Freshwater ecosystems are generally more susceptible to ecological harm resulting from the inflow of fine or dispersible clays than saline water bodies. The further inland a land disturbance is, the greater the potential for the released sediment to cause environmental harm as this sediment travels towards the coast.

For the purpose of this clause it is assumed that all sediment-laden runoff will eventually flow into saline waters. Thus, sediment-laden discharges that flow first into freshwater are likely to adversely affect both fresh and saline water bodies and are therefore considered potentially more damaging to the environment.

This clause does **not** imply that sediment-laden runoff will not cause harm to saline waters.

[9] COMMENTS:

This clause refers to subsoils exposed during the construction phase either as a result of past land practices or proposed construction activities. The exposure of subsoils resulting from the excavation of minor service trenches should not be considered.

[10] WARNINGS:

The greater the extent of external catchment, the greater the need to divert up-slope stormwater runoff around any soil disturbance.

COMMENTS:

The ability to separate "clean" (i.e. external catchment) stormwater runoff from "dirty" site runoff can have a significant effect on the size, efficiency and cost of the temporary drainage, erosion, and sediment control measures.

[11] REQUIREMENTS:

Permission must be obtained from the owner of a road reserve before placing any erosion and sediment control measures within the road reserve.

WARNINGS:

Few sediment control techniques work efficiently when placed on a road and/or around roadside stormwater inlets. Great care must be taken if sediment control measures are located on a public roadway, specifically:

- safety issues relating to road users;
- the risk of causing flooding on the road or within private property.

The construction of roads (whether temporary or permanent) will usually modify the flow path of stormwater runoff. This can affect how “dirty” site runoff is directed to the sediment control measures.

COMMENTS:

“On-road” sediment control devices are at best viewed as secondary or supplementary sediment control measures. Only in special cases and/or on very small projects (e.g. kerb and channel replacement) might these controls be considered as the “primary” sediment control measure.

[12] WARNINGS:

Soils with a pH less than 5.5 or greater than 8 will usually require treatment in order to achieve satisfactory revegetation. Soils with a pH of less than 5 (whether naturally acidic or in acid sulfate soil areas) may also limit the choice of chemical flocculants (e.g. Alum) for use in the flocculation of *Sediment Basins*.

[13] REQUIREMENTS:

A preliminary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.



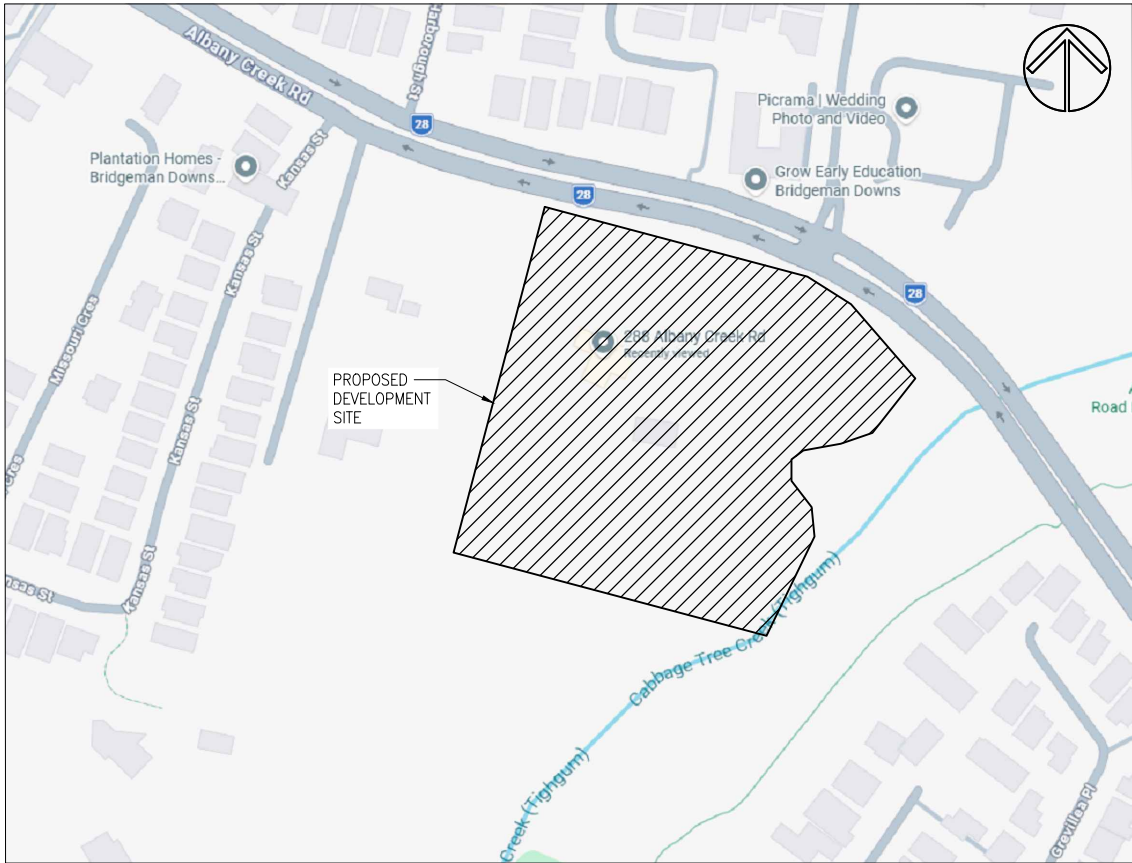
Appendix B – Preliminary Engineering Plans

PROPOSED RESIDENTIAL SUBDIVISION

288 ALBANY CREEK RD, BRIDGEMAN DOWNS

KENNY JAP PROPERTIES P/L

Project Number: B25-083



LOCALITY PLAN
NOT TO SCALE

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WESTERA PARTNERS HAS LIMITED CONTROL OR INPUT TO LOCAL GOVERNMENT OR OTHER LEGISLATED APPROVALS UNLESS SPECIFICALLY ENGAGED BY ITS' CLIENT. ANY CHANGES TO APPROVAL REQUIREMENTS (INCLUDING ORDERS FOR SUSPENSION OF WORKS ETC) SHOULD BE COMMUNICATED TO WESTERA PARTNERS AND ALL OTHER RELEVANT DESIGNERS TO ALLOW ASSESSMENT OF POTENTIAL RISKS AND ENSURE DESIGN AND SAFETY COMPLIANCE.

G2 ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITIES STANDARD DRAWINGS & SPECIFICATIONS AND COMPLETED TO THE SATISFACTION OF THE SUPERINTENDENT AND LOCAL AUTHORITY.

G3 UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.

G4 PRIOR TO THE COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR MUST LOCATE ALL EXISTING SERVICES AND PROMPTLY PROVIDE THE LOCATION DATA TO THE DESIGN ENGINEER TO ASSESS IMPACTS ON THE DESIGN.

G5 ALL CONNECTIONS TO EXISTING SEWERS AND WATER MAINS ARE TO BE CONSTRUCTED BY THE LOCAL AUTHORITY OR AN APPROVED CONTRACTOR. THE CONTRACTOR IS TO ALLOW IN HIS CONTRACT SUM FOR THE COST OF ANY PROPOSED CONNECTIONS.

G6 ALL SEWERS ARE TO BE 150MM DIA. U.P.V.C. CLASS SN8 RUBBER RING JOINTED AND PROPERTY CONNECTIONS ARE TO BE 100MM DIA. U.P.V.C CLASS SN6 UNLESS NOTED OTHERWISE

G7 THE PAVEMENT DEPTHS SHOWN ARE PRELIMINARY ONLY AND ARE TO BE VERIFIED FOLLOWING SUB-SOIL TESTS OF THE SUB-GRADE MATERIAL.

G8 ALL ROOFWATER CONNECTIONS FROM KERB ADAPTERS ARE TO BE 100MM DIA CLASS SN10 AT A MIN GRADE OF 1.0% UNLESS SHOWN OTHERWISE. ROOFWATER CONNECTIONS FROM FIELD INLETS OR GULLY PITS ARE TO BE 150MM DIA CLASS SN8 AT A MIN GRADE OF 1.0% UNLESS NOTED OTHERWISE.

ALL U.P.V.C. STORMWATER DRAINAGE PIPES ARE TO BE CLASS SN8 (U.N.O.)

ALL R.C.P. PIPES ARE TO BE CLASS 3 (U.N.O.)

 < 900ø = USE SPIGOT AND SOCKET JOINED PIPES WITH RUBBER RING JOINTS
 900ø < PIPES < 1050ø = USE FLUSH JOINED PIPES WITH EXTERNAL ELASTOMERIC BAND
 1050ø < PIPES = USE FLUSH JOINED PIPES WITH EXTERNAL ELASTOMERIC BAND AND INTERNAL CEMENT MORTAR JOINT

ALL F.R.C. PIPES ARE TO BE FRCPIPE+ CLASS 4 (U.N.O.) AND SHALL BE DUAL RUBBER RING JOINT WITH COLLAR. PIPES SHALL BE FROM 225ø TO 600ø ONLY.

POLYPROPYLENE/POLYETHYLENE STORMWATER PIPE MINIMUM CLASS SN8 (U.N.O.) SUBJECT TO ACCEPTANCE BY CERTIFYING ENGINEER AND LOCAL AUTHORITY. CONSTRUCTION AND EMBEDMENT TO BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

G10 WATER PIPES SHALL BE;
 - P.V.C.-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 DN32 WATER SERVICES SHALL BE PE80B.

G11 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.

G12 ALL ALLOTMENTS ARE TO BE GRADED AT A MINIMUM GRADE OF 1 IN 200.

C1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600
CONCRETE STRUCTURES CODE AND THE REFERENCED STANDARDS THEREIN.

C2 THE CONCRETE STRENGTH GRADE AND THE COVER TO REINFORCEMENT FOR
THE VARIOUS CONCRETE ELEMENTS SHALL BE AS LISTED BELOW:

— CLIMATE ZONE: TROPICAL TEMPERATE ARID

— LOCATION: COASTAL NEAR COASTAL INLAND

*RIGID FORMWORK & INTENSE COMPACTION

- THE MAXIMUM PERMISSIBLE TRANSPORT TIME FOR CONCRETE BETWEEN BATCHING AND PLACEMENT ON SITE SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE.

AMBIENT AIR TEMPERATURE	MAX. BATCHING TO PLACEMENT TIME
10° - 24°C	120 MINUTES
25° - 27°C	90 MINUTES
28° - 30°C	60 MINUTES
31° - 33°C	45 MINUTES
34° - 36°C	30 MINUTES
37°C+	NO PLACEMENT OF CONCRETE UNLESS CHILLED WATER OR ICE IN MIX

C6 ALL CONCRETE SHALL BE MECHANICALLY VIBRATED. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.

C7 ALL CONCRETE SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH AS1379 ADOPTING THE PROJECT ASSESSMENT METHOD FOR COMPRESSIVE STRENGTH AND SLUMP COMPLIANCE. THE RESULTS OF ALL TESTS SHALL BE PROMPTLY SUBMITTED TO THE ENGINEER FOR REVIEW.

C8 WHEN THE AIR TEMPERATURE EXCEEDS 30°C, ALIPHATIC ALCOHOL SHALL BE APPLIED TO THE CONCRETE SURFACE OF SLABS IMMEDIATELY AFTER THE INITIAL SCREED AND AGAIN AFTER BULL FLOATING.

C9 CURING OF ALL CONCRETE SURFACES SHALL COMMENCE IMMEDIATELY AFTER COMPLETING CONCRETE FINISHING AND SHALL CONTINUE FOR 7 DAYS. CONTRACTOR TO CONFIRM METHOD OF CURING WITH ENGINEER PRIOR TO USE.

C10 SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES

C11 BEAM DEPTHS ARE WRITTEN FIRST AND INCLUDE SLAB THICKNESS, IF ANY.

C12 NO HOLES, CHASES OR EMBEDDED ITEMS OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER. CONDUITS, PIPES ETC. SHALL NOT BE PLACED IN THE COVER THICKNESS OF THE CONCRETE.

C13 WHERE SERVICE PIPES PENETRATE CONCRETE ELEMENTS, PROVISION SHALL BE MADE TO ALLOW FOR MOVEMENT OF THE ELEMENT.

C14 FORMWORK SHALL BE DESIGNED, CONSTRUCTED AND STRIPPED IN ACCORDANCE WITH AS3610 FORMWORK CODE, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

C15 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION OR SCALE.

C16 ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED IN ITS CORRECT POSITION ON PLASTIC BAR CHAIRS, GENERALLY AT NOT GREATER THAN 800mm CENTRES IN BOTH DIRECTIONS.

C17 WELDING AND HEATING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT APPROVAL OF THE ENGINEER.

C18 ALL STEEL REINFORCEMENT IN CONCRETE ELEMENTS SHALL BE INSPECTED BY THE ENGINEER AND PASSED PRIOR TO POURING OF ANY CONCRETE.

C19 LAP REINFORCEMENT ONLY AT LOCATIONS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER.

C20 SLAB FABRIC SHALL BE LAPPED ONE FULL PANEL OF FABRIC PLUS 50mm SO THAT THE TWO OUTERMOST TRANSVERSE WIRES OF ONE SHEET OVERLAP THE TWO OUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED BY 50mm.

C21 BAR REINFORCEMENT SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING TABLE.

ALL CONCRETE SHALL BE MECHANICALLY VIBRATED. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.

ALL CONCRETE SHALL BE SAMPLED AND TESTED IN ACCORDANCE WITH AS1379 ADOPTING THE PROJECT ASSESSMENT METHOD FOR COMPRESSIVE STRENGTH AND SLUMP. COLLECTING THE RESULTS OF ALL TESTS SHALL BE PROMPTLY SUBMITTED TO THE ENGINEER FOR REVIEW.

WHEN THE AIR TEMPERATURE EXCEEDS 30°C, ALIPHATIC ALCOHOL SHALL BE APPLIED TO THE CONCRETE SURFACE OF SLABS IMMEDIATELY AFTER THE INITIAL SCREED AND AGAIN AFTER BULL FLOATING.

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- C11 BEAM DEPTHS ARE WRITTEN FIRST AND INCLUDE SLAB THICKNESS, IF ANY.
- C12 NO HOLES, CHASES OR EMBEDDED ITEMS OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER. CONDUITS, PIPES ETC. SHALL NOT BE PLACED IN THE COVER THICKNESS OF THE CONCRETE.
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- C19 LAP REINFORCEMENT ONLY AT LOCATIONS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER.
- C20 SLAB FABRIC SHALL BE LAPPED ONE FULL PANEL OF FABRIC PLUS 50mm SO THAT THE TWO OUTERMOST TRANSVERSE WIRES OF ONE SHEET OVERLAP THE TWO OUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED BY 50mm.
- C21 BAR REINFORCEMENT SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING TABLE.

WHERE LAPS ARE SHOWN ON THE DRAWINGS THE ABOVE LAP LENGTHS SHALL BE ADOPTED UNLESS NOTED OTHERWISE. WHERE BARS OF DIFFERENT DIAMETER ARE SHOWN LAPPED, ADOPT THE LAP LENGTH APPROPRIATE TO THE SMALLER DIAMETER BAR.

- C22 A VAPOUR BARRIER OF 0.2mm (200um) MINIMUM THICK POLYTHENE SHEET SHALL BE PLACED BENEATH SLABS ON GROUND UNLESS NOTED OTHERWISE.

ASPHALTIC CONCRETE PAVEMENT	
REINFORCED CONCRETE PAVEMENT BROOM FINISH	
R.C PAVEMENT EXPOSED AGGREGATE FINISH	
REINFORCED CONCRETE PATHWAY/CROSSOVER	
TURF	
STONE PITCHING	
CEMENT GROUTED STONE PITCHING	
ENVIRONMENTAL PROTECTION ZONE	
FILTER MEDIA	
TELECOMMUNICATION	
GAS MAIN	
ELECTRICITY OVERHEAD	
ELECTRICITY UNDERGROUND	
LIGHT POLE	
POWER POLE	
PIT (TELSTRA/ELEC)	
EDGE OF BITUMEN	
FENCE	
EXISTING SURFACE LEVEL	
EXISTING CONTOUR MINOR	
EXISTING CONTOUR MAJOR	
DESIGN SURFACE LEVEL	
DESIGN CONTOUR MINOR	
DESIGN CONTOUR MAJOR	
RETAINING WALL	
STAGE BOUNDARY	

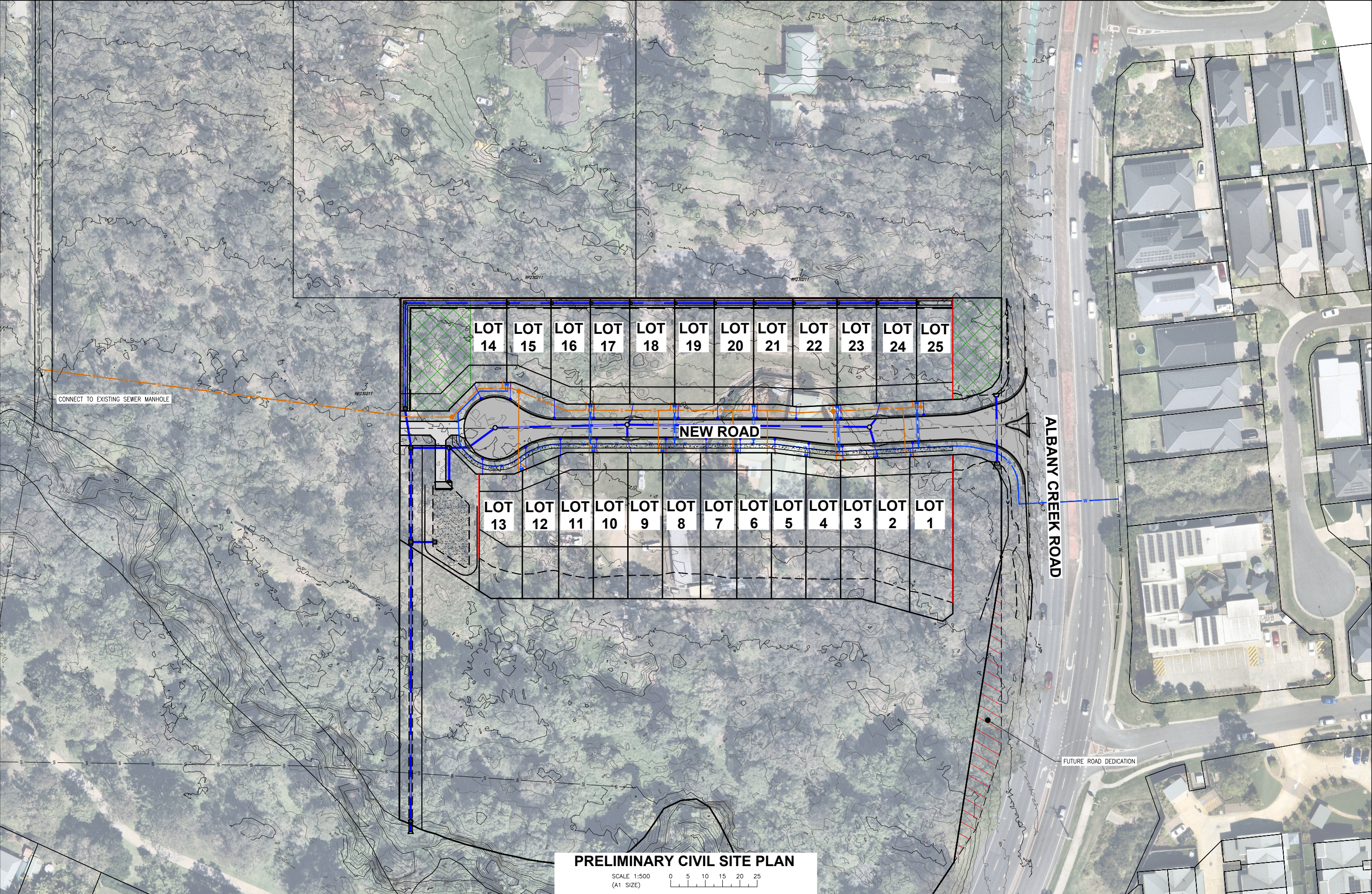
	NEW	EXISTING
STORMWATER PIPE		
SAG GULLY PIT		
ON GRADE GULLY PIT		
MANHOLE		
600 x 600 FIELD INLET		
900 x 600 FIELD INLET		
1050 DIA FIELD INLET		
HEADWALL		
KERB ADAPTER WITH ROOFWATER PIPE		

STORMWATER STRUCTURE LABEL

	NEW	EXISTING	DISUSED
WATER MAIN			
FIRE HYDRANT			
DUAL OUTLET FIRE HYDRANT			
SWABBING DUAL OUTLET FIRE HYDRANT			
SWABBING FIRE HYDRANT			
ISOLATION VALVE			
SCOUR VALVE			
AIR VALVE			
DEAD END			
TEST/CHLORINATION POINT			
REDUCER			
PIPE MATERIAL CHANGE			
WATER SERVICE PRE-TAPPED TEE			
WATER SERVICE PIPE & CONDUIT			
FLOW METER			
FLUSHING POINT			
WATER IRRIGATION			
REDUCE PRESSURE ZONE (RPZ)			

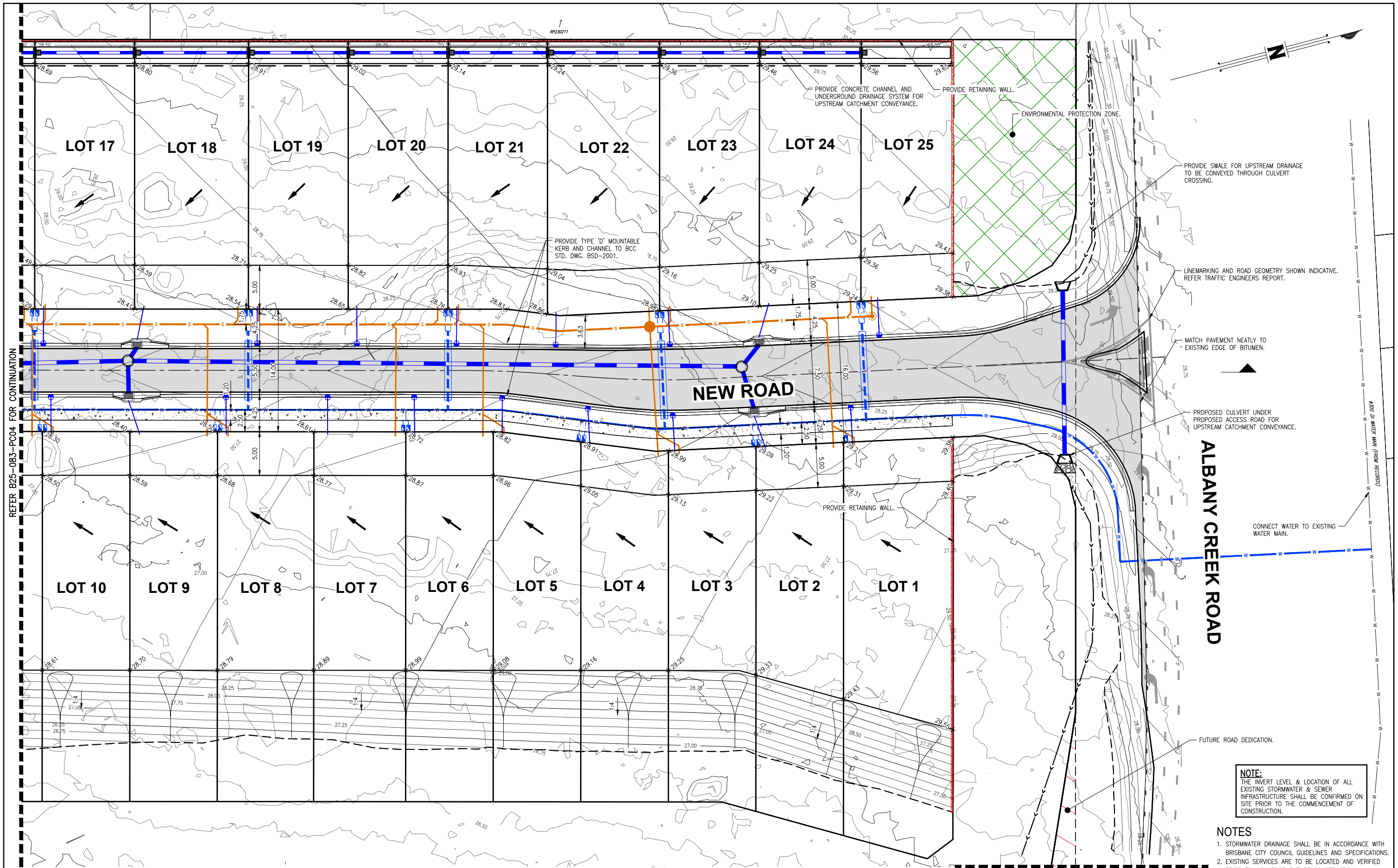
	NEW	EXISTING	DISUSED
GRAVITY SEWER MAIN			
SEWER RISING MAIN			
SEWER VACUUM MAIN			
MAINTENANCE HOLE & END OF LINE			
END OF LINE			
MAINTENANCE SHAFT			
HORIZONTAL/VERTICAL BEND			
COMPOUND BEND			
STUB / TEMPORARY END			
RODDING END			
PROPERTY CONNECTION			
OVERFLOW MAINTENANCE HOLE			
ISOLATION VALVE			
SCOUR VALVE AND CHAMBER			
GAS RELEASE VALVE			
FLUSHING POINT			
DISCHARGE MAINTENANCE HOLE			
NON-RETURN/REFLUX VALVE			
VENT POLE / ODOUR CONTROL UNIT			

B25-083-PC Pre Civil Notes.dwg



PRELIMINARY CIVIL SITE PLAN
SCALE 1:500
(A1 SIZE)

										DESIGNED L.A.B.	 S. ID# 12231, NER 2901822 For and on behalf of WESTERA PARTNERS PTY. LTD.	 WESTERA PARTNERS STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS www.westerapartners.com.au ABN 52 097 417 975	BRISBANE T 07 3852 4333 E: brisbane@westerapartners.com.au GOLD COAST T 07 5571 1599 E: goldcoast@westerapartners.com.au SUNSHINE COAST T 07 5391 3777 E: sunshinecoast@westerapartners.com.au NORTHERN NSW T 02 6674 8047 E: nsw@westerapartners.com.au CENTRAL VICTORIA T 03 5441 0922 E: centralvic@westerapartners.com.au	SURVEYOR DTS PHONE 07 3118 0600 DATE A.H.D. P.M. R.L.	PROJECT LOCATION TITLE CLIENT	PROPOSED RESIDENTIAL SUBDIVISION LOT 2 on RP138914 288 ALBANY CREEK RD, BRIDGEMAN DOWNS PRELIMINARY CIVIL SITE PLAN KENNY JAP PROPERTIES P/L	DRAWING STATUS PRELIMINARY N.F.C. DRAWING NUMBER B25-083-PC02 SHEET NUMBER 02 OF 07 REVISION A
										DRAWN J.L.							
										CHECKED N.D.							
										APPROVED S.J.I.							
A	15.05.26	ISSUE FOR DEVELOPMENT APPROVAL			DATE MAY 2026												
No.	DATE	REVISIONS			DES	DRN	CHK	APD	DOCUMENT CONTROL	APPROVED							

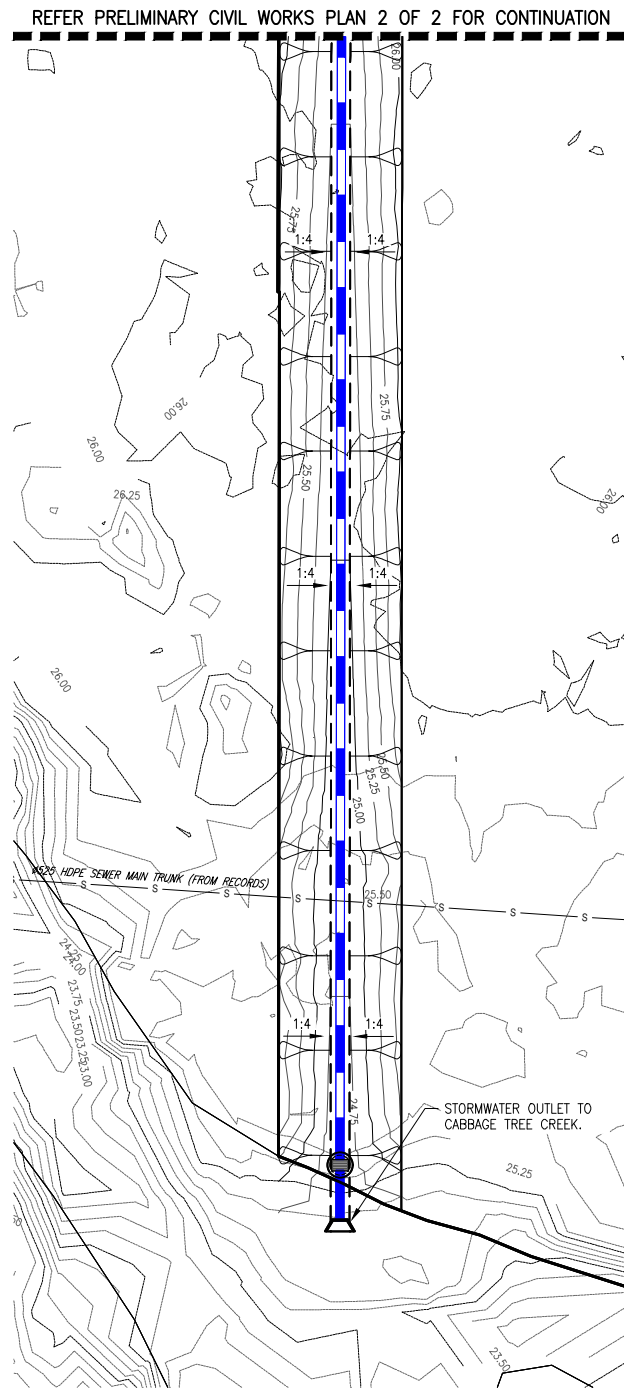


PRELIMINARY CIVIL WORKS PLAN 1 OF 2

SCALE 1:200
(A1 SIZE)

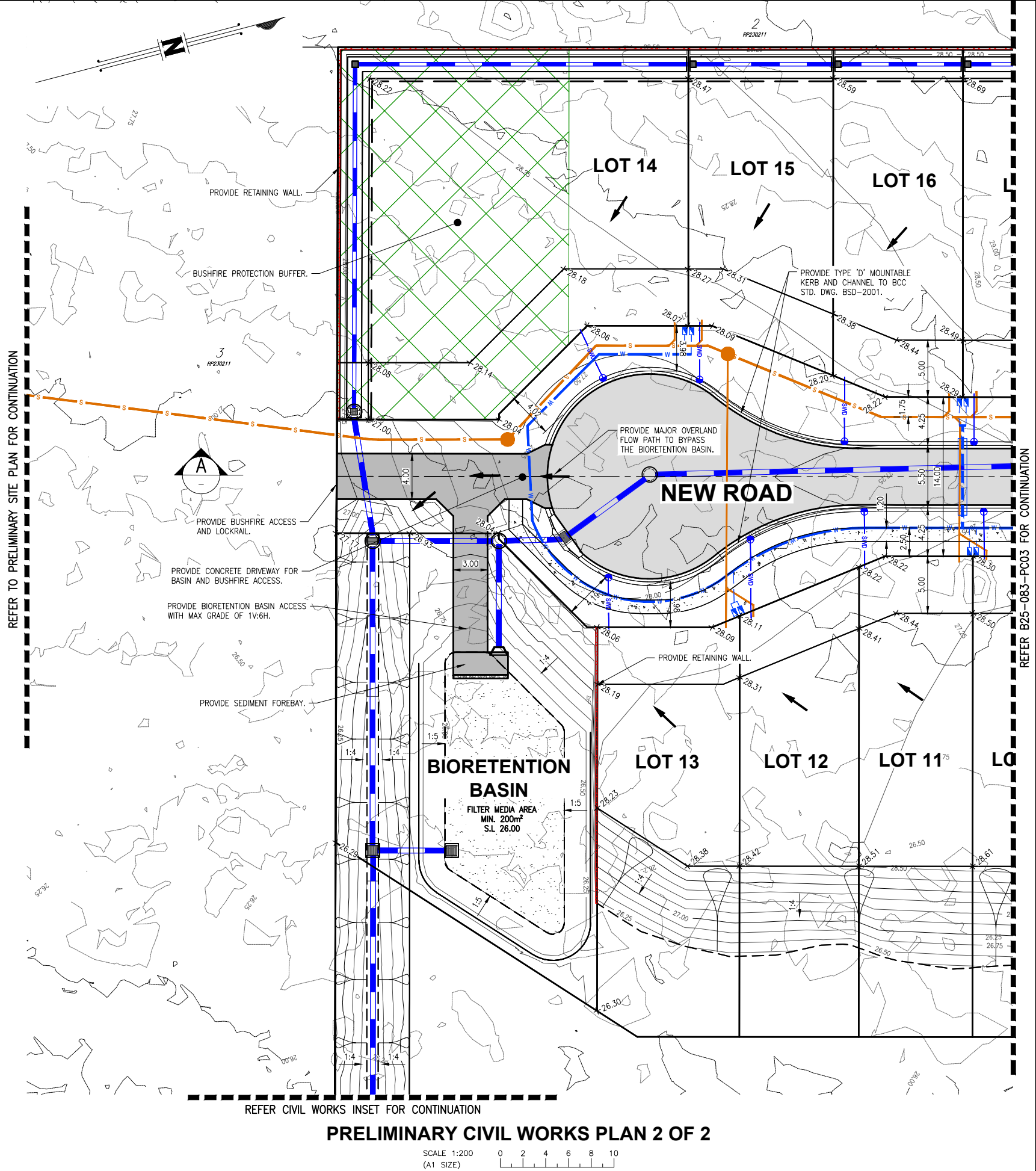
REFER TO PRELIMINARY SITE PLAN FOR CONTINUATION

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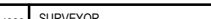
NOTE:
THE INVERT LEVEL & LOCATION OF ALL EXISTING STORMWATER & SEWER INFRASTRUCTURE SHALL BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

- NOTES**
- STORMWATER DRAINAGE SHALL BE IN ACCORDANCE WITH BRISBANE CITY COUNCIL GUIDELINES AND SPECIFICATIONS.
 - EXISTING SERVICES ARE TO BE LOCATED AND VERIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
 - INFORMATION CONTAINED IN THIS DRAWING IS PRELIMINARY ONLY AND SUBJECT TO DETAILED DESIGN INCLUDING BUT NOT LIMITED TO FINISHED LEVELS, PIPE SIZES, ALIGNMENTS AND PIT TYPES AND SIZES.

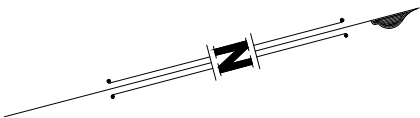
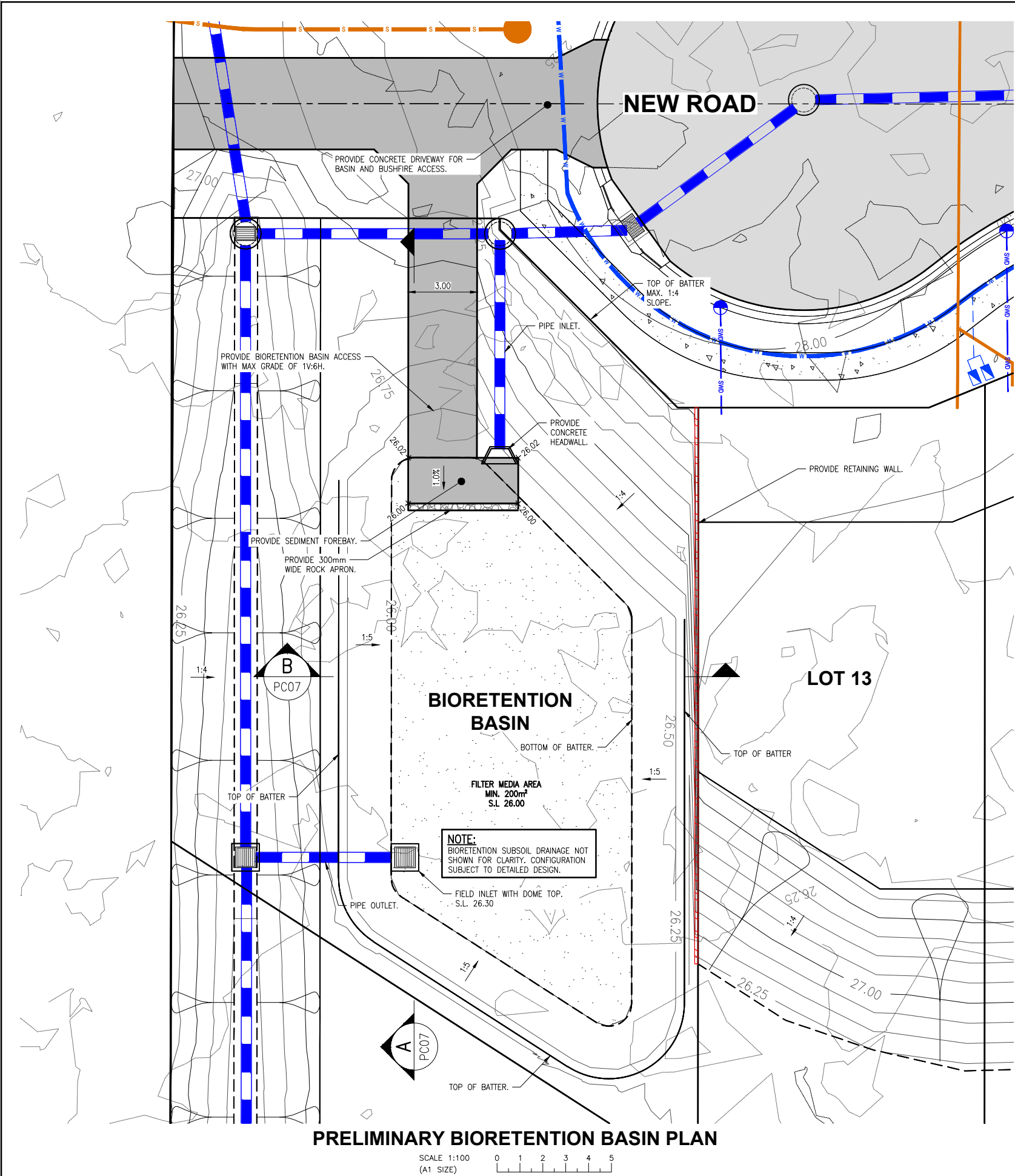


PRELIMINARY CIVIL WORKS PLAN 2 OF 2

SCALE 1:200 (A1 SIZE)

								DESIGNED L.A.B.		 WESTERA PARTNERS STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS www.westerapartners.com.au ABN 52 097 417 975	BRISBANE T 07 3852 4333 E: brisbane@westerapartners.com.au GOLD COAST T 07 5571 1599 E: goldcoast@westerapartners.com.au SUNSHINE COAST T 07 5391 3777 E: sunshinecoast@westerapartners.com.au NORTHERN NSW T 02 6874 8047 E: nsw@westerapartners.com.au CENTRAL VICTORIA T 03 5441 0922 E: centralvic@westerapartners.com.au	SURVEYOR DTS PHONE 07 3118 0600 DATUM A.H.D. P.M. R.L.	PROJECT LOCATION TITLE CLIENT	PROPOSED RESIDENTIAL SUBDIVISION LOT 2 on RP138914 288 ALBANY CREEK RD, BRIDGEMAN DOWNS PRELIMINARY CIVIL WORKS PLAN 2 of 2 KENNY JAP PROPERTIES P/L	DRAWING STATUS PRELIMINARY N.F.C.	
				DRAWN J.L.				DRAWING NUMBER B25-083-PC04								
				CHECKED N.D.												
				APPROVED S.J.J.												
A	15.05.26	ISSUE FOR DEVELOPMENT APPROVAL				L.A.B.	J.L.	N.D.	S.J.J.	DATE MAY 2026	S. IDE RPEC 12231, NER 2901822 For and on behalf of WESTERA PARTNERS PTY. LTD.					
No.	DATE	REVISIONS				DES	DRN	CHK	APD	DOCUMENT CONTROL	APPROVED					

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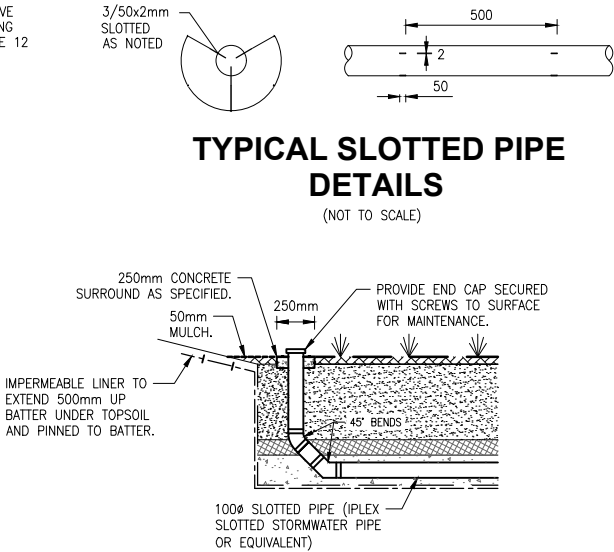
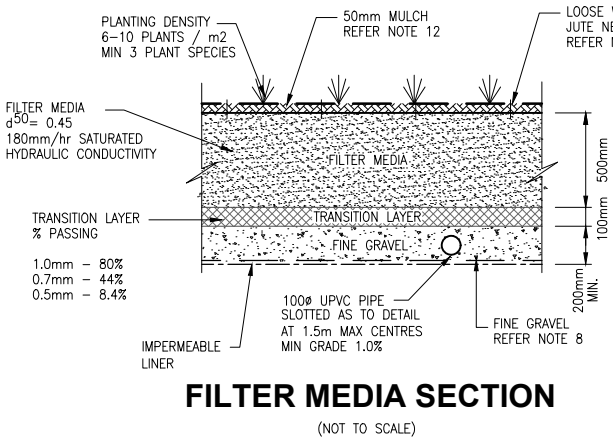


BIO-RETENTION NOTES

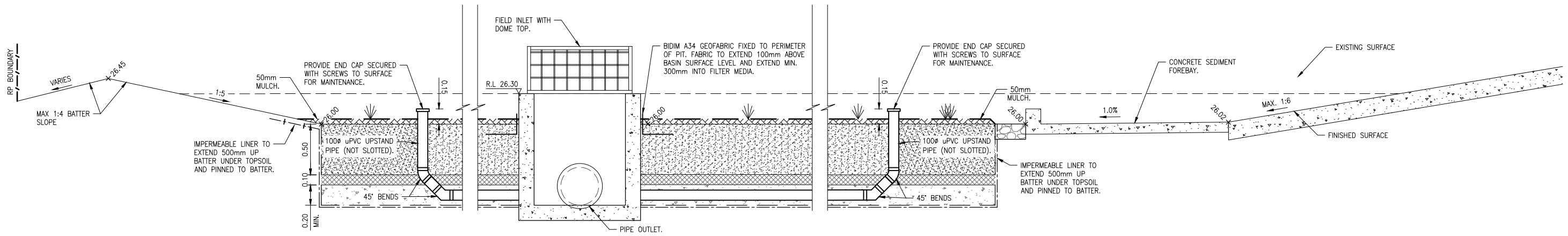
- 1. PLEASE ASK IF THERE ARE ANY DOUBTS REGARDING DETAILS SUPPLIED ON THIS DRAWING.
- 2. GENERAL CONSTRUCTION AND PROCUREMENT CONSIDERATIONS SHALL COMPLY WITH THE LATEST VERSION OF THE HEALTHY WATERWAYS GUIDELINE FOR CONSTRUCTION AND ESTABLISHMENT OF VEGETATED STORMWATER MANAGEMENT SYSTEMS. WHERE CONFLICT EXISTS BETWEEN THE GUIDELINE AND THE SPECIFICATIONS ON THIS DRAWING THE SPECIFICATIONS ON THIS DRAWING SHALL BE FOLLOWED.
- 3. THE HYDRAULIC CONDUCTIVITY OF POTENTIAL FILTER MEDIA SHOULD BE MEASURED USING THE ASTM F1815-06 METHOD. TESTING SHOULD BE UNDERTAKEN AT LEAST
 - (i) ONE MONTH FOLLOWING COMMENCEMENT OF OPERATION
 - (ii) IN THE SECOND YEAR OF OPERATIONTESTING SHOULD BE CHECKED AT A MINIMUM OF THREE POINTS WITHIN THE SYSTEM.
- 4. THE FOLLOWING PARTICLE SIZE DISTRIBUTION FOR FILTER MEDIA IS A GUIDE FOR SELECTING AN APPROPRIATE MATERIAL

CLAY & SILT	< 3%	(<0.05mm)
VERY FINE SAND	5-30%	(<0.05 - 0.15mm)
FINE SAND	10-30%	(<0.15 - 0.25mm)
MEDIUM TO COARSE SAND	40-60%	(<0.25 - 1.0mm)
COARSE SAND	7-10%	(<1.0 - 2.0mm)
FINE GRAVEL	< 3%	(<2.0 - 3.4mm)

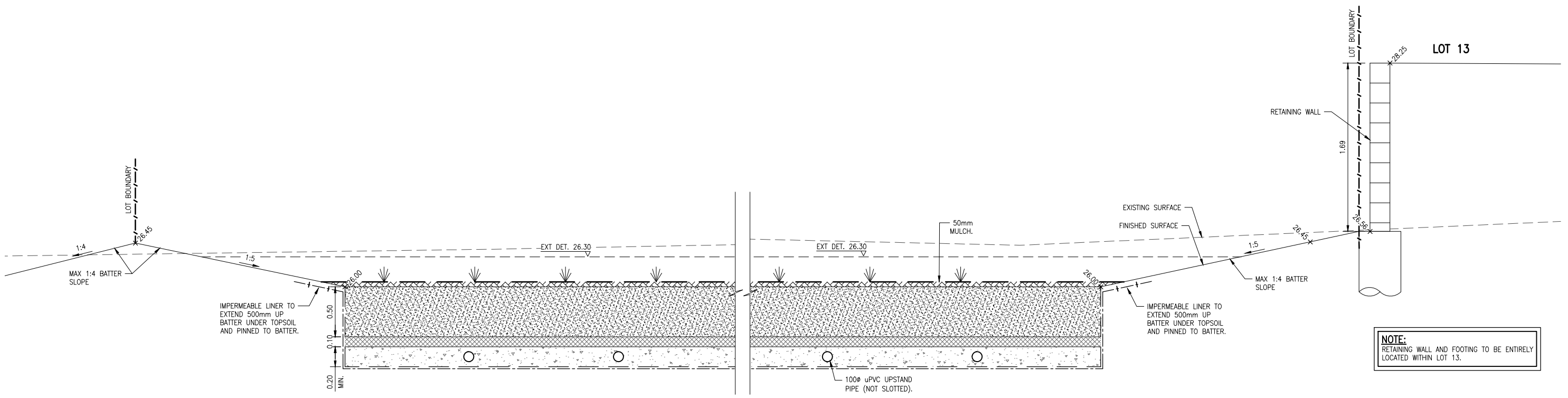
THE FILTER MEDIA SHOULD BE WELL GRADED ie, IT SHOULD HAVE ALL PARTICLE SIZE RANGES PRESENT FROM THE 0.075mm TO THE 4.75mm. THERE SHOULD BE NO GAP IN THE PARTICLE SIZE GRADING, AND THE COMPOSITION SHOULD NOT BE DOMINATED BY A SMALL PARTICLE SIZE RANGE.
- 5. SOIL PROPERTIES AS4419-2003 (SOILS FOR LANDSCAPING & GARDEN USE) FILTER MEDIA THAT DOES NOT MEET THE FOLLOWING SPECIFICATION WILL BE REJECTED :
 - i) ORGANIC MATTER CONTENT - LESS THAN 5 % (w/w)
 - ii) PH - 5.5 - 7.5
 - iii) ELECTRICAL CONDUCTIVITY (E/C) - < 1.2dS/m
 - iv) PHOSPHORUS < 400mg/kg
 - v) ORTHOPHOSPHATE < 30mg/kg
- 6. POTENTIAL FILTER MEDIA SHOULD BE ASSESSED BY A HORTICULTURALIST TO ENSURE THAT THEY ARE CAPABLE OF SUPPORTING A HEALTHY VEGETATION COMMUNITY.
- 7. THE TRANSITION LAYER MATERIAL IS TO BE A CLEAN WELL GRADED SAND/COARSE SAND MATERIAL CONTAINING LITTLE OR NO FINES.
- 8. THE DRAINAGE LAYER IS TO BE CLEAN, FINE GRAVEL, SUCH AS 2-5mm WASHED SCREENINGS.
- 9. THE FILTER MATERIAL IS TO BE LIGHTLY COMPACTED DURING INSTALLATION TO PREVENT MIGRATION OF FINE PARTICLES. IN SMALL SYSTEMS, A SINGLE PASS WITH A VIBRATING PLATE, WHILE IN LARGE SYSTEMS A SINGLE PASS WITH A ROLLER MACHINERY (eg. A DRUM LAWN ROLLER) WILL BE ADEQUATE. FILTER MEDIA SHOULD BE INSTALLED IN TWO LIFTS UNLESS THE DEPTH IS LESS THAN 500mm
- 10. FILTER MEDIA SHALL COMPLY WITH THE LATEST VERSION OF THE FAWB GUIDELINES FOR SOIL FILTER MEDIA IN BIO-RETENTION SYSTEMS. WHERE CONFLICT EXISTS BETWEEN THE FAWB GUIDELINE AND THE SPECIFICATIONS ON THIS DRAWING THE SPECIFICATIONS ON THIS DRAWING SHALL BE FOLLOWED.
- 11. LANDSCAPING, SUCH AS PLANTING AND MULCH SHALL COMPLY WITH THE LATEST VERSION OF THE HEALTHY WATERWAYS GUIDELINE FOR CONSTRUCTION AND ESTABLISHMENT OF VEGETATED STORMWATER MANAGEMENT SYSTEMS. PLANT SPECIES AND CHARACTERISTICS MUST BE IN ACCORDANCE WITH APPENDIX A- PLANT SELECTION FRO WSUD SYSTEMS, OF THE WSUD TECHNICAL DESIGN GUIDELINES FOR SOUTH EAST QUEENSLAND VERSION 1 JUNE 2006.
- 12. MULCH SHALL BE ORGANIC FRILABLE MULCH THAT DEGRADES WITHIN 6 MONTHS EG. FINE SUGAR CANE OR TEA TREE MULCH. MULCH TYPE TO BE CONFIRMED WITH DESIGNER PRIOR TO PROCUREMENT OR INSTALLATION. THE MULCH SHALL BE PINNED DOWN WITH LOOSE WEAVE JUTE NETTING AND PINNED AT NOT MORE THAN 500mm CENTRES. HEAVY DUTY MATTING EG. 500gsm JUTE MAT, SHALL BE AVOIDED.
- 13. THE BIO-RETENTION BASIN SHALL BE PROTECTED WITH GEOTEXTILE, 75mm TOPSOIL AND TURF FOR AT LEAST 12 MONTHS AND UNTIL 80% OF HOUSES HAVE BEEN CONSTRUCTED. THE PROTECTION IS THEN TO BE REMOVED, PLANTED OUT AND MAINTAINED FOR A FURTHER 12 MONTHS.



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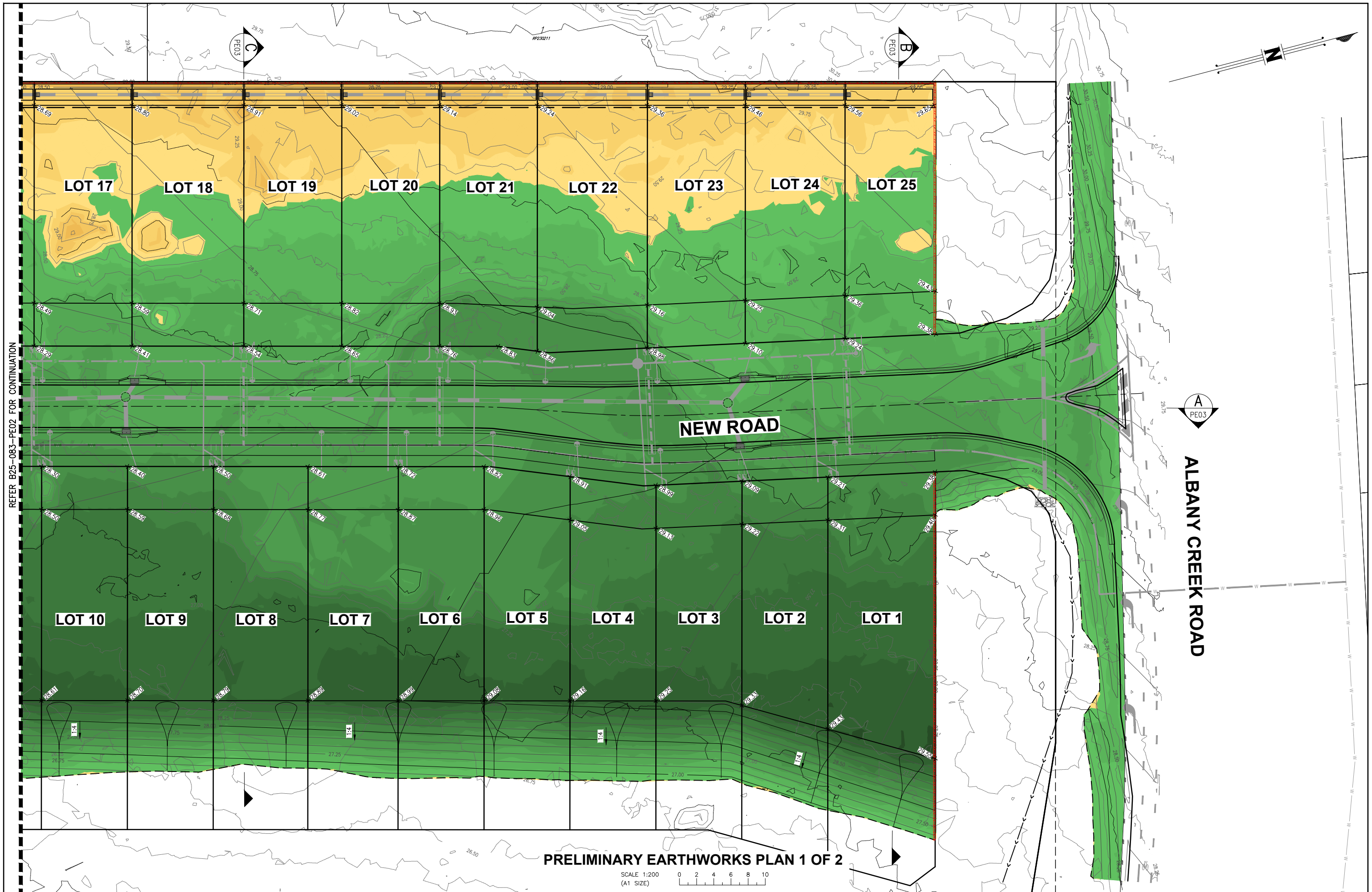
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EARTHWORKS LEGEND

DEPTH OF CUT TABLE	DEPTH OF FILL TABLE
0.0m to -0.25m	0.0m to 0.25m
-0.25m to -0.5m	0.25m to 0.5m
-0.5m to -0.75m	0.5m to 0.75m
-0.75m to -1.0m	0.75m to 1.0m
-1.0m to -1.25m	1.0m to 1.25m
-1.25m to -1.5m	1.25m to 1.5m
-1.5m to -1.75m	1.5m to 1.75m
-1.75m to -2.0m	1.75m to 2.0m
-2.0m to -2.25m	2.0m to 2.25m
-2.25m to -2.5m	2.25m to 2.5m
> -2.5m	> 2.5m

EARTHWORKS SUMMARY

AREA OF FILL - 10,672 m²
AREA OF CUT - 3,795 m²
VOLUME OF FILL - 10,540 m³
VOLUME OF CUT - 988 m³

THE EARTHWORKS SHADING SHOWN IS INDICATIVE NET FIGURES ONLY BETWEEN EXISTING SURFACE LEVEL AND FINISHED SURFACE LEVEL AND DO NOT ALLOW FOR DEMOLITION WORKS, STRIPPING OF TOPSOIL, UNSUITABLE MATERIAL AND VEGETATION OR COMPACTION LOSSES.

PAVEMENT LEVELS ARE SHOWN AS F.S.L.
LOT LEVELS ARE SHOWN AS F.S.L.
BATTER LEVELS ARE SHOWN AS F.S.L.

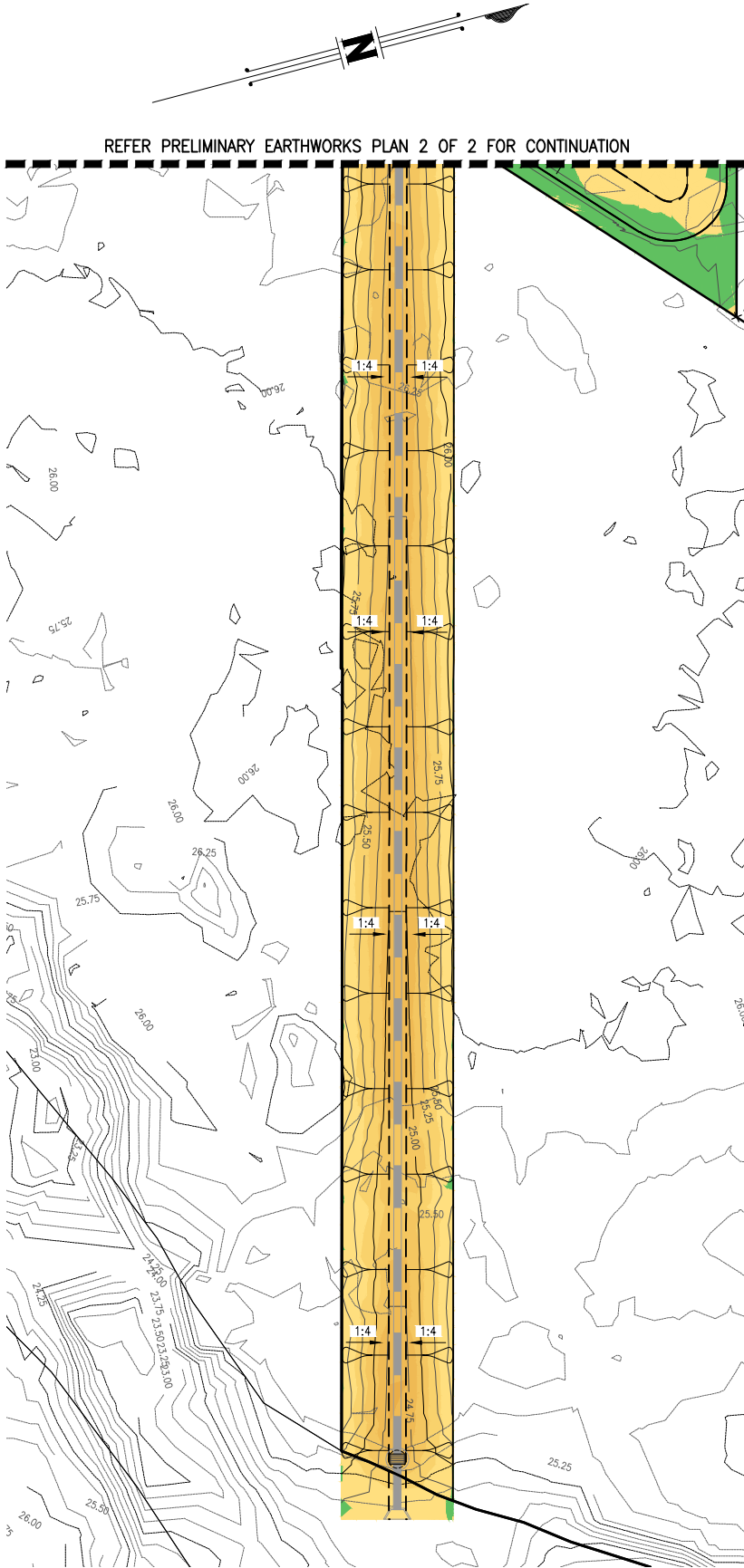
EARTHWORKS NOTES

- IN CASE OF DOUBT - ASK!
- ALL LEVELS TO AHD, DIMENSIONS IN METERS U.N.O
- ALL LIAISON WITH LOCAL, STATE & STATUTORY AUTHORITIES IS THE CONTRACTOR'S RESPONSIBILITY.
- THE LOCATION OF EXISTING SERVICES IS FOR CONTRACTOR'S INFORMATION ONLY, THE LOCATION OF SERVICES WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
- ANY DAMAGE CAUSED TO THE EXISTING SERVICE WILL BE MADE GOOD AT THE CONTRACTOR'S EXPENSE.
- EARTHWORKS PROCEDURES ARE TO BE CARRIED OUT IN ACCORDANCE WITH AS 3798 - 2007 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS".
- EARTHWORKS OPERATIONS ARE TO BE CARRIED OUT IN GENERAL ACCORDANCE WITH THE GEOTECHNICAL REPORT.
- WORKS NOT SPECIFICALLY REFERRED TO, ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE GENERAL DRAWINGS AND SPECIFICATIONS OF THE LOCAL AUTHORITY.
- THE CONTRACTOR IS TO ALLOW FOR ALL FEES AND HAULAGE COSTS ASSOCIATED WITH DISPOSAL OF MATERIAL FROM THE SITE.
- ALL COSTS ASSOCIATED WITH NOISE AND DUST SUPPRESSION FOR SITE WORKS ARE DEEMED THE CONTRACTOR'S RESPONSIBILITY.
- COMPACTION STANDARDS
 - MINIMUM RELATIVE COMPACTIONS TO AS 3798 TABLE 5.1
 - MODIFIED TO AS 1289 TEST 5.2.1
 - STANDARD TO AS 1289 TEST 5.1.1
- PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR WILL PROVIDE SCOUR AND EROSION PROTECTION INCLUDING PROVISION OF SILT TRAPS AND FENCES TO MINIMISE DEPOSITION OF MATERIAL DOWNSTREAM OF THE PROPERTY.
- NO BLASTING WILL BE PERMITTED.
- THE LOCATION OF THE SITE SHEDS, SITE OFFICE AND AMENITIES BUILDING WILL BE LOCATED TO SUIT TEMPORARY UTILITY SERVICES OR AS AGREED WITH THE MANAGER.
- TESTING FREQUENCY AS 3798 - 2007 SECTION 8.0 OR AS APPROVED BY THE GEOTECHNICAL ENGINEER.
- 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 MANAGER.
- THE LOCATION OF TEMPORARY STOCKPILES DURING CONSTRUCTION IS TO BE AGREED WITH THE MANAGER.

NOTE:
TEMPORARY EXCAVATIONS ARE TO BE SUPERVISED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.

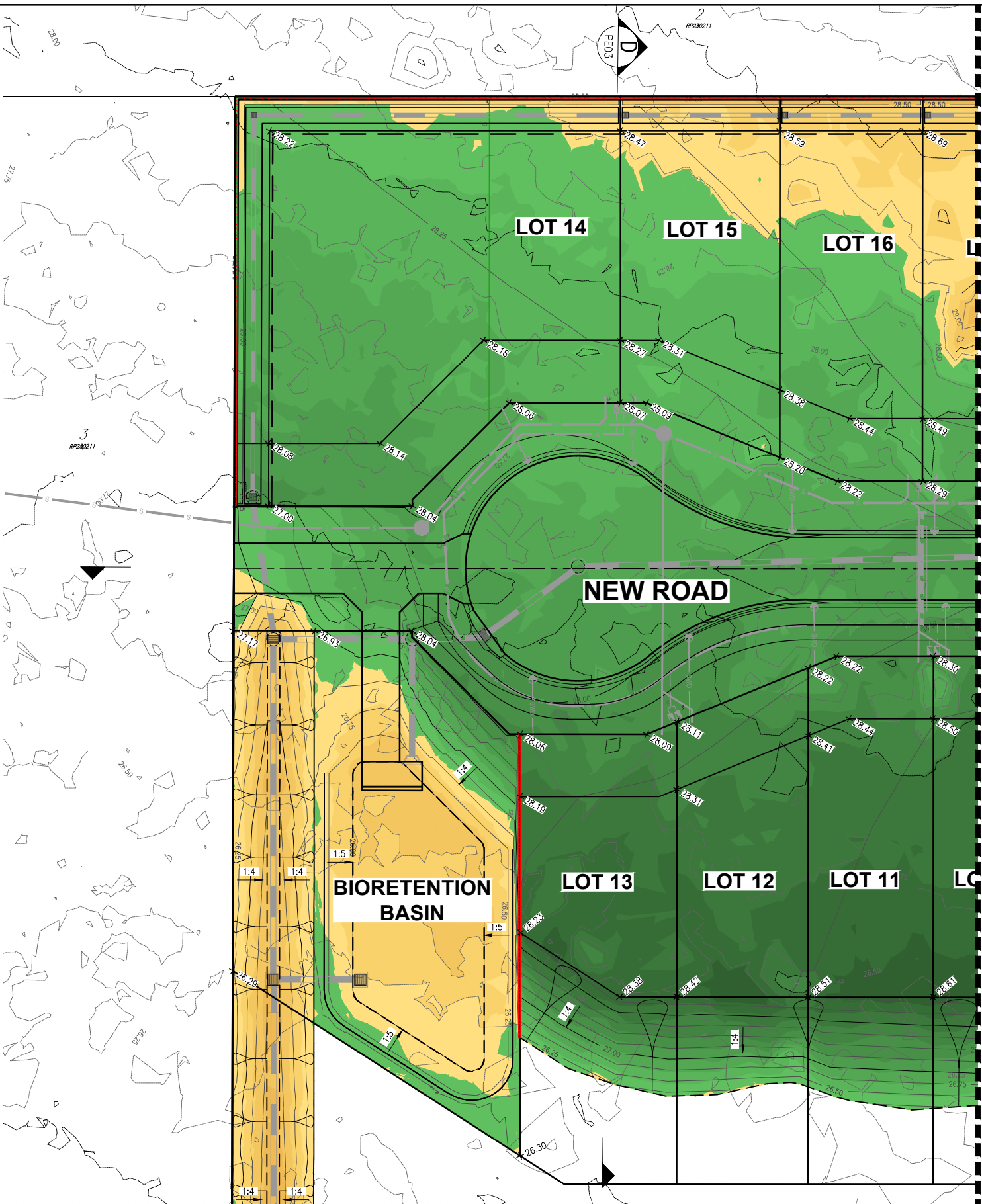
ALL RETAINING WALLS LOCATED WITHIN THE SITE TO STABILISE CUT ARE TO BE WHOLLY WITHIN THE PROPERTY BOUNDARY INCLUDING ALL ASSOCIATED FOOTINGS AND SUB-SOIL DRAINAGE.

CONTRACTOR TO USE EXCAVATION TECHNIQUE THAT WILL PREVENT SUBSIDANCE WITHIN NEIGHBOURING PROPERTIES IN ACCORDANCE WITH GEOTECHNICAL ENGINEERS REPORT AND ADVICE ON SITE.



EARTHWORKS INSET

SCALE 1:200
(A1 SIZE)

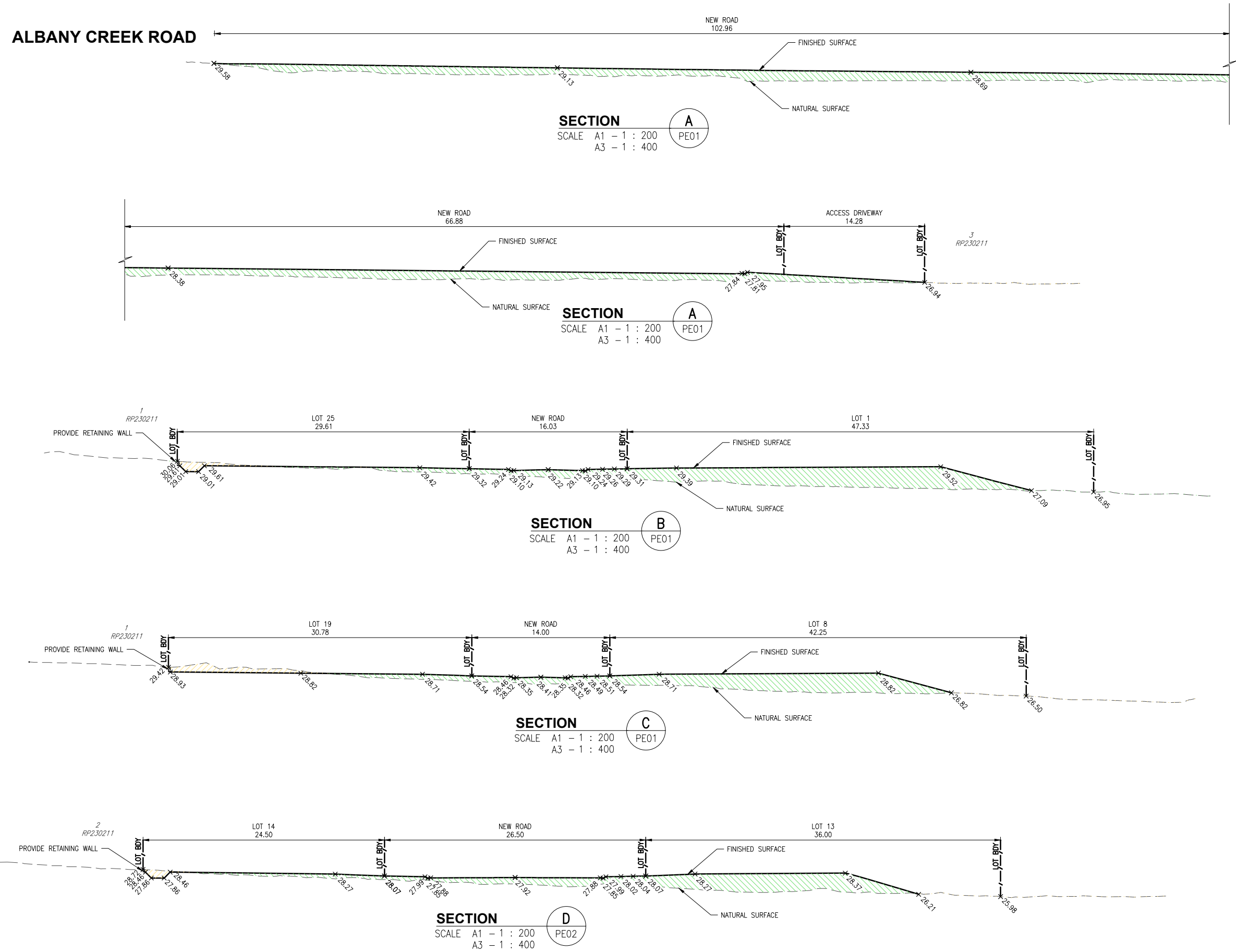


PRELIMINARY EARTHWORKS PLAN 2 OF 2

SCALE 1:200
(A1 SIZE)

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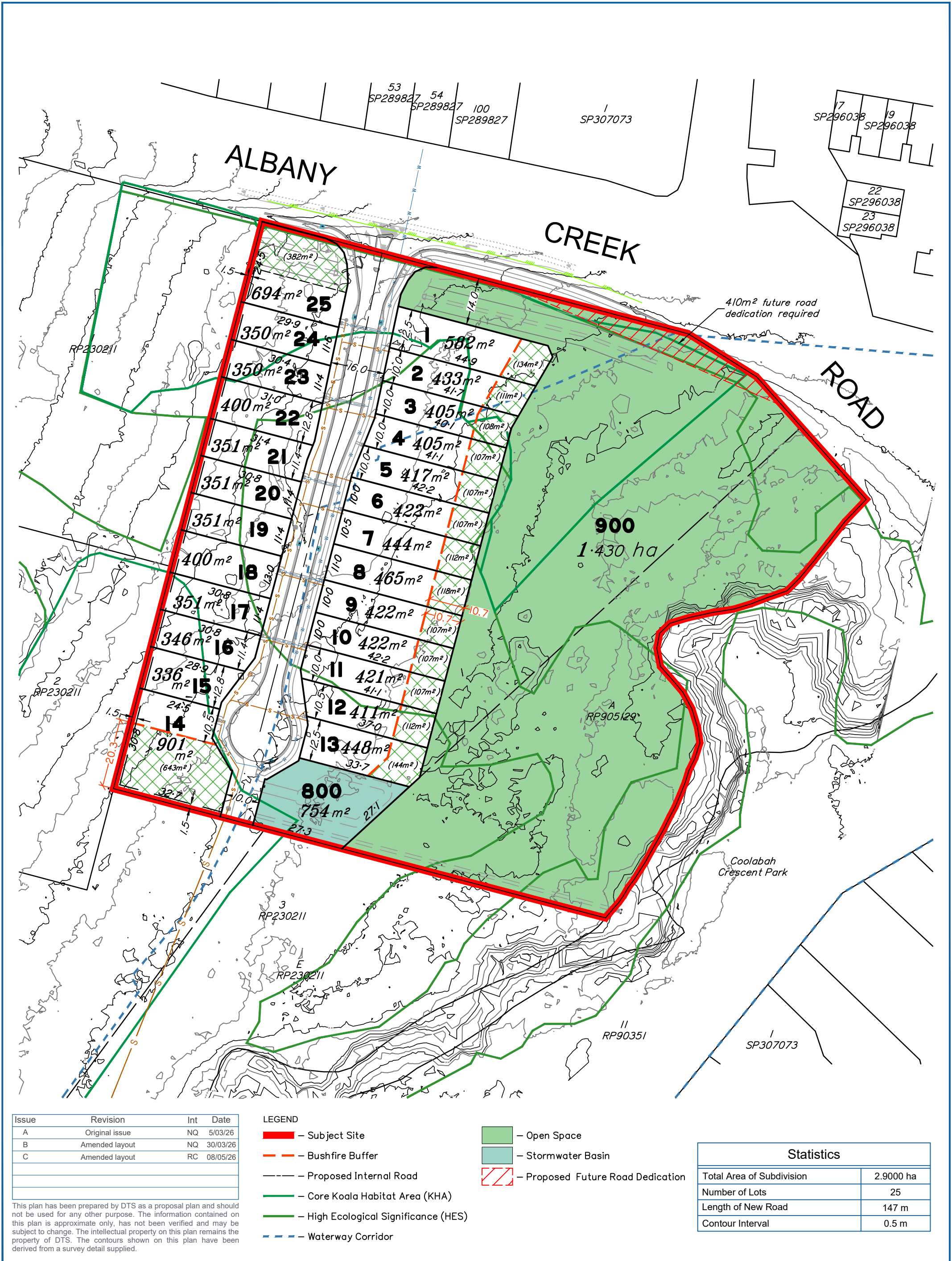
ALBANY CREEK ROAD



				DESIGNED L.A.B.	 S. IDE RPEG 12231, NER 2901822 For and on behalf of WESTERA PARTNERS PTY. LTD.	 WESTERA PARTNERS STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS www.westerapartners.com.au ABN 52 097 417 975	BRISBANE T 07 3852 4333 E: brisbane@westerapartners.com.au GOLD COAST T 07 5571 1599 E: goldcoast@westerapartners.com.au SUNSHINE COAST T 07 5391 3777 E: sunshinecoast@westerapartners.com.au NORTHERN NSW T 02 6674 8047 E: nsw@westerapartners.com.au CENTRAL VICTORIA T 03 5441 0922 E: centralvic@westerapartners.com.au	SURVEYOR DTS PHONE 07 3118 0600 DATE 15.05.26 15.05.26 15.05.26 15.05.26	DATUM A.H.D. P.M. R.L.	PROJECT LOCATION TITLE CLIENT	PROPOSED RESIDENTIAL SUBDIVISION LOT 2 on RP138914 288 ALBANY CREEK RD, BRIDGEMAN DOWNS PRELIMINARY EARTHWORKS SECTIONS KENNY JAP PROPERTIES P/L	DRAWING STATUS PRELIMINARY N.F.C. DRAWING NUMBER B25-083-PE03 SHEET NUMBER 03 OF 03 REVISION A
				DRAWN J.L.								
				CHECKED N.D.								
				APPROVED S.J.I.								
A 15.05.26 ISSUE FOR DEVELOPMENT APPROVAL				DES DRN CHK APD	DATE MAY 2026	DOCUMENT CONTROL	APPROVED					
No.	DATE	REVISIONS		DES	DRN	CHK	APD					



Appendix C – Detailed Survey and Subdivision Layout





Appendix D – FloodWise Property Report

FloodWise Property Report

288 ALBANY CREEK RD, BRIDGEMAN DOWNS 4035
Lot 2 on RP138914



Dedicated to a better Brisbane

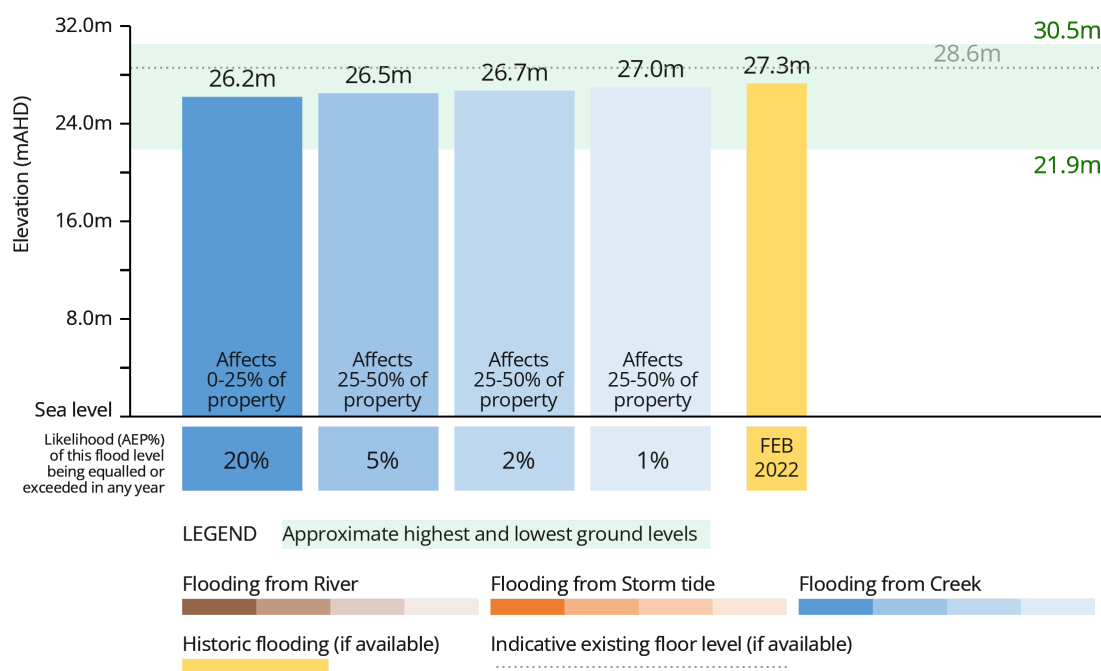
THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report provides technical flood planning information including estimated flood levels, habitable floor level requirements and more. This report uses the adopted flood planning information in Brisbane City Plan 2014, that guides how land in Brisbane is used and developed for the future. Find out more about [planning and building](#). To understand how to be resilient and prepare for floods, visit Council's [Be Prepared](#) webpage. Find more information about [how to read a FloodWise Property Report](#).

Graph showing only the highest source/type of flooding for 1%, 2%, 5% and 20% likelihoods. Also shows historic flood levels.

Other flood types and levels may be present and will be listed in the Flood Planning Information table below. This graph does not include overland flow flooding. If applicable, overland flow information is shown in the Planning and Development Information section below.

NOTE: See Useful Definitions section to explain terminology.



Combined 1% AEP for river, creek and storm tide flood extent (if applicable) from the adopted Brisbane City Plan 2014.

Read more about [Brisbane City Plan 2014](#).



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Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at brisbane.qld.gov.au/beprepared
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies
000 Police/fire/ambulance
(mobiles **000** and **112**)

State Emergency Service (SES) **132 500**
Energex **13 19 62**
Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about [planning and building](#) in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Property Information Summary

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

Property Summary	Level (mAHD) / Comment	Data Quality Code
Minimum ground level	21.9	C
Maximum ground level	30.5	C
Indicative existing floor level	28.6	C
Source of highest flooding	Creek/Waterway	

Flood Planning Information

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning and Development Information section below for further information.

Note this table does not include overland flow. If overland flow is applicable to this property, refer to the Flood Planning and Development section below for further information.

Likelihood / Description	Level (mAHD)	Source
20%	26.2	Creek/Waterway (Cabbage Tree Creek)
5%	26.5	Creek/Waterway (Cabbage Tree Creek)
2%	26.7	Creek/Waterway (Cabbage Tree Creek)
1%	27.0	Creek/Waterway (Cabbage Tree Creek)
0.2%	27.1	Creek/Waterway (Cabbage Tree Creek)
February 2022	27.3	River (Brisbane River and Creeks/Waterways)
Minimum Habitable Floor Level (dwelling house)	N/A*	

* Council may not have this data available. Customers are recommended to engage a Registered Professional Engineer of QLD (RPEQ) for further advice. For information on seeking Planning Advice, please visit www.brisbane.qld.gov.au/planning-and-building.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in [Council's planning scheme](#).

Flood planning areas (FPA)		
River	Creek / waterway	Overland flow
	FPA1	Not Applicable
	FPA2	
	FPA3	
	FPA4	
	FPA5	

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review [Council's Flood Planning Provisions](#).

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's [planning scheme](#).

Coastal hazard overlay sub-categories
There are currently no Coastal hazard overlay sub-categories that apply to this property.

Note: Where land is identified within one for more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags

Waterway corridor - This property may also be located within a mapped waterway corridor as identified in the Waterway corridors overlay map of Council's planning scheme. Please consider this in conjunction with Council's planning scheme requirements.

Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site.

For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of Brisbane City Plan 2014 Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. [Find more information here.](#)

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan 2014.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building (excluding apartments). The data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit [Brisbane City Council's Flood Information Hub](#)

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes include:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The Brisbane City Plan 2014 (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disdains any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.