

95-115 Koplick Road, Park Ridge

Koplick Developments No. 2 Pty Ltd

Engineering Services Report

23-0181ESR-V01

8 August 2023

Commercial in Confidence

This document is commercial-in-confidence. The recipient of this document agrees to hold all information presented within as confidential and agree not to use or disclose or allow to use or disclosure of the said information to unauthorized parties, directly or indirectly, irrespective of the acceptance or rejection of the presentation or at any time before, during or after an agreement has been reached, without prior written consent.

This report is prepared by Colliers | Engineering & Design for exclusive use by its client only. No responsibility is accepted for the use of or reliance upon this report in whole or in part by any third party.

Limitations

The sole purpose of this report and the associated services performed by Colliers | Engineering & Design is to display information in accordance with the scope of services set out in the contract/quotation between Colliers | Engineering & Design and its client. The scope of works and services were defined by the requests of the client, by the time and budgetary constraints imposed by the client, and by the availability of access to site/s and information.

This report is prepared with information supplied by the client and possibly others which is presumed to be accurate and complete. No responsibility is accepted for information that is withheld, incorrect or that is inaccurate, nor for changes to the conditions over the passage of time or from latent circumstance or conditions. No warranty or guarantee is made in relation to the data, findings and conclusions expressed in this report.

This report has been compiled at the level of detail specified in the report and no responsibility is accepted for interpretations made at more detailed levels than so indicated.

Report Contact:

Name:	Troy Schultz
Position	Manager - Gold Coast
Phone:	(07) 3532 1300

Document Control

Report Number

Version	Date	Details	Prepared	Checked	Approved
V01	08/08/2023	Issued for Approval	AS	TS	TS

Table of Contents

1. Introduction 1
2. Earthworks 2
3. Sediment & Erosion Control 2
4. Roadworks 3
5. Sewerage Reticulation 3
6. Water Supply 4
7. Stormwater Quality & Quantity 5
8. Utilities 5
9. Conclusion 5

List of Figures

Figure 1: Site Location 1

Appendices

Appendix A Code Responses
Appendix B Concept Engineering Drawings
Appendix C Stormwater Management Plan

1. Introduction

Colliers Engineering & Design has been engaged by Koplick Developments No. 2 Pty Ltd to prepare this Civil Engineering Services Report to support the DA submission for a residential subdivision at 95-115 Koplick Road, Park Ridge on land described as Lots 13 and 14 on RP 135029 and as shown below:



Figure 1: Site Location

This report covers the following civil infrastructure:

- Earthworks
- Sediment and Erosion Control
- Roadworks
- Sewerage Reticulation
- Water Supply
- Stormwater Quality and Quantity
- Utilities

This report will confirm that the proposed development can be adequately serviced and comply with the Logan City Council Planning Scheme where relevant, Queensland Streets, Australian Standards and other relevant guidelines where appropriate.

2. Earthworks

The development will consist of civil earthworks in accordance with AS3798-2007. Topsoil is to be stripped from the majority of the development area and used on-site where possible. Any material requiring disposal from site will be disposed of at a Council approved location in a lawful manner with acceptable haul routes to be determined at the time of construction.

The site slopes average at approximately 3-7% from the east and west boundaries to the existing overland flow path within the site that falls from the north to the south. There are a number of existing dams that are located within the proposed overland flow path/detention basin, all dams will be removed with the proposed regrading of the site in accordance with AS3798-2007.

Earthworks and retaining works are required to facilitate the proposed development. The proposed earthworks are outlined in **Appendix B** (Drawings 23-0181-P101 to 23-0181-P105 inclusive) demonstrating how the topography is appropriately addressed through sound engineering practises.

Due to the sloping nature of the site, retaining is proposed to facilitate the development. Retaining in a single terrace is proposed up to 2.0m, this is considered reasonable to address the site constraints. Where retaining is proposed greater than 2.0m, tiering is proposed. Refer Drawing Number 23-0181-P103 to 23-0181-P105 for typical retaining wall details and site sections. Due to the locations of the proposed walls, it is not envisaged that these provide any adverse impacts on visual amenity to the area.

On balance, given the topography of the site it is considered that the above is a sensible overall outcome. Appropriate treatment to the proposed retaining (planting/fencing) could be appropriately conditioned if necessary.

The bulk earthworks and retaining walls will be formalised through the detailed design phase as necessary.

3. Sediment & Erosion Control

Sediment and erosion control will generally comprise of clean and dirty water diversion drains, temporary sediment basin as appropriate, silt fences, early stabilisation of disturbed areas where possible and other control measures as appropriate and/or required to meet Logan City Council requirements.

Detail design of the sediment and erosion control strategy will be submitted at the Operational Works/Building Application phase. The civil works undertaken by the contractor will implement a site management plan to incorporate and achieve compliance with the sediment and erosion control strategy at the time of construction.

4. Roadworks

The development is proposed to be accessed via Beaumont East and Koplick Roads. These roads are proposed to be upgraded on the development side to a modified Urban Access Road for Beaumont East Road and an Urban Collector Road for Koplick Road. Please refer to the Traffic Impact Assessment prepared by TTM Consulting for further details.

The internal development will be typically serviced by urban access roads/streets 15.5m wide with 7.5m roadway, and one rear access laneway. Modified access roads are proposed along the stormwater channel with a negative verge towards the channel. All roads will be designed in accordance with Councils planning scheme, provide access to all dwellings and allow sufficient width for turfed verges which will provide service corridors for sewerage, water, electrical and telecommunications. Typical road layouts and cross sections are shown in **Appendix B** (Drawings 23-0181-P105 to 23-0181-P108).

Road pavement designs will be prepared and provided to Council where appropriate and based on CBR results taken throughout the course of construction.

5. Sewerage Reticulation

The development is proposed to be serviced from three connection points.

Connection Point 1 (Stage 1):

There is an existing trunk sewer main in Koplick Road to the East of the site, which is proposed to be extended along Koplick Road as part of adjoining development (associated with 117-127 Koplick Road). This sewer is able to service a portion of the site in the Southwest area. The area able to be serviced by this sewer connection point has been nominated as Sewer Catchment Area 1 and will form Stage 1 of the development.

Connection Point 2 (Stage 2):

There is an existing sewer main in East Beaumont Road at The Northern end of the development. This sewer is able to service a portion of the site in the East. The area able to be serviced by this sewer connection point has been nominated as Sewer Catchment Area 2 and will form Stage 2 of the development.

Connection Point 3 (balance stages):

As per advice provided by Logan Water during pre-lodgement phase of the project, the development is to be part serviced via a proposed trunk sewer connecting to existing sewer infrastructure located within Mount French Street to the north of the property.

The proposed trunk sewer is generally as shown below and as indicated on Drawing Number 23-0181-P300.

Construction of the trunk sewer will be subject to downstream property owner's consent and it is also noted that this sewer may be constructed prior to development of the subject site, by others.

It is further noted that the proposed trunk sewer is generally consistent with LHGM131, shown on Loganholme – Wastewater Master Planning 2019 Figure PI_215_Loganholme, an extract of which is included below.

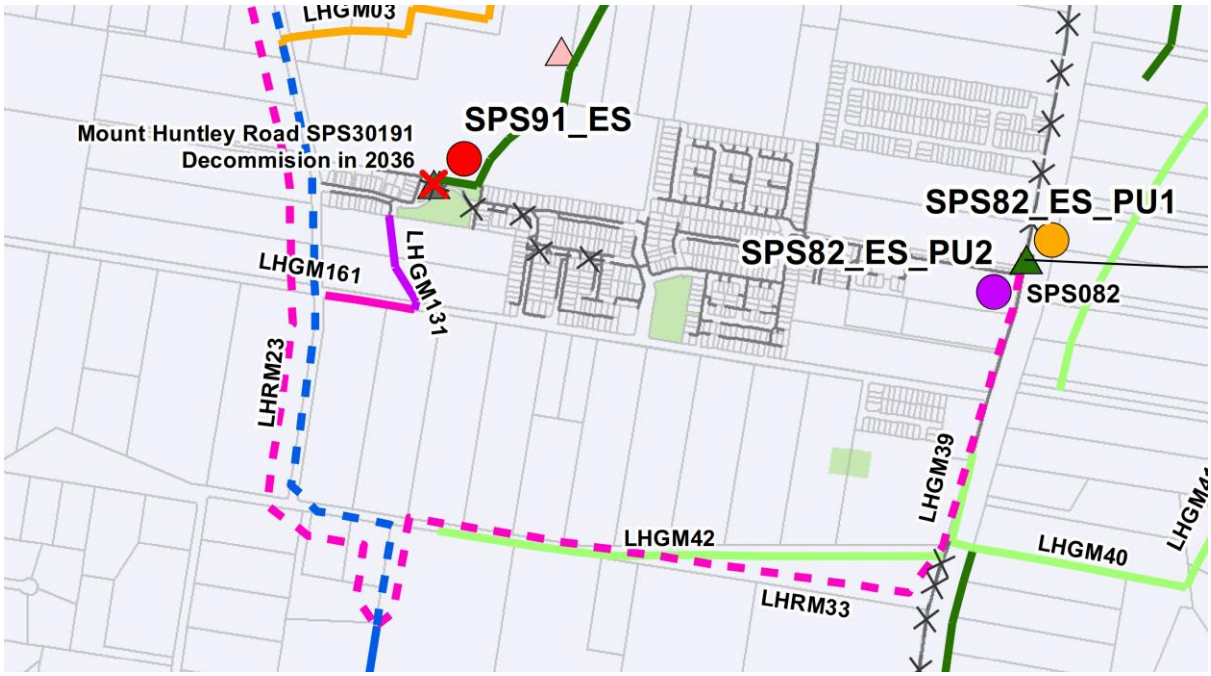


Figure 2: Proposed Trunk Sewer Location: LHGM131(source: Logan Water Infrastructure Alliance, Loganholme – Wastewater Master Planning 2019, Figure PI_215 dated 23/07/2019)

The proposed connection points and internal sewerage reticulation network is outlined in **Appendix B** (Drawing 23-0181-P300 and 23-0181-P301) and will be formalised through detailed design at the Operational Works phase with Logan Water.

6. Water Supply

The development is proposed to be serviced via existing watermains in East Beaumont Road and Koplick Road to the north and south of the site. The proposed watermain will be extended to the west along both roads to cater for future development.

The proposed connection points and internal water network is outlined in **Appendix B** (Drawing 23-0181-P300 and 23-0181-P301) and will be formalised through detailed design at the Operational Works phase with Logan Water.

7. Stormwater Quality & Quantity

The proposed development will achieve no-worsening of the upstream and downstream waterways through the implementation of a stormwater management plan.

Stormwater Quality objectives are met as required by the Logan Coast City Council Planning Scheme Policy and State Planning Policy (SPP). Specifically, the water quality objectives for post development will be satisfied through the implementation of best practise end of line stormwater quality bio-filtration basins. These have been adequately sized to effectively mitigate the pollutant loads generated from the site to the SPP pollutant load reduction targets. Also, the stormwater treatment area incorporate a detention basin to ensure post-developed flows are mitigated to pre-developed levels.

The stormwater management plans will be co-ordinated with the bulk earthworks and stormwater drainage network at the detailed design stage to ensure an optimal design outcome is achieved.

For further details with respect to Stormwater Management, please refer to **Appendix C** (Stormwater Management Plan prepared by Colliers Engineering & Design dated 31 July 2023)

8. Utilities

The site will be serviced with electrical and telecommunication reticulation with agreements entered into by the relevant service providers. Adequate service corridors will be provided to enable service connection with designs being undertaken in accordance with a suitably qualified electrical consultant at the Operational Works/Building Application phase as necessary.

9. Conclusion

This report is accompanied with the relevant code responses, concept engineering drawings and supporting documentation to demonstrate that the development can be adequately serviced in accordance with Council's standards and guidelines.

We therefore request Council approval of the engineering components for the proposed development with reasonable and relevant conditions.

Appendices

Appendix A Code Responses

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Protection of natural processes and ecosystems		
PO1 The discharge of sediments and pollutants from filling or excavation does not adversely affect a waterway or the stormwater network.	**AO1** The discharge of sediments and pollutants to a waterway or stormwater network complies with part 3.3—Filling and excavation standards in planning scheme policy 5—Infrastructure.	Complies with AO1 – Will be provided at detailed design and construction phase.
PO2 Topsoil and spoil stockpiled on the premises do not adversely affect natural processes and ecosystems.	**AO2** Topsoil and spoil is stockpiled to comply with part 3.3–Filling and excavation standards in planning scheme policy 5–Infrastructure.	Complies with AO2 – Will be provided during construction phase.
PO3 Filling is carried out using stable, solid and clean earth, free of organic and putrescible waste, rubbish and refuse material.	**AO3** Filling complies with part 3.3–Filling and excavation standards in planning scheme policy 5–Infrastructure.	Complies with AO3 – Will be provided during construction phase.
Protection of existing and planned infrastructure		
PO4 Filling or excavation works do not adversely affect infrastructure, including any services.	**AO4** Filling or excavation works comply with part 3.3–Filling and excavation standards in planning scheme policy 5–Infrastructure.	Complies with AO4 – Will be provided at detailed design and construction phase.
Protection and enhancement of personal health and safety and premises		
PO5 Filling or excavation works do not adversely affect personal health and safety.	**AO5**	Complies with AO5 – Will be provided during construction phase.

Performance outcomes	Acceptable outcomes	Comments
	Filling or excavation works comply with part 3.3–Filling and excavation standards in planning scheme policy 5–Infrastructure.	
Surface water flow		
PO6 Surface water drainage does not cause any of the following: (a) ponding on any premises; or (b) a hazard or adversely affect personal health and safety and premises; or (c) diversion or concentration of flow from or onto adjoining premises or infrastructure.	**AO6** Surface water drainage complies with part 3.3–Filling or excavation standards in planning scheme policy 5–Infrastructure.	Complies with AO6 – Will be provided at detailed design and construction phase.
Batters		
PO7 A batter: (a) does not adversely affect the natural physical processes and ecosystems; (b) protects existing and planned infrastructure; (c) is safe, stable and easily maintained; (d) is landscaped to enhance visual amenity.	**AO7** A batter is designed and constructed to comply with the standards specified in section 3.3.6–Batters and retaining walls in planning scheme policy 5–Infrastructure.	Complies with AO4 – Will be provided at detailed design phase.
Retaining walls		
PO8 A retaining wall:	**AO8** A retaining wall is designed and constructed to comply with the standards specified in section	Complies with AO8 – Will be provided at detailed design phase.

Performance outcomes	Acceptable outcomes	Comments
(a) is not constructed of timber and are not located on existing or proposed lot boundaries, or movement networks; (b) does not adversely affect the natural physical processes and ecosystems; (c) is located to avoid conflict with adjoining premises; (d) is located such that existing and planned infrastructure is not adversely affected; (e) protects the visual amenity of adjoining premises or a public open space; (f) is located within the premises that is being filled; (g) is located within the premises that is cut and is designed to take any surcharge loading allowable on the uphill lot; (h) is safe and stable; (i) enables easy access for maintenance.	3.3.6.2–Retaining walls in planning scheme policy 5–Infrastructure.	
Filling of a dam		
PO9 The filling of a dam: (a) does not adversely affect the natural physical processes and ecosystems; (b) creates a safe and stable surface; (c) is integrated into the landscape.	**AO9** The filling of a dam complies with part 3.3–Filling and excavation standards in planning scheme policy 5–Infrastructure.	Complies with AO9 – Will be provided at detailed design and construction phase.

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Provision, design, construction and location of infrastructure		
PO1 Development is demonstrated to be capable of being serviced by necessary infrastructure.	**AO1** Reports, plans and drawings are provided in accordance with part 2 of planning scheme policy 5–Infrastructure.	Complies with AO1
PO2 Development: (a) provides necessary infrastructure to service the development; (b) provides that the design, construction and location of necessary infrastructure: (i) protects existing and planned infrastructure networks; (ii) services proposed development; (iii) integrates with existing and planned infrastructure networks; (iv) delivers a standard of service that is efficient and equitable; (v) minimises the cost to the community for the life of the infrastructure by providing a suitable design life, ease of maintenance and ease of replacement; (vi) protects personal health, safety and premises; (vii) protects environmental values.	**AO2** Development: (a) in a water supply service area connects to the water network in accordance with the SEQ Water Supply and Sewerage Design and Construction Code; (b) not in a water supply service area provides a tank with a minimum storage capacity of 45,000 litres; (c) in a sewerage supply service area connects to the waste water network in accordance with the SEQ Water Supply and Sewerage Design and Construction Code; (d) not in a sewerage supply service area complies with part 1 of the Queensland Plumbing and Wastewater Code; (e) provides stormwater infrastructure in accordance with part 3.6 of planning scheme policy 5–Infrastructure; (f) provides a movement network infrastructure in accordance with part 3.4 of planning scheme policy 5–Infrastructure;	Complies with AO2 NA Complies with AO2 NA Complies with AO2 Complies with AO2 Refer others.

Performance outcomes	Acceptable outcomes	Comments
	(g) provides parks in accordance with part 3.12 of planning scheme policy 5–Infrastructure; (h) provides road lighting in accordance with part 3.5 of planning scheme policy 5–Infrastructure; (i) provides electricity reticulation in accordance with part 3.8 of planning scheme policy 5–Infrastructure; (j) provides gas and telecommunications reticulation in accordance with part 3.9 of planning scheme policy 5–Infrastructure. Editor's note—The delivery of any part of a network identified in the plans for trunk infrastructure is governed by Part 4–Local government infrastructure plan.	Complies with AO2 - will be provided at detail design stage in accordance with the planning scheme. Complies with AO2 - will be provided at detail design stage in accordance with the planning scheme Complies with AO2 - will be provided at detail design stage in accordance with the planning scheme.
Location of development		
PO3 Development is located to protect existing and planned infrastructure networks.	**AO3** Development is located outside: (a) planned widening of a road or a new road identified in Table 7.3.1.1–Road encroachment maps of planning scheme policy 5—Infrastructure; (b) planned public transport network identified on Figure 3.4.1.3.1—Public transport network in planning scheme policy 5—Infrastructure; (c) a planned cycle network identified on Figure 3.4.1.2.1–Cycle network in planning scheme policy 5–Infrastructure; (d) a planned network identified in Local government infrastructure plan map–LGIP-07.00	Complies with AO3 Complies with AO3 Complies with AO3 Complies with AO3

Performance outcomes	Acceptable outcomes	Comments
	Plan for trunk parks infrastructure in Schedule 3–Local government infrastructure plan mapping and tables.	
Fire fighting		
PO4 Development in a water service area accessed by common private title provides: (a) fire hydrant infrastructure; (b) unimpeded access for emergency services vehicles. Editor's note—The term common private title refers to areas such as access roads in community title developments or strata title unit access, which are private and under group or body corporate control.	**AO4** Development in a water service area accessed by common private title complies with the Acceptable outcomes of the SPP code: Fire services in developments accessed by common private title in Appendix 1 of the state planning policy.	NA - Development is not accessed by common private titles
PO5 Development not in a water service area provides sufficient water storage with adequate pressure, volume and flow to service development for fire fighting purposes.	**AO5** Development: (a) is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa; or (b) has an on-site water storage in accordance with **Error! Reference source not found.**, dedicated or retained for fire fighting purposes that is made of fire resistant materials and is: (i) a separate tank; or (ii) a reserve section in the bottom part of the main water supply tankwater tank .	NA - Development is in a water serviced area.

Performance outcomes	Acceptable outcomes	Comments
	Editor's note—The requirement in AO5 is; – in addition to the requirement for potable water supply/storage in AO2 in Table 9.4.3.3.1–Infrastructure code: accepted development (subject to requirements) and assessable development; – reflected in AO5 in Table 8.2.3.3.1–Bushfire hazard overlay code: accepted development (subject to requirements) and assessable development.	
Disposal of trade waste		
PO6 The disposal of trade waste in a sewerage supply service area does not adversely affect the sewerage network.	**AO6** The disposal of trade waste in a sewerage supply service area complies with the sewer admission standards in section 3.2.6–Sewer admission standards in planning scheme policy 3–Environmental management.	NA - Development is residential and does not propose discharge of trade waste.
Roof water drainage and surface water drainage		
PO7 Development provides stormwater infrastructure for the drainage of the premises so as not to cause any of the following: (a) ponding of stormwater on the premises; (b) a hazard to personal health and safety; (c) damage to premises;	**AO7** Development complies with the standards for stormwater infrastructure specified in part 3.6 of planning scheme policy 5–Infrastructure.	Complies with AO7 refer to SMP and engineering drawings

Performance outcomes	Acceptable outcomes	Comments
(d) an increased risk of flooding to premises within the catchment.		
Natural flow of surface water		
PO8 Development provides that the natural flow of surface water is: (a) not altered so as to cause a risk to personal health and safety or damage to property; (b) not increased in intensity, velocity or frequency; (c) not concentrated onto adjoining premises.	**AO8** Development complies with the standards for stormwater infrastructure specified in part 3.6 of planning scheme policy 5–Infrastructure.	Complies with AO8 refer to SMP and engineering drawings
Water sensitive urban design		
PO9 Development which provides stormwater infrastructure incorporates water sensitive urban design principles having regard to: (a) protecting existing natural features and ecological processes; (b) protecting the natural hydrologic behaviour of catchments; (c) protecting the existing natural flow and water quality regimes of waterways; (d) protecting water quality of surface and ground waters; (e) minimising demand on the water network; (f) minimising sewage discharges to the natural environment; (g) integrating water into the landscape to enhance visual and ecological values.	**AO9** Development complies with the standards for stormwater infrastructure specified in part 3.6 of planning scheme policy 5–Infrastructure.	Complies with AO9 refer to SMP and engineering drawings

Performance outcomes	Acceptable outcomes	Comments
Movement network		
PO10 The projected traffic levels for a use do not adversely affect the planned standards of service for a road or intersection.	**AO10** Development does not cause or contribute to projected traffic levels: (a) exceeding the maximum vehicle trips per day in Table 3.4.1.4.2 in planning scheme policy 5–Infrastructure; or (b) exceeding the maximum control delays through intersections in peak periods in Table 3.4.1.4.3 in planning scheme policy 5—Infrastructure.	Refer response by others.
Integrated movement concept report		
PO11 Development which generates more than 3,000 vehicle trips per average weekday is designed to integrate the movement network to minimise the transportation costs required to service the use.	**AO11** Development which generates more than 3,000 vehicle trips per average weekday provides an integrated movement concept report which integrates the planning of the movement network in accordance with part 2 and 3 of planning scheme policy 5–Infrastructure.	Refer response by others.

Performance outcomes	Acceptable outcomes	Comments
For assessable development only		
Land use and transport integration		
PO12 Development within 400 metres of existing or future public passenger transport facilities where the total site are is 5,000m^2 or more: (a) supports a road hierarchy which facilitates efficient, safe and accessible bus services connecting to existing and future public passenger transport facilities; (b) enhances connectivity between existing and future public passenger transport facilities and other transport modes; (c) optimises the walkable catchment to existing and future public passenger transport facilities; (d) provides for direct and safe access to and use of existing or future public passenger transport facilities. Note—SPP code: Land use and transport integration in Appendix 4 of the state planning policy provides guidance to achieve this outcome.	**AO12** No acceptable outcome provided.	Refer response by others.

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Provision of parking spaces for vehicles		
PO1 Vehicle parking, loading and servicing and pick up/set down areas are provided that satisfy the expected demand for the number and type of vehicles likely to be generated by a use having regard to: a. the particular circumstances of the premises including the: (i) nature, intensity and hours of operation of the use; (ii) desirability of providing a car park and attracting vehicles to the premises; (iii) maximum number of employees and customers to be on the premises at any one time; (iv) size, levels and dimensions of the premises; b. the proximity of the premises to an existing or future Parking station, other available car park or public transport facility.	**AO1** Vehicle parking, vehicle washing, loading and servicing and pick up/set down areas are provided: a. for a use listed in Table 9.4.7.3.2 - Vehicle parking and servicing, to comply with columns 2 to 5 of Table 9.4.7.3.2 - Vehicle parking and servicing; b. for a use not listed in Table 9.4.7.3.2 - Vehicle parking and servicing, in accordance with a car parking assessment report to be provided to the local government and prepared in accordance with Part 2 of Planning scheme policy 5 - Infrastructure. Editor's note - For building work, Car parking for people with a disability is to be provided in accordance with Table D3.5 - Carparking spaces for people with a disability in the Building Code of Australia.	NA- use is not listed in table 9.4.7.3.2 Complies with PO1 – the development is residential with carparking and servicing provided in accordance with councils planning scheme.
PO2 Development with a security gate provides accessible visitor vehicle parking in front of the security gate.	**AO2** Development with a security gate provides visitor vehicle parking that complies with Table 9.4.7.3.4 -	NA – Development does not propose a security gate.

Performance outcomes	Acceptable outcomes	Comments
	Visitor parking spaces for uses incorporating a security gate.	
PO3 A car park not being a Parking station provides free and unobstructed access for the use by employees and visitors during the normal hours of operation of the use.	**AO3** A use, other than a Residential activity or a Parking station, provides vehicle parking that: a. is kept, used and maintained exclusively for car parking; b. is accessible to all employees and visitors during the normal hours of operation of the use with no encumbrance, fee or charge; c. does not have a gate, door or similar device that restricts vehicular access by employees or visitors.	NA – Development does not propose a security gate.
Provision of motorcycle parking		
PO4 Motorcycle parking is provided that is safe and functional.	**AO4** Motorcycle parking is provided to comply with section 2.4.7 of AS2890.1:2004 - Parking facilities - Off street car parking.	Complies with AO4
Provision of bicycle parking		
PO5 Bicycle parking facilities are provided that: a. satisfy the likely demand for bicycle parking; b. are functional; c. are located close to a pedestrian entry to a building.	**AO5** Bicycle parking facilities comply with: a. the rate specified in column 7 of Table 9.4.7.3.2 - Vehicle parking and servicing; b. AS2890.3-1993 - Bicycle parking facilities.	NA – the development is residential with no proposed bicycle parking facilities.

Performance outcomes	Acceptable outcomes	Comments
Provision of vehicle manoeuvring area		
PO6 Development provides a safe and functional vehicle manoeuvring area.	**AO6** Development provides a vehicle manoeuvring area that: a. enables vehicles to enter and exit the site in a forward motion where the development: i. is non-residential development; or ii. is for five or more dwellings; b. accommodates the design vehicle specified in Table 9.4.7.3.5 - Design vehicle for a manoeuvring area; c. complies with section 3.4.4.10 - Manoeuvring areas of Planning scheme policy 5 – Infrastructure.	Complies with AO6 – the development is residential with carparking and servicing provided in accordance with councils planning scheme.
Vehicle washing bay		
PO7 A vehicle washing bay does not cause environmental harm.	**AO7** A vehicle washing bay provides that run off is discharged to: a. a grassed area or permeable landscape area; or b. the sewerage system.	NA - No vehicle wash bays are proposed.
Car park access		
PO8	**AO8** Vehicular queuing space to a car parking area:	NA - No car parking areas are proposed

Performance outcomes	Acceptable outcomes	Comments
Vehicular access to a car parking area has sufficient queuing space to ensure a vehicle does not queue on a road, cycleway or footpath.	a. does not provide a turning movement, intersecting aisle or a speed hump in a queuing area; b. complies with Table 9.4.7.3.3 - Queuing spaces; c. complies with Table 9.4.7.3.6 - Queuing requirements for particular uses.	
Access and driveways		
PO9 A driveway is safe, functional and does not adversely affect infrastructure.	**AO9** A driveway is designed and constructed to comply with section 3.4.5 - Design standards for access and driveways of Planning scheme policy 5 - Infrastructure.	Complies with AO9 – driveways will be designed and constructed in accordance with section 3.4.5 - Design standards for access and driveways of Planning scheme policy 5 - Infrastructure.

Performance outcomes	Acceptable outcomes	Comments
Design and construction of a car parking space		

PO10 **A car parking area is designed to:** a. provide easy way finding for pedestrians, cyclists and motorists; b. provide appropriately sized and line marked spaces in accordance with relevant Australian standards; c. provide a convenient and safe pedestrian network; d. provide safe and efficient vehicle circulation; e. provide a progressive reduction in the speed environment in moving between the road and a parking space; f. provide a safe sight distance at a potential conflict point; g. provide for efficient and simple parking space search patterns; h. provide for uncongested public transport and service vehicle movements through the premises; i. keeps a heavy vehicle out of a parking aisle; j. ensure no heavy vehicle reverses across a pathway; k. prevent parking off a circulation road; l. prevent an adverse impact on the safety and efficiency of the existing or planned movement network; m. prevent a motorist from reversing on a road;	**AO10** A car parking area is designed and constructed in accordance with section 3.4.6 - Design standards for car parking of Planning scheme policy 5 - Infrastructure.	NA - No car parking areas are proposed

Performance outcomes	Acceptable outcomes	Comments
n. prevent an unnecessary space that encourages illegal parking; o. address safety of users through appropriate lighting; p. be appropriately landscaped; q. be surfaced so as to be useable in all weather conditions; r. manage stormwater flows.		
For assessable development		
Vehicle queuing		
PO11 Queuing associated with a drive through facility (including Service stations and Car washes) does not cause blockages to traffic on the road network.	**AO11** No acceptable outcome provided.	NA - No drive through facilities are proposed

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Risk to people and premises		
PO1 A building floor level of a habitable room has adequate allowance for the hydraulic gradient above the main floodway.	**AO1** A building has a finished habitable floor level a minimum of 500mm above the defined flood event.	All habitable floors will be above the defined flood event. This will be addressed at Building Approval phase.
PO2 Development must not increase the level of risk of injury to life or risk of damage to property or adversely affect flood evacuation procedures.	**AO2** Development: a. does not result in any of the following: i. an increase in the number of people at risk from flooding up to and including the defined flood event; or ii. an increase in the number of people that need evacuation up to and including the defined flood event; or iii. an increase in the number of premises or infrastructure at risk from flooding up to and including the defined flood event; or iv. existing flood warning times being reduced for flood events up to and including the defined flood event; or v. an adverse impact on the ability of traffic to use evacuation routes or unreasonably increase traffic volumes on evacuation routes; or	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.

Performance outcomes	Acceptable outcomes	Comments
	b. is located entirely within a development envelope area approved by an earlier development approval.	
For assessable development		
Risk to people and premises		
PO3 Development provides a development envelope area that is: a. above the flood level during the defined flood event; b. of an area and dimensions to accommodate the activities associated with the intended use.	**AO3** Development provides a development envelope area above the flood level during the defined flood event with a minimum size and dimension specified in Table 8.2.5.3.2 - Development envelope area.	Please refer to the attached Stormwater Management Plan which demonstrates the proposed development area as being above the defined flood event.
PO4 Public safety and the environment are not adversely affected by floodwater by: a. locating a Medium impact industry or High impact industry to be able to function safely during and immediately after flood events; b. safely storing hazardous materials.	**AO4** Development: a. for a Medium impact industry or High impact industry is above the flood level specified in column 2 of Table 8.2.5.3.3 - Minimum flood levels; b. involving the storage, sale or use of hazardous materials is located above the flood level during the defined flood event.	Not applicable.
PO5 A car park other than a Parking station is only located below the flood level during the defined flood event where there is no increase in risk to: a. pedestrian and vehicular safety; b. a building or other structure.	**AO5** No acceptable outcome provided.	Not applicable.

Performance outcomes	Acceptable outcomes	Comments
Note - Section 4.1 - Guidelines for satisfying flood hazard overlay code in Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.		
PO6 Development for any of the uses identified in column 1 of Table 8.2.5.3.3 - Minimum flood levels, are able to function effectively during and immediately after flood events. Note - Compliance with this performance outcome is to be demonstrated by a flood study report prepared in accordance with section 2.5.1 of Planning scheme policy 5 - Infrastructure Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO6** Development for any of the uses identified in column 1 of Table 8.2.5.3.3 - Minimum flood levels is located above the flood level specified in column 2 of Table 8.2.5.3.3 - Minimum flood levels	Please refer to the attached Stormwater Management Plan which demonstrates the proposed development area as being above the defined flood event.
Flood storage and discharge capacity		
PO7 An existing floodway is protected and maintained to ensure there are no losses of conveyance capacity of waterways and storage so as not to adversely affect other premises, infrastructure and the environment. Note - Compliance with this performance outcome is to be demonstrated by a flood study report prepared in accordance with section 2.5.1 of Planning scheme policy 5 - Infrastructure Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO7** No acceptable outcome provided.	Due to the nature of the existing floodway (being a series of man made dams), significant works are proposed to create a suitable outcome in respect to flooding, stormwater conveyance and quality treatment. Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.

Performance outcomes	Acceptable outcomes	Comments
PO8 The natural conveyance of flood waters and natural overland flow paths are protected and maintained without adversely affecting adjoining premises. Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO8** No acceptable outcome provided.	Due to the nature of the existing floodway (being a series of man made dams), significant works are proposed to create a suitable outcome in respect to flooding, stormwater conveyance and quality treatment. Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.
PO9 Development (or development in combination with other development) for all flood events up to and including the defined flood event does not do any of the following: a. cause or have the potential to cause damage; or b. cause ponding of flood water; or c. adversely affect the flood discharge capacity of the floodplain; or d. decrease the flood resilience of properties and infrastructure; or e. cause a cumulative increase in flood levels external to the premises. Note - Compliance with this performance outcome is to be demonstrated by a flood study report prepared in accordance with section 2.5.1 of Planning scheme policy 5 - Infrastructure Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO9** No acceptable outcome provided.	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.

Performance outcomes	Acceptable outcomes	Comments
PO10 Any loss of floodplain storage is compensated with compensatory storage or excavation that: a. is of equal volume, creating a balance of cut to fill; b. is free draining; c. is located within the premises; d. does not adversely affect the hydraulic conveyance capacity of the flood channel or floodplain; e. is provided to the corresponding flood level; f. is landscaped to provide visual amenity and erosion control; g. is solely for the purpose of compensatory storage. Note - Compliance with this performance outcome is to be demonstrated by a flood study report prepared in accordance with section 2.5.1 of Planning scheme policy 5 - Infrastructure Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO10** No acceptable outcome provided.	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.
PO11 Development does not adversely change the following flood characteristics for all flood events up to and including the defined flood event: a. peak flow; b. flow of any part of the flood before the peak; c. flood flow velocity; d. level of flooding; e. flood time to peak Note - Compliance with this performance outcome is to be demonstrated by a flood study report prepared in	**AO11** No acceptable outcome provided.	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.

Performance outcomes	Acceptable outcomes	Comments
accordance with section 2.5.1 of Planning scheme policy 5 - Infrastructure Note - Section 4.1 - Guidelines for satisfying flood hazard overlay of Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.		
PO12 A stormwater quality improvement device is located to retain existing flood plain storage capacity and ensure functionality of the stormwater quality improvement device.	**AO12** A stormwater quality improvement high flow outlet device is located: a. above the five percent AEP flood event caused by local flooding; b. above the two percent AEP flood event caused by regional flooding.	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.
PO13 A stormwater quantity management device is located to retain existing flood plain storage capacity and ensure functionality of the stormwater quantity management device.	**AO13** A stormwater quantity management high flow outlet device is located above the two percent AEP flood event.	Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.
Filling and excavation		
PO14 Filling and excavation is carried out above the flood level of the 10 percent AEP event to protect in stream and banks of a waterway and wetland. Note - Section 4.1 - Guidelines for satisfying flood hazard overlay code in Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO14.1** Earthworks are limited to areas where: a. flooding is predominately due to backflow; b. the peak depth average velocity is less than the maximum permissible velocity for considerable bare earth channels (typically 0.5m/sec) in accordance with Table 9.0.5.3 of the Queensland Urban Drainage Manual; c. the cut/fill batter is not steeper than 1V:4H and the exposed earth surface is landscaped with erosion resistant vegetation cover. **AO14.2**	Due to the nature of the existing floodway (being a series of man made dams), significant works are proposed to create a suitable outcome in respect to flooding, stormwater conveyance and quality treatment. Please refer to the attached Stormwater Management Plan which demonstrates no adverse impacts as a result of the development proposal.

Performance outcomes	Acceptable outcomes	Comments
	A filling and excavation plan is provided in accordance with section 2.2.2 of Planning scheme policy 5 - Infrastructure.	
Access		
PO15 Development provides vehicular access to a road network that is sufficient to enable safe access and egress. Note - Section 4.1 - Guidelines for satisfying flood hazard overlay code in Planning scheme policy 5 - Infrastructure provides guidance to achieve this outcome.	**AO15** Development provides vehicular access to a road that is: a. above the flood level during the defined flood event; or b. below the flood level during the defined flood event where the road: i. has a low flood hazard; ii. remains trafficable until another road access to the development becomes trafficable; iii. directly connects to a road that is above the defined flood event that provides access to the road network.	Safe access and egress is provided to the external road network.
PO16 Development provides an access area to a building or fill area on which a building is to be constructed where the access is located on land classified as a low flood hazard in the defined flood event.	**AO16** Development provides access to a building or fill area that has: a. a maximum depth of inundation of 300 mm during all flood events up to and including the defined flood event; b. a maximum distance of inundation of 200 metres during all flood events up to and including the defined flood event; c. a depth multiplied velocity product of less than or equal to 0.4m2/s.	The development proposal provides access to all proposed allotments in accordance with this requirement.

Performance outcomes	Acceptable outcomes	Comments
	Note - Velocity in flood waters is measured as the average velocity over a column of water.	

Appendix B Concept Engineering Drawings

PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD, PARK RIDGE

FOR 'KOPLICK DEVELOPMENTS No.2 PTY LTD'

DRAWING LIST

EARTHWORKS, ROADWORKS AND DRAINAGE

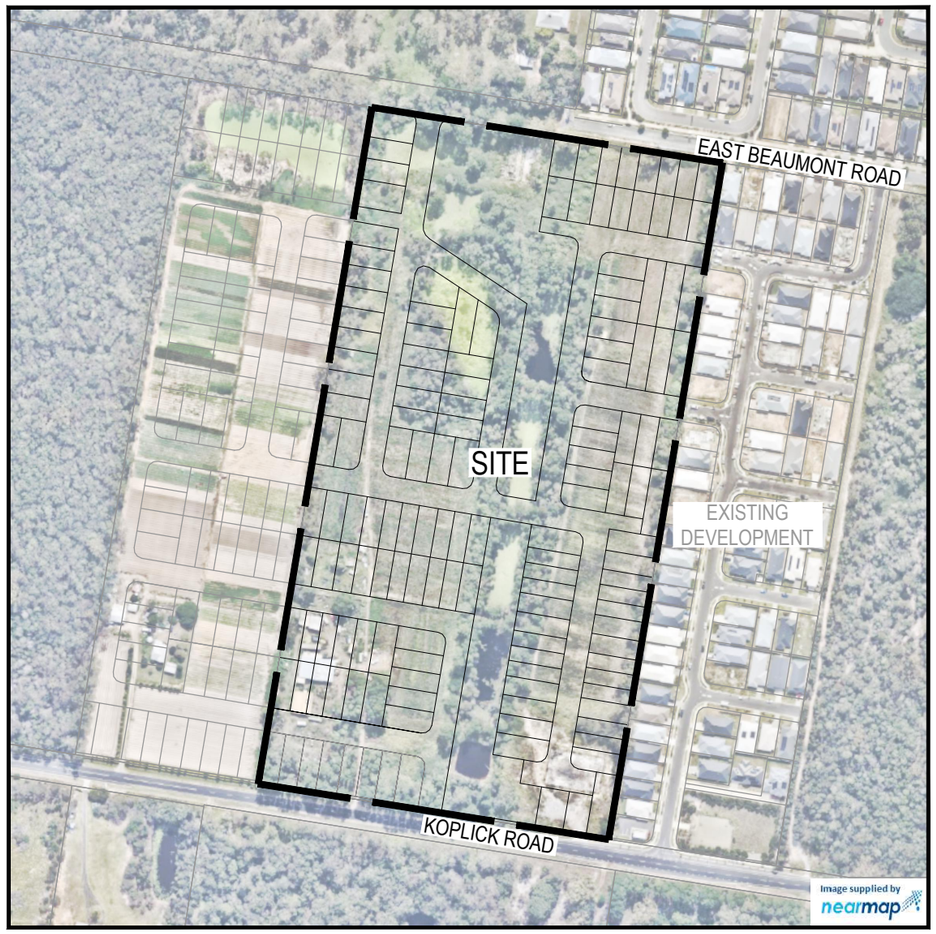
23-0181-P100	COVER PLAN
23-0181-P101	BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 2
23-0181-P102	BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 2
23-0181-P103	BULK EARTHWORKS TYPICAL SECTIONS SHEET 1 OF 3
23-0181-P104	BULK EARTHWORKS TYPICAL SECTIONS SHEET 2 OF 3
23-0181-P105	BULK EARTHWORKS TYPICAL SECTIONS SHEET 3 OF 3
23-0181-P108	ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 1 0F 2
23-0181-P109	ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 2 0F 2
23-0181-P110	TYPICAL ROAD CROSS SECTION AND SERVICE CORRIDORS

STORMWATER QUALITY

23-0181-P200	BIO RETENTION BASIN LAYOUT PLAN
23-0181-P201	BIO RETENTION BASIN TYPICAL SECTIONS SHEET 1
23-0181-P202	BIO RETENTION BASIN TYPICAL SECTIONS SHEET 2
23-0181-P203	BIO RETENTION BASIN TYPICAL DETAILS

SEWERAGE AND WATER RETICULATION

23-0181-P300	SEWERAGE LAYOUT PLAN SHEET 1 OF 2
23-0181-P301	SEWERAGE LAYOUT PLAN SHEET 2 OF 2



LOCALITY PLAN
SCALE 1:2000 (A1)
SCALE 1:4000 (A3)

PROJECT INFORMATION SUMMARY:
No. OF LOTS = 146
AREA OF SITE = 10.65ha
RP DESCRIPTION LOT 13 ON RP 135029 LOT 14 ON RP 135029
DATUM LEVEL AND LOCATION GRID 2020 LEVELS TO AHD
LOCAL AUTHORITY: LOGAN CITY COUNCIL

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:2000 20 0 20 40 60 80 100 A1
1:4000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

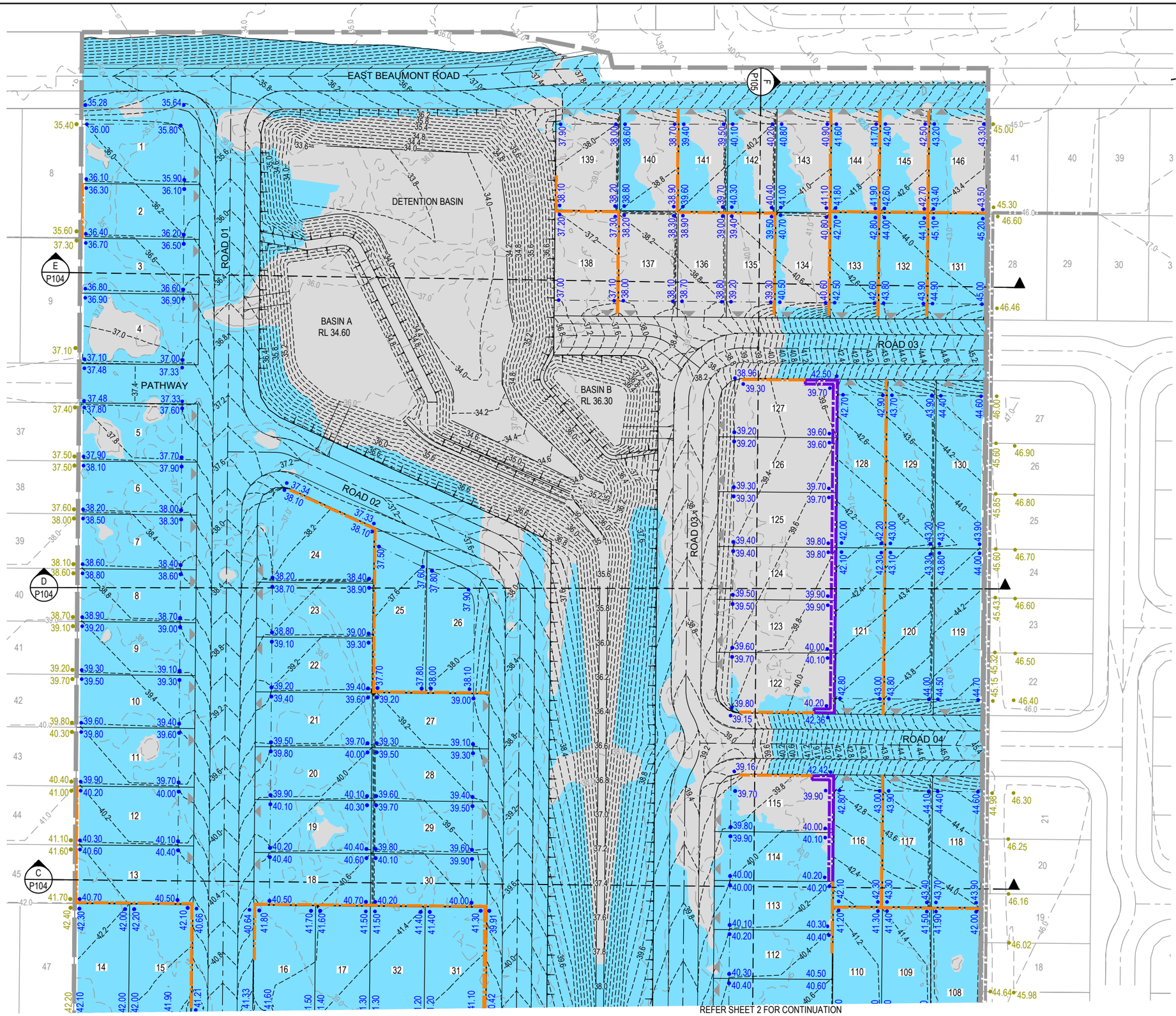
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **COVER PLAN**

PROJECT No.	DRAWING No.	REVISION
23-0181	P100	1



LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED EARTHWORKS PAD SETBACK LINE
- PROPOSED CONCRETE SLEEPER RETAINING WALL HEIGHT RANGE 0.7-2.0m (SINGLE TIER)
- PROPOSED CONCRETE SLEEPER RETAINING WALL HEIGHT RANGE 2.0-3.0m (DOUBLE TIER)
- EXISTING RETAINING WALL
- PROPOSED FINISHED SURFACE LEVEL (FSL) (AFTER TOPSOIL PLACEMENT)
- EXISTING SURFACE LEVEL (ESL)
- PROPOSED AREA OF CUT
- PROPOSED AREA OF FILL
- EXISTING STORMWATER DRAINAGE PIPE
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- TOP OF BATTER

REFER SHEET 2 FOR CONTINUATION

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: NOT FOR CONSTRUCTION

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: KOPLICK DEVELOPMETS NO.2 PTY LTD

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

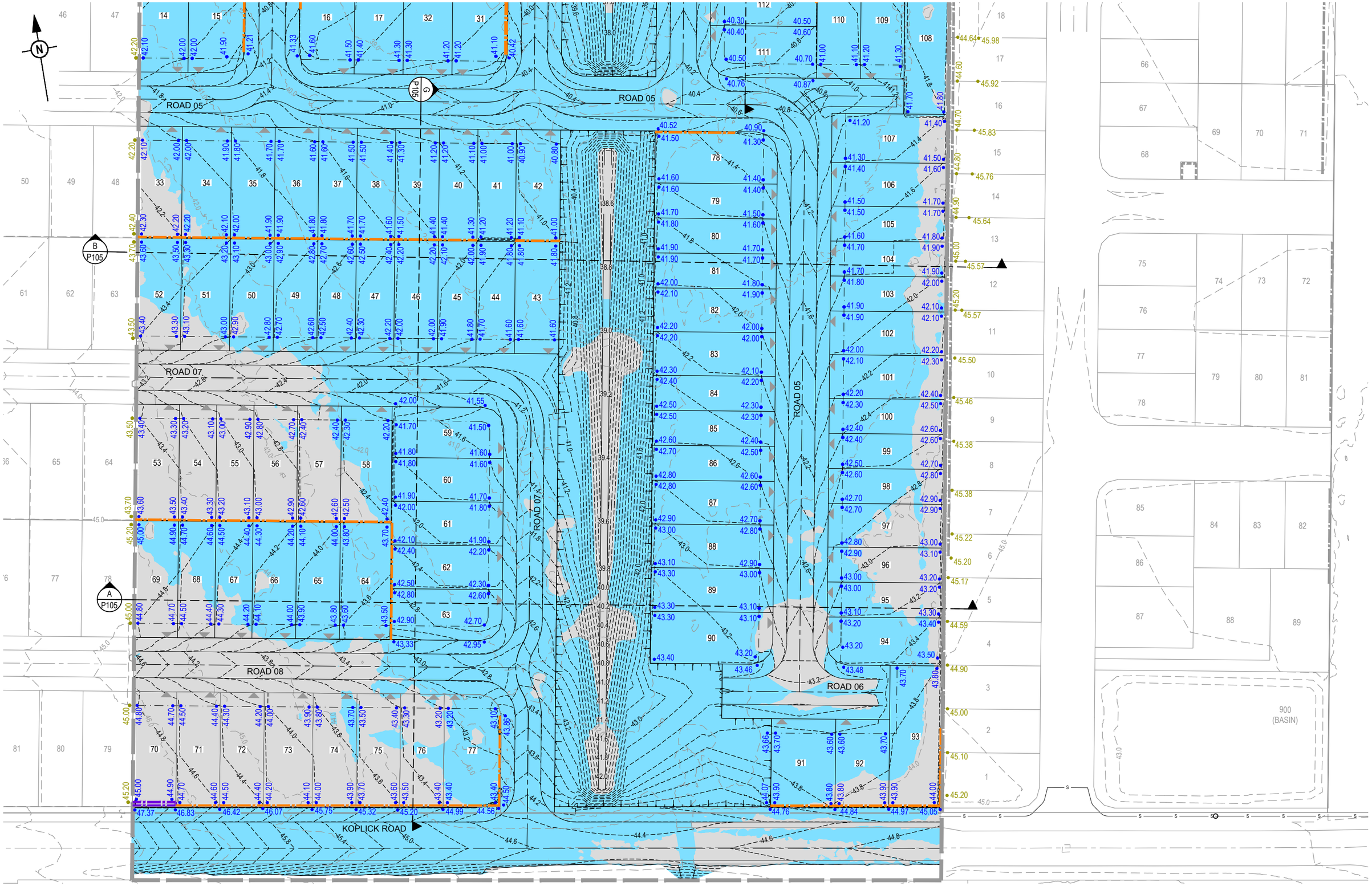
PROJECT NAME: PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 2

PROJECT No.	DRAWING No.	REVISION
23-0181	P101	1

REFER SHEET 1 FOR CONTINUATION



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:100 / 1:200 — 1 0 1 2 3 4 5 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

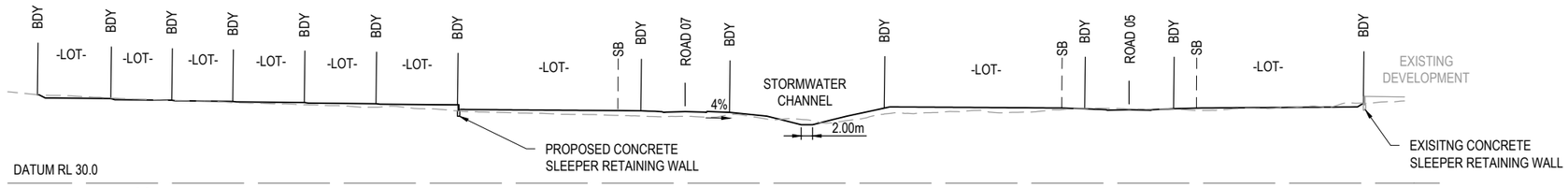
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

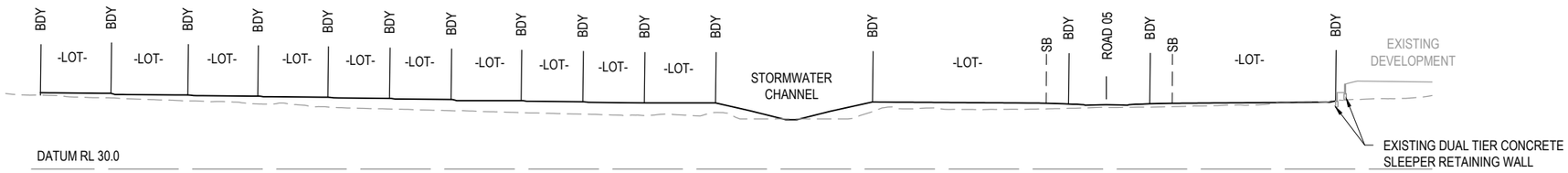
95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 2**

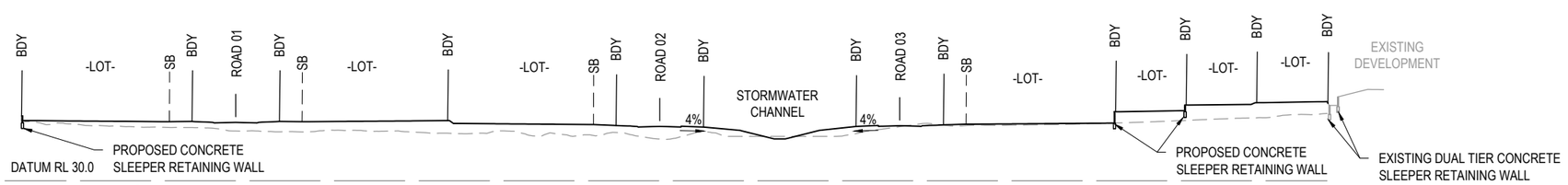
PROJECT No.	DRAWING No.	REVISION
23-0181	P102	1



SECTION A P105
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION B P105
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION C P101
SCALE 1:500 (A1)
SCALE 1:1000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

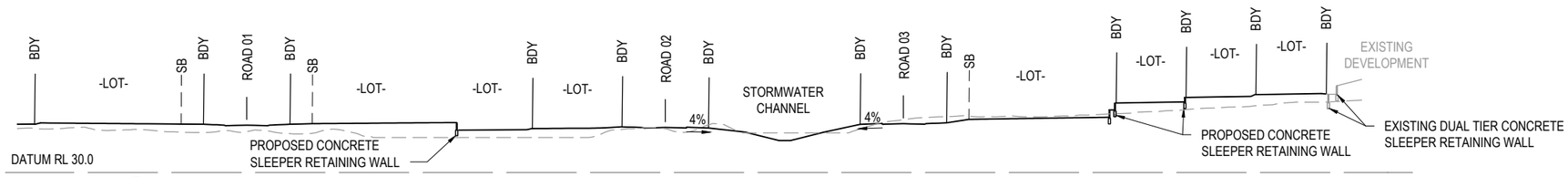
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

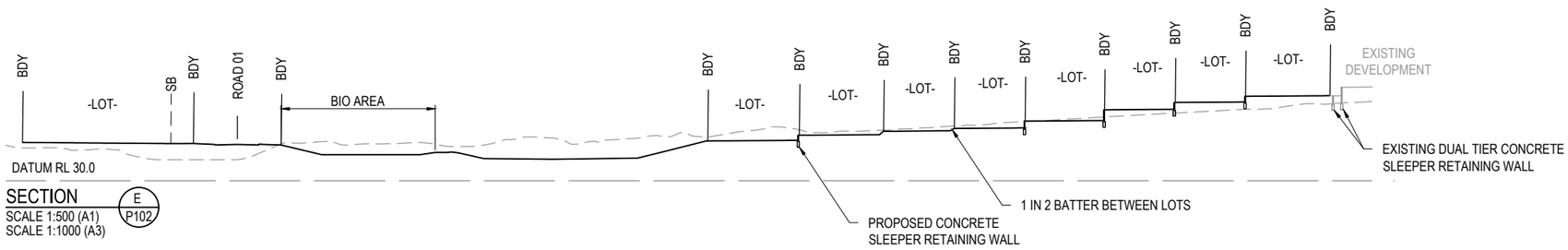
95-115 KOPLICK ROAD
PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS TYPICAL SECTIONS SHEET 1 OF 3**

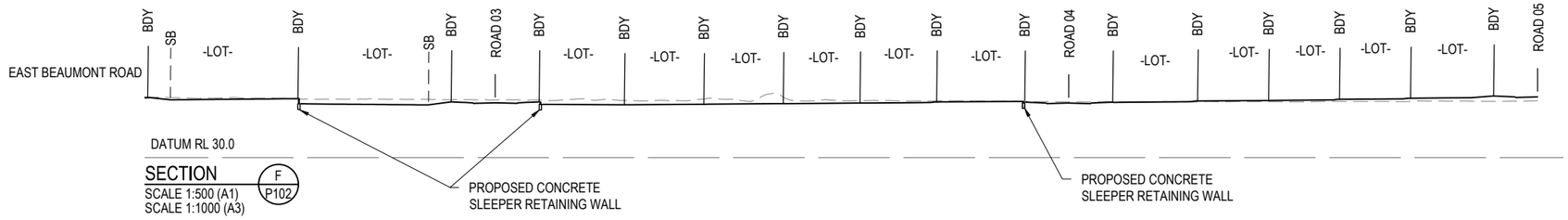
PROJECT No.	DRAWING No.	REVISION
23-0181	P103	1



SECTION D P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION E P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION F P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

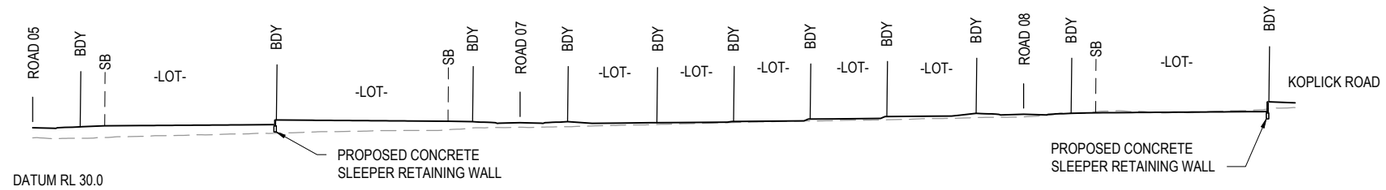
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

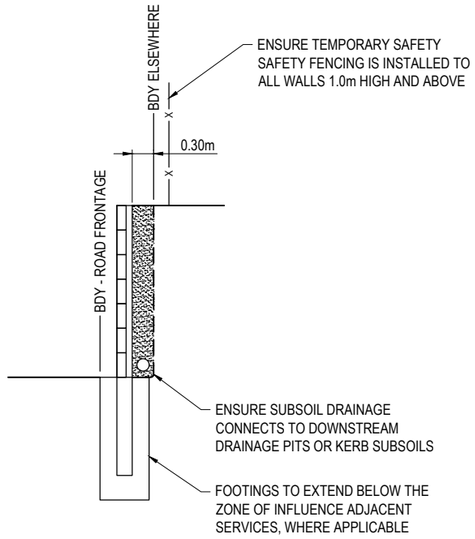
95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS TYPICAL SECTIONS SHEET 2 OF 3**

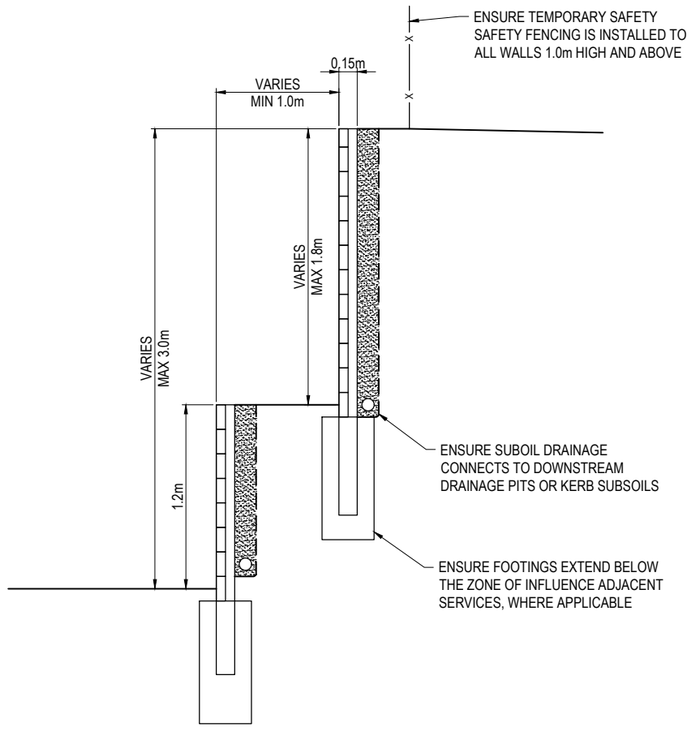
PROJECT No.	DRAWING No.	REVISION
23-0181	P104	1



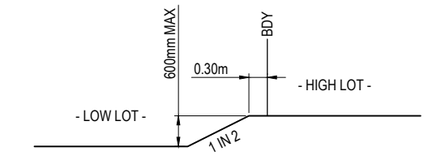
SECTION G P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



CONCRETE SLEEPER RETAINING WALL
(0.7m - 2.0m) TYPICAL DETAIL
SCALE 1:25 (A1)



CONCRETE SLEEPER RETAINING WALL
(2.0- 3.0m) TYPICAL DETAIL
SCALE 1:25 (A1)



TYPICAL STEP BETWEEN LOTS DETAIL
SCALE 1:50 (A1)
SCALE 1:100 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN
DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS TYPICAL SECTIONS SHEET 3 OF 3**

PROJECT No.	DRAWING No.	REVISION
23-0181	P105	1

REFER TO STORMWATER MANAGEMENT PLAN REPORT FOR PROPOSED DETENTION SYSTEM OUTLET DETAILS

CONNECT TO EXISTING UPSTREAM PIPE NETWORK

BASIN AREA REFER TO 23-0181 P200 FOR DETAILS

DRIVEWAY 01
ACCESS DRIVEWAY
10.0m WIDE RESERVE
6.00m WIDE PAVEMENT

ROAD 03
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

BASIN A
RL 34.60

BASIN B
RL 36.30

ROAD 01
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 02
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 03
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 04
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

PATHWAY

1.0m WIDE LOW FLOW CHANNEL

BUND AT RL 37.46 WITH 2X300mm RCP @1% GRADE AT IL 35.50

STORMWATER CHANNEL

EXISTING STAGE

RP135029

REFER SHEET 2 FOR CONTINUATION

LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED ROAD CONTROL LINE
- EXISTING ROAD CROWN
- PROPOSED KERB INVERT LINE
- PROPOSED EDGE OF BITUMEN
- EXISTING EDGE OF BITUMEN
- PROPOSED CONCRETE PATH AND PRAM RAMP
- PROPOSED NEW ROAD PAVEMENT
- PROPOSED NEW CONCRETE PAVEMENT
- FINISHED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- EXISTING STORMWATER DRAINAGE PIPE
- PROPOSED DRAINAGE SWALE
- PROPOSED AREA OF FILTER MEDIA
- PROPOSED NEW CONCRETE PAVEMENT
- PROPOSED CONCRETE SLEEPER RETAINING WALL
- EXISTING CONCRETE SLEEPER RETAINING WALL
- PROPOSED SEWERAGE MAIN
- EXISTING SEWERAGE MAIN
- EXISTING SEWERAGE TRUNK MAIN
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- TOP OF BATTER

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 1 0F 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	P108	1

REFER SHEET 1 FOR CONTINUATION

ROAD 05

3 / 750mm PIPE CULVERTS
USIL:38.18
DSIL:37.07

ROAD 05
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

BUND AT RL 40.20 WITH
2X300mm RCP @1% GRADE
AT IL 38.54

DRIVEWAY 02
ACCESS DRIVEWAY
10.0m WIDE RESERVE
6.00m WIDE PAVEMENT

ROAD 07
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

12
RP135029

ROAD 07

ROAD 05

ROAD 05
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

EXISTING
STAGE

ROAD 08
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 08

ROAD 06

ROAD 06
MODIFIED URBAN ACCESS ROAD
15.5m WIDE RESERVE
7.50m WIDE PAVEMENT

3 / 750mm PIPE CULVERTS
USIL: 43.10
DSIL: 42.23

KOPLICK ROAD
MODIFIED URBAN COLLECTOR ROAD
21.0m MIN. WIDE RESERVE 8.50m MIN. WIDE PAVEMENT

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS
NOT FOR CONSTRUCTION

APPROVED
TROY SCHULTZ RPEQ 20631 DATE 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT
KOPLICK DEVELOPMETS NO.2 PTY LTD

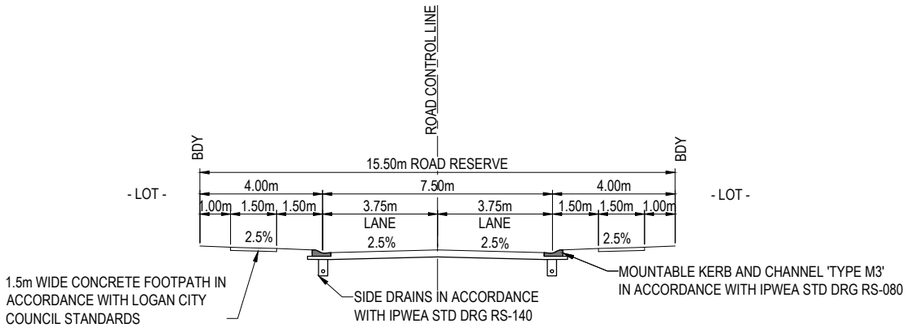
ASSOCIATED CONSULTANT
WALTER CONSULTING GROUP
07 36665200

PROJECT NAME
PROPOSED RESIDENTIAL DEVELOPMENT

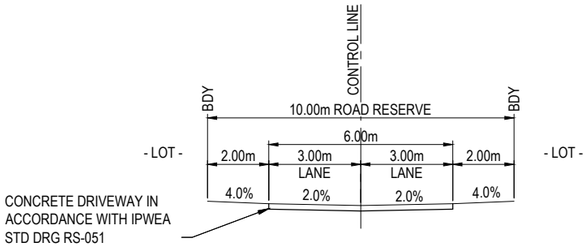
95-115 KOPLICK ROAD
PARK RIDGE

DRAWING TITLE
ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 2 0F 2

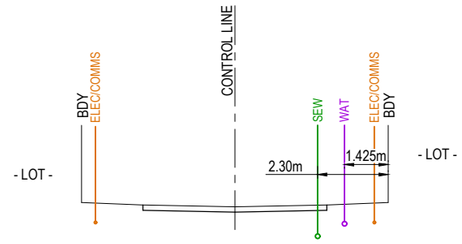
PROJECT No.	DRAWING No.	REVISION
23-0181	P109	1



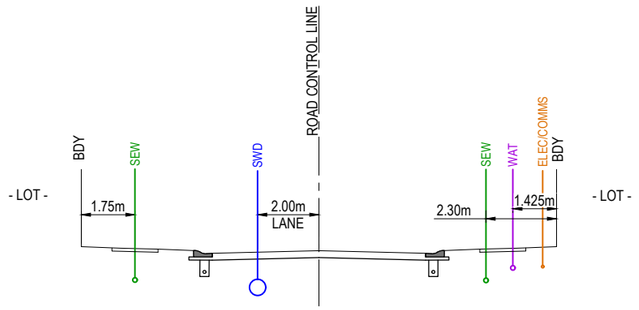
URBAN ACCESS ROAD - TYPICAL SECTION



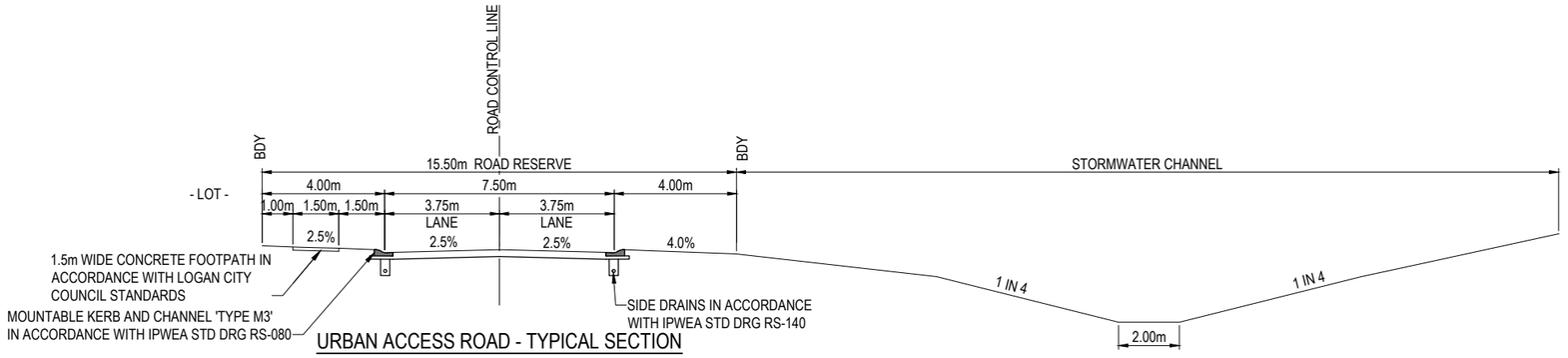
URBAN ACCESS DRIVEWAY - TYPICAL SECTION



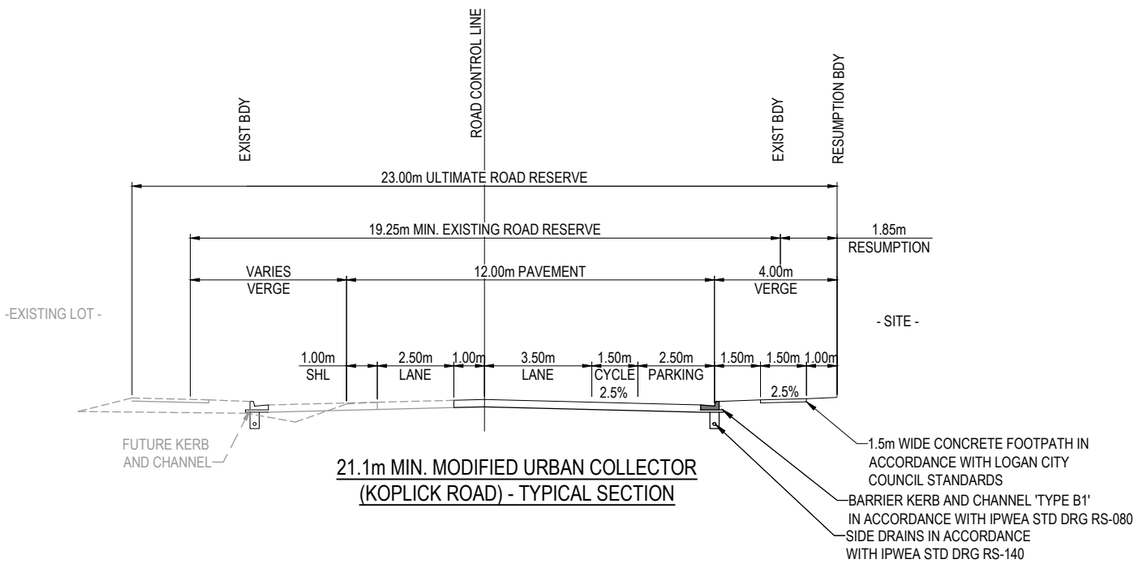
URBAN ACCESS DRIVEWAY - TYPICAL SERVICE ALIGNMENT



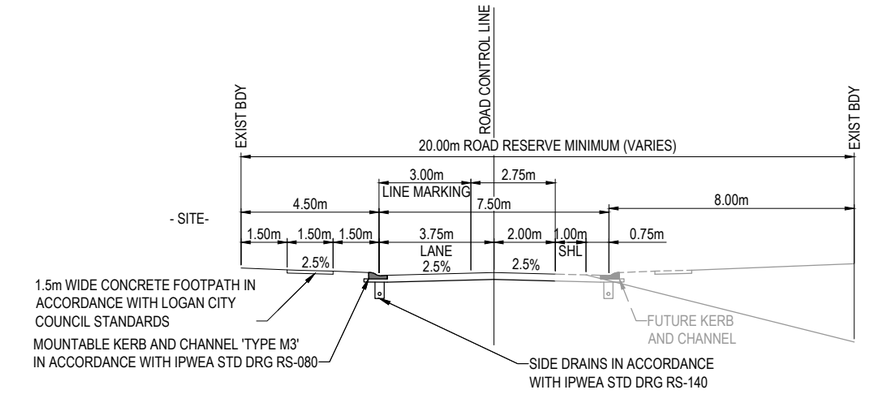
URBAN ACCESS ROAD - TYPICAL SERVICE ALIGNMENT



URBAN ACCESS ROAD - TYPICAL SECTION



21.1m MIN. MODIFIED URBAN COLLECTOR (KOPLICK ROAD) - TYPICAL SECTION



20.0m MIN. MODIFIED URBAN ACCESS ROAD (EAST BEAUMONT ROAD) - TYPICAL SECTION

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

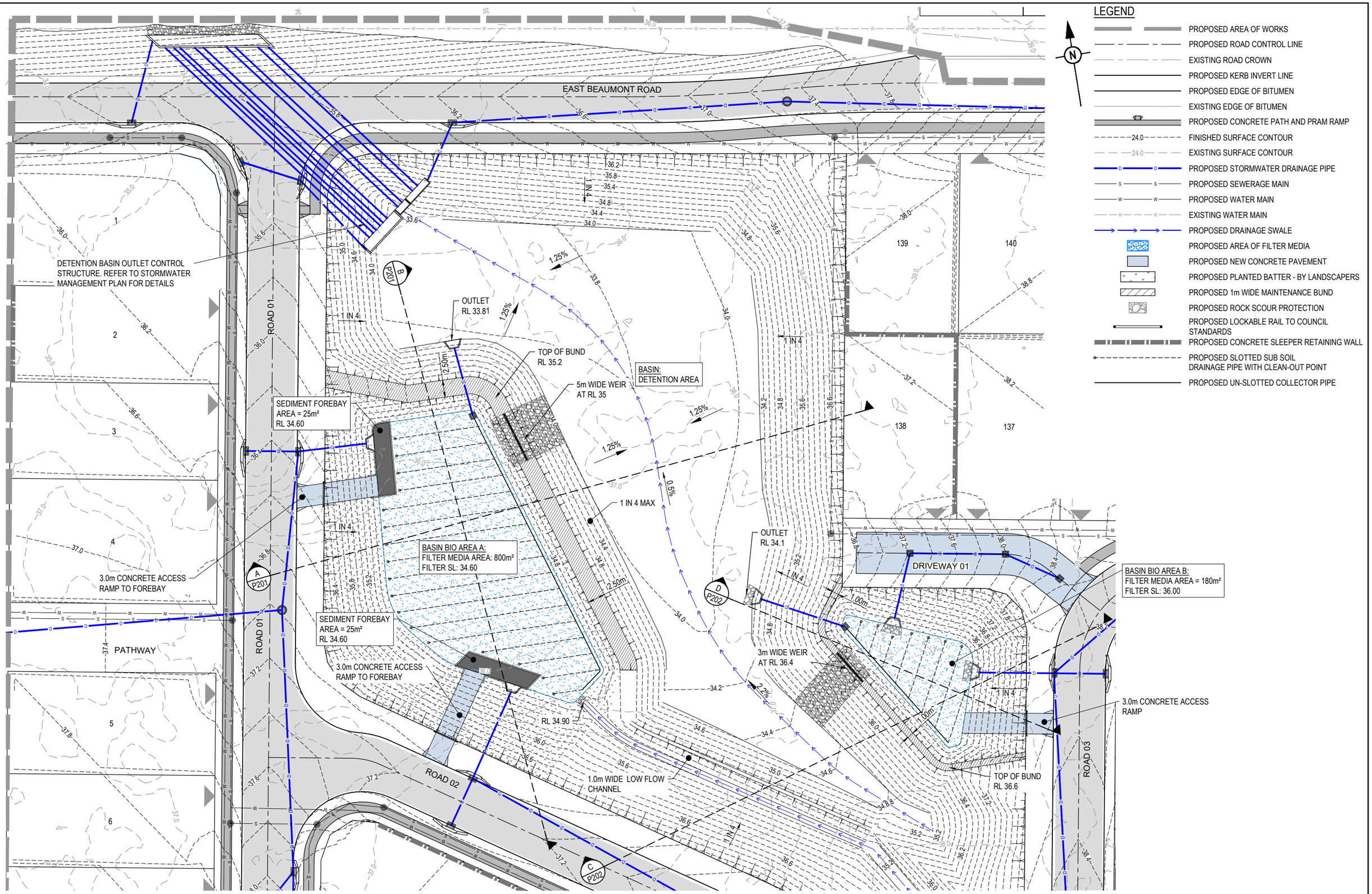
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **TYPICAL ROAD CROSS SECTION AND SERVICE CORRIDORS**

PROJECT No.	DRAWING No.	REVISION
23-0181	P110	1



LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED ROAD CONTROL LINE
- EXISTING ROAD CROWN
- PROPOSED KERB INVERT LINE
- PROPOSED EDGE OF BITUMEN
- EXISTING EDGE OF BITUMEN
- PROPOSED CONCRETE PATH AND PRAM RAMP
- 24.0 FINISHED SURFACE CONTOUR
- 24.0 EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- PROPOSED SEWERAGE MAIN
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- PROPOSED DRAINAGE SWALE
- PROPOSED AREA OF FILTER MEDIA
- PROPOSED NEW CONCRETE PAVEMENT
- PROPOSED PLANTED BATTER - BY LANDSCAPERS
- PROPOSED 1m WIDE MAINTENANCE BUND
- PROPOSED ROCK SCOUR PROTECTION
- PROPOSED LOCKABLE RAIL TO COUNCIL STANDARDS
- PROPOSED CONCRETE SLEEPER RETAINING WALL
- PROPOSED SLOTTED SUB SOIL DRAINAGE PIPE WITH CLEAN-OUT POINT
- PROPOSED UN-SLOTTED COLLECTOR PIPE

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:250 / 1:500 — 5 0 5 10 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

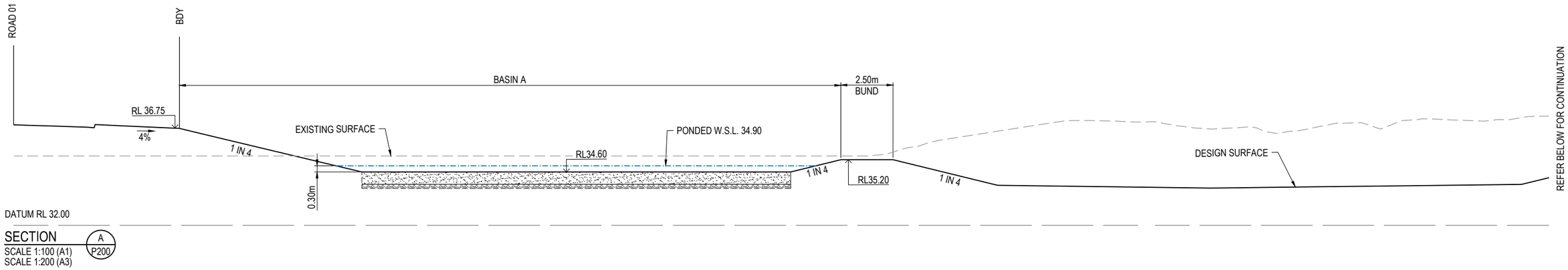
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

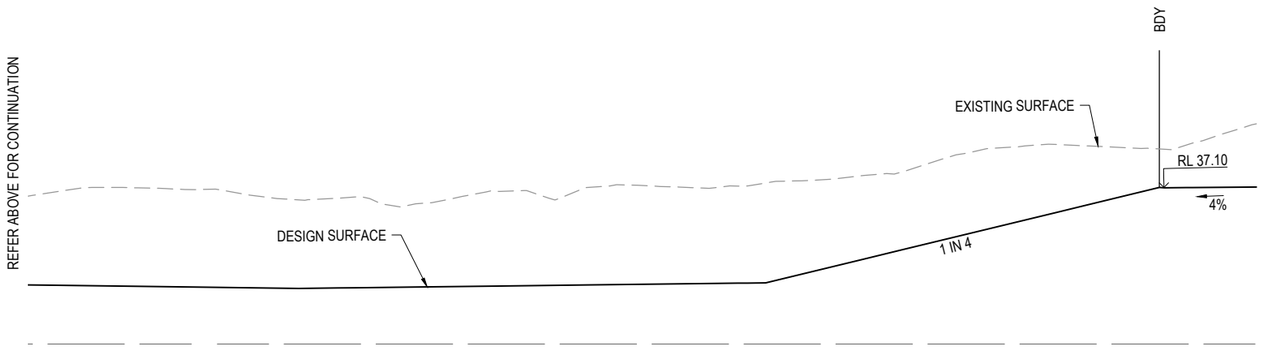
95-115 KOPLICK ROAD PARK RIDGE

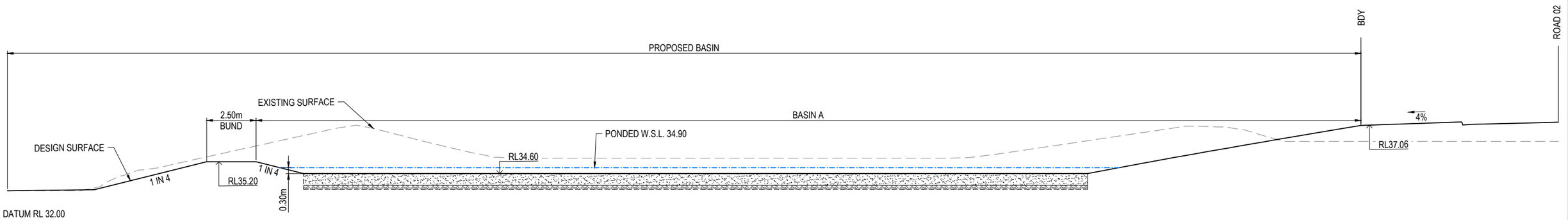
DRAWING TITLE: **BIO RETENTION BASIN LAYOUT PLAN**

PROJECT No.	DRAWING No.	REVISION
23-0181	P200	1



SECTION A
SCALE 1:100 (A1)
SCALE 1:200 (A3)
P200





SECTION B
SCALE 1:100 (A1)
SCALE 1:200 (A3)
P200

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

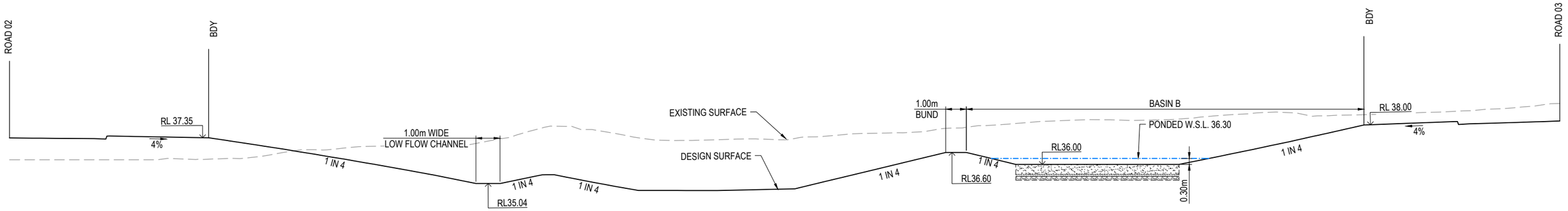
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

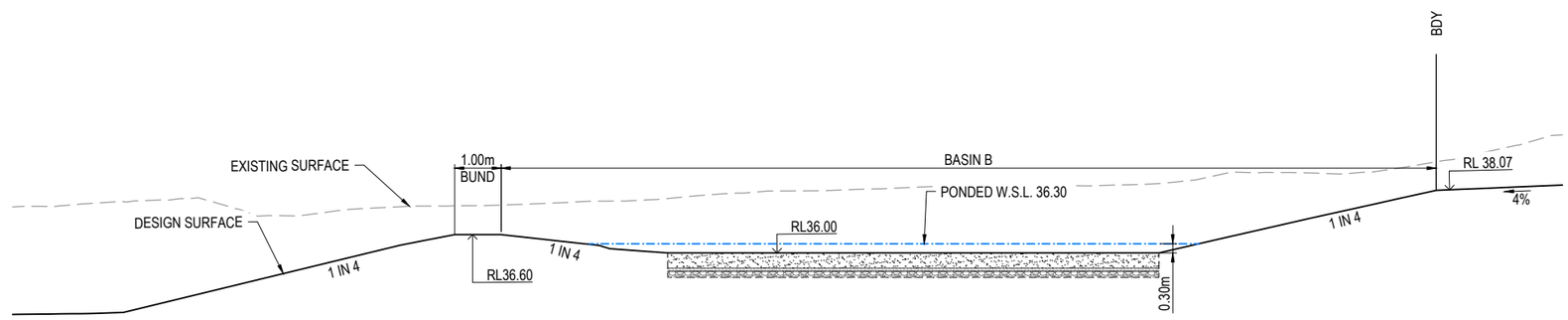
DRAWING TITLE: **BIO RETENTION BASIN TYPICAL SECTIONS SHEET 1**

PROJECT No.	DRAWING No.	REVISION
23-0181	P201	1



DATUM RL 32.00

SECTION C P202
SCALE 1:100 (A1)
SCALE 1:200 (A3)



DATUM RL 32.00

SECTION D P202
SCALE 1:100 (A1)
SCALE 1:200 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 19.07.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

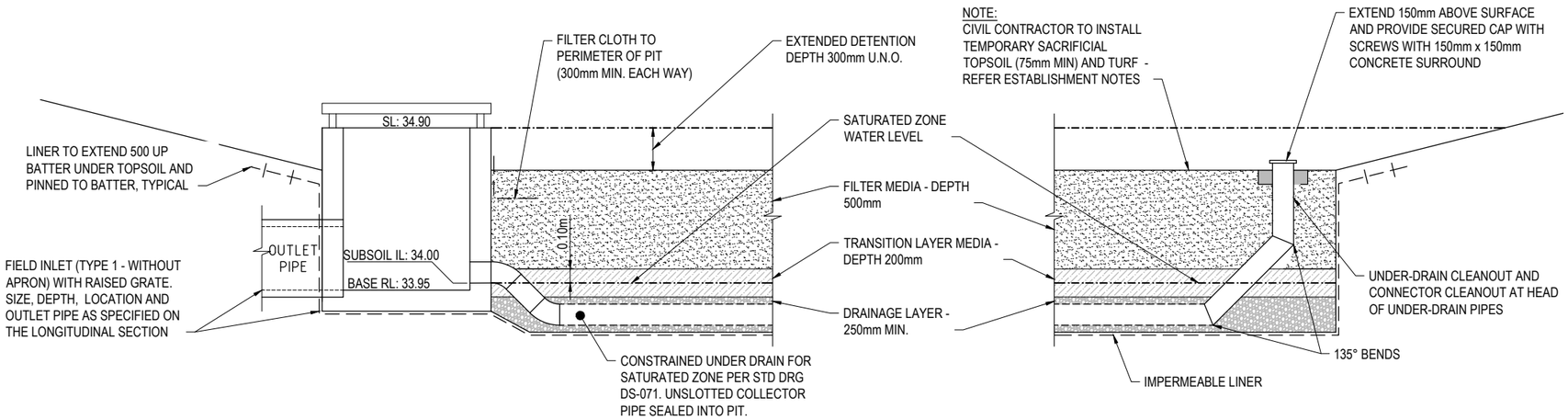
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

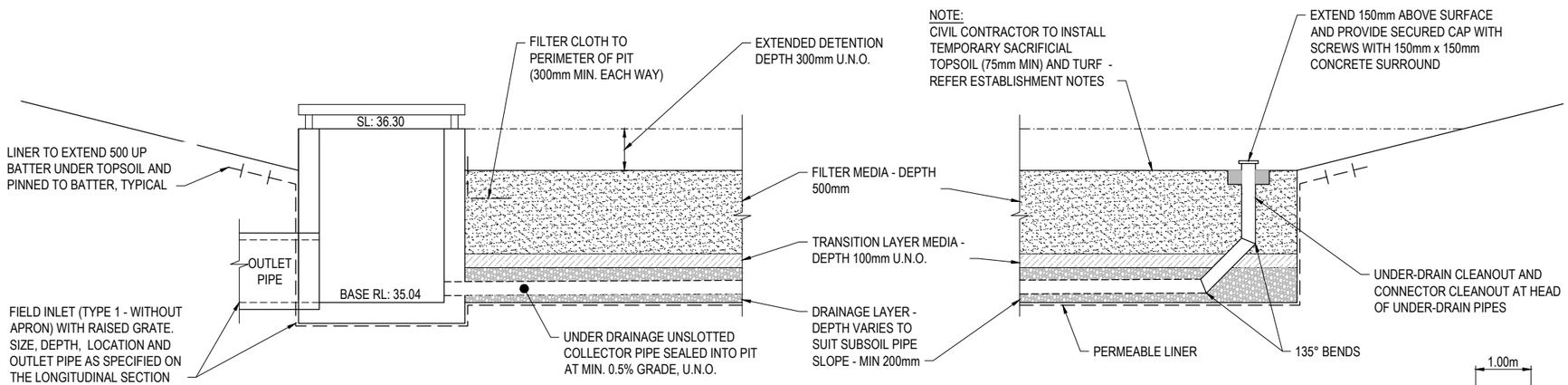
DRAWING TITLE: **BIO RETENTION BASIN TYPICAL SECTIONS SHEET 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	**P202**	**1**



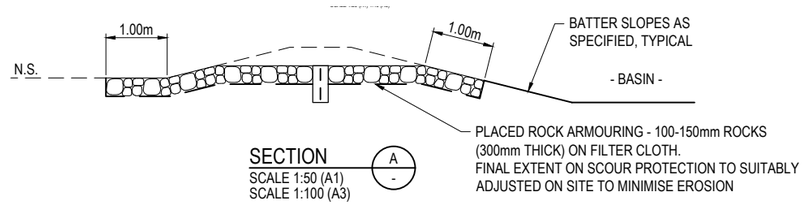
BIO RETENTION A FILTER MEDIA AND SUBSOIL DRAINAGE DETAIL SATURATED ZONE - CONSTRAINED

REFERENCE: IPWEA STD DRG DS-071
SCALE 1:20 (A1) 1:40 (A3)

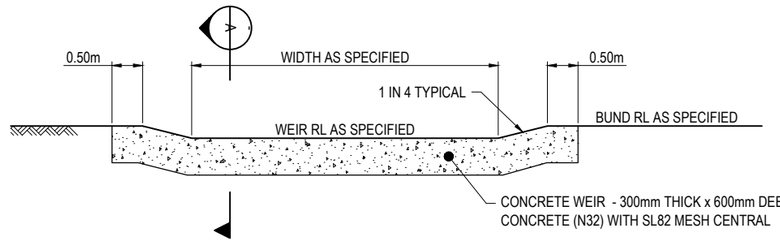


BIO RETENTION B FILTER MEDIA AND SUBSOIL DRAINAGE DETAIL CONVENTIONAL

REFERENCE: IPWEA STD DRG DS-073
SCALE 1:20 (A1) 1:40 (A3)



SECTION A-A
SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPICAL WEIR DETAIL

REFERENCE: IPWEA STD DRG DS-076
SCALE 1:50 (A1) 1:100 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN
DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BIO RETENTION BASIN TYPICAL DETAILS**

PROJECT No.	DRAWING No.	REVISION
23-0181	P203	1

EAST BEAUMONT ROAD

SEWER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

ROAD 01

ROAD 02

ROAD 03

ROAD 04

PATHWAY

SEWER CONNECTION POINT

SEWER CATCHMENT AREA 2

SEWER CATCHMENT AREA 3 - BALANCE AREA

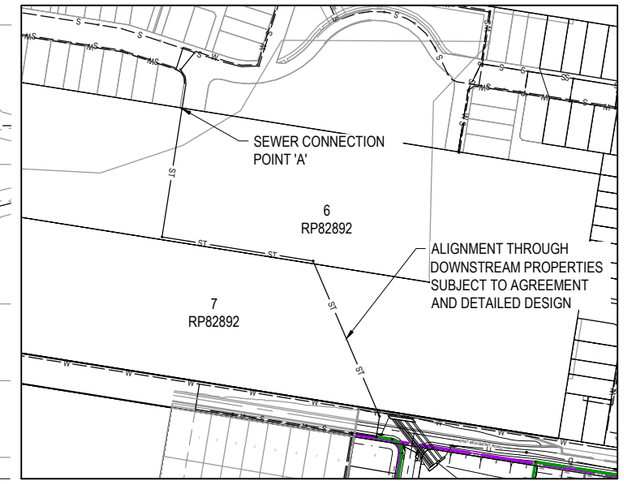
EXISTING STAGE

RP135029

REFER SHEET 2 FOR CONTINUATION

LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- PROPOSED SEWER MAIN
- EXISTING SEWER MAIN
- EXISTING SEWER MAIN
- PROPOSED ROAD CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- EXISTING STORMWATER DRAINAGE PIPE
- PROPOSED CONCRETE SLEEPER RETAINING WALL
- PROPOSED SEWERAGE CATCHMENT



SEWER CONNECTION POINT

SCALE 1:2000 (A1)

SCALE 1:4000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: NOT FOR CONSTRUCTION

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE

1:500 10 5 0 10 20 A1

1:1000 A3

CLIENT: KOPLICK DEVELOPMETS NO.2 PTY LTD

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

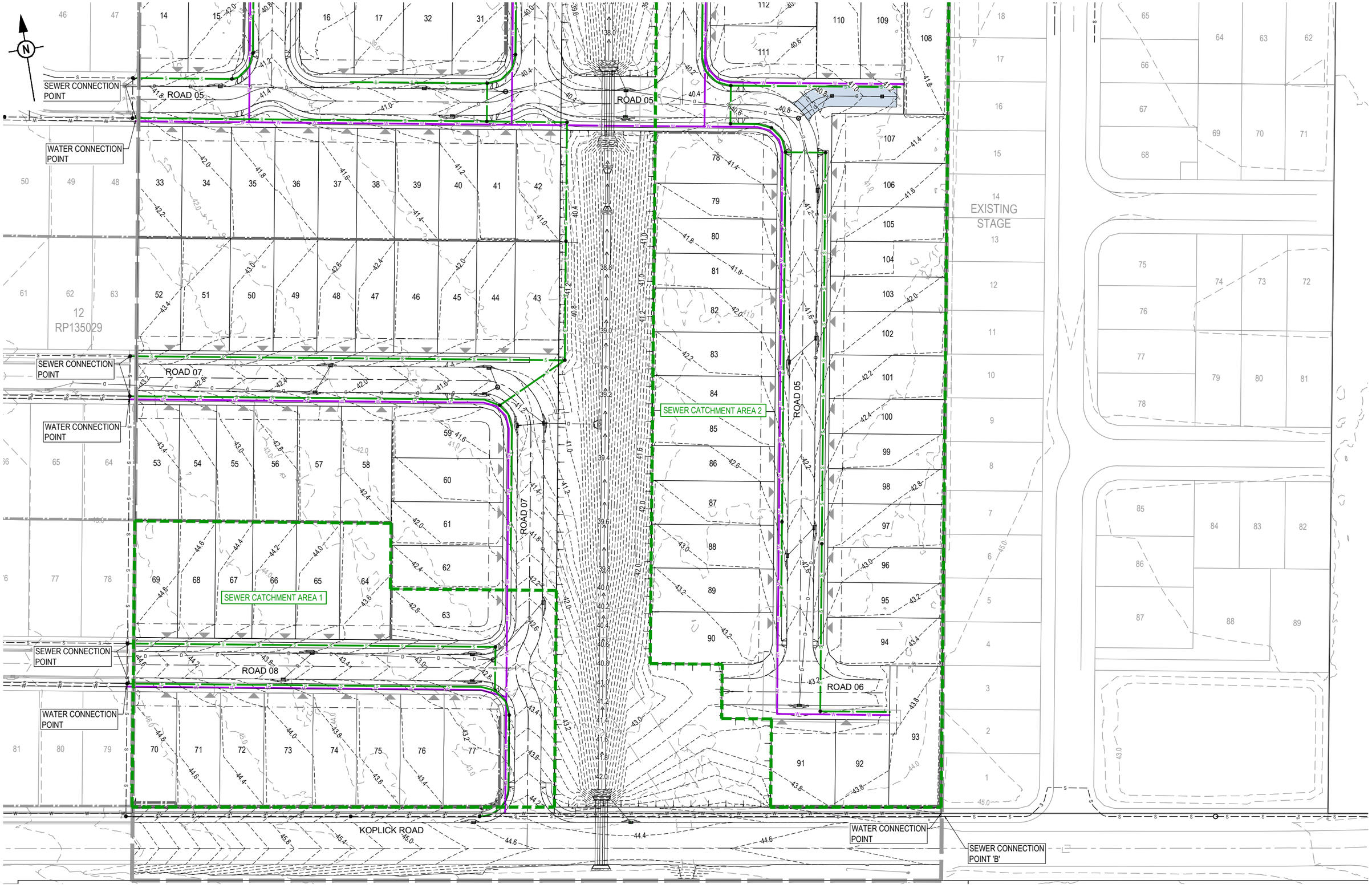
PROJECT NAME: PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: SEWERAGE LAYOUT PLAN SHEET 1 OF 2

PROJECT No.	DRAWING No.	REVISION
23-0181	P300	1

REFER SHEET 1 FOR CONTINUATION



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **SEWERAGE LAYOUT PLAN SHEET 2 OF 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	P301	1

Appendix C Stormwater Management Plan



95-115 Koplick Road, Park Ridge

Koplick Developments No.2 PTY LTD

Stormwater Management Plan

23-0181SMP01-v1

08 August 2023

Commercial in Confidence

This document is commercial-in-confidence. The recipient of this document agrees to hold all information presented within as confidential and agree not to use or disclose or allow to use or disclosure of the said information to unauthorized parties, directly or indirectly, irrespective of the acceptance or rejection of the presentation or at any time before, during or after an agreement has been reached, without prior written consent.

This report is prepared by Colliers | Engineering & Design for exclusive use by its client only. No responsibility is accepted for the use of or reliance upon this report in whole or in part by any third party.

Limitations

The sole purpose of this report and the associated services performed by Colliers | Engineering & Design is to display information in accordance with the scope of services set out in the contract/quotation between Colliers | Engineering & Design and its client. The scope of works and services were defined by the requests of the client, by the time and budgetary constraints imposed by the client, and by the availability of access to site/s and information.

This report is prepared with information supplied by the client and possibly others which is presumed to be accurate and complete. No responsibility is accepted for information that is withheld, incorrect or that is inaccurate, nor for changes to the conditions over the passage of time or from latent circumstance or conditions. No warranty or guarantee is made in relation to the data, findings and conclusions expressed in this report.

This report has been compiled at the level of detail specified in the report and no responsibility is accepted for interpretations made at more detailed levels than so indicated.

Report Contact:

Name:	Kelly McKendry
Position	Principal Water Resource Engineer
Phone:	(07) 3532 1300

Document Control

23-0181SMP01-v1

Version	Date	Details	Prepared	Checked	Approved	Signed	RPEQ
DRAFT	31/07/2023	DRAFT	MF	MM	KM		09298
V1	08/08/2023	V1	MF	MM	KM		09298

Executive Summary

Colliers Engineering & Design has been engaged by Koplick Developments No.2 PTY LTD to provide a Stormwater Management Plan (SMP) in support of a development application to Logan City Council (LCC). The application is over land located at 95-115 Koplick Road, Park Ridge on land currently described as Lot 13 and 14 on RP 135029. This development application seeks a development permit for a Reconfiguration of Lot (ROL) application to create 146 residential lots.

The site is bounded by East Beaumont Road to the north and Koplick Road to the south. The subject lot is zoned as an Emerging Community zone and covers an area of 10.34 ha. Currently, the site is used for small-scale agricultural and rural purposes and contains a series of constructed farm dams along the drainage line, with runoff flowing from south to north in alignment with the dams.

Although the site triggers the Flood Hazard code, the affected area is located at the upper extent of the site, where no permanent structures are proposed. This satisfies the intent of the LCC Planning Scheme Flood Overlay code. The legal point of discharge requirements will be met by discharging to the East Beaumont Road reserve and then to a mapped waterway corridor, ensuring no increased nuisance to third-party property.

The current report builds over the basis of the submitted Stormwater Management Plan for 117-127 Koplick Road, Park Ridge prepared by Colliers (REF: 23-0171-V1) providing an overreaching and consolidated stormwater management strategy for both sites.

The following stormwater management strategies are required:

Stormwater Quality Management:

- *Two (2) end-of-line bioretention basins with a filter media area of 800 and 180 m2 is necessary to meet water quality objectives.*

Stormwater Quantity Management:

- *A detention basin is required with the following specifications:*
  - *1 % AEP Depth of* 1.90 *m*
  - *1 % AEP Detention Volume of* 5048 *m3*

Table of Contents

Executive Summary i

1. Introduction 4

1.1. Report Structure and Objectives 4

1.2. Site Location and Description 4

2. Stormwater Quantity 6

2.1. Hydrologic Model 6

2.1.1. Rational Method Check 7

2.2. Hydraulic Analysis 7

2.2.1. Model Development 7

2.2.2. Results 10

2.2.3. Flood Afflux Maps 11

2.2.4. Peak Flow Comparison 12

2.3. Lawful Point of Discharge 12

3. Stormwater Quality 13

3.1. Design Objectives 13

3.2. Stormwater Quality Treatment 13

3.2.1. Strategy 13

3.2.2. MUSIC Parameters 13

3.2.3. Catchment Areas 14

3.2.4. MUSIC Model Layout 16

3.3. Treatment Measures 17

3.3.1. Bioretention Systems 17

3.3.2. Sediment Forebays 18

3.4. Results 18

4. Construction Phase Management 19

4.1. Erosion and Sediment Control 19

5. Establishment And Operational Phase Management 20

5.1. Establishment 20

5.2. Operational 20

6. Conclusion 21

7. References 22

List of Tables

Table 2-1: Sub-catchment Parameters 7

Table 2-2: Comparison of WBNM and Rational Method Peak Flows (Catchment P01) 7

Table 2-3: Proposed Detention System Outlet Details 10

Table 2-5: Developed vs Base Case Peak Flow Comparison at the Site's Downstream Boundary 12

Table 3-1: Site Stormwater Quality Objectives (Operational Phase) 13

Table 3-2: Urban land use (Split Source Nodes) - Pollutant Export Parameters 14

Table 3-3: MUSIC Runoff Generation Parameters 14

Table 3-4: Water Quality Catchment Areas 14

Table 3-5: Typical Bioretention Design Parameters 18

Table 3-6: MUSIC Results – Load Based Pollutant Outputs 18

List of Figures

Figure 1-1: Site Location (Source: QGIS Open Street Maps, 2022) 5

Figure 2-1: Existing and Development Sub-catchments and routing lines. 6

Figure 2-3: Model Extent 8

Figure 2-4: TIN Overlay 9

Figure 3-1: Lot Layout 16

Figure 3-2: MUSIC Model Layout 17

Appendices

Appendix A	Plan of Subdivision
Appendix B	Concept Engineering Plans
Appendix C	Rational Method
Appendix D	Flood Mapping

1. Introduction

Colliers Engineering & Design have been engaged by Koplick Developments No.2 PTY LTD to provide a Stormwater Management Plan (SMP) in support of a development application to Logan City Council (LCC). The application is over land located at 95-115 Koplick Road, Park Ridge on land currently described as Lot 13 and 14 on RP 135029. This development application seeks a development permit for a Reconfiguration of Lot (ROL) application to create 146 residential lots.

The proposed outcome of this document is to identify stormwater management options that could be implemented within the development to achieve the requirements and targets of the LCC Logan Planning Scheme (2015, v9), as well as the relevant provisions of the State Planning Policy (SPP; DSDIP, 2017). The intent of the codes associated with these documents will be achieved through the appropriate integration of stormwater management options within the proposed residential land-use. The objectives of this SMP are to:

- Detail the proposed stormwater quality management strategy and how the load reduction objectives specified by the SPP (DSDIP, 2017) and Schedule 6 of the Logan Planning Scheme are achieved during the operational phase of the development;
- Consider suitable Stormwater Quality Improvement Devices (SQIDs) based on Water Sensitive Urban Design (WSUD) principles;
- Ensure the development achieves non-worsening principles of stormwater flows downstream of the site; and
- Demonstrate how the lawful point of discharge requirements for the site will be achieved.

The current report builds over the basis of the submitted Stormwater Management Plan for 117-127 Koplick Road, Park Ridge prepared by Colliers (REF: 23-0171-V1) providing an overreaching and consolidated stormwater management strategy for both sites.

1.1. Report Structure and Objectives

This report will develop a SBSMP to ensure that 95-115 Koplick Road, Park Ridge complies with the requirements of the LCC Planning Scheme (2015, v9) and relevant regulatory authorities. As such, this plan will:

- Detail a stormwater quality management strategy that meets the post-construction objectives outlined in the Schedule 6 of the LCC Planning Scheme (2015, v9) and SPP (2017).
- Detail a stormwater quantity management strategy that meets the objectives prescribed in s2.5 of the Stormwater Management Planning Scheme Policy and Queensland Urban Drainage Manual (QUDM; 2017).

To ensure the efficacy and longevity of all stormwater management assets, maintenance requirements for all proposed devices are provided in each section.

1.2. Site Location and Description

The location of the proposed development and extension of previous application are shown in **Figure 1-1**, covering a total site area of 15.75 hectares. The site and surrounding lots are consistent with rural residential land use with low density wooded vegetation. The site is located within the Emerging Community zone and is within the flood overlay. It is proposed that the development remove the series of farm dams within the

drainage line and the rehabilitation/reinstatement of the drainage line is proposed. The strategy also consideres the remotion of the previous proposed Stormwater Detention Basin at 117-127 Koplick Road and the construction of a consolidated single detention basin within boundary of the application site.

As such, the proposal effectively meets the intent of the Flood Hazard Overlay code and previous significant environmental improvement with the rehabilitation of the waterway corridor.

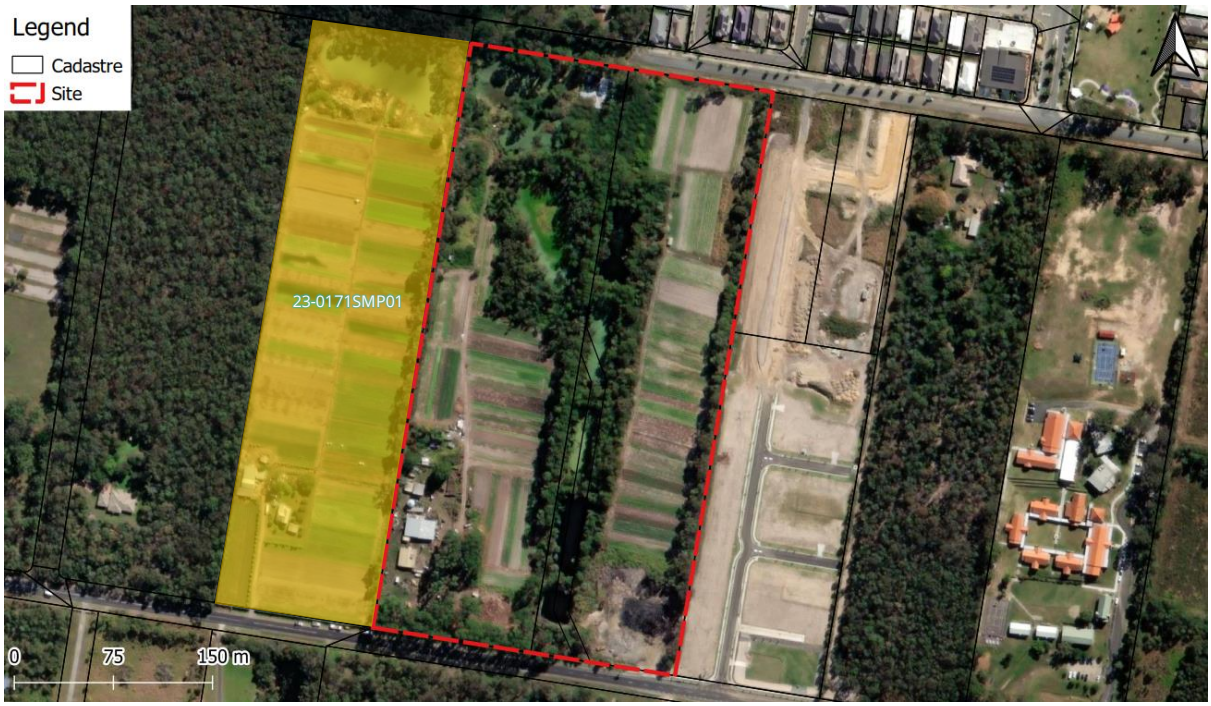


Figure 1-1: Site Location (Source: QGIS Open Street Maps, 2022)

2. Stormwater Quantity

The objective of this component of the study is to investigate the potential impact that the proposed development will have on peak flows discharging downstream of the site and any associated impacts of the proposed layout.

2.1. Hydrologic Model

A Water Bounded Network Model (WBNM) has been used to undertake a hydrologic assessment of the catchment. WBNM has been developed jointly by the University of Wollongong, Rienco Consulting and Balance R&D (Boyd et al, 2019). The September 2019 version has been used for this investigation, which utilizes ARR2019 hydrology.

Hydrologic modelling was simulated for events from 63.2% to 1% AEP and for durations of 15 minutes to 6 hours. A WBNM catchment lag factor of 1.6 was applied which is within the recommended range. An initial and continuing loss of 20mm and 1.5mm/hr has been applied to the model as per the ARR2019 datahub for the site.

The following scenarios have been investigated:

1. Existing Scenario
2. Developed Scenario

The fraction impervious values applied to the catchment, for the existing case scenario, is consistent with QUDM (2017). Catchments E07 and E04 are currently under construction and in the developed state these flows will be redirected to the south and not into the subject site. For this reason those catchment haven't been considered in any of the studied scenarios. **Figure 2-1** shows the sub-catchment delineation and routing lines for the existing and proposed scenarios with a summary of parameters shown in **Table 2-1**.

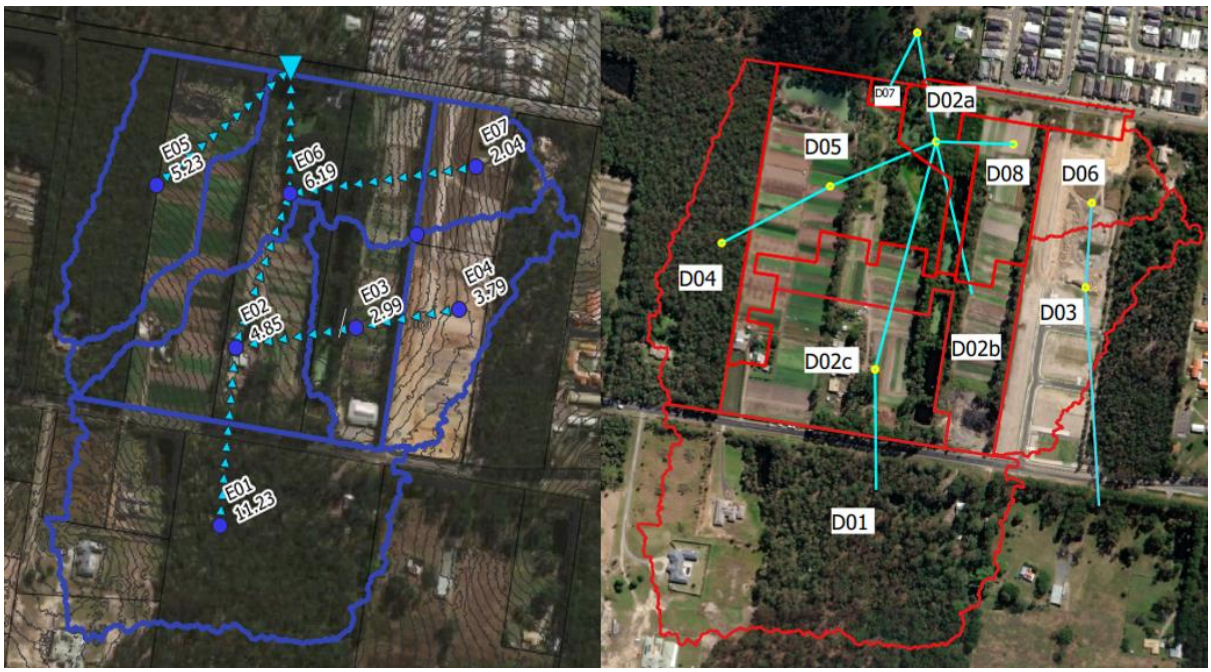


Figure 2-1: Existing and Development Sub-catchments and routing lines.

Table 2-1: Sub-catchment Parameters

Existing Scenario			Developed Scenario		
Sub-catchment	Area (ha)	% Imp	Sub-catchment	Area (ha)	% Imp
E01	11.23	10	**D01**	11.23	10
E03	2.99	10	**D02a**	1.93	60
E02	4.85	10	**D02b**	3.27	60
E06	6.19	10	**D02c**	4.18	60
E05	5.23	5	**D04**	3.51	0
			D05	5.02	60
			D07	0.15	60
			D08	1.75	60

The peak discharge values for the different storm event were used as input for the hydraulic model.

2.1.1. Rational Method Check

Pre-development peak flows from the WBNM model have been checked against peak flows determined using the Rational Method (RM). The assumptions adopted for the calculations are in accordance with ARR and QUDM 2017. The peak flows predicted being less than +/-15% for majority of the storm events and are hence considered acceptable. Refer to **Table 2-2** for a summary of rational method comparison.

Table 2-2: Comparison of WBNM and Rational Method Peak Flows (Catchment E05)

Hydrology/AEP (%)	63.2	50	20	10	5	2	1
Rational (m^3/s)	0.240	0.290	0.452	0.568	0.693	0.902	1.058
WBNM (m^3/s)	0.226	0.282	0.462	0.636	0.788	1.001	1.152
Difference (%)	6.19	2.83	-2.27	-10.68	-12.07	-9.86	-8.15

2.2. Hydraulic Analysis

Hydraulic modelling has been carried out using TUFLOW software package (Version: 2020-10-AA). TUFLOW is a computational engine that provides one-dimensional (1D) and two-dimensional (2D) solutions for free-surface flow equations to simulate flood and tidal wave propagation.

2.2.1. Model Development

2.2.1.1. Model Extent

A localised hydraulic model was constructed, incorporating the site, upstream and downstream properties. The extent of model domain is shown in **Figure 2-2** below.

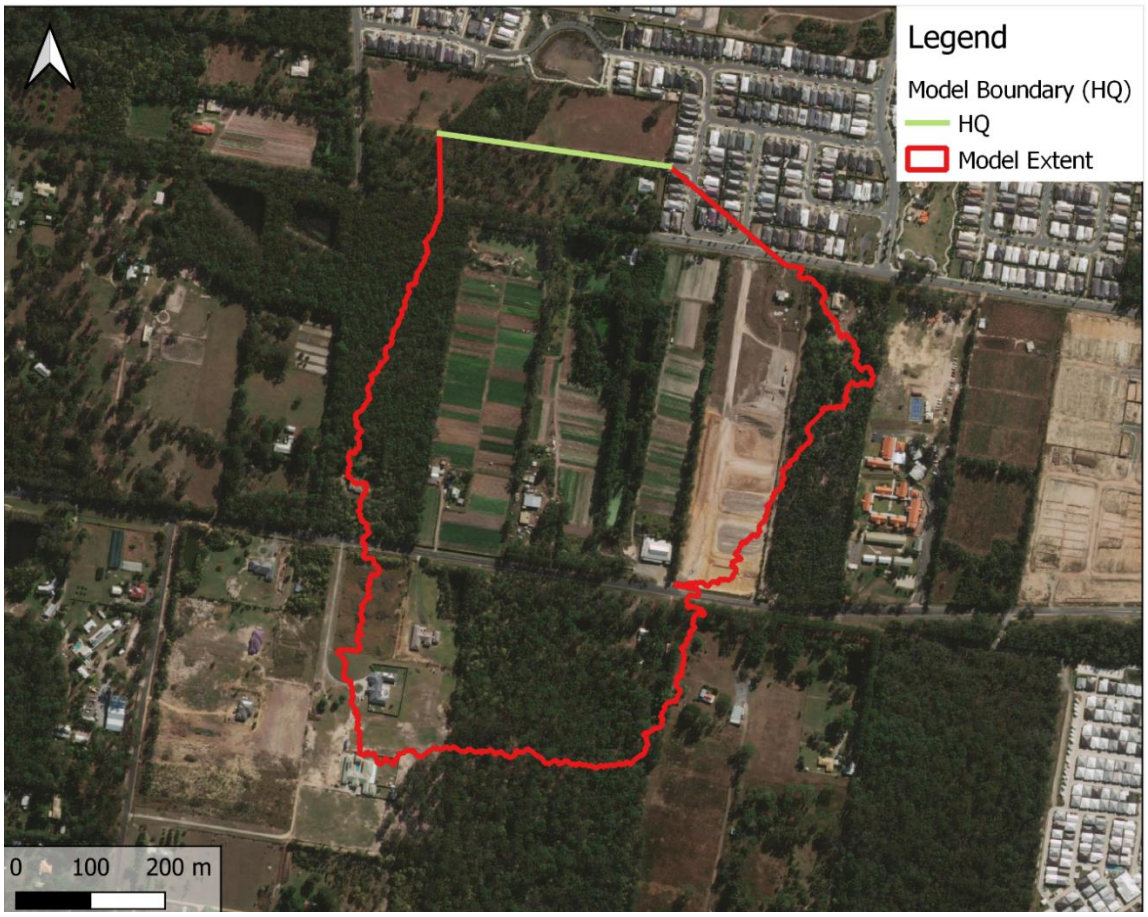


Figure 2-2: Model Extent

2.2.1.2. Topography

TUFLOW model topography is based upon the DEM that has been created from aerial LiDAR survey from 2013 and detailed site survey. There are 9 farm dams located within the model extent.

The development has been modelled using the design DEM developed in 12d – this includes road upgrades of Koplick Road and East Beaumont Road, the swale, detention basin and bio-retention basins.

Figure 2-3 shows the application of the DEM overlay in the model.

A 2m hydraulic grid has been used for the assessment.



Figure 2-3: TIN Overlay

The Manning's roughness values applied aligned with the QUDM (2017) guidelines and spatial delineation of the individual Manning's n layers was guided by ESRI satellite imagery (2020). For the developed scenario, the channel was assumed to be grassed and free of debris.

2.2.1.3. Inflow

Inflows have been incorporated into the model setup using inflow polygons (2d_sa) to read in the inflow hydrographs from the hydrology models. All inflows were applied directly from the WBNM model based on full hydrograph inclusion and run as unsteady state.

For the existing scenario, initial water levels were applied across all nine farm dams. All farm dams were assumed full, with the initial water level deduced as the low point of the crest (outlet) for each farm dam.

For the developed scenario, the location of the inflow polygons was informed by the layout of the stormwater network. Catchment D02 was discretised into three separate subcatchments – D02a, D02b and D02c, representing the north (downstream / basin), middle (central crossing) and south (upstream) discharge locations. Sub-catchments D04 and D05 were consolidated into one and applied to the basin as total inflow to considered the routing of D04 into D05. Catchment D07 was applied downstream of the basin as bypass.

2.2.1.4. Tailwater

The tailwater condition is applied in the model as a HQ (manning equation) boundary, based on a slope of 1.0% for all storm events. The model boundary has been extended a sufficient distance downstream of the site, such that it did not influence flood level determinations in the site.

2.2.1.5. Structures

Stormwater from the south-western portion of the development is anticipated to discharge south of the central crossing. The culvert arrangement for the crossing has been sized at 3 / 750 mm dia RCP to allow for this.

Low flow control structures as proposed along the central channel to manage minor flow. The structures will be materialized through constructed bunds with twin 300 mm DIA RCP connected at the invert of the channel at two locations as shown in the engineering plans.

The stormwater detention basin will be provided with a multi-stage outlet structure to ensure non-worsening of pre development flows. The specification of the control structure is outlined in **Table 2-3**.

Table 2-3: Proposed Detention System Outlet Details

Basin	
Low Flow outlet to High Flow 1	5 x 525 mm diameter at 0.01 m (33.51 m RL)
Weir to High Flow 1	8m long crest at 1.15m (34.54m RL)
High Flow 1	3 x 750 mm diameter at 0.00 m (33.50 m RL)
Weir to High Flow 2	4m long at 1.45 m (34.95)
High Flow 2	1 x 750 mm diameter at 0.00 m (33.50 m RL)
Weir to High Flow 3	6m long at 1.72 m (35.22)
High Flow 3	1 x 900 mm diameter at 0.00 m (33.50 m RL)
Embankment	RL 35.70

The arrangement of the control structure may be modified or optimised on detailed design if the hydraulic performance is consistent. For instance, the high-level outlets may be combined into an irregular orifice or partially catered for with a grated opening at the top of the outlet structure pit.

2.2.2. Results

The Existing Case (E02) and Developed Case (D09) hydraulic models have been assessed for a range of flood events from the 63.2 % to 1.0% AEP. The assessment has considered a range of design storm durations to ensure that the critical storm is defined throughout the model extent.

The resulting outcomes are summarised below:

Base Case Model Results (E02)

The Base Case modelling results indicated that:

- Widespread sheet flow across the development down to the model boundary was found in all design events resulting in a slow propagation of flooding across the catchment.

Developed Case Model Results (D09)

Major Event (1% and 5% AEP)

- The proposed stormwater measures provide no nuisance to surrounding properties.
- Reductions in the water level and magnitude of flow are observed in the waterway, downstream of the site.
- Peak flows are contained within the basin, and adequately attenuate the increase in peak flows from the development of the site.
- The peak flood level in the basin is 35.40 m AHD, yielding a peak storage of approximately 5048 m^3.
- Adequate freeboard is observed in the proposed channel, from the central crossing to the basin.
- Flow velocities in the basin and proposed channel are deemed acceptable.
- The culvert serving the central crossing is sized appropriately, with no breakout overland flow observed.

Minor Events (< 1% AEP)

- The proposed stormwater measures provide no nuisance to surrounding properties. This is substantiated by the generation of 'Was Wet Now Dry Cells' along the banks of the downstream waterway.
- Peak flows are contained within the basin, and adequately attenuate the increase in peak flows from the development of the site.
- An increase in water level in the centre of the downstream waterway is observed. This is driven by the discharge from the minor pipe outlet.
- Flow velocities in the basin and proposed channel are deemed acceptable.
- No breakout overland flow is observed from the central crossing.

The results of the hydraulic assessment are presented as a series of flood maps to illustrate the flooding characteristics of the Base Case and Developed scenario across a range of flood properties including water surface level, depth abd hazard. The maximum flood depth and afflux levels have been combined and mapped for all event durations assessed.

Due to the complexity of the system, achieving the maximum 1.2 m safety depth for the 5% AEP event has proven challenging. However, as stated in section 5.12 of the Queensland Development Urban Drainage Manual (QDUM), attaining this specific depth is rarely practical. Therefore, the inclusion of water depth indicators and fencing around the areas with potential hazards will be employed to mitigate any risks associated with the water levels.

The flood maps are presented in **Appendix D**.

2.2.3. Flood Afflux Maps

The Flood Afflux Map in **Appendix D** illustrates a comprehensive comparison of water levels between the post-development and pre-development scenarios. It is evident that across all events, there is a consistent reduction in water levels and the presence of wet cells in the south-east portion of the downstream land. Conversely, there is a rise in water levels towards the north-east region. This redistribution of flows is primarily influenced by the formalization of drainage systems proposed for the development and the establishment of connected pipes.

It is essential to emphasize that, as described in the section below, no increases in flows have been detected as a result of the proposed development.

2.2.4. Peak Flow Comparison

Table 2-4 compares the peak flow at the site outlet for the Base Case and Developed Case peak flows. The comparison demonstrates a decrease in peak flow is predicted in the developed scenario across all storm events, validating the efficacy of the mitigation measures and satisfies the principle of non-worsening downstream of the site. This is deemed an acceptable outcome.

Table 2-4: Developed vs Base Case Peak Flow Comparison at the Site's Downstream Boundary

AEP (%)	Critical Duration (min)	Base Case Peak Flow (m^3/s)	Developed Peak Flow (m^3/s)	Difference (m^3/s)	Difference (%)
63	60	1.24	1.05	-0.19	-15%
50	60	1.72	1.48	-0.24	-14%
20	60	3.09	2.74	-0.35	-11%
10	60	4	3.82	-0.18	-5%
5	60	4.97	4.85	-0.12	-2%
1	45	7.4	7.4	0	0%

The discharge behaviour at the downstream boundary for the Base Case and Developed Case scenarios for the 1% AEP and 63.2% AEP events are shown in Error! Reference source not found.. This shows discharge f rom the site occurs earlier in the developed scenario, with the swale providing a direct route for upstream flows to the downstream boundary, reducing the flow distance. Attenuation in the discharge, resulting in a reduced peak flow across both the minor and major events, demonstrates the effectiveness of the basin in detaining the increase in peak flows generated from the development.

2.3. Lawful Point of Discharge

As outlined by the Queensland Urban Drainage Manual (4th Edition – Institute of Public Works Engineering Australasia, Queensland Division) a test can be undertaken to determine whether a lawful point of discharge exists:

The criteria for determining the lawful point of discharge are:

Will the proposed development alter the site's stormwater discharge characteristics in a manner that may substantially damage a third-party property (see **Section 3.6**).

If not, then no further steps are required to obtain tenure for a lawful point of discharge (assuming any previous circumstances and changes were lawful).

It is considered that discharge from the site will be managed in such a manner as to not substantially damage third party property, and as a result it is considered suitable lawful points of discharge has been identified and achieved.

3. Stormwater Quality

3.1. Design Objectives

This report identifies the stormwater quality management objectives for the operational phase (post-construction phase) of the proposed development. Construction based stormwater quality management objectives will need to be addressed as part of operational works documentation.

The load-based Water Quality Objectives (WQO's) stipulated in the SPP (DILGP, 2017) for the Southeast Queensland region have been adopted for the site, as shown in **Table 3-1**.

Table 3-1: Site Stormwater Quality Objectives (Operational Phase)

Minimum reductions in mean annual loads from unmitigated development (%)			
Total Suspended Solids (TSS)	**Total Phosphorous (TP)**	**Total Nitrogen (TN)**	**Gross pollutants >5 mm**
80	60	45	90

3.2. Stormwater Quality Treatment

3.2.1. Strategy

The objective of this section is to assess the stormwater quality measures required based on the development layout to support the development application. Runoff from the development will be collected in a stormwater drainage system and discharged into a bioretention basin prior to being discharged from the site.

This plan sizes the required SQID's to treat runoff from the proposed development of this site only.

3.2.2. MUSIC Parameters

An assessment of stormwater runoff quality from the existing conditions and proposed developed conditions has been undertaken using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) – Version 6.3, released in 2018.

Climate data for the catchment was sourced from the MUSIC model database. The rainfall and evaporation data template for this site has been based on data from Shailer Park (40715) from 1/1/1990 to 31/12/1999 with six (6) minute rainfall duration.

Table 3-2 and **Table 3-3** outline the adopted source node parameters from "MUSIC Modelling Guidelines" (Water by Design, 2010) that were used in the MUSIC model.

Table 3-2: Urban land use (Split Source Nodes) - Pollutant Export Parameters

Land Use	Parameter	Total Suspended Solids (Log_{10} mg/L)		Total Phosphorous (Log_{10} mg/L)		Total Nitrogen (Log_{10} mg/L)	
		Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow
Ground	Mean	2.18	1.0	-0.47	-0.97	0.26	0.20
	Std Deviation	0.39	0.34	0.31	0.31	0.23	0.20
Road	Mean	2.43	1.0	-0.30	-0.97	0.26	0.20
	Std Deviation	0.39	0.34	0.31	0.31	0.23	0.20
Roof	Mean	1.30	N/A	-0.89	N/A	0.26	N/A
	Std Deviation	0.39	N/A	0.31	N/A	0.23	N/A

Table 3-3: MUSIC Runoff Generation Parameters

Parameter	Proposed - Urban
Rainfall Threshold (mm)	1
Soil Capacity (mm)	500
Initial Storage (%)	10
Field Capacity	200
Infiltration Capacity Coefficient a	211
Infiltration Capacity Coefficient b	5
Initial Depth (mm)	50
Daily Recharge (%)	28
Daily Drainage (%)	27
Daily Deep Seepage Rate (%)	0

3.2.3. Catchment Areas

The development site has been split into three catchments containing split source nodes (road, roof and ground) representing the total developed area reporting to a SQID or bypassing treatment. Table 3-4 detail the catchment areas, source and imperviousness represented within the MUSIC model for the ultimate development scenario. The lot layout is provided in **Figure 3-1**. It should be noted that only the area of the site is considered in the catchment areas.

Table 3-4: Water Quality Catchment Areas

Catchment	Total Area (ha)	Road (ha)	Roof (ha)	Ground (ha)
A	0.058	-	0.022	0.037
B	5.134	1.626	1.720	3.414
C	1.442	0.366	0.538	0.904

D	3.534	0.898	1.290	2.244
E	0.293	-	0.194	0.099
F	1.743	0.527	0.602	1.141
G	1.795	0.412	0.731	1.064
S1	0.498	-	-	0.498
S2	0.614	-	-	0.649
Imperviousness (%)		60	100	20

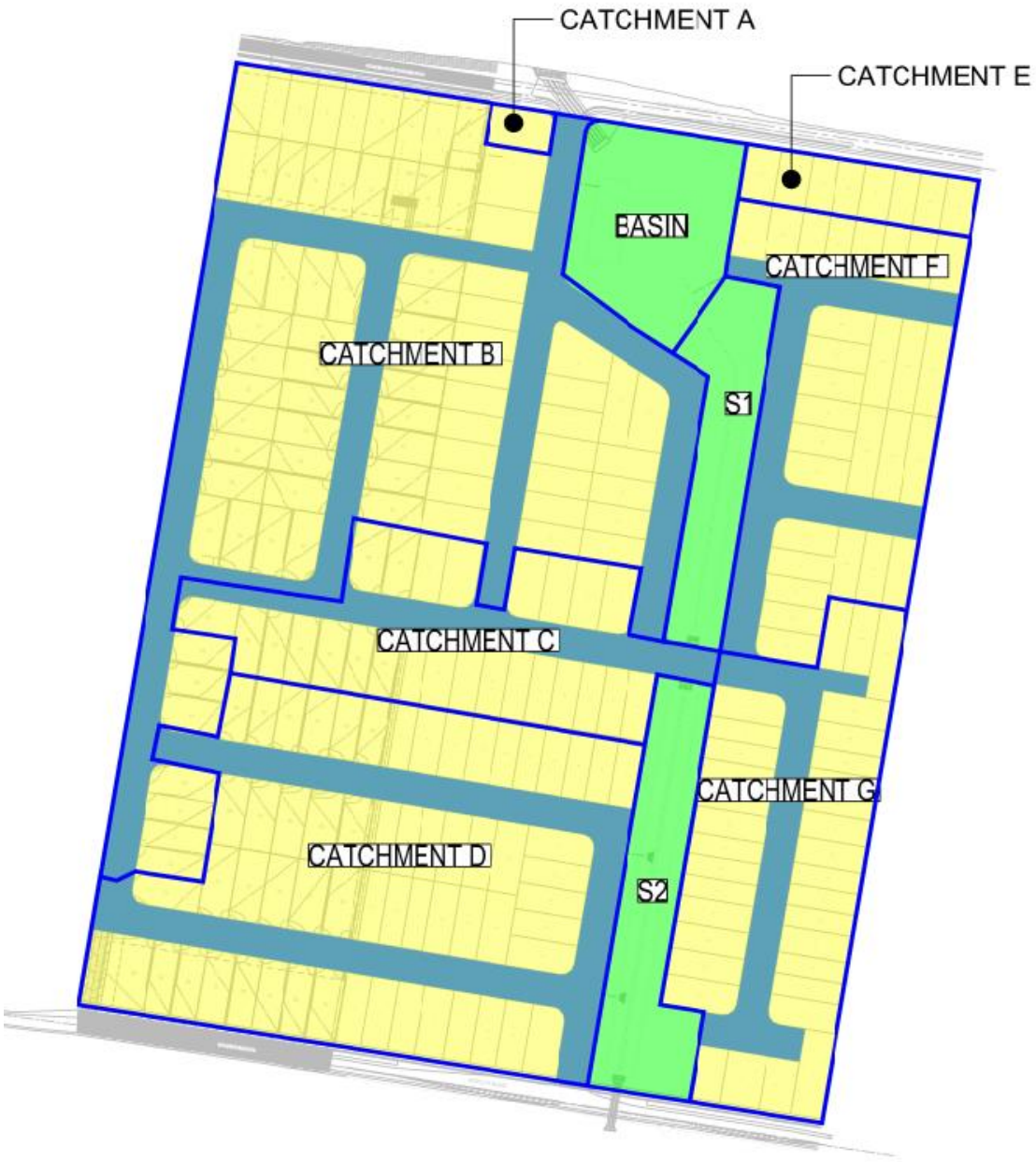


Figure 3-1: Lot Layout

3.2.4. MUSIC Model Layout

As the management of urban stormwater needs to take a holistic approach, specific management measures need to be implemented in series to form a treatment train. The correct utilisation of various devices within the treatment train is imperative to target the desired pollutants, from the gross solids to the fine colloidal particals. **Figure 3-2** shows the MUSIC model layout.

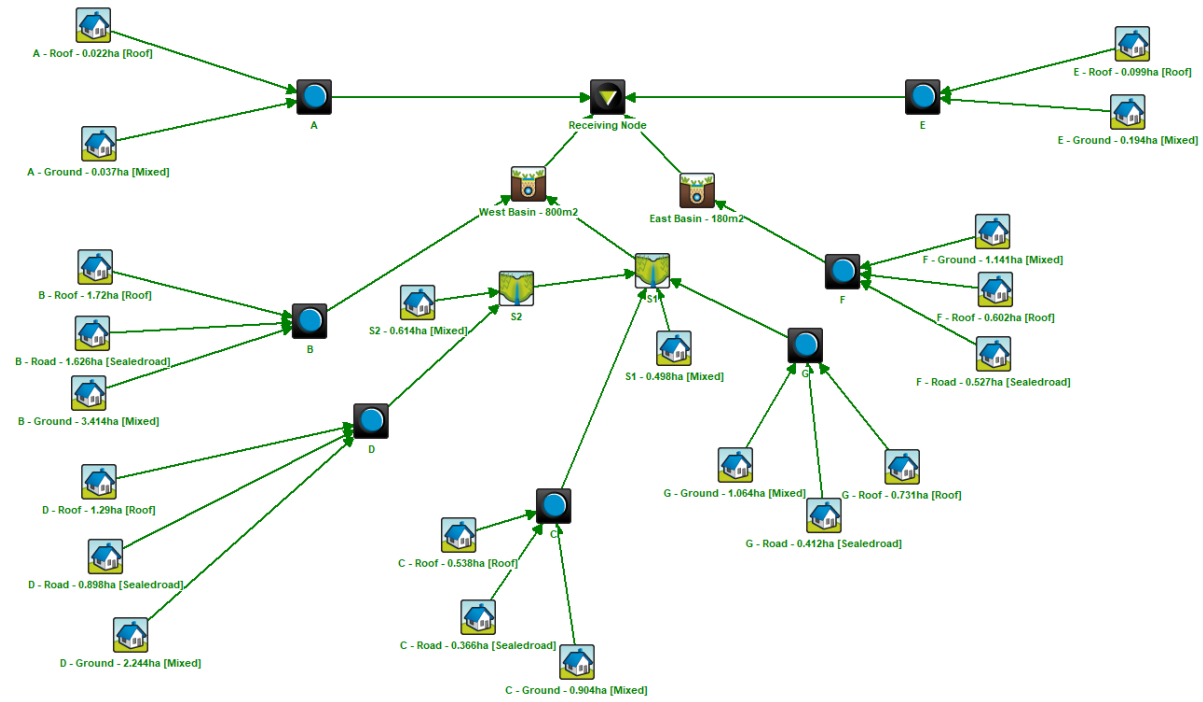


Figure 3-2: MUSIC Model Layout

3.3. Treatment Measures

Runoff from the development is proposed to be treated through two bioretention basins located within stage 1 and stage 2.

3.3.1. Bioretention Systems



Bioretention systems use ponding above a treatment surface to maximise the volume of runoff flowing through the filtration media. They typically convey flows above the design event through overflow pits or a weir. The treatment system operates by firstly filtering surface flows through surface vegetation and then percolating runoff through prescribed filtration media. This media provides treatment through fine filtration, extended detention and biological uptake of nutrients.

As these systems take approximately 12-24hrs to drain, the maximum depth of pondage allowed to occur over the filter area has been limited to 300mm, with a minimum filter media depth of 500mm. **Table 3-5** summarises the preliminary design parameters for bioretention systems modelled in MUSIC.

It is to be noted that the Orthophosphate content of the filter media has been reduced to 30mg/kg in line with recent advice from Healthy Waterways.

(http://healthywaterways.org/initiatives/waterbydesign/stormwater).

Table 3-5: Typical Bioretention Design Parameters

Parameter	West Basin Parameters	East Basin Parameters
Extended Detention Depth (m)	0.30	0.30
Storage Surface Area (m^2)	800	180
Filter Media Area (m^2)	800	180
Unlined Filter Media Perimeter (m)	0.01	0.01
Saturated Hydraulic Conductivity (mm/hr)	200	200
Filter Depth (m)	0.5	0.5
TN Content of Filter Media (mg/kg)	400	400
Orthophosphate Content of Filter Media (mg/kg)	30	30
Exfiltration Rate (mm/hr)	0.0	0.0

3.3.2. Sediment Forebays

To ensure that the deposition of coarse sediment on the filter media surface does not affect the bioretention system function, bioretention systems should be designed with pre-treatment to limit the amount of coarse sediment reaching the filter media. A sediment forebay will be required to pre-treat runoff for the proposed bioretention basin as the contributing catchment is greater than 2 ha. As the basin does have a catchment area greater than 2 ha, a forebay will be required.

3.4. Results

MUSIC modelling of the proposed treatment train for the developable area of the subdivision was performed to ensure the WQO's were achieved. **Table 3-6** presents the load-based outputs that are represented by this application. The results show the mitigated scenario achieves both compliant load reductions for the Interim and ultimate developments scenarios. This satisfies the requirements set out by the LCC Planning Scheme (2015 and SPP (2017).

Table 3-6: MUSIC Results – Load Based Pollutant Outputs

Pollutant	Unmitigated (kg/yr)	Mitigated (kg/yr)	Reduction Achieved (%)	Target Reduction (%)	Compliance
TSS	19500	3520	81.9	80%	✓
TP	39.9	11.1	72.1	60%	✓
TN	247	130	47.6	45%	✓
GP	2700	49.5	98.2	90%	✓

4. Construction Phase Management

4.1. Erosion and Sediment Control

The management of the site during the construction phase is an important step in ensuring water quality standards are achieved. Implementation of best practice Erosion and Sediment Control techniques is imperative to managing the quality of runoff affected by construction works.

The following points provide general guidance on the management of stormwater during the construction phase. Detailed Erosion and Sediment Control Management Plans should be developed in conjunction with the Operational Works design prior to construction works commencing in accordance with the International Erosion Control Association (IECA) - "*Best Practice Erosion and Sediment Control (BPESC) document*" and overseen by a Certified Professional in Erosion and Sediment Control (CPESC) or Registered Professional Engineer Queensland (RPEQ).

1. Establish a single stabilised entry/exit point for the site works;
2. Construct a shake-down grid at the entrance to facilitate the removal of sediment from trucks leaving the site. The access road extending from the end of existing road or kerb to the grid should comprise a 150-200mm deep pad of 40mm crushed rock;
3. Install sediment fences along the lower boundaries of the site;
4. Construct one or more strategically placed sediment basins in the proposed drainage reserve and construct contour drains / bunds to direct disturbed runoff to the sediment basins;
5. Install bins and/or wind-proof litter areas on-site to minimise the dispersion of gross pollutants;
6. Maintain on site sufficient materials necessary for the emergency repair of all erosion control devices. This includes silt fences, clean crushed rock for reapplication to the entrance road and for replacement of rock within temporary drainage channels, and flocculants for settling sediment basins;
7. Following each day's construction works, ensure that any material on road surfaces is swept from the road, and not permitted to be washed down the gutters and piped drainage systems;
8. Quality of pooled water within sediment basins are to be monitored prior to dewatering, sufficient time should be given to allow sediment to settle (possible with the assistance of a suitable flocculent if necessary) &/or filtering during pumping operations; and
9. Final establishment of bioretention basin should not occur until full stabilisation of upstream catchment has occurred; preferably these should be temporarily turfed during the maintenance period while dwelling construction is occurring.

It shall be the responsibility of the developer, through their principal contractor, to ensure that temporary sediment and erosion controls are installed and maintained correctly.

5. Establishment And Operational Phase Management

5.1. Establishment

Experience shows that the critical periods in the life of WSUD vegetated stormwater systems are the construction and establishment phases. The timing and approach to these systems must be carefully considered to ensure successful establishment and long-term performance. Bioretention systems are now common stormwater treatment devices for new urban developments in Queensland. Successful construction and allowing adequate time for the systems to establish is critical to their long-term performance and function. Construction of the system is also linked to having suitable bioretention designs in place to ensure, civil contractors have appropriate plans to construct to. Applying due care in the design and construction phase will ensure the function of the system whilst also keeping on-going maintenance to a minimum. It is highly recommended that the constructed activities be completed in accordance with *the Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands (Apr 2010).* This will require a sacrificial turf layer to be installed to protect the filter media from the building phase.

5.2. Operational

It is not proposed for water quality monitoring of the bioretention system to be undertaken during the operational phase of its life. The *"Maintaining Vegetated Asset"* guideline highlights that water quality monitoring is not recommended to determine the performance of every vegetated stormwater asset, as it is a specialized field that is complex and costly. In line with this guideline the on-going monitoring of water quality from this device is not considered necessary considering the small size of the development.

The bioretention system will be maintained by the LCC, who as the asset custodian, will be responsible for the on-going maintenance of the water quality device. Maintenance for the bioretention basin may involve the following:

1. Scheduled inspections;
2. Removal of noxious plants or weeds;
3. Maintaining the desired vegetation;
4. Repairing erosion;
5. Unblocking inlets and outlets;
6. Removing litter and debris;
7. Managing algal or moss growth; and
8. Maintaining the permeability of the filtration.

Operations and maintenance should be conducted in accordance with the *Maintaining Vegetated Stormwater Assets* (Feb 2012) guideline.

6. Conclusion

Colliers Engineering & Design has been engaged by Koplick Developments No.2 PTY LTD to provide a Stormwater Management Plan (SMP) in support of a development application to Logan City Council (LCC). The application is over land located at 95-115 Koplick Road, Park Ridge on land currently described as Lot 13 and 14 on RP 135029. This development application seeks a development permit for a Reconfiguration of Lot (ROL) application to create 146 residential lots.

The proposed Stormwater Quality Management Strategy achieves the Logan City Council's and State Planning Policy's water quality objectives (LCC, 2015, v9; SPP, 2017). To reduce the pollutant loads associated with the proposed development, two bioretention and vegetated swales have been designed in accordance with MUSIC Modelling Guidelines (2018) is required for each stage. This strategy will meet reduction targets.

The proposed Stormwater Quantity Management is to incorporate a detention basin to treat post development flows from 95-115 & 117-127 Koplick Road. This strategy aligns with the Logan City Council's Integrated Design Planning Scheme Policy and Queensland Urban Drainage Manual objectives (LCC, 2015 v9; IPWEA, 2017). The assessment affirms that the proposed development not only achieves its objectives but also enhances flood management efficiency in the designated region.

In summary, for 95-115 & 117-127 Koplick Road, Park Ridge to be developed in accordance with the Logan City Council Planning Scheme (2015, v9), Queensland Urban Drainage Manual (2017), and State Planning Policy (2017), the following stormwater management strategies are required:

Stormwater Quality Management:

- Two (2) end-of-line bioretention basins with a filter media area of 800 and 180 m2 is necessary to meet water quality objectives.

Stormwater Quantity Management:

- A detention basin is required with the following specifications:
  - 1 % AEP Depth of 1.90 m.
  - 1 % AEP Detention Volume of 5048m3.

We therefore request Council approval of the engineering components for the proposed development with reasonable and relevant conditions. Detailed design may result in changes to the proposed strategy; however, the design objectives will be maintained.

7. References

- Australian Rainfall and Runoff (Institute of Engineers Australia, 2019).
- Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands (Water by Design 2012).
- http://www.bom.gov.au/water/designRainfalls/revised-ifd (Bureau of Meteorology, Online Rainfall IFD Data System).
- Maintaining Vegetated Stormwater Assets (Water by Design, 2012).
- Logan City Council (LCC) Planning Scheme: Version 9, 2015.
- MUSIC Modelling Guidelines Version 1.0 (Water by Design, 2010).
- State Planning Policy (Department of Infrastructure, Local Government and Planning, 2017).
- Queensland Urban Drainage Manual – 4th Edition (Institute of Public Works Engineering Australasia, Queensland Division, 2017).

Appendices

Appendix A Plan of Subdivision



Legend

- Site Boundary
- Environmental Management Area
- Greenspace/Park/Stormwater Area
- Road
- 1.85m Road Widening

Scale 1:2000 @ A3- Lengths are in Metres.

20 0 20 40 60 80 100

Typical Lot Frontages	Yield
10–12.4m	26
12.5–13.9m	70
14–14.9m	31
15–16.9m	17
17+m	2
TOTAL RESIDENTIAL LOTS	146

Notes

1. Subject base line work and 1m contours sourced from QSpatial. All data is approximate only.

2. Any licence, express or implied, to use this document for any purpose whatsoever is restricted to the terms of the agreement or implied agreement between wolter consulting group and the instructing party.

3. Design has been prepared for the purposes of a Plan of Reconfiguration only and is subject to local authority approval & detailed engineering requirements. Areas and dimensions are approximate only and are subject to survey.

4. This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

PLAN OF RECONFIGURATION

95-103 & 105-115 Koplick Road, Park Ridge

CLIENT - CFMG CAPITAL

DRAWING NO.	SHEET NO.	DATE DRAWN	VERSION
21-0346U_06	1 of 1	26-07-2023	C

COUNCIL
Logan City

DESCRIPTION
Lots 13 & 14 on RP135029

Appendix B Concept Engineering Plans

PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD, PARK RIDGE

FOR 'KOPLICK DEVELOPMENTS No.2 PTY LTD'

DRAWING LIST

EARTHWORKS, ROADWORKS AND DRAINAGE

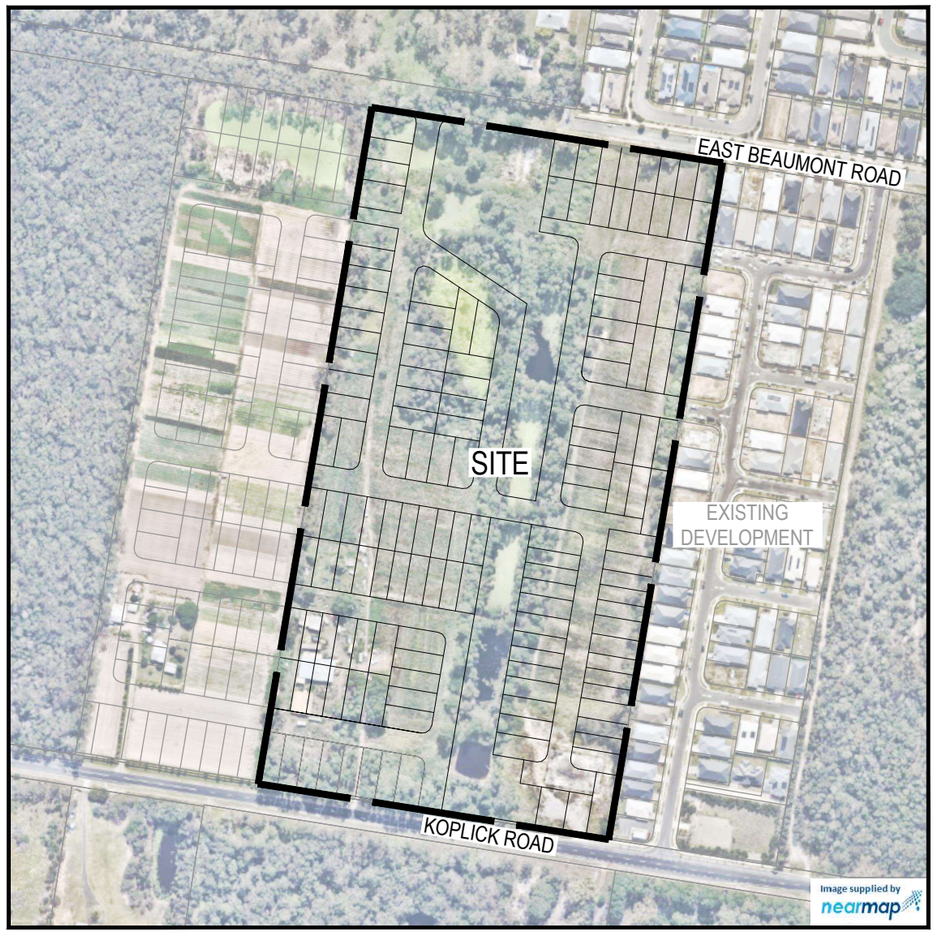
23-0181-P100	COVER PLAN
23-0181-P101	BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 2
23-0181-P102	BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 2
23-0181-P103	BULK EARTHWORKS TYPICAL SECTIONS SHEET 1 OF 3
23-0181-P104	BULK EARTHWORKS TYPICAL SECTIONS SHEET 2 OF 3
23-0181-P105	BULK EARTHWORKS TYPICAL SECTIONS SHEET 3 OF 3
23-0181-P108	ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 1 0F 2
23-0181-P109	ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 2 0F 2
23-0181-P110	TYPICAL ROAD CROSS SECTION AND SERVICE CORRIDORS

STORMWATER QUALITY

23-0181-P200	BIO RETENTION BASIN LAYOUT PLAN
23-0181-P201	BIO RETENTION BASIN TYPICAL SECTIONS SHEET 1
23-0181-P202	BIO RETENTION BASIN TYPICAL SECTIONS SHEET 2
23-0181-P203	BIO RETENTION BASIN TYPICAL DETAILS

SEWERAGE AND WATER RETICULATION

23-0181-P300	SEWERAGE LAYOUT PLAN SHEET 1 OF 2
23-0181-P301	SEWERAGE LAYOUT PLAN SHEET 2 OF 2



LOCALITY PLAN
SCALE 1:2000 (A1)
SCALE 1:4000 (A3)

N

PROJECT INFORMATION SUMMARY:
No. OF LOTS = 146
AREA OF SITE = 10.65ha
RP DESCRIPTION LOT 13 ON RP 135029 LOT 14 ON RP 135029
DATUM LEVEL AND LOCATION GRID 2020 LEVELS TO AHD
LOCAL AUTHORITY: LOGAN CITY COUNCIL

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:2000 20 0 20 40 60 80 100 A1
1:4000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

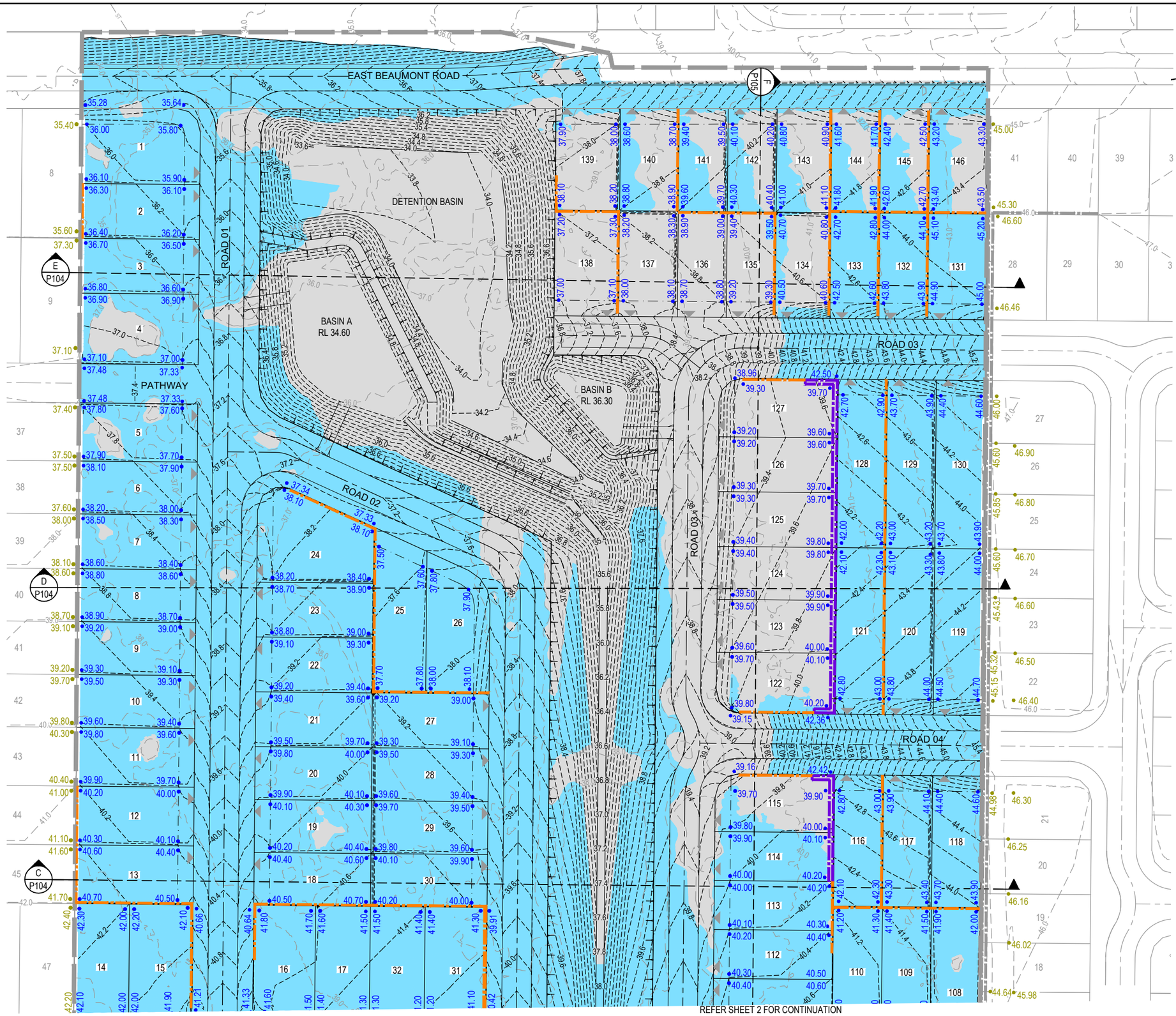
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **COVER PLAN**

PROJECT No.	DRAWING No.	REVISION
23-0181	P100	1



LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED EARTHWORKS PAD SETBACK LINE
- PROPOSED CONCRETE SLEEPER RETAINING WALL HEIGHT RANGE 0.7-2.0m (SINGLE TIER)
- PROPOSED CONCRETE SLEEPER RETAINING WALL HEIGHT RANGE 2.0-3.0m (DOUBLE TIER)
- EXISTING RETAINING WALL
- PROPOSED FINISHED SURFACE LEVEL (FSL) (AFTER TOPSOIL PLACEMENT)
- EXISTING SURFACE LEVEL (ESL)
- PROPOSED AREA OF CUT
- PROPOSED AREA OF FILL
- EXISTING STORMWATER DRAINAGE PIPE
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- TOP OF BATTER

REFER SHEET 2 FOR CONTINUATION

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

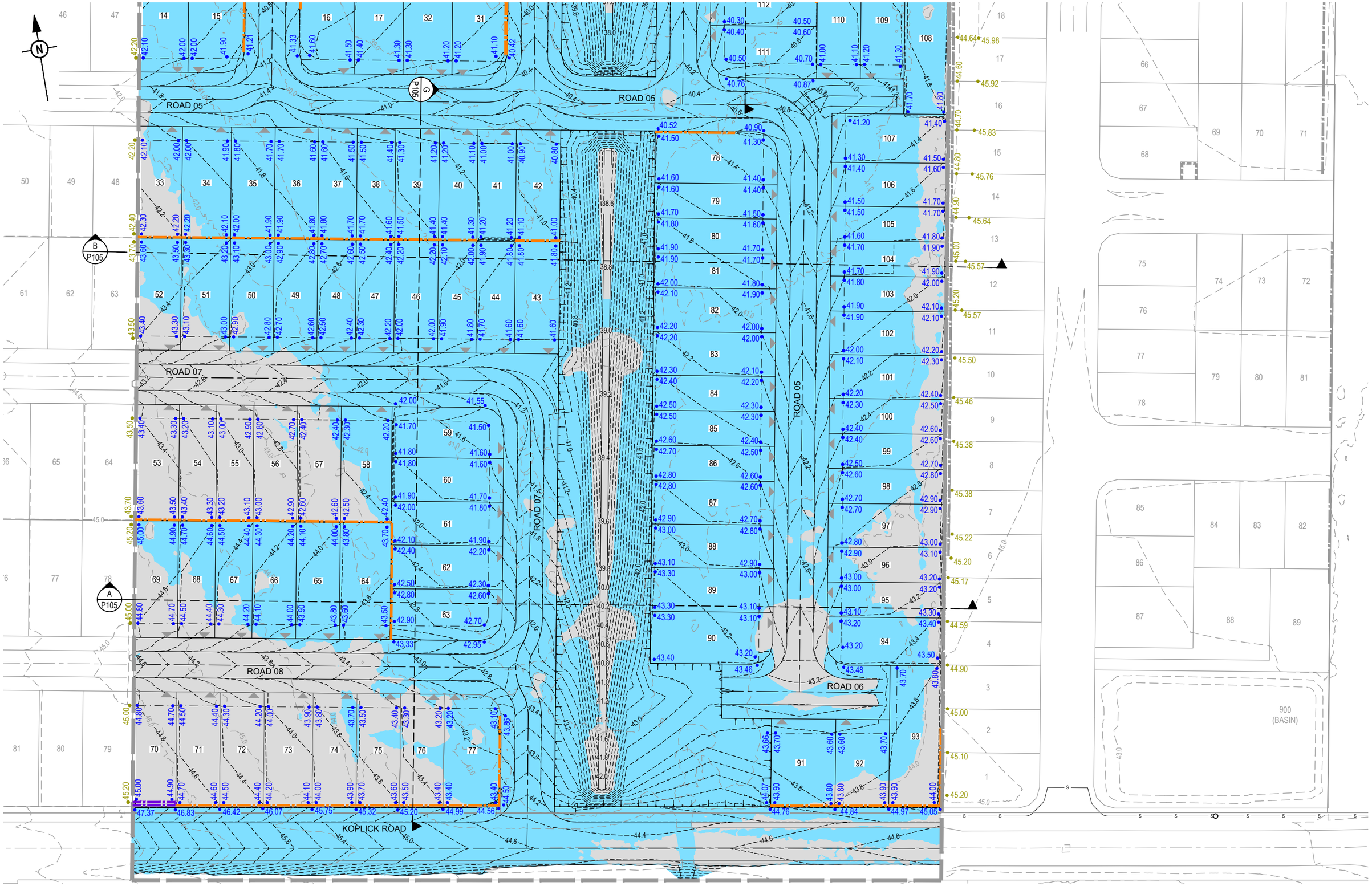
PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	P101	1

REFER SHEET 1 FOR CONTINUATION



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:100 / 1:200 — 1 0 1 2 3 4 5 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

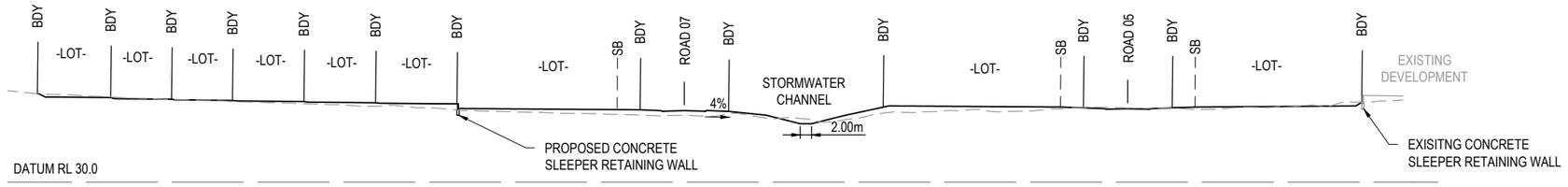
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

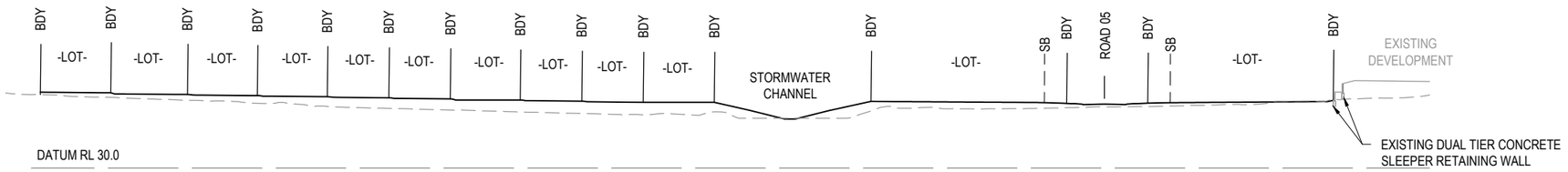
95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 2**

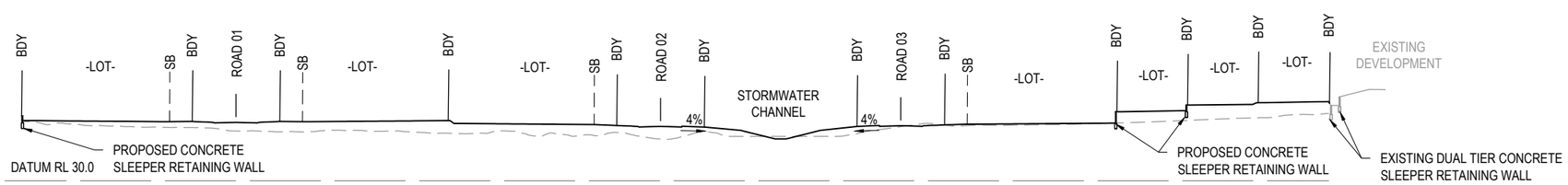
PROJECT No.	DRAWING No.	REVISION
23-0181	P102	1



SECTION A P105
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION B P105
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION C P101
SCALE 1:500 (A1)
SCALE 1:1000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS
NOT FOR CONSTRUCTION

APPROVED
TROY SCHULTZ RPEQ 20631 DATE 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT
KOPLICK DEVELOPMETS NO.2 PTY LTD

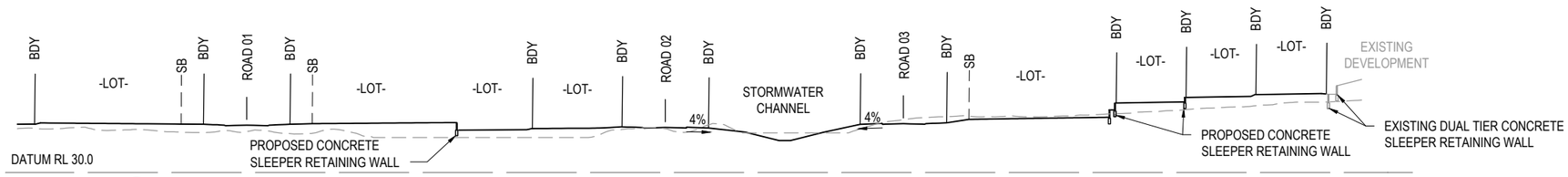
ASSOCIATED CONSULTANT
WALTER CONSULTING GROUP
07 36665200

PROJECT NAME
PROPOSED RESIDENTIAL DEVELOPMENT

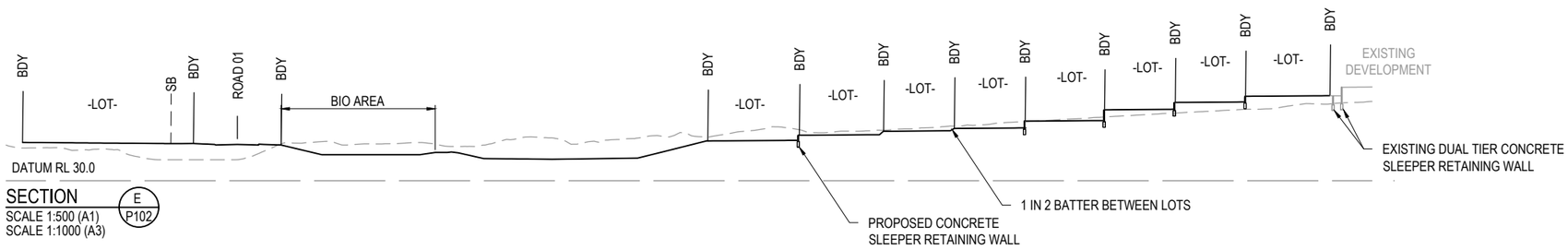
95-115 KOPLICK ROAD
PARK RIDGE

DRAWING TITLE
BULK EARTHWORKS TYPICAL SECTIONS SHEET 1 OF 3

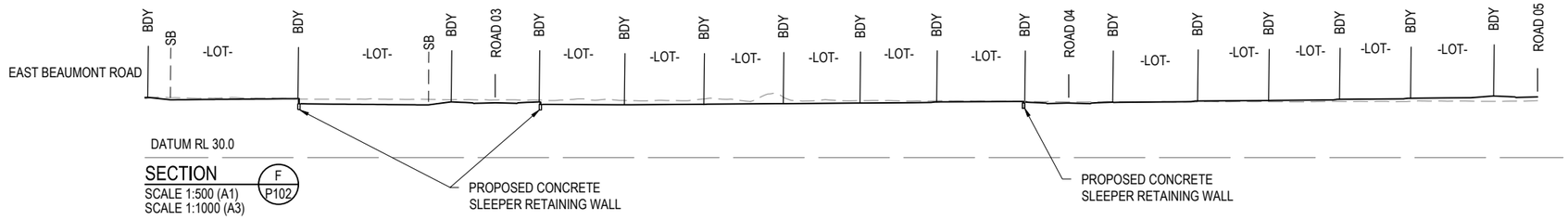
PROJECT No.	DRAWING No.	REVISION
23-0181	P103	1



SECTION D P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION E P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



SECTION F P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

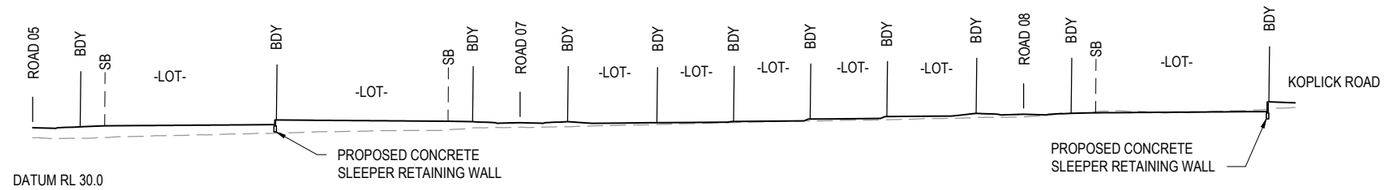
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

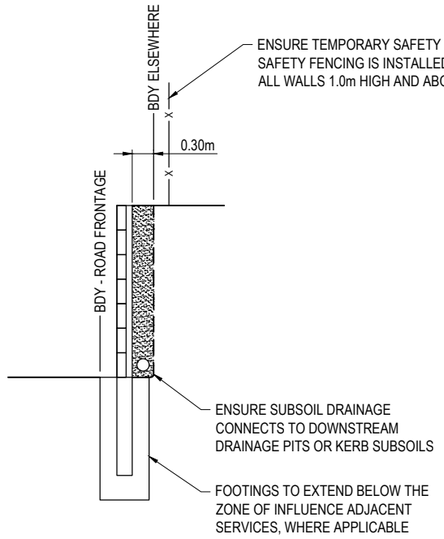
95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS TYPICAL SECTIONS SHEET 2 OF 3**

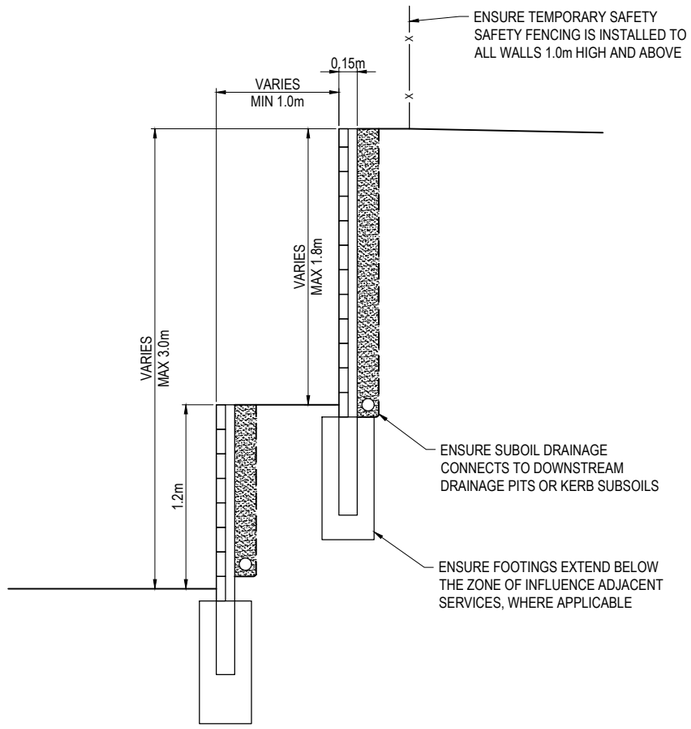
PROJECT No.	DRAWING No.	REVISION
23-0181	P104	1



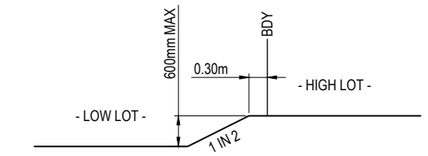
SECTION G P102
SCALE 1:500 (A1)
SCALE 1:1000 (A3)



CONCRETE SLEEPER RETAINING WALL
(0.7m - 2.0m) TYPICAL DETAIL
SCALE 1:25 (A1)



CONCRETE SLEEPER RETAINING WALL
(2.0- 3.0m) TYPICAL DETAIL
SCALE 1:25 (A1)



TYPICAL STEP BETWEEN LOTS DETAIL
SCALE 1:50 (A1)
SCALE 1:100 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN
DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BULK EARTHWORKS TYPICAL SECTIONS SHEET 3 OF 3**

PROJECT No.	DRAWING No.	REVISION
23-0181	P105	1

REFER SHEET 1 FOR CONTINUATION

ROAD 05

3 / 750mm PIPE CULVERTS
USIL:38.18
DSIL:37.07

ROAD 05
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

BUND AT RL 40.20 WITH
2X300mm RCP @1% GRADE
AT IL 38.54

DRIVEWAY 02
ACCESS DRIVEWAY
10.0m WIDE RESERVE
6.00m WIDE PAVEMENT

ROAD 07
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 07

ROAD 07
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 08
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 08

KOPLICK ROAD
MODIFIED URBAN COLLECTOR ROAD
21.0m MIN. WIDE RESERVE 8.50m MIN. WIDE PAVEMENT

ROAD 06
MODIFIED URBAN ACCESS ROAD
15.5m WIDE RESERVE
7.50m WIDE PAVEMENT

3 / 750mm PIPE CULVERTS
USIL: 43.10
DSIL: 42.23

ROAD 05
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 06

EXISTING STAGE

12
RP135029

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS
NOT FOR CONSTRUCTION

APPROVED
TROY SCHULTZ RPEQ 20631
DATE 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE
1:500 10 5 0 10 20 A1
1:1000 A3

CLIENT
KOPLICK DEVELOPMETS NO.2 PTY LTD

ASSOCIATED CONSULTANT
WALTER CONSULTING GROUP
07 36665200

PROJECT NAME
PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD
PARK RIDGE

DRAWING TITLE
ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 2 0F 2

PROJECT No.	DRAWING No.	REVISION
23-0181	P109	1

REFER TO STORMWATER MANAGEMENT PLAN REPORT FOR PROPOSED DETENTION SYSTEM OUTLET DETAILS

CONNECT TO EXISTING UPSTREAM PIPE NETWORK

BASIN AREA REFER TO 23-0181 P200 FOR DETAILS

DRIVEWAY 01
ACCESS DRIVEWAY
10.0m WIDE RESERVE
6.00m WIDE PAVEMENT

ROAD 03
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

BASIN A
RL 34.60

BASIN B
RL 36.30

ROAD 01
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 02
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 03
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

ROAD 04
URBAN ACCESS ROAD
15.50m WIDE RESERVE
7.50m WIDE PAVEMENT

PATHWAY

1.0m WIDE LOW FLOW CHANNEL

BUND AT RL 37.46 WITH 2X300mm RCP @1% GRADE AT IL 35.50

STORMWATER CHANNEL

EXISTING STAGE

RP135029

REFER SHEET 2 FOR CONTINUATION

LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED ROAD CONTROL LINE
- EXISTING ROAD CROWN
- PROPOSED KERB INVERT LINE
- PROPOSED EDGE OF BITUMEN
- EXISTING EDGE OF BITUMEN
- PROPOSED CONCRETE PATH AND PRAM RAMP
- PROPOSED NEW ROAD PAVEMENT
- PROPOSED NEW CONCRETE PAVEMENT
- FINISHED SURFACE CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- EXISTING STORMWATER DRAINAGE PIPE
- PROPOSED DRAINAGE SWALE
- PROPOSED AREA OF FILTER MEDIA
- PROPOSED NEW CONCRETE PAVEMENT
- PROPOSED CONCRETE SLEEPER RETAINING WALL
- EXISTING CONCRETE SLEEPER RETAINING WALL
- PROPOSED SEWERAGE MAIN
- EXISTING SEWERAGE MAIN
- EXISTING SEWERAGE TRUNK MAIN
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- TOP OF BATTER

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

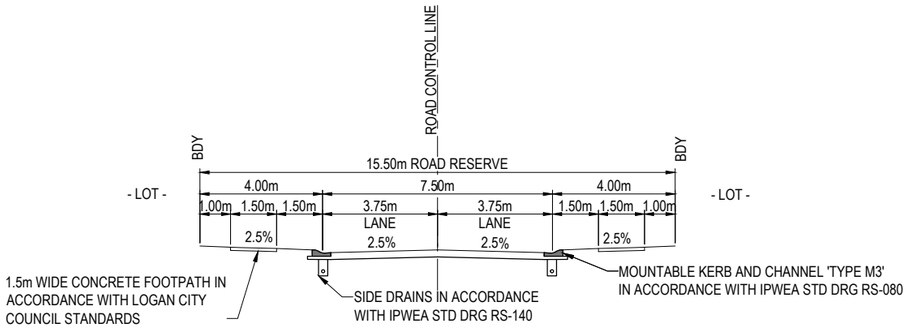
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

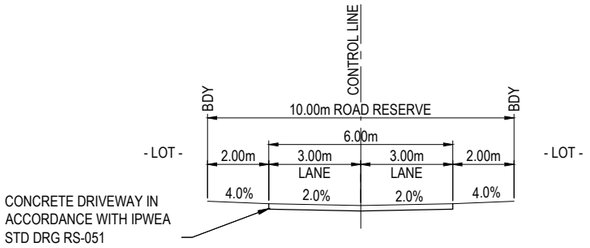
95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **ROADWORKS AND DRAINAGE LAYOUT PLAN SHEET 1 0F 2**

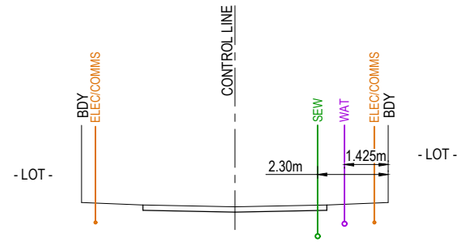
PROJECT No.	DRAWING No.	REVISION
23-0181	P108	1



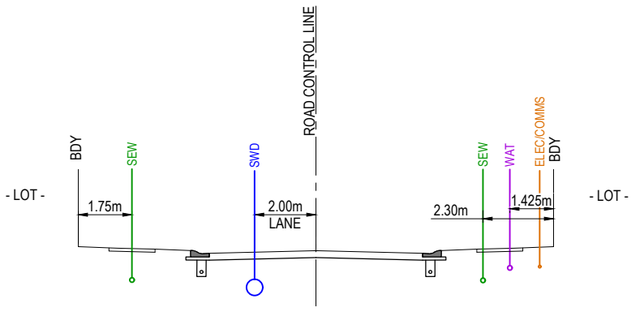
URBAN ACCESS ROAD - TYPICAL SECTION



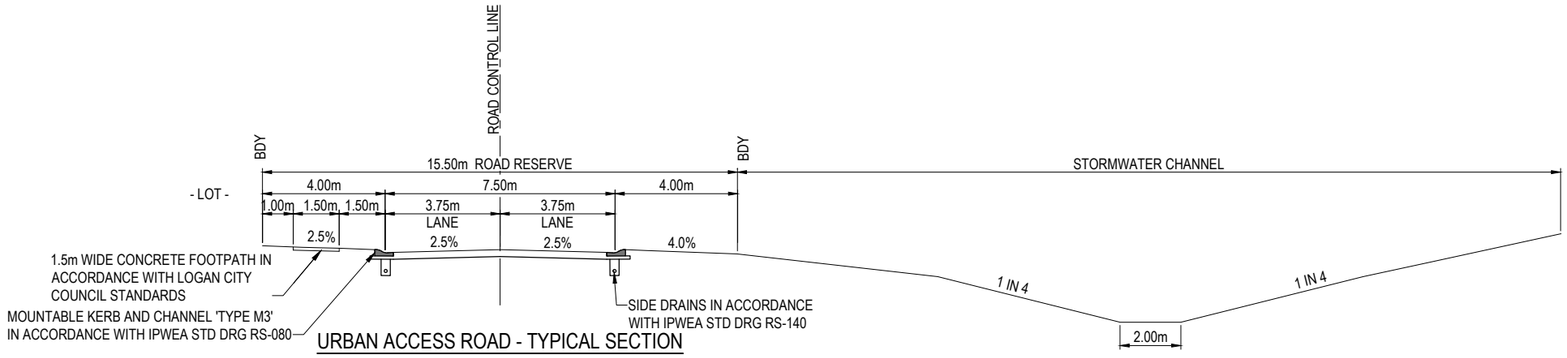
URBAN ACCESS DRIVEWAY - TYPICAL SECTION



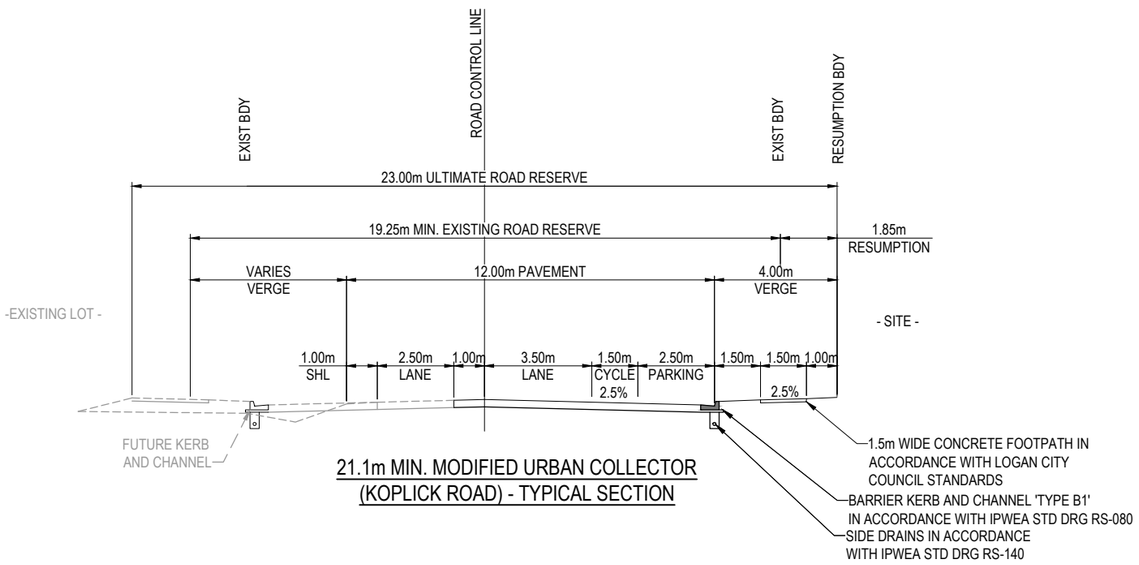
URBAN ACCESS DRIVEWAY - TYPICAL SERVICE ALIGNMENT



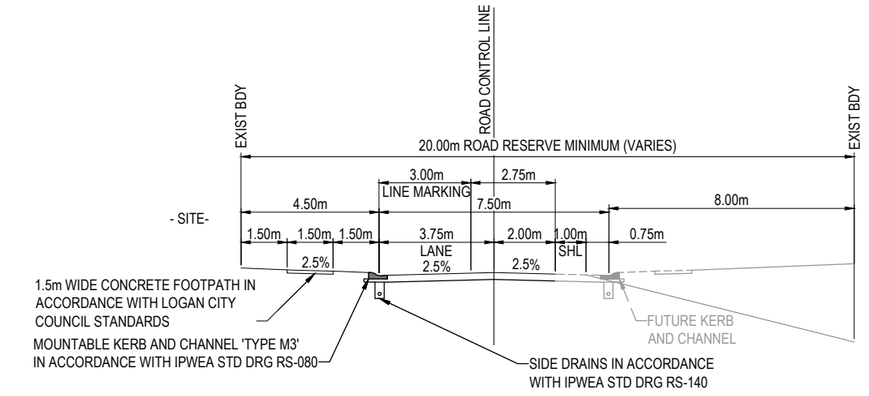
URBAN ACCESS ROAD - TYPICAL SERVICE ALIGNMENT



URBAN ACCESS ROAD - TYPICAL SECTION



21.1m MIN. MODIFIED URBAN COLLECTOR (KOPLICK ROAD) - TYPICAL SECTION



20.0m MIN. MODIFIED URBAN ACCESS ROAD (EAST BEAUMONT ROAD) - TYPICAL SECTION

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:500 / 1:1000 — 10 5 0 10 20 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

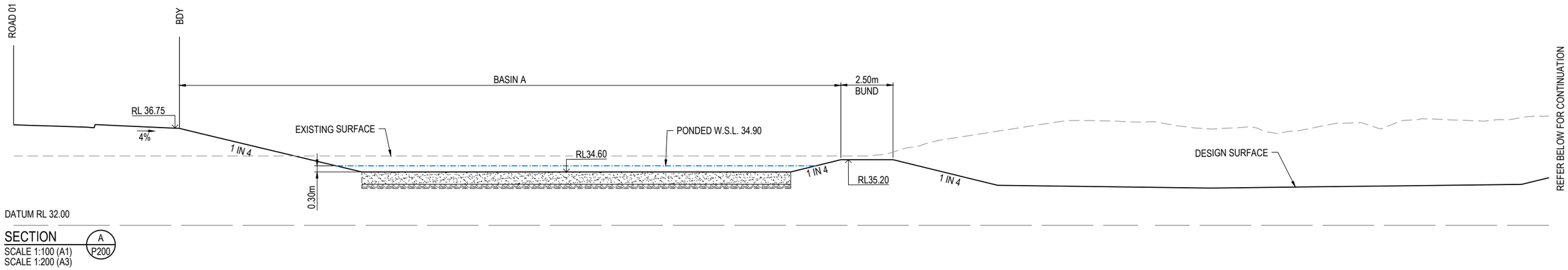
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

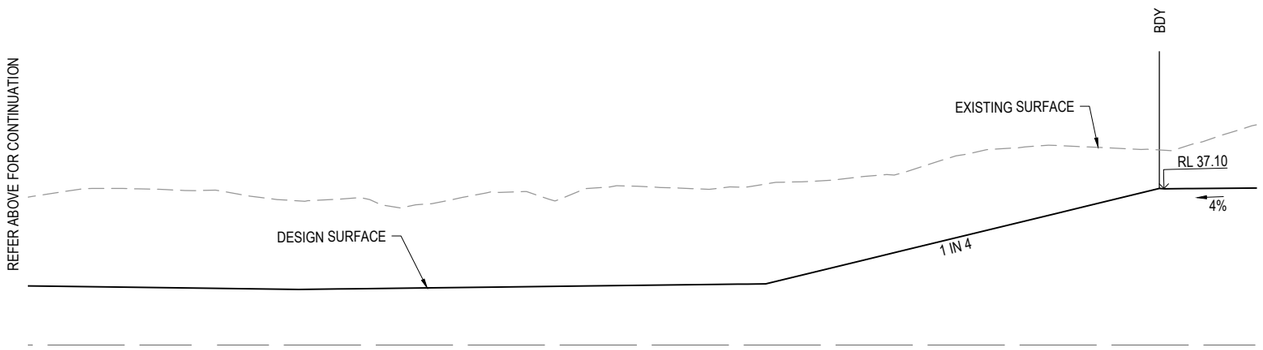
95-115 KOPLICK ROAD PARK RIDGE

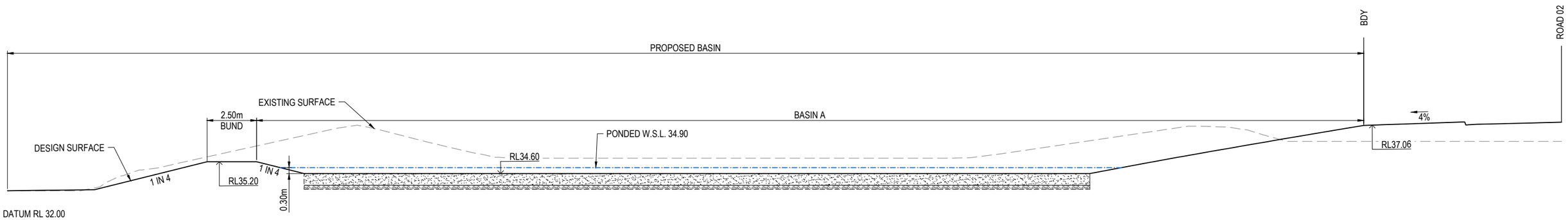
DRAWING TITLE: **TYPICAL ROAD CROSS SECTION AND SERVICE CORRIDORS**

PROJECT No.	DRAWING No.	REVISION
23-0181	P110	1



SECTION A P200
SCALE 1:100 (A1)
SCALE 1:200 (A3)





SECTION B P200
SCALE 1:100 (A1)
SCALE 1:200 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

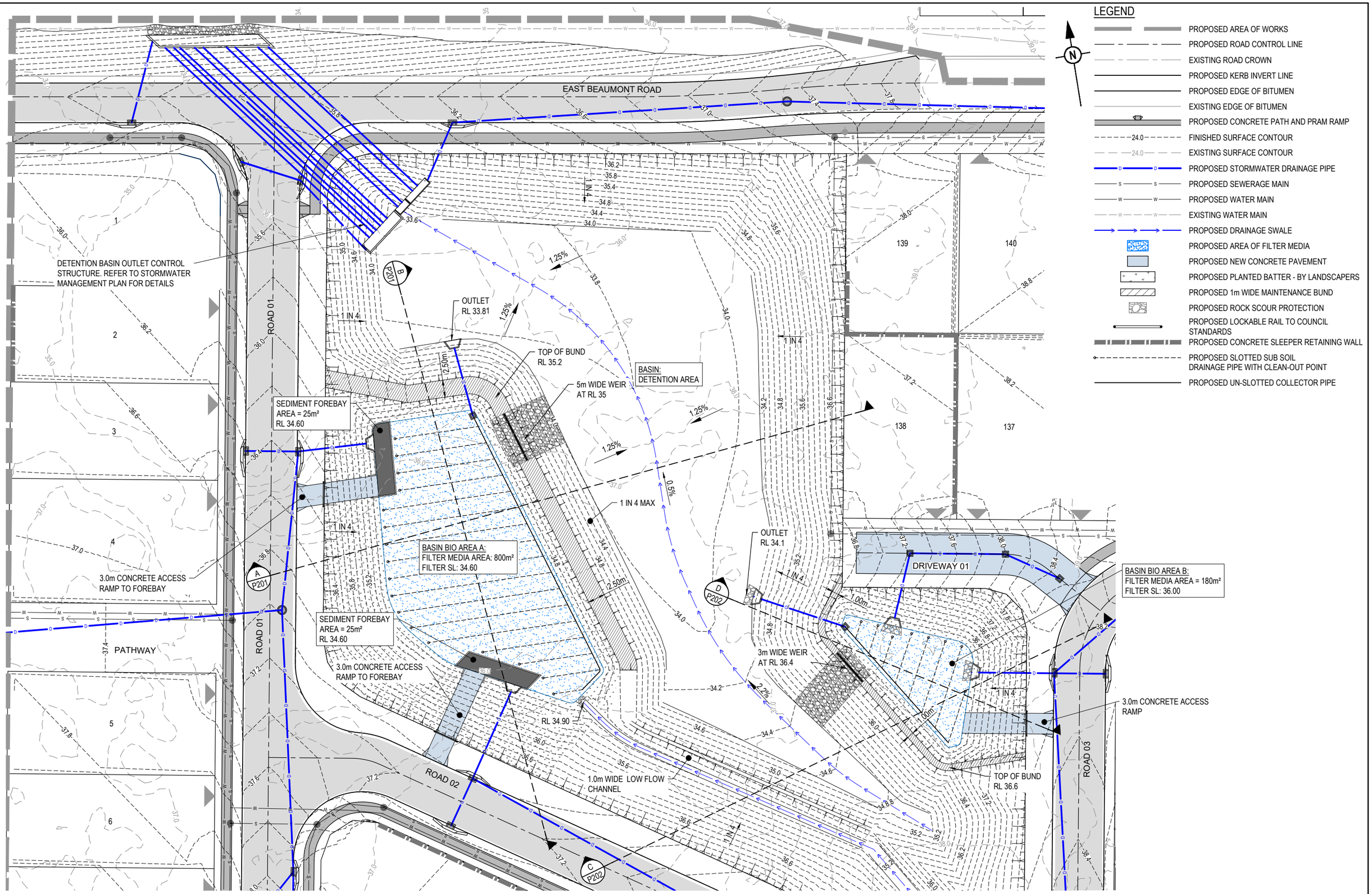
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BIO RETENTION BASIN TYPICAL SECTIONS SHEET 1**

PROJECT No.	DRAWING No.	REVISION
23-0181	P201	1



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: 1:250 / 1:500 — 5 0 5 10 — A1 / A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

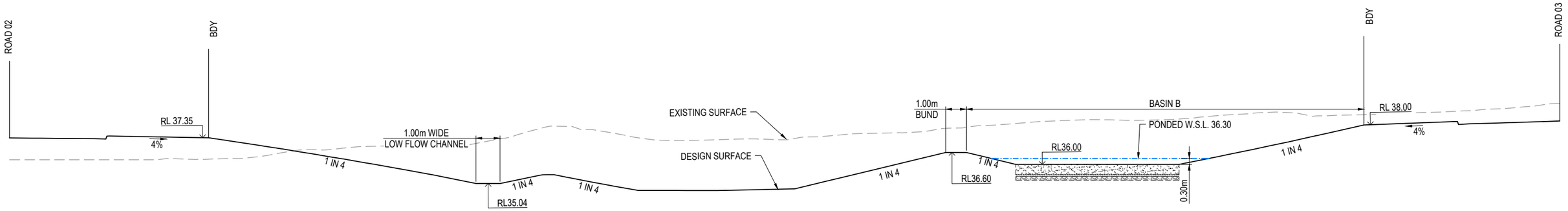
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BIO RETENTION BASIN LAYOUT PLAN**

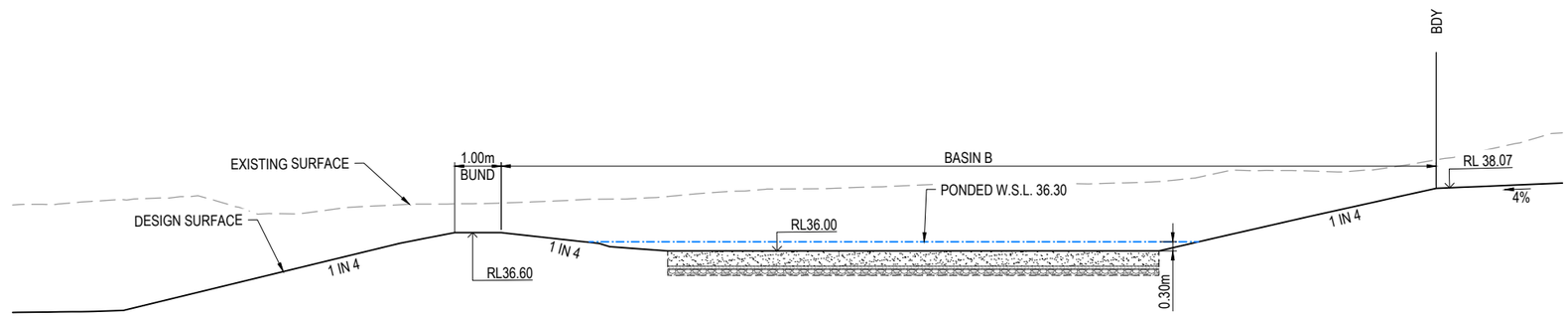
PROJECT No.	DRAWING No.	REVISION
23-0181	P200	1



DATUM RL 32.00

SECTION C P202

SCALE 1:100 (A1)
SCALE 1:200 (A3)



DATUM RL 32.00

SECTION D P202

SCALE 1:100 (A1)
SCALE 1:200 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 19.07.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

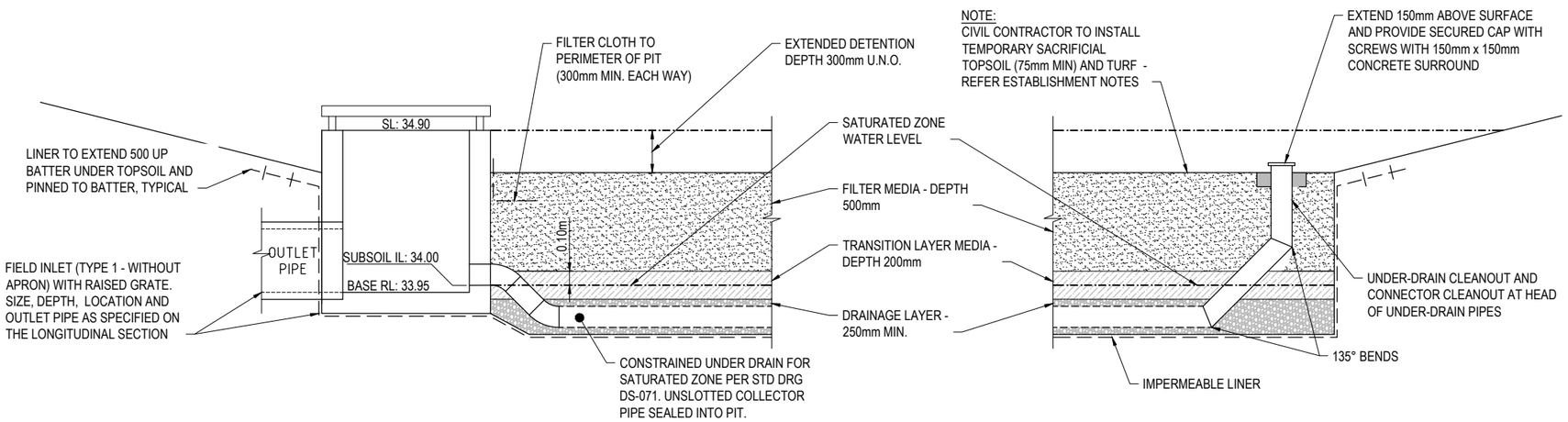
ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

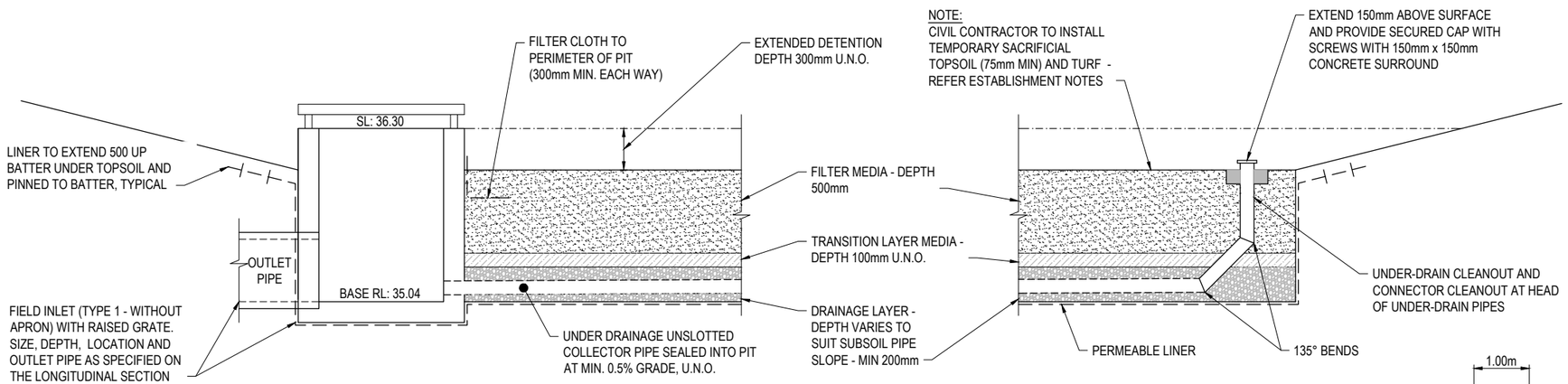
DRAWING TITLE: **BIO RETENTION BASIN TYPICAL SECTIONS SHEET 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	P202	1



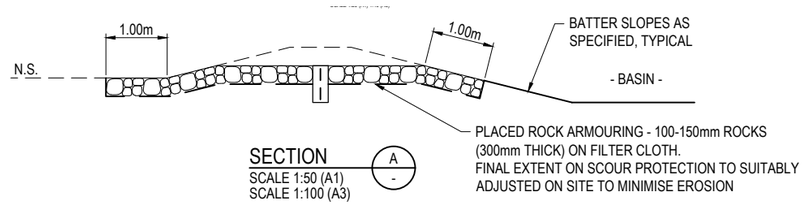
BIO RETENTION A FILTER MEDIA AND SUBSOIL DRAINAGE DETAIL SATURATED ZONE - CONSTRAINED

REFERENCE: IPWEA STD DRG DS-071
SCALE 1:20 (A1) 1:40 (A3)



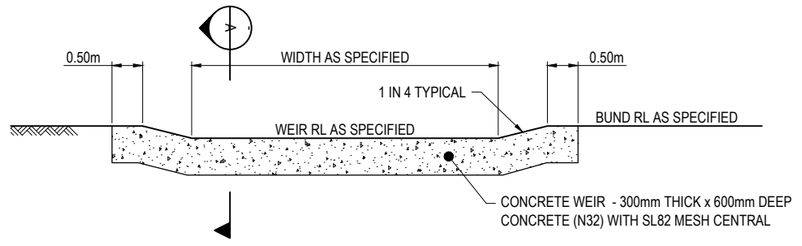
BIO RETENTION B FILTER MEDIA AND SUBSOIL DRAINAGE DETAIL CONVENTIONAL

REFERENCE: IPWEA STD DRG DS-073
SCALE 1:20 (A1) 1:40 (A3)



SECTION A-

SCALE 1:50 (A1)
SCALE 1:100 (A3)



TYPICAL WEIR DETAIL

REFERENCE: IPWEA STD DRG DS-076
SCALE 1:50 (A1) 1:100 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN
DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE: AS SHOWN

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **BIO RETENTION BASIN TYPICAL DETAILS**

PROJECT No.	DRAWING No.	REVISION
23-0181	P203	1

EAST BEAUMONT ROAD

SEWER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

WATER CONNECTION POINT

ROAD 01

ROAD 02

ROAD 03

ROAD 04

PATHWAY

SEWER CONNECTION POINT

SEWER CATCHMENT AREA 2

SEWER CATCHMENT AREA 3 - BALANCE AREA

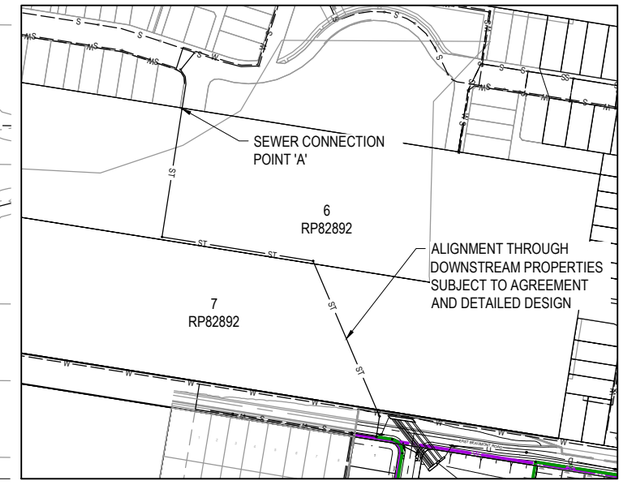
EXISTING STAGE

RP135029

REFER SHEET 2 FOR CONTINUATION

LEGEND

- PROPOSED AREA OF WORKS
- PROPOSED WATER MAIN
- EXISTING WATER MAIN
- PROPOSED SEWER MAIN
- EXISTING SEWER MAIN
- EXISTING SEWER MAIN
- PROPOSED ROAD CONTOUR
- EXISTING SURFACE CONTOUR
- PROPOSED STORMWATER DRAINAGE PIPE
- EXISTING STORMWATER DRAINAGE PIPE
- PROPOSED CONCRETE SLEEPER RETAINING WALL
- PROPOSED SEWERAGE CATCHMENT



SEWER CONNECTION POINT

SCALE 1:2000 (A1)

SCALE 1:4000 (A3)

REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: NOT FOR CONSTRUCTION

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE

1:500 10 5 0 10 20 A1

1:1000 A3

CLIENT: KOPLICK DEVELOPMETS NO.2 PTY LTD

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

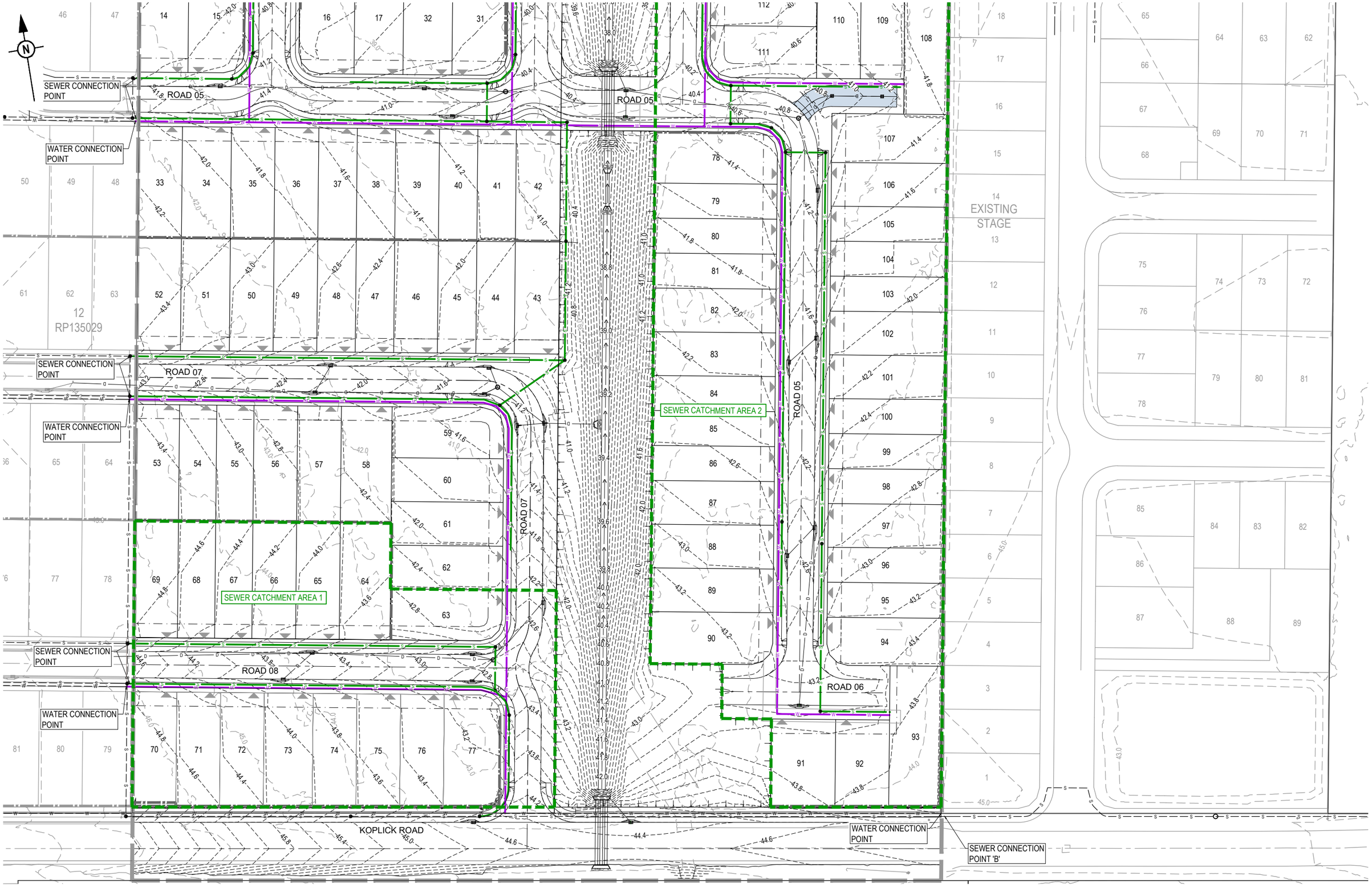
PROJECT NAME: PROPOSED RESIDENTIAL DEVELOPMENT

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: SEWERAGE LAYOUT PLAN SHEET 1 OF 2

PROJECT No.	DRAWING No.	REVISION
23-0181	P300	1

REFER SHEET 1 FOR CONTINUATION



REV	DATE	DESIGN	DRAWN	REVISION DETAILS
1	3.08.23	AS	NS	ORIGINAL ISSUE

DRAWN

DESIGN

STATUS: **NOT FOR CONSTRUCTION**

APPROVED: TROY SCHULTZ RPEQ 20631 DATE: 3.08.23

FOR AND ON BEHALF OF PEAKURBAN PTY LTD

Colliers

SCALE

1:500 10 5 0 10 20 A1

1:1000 A3

CLIENT: **KOPLICK DEVELOPMETS NO.2 PTY LTD**

ASSOCIATED CONSULTANT: WALTER CONSULTING GROUP 07 36665200

PROJECT NAME: **PROPOSED RESIDENTIAL DEVELOPMENT**

95-115 KOPLICK ROAD PARK RIDGE

DRAWING TITLE: **SEWERAGE LAYOUT PLAN SHEET 2 OF 2**

PROJECT No.	DRAWING No.	REVISION
23-0181	P301	1

Appendix C Rational Method

Rainfall Intensity (mm/hr)

DURATION		ANNUAL EXCEEDANCE PROBABILITY (%)						
(hours)	(minutes)	63.2	50	20	10	5	2	1
5	5	103	117	162	193	223	262	293
10	10	85.5	97.4	134	158	181	211	234
15	15	72.5	82.5	113	134	154	179	198
20	20	62.9	71.6	98.6	116	134	156	173
25	25	55.6	63.3	87.3	103	119	139	154
30	30	49.9	56.9	78.5	93.1	107	126	140
45	45	38.6	43.9	60.9	72.6	84	99.3	111
1	60	31.7	36.1	50.3	60.1	69.8	83	93.3
1.5	90	23.9	27.2	38	45.6	53.3	63.9	72.2
2	120	19.5	22.2	31.1	37.4	43.9	52.8	60
3	180	14.7	16.7	23.5	28.4	33.4	40.4	46.1
4.5	270	11.1	12.7	17.9	21.7	25.6	31.1	35.5
6	360	9.19	10.5	14.8	18	21.3	25.9	29.6
9	540	7.1	8.12	11.5	14	16.6	20.2	23.1
12	720	5.94	6.8	9.68	11.8	14	17	19.5
18	1080	4.63	5.33	7.63	9.31	11	13.5	15.4
24	1440	3.88	4.48	6.45	7.89	9.37	11.4	13.1
30	1800	3.38	3.91	5.65	6.93	8.24	10.1	11.6
36	2160	3.01	3.48	5.06	6.22	7.41	9.07	10.4
48	2880	2.48	2.88	4.22	5.21	6.22	7.64	8.78
72	4320	1.86	2.17	3.19	3.96	4.76	5.87	6.77

Catchment Data

Details: E05

Variable	Value	Units
Area:	5.23	ha
C_{10}	0.65	fraction

Rational Method Summary

Adopted Time of Concentration (tc) 60 Minutes (or 1.00 hours) Friends

	ANNUAL EXCEEDANCE PROBABILITY (%)						
Variable	63.2	50	20	10	5	2	1
Freq Factor	0.80	0.85	0.95	1.00	1.05	1.15	1.20
Intensity (mm/hr)	32	36	50	60	70	83	93
Discharge (m^3/s)	0.24	0.29	0.45	0.57	0.69	0.90	1.06

Appendix D Flood Mapping

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Existing Scenario (E02) - 63.2%

FIGURE NO: E02-001

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Existing Scenario (E02) - 50%

FIGURE NO: E02-002

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Existing Scenario (E02) - 20%

FIGURE NO: E02-003

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE: 31/07/2023
CREATED BY: M. FERGUSON
REVISION: A
STATUS: ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000
COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

CLIENT: Koplick Developments No.2 PTY LTD

FIGURE TITLE: Existing Scenario (E02) - 10%

FIGURE NO: E02-004

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E:Beaumont Road

Koplick Road

DATE: 31/07/2023
CREATED BY: M. FERGUSON
REVISION: A
STATUS: ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000
COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

CLIENT: Koplick Developments No.2 PTY LTD

FIGURE TITLE: Existing Scenario (E02) - 5%

FIGURE NO: E02-005

LEGEND

Layout

Site

Flood Depth (m)
Band 1

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE: 31/07/2023
CREATED BY: M. FERGUSON
REVISION: A
STATUS: ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000
COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Existing Scenario (E02) - 1%

FIGURE NO: E02-006

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Proposed Scenario (D09) - 63.2%

FIGURE NO: D09-001

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE: 31/07/2023
CREATED BY: M. FERGUSON
REVISION: A
STATUS: ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000
COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

CLIENT: Koplick Developments No.2 PTY LTD

FIGURE TITLE: Proposed Scenario (D09) - 50%

FIGURE NO: D09-002

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Proposed Scenario (D09) - 20%

FIGURE NO: D09-003

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

CLIENT: Koplick Developments No.2 PTY LTD

FIGURE TITLE: Proposed Scenario (D09) - 10%

FIGURE NO: D09-004

LEGEND

Layout

Site

Flood Depth (m)

- <= 0.1
- 0.1 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

E:Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

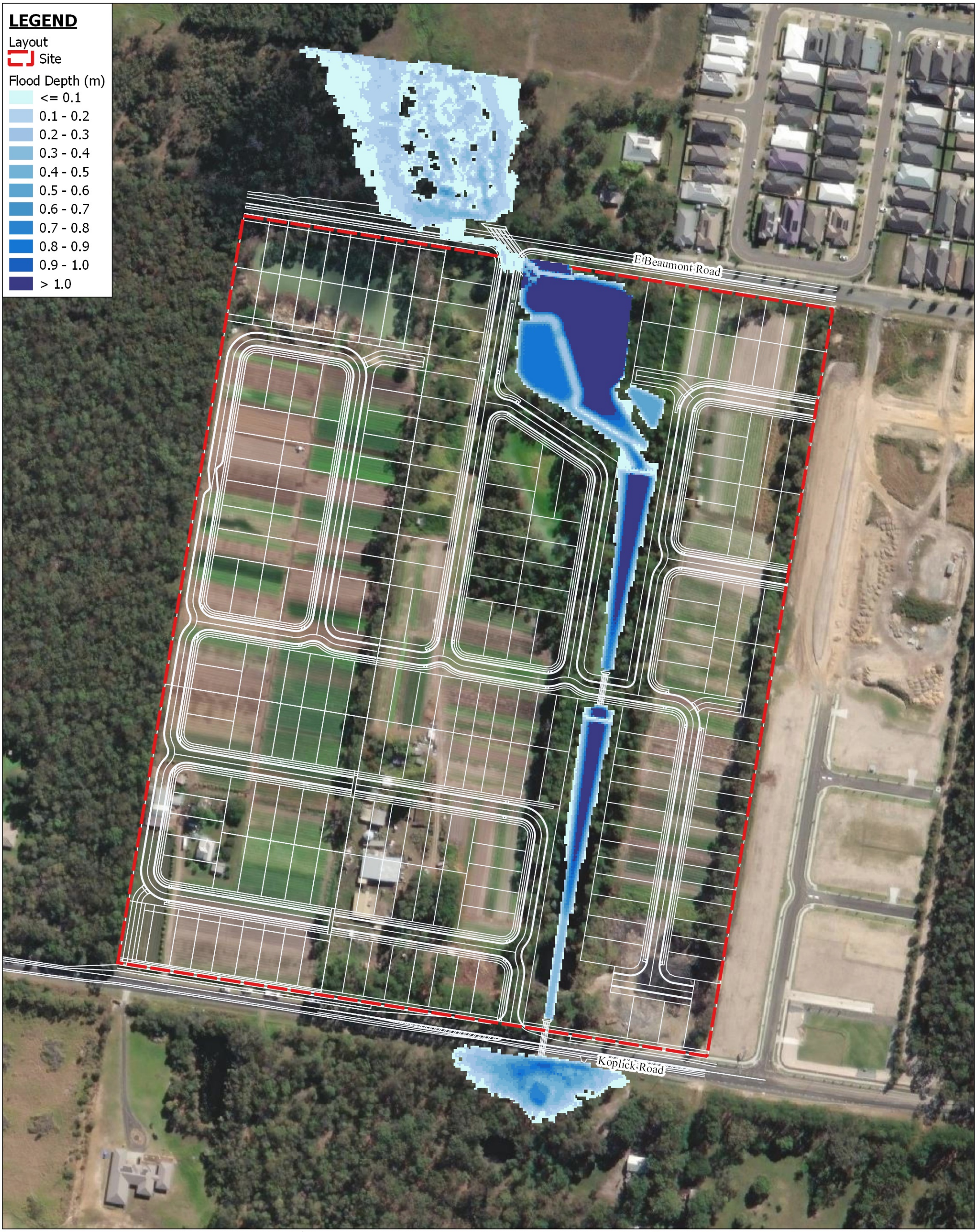
PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Proposed Scenario (D09) - 5%

FIGURE NO: D09-005

CLIENT: Koplick Developments No.2 PTY LTD



DATE: 31/07/2023
CREATED BY: M. FERGUSON
REVISION: A
STATUS: ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000
COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

CLIENT: Koplick Developments No.2 PTY LTD

FIGURE TITLE: Proposed Scenario (D09) - 1%

FIGURE NO: D09-006

LEGEND

Layout

Site

Flood Afflux (m)

- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 63.2%

FIGURE NO: AFF-001

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout
- Site

Flood Afflux (m)
- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 50%

FIGURE NO: AFF-002

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Afflux (m)

- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 20%

FIGURE NO: AFF-003

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Afflux (m)

- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 10%

FIGURE NO: AFF-004

CLIENT: Koplick Developments No.2 PTY LTD

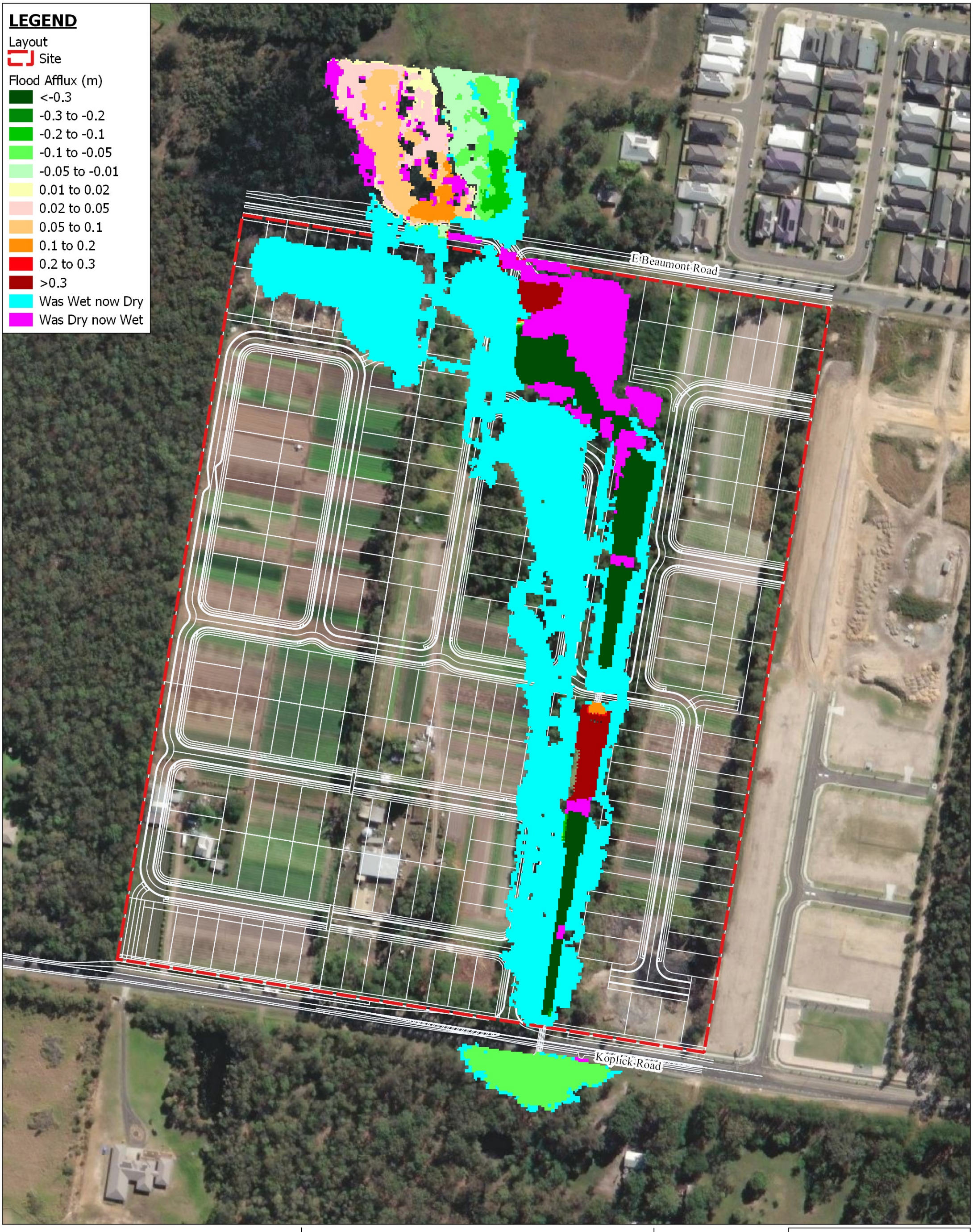
LEGEND

Layout

Site

Flood Afflux (m)

- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet



DATE:	31/07/2023	0 30 60 90 120 m	CONSULTANT: Colliers
CREATED BY:	M. FERGUSON	PAGE SIZE: A3 SCALE: 1:2,000	
REVISION:	A	COORDINATE SYSTEM: GDA 94 / MGA ZONE 56	N
STATUS:	ISSUE FOR APPROVAL		

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 5%

FIGURE NO: AFF-005

CLIENT: Koplick Developments No.2 PTY LTD

LEGEND

Layout

Site

Flood Afflux (m)

- <-0.3
- -0.3 to -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- 0.01 to 0.02
- 0.02 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- 0.2 to 0.3
- >0.3
- Was Wet now Dry
- Was Dry now Wet

E Beaumont Road

Koplick Road

DATE:	31/07/2023
CREATED BY:	M. FERGUSON
REVISION:	A
STATUS:	ISSUE FOR APPROVAL

0 30 60 90 120 m

PAGE SIZE: A3 SCALE: 1:2,000

COORDINATE SYSTEM: GDA 94 / MGA ZONE 56

N

CONSULTANT: Colliers

PROJECT TITLE: 95-115 KOPLICK ROAD, PARK RIDGE

PROJECT NO: 23-0181

FIGURE TITLE: Afflux (D09 vs E02) - 1%

FIGURE NO: AFF-006

CLIENT: Koplick Developments No.2 PTY LTD

Colliers

At Colliers, we are **enterprising.**

We maximise the potential of property to accelerate the success of our clients and our people.

Our expert advice to property occupiers, owners and investors leads the industry into the future. We invest in relationships to create enduring value. What sets us apart is not what we do, but how we do it. Our people are passionate, take personal responsibility and always do what's right for our clients, people and communities. We attract and develop industry leaders, empowering them to think and act differently to drive exceptional results. What's more, our global reach maximizes the potential of property, wherever our clients do business.

colliers.com.au

Colliers

At Colliers, we are **enterprising.**

We maximise the potential of property to accelerate the success of our clients and our people.

Our expert advice to property occupiers, owners and investors leads the industry into the future. We invest in relationships to create enduring value. What sets us apart is not what we do, but how we do it. Our people are passionate, take personal responsibility and always do what's right for our clients, people and communities. We attract and develop industry leaders, empowering them to think and act differently to drive exceptional results. What's more, our global reach maximizes the potential of property, wherever our clients do business.

colliers.com.au