



155-217 Aldington Road,
Kemps Creek

Civil Design Report

SSD-17552047

Frasers Property Pty Ltd

JUNE 2021

20-776

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1. Executive Summary

This report is a summary of the civil infrastructure requirements to aid in the development of the Frasers Property development site. The site is located to the west of Aldington Road, and is located at 155-217 Aldington Road, Kemps Creek (Lot 33 DP 258949 and Lots 25-28 DP 255560) in the Penrith City local government area (LGA).

The site is located along the western side of Aldington Road and has approximately 650m of direct frontage to Aldington Road. The site has an existing 60m wide TransGrid easement running north south along the eastern portion of the site which restricts development in this area apart from stormwater basins.

The site is located approximately 6km north-west of the future Western Sydney Nancy-Bird Walton Airport, 15km south-east of the Penrith CBD and 40km west of the Sydney CBD.

The site is part of the Broader Western Sydney Employment Area and is zoned land under the *State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP WSEA)*.

Consistent with the above, this report has been prepared to support a State Significant Development Application (SSD-17552047) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to enable the construction, fit-out and operation of one warehouse and distribution building over two parts with a total floor area of 65,327 m² including offices, loading docks, parking and hardstand areas, landscaping, utilities and services. Associated works including demolition and bulk earthworks, vegetation removal, construction of internal roads and an access road off Aldington Road and a 9-lot Torrens Title subdivision.

2. Compliance with SEARs

This report responds to the NSW Planning Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Industry and Environment (DPIE) on 12 May 2021. Table 1 below summaries all key civil infrastructure issues raised in the SEARs and how they have been addressed in this report.

Table 1: Secretary's Environmental Assessment Requirements addressed in this report

Key Issue listed in the SEARs	Response
Traffic and Transport	
<p>Connection of development to adjoining sites</p> <p>Detailing how the proposed development connects to adjoining sites to facilitate their future development for their intended purposes</p>	<p>The Overall General Arrangement Plan 20-776-C1006 prepared by AT&L indicates Aldington Road layout which provide the primary connection to the site and allow connection north and south to Mamre Road and the future Southern Link Road.</p> <p>It is proposed that detailed coordination of precinct connectivity may occur post formal SSD exhibition stage to enable concurrent development of the <i>Aldington Road Precinct Structure Plan – Local Road Network Structure Plan</i> by Transport for NSW and Penrith City Council.</p>
<p>Site access and internal road layout</p> <p>Details and plans of the proposed internal road network, loading dock servicing and provisions, on-site parking provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards and the Draft Mamre Road Precinct Development Control Plan</p>	<p>Access for the site is off Aldington Road via a proposed Roundabout. The roundabout does not form part of this approval and is subject to a separate approval related to the Stage 1 upgrade of Aldington Road.</p> <p>It is proposed for two internal access roads to provide internal access to the development lots and are generally in accordance with the Draft Mamre Road DCP. The internal roads are proposed and have been design too, provide both north-south and east-west connection to the greater precinct.</p>
<p>Swept path diagrams</p> <p>Swept path diagrams depicting the largest anticipated vehicle entering, exiting and manoeuvring throughout the site</p>	<p>Refer to Vehicle Turn Path drawings 20-776-C1050 prepared by AT&L for Road 1 and road 2 roundabout vehicle analysis.</p> <p>For internal lot turning manoeuvres, refer to the traffic engineering report prepared by ASON.</p>
<p>Road upgrade detail</p> <p>Details of road upgrades, infrastructure works, or new roads or access points required for the development</p>	<p>All new roads within the development have been documented within the AT&L Civil drawings. Any External works are not subject to this application.</p>

Soils and Water	
Topographic assessment A topographic assessment and justification the proposed earthworks are site responsive and contextually appropriate	A Topographic assessment and justification on proposed earthworks are discussed within Section 5 and 7 of this report

3. Agency Consultation

This report summarises all consultation and correspondence undertaken with the relevant authorities during the design phase. The following table summarises and the relevant correspondence. It should be noted that not all authorities were consulted during the initial design phase.

Table 2: Summary of agency consultation

Agency Consulted	Correspondence
Sydney Water	Initial applications have been submitted to Sydney Water. Case Number CN 191531
TransGrid	On the 27 th April 2021 a meeting was held with Transgrid to present the overall masterplan of the site. At the time, Transgrid had no objection to the proposal including the location of the stormwater basins within the easement. Subsequently, minutes of the meeting were issued along with a request for in-principle approval. No response has been received to date.

4. Introduction

4.1. Background

This report is a summary of the Civil Engineering Design requirements to aid in the development of the Frasers Property Site located on 155-217 Aldington Road Kemp's Creek.

The Site is located within the Penrith City Council LGA, approximately 4km south of Erskine Park and approximately 6km north-east from the proposed Western Sydney Airport. The Site is legally known as Lot 33 DP 258949 and Lots 25-28 DP255560. The site has a total land area of approximately 43 Ha. The extent of the site is presented in Figure 1.

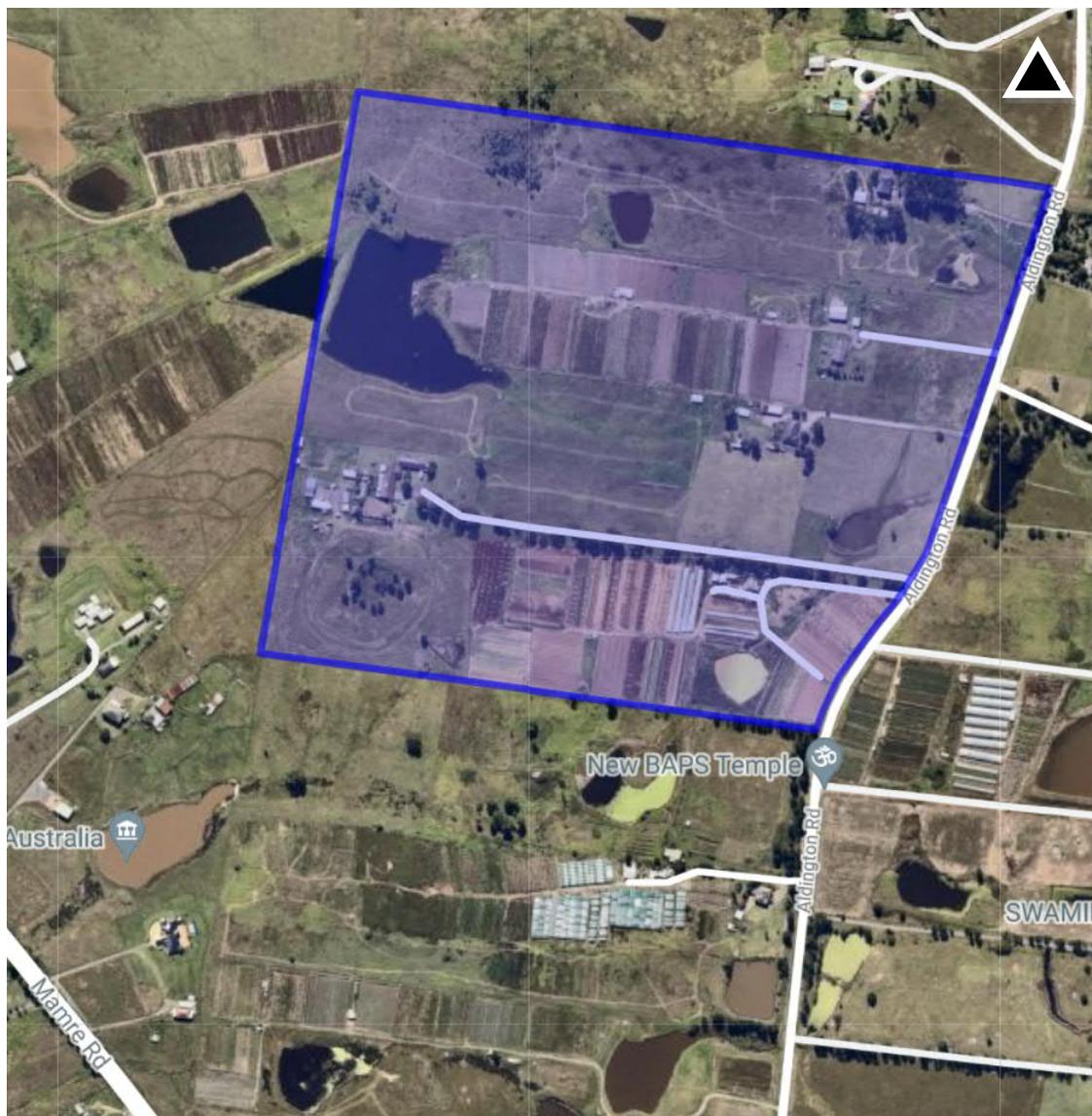


Figure 1: Site Location (Courtesy of Nearmap)

4.2. Development Site

The total Site area is approximately 43 Ha and is currently rural in use, comprising of dwellings, sheds, dams and grassed fields. The Site is partially bordered by Aldington Road to the east and existing rural lots to the west, north and south.

The Site has a general fall from the north-east to south-west with existing levels ranging from RL98.5 in the north, RL 57 in the south.

There are numerous external catchments with a total area approximately 12 Ha entering the northern and eastern boundaries of the site. Refer to Figure 2 for external catchment locations.

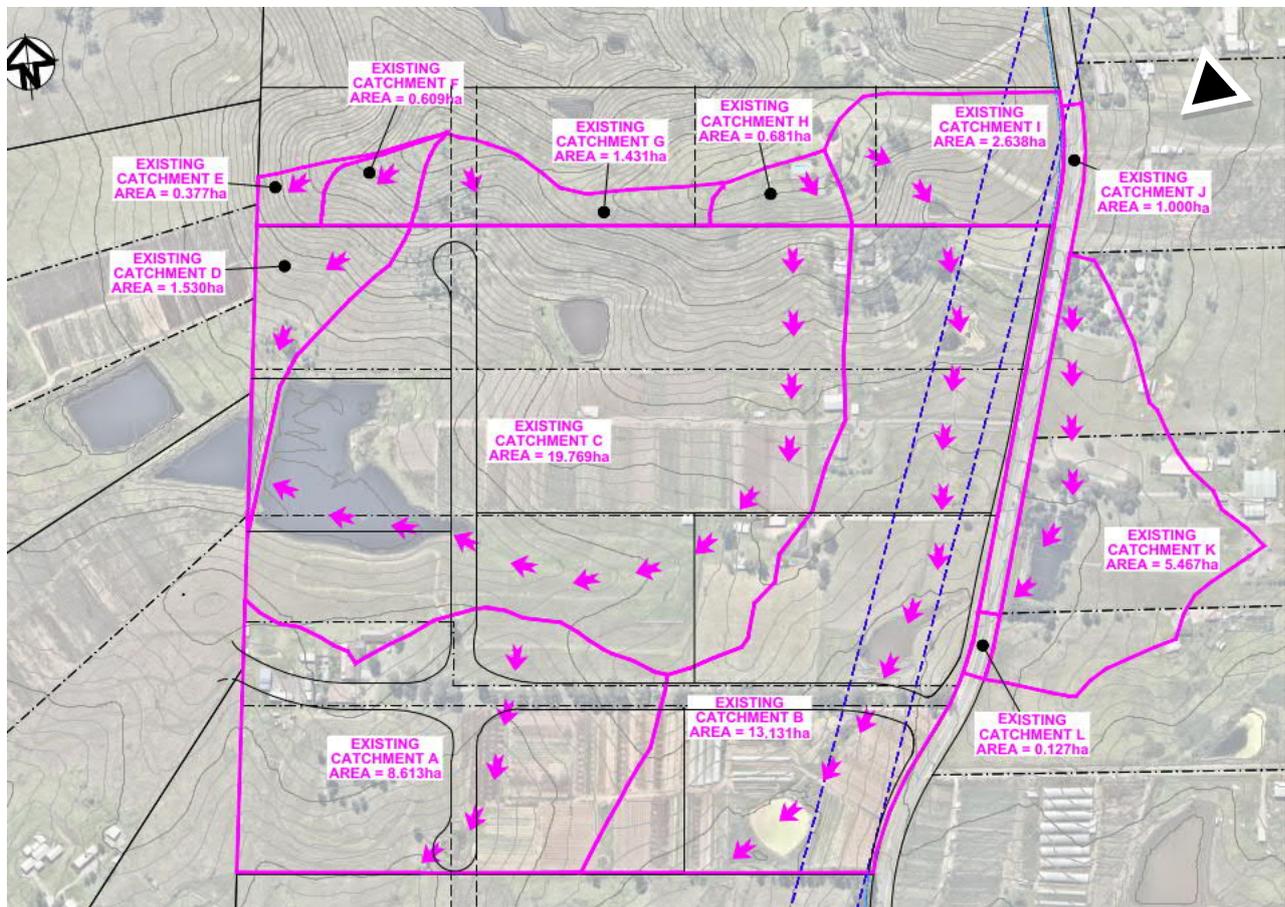


Figure 2: Extent of external catchments

The Site can be categorised as undulating rural land with several key constraints, including:

- the relatively steep slopes
- lack of existing services
- rural road access

There is little or no significant vegetation on the site apart from trees that have been planted and grown around the existing dwellings.

Most of the site is used for general farming activities which appear to be ongoing. There is a potential for low-level pesticide and herbicide contamination which would need to be investigated by the relevant specialist.



Figure 3: Site View from Aldington Rd (Google Street View)

The development site is proposed to be cleared of all the existing built form, dams de-watered and filled, with earthworks to be undertaken across the Site to provide for flat benched platforms. Road and associated infrastructure are proposed to be constructed to services the developed platforms.

External services infrastructure required to service the Site include water main, sewer main, lead-in electrical and NBN.

4.3. Scope and Staging

The scope of this report is to provide the findings of the master planning that has been undertaken to establish the ideal layout for the site. The report summarises the following outcomes:

- Sedimentation and Erosion Control
- Earthworks strategy
- Retaining walls and boundary conditions
- Road Design and criteria

Investigations of the Site were carried out based on:

- Dial Before You Dig (DBYD)
- Sydney Water Hydra System
- Penrith City Council Engineering Design Specification
- Penrith City Council Stormwater Drainage Specification
- LIDAR Survey information
- Sydney Water South West Growth Servicing Plan 2017-2022

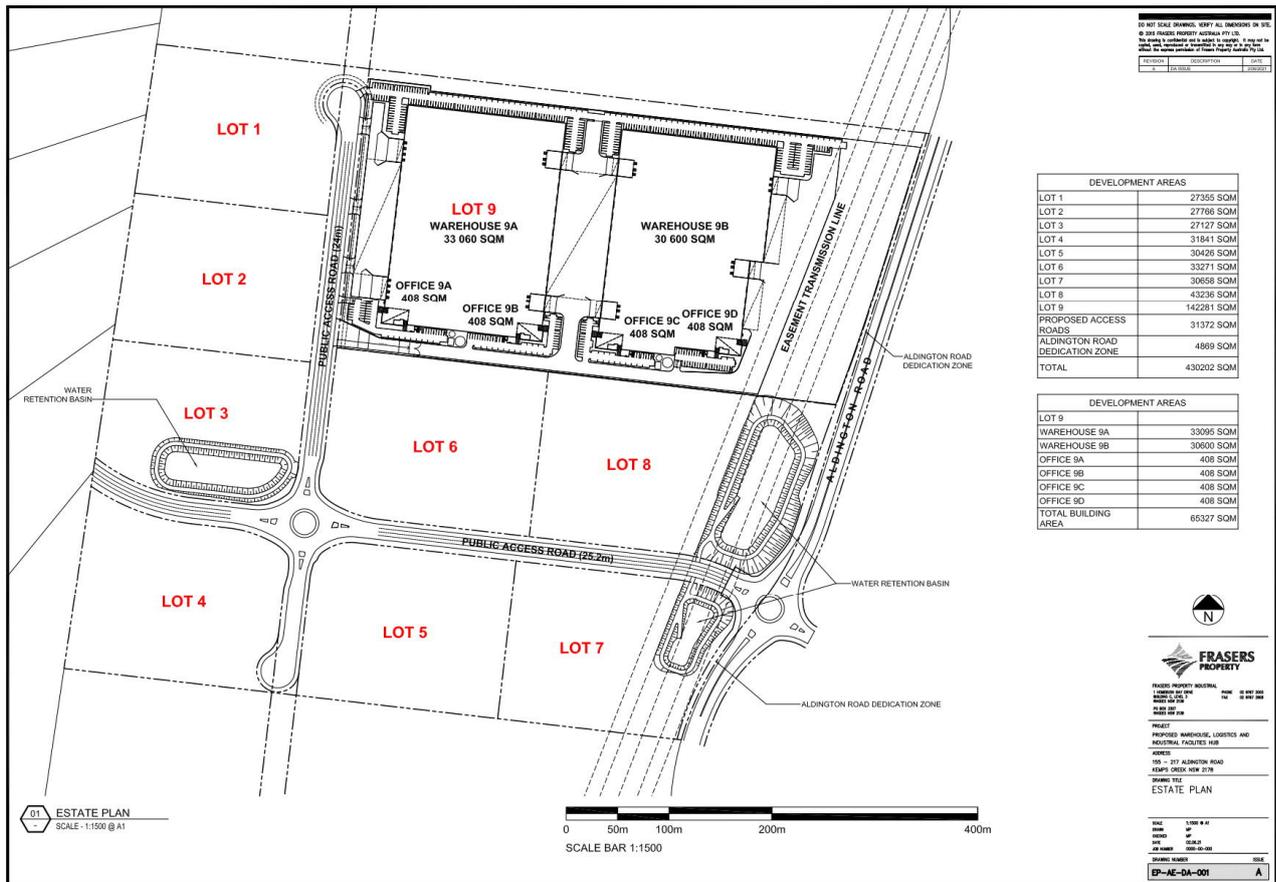


Figure 4: Proposed Estate Plan

5. Earthworks

5.1. Existing Geology

Based on the Preliminary Geotechnical Investigation undertaken by PSM reference PSM3589-003L dated June 2019, the following inferred sub surface soils were encountered across the site:

- TOPSOIL / topsoil filling to depths of 0.1 - 0.6m
- FILL to depths of 2.3m over parts of the site
- Residual Soil – variably stiff to hard silty clay, to depths in the range 2.5-3.5m
- BEDROCK - initially extremely low to very low strength shale or sandstone at first contact at depths of 0.7

5.2. Proposed Earthworks

The site in its existing condition is characterised by steep undulating topography. It is the intent of the proposed development to produce several “flat” pads to facilitate the development of large-scale industrial lots as intended by the zoning IN1. This will require earthworks across the site to achieve a benched site, refer to Appendix A for a cut/fill plan.

The cut / fill requirements within the site have been defined through multiple iterations and careful consideration of the following:

- Undulating topography within the Mamre Road Precinct resulting in the requirement for extensive cut and fill operations to allow the development to facilitate economic development and provide flexibility to cater for the range of industrial customer requirements.
- Provisioning for connectivity to adjoining lands and managing existing upstream catchment flows.
- Avoiding retaining walls fronting Aldington Road and mitigating retaining walls fronting internal public road reserves.
- Mitigate extensive cut in bedrock sub-surface units.
- Meet the requirements for the site to cater for IN1 – General Industrial employment which requires large flexible allotments.

It is proposed that the proposed earthworks design contained within the AT&L documentation provides the most contextually and economically appropriate design in consideration of the above requirements. Whilst boundary retaining walls to the north, south and west are required, we have minimised, where possible, retaining wall fronting the public roadways.

Due to the steep topography, some walls are more than 10m along the northern boundary. Interface design with adjacent developments has also been considered to ensure the most economical and environmentally sustainable solution is achieved subject to owner’s consent.

Refer to Drawing 20-776-C1030 for Bulk Earthworks Cut/Fill Plan within Appendix A. Net import is the value highlighted in bold in Table 3 below.

Table 3: Summary of proposed cut and fill volumes across the site

Item	Volume (m ³)
Stripping of existing topsoil	- 96,913
Excavation of existing creeks and dams (to be exported from site)	- 15,000
Net Cut (including topsoil stripping)	- 739,432
Net Fill	+ 779,582
Balance	- 25,149 (import)

Note these volumes are based on the current design, further detailed design may alter these. – (Negative) balance indicates net cut whilst + (positive) balance indicates import required. It is assumed that all topsoil from the site will be re-used on site as per the specification of the Geotechnical Engineer. Excess topsoil will be exported as required.

The cut and fill volumes presented above have been calculated based on the following assumptions:

- 200mm depth of topsoil stripping over the entire site.
- Any topsoil stripped from the site can be blended in with cut material to be reused based on our experience on similar sites within the vicinity and will therefore not need to be exported off site. This will need to be confirmed by a Geotechnical Engineer at the detailed design phase.

All import materials will comply with the requirements of the requirements of the Import Fill Protocol and Geotechnical Specifications for the Development. Topsoil stripping, blending and placement will be completed in accordance with the Geotechnical Engineering Specifications for the project.

6. Retaining Walls

Where possible, batter slopes will be provided to accommodate level changes. Where this is not possible retaining walls will be constructed along the road, lots and basins based on the current civil and earthworks design. A keystone product or other similar face block will be adopted for all retaining walls and will be detailed on the civil drawings. Refer to Figure 5 to Figure 7 inclusive for images of the proposed retaining walls.

The proposed retaining walls will be built to the manufacturers design guideline requirements and verified by a structural engineer prior to construction. This practice has previously been adopted other developments within the Penrith City Council LGA and considered input from the geotechnical engineer, utility coordination as well as entry and exit points from proposed lots.

'Boulder' retaining walls are considered another potential retaining wall option for the site. Potential locations of 'boulder' walls will be identified during the detailed design. The walls will be designed and constructed to the structural engineer's specification. Refer to Figure 8 for an example of the potential "boulder" retaining wall.

Retaining is required along the north, east, and southern site boundary where the proposed building pad levels will be altered from existing levels. Refer to Drawing 20-776-C1080 for cut and fill wall locations. Retaining walls will be designed and constructed using standard industry practices.

All retaining walls will be constructed as required to suit the timing and development of the earthworks and stormwater basin works. Where the walls are not constructed a batter of 1 in 4 will be maintained for stability purposes. Any batter steeper than 1 in 5 shall be vegetated.

All retaining walls will be located within private property and not within the road reserve areas, unless within drainage easements.

All retaining walls will have pedestrian and vehicular safety barriers (if required) in accordance with Austroads Guidelines as required.

Where owners consent is possible, battering across boundaries is highly recommended as to provide the most economical and environmentally sustainable outcome. Refer typical sections for further explanation on this proposal.

Where boundary fill walls are proposal, these are proposed to be delayed until such time the adjacent lot is developed.

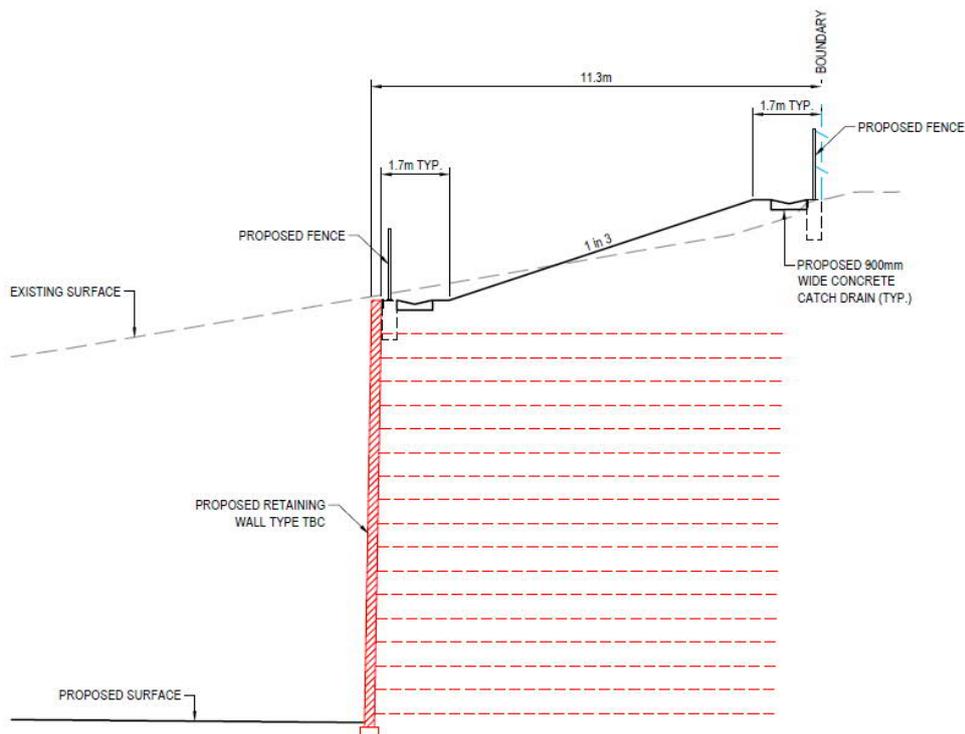


Figure 5: Typical retaining wall section



Figure 6: Example of retaining wall in location of fill adjacent to road reserve

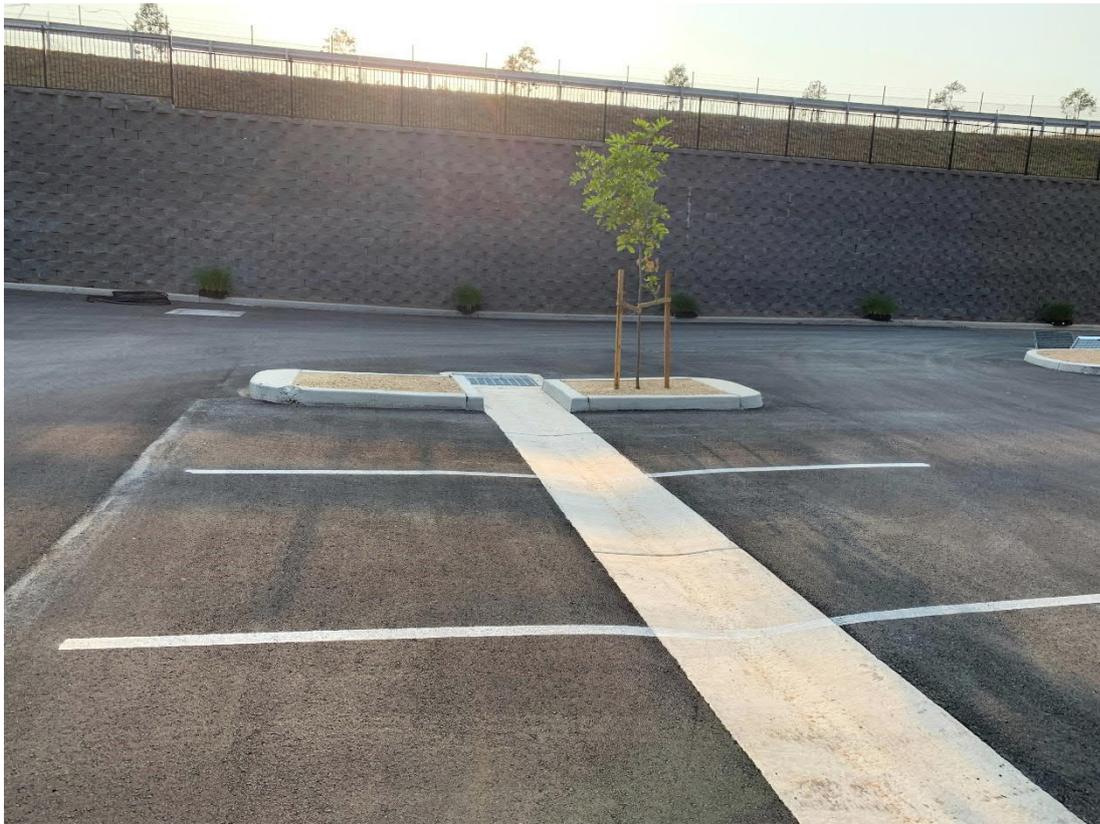


Figure 7: Example of retaining wall in location of cut



Figure 8: Tiered boulder retaining wall

7. Road Design

7.1. Internal Road Network

The internal road network will be designed and constructed in accordance with the Penrith City Council design and construction specifications and the Draft Mamre Road DCP.

Cul-de-sacs will also be designed and constructed in accordance with the Council guidelines requiring a 16.5m radius on the turn heads and to accommodate 36m long B-Triple.

The Design vehicle is to be a 26m long B-Double with a design speed of 60km/hr in the estate roads (with the check vehicle being the 36m long B-Triple).

The Mamre Road Draft DCP requires the east west road (Road No. 1) to be 25.2m with the north south road (Road No. 2) to be 24.0m.

A summary of the general design criteria adopted for the internal estate roads is summarised in Table 4.

Table 4: General road design criteria

Component	Road 2	Road 1
Road Type (as per Mamre Road Precinct Draft DCP)	Local Industrial Rd (24.0m)	Collector Rd (25.2m)
Design Speed	60km/h (signposted 50km/h)	70km/h (signposted 60km/h)
Pedestrian and cycle path (within verge width)	Verge 1 – 1.5m path Verge 2 – 2.5m shared path	Verge 1 – 1.5m path Verge 2 – 2.5m shared path
Through traffic lane	2 x 3.5m	2 x 3.5m
Kerb side lane	2 x 4.0m	2 x 4.0m
Median width	N/A	N/A

Roadway carriageway width	15.0m kerb to kerb	15.0m kerb to kerb
Verge width	Verge 1 = 4.0m Verge 2 = 5.0m	Verge 1 = 4.6m Verge 2 = 5.6m
Road reserve	24.0m	25.2m

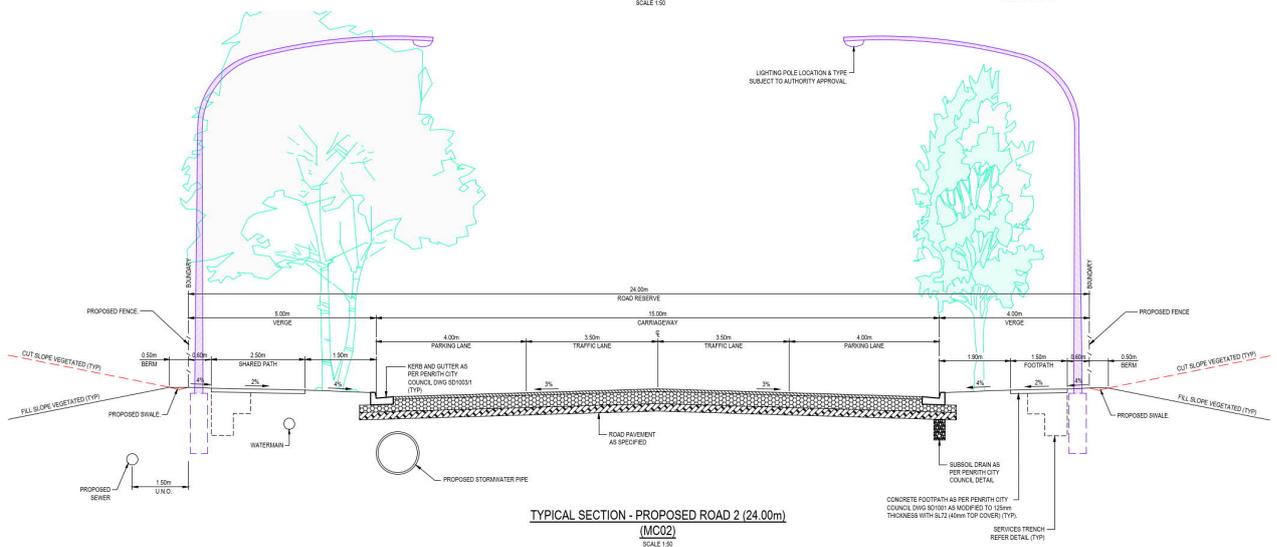
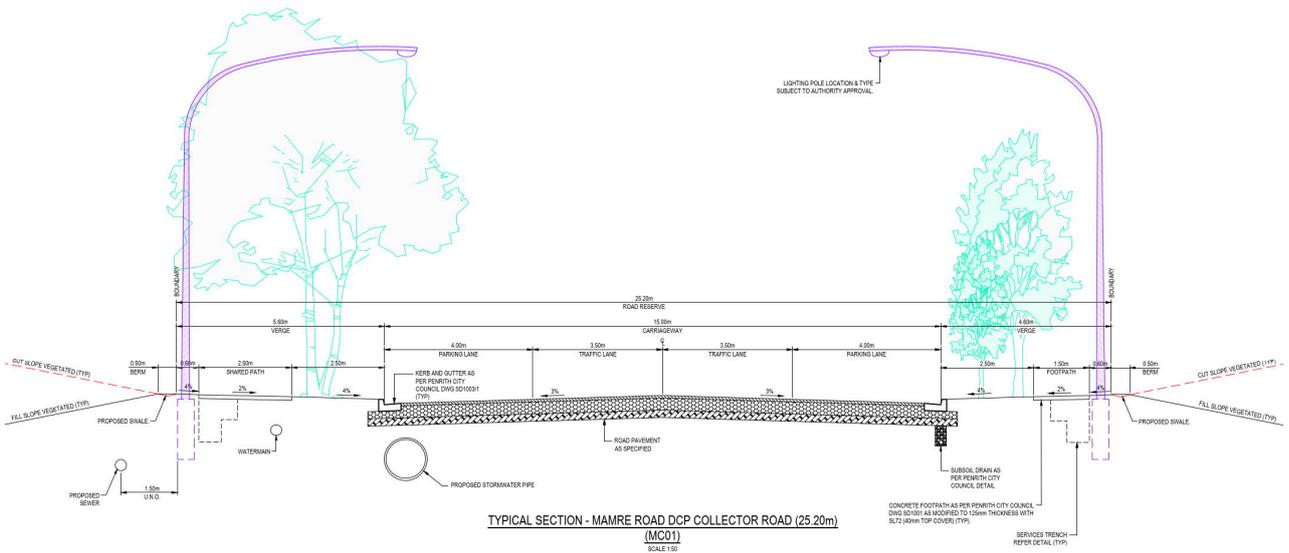


Figure 9: Typical Section of the proposed Internal roads

7.2. Pavement

Pavement will be designed based on the requirements of Austroads Pavement Design Guide – A Guide to the Structural Design of Road Pavements and recommendations provided by Douglas Partners and Alliance Geotechnical reports submitted as part of this SSDA.

The basis of this design is:

- Design Traffic Loading: $N = 1 \times 10^7$ ESA (in accordance with Penrith City Council requirements for Heavy Industrial)
- Design subgrade CBR = 2% (based on the PSM reference PSM3589-003L dated June 2019)

Based on these parameters the indicative pavement design is as follows:

- 70mm AC 14 320 Bitumen
- 7mm Spray Seal
- 250mm DGB 20 (placed in two layers)
- 500mm Select Sandstone Fill with minimum CBR = 35% (placed in three layers)

If the subgrade CBR = 5% the bottom 200mm of select sandstone fill can be replaced with select fill with minimum CBR of 5%.

CBR testing is proposed to be undertaken at the subgrade level to confirm this pavement design. Polymer modified asphalt will be used within all cu-de-sacs with the asphalt concrete layer becoming a 75mm thick polymer modified AC14.

7.3. Batter Design

Any permanent batter's steeper than 1 in 5 will be vegetated in accordance with Penrith City Council requirements. All external batters to the development have been limited to 1 in 4 as a minimum generally, with the maximum localised batter being 1 in 3.

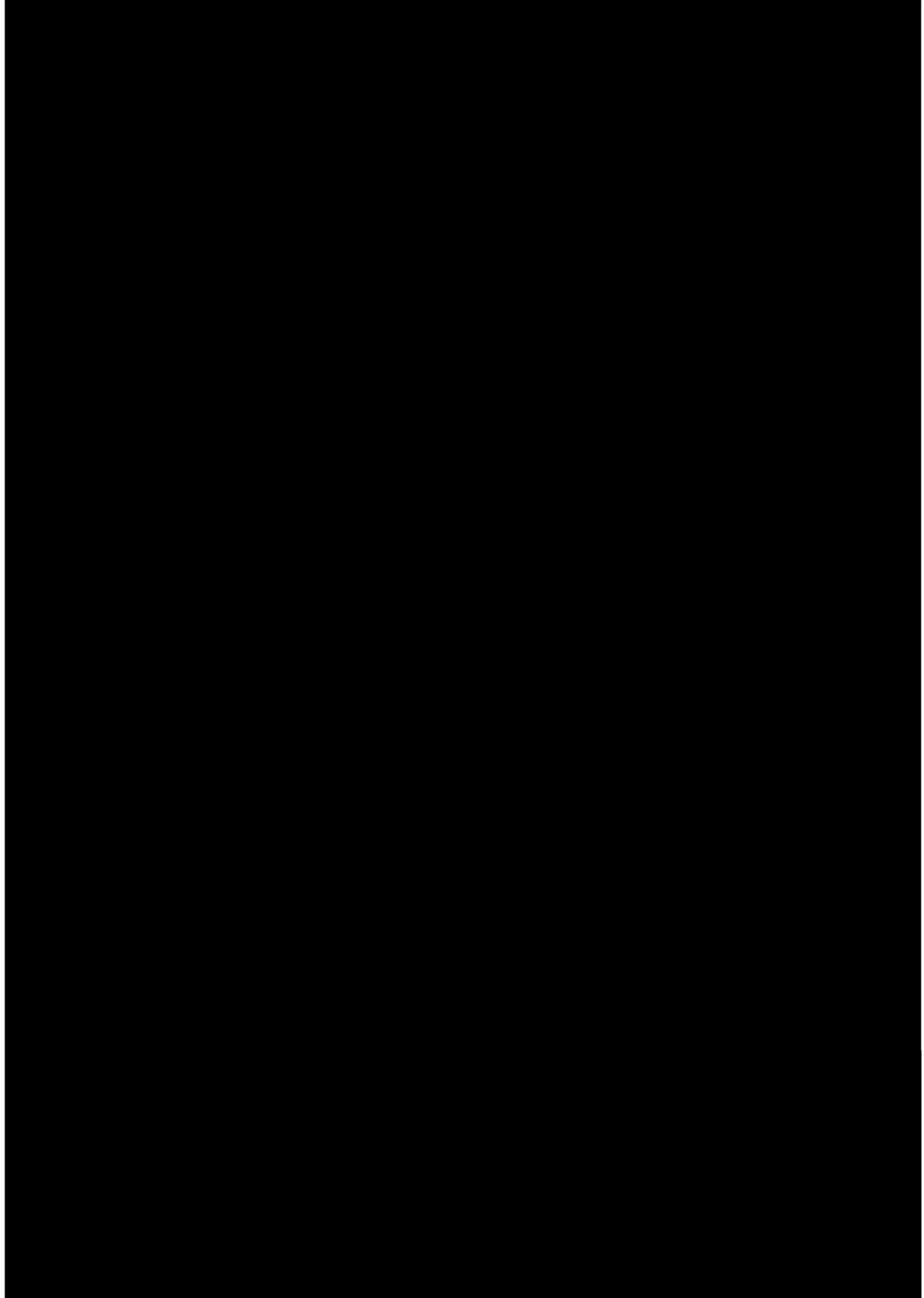
Any temporary batters constructed during the works will be in accordance with the geotechnical report and ongoing advice from the Level 1 supervisor. All temporary batters to be stabilized with appropriate methods and vegetated.

7.4. Conclusion

All road design as demonstrated above is in accordance with Austroads Standards and the requirements of Penrith City Council, as a minimum.

A professional geotechnical engineer will be engaged to design the structural pavement. This will be in accordance with *Austroads Pavement Design Guide – A Guide to Structural Design of Road Pavements*.

APPENDIX A – Civil Engineering Plans





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