Costin Roe Consulting

Value in Engineering and Management

Earthworks Report

Proposed Subdivision
'Illawarra Regional Business Park'
Albion Park, NSW

Prepared For
Delmo Albion Park Pty Ltd

Prepared By:
Costin Roe Consulting
March 2007

CONTENTS

1. BACKGROUND

The project involves the subdivision of an existing rural area of Albion Park located adjacent to the Illawarra Regional Airport. The proposed subdivision occupies an area of approximately 81.2 hectares. The eastern side of the site is bounded by the Illawarra Regional Airport. To the south the site is bounded by Tongarra Rd with the Illawarra Highway adjacent to the northern boundary. Frazer Creek passes through the site starting from the southern boundary at Tongarra Rd and running north-west toward an existing wetland. From the wetland Frazer creek passes through the north-west of the siten then turning east toward Croome Lane. The existing wetland is included in the State Environmental Protection Policy No.14-Coastal Wetlands (SEPP no.14).

The purpose of this report is to provide details as to the earthworks required to achieve the desired finished levels for the project.

2. PROPOSED EARTHWORKS

To achieve the design levels as detailed on the Proposed Levels Contour Plan, cut to fill earthworks will be required on both the northern and southern portions of the site.

Ground modelling using the software package 12d has indicated that the there will be a topsoil strip volume of approximately 115,500m³ based on an average strip depth of 250mm. After the initial topsoil strip the cut volume shall be 247,500m³ and the fill volume shall be 478,000m³, this results in a net importation of fill of approximately 230,500m³.

The proposed fill is to be coal wash that is produced by Illawarra Coal. Coal wash is in essence clay and rock that has been separated from excavated natural material (i.e. run of mine coal) using specific gravity separation techniques. This coal wash is not contaminated with manufactured chemicals or sulfidic minerals. Coal wash is not mixed with any other wastes. As such, coal wash has been assessed and classified in accordance with the Waste Guidelines as inert waste. Coal wash has already been successfully used as select fill for residential subdivisions in the Illawarra region, these include Pioneer Beach Estate at Woonona East, and Haywards Bay at Yallah. Wollongong City Council's technical policy for the use of coal wash as fill has been included in ***Appendix A***, with the importation and use of coal wash to follow the conditions of this poicy.

The bulk excavation and filling of the site will be carried out with regard to the recommendations of the *PRELIMINARY GEOTECHNICAL ASSESSMENT REPORT: PROPOSED COMMERCIAL/INDUSTRIAL SUBDIVISION, 58 TONGARRA ROAD, ALBION PARK, PREPARED BY CONSULTING EARTH SCIENTISTS*, (PGAM).

2.1 Acid Sulphate Soils

The PGAM has indicated that there is a low potential acid sulphate soil risk (PASS) located in the southern portion of the site located adjacent to the existing heritage property. To manage this risk the adoption of the following dosage rate of 7.5kg of lime per tonne of soil for shall be followed for the earthworks undertaken in this area. To ensure that the PASS risk has been neutralized the soil is to be re-sampled once the earthworks are complete.

2.2 Subgrade Preparation

The subgrade shall be prepared in accordance with the following:

- Strip existing topsoil material including unsuitable materials from site (e.g. material containing deleterious matter). Stockpile remainder for re-use aas landscaping material or remove from site.

- The exposed subgrade surface is tbe proof rolled to a minimum density ratio of 100% standard. A NATA-registered Laboratory should be engaged to monitor the compaction.
- Any areas that show visible heave under compaction equipment should be over excavated a further 0.3m and replaced with suitable approved fill material and re-compacted to 100% standard

The erosion and sediment control details will be based on the recommendations of section 7.1 of the *Flora & Fauna Assessment Report, March 2007, Whelans InSites (Gunninah Environmental Consultants)*, and the methods outlined in the document *MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION, Volume 1, 4th Edition, March 2004, LANDCOM*.

A sediment and erosion control plan has been prepared and is located in ***Appendix (to be included)***

3. EROSION & SEDIMENT CONTROL PLAN

An erosion and sediment control plan (ESCP) is shown on drawing CO8931.00-C02. This is a conceptual plan only providing sufficient detail to clearly show that the works can proceed without undue pollution to receiving waters. A detailed plan will be prepared once consent is given and before works start.

3.1 General Conditions

1. The ESCP will be read in conjunction with the engineering plans, and any other plans or written instructions that may be issued in relation to development at the subject site.
2. Contractors will ensure that all soil and water management works are undertaken as instructed in this specification and constructed following the guidelines stated in *MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION, Volume 1, 4th Edition, March 2004, LANDCOM* and Shellharbour City Council specifications.
3. All subcontractors will be informed of their responsibilities in minimising the potential for soil erosion and pollution to down slope areas.

3.2 Land Disturbance

1. Where practicable, the soil erosion hazard on the site will be kept as low as possible and as recommended in Table 1

Land Use	Limitation	Comments
Construction areas	Limited to 5 (preferably 2) metres from the edge of any essential construction activity as shown on the engineering plans.	All site workers will clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope), or

		similar materials.
Access areas	Limited to a maximum width of 5 metres	The site manager will determine and mark the location of these zones onsite. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries.
Remaining lands	Entry prohibited except for essential management works	

Table 1 Limitations to access

3.3 Work Schedule Conditions

Works will be undertaken in the following sequence. Each subsequent stage is not to commence until the previous one is completed.

3.4 Stage 1 Conditions

1. Construct stabilised site access.
2. Install all barrier fencing to exclude access to the nominated restricted areas.
3. Construct catch drain on the western and northern site boundary.
4. Install silt fencing as shown on the plan.

3.5 Erosion Control Conditions

1. Clearly visible barrier fencing shall be installed as shown on the plan and elsewhere at the discretion of the site superintendent to ensure traffic control and prohibit unnecessary site disturbance. Vehicular access to the site shall be limited to only those essential for construction work and they shall enter the site only through the stabilised access points.
2. Soil materials will be replaced in the same order they are removed form the ground. It is particularly important that all subsoils are buried and topsoils remain on the surface at the completion of works.
3. Where practicable, schedule the construction program so that the time from starting land disturbance to stabilisation has a duration of less than six months.
4. Not withstanding this, schedule works so that the duration from the conclusion of land shaping to completion of final stabilisation is less than 20 working days.
5. Land recently established with grass species will be watered regularly until an effective cover has properly established and plants are growing

vigorously. Further application of seed might be necessary later in areas of inadequate vegetation establishment.

6. Where practical, foot and vehicular traffic will be kept away from all recently established areas

7. Earth batters shall be constructed with as low a gradient as practical but not steeper than:

- 2H:1V where slope length is less than 7 meters
- 2.5H:1V where slope length is between 7 and 10 meters
- 3H:1V where slope length is between 10 and 12 meters
- 4H:1V where slope length is between 12 and 18 meters
- 5H:1V where slope length is between 18 and 27 meters
- 6H:1V where slope length is greater than 27 meters

8. All earthworks, including waterways/drains/spillways and their outlets, will be constructed to be stable in at least the design storm event.

9. During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control. In the event water is not available in sufficient quantities, soil binders and/or dust retardants will be used or the surface will be left in a cloddy state that resists removal by wind.

3.6 Pollution Control Conditions

1. Stockpiles will not be located within 5 meters of hazard areas, including likely areas of high velocity flows such as waterways, paved areas and driveways.

2. Sediment fences will:

   a) Be installed at the boundary of the site, along the boundaries of all subsequent lots, and within all lots to achieve the requirements below. And elsewhere at the discretion of the site superintendent to contain the coarser sediment fraction (including aggregated fines) as near as possible to their source.

   b) Have a catchment area not exceeding 720 square meters, a storage depth (including both settling and settled zones) of at least 0.6 meters, and internal dimensions that provide maximum surface area for settling, and

   c) Provide a return of 1 meter upslope at intervals along the fence where catchment area exceeds 720 square meters, to limit discharge reaching each section to 10 litres/second in a maximum 20 year t_c discharge.

3. Sediment removed from any trapping device will be disposed in locations where further erosion and consequent pollution to down slope lands and waterways will not occur.

4. Water will be prevented from directly entering the permanent drainage system unless it is relatively sediment free (i.e. the catchment area has

been permanently landscaped and/or likely sediment has been treated in an approved device). Nevertheless, stormwater inlets will be protected.

5. Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.

3.7 Site Inspection and Maintenance

1. A self-auditing program will be established based on a Check Sheet. A site inspection using the Check Sheet will be made by the site manager:

- At least weekly.
- Immediately before site closure.
- Immediately following rainfall events in excess of 5mm in any 24 hour period.

The self audit will include:

- Recording the condition of every sediment control device
- Recording maintenance requirements (if any) for each sediment control device
- Recording the volumes of sediment removed from sediment retention systems, where applicable
- Recording the site where sediment is disposed
- Forwarding a signed duplicate of the completed Check Sheet to the project manager/developer for their information

2. In addition, a suitably qualified person will be required to oversee the installation and maintenance of all soil and water management works on the site. The person shall be required to provide a short monthly written report. The responsible person will ensure that:

- The plan is being implemented correctly
- Repairs are undertaken as required
- Essential modifications are made to the plan if and when necessary

The report shall carry a certificate that works have been carried out in accordance with the plan.

3. Waste bins will be emptied as necessary. Disposal of waste will be in a manner approved by the Site Superintendent.

4. Proper drainage will be maintained. To this end drains (including inlet and outlet works) will be checked to ensure that they are operating as intended, especially that,

- No low points exist that can overtop in a large storm event
- Areas of erosion are repaired (e.g. lined with a suitable material) and/or velocity of flow is reduced appropriately through construction of small check dams of installing additional diversion upslope.
- Blockages are cleared (these night occur because of sediment pollution, sand/soil/spoil being deposited in or too close to them, breached by vehicle wheels, etc.).

5 .Sand/soil/spoil materials placed closer than 2 meters from hazard areas will be removed. Such hazard areas include and areas of high velocity water flows (e.g. waterways and gutters), paved areas and driveways.

6. Recently stabilised lands will be checked to ensure that erosion hazard has been effectively reduced. Any repairs will be initiated as appropriate.

7. Excessive vegetation growth will be controlled through mowing or slashing.

8. All sediment detention systems will be kept in good, working condition. In particular, attention will be given to:

   a) Recent works to ensure they have not resulted in diversion of sediment laden water away from them

   b) Degradable products to ensure they are replaced as required, and

   c) Sediment removal, to ensure the design capacity or less remains in the settling zone.

9. Any pollutants removed from sediment basins or litter traps will be disposed of in areas where further pollution to down slope lands and waterways should not occur.

10. Additional erosion and/or sediment control works will be constructed as necessary to ensure the desired protection is given to down slope lands and waterways, i.e. make ongoing changes to the plan where it proves inadequate in practice or is subjected to changes in conditions at the work site or elsewhere in the catchment.

11. Erosion and sediment control measures will be maintained in a functioning condition until all earthwork activities are completed and the site stabilised

12. Litter, debris and sediment will be removed form the gross pollutant traps and trash racks as required.

REFERNCES

MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION, Volume 1, 4th Edition, March 2004, LANDCOM

CONSULTING EARTH SCIENTISTS, Preliminary Geotechnical Assessment Report: Proposed Commercial/ Industrial Subdivision, 58 Tongarra Road Albion Park, January 2007

Flora & Fauna Assessment Report, March 2007, Whelans InSites (Gunninah Environmental Consultants)

APPENDIX A

WOLLONGONG CITY COUNCIL - TECHNICAL POLICT 2.40

NAME:	NEW COAL WASHERY REFUSE IN SUBDIVISIONS
PROGRAM:	DEVELOPMENT MANAGEMENT
FUNCTION:	DEVELOPMENT ASSESSMENT & COMPLIANCE
DIVISION:	WORKS & SERVICES

File No: SU19294

OBJECTIVE

To allow the use of coalwash in residential type subdivisions.

POLICY STATEMENT

The use of coal washery refuse for filling in residential type subdivisions be permitted under the following conditions:

1 Very coarse materials (greater than 150 mm) or fine slurry materials (tailings) are to be rejected.

2 Structures are to be slab-on-ground design. Other footing designs by a Structural/Geotechnical Engineer may be considered.

3 Compaction to be in layers under full engineering control to at least 100% standard density.

4 Combustibles contents to be determined from site sampling at a regular frequency. Minimum testing requirements:

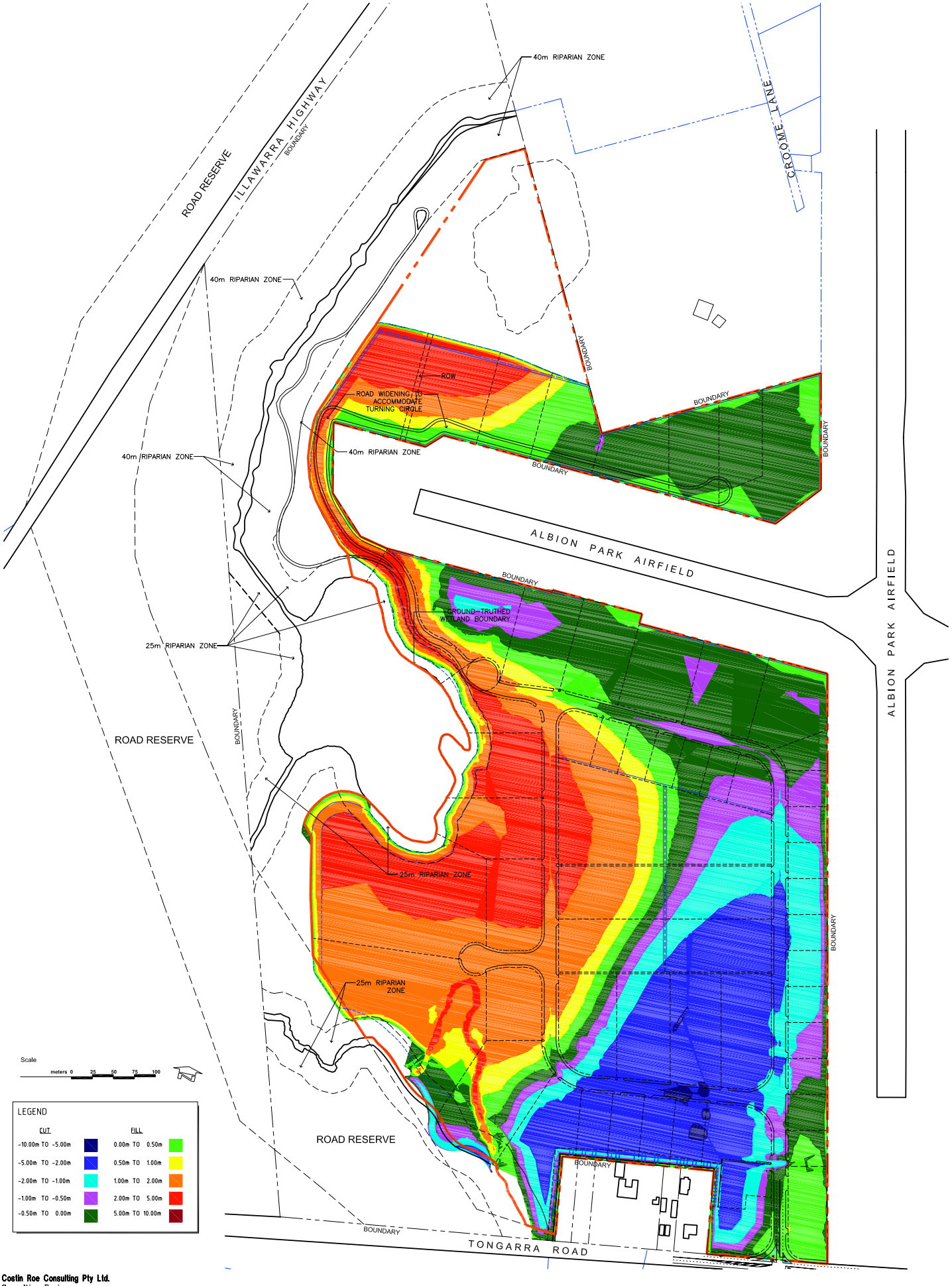
Quantity of Coalwash to be Emplaced (tonnes)	Minimum Frequency of Testing (tonnes per test)
< 5,000	1,000 (5 tests)
< 25,000	2,500 (10 tests)
< 125,000	6,000 (20 tests)
< 500,000	15,000 (35 tests)
< 2,000,000	30,000 (65 tests)
> 2,000,000	50,000

5 Combustibles contents to be at a mean value not greater than 30% with the upper value not exceeding 40%.

6 Inert fill should be used to backfill service trenches.

7 Coalwash is to be covered by at least 300 mm of inert cover.

8 Proper site control to prevent run-off or dust nuisance.



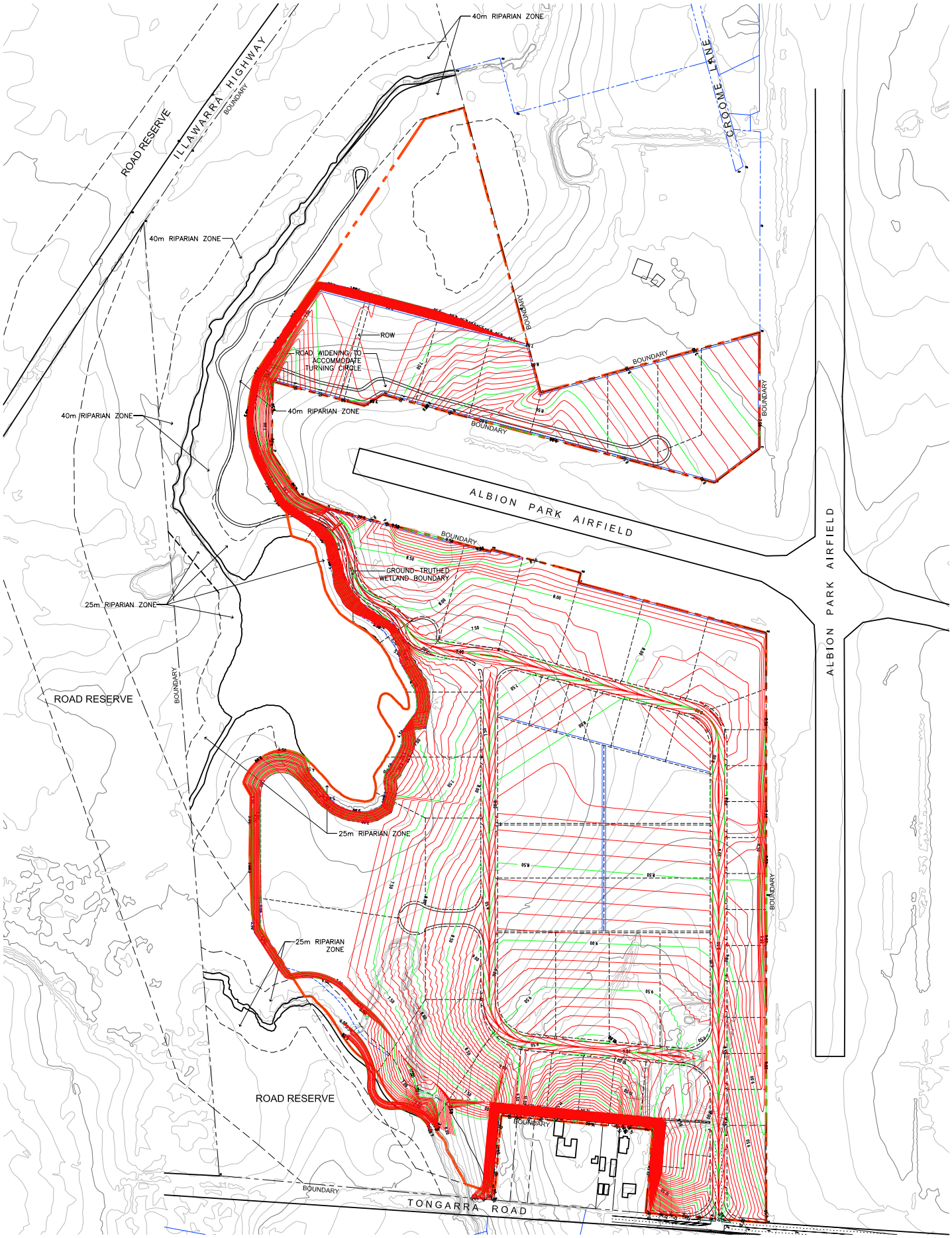
Costin Roe Consulting Pty Ltd.
Consulting Engineers
Suite 310, 55 Harrington Street
The Rocks, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

Costin Roe Consulting
Value in Engineering and Management

JULIUS BOKOR ARCHITECT PTY LTD
Level 1, 88 Foveaux Street, Surry Hills NSW. 2101
t: 02 9212 6606 f: 02 9212 6670 m: 0419 258 432 e: jbokor@juliusbokor.com.au

CUT TO FILL PLAN

Illawarra Regional Business Park For Delmo Albion Park Pty Ltd - 78 Tongarra Road, Albion Park



LEGEND

8.00 PROPOSED CONTOUR

100 EXISTING CONTOUR

Scale

meters 0 25 50 75 100

Costin Roe Consulting Pty Ltd.
Consulting Engineers
Suite 310, 55 Harrington Street
The Rocks, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

Costin Roe Consulting
Value in Engineering and Management

JULIUS BOKOR ARCHITECT PTY LTD
Level 1, 88 Foveaux Street, Surry Hills NSW. 2101
t: 02 9212 6606 f: 02 9212 6670 m: 0419 258 432 e: jbokor@juliusbokor.com.au

PROPOSED LEVELS CONTOUR PLAN

Illawarra Regional Business Park For Delmo Albion Park Pty Ltd - 78 Tongarra Road, Albion Park