

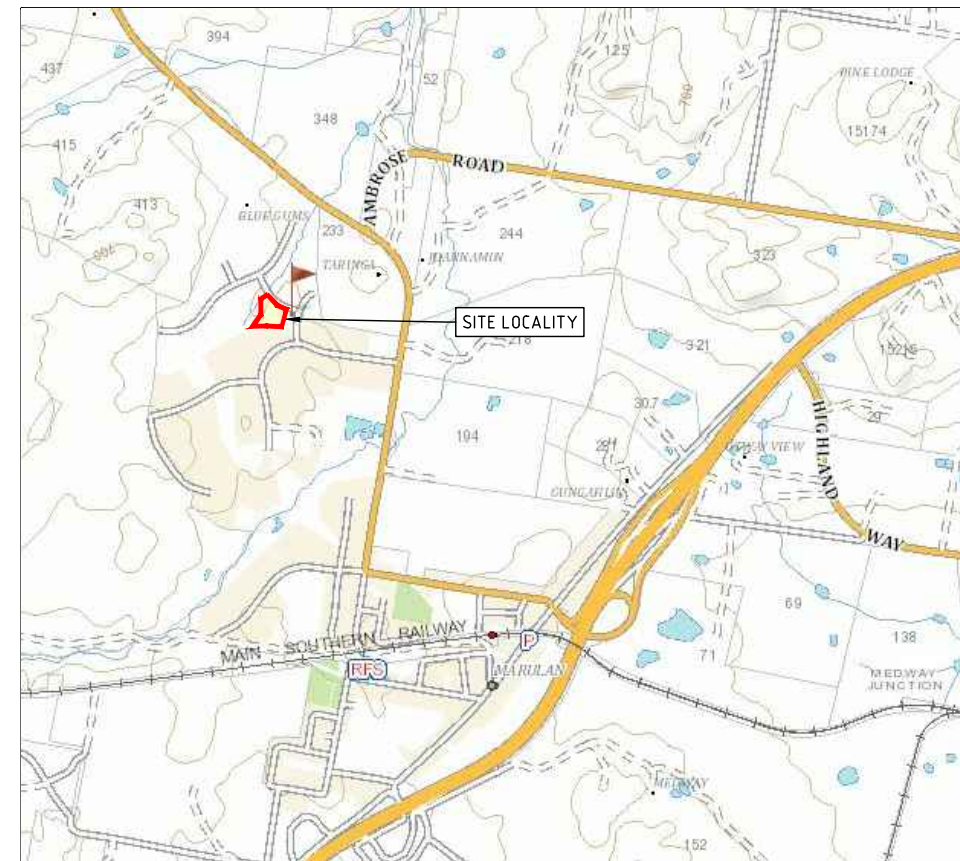
PROPOSED RESIDENTIAL SUBDIVISION

3 SOUTHDOWN ROAD, MARULAN NSW

CONCEPT CIVIL & STORMWATER PLANS

DRAWING SCHEDULE

DRAWING NUMBER	DRAWING TITLE
C000	TITLE SHEET, DRAWING SCHEDULE & SITE LOCALITY PLAN
C100	CONCEPT SITE GENERAL ARRANGEMENT PLAN
C200	CONCEPT ROAD LAYOUT & LONGITUDINAL SECTION
C300	CONCEPT ROAD TYPICAL CROSS-SECTION & STANDARD DRAWINGS
C301	CONCEPT ROAD CROSS-SECTION SHEET
C400	CONCEPT STORMWATER DRAINAGE PLAN
C401	CONCEPT STORMWATER DRAINAGE CATCHMENT PLAN & 'DRAINS' MODEL LAYOUT & RESULTS
C500	CONCEPT WATER QUALITY ASSUMPTIONS & BIORETENTION BASIN DETAILS
C501	CONCEPT NorBE ASSESSMENT & MUSIC MODEL LAYOUT
C502	CONCEPT WATER QUALITY MAINTENANCE/MANAGEMENT CHECKLISTS
C600	CONCEPT CUT/FILL PLAN & SUMMARY
C700	CONCEPT SOIL & WATER MANAGEMENT SITE ARRANGEMENT
C701	CONCEPT SOIL & WATER MANAGEMENT STANDARD DRAWINGS & NOTES (PAGE 1 OF 2)
C702	CONCEPT SOIL & WATER MANAGEMENT STANDARD DRAWINGS & NOTES (PAGE 2 OF 2)



LOCALITY PLAN
N.T.S

DOCUMENT CERTIFICATION

This plan has been developed based on agreed requirements as understood by SEEC at the time of engagement. It applies only to a specific task on the nominated lands. Other interpretations should not be made, including changes in scale or application to other projects. Changes to the project scope or extent might impact on the validity of this plan.

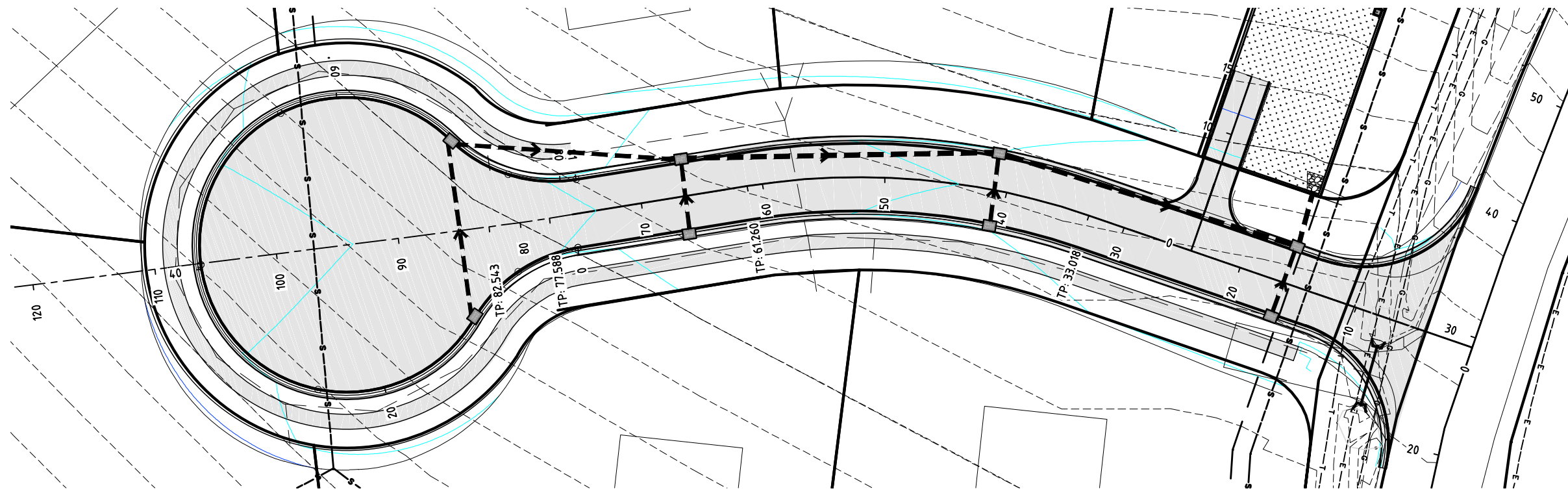
Any recommendations contained in this plan are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, or as advised to us. Such recommendations are potentially subject to the limited scope and resources available.

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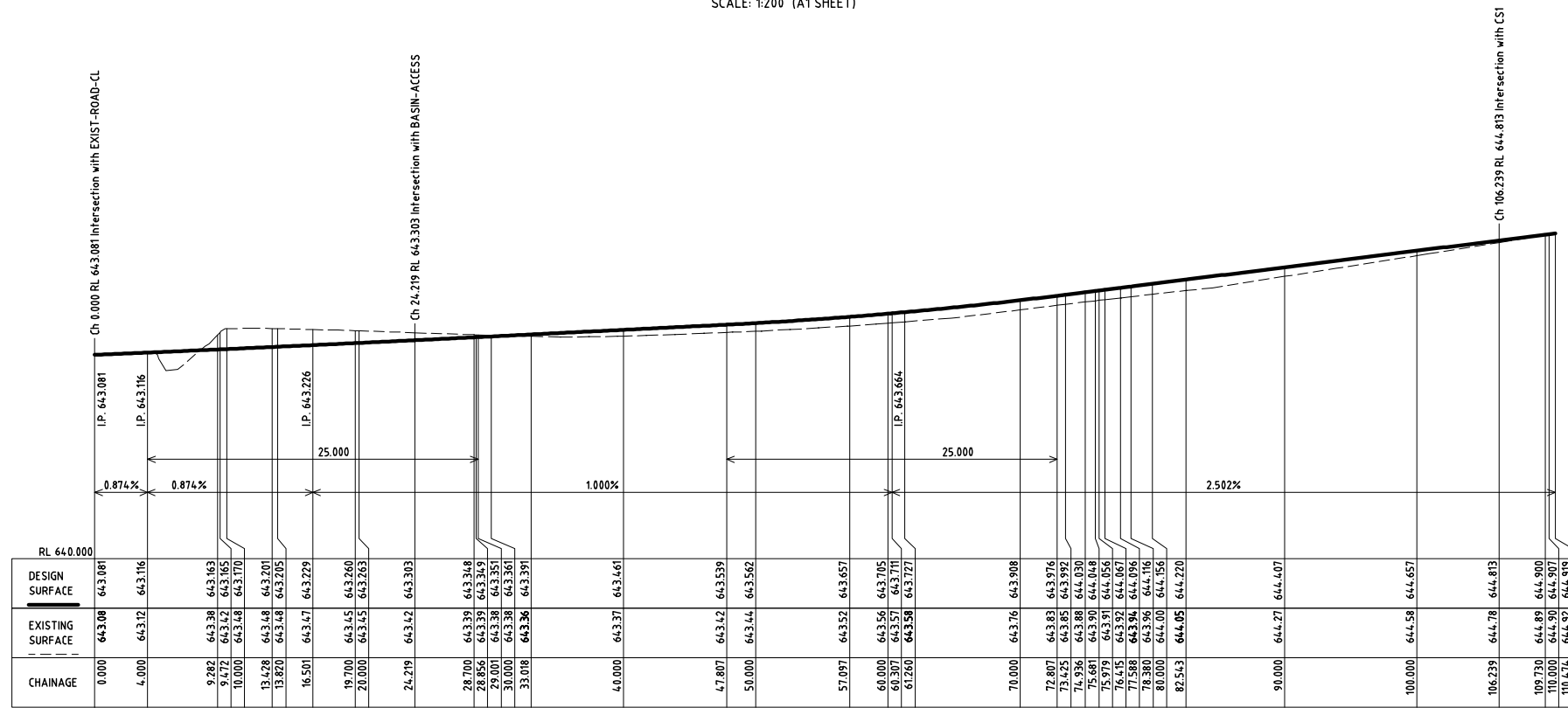
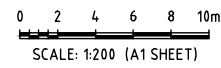


REV	DATE	DES.	DRN.	APP.	REVISION DETAILS	DRAWING STATUS	North	CLIENT	PROJECT TITLE	DRAWING TITLE								
						DESIGN BY: R.B. DRAWN BY: R.B. FINAL APPROVAL: J.A. SCALE: (on A1 Original) NOT TO SCALE		KEITH ALLEN LATERALS PLANNING	 Suites 7 & 8, 68-70 Station Street PO Box 1098, Bowral NSW 2576. (t) 02 4862 1633 (f) 02 4862 3088 email: reception@seec.com.au WWW.SEEC.COM.AU	PROPOSED RESIDENTIAL SUBDIVISION LOT 11 DP1271846 3 SOUTHDOWN RD, MARULAN NSW	TITLE SHEET, DRAWING SCHEDULE & SITE LOCALITY PLAN							
00	24/01/24	R.B.	R.B.	J.A.	FOR APPROVAL	DA												
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A	28/07/23	R.B.	R.B.	J.A.	DRAFT ISSUE - FOR REVIEW													
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23000043	P01	C000	00															

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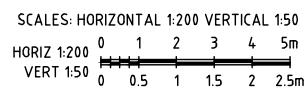


CONCEPT ROAD LAYOUT



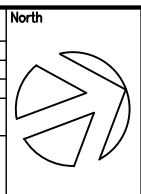
CONCEPT ROAD LONGITUDINAL SECTION

CH 0.000 TO CH 110.474



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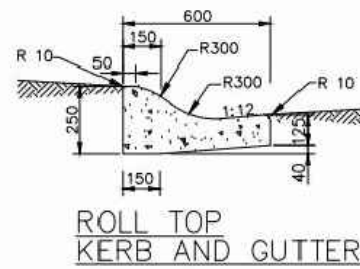
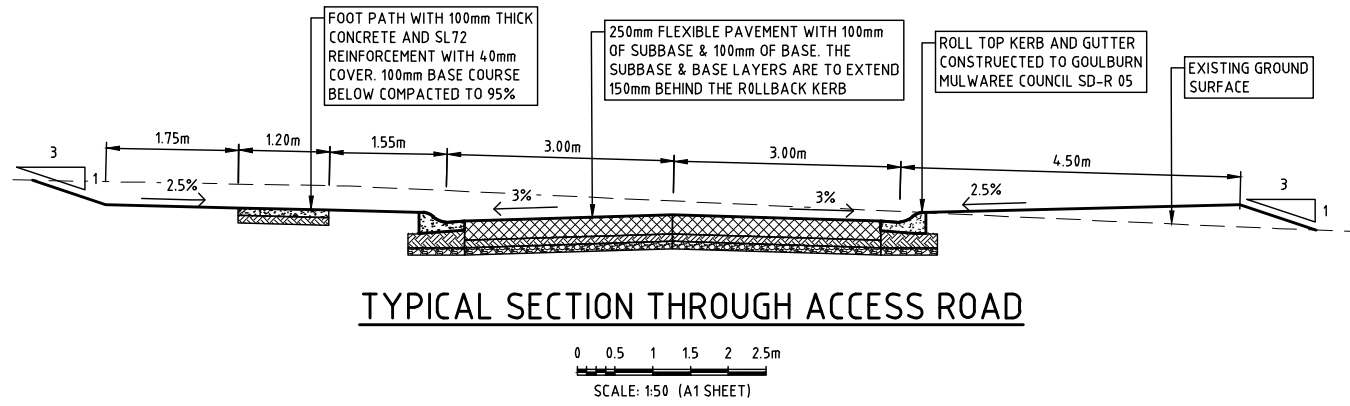
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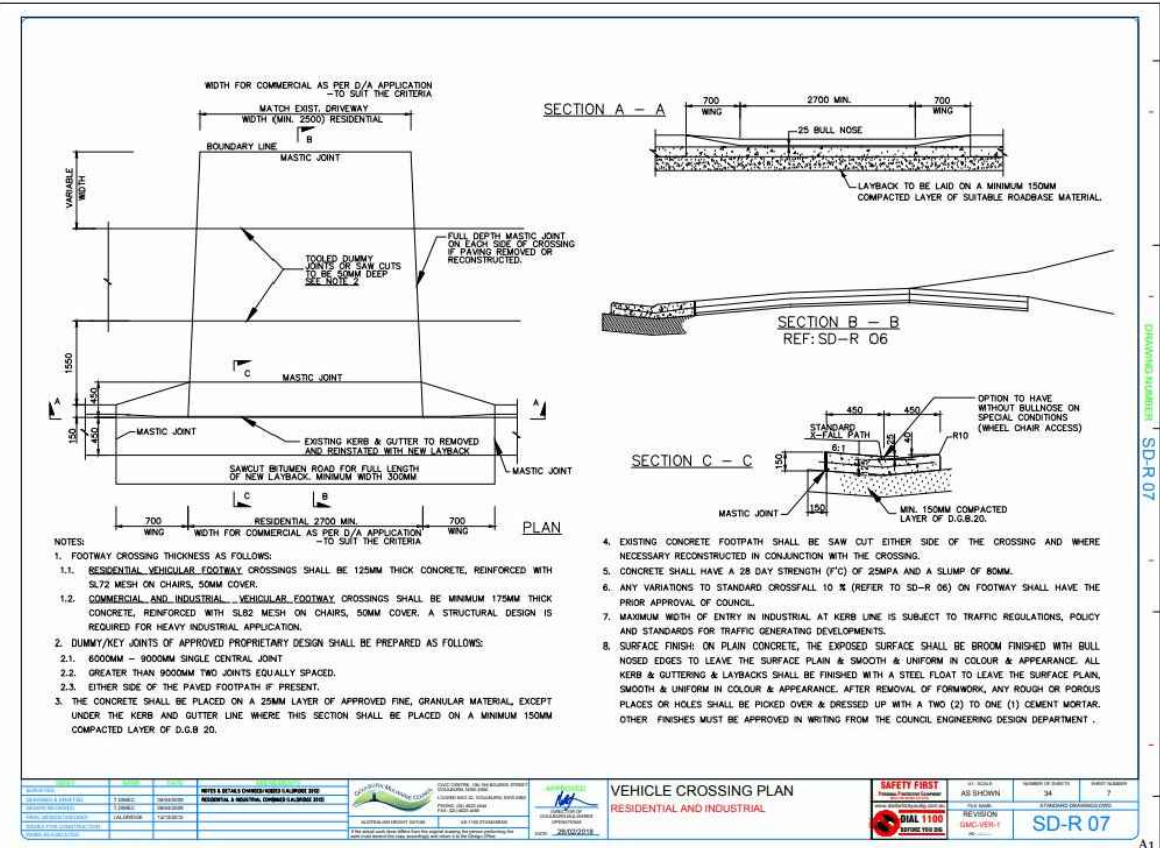
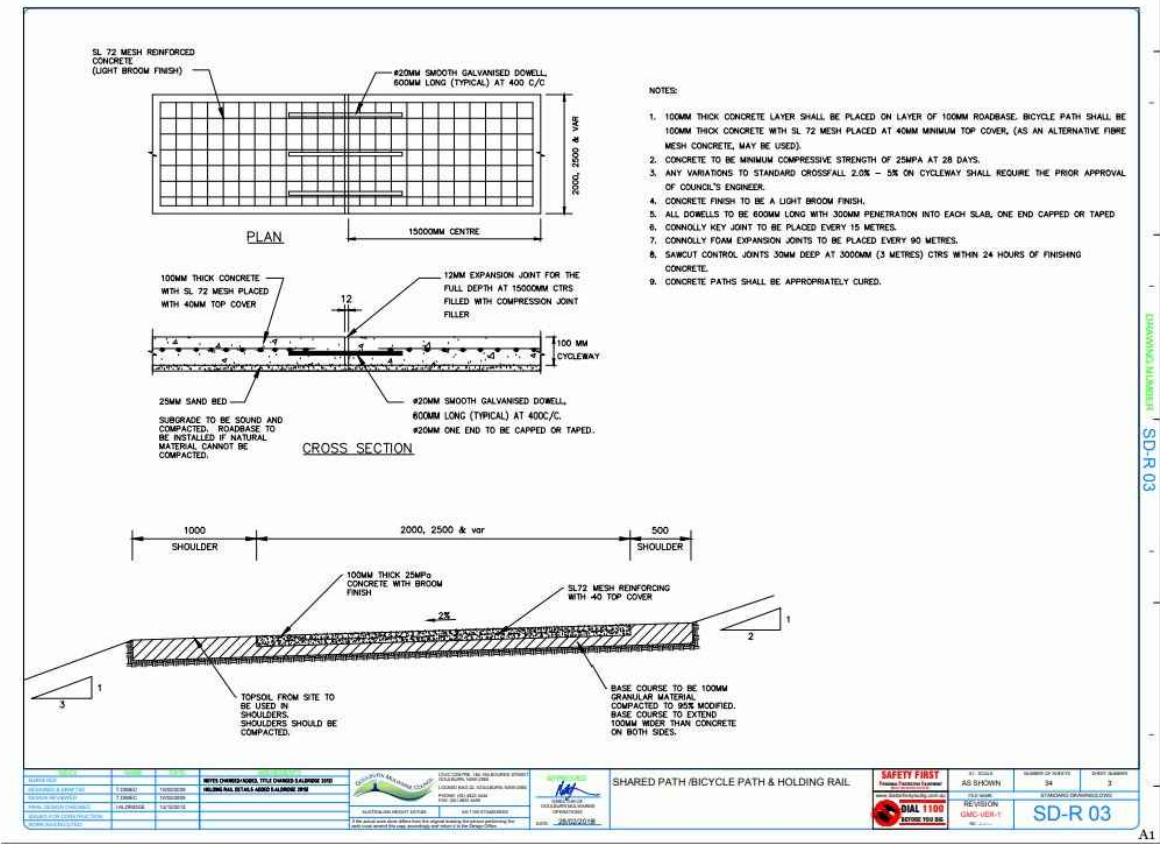
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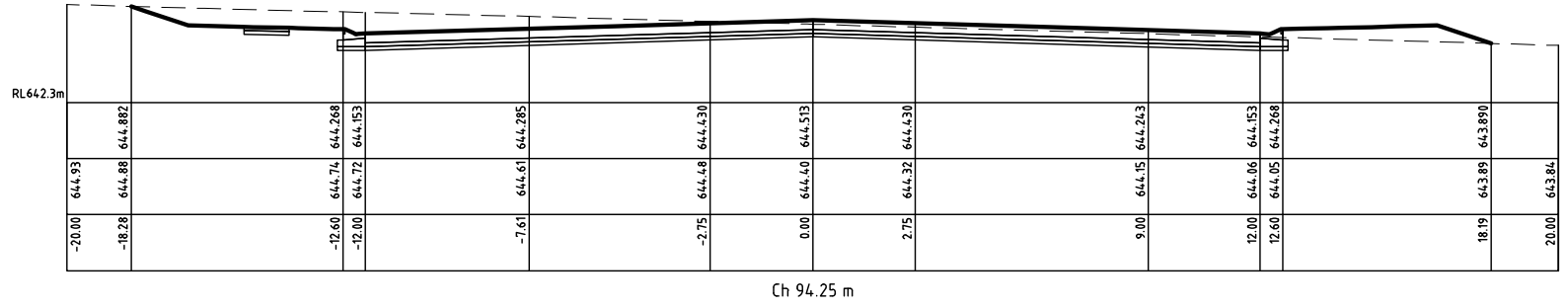
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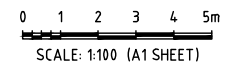
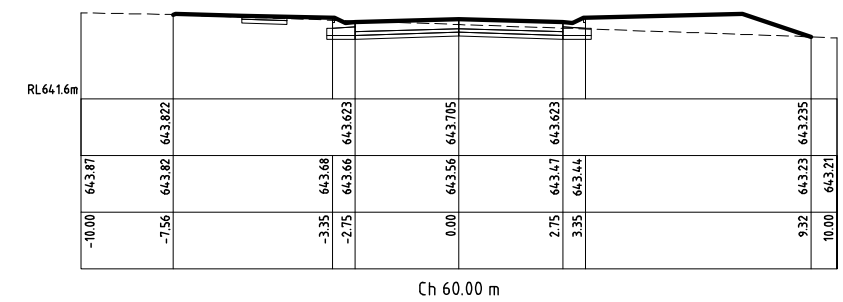
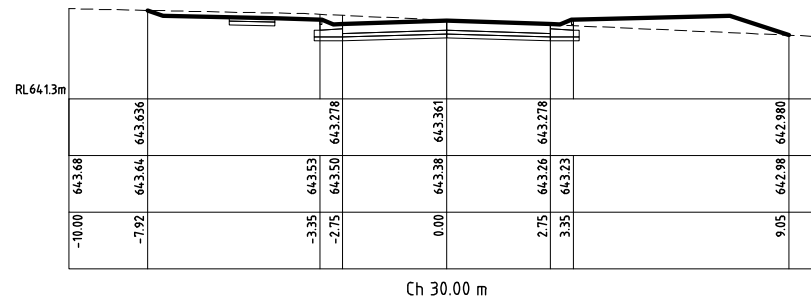
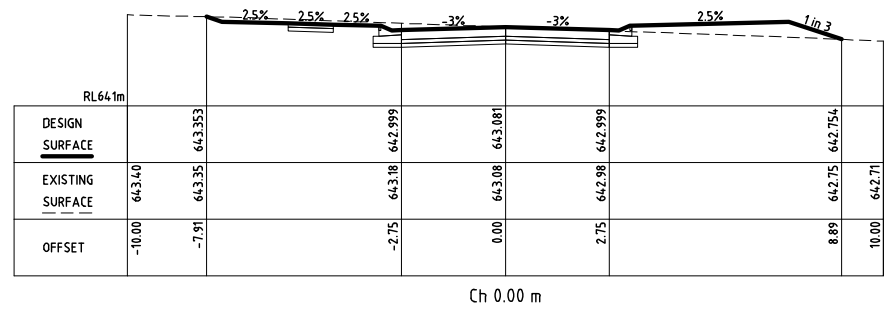
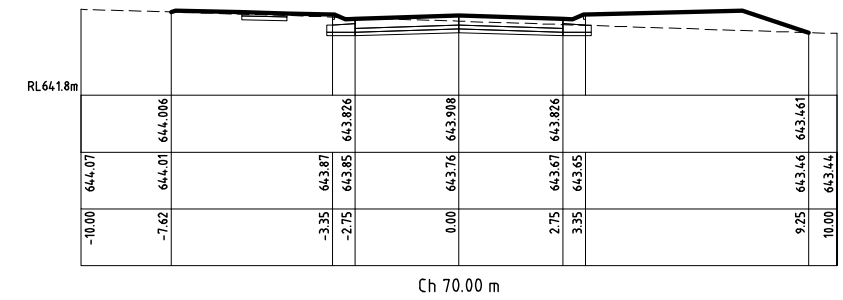
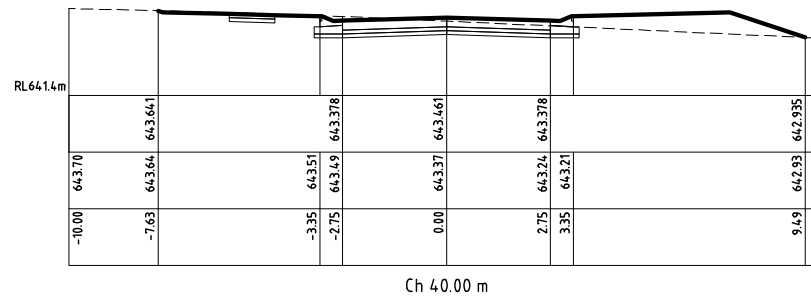
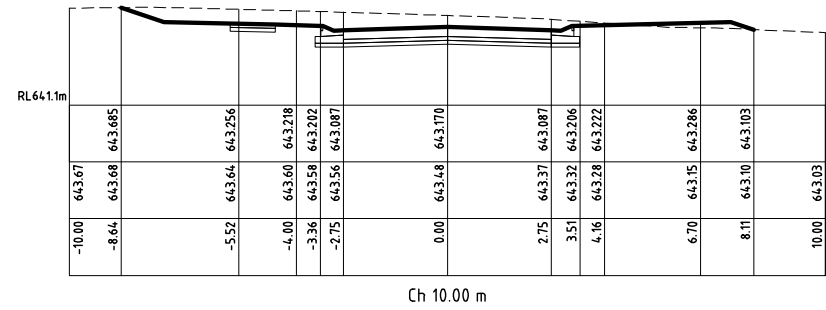
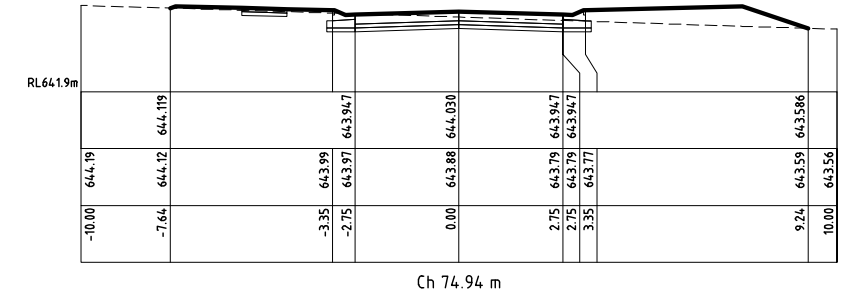
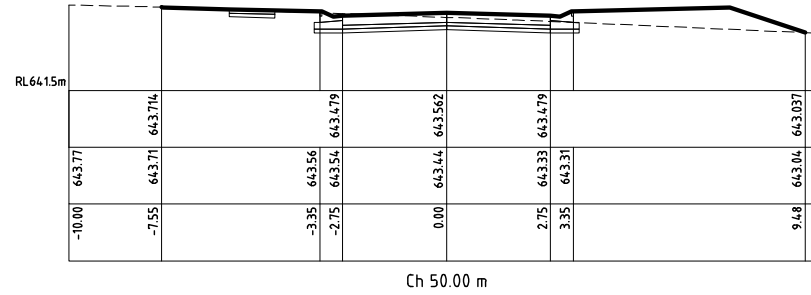
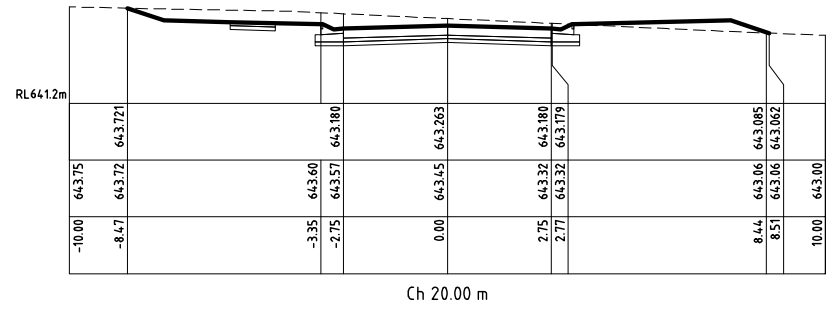


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SECTION THROUGH CENTRE OF CUL-DE-SAC



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FINAL APPROVAL	J.A.
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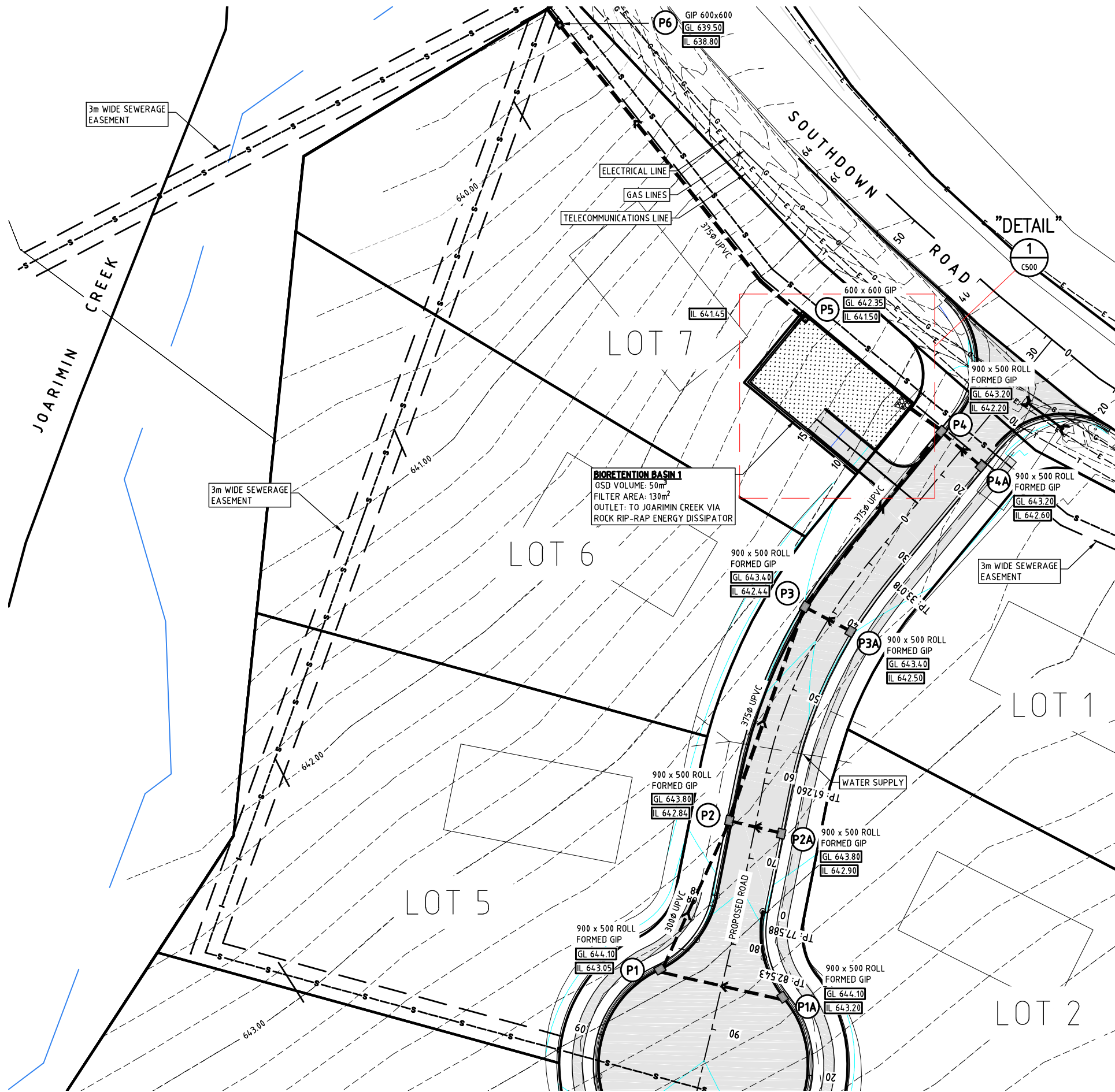
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CONCEPT ROAD CROSS-SECTION SHEET			
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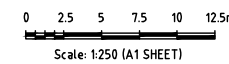
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LEGEND:

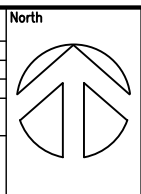
- GL 622.56 PIT GRATE LEVEL
- IL 622.56 PIT INVERT LEVEL
- - - - - EXISTING SURFACE CONTOUR (0.20m INTERVAL)
- DIRECTION OF WATER FLOW
- — — — — STORMWATER DRAINAGE PIPE
- JP X COVERED JUNCTION PIT WITH FILTER SCREEN
- GIP ■ GRATED INLET PIT
- P1 PIT NUMBER
- ▲ ROCK RIP-RAP ENERGY DISSIPATOR
- BIORETENTION BASIN / RAINGARDEN FILTER BED

CONCEPT STORMWATER DRAINAGE PLAN



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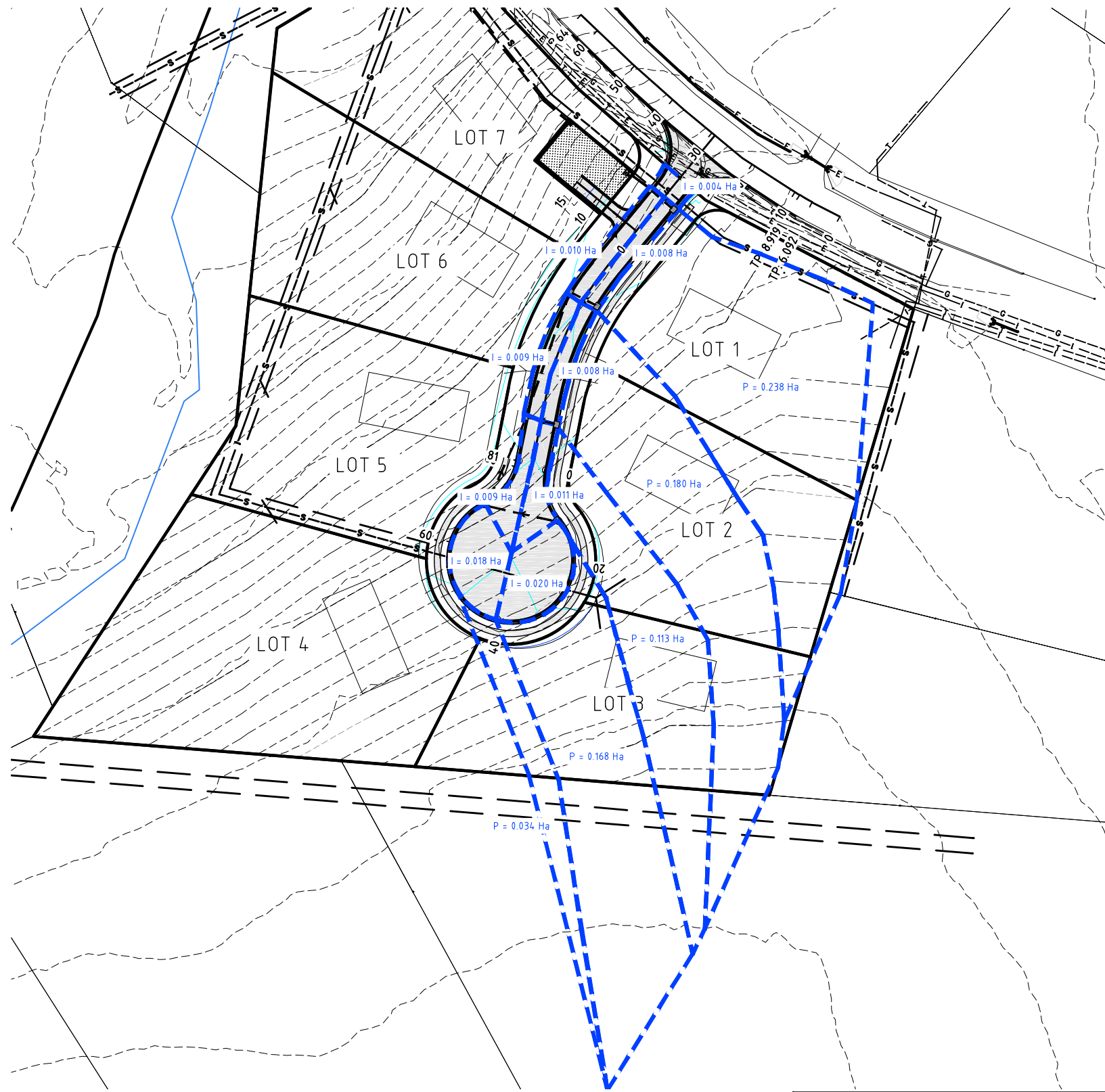
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LEGEND:

- CATCHMENT BOUNDARIES
- P = 50 Ha PERVIOUS CATCHMENT AREA
- I = 50 Ha IMPERVIOUS CATCHMENT AREA

STORMWATER DRAINAGE SUMMARY

SITE DETAILS
 MODELED CATCHMENT AREA = 0.840 Ha
 PRE-DEVELOPMENT IMPERVIOUS AREA = 0%
 POST-DEVELOPMENT IMPERVIOUS AREA = 6%

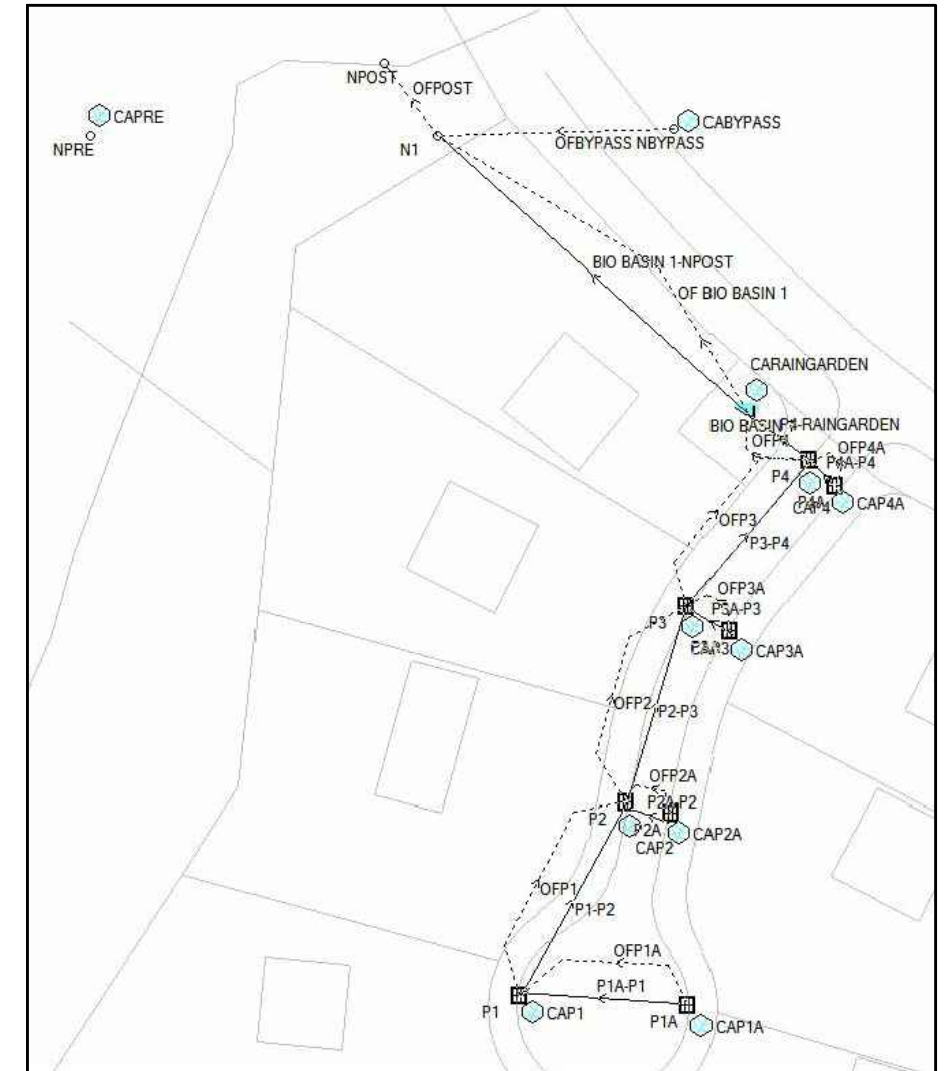
PRE- & POST-DEVELOPMENT DISCHARGE & STORAGE VOLUMES

PRE-DEVELOPMENT Q_{5YR} = 0.054 m³/s
 POST-DEVELOPMENT Q_{5YR} (WITHOUT OSD) = 0.064 m³/s
 POST-DEVELOPMENT Q_{5YR} (WITH OSD) = 0.036 m³/s

PRE-DEVELOPMENT Q_{10YR} = 0.090 m³/s
 POST-DEVELOPMENT Q_{10YR} (WITHOUT OSD) = 0.098 m³/s
 POST-DEVELOPMENT Q_{10YR} (WITH OSD) = 0.063 m³/s

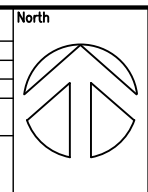
PRE-DEVELOPMENT Q_{100YR} = 0.225 m³/s
 POST-DEVELOPMENT Q_{100YR} (WITHOUT OSD) = 0.230 m³/s
 POST-DEVELOPMENT Q_{100YR} (WITH OSD) = 0.220 m³/s

ON-SITE DETENTION
 50m² OF ON-SITE DETENTION HAS BEEN PROVIDED IN BIORETENTION BASIN 1.
 REFER TO THE ACCOMPANYING 'DRAINS' MODEL FOR DETAILED CALCULATIONS.



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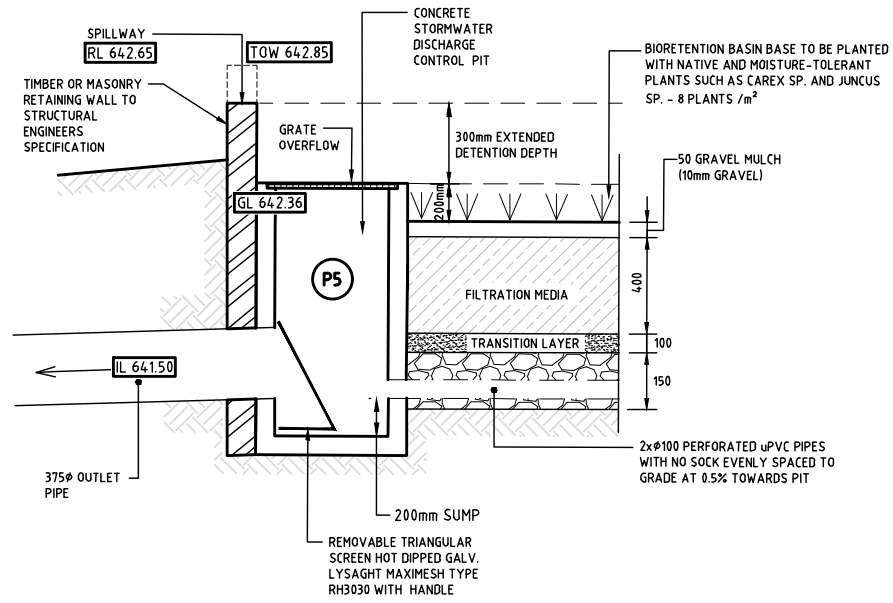
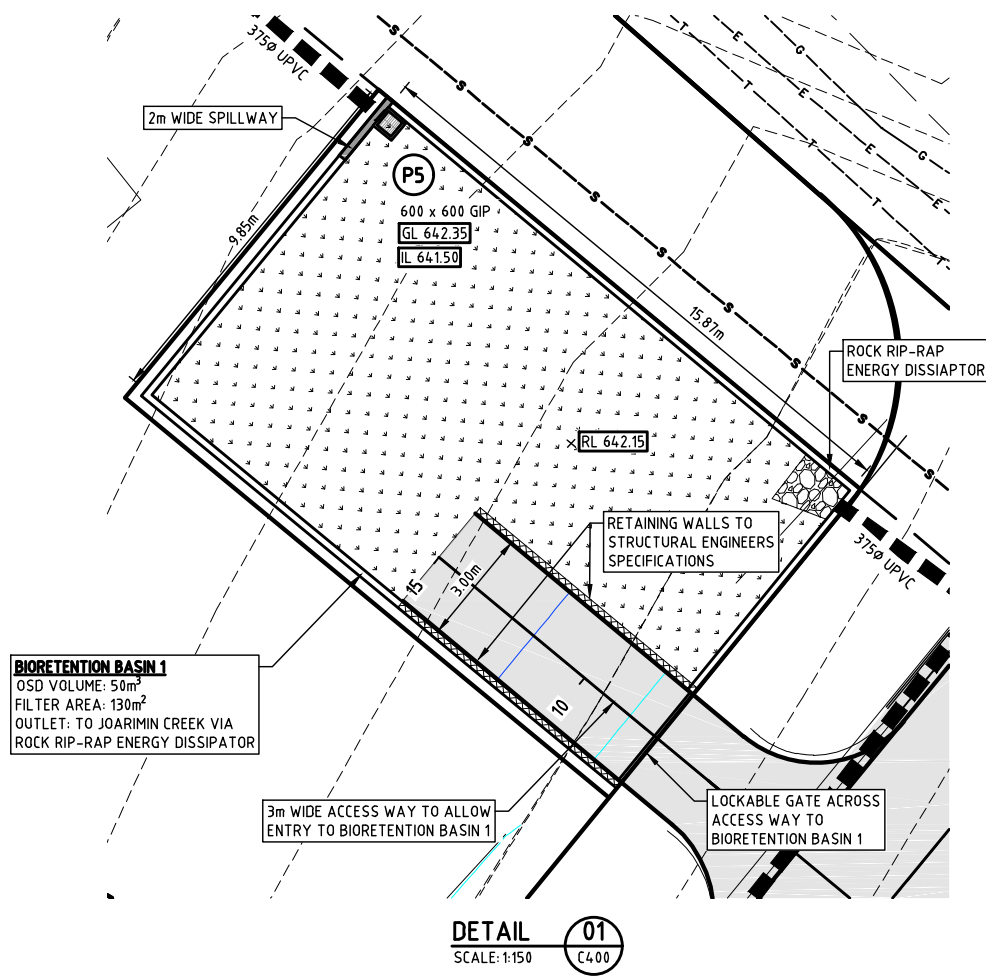
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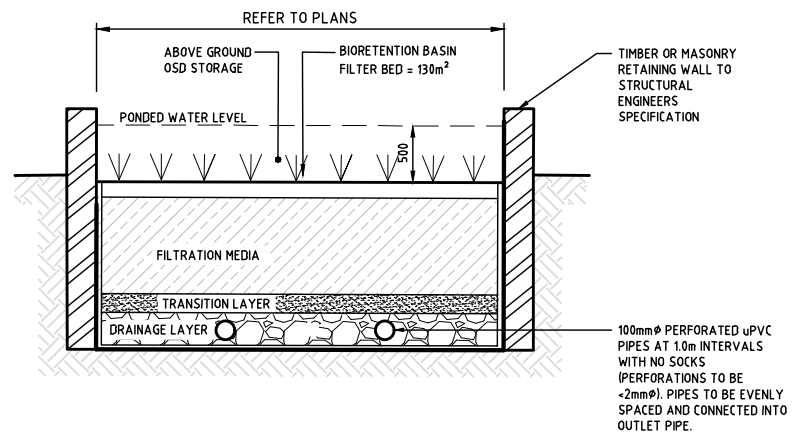
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CONCEPT STORMWATER DRAINAGE CATCHMENT PLAN & 'DRAINS' MODEL LAYOUT & RESULTS			
PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
23000043	P01	C401	00

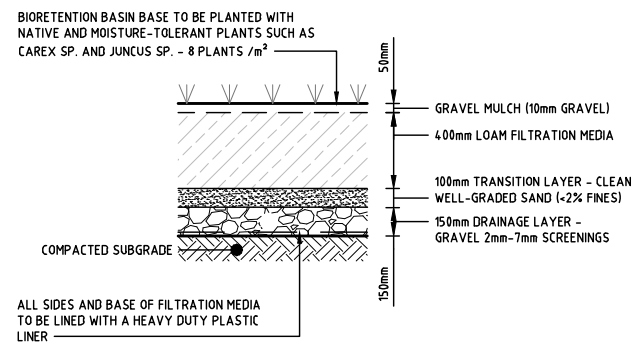
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TYPICAL CROSS SECTION THROUGH BIORETENTION BASIN 1 OUTLET
 NOTE: DETAIL IS NOT TO SCALE (INDICATIVE ONLY)



TYPICAL CROSS SECTION THROUGH BIORETENTION BASINS 1
 NOTE: DETAIL IS NOT TO SCALE (INDICATIVE ONLY)



BIORETENTION MEDIA DETAIL
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Media Specifications

The filtration media shall be well graded loamy sand with:

- Saturated hydraulic conductivity (ASTM F1815-06) approximately 100 mm/hour
- pH between 5.5 and 7.5
- Organic content less than 5 percent
- Electrical conductivity less than 1.2 ds/m
- Orthophosphate content less than 40 mg/kg
- Total nitrogen content <400 mg/kg

Subject to adequate hydraulic conductivity the following particle size distribution is a guide:

Clay and silt	< 3%	(<0.05 mm)
vVery fine sand	5-30%	(0.05 - 0.15 mm)
Fine sand	10-30%	(0.15 - 0.25 mm)
Med-coarse sand	40-60%	(0.25 - 1.0 mm)
Coarse sand	7-10%	(1.0 - 2.0 mm)
Fine gravel	<3%	(>2.0 mm)

The filtration media will be compacted with **one** pass of a vibratory plate compactor or drum roller.

The **transition layer** shall be clean, well-graded sand containing little or no clay and silt (<2%). d15 of the transition layer must be <5 x d85 of the filter zone.

The **submerged zone** is to consist of medium to coarse sand or fine gravel combined with carbon source (usually 5% by volume hardwood chips)

The **drainage layer** shall be 2-5 mm washed screenings with <2% silt and clay.

Plants such as carex and juncus must be planted at a density of 8 plants/m².

A once-off **initial amelioration** is required to provide an initial boost to plant growth. incorporate the constituents in table 1 into the top 100 mm of filter layer.

TABLE 1 - AMELIORANT RECIPE FOR TOP 100mm OF FILTER BED

Constituent	Quantity kg/100m ² filter area
Granulated poultry manure	50
Superphosphate	2
Magnesium sulphate	3
Potassium sulphate	2
Trace element mix	1
Fertilizer (16:4:14)	4
Lime	20

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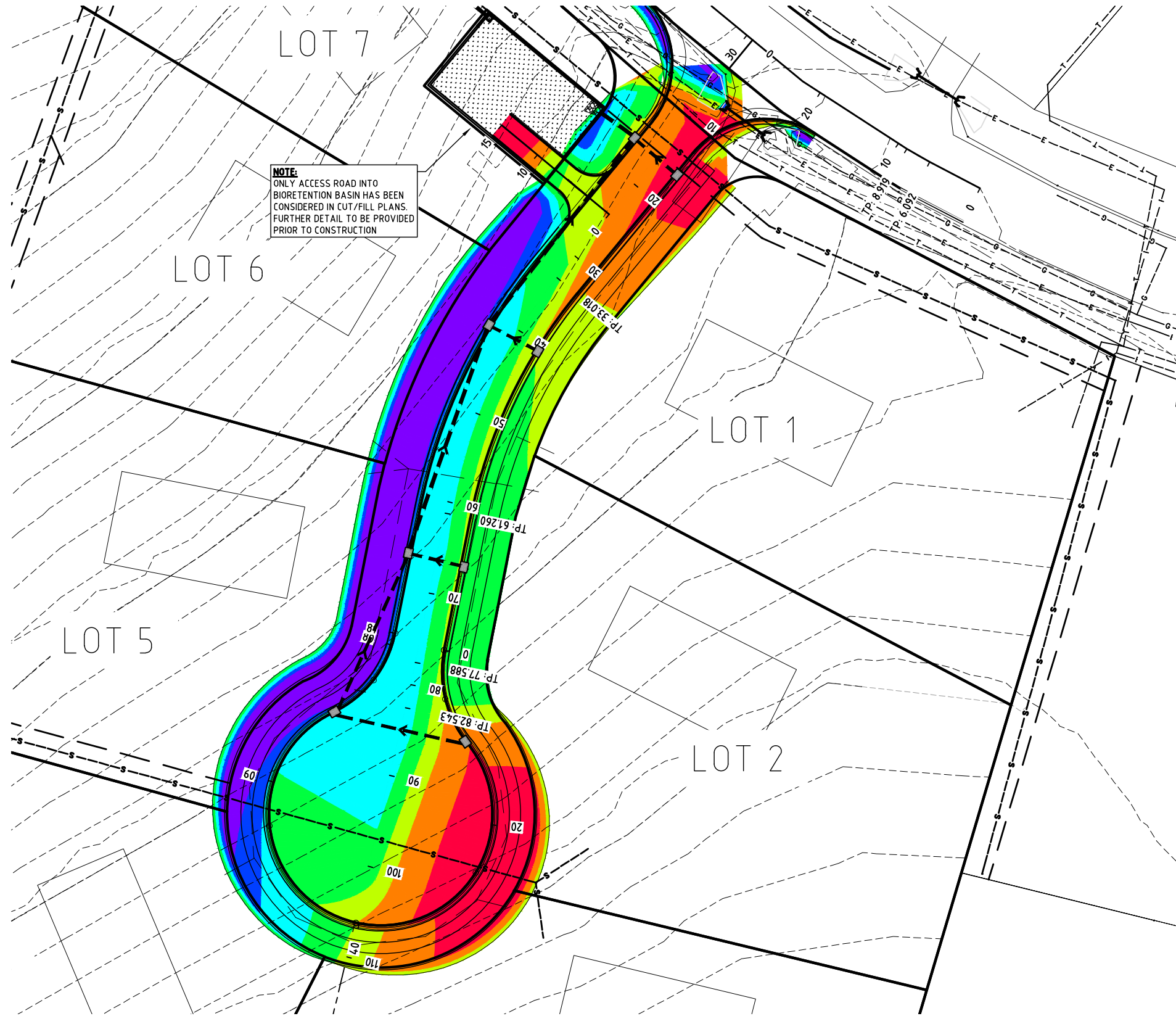
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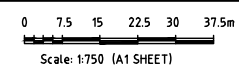
Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
CUT FILL	1.000	1.000	1348.480sq.m	38.326 Cu. M.	154.152 Cu. M.	115.826 Cu. M.<Fill>
Totals			1348.480sq.m	38.326 Cu. M.	154.152 Cu. M.	115.826 Cu. M.<Fill>



Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m ²)	Volume (m ³)
1	Red	-0.639	-0.300	270.6	28.1
2	Orange	-0.300	-0.100	323.0	85.7
3	Yellow	-0.100	0.000	282.7	71.6
4	Green	0.000	0.100	480.0	111.2
5	Cyan	0.100	0.200	401.6	63.2
6	Blue	0.200	0.300	116.8	41.0
7	Purple	0.300	0.600	348.2	40.8

CONCEPT CUT & FILL PLAN

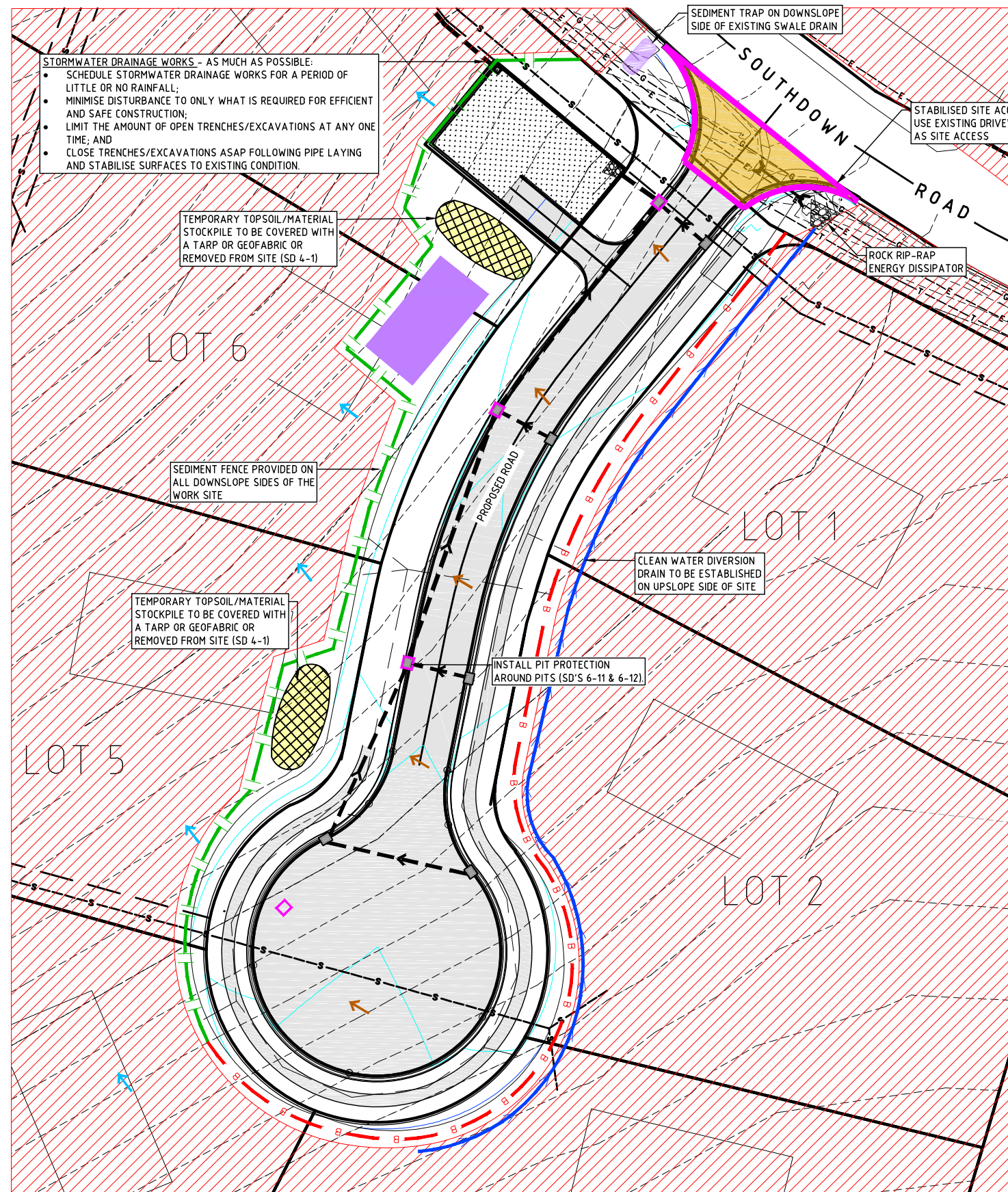


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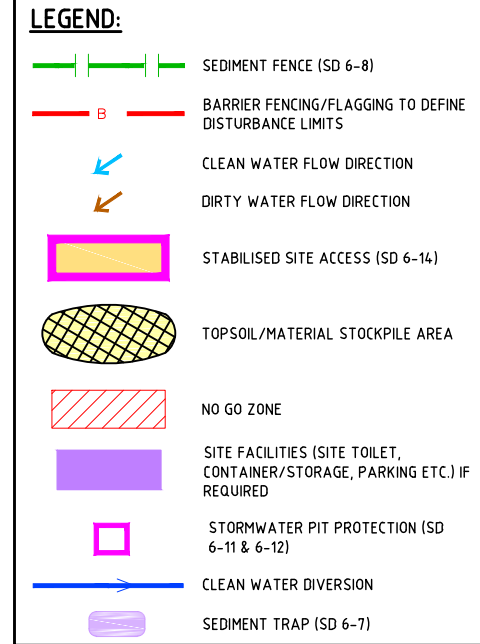
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CONCEPT SOIL & WATER MANAGEMENT PLAN

0 2.5 5 7.5 10 12.5m
SCALE: 1:250 (A1 SHEET)



BACKGROUND

EROSION AND SEDIMENT CONTROL DESIGN

THIS EROSION AND SEDIMENT CONTROL PLAN (ESCP) HAS BEEN PREPARED IN ACCORDANCE WITH BLUE BOOK VOLUME 1 (LANDCOM, 2004) AND PROJECT APPROVAL CONDITIONS.

THE SITE DISTURBANCE AREA IS ~2,500m² AND THEREFORE, DOES NOT TRIGGER THE REQUIREMENT FOR A SWMP AND A SEDIMENT BASIN ASSESSMENT. THEREFORE AN EROSION HAZARD ASSESSMENT HAS NOT BEEN CARRIED OUT FOR THIS SITE.

IMPLEMENTATION OF EROSION AND SEDIMENT CONTROLS

WORKS ARE TO BE STAGED IN THE FOLLOWING ORDER WITH THE RELEVANT EROSION AND SEDIMENT CONTROLS IMPLEMENTED PRIOR TO AND DURING EACH SECTION OF WORKS AS SPECIFIED.

BEFORE COMMENCEMENT OF CLEARING, TOPSOIL STRIPPING AND EARTHWORKS IN EACH AREA/SECTION OF WORKS, THE SITE IS TO BE SECURED AND THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES INSTALLED IN ORDER EXCEPT FOR ITEMS 7 TO 10 WHICH ARE TO BE UNDERTAKEN PROGRESSIVELY AS REQUIRED THROUGHOUT ALL STAGES OF WORKS. STRIPPING AND EARTHWORKS NECESSARY TO INSTALL THE EROSION AND SEDIMENT CONTROLS ARE PERMITTED BUT MUST BE KEPT TO AN ABSOLUTE MINIMUM:

- EXISTING SITE FENCING (OR ALTERNATIVE MEASURES) SHOULD BE MAINTAINED IN PLACE AROUND THE EDGE OF THE CONSTRUCTION BOUNDARY TO RESTRICT ACCESS AND BARRIER FENCING INSTALLED IN ANY ADDITIONAL LOCATIONS AS REQUIRED TO MINIMISE UNNECESSARY DISTURBANCE.
- ESTABLISH STABILISED SITE ENTRY/EXIT POINTS (MAINTAIN EXISTING GRAVEL DRIVEWAY IN A STABLE CONDITION OR PROVIDE AS STANDARD DRAWING SD 6-14 ON C702) IN THE LOCATION SHOWN AND ANYWHERE WHERE CONSTRUCTION VEHICLES EXIT A WORK AREA ONTO A PUBLIC ROAD.
- ESTABLISH A TEMPORARY SITE FACILITIES (E.G. TOILET AND PARKING AREA).
- INSTALL SEDIMENT FENCING IN THE LOCATIONS SHOWN AND FOLLOWING STANDARD DRAWING SD 6-8 ON C701. ENSURE RETURNS ARE INSTALLED AT MAX. 20M INTERVALS.
- A STOCKPILE AREA IS TO BE ESTABLISHED IN THE LOCATION AS SHOWN OR AS SPECIFIED BY THE SITE MANAGER AND IN ACCORDANCE WITH STANDARD DRAWING SD 4-1 ON C701.
- ONCE ALL OF THE ABOVE MEASURES ARE COMPLETE AND STABLE, TOPSOIL STRIPPING CAN COMMENCE AND CONSTRUCTION WORKS CAN PROCEED IN ACCORDANCE WITH THE ENGINEERING PLANS.

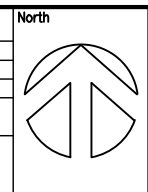
ONCE WORKS HAVE COMMENCED, PROGRESSIVELY UNDERTAKE THE FOLLOWING AT ALL TIMES AS REQUIRED:

- DUST SUPPRESSION TO BE CARRIED OUT AS REQUIRED TO MINIMISE THE RISK OF DUST RISE.
- IF DE-WATERING OF EXCAVATIONS/TRENCHES IS REQUIRED, THE BELOW WATER QUALITY TARGETS MUST BE ACHIEVED:
 - <50 mg/L TSS (TOTAL SUSPENDED SOLIDS)
 - PH 6.6 - 8.5; AND
 - <10 mg/L OIL AND GREASE AND NO VISIBLE TRACE.
- MONITORING, MAINTENANCE AND INSPECTIONS ARE TO BE CARRIED OUT REGULARLY BY THE SITE ENVIRONMENT MANAGER (OR THEIR REPRESENTATIVE):
 - AT LEAST WEEKLY DURING NORMAL CONSTRUCTION HOURS; AND
 - PRIOR TO FORECAST RAINFALL (SEE ABOVE); AND
 - DAILY DURING RAIN EVENTS (IF SAFE TO DO SO); AND
 - WITHIN 24 HOURS OF THE CESSATION OF A RAIN EVENT THAT CAUSES RUNOFF.
- UNDERTAKE PROGRESSIVE STABILISATION OF LANDS AS FINAL EARTHWORKS ARE COMPLETE IN EACH AREA (RATHER THAN WAITING UNTIL THE COMPLETION OF WORKS). FINAL STABILISATION IS TO BE ACHIEVED WITH:
 - TOPSOIL (MIN. 75mm THICK), SEED AND A BIODEGRADABLE SOIL POLYMER; OR
 - TOPSOIL (MIN. 75mm THICK) AND TURF; OR
 - TOPSOIL (MIN. 75mm THICK) AND HYDROMULCH.
 (REFER TO STANDARD DRAWINGS 4-2 AND 7-1 ON C701 & C702 RESPECTIVELY FOR TOPSOIL REPLACEMENT AND SEEDBED PREPARATION RESPECTIVELY)



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DRAWN BY	R.B.
FINAL APPROVAL	J.A.
SCALE:	1:250
(on A1 Original)	
DA	



CLIENT
**KEITH ALLEN
LATERALS PLANNING**

Suites 7 & 8, 68-70 Station Street
PO Box 1098, Bowral NSW 2576.
(t) 02 4862 1633
(f) 02 4862 3088
email: reception@seec.com.au
WWW.SEEC.COM.AU

PROJECT TITLE
**PROPOSED RESIDENTIAL SUBDIVISION
LOT 11 DP1271846
3 SOUTHDOWN RD,
MARULAN NSW**

DRAWING TITLE			
CONCEPT SOIL & WATER MANAGEMENT SITE ARRANGEMENT			
PROJECT NO.	SUB-PR NO.	DRAWING NO.	REV
23000043	P01	C700	00

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Construction Notes

- Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
- Construct on the contour as low, flat, elongated mounds.
- Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
- Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
- Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES SD 4-1

Construction Notes

- Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardsetting surfaces and to provide a good bond between the respread material and subsoil.
- Add soil ameliorants as required by the ESCP or SWMP.
- Rip to a depth of 300 mm if compacted layers occur.
- Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

REPLACING TOPSOIL SD 4-2

Construction Notes

- Compact the subgrade fill to the density of the surrounding undisturbed material.
- Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
- Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
- Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
- Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.

ENERGY DISSIPATER SD 5-8

Construction Notes

- Construct the straw bale filter as close as possible to being parallel to the contours of the site.
- Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.
- Ensure that the maximum height of the filter is one bale.
- Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.
- Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
- Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.

STRAW BALE FILTER SD 6-7

Construction Notes

- Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
- Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
- Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
- Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
- Join sections of fabric at a support post with a 150-mm overlap.
- Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE SD 6-8

Construction Notes

- Install this type of sediment fence when use of support posts is not desirable or not possible. Such conditions might apply, for example, where approval is granted from the appropriate authorities to place these fences in highly sensitive estuarine areas.
- Use bent trench mesh to support the F82 welded mesh facing as shown on the drawing above. Attach the geotextile to the welded mesh facing using UV resistant cable ties.
- Stabilise the whole structure with sandbag or rock anchoring over the trench mesh and the leading edge of the geotextile. The anchoring should be sufficiently large to ensure stability of the structure in the design storm event, usually the 10 year event.

ALTERNATIVE SEDIMENT FENCE SD 6-9

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North

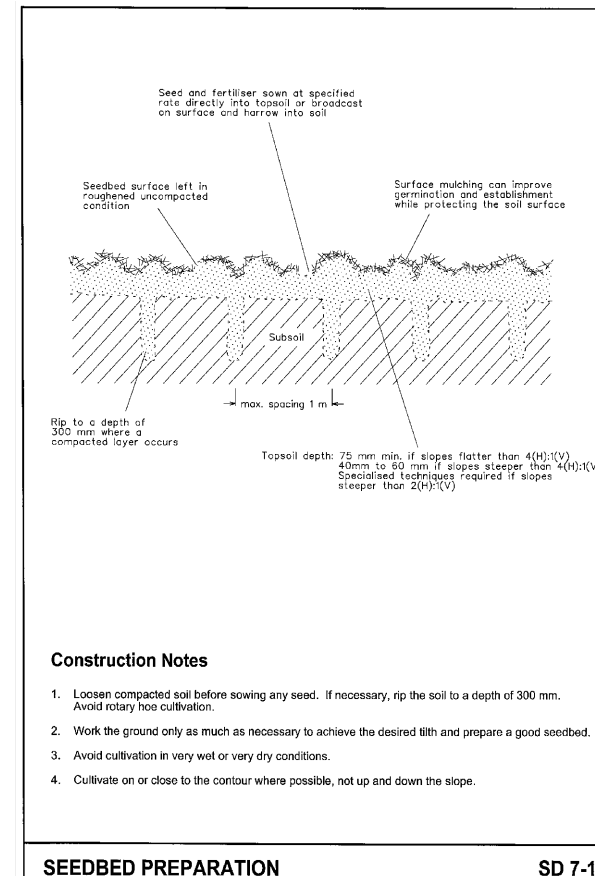
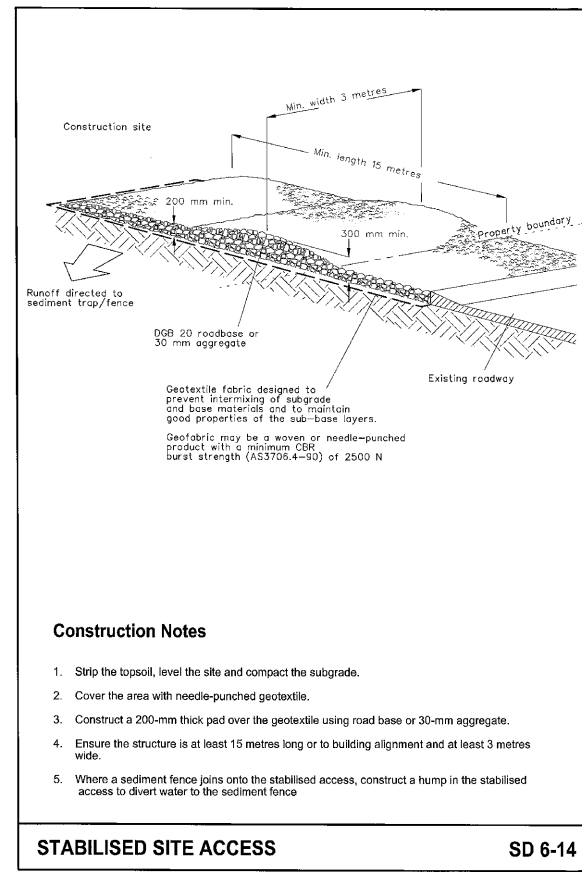
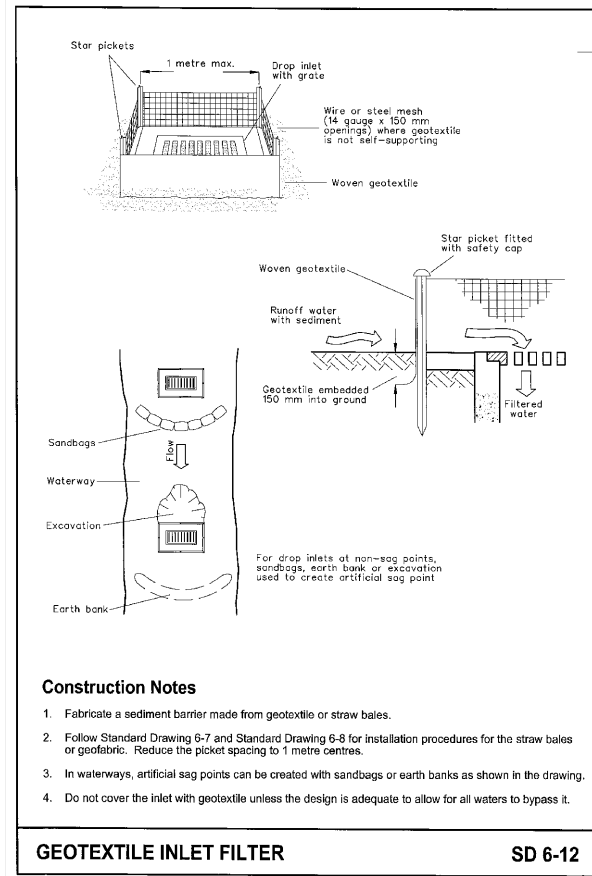
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**KEITH ALLEN
LATERALS PLANNING**

Suites 7 & 8, 68-70 Station Street
PO Box 1098, Bowral NSW 2576.
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(f) 02 4862 3088
email: reception@seec.com.au
WWW.SEEC.COM.AU

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