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Reference: DC14139_01-SWM-L01

2nd March 2016

Tim Shiu
Joshua Farkash & Associates
Level 4, 432 Kent Street
SYDNEY, NSW 2000

Dear Tim,

**RESIDENTIAL DEVELOPMENT – 15 RYNAN AVENUE, EDMONDSON PARK
(EAST)
CONCEPT STORMWATER DRAINAGE STRATEGY**

Diversi Consulting has been engaged to prepare a Concept Stormwater Drainage Strategy for the proposed residential subdivision located at No. 15 Rynan Avenue, Edmondson Park.

Following is a summary of the concept stormwater drainage design including the sizing of the street drainage system.

This should be read in conjunction with the Civil Engineering Works Drawings 14139-DA01 to DA07 and the Statement of Environmental Effects accompanying the Development Application submission requirements.

This assessment has been developed in accordance with Liverpool City Council's requirements for the purposes of describing the analysis undertaken and to explain the concept behind the proposed stormwater drainage infrastructure.

If you have any questions or require any clarifications please call me on 0421 484 152 or (02) 8883 1113.

Yours faithfully

Diversi Consulting

A handwritten signature in blue ink, appearing to read "P. Diversi", with a horizontal line extending to the right.

Phil Diversi
Director

1 BACKGROUND INFORMATION

1.1 Site

The subject development area is located in the suburb of Edmondson Park within the Liverpool City Council Local Government Area (LGA). The site is bounded by Rynan Avenue to the East and adjoins rural and residential properties along all other boundaries. **Figure 1** below shows the location and boundary of the proposed site.

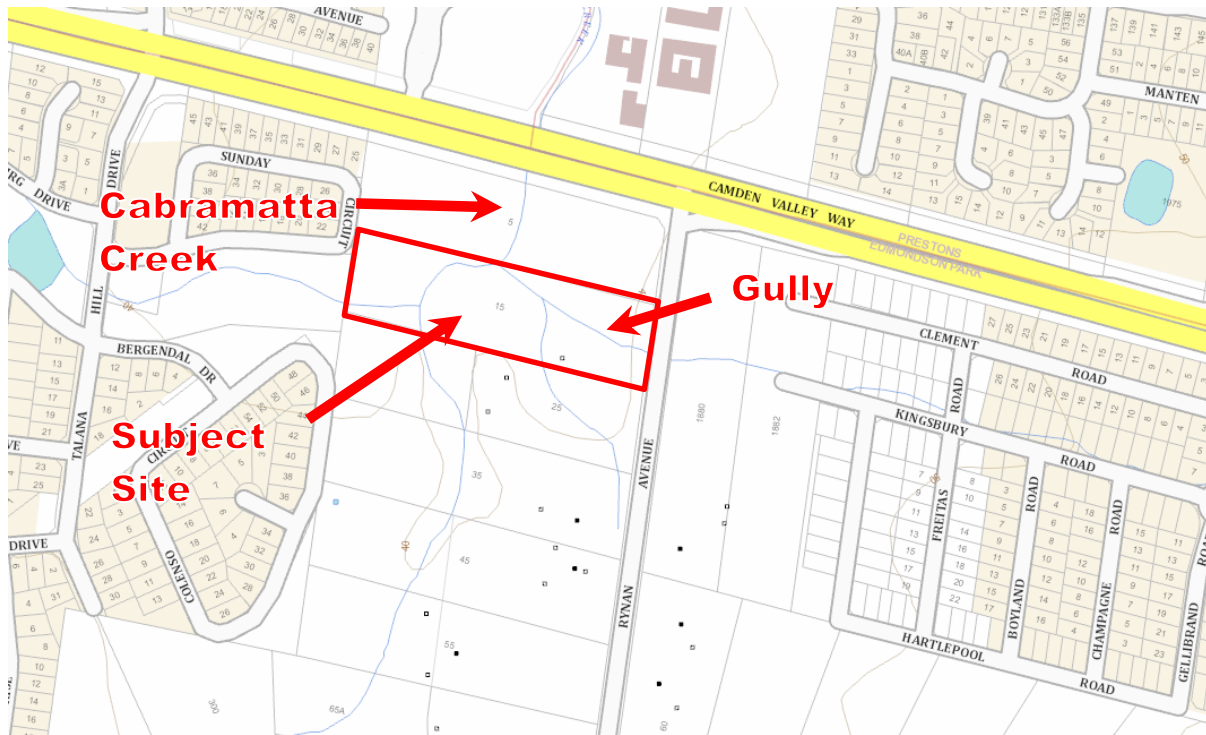


Figure 1: Locality Plan (NSW SIX maps 2015)

Cabramatta Creek traverses the site draining generally in a northerly direction almost through the centre of the lot, as indicated by the blue line in Figure 1. There is also a gully draining a significant catchment to the East of the site to Cabramatta Creek as shown in Figure 1 above.

Slopes across the site vary between 1-4%, with a total lot area of approximately 2.02ha. This proposal is for the development of the eastern portion of the lot only (east of Cabramatta Creek) which has a total site area of approximately 1.09ha.

1.2 Proposed Development

The proposed development is for a residential subdivision creating 2 lots and 3 apartment buildings with associated roadways and basement parking. Part of the proposed buildings connect to the building proposed at No. 5 Rynan Avenue. The rear portion of the site (closest to the Creek) is to remain undeveloped as part of this proposal. The rear portion of the site will in future include two (2) raingardens in accordance with Liverpool Council's S.94 Contributions plan. The total developed site area is approximately 6300m².

1.3 Pre-Lodgement Application Advice

A pre-lodgement meeting (reference No. PL-124/2015) was held with Council on the 18th November 2015 to discuss requirements for the proposed development at 5 and 15 Rynan Avenue.

The following list below summarises the Pre-Lodgement application advice relating to stormwater drainage for the site, along with any further conversations with Council regarding these items;

Stormwater

- Stormwater drainage for the site must be in accordance with Council's Development Control Plan.
- A stormwater concept plan shall be submitted with the application.
- The stormwater concept plan shall be accompanied by a supporting report and calculations.
- On-site detention is required to be provided for the site.
- The on-site detention system must be within common property and accessible from the street without going through dwellings or private courtyards.
- A water quality treatment device shall be provided in accordance with Council's Development Control Plan.

Further discussions have occurred with Councils Engineers to clarify the requirements around OSD and WSUD for the site. In discussions with Liverpool Councils Coordinator Land Development Charlie Caraballo it has been confirmed that;

1. OSD is not required for the site, and
2. Temporary WSUD measures are required for the site i.e. bio-basin and/or GPT sized using MUSIC or alternatively construct the permanent bio-retention basin as works in kind and offset the losses against Section 94 contributions for the project.

2 STORMWATER DRAINAGE CONCEPT DESIGN

2.1 General

The concept stormwater management strategy for the site has been driven by a number of requirements and guidelines provided by Council. These guidelines have been utilised in conjunction with industry best practice to develop the proposed concept stormwater management strategy.

WSUD treatment measures for the site have not been included in this report. It is envisaged that the proposed sediment basin will be utilised for a bio-retention basin, to be designed during the CC stage. The key elements in undertaking the concept drainage design for the site comprises;

- Drainage modelling of the overland flow path along Rynan Ave and Road 1, and
- Pipe drainage analysis and pipe sizing.

2.2 Existing Drainage

Rynan Avenue is predominately a rural road with table drains along both sides of the road. There is a crest near No. 35 Rynan Avenue resulting in some waters draining north towards Camden Valley Way and the remainder of waters draining south towards Jardine Drive. As previously mentioned, there is an existing gully draining a significant upstream catchment through the site (as shown by the blue line in Figure 1). This gully is approximately in line with the proposed roadway as per the Edmondson Park DCP road network plan that connects Kingsbury Road to Rynan Avenue and continues west through No. 15 Rynan Avenue towards Cabramatta Creek.

A schematic of the Edmondson Park DCP road network system is provided in **Attachment A**. It is envisaged that the main trunk drainage line to facilitate future development of Edmondson Park will be along this roadway following the existing gully. In order to ensure this catchment drains along Road 1 a low point has been created at the intersection of Rynan Avenue. Please refer to the road design plans contained within **Attachment B**. Further information on the proposed drainage strategy and overland flow path is provided in following sections.

2.3 Contributing Catchment

A combination of orthophoto map imagery, site inspection and detailed ground survey prepared was used to determine the catchment areas for the stormwater drainage design. Approximately half of Rynan Avenue drains in a northerly direction towards Camden Valley Way, with the crest occurring between No. 35 and 45 Rynan Avenue.

There is a significant catchment area to the east of the site that drains towards Cabramatta Creek, extending some 650m east of the site past Gellibrand Road, with a total catchment in the order of 15.93ha. A majority of this upstream catchment (11.5ha) drains to an existing gully that passes under No. 15 Rynan Avenue. This has been accommodated for within Road 1 in the 15.2m road reserve. Further detail is provided in later sections of this report.

The remaining part of the upstream catchment (4.43ha) either drains directly to Camden Valley Way to the RMS road drainage system, or to an informal overland flow path that drains down

the laneway of No. 5 Ryman Avenue. Please refer to **Attachment C** for the external catchment plan.

2.4 Peak Runoff Rates

The peak 5yr ARI and 100yr ARI discharge rates have been determined to assess the overland flow within Ryman Avenue, Road 1 and to appropriately size the piped drainage system for the site by using Rational method calculations. Runoff coefficients have been adopted directly from Liverpool Council's Drainage Handbook, based on an 85% impervious fraction to reflect the future residential use.

A detailed hydraulic assessment of the proposed piped drainage system to Ryman Avenue and the proposed development site will be undertaken with the detailed design (CC) phase.

Calculations to determine the peak ARI flows from the adjacent upstream catchment and the site are provided below. In accordance with Liverpool Councils requirements the minor ARI event for the piped drainage system is 5 years. The overland flow within Ryman Avenue and Road 1 has therefore been adopted as the 100yr flow less the 5yr flows.

Rational Calc for 100yr ARI flow

From the upstream catchment

Area (ha)	11.5
Coefficient	0.98
Tc (min)	20
I (mm/hr)	122.41

$$Q = CIA = 3.83 \text{ (m}^3\text{/s)}$$

From the site

Area (ha)	1.09
Coefficient	0.98
Tc (min)	6
I (mm/hr)	207.11

$$Q = CIA = 0.61 \text{ (m}^3\text{/s)}$$

Rational Calc for 5yr ARI flow

From the upstream catchment

Area (ha)	11.5
Coefficient	0.78
Tc (min)	20
I (mm/hr)	69.94

$$Q = CIA = 1.74 \text{ (m}^3\text{/s)}$$

From the site

Area (ha)	1.09
Coefficient	0.78
Tc (min)	6
I (mm/hr)	117.9

$$Q = CIA = 0.28 \text{ (m}^3\text{/s)}$$

The resulting overland flow approaching the intersection of Road 1 and Ryman Ave is therefore $3.83 - 1.74 = 2.09 \text{ m}^3\text{/s}$. The overland flow in Road 1 (conservatively) is $2.09 + (0.61 - 0.28) = 2.42 \text{ m}^3\text{/s}$.

2.5 Overland Flow Route

As detailed on the engineering plans contained within **Attachment B**, a sag point in Ryman Avenue adjacent to the intersection with Road 1 is proposed to ensure runoff from the upstream catchment drainage along the main trunk drainage line. This will ensure that the overland flows that currently traverse Ryman Avenue and drain either directly towards Cabramatta Creek or to Camden Valley Way will only drain to Cabramatta creek via Road 1. The capacity of the sag in Ryman Ave to cater for the overland flow of $2.09 \text{ m}^3\text{/s}$ as undertaken using Mannings Formula. Figure 2 below shows the resultant water level and road profile along the center line.

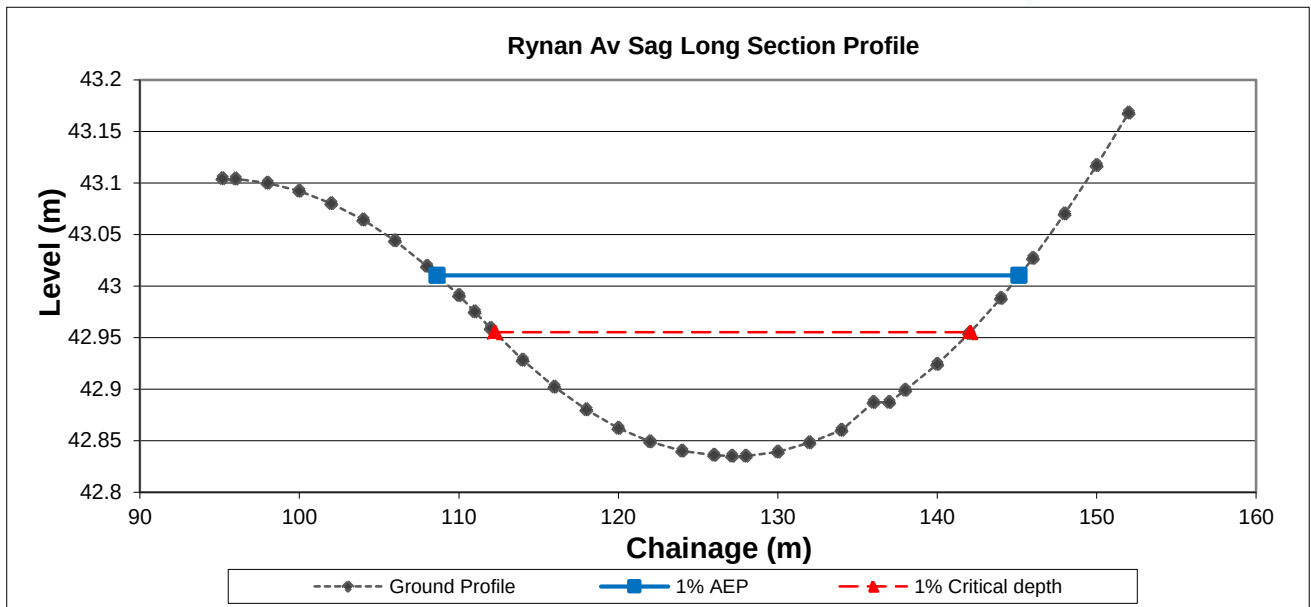


Figure 2: Rynan Ave sag profile and water level

Figure 2 above shows the proposed sag in Rynan Avenue has the capacity to cater for the overland flow, with a maximum depth of water of 175mm. This depth allows for approximately 90mm to the crest at chainage 95. The velocity is 0.5m/s with a corresponding Vd of 0.09.

A calculation of the capacity of Road 1 to cater for the overland flow of 2.42 m³/s was also undertaken using Mannings Formula. Figure 3 below shows the resultant water level and road cross section profile for Road 1.

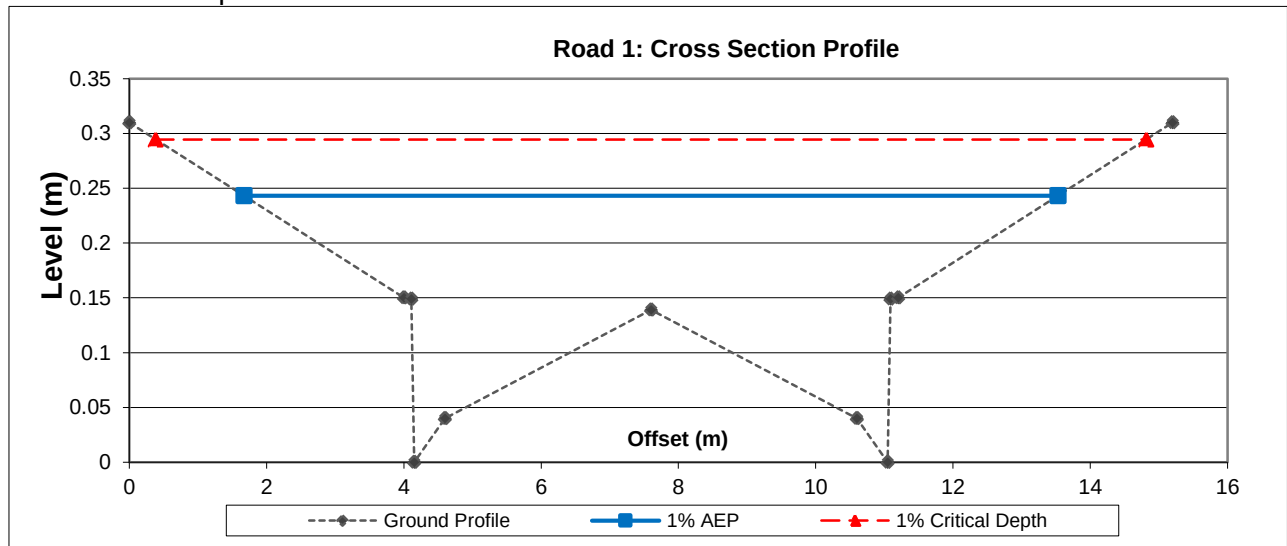


Figure 3: Road 1 Cross section profile and water level

This calculation indicates that Road 1 has the capacity to cater for the overland flow, with a maximum depth of **243mm** in the gutter, a velocity of 1.76m/s and Vd product of 0.43. As the depth of water and Vd product exceeds Councils limits the pipe system may need to be upgraded to cater for a larger ARI event. Detailed hydraulic analysis of the pipe system will be undertaken during CC design. The ground levels for the proposed buildings will be a minimum 300mm above boundary. The 100yr ARI flows will therefore be catered for within the proposed roadways.

3 CONCLUSION

This report is submitted for Council's review and approval and should be read in conjunction with the engineering plans submitted for the Development Application for the proposed development.

Based on the proposed stormwater drainage design shown in Engineering Plans 14139-DA01 to DA07 we summarise the following:

- The piped drainage system through the site is to be designed for the 5yr ARI event;
- The proposed local access road (Road 1) has sufficient capacity to convey the resulting overland flows in the 100yr storm event; and
- External catchments to the site will be catered for via Road 1 and the proposed sag in Rynan Avenue.

It is therefore concluded that the drainage design for the site addressed Councils requirements.

ATTACHMENT A: DCP Road Network Map



Edmondson Park DCP 2.11 Street network

ATTACHMENT B: Concept Engineering Plans

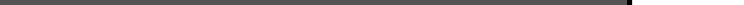
15 RYNAN AVENUE EDMONDSON PARK

CIVIL ENGINEERING WORKS DRAWINGS

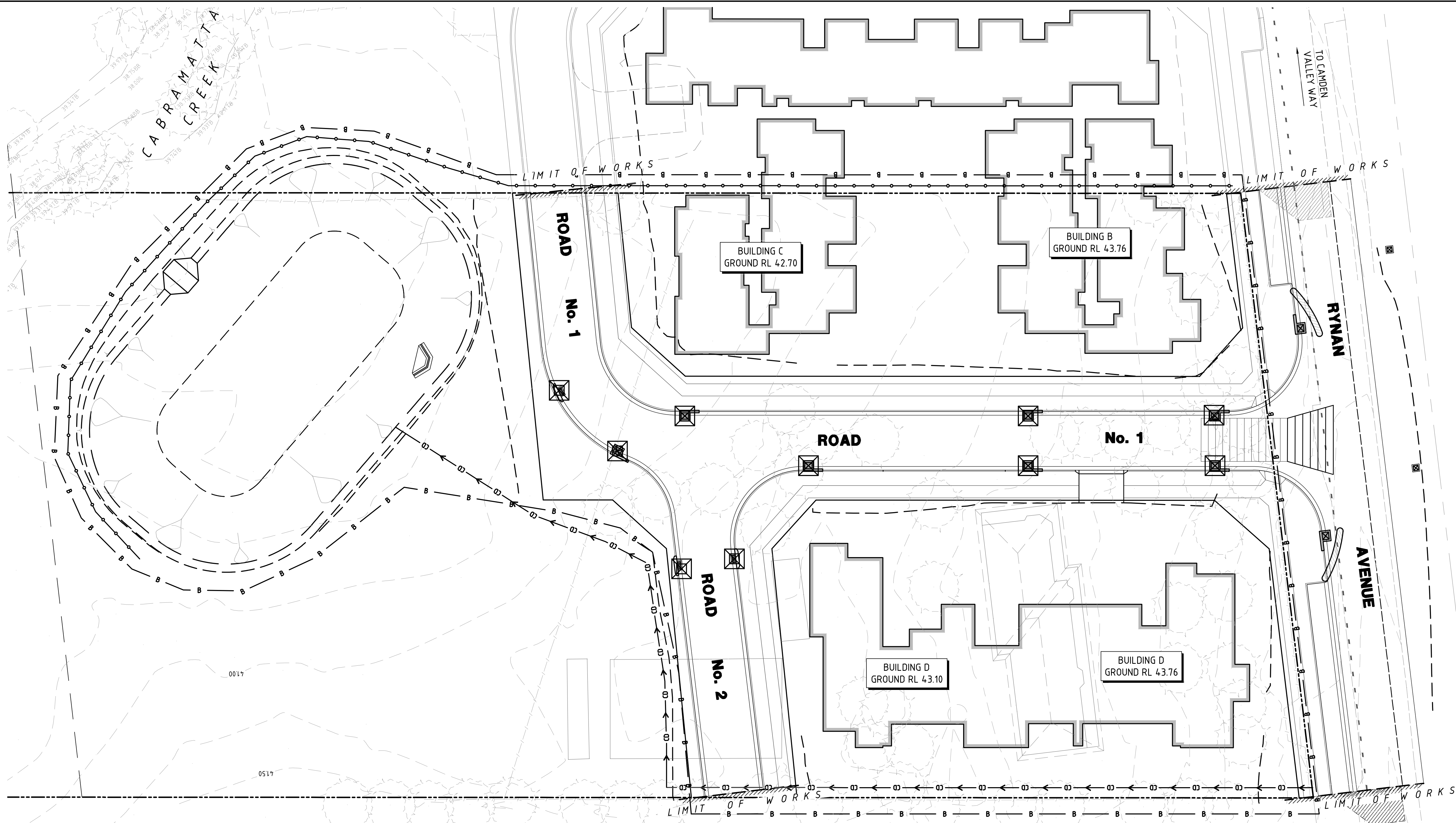
APRIL 2016



DRAWING No.	REV.	DRAWING TITLE
14139-DA01	C	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
14139-DA02	C	EROSION AND SEDIMENT CONTROL PLAN
14139-DA03	A	EROSION AND SEDIMENT CONTROL DETAILS
14139-DA04	C	BULK EARTHWORKS PLAN
14139-DA05	C	ROADWORKS AND DRAINAGE PLAN
14139-DA06	B	ROAD LONGITUDINAL SECTIONS
14139-DA07	B	ROAD TYPICAL SECTIONS
14139-DA08	B	SEDIMENT BASIN / BIO BASIN DETAILS

	NOT FOR CONSTRUCTION   DRAWING DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE	DESIGNED DT	DATE 2/03/2016	Suite 103, 29-31 Solent Ct Baulkham Hills, NSW 2153 P 02 9883 1113 F 02 9659 1800 E mail@diversi.com.au W www.diversi.com.au		PROJECT: 15 RYMAN AVENUE, EDMONDSON PARK PROPOSED RESIDENTIAL SUBDIVISION
		CHECKED BB	DATE 2/03/2016			TITLE: COVER SHEET, DRAWING LIST AND LOCALITY PLAN
		APPROVED PGD	DATE 2/03/2016			PROJ No.: 14139
		SCALE NTS	CLIENT: KMT Pty Ltd	DRG No.: DA01		Rev: C

03 PROJECTS2014113515 RYAN AVENUE EDMONDSON PARK DRAFTING14139-DA02
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EROSION AND SEDIMENT CONTROLS

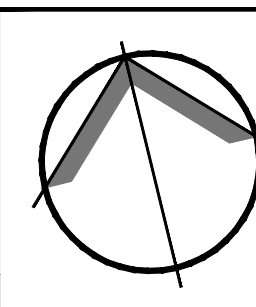
- ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH THESE DOCUMENTS AND
 - LOCAL AUTHORITY REQUIREMENTS
 - EPA REQUIREMENTS
 - NSW DEPARTMENT OF HOUSING MANUAL 'MANAGING URBAN STORM WATER, SOILS AND CONSTRUCTION', 4TH EDITION, MARCH 2004.
- MAINTAIN THE EROSION CONTROL DEVICES INDICATED TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
- WHEN STORM WATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SILT FENCES ARE ERECTED AROUND THE PITS.
- CONTRACTOR IS TO ENSURE ALL EROSION AND SEDIMENTATION CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFICIENTLY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.
- CONTRACTOR TO PROVIDE 300mm WIDE TURF STRIPED BEHIND ALL KERBS
- GRAVEL SAUSAGES TO BE PROVIDED AT 5m CENTRES.

LEGEND:

- SILT FENCE
- BARRIER FENCING
- CATCH DRAIN
- TRAFFIC ROUTE
- STABILISED SITE ACCESS
- ROCK PROTECTION
- INLET SEDIMENT BARRIER (ISB)
- GRAVEL SAUSAGE (GS)

0 10 20 30 40 50 60 70 80 90 100

REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD	REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD
C	5/04/2016	ISSUED FOR DA APPROVAL		DT	PGD				
B	1/04/2016	BASIN AMENDED		DT	BB				
A	2/03/2016	ISSUED FOR DA APPROVAL		DT	PGD				



NOT FOR CONSTRUCTION

Scale: 1:250

0 2.5 5 10 15m

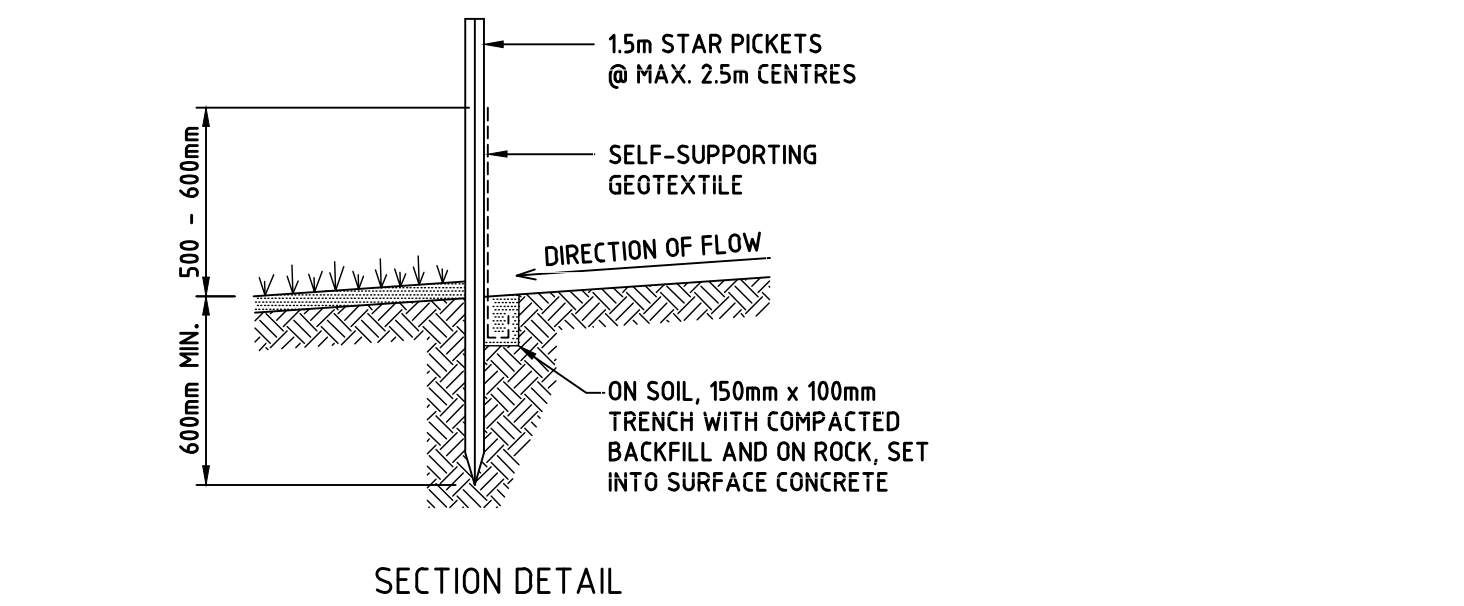
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DESIGNED	DT	DATE	2/03/2016
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APPROVED	PGD	DATE	2/03/2016
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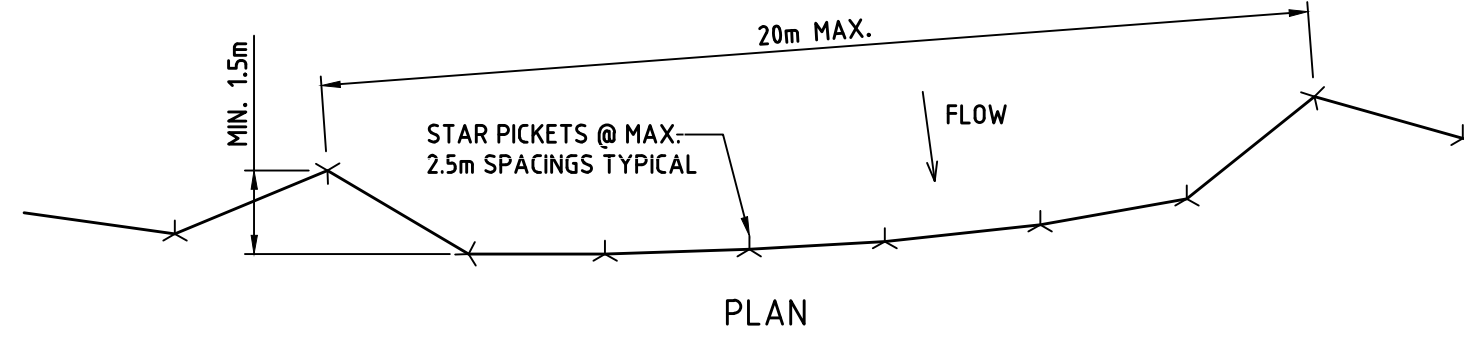
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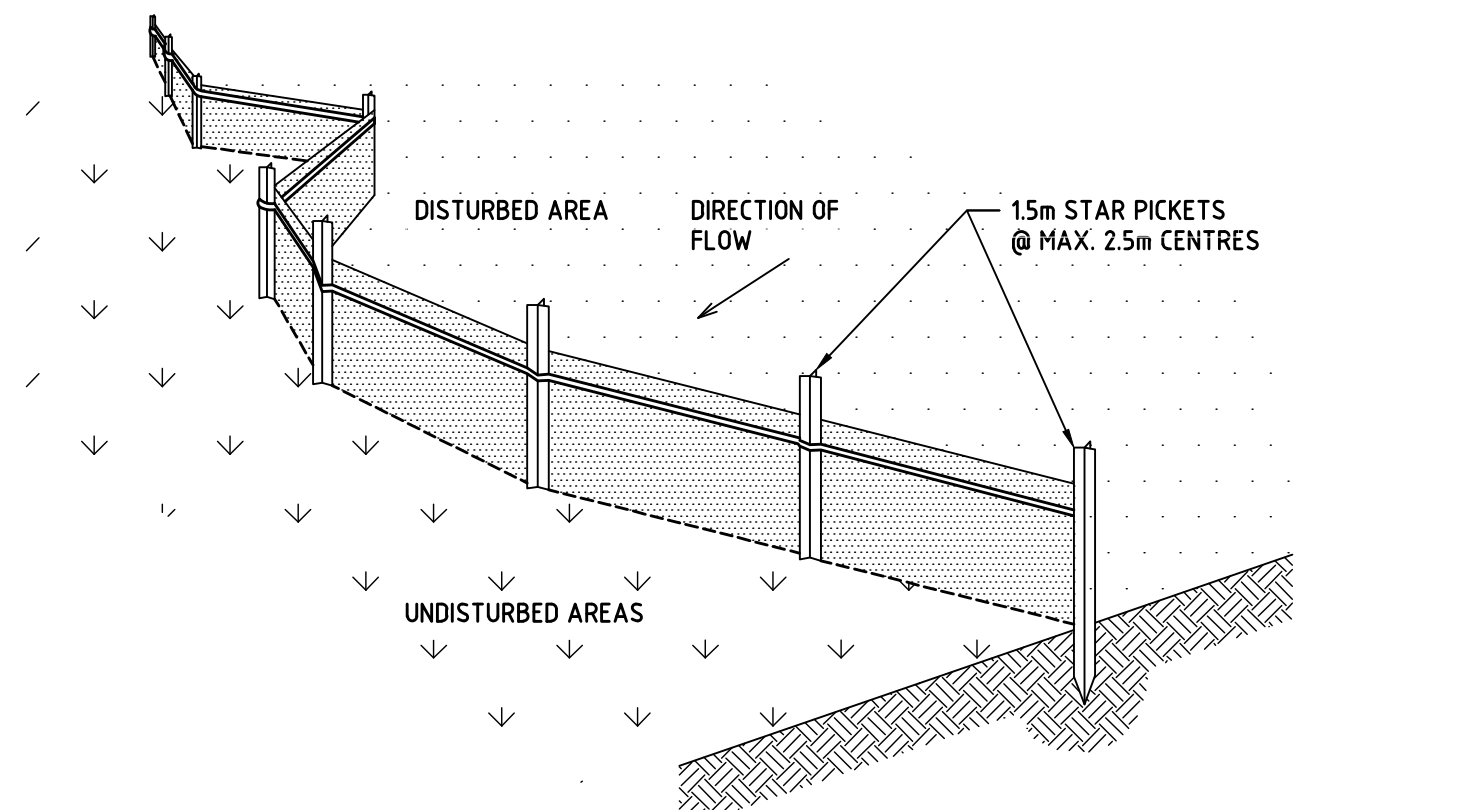
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TITLE:	EROSION AND SEDIMENT CONTROL PLAN		
PROJ No:	14139	DRG No:	DA02
Rev:	C		



SECTION DETAIL



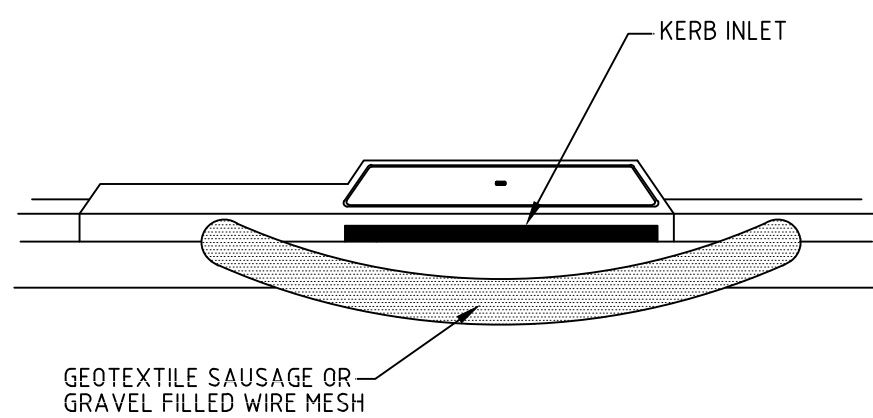
PLAN



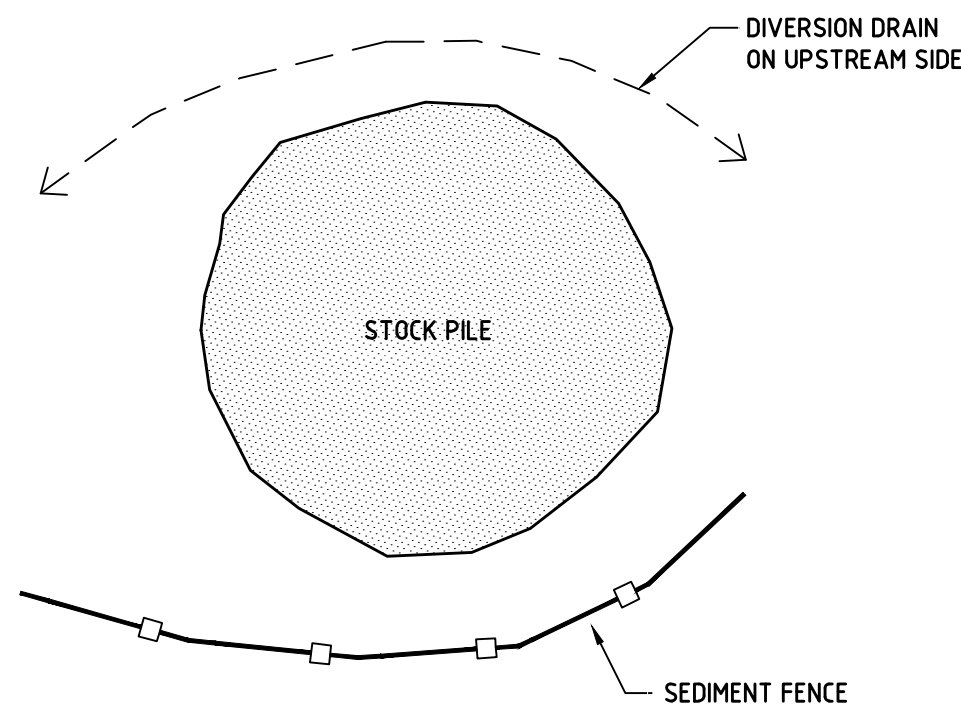
SEDIMENT FENCE (SF)
SCALE N.T.S.

SEDIMENT FENCE CONSTRUCTION NOTES:

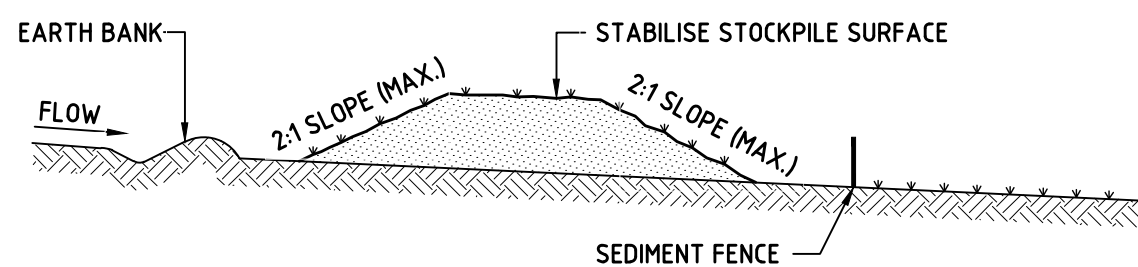
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. 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.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



GRAVEL SAUSAGE (GS)
SCALE N.T.S.



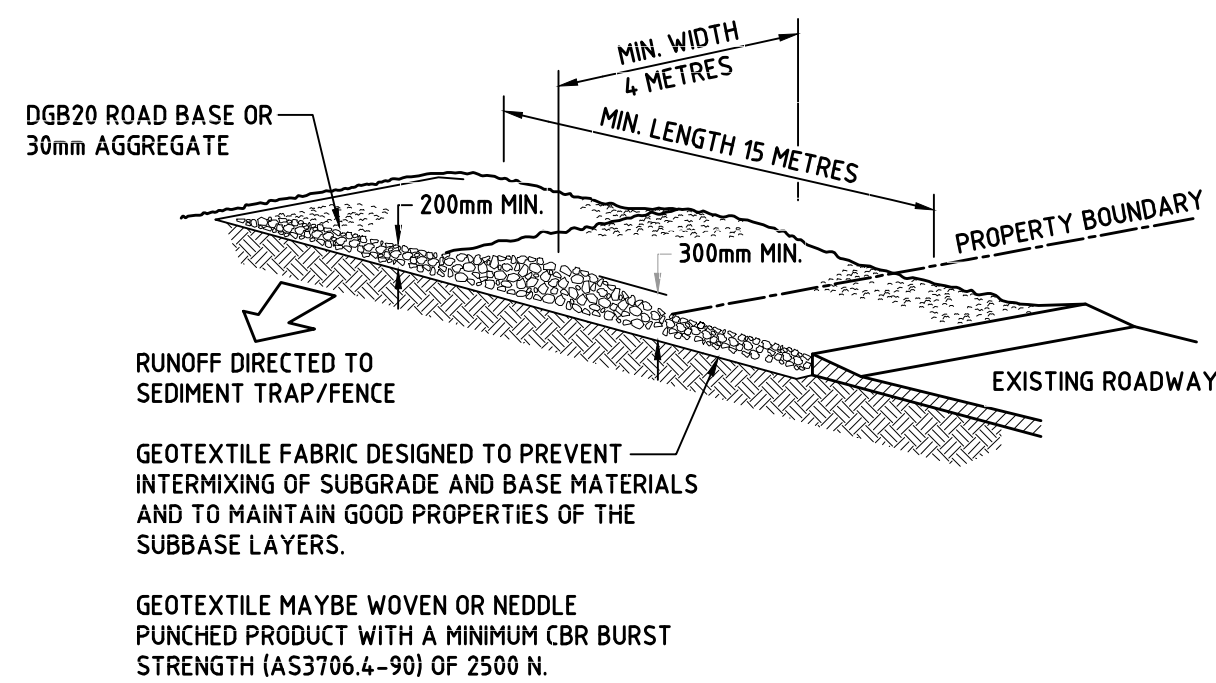
STOCKPILE PLAN
SCALE N.T.S.



STOCKPILE SECTION
SCALE N.T.S.

STOCKPILE CONSTRUCTION NOTES:

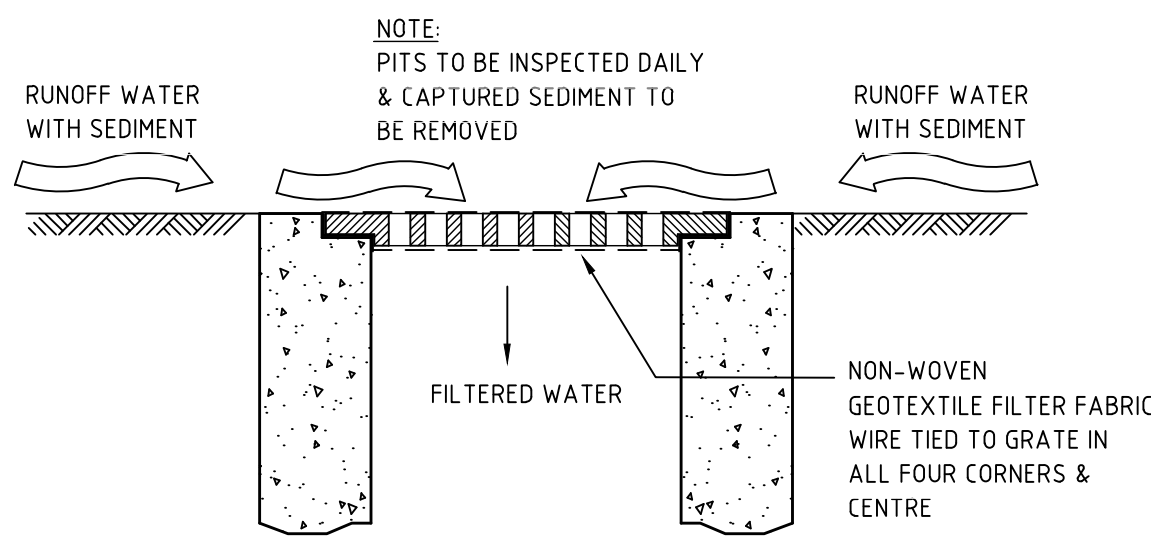
1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.



STABILISED SITE ACCESS CONSTRUCTION NOTES:

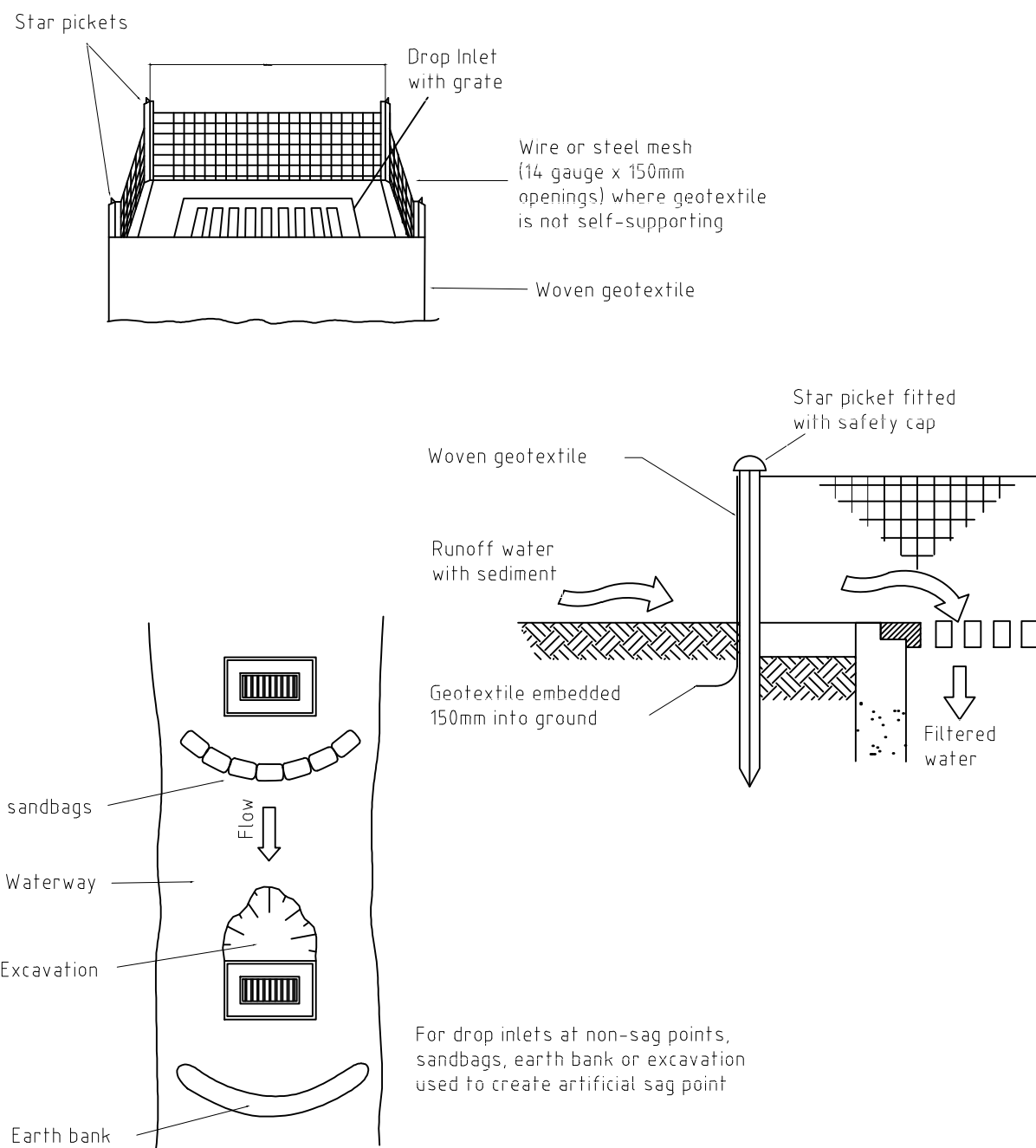
1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE - PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO SEDIMENT FENCE.

STABILISED SITE ACCESS (SSA)
SCALE N.T.S.



INLET TRAP
SCALE N.T.S.

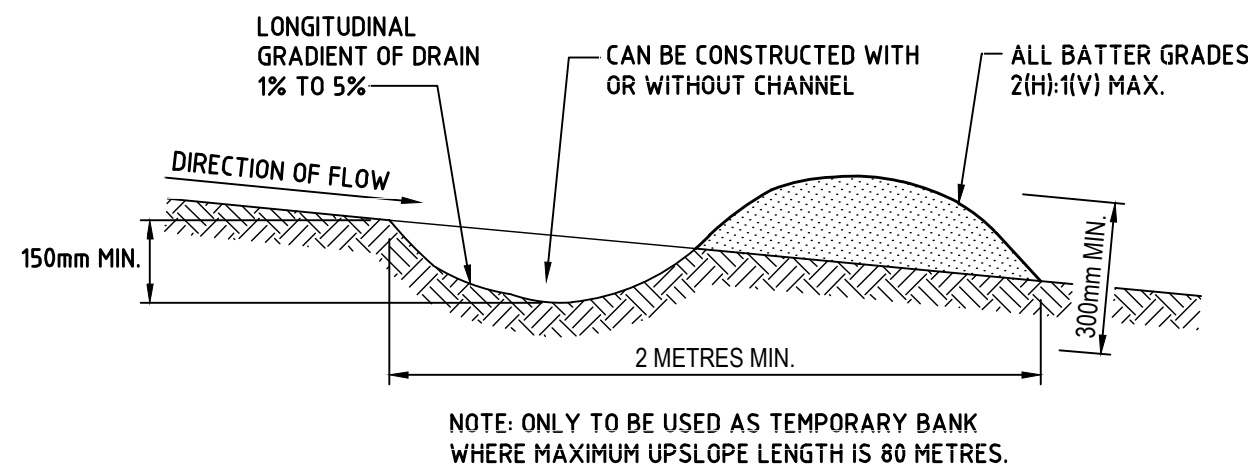
NOTE:
TO BE USED IN PAVED AREAS
WHERE TRAFFIC ACCESS IS REQUIRED



Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Support geotextile with mesh tied to posts spaced at 1 metre centres.
3. Do not cover inlet with geotextile.
4. Construction details are similar to Standard Drawing 6-6 and 6-7.

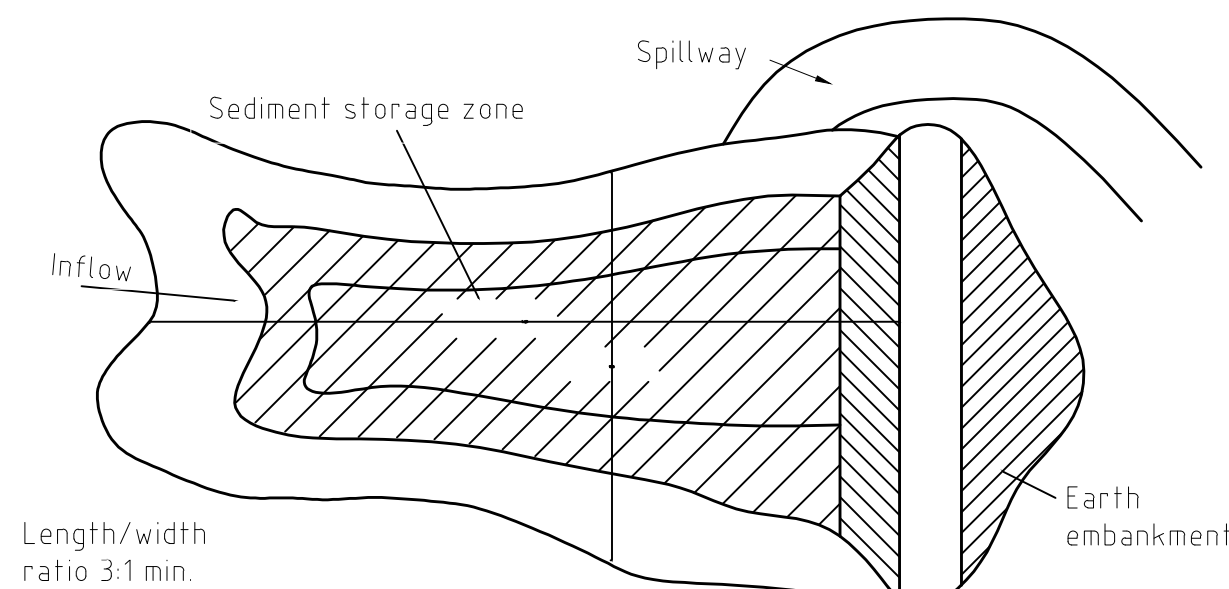
INLET SEDIMENT BARRIER (ISB)
SCALE N.T.S.



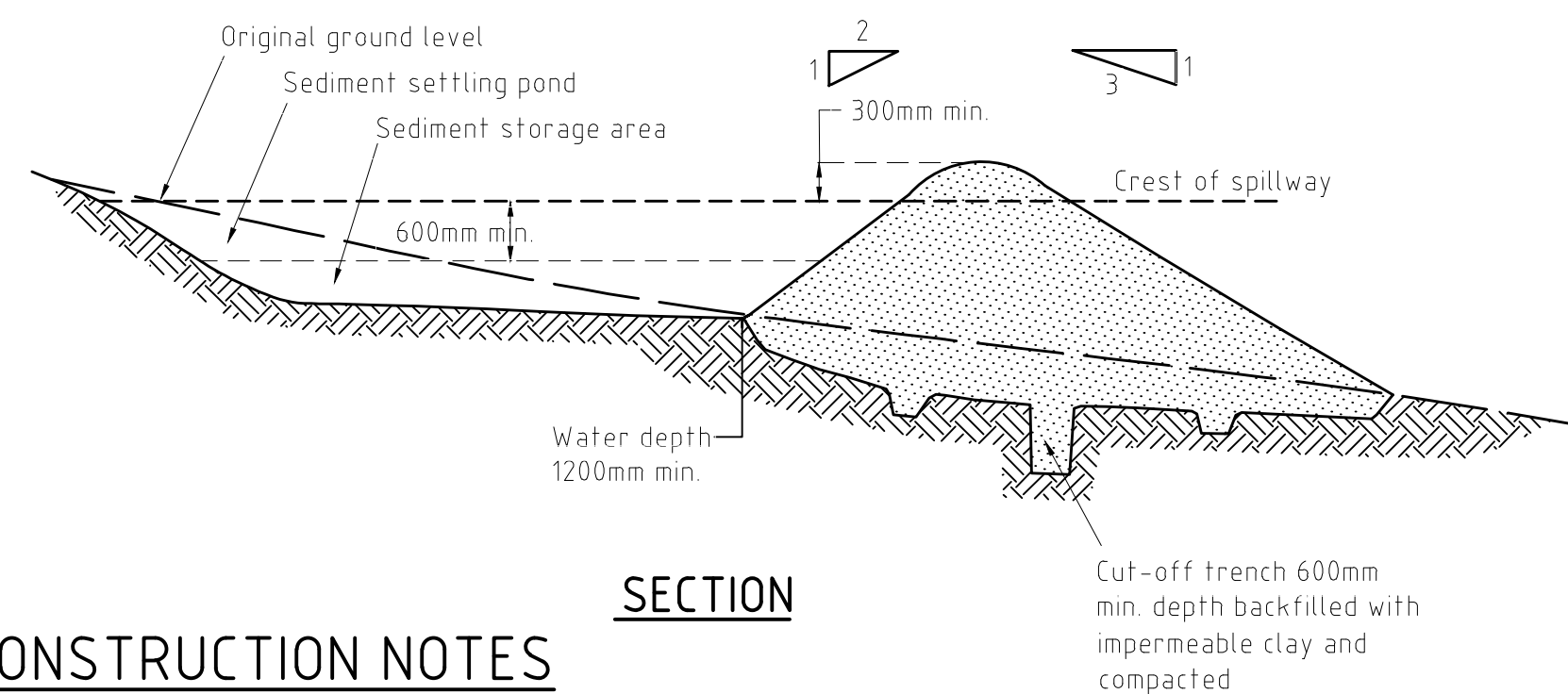
EARTH BANK CONSTRUCTION NOTES:

1. BUILD WITH GRADIENTS BETWEEN 1% AND 5%.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS-SECTIONS, NOT "V" SHAPED.
5. ENSURE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

CATCH DRAIN (CD)
SCALE N.T.S.



PLAN



SECTION

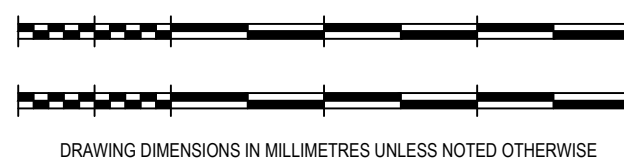
CONSTRUCTION NOTES

1. Remove all vegetation & topsoil from under the dam wall & from within the storage area
2. Construct a cut-off trench 500mm deep & 1200mm wide along the centreline of the embankment extending to a point on the gully wall level with the riser crest.
3. Maintain the trench free of water & recompact the material with equipment as in the SWMP to 95% Standard Proctor density.
4. Select fill according to the directions of the SWMP that is free from roots, wood rock, large stones or foreign materials.
5. Prepare the site under the embankment by ripping at least 100mm deep to help bond compacted fill to existing substrate.
6. Spread fill in 100mm to 150mm layers & compact at optimum moisture content in accordance with the SWMP.
7. Construct emergency spillway.
8. Rehabilitate the structure in accordance with the SWMP.
9. Place a "Full of Sediment" marker to show when less than design capacity occurs & sediment removal is required.

TEMPORARY SEDIMENTATION BASIN
SCALE N.T.S.

REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD	REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD
A	2/03/2016	ISSUED FOR DA APPROVAL	DT	PGD					

NOT FOR CONSTRUCTION



DESIGNED	DT	DATE	2/03/2016
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APPROVED	PGD	DATE	2/03/2016

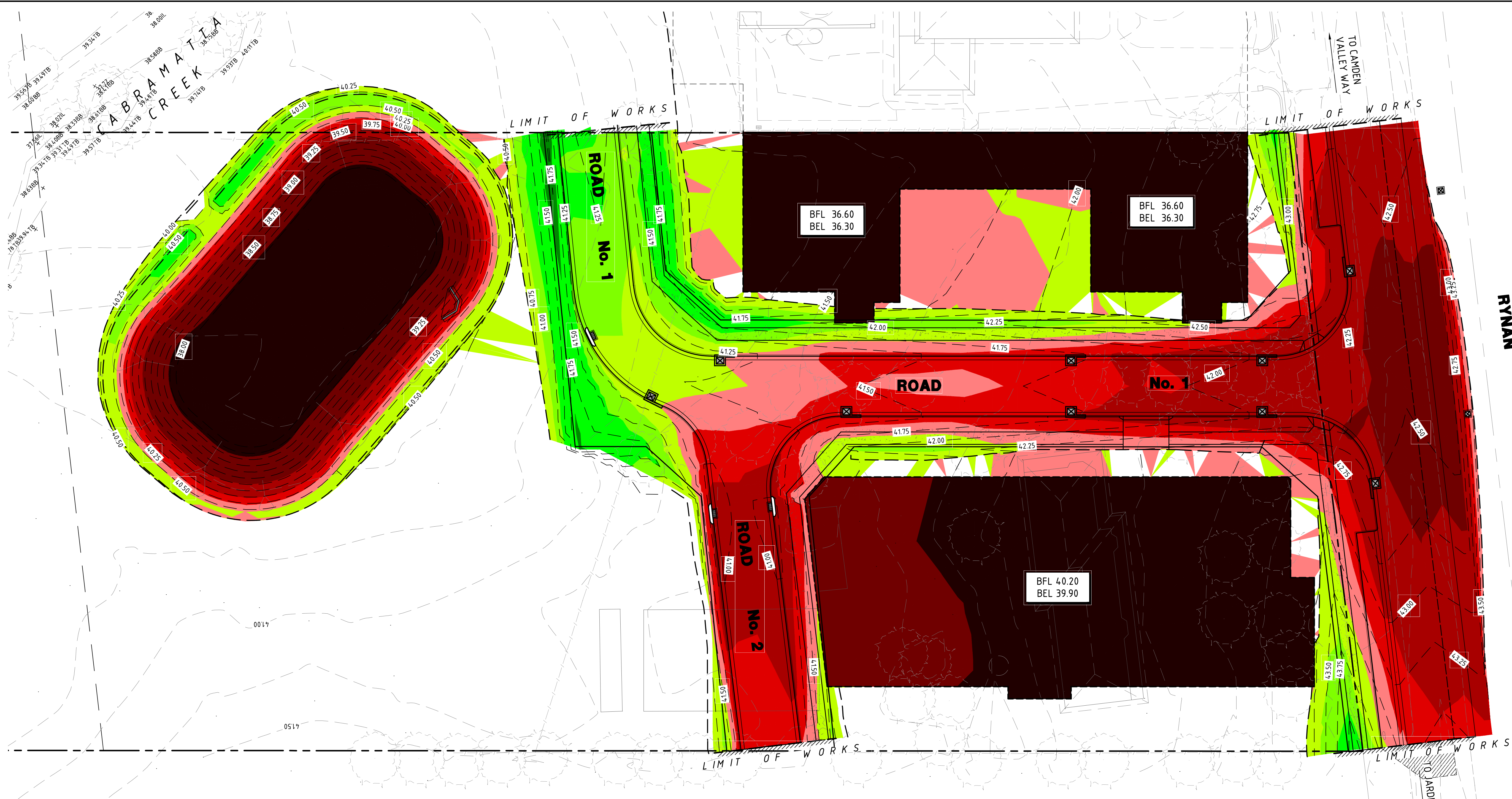
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PROJECT:	15 RYAN AVENUE, EDMONDSON PARK PROPOSED RESIDENTIAL SUBDIVISION
TITLE:	EROSION AND SEDIMENT CONTROL DETAILS

PROJ No:	14139	DRG No:	DA03	Rev:	A
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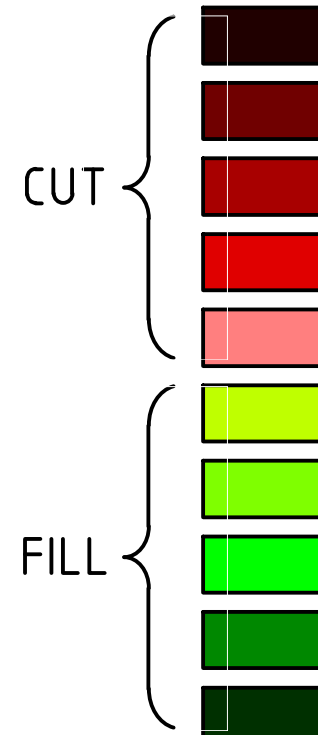
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Friday, 19 February 2016 2:58:41 PM



LEGEND:

DEPTH RANGE

-9999 TO -1
-1.00 TO -0.75
-0.75 TO -0.50
-0.50 TO -0.25
-0.25 TO 0.00
0.00 TO 0.25
0.25 TO 0.50
0.50 TO 0.75
0.75 TO 1.00
1.00 TO 9999



BFL BASEMENT FLOOR LEVEL
BEL BULK EARTHWORKS LEVEL

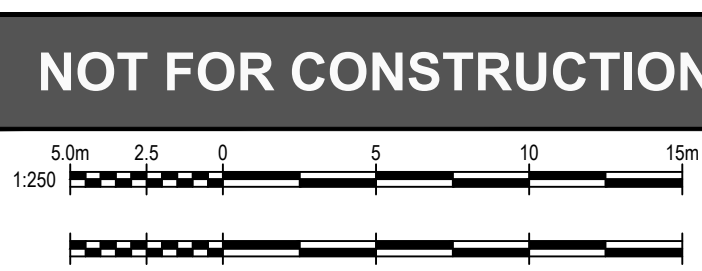
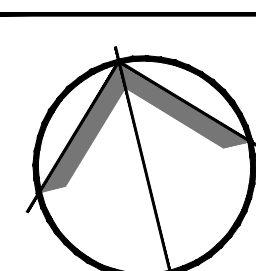
QUANTITIES:

TOTAL CUT ~12354m³
TOTAL FILL 518m³
TOTAL BALANCE -11836m³
IE EXCESS OF CUT OVER FILL 11836m³

NOTE:

1. ALLOWANCE MADE FOR DESIGN PAVEMENT DEPTH OF 400mm (TBC AT DETAIL DESIGN)
2. ALLOWANCE OF MADE FOR BUILDING SLAB, BASECOURSE AND BLINDING OF 300mm (TBC AT DETAIL DESIGN)
3. NO ALLOWANCE MADE FOR ADDITIONAL EXCAVATION AND LEVELLING FOR BUILDING FOUNDATIONS AND RETAINING WALLS ETC.

REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD	REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD
C	5/04/2016	ISSUED FOR DA APPROVAL		DT	PGD				
B	1/04/2016	BASIN AMENDED		DT	BB				
A	2/03/2016	ISSUED FOR DA APPROVAL		DT	PGD				

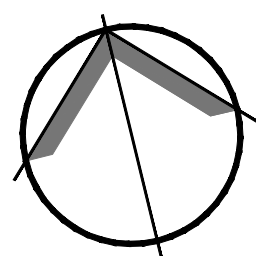


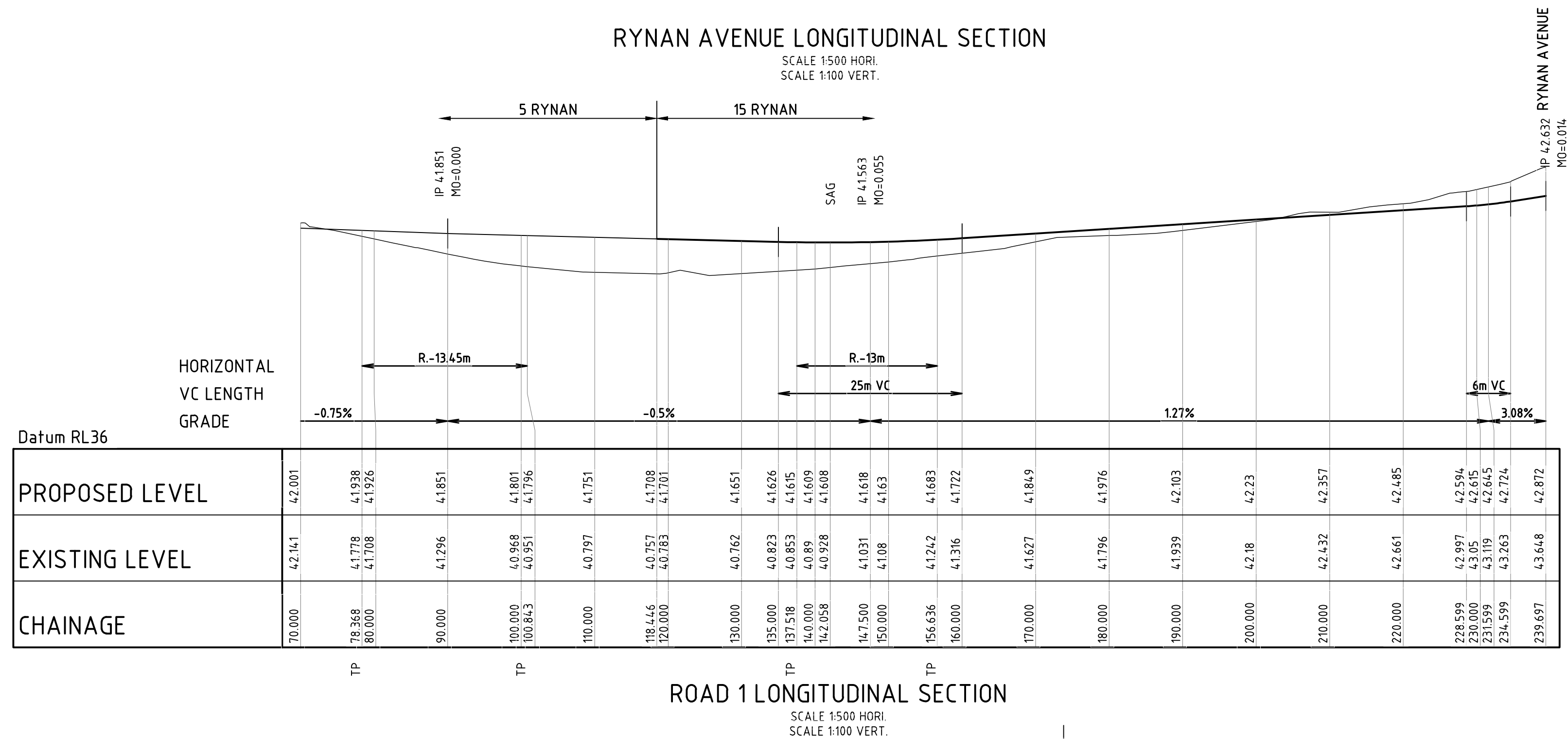
DESIGNED	DT	DATE	2/03/2016
CHECKED	BB	DATE	2/03/2016
APPROVED	PGD	DATE	2/03/2016

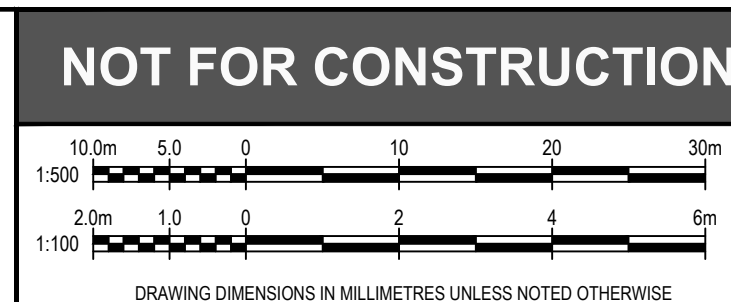
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PROJECT:	15 RYAN AVENUE, EDMONDSON PARK PROPOSED RESIDENTIAL SUBDIVISION
TITLE:	BULK EARTHWORKS PLAN
PROJ No:	14139
DRG No:	DA04
Rev:	C



[illegible]



DESIGNED DT	DATE 2/03/2016
CHECKED BB	DATE 2/03/2016
APPROVED PGD	DATE 2/03/2016
SCALE	

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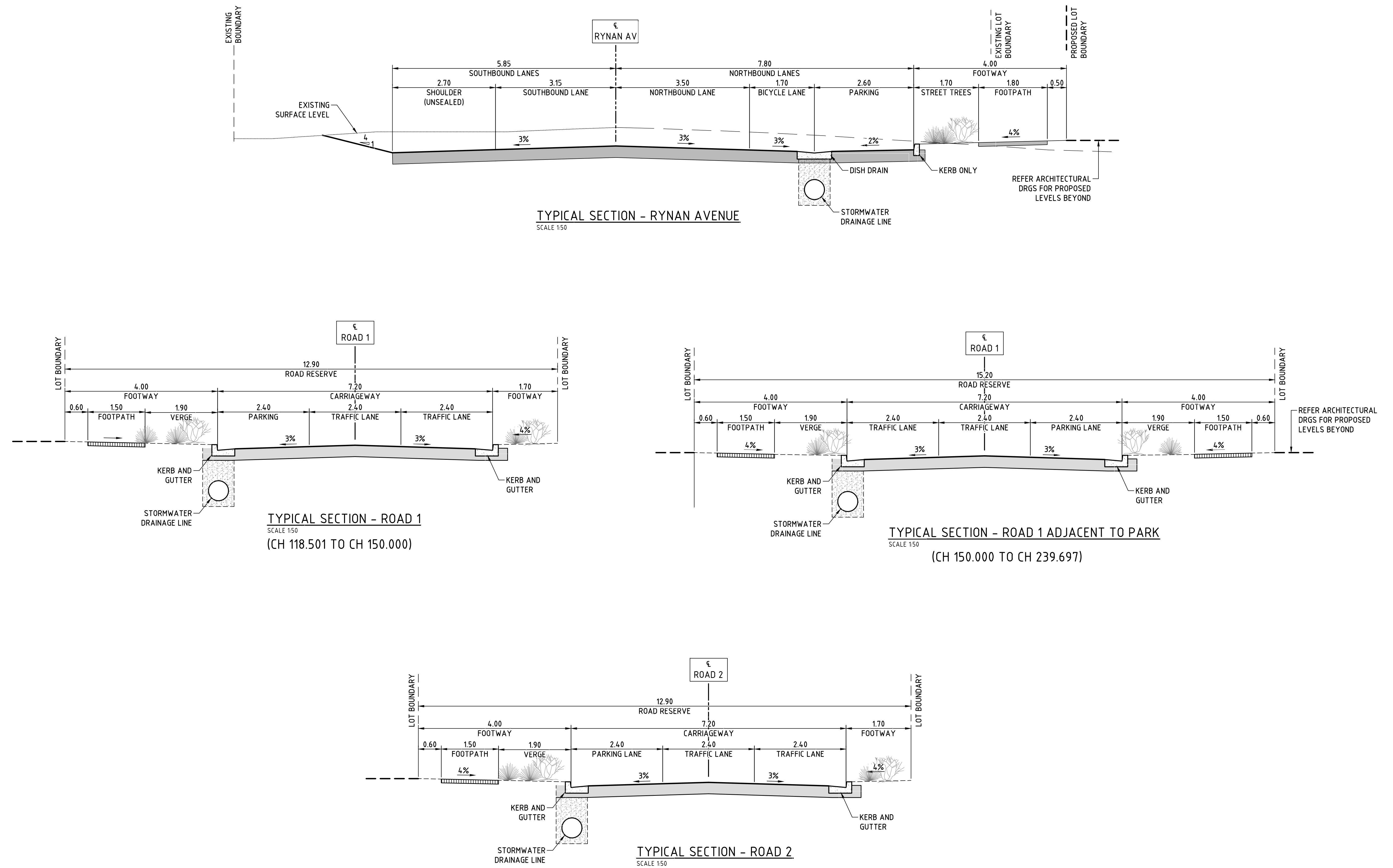
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CLIENT: **KMT F**



PROJECT: 15 RYNAN AVENUE, EDMONDSON PARK PROPOSED RESIDENTIAL SUBDIVISION			
TITLE: ROAD LONGITUDINAL SECTIONS			
PROJ No.: 144120	DRG No.: DA06	Rev.: 0	



REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD	REV	DATE	AMENDMENT / DESCRIPTION	BY	APPD
B	5/04/2016	ISSUED FOR DA APPROVAL	DT	PGD					
A	2/03/2016	ISSUED FOR DA APPROVAL	DT	PGD					

NOT FOR CONSTRUCTION

10.0m 5.0 0 10 20 30m

1:500

2.0m 1.0 0 2 4 6m

1:100

DRAWING DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

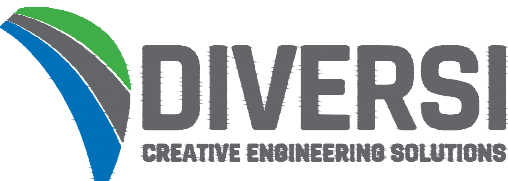
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CHECKED BB DATE 2/03/2016

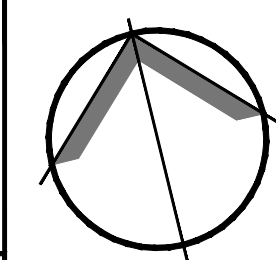
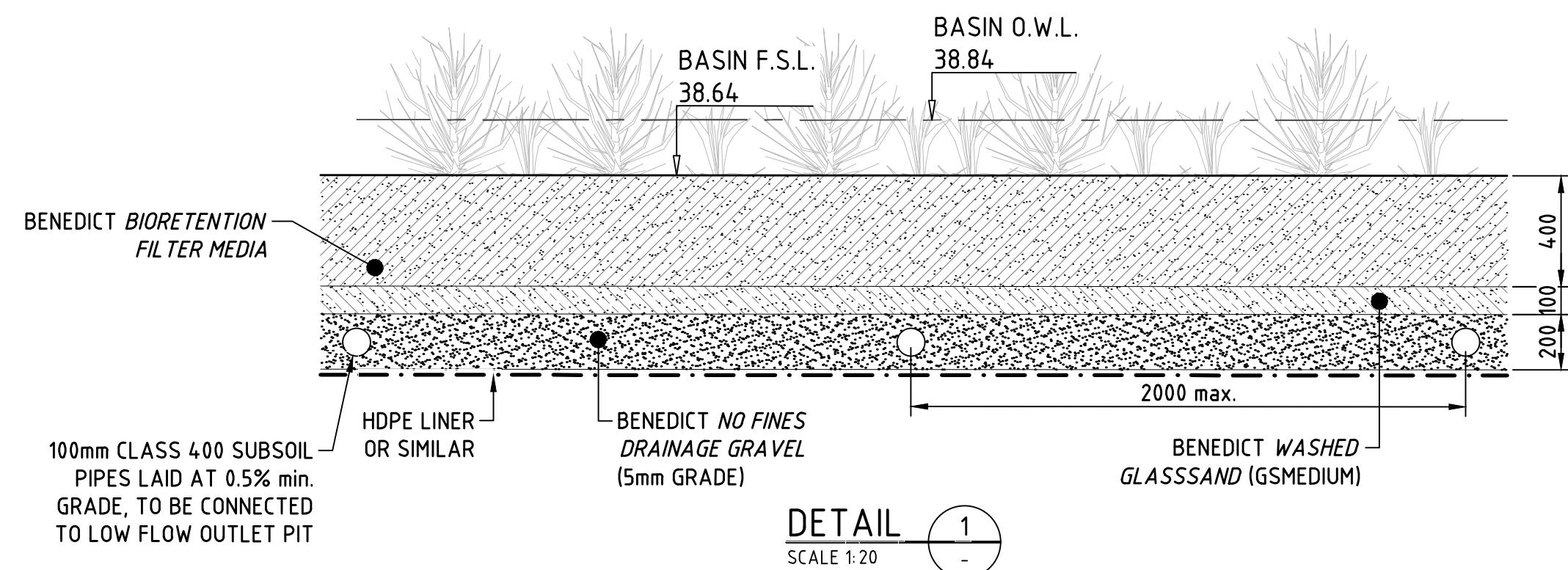
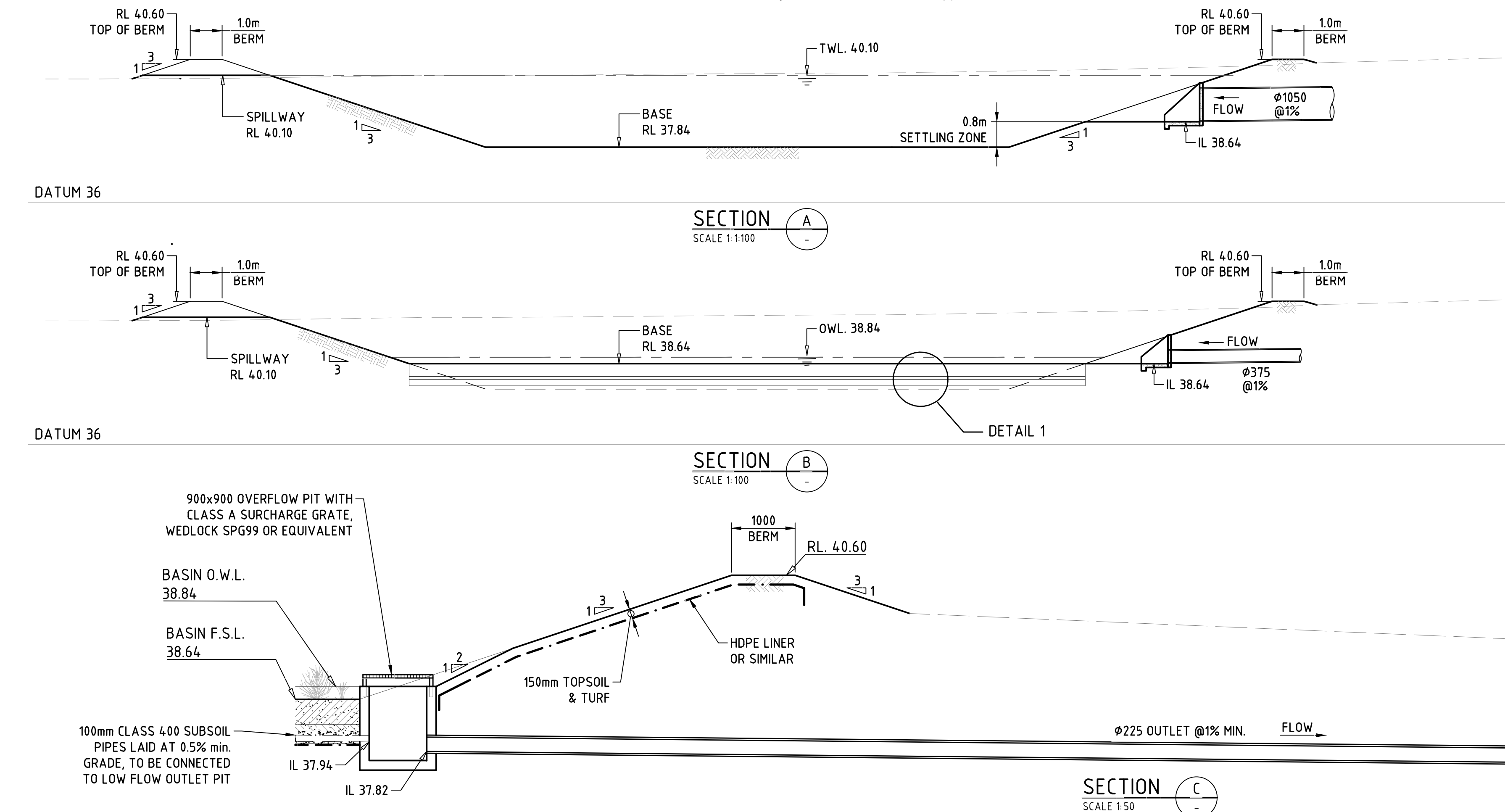
APPROVED PGD DATE 2/03/2016

SCALE AS SHOWN

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PROJECT: 15 RYNAN AVENUE, EDMONDSON PARK
PROPOSED RESIDENTIAL SUBDIVISION
TITLE: ROAD TYPICAL SECTIONS
PROJ No: 14139 DRG No: DA07 Rev: B



5.0m 2.5 0 5 10 15m
1:250
4m 2 0 2 4 6m
1:100
DRAWING DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

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CLIENT: **KMT P**

PROJECT: 15 RYNAN AVENUE, EDMONDSON PARK PROPOSED RESIDENTIAL SUBDIVISION	
TITLE: SEDIMENT BASIN / BIO BASIN DETAILS	
PROJ No.: 14139	DRG No.: DA08

ATTACHMENT C: Catchment Plan

LEGEND:

-  FLOW PATH
-  CATCHMENT BOUNDARY
-  FLOW DIRECTION
-  2m INTERVAL CONTOURS
BASED ON
ORTHOPHOTOMAPS

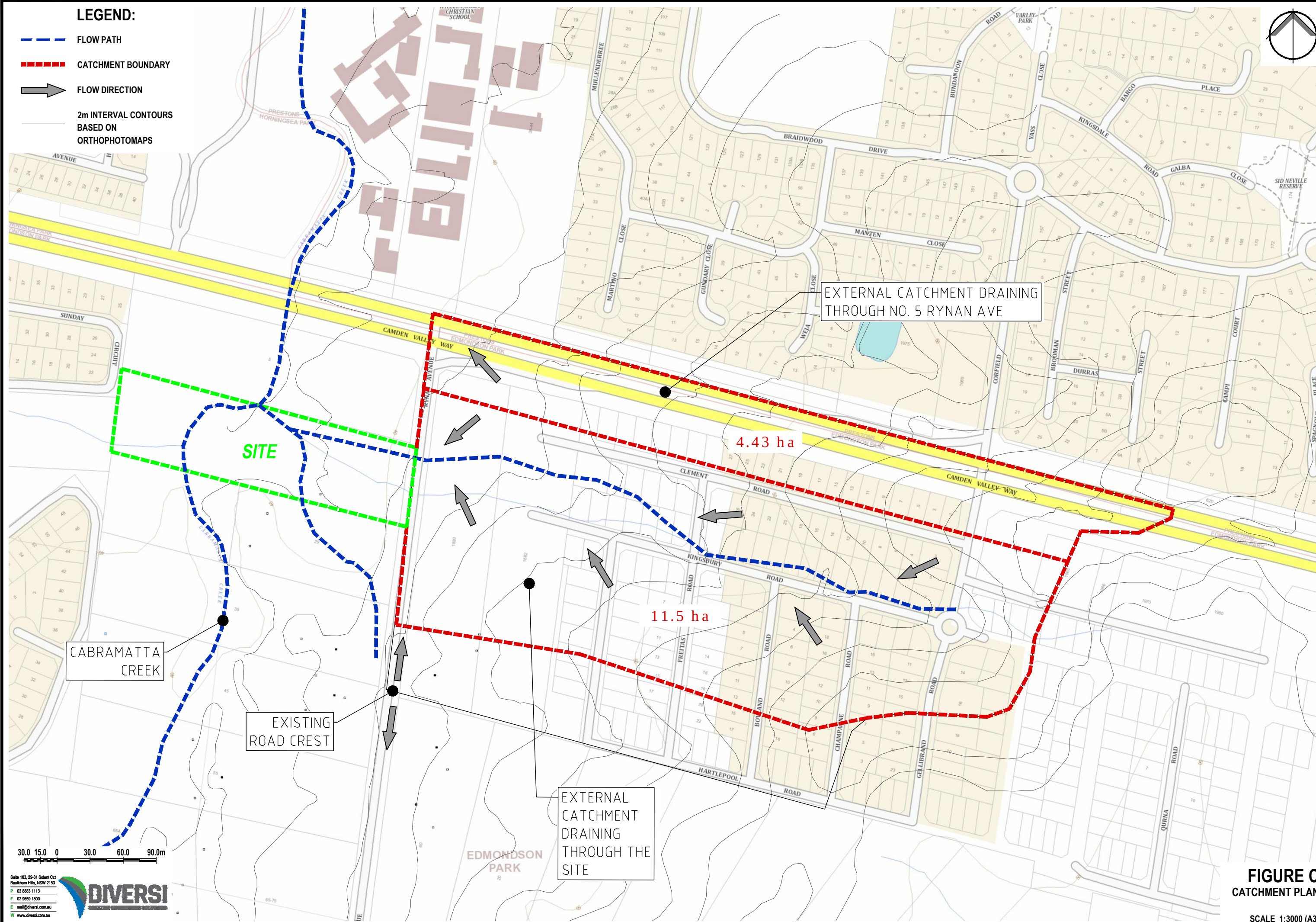


FIGURE C
CATCHMENT PLAN

SCALE 1:3000 (A3)