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31 August 2017

Frasers Property Australia
C/- Property Development Solutions (Aust) Pty Ltd
Level 1, 63 York St
SYDNEY NSW 2000

Attention: Ms Vanessa English

Dear Vanessa,

RE: EASTERN CREEK RETAIL CENTRE STAGE 1
ROOTY HILL ROAD SOUTH, EASTERN CREEK
STORMWATER ISSUES AND DESIGN REPORT FOR DEVELOPMENT APPLICATION

PROJECT OVERVIEW

It is proposed to develop an existing Greenfield site of approximately 4.2 hectares to a mixed use development consisting of commercial and retail areas. This site is part of a larger retail and commercial precinct that will be known as the *Eastern Creek Quarter* (ECQ). It is proposed that the overall precinct will be developed in three separate stages. This development application (DA) will focus on stage 1 and its location is shown on figure 1 below.

This report has been prepared to support State Significant Development Application SSD 8588 for the detailed design and construction of a convenience retail shopping centre, medical centre, gym and associated car parking on Lot 2, Rooty Hill Road South, Eastern Creek. The assessment undertaken in this report has been prepared to address the following Secretary's Environmental Assessment Requirements (dated 26 July 2017) and the relevant conditions of consent under Concept Approval SSD 5175:

The site lies directly to the east of Rooty Hill Road South. At the time of this submission, we have shown the surrounding infrastructure on our plans as being in place. In reality, this has not been constructed yet, but have had to assume that the site will be connecting into these roads, channels, stormwater and quantity/quality basins. The status of these surrounding works will be explained in detail in later sections of this report.

The existing topography of the site is that the majority falls in an easterly direction at approximately 5%. Runoff from the site currently is directed overland to two sets of culverts located at the far eastern edge of the overall precinct site. These culverts discharge to the east and eventually to Eastern Creek. The proposed stormwater from the developed stage 1 site will ultimately follow this same path to Eastern Creek.

In terms of stormwater measures, it is proposed to direct the site's stormwater to the previously designed stormwater infrastructure within the proposed subdivision access road. This downstream stormwater and road infrastructure design includes combined On Site Detention (OSD) and Water Quality (WQ) basins to treat the entire ECQ precinct, including this stage 1 development. As such, there is no requirement for full WQ and OSD measures on this site. However, we have designed the site stormwater

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system to provide pit inlet filters in all surface inlet pits as well as water conservation measures. The details of the measures will be further explained in later sections of this report.

Figure 1: Location of proposed site

SURROUNDING ROADS AND STORMWATER INFRASTRUCTURE

As mentioned above, the site is 1 stage of a 3 stage commercial/retail precinct. This overall precinct area requires the installation of appropriate access roads and downstream stormwater infrastructure for the site to connect in to. In addition to this, there are proposed upgrades and amplifications of the adjoining Rooty Hill Road/Cable Place intersection and Rooty Hill Road South/Great Western Highway intersection.

The original subdivision access road and stormwater infrastructure design for the precinct area was carried out and approved under the following application and development consent.

- Application no. SSD 5175 MOD 1
- Applicant: Western Sydney Parklands Trust
- Consent Authority: Minister for Planning
- Approval date: 28th April 2016

The civil infrastructure design and drawings that formed part of this consent have been used as the basis for the site's connecting stormwater and access. The original civil infrastructure drawings were completed by *Costin Roe Engineers* with both water quality and OSD requirements for the northern precinct lots catered for in their design. For information purposes, we have included the overall site works plan for these infrastructure works as an appendix to this report – *C012693.00-DA15 (B).* A full and detailed analysis of the proposed precinct water quality and OSD controls are provided in the Costin Roe Engineering report - *Civil engineering report: amendment to state significant development 5175-2012 (rev B – 2015).*

It should be noted that the above development consent contained conditions relating to the subdivision road and stormwater infrastructure. At the time of this report, Henry and Hymas have not been responsible for any formal updates/changes to this design.

The Rooty Hill Road South/Cable Place amplifications are shown as a background to the site layout plans. These are currently being documented to a standard to obtain a Works Authorisation Deed (WAD) with RMS. As such, this layout is provided on our drawings for information purposes only. The RMS approved concept plans for these surrounding road works are attached as an appendix to this report.

STORMWATER STRATEGY

As discussed earlier, the site has an area of approximately 4.2 hectares and currently drains in an easterly direction towards two culverts that pass under the M7 motorway. The site stormwater system has been designed to connect to a set of twin culverts that are located underneath the low point of the future access road. Given that the proposed invert levels of this culvert are RL39.60 and that the site floor level is RL44.30, there is ample depth to be able to pipe the entirety of the site stormwater.

As explained above, there is a precinct wide strategy proposed to deal with this site's stormwater quantity controls. As such, no OSD is proposed for this site.

In accordance with Blacktown City Council's Engineering Guideline (2005), the piped stormwater system has been designed to accommodate the 1:20 ARI peak flows. The site grading has been designed in such a way that any emergency overflow up to the 100ARI peak storm will pass through the site and to the external site access road without adversely impacting the site floor level.

Drawings 17570_DA_C101-C104 detail the site grading and stormwater layout/strategy. All site stormwater longitudinal sections are shown on drawings 17570_DA_C210-C213. A general stormwater maintenance strategy for the various stormwater elements on the site is provided as an attachment to this report.

The site drainage system has been designed using the DRAINS modelling software. The DRAINS model prepared and submitted for the site stormwater system is;

- *17570 DRAINS2.drn*

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DRAINS MODELLING DATA

For the above mentioned model, the IFD data used for the rainfall generation is;

Table 1

	2ARI	50ARI		
1hr	30.6(mm/hr)	56.4(mm/hr)	**G**	0.01
12hr	6.67(mm/hr)	12.8(mm/hr)	**F2**	4.30
72hr	2(mm/hr)	4.3(mm/hr)	**F50**	15.81

The standard parameters used in the DRAINS model are as follows;

Table 2

Description	Value
Model for Design and Analysis Run	Rational Method
Rational Method Procedure	ARR87
Soil Type - Normal	3.0
Paved (Impervious) Are Depression Storage	1mm
Supplementary Area Depression Storage	1mm
Grassed (Pervious) Area Depression Storage	5mm (15mm for pre-dev)
Antecedent Moisture Condition (ARI = 1-5 years)	2.5
Antecedent Moisture Condition (ARI = 10-20 years)	3.0
Antecedent Moisture Condition (ARI = 50-100 years)	3.5
Sag Pit Blocking Factor	0.5
On Grade Pit Blocking Factor	0.2

WATER QUALITY STRATEGY

In accordance with the precinct wide water strategy proposed in the Costing Roe Engineering Report and Plans, tertiary treatment will be provided within the communal basin downstream of the site. The strategy proposed by Costing Roe assumes that only primary treatment for the on-lot stormwater system is required. As such, we have nominated that all surface inlet pits within the site are to be fitted with Enviropod pit baskets. In areas of vehicular traffic, oilsorbs are to be fitted within the baskets. Drawing 17570_DA_C200 indicates all the pits that are to be fitted with the Enviropods.

A generic operational and maintenance manual for the enviropod pit basket is attached as an appendix to this report.

In accordance with Blacktown Council's Development Control Plan, Part J, the site must meet the following pollutant reduction targets.

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Table 3

Pollutant	% post development reduction target
Gross Pollutants	90
Total Suspended Solids	85
Total Phosphorous	65
Total Nitrogen	45
Total Hydrocarbons	90

Refer to the precinct wide Engineering report by Costin Roe for details on how these targets will be met for all lots within the precinct.

WATER CONSERVATION

To assist with water conservation, it is proposed that a 200kL rainwater tank be incorporated to meet a significant portion of the non-potable demands. As the original development application of this site pre-dates Council's water quality conservation policy, we have not designed the tank to supply 80% of the re-use demand. We have used a practical roof catchment area and rainwater tank size based on the building and roof layout.

The following non-potable demands were used in order to calculate the proposed rainwater tank effectiveness.

- Toilet Flushing: 56 toilets @0.1kL/day = 5.6kL/day. Number of toilets based on the B.C.A. report for the development.
- Irrigation: 5000m² of irrigable area (area provided by landscape architect) @ 0.3kL/m²/yr (drip): = 1500kL/yr.

These demands were used in a MUSIC model water balance to determine the re-use demand met based on a roof catchment area of 8578m². For a 200kL tank, the effective storage is 160kL which allows for a 20% loss due to anaerobic zones.

Refer to catchment plan 17570_DA_C251 for detailed analysis of the rainwater re-use strategy. Based on a catchment area of 8578m², the 200kL rainwater tank will meet 64% of the non-potable demand for the site.

The modelling procedure was undertaken using the MUSIC software program.

The MUSIC model provided for Council assessment for this site is;

- *17570 – RW tank sizing 200Kl – final for DA.SQZ*

For the MUSIC model itself, we have used the following rainfall station and time period data.

Table 4

Rainfall Station	Modelling period	Annual rainfall(mm)
067035 Liverpool (Whitlam Centre)	**1967 - 1976**	**857**

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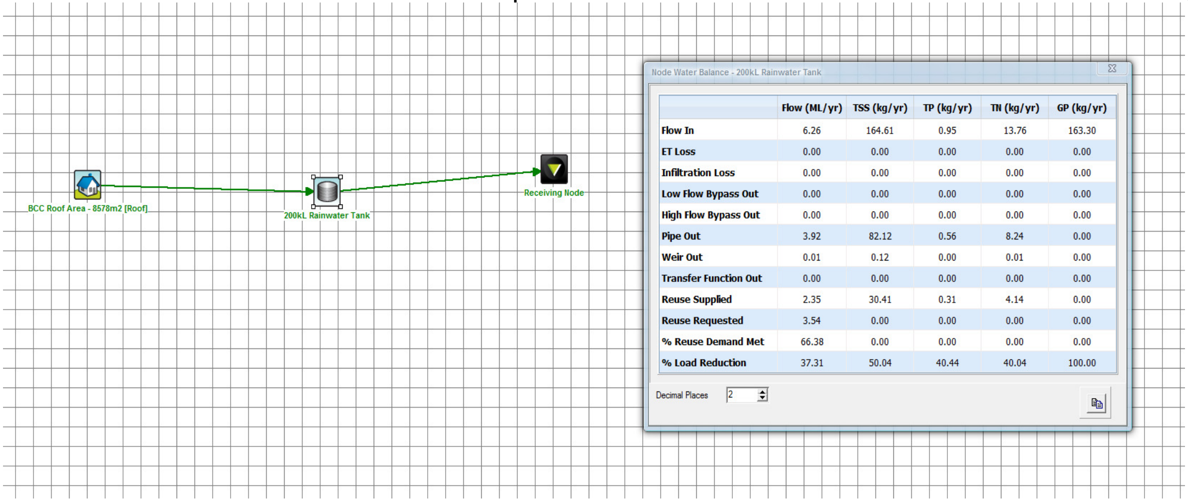
The below screen shot shows the set-up and results from the MUSIC for the rainwater sizing.



	Flow (ML/yr)	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)	GP (kg/yr)
Flow In	6.26	164.61	0.95	13.76	163.30
ET Loss	0.00	0.00	0.00	0.00	0.00
Infiltration Loss	0.00	0.00	0.00	0.00	0.00
Low Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
High Flow Bypass Out	0.00	0.00	0.00	0.00	0.00
Pipe Out	3.92	82.12	0.56	8.24	0.00
Weir Out	0.01	0.12	0.00	0.01	0.00
Transfer Function Out	0.00	0.00	0.00	0.00	0.00
Reuse Supplied	2.35	30.41	0.31	4.14	0.00
Reuse Requested	3.54	0.00	0.00	0.00	0.00
% Reuse Demand Met	66.38	0.00	0.00	0.00	0.00
% Load Reduction	37.31	50.04	40.44	40.04	100.00

Figure 2

FLOODING

An investigation of Blacktown Council's online flooding maps system showed that the site is not within a high, medium or low risk flood area. The proposed floor level of the site is RL44.30 which is over 3m higher than the lowest site access point to the proposed access road. Figure 3 shows the flooding zone extents in relation to the site. The maximum level that the furthest flood zone extends to is below RL39.25. Therefore there is in excess of 1000mm freeboard to even the lowest access point of the site. This point is at the northern driveway crossover point which is at approximately RL40.50.

In accordance with the NSW Floodplain Development Manual (2005), the floor level of the development has been set so that it is not impacted by surrounding flood levels. Furthermore, the site grading and levels have been designed so that there is a safe path of egress from the site to Rooty Hill Road South that is more than 1000mm above even the highest possible flood extents.

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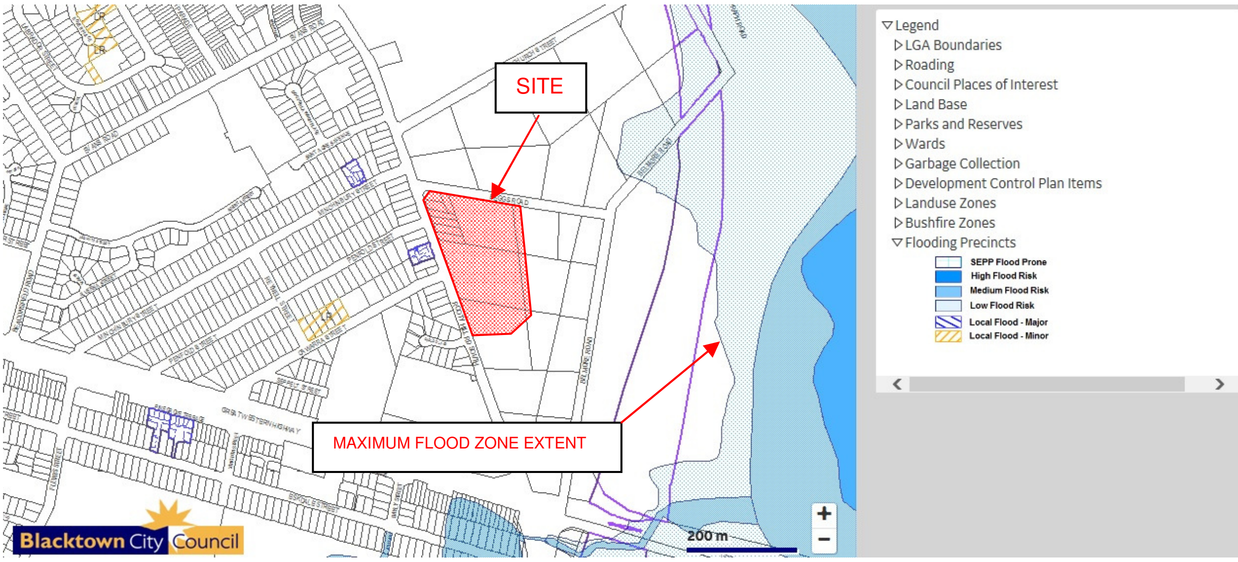

Figure 3

EROSION AND SEDIMENT CONTROL

During construction, appropriate sediment and erosion control measures need to be implemented to ensure that downstream receiving water are not adversely impacted. Our drawings 17570_DA_SE01 – SE02 have detailed the required measures. These have been designed in accordance with the requirements of the *Landcom – Managing Urban Stormwater - Soils and Construction, Volume 1, 4th Edition March 2004*.

DRAWING LIST

The Civil DA drawings provided for submission and to be read in conjunction with this report are;

Drawing No.	Drawing Name
17570_DA_C000	COVER SHEET, DRAWING SCHEDULE, NOTES & LOCALITY
17570_DA_C100	ROAD WORKS OVERALL SITE PLAN
17570_DA_C101	DETAIL PLANS SHEET 1 OF 4
17570_DA_C102	DETAIL PLANS SHEET 2 OF 4
17570_DA_C103	DETAIL PLANS SHEET 3 OF 4
17570_DA_C104	DETAIL PLANS SHEET 4 OF 4
17570_DA_C110	TYPICAL SECTIONS
17570_DA_C200	STORMWATER MISCELLANEOUS DETAILS & PIT LID SCHEDULE
17570_DA_C210	STORMWATER LONGSECTIONS SHEET 1 OF 4
17570_DA_C211	STORMWATER LONGSECTIONS SHEET 2 OF 4
17570_DA_C212	STORMWATER LONGSECTIONS SHEET 3 OF 4
17570_DA_C213	STORMWATER LONGSECTIONS SHEET 4 OF 4
17570_DA_C250	STORMWATER CATCHMENT PLAN
17570_DA_C251	RAINWATER TANK CATCHMENT PLAN
17570_DA_SE01	SEDIMENT AND EROSION CONTROL PLAN
17570_DA_SE02	SEDIMENT AND EROSION CONTROL DETAILS

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We trust this serves as an adequate summary and explanation for the complex nature of the storm water and grading issues related to this site.

Yours faithfully,

TOM DEMPSEY (Senior Civil Engineer)
For, and on behalf of,
H & H Consulting Engineers Pty Ltd

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APPENDIX A:
CIVIL DEVELOPMENT APPLICATION PLANS

PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
CIVIL ENGINEERING WORKS

GENERAL NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL'S SPECIFICATION. CONTRACTOR TO OBTAIN AND RETAIN A COPY ON SITE DURING THE COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. HENRY AND HYMAS CONSULTING PTY. LTD. CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND BLACKTOWN CITY COUNCIL'S REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

N

EXISTING SERVICES & FEATURES

- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA OR AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF HIS PROGRAM FOR THE RELOCATION/ CONSTRUCTION OF TEMPORARY SERVICES.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN SUPPLY TO EXISTING BUILDING REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
- INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL FROM THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
- EXISTING SERVICES, BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE EXISTING FEATURES PRIOR TO ANY DEMOLITION WORKS.
- EXISTING SERVICES UNLESS SHOWN ON SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE A 'DIAL BEFORE YOU DIG' SEARCH AND TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.

LOCALITY PLAN
SCALE: NTS

DRAWING SCHEDULE

17570_DA_C000	COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH
17570_DA_C100	GENERAL ARRANGEMENT PLAN
17570_DA_C101	DETAIL PLANS, SHEET 1 OF 4
17570_DA_C102	DETAIL PLANS, SHEET 2 OF 4
17570_DA_C103	DETAIL PLANS, SHEET 3 OF 4
17570_DA_C104	DETAIL PLANS, SHEET 4 OF 4
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17570_DA_C213	STORMWATER LONGITUDINAL SECTIONS SHEET 4 OF 4
17570_DA_C250	STORMWATER CATCHMENT PLAN
17570_DA_C251	RAINWATER TANK CATCHMENT PLAN
17570_DA_SE01	SEDIMENT AND EROSION CONTROL PLAN
17570_DA_SE02	SEDIMENT AND EROSION CONTROL DETAILS

SITEWORKS NOTES

- DATUM : A.H.D.
- ORIGIN OF LEVELS : REFER TO BENCH OR STATE SURVEY MARKS WHERE SHOWN ON PLAN.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
- ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE DIRECTIONS OF THE SUPERINTENDENT.
- EXISTING SERVICES UNLESS SHOWN ON THE SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS ACHIEVED.
- THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
- CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATION IS TO BE UNDERTAKEN OVER TELSTRA OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
- CONTRACTOR TO OBTAIN AUTHORITY APPROVALS WHERE APPLICABLE.
- MAKE SMOOTH TRANSITION TO EXISTING SURFACES AND MAKE GOOD.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS
OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING TO DEVELOPMENT AT THE SITE.
- TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MINIMUM OF 50mm IN BITUMINOUS PAVING.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.
- GRADES TO PAVEMENTS TO BE AS IMPLIED BY RL'S ON PLAN . GRADE EVENLY BETWEEN NOMINATED RL'S. AREAS EXHIBITING PONDING GREATER THAN 5mm DEPTH WILL NOT BE ACCEPTED UNLESS IN A DESIGNATED SAG POINT.
- ALL COVERS AND GRATES ETC TO EXISTING SERVICE UTILITIES ARE TO BE ADJUSTED TO SUIT NEW FINISHED SURFACE LEVELS WHERE APPLICABLE.

SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE SURVEYOR SPECIFIED IN THE TITLE BLOCK.
THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. HENRY AND HYMAS PTY. LTD. DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT HENRY AND HYMAS PTY. LTD. THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM ORIGINAL SURVEY DOCUMENTS.
ORIGIN OF LEVELS PM 30122 - RL 43.58
DATUM A.H.D

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TC	30.08.2017					

Client: FRASER PROPERTY AUSTRALIA
Architect: i2C ARCHITECTS

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Project: PROPOSED NEW SHOPPING CENTRE ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title: COVER SHEET, DRAWING SCHEDULE NOTES AND LOCALITY SKETCH

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	**Approved**	**Scale**
T.Dempsey	A.Francis	NTS @ A1

Drawing number: 17570_DA_C000 Revision: 01

GENERAL ARRANGEMENT PLAN
SCALE 1:500

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TC	30.08.2017					

Client
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Architect
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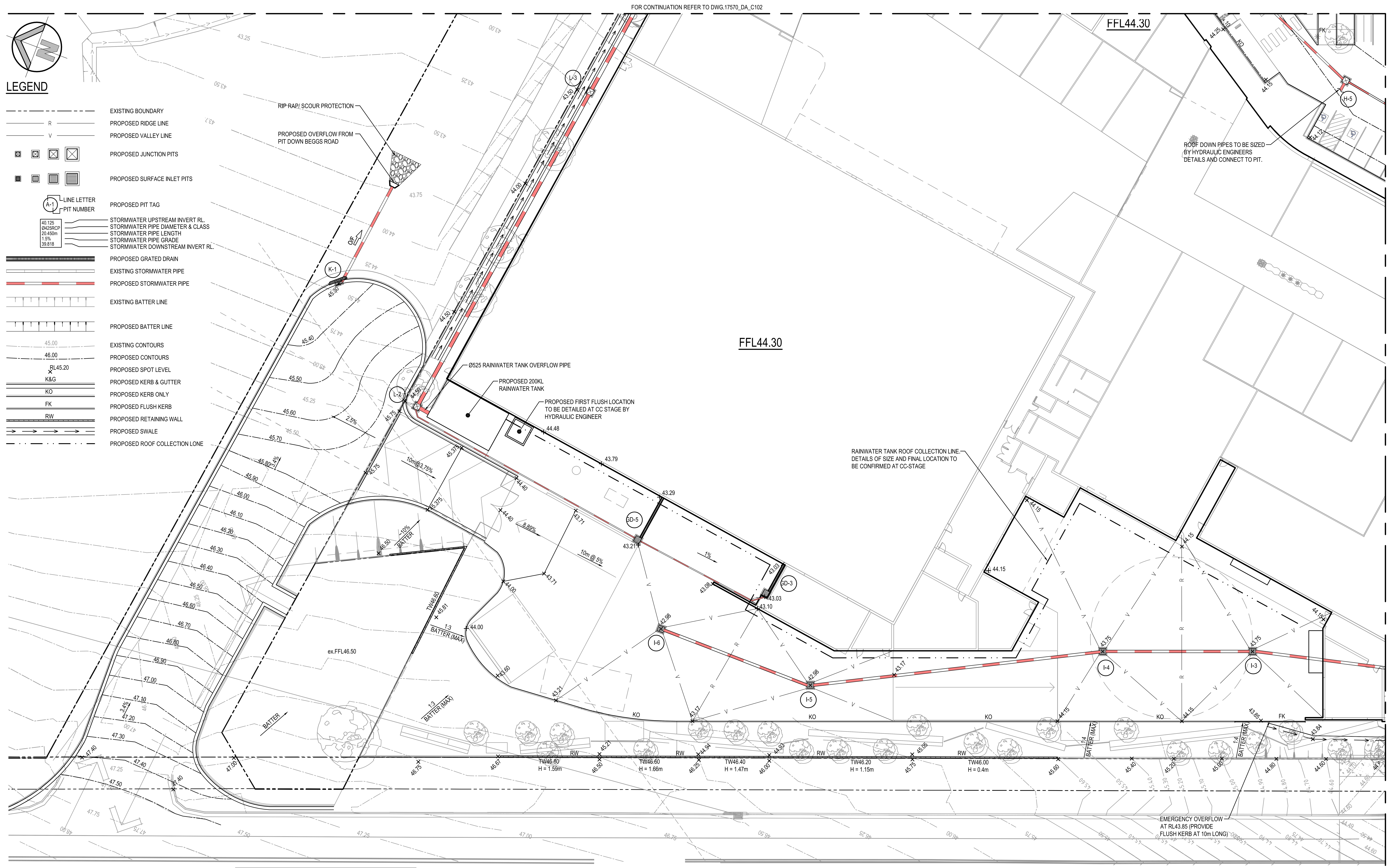
Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title
GENERTAL ARRANGEMENT PLAN

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:500 @ A1

Drawing number: 17570_DA_C100
Revision: 01



NOTES:

ROOF COLLECTION LINES NOT DOCUMENTED AT DA STAGE.
REFER TO DRAWING C250 FOR ROOF AREA CATCHMENT ALLOCATION
SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREAS ARE NOT SHOWN
FOR THE DA SUBMISSION. THESE TO BE DETAILED AT CC STAGE

DETAIL PLAN

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	ISSUED FOR DA ONLY	IK	TC	30.08.2017
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017
01	ISSUED FOR DA ONLY	IK	TC	15.08.2017

Client: FRASER PROPERTY AUSTRALIA
Architect: i2C ARCHITECTS

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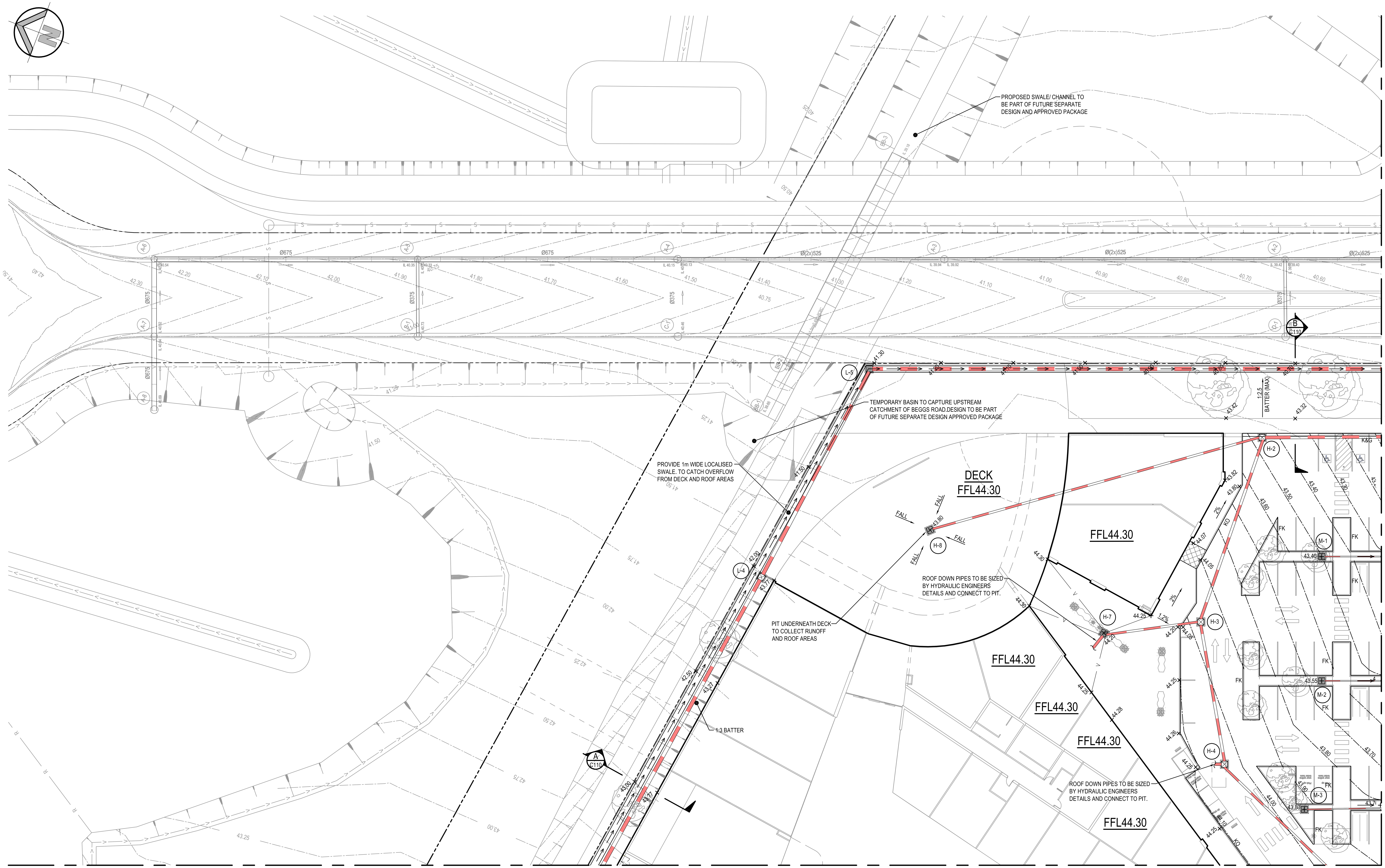
Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title: DETAIL PLAN
SHEET 1 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:250 @ A1

Drawing number: 17570_DA_C101
Revision: 03



FOR CONTINUATION REFER TO DWG.17570_DA_C101

DETAIL PLAN

SCALE 1:250

0 5 10 15 20 25m

SCALE 1:250

NOTES:

ROOF COLLECTION LINES NOT DOCUMENTED AT DA STAGE.
REFER TO DRAWING C250 FOR ROOF AREA CATCHMENT ALLOCATION
SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREAS ARE NOT SHOWN
FOR THE DA SUBMISSION. THESE TO BE DETAILED AT CC STAGE

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017
01	ISSUED FOR DA ONLY	IK	TC	15.08.2017

Client: FRASER PROPERTY AUSTRALIA

Architect: i2C ARCHITECTS

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henry&hymas

Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title: DETAIL PLAN
SHEET 2 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:250 @A1

Drawing number: 17570_DA_C102 Revision: 02

NOTES:

ROOF COLLECTION LINES NOT DOCUMENTED AT DA STAGE.
REFER TO DRAWING C250 FOR ROOF AREA CATCHMENT ALLOCATION
SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREAS ARE NOT SHOWN FOR THE DA SUBMISSION. THESE TO BE DETAILED AT CC STAGE

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

DETAIL PLAN

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017					
01	ISSUED FOR DA ONLY	IK	TC	15.08.2017					

Client: FRASER PROPERTY AUSTRALIA
Architect: i2C ARCHITECTS

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Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title: DETAIL PLAN
SHEET 3 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:250 @A1

Drawing number: 17570_DA_C103
Revision: 02

DETAIL PLAN

SCALE 1:250

SCALE 1:250

NOTES:

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REFER TO DRAWING C250 FOR ROOF AREA CATCHMENT ALLOCATION
SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREAS ARE NOT SHOWN
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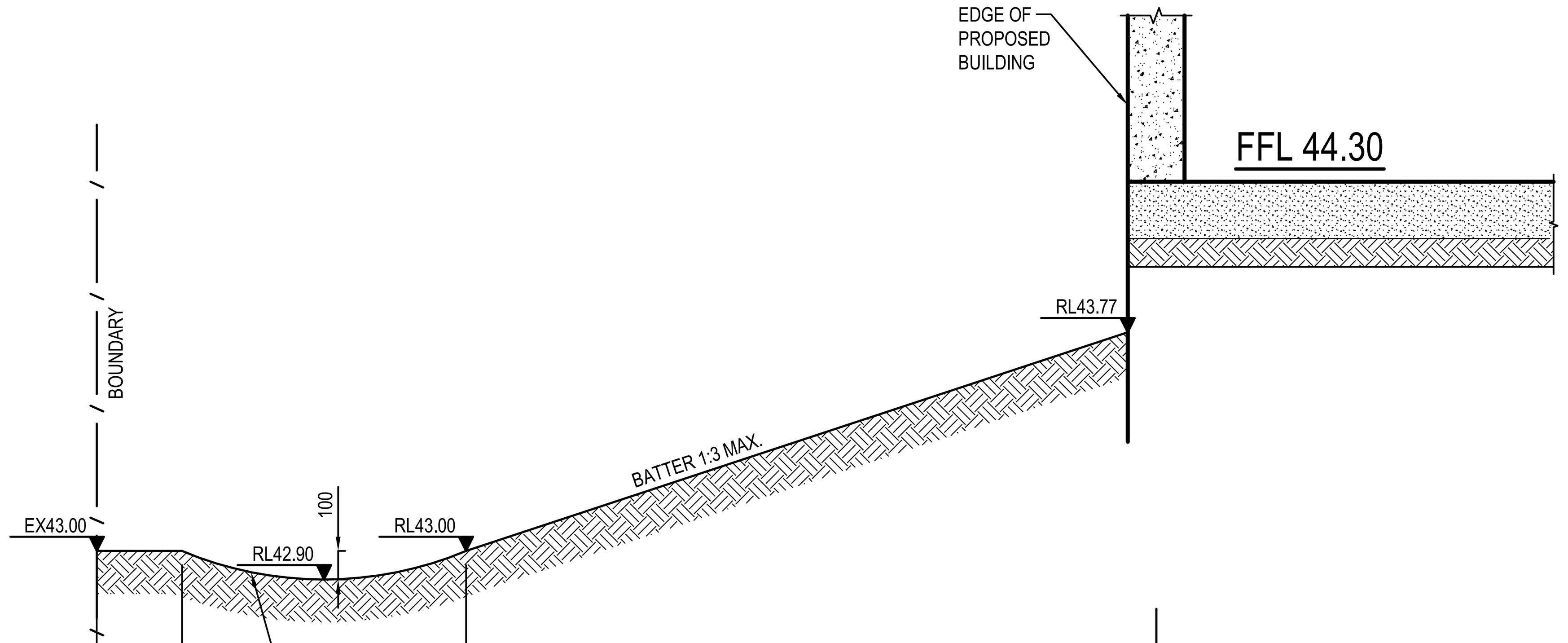
Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

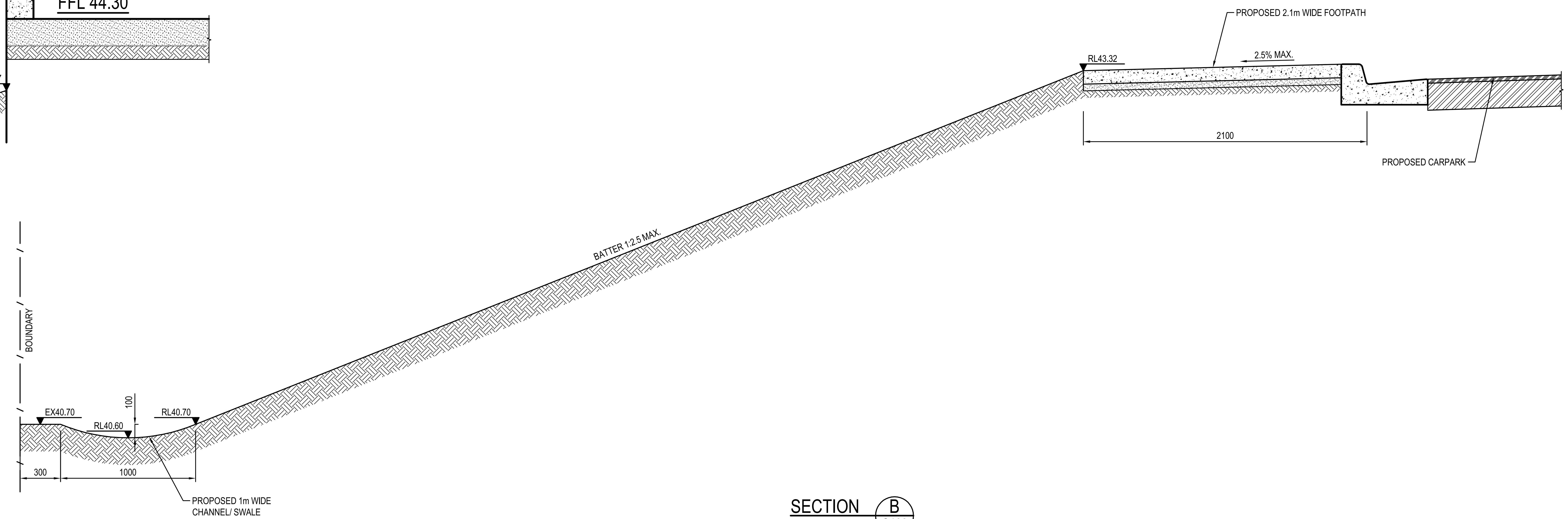
Title: DETAIL PLAN
SHEET 4 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:250 @A1

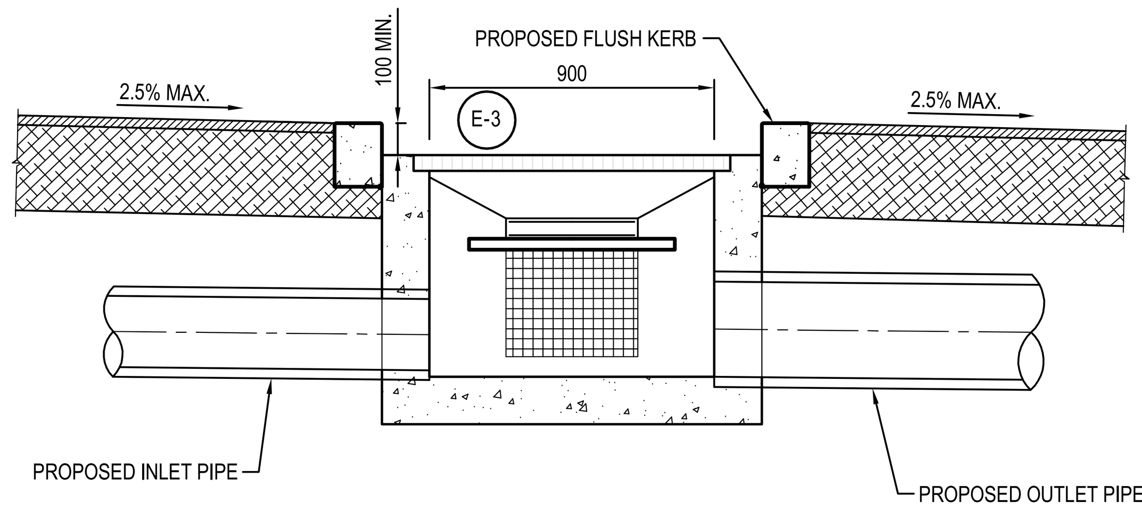
Drawing number: 17570_DA_C104 | Revision: 02



SECTION A C102
SCALE: 1:20

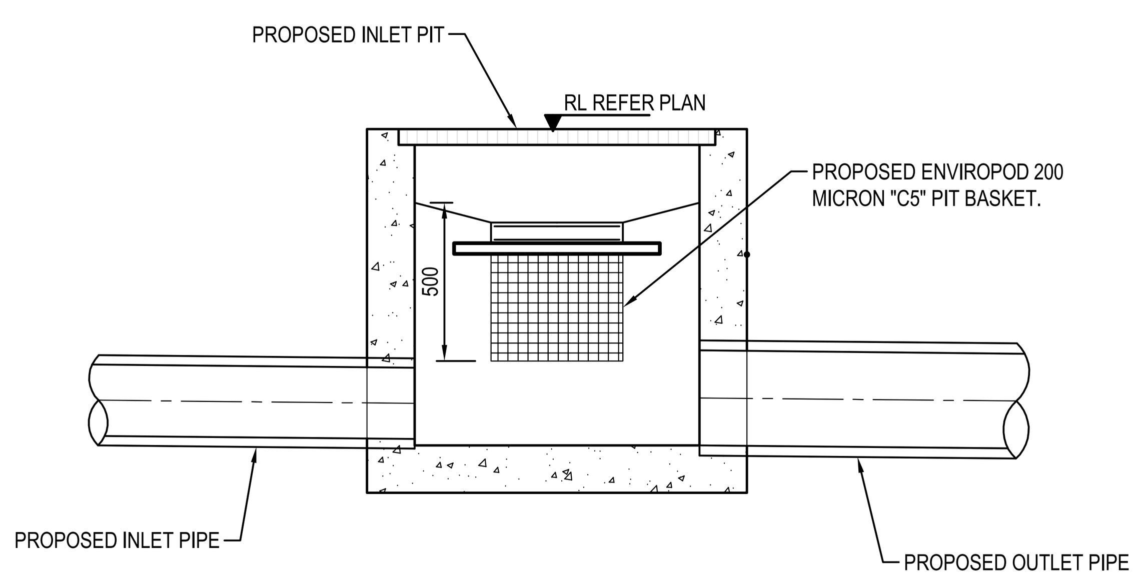


SECTION B C102
SCALE: 1:20

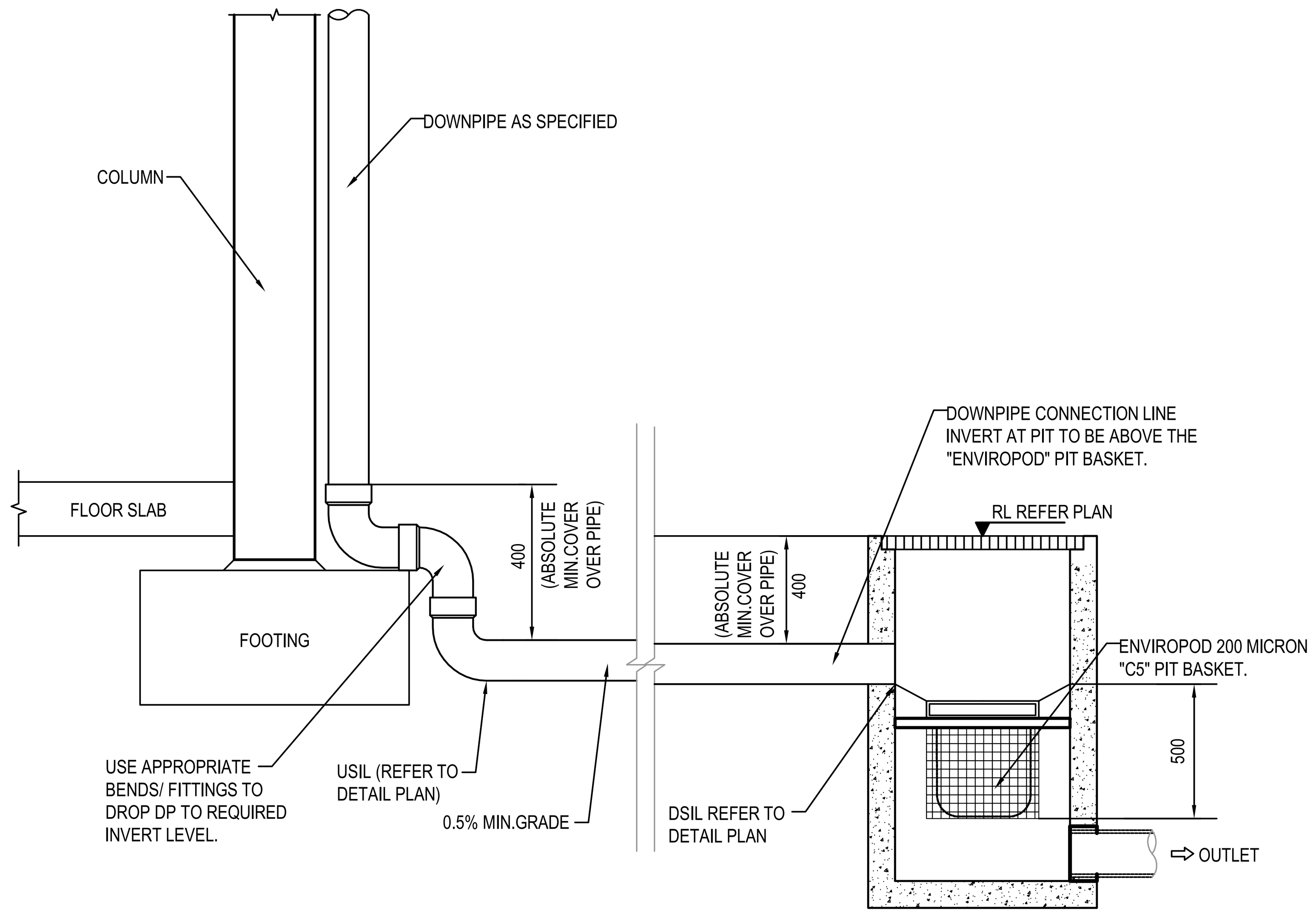


SECTION C C103
SCALE: 1:20

NOTE: THIS SECTION IS REFLECTIVE AND TYPICAL OF ALL LANDSCAPE PIT/SWALE AREAS WITHIN THE SITE CARPARK.

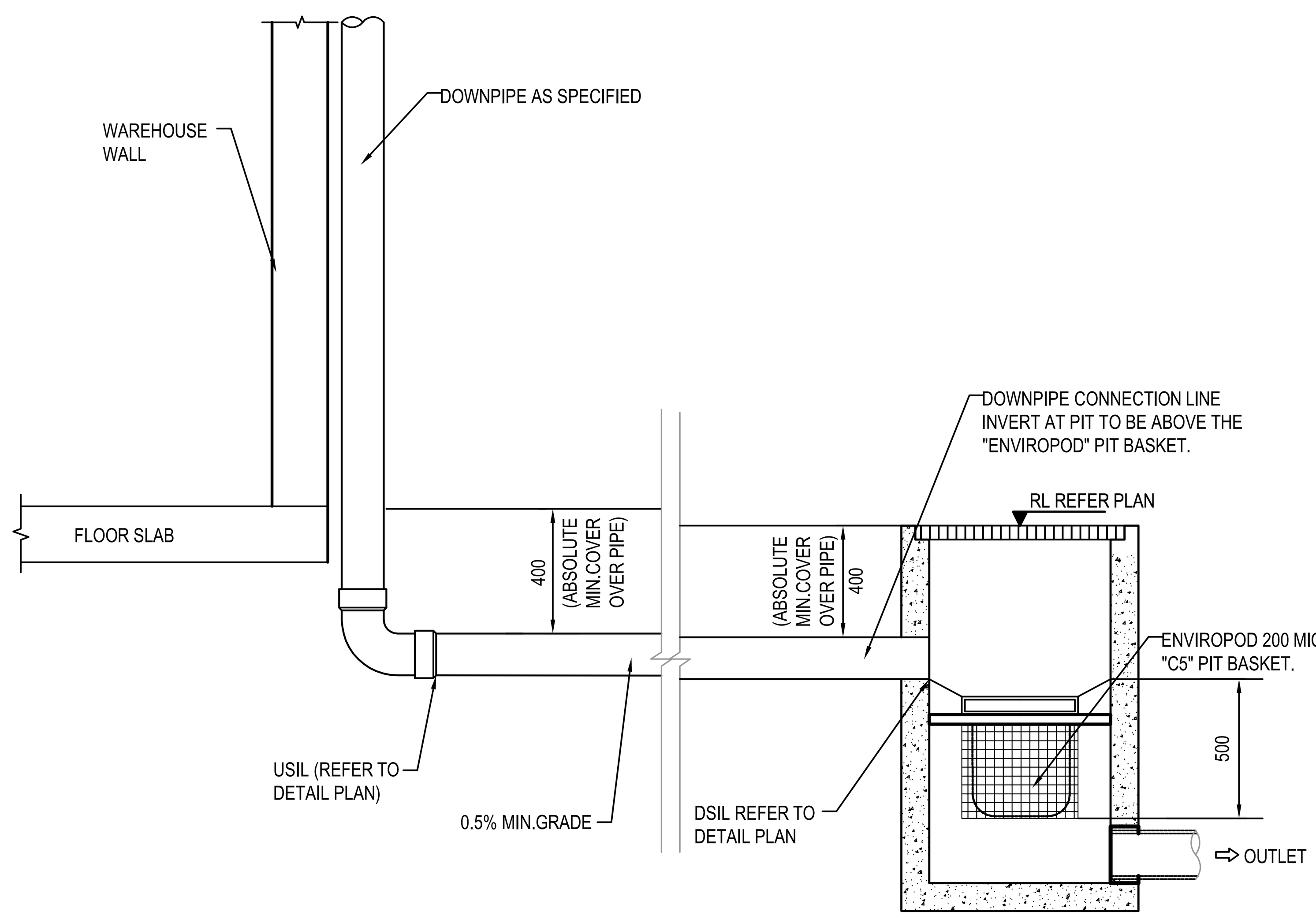


SCHEMATIC SECTION ENVIROPOD 200 SERIES
TYPICAL PIT FITTED WITH ENVIROPOD
SCALE 1:20



SCHEMATIC SECTION ENVIROPOD 200 SERIES
TYPICAL ROOF CONNECTION PIT AT COLUMN LOCATIONS
SCALE 1:20

NOTE: TO ENSURE THAT THE CORRECT CONFIGURATION OF THE "ENVIROPOD" PITS IS ACHIEVED, REFER TO INVERT LEVELS ON THE DETAIL PLANS. THESE INVERTS WILL ENSURE CORRECT COVER AND CONFIGURATION IS ACHIEVED.



SCHEMATIC SECTION ENVIROPOD 200 SERIES
TYPICAL ROOF CONNECTION PIT AT NON COLUMN LOCATIONS
SCALE 1:20

NOTE: TO ENSURE THAT THE CORRECT CONFIGURATION OF THE "ENVIROPOD" PITS IS ACHIEVED, REFER TO INVERT LEVELS ON THE DETAIL PLANS. THESE INVERTS WILL ENSURE CORRECT COVER AND CONFIGURATION IS ACHIEVED.

400 200 0 400 800 1200 1600 2000mm
SCALE 1:20

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

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Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

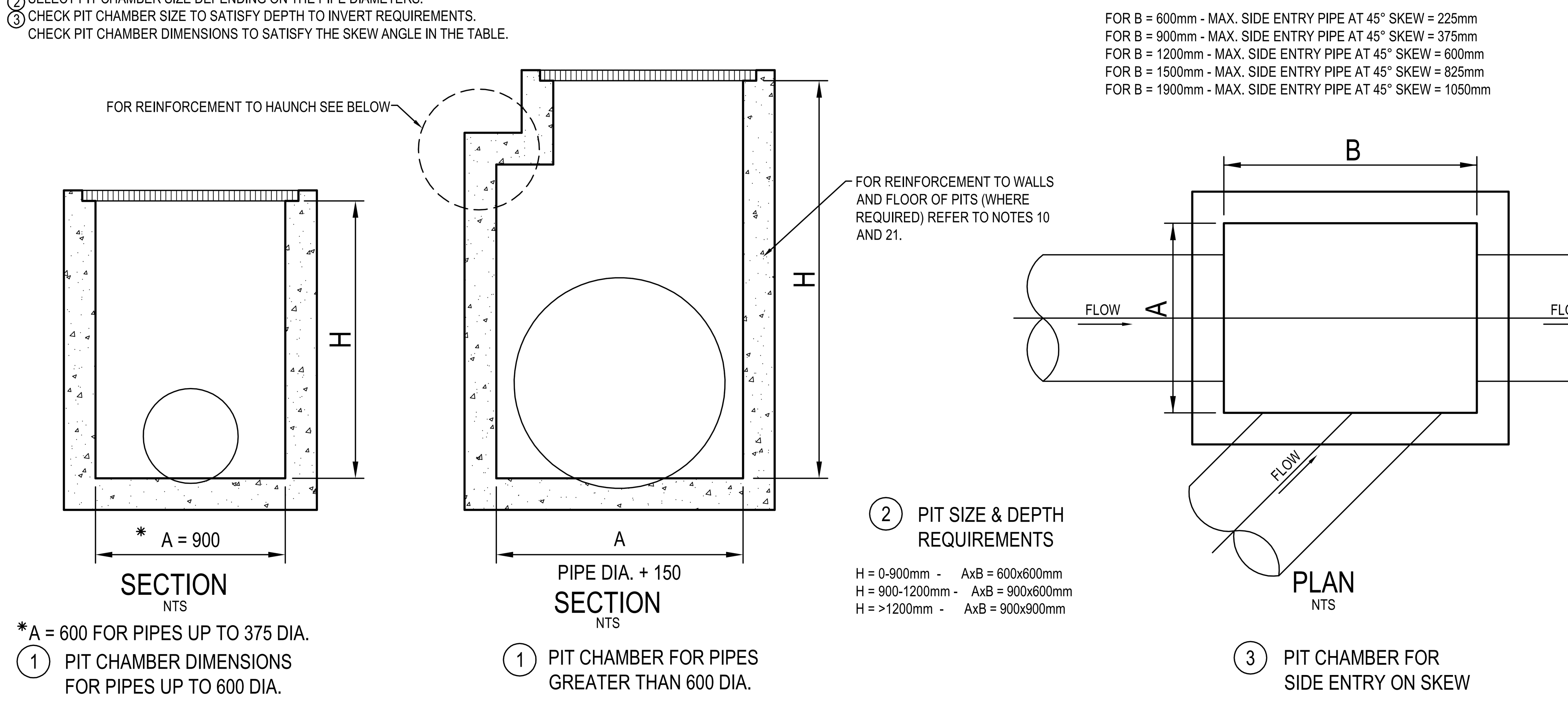
Title
TYPICAL SECTIONS

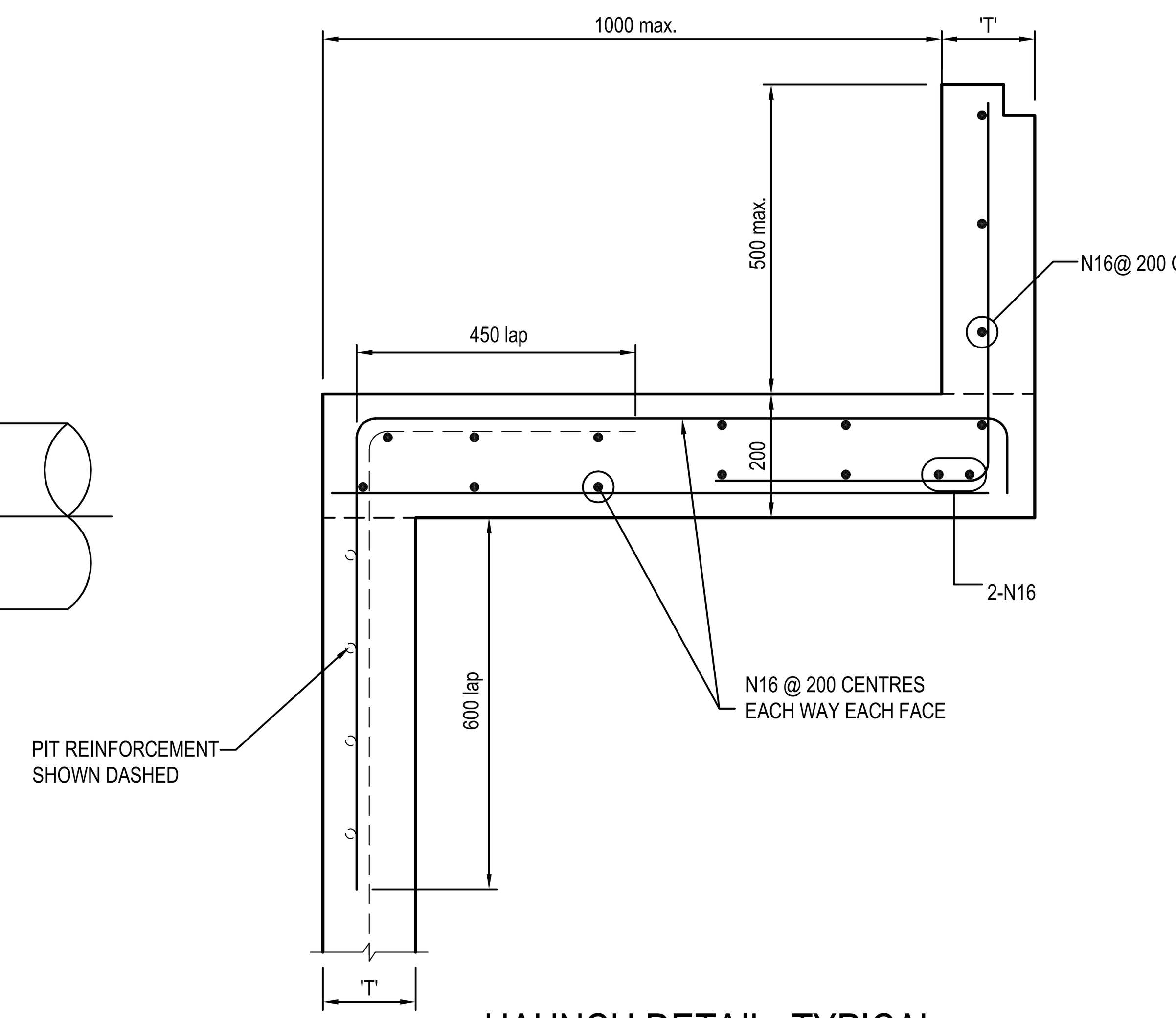
Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:20 @ A1

Drawing number: 17570_DA_C110
Revision: 01

TYPICAL PIT CHAMBER SIZES
IT IS THE CONTRACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

1. SELECT PIT CHAMBER USING THE STEPS BELOW:
2. SELECT PIT CHAMBER SIZE DEPENDING ON THE PIPE DIAMETERS.
3. CHECK PIT CHAMBER SIZE TO SATISFY DEPTH TO INVERT REQUIREMENTS.
CHECK PIT CHAMBER DIMENSIONS TO SATISFY THE SKEW ANGLE IN THE TABLE.

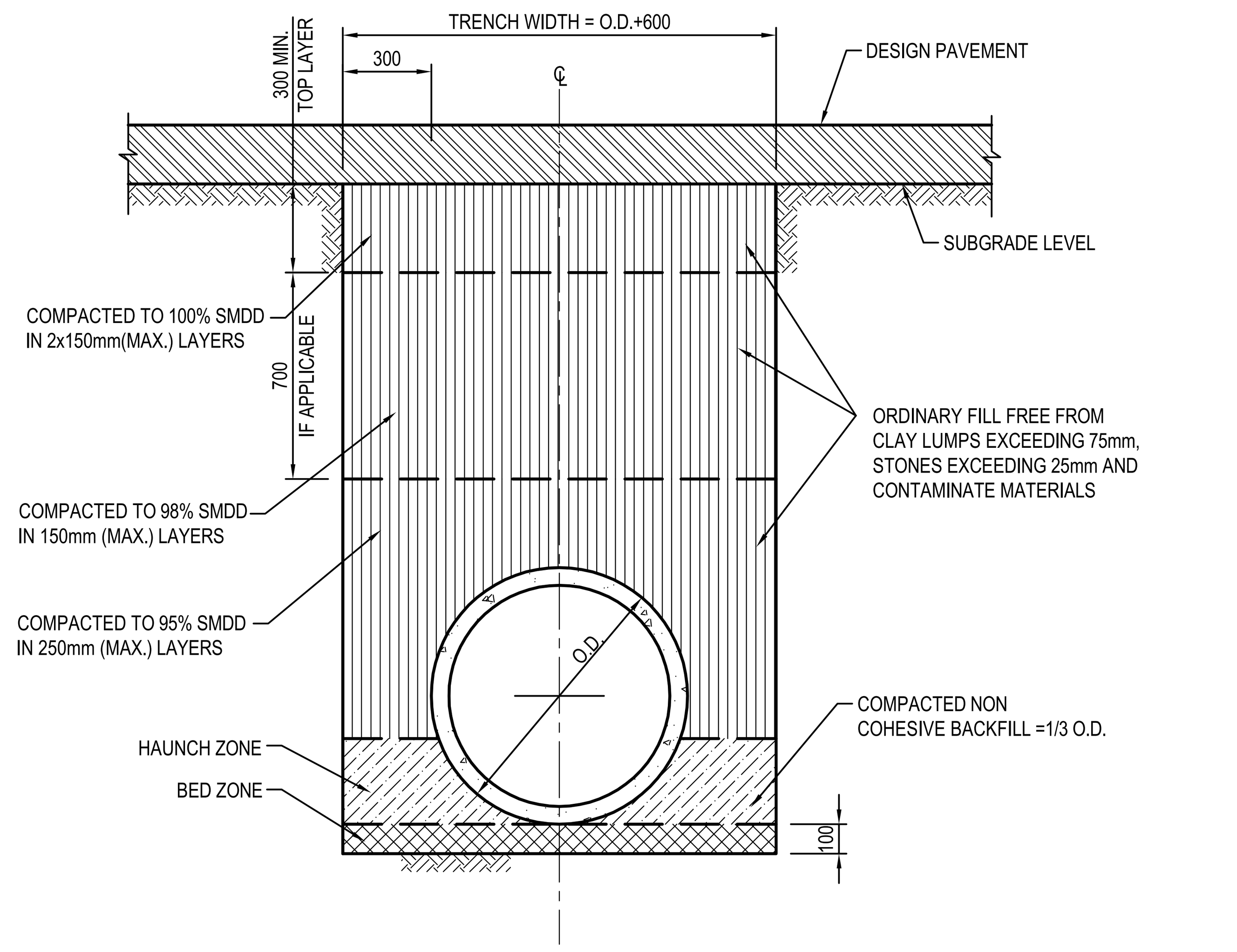




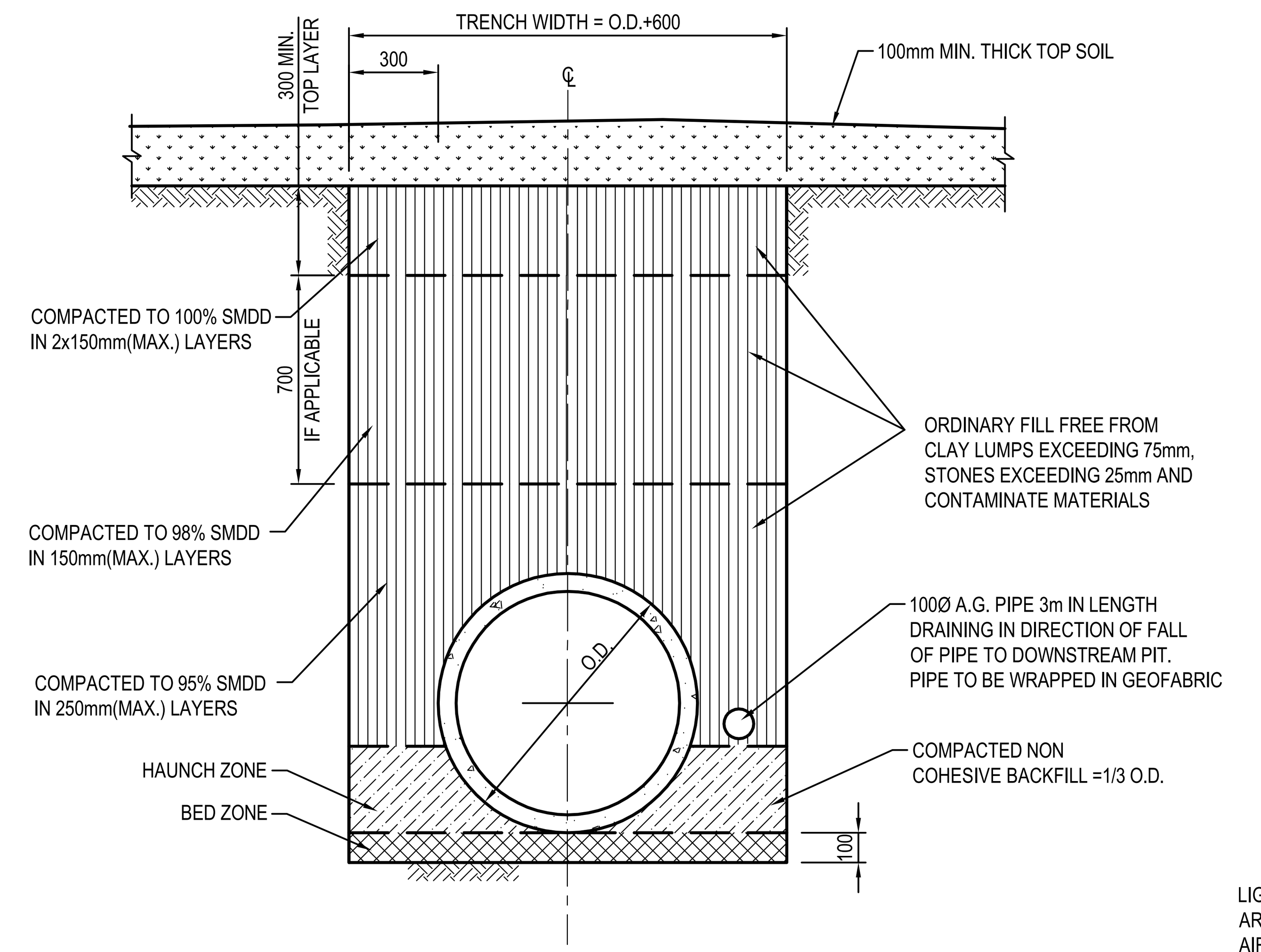
HAUNCH DETAIL -TYPICAL
SCALE 1:10

PIT LID SCHEDULE

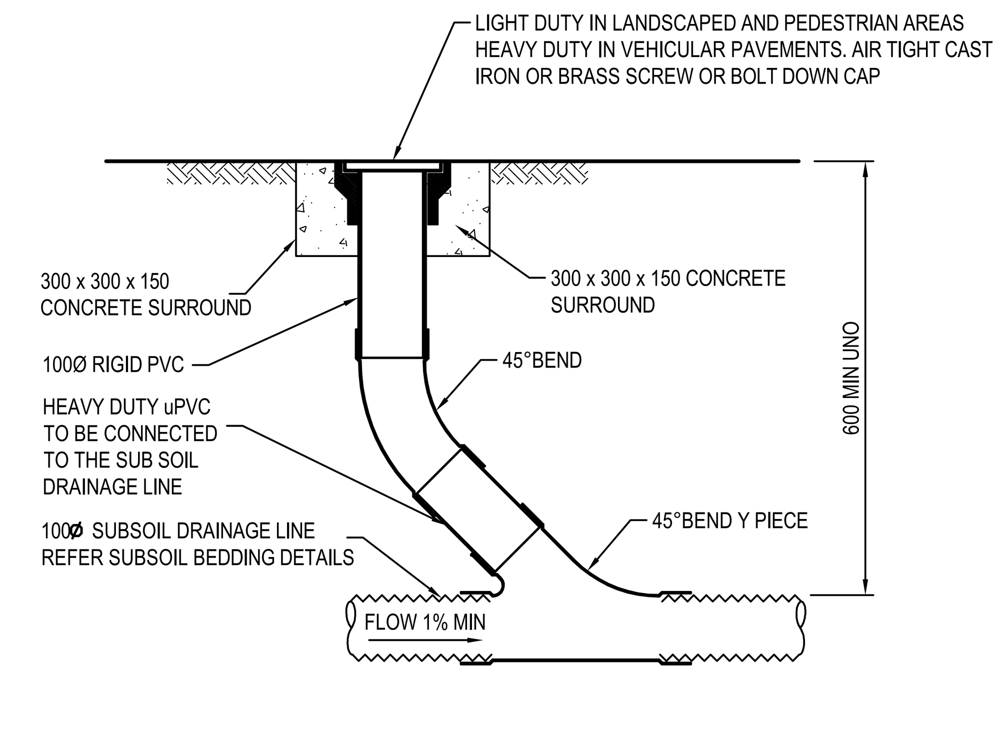
PIT/STRUCTURE NUMBER	DESCRIPTION
A-2, A-3, A-4, A-5, A-7, A-8, A-9, B-2, B-3, C-2, D-2, E-1, E-2, E-3, E-4, E-5, F-1, F-2, F-3, F-4, F-5, G-3, G-4, H-1, M-1, M-2, M-3	PROPOSED INLET PIT WITH 900x900 HINGED MEDIUM DUTY GRATED LID CLASS "C" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PITS TO BE FITTED WITH "ENVIROPOD" 200 MICRON PIT BASKET WITH OILSORBS OR EQUAL APPROVED EQUIVALENT.
A-6, B-1, C-1, D-1, G-1, G-2, H-2, H-3, H-4, H-5, H-6, I-1, I-2	PROPOSED JUNCTION PIT WITH 900x900 MEDIUM DUTY SEALED LID CLASS "C" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
I-3, I-4, I-5, I-6	PROPOSED INLET PIT WITH 900x900 HINGED HEAVY DUTY GRATED LID CLASS "D" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE FITTED WITH "ENVIROPOD" 200 MICRON PIT BASKET WITH OILSORBS OR EQUAL APPROVED EQUIVALENT.
L-2, L-3, L-4, J-1	PROPOSED JUNCTION PIT WITH 900x900 LIGHT DUTY SEALED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
A-1, H-7, H-8, K-2, K-3, K-4, K-5, L-5	PROPOSED INLET PIT WITH 900x900 HINGED LIGHT DUTY GRATED LID CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PITS TO BE FITTED WITH "ENVIROPOD" 200 MICRON PIT BASKET WITH OILSORBS OR EQUAL APPROVED EQUIVALENT.
K-1	PROPOSED KERB INLET PIT WITH 2.4m LINTEL AND HEAVY DUTY GRATED LID CLASS "D" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT. PIT TO BE FITTED WITH ENVIRPOD PIT BASKET WITH OILSORB IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.
SD-1, SD-2, SD-3, SD-4, SD-5	PROPOSED 300mm WIDE (ACO DRAIN) HEAVY DUTY GRATED DRAIN CLASS "D", GRATED DRAIN TO CONNECT TO A 900X900 GRATED INLET PIT FITTED WITH ENVIROPOD PIT BASKET WITH OILSORB IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENT.



PIPE TRENCH INSTALLATION BENEATH PAVEMENT
(H1 & H2 SUPPORT)
SCALE 1:20

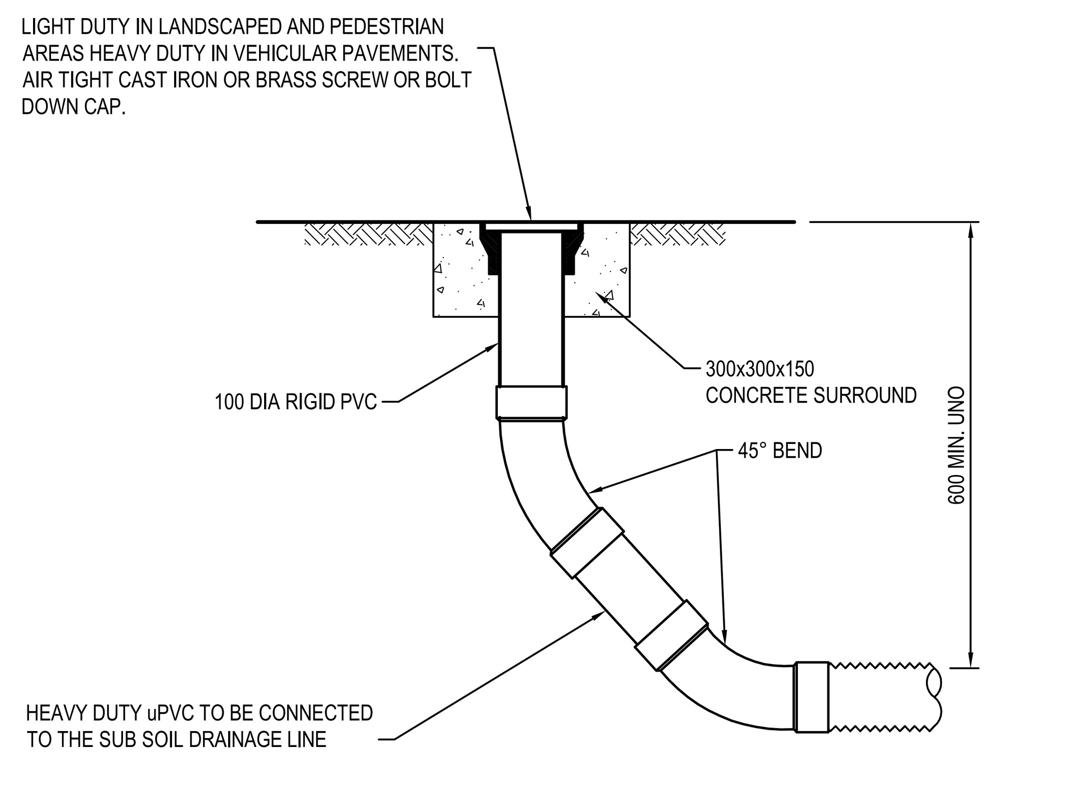


PIPE TRENCH INSTALLATION IN LANDSCAPE AREAS
(H1 & H2 SUPPORT)
SCALE 1:20



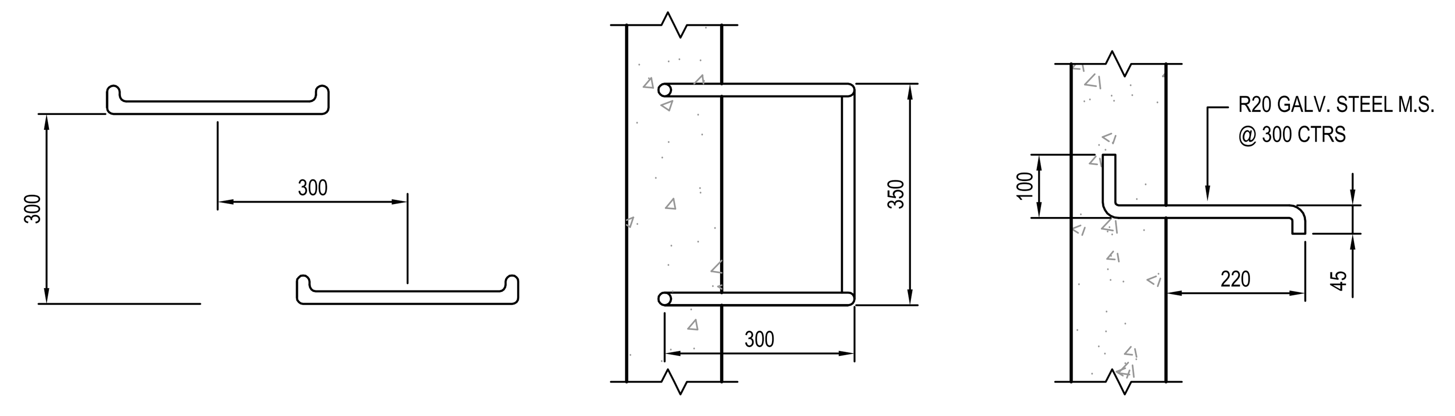
INTERMEDIATE RISER (IR)
SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED

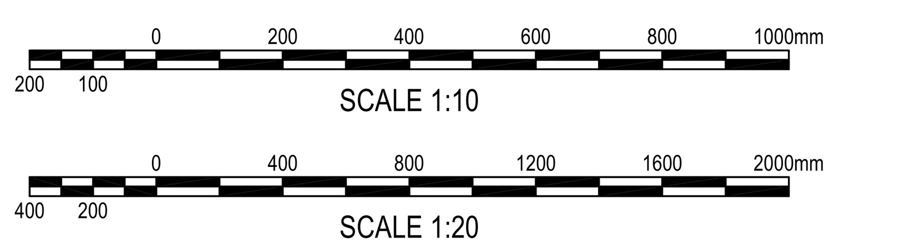


FLUSHING POINT (FP)
SCALE 1:10

NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



TYPICAL STEP IRON DETAIL
SCALE 1:10



DRAINAGE NOTES:

1. ALL STORMWATER WORK TO COMPLY WITH AS 3500 PART 3.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM COVER OF 600mm ON ALL PIPES.
3. PROTECTION OF PIPES DUE TO LOADS EXCEEDING W7 WHEEL LOAD SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
4. BEDDING TYPE SHALL BE TYPE H2 FOR RCP. WHERE NECESSARY THE OVERLAY ZONE SHALL BE REDUCED TO ACCOMMODATE PAVEMENT REQUIREMENTS. REFER TO THIS DRAWING FOR DETAILS.
5. MINIMUM COVER OVER EXISTING PIPES FOR PROTECTION DURING CONSTRUCTION SHALL BE 800mm.
6. NO CONSTRUCTION LOADS SHALL BE APPLIED TO PLASTIC PIPES.
7. FINISHED SURFACE LEVELS SHOWN ON LAYOUT PLAN DRGS TAKE PRECEDENCE OVER DESIGN DRAINAGE SURFACE LEVELS.
8. ALL PIPES UP TO AND INCLUDING 300 DIA. SHALL BE SOLVENT OR RUBBER RING JOINTED PVC CLASS SH PIPE TO AS1260. ALL OTHER PIPES TO BE RCP USING CLASS 2 RUBBER RING JOINTED PIPE. HARDIES FRC PIPE MAY BE USED IN LIEU OF RCP IF DESIRED IN GROUND. ALL AERIAL PIPES TO BE PVC CLASS SH.
9. ALL PITS IN NON TRAFFICABLE AREAS TO BE PREFABRICATED POLYESTER CONCRETE "POLYCRETE" WITH "LIGHT DUTY" CLASS B GALV. MILD STEEL GRATING AND FRAME.
ALL PITS IN TRAFFICABLE AREAS (CLASS "D" LOADING MAX) TO HAVE 150mm THICK CONCRETE WALLS AND BASE CAST IN-SITU f'c=32 MPa, REINFORCED WITH N12-200 BOTH LOADING WAYS CENTRALLY PLACE .U.N.O. ON SEPARATE DESIGN DRAWINGS IN THIS SET. GALV.MILD STEEL GRATING AND FRAME TO SUIT DESIGN LOADING. PRECAST PITS, RECTANGULAR OR CIRCULAR IN SHAPE, MAY BE USED IN LIEU AND SHALL COMPLY WITH RELEVANT AUSTRALIAN STANDARDS.
10. ALL PITS, GRATINGS AND FRAMES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION AND TO BE IN ACCORDANCE WITH AS3500.3 AND AS3996.
11. PIT CHAMBER DIMENSIONS ARE TO BE SELECTED TO SATISFY THE FOLLOWING:
- PIPE SIZE
- DEPTH TO INVERT
- SKEW ANGLE
REFER TYPICAL PIT CHAMBER DETAILS BELOW
IF PIT LID SIZE IS SMALLER THAN THE PIT CHAMBER SIZE THEN THE PIT LID IS TO BE CONSTRUCTED ON THE CORNER OF THE PIT CHAMBER WITH THE STEP IRONS DIRECTLY BELOW. ALTERNATIVELY THE PIT LID TO BE USED, IS TO BE THE SAME SIZE AS THE PIT CHAMBER.
12. FOR PIPE SIZES GREATER THAN Ø300mm, PIT FLOOR IS TO BE BENCHED TO FACILITATE FLOW.
13. GALVANISED STEP IRONS SHALL BE PROVIDED AT 300 CTS FOR PITS HAVING A DEPTH EXCEEDING 1200mm. SUBSOIL DRAINAGE PIPE SHALL BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES. (MINIMUM LENGTH 3m).
14. ALL SUBSOIL PIPES SHALL BE 100mm SLOTTED PVC IN A FILTER SOCK, UNO, WITH 3m INSTALLED UPSTREAM OF ALL PITS.
15. ALL PIPEWORK SHALL HAVE MINIMUM DIAMETER 100.
16. MINIMUM GRADE FOR ROOFWATER DRAINAGE LINES SHALL BE 1%.
17. ALL PIPE JUNCTIONS AND TAPER UP TO AND INCLUDING 300 DIA. SHALL BE VIA PURPOSE MADE FITTINGS.
18. ALL ROOF DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH AS3500, PART 3. TESTING TO BE UNDERTAKEN AND REPORTS PROVIDED TO THE SUPERINTENDENT.
19. LOCATION OF THE DIRECT DOWN PIPE CONNECTIONS MAY VARY ON SITE TO SUIT SITE CONDITIONS, WHERE CONNECTION SHOWN ON LONG SECTIONS CHAINAGES ARE INDICATIVE ONLY.
20. PITS IN EXCESS OF 1.5 m DEEP TO HAVE WALL AND FLOOR THICKNESS INCREASED TO 200mm. REINFORCED WITH N12@200 CTS CENTRALLY PLACED BOTH WAYS THROUGHOUT U.N.O.ON SEPARATE DESIGN DRAWINGS IN THIS SET. IF DEPTH EXCEEDS 5m CONTACT ENGINEER.
21. SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREA NOT SHOWN ON THESE DRAWINGS. REFER TO LANDSCAPING PLANS FOR DETAILS.
22. ALL STORMWATER PITS TO HAVE Ø100 uPVC SLOTTED SUBSOIL PIPES CONNECTED TO THEM. THESE SUBSOILS TO EXTEND 3m UPSTREAM OF THE PIT AT A MINIMUM GRADE.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

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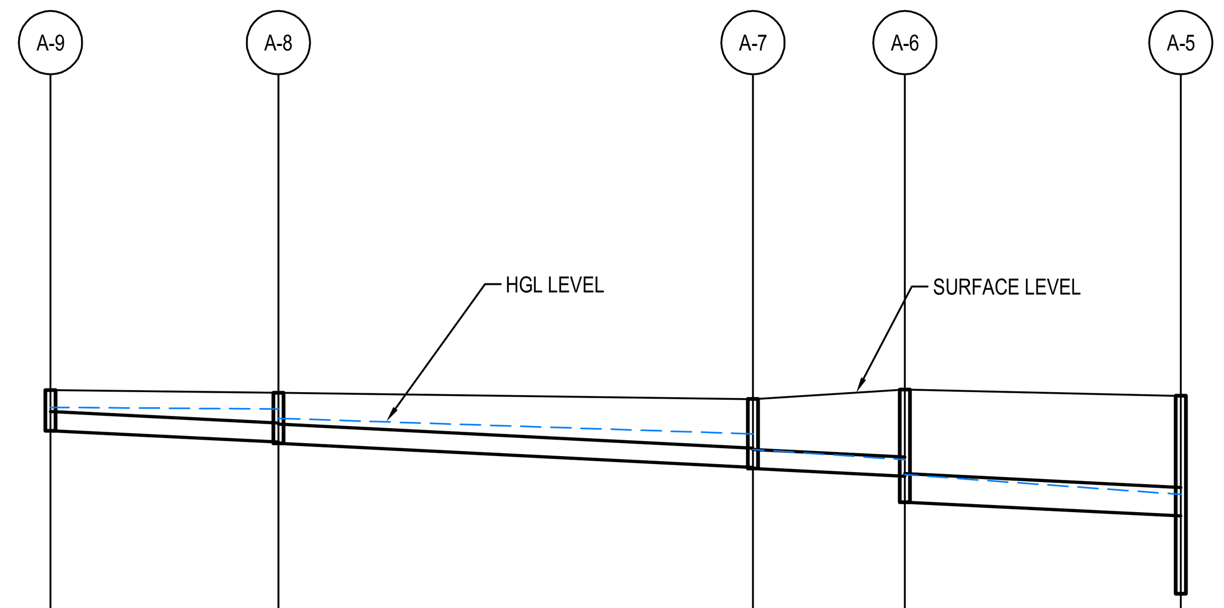
Project: PROPOSED NEW SHOPPING CENTRE ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title: STORMWATER MISCELLANEOUS DETAILS & PIT LID SCHEDULE

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	**Approved**	**Scale**
T.Dempsey	A.Francis	AS NOTED @ A1

Drawing number: 17570_DA_C200 Revision: 02

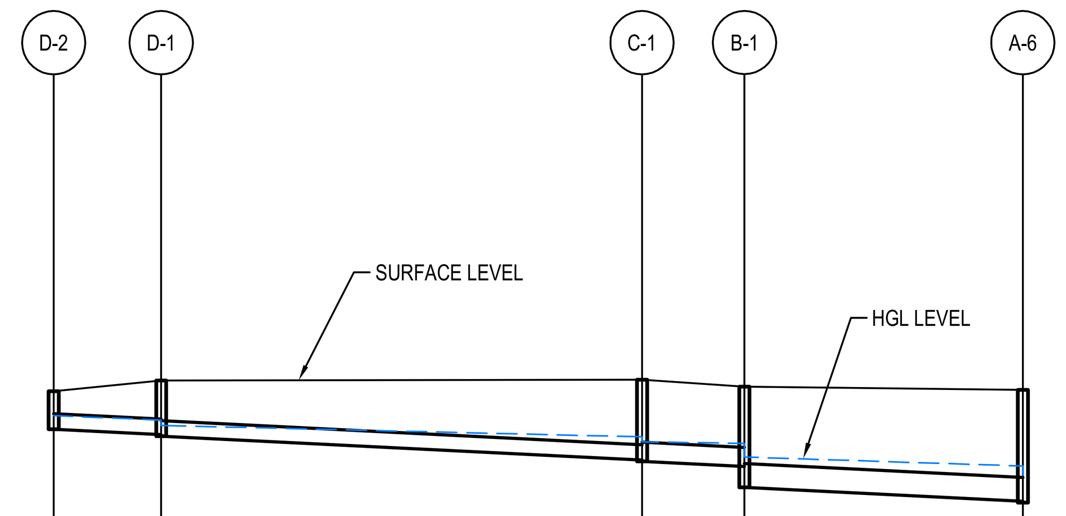


Flow (L/s)	40L/s	87L/s	117L/s	258L/s
Velocity (m/s)	0.55m/s	1.21 m/s	1.76 m/s	2.01 m/s
Pipe Size & Class	Ø300 uPVC	Ø300 uPVC	Ø300 uPVC	Ø450 RCP C2
Grade (%)	1.00%	1.01%	1.00%	1.00%

Datum RL 30.00

	A-9	A-8	A-7	A-6	A-5
DEPTH TO INVERT (m)	0.700	1.000	1.230	1.780	3.130
H.G.L. LEVELS 1 in 20 Year ARI	43.668	43.643 / 43.495	43.249 / 43.003	42.841 / 42.604	42.292
SURFACE R.L.	43.75	43.85	43.68	43.95	43.85
INVERT R.L.	43.050	42.870 / 42.850	42.470 / 42.450	42.330 / 42.170	41.952
PIPE CHAINAGE (m)	0	18.00	55.50	67.50	89.30

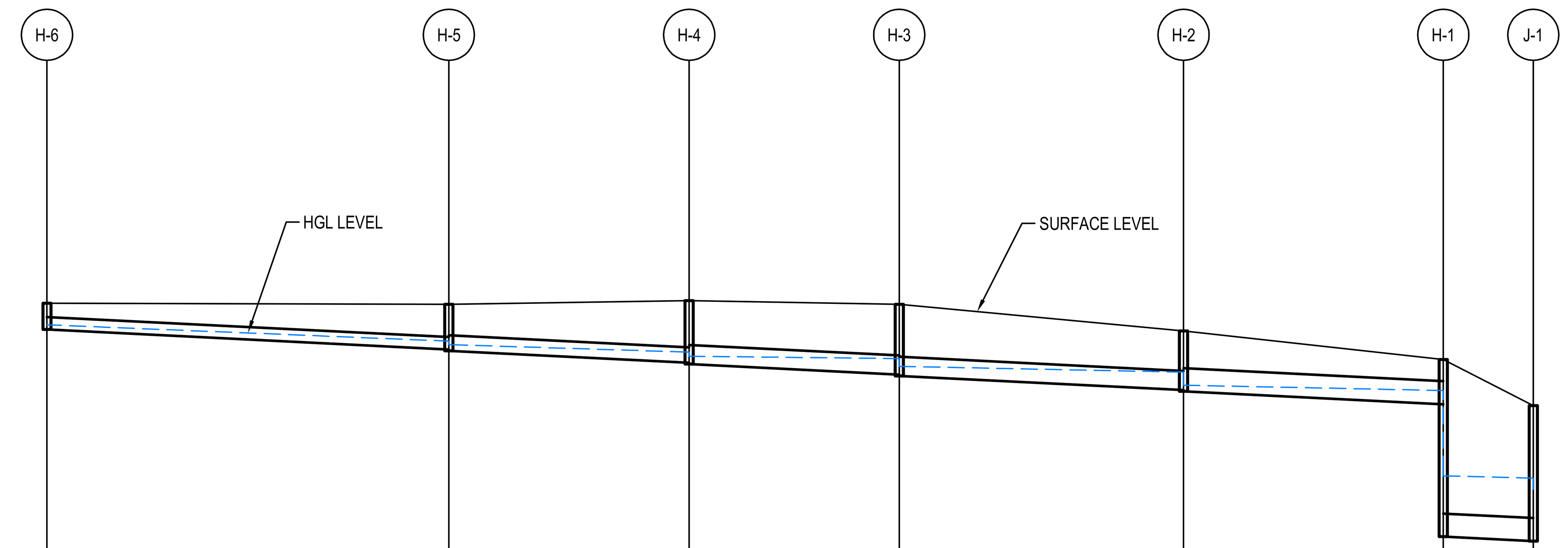
LINE A
SCALE: H 1:500 / V 1:100



Flow (L/s)	40L/s	40L/s	65L/s	148L/s
Velocity (m/s)	0.93m/s	1.19m/s	0.89m/s	1.33m/s
Pipe Size & Class	Ø225 uPVC	Ø225 uPVC	Ø300 uPVC	Ø375 RCP C2
Grade (%)	1.00%	1.00%	1.00%	1.00%

	D-2	D-1	C-1	B-1	A-6
DEPTH TO INVERT (m)	0.630	0.870	1.420	1.590	1.780
H.G.L. LEVELS 1 in 20 Year ARI	43.543	43.472 / 43.387	43.208 / 43.131	43.103 / 42.889	42.747
SURFACE R.L.	43.83	43.960	44.11	44	43.95
INVERT R.L.	43.200	43.110 / 43.090	42.710 / 42.690	42.600 / 42.410	42.190 / 42.170
PIPE CHAINAGE (m)	0	8.50	46.50	54.60	76.60

LINE D
SCALE: H 1:500 / V 1:100



Flow (L/s)	17L/s	37L/s	63L/s	106L/s	191L/s	204L/s
Velocity (m/s)	1.12m/s	1.35m/s	1.46m/s	1.93m/s	5.78m/s	1.28m/s
Pipe Size & Class	Ø225 uPVC	Ø300 uPVC	Ø375 RCP C2	Ø375 RCP C2	Ø450 RCP C2	Ø450RCP C2
Grade (%)	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

	H-6	H-5	H-4	H-3	H-2	H-1	J-1
DEPTH TO INVERT (m)	0.680	1.080	1.410	1.570	1.350	3.460	2.650
H.G.L. LEVELS 1 in 20 Year ARI	43.579	43.261 / 43.192	43.045 / 42.965	42.919 / 42.766	42.655 / 42.397	42.295 / 40.625	40.367
SURFACE R.L.	44	43.98	44.05	43.98	43.46	42.90	42
INVERT R.L.	43.320	42.920 / 42.900	42.660 / 42.640	42.430 / 42.410	42.130 / 42.110	41.850 / 39.438	39.350
PIPE CHAINAGE (m)	0	39.30	62.80	83.34	111.14	136.54	145.34

LINE H
SCALE: H 1:500 / V 1:100

SCALE 1:100

SCALE 1:500

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
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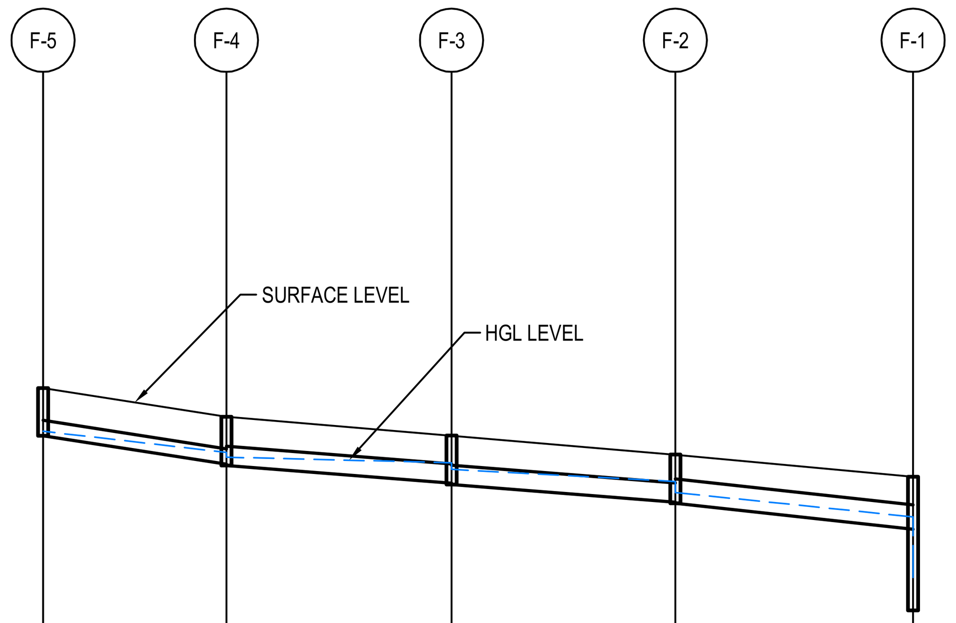
Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title
STORMWATER LONGITUDINAL SECTIONS
SHEET 1 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	AS NOTED @ A1

Drawing number: 17570_DA_C210
Revision: 01

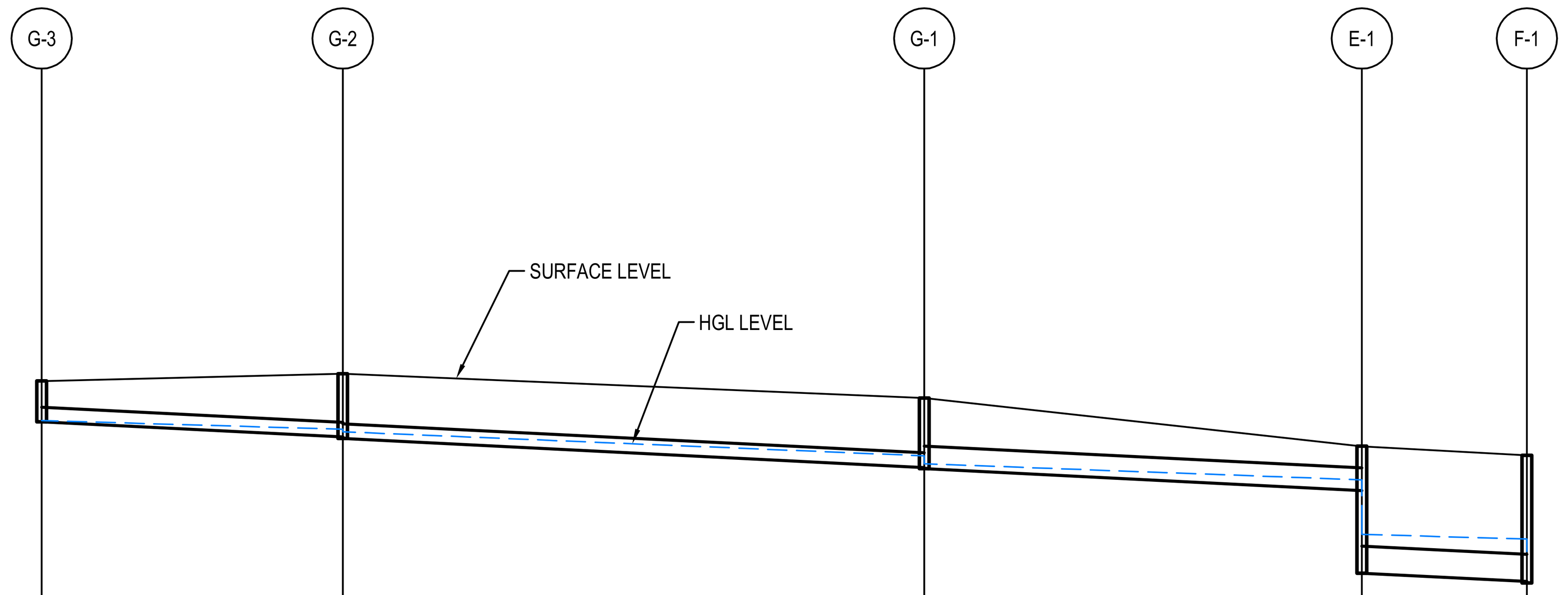


Datum RL 30.00

Station	F-5	F-4	F-3	F-2	F-1
DEPTH TO INVERT (m)	0.680	0.770	0.770	0.770	2.110
H.G.L. LEVELS 1 in 20 Year ARI	43.070	42.735 / 42.660	42.573 / 42.467	42.276 / 42.102	41.716
SURFACE R.L.	43.50	43.3	43	42.70	42.35
INVERT R.L.	42.820	42.550 / 42.530	42.250 / 42.230	41.950 / 41.930	41.520
PIPE CHAINAGE (m)	0	14.50	32.30	50.00	68.80

Segment	F-5 to F-4	F-4 to F-3	F-3 to F-2	F-2 to F-1
Flow (L/s)	19L/s	52L/s	95L/s	121L/s
Velocity (m/s)	1.72m/s	1.74m/s	1.64m/s	3.08m/s
Pipe Size & Class	Ø225 uPVC	Ø300 uPVC	Ø300 uPVC	Ø375 RCP C2
Grade (%)	1.86%	1.57%	1.58%	2.18%

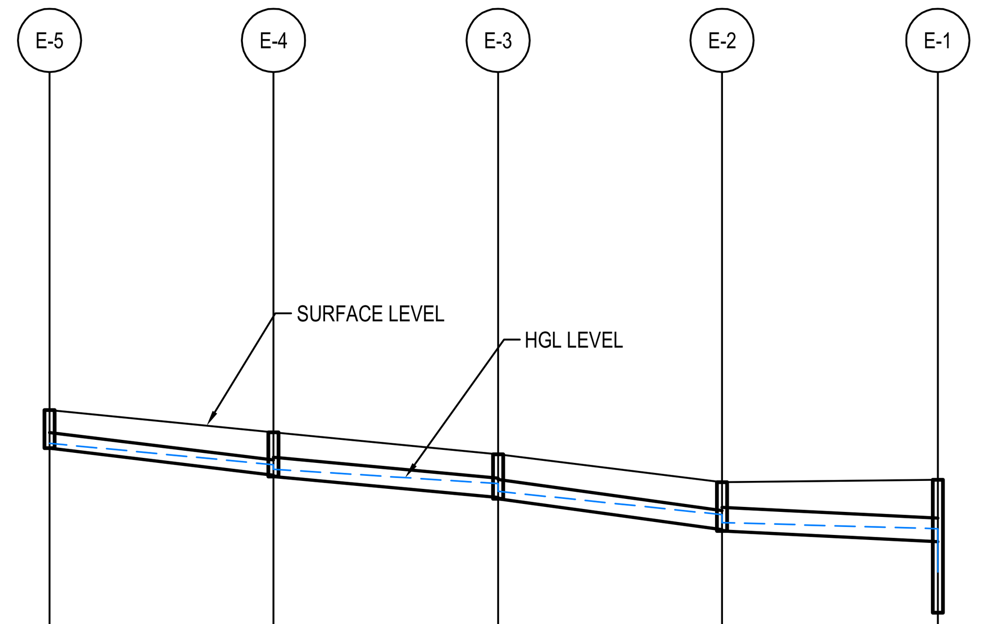
LINE F
SCALE: H 1:500 / V 1:100



Station	G-3	G-2	G-1	E-1	F-1
DEPTH TO INVERT (m)	0.675	1.070	1.170	2.100	2.110
H.G.L. LEVELS 1 in 20 Year ARI	42.927	42.782 / 42.741	42.342 / 42.211	41.946 / 41.042	40.966
SURFACE R.L.	43.58	43.7	43.3	42.5	42.35
INVERT R.L.	42.905	42.656 / 42.630	42.149 / 42.130	41.550 / 40.400	40.264
PIPE CHAINAGE (m)	0	24.90	73.00	109.20	122.85

Segment	G-3 to G-2	G-2 to G-1	G-1 to E-1	E-1 to F-1
Flow (L/s)	26L/s	26L/s	80L/s	208L/s
Velocity (m/s)	12.24m/s	1.24m/s	4.52m/s	1.31m/s
Pipe Size & Class	Ø225 uPVC	Ø225 uPVC	Ø375 RCP C2	Ø450 RCP C2
Grade (%)	1.00%	1.00%	1.60%	1.00%

LINE G
SCALE: H 1:500 / V 1:100



Station	E-5	E-4	E-3	E-2	E-1
DEPTH TO INVERT (m)	0.675	0.770	0.770	0.850	2.100
H.G.L. LEVELS 1 in 20 Year ARI	43.075	42.737 / 42.665	42.439 / 42.315	41.949 / 41.823	41.726
SURFACE R.L.	43.50	43.25	42.90	42.46	42.5
INVERT R.L.	42.825	42.500 / 42.480	42.150 / 42.130	41.630 / 41.610	41.430
PIPE CHAINAGE (m)	0	17.70	35.45	53.15	70.20

Segment	E-5 to E-4	E-4 to E-3	E-3 to E-2	E-2 to E-1
Flow (L/s)	19L/s	45L/s	79L/s	103L/s
Velocity (m/s)	1.58m/s	1.79m/s	3.13m/s	2.95m/s
Pipe Size & Class	Ø225 uPVC	Ø300 uPVC	Ø300 uPVC	Ø375 RCP C2
Grade (%)	1.84%	1.86%	2.82%	1.00%

LINE E
SCALE: H 1:500 / V 1:100

2 1 0 2 4 6 8 10m
SCALE 1:100

10 8 6 4 2 0 10 20 30 40 50m
SCALE 1:500

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TC	25.08.2017

Client
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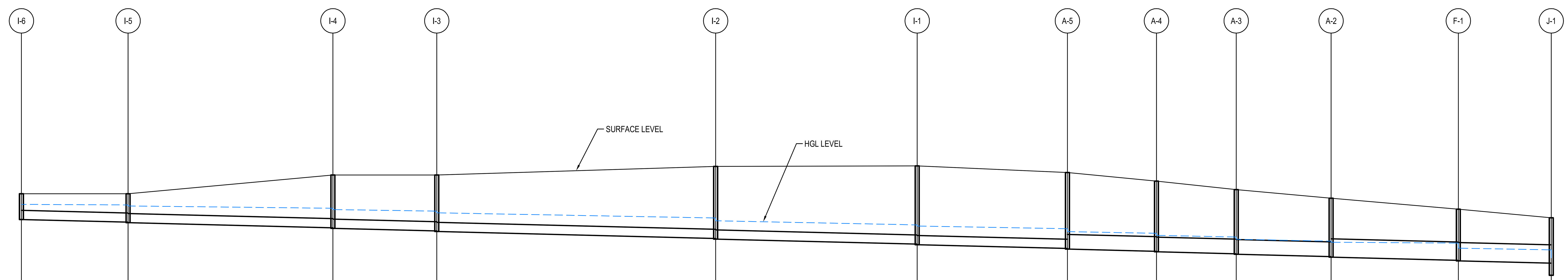
Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title
STORMWATER LONGITUDINAL SECTIONS
SHEET 2 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	AS NOTED @ A1

Drawing number: 17570_DA_C211
Revision: 01



	I-6 to I-5	I-5 to I-4	I-4 to I-3	I-3 to I-2	I-2 to I-1	I-1 to A-5	A-5 to A-4	A-4 to A-3	A-3 to A-2	A-2 to F-1	F-1 to J-1
Flow (L/s)	59L/s	87L/s	99L/s	113L/s	114L/s	115L/s	377L/s	387L/s	398L/s	410L/s	782L/s
Velocity (m/s)	0.52m/s	0.78m/s	0.86m/s	0.97m/s	0.98m/s	0.98m/s	1.29m/s	1.32m/s	1.35m/s	1.03m/s	2.37m/s
Pipe Size & Class	Ø375 RCP C2	Ø375 RCP C2	Ø375 RCP C2	Ø375 RCP C2	Ø375 RCP C2	Ø375 RCP C2	Ø600 RCP C2	Ø600 RCP C2	Ø600 RCP C2	Ø750 RCP C2	Ø750 RCP C2
Grade (%)	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%

Datum RL 30.00

	I-6	I-5	I-4	I-3	I-2	I-1	A-5	A-4	A-3	A-2	F-1	J-1
DEPTH TO INVERT (m)	1.050	1.180	2.180	2.310	2.970	3.220	3.130	2.890	2.640	2.410	2.110	2.350
H.G.L. LEVELS 1 in 20 Year ARI	42.548	42.526 / 42.483	42.389 / 42.336	42.273 / 42.204	41.991 / 41.877	41.709 / 41.663	41.553 / 41.433	41.366 / 41.282	41.212 / 41.123	41.044 / 41.001	40.966 / 40.758	40.689
SURFACE R.L.	42.98	42.98	43.75	43.75	44.10	44.12	43.85	43.5	43.15	42.8	42.35	42
INVERT R.L.	41.930	41.821 / 41.800	41.591 / 41.570	41.464 / 41.440	41.155 / 41.130	40.924 / 40.900	40.747 / 40.720	40.629 / 40.610	40.528 / 40.510	40.413 / 40.390	40.260 / 40.240	40.145
PIPE CHAINAGE (m)	0	21.80	63.67	84.89	141.89	183.09	213.79	231.99	248.29	267.69	293.69	312.69

LINE I

SCALE: H 1:500 / V 1:100

SCALE 1:100 (0 2 4 6 8 10m)

SCALE 1:500 (0 10 20 30 40 50m)

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TC	25.08.2017					

Client: FRASER PROPERTY AUSTRALIA

Architect: i2C ARCHITECTS

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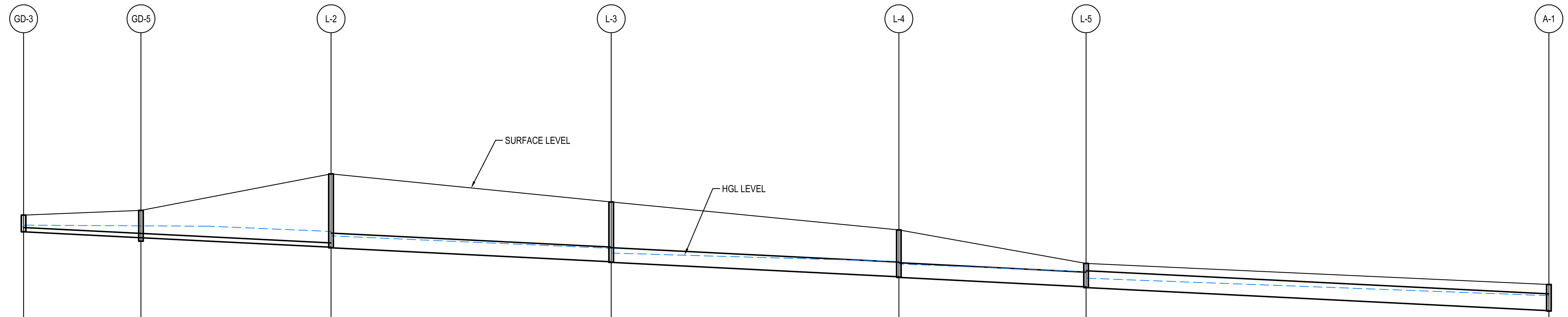
Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title: STORMWATER LONGITUDINAL SECTIONS
SHEET 3 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	AS NOTED @ A1

Drawing number: 17570_DA_C212
Revision: 01



	GD-3 to GD-5	GD-5 to L-2	L-2 to L-3	L-3 to L-4	L-4 to L-5	L-5 to A-1
Flow (L/s)	6L/s	16L/s	369L/s	361L/s	355L/s	362L/s
Velocity (m/s)	0.31m/s	0.88m/s	1.96m/s	2.51m/s	1.71m/s	2.25m/s
Pipe Size & Class	Ø150 uPVC	Ø150 uPVC	Ø525 RCP C2	Ø525 RCP C2	Ø525 RCP C2	Ø600 RCP C2
Grade (%)	1.50%	0.60%	1.00%	1.00%	1.00%	1.00%

Datum RL 30.00

	GD-3	GD-5	L-2	L-3	L-4	L-5	A-1
DEPTH TO INVERT (m)	0.600	1.101	2.640	2.160	1.700	0.860	0.950
H.G.L. LEVELS 1 in 20 Year ARI	42.669	42.632 / 42.632	42.445 / 42.286	41.839 / 41.671	41.371 / 41.283	41.007 / 40.773	40.150
SURFACE R.L.	43.03	43.20	44.5	43.50	42.5	41.3	40.55
INVERT R.L.	42.430	42.099 / 42.099	41.880 / 41.860	41.359 / 41.340	40.825 / 40.800	40.465 / 40.440	39.612
PIPE CHAINAGE (m)	0	21.00	55.01	105.13	156.59	190.09	272.89

LINE L

SCALE: H 1:500 / V 1:100

0 2 4 6 8 10m
2 1
SCALE 1:100

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017
01	ISSUED FOR DA ONLY	IK	TC	25.08.2017

Client
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Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title
STORMWATER LONGITUDINAL SECTIONS
SHEET 4 OF 4

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	AS NOTED @ A1

Drawing number: 17570_DA_C213
Revision: 02

STORMWATER CATCHMENT PLAN

SCALE 1:400

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SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017
01	ISSUED FOR DA ONLY	IK	TC	30.08.2017

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Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title: STORMWATER CATCHMENT PLAN

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:400 @ A1

Drawing number: 17570_DA_C250
Revision: 02

STORMWATER CATCHMENT PLAN

SCALE 1:400

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS

DATUM: AHD

ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TC	30.08.2017
01	ISSUED FOR DA ONLY	IK	TC	30.08.2017

Client: FRASER PROPERTY AUSTRALIA

Architect: i2C ARCHITECTS

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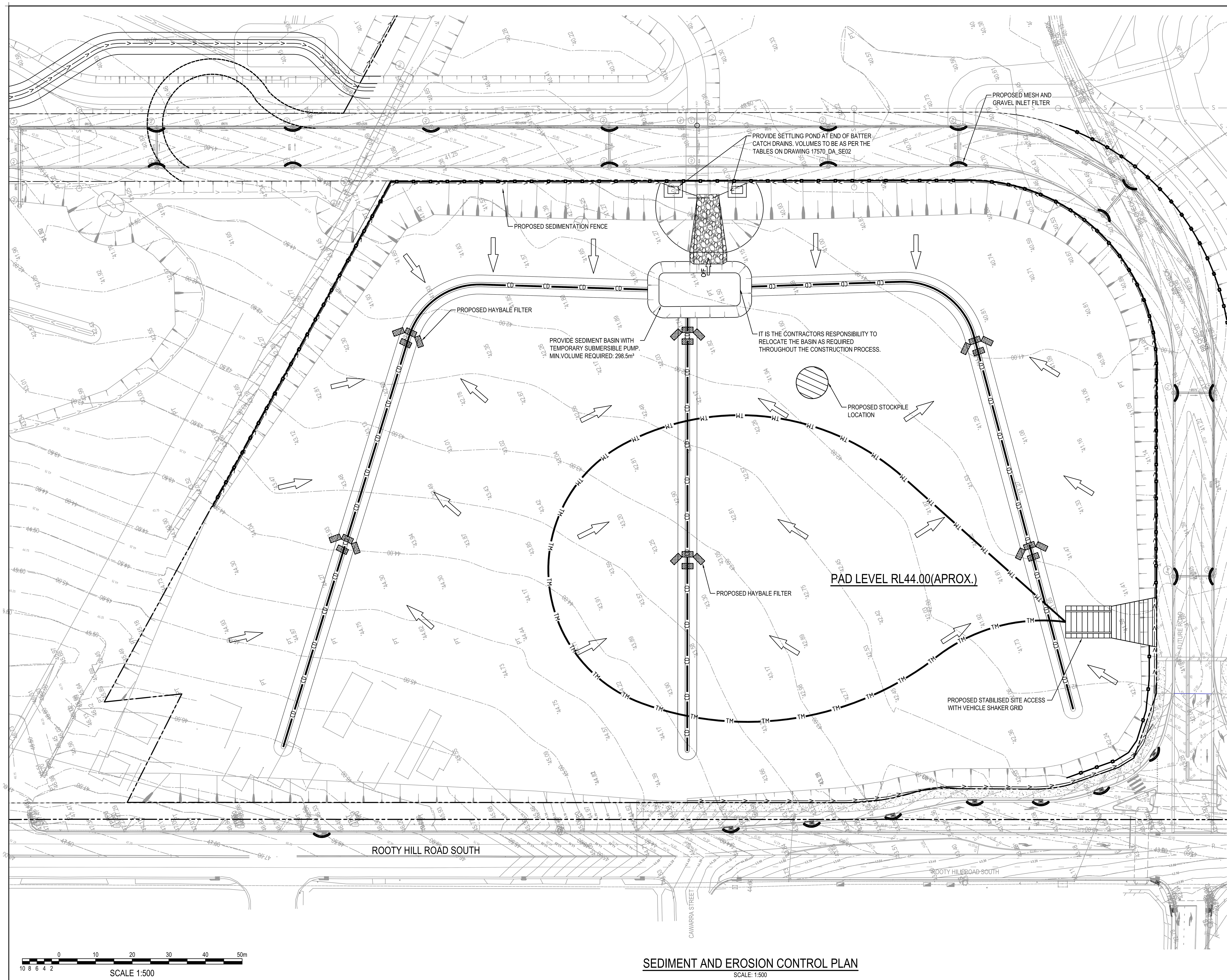
Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title: RAINWATER CATCHMENT PLAN

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:400 @ A1

Drawing number: 17570_DA_C251 Revision: 02



LEGEND

- CATCH DIVERSION DRAIN
- TRAFFIC MANOEUVRING
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID
- PROPOSED STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION
- PROPOSED HAYBALE FILTER
- PROPOSED MESH & GRAVEL INLET FILTER
- EARTHWORKS FALL LINE TO CATCH DRAINS
- O/F OVERLAND FLOW PATH

SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH RESPECTIVE COUNCIL SPECIFICATIONS AND LANDCOM'S "SOIL AND CONSTRUCTION" MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILTY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

FOR DA ONLY

SEDIMENT AND EROSION CONTROL PLAN

SCALE: 1:500

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TC	30.08.2017					

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Project: PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW
Title: SEDIMENT AND EROSION CONTROL PLAN

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	1:500 @ A1

Drawing number: 17570_DA_SE01
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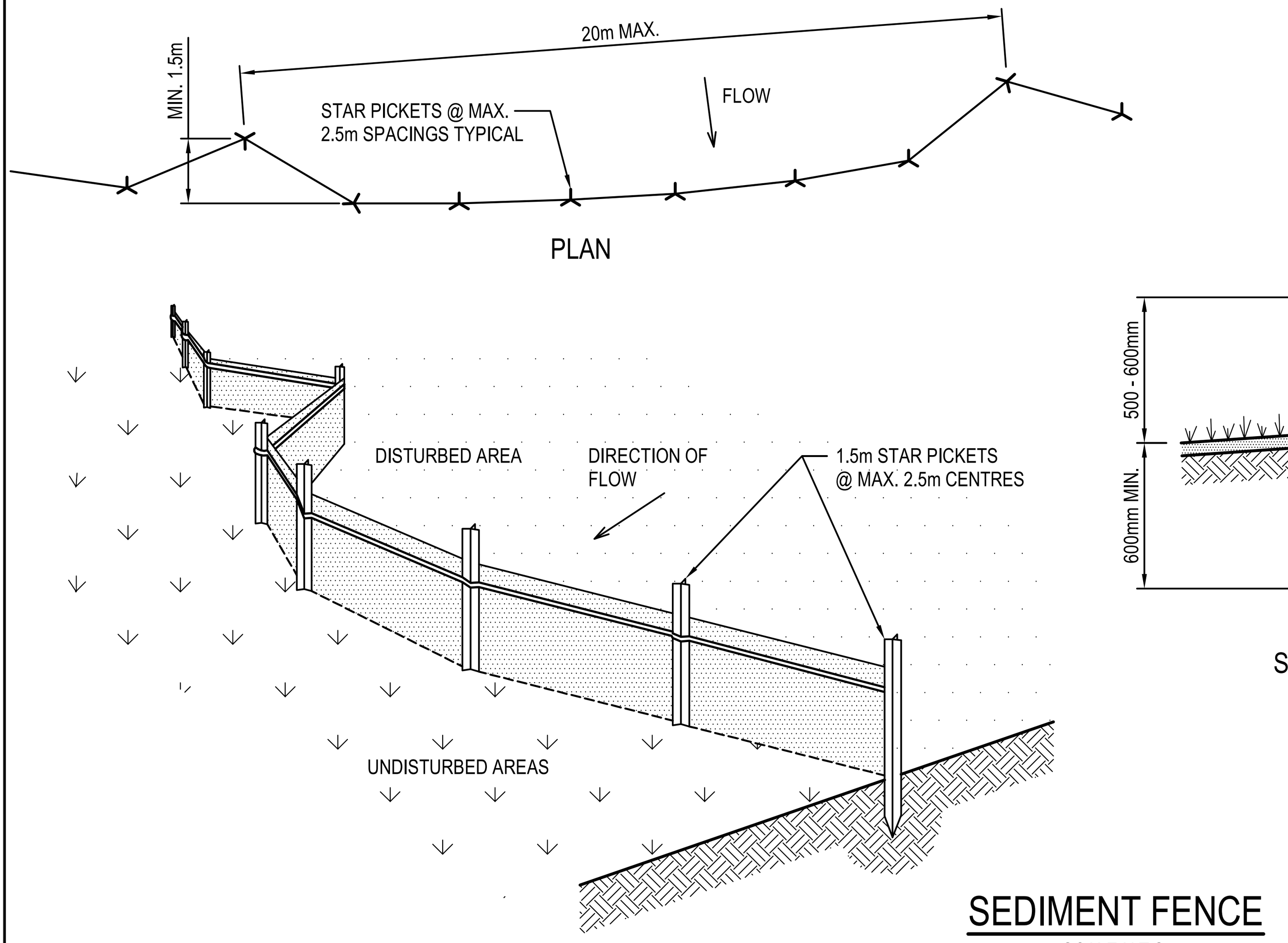
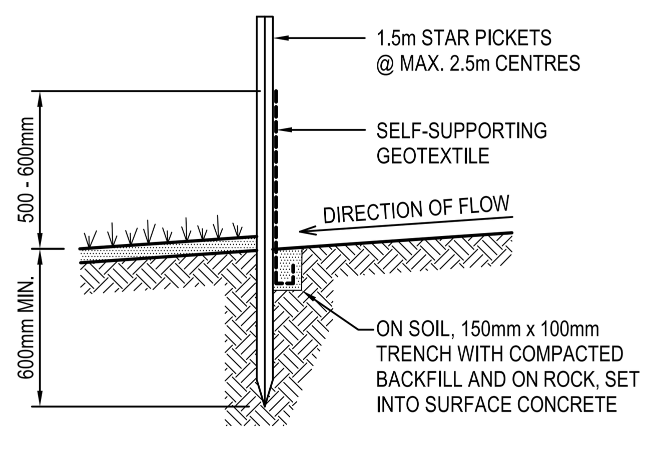




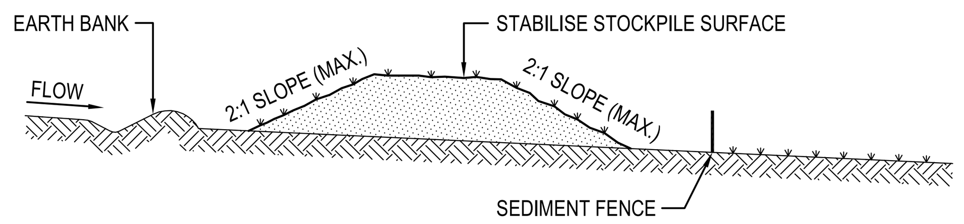
SECTION DETAIL

SEDIMENT FENCE

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. 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. 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. 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.

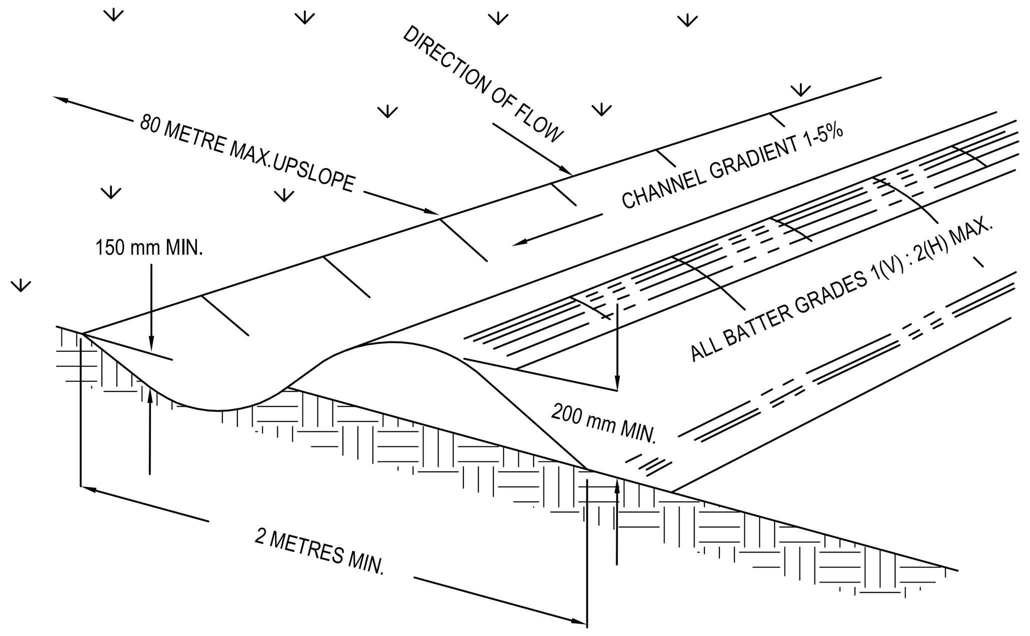


STOCKPILE CONSTRUCTION NOTES:

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.

STOCKPILES

SCALE N.T.S.



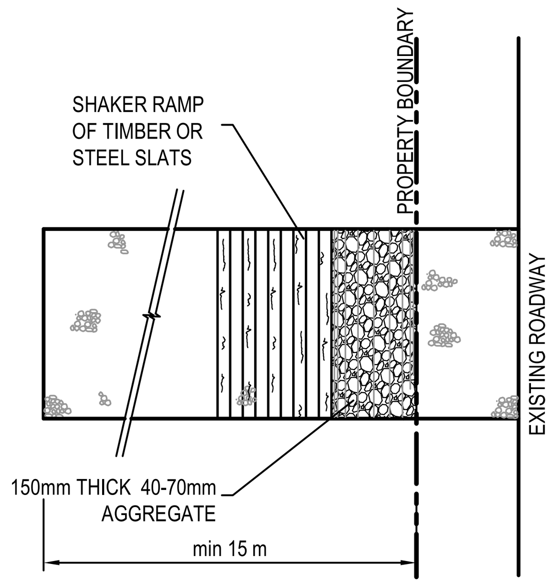
NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAC.UPSLOPE LENGTH IS 80 METERS.

CATCH DRAIN CONSTRUCTION NOTES:

1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE 80 METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION IS OF A TEMPRORARY NATURE AND SHALL BE COMPACTED AT THE END A DAYS WORK OR IMMEDIATELY PRIOR RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL AISTE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

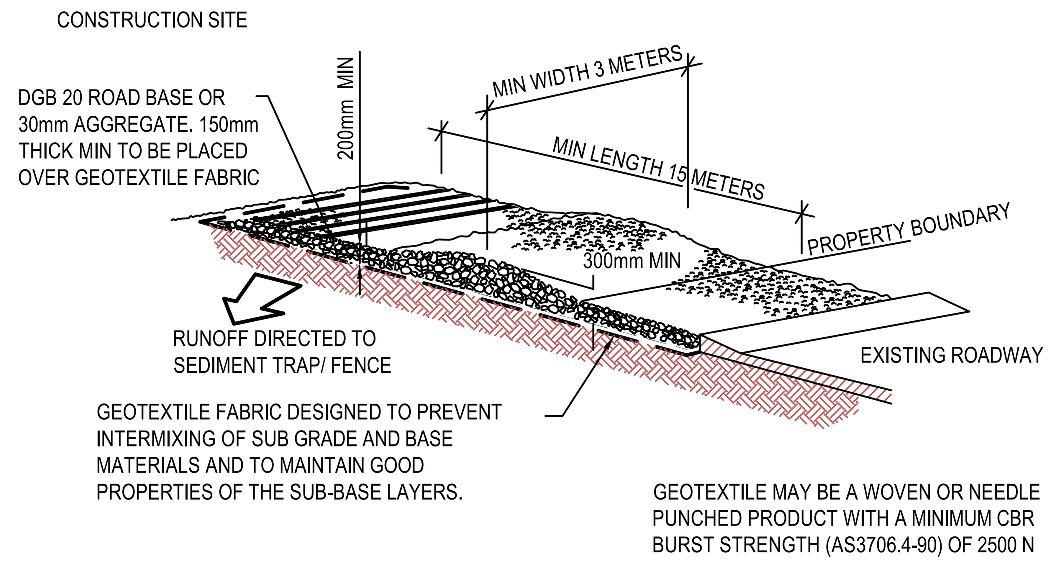
CATCH DRAINS SD 5-8

SCALE N.T.S.



PLAN
STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.



STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

NOTES:

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.

CONSTRUCTION SEQUENCE

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL'S REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

SEDIMENT BASIN SIZING

1. THE SEDIMENT BASIN SHALL BE CONSTRUCTED ON A RATE PER HECTARE BASIS AND HAS BEEN IN ACCORDANCE WITH THE REQUIREMENTS OF THE LANDCOM MANUAL "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", FOR SEDIMENTATION **TYPE D** SOILS. THE DISTURBED AREA WITHIN THIS CATCHMENT AT ANY ONE TIME SHOULD BE LIMITED TO AN AREA FOR WHICH EACH SEDIMENT BASIN CAN HANDLE. EACH BASIN SHALL BE SIZED IN ACCORDANCE WITH THE TABLE BELOW.

SEDIMENT BASIN SIZING TYPE D SOILS	
VOLUMETRIC RUNOFF COEFFICIENT, CV	0.25 (APPENDIX F - TABLE F2)
75TH PERCENTILE 5 DAY TOTAL RAINFALL DEPTH, R	19.0 mm
CATCHMENT AREA, A	1 Ha (UNIT AREA)
SETTLING ZONE VOLUME (PER HECTARE) 10 CV A R	47.5 m³
DISTURBED CATCHMENT AREA	1 Ha (UNIT AREA)
R K LS P C	110.87m³
SEDIMENT ZONE VOLUME (0.17 A (R K LS P C)/1.3	14.5m³ < 50% SETTLING VOL
TOTAL SEDIMENT BASIN VOLUME REQUIRED :	71.25 m³/Ha

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

2. THE FOLLOWING DESIGN PARAMETERS HAVE BEEN ASSESSED FOR THE SITE:

CONSTRAINT	VALUE	(SOURCE)*
RAINFALL EROSIVITY (R-FACTOR)	2350	APPENDIX B
LENGTH/SLOPE GRADIENT FACTOR, LS	0.955	APPENDIX A - TABLE A1
SOIL ERODIBILITY (K-FACTOR)	0.038	(TABLE C20 - BLACKTOWN)
EROSION CONTROL PRACTICE FACTOR (P-FACTOR)	1.3 (COMPACTED)	APPENDIX A - TABLE A2
COVER FACTOR (C-FACTOR)	1.0 (DURING EARTHWORKS)	APPENDIX A - FIGURE A5
CALCULATED SOIL LOSS, A (RUSLE EQUATION)	110.87t/Ha/YR	A = R K LS P C
SOIL HYDROLOGIC GROUP	GROUP C	APPENDIX C TABLE 20
SEDIMENT TYPE	TYPE D	APPENDIX C TABLE 4
75TH PERCENTILE 5-DAY RAINFALL EVENT	19.0mm (BLACKTOWN)	TABLE 6.3A

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

BASIN MANAGEMENT

1. THE CAPTURED STORMWATER IN THE SETTLING ZONE SHOULD BE DRAINED TO MEET THE MINIMUM STORAGE CAPACITY REQUIRED WITHIN A FIVE (5) DAY PERIOD FOLLOWING RAINFALL, PROVIDED THE ACCEPTABLE WATER QUALITY (NFR) AND TURBIDITY HAVE BEEN ACHIEVED.
2. CHEMICAL FLOCCULENT SUCH AS GYPSUM MAY BE DOSED TO AID SETTLING WITHIN 24 HOURS OF CONCLUSION OF EACH STORM. THE APPLIED DOSING RATES SHOULD ACHIEVE THE TARGET QUALITY WITHIN 36 TO 72 HOURS OF THE STORM EVENT.
3. INSPECT THE SEDIMENT BASINS AFTER EACH RAINFALL EVENT AND/OR WEEKLY. ENSURE THAT ALL SEDIMENT IS REMOVED ONCE THE SEDIMENT STORAGE ZONE IS FULL (REFER TO PEGS INSTALLED IN BASINS IN ACCORDANCE WITH THE SWMP). ENSURE THAT OUTLET AND EMERGENCY SPILLWAY WORKS ARE MAINTAINED IN A FULLY OPERATIONAL CONDITION AT ALL TIMES.

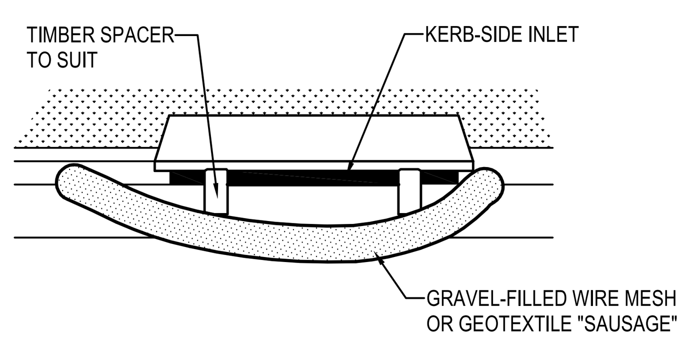
SOWING SEASON	SEED MIX
AUTUMN/WINTER	OATS@40KG/Ha + JAPANESE MILLET@10kg/Ha
SPRING/SUMMER	OATS@20kg/Ha + JAPANESE MILLET@20kg/Ha

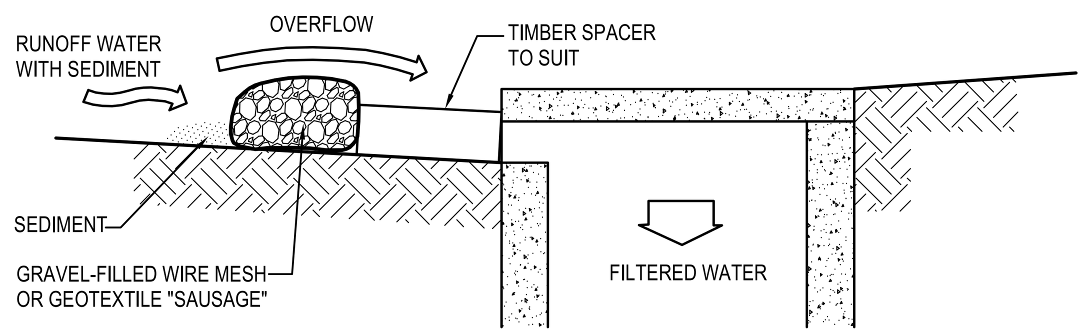
NOTE : THESE PLANT SPECIES ARE FOR TEMPORARY REVEGETATION ONLY. THEY WILL ONLY PROVIDE PROTECTION FROM EROSION FOR SIX MONTHS. WHERE THE LOTS ARE TO BE LEFT UNDEVELOPED FOR A LONGER PERIOD, THE CONTRACTOR SHALL SEEK ADVICE FROM THE SITE SUPERINTENDENT AS TO MORE APPROPRIATE REVEGETATION METHODS.

REVEGETATION IN ACCORDANCE WITH THE ABOVE TABLE WILL BE ENHANCED BY ADDING LIME AT A RATE OF 4kg/TONNE OF TOPSOIL AND 7.5kg/TONNE OF SUBSOIL.

4. THE LONG TERM GROUND COVER FACTORS FOR THE CONSTRUCTION WORKS IS NOT TO EXCEED THE FOLLOWING LIMITS:

LAND	MAXIMUM C-FACTOR	REMARKS
WATERWAYS AND OTHER AREAS OF CONCENTRATED FLOWS, POST CONSTRUCTION	0.05	APPLIES AFTER TEN WORKING DAYS OF COMPLETION OF FORMATION AND BEFORE CONCENTRATED FLOWS ARE APPLIED. FOOT AND VEHICULAR TRAFFIC IS PROHIBITED IN THIS AREA AND 70% GROUND COVER IS REQUIRED.
STOCKPILES, POST CONSTRUCTION	0.10	APPLIES AFTER TEN WORKING DAYS FROM COMPLETION OF FORMATION. 60% GROUND COVER IS REQUIRED.
ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION.	0.15	APPLIES AFTER 20 DAYS OF INACTIVITY, EVEN THOUGH WORKS MAY BE INCOMPLETE. 50% GROUND COVER IS REQUIRED.



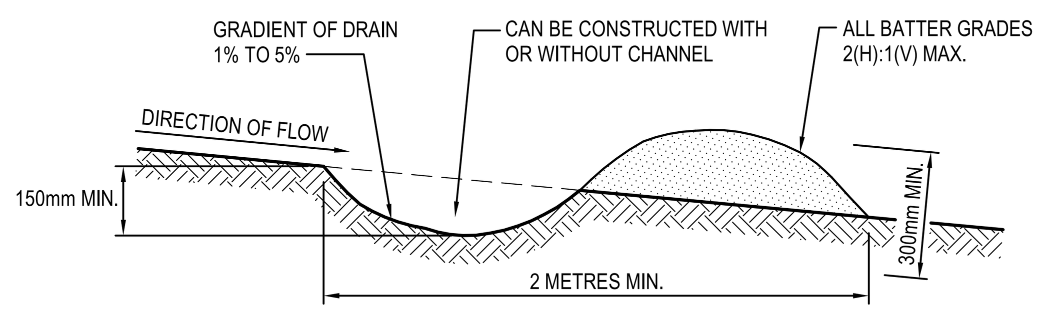


MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER

SCALE N.T.S.



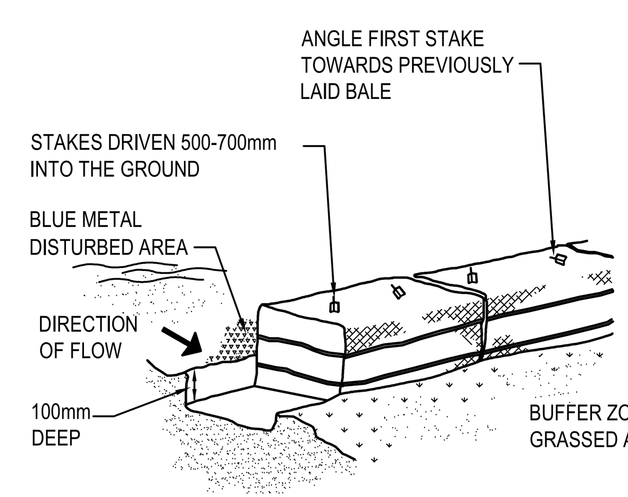
NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

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.

EARTH BANK (LOW FLOW)

SCALE N.T.S.



HAYBALE BARRIERS

N.T.S.

FOR DA ONLY

01	ISSUED FOR DA ONLY	IK	TC	30.08.2017							
REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE		

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 - RL 43.58

Client
FRASER PROPERTY AUSTRALIA

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Project
PROPOSED NEW SHOPPING CENTRE
ROOTY HILL ROAD SOUTH, EASTERN CREEK NSW

Title
SEDIMENT AND EROSION CONTROL
TYPICAL SECTIONS AND DETAILS

Drawn	Designed	Date
I.Khachab	T.Chan	JULY 2017
Checked	Approved	Scale
T.Dempsey	A.Francis	NTS @ A1

Drawing number: 17570_DA_SE02
Revision: 01

APPENDIX B:
STORMWATER MAINTENANCE MANUALS

HENRY & HYMAS

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MAINTENANCE SCHEDULE

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Enviropod Pit Baskets			
	(Refer to SW360 maintenance schedule/handbook)	Owner/Maintenance Contractor	(Refer to SW360 maintenance schedule/handbook)
Grass Lined Swale(s)			
Sediment deposition	Three monthly or after heavy rain	Maintenance Contractor	Remove sediment build up from swale and in and around trees
Holes or Scour	Three monthly or after heavy rain	Maintenance Contractor	Infill any holes in the turf/grass area. Check for erosion or scour repair. Provide energy dissipation (eg. Rocks and pebbles at inlet) if necessary.
Litter Control	Three monthly or as desired for aesthetics	Maintenance Contractor	Check for litter (including organic litter) in and around the swale area. Remove both organic and anthropogenic litter to ensure flow paths is maintained.
Pests and diseases	Three monthly or as desired for aesthetics	Maintenance Contractor	Assess plants for disease, pest infection, stunted growth or senescent plants. Treat or replace as necessary. Reduced plant density reduces pollutant removal and performance
Maintain original plant densities	Three monthly or as desired for aesthetics	Maintenance Contractor	Infill planting – between 6 and 10 plants per square metre should be adequate (depending on species) to maintain a density where the plants' roots touch each other. Planting should be evenly spaced to help prevent scouring due to a concentration of flow.
Weeds	Three monthly or as desired for aesthetics	Maintenance Contractor	Inspect for and manually remove weed species. Application of herbicide should be limited to a wand or restrictive spot spraying due to the fact that the swale is directly connected to the waterways.
Inspection after rainfall	Twice a year after rain	Maintenance Contractor	Occasionally observe the swale system after a rainfall event to check infiltration. Identify signs of poor drainage (extended ponding). If poor drainage is identified, check land use and assess whether it has altered from design capacity (eg. Unusually high sediment loads may require installation of a sediment forebay).

MAINTENANCE ACTION	FREQUENCY	RESPONSIBILITY	PROCEDURE
Stormwater Pits, Grated Drains and Pipes			
Pits, grated drains and pipes around the site	Annually	Maintenance Contractor	Check pits, grated drains and pipes for blockages. Remove debris and flush pipes if required.
Check step irons for corrosion	Annually	Maintenance Contractor	Remove grate. Examine step irons and repair any corrosion or damage.
Check fixing of step irons is secure	Six monthly	Maintenance Contractor	Remove grate and ensure fixings secure prior to placing weight on step iron.
Rainwater Sprinkler Tank			
Refer to manufacturer or tank suppliers recommendations	As per suppliers recommendations	Maintenance Contractor	As per suppliers recommendations

Yours sincerely,

Tom Dempsey
For, and on behalf of,
H & H Consulting Engineers Pty Ltd

Our Ref: 17570/td
Date: 31/08/17

Operations and maintenance

StormFilter® EnviroPod Treatment Train

Stormwater360
AUSTRALIA

Device details			
Location of Device			
GPS Coord	N:	E:	D P Number:
Relevant Council			
Company			
Contact		Email	Ph
Engineer			
Contact		Email	Ph

SFEP Treatment
1
2

Frequency of Inspection/Maintenance		
	Inspections (time/year)	Major Maintenance
StormFilter		
EnviroPod		

Maintenance Estimated Annual Cost
StormFilter
EnviroPod
TOTAL

Contents

Maintaining the EnviroPod® Stormwater Gully Pit Insert

Maintenance is as integral to every stormwater management system as it is to any other item of machinery or equipment.

The primary purpose of the EnviroPod® Stormwater Gully Pit insert is to filter out and remove pollutants from entering our waterways. To ensure that the EnviroPod® continues to function effectively, it is important that the pollutants it captures are periodically removed, and the filtration components properly cleaned.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site, as well as the occurrence of events such as chemical spills or excessive sediment loading due to site erosion or extreme storms. Similarly, the system should be inspected after all major storm events.

Treatment Train Specifications

Performance Specification

The stormwater filtration treatment train shall consist of x 200 micron gully pit basket/s and x 460/690mm passive, siphon-actuated, radial flow, self cleaning media filtration cartridge system/s operating at a specific flow rate of not more than 1.5L/s/m^2.

The gully pit basket system shall consist of the following components;

- Removable 200 micron Nylon monofilament Precision woven Filtration Bag
- Fixed Galvanised Mesh Cage (no greater than 80mm x 80mm) around the Filtration Bag
- Recycled modified ABS plastic to seal the unit into the pit
- By-pass mechanism above the Filter with no moving parts
- System rigidly fixed to the walls of the pit.

The media filtration system shall be located within the following structure.

- Manhole
- DownPipe
- Linear
- Vault
- Large Box
- Detention.

Regardless of the system type, the media filtration system shall consist of the following components;

- Inlet energy dissipation
- Cartridge section
- Outlet section to bypass storm flows and convey treated stormwater
- Access Lids in roof slab for access to Cartridges
- Siphon actuated cartridges filled with proprietary ZPG™ filter media
- Specific flow rate of each individual cartridge limited not to exceed 1.5L/s/m^2
- Air Lock Cap complete with one way Air Valve Flap
- Outer Hood complete with Scrubbing Regulators
- Automated high-energy turbulence on the screen face (only) at the end of storm flows to flush pollutants from the cartridge
- Centre Drainage Tube complete with Buoyancy Float
- Individual Cartridge Flow Restrictor Disc
- ¼ Turn Bayonet Fittings
- Under drain manifold to convey treated stormwater to the receiving environment.

Components of any proposes treatment train or technology

The components of any proposed the treatment train or technology, including a gully pit basket upstream of a radial flow cartridge filtration system, must be evaluated for a range of pollutants and these performance expectations must comply with current best practice guidelines, i.e. Water by Design "MUSIC Modeling Guidelines version 1.0 2010" for South East Queensland.

In short, the performance evaluation of any system must show:

1. Any reduction efficiencies are justified by rigorous scientific testing as determined by an independent peer reviewer and the results further peer reviewed and published in a credible scientific journal. Any potential or perceived conflicts of interest should be disclosed within the published article.
2. Published article providing insight into the pollutant composition (e.g. soluble vs particulate for nitrogen) and the mean concentration of inflow and outflow to compare to local and or regional conditions.
3. Performance evaluation undertaken in dry weather conditions or a method to take into account any potential leaching of nutrients that may occur in the system(s).
4. Evaluation is conducted using full-scale systems with details of treatable flow rates sampled and how they correlate to discrete removal efficiencies and comparisons to the designed treatable flow rates of the device. A comparison should also be made to the climatic conditions especially where un-restricted filters are used.

Maintenance Overview

The primary purpose of the Stormwater Treatment Train is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the system to its full efficiency and effectiveness.

* Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance must be performed in accordance with the Treatment Trains Operation and Maintenance Guidelines.

Introduction

This manual has been designed to assist you with cleaning and maintaining the EnviroPod Stormwater Gully Pit Insert, using the methods recommended by the manufacturer.

The cleaning process and methods described cover all aspects of the system, including:

- Removing the grate
- Cleaning the filter bag
- Inspecting the unit
- Rejuvenating the filter bag
- Re-installing the filter bags.

The manual should be used in conjunction with your site's traffic management and safety plans, as well as other appropriate Stormwater360 (IES) documents such as the IES Employee Health and Safety Manual. We also recommend that maintenance and cleaning contractors, or device owners, develop their own site-specific health and safety activity plans to ensure a safe work environment.

* **Please note:** This manual consists primarily of the processes and tasks associated with the hand maintenance and inductor maintenance procedures. It does not include details of the site's traffic management or occupational health and safety requirements. Contractors or IES staff should utilise their own Employee Health and Safety Manual, which details the policies and procedures for safe work.

Why cleaning and maintenance are so vitally important

Adhering to the inspection and maintenance schedule of each stormwater treatment device is essential to ensuring that it works properly throughout its estimated design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It's also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner. To ensure consistency, we recommend that one person be responsible for overseeing the management of the maintenance and cleaning process.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up).

Health and safety

The EnviroPod has been designed to trap and retain pollutants in stormwater runoff, helping to maintain the quality of water entering our aquatic ecosystems. Depending on the nature of your site, pollutants can range from organic material such as leaves and sticks through to debris such as broken glass, syringes or other potentially harmful materials.

Access to gully pits containing EnviroPods may require removing heavy protective grates, while cleaning such pits may entail working in confined spaces. For these reasons, all aspects of maintaining and cleaning your EnviroPod require careful adherence to Occupational Health and Safety (OH&S) guidelines. Doing so will ensure that all maintenance personnel are adequately protected and have been properly trained before taking part in any specialist activities. The same level of care needs to be taken to protect non-work personnel in and around the site, while appropriate traffic control measures must be put in place where collection pits are situated in, or adjacent to, roadways or car parks.

* The procedures indicated in the Operations section of this manual are recommended as the safest and most efficient manner of conducting the maintenance of EnviroPod units (Section 2), however contractors and cleaning staff may vary the procedure in response to the site conditions; varying work practices; or general preferences in the cleaning techniques. Please note that procedures outlined in this manual are not exhaustive, and that any changes made should always comply with general safe work practices.

Cleaning of EnviroPod filters and StormFilters is a specialist activity. The material collected by the devices can be harmful, and needs to be handled correctly. For example, sediments may contain heavy metals and carcinogenic substances as well as harmful objects such as broken glass and syringes. It is essential that Occupational Safety and Health guidelines are followed at all times, and that the following steps are carried out to ensure safe and successful maintenance operations.

In addition to the dangers associated with the cleaning and handling of material in the filter bags, precaution needs to be taken with activities such as removing the grate as well as with managing the traffic, pedestrians and other non-worker personnel at the site. The general workplace hazards associated with working outdoors also need to be taken into account.

2.1 Personnel health and safety

All contractors and staff must comply with all current workplace health and safety legislation and take all practicable steps to:

- Comply with all applicable laws, regulations and standards
- Ensure that all employees, contractors and visitors are informed of and understand their obligations in respect of current workplace health and safety legislation
- Ensure that employees understand and accept their responsibility to practice and promote a safe and healthy work environment.

> * Take proper care. Pollutants can range from organic materials such as leaves and sticks through to debris such as broken glass, syringes or other potentially harmful materials.

While cleaning and maintaining filters, all relevant precautions must be taken to prevent contact with sediment and litter. This includes wearing the following personal protective and safety equipment:

- Puncture resistant gloves
- Steel capped safety boots
- Fluorescent safety vest
- Overalls or similar skin protection
- Safety apron (if necessary)*
- Eye protection (if necessary)*.

* Higher personal safety conditions may be required when maintaining units that may contain more hazardous material, for example pits where syringes have been observed or pits located in areas associated with such activities.

2.2 Traffic control

Stormwater collection pits are typically situated either in or on roads and car parks, or adjacent to roads in a footpath or swale. Traffic control requirements across all such locations differ with most of the state and local road authorities requiring the same controls to be implemented whether the work is to be conducted on the road or on the road reserve.

As traffic requirements differ depending on road usage and the specific road configuration, separate traffic control plans should be prepared for each site. Given that maintenance is typically a quick process, the contractor should liaise with the relevant road authority to determine the specific road safety requirements for each location to ensure that on site workers can conduct the cleaning operations safely and efficiently, while complying with all laws and regulations.

State government publications such as the NSW RMS *Traffic Control at Work Sites* safety manual outline the signage requirements, placement of barricades or witches hats and the positioning of traffic control personnel that's required when working on public roads. For increased safety, IES recommends that the maintenance vehicle be used to shield the work area from oncoming traffic.

Photo 1 shows the maintenance vehicle with cones placed around and positioned to shield the work area. **Photo 2** shows the head-on view, note the vehicle is positioned to allow access to the drive, whilst still blocking the pit from on-coming traffic. The vehicle has a flashing light on the roof and the hazard lights switched on.

2.3 Confined spaces

Confined space entry procedures are not included as part of this manual. For IES employees these procedures are included as part of the IES Safety Manual. It is recommended that all contractors evaluate their own needs for confined space entry and compliance with Occupational Health and Safety regulations.

When repairs or maintenance activities cannot be conducted from the surface, and there is a need to enter and work in a confined space, only staff with current confined space training are permitted to operate in a confined space. Appropriate measures and controls must be put in place to meet confined space entry requirements. At all times the necessary safety equipment must be worn, and where gas or oxygen hazards occur, only staff trained in its use will use breathing apparatus gear. **Non-trained staff must not go into confined spaces.**

* Confined spaces pose a serious safety hazard for all personnel; however during the normal maintenance procedures there should be no reason to enter a confined space and all maintenance procedures are able to be conducted from the surface.

Photo 1 Vehicle positioned near pit, preventing traffic from passing close to the pit.

Photo 2 Head-on view, indicating the placement of the vehicle near the pit.

Operations

EnviroPod units need to be regularly inspected to determine whether they require maintenance or cleaning. This process involves several steps, and may require two or more maintenance personnel working together, as well the use of specialised equipment such as a hydraulic lifting arm or an inductor truck with a vacuum hose.

As gully pit grates are usually quite heavy, it is important that correct lifting procedures are adopted, and that the area surrounding the opened pit is shielded from access to non-work personnel.

If inspection reveals that the filter bag needs to be emptied and rejuvenated, the entire unit should also be examined to ensure that all connections and joints are sound. Any material that has accumulated in the overflow diversion channels or outlet pipes also needs to be removed, with those areas then being flushed. Where required, filter bags may need to be cleaned or repaired, and all waste material must be disposed of according to local guidelines at either an approved disposal site or transfer station.

This section outlines the procedures for cleaning the EnviroPod units. It has been written so that someone who has never previously encountered a stormwater pit or an EnviroPod unit can carry out such maintenance by simply following the outlined steps.

3.1 Maintenance and monitoring of EnviroPod filters

To ensure that each EnviroPod unit achieves optimal performance, the material collected by the filter bag should be emptied when the level of material is no more than approximately **half to two thirds** of the total bag depth or when there is evidence of material overflow. While the bag has a greater storage capacity, it is recommended that it is not left to fill completely prior to emptying, for the following reasons:

- the bags are capable of retaining a heavy mass of material (in excess of 50kg), which will make them more difficult to lift and empty
- material near the top of the bag can be re-suspended during high to extreme rainfall events
- blockage of the overflow sections can occur, when material is allowed to build up above the filter bag.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when preceding months have had little or no rainfall. This increased frequency of monitoring is necessary as there is a greater accumulation of surface contamination during low rainfall periods, which will then enter the unit with the higher volumes of runoff generated during a major rainfall event. It is also important to ensure that the units have not been damaged due to high pipe velocities.

3.2 Stormwater pit cover removal

3.2.1 Hinged pit grates

These are the steps for opening a hinged pit grate:

1. Insert the lifting hooks beneath the grate. (Position indicated in **Photo 3**)
2. Check hinge point is not damaged and debris is not caught in the hinge area.
3. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held should be removed or secured during cleaning or maintenance activities. **Photo 4** indicates the grate being opened and grate resting freely in the open position, respectively.

* **Please note:** Many cast iron hinges are not hinged securely (to enable the removal of the grate). This may result in the pit grate not being able to sit in an open position. Additionally the hinge pins may also be damaged or corroded, which may allow the grate to fall into the pit. Such pit grates can be removed using the method indicated below for non-hinged grates.

Photo 3 Lifting the grate

Photo 4 Fully open grate

Photo 5 Lowering grate

3.2.2 Non-hinged pit grates

To remove a non-hinged pit grate:

1. Place lifting hooks beneath grate, where possible in the four corners of the grate (see **Photo 6**). Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters
2. Position each person either side of the grate (see **Photo 7**)
3. Lift the grate, ensuring that good heavy lifting posture is used at all times
4. Place the grate on an angle on the gutter, to allow for the lifting hooks to be removed (see **Photo 8**)
5. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back. Note some lids may still require two people

Photo 6 Insert hook near edge of grate

Photo 7 Position each lifter either side of the grate

Photo 8 Lift grate and move grate to one side

Photo 9 Lift grate above the support frame

Photo 10 Reinstated non hinged grate

3.3 Cleaning methods

One of the following maintenance methods should be used for servicing EnviroPod Filters:

3.3.1 Cleaning using an inductor truck

Follow these steps to safely and efficiently clean the EnviroPod using an inductor truck:

1. Open gully pit (See Section 3.2)
2. Place the inductor hose over the material collected in the filter bag and switch on the inductor
3. Using the inductor hose, suck out all of the sediment, organic leaf material, litter etc. collected in the filter bag
4. Allow the filter bag to be sucked up into the inductor hose for a few seconds to allow for the filter mesh pores to be cleaned. Care is to be taken that there are no sharp edges on the inductor hose that can damage the filter bag
5. If material has built up around the overflows, use the inductor hose to clear the accumulated material
6. Remove filter bag from the pit
7. Sediment retained in the gully pit grate is to be removed
8. Back-opening channels are to be cleared of any debris to ensure flow is not hindered. This debris can also be collected using the inductor truck
9. All gully pit waste is to be removed from the pit
10. Check the EnviroPod unit (Section 3.4)
11. Check filter bag (Section 3.4)
12. Reinstate filter bag and gully pit lids

Photo 11 Cleaning an EnviroPod using the inductor method

3.3.2 Hand maintenance

To clean the EnviroPod manually by hand, follow these steps:

1. Open gully pit (See Section 1)
2. Place the lifting hooks in the lifting loops of the filter bag (See **Photo 12**)
3. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the bag, or remove excess material using a shovel or similar piece of equipment. IES prefers the use of a post hole shovel, due to the reduced strain on the back when digging and the ability of the shovel to grab material vertically
4. Lift the bag vertically off the supporting frame, ensuring that no undue pressure is placed on the filter bag. (See **Photo 13**)
5. Lift the bag clear of the stormwater pit (See **Photo 14**)
6. Position the bag over the truck or other collection vehicle, taking hold of the loops at the base of the bag (See **Photo 15** and **Photo 16**)
7. Lift and empty the filter bag by holding the bottom lifting loops only (See **Photo 17**)
8. Completely empty the filter bag (See **Photo 18**)
9. Brush the filter bag with a stiff brush to remove bound sediment from the filter pores
10. Check the EnviroPod unit (Section 3.4)
11. Check the filter bag (Section 3.5)
12. Reinstate filter bag, ensuring bag is installed the correct way (See **Photo 19** and **Photo 20**)
13. Reinstate gully pit lids (See **Photo 21** and **Photo 22**)

Photo 12 Place the lifting hooks through the bag loops

Photo 13 Lift the bag from the cage and support frame

Photo 14 Lift the bag from the stormwater pit

Photo 15 Lift the bag onto the collection vehicle

Photo 16 Grab the bottom lifting loops

Photo 17 Lifting the bottom bag loops empty the filter bag

Photo 18 Completely empty the contents of the filter bag

Photo 19 Reinstall filter bag

Photo 20 Ensure that the unit is positioned correctly, with the lifting loops on the inside

Photo 21 Correctly installed filter bag

Photo 22 Installed filter bag and sealed pit

* **Please note:** Under no circumstances are gully pit sediments to be backwashed into the gully pit.

Photo 23 Check seals are pushed against the pit walls

Photo 24 Check joining rivets (two piece unit shown above)

3.4 Unit inspection

After the EnviroPod filter bag has been removed, emptied and cleaned, the following should be checked to ensure that the unit has not been damaged:

- All connections and joints should be checked and broken rivets replaced (See **Photo 23**)
- The plastic pit seals should be inspected for unit movement or damage (See **Photo 24**)
- The cage should be inspected for damage or movement.

The overflow diversion channels, and the area between the EnviroPod cage and pit wall should also be inspected for any accumulated debris. Any observed debris should be removed and disposed of off-site. Accumulated material within the outlet pipe may also need to be flushed.

If spare parts are required, Stormwater360 is able to provide these at a cost to the owner of the EnviroPod unit, although these parts may also be obtained from other suppliers.

* **Please note:** If the units are not cleaned regularly, the mobilisation of material collected in the EnviroPod unit may occur. As such, cleaning of the units in accordance with this management plan is required. As this plan is based on observations and data collected during the monitoring period, ongoing adjustment of the cleaning frequency is generally required to improve the overall efficiency in the removal of collected material and prevent material overflow.

3.5 Filter bag inspection and rejuvenation

After the filter bags have been emptied and cleaned, they should be inspected to evaluate their condition. Given the nature of stormwater, the filter bag may become considerably clogged with fine sediment or damaged by various objects in stormwater as well as fauna. Sharp material such as sticks, combined with high velocity water and a large mass in the filter bag, can cause small tears in the filter material. Animals such as rats have also been known to chew through fine mesh filter bags located in gully pits near takeaway food outlets.

3.5.1 Clogged filters

Clogged filter bags can be cleaned using several different methods. If the techniques described in the general maintenance sections above do not adequately clean the filter bags, the following options should be considered:

- Using a stiff brush and a bucket of soapy water, scrub the filter bag surface.
- Remove filter bags from the pit and wash the bags using a high pressure water spray, taking care not to transfer the contamination elsewhere. Wastewater from the process should be collected and disposed of correctly.
- Remove the filter bags from the pits and the support rings and wash the bags in an industrial washing machine.

This final option typically results in the bags appearing like new, with no visible stain or pore clogging within the filter mesh.

Photo 25 Slightly clogged filter bag, indicated by the brown stain on in the centre of the bag

Photo 26 A clean used filter bag

3.5.2 Damaged filters

Damaged filter bags can often be repaired, provided the damage is small. Small tears in the fabric may occur due to several reasons, however the overall strength and structure of the nylon fabric typically prevents small tears becoming much larger. Although the bag is unlikely to tear further, care must be used when cleaning torn bags so as not to spill the collected material into the pit.

Small tears may be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of the filter material onto the filter bag. If large tears are present, the filter bag may need to be replaced as it is no longer able to function as intended.

3.6 Disposal of material

All gully pit wastes are to be taken off site and disposed of at a transfer station or similar approved disposal site. Stormwater sediments can contain lead, copper, zinc, mercury, hydrocarbons and PCBs, which are harmful to both humans and the receiving environment. Appropriate sampling and laboratory analysis may be required to classify the material as suitable for reuse, or disposal under appropriate local guidelines.

Emergency procedures

Spills and blockages can have an immediate impact on the performance of a stormwater management system, and can potentially result in serious damage to built infrastructure as well as the surrounding waterways and wetlands.

In these types of emergencies, it is important to act quickly to remediate the problem by removing affected sediment or clearing the cause of the blockage, so that the system can resume normal and effective functioning as soon as possible.

4.1 Spill procedures

In the event of a spill discharging into any gully pit, all sediment is to be extracted and the filter bags are to be removed and replaced with rejuvenated filter bags. Normal operation procedures apply to additional cleaning as a result of spills.

4.2 Blockages

In the unlikely event of surface flooding around a gully pit fitted with an EnviroPod the following steps should be carried out:

1. Check EnviroPod overflow bypass. The EnviroPod filter has been designed with an overflow mechanism built into the filter box. If surface flooding still exists, check the overflow slots underneath the rubber seal. If debris is lodged in the overflow slots it can be easily cleared by hand or a steel rod.
2. If overflow is clear and surface flooding still exists remove EnviroPod and check outlet pipe for blockages.
3. Removal of the EnviroPod may be difficult if the filter is clogged and the EnviroPod is holding water. If the filter is clogged, brush the sidewalls of the filter with a yard broom or similar. This will dislodge particles trapped at the interface allowing contained water to flow through the filter.
4. If the outlet pipe is blocked, it is likely that a gully sucker truck will be required to unblock it. Debris should be removed from the EnviroPod with the gully sucker truck before removal of the EnviroPod filter. If a gully sucker truck is not available and the EnviroPod needs to be removed by hand, follow the steps below:
   a. Remove excess debris by hand or brush the side of the filter.
   b. Lift and place filter ring through the filter box and into cage.
   c. Remove Filter box.
   d. Lift cage containing filter bag and ring out of the pit.
   e. Unblock outlet pipe.

The Stormwater Management StormFilter®

For almost two decades the Stormwater Management StormFilter® has helped meet the most stringent stormwater quality requirements.

The system has been continually tested and refined, to ensure it achieves maximum reliability and performance.

As a best management practice (BMP) system, it removes the most challenging target pollutants – including fine solids, soluble heavy metals, oils and total nutrients (including soluble) – by using a variety of media to achieve site-specific pollutant removal objectives.

StormFilter® overview

1.1 Description

StormFilter is a passive, flow-through stormwater filtration system consisting of vaults that house rechargeable cartridges filled with a variety of filter media, and is installed in-line with storm drains. The StormFilter works by passing stormwater through media-filled cartridges, which trap particulates and adsorb materials such as dissolved metals and hydrocarbons. After being filtered through the media, the treated stormwater flows into a collection pipe or discharges into an open channel drainage way. StormFilter is offered in three different configurations: cast-in-place, precast and linear. The precast and linear models utilise pre-manufactured vaults. The cast-in-place units are customised for larger flows and may be either covered or uncovered underground units.

1.2 Operation

1.2.1 Purpose

The StormFilter is a passive stormwater filtration system designed to improve the quality of stormwater runoff from the urban environment before it enters receiving waterways.

Through independent third party studies, it has been demonstrated that the StormFilter is highly effective for treatment of first flush flows, and fast-paced flows, during the latter part of a storm. In general, StormFilter's efficiency is highest when pollutant concentrations are highest.
The primary target pollutants for removal are: sediments (TSS), soluble metals, soluble phosphorus, nitrates, and oil and grease.

1.2.2 Sizing

The StormFilter is typically sized to meet design water quality objectives, which are subject to legislation regulated by local government authorities and other relevant environmental bodies. MUSIC modelling software is used to determine pollutant loads from a site, influenced by a number of factors such as site area, imperviousness and land use. Pollutant load reduction capabilities, based on third party testing, allows the number of StormFilter cartridges required to achieve the relevant objectives to be established. Cartridges are designed to treat a peak flow between 0.7 and 1.6 litres/second, depending on the cartridge size used. For example, 10 standard sized cartridges (460mm) are able to treat 11 L/s, as each filter can treat 1.1 L/s.

Because of the highly porous nature of the granular filter media, the flow through a newly installed cartridge is restricted to 1 L/s (average 460mm), using a restrictor disc, to ensure adequate pollutant-media contact time.

Photo 27 Filter cartridge

1.2.3 Basic function

The StormFilter is designed to siphon stormwater runoff through a filter cartridge containing media. The variety of media available can be designed to act as a mechanical filter to remove sediments, as an ion exchanger to remove dissolved heavy metals, and as an absorber to remove oils and greases.

1.2.4 Priming system function

The treated stormwater collects in the centre tube of the cartridge, which is equipped with a self-priming siphon system. (Figure 1 illustrates this system.) The key component of the system is the plastic float, consisting of a ball located at the base leading up to a larger portion, which provides increased buoyancy. Initially the ball rests in a seat, effectively closing off the port to the drainage manifold.

As a result, the filter fills the centre drainage tube until the water level has risen high enough to purge the air from the filter cartridges and displaces the float. At a water depth of 22 inches the float pulls loose and allows the filtered water to drain out through the manifold. This effectively "primes" a siphon within the drainage tube and greatly increases the potential across the filter. The priming system increases StormFilter's ability to be loaded with sediment. A related feature is the cartridge "hood". This hood maintains the siphon effect by preventing air from being drawn into the cartridge until the external water level drops below the bottom of the hood.

Cartridges are connected to the manifold with a plastic connector. These can be either quarter turn connectors or in the older systems, threaded connectors.

StormFilter is also equipped with flow spreaders that trap floating debris and surface films, even during overflow conditions. Depending on individual site characteristics, some systems are equipped with high and/or low flow bypasses. High flow bypasses are installed when the calculated peak storm event generates a flow that overcomes the overflow capacity of the system. This is especially important for precast systems. Low flow bypasses are sometimes installed to bypass continuous inflows caused by ground water seepage, which usually do not require treatment. All StormFilter units are designed with an overflow. The overflow operates when the inflow rate is greater than the infiltration capacity of the filter media.

1.2.5 Maintenance overview

The primary purpose of the StormFilter is to filter out and prevent pollutants from entering our waterways. Like any effective filtration system, these pollutants must be removed periodically to restore the StormFilter to its full efficiency and effectiveness. Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. To assist the owner with maintenance issues, Stormwater360 provides detailed Operation and Maintenance Guidelines with each unit.

Stormwater360 can provide maintenance services completely, or in part. Available services include tracking of installed systems, advising the system's owner of maintenance needs, and notification of the regulatory agency once the system has been maintained.

Maintenance is usually performed in the dryer periods to rejuvenate the filter media and prepare the system for the next rainy period. Maintenance activities can also be required in the event of a chemical spill or excessive sediment loading due to site erosion or extreme storms. It is good practice to inspect the system after severe storm events.

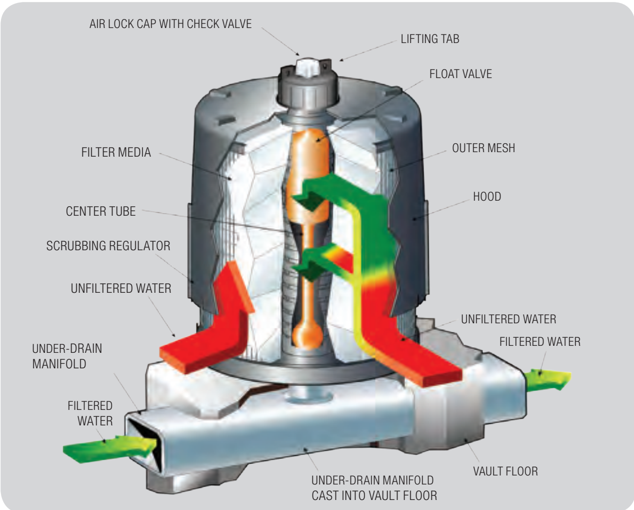

Figure 1 Filter cartridge

StormFilter® maintenance and performance expectations

To ensure the optimal and ongoing performance of the StormFilter, the system requires systematic inspection, cleaning and maintenance. This maintenance regime falls into two categories – ongoing minor inspection and maintenance, and major cleaning and maintenance. The maintenance frequency is largely determined by the conditions of each site, and the amount of sedimentation in the stormwater runoff that flows through the system. Unexpected events such as chemical spills, erosion or extreme storm activity require immediate inspection of the system, together with removal of debris or contaminated sediment, and where appropriate, replacement of the media cartridges.

While some maintenance activities can be completed by hand, others require specialised equipment such as an inductor truck with a vacuum hose. In all cases, it is important that maintenance staff are properly trained in the functioning of the StormFilter system and have a good knowledge of the correct procedures for disposing contaminated sediment as well as the methods for removing and installing StormFilter media cartridges.

At all times, appropriate safety equipment must be used, and Occupational Health And Safety (OH&S) guidelines adhered to.

2.1 Types of maintenance

Presently, procedures have been developed for two levels of maintenance:

- Inspection and/or minor maintenance
- Major maintenance.

Inspection/minor maintenance activities are combined since the minor maintenance does not require special equipment and typically little or no materials are in need of disposal.

Inspection/minor maintenance typically involves opening the flow restricting valves (to pre-set levels) and cleaning up vegetation and debris. Major maintenance typically includes cartridge recharging. Major maintenance may involve disposal of materials that require consideration of regulatory guidelines. Depending on the particular unit configuration and equipment used, major maintenance may require an understanding of OSHA rules. **Table 1** summarises the primary activities associated with StormFilter maintenance.

Table 1: StormFilter

Facility component requiring maintenance	Maintenance activity	When maintenance activity is required	Expected facility performance after maintaining
StormFilter cartridges and containment structure	Litter and debris removal	Floatable objects or other litter is present in the filter. Remove to avoid hindrance of filtration and eliminate unsightly debris and litter.	Permanent removal from storm system.
StormFilter cartridges and containment structure	Cartridge replacement and sediment removal	Media has been contaminated by high levels of pollutants, such as after a spill.	New media is able to effectively treat stormwater.
Drainage system piping	Flushing with water	Drainage system is obstructed by debris or sediment.	Outflow is not restricted.

2.2 Maintenance activities

2.2.1 Maintenance activity timing

Two scheduled inspections/maintenance activities should take place during the year. During the minor maintenance activities (routine inspection, debris removal), the type of major maintenance required is determined and, if required for disposal, samples of the sediments and media are obtained.

The next scheduled date is to perform major maintenance activities (replacement of the filter cartridges and associated sediment removal). In addition to the scheduled activities, it is important to check the condition of the filter after major storms to check for damage caused by high flows and to check for high sediment accumulation, which may be caused by localised erosion in the drainage area. It may be necessary to adjust maintenance activity scheduling depending on the actual operating conditions encountered by the system.

2.2.2 Maintenance activity frequency

The primary factor controlling timing of maintenance for the StormFilter is sedimentation. A properly functioning system will remove solids from water by trapping these particulates within the porous structure of the media. The flow through the system will naturally decrease as more and more solids are trapped. Eventually the flow through a system will be low enough to require replacement of the cartridges. Sediment should be removed from upstream trapping devices on an as-needed basis to prevent material from being re-suspended and discharged to the system.

Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction should be inspected and maintained more often than those in fully established areas. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after large storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual filter.

2.3 Maintenance crew requirements

Table 2 lists the anticipated crew requirements for maintenance operations. Removal of water and sediments during major maintenance activities can be accomplished using either a pump and water truck or a vacuum truck. All applicable occupational health and safety (OH&S) and disposal regulations should be followed. A general description of the maintenance activities follows.

Table 2 Anticipated Crew Requirements

	Inspection/Minor Maintenance	Major Maintenance: Sediment Removal	Major Maintenance: Cartridge Replacement
Labourer	1		1
Skilled Worker	1	1	1
Vacuum/Water Truck Operator		1	0/1
Total	**2***	**2***	**2/3***
Special Requirements	Knowledge of Proper StormFilter Function	Knowledge of Disposal Requirements	Knowledge of Cartridge Removal and Installation Procedures

* May require OH&S trained person if/when vault entry occurs.

2.4 Maintenance methods

2.4.1 Minor maintenance/inspection (twice a year)

Minor maintenance typically will involve the steps below, however if it appears that a spill of some type has occurred, the local hazard control agency and Stormwater360 should be notified immediately.

Steps for Minor Maintenance/Inspection

1. Maintenance to be performed by a skilled worker familiar with StormFilter units.
2. If applicable, set up safety equipment to protect pedestrians from fall hazards presented by open access covers. Also set up appropriate safety equipment for work near roadways.
3. Inspect the external condition of the unit and take notes concerning defects/problems.
4. Open the access covers to the vault and allow the system to air out for 5-10 minutes.
5. **Without entering the vault,** inspect the inside of the unit, including components.
6. Take notes about the external and internal condition. This includes inspecting pit penetrations, walls, lids, ladders and grates etc.
7. Give particular attention to recording the level of sediment build-up on the floor of the vault and on top of the internal components. If flow is occurring, note the level of water and estimate the flow rate per drainage pipe. Record all observations.
8. Remove large loose debris and litter using a pole with a grapple or net on the end.
9. Close and fasten the access cover, and remove safety equipment.
10. Finally, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loadings of other materials to the system.

* In the case of a spill, workers should abort maintenance activities until the proper guidance has been obtained.

2.4.2 Major maintenance inspection (once a year)

The primary goal of the major maintenance inspection is to assess the condition of the cartridges relative to the level of sediment loading. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, large amounts of sediments should be present and very little flow will be discharging from the drainage pipes. It is likely that the cartridges need to be replaced. Major maintenance inspection will typically involve the steps below. However, if it appears that a spill of some type has occurred, the local hazard control agency and Stormwater360 should be notified immediately. **In the case of a spill, the worker should abort maintenance activities until the proper guidance has been obtained.**

Steps for Pre-Major Maintenance Inspection

1. Maintenance to be performed by a skilled worker familiar with StormFilter units.
2. If applicable, set up safety equipment to protect pedestrians from fall hazards presented by open doors. Also, set up appropriate safety equipment for work near roadways.
3. Inspect the external condition of the unit and take notes concerning defects/problems.
4. Open the access covers to the vault and allow the vault to air out for 5-10 minutes.
5. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
6. Take notes about the external and internal condition.
7. Give particular attention to recording the level of sediment build-up on the floor of the vault, and on top of the internal components.
8. Remove large loose debris and litter using a pole with a grapple or net on the end.
9. If the visit is during a storm, make the flow observations discussed above.
10. Close and fasten the access cover, and remove safety equipment.
11. Make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
12. Review the condition reports from the previous minor and major maintenance visits and schedule for cartridge replacement if needed.

2.4.3 Major maintenance: sediment removal and cartridge replacement (and emergency)

Major maintenance/filter cartridge replacement typically involves the steps below. However, if it appears that a spill of some type has occurred, the local hazard control agency and Stormwater360 should be notified immediately. **In the case of a spill, the worker should abort maintenance activities until the proper guidance has been obtained.**

Depending on the configuration of the particular system, a worker may be required to enter the vault to perform some tasks. If vault entry is required, OH&S rules for general confined space entry must be strictly adhered to. Filter cartridge replacement should occur during dry weather and it may be necessary to plug the filter inlet pipe if base flows exist. Standing water present in the vault should be regarded as polluted and contained during this operation by temporarily capping the manifold connectors.

> * **Please note:** Confined space entry may be required on StormFilter systems. In this case, please ensure that appropriate Confined Space entry training and subsequent certification has been undertaken and is valid, and work procedures are strictly adhered to. If you are unsure, do not enter the vault and contact Stormwater360 immediately.

Steps For Cartridge Replacement Maintenance

1. Depending on the particular unit, one or two utility workers and a hauling truck operator will deliver the replacement cartridges to the site. Information concerning how to obtain the replacement cartridges is available from Stormwater360.
2. If applicable, set up safety equipment to protect pedestrians from fall hazards presented by open doors. Also, set up appropriate safety equipment for work near roadways.
3. Inspect the external condition of the unit and take notes concerning defects/problems.
4. Open the doors to the vault and allow the system to air out for 5-10 minutes.
5. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
6. Make notes about the external and internal condition.
7. Give particular attention to recording the level of sediment build-up on the floor of the vault and on top of the internal components.
8. Ensuring safe working procedures are met, off load the replacement cartridges (16-39kgs each) and set aside.
9. Remove the top cap (threaded), upper seal and float from the cartridge. Repeat procedure for every cartridge within StormFilter vault. Place items in a large plastic container to be lifted form the vault.
10. Using a cordless drill and 8mm hex head, remove the three screws located around the top perimeter of the cartridge hood. Place screws in the large plastic container and, once full or completed, remove plastic container from vault.
11. Move the vacuum truck near the StormFilter vault on the down-wind side. Be sure that the truck is not too close to the vault so that fumes will not enter the vault. Make sure that the last 500mm of the nozzle is approximately 100-125mm in outside diameter.
12. Feed vacuum nozzle into cartridge bay and start vacuum truck. Remove cartridge hood and place nozzle directly onto filter media. Completely remove media from each cartridge and repeat process for every cartridge in vault.
13. Once completed disconnect cartridges from vault floor and place hood back on cartridges
14. Using the appropriate lifting cap, attach the cable and remove the cartridge (up to 10kgs. each) from the vault. It is strictly prohibited to have personnel standing under suspended cartridges. Care must also be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner unless Stormwater360 is performing maintenance activities and damage is not related to discharges to the system.
15. Set the used cartridge aside or load onto the hauling truck.
16. Repeat steps 14 to 15 until all cartridges have been removed.
17. Remove deposited sediment from the floor of the vault. This can be accomplished by using the vacuum truck
18. Once the sediments are removed, it is necessary to assess the condition of the vault, particularly the manifold and the connectors. These are short sections of 2-inch schedule 50 PVC, or threaded schedule 80 PVC that should protrude above the floor of the vault. If required, apply a light coating of FDA approved silicon grease to the outside of the exposed portion of the connectors. This ensures a watertight connection between the cartridge and the drainage pipe. Replace any damaged connectors.
19. Using the boom, crane, or tripod, lower and install the new cartridges (typically 30kg for standard 460 cartridges). Once again, take care not to damage connectors.
20. Close and fasten the access cover, and remove safety equipment.
21. Make notes about the local drainage area relative to ongoing construction, erosion problems, or high loadings of other materials to the system.
22. Finally, dispose of the residual materials in accordance with applicable regulations. Make arrangements to return the used cartridges to Stormwater360.

2.4.4 Related maintenance activities (performed on an as-needed basis)

StormFilter units are often just one of many components in a more comprehensive stormwater drainage and treatment system. The entire system may include catch basins, detention vaults, sedimentation vaults and manholes, detention/retention ponds, swales, artificial wetlands, and other miscellaneous components. In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities. In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil and grease loading, and discharges of inappropriate materials.

2.5 Typical equipment required for maintenance activities

Typical equipment required for conducting maintenance is shown in Table 3. Some of the materials listed are suggestions rather than requirements. It should be noted that there is more than one way to accomplish some tasks. Owners with available labour and equipment resources may desire to use alternative methods. However, it is advisable that guidance from Stormwater360 be obtained prior to using alternative techniques.

Table 3 Maintenance Equipment Requirements

Maintenance equipment required		
Minor maintenance	**Pre-major maintenance inspection**	**Major maintenance cartridge replacement**
• Safety equipment*: First aid, cones, barricades, flagging, flares, tape, vests, hard hats • Work clothes: Rubber boots, overalls, and gloves • Door bolt, wrench, proprietary lifters (e.g. Gatic) and miscellaneous Tools • Tape measure • Flashlight • Grapple or net pole • Record keeping forms • Litter/debris container	• Safety equipment*: First aid, cones, barricades, flagging, flares, tape, vests, hard hats • Work clothes: Rubber boots, overalls, and gloves • Door bolt, wrench, proprietary lifters (e.g. Gatic) and miscellaneous Tools • Tape measure • Flashlight • Grapple or net pole • Record keeping forms • Litter/debris container	• Safety equipment*: First aid, cones, barricades, flagging, flares, tape, vests, hard hats • Work clothes: Rubber boots, overalls, and gloves • Door bolt, wrench, Pentasocket and miscellaneous Tools • Tape measure • Flashlight • Grapple or net pole • Record keeping forms • Vacuum truck • Replacement cartridges • Cartridge hauling truck • Crane, tripod and hoist, or other lifting device (150kg minimum capacity) • Shovels • Extra 50mm PVC cartridge connectors • Spare flow restrictor discs • Litter/debris container • Vault inlet pipe plug • Dolly • PVC Pipe cutter • Ladder • Cartridge installation and removal sling

*Confined space equipment may be required for vault entry. This equipment must be used by personnel with the appropriate OH&S training. This equipment typically includes: Atmospheric testing devices, atmospheric purging and ventilating devices, and entry, exit, and rescue assisting devices.

2.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in a manner that will not allow the material to affect surface or ground water. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily travelled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations.

It is not appropriate to discharge these materials back to the stormwater drainage system. Part of arranging for maintenance to occur should include coordination of disposal of solids (landfill coordination) and liquids (municipal vacuum truck decant facility, local wastewater treatment plant, on-site treatment and discharge). Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals. Stormwater360 will determine disposal methods or reuse of the media contained in the cartridges. If the material has been contaminated with any unusual substance, the cost of special handling and disposal will be the responsibility of the owner.

SFEP StormFilter & Enviropod Maintenance Data Sheet

Stormwater360 AUSTRALIA

Date:	Location:	GPS COORD:
System size:	Type: ○ Cast-in-place ○ Precast ○ Linear	
Number of Cartridges:	Type of Cartridge: ◉ 460mm ○ 690mm ○ 310mm	
Filter Media: ○ ZPG ○ Perlite		
Type of EnviroPods:		Number of EnviroPods:
Personnel:		

STORMFILTER SYSTEM OBSERVATIONS

Last service:
Sediment Depth on Vault Floor:
Structural Damage:
Cartridges submerged: ○ Yes ○ No How deep:
Comments:

ENVIROPOD SYSTEM OBSERVATIONS

Last service:
Amount of Sediment in Basket:
Structural Damage:
Comments:

DRAINAGE AREA REPORT

Excessive Oil and Grease Loading	○ Yes ○ No	Source:
Sediment Accumulation on Pavement	○ Yes ○ No	Source:
Erosion of Landscaped Areas	○ Yes ○ No	Source:
Comments:		

STORMFILTER CARTRIDGE MAINTENANCE ACTIVITIES

Remove Litter and Debris	○ Yes ○ No	Details:
Sediment Removed from Vault Floor	○ Yes ○ No	Details:
Quantity of Sediment Removed (estimate?):		
Replace Cartridges	○ Yes ○ No	Details:
Minor Structural Repairs	○ Yes ○ No	Details:
Residuals (debris, sediment) Disposal Methods:		
Notes/Problems:		

ENVIROPOD MAINTENANCE ACTIVITIES

Number of Bags Replaced:	Clogged EnviroPods/Bags: ○ Yes ○ No
Comments:	

SFEP Treatment Train Inspection Data Sheet

Stormwater360 AUSTRALIA

It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, large amounts of sediments should be present, very little flow will be discharging from the drainage pipes, and it is likely that the cartridges need to be replaced during major maintenance.

Date:	Location:	GPS COORD:
System size:	Type: ○ Cast-in-place ○ Precast ○ Linear	
Number of Cartridges:	Type of Cartridge: ○ 460mm ○ 690mm ○ 310mm	
Filter Media: ○ ZPG ○ Perlite		
Type of EnviroPods:		Number of EnviroPods:
Personnel Attending Inspection:		

STORMFILTER SYSTEM OBSERVATIONS
Last service:
Sediment Depth on Vault Floor:
Structural Damage:
Cartridges submerged: ○ Yes ○ No How deep:
Comments:

ENVIROPOD SYSTEM OBSERVATIONS
Last service:
Amount of Sediment in Basket:
Structural Damage:
Comments:

DRAINAGE AREA REPORT		
Excessive Oil and Grease Loading	○ Yes ○ No	Source:
Sediment Accumulation on Pavement	○ Yes ○ No	Source:
Erosion of Landscaped Areas	○ Yes ○ No	Source:
Comments:		

Next steps

Learn more

For more detailed technical information about Stormwater360 products and solutions, visit **www.stormwater360.com.au**

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With more than 12 years experience in developing, installing and maintaining innovative and efficient site-specific stormwater management solutions, Stormwater360's highly qualified engineers and consultants can assist you with every aspect of your stormwater project.

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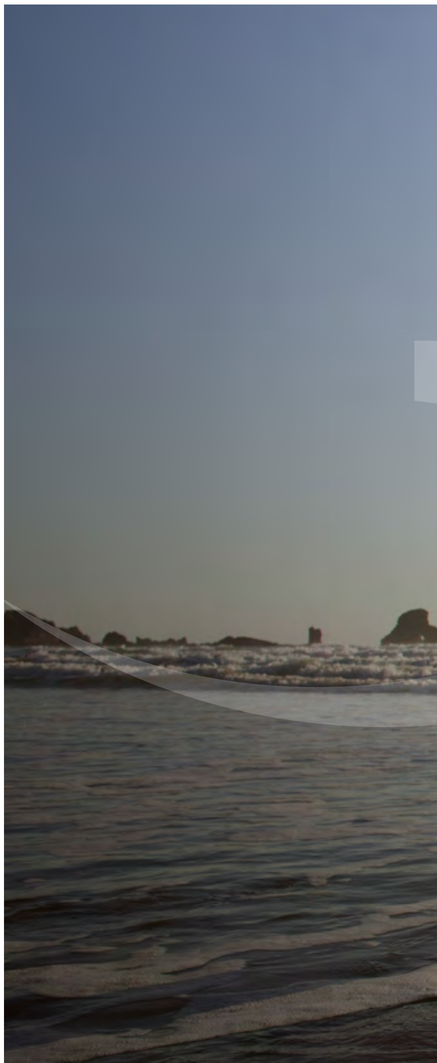
Stormwater360 supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722



www.stormwater360.com.au

henry&hymas

APPENDIX C:
COSTIN ROE GENERAL LAYOUT PLAN – SURROUNDING STORMWATER INFRASTRUCTURE

FOR SECTION 96

10m 0 10 20 30 40 50 60 70 80 90 100m
SCALE 1:1000 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR SECTION 96	21.07.15	B
FOR INFORMATION ONLY	30.03.15	A

ARCHITECT

CLIENT
Western Sydney Parklands Trust
WESTERN SYDNEY PARKLANDS TRUST
LEVEL 7, 10 VALENTINE AVE
PARRAMATTA NSW 2150

PROJECT
EASTERN CREEK BUSINESS HUB
WESTERN SYDNEY PARKLANDS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.W.	X.C.	MAR 2015		A0		12693.00-DA15

Costin Roe Consulting Pty Ltd.
Consulting Engineers
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
email: mail@costinroe.com.au ©

CostinRoe Consulting
Value in Engineering and Management

DRAWING TITLE
OVERALL SITE PLAN

DRAWING No. C012693.00-DA15
ISSUE B

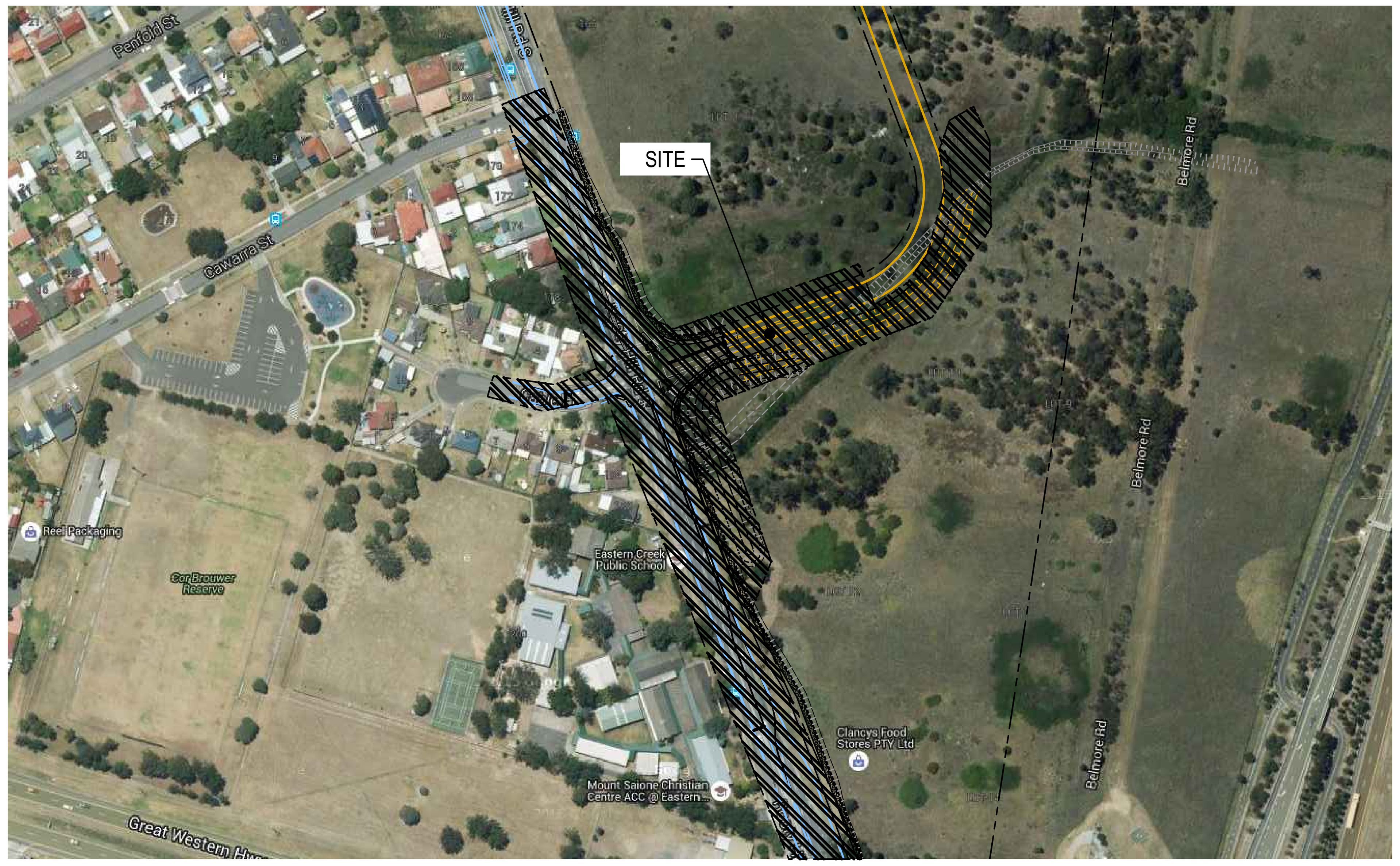
APPENDIX D:
ROOTY HILL ROAD UPGRADES PLANS

INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW
CIVIL ENGINEERING WORKS
OPTION 1

GENERAL NOTES:

1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL SPECIFICATION. CONTRACTOR TO OBTAIN AND RETAIN A COPY ON SITE DURING THE COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS, AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. HENRY AND HYMAS CONSULTING PTY. LTD. CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND CAMDEN COUNCIL REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

N



LOCALITY SKETCH
N.T.S.

SIGNAGE AND LINEMARKING NOTES:

1. PAVEMENT MARKING AND SIGN POSTING TO BE IN ACCORDANCE WITH RMS "INTERIM GUIDE TO SIGNS AND MARKING."
2. RAISED PAVEMENT MARKERS TO BE IN ACCORDANCE WITH RMS "INTERIM GUIDE TO SIGNS AND MARKING."
3. WHERE EXISTING PAVEMENT MARKING CONFLICTS WITH PROPOSED, IT IS TO BE REMOVED.
4. LANE WIDTHS DO NOT INCLUDE WIDTH OF GUTTER.
5. LINEMARKING PLAN DOES NOT DEFINE BOUNDARIES.
6. ERECT TEMPORARY SIGN "CHANGED TRAFFIC CONDITIONS AHEAD" 120m AHEAD OF NEW WORK IN BOTH DIRECTIONS.
7. ESTABLISH THE LOCATION OF EXISTING UTILITY SERVICES AND LOCATE NEW SIGNS CLEAR OF THESE INSTALLATIONS.
8. THE SLOPED FACE OF THE SF MEDIAN KERBS WHICH ADJOIN THROUGH LANES, ARE TO BE PAINTED WHITE IN LIEU OF AN E3 EDGE LINE. THE REFLECTIVE PAVEMENT MARKERS NORMALLY ASSOCIATED WITH AN E3 EDGE LINE ARE TO BE LOCATED ON THE PAVEMENT ADJACENT TO SF KERB.
9. THE DESIGN OF MAJOR DIRECTIONAL SIGN POSTING TO BE PREPARED AND ASSESSED BY THE RMS.
10. BICYCLE PAVEMENT MARKING AND SIGN POSTING TO BE IN ACCORDANCE WITH AUSTROADS STANDARDS.

DRAWING SCHEDULE

15766_C1_C000	COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH - OPTION 1
15766_C1_C100	INTERSECTION LAYOUT - OVERALL PLAN - OPTION 1
15766_C1_C110	
15766_C1_C120	INTERSECTION LAYOUT - GRADING PLAN , SHEET 1 OF 3
15766_C1_C121	INTERSECTION LAYOUT - GRADING PLAN , SHEET 2 OF 3
15766_C1_C122	INTERSECTION LAYOUT - GRADING PLAN , SHEET 3 OF 3
15766_C1_C240	OPEN CHANNEL PLAN
15766_C1_C241	OPEN CHANNEL, TYPICAL AND LOGITUDINAL SECTION
15766_C1_C242	OPEN CHANNEL CROSS SECTIONS
15766_C1_C250	OVERALL CATCHMENT PLAN
15766_C1_C251	DETAIL CATCHMENT PLAN, SHEET 1 OF 3
15766_C1_C252	DETAIL CATCHMENT PLAN, SHEET 2 OF 3
15766_C1_C253	DETAIL CATCHMENT PLAN, SHEET 3 OF 3
15766_C1_C601	
15766_C1_C601	INTERSECTION LAYOUT- CONCEPT, -OPTION 1 LINEMARKING PLAN, SHEET 1 OF 3
15766_C1_C602	INTERSECTION LAYOUT- CONCEPT, LINEMARKING PLAN, SHEET 2 OF 3
15766_C1_C603	INTERSECTION LAYOUT- CONCEPT, LINEMARKING PLAN, SHEET 3 OF 3
15766_C1_C650	INTERSECTION LAYOUT - TURNING PATHS, SHEET 1 OF 3 - OPTION 1
15766_C1_C651	INTERSECTION LAYOUT - TURNING PATHS , SHEET 2 OF 3 - OPTION 1
15766_C1_C652	INTERSECTION LAYOUT - TURNING PATHS , SHEET 3 OF 3

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

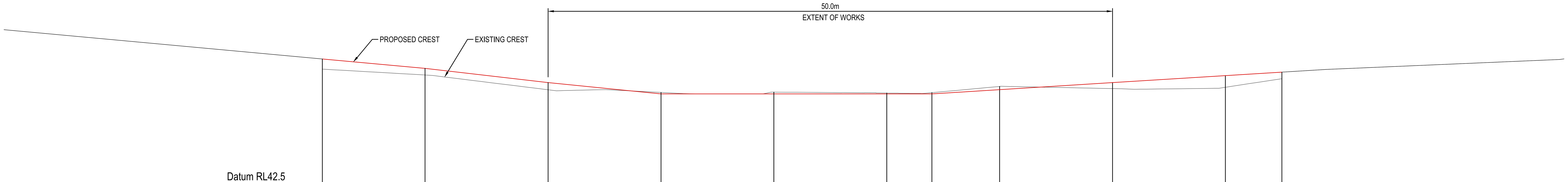
Title
COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH - OPTION 1

Drawn	Designed	Date
A. ALKATEB	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	N.T.S

Drawing number: 15766_C1_C000
Revision: 03

EXISTING CREST RELOCTION

SCALE: 1:200 @A1



Datum RL42.5

HEIGHT	0.045	0.029	0.032	-0.007	-0.008	-0.004	-0.006	-0.014	0.026	0.051	0.029
EXISTING CREST	43.010	42.984	42.918	42.907	42.908	42.904	42.906	42.933	42.924	42.929	42.967
PROPOSED CREST	43.055	43.013	42.950	42.900	42.900	42.900	42.900	42.919	42.950	42.981	42.996
CHAINAGE	-20.000	-10.906	-0.000	10.000	20.000	30.000	34.000	40.000	50.000	60.000	65.000

REVISED ROOTY HILL ROAD CREST

HORIZONTAL SCALE 1:200 @ A1
VERTICAL SCALE 1:10 @ A1

0 200 400 600 800 1000mm
200 100
SCALE 1:10

0 4 8 12 16 20m
4 3 2 1
SCALE 1:200

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	16.06.2017					

Client
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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
EXISTING CREST RECONSTRUCTION
SHEET 1 OF 1

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C015
Revision: 01

RMS REGISTRATION NUMBER: ....

INTERSECTION LAYOUT - OVERALL PLAN

SCALE: 1:750 @A1

0 15 30 45 60 75m
15 10 5
SCALE 1:750

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

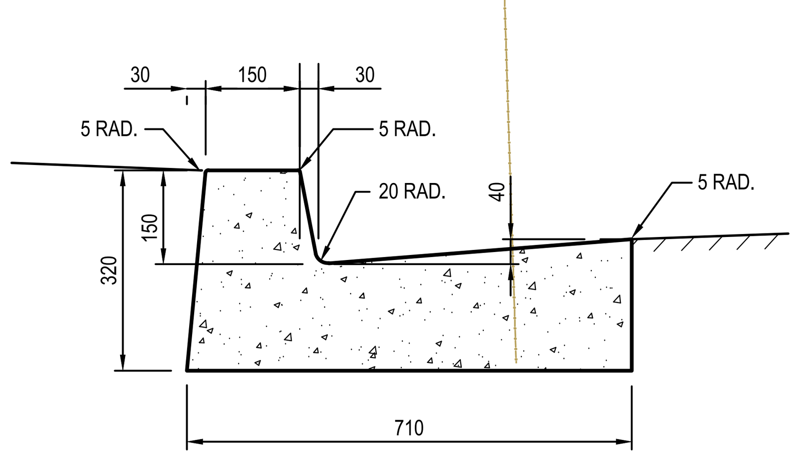
Title
INTERSECTION LAYOUT - OVERALL PLAN
OPTION 1

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:750 @ A1

Drawing number: 15766_C1_C100
Revision: 04

INTERSECTION LAYOUT - WORKS PLAN

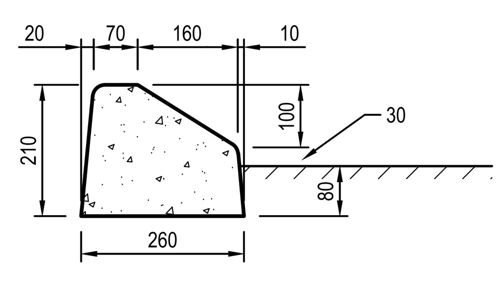
SCALE: 1:250 @A1



SA - KERB & GUTTER

SCALE 1:10

BARRIER KERB AND GUTTER ADJACENT TO FOOTWAY



SF - MOUNTABLE KERB

SCALE 1:10

RAISED MEDIANS AND TRAFFIC ISLANDS

NOTES:

1. PROPOSED KERB RAMP - REFER TO RMS DRAWING R0300-11 FOR DETAILS
2. PROPOSED KERBS - REFER TO RMS DRAWING R0300-01 FOR DETAILS
3. PROPOSED STORMWATER PIT - REFER TO RMS DRAWING R0200-01
4. EXISTING SERVICES TO BE ADJUSTED OR RELOCATED TO AUTHORITY REQUIREMENTS.
5. ALL WORKS TO BE IN ACCORDANCE WITH RMS QUALITY ASSURANCE ROADWORK SPECIFICATIONS
6. FOR DETAILS OF TRAFFIC SIGNALS REFER TO TRANSPORT AND TRAFFIC PLANNING ASSOCIATES' DRAWING
7. INTERSECTION GRADING PLAN REFER TO DRAWING 15766_CC_C120-C122
8. KERB RETURNS ALIGNMENT AND SETOUT REFER TO DRAWING 15766_CC_C180
9. FOR DETAILS OF LINEMARKING REFER TO 15766_CC_C601-C603

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	10.06.2016					

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henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT - WORKS PLAN SHEET 1 OF 4

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C101 Revision: 01

ROAD LAYOUT - WORKS PLAN

SCALE: 1:250 @A1

NOTE:
REFER DRAWING 15766_C1_C101 FOR NOTES, LEGEND AND KERB DETAILS

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUED FOR RMS APPROVAL	LC	LC	10/11/2015					
04	ISSUED FOR RMS APPROVAL	LC	LC	20/10/2015					
03	ISSUED FOR RMS APPROVAL	LC	LC	06.10.2015					
02	ISSUED FOR RMS APPROVAL	LC	LC	01.10.2015					
01	ISSUED FOR RMS APPROVAL	LC	LC	18.09.2015					

Client: HANSEN YUNCKEN PTY.LTD.
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Project	Drawn	Designed	Date
INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW	L. CAHA	L. CAHA	SEP 2015
	Checked: T. DEMPSEY	Approved: A. FRANCIS	Scale: 1:250 @ A1
Title: ROAD LAYOUT - WORKS PLAN SHEET 2 OF 4	Drawing number: 15766_C1_C102		Revision: 01

LEGEND

EXISTING BOUNDARY
PROPOSED LINTEL ONGRADE & SAG PITS
SA — PROPOSED KERB & GUTTER - SA
SF — PROPOSED MOUNTABLE KERB - SF
EXISTING KERB TO BE RETAINED
EXISTING KERB TO BE REMOVED
EXISTING STORMWATER PIPE
PROPOSED STORMWATER PIPE
E — EXISTING ELECTRICAL OVERHEAD LINE
T — EXISTING TELSTRA/ COMMUNICATION LINES
W — EXISTING WATER LINE
S — EXISTING SEWER RISING MAIN
NBN — EXISTING FIBRE OPTIC/TELECOMUNICATION LINES
EXISTING PIT TO BE RETAINED
EXISTING PIT TO BE REMOVED

A-1 LINE LETTER / PIT NUMBER — PROPOSED PIT TAG
EXISTING SEWER MANHOLE
EXISTING TELSTRA/ COMMUNICATION PIT
EXISTING WATER HYDRANT
EXISTING POWER POLE/ LIGHT POLE
EXISTING PIT WITH CONCRETE LIT
EXISTING PIT WITH METAL LIT
EXISTING ELECTRIC BOX
EXISTING TRAFFIC LIGHT
EXISTING STREET SIGN

ROAD LAYOUT - WORKS PLAN

SCALE: 1:250 @A1

NOTE:
REFER DRAWING 15766_C1_C101 FOR NOTES, LEGEND AND KERB DETAILS

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	18.09.2015					

Client: HANSEN YUNCKEN PTY.LTD.
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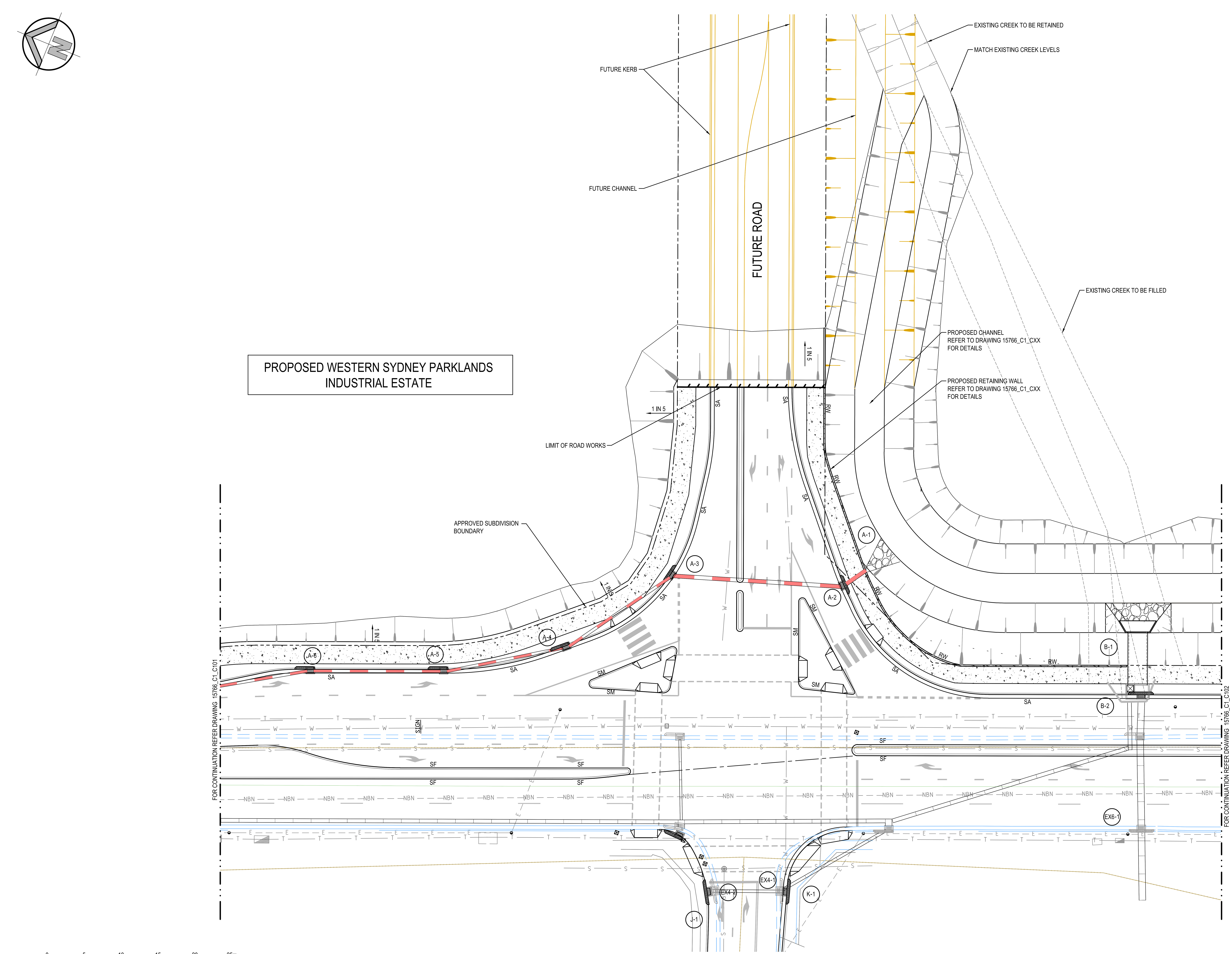
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: ROAD LAYOUT - WORKS PLAN SHEET 3 OF 4

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C103
Revision: 01



LEGEND

- EXISTING BOUNDARY
- PROPOSED LINTEL ONGRADE & SAG PITS
- PROPOSED KERB & GUTTER - SA
- PROPOSED MOUNTABLE KERB - SF
- EXISTING KERB TO BE RETAINED
- EXISTING KERB TO BE REMOVED
- PROPOSED RETAINING WALL
- FUTURE KERB
- FUTURE BATTER LINE
- PROPOSED BATTER LINE
- EXISTING BATTER LINE
- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- EXISTING ELECTRICAL OVERHEAD LINE
- EXISTING TELSTRA/ COMMUNICATION LINES
- EXISTING WATER LINE
- EXISTING SEWER RISING MAIN
- EXISTING FIBRE OPTIC/TELECOMUNICATION LINES
- EXISTING PIT TO BE RETAINED
- EXISTING PIT TO BE REMOVED
- PROPOSED PIT TAG (A-1: LINE LETTER, PIT NUMBER)
- EXISTING SEWER MANHOLE
- EXISTING TELSTRA/ COMMUNICATION PIT
- EXISTING WATER HYDRANT
- EXISTING POWER POLE/ LIGHT POLE

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

INTERSECTION LAYOUT - WORKS PLAN

SCALE: 1:250 @A1

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	10.06.2016

Client: HANSEN YUNCKEN PTY.LTD.
Surveyor: LANDPARTNERS

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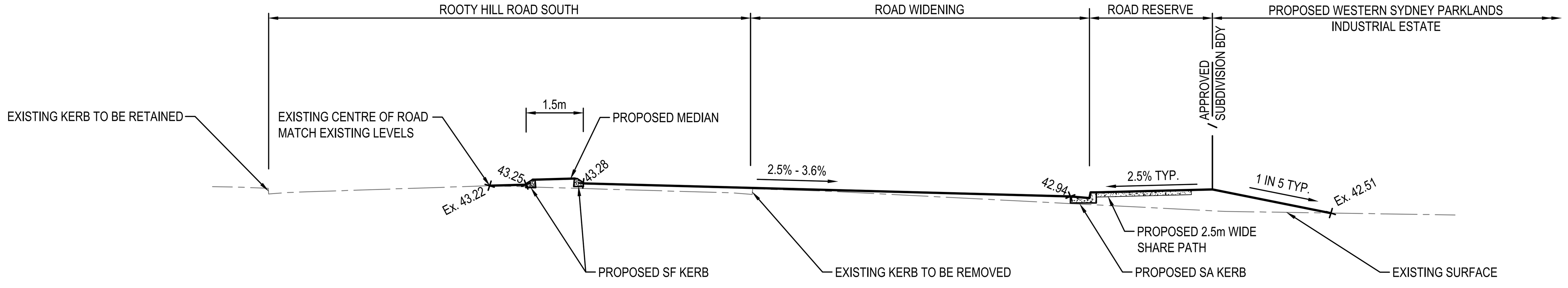
henry&hymas

Project: INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

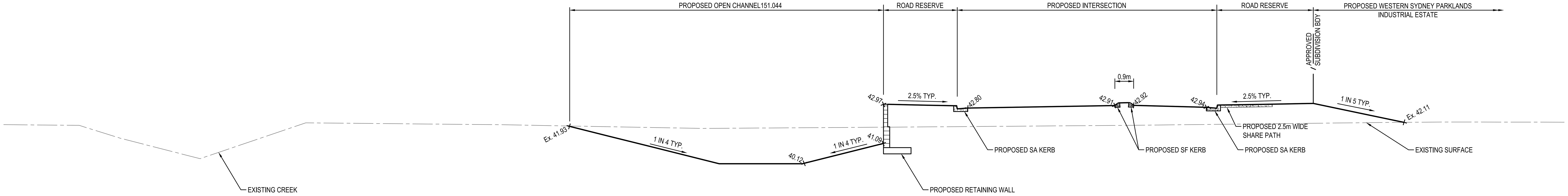
Title: INTERSECTION LAYOUT - WORKS PLAN
SHEET 4 OF 4

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

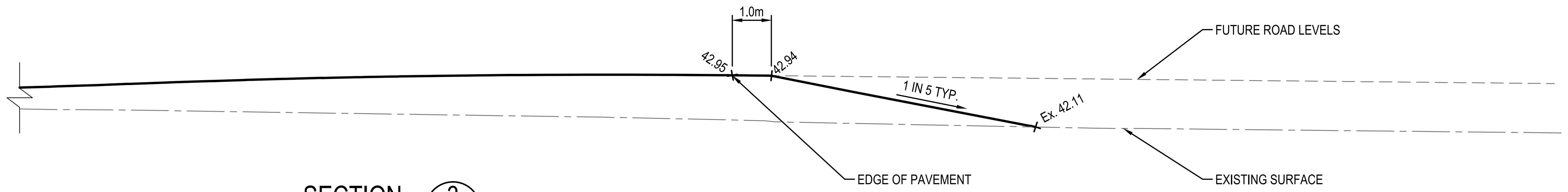
Drawing number: 15766_C1_C104
Revision: 01



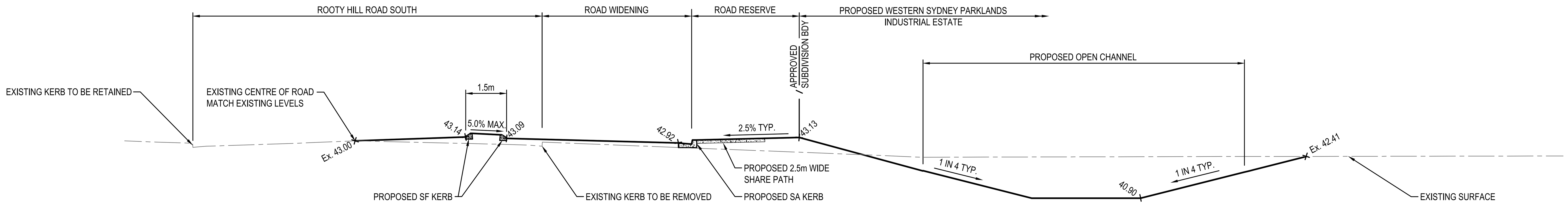
SECTION 1 C100
SCALE: 1:100 @ A1



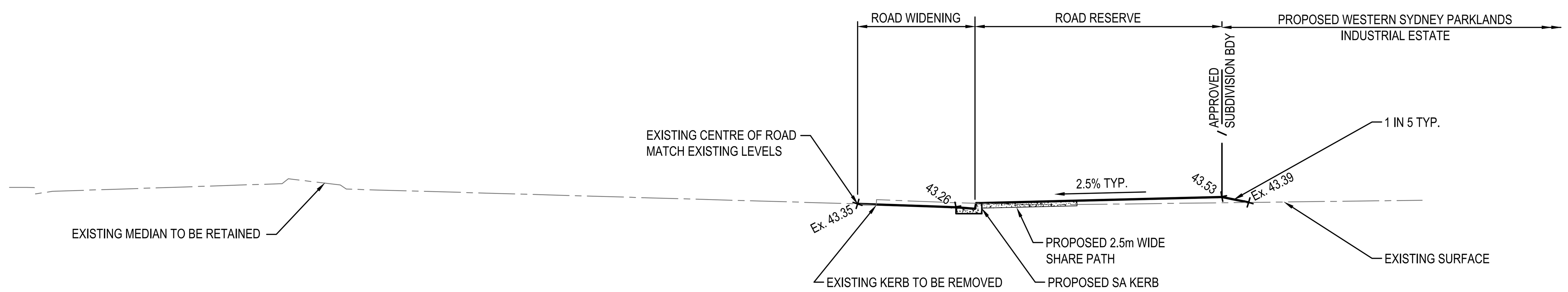
SECTION 2 C100
SCALE: 1:100 @ A1



SECTION 3 C100
SCALE: 1:100 @ A1



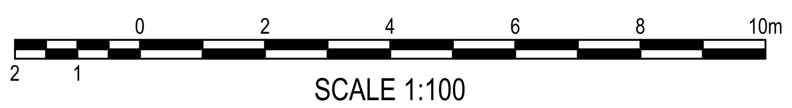
SECTION 4 C100
SCALE: 1:100 @ A1



SECTION 5 C100
SCALE: 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL



SCALE 1:100

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.05.2017					

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henry&hymas

Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
TYPICAL SETIONS

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:100 @ A1

Drawing number: 15766_C1_C110
Revision: 01

LEGEND

	EXISTING BOUNDARY
SA	PROPOSED KERB & GUTTER - SA
SF	PROPOSED MOUNTABLE KERB - SF
SM	PROPOSED BARRIER KERB - SM
	EXISTING KERB TO BE RETAINED
6.50	EXISTING CONTOURS
6.50	PROPOSED DESIGN CONTOURS
R	PROPOSED RIDGE LINE
43.00 ×	PROPOSED DESIGN LEVEL
43.00 ×	EXISTING LEVEL
	SAWCUT LINE

INTERSECTION LAYOUT - GRADING PLAN

SCALE: 1:250 @A1

RMS REGISTRATION NUMBER: ....

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.0X.2017					

Client: HANSEN YUNCKEN PTY.LTD.
Surveyor: LANDPARTNERS

Level 5, 79 Victoria Avenue Chatswood NSW 2067
Telephone +61 2 9417 8400
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Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: INTERSECTION LAYOUT - GRADING PLAN SHEET 1 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C120
Revision: 01

INTERSECTION LAYOUT - GRADING PLAN

SCALE: 1:250 @A1

LEGEND

	EXISTING BOUNDARY
SA	PROPOSED KERB & GUTTER - SA
SF	PROPOSED MOUNTABLE KERB - SF
SM	PROPOSED BARRIER KERB - SM
	EXISTING KERB TO BE RETAINED
6.50	EXISTING CONTOURS
6.50	PROPOSED DESIGN CONTOURS
R	PROPOSED RIDGE LINE
43.00 ×	PROPOSED DESIGN LEVEL
43.00 ×	EXISTING LEVEL
	SAWCUT LINE

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.05.2017					

Client: HANSEN YUNCKEN PTY.LTD.

Surveyor: LANDPARTNERS

Level 5,
79 Victoria Avenue
Chatswood NSW 2067
Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
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henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT - GRADING PLAN SHEET 2 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C121 Revision: 01

INTERSECTION LAYOUT - GRADING PLAN

SCALE: 1:250 @A1

LEGEND

- EXISTING BOUNDARY
- SA — PROPOSED KERB & GUTTER - SA
- SF — PROPOSED MOUNTABLE KERB - SF
- SM — PROPOSED BARRIER KERB - SM
- EXISTING KERB TO BE RETAINED
- 6.50 — EXISTING CONTOURS
- 6.50 — PROPOSED DESIGN CONTOURS
- R — PROPOSED RIDGE LINE
- 43.00 × — PROPOSED DESIGN LEVEL
- 43.00 × — EXISTING LEVEL
- SAWCUT LINE

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.05.2017					

Client: HANSEN YUNCKEN PTY.LTD.

Surveyor: LANDPARTNERS

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henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT - GRADING PLAN SHEET 3 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C122
Revision: 01

DESIGN CONTROL LINE ROOTY HILL ROAD SOUTH CHAINAGES PLAN

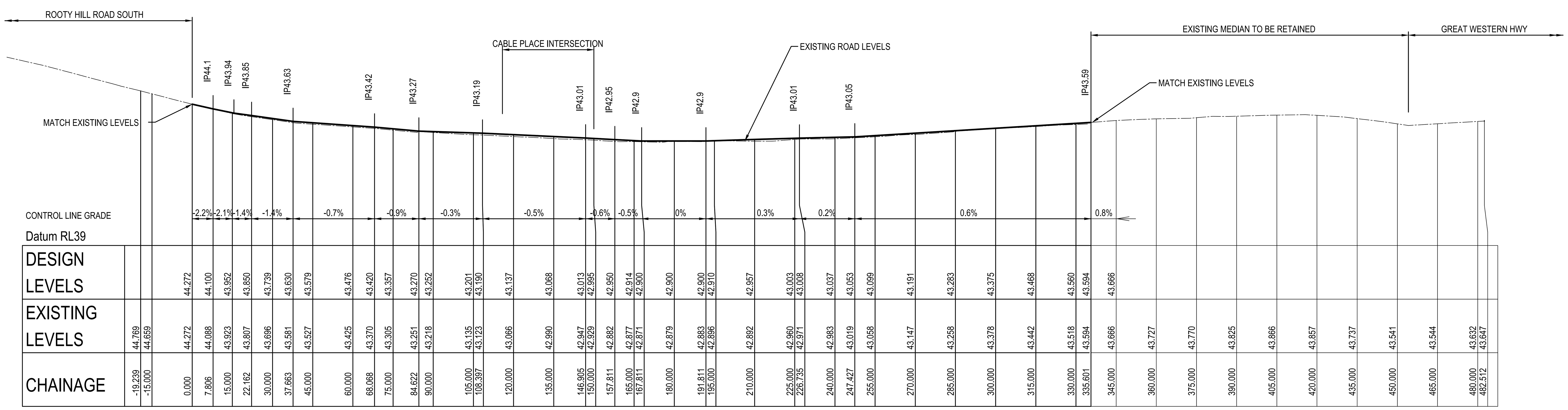
SCALE: 1:750 @A1

LEGEND

EXISTING BOUNDARY

LIMIT OF WORKS

DESIGN CONTROL LINE - CENTER OF ROAD - ROOTY HILL ROAD SOUTH					
Pt	Chainage	Easting	Northing	Level	Bearing
A1	-19.239	301178.423	6259652.264	44.769	159°35'58.87"
	-15	301179.901	6259648.291	44.659	159°35'58.87"
A2	0	301185.13	6259634.232	44.272	157°44'18.35"
	15	301190.812	6259620.35	43.952	157°44'18.35"
A3	22.162	301193.525	6259613.722	43.85	
	30	301196.282	6259606.385	43.739	159°24'25.07"
	45	301201.558	6259592.343	43.579	159°24'25.07"
	60	301206.834	6259578.301	43.476	159°24'25.07"
	75	301212.11	6259564.26	43.357	159°24'25.07"
	90	301217.386	6259550.218	43.252	159°24'25.07"
	105	301222.662	6259536.177	43.201	159°24'25.07"
A4	108.397	301223.856	6259532.997	43.19	
	120	301227.937	6259522.135	43.137	159°24'29.77"
	135	301233.213	6259508.094	43.068	159°24'29.77"
A5	146.905	301237.4	6259496.949	43.013	
	150	301238.486	6259494.051	42.995	159°27'48.70"
	165	301243.748	6259480.004	42.914	159°27'48.70"
	180	301249.01	6259465.957	42.9	159°27'48.70"
	195	301254.272	6259451.911	42.91	159°27'48.70"
	210	301259.534	6259437.864	42.957	159°27'48.70"
	225	301264.796	6259423.817	43.003	159°27'48.70"
	240	301270.058	6259409.77	43.037	159°27'48.70"
	255	301275.32	6259395.724	43.099	159°27'48.70"
	270	301280.582	6259381.677	43.191	159°27'48.70"
	285	301285.844	6259367.63	43.283	159°27'48.70"
A6	289.34	301287.367	6259363.566	43.31	
	300	301291.035	6259353.557	43.375	159°52'14.38"
	315	301296.197	6259339.473	43.468	159°52'14.38"
	330	301301.36	6259325.39	43.56	159°52'14.38"
A7	335.601	301303.287	6259320.131	43.594	
A8	444.31	301341.343	6259218.301	43.624	
	450	301343.337	6259212.971	43.541	159°29'12.18"
	465	301348.593	6259198.923	43.544	159°29'12.18"
	480	301353.85	6259184.874	43.632	159°29'12.18"
A9	482.512	301354.73	6259182.521		159°29'12.18"



DESIGN CONTROL LINE ROOTY HILL ROAD SOUTH LONGITUDINAL SECTION

HORIZONTAL SCALE 1:1000 @ A1
VERTICAL SCALE 1:100 @ A1

SCALE 1:100

SCALE 1:750

SCALE 1:1000

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

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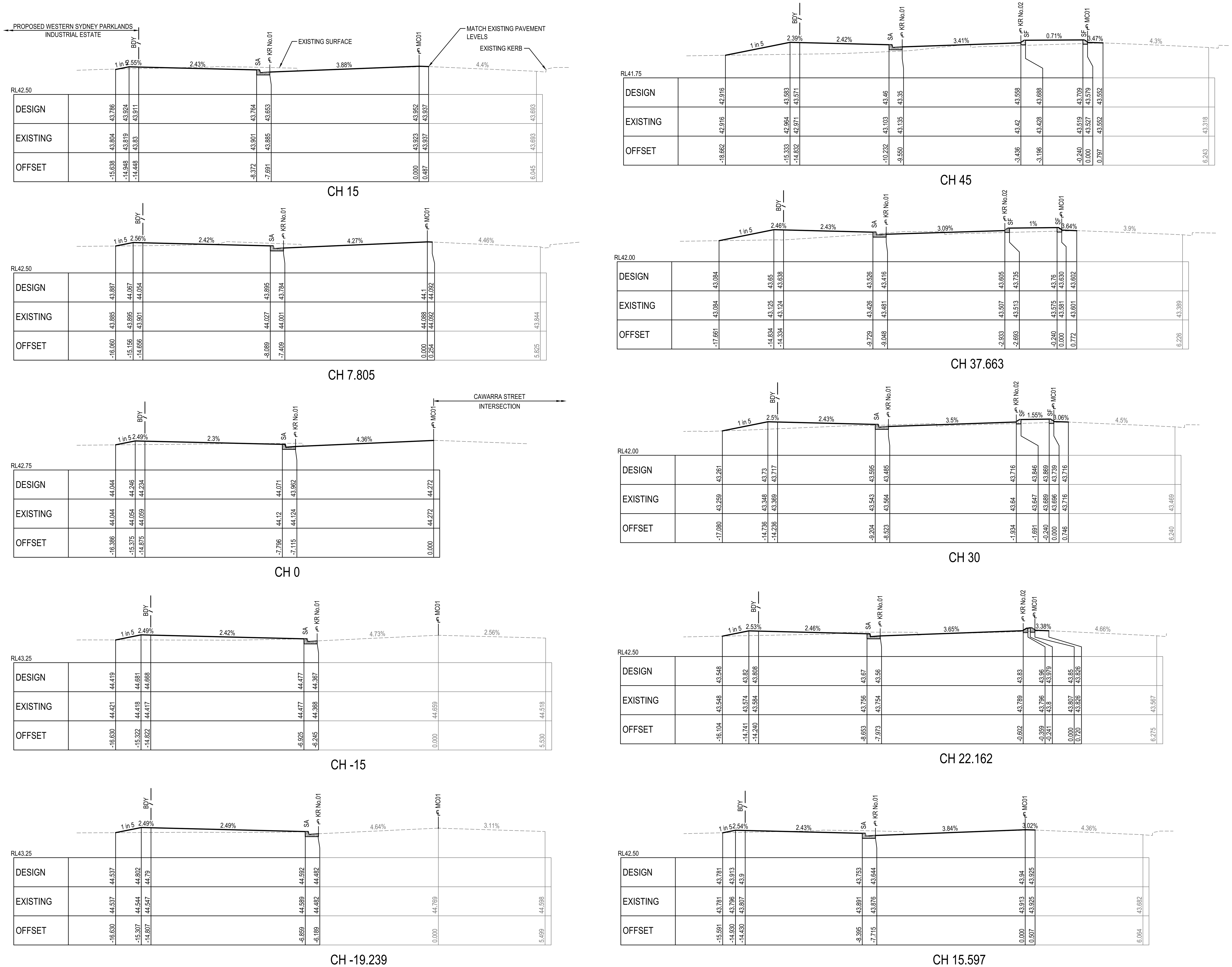
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: ROAD ALIGNMENT CONTROL PLAN LONGITUDINAL SECTION & SETOUT TABLE

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C130 Revision: 01



LEGEND

BDY — SITE BOUNDARY

SA — PROPOSED KERB & GUTTER - SA

SF — PROPOSED MOUNTABLE KERB - SF

0 2 4 6 8 10m
2 1
SCALE 1:100

CROSS SECTIONS - ROOTY HILL ROAD SOUTH CH -19.239 - CH 30.00

HORIZONTAL SCALE 1:100 @ A1
VERTICAL SCALE 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST
Surveyor: LANDPARTNERS

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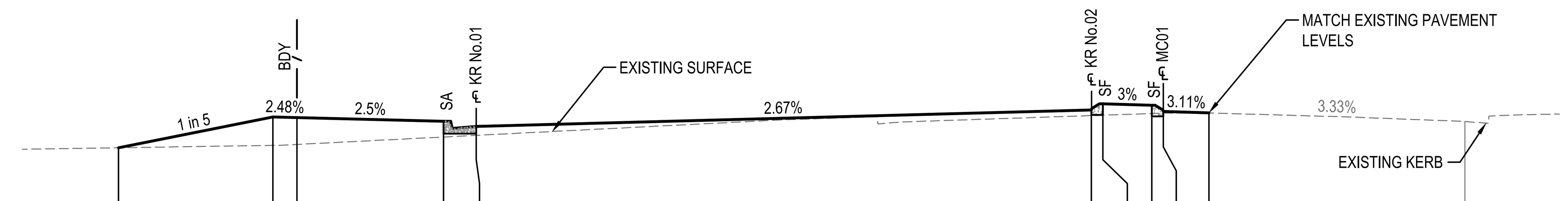
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: ROOTY HILL ROAD SOUTH CROSS SECTIONS SHEET 1 OF 5

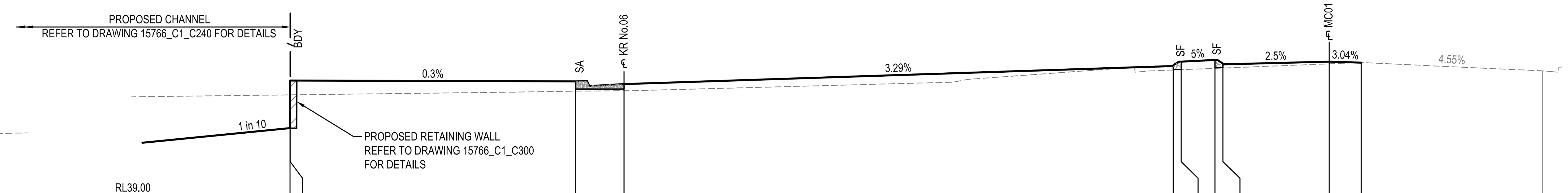
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:100 @ A1

Drawing number: 15766_C1_C135
Revision: 01



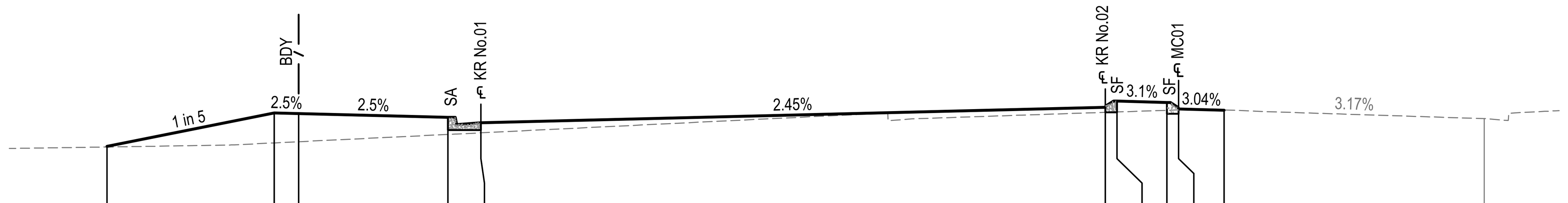
DESIGN	42.497	43.139	43.127	43.05	42.94	43.283	43.413	43.382	43.252	43.222	
EXISTING	42.497	42.546	42.566	42.721	42.755	43.167	43.175	43.21	43.218	43.222	43.045
OFFSET	-21.744	-18.532	-18.032	-14.980	-14.300	-1.500	-1.260	-0.240	0.000	0.948	6.276

CH 90



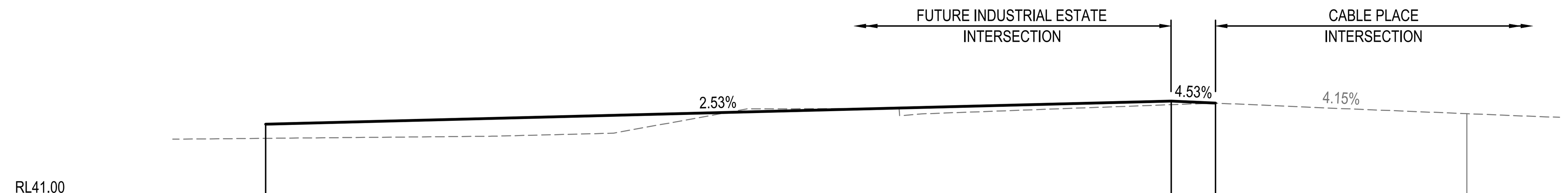
DESIGN	40.133	41.009	42.446	42.42	42.337	42.882	43.012	43.063	42.933	43.013	42.984	
EXISTING	41.901	42.012	42.012	42.124	42.137	42.762	42.771	42.811	42.821	42.947	42.984	42.735
OFFSET	-40.197	-31.300	-31.297	-22.696	-21.240	-4.700	-4.460	-3.440	-3.200	0.000	0.963	6.417

CH 146.905



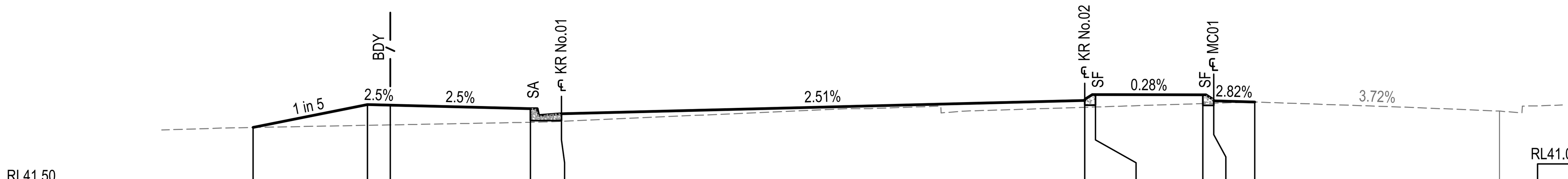
DESIGN	42.502	43.188	43.175	43.099	42.989	43.302	43.432	43.4	43.270	43.242	
EXISTING	42.49	42.574	42.598	42.747	42.781	43.2	43.208	43.243	43.251	43.251	43.072
OFFSET	-21.967	-18.536	-18.036	-14.980	-14.300	-1.502	-1.262	-0.240	0.000	0.930	6.264

CH 84.622



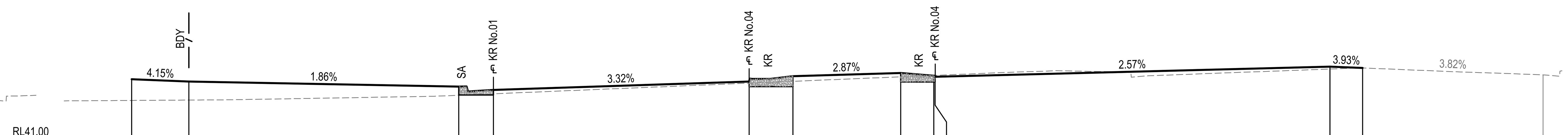
DESIGN	42.573	43.068	43.024	
EXISTING	42.268	42.99	43.024	42.797
OFFSET	-19.517	0.000	0.956	6.370

CH 135



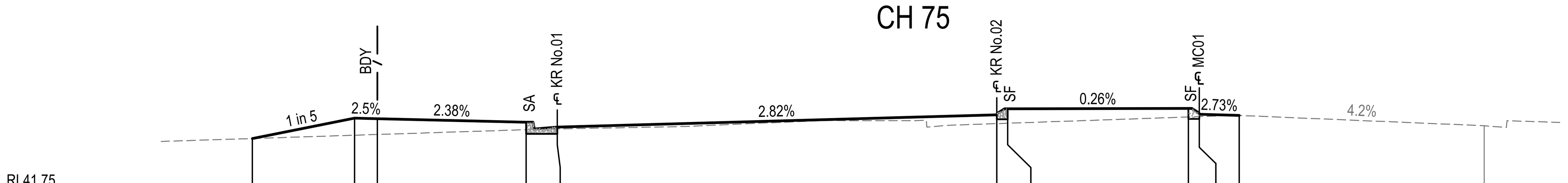
DESIGN	42.773	43.275	43.262	43.185	43.075	43.364	43.494	43.487	43.357	43.332	
EXISTING	42.774	42.821	42.83	42.887	42.91	43.214	43.222	43.297	43.305	43.332	43.132
OFFSET	-21.061	-18.552	-18.052	-14.980	-14.300	-2.829	-2.590	-0.240	0.000	0.898	6.266

CH 75



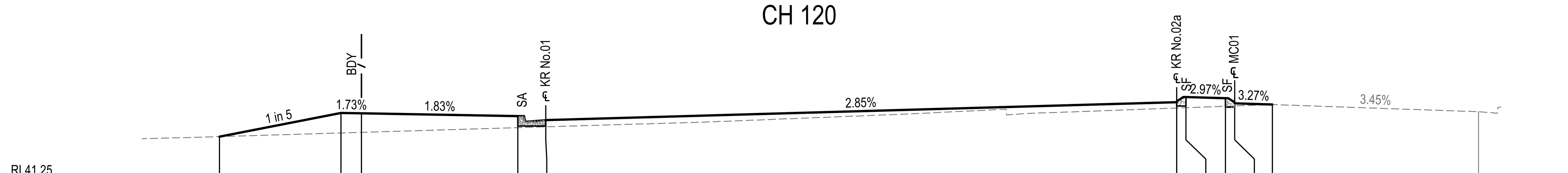
DESIGN	42.767	42.696	42.548	42.447	42.699	42.856	42.948	42.868	42.836	43.137	43.099	
EXISTING	42.138	42.149	42.292	42.334	42.65	42.704	42.837	42.877	42.879	43.066	43.099	42.895
OFFSET	-35.489	-33.796	-25.804	-24.776	-17.204	-15.905	-12.716	-11.733	-11.693	0.000	0.965	6.309

CH 120



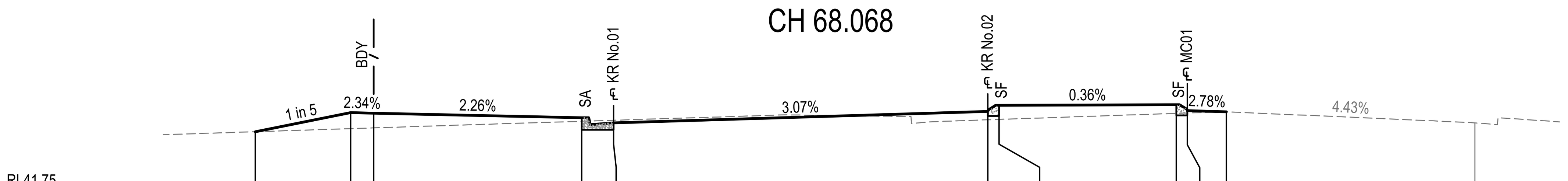
DESIGN	42.888	43.338	43.325	43.247	43.138	43.41	43.54	43.55	43.420	43.396	
EXISTING	42.888	42.961	42.977	43.082	43.1	43.216	43.224	43.362	43.370	43.396	43.17
OFFSET	-20.812	-18.564	-18.064	-14.794	-14.107	-4.453	-4.212	-0.240	0.000	0.874	6.258

CH 68.068



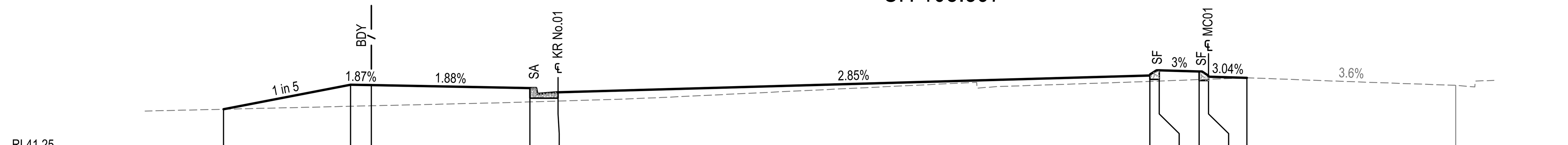
DESIGN	42.331	42.942	42.933	42.859	42.752	43.22	43.35	43.32	43.201	43.158	
EXISTING	42.331	42.425	42.44	42.561	42.583	43.068	43.077	43.114	43.135	43.158	42.974
OFFSET	-26.280	-23.135	-22.603	-18.557	-17.834	-1.500	-1.260	-0.240	0.000	0.975	6.310

CH 108.397



DESIGN	43.02	43.435	43.423	43.321	43.212	43.462	43.592	43.606	43.476	43.452	
EXISTING	43.02	43.087	43.103	43.247	43.269	43.279	43.287	43.417	43.425	43.452	43.213
OFFSET	-20.247	-18.177	-17.675	-13.158	-12.464	-4.333	-4.093	-0.240	0.000	0.847	6.247

CH 60



DESIGN	42.37	42.995	42.985	42.909	42.802	43.232	43.362	43.331	43.201	43.172	
EXISTING	42.37	42.446	42.458	42.557	42.579	43.08	43.089	43.127	43.135	43.172	42.98
OFFSET	-25.149	-21.907	-21.375	-17.329	-16.607	-1.500	-1.260	-0.240	0.000	0.978	6.308

CH 105

0 2 4 6 8 10m
2 1
SCALE 1:100

CROSS SECTIONS - ROOTY HILL ROAD SOUTH CH -19.239 - CH 30.00

HORIZONTAL SCALE 1:100 @ A1
VERTICAL SCALE 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client
WESTERN SYDNEY PARKLANDS TRUST

Surveyor
LANDPARTNERS

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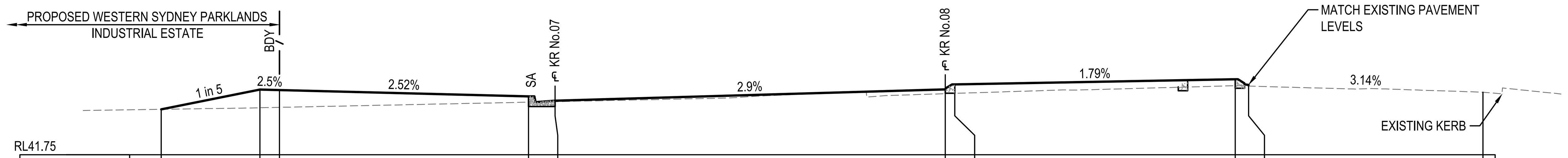
henry&hymas

Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
ROOTY HILL ROAD SOUTH CROSS SECTIONS
SHEET 2 OF 5

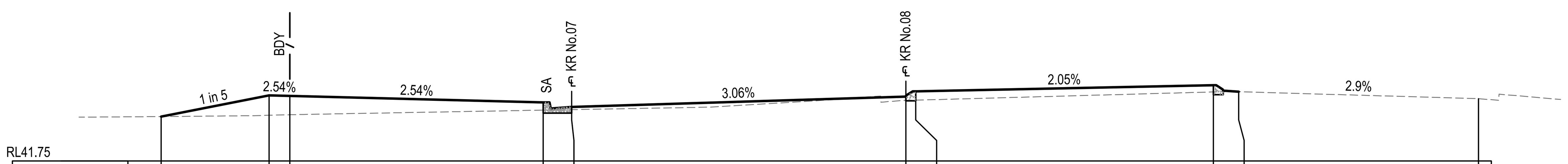
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:100 @ A1

Drawing number 15766_C1_C136
Revision 01



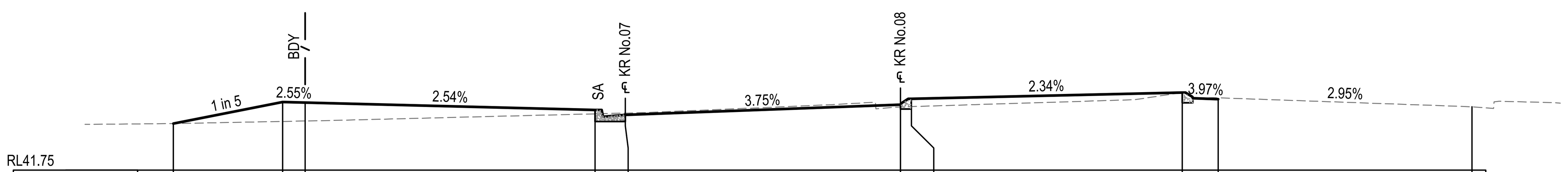
DESIGN	42.919	43.425	43.412	43.251	43.141	43.431	43.561	43.69	43.547	
EXISTING	42.919	42.958	42.969	43.102	43.116	43.32	43.328	43.525	43.515	43.358
OFFSET	-27.751	-25.223	-24.723	-18.342	-17.661	-7.665	-7.423	-0.240	0.103	6.105

CH 330



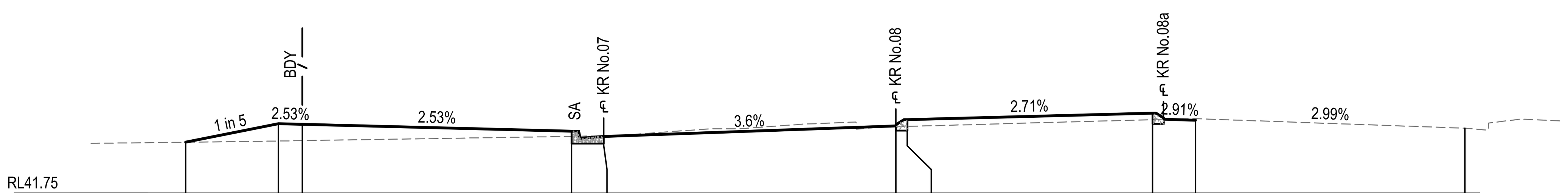
DESIGN	42.835	43.351	43.338	43.181	43.07	43.319	43.449	43.598	43.44	
EXISTING	42.834	42.866	42.878	42.991	43.003	43.228	43.234	43.435	43.44	43.271
OFFSET	-25.846	-23.221	-22.713	-16.548	-15.855	-7.724	-7.483	-0.240	0.378	6.213

CH 315



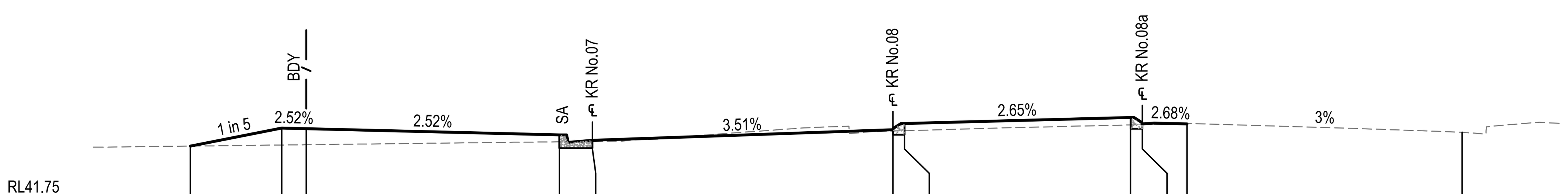
DESIGN	42.804	43.289	43.276	43.109	42.998	43.232	43.362	43.505	43.353	
EXISTING	42.803	42.852	42.862	43.023	43.04	43.179	43.186	43.371	43.386	43.184
OFFSET	-23.067	-20.595	-20.087	-13.528	-12.842	-5.615	-5.370	-0.240	0.572	6.314

CH 300



DESIGN	42.827	43.214	43.202	43.058	42.948	43.17	43.3	43.44	43.291	
EXISTING	42.825	42.851	42.859	42.948	42.959	43.151	43.158	43.3	43.322	43.121
OFFSET	-20.663	-18.703	-18.199	-12.513	-11.831	-5.662	-5.422	-0.240	0.667	6.358

CH 289.34



DESIGN	42.809	43.182	43.169	43.038	42.927	43.144	43.274	43.398	43.268	43.265	
EXISTING	42.809	42.831	42.837	42.897	42.904	43.119	43.126	43.246	43.252	43.273	43.095
OFFSET	-19.857	-17.975	-17.471	-12.256	-11.575	-5.384	-5.144	-0.486	-0.245	0.674	6.345

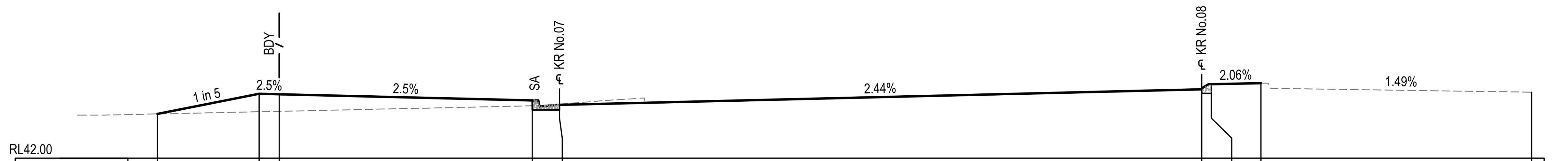
CH 285

LEGEND

BDY — SITE BOUNDARY

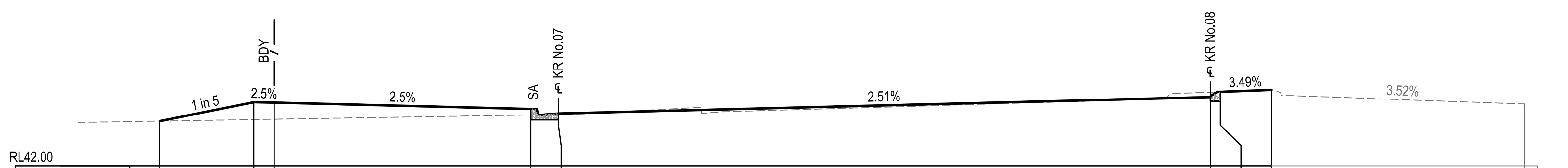
SA — PROPOSED KERB & GUTTER - SA

SF — PROPOSED MOUNTABLE KERB - SF



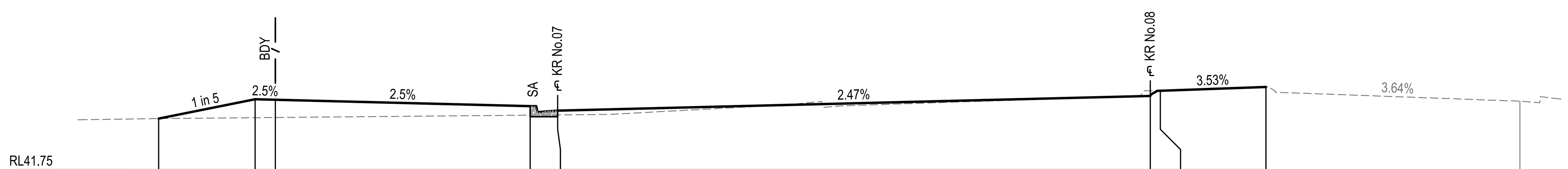
DESIGN	43.106	43.613	43.601	43.443	43.333	43.723	43.853	43.879	
EXISTING	43.106	43.161	43.172	43.31	43.353	43.721	43.853	43.745	43.652
OFFSET	-27.768	-25.232	-24.732	-18.422	-17.742	-1.721	-1.481	-0.243	6.507

CH 372.476



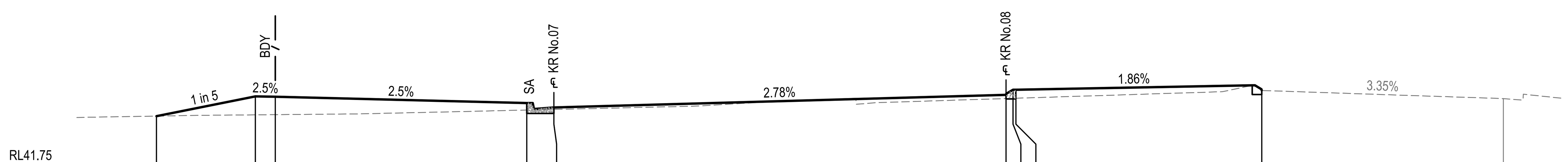
DESIGN	43.099	43.562	43.549	43.392	43.282	43.684	43.814	43.858	
EXISTING	43.099	43.137	43.145	43.25	43.261	43.812	43.814	43.858	43.516
OFFSET	-27.554	-25.240	-24.740	-18.430	-17.750	-1.714	-1.474	-0.215	6.016

CH 360



DESIGN	43.015	43.491	43.479	43.321	43.211	43.574	43.704	43.796	
EXISTING	43.014	43.036	43.041	43.099	43.106	43.703	43.706	43.796	43.446
OFFSET	-27.634	-25.249	-24.749	-18.440	-17.760	-3.093	-2.844	-0.230	6.057

CH 345



DESIGN	42.952	43.448	43.436	43.278	43.168	43.483	43.614	43.614	43.594	
EXISTING	42.952	42.983	42.988	43.104	43.119	43.392	43.398	43.4	43.594	43.391
OFFSET	-27.737	-25.256	-24.756	-18.446	-17.766	-6.418	-6.241	-6.168	0.000	6.065

CH 335.601

0 2 4 6 8 10m
2 1
SCALE 1:100

CROSS SECTIONS - ROOTY HILL ROAD SOUTH " CH 375 - CH 450"

HORIZONTAL SCALE 1:100 @ A1
VERTICAL SCALE 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

Level 5, 79 Victoria Avenue Chatswood NSW 2067
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Facsimile +61 2 9417 8337
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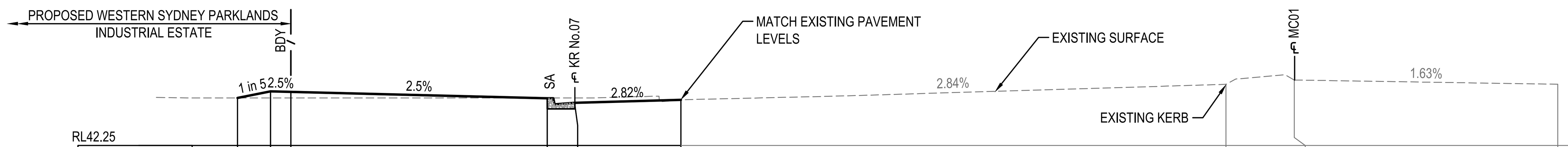
Web www.henryandhymas.com.au
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: ROOTY HILL ROAD SOUTH CROSS SECTIONS SHEET 5 OF 6

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:100 @ A1

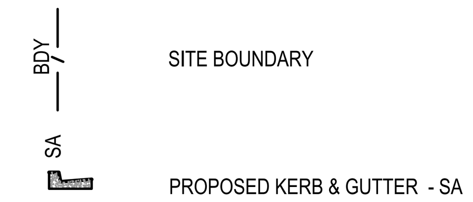
Drawing number: 15766_C1_C137 Revision: 01



DESIGN	43.423	43.585	43.573	43.415	43.305	43.378			
EXISTING	43.423	43.423	43.423	43.423	43.422	43.378	43.76	43.866	43.761
OFFSET	-26.012	-25.199	-24.699	-18.390	-17.710	-15.099	-1.679	0.000	6.488

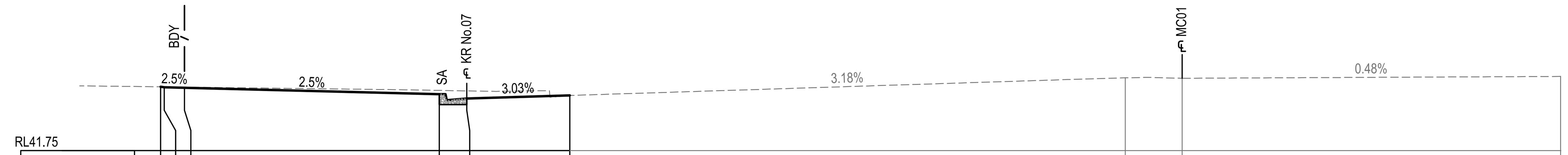
CH 405

LEGEND



DESIGN	43.426	43.629	43.616	43.458	43.348	43.42			
EXISTING	43.429	43.427	43.426	43.412	43.411	43.42	43.754	43.826	43.701
OFFSET	-26.211	-25.200	-24.700	-18.390	-17.710	-15.120	-1.665	0.000	6.546

CH 390

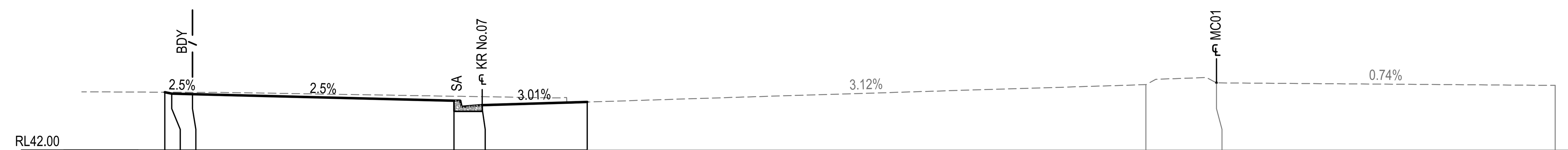


DESIGN	43.329	43.318	43.306	43.148	43.038	43.115			
EXISTING	43.329	43.328	43.322	43.24	43.228	43.115	43.552	43.541	43.586
OFFSET	-25.285	-25.193	-24.693	-18.383	-17.703	-15.154	-1.408	0.000	9.366

CH 450

DESIGN	43.212	43.63	43.617	43.46	43.35	43.435			
EXISTING	43.212	43.216	43.216	43.304	43.363	43.435	43.777	43.82	43.662
OFFSET	-27.288	-25.200	-24.700	-18.390	-17.710	-15.109	-0.781	0.000	6.512

CH 381.007



DESIGN	43.399	43.366	43.353	43.195	43.085	43.161			
EXISTING	43.399	43.398	43.396	43.302	43.29	43.161	43.582	43.624	43.564
OFFSET	-25.366	-25.198	-24.698	-18.389	-17.709	-15.175	-1.701	0.000	8.170

CH 444.31

DESIGN	43.21	43.63	43.617	43.46	43.35	43.435			
EXISTING	43.21	43.213	43.214	43.304	43.362	43.435	43.777	43.82	43.662
OFFSET	-27.299	-25.200	-24.700	-18.390	-17.710	-15.109	-0.780	0.000	6.512

CH 381.007

DESIGN	43.54	43.443	43.43	43.273	43.163	43.262		
EXISTING	43.541	43.53	43.52	43.386	43.372	43.262	43.642	43.737
OFFSET	-25.682	-25.199	-24.699	-18.389	-17.709	-15.138	-1.687	0.000

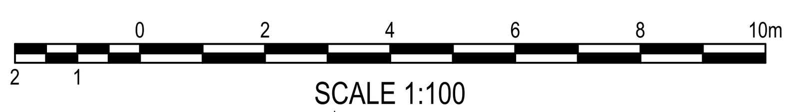
CH 435

DESIGN	43.099	43.62	43.607	43.45	43.34	43.413		
EXISTING	43.099	43.157	43.168	43.306	43.354	43.413	43.770	43.652
OFFSET	-27.824	-25.222	-24.722	-18.413	-17.733	-15.125	0.000	6.500

CH 375

DESIGN	43.434	43.516	43.504	43.346	43.236	43.336			
EXISTING	43.434	43.426	43.417	43.395	43.41	43.336	43.719	43.857	43.759
OFFSET	-25.612	-25.199	-24.699	-18.389	-17.709	-15.114	-1.679	0.000	6.660

CH 420



SCALE 1:100

CROSS SECTIONS - ROOTY HILL ROAD SOUTH " CH 375 - CH 450"

HORIZONTAL SCALE 1:100 @ A1
VERTICAL SCALE 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

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Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: ROOTY HILL ROAD SOUTH CROSS SECTIONS SHEET 6 OF 6

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:100 @ A1

Drawing number: 15766_C1_C138
Revision: 01

RMS REGISTRATION NUMBER: ....

INTERSECTION LAYOUT - OVERALL SETOUT ALIGNMENT PLAN

SCALE: 1:750 @A1

0 15 30 45 60 75m
15 10 5
SCALE 1:750

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST
Surveyor: LANDPARTNERS

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Chatswood NSW 2067
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Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
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Global-Mark.com.au®
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: OVERALL SETOUT ALIGNMENT PLAN

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:750 @ A1

Drawing number: 15766_C1_C150
Revision: 01

LEGEND

EXISTING BOUNDARY
LIMIT OF WORKS
43.10 EXISTING CONTOURS
42.80 PROPOSED CONTOURS

KERB & GUTTER (SA)

SCALE N.T.S

KERB RETURN No.01

SCALE 1:250 @ A1

NOTE:
REFER TO DRAWING 15766_C1_C152 FOR KERB RETURN No. 01 SETOUT TABLE

Datum RL40

CHAINAGE	DESIGN LEVELS	EXISTING LEVELS
0.000	44.486	44.486
10.000	44.215	44.205
13.515	44.120	44.109
18.272	43.992	44.150
20.000	43.946	44.111
30.000	43.724	43.943
30.772	43.710	43.932
40.000	43.574	43.772
43.272	43.541	43.709
50.000	43.480	43.556
60.000	43.390	43.321
64.648	43.348	43.151
67.470	43.323	43.398
70.000	43.300	43.440
80.000	43.210	43.264
86.722	43.149	43.129
90.000	43.120	43.040
90.740	43.113	43.019
100.000	43.030	42.829
110.000	42.940	42.755
111.465	42.927	42.745
120.000	42.850	42.643
124.118	42.812	42.582
125.515	42.799	42.579
130.000	42.736	42.584
131.618	42.706	42.586
139.118	42.522	42.457
140.000	42.498	42.426
145.883	42.422	42.239
146.618	42.423	42.227
150.000	42.459	42.171
154.028	42.568	42.109
154.118	42.571	42.108
157.393	42.689	42.083
160.000	42.773	42.045
160.295	42.781	42.040
164.893	42.873	41.965
167.180	42.895	41.930
170.000	42.900	41.828
172.393	42.885	41.775

LONGITUDINAL SECTION KERB RETURN No.01 - LIP OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

0 1000 2000 3000 4000 5000mm
1000 600 200
SCALE 1:50

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST
Surveyor: LANDPARTNERS

Level 5, 79 Victoria Avenue Chatswood NSW 2067
Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: SETOUT DETAILS AND SECTION KERB RETURN No.01

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C151
Revision: 01

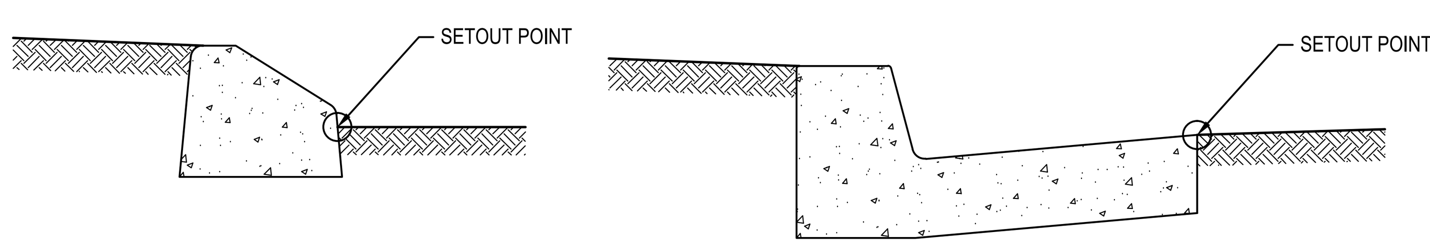
LEGEND

EXISTING BOUNDARY

LIMIT OF WORKS

EXISTING CONTOURS

PROPOSED CONTOURS

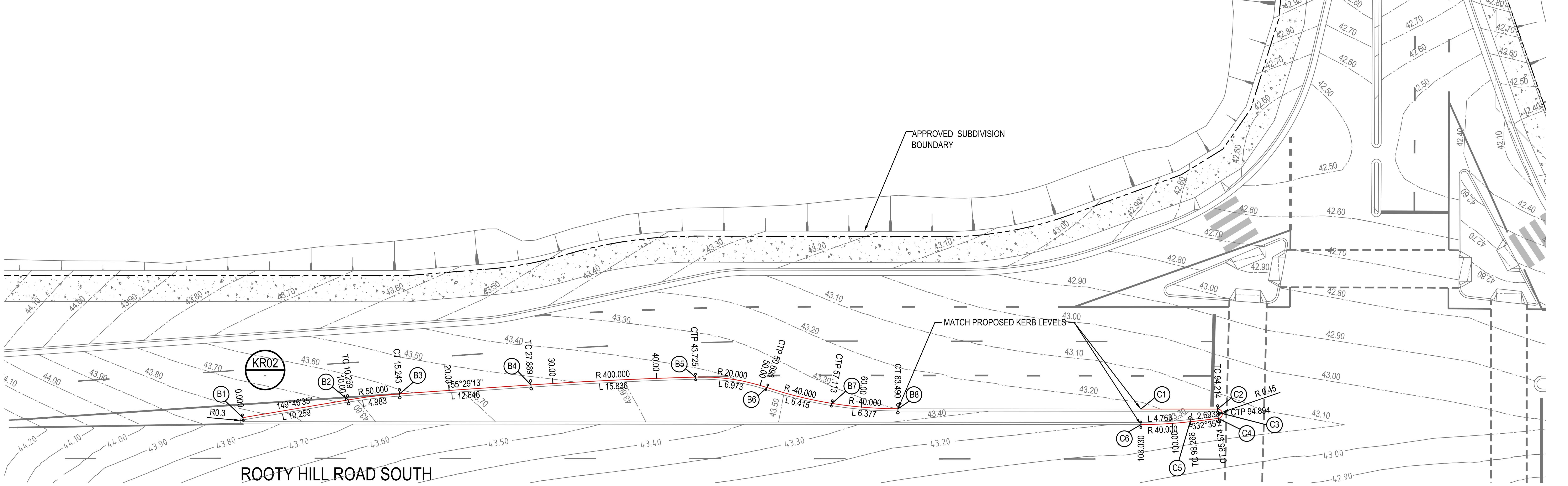


RAISED MEDIANS KERB (SF)

SCALE N.T.S

KERB & GUTTER (SA)

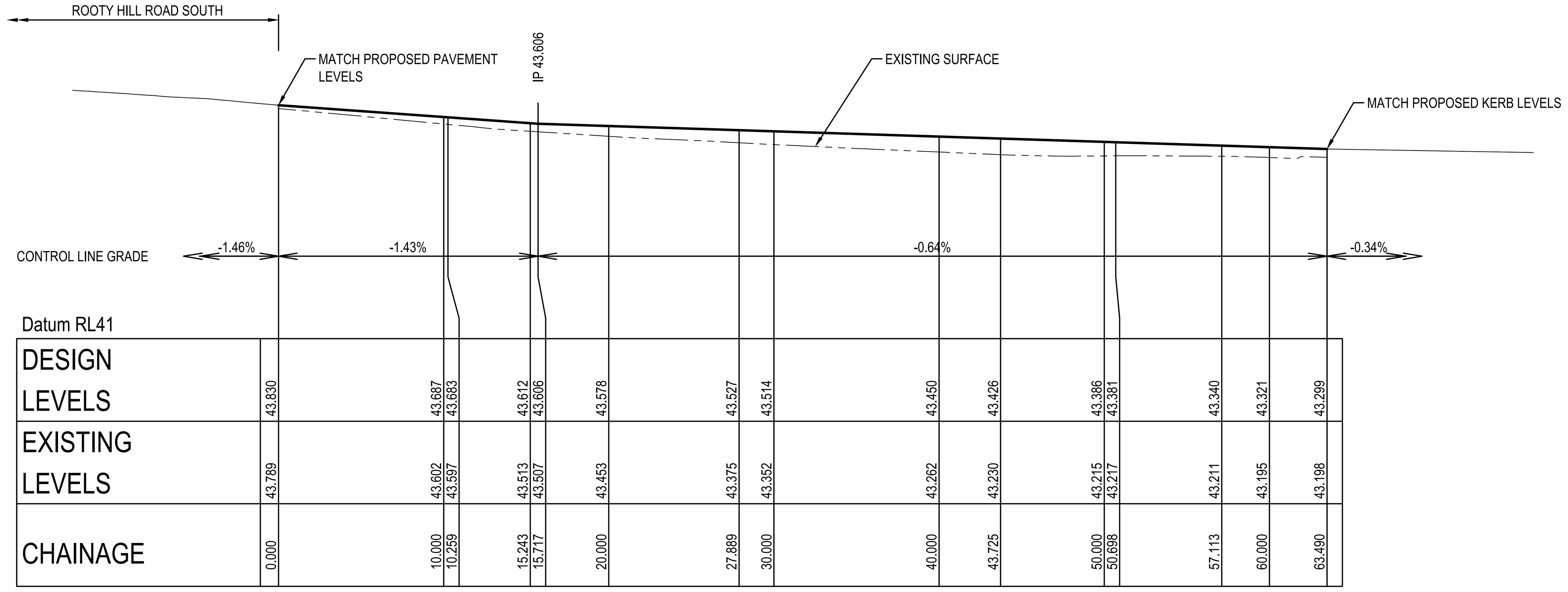
SCALE N.T.S



KERB RETURN No.02 & No.02a

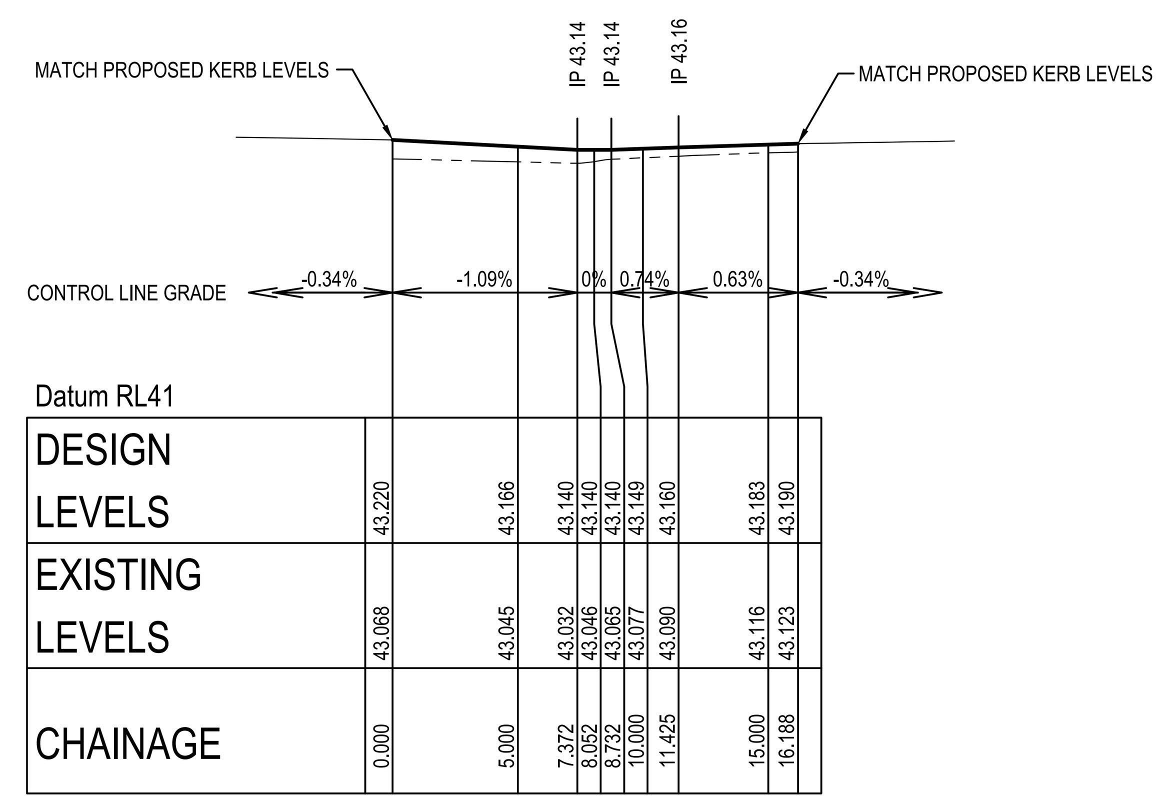
SCALE 1:250 @ A1

NOTE:
REFER TO DRAWING 15766_C1_C151 FOR KERB RETURN No. 01 PLAN AND LONG SECTION



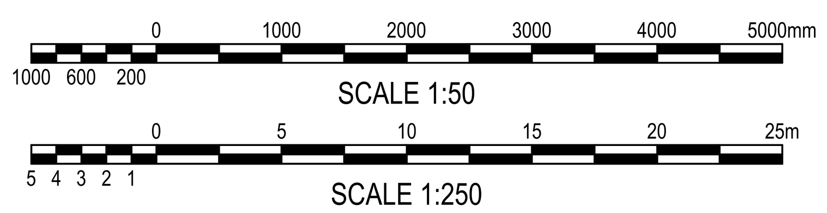
LONGITUDINAL SECTION KERB RETURN No.02 - FACE OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1



LONGITUDINAL SECTION KERB RETURN No.02a - FACE OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1



SCALE 1:50

SCALE 1:250

KERB RETURN No. 01 - CONTROL LINE DETAILS - LIP OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
A1	0	301184.167	6259654.545	44.486	159°20'56.71"			
A1-A2	6.757	301186.551	6259648.219	44.303		-200.5	13.515	3°51'43.22"
	10	301187.925	6259645.279	44.215	156°29'29.19"			
A2	13.515	301189.355	6259642.068	44.12	155°29'13.49"			
	20	301192.046	6259636.168	43.946	155°29'13.49"			
	30	301196.195	6259627.069	43.724	155°29'13.49"			
	40	301200.344	6259617.97	43.574	155°29'13.49"			
	50	301204.493	6259608.872	43.48	155°29'13.49"			
	60	301208.642	6259599.773	43.39	155°29'13.49"			
A3	64.648	301210.57	6259595.544	43.348	155°29'13.49"			
A3-A4	66.059	301211.157	6259594.258	43.336		-20.5	2.822	7°53'14.72"
A4	67.47	301211.914	6259593.065	43.323	147°35'58.77"			
	70	301213.27	6259590.929	43.3	147°35'58.77"			
	80	301218.628	6259582.485	43.21	147°35'58.77"			
A5	86.722	301222.23	6259576.81	43.149	147°35'58.77"			
A5-A6	88.731	301223.31	6259575.108	43.131		19.5	4.018	11°48'26.30"
	90	301223.746	6259573.908	43.12	157°13'56.24"			
A6	90.74	301224.019	6259573.22	43.113	159°24'25.07"			
	100	301227.276	6259564.552	43.03	159°24'25.07"			
	110	301230.794	6259555.191	42.94	159°24'25.07"			
A7	111.465	301231.309	6259553.819	42.927	159°24'25.07"			
A7-A8	118.49	301233.805	6259547.176	42.863		-40.5	14.05	19°52'36.04"
	120	301235.127	6259546.204	42.85	147°19'58.26"			
A8	125.515	301238.411	6259541.778	42.799	139°31'49.02"			
	130	301241.322	6259538.366	42.736	139°31'49.02"			
A9	131.618	301242.372	6259537.135	42.706	139°31'49.02"			
	140	301248.861	6259531.907	42.498	118°11'07.25"			
A9-A10	142.823	301250.312	6259527.828	42.443		-22.5	22.41	57°04'04.24"
	150	301258.421	6259529.264	42.459	92°43'14.01"			
A10	154.028	301262.44	6259529.433	42.568	82°27'44.78"			
	160	301268.36	6259530.217	42.773	82°27'44.78"			
A11	160.295	301268.652	6259530.255	42.781	82°27'44.78"			
A11-A12	163.737	301272.08	6259530.709	42.856		-30.5	6.885	12°55'59.14"
A12	167.18	301275.318	6259531.918	42.895				
	170	301277.961	6259532.904	42.9	69°31'46.00"			
A13	172.393	301280.202	6259533.741	42.885	69°31'46.00"			

KERB RETURN No. 02 - CONTROL LINE DETAILS - FACE OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
B1	0	301194.065	6259613.979	43.83	149°46'35.36"			
	10	301199.099	6259605.338	43.687	149°46'35.36"			
B2	10.259	301199.229	6259605.114	43.683	149°46'35.36"			
B2-B3	12.751	301200.485	6259602.959	43.648		50	4.983	5°42'38.14"
B3	15.243	301201.519	6259600.69	43.612	155°29'13.49"			
	20	301203.493	6259596.362	43.578	155°29'13.49"			
B4	27.889	301206.766	6259589.184	43.527	155°29'13.49"			
	30	301207.637	6259587.261	43.514	155°47'22.14"			
B4-B5	35.807	301210.052	6259581.978	43.477		400	15.836	2°16'06.19"
	40	301211.624	6259578.09	43.45	157°13'18.76"			
B5	43.725	301213.05	6259574.649	43.426	157°45'19.68"			
B5-B6	47.211	301214.383	6259571.389	43.403		20	6.973	19°58'29.45"
	50	301214.483	6259568.566	43.386	175°43'53.78"			
B6	50.698	301214.523	6259567.869	43.381	177°43'49.13"			
B6-B7	53.905	301214.65	6259564.658	43.36		-40	6.415	9°11'19.81"
B7	57.113	301215.288	6259561.507	43.34	168°32'29.32"			
	60	301215.964	6259558.701	43.321	164°24'20.60"			
B7-B8	60.301	301215.923	6259558.376	43.319		-40	6.377	9°08'04.25"
B8	63.49	301217.047	6259555.384	43.299	159°24'25.07"			

KERB RETURN No. 02a - CONTROL LINE DETAILS - FACE OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
C1	0	301225.261	6259533.525	43.22	159°24'25.07"			
	5	301227.019	6259528.844	43.166	159°24'25.07"			
C2	7.372	301227.854	6259526.624	43.14	159°24'25.07"			
C2-C3	7.712	301228.003	6259526.227	43.14		0.45	0.68	86°35'18.32"
C3	8.052	301227.615	6259526.054	43.14	245°59'43.39"			
C3-C4	8.392	301227.228	6259525.882	43.14		0.45	0.68	86°35'18.32"
C4	8.732	301227.033	6259526.258	43.14	332°35'01.72"			
	10	301226.449	6259527.383	43.149	332°35'01.72"			
C5	11.425	301225.793	6259528.648	43.16	332°35'01.72"			
C5-C6	13.807	301224.695	6259530.765	43.175		40	4.763	6°49'23.35"
	15	301224.291	6259531.891	43.183	337°42'17.00"			
C6	16.188	301223.856	6259532.997	43.19	339°24'25.07"			

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

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Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

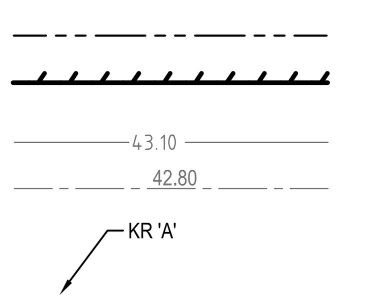
Title: SETOUT DETAILS AND SECTIONS KERB RETURN No.01, No.02 & No.02a

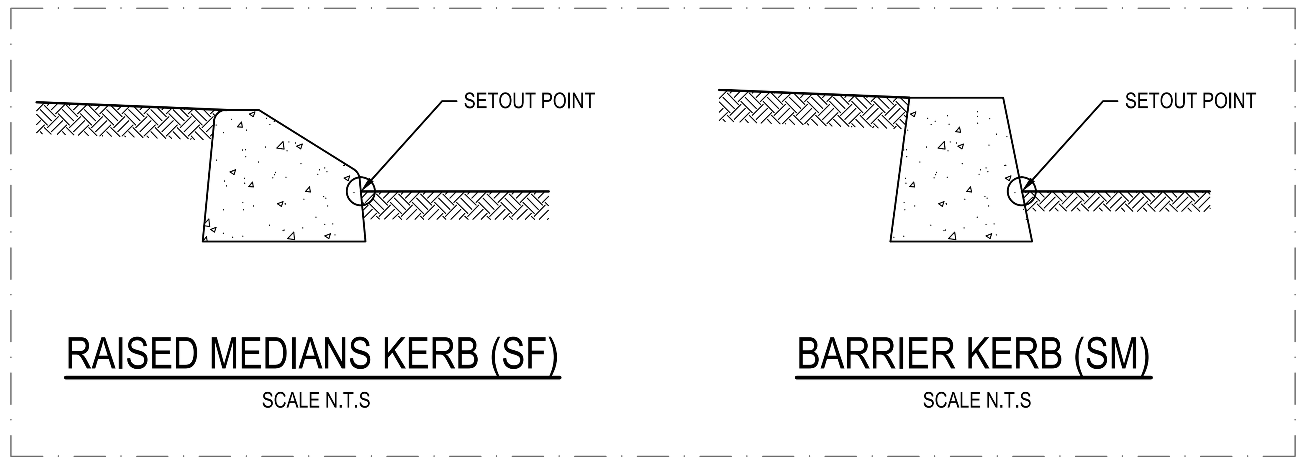
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C152

Revision: 01

LEGEND





RAISED MEDIANS KERB (SF)
SCALE N.T.S

BARRIER KERB (SM)
SCALE N.T.S

KERB RETURN No. 03 - CONTROL LINE DETAILS - FACE OF KERB "SF KERB"					
Pt	Chainage	Easting	Northing	Level	Bearing
A1	0	301250.77	6259519.445	42.578	69°31'46.00"
A2	4.632	301255.109	6259521.065	42.526	69°31'46.00"
A3	6.632	301256.983	6259521.764	42.526	69°31'46.00"
	5	301255.454	6259521.194	42.525	69°31'46.00"
	10	301260.138	6259522.942	42.556	69°31'46.00"
	15	301264.823	6259524.691	42.673	69°31'46.00"
	20	301269.507	6259526.439	42.849	69°31'46.00"
	25	301274.191	6259528.188	42.962	69°31'46.00"
	30	301278.876	6259529.937	42.994	69°31'46.00"
A4	32.573	301281.286	6259530.837	42.979	69°31'46.00"

KERB RETURN No. 04 - CONTROL LINE DETAILS - FACE OF KERB "SM KERB"								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
B1	0	301244.928	6259525.888	42.69				
B2	4.876	301240.132	6259525.011	42.819				
B2-B3	5.582	301239.287	6259524.899	42.826		1	1.412	80°52'53.10"
B3	6.288	301239.043	6259525.716	42.833	343°21'07.86"			
B4	15.663	301236.357	6259534.698	42.88				
B4-B5	16.075	301236.185	6259535.159	42.874		0.6	0.824	78°40'33.72"
B5	16.487	301236.602	6259535.418	42.869	58°10'40.85"			
B5-B6	16.899	301237.02	6259535.678	42.863		0.6	0.824	78°40'33.72"
B6	17.311	301237.357	6259535.319	42.857	136°51'14.57"			
B7	28.865	301245.258	6259526.889	42.67	136°51'14.57"			
B7-B8	29.187	301245.502	6259526.629	42.675		0.6	0.643	61°23'27.30"
B8	29.508	301245.39	6259526.291	42.68	198°14'41.86"			
B8-B1	29.83	301245.279	6259525.952	42.685		0.6	0.643	61°23'27.30"
B1	30.151	301244.928	6259525.888	42.69	259°38'09.16"			

KERB RETURN No. 05 - CONTROL LINE DETAILS - FACE OF KERB "SM KERB"								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
C1	0	301247.911	6259501.634	42.830				
C1-C2	0.163	301247.956	6259501.459	42.825		-0.3	0.325	62°09'49.49"
C2	0.325	301248.132	6259501.417	42.82	103°23'38.78"			
C2-C3	0.488	301248.308	6259501.375	42.815		-0.3	0.325	62°09'49.49"
C3	0.651	301248.427	6259501.511	42.81	41°13'49.29"			
C4	14.661	301257.661	6259512.047	42.44	41°13'49.29"			
C4-C5	14.992	301257.917	6259512.34	42.442		-0.5	0.662	75°51'01.65"
C5	15.323	301257.696	6259512.661	42.445	325°22'47.65"			
C5-C6	15.654	301257.475	6259512.982	42.447		-0.5	0.662	75°51'01.65"
C6	15.985	301257.11	6259512.845	42.45	249°31'46.00"			
C7	26.854	301246.927	6259509.044	42.77	249°31'46.00"			
C7-C8	27.587	301246.083	6259508.729	42.785		-1	1.466	83°58'17.73"
C8	28.32	301246.308	6259507.858	42.8	165°33'28.27"			
C1	34	301247.911	6259501.634	42.830				

KERB RAMP KR 'A' SETOUT			
Pt	Easting	Northing	Level
KR A-1	301244.912	6259535.502	42.752
KR A-2	301245.255	6259534.964	42.587
KR A-3	301247.590	6259533.234	42.509
KR A-4	301248.158	6259533.092	42.642
KR A-5	301248.434	6259534.091	42.660
KR A-6	301246.119	6259535.817	42.740

KERB RAMP KR 'E' SETOUT			
Pt	Easting	Northing	Level
KR E-1	301247.024	6259508.888	42.869
KR E-2	301247.515	6259509.264	42.703
KR E-3	301249.640	6259510.057	42.644
KR E-4	301250.255	6259510.094	42.779
KR E-5	301250.060	6259508.933	42.790
KR E-6	301247.935	6259508.139	42.850

KERB RAMP KR 'B' SETOUT			
Pt	Easting	Northing	Level
KR B-1	301241.276	6259530.874	42.911
KR B-2	301241.841	6259530.534	42.751
KR B-3	301243.816	6259528.428	42.704
KR B-4	301244.082	6259527.880	42.845
KR B-5	301243.068	6259527.470	42.850
KR B-6	301241.093	6259529.578	42.900

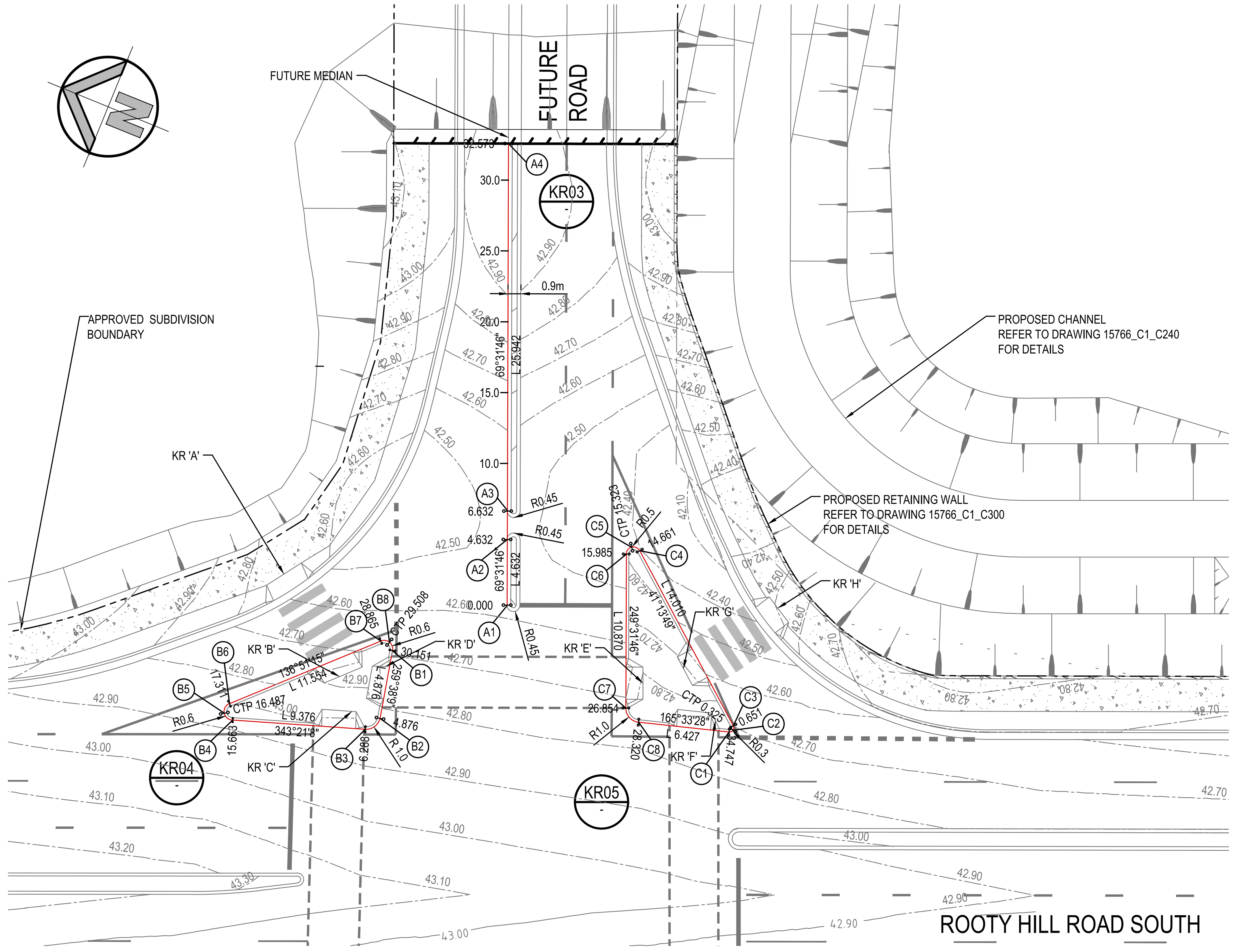
KERB RAMP KR 'F' SETOUT			
Pt	Easting	Northing	Level
KR F-1	301247.011	6259505.848	42.891
KR F-2	301246.983	6259505.238	42.737
KR F-3	301247.582	6259502.912	42.721
KR F-4	301247.905	6259502.378	42.866
KR F-5	301248.731	6259503.262	42.820
KR F-6	301248.131	6259505.589	42.840

KERB RAMP KR 'C' SETOUT			
Pt	Easting	Northing	Level
KR C-1	301238.163	6259529.287	43.001
KR C-2	301238.158	6259528.676	42.849
KR C-3	301238.846	6259526.375	42.837
KR C-4	301239.189	6259525.854	42.984
KR C-5	301239.980	6259526.769	42.940
KR C-6	301239.292	6259529.071	42.950

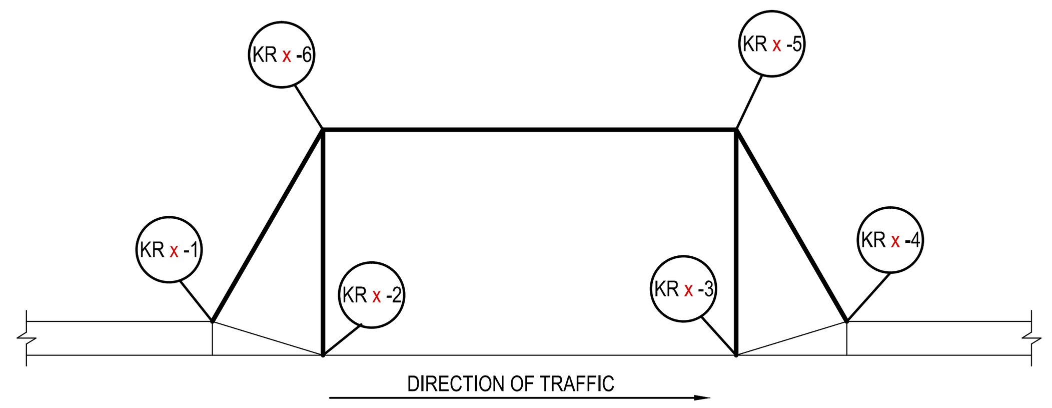
KERB RAMP KR 'G' SETOUT			
Pt	Easting	Northing	Level
KR G-1	301252.732	6259506.697	42.688
KR G-2	301252.479	6259506.135	42.552
KR G-3	301250.984	6259504.429	42.607
KR G-4	301250.461	6259504.105	42.771
KR G-5	301250.082	6259505.220	42.760
KR G-6	301251.577	6259506.926	42.700

KERB RAMP KR 'D' SETOUT			
Pt	Easting	Northing	Level
KR D-1	301240.934	6259525.341	42.947
KR D-2	301241.541	6259525.269	42.781
KR D-3	301243.807	6259525.683	42.720
KR D-4	301244.409	6259525.976	42.853
KR D-5	301243.381	6259526.825	42.860
KR D-6	301241.114	6259526.411	42.920

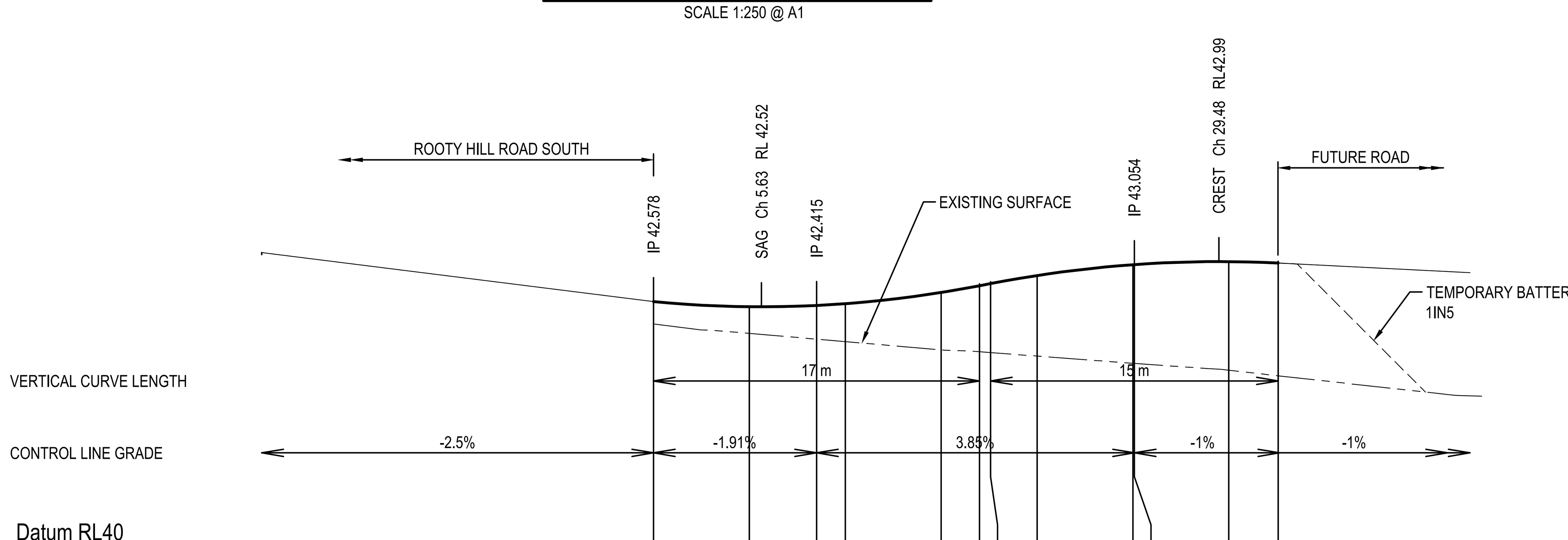
KERB RAMP KR 'H' SETOUT			
Pt	Easting	Northing	Level
KR H-1	301257.300	6259503.342	42.469
KR H-2	301256.820	6259502.992	42.335
KR H-3	301255.606	6259501.060	42.396
KR H-4	301255.465	6259500.411	42.562
KR H-5	301256.623	6259500.424	42.550
KR H-6	301257.830	6259502.345	42.480



KERB RETURN No.02, 03 & 04
SCALE 1:250 @ A1



KERB RAMP SETOUT DETAIL
SCALE N.T.S.



Datum RL40

DESIGN LEVELS	42.578	42.525	42.538	42.556	42.673	42.743	42.765	42.849	42.962	42.963	42.994	42.979	
EXISTING LEVELS	42.343	42.246	42.186	42.160	42.074	42.054	42.046	42.009	41.935	41.934	41.861	41.804	
CHAINAGE	0.000	5.000	8.500	10.000	15.000	17.000	17.573	20.000	25.000	25.073		32.573	

LONGITUDINAL SECTION KERB RETURN No.03 - FACE OF KERB
HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

0 1000 2000 3000 4000 5000mm
1000 600 200
SCALE 1:50

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client
WESTERN SYDNEY PARKLANDS TRUST

Surveyor
LANDPARTNERS

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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
SETOUT DETAILS AND SECTION
KERB RETURN No.03, 04 & 05

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C153
Revision: 01

LEGEND

— · — · —	EXISTING BOUNDARY
╱╱╱╱╱╱	LIMIT OF WORKS
—— 43.10 ——	EXISTING CONTOURS
- - 42.80 - -	PROPOSED CONTOURS

SETOUT POINT

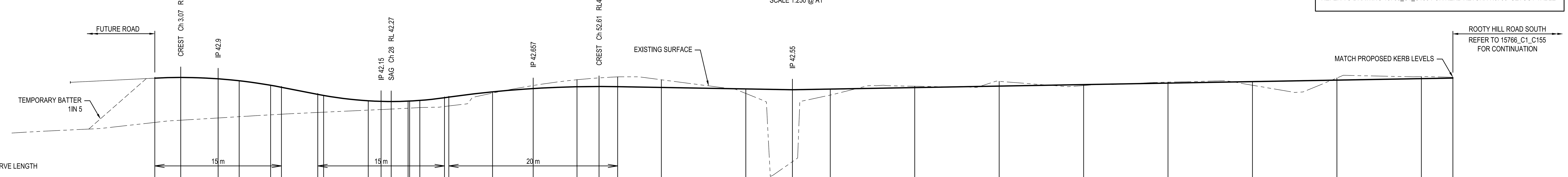
KERB & GUTTER (SA)

SCALE N.T.S

KERB RETURN No.06

SCALE 1:250 @ A1

NOTE:
REFER TO DRAWING 15766_C1_C156 FOR KERB RETURN No. 06 SETOUT TABLE



Datum RL39

DESIGN LEVELS	42.825	42.840	42.808	42.762	42.655	42.608	42.441	42.415	42.289	42.276	42.272
EXISTING LEVELS	41.778	41.831	41.883	41.914	41.958	41.972	42.013	42.020	42.068	42.082	42.093
CHAINAGE	0.000	3.072	7.500	10.000	13.721	15.000	19.306	20.000	25.283	26.806	27.999

DESIGN LEVELS	42.281	42.283	42.298	42.361	42.376	42.500	42.578	42.621	42.626	42.622	42.604
EXISTING LEVELS	42.114	42.116	42.129	42.154	42.166	42.471	42.651	42.787	42.830	42.853	42.785
CHAINAGE	30.000	30.180	31.392	34.306	34.819	40.000	44.819	50.000	52.609	54.819	60.000

DESIGN LEVELS	42.569	42.550	42.566	42.601	42.637	42.672	42.707	42.743	42.778	42.813	42.827
EXISTING LEVELS	42.463	40.851	42.424	42.633	42.748	42.649	42.730	42.656	42.828	42.860	42.846
CHAINAGE	70.000	75.519	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	153.736

LONGITUDINAL SECTION KERB RETURN No.06 - LIP OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

0 1000 2000 3000 4000 5000mm
1000 600 200
SCALE 1:50

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	XX.06.2017					

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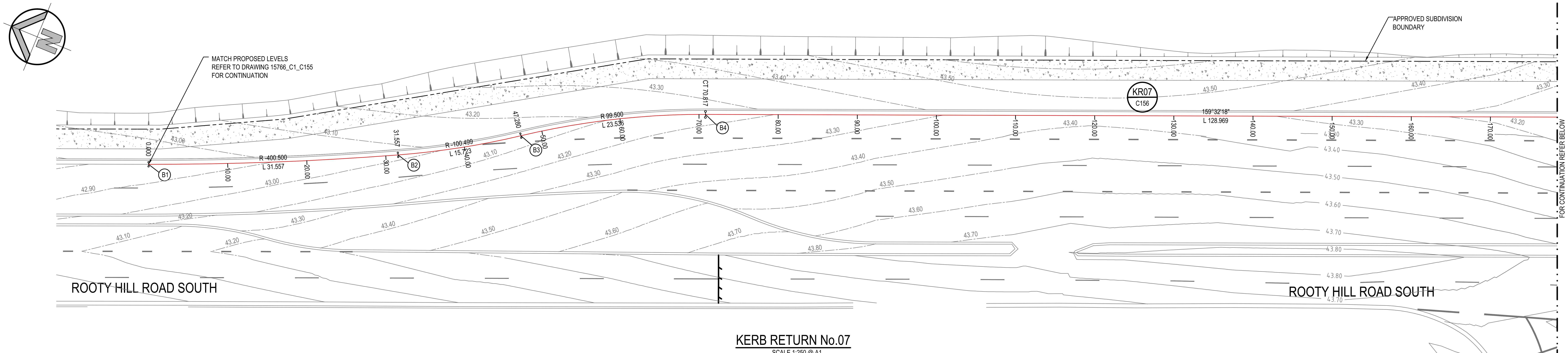
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
SETOUT DETAILS AND SECTION
KERB RETURN No.06

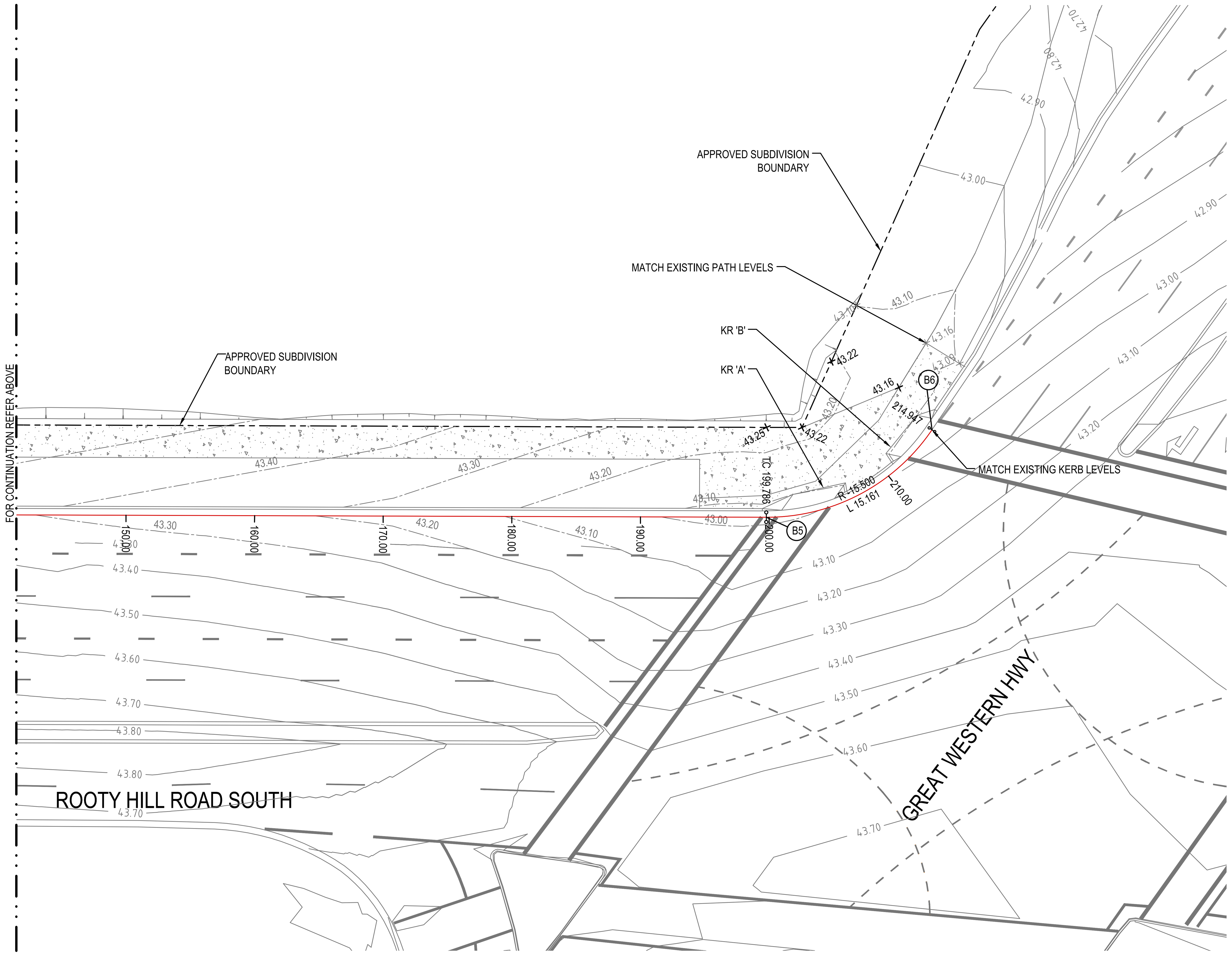
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C154
Revision: 01



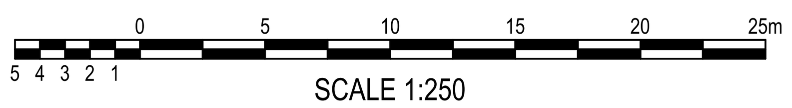
KERB RETURN No.07

SCALE 1:250 @ A1



KERB RETURN No.07

SCALE 1:250 @ A1



SCALE 1:250

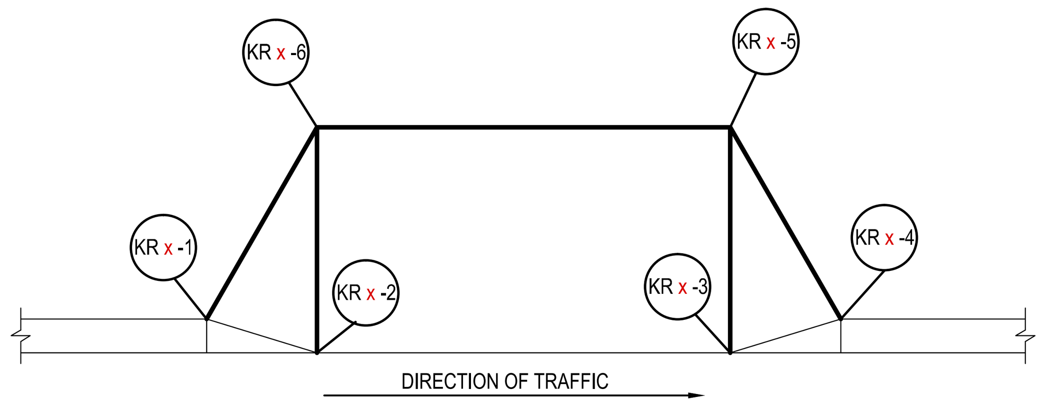
KERB RAMP KR 'A' SETOUT			
Pt	Easting	Northing	Level
KR A-1	301364.947	6259207.643	43.092
KR A-2	301365.347	6259206.190	42.945
KR A-3	301367.633	6259202.677	42.970
KR A-4	301368.540	6259201.975	43.127
KR A-5	301369.092	6259202.300	43.120
KR A-6	301366.819	6259205.797	43.100

KERB RAMP KR 'B' SETOUT			
Pt	Easting	Northing	Level
KR B-1	301371.858	6259199.515	43.131
KR B-2	301372.517	6259198.978	42.978
KR B-3	301376.153	6259197.776	42.947
KR B-4	301376.906	6259197.781	43.089
KR B-5	301375.963	6259198.961	43.100
KR B-6	301372.327	6259200.163	43.130

NOTE:
REFER TO DRAWING 15766_C1_C156 FOR KERB RETURN No. 06 SETOUT TABLE & LONG SECTION

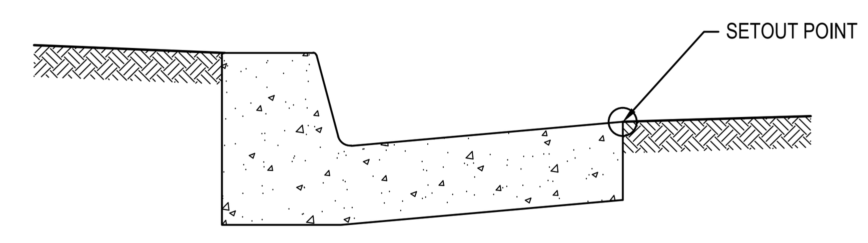
LEGEND

EXISTING BOUNDARY
LIMIT OF WORKS
EXISTING CONTOURS
PROPOSED CONTOURS
KERB RAMP SETOUT ID
PROPOSED SPOT LEVEL
EXISTING SPOT LEVEL



KERB RAMP SETOUT DETAIL

SCALE N.T.S.



KERB & GUTTER (SA)

SCALE N.T.S

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

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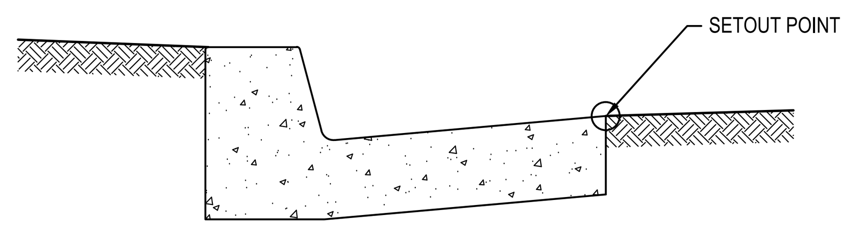
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: SETOUT DETAILS KERB RETURN No.07

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

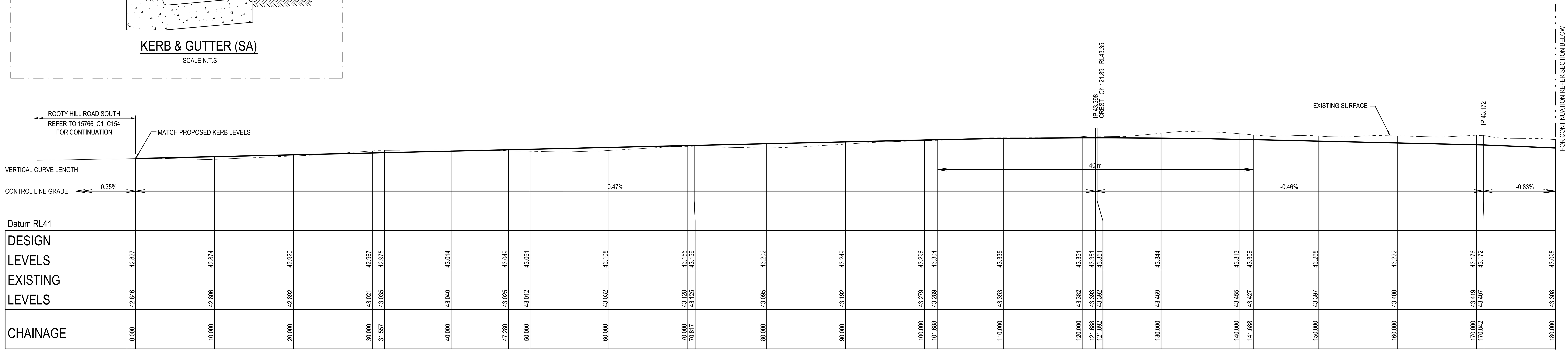
Drawing number: 15766_C1_C155 Revision: 01



KERB & GUTTER (SA)

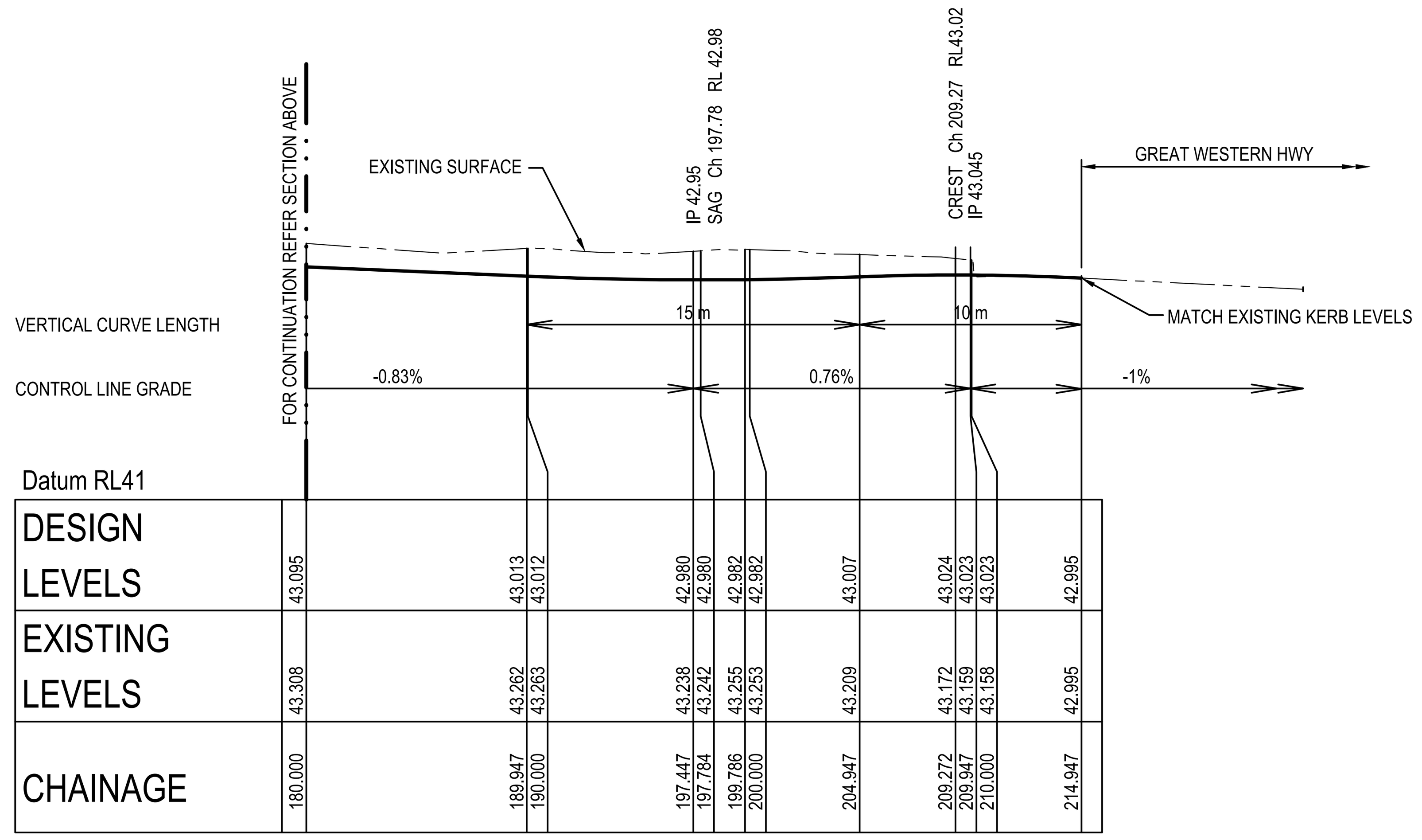
SCALE N.T.S

NOTE:
REFER TO DRAWING 15766_C1_C154 FOR KERB RETURN No. 06 PLAN AND LONG SECTION
REFER TO DRAWING 15766_C1_C155 FOR KERB RETURN No. 07 PLAN



LONGITUDINAL SECTION KERB RETURN No.07 - LIP OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

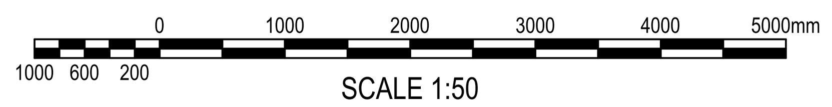


LONGITUDINAL SECTION KERB RETURN No.07 - LIP OF KERB - CONTINUATION

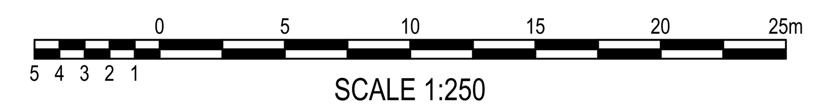
HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

KERB RETURN No. 06 - CONTROL LINE DETAILS - LIP OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
A1	0	301283.699	6259524.373	42.825	249°31'49.02"			
A1-A2	6.86	301277.209	6259521.951	42.817		-40.5	13.721	19°24'38.63"
	10	301274.855	6259519.761	42.762	235°22'59.44"			
A2	13.721	301271.894	6259517.51	42.655				
	20	301267.075	6259513.483	42.415	230°07'09.79"			
A3	25.283	301263.021	6259510.096	42.289				
A3-A4	27.731	301261.14	6259508.524	42.273		-40.5	4.897	6°55'39.90"
	30	301259.586	6259506.868	42.281	223°26'45.34"			
A4	30.18	301259.462	6259506.737	42.283				
A5	31.392	301258.606	6259505.879	42.298	224°56'21.41"			
	40	301253.963	6259498.705	42.5	200°52'50.97"			
A5-A6	43.105	301249.296	6259496.549	42.555		-20.5	23.427	65°28'31.85"
	50	301252.773	6259488.876	42.621	172°55'54.00"			
A6	54.819	301253.92	6259484.207	42.622				
	60	301255.737	6259479.355	42.604	159°27'48.81"			
	70	301259.245	6259469.991	42.569	159°27'48.81"			
	80	301262.754	6259460.626	42.566	159°27'48.81"			
	90	301266.262	6259451.262	42.601	159°27'48.81"			
	100	301269.77	6259441.897	42.637	159°27'48.81"			
	110	301273.278	6259432.533	42.672	159°27'48.81"			
	120	301276.786	6259423.168	42.707	159°27'48.81"			
	130	301280.294	6259413.804	42.743	159°27'48.81"			
	140	301283.802	6259404.439	42.778	159°27'48.81"			
	150	301287.31	6259395.075	42.813	159°27'48.81"			
A7	153.736	301288.62	6259391.576	42.827	159°27'48.81"			

KERB RETURN No. 07 - CONTROL LINE DETAILS - LIP OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
B1	0	301288.62	6259391.576	42.827	159°27'48.81"			
	10	301292.245	6259382.256	42.874	158°01'58.63"			
B1-B2	15.779	301294.158	6259376.793	42.901		-400.5	31.557	4°30'52.57"
	20	301296.101	6259373.03	42.92	156°36'08.45"			
	30	301300.186	6259363.903	42.967	155°10'18.27"			
B2	31.557	301300.843	6259362.491	42.975				
B2-B3	39.419	301304.179	6259355.354	43.012		-100.499	15.723	8°57'49.82"
	40	301304.735	6259355.001	43.014	150°08'08.25"			
B3	47.28	301308.585	6259348.825	43.049				
	50	301310.076	6259346.55	43.061	147°33'04.71"			
B3-B4	59.048	301315.199	6259339.024	43.104		99.5	23.536	13°33'11.23"
	60	301315.008	6259337.856	43.108	153°18'34.84"			
	70	301319.044	6259328.711	43.155	159°04'04.97"			
B4	70.817	301319.333	6259327.947	43.159	159°32'17.74"			
	80	301322.543	6259319.343	43.202	159°32'17.74"			
	90	301326.039	6259309.974	43.249	159°32'17.74"			
	100	301329.535	6259300.605	43.296	159°32'17.74"			
	110	301333.03	6259291.236	43.335	159°32'17.74"			
	120	301336.526	6259281.867	43.351	159°32'17.74"			
	130	301340.022	6259272.498	43.344	159°32'17.74"			
	140	301343.518	6259263.129	43.313	159°32'17.74"			
	150	301347.014	6259253.76	43.268	159°32'17.74"			
	160	301350.51	6259244.39	43.222	159°32'17.74"			
	170	301354.005	6259235.021	43.176	159°32'17.74"			
	180	301357.501	6259225.652	43.095	159°32'17.74"			
	190	301360.997	6259216.283	43.012	159°32'17.74"			
B5	199.786	301364.418	6259207.115	42.982	159°32'17.74"			
	200	301364.494	6259206.915	42.982	158°44'50.89"			
B5-B6	207.367	301367.302	6259199.386	43.02		-15.5	15.161	56°02'35.47"
	210	301370.776	6259199.357	43.023	121°46'56.82"			
B6	214.947	301375.323	6259197.461	42.995	103°29'42.27"			



SCALE 1:50



SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

01	ISSUE FOR REVIEW	LC	LC	30.06.2017				
REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

Client: WESTERN SYDNEY PARKLANDS TRUST
Surveyor: LANDPARTNERS

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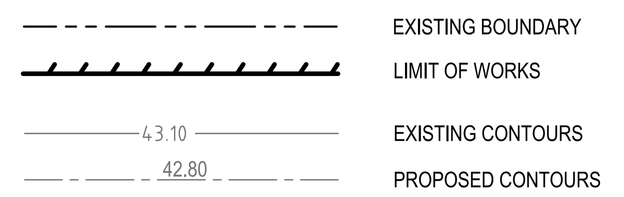
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

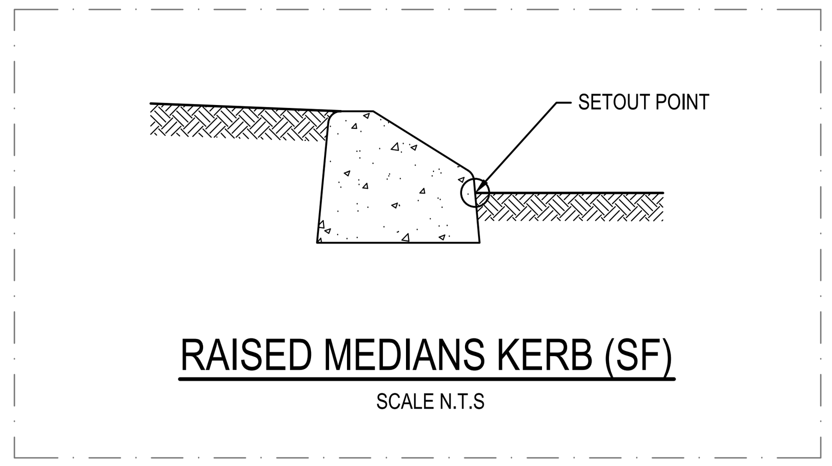
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: SETOUT TABLES AND SECTION KERB RETURN No.06 & No.07

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1
Drawing number		Revision
15766_C1_C156		01

LEGEND

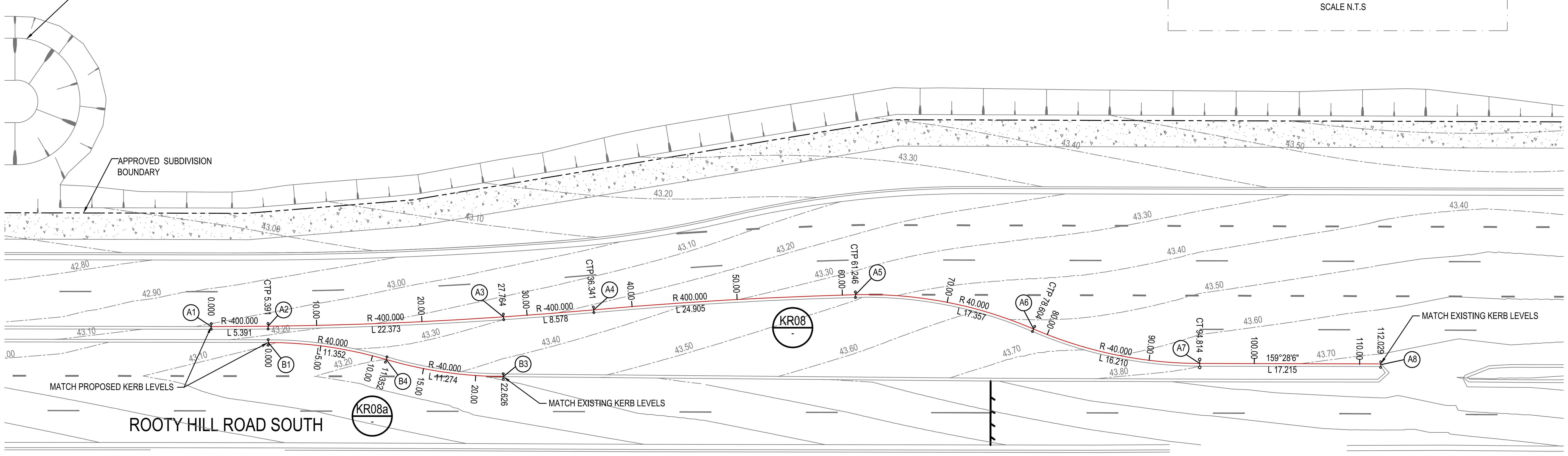




RAISED MEDIANS KERB (SF)

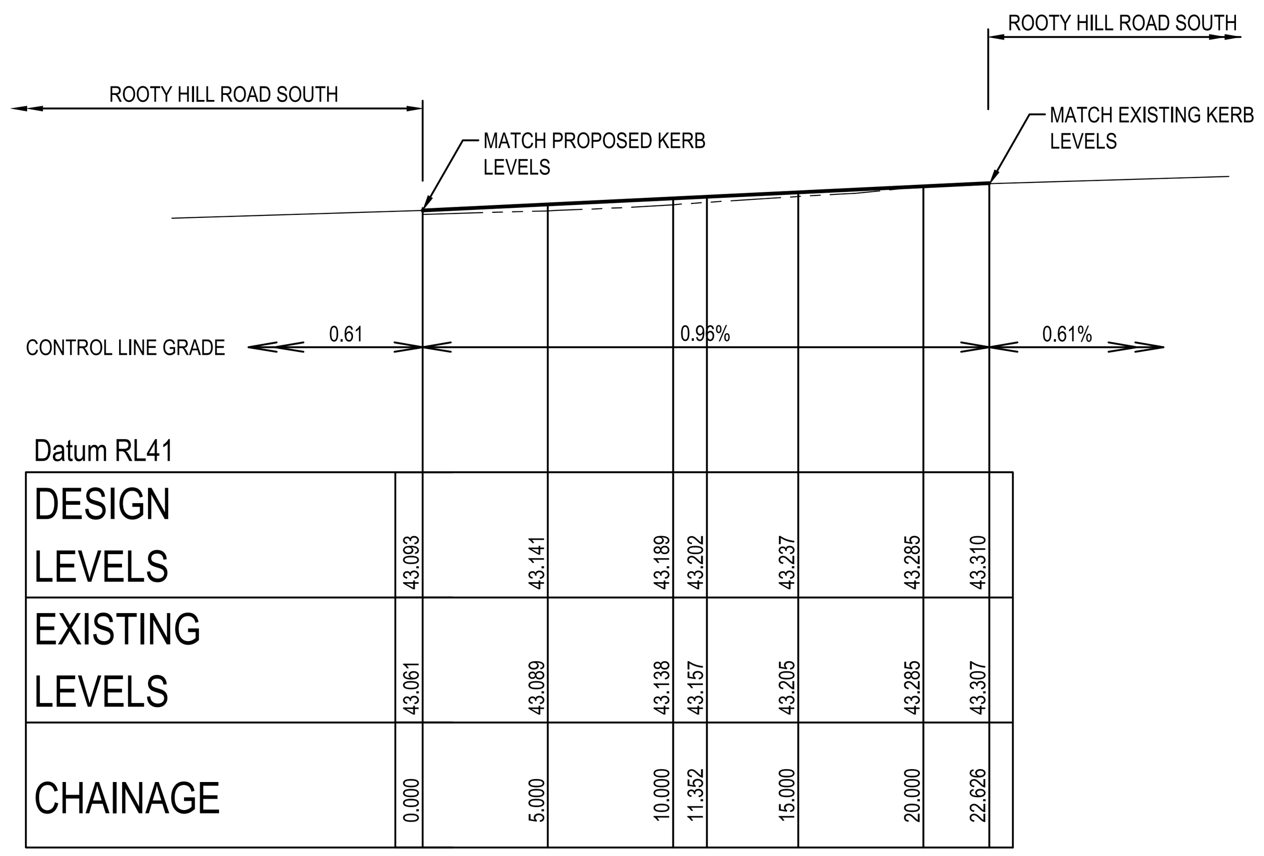
SCALE N.T.S

KERB RETURN No. 08a - CONTROL LINE DETAILS - FACE OF KERB "SF KERB"								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
B1	0	301282.533	6259385.592	43.093	159°27'49.27"			
	5	301283.99	6259380.812	43.141	166°37'32.37"			
B1-B	5.676	301284.538	6259380.241	43.147		40	11.352	16°15'37.46"
	10	301284.84	6259375.888	43.189	173°47'15.47"			
B2	11.352	301284.964	6259374.542	43.202				
	15	301285.401	6259370.922	43.237	170°29'53.71"			
B2-B3	16.989	301285.387	6259368.883	43.256		-40	11.274	16°08'54.46"
	20	301286.532	6259366.055	43.285	163°20'10.61"			
B3	22.626	301287.367	6259363.566	43.31	159°34'31.09"			



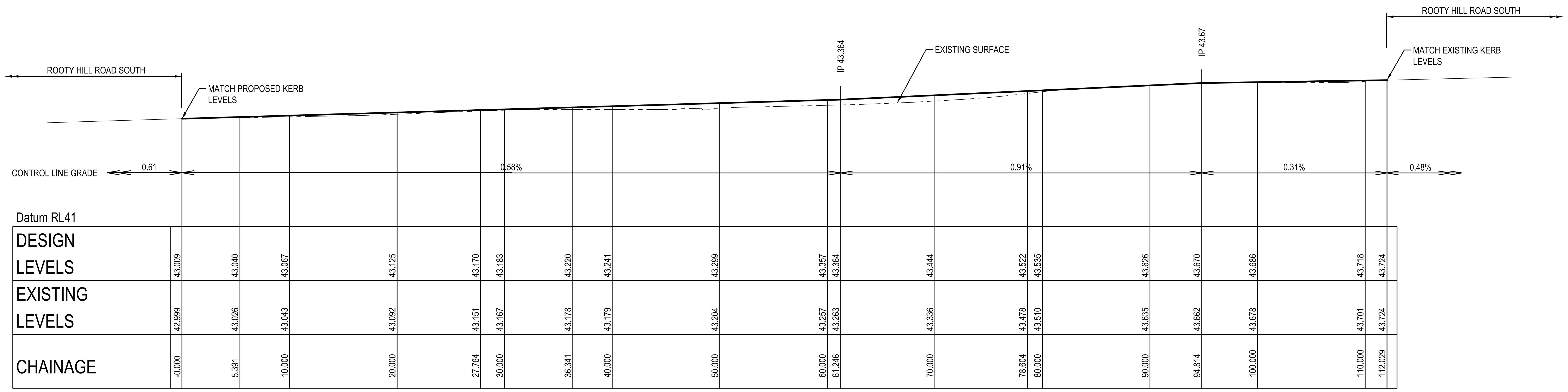
KERB RETURN No.08

SCALE 1:250 @ A1



LONGITUDINAL SECTION KERB RETURN No.08a - FACE OF KERB

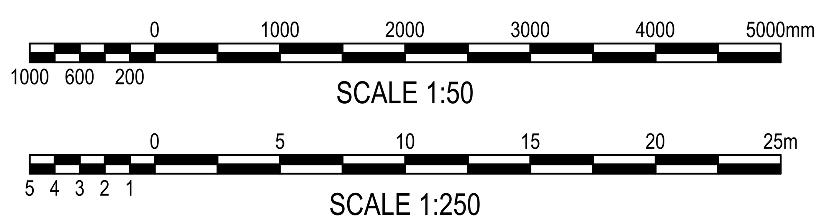
HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1



LONGITUDINAL SECTION KERB RETURN No.08 - FACE OF KERB

HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

KERB RETURN No. 08 - CONTROL LINE DETAILS - FACE OF KERB "SF KERB"								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
A1	0	301282.04	6259391.182	43.009	159°27'49.27"			
A1-A2	2.695	301282.986	6259388.658	43.024		-400	5.391	0°46'19.86"
A2	5.391	301283.965	6259386.147	43.04	158°41'29.40"			
	10	301285.665	6259381.863	43.067	158°01'52.65"			
A2-A3	16.577	301288.032	6259375.723	43.105		-400	22.373	3°12'16.78"
	20	301289.522	6259372.637	43.125	156°35'56.03"			
A3	27.764	301292.674	6259365.542	43.17				
	30	301293.608	6259363.51	43.183	155°09'58.95"			
A3-A4	32.052	301294.454	6259361.64	43.195		-400	8.578	1°13'43.17"
A4	36.341	301296.316	6259357.776	43.22	154°15'29.00"			
	40	301297.89	6259354.473	43.241	154°46'55.67"			
A4-A5	48.794	301301.726	6259346.556	43.292		400	24.905	3°34'02.52"
	50	301302.037	6259345.374	43.299	156°12'52.29"			
	60	301305.956	6259336.174	43.357	157°38'48.91"			
A5	61.246	301306.428	6259335.021	43.364	157°49'31.52"			
A5-A6	69.925	301309.756	6259326.855	43.443		40	17.357	24°51'45.36"
	70	301308.822	6259326.619	43.444	170°21'51.60"			
A6	78.604	301309.342	6259318.048	43.522	182°41'16.88"			
	80	301309.301	6259316.652	43.535	180°41'15.96"			
A6-A7	86.709	301308.957	6259309.839	43.596		-40	16.21	23°13'10.39"
	90	301310.426	6259306.741	43.626	166°21'49.76"			
A7	94.814	301311.839	6259302.143	43.67	159°28'06.50"			
	100	301313.658	6259297.286	43.686	159°28'06.50"			
	110	301317.165	6259287.921	43.718	159°28'06.50"			
A8	112.029	301317.877	6259286.021	43.724	159°28'06.50"			



RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017					

Client: WESTERN SYDNEY PARKLANDS TRUST
Surveyor: LANDPARTNERS

Level 5, 79 Victoria Avenue Chatswood NSW 2067
Telephone +61 2 9417 8400
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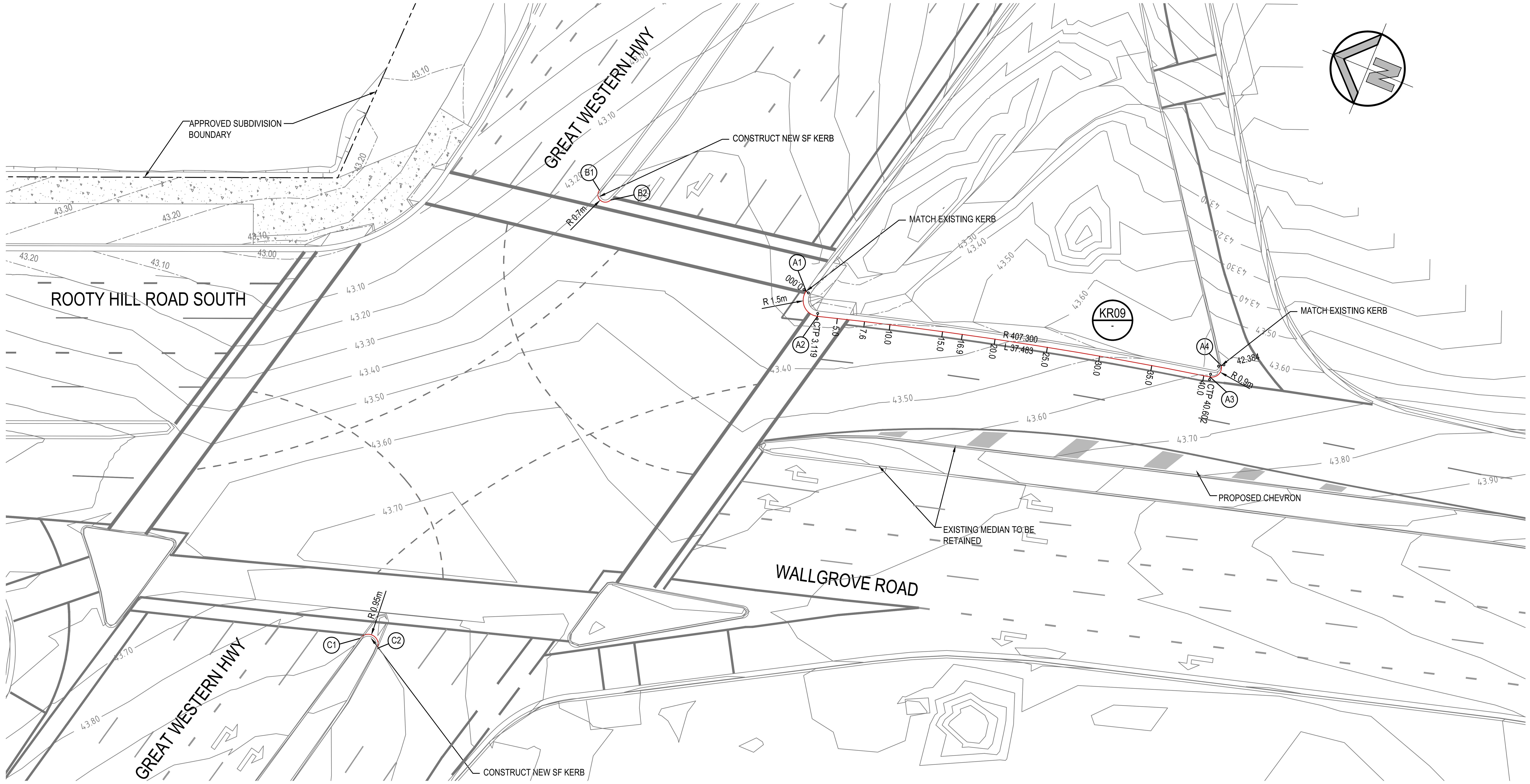
Email email@hhconsult.com.au
Web www.henryandhymas.com.au
henry&hymas

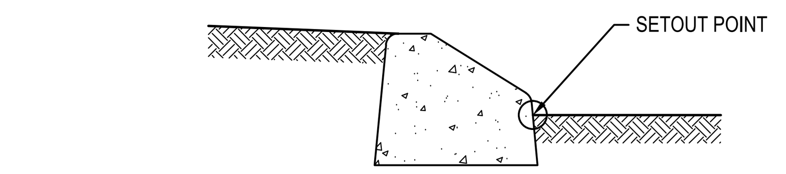
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: SETOUT DETAILS AND SECTION KERB RETURN No.08 & No.08a

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C157
Revision: 01

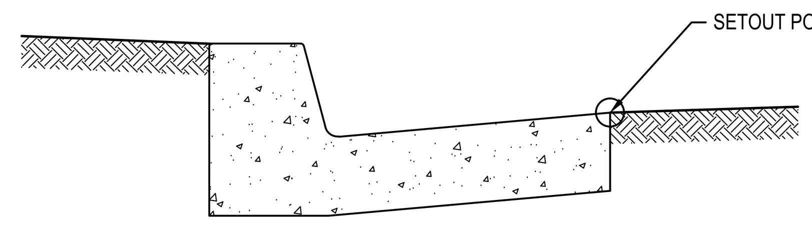


KERB RETURN No.01



RAISED MEDIANS KERB (SF)

SCALE N.T.S



KERB & GUTTER (SA)

SCALE N.T.S

LEGEND

EXISTING BOUNDARY

43.10 EXISTING CONTOURS

42.80 PROPOSED CONTOURS

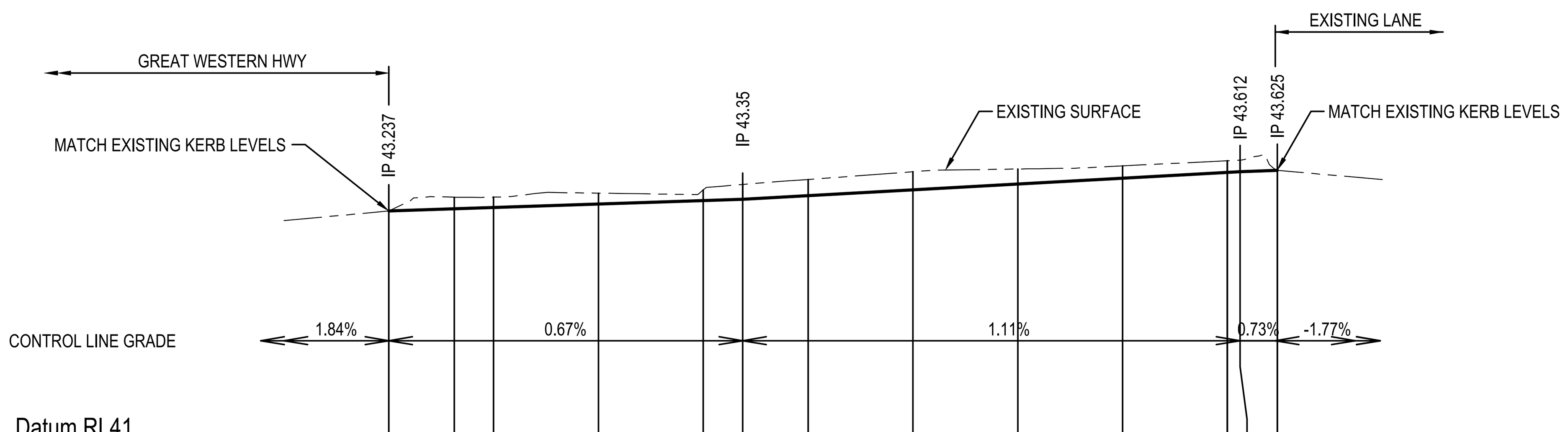
KR 'A' KERB RAMP SETOUT ID

KERB RETURN No. xx - CONTROL LINE DETAILS - LIP OF KERB								
Pt	Chainage	Easting	Northing	Level	Bearing	Rad/Spiral	A.Length	D.Angle
A1	0	301377.488	6259161.852	43.237	284°37'47.50"			
A1-A2	1.559	301375.018	6259162.497	43.248		-1.5	3.119	119°07'40.87"
A2	3.119	301375.657	6259160.025	43.258	165°30'06.64"			
MJ	5	301376.124	6259158.202	43.271	165°45'59.33"			
MJ	10	301377.324	6259153.349	43.304	166°28'11.43"			
MJ	15	301378.464	6259148.48	43.337	167°10'23.53"			
MJ	20	301379.544	6259143.598	43.385	167°52'35.63"			
A2-A3	21.86	301380.353	6259141.867	43.405		407.3	37.483	5°16'22.17"
MJ	25	301380.564	6259138.703	43.44	168°34'47.73"			
MJ	30	301381.524	6259133.797	43.495	169°16'59.83"			
MJ	35	301382.423	6259128.878	43.55	169°59'11.93"			
MJ	40	301383.262	6259123.949	43.606	170°41'24.03"			
A3	40.602	301383.359	6259123.355	43.612	170°46'28.81"			
A3-A4	41.493	301383.579	6259122.001	43.619		-0.9	1.782	113°27'10.69"
A4	42.384	301384.734	6259122.742	43.625	57°19'18.12"			

KERB RAMP KR 'A' SETOUT			
Pt	Easting	Northing	Level
KR A-1	301381.551	6259160.043	43.260
KR A-2	301380.918	6259160.464	43.146
KR A-3	301377.388	6259161.441	43.211
KR A-4	301376.769	6259161.164	43.354
KR A-5	301377.535	6259160.123	43.340
KR A-6	301381.064	6259159.141	43.270

NOSE OF MEDIAN SETOUT			
Pt	Easting	Northing	Level
B1	301379.533	6259183.455	43.279
B2	301379.054	6259182.142	43.329
C1	301332.002	6259189.681	43.888
C2	301331.698	6259187.818	43.900

KERB RAMP KR 'A' SETOUT			
Pt	Easting	Northing	Level
KR B-1	301376.424	6259160.850	43.360
KR B-2	301376.116	6259160.288	43.217
KR B-3	301376.892	6259157.200	43.238
KR B-4	301377.216	6259156.648	43.393
KR B-5	301378.160	6259157.079	43.360
KR B-6	301377.376	6259160.167	43.340



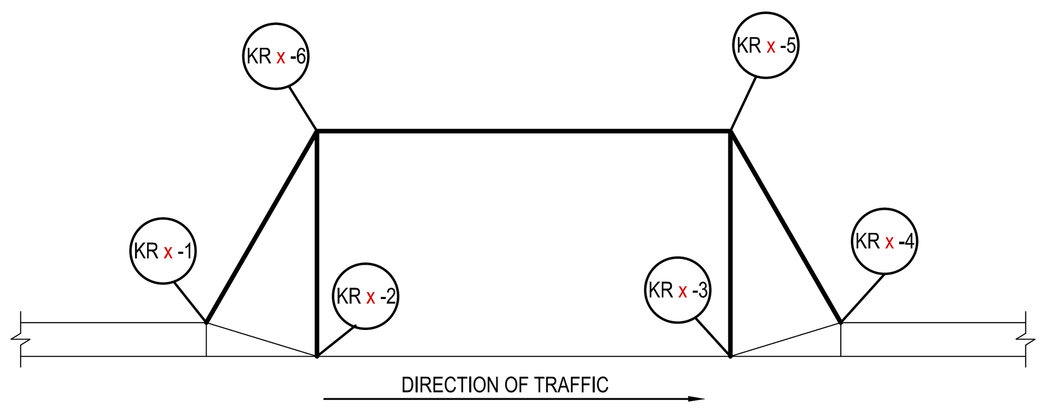
Datum RL41

DESIGN LEVELS	43.237	43.258	43.271	43.304	43.337	43.350	43.385	43.440	43.495	43.550	43.606	43.612	43.625
EXISTING LEVELS	43.237	43.368	43.369	43.408	43.438	43.490	43.538	43.611	43.638	43.668	43.717	43.723	43.625
CHAINAGE	0.000	3.119	5.000	10.000	15.000	16.877	20.000	25.000	30.000	35.000	40.000	40.602	42.384

LONGITUDINAL SECTION KERB RETURN No.0X - LIP OF KERB

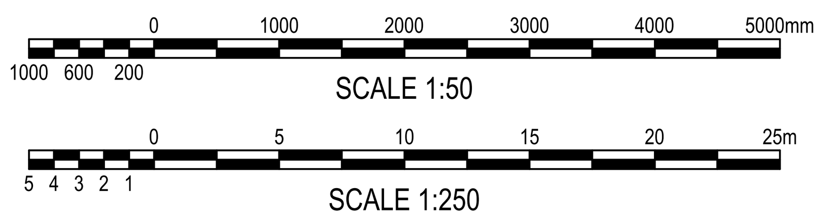
HORIZONTAL SCALE 1:250 @ A1

VERTICAL SCALE 1:50 @ A1



KERB RAMP SETOUT DETAIL

SCALE N.T.S.



SCALE 1:50

SCALE 1:250

NOTE:

REFER TO DRAWING 15766_C1_C160 FOR KERB RETURN No. 09 CROSS SECTIONS

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS

DATUM: AHD

ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUE FOR REVIEW	LC	LC	30.06.2017

Client: WESTERN SYDNEY PARKLANDS TRUST

Surveyor: LANDPARTNERS

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79 Victoria Avenue
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Email email@hhconsult.com.au
Web www.henryandhymas.com.au

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henry&hymas

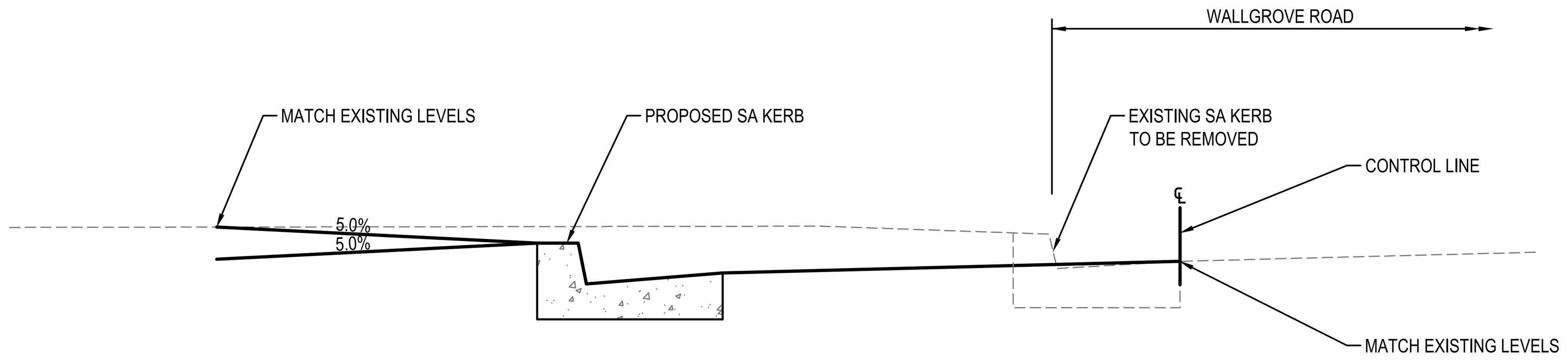
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: SETOUT DETAILS AND SECTION KERB RETURN No.09

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C158

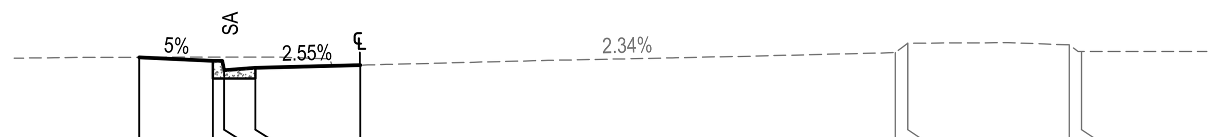
Revision: 01



TYPICAL SECTION
SCALE 1:20 @ A1

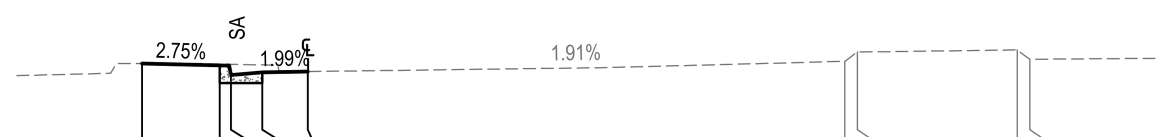
DESIGN		43.380	43.414	43.264	43.304	43.350				
EXISTING	43.309	43.380	43.404	43.405	43.408	43.350	43.584	43.733	43.603	43.590
OFFSET	-5.128	-2.673	-0.680	-0.500	0.000	1.736	10.587	10.788	13.333	13.533

CH 10



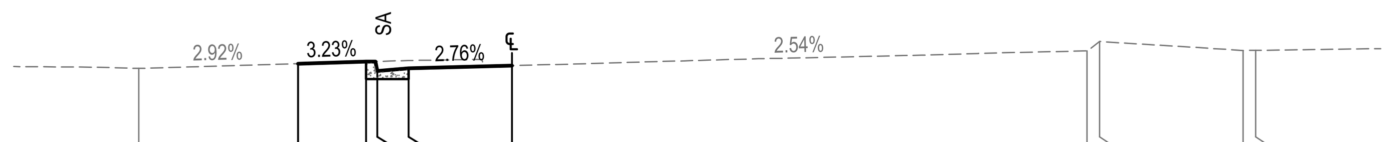
DESIGN	43.609	43.550	43.400	43.440	43.483				
EXISTING	43.609	43.610	43.611	43.611	43.483	43.683	43.833	43.807	43.699
OFFSET	-1.855	-0.680	-0.500	0.000	1.877	10.228	10.428	13.006	13.206

CH 25



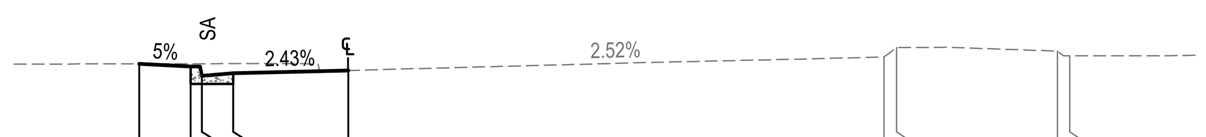
DESIGN	43.761	43.727	43.576	43.616	43.630				
EXISTING	43.761	43.751	43.747	43.736	43.630	43.794	43.944	43.976	43.827
OFFSET	-1.919	-0.681	-0.500	0.000	0.728	9.307	9.508	12.061	12.262

CH 40.921



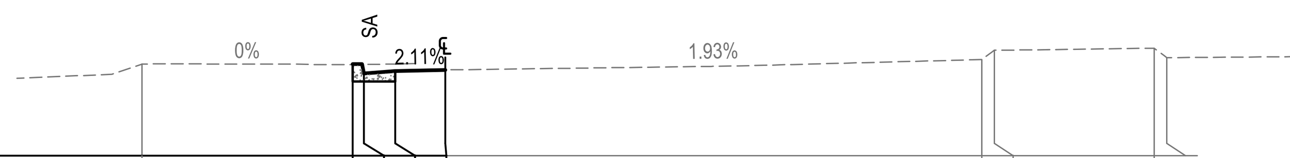
DESIGN		43.363	43.398	43.248	43.288	43.333				
EXISTING	43.288	43.363	43.395	43.400	43.414	43.333	43.567	43.716	43.573	43.576
OFFSET	-4.314	-1.768	-0.680	-0.500	0.000	1.650	10.841	11.043	13.334	13.534

CH 7.577



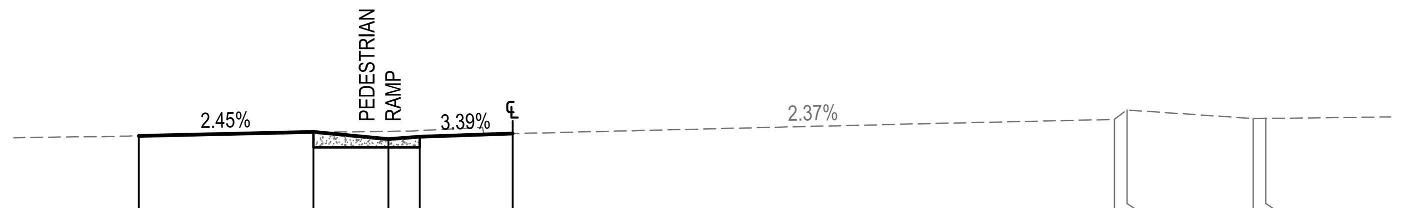
DESIGN	43.535	43.495	43.345	43.385	43.429				
EXISTING	43.535	43.537	43.537	43.538	43.429	43.645	43.794	43.739	43.663
OFFSET	-1.498	-0.680	-0.500	0.000	1.841	10.404	10.604	13.174	13.374

CH 20



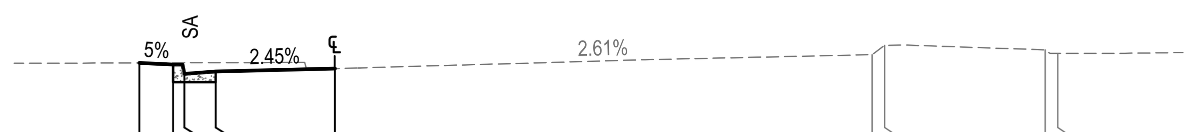
DESIGN	43.715	43.716	43.566	43.606	43.622				
EXISTING	43.715	43.705	43.708	43.717	43.622	43.788	43.938	43.969	43.819
OFFSET	-4.044	-0.680	-0.500	0.000	0.800	9.376	9.576	12.133	12.333

CH 40



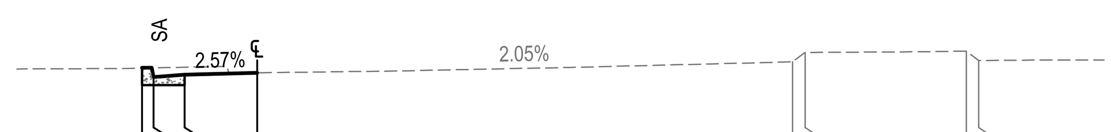
DESIGN	43.282	43.350	43.231	43.271	43.321				
EXISTING	43.285	43.343	43.358	43.369	43.321	43.549	43.699	43.563	43.565
OFFSET	-4.487	-1.697	-0.500	0.000	1.485	11.099	11.303	13.316	13.516

CH 5



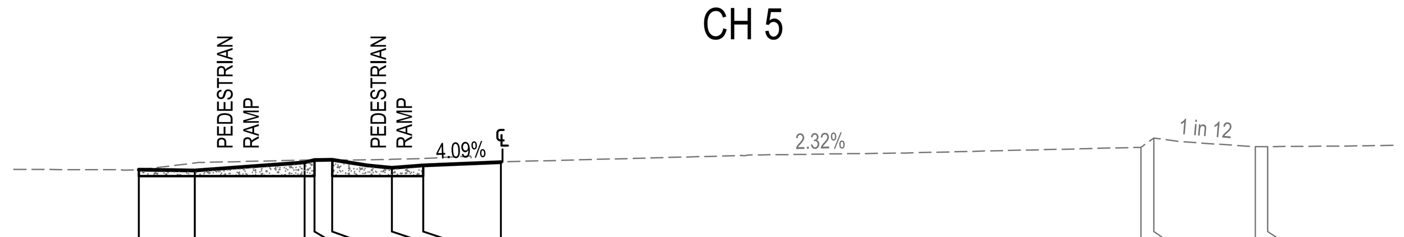
DESIGN	43.487	43.460	43.310	43.350	43.397				
EXISTING	43.487	43.488	43.489	43.490	43.397	43.621	43.771	43.697	43.640
OFFSET	-1.216	-0.680	-0.500	0.000	1.904	10.484	10.684	13.249	13.449

CH 16.877



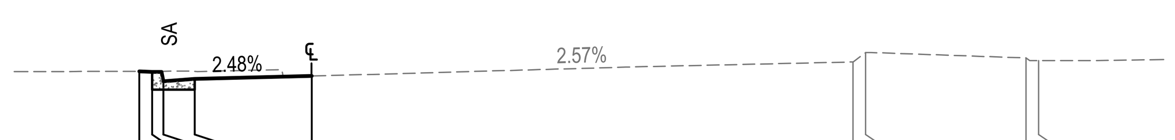
DESIGN	43.660	43.510	43.550	43.580				
EXISTING	43.655	43.658	43.668	43.580	43.755	43.905	43.926	43.776
OFFSET	-0.680	-0.500	0.000	1.158	9.712	9.912	12.486	12.687

CH 35



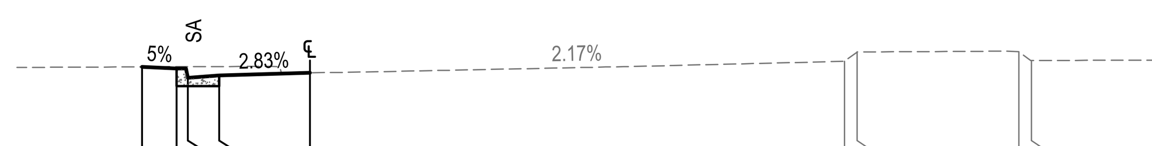
DESIGN	43.188	43.176	43.303	43.344	43.346	43.218	43.258	43.309				
EXISTING	43.189	43.296	43.342	43.345	43.345	43.355	43.368	43.309	43.546	43.696	43.557	43.558
OFFSET	-4.544	-3.651	-1.896	-1.738	-1.456	-0.500	0.000	1.241	11.467	11.671	13.292	13.492

CH 3.119



DESIGN	43.458	43.447	43.297	43.337	43.384				
EXISTING	43.458	43.458	43.459	43.438	43.384	43.606	43.756	43.671	43.627
OFFSET	-2.267	-2.065	-1.885	-1.385	0.485	9.135	9.335	11.898	12.098

CH 15



DESIGN	43.632	43.605	43.455	43.495	43.536				
EXISTING	43.632	43.635	43.636	43.638	43.536	43.721	43.871	43.876	43.736
OFFSET	-1.229	-0.680	-0.500	0.000	1.452	9.992	10.192	12.778	12.978

CH 30

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

0 2 4 6 8 10m
2 1
SCALE 1:100

CROSS SECTIONS - KERB RETURN No. XX
HORIZONTAL SCALE 1:100 @ A1
VERTICAL SCALE 1:100 @ A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	30.06.2017					

Client
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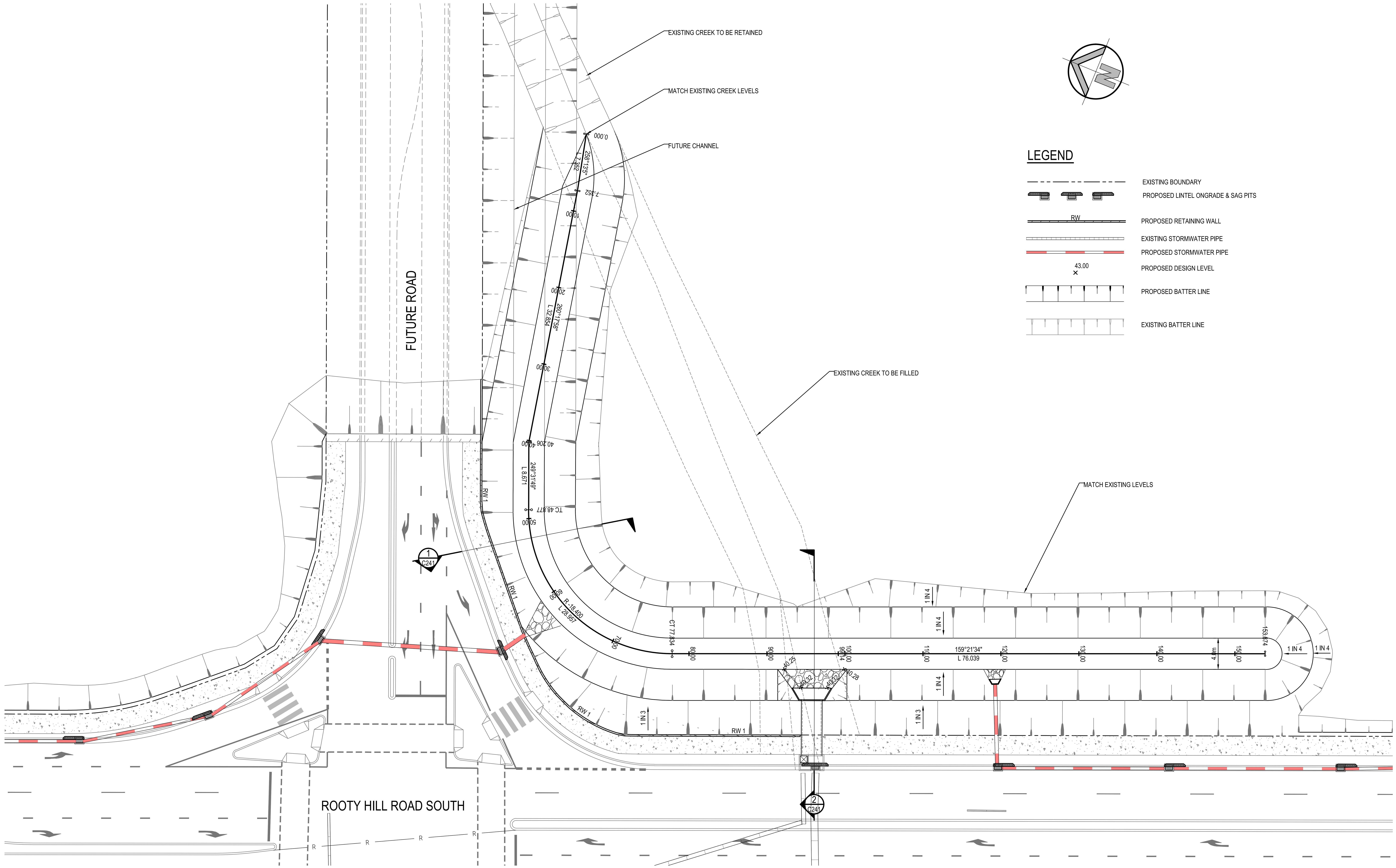
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW
Title
CROSS SECTIONS
KERB RETURN No.09

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C160
Revision: 01



LEGEND

— - — - —	EXISTING BOUNDARY
	PROPOSED LINTEL ONGRADE & SAG PITS
RW	PROPOSED RETAINING WALL
	EXISTING STORMWATER PIPE
	PROPOSED STORMWATER PIPE
43.00 ×	PROPOSED DESIGN LEVEL
	PROPOSED BATTER LINE
	EXISTING BATTER LINE

OPEN CHANNEL PLAN

SCALE: 1:250 @A1

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.0X.2017					

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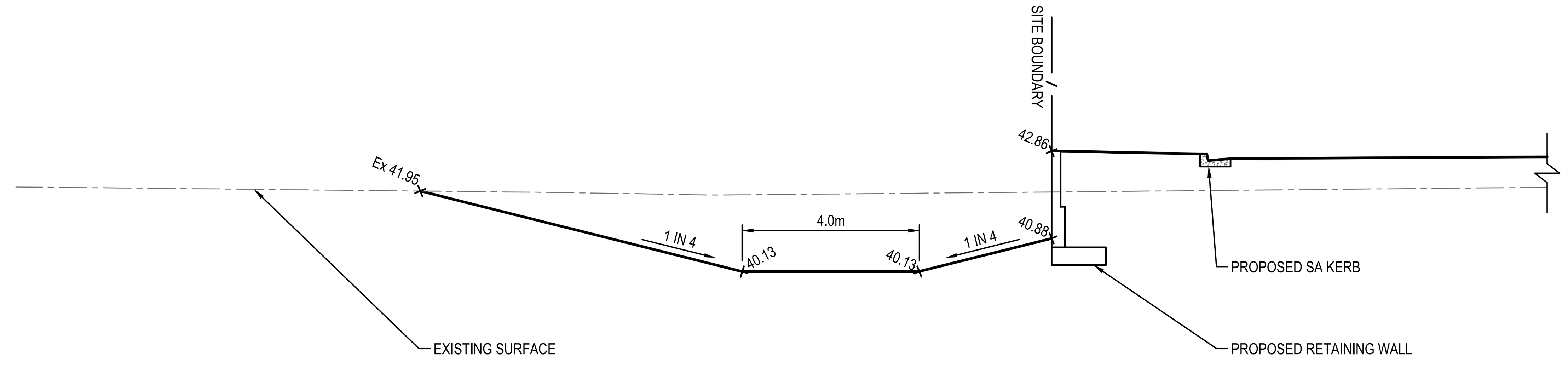
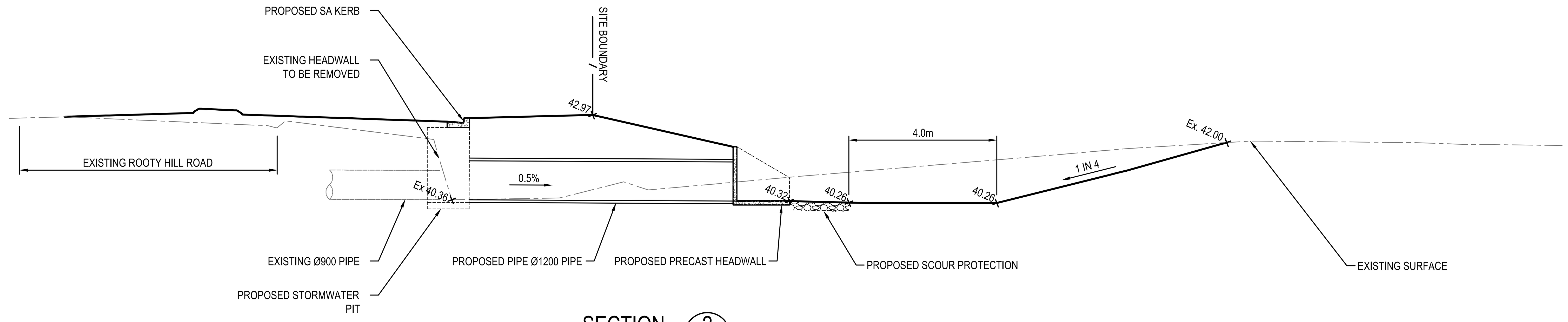
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: OPEN CHANNEL PLAN

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

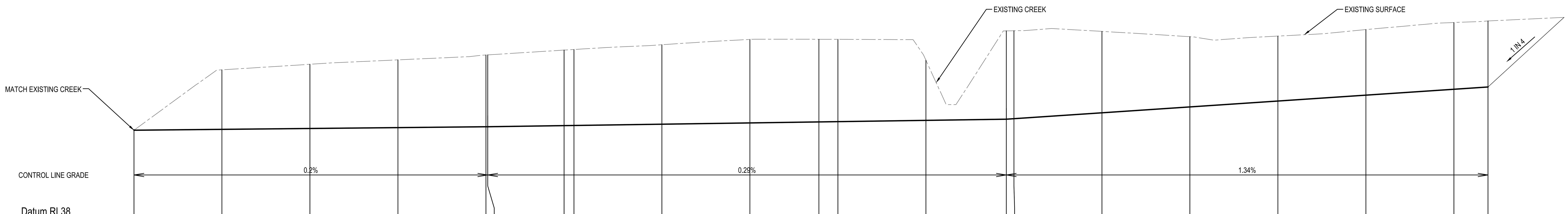
Drawing number: 15766_C1_C240 Revision: 01



SECTION 1 C240
SCALE: 1:100 @ A1



SECTION 2 C240
SCALE: 1:100 @ A1



DESIGN LEVELS	40.017	40.037	40.057	40.077	40.097	40.097	40.122	40.125	40.154	40.183	40.205
EXISTING LEVELS	40.017	41.388	41.515	41.615	41.726	41.729	41.837	41.851	41.959	42.080	42.082
CHAINAGE	0.000	10.000	20.000	30.000	40.000	40.206	48.877	50.000	60.000	70.000	77.834

DESIGN LEVELS	40.211	40.240	40.267	40.278	40.412	40.546	40.680	40.814	40.948	41.000
EXISTING LEVELS	42.081	41.606	42.274	42.277	42.262	42.141	42.156	42.303	42.463	42.498
CHAINAGE	80.000	90.000	99.136	100.000	110.000	120.000	130.000	140.000	150.000	153.874

LONGITUDINAL SECTION - OPEN CHANNEL - BASE OF CHANNEL
HORIZONTAL SCALE 1:250 @ A1
VERTICAL SCALE 1:50 @ A1

0 1000 2000 3000 4000 5000mm
1000 600 200
SCALE 1:50

0 2 4 6 8 10m
2 1
SCALE 1:100

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.0X.2017					

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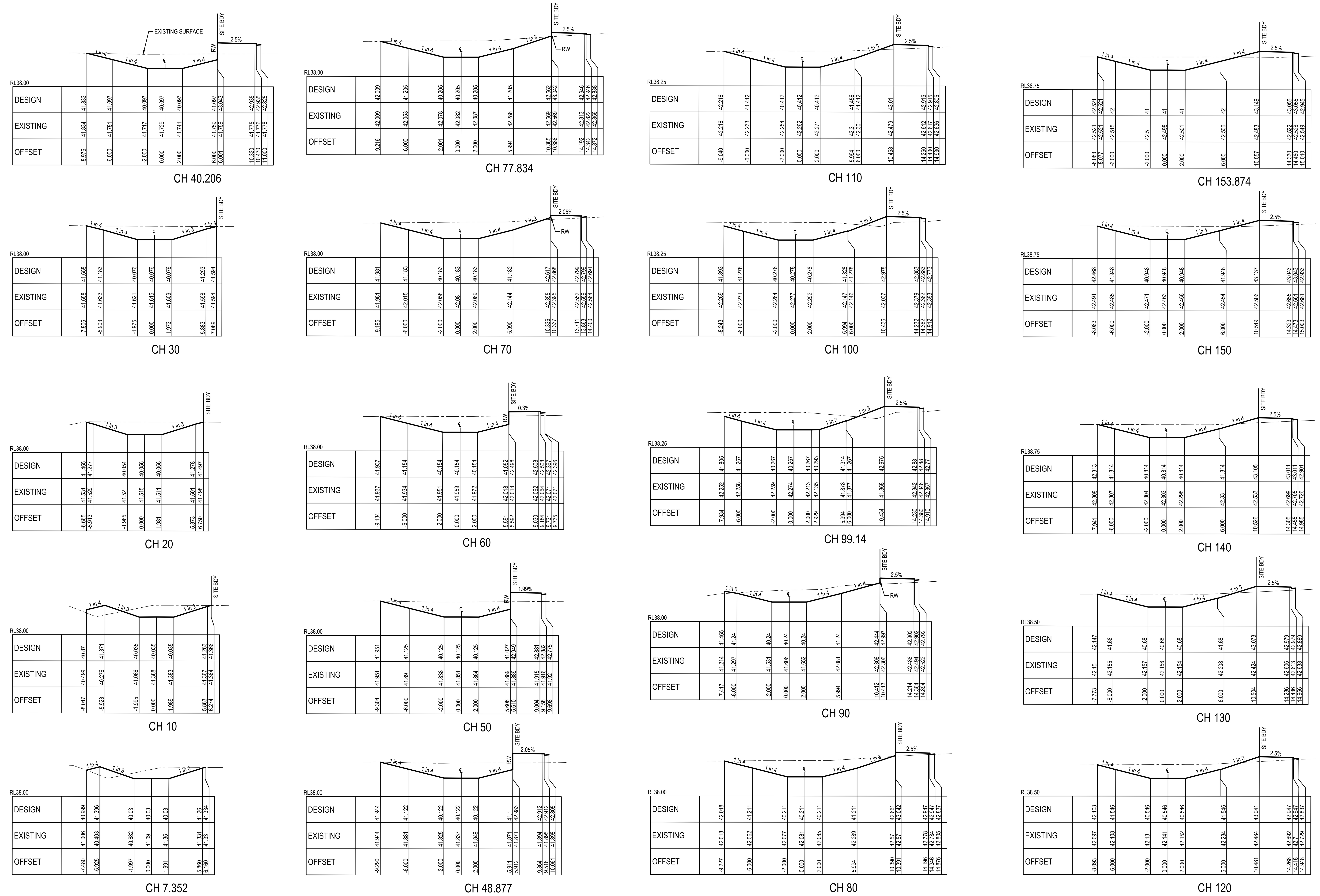
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
OPEN CHANNEL
TYPICAL AND LOGITUDINAL SECTION

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C241
Revision: 01



OPEN CHANNEL CROSS SECTIONS

HORIZONTAL SCALE 1:200 @ A1
VERTICAL SCALE 1:200 @ A1

0 4 8 12 16 20m
4 3 2 1
SCALE 1:200

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

01	ISSUED FOR RMS APPROVAL	LC	LC	XX.0X.2017
REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

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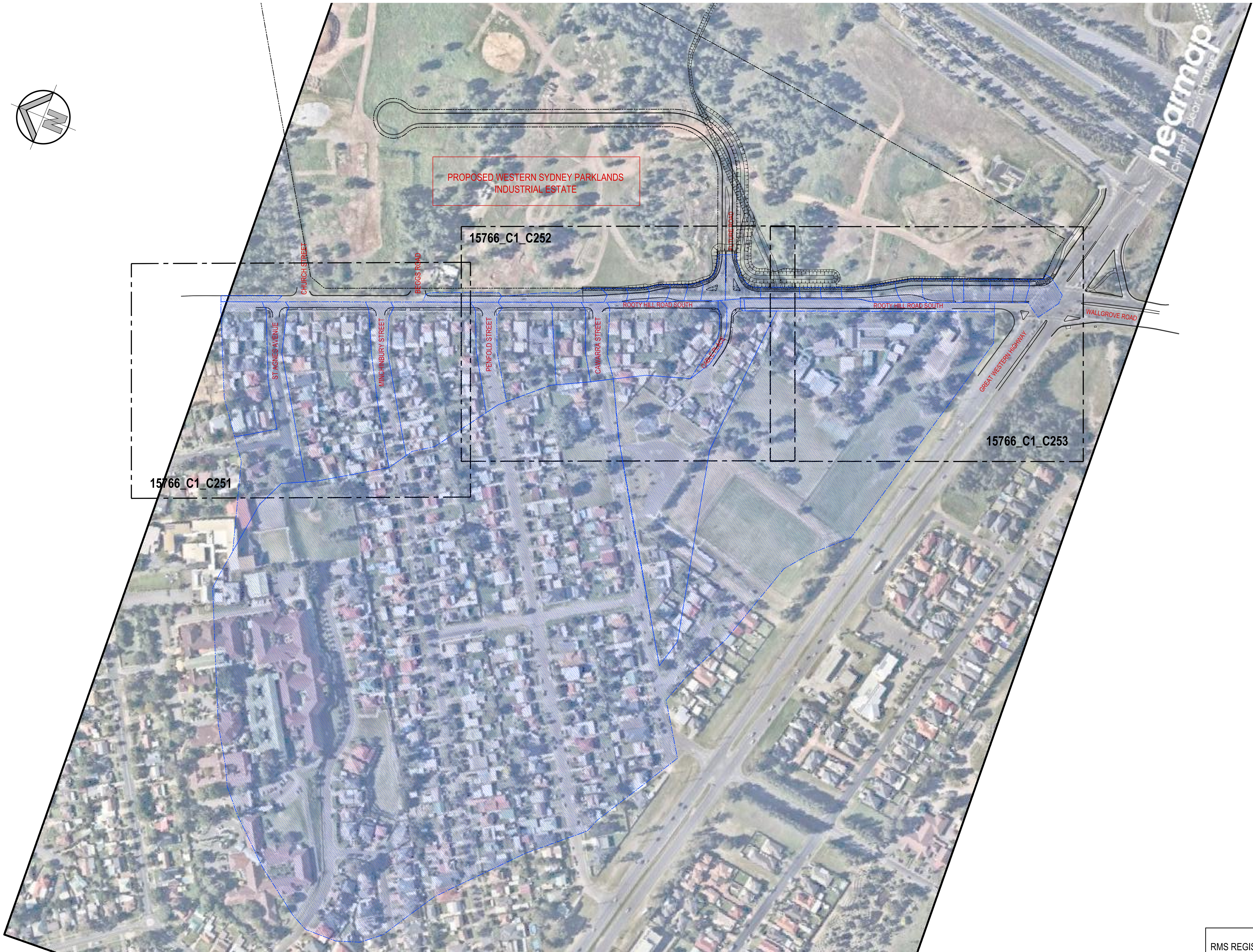
Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: OPEN CHANNEL CROSS SECTIONS

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:200 @ A1

Drawing number: 15766_C1_C242
Revision: 01



OVERALL CATCHMENT PLAN

SCALE: 1:2000 @A1

0 40 80 120 160 200m
40 30 20 10

SCALE 1:2000

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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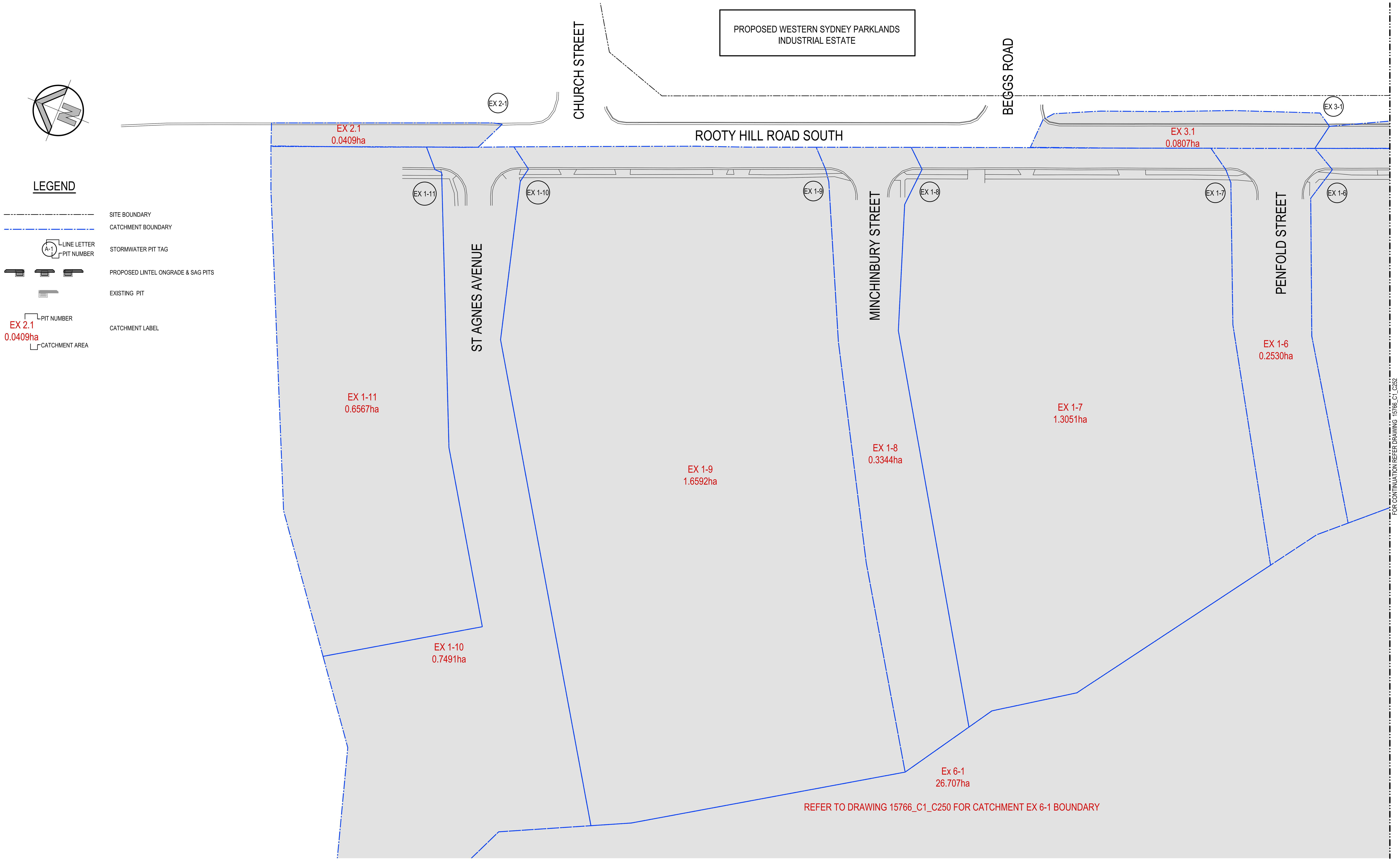
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT
OVERALL CATCHMENT PLAN

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:2000 @ A1

Drawing number: 15766_C1_C1250
Revision: 01



DETAIL CATCHMENT PLAN

SCALE: 1:500 @A1

RMS REGISTRATION NUMBER: ....

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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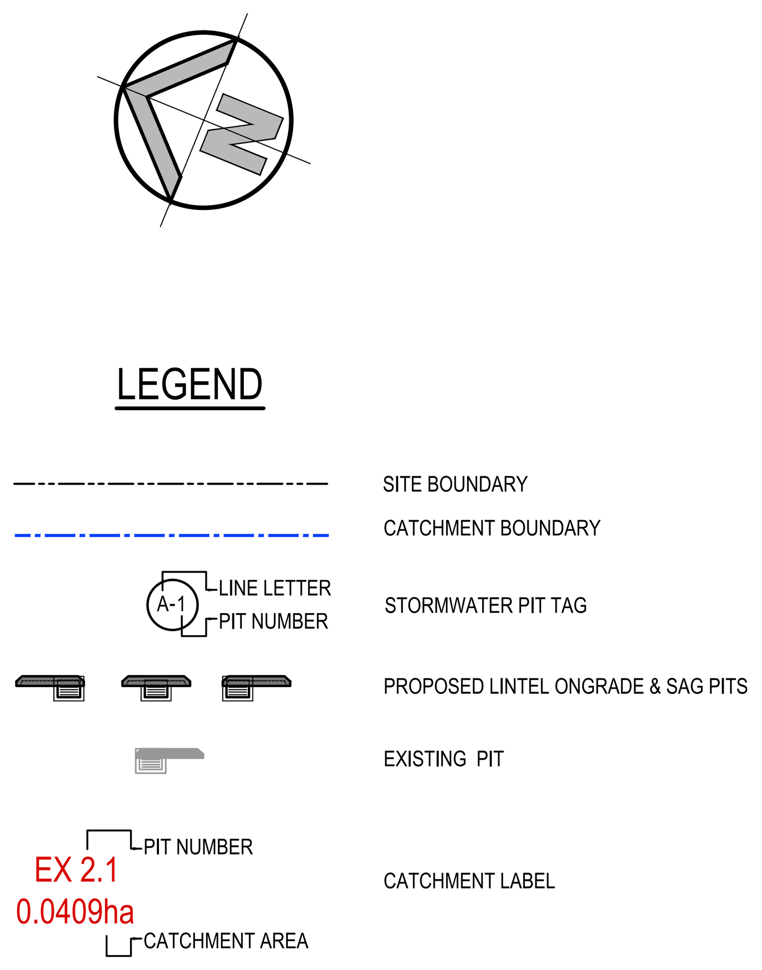
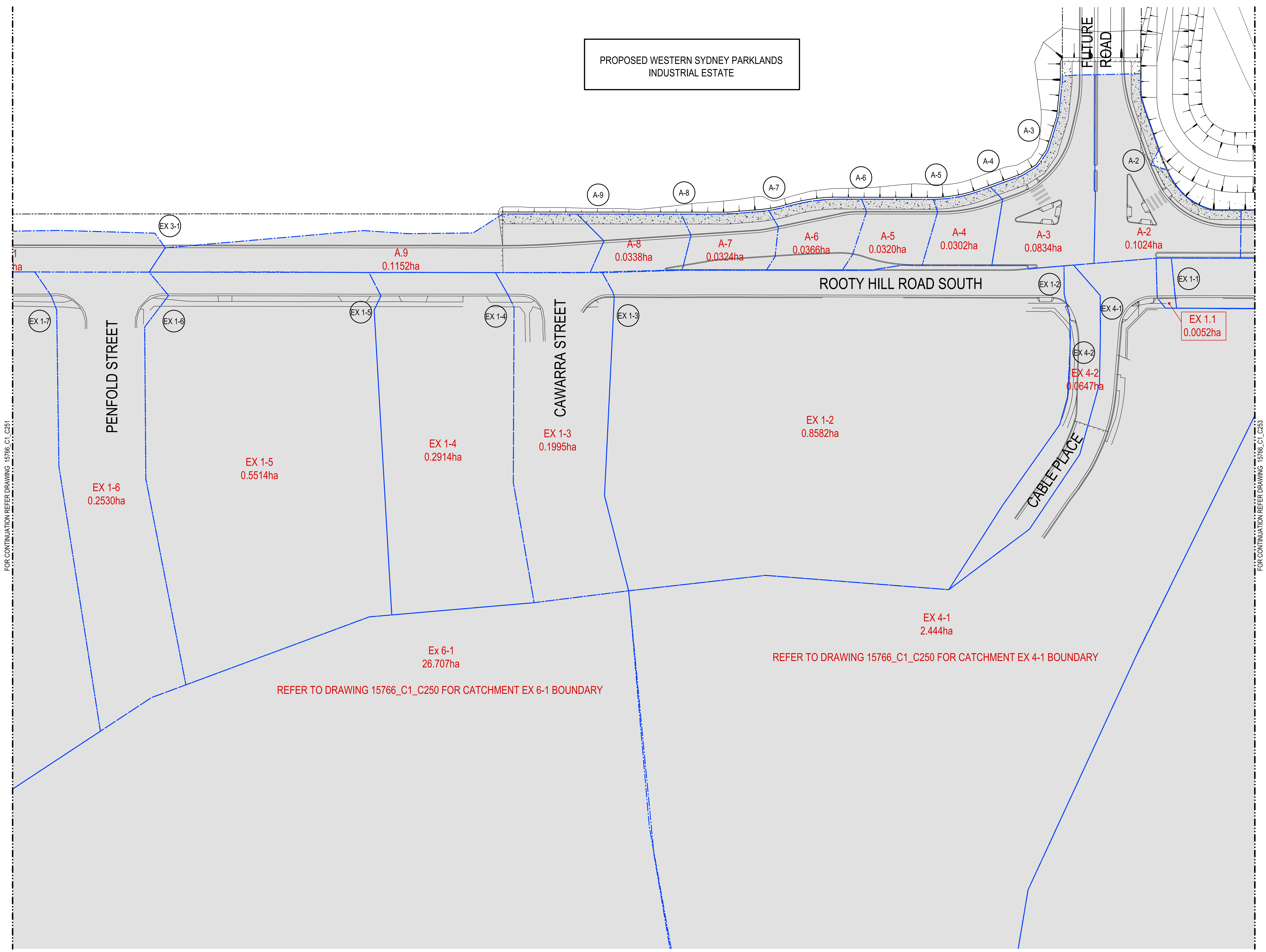
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
DETAL CATCHMENT PLAN
SHEET 1 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:500 @ A1

Drawing number: 15766_C1_C251
Revision: 01





DETAIL CATCHMENT PLAN

SCALE: 1:500 @A1

RMS REGISTRATION NUMBER: ....

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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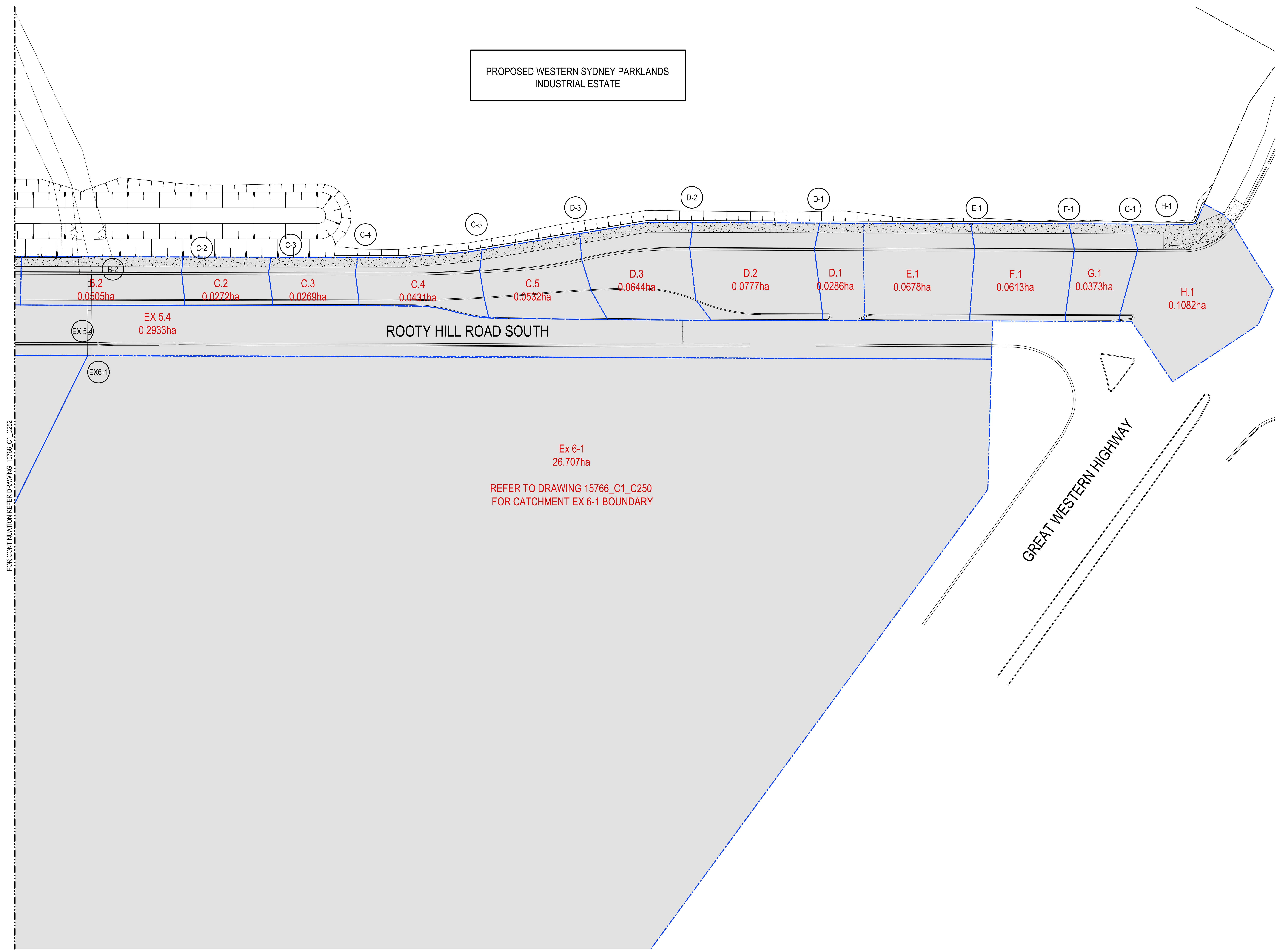
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
DETAL CATCHMENT PLAN
SHEET 2 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:500 @ A1

Drawing number	Revision
15766_C1_C252	01



LEGEND

	SITE BOUNDARY
	CATCHMENT BOUNDARY
A-1 LINE LETTER / PIT NUMBER	STORMWATER PIT TAG
	PROPOSED LINTEL ONGRADE & SAG PITS
	EXISTING PIT
PIT NUMBER / EX 2.1 / 0.0409ha / CATCHMENT AREA	CATCHMENT LABEL

DETAIL CATCHMENT PLAN

SCALE: 1:500 @A1

0 10 20 30 40 50m
10 8 6 4 2
SCALE 1:500

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
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Surveyor
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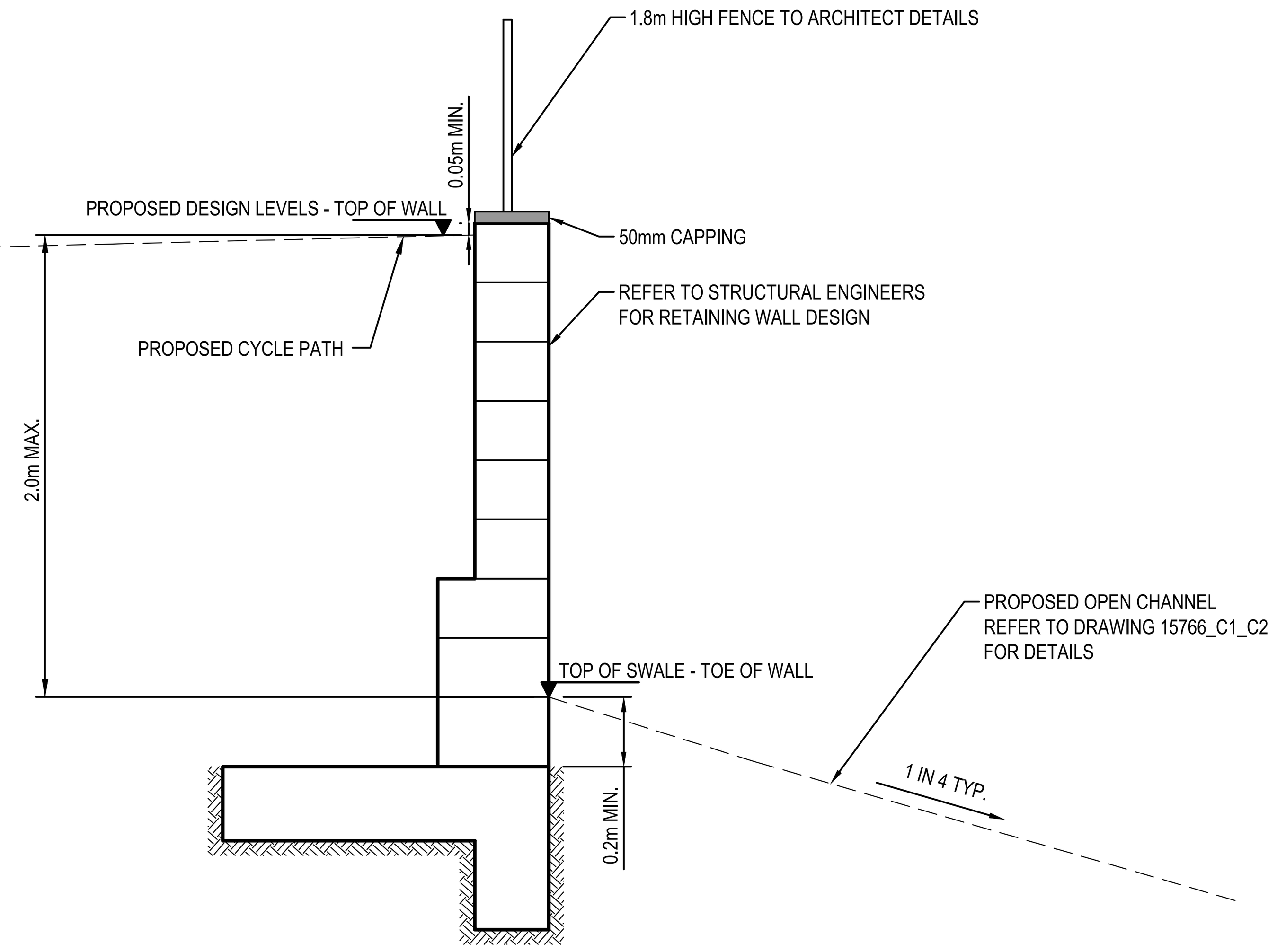
Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
DETAL CATCHMENT PLAN
SHEET 3 OF 3

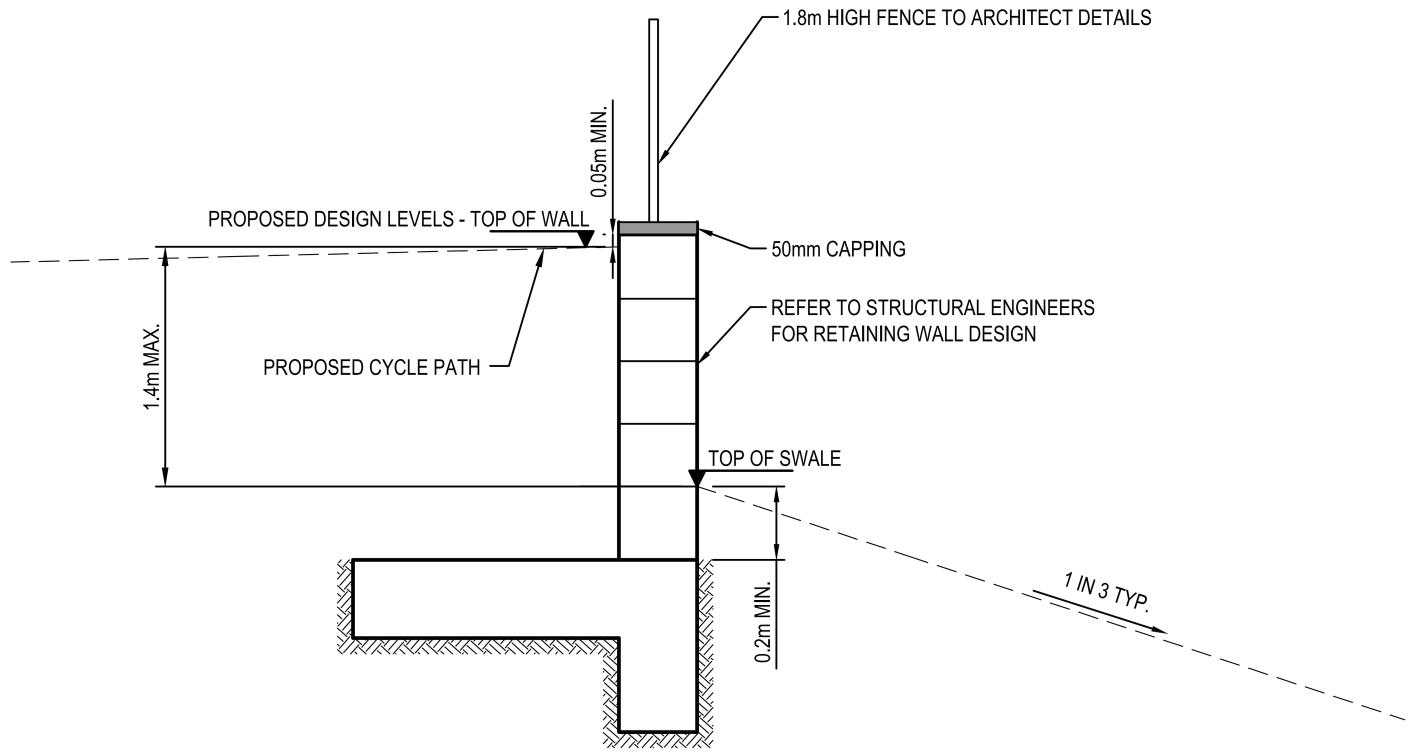
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:500 @ A1

Drawing number: 15766_C1_C253
Revision: 01



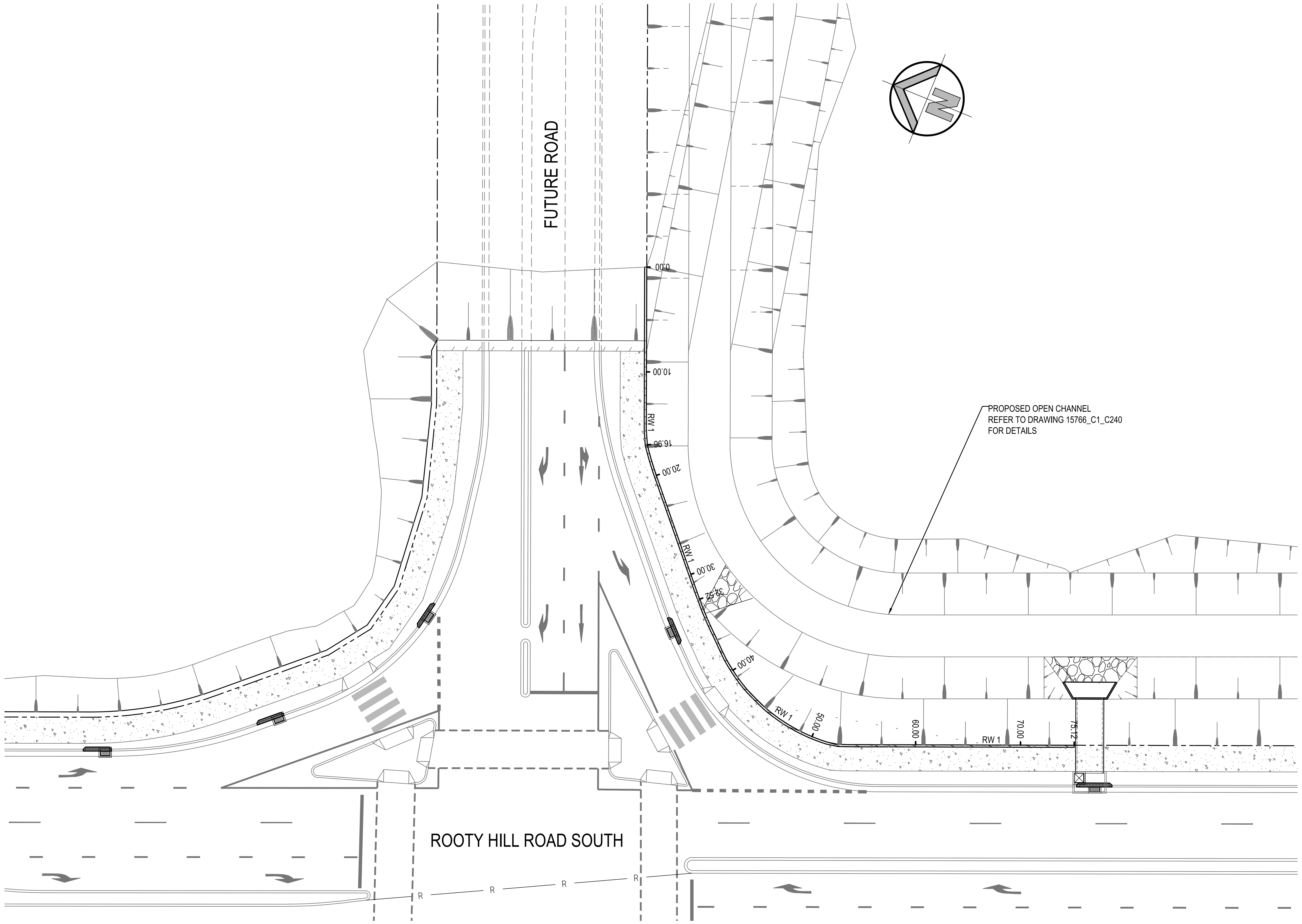
RETAINING WALL - RW 1 TYPICAL SECTION 1

SCALE N.T.S



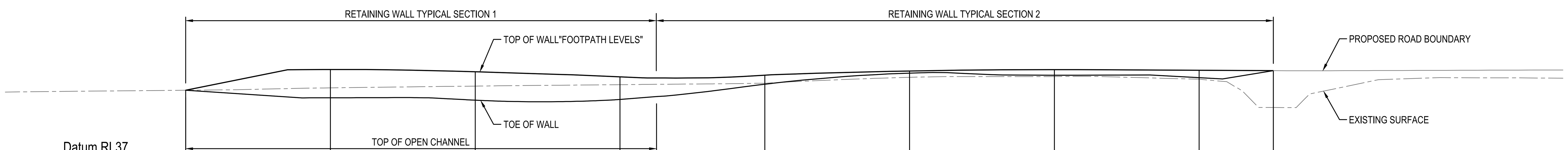
RETAINING WALL - RW 1 TYPICAL SECTION 2

SCALE N.T.S



RETAININ WALL PLAN

SCALE: 1:250 @A1



Datum RL37

HEIGHT	0.000	1.954	1.960	1.560	0.622	0.145	0.386	0.509	0.000
DESIGNED TOP OF WALL	41.625	43.056	42.900	42.545	42.661	42.949	43.043	43.002	42.976
DESIGNED TOE OF WALL	41.625	41.102	40.940	40.985	42.039	42.805	42.657	42.492	42.976
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	75.122

RETAINING WALL - RW 1

HORIZONTAL SCALE 1:200 @ A1
VERTICAL SCALE 1:200 @ A1

4 3 2 1 0 4 8 12 16 20m
SCALE 1:200

5 4 3 2 1 0 5 10 15 20 25m
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.0X.2017					

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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: RETAINING WALL PLAN, TYPICAL SECTION AND LONGITUDINAL SECTION

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C300 Revision: 01

EXISTING ROAD PAVEMENT REMOVAL PLAN

SCALE: 1:750 @A1

LEGEND

- EXISTING BOUNDARY
- LIMIT OF WORKS
- EXTENT OF EXISTING PAVEMENT REMOVAL

0 15 30 45 60 75m
15 10 5
SCALE 1:750

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	XX.XX.2017					

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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
EXISTING ROAD PAVEMENT REMOVAL PLAN

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	AS SHOWN @ A1

Drawing number: 15766_C1_C500
Revision: 01

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LINEMARKING TABLE

LINE TYPE	USE	DIMENSIONS (m)	COLOUR
BB	MOVEMENTS ACROSS LINES, OVERTAKING, U TURN ARE PROHIBITED	0.025 min. 0.05 max. 0.10 0.1 * 0.10	WHITE
T1	DEFINES TURNING AND THROUGH PATH AT COMPLEX INTERSECTIONS	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.10	WHITE
L1	LANE LINE ON MULTI LANE ROADS INCLUDING MOTORWAYS AND DUAL-CARRIAGEWAYS	3 9 3 9 3 9 3 9 3 = = * 0.10	WHITE
TF	STOP LINE	0.30	WHITE
E3	RIGHT HAND EDGE ON DIVIDED CARRIAGEWAY	0.15	WHITE
E4	OUTLINE OF TRAFFIC ISLAND	0.15	WHITE
E6	LINE APPLIED TO INCLINE FACE OF MEDIAN KERB	0.15	WHITE
C1	DEFINES EDGE OF THROUGH CARRIAGEWAY LANE	1 3 1 3 1 3 1 3 1 3 0.15 * 1	WHITE
PCW	PEDESTRIAN CROSS WALK LINES	1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.15	WHITE
PX	PEDESTRIAN CROSSING	0.6 0.6 3.6m	WHITE

1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1 0.6 1
0.15

LEGEND

	EXISTING BOUNDARY
SA	PROPOSED KERB & GUTTER - SA
SM	PROPOSED BARRIER KERB - SM
SF	PROPOSED MOUNTABLE KERB - SF
	EXISTING KERB TO BE RETAINED

NOTE:
1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUE FOR REVIEW	LC	LC	30.06.2017					
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT-CONCEPT,OPTION 1
LINEMARKING PLAN, SHEET 1 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C601
Revision: 05

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LEGEND

- EXISTING BOUNDARY
- SA — PROPOSED KERB & GUTTER - SA
- SF — PROPOSED MOUNTABLE KERB - SF
- EXISTING KERB TO BE RETAINED

NOTE:
REFER DRAWING 15766_C1_C601
FOR LINEMARKING TABLE

NOTE:
1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	ISSUE FOR REVIEW	LC	LC	30.06.2017					
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
WESTERN SYDNEY PARKLANDS TRUST

Surveyor
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henry&hymas

Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT-CONCEPT
LINEMARKING PLAN, SHEET 2 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015

Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number	Revision
15766_C1_C602	05

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LEGEND

- EXISTING BOUNDARY
- SA — PROPOSED KERB & GUTTER - SA
- SF — PROPOSED MOUNTABLE KERB - SF
- EXISTING KERB TO BE RETAINED

NOTES:

1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9
3. PAINTED CHEVRON MARKING IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 8.3
4. FOR LINEMARKING MATERIALS AND PAINT TYPE, REFER TO RMS GUIDE - DELINEATION, SECTION 3 - PAVEMENT MARKING AND AS 1742
5. REFER TO DRAWING 15766_C1_C601 FOR LINEMARKING

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
06	ISSUE FOR REVIEW	LC	LC	30.06.2017					
05	RE-ISSUED FOR RMS APPROVAL	LC	LC	20.01.2017					
04	RE-ISSUED FOR RMS APPROVAL	MS	LC	07.12.2016					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	26.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT-CONCEPT LINEMARKING PLAN, SHEET 3 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C603
Revision: 06

INTERSECTION LAYOUT - SINGAGE PLAN

SCALE: 1:250 @A1

LEGEND

- PROPOSED ROAD BOUNDARY
- PROPOSED CYCLE WAY
- LIMIT OF WORKS
- SING POST

NOTE:
1. ALL SIGNS TO BE SIZE 'B'
2. ALL SIGNS SHALL BE IN ACCORDANCE WITH AS 1743
3. REFER TO DRAWING 15766_CC_C601-C602 FOR LINEMARKING PLAN

SCALE 1:250 (0 5 10 15 20 25m)

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016

Client: HANSEN YUNCKEN PTY.LTD.
Surveyor: LANDPARTNERS

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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: SIGNAGE PLAN SHEET 1 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C610
Revision: 01

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LEGEND

	EXISTING BOUNDARY
SA	PROPOSED KERB & GUTTER - SA
SF	PROPOSED MOUNTABLE KERB - SF
	EXISTING KERB TO BE RETAINED

NOTE:
REFER DRAWING 15766_C1_C601 FOR LINEMARKING TABLE

NOTE:
1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client: HANSEN YUNCKEN PTY.LTD.
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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW
Title: INTERSECTION LAYOUT-CONCEPT LINEMARKING PLAN, SHEET 2 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C602
Revision: 04

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LEGEND

EXISTING BOUNDARY

SA — PROPOSED KERB & GUTTER - SA

SF — PROPOSED MOUNTABLE KERB - SF

EXISTING KERB TO BE RETAINED

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

NOTES:
1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9
3. PAINTED CHEVRON MARKING IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 8.3
4. FOR LINEMARKING MATERIALS AND PAINT TYPE, REFER TO RMS GUIDE - DELINEATION, SECTION 3 - PAVEMENT MARKING AND AS 1742
5. REFER TO DRAWING 15766_C1_C601 FOR LINEMARKING

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	RE-ISSUED FOR RMS APPROVAL	LC	LC	20.01.2017					
04	RE-ISSUED FOR RMS APPROVAL	MS	LC	07.12.2016					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	26.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client: HANSEN YUNCKEN PTY.LTD.

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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT-CONCEPT LINEMARKING PLAN, SHEET 3 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015

Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C603

Revision: 05

NOTE:

SIGNAL STAGE PHASING REQUIRED FOR INTERSECTION OPTION 1 (2 TURNING LANES FROM CABLE PLACE)

RMS REGISTRATION NUMBER: ....

INTERSECTION LAYOUT - TURNING PATH

SCALE: 1:250@A1

FOR RMS APPROVAL

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS

DATUM: AHD

ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	26.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT - TURNING PATHS
SHEET 1 OF 3 - OPTION 1

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number	Revision
15766_CC_C650	04

0 5 10 15 20 25m
5 4 3 2 1

SCALE 1:250

INTERSECTION LAYOUT - TURNING PATH

SCALE: 1:250@A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS

DATUM: AHD

ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	26.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
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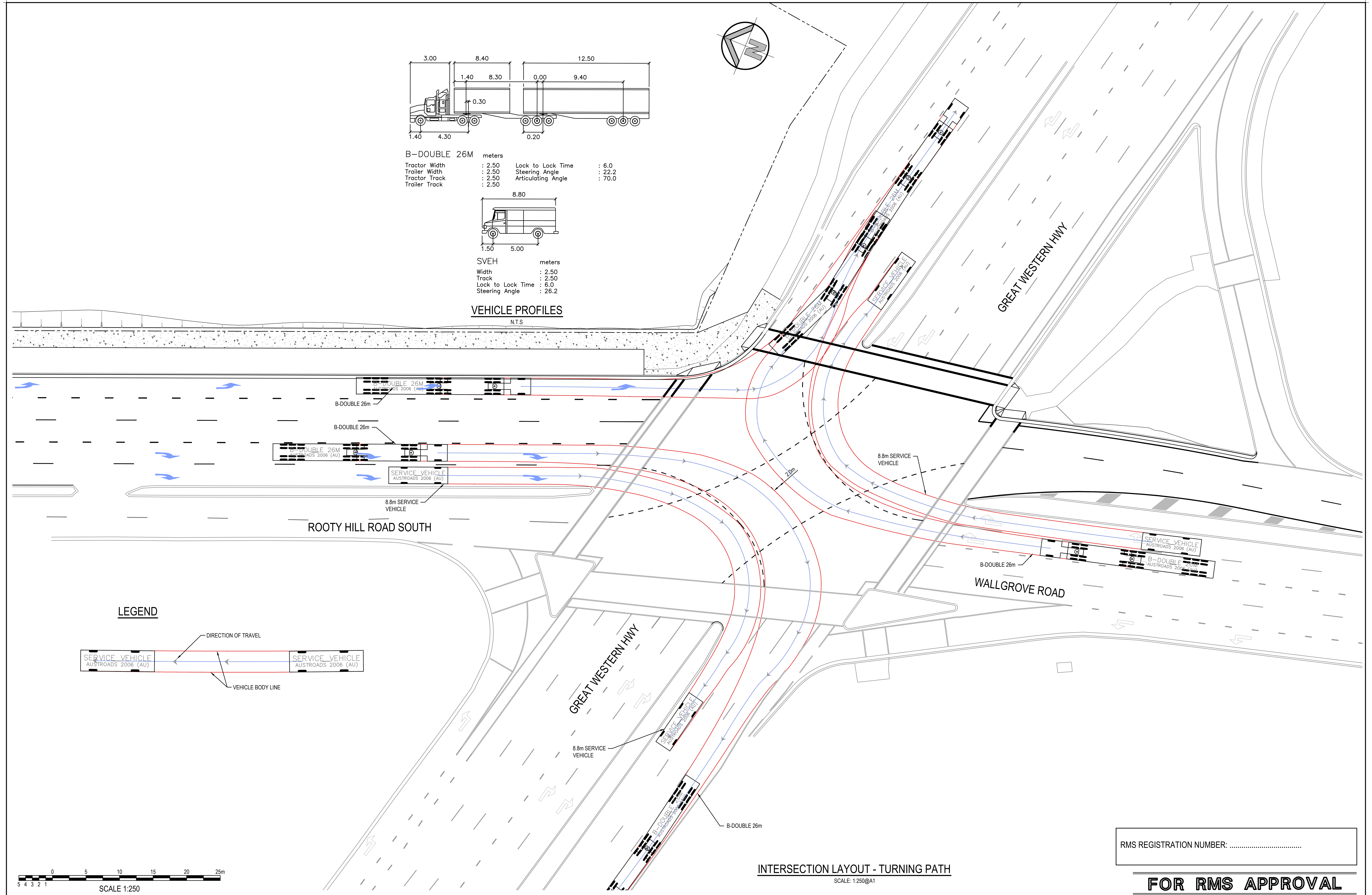
Project	Drawn	Designed	Date
INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW	L. CAHA	L. CAHA	SEP 2015
	Checked: T. DEMPSEY	Approved: A. FRANCIS	Scale: 1:250 @ A1

Title
INTERSECTION LAYOUT - TURNING PATHS
SHEET 2 OF 3 - OPTION 1

Drawing number: 15766_C1_C651
Revision: 04



RMS REGISTRATION NUMBER: ....

INTERSECTION LAYOUT - TURNING PATH

SCALE: 1:250@A1

FOR RMS APPROVAL

SURVEY INFORMATION

SURVEYED BY LANDPARTNERS

DATUM: AHD

ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
05	RE-ISSUED FOR RMS APPROVAL	LC	LC	20.01.2017
04	RE-ISSUED FOR RMS APPROVAL	MS	LC	07.12.2016
04	RE-ISSUED FOR RMS APPROVAL	MS	LC	07.12.2016
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016

Client: HANSEN YUNCKEN PTY.LTD.

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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT - TURNING PATHS SHEET 3 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C652

Revision: 05

INTERSECTION LAYOUT - SERVICES PLAN

SCALE: 1:250 @A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR INFORMATION	LC	LC	03.05.2017

Client: HANSEN YUNCKEN PTY.LTD.

Surveyor: LANDPARTNERS

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Project: INTERSECTION AND ROAD WIDENING CABLE PLACE, EASTERN CREEK, NSW

Title: INTERSECTION LAYOUT-SERVICES PLAN LINEMARKING PLAN, SHEET 1 OF 3

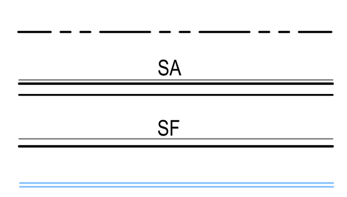
Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C801 Revision: 01

INTERSECTION LAYOUT - CONCEPT LINEMARKING PLAN

SCALE: 1:250 @A1

LEGEND



EXISTING BOUNDARY
PROPOSED KERB & GUTTER - SA
PROPOSED MOUNTABLE KERB - SF
EXISTING KERB TO BE RETAINED

NOTE:
REFER DRAWING 15766_C1_C601 FOR LINEMARKING TABLE

NOTE:
1. E6 EDGE LINE TO BE PLACE ON THE INCLINED FACE OF TYPE SF KERB ALONG CENTRAL MEDIANS
2. PAVEMENT ARROWS IN ACCORDANCE WITH RMS AS1742.2 - FIGURE 5.9

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
04	RE-ISSUED FOR RMS APPROVAL	LC	LC	22.03.2017					
03	RE-ISSUED FOR RMS APPROVAL	LC	LC	29.08.2016					
02	RE-ISSUED FOR RMS APPROVAL	LC	LC	13.07.2016					
01	ISSUED FOR RMS APPROVAL	LC	LC	09.06.2016					

Client
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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT-SERVICES PLAN
SHEET 2 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	**Approved**	**Scale**
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C802
Revision: 04

INTERSECTION LAYOUT - SERVICES PLAN

SCALE: 1:250 @A1

RMS REGISTRATION NUMBER: ....

FOR RMS APPROVAL

0 5 10 15 20 25m
5 4 3 2 1
SCALE 1:250

SURVEY INFORMATION
SURVEYED BY LANDPARTNERS
DATUM: AHD
ORIGIN OF LEVELS: PM 30122 RL 43.58

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE	REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR INFORMATION	LC	LC	04.05.2017					

Client
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Project
INTERSECTION AND ROAD WIDENING
CABLE PLACE, EASTERN CREEK, NSW

Title
INTERSECTION LAYOUT-SERVICES PLAN
SHEET 3 OF 3

Drawn	Designed	Date
L. CAHA	L. CAHA	SEP 2015
Checked	Approved	Scale
T. DEMPSEY	A. FRANCIS	1:250 @ A1

Drawing number: 15766_C1_C803
Revision: 01