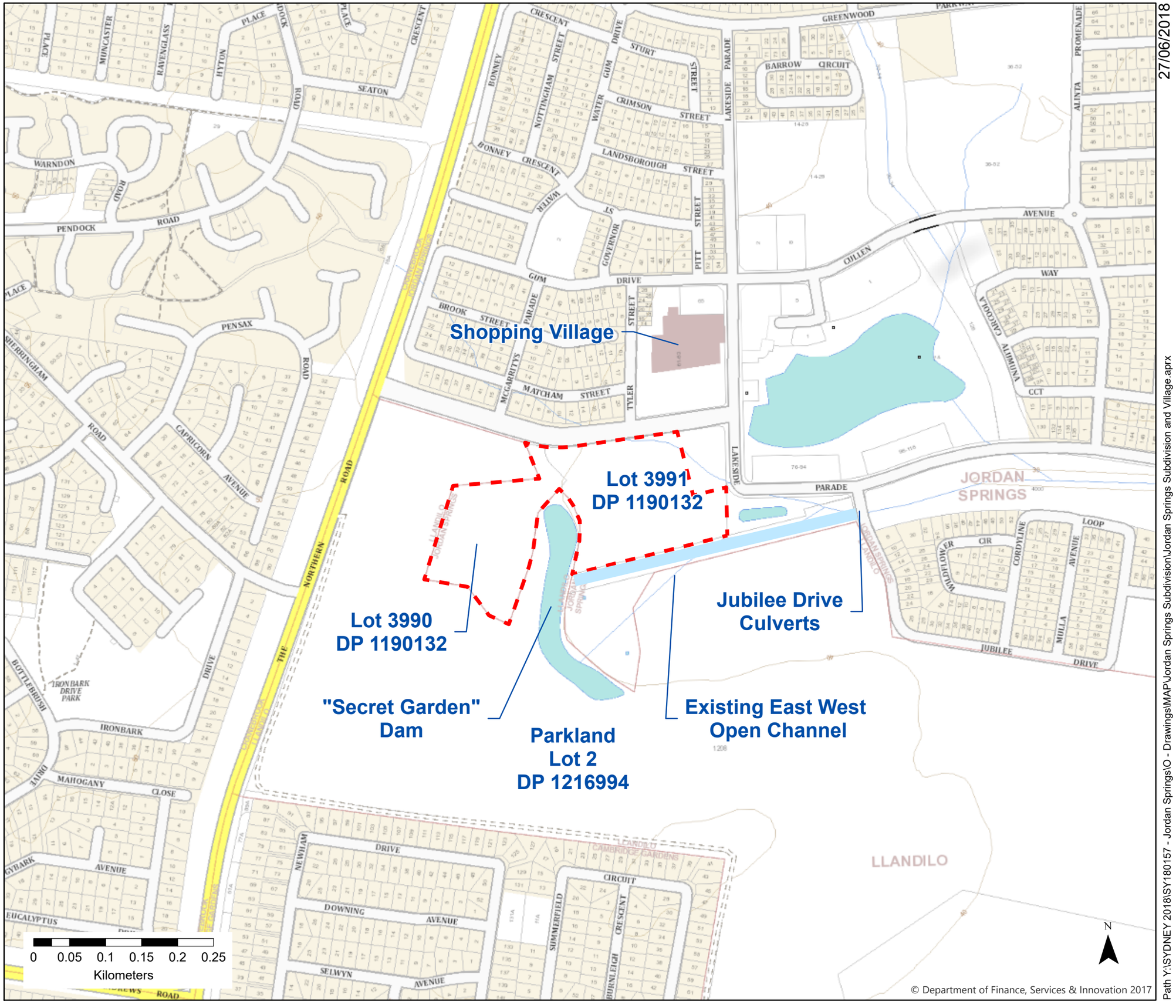
Appendix 22

Flood Study prepared by Northrop

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Figure A1
Locality Plan



27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

Subject Site

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Figure A2
Catchment Plan

27/06/2018

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C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32

0 70 140 210 280 350
Meters

N

Legend
- Subject Site
- Catchments
- 1m Contour
- 5m Contour

Elevation (m AHD)
70
20

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Figure A3

Manning's Roughness Existing

27/06/2018

Legend

Mannings Roughness

- n = 0.05
- n = 0.02
- n = 0.30
- n = 0.035
- n = 0.08
- n = 0.07
- n = 0.03
- n = 0.012

0 40 80 120 160 200

Meters

N

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

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Figure A4

Manning's Roughness Developed

27/06/2018

Legend

Mannings Roughness

- n = 0.05
- n = 0.02
- n = 0.30
- n = 0.035
- n = 0.08
- n = 0.07
- n = 0.03
- n = 0.012

0 40 80 120 160 200

Meters

N

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

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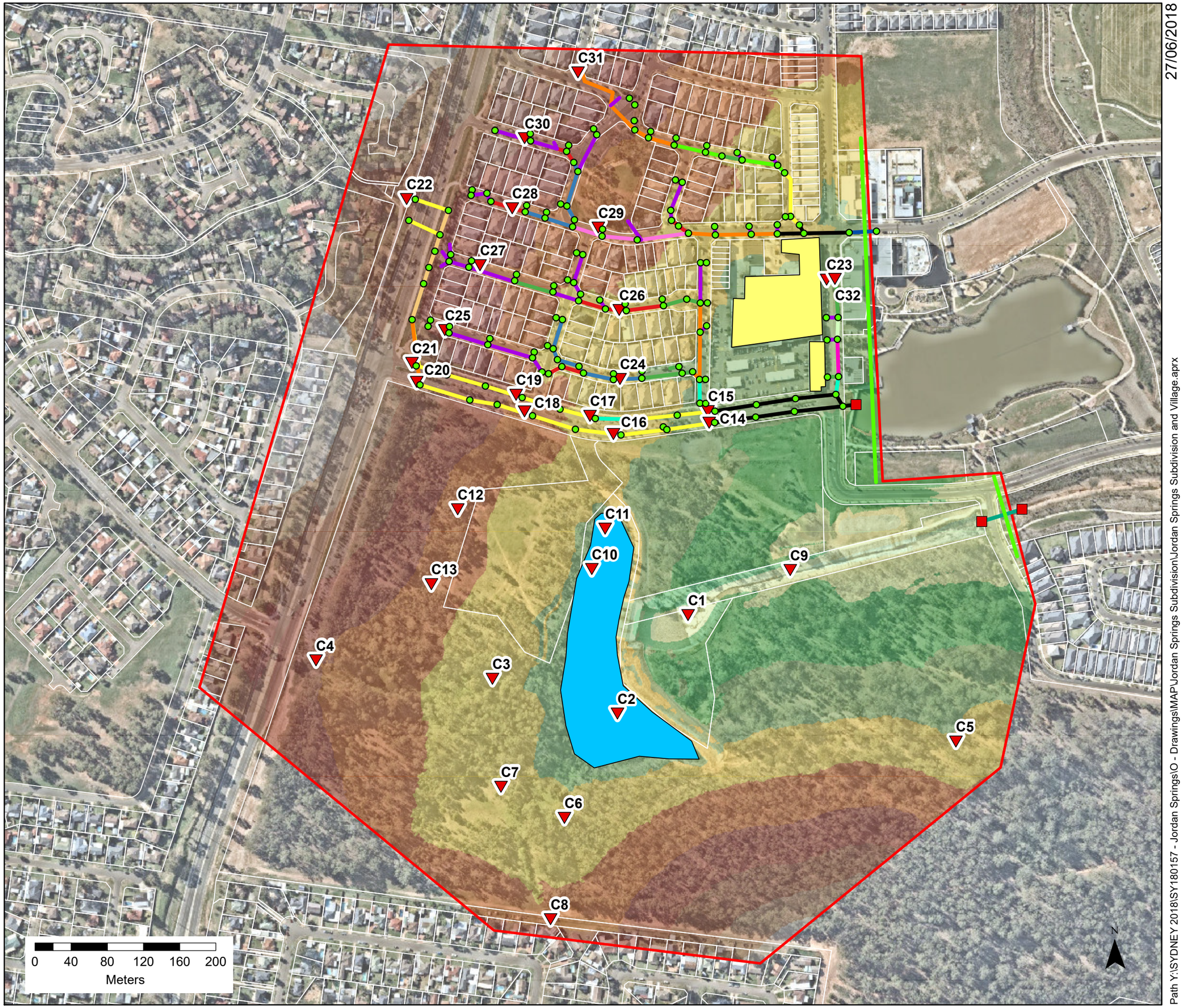
Figure A5

Existing Model Schematic

27/06/2018



Legend

Pipe Size (mm)
- 375 RCP
- 450 RCP
- 525 RCP
- 600 RCP
- 675 RCP
- 750 RCP
- 825 RCP
- 900 RCP
- 1050 RCP
- 1200 RCP
- 1650 RCP
- 1500x900 RCBC
- 2100x900 RCBC
- 2400x1350 RCBC
- 4200x900 RCBC
- 2D Model Extent
- Catchment Inflow
- Tailwater Boundary
- Initial Water Level
- Blockage
- Inlet Pit
- Headwall

Elevation (m AHD)
- ≤32
- ≤34
- ≤36
- ≤38
- ≤40
- ≤42
- ≤44
- ≤46
- ≤48
- ≤50
- ≤52
- ≤54
- ≤56

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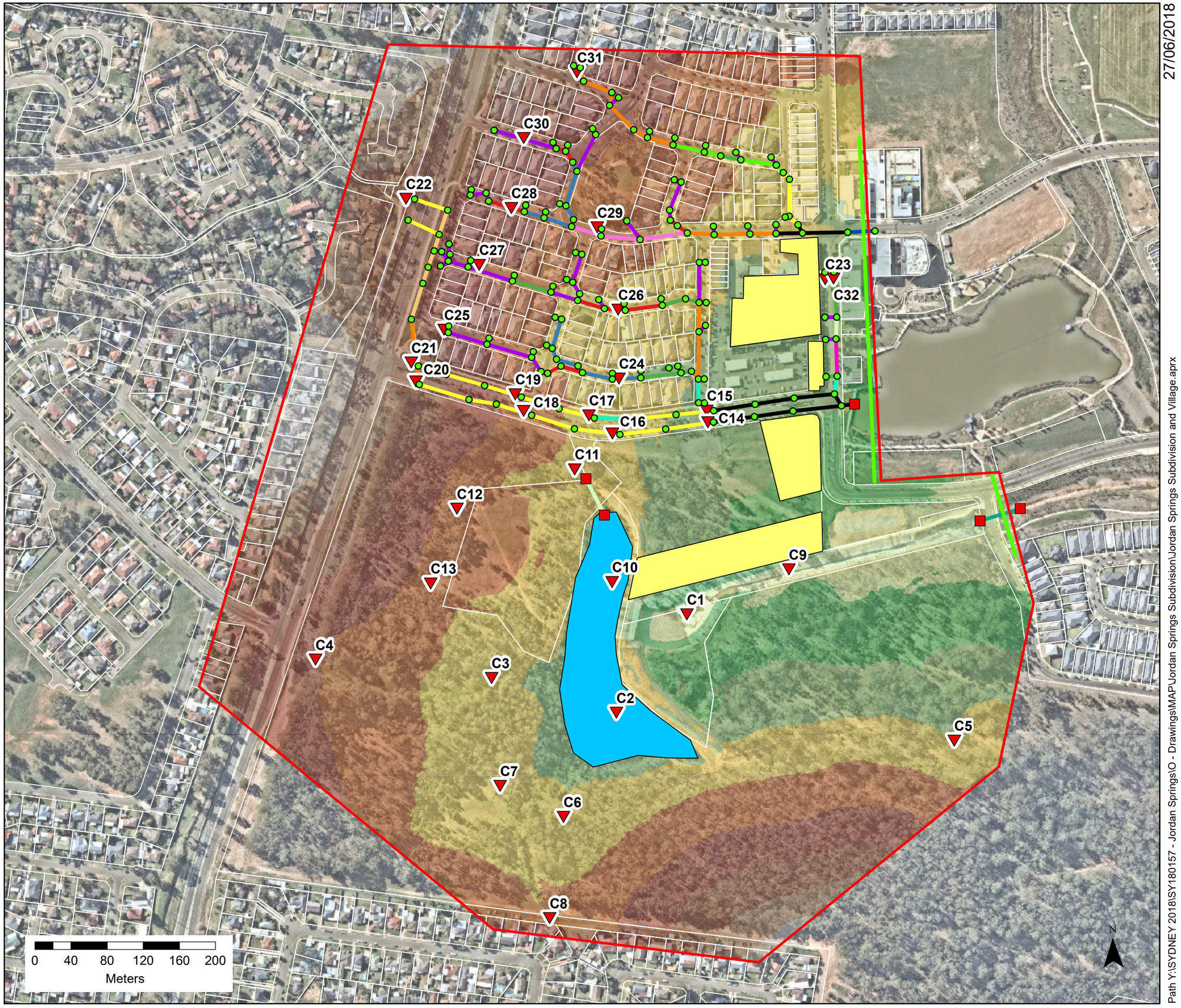
Figure A6
Developed Model Schematic

27/06/2018



Legend

Pipe Size (mm)
- 375 RCP
- 450 RCP
- 525 RCP
- 600 RCP
- 675 RCP
- 750 RCP
- 825 RCP
- 900 RCP
- 1050 RCP
- 1200 RCP
- 1650 RCP
- 1500x900 RCBC
- 2100x900 RCBC
- 2400x1350 RCBC
- 4200x900 RCBC
- 2D Model Extent
- Catchment Inflow

- Tailwater Boundary
- Initial Water Level
- Blockage
- Inlet Pit
- Headwall

Elevation (m AHD)
- ≤32
- ≤34
- ≤36
- ≤38
- ≤40
- ≤42
- ≤44
- ≤46
- ≤48
- ≤50
- ≤52
- ≤54
- ≤56

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Version: 1, Version Date: 13/07/2018

Figure B1

Existing 1%AEP
Depth and Elevation

27/06/2018

Dam Level
39.89

Dam Level
39.90

0 25 50 75 100 125
Meters

N

Legend

- 2D Model Extent
- Blockage
- 1m Contour
- 200mm Contour

Depth (m)

- Less than 0.3
- 0.3 to 0.5
- 0.5 to 1.0
- 1.0 to 1.5
- 1.5 to 2.0
- 2.0 to 3.0
- Greater than 3.0

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Figure B2

Existing 1%AEP
Maximum Velocity

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Velocity (m/s)

- Less than 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- Greater than 5.0

0 25 50 75 100 125
Meters

N

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Document Set ID: 8291178
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Figure B3

Existing 1%AEP
Hazard Categories

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

ARR 2016 Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 25 50 75 100 125
Meters

N

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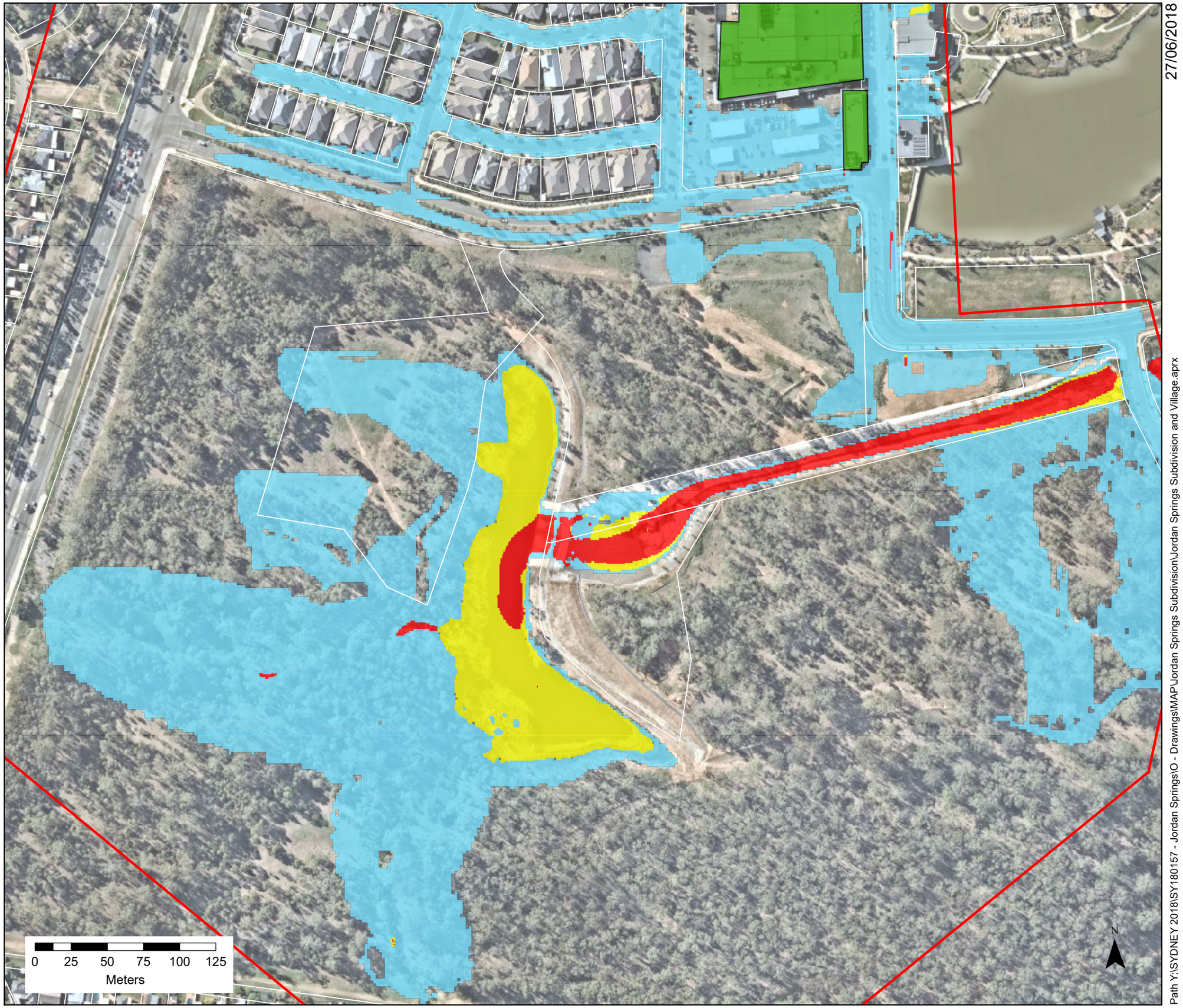
Figure B4

Existing 1%AEP
Hydraulic Categories



27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Hydraulic Categories

- Flood Fringe
- Flood Storage
- Floodway

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Figure C1

Developed 50%AEP
Depth and Elevation

27/06/2018

Dam Level
39.66

Dam Level
39.67

0 25 50 75 100 125
Meters

N

Legend

- 2D Model Extent
- Blockage
- 1m Contour
- 200mm Contour

Depth (m)

- Less than 0.3
- 0.3 to 0.5
- 0.5 to 1.0
- 1.0 to 1.5
- 1.5 to 2.0
- 2.0 to 3.0
- Greater than 3.0

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Figure C2

Developed 50%AEP
Maximum Velocity

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Velocity (m/s)

- Less than 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- Greater than 5.0

0 25 50 75 100 125
Meters

N

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Figure C3

Developed 50%AEP
Hazard Categories

27/06/2018

Legend

- Blockage
- 2D Model Extent

ARR 2016 Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 25 50 75 100 125
Meters

N

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

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Figure C4

Developed 50%AEP
Hydraulic Categories

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Hydraulic Categories

- Flood Fringe
- Flood Storage
- Floodway

0 25 50 75 100 125
Meters

N

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Figure C5

Developed 1%AEP
Depth and Elevation

27/06/2018

Dam Level
39.89

Dam Level
39.91

0 25 50 75 100 125
Meters

N

Legend

- 2D Model Extent
- Blockage
- 1m Contour
- 200mm Contour

Depth (m)

- Less than 0.3
- 0.3 to 0.5
- 0.5 to 1.0
- 1.0 to 1.5
- 1.5 to 2.0
- 2.0 to 3.0
- Greater than 3.0

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Figure C6

Developed 1%AEP
Maximum Velocity

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Velocity (m/s)

- Less than 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- 2.0 to 5.0
- Greater than 5.0

0 25 50 75 100 125
Meters

N

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Figure C7

Developed 1%AEP
Hazard Categories

27/06/2018

Legend

- Blockage
- 2D Model Extent

ARR 2016 Hazard

- H1
- H2
- H3
- H4
- H5
- H6

0 25 50 75 100 125
Meters

N

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

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Figure C8

Developed 1%AEP
Hydraulic Categories

27/06/2018

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Legend

- Blockage
- 2D Model Extent

Hydraulic Categories

- Flood Fringe
- Flood Storage
- Floodway

0 25 50 75 100 125
Meters

N

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Figure D1

1% AEP Comparison
Elevation

27/06/2018

Increase up to approx 12mm

Increase up to approx 50mm

Increase up to approx 250mm

Increase up to approx 74mm

Increase up to approx 55mm

Increase up to approx 12mm

Increase up to approx 85mm

0 25 50 75 100 125
Meters

N

Legend

Wet/Dry
- Was Dry Now Wet
- Was Wet Now Dry

Difference (m)
- ≤ -0.063
- -0.063 - -0.050
- -0.049 - -0.020
- -0.019 - -0.010
- -0.009 - 0.010
- 0.011 - 0.020
- 0.021 - 0.050
- 0.051 - 0.100
- 0.101 - 0.250
- >0.251

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NORTHROP

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Figure D2

1% AEP Comparison
Velocity

27/06/2018

Legend

Wet/Dry

- Was Dry Now Wet
- Was Wet Now Dry

Difference (m/s)

- ≤ -0.500
- -0.499 - -0.250
- -0.249 - -0.100
- -0.099 - 0.100
- 0.101 - 0.250
- 0.251 - 0.500
- >0.501

0 25 50 75 100 125
Meters

N

Path Y:\SYDNEY 2018\SY180157 - Jordan Springs\O - Drawings\MAP\Jordan Springs Subdivision\Jordan Springs Subdivision and Village.aprx

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Our Ref: PL18/0019
Contact: Wendy Connell
Telephone: (02) 4732 7908

20 March 2018

Karen Armstrong
Lendlease
300 Barangaroo Ave
BARANGAROO NSW 2000

Dear Karen

Pre-lodgement Advice
Proposed Residential Subdivision at Lot 3990 DP 1190132, Jordan Springs Boulevard Jordan Springs NSW 2747

We welcome your initiative to undertake a project in the Penrith Area.

Thank you for taking part in Council's pre-lodgement meeting on 8 March 2018**.** The meeting was useful for Council in gaining an understanding of your proposal.

You are advised that should the items in the attached information be addressed, your application should be suitable for submission and consideration.

As I am sure you are aware, Council's full assessment and determination can only be made after you lodge an application.

If we can help you any further regarding the attached advice, please feel free to contact me on (02) 4732 7908.

Yours sincerely

Wendy Connell
Senior Environmental Planner

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

PROPERTY AND PLANNING INFORMATION	
Attendees	**Proponent** Karen Armstrong – Lendlease Steve Laffey – Lendlease Murray Robertson – Lendlease Dan Keary – Keylan Consulting **Penrith City Council** Kate Smith – Principal Planner Wendy Connell – Senior Environmental Planner Stephen Masters – Senior Development Engineer Graham Green – Traffic Engineer Joshua Romeo – Waste Management Officer
Proposal	Residential Subdivision
Address	Lot 3990 DP 1190132, Jordan Springs Boulevard Jordan Springs NSW 2747
Zoning	The site is zoned 'Urban' under Sydney Regional Environmental Plan No. 30 – St Marys
Site constraints	Contains native vegetation Identified as bushfire prone land Adjoins a mapped watercourse Subject to a right of carriageway and easement for services
Development Type	Integrated

KEY ISSUES AND OUTCOMES

The proposal is to address the following issues:

RELEVANT EPI's POLICIES AND GUIDELINES

Planning provisions applying to the site, the provisions of all plans and policies are contained in **Appendix A**.

PLANNING REQUIREMENTS

- A pedestrian path is proposed along the back of the lots fronting the lake. Paths in this location are not supported as they do not align with CPTED principles. This type of development results in Council resolving ongoing problems including anti-social behaviour, graffiti to back fences, vandalism and rubbish dumping. A perimeter road should be incorporated along the lake frontage to provide amenity and passive surveillance to the lake and its surrounds.
- Lots with BAL ratings above 29 will not be supported.

- Building envelopes should be included on highly constrained lots.

- There may be an opportunity to provide larger dual occupancy sites on corner allotments.

- The St Mary's Western Precinct Plan states that the Cumberland Plain Woodland (CPW) in the Regional Park is in excellent condition. A Flora and Fauna Assessment Report is to be provided, and this may identify the need for a Species Impact Statement and referral to the commonwealth. Retention of trees and native vegetation should occur wherever possible. Existing trees should ideally be incorporated into the development rather than clear-felling the site. Only native species are to be used in all landscaping.

- The proposed site is within 40 metres of a mapped watercourse. The application will be integrated under the Water Management Act 2000 and referral will be made to the Office of Water for their review and approval. Early consultation with them is encouraged for their requirements.

- The site is bushfire prone land. Any proposal on bushfire prone land will be 'integrated' development under the Rural Fires Act 1997. A Bushfire Report is to be provided with any development applications for this purpose on this site. You are encouraged to liaise early with the RFS for any advice.

- The application will be referred to the National Parks and Wildlife Service for their advice in accordance with Clause 44 of SREP 30 – St Marys.

- Any proposed development will need to clarify the relationship between any existing approvals or proposals in the area. Details including building concepts of what is proposed adjoining sites is requested to understand the context and any necessary interface treatments between proposed and adjoining developments.

ENVIRONMENTAL MANAGEMENT REQUIREMENTS

Remediation and contamination
The application is to address all relevant requirements under State Environmental Planning Policy 55 Remediation of Land (SEPP 55). Council cannot consent to any development unless these requirements have been satisfied. The application is to demonstrate that the land is suitable for the proposed purpose.

Acoustics
The proximity of the proposed development to The Northern Road and Jordan Springs Drive is likely to result in some parts of the proposed development being exposed to high levels of road traffic noise. The acoustic assessment needs to be prepared in accordance with the NSW EPA's Noise Policy for Industry and the Road Noise Policy.

Fill Management Protocol
If large amounts of fill are going to be imported to the site, a Fill Management Protocol (FMP) will be required with the application. The FMP will need to be outline how the sourcing and importation of fill will be conducted to prevent contaminated material being delivered, and how responsibilities under the

Protection of the Environment Operations Act and Regulations will be complied with.

Water Reuse
If water from site dams is to be used for any use (such as irrigation of landscaping) a risk assessment prepared in accordance with the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks. This may trigger approval from the Office of Water.

ENGINEERING REQUIREMENTS

General

- Council's engineering requirements for subdivisions and developments, including policies and specifications listed herein, can be located on Council's website at the following link:
https://www.penrithcity.nsw.gov.au/Building-and-Development/Development-Applications/Engineering-requirements-for-developments/

- All engineering works must be designed and constructed in accordance with Council's *Design Guidelines for Engineering Works for Subdivisions and Developments* and Council's *Engineering Construction Specification for Civil Works.*

Stormwater

- Stormwater drainage for the site must be in accordance with the following:
    - Council's Development Control Plan,
    - *Stormwater Drainage Specification for Building Developments* policy, and
    - *Water Sensitive Urban Design Policy* and *Technical Guidelines.*
- A stormwater concept plan, accompanied by a supporting report and calculations, shall be submitted with the application
- A water sensitive urban design strategy prepared by a suitably qualified person is to be provided for the site. The strategy shall address water conservation, water quality, water quantity, and operation and maintenance. The strategy shall address Council's *Water Sensitive Urban Design Policy* and *Technical Guidelines.*

Flooding

- The applicant is to ensure all roads and lots are above the top water level of the 1% Annual Exceedance Probability (AEP) of the adjoining lake. All future habitable floor levels for all lots shall be a minimum of 0.5m above the 1% AEP top water level of the lake.

Traffic

- The application shall be supported by a traffic report prepared by a suitably qualified person addressing, but not limited to, traffic generation, access, car parking, and manoeuvring. The traffic report shall consider traffic generation for the ultimate developed site including the seniors living development, the aged care facility and the residential

subdivision.

- Future access to the aged care site is to be demonstrated.
- The application must demonstrate that access, car parking, and manoeuvring details comply with AS2890 Parts 1, 2 & 6 and Council's Development Control Plan.
- The proposed development shall be designed to be serviced by a 12.5m Heavy Rigid Vehicle.
- Driveway locations for each lot are to be shown on the building envelope plan. The minimum driveway width for a single car garage is 3.0m with a double garage having a maximum driveway width of 4.5m. Driveway locations are to be more than 6.0m from the tangent point of any kerb return. Refer to Penrith City Council Standard Drawing SD1004 in Council's Engineering Construction Specification.

Roadworks

- The development will require the following external road works:
    - *Provision of an intersection and right turn bay in Jordan Springs Boulevard. The length of the bay shall accommodate traffic for the ultimate developed site. The locations of the existing intersections at McGarritys Parade and Tyler Street along Jordan Springs Boulevard are to be shown.*

Earthworks

- No retaining walls or filling is permitted for this development which will impede, divert or concentrate stormwater runoff passing through the site.
- Earthworks and retaining walls must comply with Council's Development Control Plan.
- Proposed fill material must comply with Council's Development Control Plan.

Subdivision Works

- The application is to be accompanied by a subdivision concept plan.
- The subdivision layout shall be in general accordance with Council's Development Control Plan.
- A Stage 2 Road Safety Audit is to be submitted with the application.
- The subdivision shall be deigned to ensure adequate access and turning paths are provided for Council's waste collection vehicles.

Other

- Provide a plan showing the locations of all proposed fencing for the Regional Park within the vicinity of the development site and the lake.

Documents to be submitted with development application	▪ Survey drawing ▪ Subdivision Plan ▪ Statement of Environmental Effects ▪ Stormwater Concept Plan ▪ Traffic Assessment Report ▪ Contamination Assessment (in SEE) ▪ One (1) printed and two (2) electronic (PDF) copies of your development application Please refer to Council's Development Application checklist, as attached, for further details of submission requirements and ensure that plans submitted illustrate consistent detail. Please ensure you contact Council's duty officer on 4732 7991 to make an appointment for lodgement of this application.
Fees	Please call the Development Services Department Administrative Support on (02) 4732 7991 to enquire about fees and charges.

APPENDIX A

- Sydney Regional Environmental Plan No 20 – Hawkesbury Nepean River (no 2 - 1997)
- Sydney Regional Environmental Plan No. 30 – St Marys
- State Environmental Planning Policy. No 55 – Remediation of Land
- Penrith Local Environmental Plan 2010
- Penrith Development Control Plan 2014

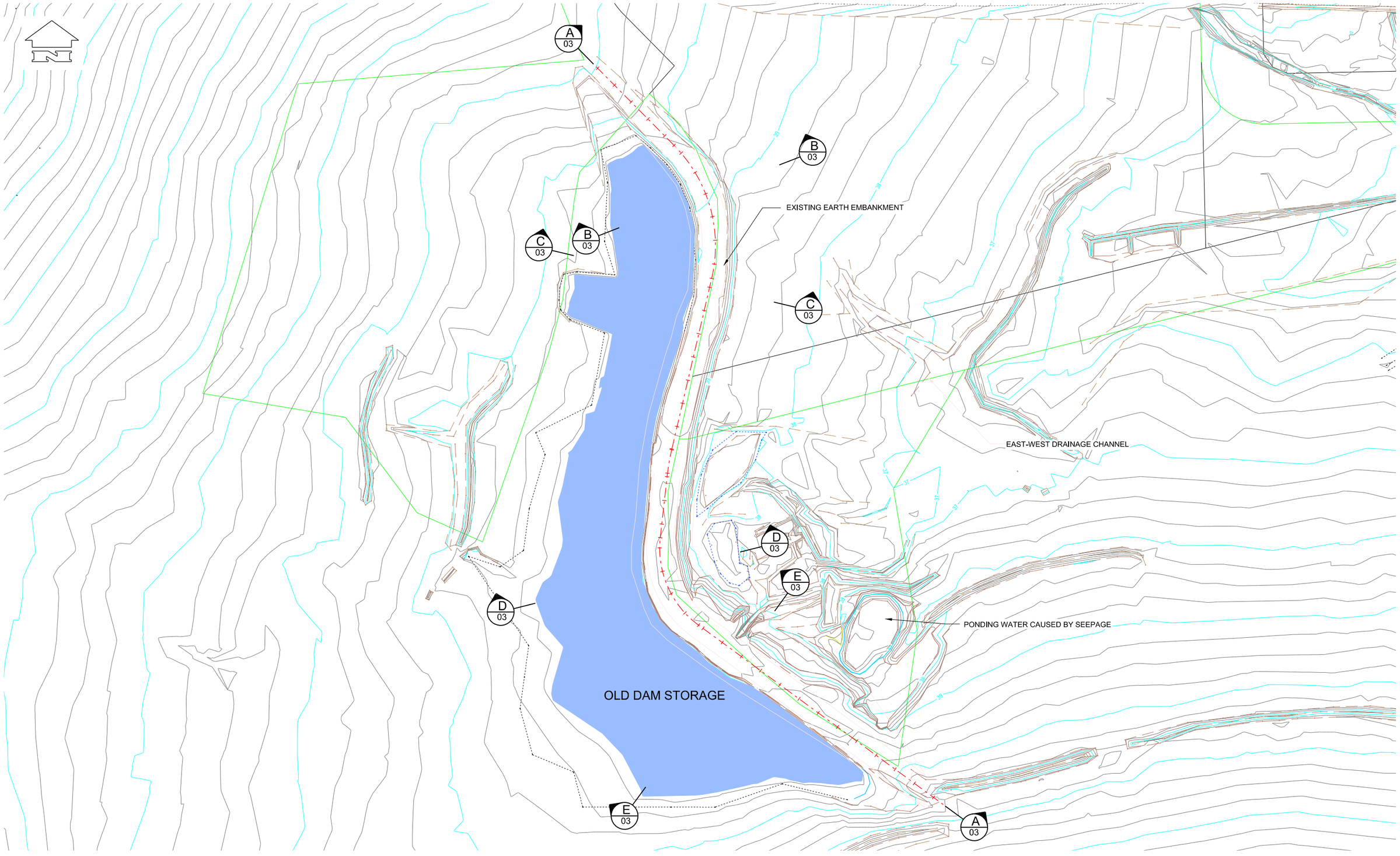
Important Note

The pre-lodgement panel will endeavour to provide information which will enable you to identify issues that must be addressed in any application. The onus remains on the applicant to ensure that all relevant controls and issues are considered prior to the submission of an application.

Information given by the pre-lodgement panel does not constitute a formal assessment of your proposal and at no time should comments of the officers be taken as a guarantee of approval of your proposal.

It is noted that there is no Development Application before the Council within the meaning of the Environmental Planning and Assessment Act 1979. This response is provided on the basis that it does not fetter the Council's planning discretion and assessment of any Development Application if lodged. It is recommended that you obtain your own independent expert advice.

The response is based upon the information provided at the time of the meeting.



1:750

0 20 40 60 80 m

10

REV	AMENDMENT DETAILS	APPROVED	DATE
A	ISSUED FOR CONSTRUCTION	G.S.	12.07.2016

1. NSW Water Solutions, a division of the Department of Finance, Services and Innovation shall not be liable or responsible for any loss or damage arising out of the conversion of any electronic document, data or program. 2.The recipient or user of any electronic document, data or program is solely responsible for ascertaining its accuracy and its suitability for their purposes

FOR CONSTRUCTION

lendlease

NSW GOVERNMENT Water Solutions
LEVEL 13, McKELL BUILDING
2-24 RAWSON PLACE, SYDNEY 2000
PHONE (02) 9372 7972 FAX (02) 9372 7597
SIMON SMITH - Chief Executive
Office of Finance and Services

DESIGNED	GEORGE SAMIOS
CHECKED	GEORGE SAMIOS
DRAFTED	C.PANG
CHECKED	
PRINCIPAL ENGINEER	J. DIXON

JORDAN SPRINGS
OLD DAM SAFETY ASSESSMENT
DAM UPGRADE EXISTING SITE PLAN

PROJECT/CONTRACT No.	123-456
SCALE @ A1	A1 1:750
DRAWING No.	- 01
REV	A

CONFIRM SCALE — 100mm ON A1 ORIGINAL

G:\Watertec\Prod\1518 - JORDAN SPRINGS\1518P-JordanSpr 01.dgn
pangx
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13/07/2016

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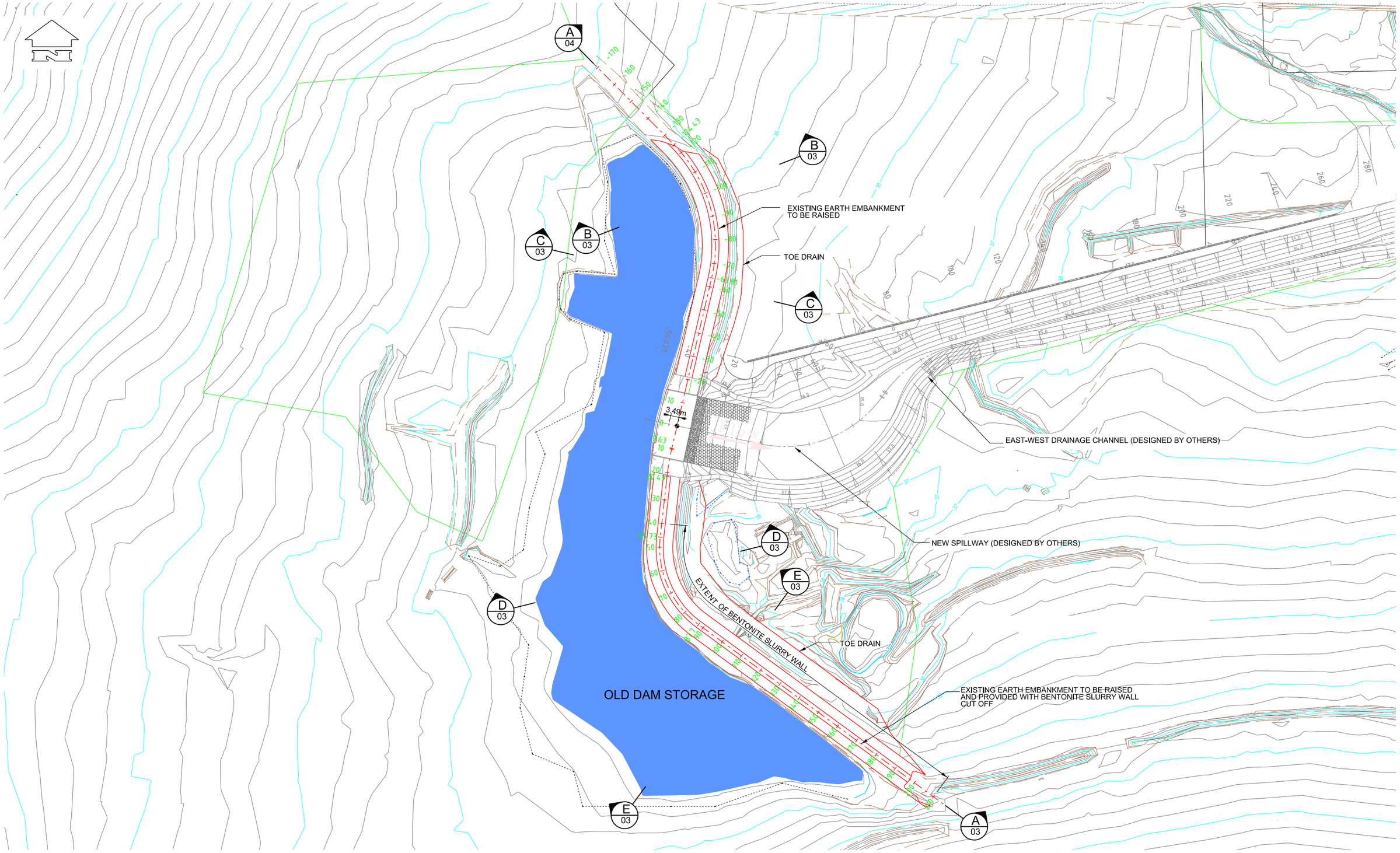

1:750

0 20 40 60 80 m

10

REV	AMENDMENT DETAILS	APPROVED	DATE
A	ISSUED FOR CONSTRUCTION	G.S.	12.07.2016

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FOR CONSTRUCTION

lendlease

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SIMON SMITH - Chief Executive
Office of Finance and Services

DESIGNED	GEORGE SAMIOS
CHECKED	GEORGE SAMIOS
DRAFTED	C.PANG
CHECKED	
PRINCIPAL ENGINEER	J. DIXON

JORDAN SPRINGS
OLD DAM SAFETY ASSESSMENT
DAM UPGRADE GENERAL ARRANGEMENT

PROJECT/CONTRACT No.	123-456
SCALE @ A1	A1 1:750
DRAWING No.	- 02
REV	A

CONFIRM SCALE — 100mm ON A1 ORIGINAL

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Version: 1, Version Date: 13/07/2018

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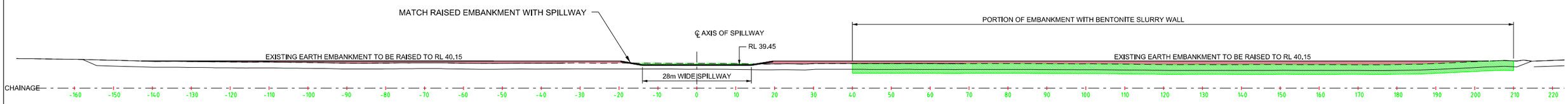
13/07/2016



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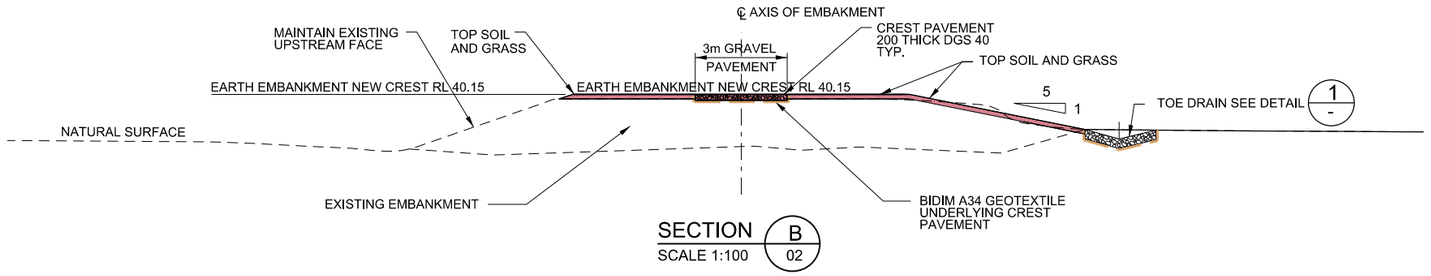

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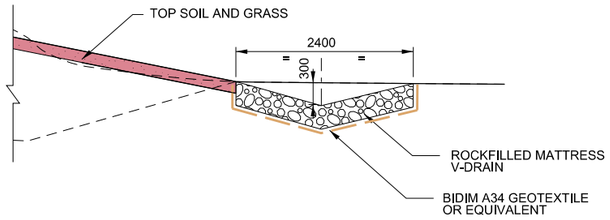
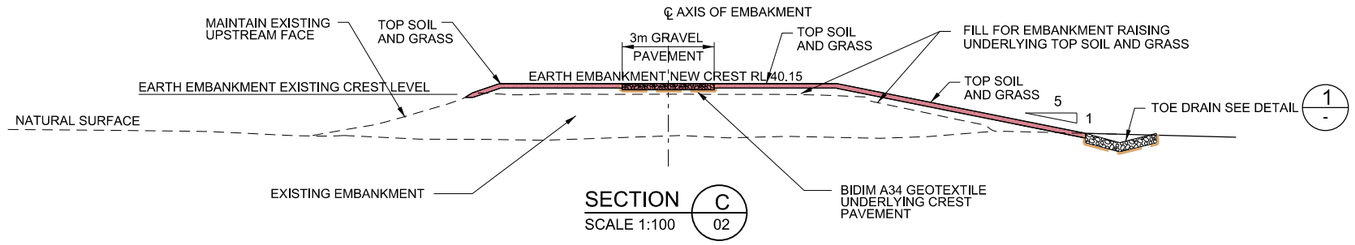


DETAIL 1/-
SCALE 1:25

NOTE: TOE DRAIN TO BE CONNECTED TO DRAINAGE AT SPILLWAY AND DOWNSTREAM CHANNEL.



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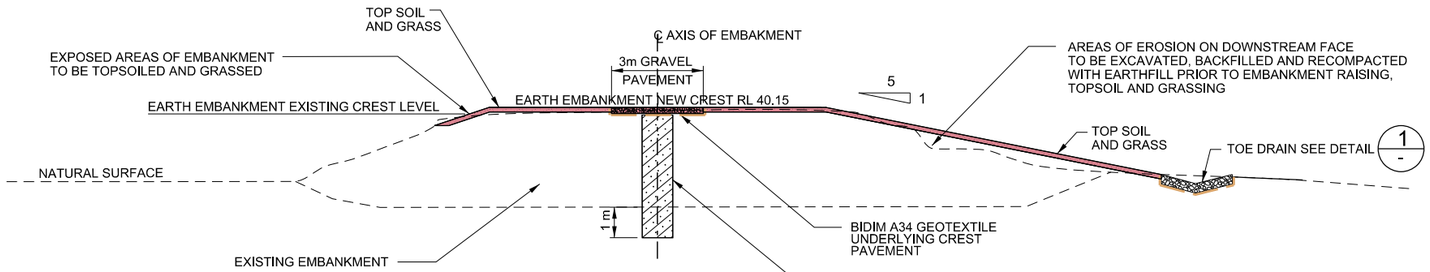
SCALE 1:100 — 02



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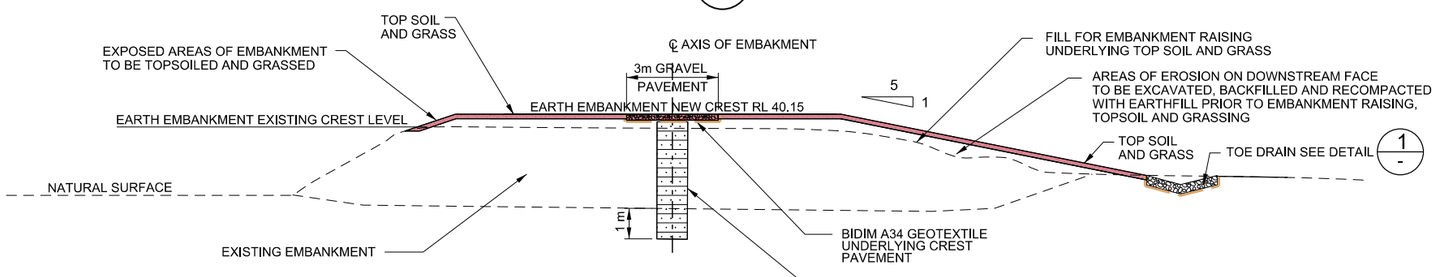
SCALE 1:100 — 02



SECTION E
SCALE 1:100 — 02

1:500 0 10 20 30 40 50 m (10)
1:100 0 2 4 6 8 10 m (2 1)
1:25 0 0.5 1 1.5 2 2.5 m (0.5)

REV	AMENDMENT DETAILS	APPROVED	DATE
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CHECKED	
PRINCIPAL ENGINEER	J. DIXON

JORDAN SPRINGS
OLD DAM SAFETY ASSESSMENT
DAM UPGRADE SECTIONS

PROJECT/CONTRACT No. 123-456
SCALE @ A1 A1 1:500. 1:100
DRAWING No. - 03
REV A

CONFIRM SCALE — 100mm ON A1 ORIGINAL

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13/07/2016

MGA

ROWLAND PLACE

SEE SHEET 2

SANDSTOCK CRESCENT

PARADE

MATCHAM STREET

JORDAN SPRINGS BOULEVARD

SEE SHEET 3

ROWLAND PLACE

TYLER STREET

MATCHAM STREET

JORDAN SPRINGS BOULEVARD

SEE SHEET 4

LAKESIDE PARADE

SEE SHEET 5

SEE SHEET 8

3391
DP 1190132
3.633 ha (Title)

3989
DP 1190132
5026 m² (Title)

3992
DP 1190132
1.084 ha (Title)

LAKESIDE PARADE

JUBILEE DRIVE

SEE SHEET 6

3990
DP 1190132
2.345 ha (Title)

SEE SHEET 7

SEE SHEET 9

SEE SHEET 10

3993
DP 1190132
1.183 ha (Title)

SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

10 20 30 40 50 100
1:1000

GENERAL NOTES:-

1. THIS SURVEY IS NOT A 'LAND SURVEY' AS DEFINED BY THE SURVEYING AND SPATIAL INFORMATION ACT, 2002.
2. THE BOUNDARIES OF THE LAND HAVE NOT BEEN SURVEYED. THE RELATIONSHIP BETWEEN THE BOUNDARIES SHOWN AND FEATURES SURVEYED ARE APPROXIMATE AND SUITABLE FOR PLOTTING PURPOSES ONLY.
3. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND ARE QUALITY LEVEL A AS DEFINED BY AS 5488-2013.
4. UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE'YOU-DIG' PLANS AND ARE QUALITY LEVEL D AS DEFINED BY AS 5488-2013. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.
5. ONLY TREES GREATER THAN 3.5 METRES IN HEIGHT ARE SHOWN ON THIS PLAN AND THEIR POSITIONS AREA DIAGRAMMATIC ONLY AND MAY REQUIRE ADDITIONAL SURVEY WHERE CRITICAL TO DESIGN. NO TREES HAVE BEEN LOCATED ON LOTS 3990 & 3991 IN DP1190132.
6. CONTOURS ARE INDICATIVE AT GROUND FORM ONLY. SPOT LEVELS ONLY SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION.
7. CONTOUR INTERVAL 0.5 m.
8. ALL SETOUT LEVELS MUST BE REFERRED TO THE BENCH MARK.
9. THE ORIENTATION OF THIS PLAN IS MGA NORTH AS DETERMINED FROM DP 1190132. THE VARIATION FROM MGA NORTH TO TRUE NORTH IS APPROXIMATELY 1°06'.
10. SCHEDULE OF EASEMENTS NOTED ON TITLES DATED 11/01/2017:

LOT 3989 IN DP 1190132
APPURTENANT (NOT SHOWN ON PLAN):
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274)
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528)
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620)
* EASEMENT FOR TRANSMISSION LINE 4.85 WIDE (N324748)
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196)

LOT 3990 IN DP 1190132
APPURTENANT (NOT SHOWN ON PLAN):
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274)
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528)
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620)
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748)
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196)

BURDENED:
* EASEMENT FOR SERVICES VARIABLE WIDTH (DP 1190132) SHOWN 'S'
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3991 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP1190132) SHOWN 'R'
* EASEMENT FOR SERVICES VARIABLE WIDTH (DP 1190132) SHOWN 'S'
* COVENANT (DP 1190132)

BURDENED:
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3992 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP1190132) SHOWN 'R'

BURDENED:
* RIGHT OF CARRIAGE WAY 11.8 WIDE & VARIABLE WIDTH (DP 1190132) SHOWN 'R'

LOT 3993 IN DP 1190132
APPURTENANT:
* EASEMENT FOR DRAINAGE 10.06 WIDE (D431274) NOT SHOWN ON PLAN
* EASEMENT FOR POWER LINE 9.145 WIDE (K780528) NOT SHOWN ON PLAN
* EASEMENT FOR TRANSMISSION LINE 4.88 WIDE (L569620) NOT SHOWN ON PLAN
* EASEMENT FOR ELECTRICITY 4.85 WIDE (N324748) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 20.115 WIDE (DP 789196) NOT SHOWN ON PLAN
* RIGHT OF CARRIAGE WAY 11.8 WIDE (DP 1190132) SHOWN 'R'

11. COVENANTS AND RESTRICTIONS ARE NOTED ON ALL TITLES. THESE HAVE NOT BEEN INVESTIGATED.
12. SURVEY SHOWN IN GRAY ON LOT 3989 IS FROM A PREVIOUS SURVEY BY LAWRENCE GROUP PTY. LTD. DATED 15/07/14 JOB NUMBER 132673 ISSUE No DETL-002/A AND HAS BEEN PROVIDED BY THE CLIENT. SDG HAS NOT CHECKED THIS SURVEY.
13. MGA COORDINATES ARE BASED ON SSM 175299 (CLASS C ORDER 3)

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B	15/02/17	ADDITIONAL INFORMATION LOT 3993 DP1190132
C	15/01/18	ADDITIONAL INFORMATION LOTS 3390 & 3391 DP1190132

CLIENT: LENDLEASE

SCALE 1:1000
ORIGIN OF LEVELS: SSM 80426 RL 47.288
DATUM: A.H.D.
REF.: 7202
DATE: 15/01/2018
SURV/CHK: SW/CT
SHEET 1 OF 10 SHEETS
PLAN A1
ISSUE C

DETAIL AND LEVEL SURVEY OF PART OF
JORDAN SPRINGS BOULEVARD, LAKESIDE PARADE & JUBILEE DRIVE
JORDAN SPRINGS

SDG LAND DEVELOPMENT SOLUTIONS A.B.N. 85 213 323 621
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e: office@sdg.net.au
w: www.sdg.net.au

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

UNDERGROUND SERVICES LEGEND - QUALITY LEVEL D (AS 5488-2013)

- POTABLE WATER MAIN
- STORMWATER PIPE
- SEWER MAIN
- COMMUNICATIONS CABLES
- ELECTRICITY CABLES
- GAS MAIN
- UNIDENTIFIED SERVICES

APPROXIMATE POSITION ONLY VIDE 'DIAL-BEFORE-YOU-DIG' PLANS JOB No. 11675307. WHERE CRITICAL TO DESIGN, UNDERGROUND SERVICES SHOULD BE LOCATED BY MORE ACCURATE METHODS.

CAUTION: FIBRE OPTIC CABLES ARE PRESENT IN THIS AREA

SERVICES NOTES:-

1. ONLY THOSE SERVICES VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND IF SHOWN AS '+ 89.67' ARE QUALITY LEVEL A AS DEFINED BY AS 5488-2013. LEVELS SHOWN ARE SURFACE LEVELS UNLESS NOTED OTHERWISE.
2. UNDERGROUND SERVICES HAVE BEEN PLOTTED FROM 'DIAL-BEFORE'YOU-DIG' PLANS AND ARE QUALITY LEVEL D AS DEFINED BY AS 5488-2013. ALL RELEVANT AUTHORITIES MUST BE CONTRACTED TO DETERMINE THE FULL EXTENT OF SERVICES PRIOR TO ANY PLANNING OR WORKS NEAR THE SITE.

LEGEND:-

VC denotes VEHICLE CROSSING
PC denotes PEDESTRIAN CROSSING
BK denotes BACK OF KERB
TK denotes TOP OF KERB
GUT denotes KERB GUTTER
LIP denotes LIP LINE
COM denotes COMMUNICATIONS PIT
CPIL denotes COMMUNICATIONS PILLAR
GAS denotes GAS MARKER/LID
PP denotes POWER POLE
LP denotes LIGHT POLE
ELP denotes ELECTRICITY PILLAR
HYD denotes HYDRANT
SV denotes STOP VALVE
SWP denotes STORMWATER PIT
SL denotes SURFACE LEVEL
IL denotes INVERT LEVEL
SMH denotes SEWER MANHOLE
SIP denotes SEWER INSPECTION PIT
TS denotes TRAFFIC SIGNAL
TSB denotes TRAFFIC SIGNAL BOX
TSP denotes TRAFFIC SIGNAL PIT
SS denotes STREET SIGN
US denotes UNCLASSIFIED SERVICE
TOW denotes TOP OF WALL
BOW denotes BOTTOM OF WALL
D:S:H denote DIAMETER, SPREAD and HEIGHT of TREE
SAP denotes SAPLING

MGA

SEE SHEET 1 FOR NOTES

ROWLAND PLACE
PARADE
SANDSTOCK CRESCENT
MATCHAM STREET
JORDAN
SPRINGS
BOULEVARD
MCGARRITYS

1008 DP 1149525
1007 DP 1149525
1072 DP 1149525
1067 DP 1149527
1071 DP 1149525
1068 DP 1149527
1070 DP 1149525
1069 DP 1149525
1057 DP 1149527
1056 DP 1149527
1055 DP 1149527
1054 DP 1149527
1053 DP 1149527
1052 DP 1149527
1051 DP 1149527
1049 DP 1153732
1048 DP 1153732
1047 DP 1153732
1046 DP 1153732
1045 DP 1153732
1044 DP 1153732
2 DP 1216994

BENCHMARK SSM 175299 RL41.87 A.H.D
BENCHMARK SSM 145203 RL41.50 A.H.D
BENCHMARK SSM 175299 RL42.71 A.H.D

2 4 6 8 10 20 30
1:300

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CLIENT: LENDLEASE

SCALE 1:300
ORIGIN OF LEVELS: SSM 80426 RL 47.288
DATUM: A.H.D.
REF.: 7202
DATE: 15/01/2018
SURV/CHK: SW/CT
SHEET 2 OF 10 SHEETS
PLAN A1
ISSUE C

DETAIL AND LEVEL SURVEY OF PART OF JORDAN SPRINGS BOULEVARD, LAKESIDE PARADE & JUBILEE DRIVE JORDAN SPRINGS

SDG LAND DEVELOPMENT SOLUTIONS
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Version: 1, Version Date: 13/07/2018

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2 4 6 8 10 20 30
1:300

SEE SHEET 1 FOR NOTES

SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

ROWLAND PLACE

TYLER STREET

MATCHAM STREET

JORDAN SPRINGS BOULEVARD

1072 DP 1149525
1071 DP 1149525
1080 DP 1149527
1039 DP 1153732
1040 DP 1153732
1041 DP 1153732
1042 DP 1153732
1043 DP 1153732
1044 DP 1153732
1045 DP 1153732
1046 DP 1153732
1047 DP 1153732
1120 DP 1172934

3391
DP 1190132
3.633 ha (Title)

BENCHMARK
SSM 175284
RL39.68 A.H.D

STORMWATER PIT Grate RL:41.51
STORMWATER PIT Grate RL:40.18 Invert RL:38.16 Pipe inaccessible
STORMWATER PIT Grate RL:39.95
STORMWATER PIT Grate RL:39.86
STORMWATER PIT Grate RL:39.36 Invert RL:37.77 Pipe inaccessible
STORMWATER PIT Grate RL:39.14 Invert RL:37.11 Pipe inaccessible
STORMWATER PIT Grate RL:39.13 Invert RL:37.01 Pipe inaccessible
STORMWATER PIT Grate RL:39.28 Invert RL:36.96 Pipe inaccessible
STORMWATER PIT Grate RL:38.79 Invert RL:36.59 Pipe inaccessible
STORMWATER PIT Grate RL:38.79 Invert RL:36.56 Pipe inaccessible
STORMWATER PIT Grate RL:38.40 Invert RL:36.35 Pipe inaccessible
STORMWATER PIT Grate RL:39.21 Invert RL:36.78 Pipe inaccessible
STORMWATER PIT Grate RL:40.77
STORMWATER PIT Grate RL:40.05
STORMWATER PIT Grate RL:41.26
STORMWATER PIT Grate RL:40.30
STORMWATER PIT Grate RL:39.71 Invert RL:37.36

UNABLE TO MEASURE

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DATUM: A.H.D.

REF.: 7202
DATE: 15/01/2018
SURV/CHK: SW/CT
SHEET 3 OF 10 SHEETS

PLAN A1
ISSUE C

DETAIL AND LEVEL SURVEY OF PART OF JORDAN SPRINGS BOULEVARD, LAKESIDE PARADE & JUBILEE DRIVE JORDAN SPRINGS

SDG LAND DEVELOPMENT SOLUTIONS
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SINGLE STOREY RENDERED SHOP FRONTS

SP 92763

FOUR STOREY RENDERED APARTMENT BLOCK

4
DP 1171575

LAKESIDE

PARADE

JORDAN SPRINGS BOULEVARD

20
DP 1195110

SINGLE STOREY RENDERED & BRICK SALES OFFICE

SINGLE STOREY RENDERED SHOP FRONTS

1120
DP 1172934

BENCHMARK
SSM 176577
RL38.30 A.H.D

STORMWATER PIT
Grate RL:38.72

STORMWATER PIT
Grate RL:38.77

STORMWATER PIT
Grate RL:38.44

STORMWATER PIT
Grate RL:38.42

STORMWATER PIT
Grate RL:38.11

STORMWATER PIT
Grate RL:38.04

STORMWATER PIT
Grate RL:37.98

STORMWATER PIT
Grate RL:38.16
Invert RL:36.30
Pipe Inaccessible

STORMWATER PIT
Grate RL:38.35
Invert RL:36.39
Pipe Inaccessible

STORMWATER PIT
Grate RL:37.94
Invert RL:36.16
Pipe Inaccessible

STORMWATER PIT
Grate RL:38.78
Invert RL:36.59
Pipe Inaccessible

STORMWATER PIT
Grate RL:38.40
Invert RL:36.35
Pipe Inaccessible

STORMWATER PIT
Grate RL:38.79
Invert RL:36.56
Pipe Inaccessible

SEE SHEET 1 FOR NOTES

SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

2 4 6 8 10 20 30
1:300

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SCALE 1:300
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SURV/CHK: SW/CT
SHEET 4 OF 10 SHEETS
PLAN A1
ISSUE C

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JORDAN SPRINGS

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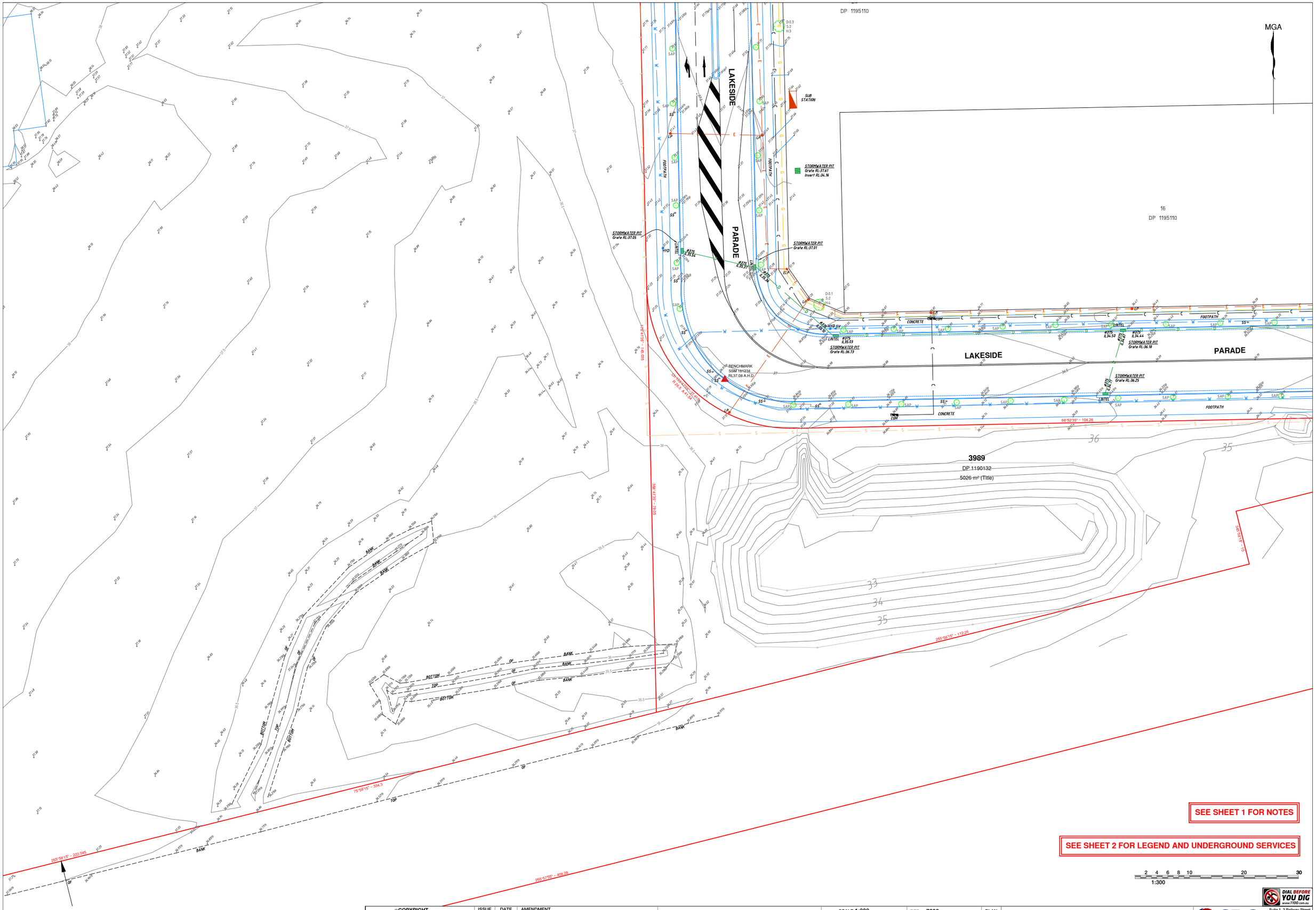

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REF.: 7202
DATE: 15/01/2018
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SHEET 5 OF 10 SHEETS

PLAN A1
ISSUE C

DETAIL AND LEVEL SURVEY OF PART OF
JORDAN SPRINGS BOULEVARD, LAKESIDE PARADE & JUBILEE DRIVE
JORDAN SPRINGS

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17
DP 1195110

20
DP 1195110

PARADE

LAKESIDE

JUBILEE

DRIVE

3992
DP 1190132
1.084 ha (Title)

4000
DP 1179646

4001
DP 1179646

4002
DP 1179646

2
DP 1216994

BENCHMARK
SSM 181233
RL35.41 A.H.D

BENCHMARK
SSM 181246
RL34.76 A.H.D

STORMWATER PIT
Grate RL:35.33

STORMWATER PIT
Grate RL:35.03

STORMWATER PIT
Grate RL:33.73

STORMWATER PIT
Grate RL:33.53

STORMWATER PIT
Grate RL:34.70

STORMWATER PIT
Grate RL:35.70

STORMWATER PIT
Grate RL:35.36

STORMWATER PIT
Grate RL:34.54

STORMWATER PIT
Grate RL:34.52

STORMWATER PIT
Grate RL:35.05

MGA

SEE SHEET 1 FOR NOTES

SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

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DETAIL AND LEVEL SURVEY OF PART OF
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JORDAN SPRINGS

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MGA

3990
DP 1190132
2.345 ha (Title)

3391
DP 1190132
3.633 ha (Title)

MGA

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85°14'10" – 120.385

Ch 100°33'20"–31.92
R 157.66 A 57.023

Ch 88°31'35"–35.945
R 157.66 A 36.025

335°10'20" – 33.94

Ch 196°21'40"–29.03
R 352 A 29.02

155°55'25" – 90.52

41°43'05" – 15.72

316°37'40"

319°37'50"

328°38'10"

337°36'30"

358°55'20" 11.29

184°43'10" 16.96

180°25'40" 11.15

184°43'10" 17.615

184°43'10" 22.444

LAKE

BITUMEN CARPARK

TOP

BOTTOM

TOE

DRAIN

SWALE

KERB

FOOTPATH

CONCRETE

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#1300 II 38.01

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SEE SHEET 2 FOR LEGEND AND UNDERGROUND SERVICES

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194°40'30"
17.115
160°24'40"
R 25.52 A 25.82
R 1.5 A 2.35
R 1.5 A 2.35
R 1.5 A 2.35



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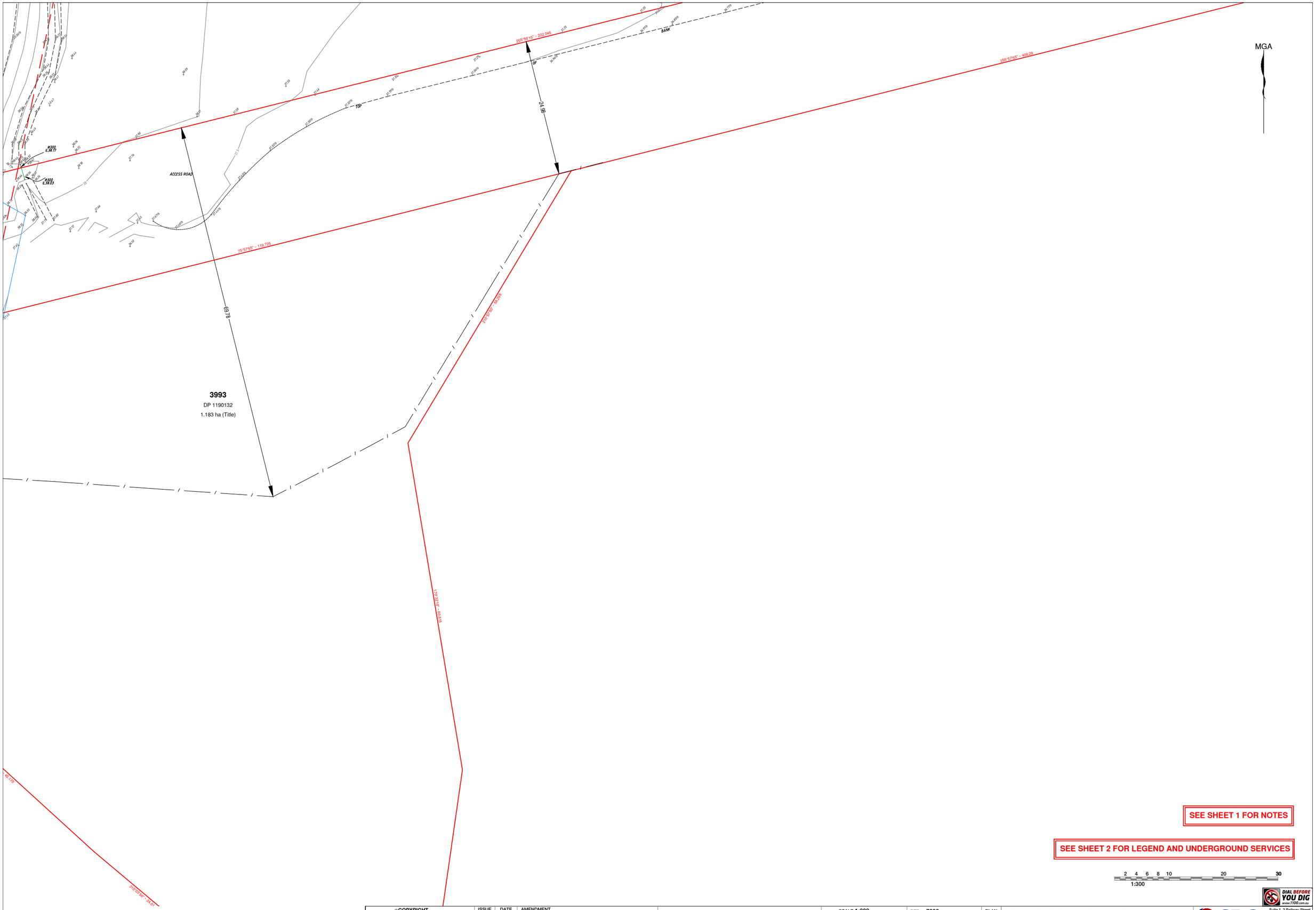

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JORDAN SPRINGS OLD DAM SAFETY ASSESSMENT

Report Number: DC15154

September 2015

Lend Lease

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JORDAN SPRINGS OLD DAM SAFETY ASSESSMENT

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Executive Summary

Jordan Springs is a new subdivision development being built by Lend Lease Pty Ltd at Penrith in Sydney's west. The development covers an area of approximately 220 ha and is located in the catchment of South Creek, which is a minor tributary of the Hawkesbury River.

An old earthen dam, named in this report as the Old Dam (and also known as Secret Garden Dam) is located on the southern edge of the development. The dam has a direct catchment area of approximately 45 ha and a full supply storage capacity of approximately 13.5 ML.

Future residential development is planned for land surrounding the dam, and an open channel extension is planned to link the dam with Jordan Springs Lake, located to the north-east, and South Creek beyond.

The NSW Office of Environment and Heritage (OEH) has requested Lend Lease Pty Ltd to address any issues with the existing dam before it can be included in a proposed Regional Park area that OEH will eventually control following completion of the subdivision development.

NSW Public Works has been engaged to investigate and provide suitable responses to the above issues. In order to fulfil adequately the NSW Dams Safety Committee (DSC) requirements and respond appropriately to OEH concerns, the following tasks have been undertaken by NSW Public Works as part of an overall dam safety assessment:

- Condition assessment of the existing dam,
- Flood and hydrology study,
- Assessment of the existing dam's flood handling capacity,
- Dambreak study incorporating downstream inundation mapping,
- Determination of the dam's Consequence Category based on Population at Risk (PAR) and Probable Loss of Life (PLL) studies,
- Geotechnical investigation of the existing embankment,
- Structural assessment of the existing embankment including stability analysis,
- Development of proposed feasible upgrade/remedial works.

Results of the flood and hydrology studies have been fed into a dambreak computer model and inundation maps have been produced. The dambreak study has incorporated Population at Risk (PAR) and Probable Loss of Life (PLL) assessments which have assigned the Consequence Category of the existing dam as VERY LOW for the Sunny Day and LOW for the Flood dambreak scenarios. Consequently, the dam is required to allow safe passage of the 1 in 1,000 year AEP flood in accordance with DSC guidelines.

Investigation of the existing dam shows the embankment to be in a good and stable condition for the most part except at the southern end where the embankment is damp and seepage and erosion are noticeable at a number of points. Stability analysis indicates that the southern portion of the embankment does not satisfy acceptable safety criteria and that significant upgrade works are required in that area.

A preferred upgrade option is presented which combines construction of a new spillway channel within the middle part of the embankment and a small raising of the existing dam crest. The spillway will be able to pass the required flood and discharge flows directly into the East West Open Drainage Channel downstream of the dam. The preferred upgrade option satisfies DSC and modern practice requirements.

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Appendix B – Geotechnical Investigation Report

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1. Introduction

Jordan Springs is a new subdivision development being built by Lend Lease Pty Ltd in Penrith, a suburb to the west of Sydney. The development covers an area of approximately 220 ha on the eastern side of The Northern Road, located between Dunheved Road to the south and Ninth Avenue to the north. **Figure 1.1** shows the location of the development.

The development is located in the catchment of South Creek, which is a minor tributary of the Hawkesbury River. South Creek flows in a northerly direction, approximately 1.7 km east of the development, before meeting the Hawkesbury River approximately 14 km north-east of the development

An old earthen dam, named in this report as the Old Dam (and also known as Secret Garden Dam) is located on the southern edge of the development as shown in **Figure 1.1**. The dam is located on an unnamed tributary of South Creek which flows to the south of the development and meets South Creek approximately 2 km east of the development. The dam has a direct catchment area of approximately 45 ha. An additional catchment area of approximately 10 ha, which would not ordinarily drain to the dam, has been directed into the dam via earthen bunds. The dam has a full supply storage capacity of approximately 13.5 ML.

Future residential development is planned for land surrounding the dam, and an open channel extension is planned to link the dam with Jordan Springs Lake, located to the north-east, and South Creek beyond. Once residential development is completed, the dam would provide an aesthetic recreational area for the residential precinct and would also act as a flood detention dam and conduit during periods of high rainfall.

The site is fenced, and public access is restricted. The area surrounding the dam is generally flat, and grades gently to the north-east. The site is mostly covered by long, grassy vegetation with some minor patches of dense vegetation; mature trees and shrubs are present across the site.

The NSW Office of Environment and Heritage (OEH) has requested Lend Lease Pty Ltd to address any issues with the existing dam before it can be included in a proposed Regional Park area that OEH will eventually control following completion of the subdivision development. This would need to include coordination with the NSW Dams Safety Committee (DSC) and to provide upgrade works in accordance with DSC guidelines.

In particular, OEH indicated the following key issues that needed to be addressed:

1. What is the current condition of the dam as it currently sits?
2. In the event that the dam breaches, what is the severity of the outcome?
3. With consideration of 1 and 2 above, what is the extent of any remedial works required so as to hand over the dam in what would be considered as 'reasonable' condition?

NSW Public Works has been engaged to investigate and provide suitable responses to the above issues. In order to fulfil adequately the DSC requirements and respond appropriately to OEH concerns, the following tasks have been undertaken by NSW Public Works as part of an overall dam safety assessment:

- Condition assessment of the existing dam,
- Flood and hydrology study,
- Assessment of the existing dam's flood handling capacity,
- Dambreak study incorporating downstream inundation mapping,
- Determination of the dam's Consequence Category based on Population at Risk (PAR) and Probable Loss of Life (PLL) studies,

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- Geotechnical investigation of the existing embankment,
- Structural assessment of the existing embankment including stability analysis,
- Development of proposed feasible upgrade/remedial works.

This report presents discussion and results of the above studies, makes appropriate comments regarding the overall safety of the dam structure and provides feasibility design of a preferred upgrade option which will satisfy DSC and modern practice requirements.

The Flood Hydrology and Dambreak reports are comprehensive and voluminous documents and have been issued separately. The Dambreak report includes downstream inundation maps. Both reports are also summarised in this report.

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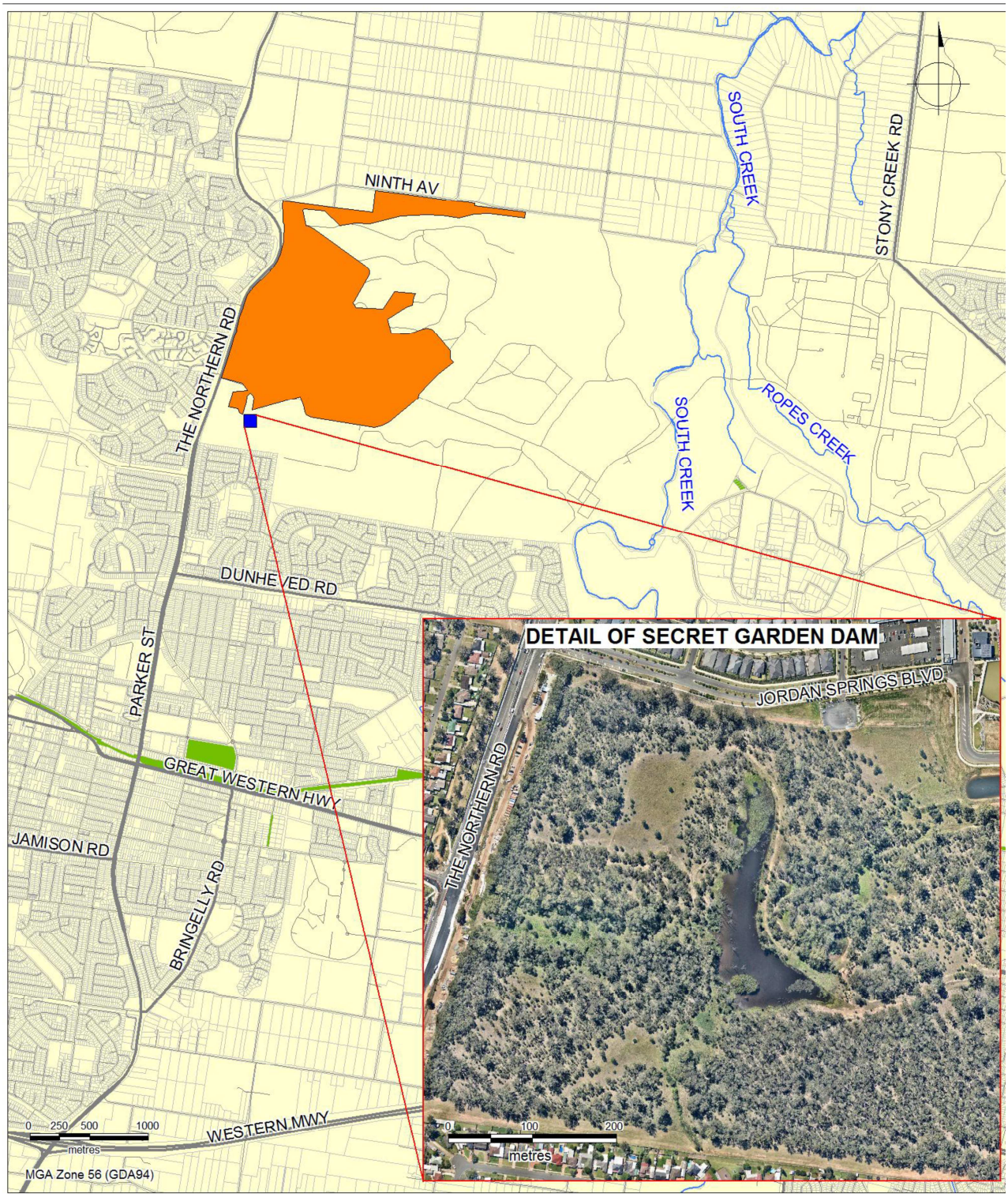

Figure 1.1: Location of Old (Secret Gardens) Dam and Jordan Springs Development

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2. Visual Condition Assessment

An inspection of the Old Dam was undertaken on 15th April 2015 by officers from NSW Public Works in company with Lend Lease project personnel.

Generally the dam embankment was found to be in good condition and batters were stable, particularly at the northern end and central areas.. The crest was wide enough for vehicle access. Slopes and surrounding areas were covered with dense vegetation. The embankment surface was dry for most of its length.

Wet patches on the embankment were noticed on the southern end of the embankment and downstream slope and seepage was ponding at the toe. It was assessed that the seepage had emanated from that part of the earth embankment which may not have been as well compacted as the remaining structure. Erosion of the downstream face of the embankment at the southern end was evident at a number of points.

Photos of the existing dam are attached at **Appendix A**.

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3. Flood and Hydrology

3.1 Background

WRM Water & Environment Pty Ltd (WRM) was engaged by NSW Public Works to estimate inflows into the dam, as well as residual discharges at several locations downstream of the dam, for the 1 in 10,000 Annual Exceedance Probability (AEP), 1 in 100,000 AEP and Probable Maximum Flood (PMF) events. Details are provided in WRM's report titled **"Extreme Flood Discharge Estimation for Old Earthen Dam, Jordan Springs, Penrith"** (Report No. 1109-01-B1) issued in June 2015.

A summary of WRM's report is provided below.

The scope of works for this flood and hydrology study comprised:

- Collection, collation and review of available data and information on the existing dam, including dam spillway configuration and stage-surface area-storage data;
- Development of a rating curve for the existing dam spillway discharges;
- Development and validation of an XP-RAFTS model of the existing dam and surrounding Jordan Springs development; and
- Estimation of the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF hydrographs at the dam site and at nominated locations downstream of the dam.

LiDAR data covering the full extent of the Jordan Springs development catchment area was obtained from the Land and Property Information (LPI) division of the NSW Department of Finance, Services & Innovation. The LiDAR data set was date stamped 6 April 2011, and was reported to have horizontal and vertical accuracies of 0.8 m and 0.3 m respectively.

In addition, the following data was provided by Lend Lease:

- Detailed survey & bathymetry of the dam; and
- Development plans showing proposed and constructed stormwater management infrastructure for the overall Jordan Springs development.

Aerial photography covering the study area was also downloaded from the nearmap PhotoMaps portal (nearmap, 2015).

3.2 Model Configuration

An XP-RAFTS (XP Software, 2013) model of the Jordan Springs study area was developed to estimate the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF hydrographs. The model was initially configured to represent the entire catchment as undeveloped so as to allow validation against Rational Method estimates of peak discharge for the 1% AEP event. Model parameters were then modified to reflect existing development, including the completed Jordan Springs development. The developed case model was then used to estimate the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF design hydrographs.

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The existing dam and detention basins in the Jordan Springs development were represented in the XP-RAFTS model using storage nodes. The stage-surface area-storage relationship for the dam was determined from the detailed survey and bathymetric data supplied. The adopted stage-storage relationship is shown in **Table 3.1**.

Table 3-1: Dam Stage/Storage Relationship

Stage (m AHD)	Storage Volume (cu m)
37.20	0
37.50	23
38.00	962
38.50	3,089
39.00	6,682
39.45 Full Supply Level	13,372
39.95	25,191
40.45	44,028

The spillway discharge rating curve was determined using the HEC-RAS model (USACE, 2010) of the dam crest developed from detailed survey data. The stage-discharge rating curve calculated using HEC-RAS and adopted in the XP-RAFTS model is shown in **Table 3.2.**

Table 3-2: Spillway Stage/Discharge Relationship

Stage (m AHD)	Discharge (cu m/sec)
39.45 Full Supply Level	0.00
39.55	3.26
39.65	8.56
39.75	20.90
39.85	42.58
39.95	74.86
40.05	116.07
40.15	165.17
40.25	222.56
40.35	287.34
40.45	359.60

3.3 Design Rainfall

Estimates of design rainfall depths for a range of storm durations were required for the 1 in 10,000 AEP, 1 in 100,000 AEP and Probable Maximum Precipitation (PMP) design events. PMP depths were estimated using the methodology provided by the Commonwealth Bureau of Meteorology (BoM) (BoM, 2003). Rainfall depths for the 1 in 10,000 AEP and 1 in 100,000 AEP events were derived using the interpolation methodology provided in Australian Rainfall & Runoff

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(AR&R) (Pilgrim, 1998). Preliminary XP-RAFTS model runs indicated that critical storm durations for the modelled catchment did not exceed 2 hours and so design rainfall depths were calculated for durations up to 6 hours only.

Estimates of the 1 in 10,000 AEP and 1 in 100,000 AEP design rainfall depths were made using AR&R (Pilgrim, 1998). **Table 3.3** shows the adopted rainfall depths for all design events for durations between 15 minutes and 6 hours.

Table 3-3: Adopted Design Rainfall Depths for Durations Between 0.25 and 6 Hours

Duration (hrs)	1 in 10,000 AEP Rainfall Depth (mm)	1 in 100,000 AEP Rainfall Depth (mm)	PMP Rainfall Depth (mm)
0.25	69	92	161
0.5	97	131	234
0.75	118	161	295
1	134	185	343
1.5	161	224	442
2	181	255	517
2.5	198	281	571
3	217	307	626
4	238	339	716
5	258	368	789
6	277	395	834

3.4 Design Flood Estimation

The XP-RAFTS model was run with the adopted design rainfall depths to estimate design flood discharges for the 1 in 10,000 AEP, 1 in 100,000 AEP and Probable Maximum Flood (PMF) events. For a conservative result, it was assumed in the XP-RAFTS model that the Old (Secret Gardens) Dam and the two Jordan Springs development detention basins were full at the commencement of all events.

Table 3.4 shows the design discharge outflows from the Old Dam for the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF events respectively for the critical storm duration.

Table 3-4: Peak Discharges and Critical Storm Durations

Location	1 in 10,000 AEP		1 in 100,000 AEP		PMF	
	Peak Discharge (cu m/sec)	Critical Duration (hrs)	Peak Discharge (cu m/sec)	Critical Duration (hrs)	Peak Discharge (cu m/sec)	Critical Duration (hrs)
At Dam	25.1	0.5	35.6	0.5	70.8	0.5

Estimates of peak water level in the dam are 39.82 m AHD, 39.87 m AHD and 40.00 m AHD for the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF events respectively

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4. Dambreak

4.1 General

As part of the overall safety assessment of the Jordan Springs Old Dam, a Dambreak and Potential Loss of Life (PLL) Study was carried out. Details of the study, including inundation maps, are presented in the NSW Public Works report titled **"Jordan Springs Old Dam Dambreak and Potential Loss of Life Study"** (Report No. DC15146) issued in August 2015.

A summary the report is provided below.

In the Dambreak study, the following flood scenarios were examined:

1. Sunny Day Dambreak (SDDB;
2. Probable Maximum Flood (PMF); and
3. PMF dambreak (PMFDB) event.

The main objective of this study was to determine the existing Sunny Day and Flood Consequence Categories for Jordan Springs Old Dam. These Consequence Categories would allow the Maximum Design Earthquake (MDE) and the Acceptable Flood Capacity (AFC) to be established for the dam.

Table 4-1 summarises the existing properties of Jordan Springs Old Dam.

Table 4-1: Jordan Springs Old Dam Data

Ownership	Lend Lease
Dam Type	Earth Embankment
Catchment Area	45 ha (naturally draining into storage) 10 ha (artificially directed into storage)
Storage Capacity	Approx. 13.5 ML
Full Supply Level (FSL)	RL 39.45 m AHD
Dam Crest Level (DCL)	From RL 40.00 m AHD (left abutment) to RL 39.45 m AHD (right abutment)
Dam Height	Approx. 2.30 m to FSL
Available Freeboard	0.00 m
Crest Length	Approx. 300 m (estimated from aerial photography)
Spillway Type	None
Spillway Crest Level	Overtops embankment at FSL = RL 39.45 m AHD
Return Period of Dam Crest Flood Event (DCF)	Cannot be established Any flood inflows on top of the FSL would overtop the embankment
Return Period of Probable Maximum Flood Event (PMF)	1 in 10 million AEP

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Jordan Springs Old Dam's flood and dambreak computer hydraulic modelling was simulated by the MIKEFLOOD 2D hydrodynamic software. Maximum flood inundation maps were produced for each of the above dambreak scenarios.

The dam's flood hydrology study, which produced the dam's and downstream concurrent flooding inflow hydrographs, was carried out by WRM (refer Section 3 of this report) and its results were inserted as inputs to the MIKEFLOOD models.

Subsequently with the hydraulic modelling results and high resolution aerial photography from NearMap, the Population At Risk (PAR) and PLL analyses were carried out in accordance with Graham's and Hill et al's Method.

PAR is the population downstream of the dam that would be flood-affected by the potential floodwaters. PLL is the estimated number of potential fatalities within the PAR.

In addition to the conventional incremental PAR / PLL estimates, the Base Safety Condition (BSC) Dambreak estimates were also calculated in accordance with ANCOLD (2000 and 2003). The BSC counts all flood-affected properties within the *Dambreak Affected Zone*, the flood region where incremental flood depths are equal to greater than 300 mm.

LiDAR data covering the modelling area of interest was obtained from the Lands and Property Information (LPI). The obtained data was in 1 m grid resolution and date stamped 6th April 2011 with horizontal and vertical accuracies of 0.8 m and 0.3 m respectively. This LiDAR dataset was processed into a Digital Elevation Model (DEM) and used as the modelling base of the MIKEFLOOD models.

4.2 Downstream Areas

Uncontrolled dam overflows from Jordan Springs Old Dam are to be released into an artificial stormwater channel, named the East to West Open Channel, which drains stormwaters from the new Jordan Springs subdivision development east into densely forested areas of Wianamatta Regional Park. This channel runs along the southern perimeter of the subdivision development, south of Lakeside Parade.

4.3 Flood Routing

The PMF dam inflow hydrographs were routed through the MIKE11 dam routing model to examine which PMP duration would produce the highest flood elevation in the dam storage, i.e. known as the critical duration. **Table 4.2** presents the dam flood routing results.

Table 4-2: Jordan Springs Old Dam PMF Routing Results

PMP Duration (hours)	Peak Dam Inflow (cu m/sec)	Peak. Flood Elevation in Dam (m AHD)	Peak Overtopping Height* (m)
0.25	69.29	39.99	0.49
0.5	***70.84***	***40.00***	***0.50***
1	64.76	39.99	0.49
1.5	61.08	39.97	0.47
2	56.10	39.96	0.46

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2.5	50.55	39.94	0.44
3	46.71	39.93	0.43
4	40.09	39.90	0.40
5	35.67	39.88	0.38
6	32.33	39.87	0.37

* Lowest Dam Crest Level = FSL = RL 39.45 m AHD.

As a result of the dam routing exercise, the 0.5 hour PMP was found to be the critical duration, producing a maximum peak flood elevation of RL 40.00 m AHD. It is noted that at this flood elevation, the embankment overtopping was found to be bounded within the dam abutments. No spillages of floodwaters released around the left and right abutments were modelled as the abutments rise to high grounds above RL 41.00 m AHD. .

Subsequently, the 0.5 hour PMF inflow hydrographs of the downstream concurrent flood outlet locations were selected for use in the MIKEFLOOD model for consistency.

Since the dam currently does not have a formal spillway and that any flood inflows on top of the FSL would overtop the embankment, a Dam Crest Flood (DCF) event could not be established.

4.4 Population at Risk (PAR)

For each modelled flood event, the number of flood-affected properties was estimated with the generated respective maximum inundation maps by initially counting all the properties situated within the maximum flood inundation envelope. These numbers were later used for the calculation of the *Total Dambreak*, *No Dambreak* and *Incremental* PAR estimates assessed to be flood-affected.

For residential dwellings, the *non-itinerant* PAR estimates were carried out by multiplying the total number of identified properties assessed to be flood-affected (i.e. modelled flood depth > 0 m from the assumed floor levels) by the average people per household of 3.4, obtained from latest available 2011 census data for Llandilo (which encompasses the area of Jordan Springs) from the Australian Bureau of Statistics.

There were no *other non-itinerant* properties (e.g. schools, hospitals, clubs, commercial and industrial premises etc.) identified with the study area.

As previously discussed, itinerants were not assessed for this study as it was considered their impact (increase in exposed PAR) would not be sufficient to increase the dam's Consequence Categories to the next level. This is also supported by the fact that no major roadways with heavy traffic densities run through the potential floodplain of the Jordan Springs subdivision development.

The following tables summarise the PAR findings.

Table 4-2: Flood-Affected Properties Estimates

Event	Sunny Day	PMF
Total Dambreak#	0	20
No Dambreak*		20
Incremental^		0
BSC Dambreak		0

^ = # minus *

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Table 4-3: PAR Estimates

Event	Sunny Day	PMF
Total Dambreak#	0	68
No Dambreak*		68
Incremental^		0
BSC Dambreak		0

^ = # minus *

4.5 Probable Loss of Life (PLL)

The PLL assessments were examined using two methods, which are consistent with the PAR assessments:

1. Conventional *Incremental* PLL assessment based on above DSC definition – where all flood-affected properties in the study reach are included in the count and the difference between *Total Dambreak* PLL and *No Dambreak* PLL represents the *Incremental* PLL.
2. Base Safety Condition (BSC) Dambreak PLL assessment – where only the flood-affected houses within the defined *Dambreak Affected Zone* or which are individually subject to incremental flood depths of 300 mm or greater, are included in the count.

Calculating PLL for all houses within the whole model domain (i.e. disregarding the *Dambreak Affected Zone*) via the Graham's Method (1999) is likely to significantly overestimate the PLL due to dambreak. This is because a large proportion of the flood affected residences would include:

- Houses that are affected by flooding resembling natural flooding, but with PLL calculated with dambreak fatality rates;
- Houses that are subject to extensive natural flooding but not significantly affected by dambreak flooding (incremental flood depth < 300 mm).

The BSC approach is considered most appropriate for determining the Flood Consequence Category (FCC). This method is consistent with the ANCOLD Guidelines and the approach by other authorities such as USBR and FERC in the United States. It also provides a means of allowing for the effects of dambreak flood attenuation and the contribution of natural antecedent flooding downstream of the dam.

The BSC Dambreak PLL was therefore calculated based on houses that are affected by dambreak floodwaters equal to and greater than 300 mm above non-dambreak floodwater levels.

The following table summarise the final PLL estimates.

Table 4-5: PLL Estimates

Event	Sunny Day	PMF
Total Dambreak#	0	0.57
No Dambreak*		0.01
Incremental^		0.55
BSC Dambreak		0

^ = # minus *

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5. Consequence Category

5.1 Sunny Day Consequence Category (SDCC)

The Sunny Day Consequence Category (SDCC) is based upon the adverse consequences that would result from failure of a dam, at a time when flows through the dam spillway or in the stream on which the dam is situated, are “normal”. In this case all of the adverse consequences that result in the downstream inundation area can be ascribed to the failure of the dam.

The cause of dam failure could be attributed to factors such as slope instability, internal erosion, sliding due to seismic loading or, foundation or embankment liquefaction due to seismic loading.

The SDCC identifies the design earthquake (i.e. the Maximum Design Earthquake (MDE), measured in terms of Annual Exceedance Probabilities (AEP)) in which the dam wall is to cater for.

The DSC guidance sheet DSC3A was used to determine the SDCC for Jordan Springs Old Dam, based on the Sunny Day Dambreak PLL estimate. **Table 5-** below summarises the findings.

Table 5-1: SDCC Summary

Dambreak Event	Total PLL	Max. Level of Severity of Damages and Losses	SDCC
Sunny Day	0	Minor	VERY LOW

5.2 Maximum Design Earthquake (MDE)

According to DSC guidance sheet DSC3C, dams with a VERY LOW SDCC have no MDE requirements.

5.3 Flood Consequence Category (FCC)

The Flood Consequence Category (FCC) is based upon the “worst case” consequences that result from failure of a dam during a flood. The consequences to be taken into account are similar to those for the SDCC case but include consideration of the dambreak wave front effect on the areas inundated before failure, as well as the additional areas of the inundation after failure

Typically, the FCC is determined by examining the difference in consequences between flooding due to the flood without dam failure and the flooding after dam failure for floods up to PMF. The incremental consequences are those directly attributable to the dam failure and therefore represent the total adverse consequences resulting from dambreak.

The FCC identifies the design storm i.e. the Acceptable Flood Capacity (AFC), measured in terms of Annual Exceedance Probabilities (AEP)) in which the dam wall and its associated hydraulic structures are to cater for.

DSC guidance sheet DSC3A was used to determine the FCC for Jordan Springs Old Dam, based on the PMF calculated relevant PLL estimates. **Table 5-.2** below summarises the findings.

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Table 5-2: FCC Summary

Dambreak Event	PLL	Max. Level of Severity of Damages and Losses	FCC
PMF	Incremental = 0.55	Medium	SIGNIFICANT
	BSC = 0		LOW

5.4 Acceptable Flood Capacity (AFC)

According to DSC guidance sheet DSC3B, dams with a LOW FCC are required to cater for flood events from 1 in 100 AEP to 1 in 1,000 AEP, with no minimum freeboard requirements. Dams with a SIGINIFICANT FCC are required to cater for the 1 in 10,000 AEP flood event, with a minimum freeboard of 0.30 m.

5.5 Dam Related Assessments

With the assigned Consequence Categories, the Maximum Design Earthquake (MDE) and Acceptable Flood capacity (AFC) of the dam were determined in accordance with DSC guidance sheets DSC3C and DSC3B respectively. Refer to the summary in **Table 5.3** below.

Table 5-3: Assessed Dam Capacities

Consequence Category	Design Event Capacity	Other Requirements
SDCC = VERY LOW	MDE = No requirements	---
FCC = LOW	AFC = 1 in 100 AEP to 1 in 1,000 AEP	No freeboard requirement

Due to Jordan Springs Old Dam's overall LOW Consequence Category, it is considered adequate for the dam to cater for the 1 in 1,000 AEP event with no freeboard allowance. It is recommended, therefore, to construct a formal spillway for the dam to safely pass this design flood event without overtopping the earthen dam crest.

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6. Geotechnical Investigation

6.1 Background

NSW Public Works conducted a reconnaissance geotechnical investigation to investigate the embankment soil properties and condition in the existing earthen embankment. Field investigations were undertaken on the 5th May 2015 and included push tube boreholes, soil samples and laboratory soil tests. The boreholes were positioned, sampled and logged. A copy of the geotechnical investigation report is attached at **Appendix B**. A summary is provided below.

The dam site is fenced, and public access is restricted. The area surrounding the dam is generally flat, and grades gently to the north-east. The site is mostly covered by long, grassy vegetation with some minor patches of dense vegetation; mature trees and shrubs are present across the site.

6.2 Regional Geology

The Penrith 1:100,000 Geological Series Sheet 9130 (Edition 1 - 1991) shows the site to be underlain by Bringelly Shale of the Wianamatta Group, which is Triassic in age. The formation comprises shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff.

The field investigations revealed that the subsurface profile in the area of investigation adjacent to the dam embankment generally comprises a layer of silty clay fill, underlain by clayey soil above weathered shale and claystone.

6.3 Summary of Results

Embankment

The investigation boreholes were drilled in two general areas (refer **Figure 6.1** below): B1 to B4 in the southern and central higher portion of the embankment and B5 and B6 in the lower northern portion.

The embankment fill comprised an upper horizon of silty clay ‘topsoil’ underlain by plastic silty clay. Typically, the profile comprised:

0 – 0.20 m SILTY CLAY (CI/CH); with grass, light brown, light grey-brown, or red-brown.

0.2 – 0.70/2.40 m SILTY CLAY (CH/CL); with some gravel, orange-brown, red-brown, brown and dark brown, gravel comprises ironstone pebbles and small shale fragments.

It is interpreted that the embankment was formed from clay soils won from the storage area. These soils would have included ironstone pebbles, and deeper areas of excavation would have encountered the weathered shale encountered in portions of the fill. Beneath the surficial horizon the fill, laboratory Atterberg Limits indicated a mixture of clays of high plasticity and low plasticity.

Compaction of the embankment was investigated by SPT’s. Apart from in a wet area of the main embankment area, SPT results varied between N = 6 and N = 10 (average N = 8), indicating a medium stiff/stiff, moist cohesive soil. In boreholes B2 and B3 in the main embankment area, the SPT tube fell under the hammer weight (N = 0) in wet cohesive soil, indicating very soft conditions. Moisture and density test results show high moisture content and low dry density in B2 (1.00 – 1.40 m).

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The drilling investigation was undertaken after a period of wet weather and the embankment crest was boggy in the southern, higher portion of the embankment. This area is consistently wet and damp, even during dry periods, particularly between boreholes B2 and B3. There is also a seepage pond at the toe of the embankment

Representative conservative parameters for the materials in the embankment at Jordan Springs would be c' = 0 kPa and Ø' = 22°; however, localized wet soils would be expected to have lower strength parameters of c' = 0 kPa and Ø' = 17°.

Emerson Crumb tests indicate that the embankment fill soils do not exhibit dispersive character.

Foundation

All boreholes encountered embankment fill overlying mottled silty clay soils. Topsoil is interpreted to have been stripped from the foundation prior to placement of the embankment. Typically, the foundation soil profile comprised:

0.70/2.40 – 3.7/4.8 m CLAY with silt and trace gravel (CH/CL): light grey and red-brown mottled

3.7/4.8 – 4.8/4.95 m CLAY/EW SHALE: rock fragments, light grey, dark grey with red-brown and brown mottles.

The foundation soil has not been tested in the laboratory. The embankment was constructed with the foundation soil and extremely weathered shale and these are interpreted to have similar properties to the embankment materials; however, unlike the embankment, the foundation follows a grading from silty clay (CH) soil into clayey soil with extremely weathered shale with depth.

Apart from in a wet area of the main embankment area, SPT results within the foundation soil varied from N = 11 to N = R (average N = 18), indicating moist, cohesive soil of very stiff consistency. In boreholes B2 and B3 in the main embankment area, SPT results of N = 3 were recorded at the top of the foundation profile, indicating a soft, wet cohesive soil.

Representative conservative parameters for the clay soil in the foundation at Jordan Springs would be c' = 0 kPa and Ø' = 25°, with strength increasing with depth; however, localized wet soils would be expected to have lower strength parameters of c' = 0 kPa and Ø' = 20°.

Seepage

There is a seepage area in the higher portion of the embankment at the southern end of the dam, as defined by the vegetation on the downstream face and ponded water adjacent to the embankment toe (see **Figure 6.1**).

This area is interpreted to act as the current spillway for the dam. However, there is also seepage through the embankment and upper foundation soils in this area, as evidenced by the SPT's N = 0 in the embankment and N = 3 in the foundation in boreholes B2 and B3.

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Figure 6.1 Jordan Springs Old Dam and Location of Investigation Holes

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7. Stability

7.1 General

Stability analysis of the existing dam embankment was carried out for the steady state condition, ie when the water level in the dam has reached the crest while the area downstream is dry.

Having no outlet system, there was no need to analyse for the rapid drawdown condition. Being a LOW Consequence Category dam, stability analysis under earthquake conditions was also not required (in accordance with DSC guidelines).

Parameters for the analysis have been obtained from the geotechnical investigation (refer to Section 6 of this report). The parameters have been adjusted appropriately to provide the most critical condition and to assess the sensitivity of the results.

Computer analysis has included the use of the SLOPEW program for the calculation of stability factor of safety.

7.2 Analysis and Results

Stability analysis for the steady state condition was undertaken at two cross sections of the embankment considered the most critical. One section is at borehole B3 which is near the southern end of the embankment and the other section is at borehole B6 which is closer to the northern end of the embankment. The parameters have been adjusted to assess the sensitivity of the results. An overview is presented in **Table 7.1** below. Partial saturation of the embankment section is assumed.

Table 7-1: Steady State (Water at Dam Crest Level)

Location of Failure	Embankment Parameters	Foundation Parameters	Factor of Safety
Downstream Face at B3	c' = 0 kPa and Ø' = 17°	c' = 0 kPa and Ø' = 20°	1.06
Downstream Face at B3	c' = 0 kPa and Ø' = 22°	c' = 0 kPa and Ø' = 25°	1.40
Downstream Face at B6	c' = 0 kPa and Ø' = 17°	c' = 0 kPa and Ø' = 25°	1.51
Downstream Face at B6	c' = 0 kPa and Ø' = 22°	c' = 0 kPa and Ø' = 25°	1.68

As can be seen in Error! Reference source not found.**1**, the embankment stability analysis has shown the northern end of the existing embankment to satisfy the minimum accepted factor of safety of 1.5 for the steady state full water level condition. However, the southern end does not satisfy the acceptable criteria, which is expected, and is reflective of that portion of the embankment which remains constantly wet and contains a varied cross section and significant erosion at several points.

Reconstruction of the southern end of the embankment with acceptable factors of safety for stability is recommended.

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8. Dam Upgrade

8.1 General

Feasible upgrade options have been developed in order to provide a dam that satisfies DSC requirements as well as current dam practice. The options have been based on available survey, on site inspection and on the investigation studies carried out and discussed in previous sections of this report.

As mentioned, the Consequence Category of the dam has been assessed as LOW. This means that dam is required to pass safely the 1 in 1,000 year AEP flood. Based on the flood and hydrology studies, and extrapolating the flood frequency curve, the 1 in 1,000 year AEP outflow flood has been determined to be 18 cumecs.

It is recommended, therefore, to construct a formal spillway for the dam to safely pass this design flood event.

8.2 Preferred Upgrade Option

The preferred upgrade option is illustrated in **Drawings 01 and 02** attached. Essentially it comprises a spillway channel in combination with an upgraded and slightly raised earth embankment which would provide the appropriate flood security against a 1 in 1,000 year AEP flood event.

Based on assessment of design options, a spillway width of 28 metres has been adopted and, using a coefficient of discharge of 1.7, water depth has been estimated – and hence spillway depth.

For comparison purposes, the following **Table 8.1** summarises the preferred upgrade features for the dam while passing **both the 1 in 1,000 year AEP and the 1 in 100 year AEP flood events**.

Although not required by the DSC, a freeboard of 0.3m has been allowed initially on top of the water depth for the 1 in 100 year AEP flood event as a general contingency in order to ensure flood waves do not overtop the embankment crest and that flood security is improved, particularly since there is a likelihood of further development downstream of the dam in the future

Table 8-1: Preferred Dam Upgrade Option

Structure	1 in 1,000 year AEP	1 in 100 year AEP
Full Supply (Spillway Floor) Level	39.45 m AHD	39.45m AHD
Spillway Width (at Base)	28 m	28.0 m
Spillway Channel Side Slopes	1v to 6h	1v to 6h
Water Depth for Q(1,000) = 18 cumecs	0.52 m	
Water Depth for Q (100) = 11 cumecs		0.40 m
Freeboard	0.18 m	0.3 m
Embankment Crest Level	40.15 m AHD	40.15 m AHD
Embankment Crest Width	4 m (minimum)	4 m (minimum)
Embankment Downstream Slope	1v to 3h	1v to 3h

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The spillway channel will transition into a separately provided downstream stormwater channel, named the East to West Open Channel.

Figure 8.1 below shows the location of the downstream drainage channel relative to the Old Dam.



Figure 8.1: Plan of Old Dam and Downstream Drainage Channel

To allow passage of vehicles, the embankment crest will be paved with gravel while the spillway channel will be concrete lined. The downstream slope and toe of the spillway channel will also be concrete lined to prevent erosion of the embankment during spillway flows. Energy dissipation will be provided at the toe of the spillway channel.

This transition area between the spillway downstream slope and the stormwater channel will be lined with rockfilled mattressing.

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JORDAN SPRINGS
OLD DAM SAFETY ASSESSMENT
DAM UPGRADE SITE PLAN

PROJECT/CONTRACT No.	123-456
SCALE @ A1	A1 — 1:750
DRAWING No.	- 01
REV	0

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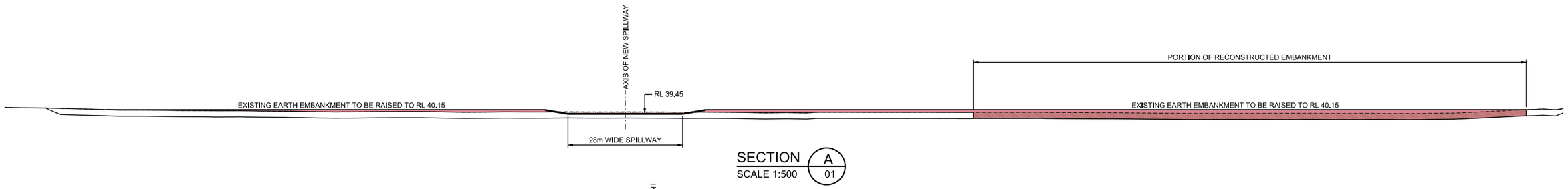

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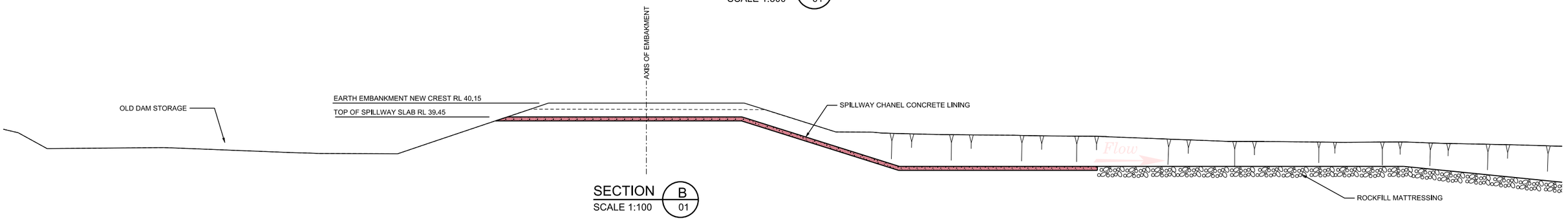

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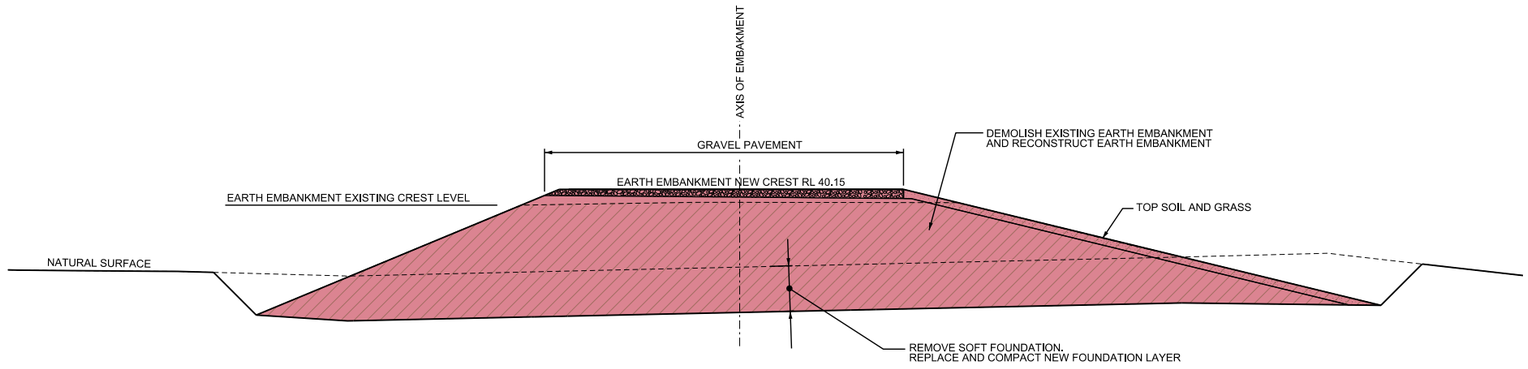

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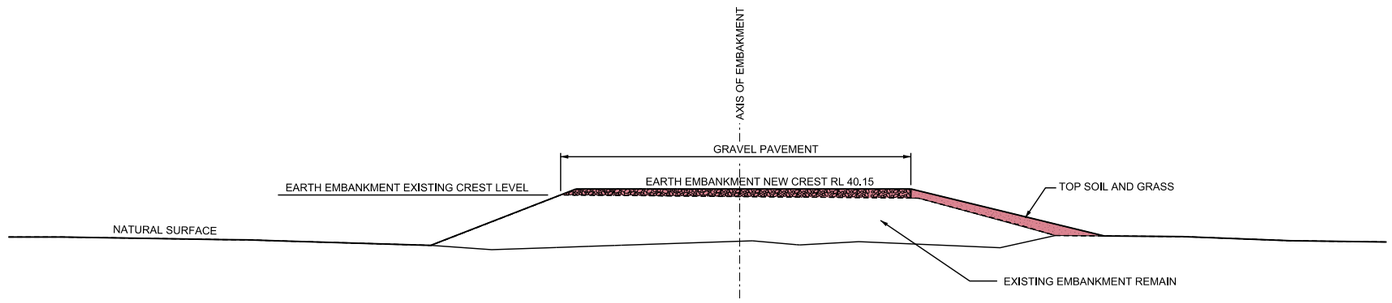

SECTION D
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JORDAN SPRINGS
OLD DAM SAFETY ASSESSMENT
DAM UPGRADE SECTIONS

PROJECT/CONTRACT No. 123-456
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DRAWING No. - 02
REV 0

CONFIRM SCALE — 100mm ON A1 ORIGINAL

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References

1. WRM Water & Environment Pty Ltd (WRM), “Extreme Flood Discharge Estimation for Old Earthen Dam, Jordan Springs, Penrith” (Report No. 1109-01-B1) issued June 2015.

2. NSW Public Works NSW Public Works report titled “Jordan Springs Old Dam Dambreak and Potential Loss of Life Study” (Report No. DC15146) issued in August 2015.

3. USBR “Design of Small Dams”

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Appendices

Appendix A – Photos of the Existing Dam

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Photo 1: Looking into storage from crest of northern end of embankment



Photo 2: Crest and downstream slope near northern end of embankment

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Photo 3: Embankment crest approximately at centre of dam embankment



Photo 4: Embankment crest dry

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Photo 5: Upstream side approximately at centre of embankment



Photo 6: Erosion and seepage near southern end of embankment

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Photo 7: Erosion and seepage near southern end of embankment



Photo 8: Further erosion point at southern end

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Photo 9: Embankment downstream slope at southern end



Photo 10: Embankment downstream slope at southern end

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Photo 11: Seepage ponding downstream of southern end of dam



Photo 12: Embankment from southern end

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Photo 13: Dry downstream slope away from southern end



Photo 14: Old monitoring well

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Appendix B – Geotechnical Investigation Report

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M E M O R A N D U M

TO	George Samios A. Principal Engineer, Dams & Civil Technologies	CC	
FROM	Michael Neville Senior Engineering Geologist, Specialist Services	DATE	1st June 2015
SUBJECT	JORDAN SPRINGS OLD DAM: RECONNAISSANSE GEOTECHNICAL INVESTIGATION g/watertec/geotech/projects/Jordan Springs/GS83A_S1		

1 INTRODUCTION

This memo report presents the data obtained from a reconnaissance geotechnical investigation made on the 5th May 2015 of an existing earthen dam at Jordan Springs, near Penrith, NSW. At the request of Dams and Civil Section, NSW Public Works, the Specialist Services Unit conducted a reconnaissance geotechnical investigation to investigate the embankment soil properties and condition in the existing earthen embankment. The investigation at the Old Jordan Springs Dam is in association with work being undertaken by Dams and Civil Section to assess the safety of the dam.

Accepted engineering geological terminology is used in this report. The methods used in this report to describe the subsurface profiles, and visual classification of material types encountered at discrete borehole locations are in accordance with AS1726 – 1993 Geotechnical Site Investigation. The definitions of terminology used are presented in **Appendix A**.

It should be noted that this report is based on interpolation of data from discrete boreholes and may not represent actual conditions between them.

2 LOCATION AND SITE CONDITIONS

Jordan Springs Old Dam is located on undeveloped land owned by Lend Lease P/L, and is within the proposed Jordan Springs residential development area. The dam is located in the suburb of Jordan Springs, approximately 50 km north-west of the Sydney CBD. Access to the site is via Jordan Springs Boulevard, off the Northern Road. A location plan of the site is shown in **Figure 1**.

Future residential development is planned for land surrounding the dam, and an open channel extension is planned to link the dam with Jordan Springs Lake, located to the north-east. Once residential development is completed, the dam would provide an aesthetic recreational area for the residential precinct, and also to act as a flood detention dam and conduit during periods of high rainfall.

The site is fenced, and public access is restricted. The area surrounding the dam is generally flat, and grades gently to the north-east. The site is mostly covered by long, grassy vegetation with some minor patches of dense vegetation; mature trees and shrubs are present across the site. Fieldwork took place after a protracted period of heavy rainfall, and the site was extremely wet water-logged ground.

3 REGIONAL GEOLOGY

The Penrith 1:100,000 Geological Series Sheet 9130 (Edition 1 - 1991) shows the site to be underlain by Bringelly Shale of the Wianamatta Group, which is Triassic in age. The formation comprises shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff.

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The field investigation revealed that the subsurface profile in the area of investigation adjacent to the dam embankment generally comprises a layer of silty clay fill, underlain by clayey soil above weathered shale and claystone.

4 SUMMARY OF INVESTIGATIONS

Field investigation was undertaken on the 5th May 2015. Investigation methods included: push tube boreholes, soil samples, and laboratory soil tests. The boreholes were positioned, sampled and logged by Ms. K. Parmeter, an engineering geologist, of the Specialist Services Section, NSW Public Works.

4.1 Push Tube Boreholes

Six (6) boreholes (B1 to B6) were drilled at various locations of the embankment area by Terratest Pty. Ltd., using a Geoprobe 7822DT track mounted drilling rig. Each borehole was advanced using a continuous push tube sampler to depths of 3.95m to 4.95m. Total length of drilling was 26.56 m.

Standard Penetration Tests (SPT's) were conducted at regular intervals to test the consistency of the embankment and foundation materials, and to provide samples as an aid for material identification. U50 tubes were also taken to provide samples of the embankment materials for laboratory testing. Their locations (and SPT results) are shown on each borehole log. The borehole locations are shown on **Figure 2**, and borehole logs are presented in **Appendix B**.

The completed boreholes were re-filled with the excavated materials, with shortfalls of materials caused by sampling being made up with bentonite.

4.2 Laboratory Soil Tests

Five (5) representative samples (SPT and U50 tubes) of representative soil types (fill) from the embankment were chosen for index testing, including:

(a) Atterberg Limits and Classification;
(b) Moisture Content and Density; and
(c) Emerson Class Soil Dispersion Testing

The Unified Soil Classification (metricated) has been adopted for soil classification. Laboratory tests were performed according to the relevant method in AS1289 (1997) - Methods of Testing Soils for Engineering Purposes.

All soil testing was carried out at the NSW Public Works, Geotechnical Centre, at Manly Vale. This laboratory is NATA registered for the tests performed. Summary test results and individual test result sheets are presented in **Appendix C**.

5 RESULTS

5.1 Embankment

The investigation boreholes were drilled in two general areas (see **Figure 2**): B1 – B4 in the main, higher portion of the embankment, and B5/B6 on the low northern extension portion. Borehole B6 is located in a potential spillway area. The interpreted embankment thickness and foundation types are summarized in **Table 1**.

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TABLE 1
Summary Of Embankment Thickness and Foundation Conditions

Borehole	Foundation Depth (m)	Fill Material	Foundation Material	Depth to EW Shale (m)	Borehole Depth (m)
B1	0.70	CI/CH, CH	CH	3.80	3.95
B2	1.40	CI/CH, CH	CH	4.50	4.81
B3	2.40	CL, CH	CH	>4.95	4.95
B4	2.20	CI/CH, CH, CL	CH	4.80	4.95
B5	1.10	CI/CH, CH	CH	~3.65	3.95
B6	1.85	CI/CH, CH	CH	3.70	3.95

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The embankment fill comprised an upper horizon of silty clay 'topsoil' underlain by plastic silty clay. Typically, the profile comprised:

0 – 0.20 m	SILTY CLAY (CI/CH); with grass, light brown, light grey-brown, or red-brown.
0.2 – 0.70/2.40 m	SILTY CLAY (CH/CL); with some gravel, orange-brown, red-brown, brown and dark brown, gravel comprises ironstone pebbles and small shale fragments.

It is interpreted that the embankment was formed from clay soils won from the storage area. These soils would have included ironstone pebbles, and deeper areas of excavation would have encountered the weathered shale encountered in portions of the fill. Beneath the surficial horizon the fill, laboratory Atterberg Limits indicated a mixture of clays of high plasticity and low plasticity. The variability may be a reflection of the source of the material, with the more plastic fill won from the upper portion of the soil profile and the low plasticity fill won from deeper portions of the profile in a mixture of clay and extremely weathered shale.

Compaction of the embankment was investigated by SPT's. Apart from in a wet area of the main embankment area, SPT results varied between N = 6 and N = 10 (average N = 8), indicating a medium stiff/stiff, moist cohesive soil. In boreholes B2 and B3 in the main embankment area, the SPT tube fell under the hammer weight (N = 0) in wet cohesive soil, indicating very soft conditions. Moisture and density test results show high moisture content of 32.9% and low dry density in B2 (1.00 – 1.40 m).

The drilling investigation was undertaken after a period of wet weather and the embankment crest was boggy in the southern, higher portion of the embankment. This area is consistently wet/damp, even during dry periods. Imagery from January 1014 shows the downstream face of this portion of the embankment, particularly between boreholes B2 and B3, to be damp (green) compared with the remainder of the embankment length (see Figure 3). There is also a seepage pond at the toe of the embankment.

Soils derived from the Bringelly Shale are normally reactive. CH soils in the embankment fill are likely to have high potential for volume changes with moisture content fluctuations.

Typical average CU shear strength parameters as tabulated in the Design of Small Dams (USBR, 1981), are c' = 0 kPa and Ø' = 17° for a CH material, and c' = 0 kPa and Ø' = 25° for a CL material. Representative conservative parameters for the materials in the embankment at Jordan Springs would be c' = 0 kPa and Ø' = 22°; however, localized wet soils would be expected to have lower strength parameters of c' = 0 kPa and Ø' = 17°.

Emerson Crumb tests indicate that the embankment fill soils do not exhibit dispersive character.

5.2 Foundation

All boreholes encountered embankment fill overlying mottled silty clay soils. Topsoil is interpreted to have been stripped from the foundation prior to placement of the embankment. Typically, the foundation soil profile comprised:

0.70/2.40 – 3.7/4.8 m	CLAY with silt and trace gravel (CH/CL): light grey and red-brown mottled.
3.7/4.8 – 4.8/4.95 m	CLAY/EW SHALE: rock fragments, light grey, dark grey with red-brown and brown mottles.

The foundation soil has not been tested in the laboratory. The embankment was constructed with the foundation soil and extremely weathered shale and these are interpreted to have similar properties to the embankment materials; however, unlike the embankment, the foundation follows a grading from silty clay (CH) soil into clayey soil with extremely weathered shale with depth. The clay/weathered shale are

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interpreted to quickly transition into less weathered rock; however, this was beyond the current depth of investigation.

Apart from in a wet area of the main embankment area, SPT results within the foundation soil varied from N = 11 to N = R (average N = 18), indicating moist, cohesive soil of very stiff consistency. In boreholes B2 and B3 in the main embankment area, SPT results of N = 3 were recorded at the top of the foundation profile, indicating a soft, wet cohesive soil.

Representative conservative parameters for the clay soil in the foundation at Jordan Springs would be c' = 0 kPa and Ø' = 25°, with strength increasing with depth; however, localized wet soils would be expected to have lower strength parameters of c' = 0 kPa and Ø' = 20°.

5.3 Seepage

There is a seepage area in the higher portion of the embankment at the southern end of the dam, as defined by the vegetation on the downstream face and ponded water adjacent to the embankment toe (see **Figure 2**). This area is interpreted to act as the current spillway for the dam. However, there is also seepage through the embankment and upper foundation soils in this area, as evidenced by the SPT's N = 0 in the embankment and N = 3 in the foundation in boreholes B2 and B3.

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FIGURES

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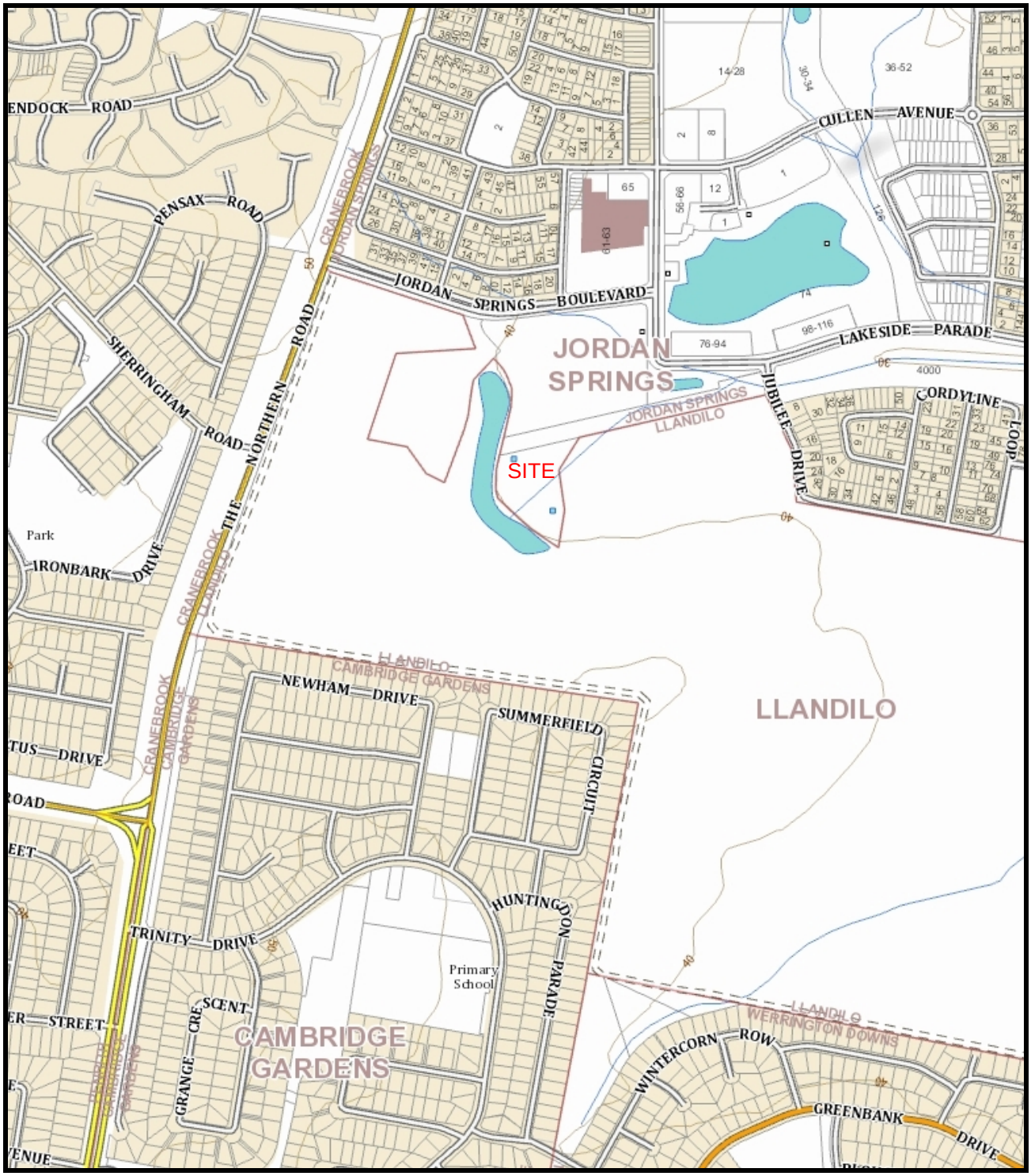

FIGURE 1 Locality Map

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FIGURE 2 Locations of Investigations

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Appendix A – Definitions of Terms

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SOIL DESCRIPTION

The methods of description and classification of soils are based on Australian Standard 1726, the SAA Site Investigation Code. The description of a soil is based on particle size distribution and plasticity as shown in the "GUIDE TO THE DESCRIPTION, IDENTIFICATION AND CLASSIFICATION OF SOILS".

SOIL CLASSIFICATION

The basic soil types and their subdivisions are defined by their particle sizes:

MAJOR SOIL CATEGORIES

Soil Classification	Particle Size
Boulders	Greater than 200mm
Cobbles	63 - 200mm
Gravel	2.36 - 63mm
Sand	0.075 - 2.36mm
Silt	0.002 - 0.075mm
Clay	Less than 0.002mm

MINOR SOIL CONSTITUENTS

As most natural soils are combinations of various constituents, the primary soil is further described and modified by its minor components:

Coarse grained soils			Fine grained soils		
% Fines		Modifier	% Coarse		Modifier
	≤ 5	Omit, or use 'trace'		≤ 15	Omit, or use 'trace'
> 5	≤ 12	Describe as 'with clay/silt', as applicable	> 15	≤ 30	Describe as 'with sand/gravel', as applicable
> 12		Prefix soil as 'silty/clayey', as applicable	> 30		Prefix soil as 'sand/gravelly', as applicable

COHESIVE SOILS

Clay and silt may be described according to their plasticity:

Descriptive Term	Range of liquid limit (percent)	
Of low plasticity		≤ 35
Of medium plasticity	> 35	≤ 50
Of high plasticity	> 50	

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MOISTURE CONDITION

Term	Description
Dry (D)	Cohesive soils; hard and friable or powdery, well dry of plastic limit. Granular soils; cohesionless and free-running.
Moist (M)	Soil feels cool, darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
Wet (W)	Soil feels cool, darkened in colour. Cohesive soils usually weakened and free water forms on hands when handling. Granular soils tend to cohere.

CONSISTENCY - NON-COHESIVE SOILS

Term	Density index %		SPT "N" value
Very loose		≤ 15	< 5
Loose	> 15	≤ 35	5 - 10
Medium dense	> 35	≤ 65	10 - 30
Dense	> 65	≤ 85	30 - 50
Very dense	> 85		> 50

CONSISTENCY - COHESIVE SOILS

Term	Undrained shear strength (kPa)		Field guide to consistency	SPT "N" value
Very soft		≤ 12	Exudes between the fingers when squeezed in hand.	< 2
Soft	> 12	≤ 25	Can be moulded by light finger pressure.	2 - 4
Firm	> 25	≤ 50	Can be moulded by strong finger pressure.	4 - 8
Stiff	> 50	≤ 100	Cannot be moulded by fingers; can be indented by thumb	8 - 16
Very stiff	> 100	≤ 200	Can be indented by thumb nail.	16 - 32
Hard	> 200		Can be indented with difficulty by thumb nail.	> 32

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GRAPHICAL SYMBOLS USED FOR GEOTECHNICAL BOREHOLE AND TEST PIT LOGS

SOIL - COARSE GRAINED

 GW

 GP

 GM

 GC

 SW

 SP

 SM

 SC

SOIL - FINE GRAINED

 MH

 MI

 ML

 CH

 CI

 CL

 OH

 OL

 Pt

ROCK

 Sedimentary rock

 Igneous rock

 Metamorphic rock

FILL MATERIAL

 Fill

GROUNDWATER

 Level

 Inflow

NGE No Groundwater Encountered

SOIL HORIZON BOUNDARIES

——— Boundary measured or determined from drilling conditions

..... Diffuse or uncertain boundary

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GUIDE TO THE DESCRIPTION IDENTIFICATION AND CLASSIFICATION OF SOILS

Major Divisions		Particle Size (mm)	Group Symbol	Typical Names	Field Identification Sand and Gravels	Laboratory Classification				
						% < 0.06mm (see note 2)	Plasticity of Fine Fraction	$C_u = \frac{D_{50}}{D_{10}}$	$C_c = \frac{(D_{30})^2}{D_{10}D_{60}}$	Notes
COARSE GRAINED SOILS (more than half of material less than 63 mm is larger than 0.075 mm)	BOULDERS	200				—	—	—	—	
	COBBLES	63				—	—	—	—	
	GRAVELS (more than half of coarse fraction is larger than 2.36mm)	coarse 20	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	0-5	—	> 4	between 1 and 3	1. Identify lines by the method given for fine grained soils.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	0-5	—	Fails to comply with above	—	
		medium 6	GM	Silty gravels, gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	12-50	Below 'A' line or $I_p < 4$	—	—	2. Borderline classifications occur when the percentage of fines (fraction smaller than 0.06mm size) is greater than 5% and less than 12%.
			GC	Clayey gravels, gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	12-50	Above 'A' line or $I_p > 7$	—	—	Borderline classifications require the use of dual symbols e.g. SP-SM, GW-GC
		fine 2.36								
	SANDS (more than half of coarse fraction is smaller than 2.36mm)	coarse 0.6	SW	Well graded sands, gravelly sands, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	0-5	—	> 6	between 1 and 3	3. I_p = Plasticity Index
			SP	Poorly graded sands and gravelly sands; little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	0-5	—	Fails to comply with above	Fails to comply with above	
		medium 0.2	SM	Silty sands, sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	12-50	Below 'A' line or $I_p < 4$	—	—	
		fine 0.075	SC	Clayey sands, sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	12-50	Above 'A' line or $I_p > 7$	—	—	

Use the gradation curve of material passing 63mm for classification of fractions according to the criteria given in "Major Divisions"

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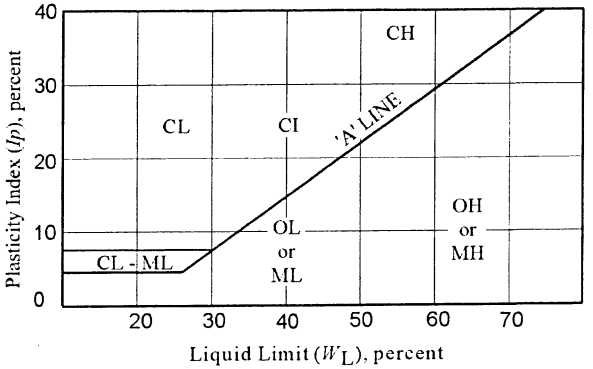
GUIDE TO THE DESCRIPTION, IDENTIFICATION AND CLASSIFICATION OF SOILS (CONT.)

Major Divisions		Particle Size (mm)	Group Symbol	Typical Names	Field Identification: Dry* Strength	Field Identification: Dilatancy†	Field Identification: Toughness ‡	Laboratory Classification		Laboratory Classification: Plasticity of Fine Fraction	Notes
FINE GRAINED SOILS (more than half of material less than 63 mm is smaller than 0.075 mm)	SILTS & CLAYS (liquid limit < 50%)	<0.075	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	None to low	Quick to slow	None	Use the gradation curve of material passing 63mm for classification of fractions according to the criteria given in "Major Divisions"	More than 50% passing 0.06 mm	Below 'A' line	PLASTICITY CHART FOR CLASSIFICATION OF FINE GRAINED SOILS
			CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Medium to high	None to very slow	Medium			Above 'A' line	
			OL ✧	Organic silts and organic silty clays of low plasticity	Low to medium	Slow	Low			Below 'A' line	
	SILTS & CLAYS (liquid limit > 50%)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, clastic silts	Low to medium	Slow to none	Low to medium			Below 'A' line	
			CH	Inorganic clays of high plasticity, fat clays	High to very high	None	High			Above 'A' line	
			OH ✧	Organic clays of medium to high plasticity, organic silts	Medium to high	None to very slow	Low to medium			Below 'A' line	
	HIGHLY ORGANIC SOILS		Pt ✧	Peat and other highly organic soils	Identified by colour, odour, spongy feel and generally by fibrous texture					—	✧ Effervesces with H_2O_2



FIELD IDENTIFICATION PROCEDURE FOR FINE GRAINED SOILS OR FRACTIONS

THESE PROCEDURES ARE TO BE PERFORMED ON THE MINUS 0.2MM SIZE PARTICLES. FOR FIELD CLASSIFICATION PURPOSES, SCREENING IS NOT INTENDED, SIMPLY REMOVE BY HAND THE COARSE PARTICLES THAT INTERFERE WITH THE TESTS.

*** Dry strength (Crushing characteristics)**

After removing particles larger than 0.2mm size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven, sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity. High dry strength is characteristic for clays of the CH group.

A typical inorganic silt possesses only very slight dry strength.

Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

† Dilatancy (Reaction to shaking)

After removing particles larger than 0.2mm size, prepare a pat of moist soil with a volume of 10 cm³. Add enough water if necessary to make the soil soft but not sticky.

Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens, and finally it cracks or crumbles.

The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil.

Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as a typical rock flour, shows a moderately quick reaction.

‡ Toughness (Consistency near plastic limit)

After removing particles larger than 0.2mm size, a specimen of soil about 10cm³ in size is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. The specimen is then rolled out by hand on a smooth surface or between the palms into a thread about 3mm in diameter. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.

After the thread crumbles, the pieces should be lumped together with a slight kneading action continued until the lump crumbles. The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil.

Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay of low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line. Highly organic clays have a very weak and spongy feel at the plastic limit.

DEFINITIONS OF ENGINEERING GEOLOGICAL TERMS

This classification system provides a standard terminology for the engineering description of rock.

DEGREE OF WEATHERING [1]

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Rock is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.
Extremely Weathered	EW	Rock substance affected by weathering to the extent that the rock exhibits soil properties - i.e. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly Weathered	HW	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance, and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock, usually as a result of iron bleaching or deposition. The colour and strength of the original substance is no longer recognisable.
Moderately Weathered	MW	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance, and the original colour of the fresh rock is no longer recognisable.
Slightly Weathered	SW	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance, usually by limonite has taken place. The colour and texture of the fresh rock is recognisable.
Fresh (stained)	F_S	Rock substance unaffected by weathering. Weathering is limited to the surface of major discontinuities, for example an iron-stained joint.
Fresh	F	Rock substance unaffected by weathering.

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ROCK STRENGTH [2]

Rock strength is defined by the Point Load Strength Index (Is (50)), and refers to the strength of the rock substance in the direction normal to the bedding.

TERM	Is (50)	FIELD GUIDE	APPROX. qu MPa *
Extremely Weak (EW)		Easily remoulded by hand to a material with soil properties.	
	0.03		0.7
Very weak (VW)		May be crumbled in the hand. Sandstone is "sugary" and friable.	
	0.1		2.4
Weak (W)		A piece of core 150mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	
	0.3		7
Medium Strong (MS)		A piece of core 150mm long x 50mm dia. may be broken by hand with considerable difficulty. Readily scored with a knife.	
	1		24
Strong (S)		A piece of core 150mm long x 50mm dia. cannot be broken by unaided hands, may be slightly scratched or scored with knife.	
	3		70
Very Strong (VS)		A piece of core 150mm long x 50mm dia. may be broken readily with hand held hammer. Cannot be scratched with pen knife.	
	10		240
Extremely Strong (ES)		A piece of core 150mm long x 50mm dia. is difficult to break with hand held hammer. Rings when struck with hammer.	

* The approximate unconfined compressive strength (qu) shown in the table is based on an assumed ratio to the point load index of 24:1. This ratio may vary widely and should be calibrated on site.

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STRATIFICATION SPACING [2]

TERM	SEPARATION OF STRATIFICATION PLANES
Thinly laminated	< 6mm
Laminated	6mm - 20mm
Very thinly bedded	20mm - 60mm
Thinly bedded	60mm - 200mm
Medium bedded	200mm - 600mm
Thickly bedded	600mm - 2m
Very thickly bedded	> 2m

DISCONTINUITY SPACING [3]

TERM	SPACING
Very widely spaced	> 2m
Widely spaced	600mm - 2m
Moderately widely spaced	200mm 600mm
Closely spaced	60mm - 200mm
Very closely spaced	20mm - 60mm
Extremely closely spaced	< 20mm

APERTURE OF DISCONTINUITY SURFACES [4]

The degree to which a discontinuity is open, or to which the faces of the discontinuity have been separated and the space subsequently infilled (such as in a vein, fault or joint).

TERM	APERTURE THICKNESS (Discontinuities, veins, faults, joints)
Wide	> 200mm
Moderately wide	60mm - 200mm
Moderately narrow	20mm - 60mm
Narrow	6mm - 20mm
Very narrow	2mm - 6mm
Extremely narrow	> 0 - 2 mm
Tight	Zero

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BLOCK SHAPE AND SIZE [4]

The following descriptive terms define shape:

Blocky	- approximately equidimensional.
Tabular	- one dimension considerably shorter than the other two.
Columnar	- one dimension considerably larger than the other two.

Block sizes are defined by the following descriptive terms:

TERM	BLOCK SIZE	EQUIVALENT DISCONTINUITY SPACINGS IN BLOCKY ROCK
Very large	$> 8m^3$	Extremely wide
Large	$> 0.2m^3$ - $8m^3$	Very wide
Medium	$> 0.008m^3$ - $0.2m^3$	Wide
Small	$> 0.0002m^3$ - $0.008m^3$	Moderately wide
Very small	$\leq 0.0002m^3$	Less than moderately wide

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2. McMahon, B.K., Douglas , D.J., & Burgess, P. J., 1975. Engineering classification of sedimentary rocks in the Sydney area. Australian Geomechanics Journal, G5 (1), 51 -53.

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Appendix B – Borehole Logs

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Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B1

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER

EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE

DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	SILTY CLAY (CI/CH), with grass; light brown, some orange; soft-firm; wet.				
				0.15				
				SILTY CLAY/ CLAY (CH), with some gravel; dark brown, red-orange, some grey; firm-stiff; moist.				
0.5			FILL (v)					
				0.70	SPT	2,3,4 N=7		
				CLAY, some silt; light grey with red and orange mottle; firm then stiff with depth; moist to just moist.				
1.0								
1.5					SPT	2,5,7 N=12	Drilled Over Water	TUBE
2.0			CH (v)					
				Red clayey horizon at 2.4 -2.5m				
2.5					SPT	3,5,10 N=15		
3.0								
				3.40				
3.5			CH (v)	CLAY; some shale fragments; grey-brown, some orange-yellow; stiff; just moist.	SPT	12,23,31 N=54		
				3.80				
			CH (v)	CLAY/ SHALE - Extremely Weathered; laminations visible; dark grey-brown; hard; just moist.				
				3.95				
4.0				Hole Terminated at 3.95 m				
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS83A-JORDAN SPRINGS DAM_BH.GPJ <<DrawingFile>> 27/05/2015 11:14 8.30.004 Datgel Lab and In Situ Tool

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B2

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER

EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE

DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	SILTY CLAY (CI/CH), with grass; light grey-brown; very soft; wet.				
				0.20				
			FILL (v)	CLAY (CH), some silt and roots; light brown with orange mottle; soft; wet.				
				0.50				
0.5			FILL (l)	SILTY CLAY (CH), gravel and roots fibres; light brown, red-orange mottle; soft; moist-wet.	SPT	1,0,0 N=0		
1.0					U			
				1.40				
1.5			CH (v)	CLAY; light grey with red mottle; soft; moist.	SPT	2,1,3 N=3	Drilled Over Water	TUBE
2.0								
2.5				as above but firm from 2.5m.	SPT	2,4,7 N=11		
3.0								
				3.50				
3.5			CH (v)	CLAY; red with grey mottle; stiff; moist to just moist.	SPT	5,10,14 N=24		
4.0								
				4.35				
			CH (v)	CLAY with shale fragments; dark grey; stiff; just moist.				
4.5				4.50				
			CH (v)	CLAY/ SHALE- Extremely Weathered; light grey, dark grey; very stiff to hard; just moist.	SPT	11,14,30/10 N=R		
				4.81				
5.0				Hole terminated - push tube refusal at 4.81m. Hole Terminated at 4.81 m				

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS83A-JORDAN SPRINGS DAM_BH.GPJ <<DrawingFile>> 27/05/2015 11:14 8.30.004 Datgel Lab and In Situ Tool

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B3**

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER
EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE
DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	NOT RECOVERED wet - lost in tube, no recovery.			Drilled Over Water	TUBE
0.5				0.50				
			FILL (l)	CLAYEY SANDY SILT(CL) with grass and roots; red-brown; very soft; wet.	U			
				0.90				
1.0			FILL (l)	SANDY CLAYEY SILT (CL), with grass, some pebbles to 5mm in size; light brown, grey, some red; very soft; wet.	SPT	0,0,0 N=0		
				1.35				
1.5			FILL (v)	CLAY (CH); light brown, some red; soft; wet.				
2.0				2.20				
			FILL (v)	CLAY (CH); red, red-brown; soft; moist.				
				2.40				
2.5			CH (v)	CLAY; some shale and ironstone gravel; red; soft-firm; moist.	SPT	2,1,2 N=3		
3.0								
3.5				3.50				
			CH (v)	CLAY; some shale/claystone and some ironstone gravel upto 20mm; red-brown with grey mottle; soft-firm; wet.	SPT	7,6,8 N=14		
4.0				4.20				
			CH (v)	CLAY; some small shale/claystone fragments; light grey with red mottle; firm-stiff; just moist.	SPT	15,11,25 N=36		
4.5				4.95				
5.0				Hole Terminated at 4.95 m				

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS83A-JORDAN SPRINGS DAM_BH.GPJ <<DrawingFile>> 27/05/2015 11:14 8.30.004 Datgel Lab and In Situ Tool

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Public Works
NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B4

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER
EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE
DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	SILTY CLAY (CI/CH), with fine roots; red brown; soft, just moist.				
				0.20				
			FILL (v)	SILTY CLAY (CI/CH), roots fibres; shale gravel upto 20mm; brown, dark brown, some red and grey-black mottle; soft; just moist.				
0.5				0.50				
				SILTY CLAY (CL); shale gravel upto 20mm; brown with red mottle; soft to firm; moist.	SPT	3,4,4 N=8		
1.0								
			FILL (l)					
1.5					SPT	0,3,4 N=7		
2.0								
				2.20				
			CH (v)	CLAY; some gravel to 10mm; light grey, red-orange, red-brown; soft; moist.			Not Encountered	TUBE
2.5								
				2.75	SPT	4,7,13 N=20		
			CH (v)	SILTY CLAY lense, with trace sand; some shale fragments; red, yellow, brown with grey mottle; soft to firm; moist				
				2.95				
3.0				CLAY; minor claystone/shale fragments in sections; grey with red mottle, some orange-yellow and red; firm; just moist.				
3.5					SPT	5,6,8 N=14		
			CH (v)					
4.0								
4.5								
					SPT	18,14,22 N=36		
				4.80				
			CH (v)	CLAY/ SHALE - Extremely Weathered; shale fragments; grey with red mottle/coating; very stiff; just moist.				
				4.95				
5.0				Hole Terminated at 4.95 m				

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS83A-JORDAN SPRINGS DAM_BH.GPJ <<DrawingFile>> 27/05/2015 11:14 8.30.004 Datgel Lab and In Situ Tool

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Version: 1, Version Date: 13/07/2018

Public Works NSW Water Solutions

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No. **B5**

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER
EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE
DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	SILTY CLAY (CI/CH), grass roots in top 0.15m; ironstone gravel to 5mm; brown, red-brown; soft; moist.			Not Encountered	TUBE
0.5				0.50				
			FILL (l)	SILTY CLAY (CH) light brown and grey clods, with red mottle; soft; moist.	U			
1.0				1.10	SPT	4,5,5 N=10		
			CH (v)	CLAY, includes pebble/gravel; grey with red mottle, some orange; soft-firm; moist.				
1.5								
2.0								
2.5				2.50 CLAY; grey with red mottling; some red claystone fragments/ zones; soft-firm; just moist.	SPT	3,3,6 N=9		
3.0			CH (v)					
3.5				3.65				
			CH (v)	CLAY, with red claystone fragments; red with grey and orange mottle; stiff; just moist.	SPT	10,13,16 N=29		
				3.95				
4.0				Hole Terminated at 3.95 m				
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

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GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE No.

B6

PROJECT: JORDAN SPRINGS DAM
LOCATION: JORDAN SPRINGS
CONTRACTOR: TERRATEST
SITE SUPERVISOR: K.PARMETER

EQUIPMENT: Geoprobe7822DT
PROJECT COORDINATOR: M.NEVILLE

DATE: 05/05/2015
SURFACE RL: AHD
EASTING:
NORTHING:

DEPTH (m)	RL (m)	GRAPHIC LOG	SOIL GROUP	MATERIAL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	SAMPLE or TEST		WATER	METHOD
			FILL (v)	SILTY CLAY (CI/CH), abundant grass roots; red-brown, soft, moist.				
				0.20				
			FILL (v)	CLAY (CH), roots; shale and ironstone gravel; dark red brown; soft; moist.				
0.5				0.50				
				CLAY (CH), some organic material and roots; shale and ironstone gravel; light brown, red brown mottle; soft; moist.	SPT	4,3,3 N=6		
1.0			FILL (v)					
1.5					SPT	3,4,5 N=9	Not Encountered	TUBE
				1.85				
2.0				CLAY; light grey with orange-red motte; some red claystone fragments; firm; just moist.				
2.5				some red claystone fragments; firm to stiff; just moist.	SPT	5,5,8 N=13		
3.0			CH (v)					
3.5								
				3.70	SPT	4,11,14 N=25		
			CH (v)	CLAY/ CLAYSTONE- Extremely Weathered; red, grey with brown mottling; stiff; just moist.				
				3.95				
4.0				Hole Terminated at 3.95 m				
4.5								

v : visual
l : laboratory

SAMPLE OR TEST
Undisturbed: U
Disturbed: D
Bulk: B
Standard Penetration Test: SPT

GROUNDWATER
Water Table
Water Inflow

PROJECT No.: GS83A

SHEET: 1 OF 1

NSWPW LIB 1.03.GLB Log NSW PW BOREHOLE GS83A-JORDAN SPRINGS DAM_BH.GPJ <<DrawingFile>> 27/05/2015 11:15 8.30.004 Datgel Lab and In Situ Tool

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Appendix C – Soil Laboratory Results

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Geotechnical Centre
110B King Street, Manly Vale, NSW 2093
Telephone 02- 9949 0200 Facsimile 02-9948 6185

NSW GOVERNMENT | Public Works

CLIENT:	GEOTECHNICAL & ENVIRONMENTAL	BATCH No:	15016
	SOIL SUMMARY SHEET		
PROJECT:	JORDAN SPRINGS OLD DAM	COMPILED BY:	ZG
LOCATION:	EMBANKMENT CREST	DATE:	18/05/2015

General Information Note: All test methods are as indicated on accompanying test reports.

Sample No.	**6131**	**6132**	**6133**	**6134**	**6135**	
Bore/Reference	B2	B3	B3	B4	B5	
Depth (m)	1.00 - 1.40	0.50 - 0.90	0.90 - 1.35	1.50 - 1.95	0.50 - 0.90	
Sample Type	U	U	SPT	SPT	U	
Soil Colour & Description (v) indicates visual classification	Mottled Grey Red and Yellow Brown Silty Clay	Mottled Dark Grey Orange Brown Clayey Sandy Silt trace of Gravel	Yellowish Grey Brown Sandy Clayey Silt trace of Gravel	Orange Brown and Light Grey Silty Clay trace of Sand	Mottled Grey Red and Yellow Brown Silty Clay with Gravel	
Classification	CH (v)	CL (v)	CL (v)	CL (v)	CH (v)	

Moisture Content & Density

Field Moisture Content (%)	32.9	22.6			20.2	
Field Wet Density (t/m³)	1.91	2.02			2.10	
Field Dry Density (t/m³)	1.44	1.65			1.74	
Soil Particle Density (t/m³)						

Particle Size Distribution

Cobble Size (%)						
Gravel Size (%)						
Sand Size (%)						
Silt Size (%)						
Clay Size (%)						
Effective Size (mm)						
Uniformity Coefficient						
Curvature Coefficient						

Plasticity

Liquid Limit (%)			27	34		
Plastic Limit (%)			18	16		
Plasticity Index (%)			9	18		
Linear Shrinkage (%)						

Dispersion

Dispersal Index						
Percent Dispersion (%)						
Emerson Class No.			5	6		

Compaction

Compaction Type						
Optimum Moisture Content (%)						
Maximum Dry Density (t/m³)						

California Bearing Ratio

Placement Moisture Content (%)						
Placement Dry Density (t/m³)						
Swell under 4.5kg Surcharge (%)						
C.B.R. at 2.5 mm Penetration (%)						
C.B.R. at 5.0 mm Penetration (%)						

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Geotechnical Centre

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Telephone 02 9949 0200 Facsimile 02 9948 6185
NATA Accreditation Number: 13380

NSW GOVERNMENT | Public Works

CLIENT: GEOTECHNICAL & ENVIRONMENTAL | REPORT No: 15016/6133/R1115

SOIL INDEX PROPERTIES

PROJECT: JORDAN SPRINGS OLD DAM | SAMPLE No: 6133

LOCATION: EMBANKMENT CREST | HOLE No: B3 | DEPTH (m): 0.90

SOIL INDEX PROPERTIES		RESULT		TEST METHOD
Moisture Content (as received)	:	-		AS 1289.2.1.1
Liquid Limit	:	27	%	AS 1289.3.1.1
Plastic Limit	:	18	%	AS 1289.3.2.1
Plasticity Index	:	9	%	AS 1289.3.3.1
Linear Shrinkage	:	-		AS 1289.3.4.1
Soil Particle Density	:	-		GM 8
Classification	:	CL (v)		AS 1726

Sample History: ☐ Natural State ☒ Air Dried ☐ Oven Dried

Method of Preparation: ☐ Wet Sieved ☒ Dry Sieved

Linear Shrinkage Sample: ☐ Curling ☐ Crumbling ☐ No Deformation

Notes on test: Sample tested as received from client.

ATTERBERG LIMITS R1115 (ISSUE 4, 2005)

NATA **Accredited for compliance with ISO/IEC 17025.**

Tested By: ZG Date Tested: 15/05/2015

APPROVED SIGNATORY

Zoran Gusevski 18/05/2015

Document Set ID: 8291178
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Telephone 02 9949 0200 Facsimile 02 9948 6185
NATA Accreditation Number: 13380

NSW GOVERNMENT | Public Works

CLIENT: GEOTECHNICAL & ENVIRONMENTAL	REPORT No: 15016/6133/R1118

DISPERSION TESTS

PROJECT: JORDAN SPRINGS OLD DAM		SAMPLE No: 6133
LOCATION: EMBANKMENT CREST	HOLE No: B3	DEPTH (m): 0.90

Determination of the Emerson Class Number of a soil

Immerse air-dried 2 to 4 mm diameter crumbs of soil in distilled water in a beaker

- Slaking [X]
  - Complete Dispersion Class 1 [ ]
  - Some Dispersion Class 2 [ ]
  - No Dispersion [X]
    - Immerse moistened remoulded 3mm diameter soil balls in distilled water in a beaker
      - Dispersion Class 3 [ ]
      - No dispersion [X]
        - No calcite or gypsum present [X]
          - Make up 1:5 soil/water suspension in a test tube and shake
            - Dispersion Class 5 [X]
            - Flocculation Class 6 [ ]
        - Calcite or gypsum present Class 4 [ ]
- No Slaking [ ]
  - Swelling Class 7 [ ]
  - No Swelling Class 8 [ ]

Emerson Class Number	(AS 1289.3.8.1)	5
Percent Dispersion	(AS 1289.3.8.2)**	No Test
Dispersal Index	(DPWS GM 15)	No Test

Sample Description: Yellowish Grey Brown Sandy Clayey Silt

Type and temperature of water: Distilled, 21.5 ° C

Notes on test: Sample tested as received from client.

** 0.05mm size interpolated from hydrometer readings taken after 21min, 1hour and 2 hours.

NATA **Accredited for compliance with ISO/IEC 17025.**

Tested By: MA Date Tested: 12/05/2015

APPROVED SIGNATORY

Zoran Gusevski 18/05/2015

DISPERSIVE SOILS R1118 (ISSUE 4, 2005)

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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110B King Street, Manly Vale NSW 2093
Telephone 02 9949 0200 Facsimile 02 9948 6185
NATA Accreditation Number: 13380

NSW GOVERNMENT | Public Works

CLIENT: GEOTECHNICAL & ENVIRONMENTAL | REPORT No: 15016/6134/R1115

SOIL INDEX PROPERTIES

PROJECT: JORDAN SPRINGS OLD DAM | SAMPLE No: 6134

LOCATION: EMBANKMENT CREST | HOLE No: B4 | DEPTH (m): 1.50

SOIL INDEX PROPERTIES		RESULT		TEST METHOD
Moisture Content (as received)	:	-		AS 1289.2.1.1
Liquid Limit	:	34	%	AS 1289.3.1.1
Plastic Limit	:	16	%	AS 1289.3.2.1
Plasticity Index	:	18	%	AS 1289.3.3.1
Linear Shrinkage	:	-		AS 1289.3.4.1
Soil Particle Density	:	-		GM 8
Classification	:	CL (v)		AS 1726

Sample History: ☐ Natural State ☒ Air Dried ☐ Oven Dried

Method of Preparation: ☐ Wet Sieved ☒ Dry Sieved

Linear Shrinkage Sample: ☐ Curling ☐ Crumbling ☐ No Deformation

Notes on test: Sample tested as received from client.

ATTERBERG LIMITS R1115 (ISSUE 4, 2005)

NATA **Accredited for compliance with ISO/IEC 17025.**

Tested By: ZG Date Tested: 15/05/2015

APPROVED SIGNATORY

Zoran Gusevski 18/05/2015

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NATA Accreditation Number: 13380

NSW GOVERNMENT Public Works

CLIENT: GEOTECHNICAL & ENVIRONMENTAL	REPORT No: 15016/6134/R1118

DISPERSION TESTS

PROJECT: JORDAN SPRINGS OLD DAM		SAMPLE No: 6134
LOCATION: EMBANKMENT CREST	HOLE No: B4	DEPTH (m): 1.50

Determination of the Emerson Class Number of a soil

Immerse air-dried 2 to 4 mm diameter crumbs of soil in distilled water in a beaker

- Slaking [X]
  - Complete Dispersion Class 1 [ ]
  - Some Dispersion Class 2 [ ]
  - No Dispersion [X]
    - Immerse moistened remoulded 3mm diameter soil balls in distilled water in a beaker
      - Dispersion Class 3 [ ]
      - No dispersion [X]
        - No calcite or gypsum present [X]
          - Make up 1:5 soil/water suspension in a test tube and shake
            - Dispersion Class 5 [ ]
            - Flocculation Class 6 [X]
        - Calcite or gypsum present Class 4 [ ]
- No Slaking [ ]
  - Swelling Class 7 [ ]
  - No Swelling Class 8 [ ]

Emerson Class Number	(AS 1289.3.8.1)	6
Percent Dispersion	(AS 1289.3.8.2)**	No Test
Dispersal Index	(DPWS GM 15)	No Test

Sample Description: Orange Brown and Light Grey Silty Clay trace of Sand

Type and temperature of water: Distilled, 21.5 ° C

Notes on test: Sample tested as received from client.

** 0.05mm size interpolated from hydrometer readings taken after 21min, 1hour and 2 hours.

NATA **Accredited for compliance with ISO/IEC 17025.**

Tested By: MA Date Tested: 12/05/2015

APPROVED SIGNATORY

Zoran Gusevski 18/05/2015

DISPERSIVE SOILS R1118 (ISSUE 4, 2005)

Document Set ID: 8291178
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Public Works

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2-24 Rawson Place
SYDNEY NSW 2000

www.publicworks.nsw.gov.au

Document Set ID: 8291178
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Extreme Flood Discharge Estimation for Old Earthern Dam, Jordan Springs, Penrith

NSW Public Works

1109-01-B1, 23 June 2015

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Report Title	Extreme Flood Discharge Estimation for Old Earthern Dam, Jordan Springs, Penrith
Client	NSW Public Works Level 13, McKell Building 2-24 Rawson Place Sydney NSW 2000
Report Number	1109-01-B1

Revision Number	Report Date	Report Author	Reviewer
0	18 June 2015	DS	SM
1	23 June 2015	DS	SM

For and on behalf of WRM Water & Environment Pty Ltd
Level 9, 135 Wickham Tce, Spring Hill
PO Box 10703 Brisbane Adelaide St Qld 4000
Tel 07 3225 0200



Sharmil Markar
Director

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1 Introduction

1.1 OVERVIEW

Jordan Springs (the development) is a new subdivision development being built in Penrith, a suburb to the west of Sydney. The development covers an area of approximately 220 ha on the eastern side of The Northern Road, located between Dunheved Road to the south and Ninth Avenue to the north. Figure 1.1 shows the location of the development.

The development is located in the catchment of South Creek, which is a minor tributary of the Hawkesbury River. South Creek flows in a northerly direction, approximately 1.7 km east of the development, before meeting the Hawkesbury River approximately 14 km north-east of the development

An old earthen dam, known as Secret Garden Dam (the dam), is located on the southern edge of the development as shown in Figure 1.1. The dam is located on an unnamed tributary of South Creek which flows to the south of the development and meets South Creek approximately 2 km east of the development. The dam has a direct catchment area of approximately 45 ha. An additional catchment area of approximately 10 ha, which would not ordinarily drain to the dam, has been directed into the dam via earthen bunds. The dam has a full supply storage capacity of approximately 13.5 ML.

New South Wales Public Works (NSWPW) requested WRM Water & Environment Pty Ltd (WRM) to estimate inflows into the dam, as well as residual discharges at several locations downstream of the dam, for the 1-in-10,000 Annual Exceedance Probability (AEP), 1-in-100,000 AEP and Probable Maximum Flood (PMF) events. This report has been prepared in response to that request.

1.2 SCOPE OF WORK

The scope of works for this study is as follows:

- Collect, collate and review available data and information on the Secret Garden dam, including dam spillway configuration and stage-surface area-storage data;
- Develop a rating curve for the Secret Garden dam spillway discharges;
- Develop and validate an XP-RAFTS model of the Secret Garden dam and surrounding Jordan Springs development; and
- Estimate 1-10,000 AEP, 1-in-100,000 AEP and PMF hydrographs at the dam site and at nominated locations downstream of the dam.

The report is structured as follows:

- Section 2 describes the data available for the development and calibration of the hydrologic model;
- Section 3 describes the development and validation of the hydrologic model;
- Section 4 describes the determination of design rainfall depths; and
- Section 5 presents the estimated design discharges.

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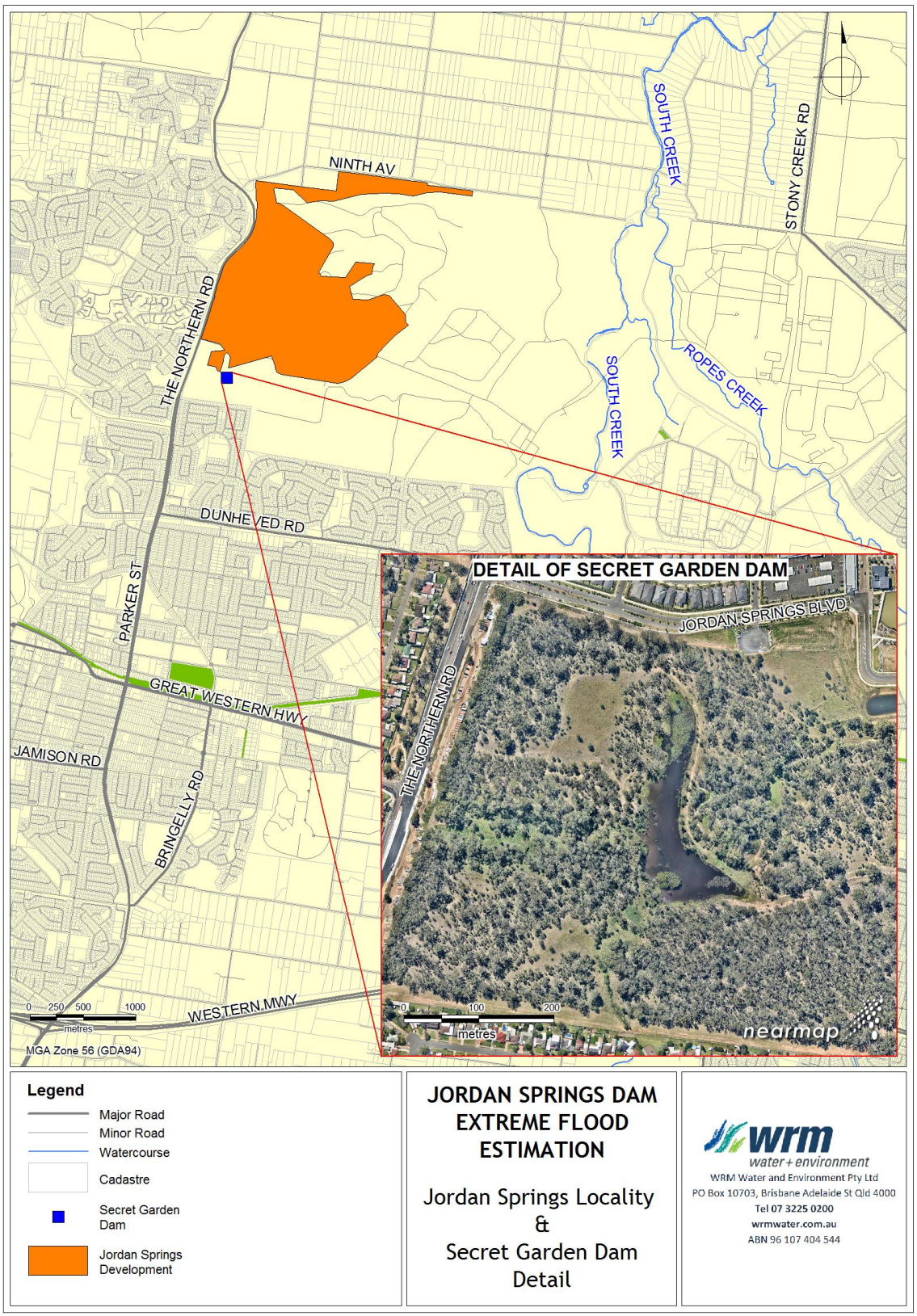

Figure 1.1 - Location of Secret Garden Dam and the Jordan Springs development

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2 Available data

LiDAR data covering the full extent of the Jordan Springs development catchment area was obtained from the Land and Property Information (LPI) division of the New South Wales Government Office of Finance and Services. The LiDAR data set is date stamped 6 April 2011, and is reported to have horizontal and vertical accuracies of 0.8 m and 0.3 m respectively.

In addition, the following data was provided by Lend Lease (through NSWPW):

- Detailed survey & bathymetry of Secret Garden Dam; and
- Development plans showing proposed and constructed stormwater management infrastructure for the Jordan springs development.

Aerial photography covering the study area was downloaded from the nearmap PhotoMaps portal (nearmap, 2015).

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3 XP-RAFTS configuration

3.1 OVERVIEW

An XP-RAFTS (XP Software, 2013) model of the Jordan Springs study area was developed to estimate the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF hydrographs. The model was initially configured to represent the entire catchment as undeveloped so as to allow validation against Rational Method estimates of peak discharge for the 1% AEP event. Model parameters were then modified to reflect existing development, including the completed Jordan Springs development. The developed case model was then used to estimate the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF design hydrographs.

3.2 MODEL CONFIGURATION

The XP-RAFTS model of the Jordan Springs Dam study area was broken into 23 subcatchments as shown in Figure 3.1. The total catchment area is 777 ha, of which approximately 55 ha drains to the Secret Garden Dam.

Sub-catchment delineation was done using LiDAR topographic data and development plans. Catchment area, slope and channel length values were determined from topographic data. Catchment land use types were determined from aerial photography and fraction impervious and PERN 'n' values determined based on the proportion of each land use type within the subcatchment. Table 3.1 shows the adopted parameters for each land use type. Initial and continuing losses for each subcatchments were adopted based on AEP and subcatchment percentage impervious, as shown in Table 3.2.

Table 3.1 - Adopted land use parameters

Land Use Category	Percent Impervious (%)	Catchment PERN 'n'
Open Space	2	0.050
Urban Residential (Existing)	50	0.045
Urban Residential (Jordan Springs)	60	0.040
Commercial / Industrial	70	0.030
Water Body	100	0.010

Table 3.2 - Adopted initial and continuing losses

Percentage Impervious (%)	1% AEP		<1% AEP	
	Initial Loss (mm)	Continuing Loss (mm/h)	Initial Loss (mm)	Continuing Loss (mm/h)
< 25	15	2.5	0	2.5
25 to 40	10	1.5	0	1.5
> 40	5	1	0	1

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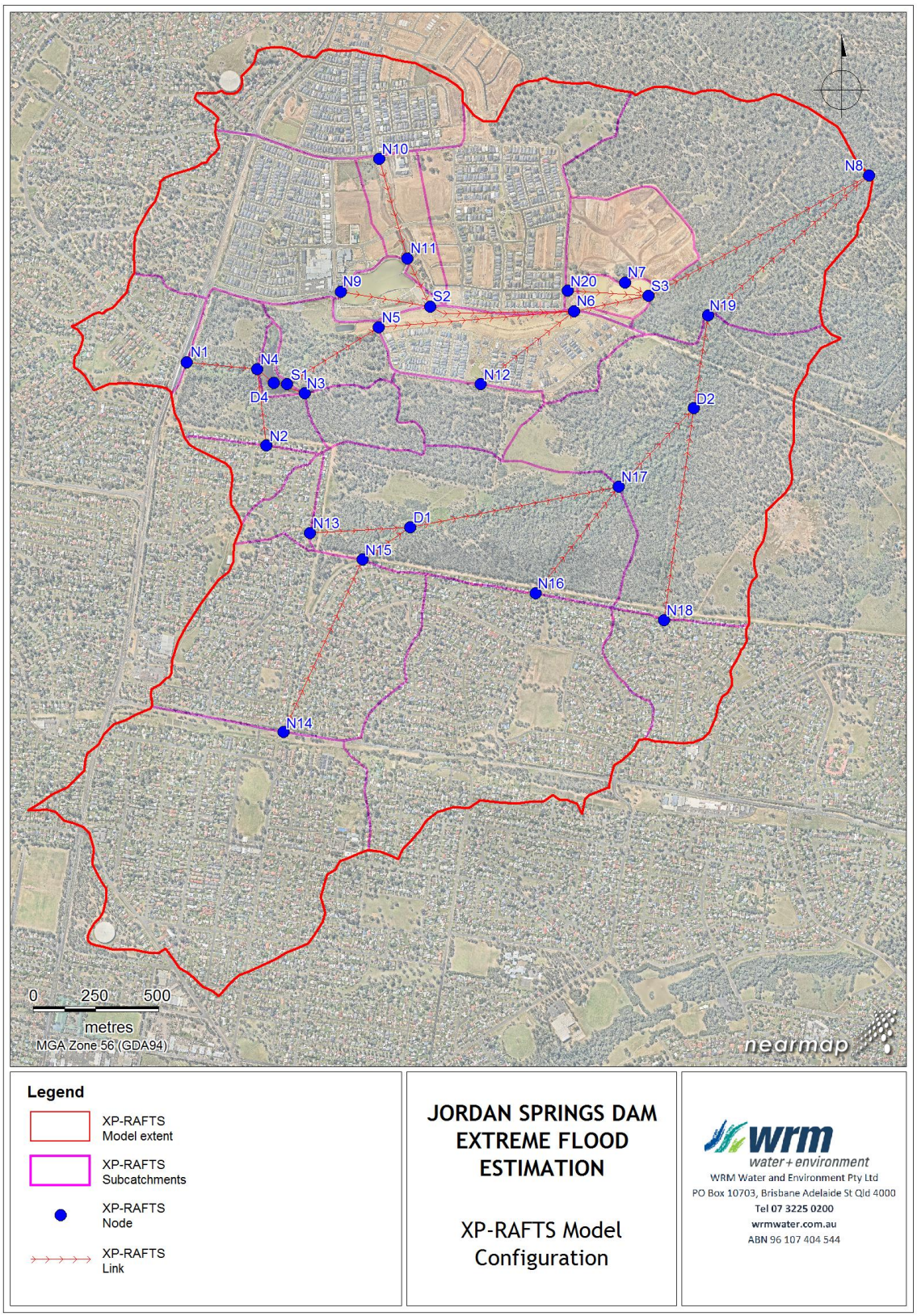

Figure 3.1 - Configuration of XP-RAFTS model

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The Secret Garden dam and detention basins in the Jordan Springs development were represented in the XP-RAFTS model using storage nodes. The stage-surface area-storage relationship for the dam was determined from the detailed survey and bathymetric data supplied. The adopted stage-storage relationship is shown in Table 3.3.

The spillway discharge rating curve was determined using the HEC-RAS model (USACE, 2010) of the dam crest developed from detailed survey data. The stage-discharge rating curve calculated using HEC-RAS and adopted in the XP-RAFTS model is shown in Table 3.4.

Storage parameters for the Jordan Springs detention basins were adopted based on storage surface area and an assumed depth of 3 m. Spillway discharges for the detention basins were calculated within the XP-RAFTS model based on a spillway coefficient of 1.7 and estimates of spillway width from aerial photographs and design drawings.

In the absence of better information, a uniform value of 0.2 was adopted for the XP-RAFTS routing link parameter 'X'. Values of the routing link parameter 'k' were calculated based on link length and an assumed flow velocity of 1.5 m/s for large open channels and 1 m/s for all other links.

Table 3.3 – Secret Garden Dam stage-storage relationship

Stage (mAHD)	Storage Volume (m^3)
37.2	0.00
37.5	23.0
38.0	962
38.5	3,089
39.0	6,682
39.5[1]	13,372
40.0	25,191
40.5	44,028

1. Full Supply Level

Table 3.4 – Secret Garden Dam spillway stage-discharge relationship

Stage (mAHD)	Discharge (m^3/s)
39.5	0.00
39.6	3.26
39.7	8.56
39.8	20.90
39.9	42.58
40.0	74.86
40.1	116.07
40.2	165.17
40.3	222.56
40.4	287.34
40.5	359.60

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3.3 MODEL VALIDATION

In the absence of recorded data against which to validate the XP-RAFTS model outputs, validation was carried out against Rational Method (RM) estimates of peak discharge. RM estimates of peak discharge were calculated using the methodology recommended for the estimation of peak flows in small to medium sized rural catchments in eastern New South Wales (Pilgrim, 1998). The XP-RAFTS model was modified to reflect pre-development (rural) conditions as follows:

- Uniform percent impervious of 2% and PERN 'n' of 0.05;
- Uniform initial loss of 15 mm and continuing loss of 2.5 mm/h;
- Routing link parameters calculated based on a uniform channel velocity of 1 m/s; and
- Removal of the Secret Garden dam and Jordan Springs development detention basins.

Table 3.5 compares RM and XP-RAFTS estimates of peak discharge for the 1% AEP design event at a selection of locations (see Figure 3.1). The comparison shows good agreement between RM and XP-RAFTS estimates of peak discharge.

Table 3.5 - Comparison of Rational Method and XP-RAFTS estimates of 1% AEP peak discharge

Node	Estimate of Peak Discharge (m3/s)		Difference
	RM	XP-RAFTS	
N1	2.70	2.50	-7%
S1	7.00	7.00	0%
S3	25.0	27.1	8%
N19	34.0	33.9	0%

Following validation, subcatchments and routing link parameters were modified to reflect existing levels of development and the completed Jordan Springs development. Full details of adopted subcatchments and routing link parameters are shown in Appendix A.

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4 Design rainfall

4.1 OVERVIEW

Estimates of design rainfall depths for a range of storm durations were required for the 1-in-10,000 AEP, 1-in-100,000 AEP and Probable Maximum Precipitation (PMP) design events. PMP depths were estimated using the methodology provided by the Commonwealth Bureau of Meteorology (BoM) (BoM, 2003). Rainfall depths for the 1-in-10,000 AEP and 1-in-100,000 AEP events were derived using the interpolation methodology provided in Australian Rainfall & Runoff (AR&R) (Pilgrim, 1998). Preliminary XP-RAFTS model runs indicated that critical storm durations for the modelled catchment did not exceed 2 hours and so design rainfall depths were calculated for durations up to 6 hours only.

4.2 PMP ESTIMATES

PMP design event depths were estimated using the methodologies provided by BoM. Depths for design events up to six hours duration were estimated using the Generalised Short Duration Method (GSDM) (BoM, 2003). The following parameters were adopted in the calculation of GSDM PMP depths:

- Elevation Adjustment Factor of 1.0;
- Moisture Adjustment Factor of 0.695; and
- 100% of the catchment was considered rough due to proximity to rough terrain in the Blue Mountains National Park.

Table 4.1 shows the preliminary estimates of PMP depth (rounded to the nearest 10 mm) for durations between 15 minutes and 6 hours.

Table 4.1 - Preliminary PMP depth estimates

Event Duration (h)	Rainfall Depth (mm)
0.25	150
0.5	220
0.75	280
1	330
1.5	420
2	490
2.5	550
3	590
4	680
5	740
6	790

Spatial distribution of the GSDM PMP depths was examined using the ellipse methodology provided in BoM (2003). The entire XP-RAFTS catchment was enclosed within the B ellipse and the PMP depths for the A & B ellipses were found to be similar. The GSDM PMP rainfall depths for the A ellipse were between 4% and 7% higher than the preliminary PMP estimates and were adopted as conservative estimate of GSDM PMP depth for all subcatchments.

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4.3 DESIGN RAINFALL ESTIMATES

Estimates of the 1-in-10,000 AEP and 1-in-100,000 AEP design rainfall depths were made by interpolating between the 1% AEP and the PMP as described by AR&R (Pilgrim, 1998). Table 4.2 shows the adopted rainfall depths for all design events for durations between 15 minutes and 6 hours.

Table 4.2 - Adopted design rainfall depths for durations between 0.25 to 6 hours

Duration (h)	Rainfall Depth (mm)		
	1-in-10,000 AEP	1-in-100,000 AEP	PMP
0.25	69.0	92.3	161
0.5	96.7	131	234
0.75	118	161	295
1	134	185	343
1.5	161	224	442
2	181	255	517
2.5	198	281	571
3	217	307	626
4	238	339	716
5	258	368	789
6	277	395	834

4.4 DESIGN RAINFALL TEMPORAL PATTERNS

GSDM PMP temporal patterns were adopted from BoM (2003) for the PMP design storms. As recommended in AR&R (Pilgrim, 1998), PMP temporal patterns were also adopted for the 1-in-10,000 AEP and 1-in-100,000 AEP design storms.

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5 Design flood estimation

The XP-RAFTS model was run with the adopted design rainfall depths to estimate design flood discharges for the 1-in-10,000 AEP, 1-in-100,000 AEP and Probable Maximum Flood (PMF) events. For a conservative result, it was assumed in the XP-RAFTS model that the Secret Garden Dam and the two Jordan Springs development detention basins were full at the commencement of all events.

Table 5.1 shows the peak discharges and critical storm durations for the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF events at a number of locations, (see Figure 3.1).

Table 5.1 - Peak discharges and critical storm durations at selected locations

Location	1-in-10,000 AEP		1-in-100,000 AEP		PMF	
	Peak Discharge (m^3/s)	Critical Duration (h)	Peak Discharge (m^3/s)	Critical Duration (h)	Peak Discharge (m^3/s)	Critical Duration (h)
N4[1]	24.0	0.25	33.5	0.25	63.8	0.25
D4[1]	25.6	0.5	36.1	0.5	70.8	0.5
S1[2]	25.1	0.5	35.6	0.5	70.4	0.5
N3[3]	3.32	1	4.97	1	10.2	1
N5[3]	5.78	0.5	8.48	0.5	17.3	0.5
S2[2]	46.9	0.5	67.4	0.5	134	0.5
N12[3]	5.26	1	7.59	1	15.1	1
N6[3]	18.6	0.25	26.3	0.25	51.2	0.25
N20[3]	27.0	0.25	39.0	0.25	75.6	0.25
N7[3]	14.3	0.25	20.0	0.25	37.1	0.25
S3[3]	1.91	0.5	2.74	0.5	5.46	0.5
S3[2]	93.2	1	135	1	271	1
N19[1]	129	1	184	1	383	1.5
N8[3]	21.1	2	31.8	2	72.2	1.5
N8[1]	219	1.5	316	1.5	650	1.5

1. Total discharge from catchment upstream of this location

2. Outflow from storage node

3. Discharge from local subcatchment only

Figure 5.1 shows the design discharge (outflow) hydrographs from Secret Garden Dam (XP-RAFTS node S1) for the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF events respectively for the critical storm duration events. XP-RAFTS estimates of peak water level in Secret Garden Dam are 39.82 mAHD, 39.87 mAHD and 39.99 mAHD for the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF events respectively.

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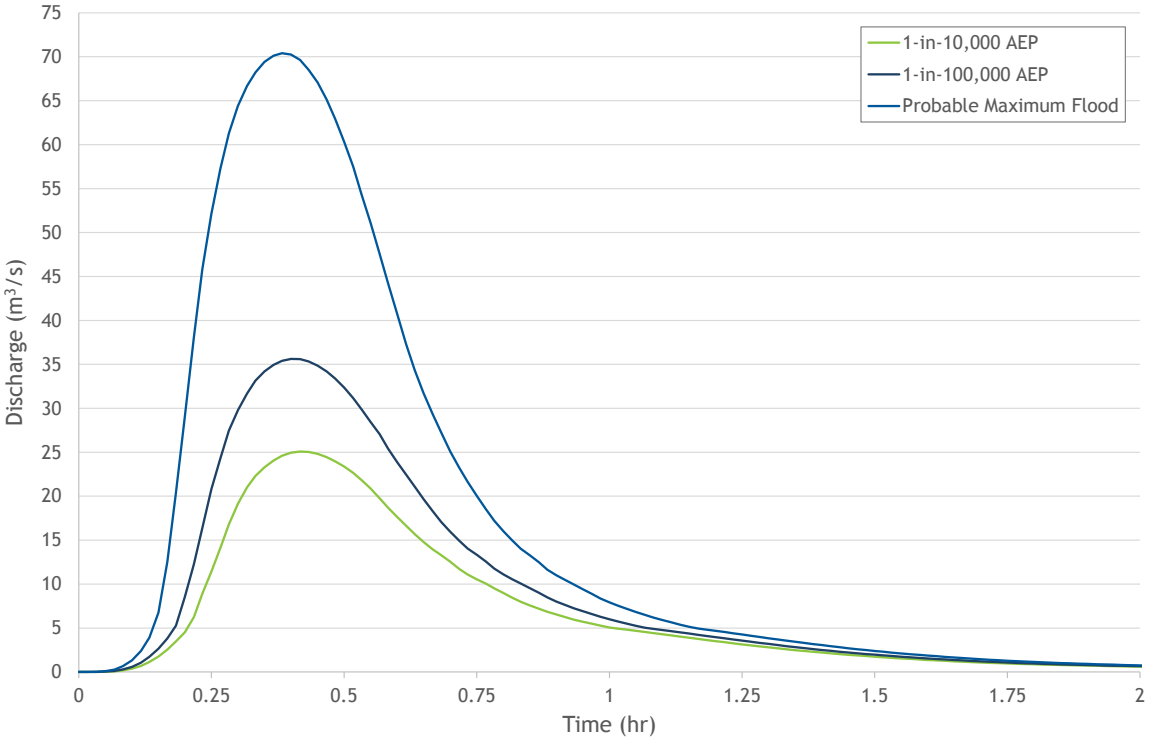

Figure 5.1 – XP-RAFTS critical duration event discharge hydrographs for Secret Garden Dam

Design discharge hydrographs for all modelled storm durations for the 1-in-10,000 AEP, 1-in-100,000 AEP and PMF events at selected output locations are provided in Appendix B, Appendix C and Appendix D respectively. Figure 5.2 shows the various output locations, which are described in Table 5.2.

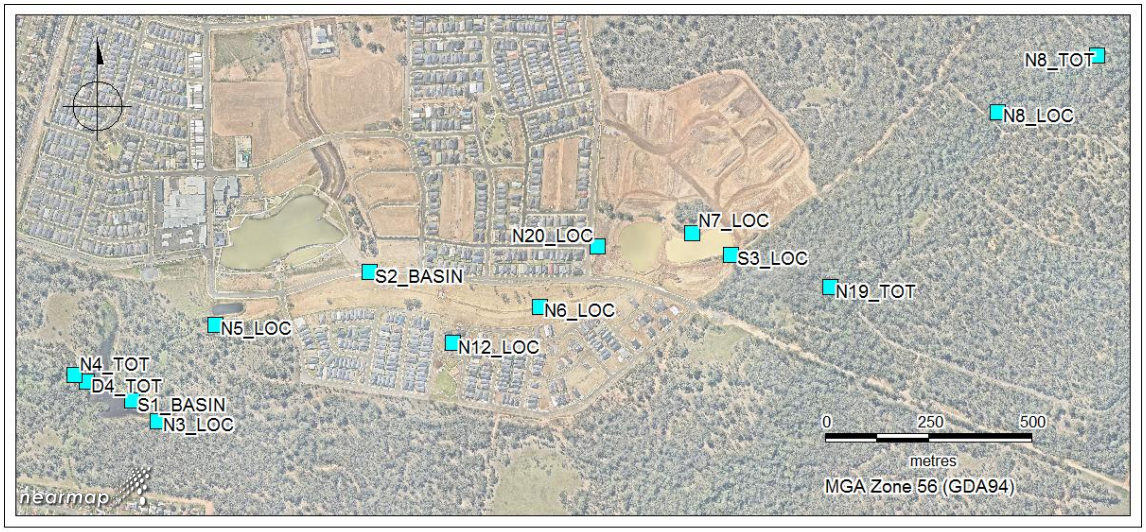

Figure 5.2 – Design discharge hydrograph reporting locations

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Table 5.2 – Design discharge hydrograph reporting locations

Location	Description
N3_LOC	Local catchment inflow. Directed by bunds to Secret Garden Dam.
N4_TOT	Combined inflows to Secret Garden Dam. Excludes N3_LOC
D4_TOT	Combined inflows to Secret Garden Dam. Includes N3_LOC & N4_TOT
S1_BASIN	Total outflow from Secret Garden Dam
N5_LOC	Local catchment inflow
S2_BASIN	Total outflow from detention basin adjacent to Village Centre
N12_LOC	Local catchment inflow
N6_LOC	Local catchment inflow
N20_LOC	Local catchment inflow
N7_LOC	Local catchment inflow
S3_LOC	Local catchment inflow
N19_TOT	Combined inflows from gully to the South of Jordan Springs
N8_LOC	Local catchment inflow
N8_TOT	Total model outflow

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6 References

BoM (2003)	*'The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method'*, Commonwealth of Meteorology, 2003
Nearmap (2015)'	*'PhotoMaps Portal'*, nearmap Australia Pty Ltd, Accessed March 2015
Pilgrim (1998)	Pilgrim, DH, (ed)., '*Australian Rainfall & Runoff - A Guide to Flood Estimation'*, Institution of Engineers, Australia, Barton, ACT, 1998
USACE (2010)	'*HEC-RAS User's Manual*', US Army Corps of Engineers, 20103
XP Software (2013)	*'XP-RAFTS User Manual'*, XP Software, 2013

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Appendix A – XP-RAFTS model parameters

Table A.1 – XP-RAFTS subcatchments parameters

Node	Area (ha)	Slope (%)	Percent Impervious (%)	PERN 'n'
N1	16.6	2.56	50.0	0.045
N2	7.16	1.75	50.0	0.045
N3	9.46	0.62	2.00	0.050
N4	21.9	1.76	7.82	0.049
N5	13.3	0.62	22.1	0.047
N6	27.0	1.40	39.8	0.043
N7	17.2	1.40	49.9	0.042
N8	85.2	0.96	2.00	0.050
N9	50.1	1.40	57.0	0.041
N10	34.3	1.40	50.5	0.042
N11	11.5	1.00	32.3	0.044
N12	12.9	2.18	2.00	0.050
N13	6.49	1.87	50.0	0.045
N14	97.8	1.15	47.5	0.045
N15	61.4	1.05	50.0	0.045
N16	83.2	1.54	46.5	0.045
N17	61.8	0.75	2.00	0.050
N18	20.0	1.11	50.0	0.045
N19	86.3	1.13	2.0	0.050
N20	40.3	1.40%	44.3	0.043
S1	0.00	0.00	100	0.010
S2	6.70	0.00	100	0.010
S3	3.85	0.00	100	0.010
D1	0.00	0.00	2.0	0.050
D2	0.00	0.00	2.0	0.050
D4	2.33	0.00	2.0	0.050

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Table A.2 – XP-RAFTS routing link parameters

Link	Length (m)	Channel Routing 'K' (hr)	Channel Routing 'X'
D1-N17	896	0.25	0.2
D2-N19	429	0.12	0.2
N12-N6	571	0.16	0.2
N13-D1	406	0.11	0.2
N14-N15	808	0.22	0.2
N15-D1	234	0.07	0.2
N16-N17	601	0.17	0.2
N17-D2	514	0.14	0.2
N18-D2	1024	0.28	0.2
N19-N8	1027	0.29	0.2
N20-S3	350	0.1	0.2
N3-S1	90	0.03	0.2
N4-S1	150	0.04	0.2
N5-N6	809	0.15	0.2
N6-S3	350	0.10	0.2
S3-N8	1276	0.35	0.2
N9-S2	450	0.13	0.2
S1-N5	520	0.10	0.2
N7-S3	150	0.04	0.2
N1-N4	321	0.09	0.2
N2-N4	227	0.06	0.2
N10-N11	469	0.09	0.2
N11-S2	300	0.08	0.2
S2-N6	608	0.11	0.2

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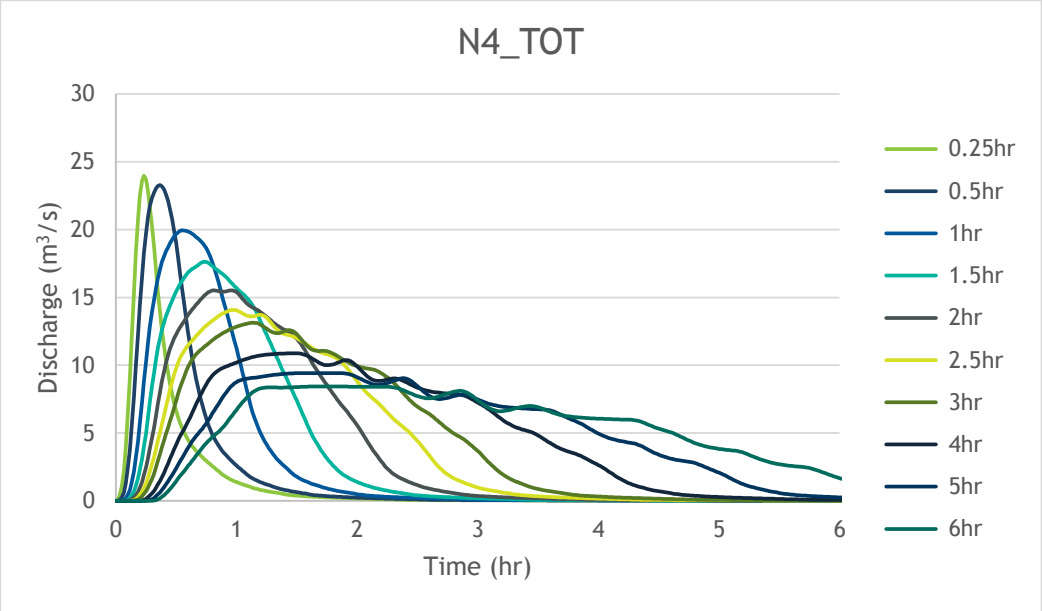
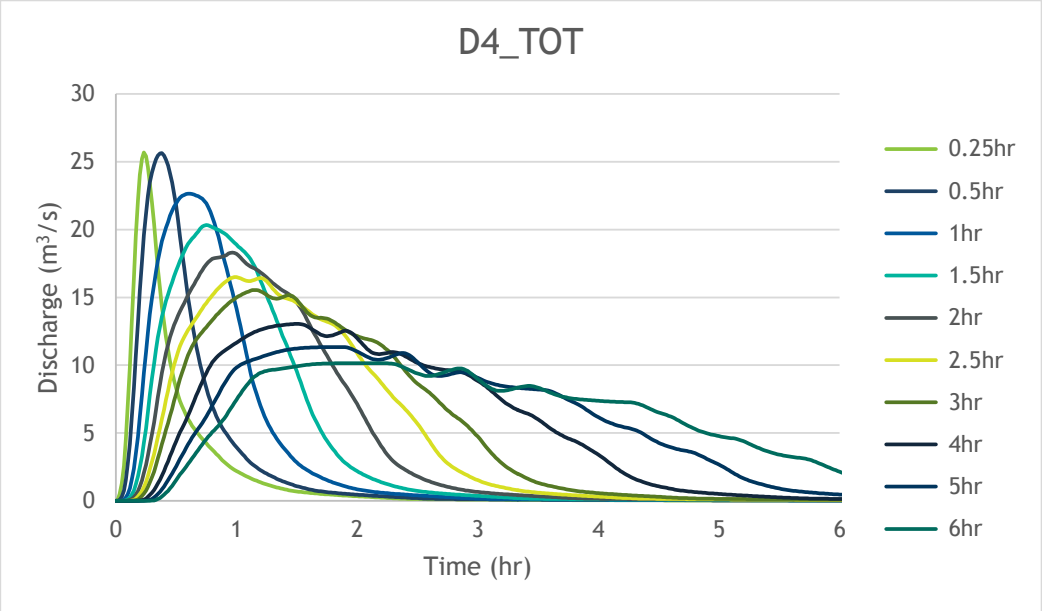
Appendix B - **1-in-10,000 AEP hydrographs**





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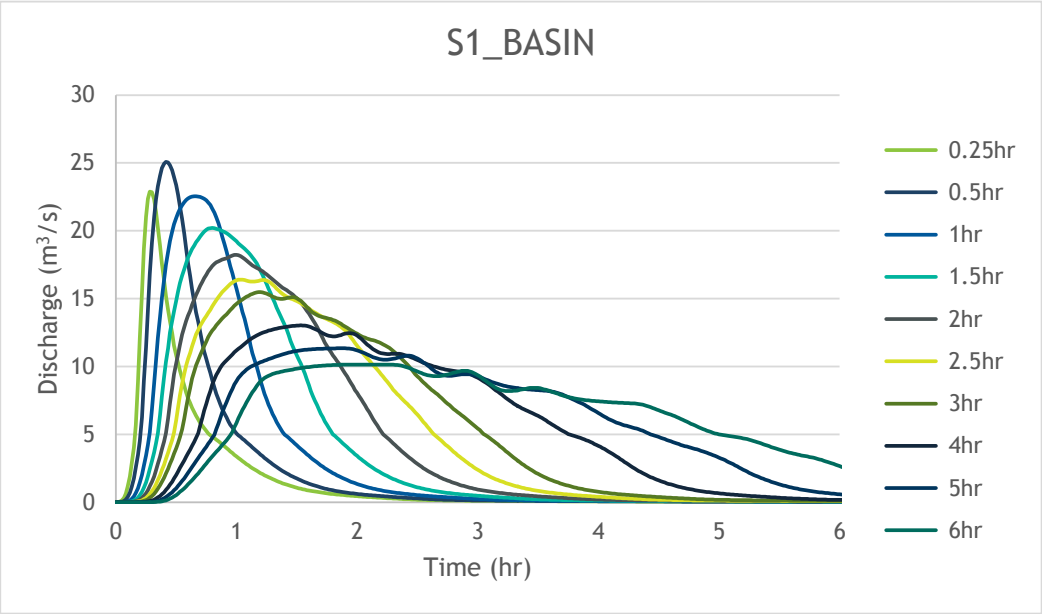

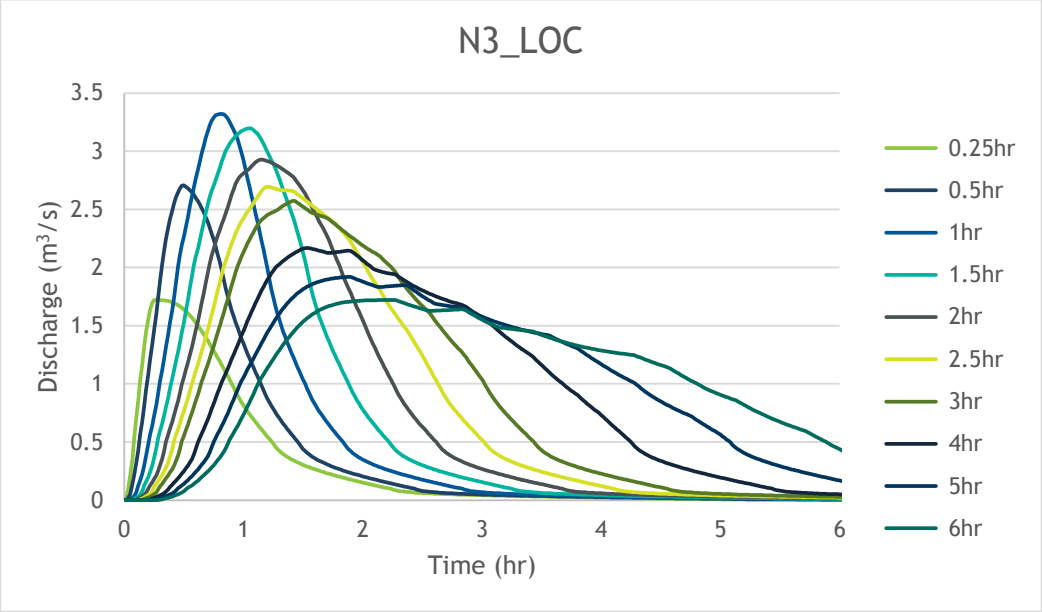

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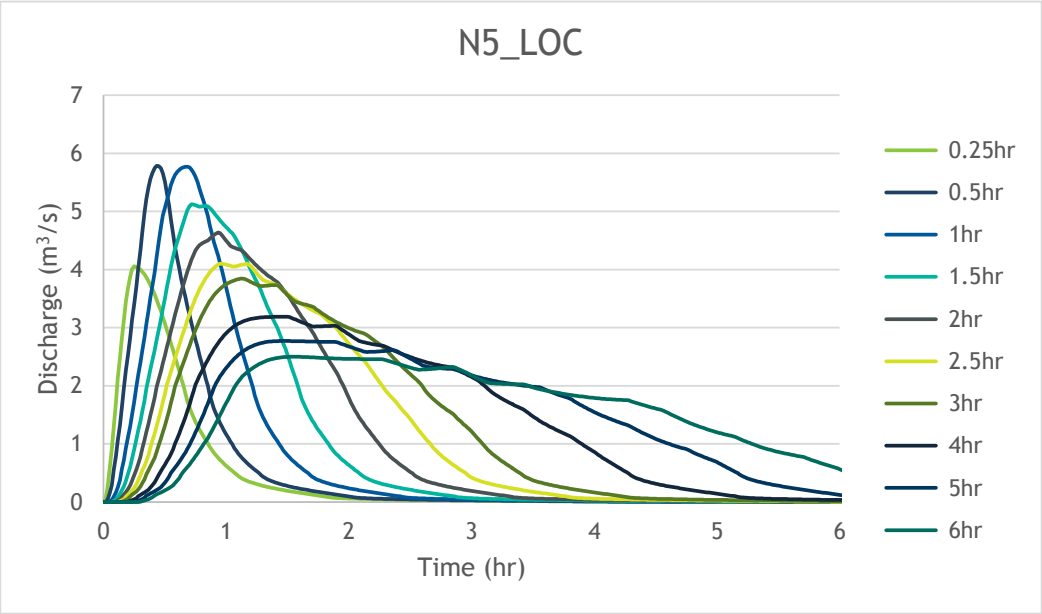

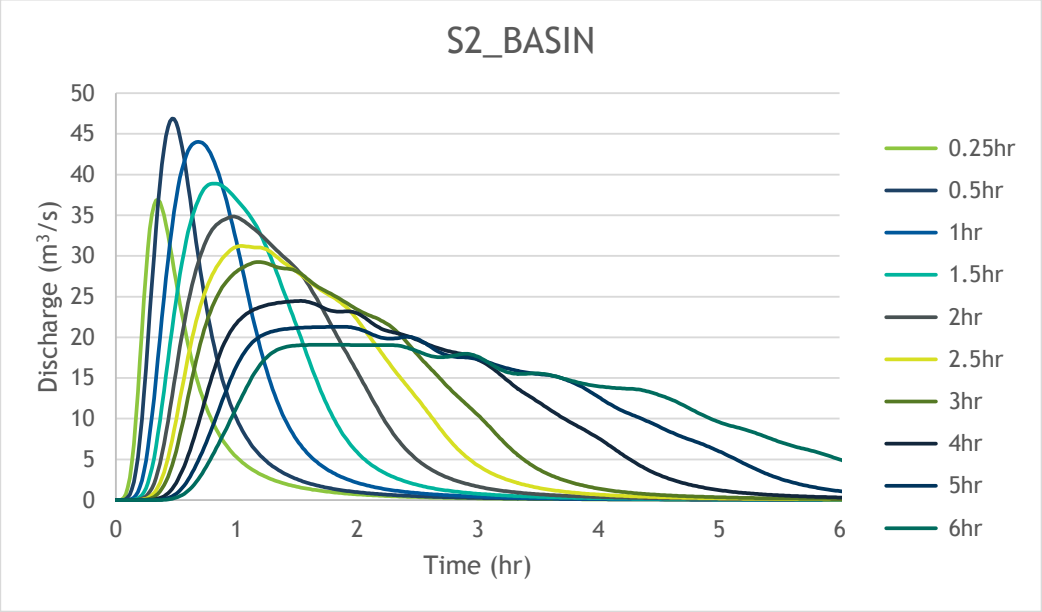

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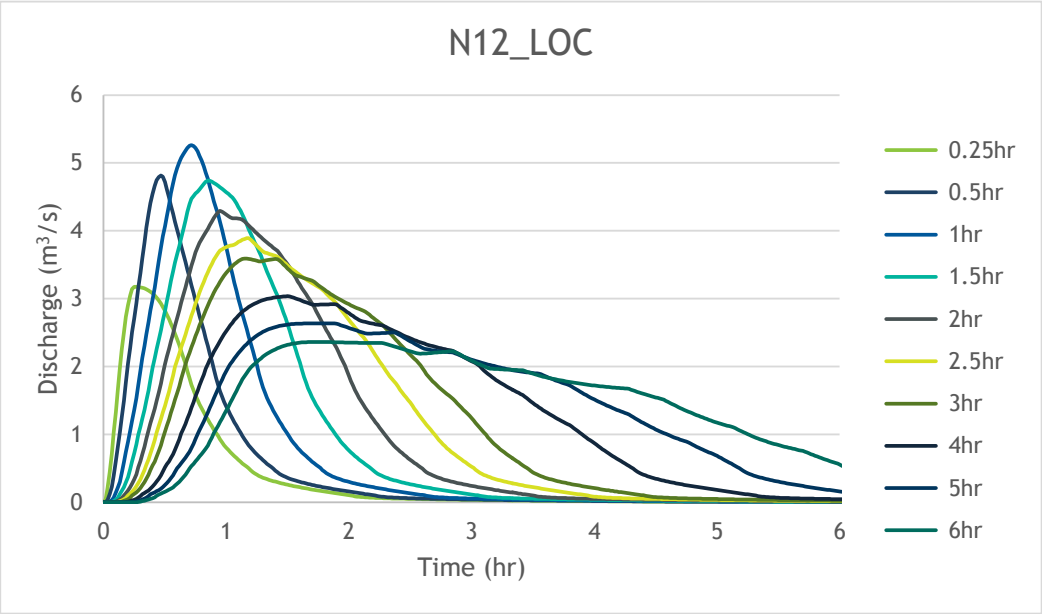

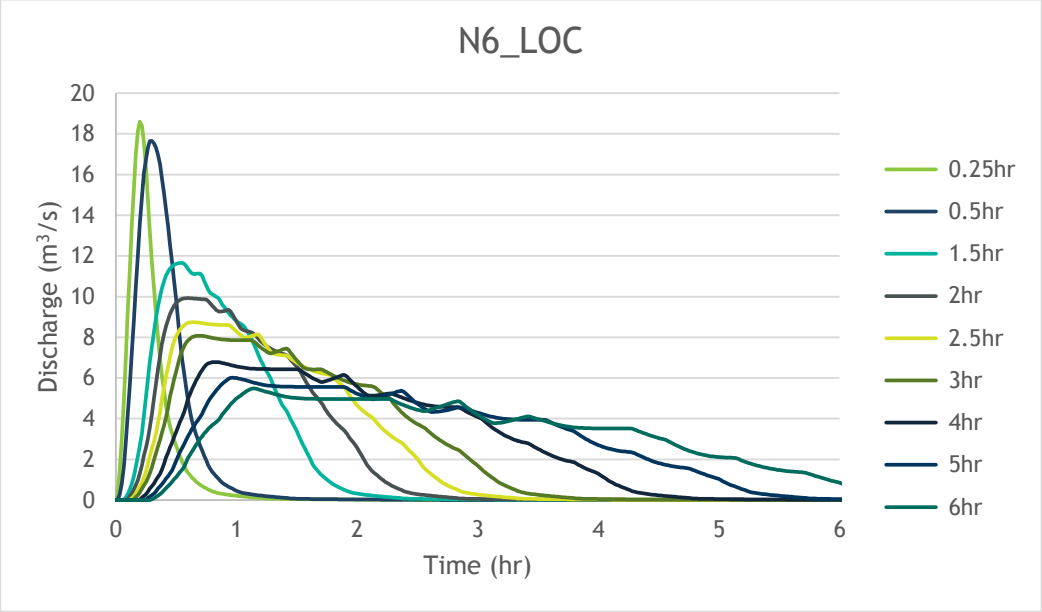

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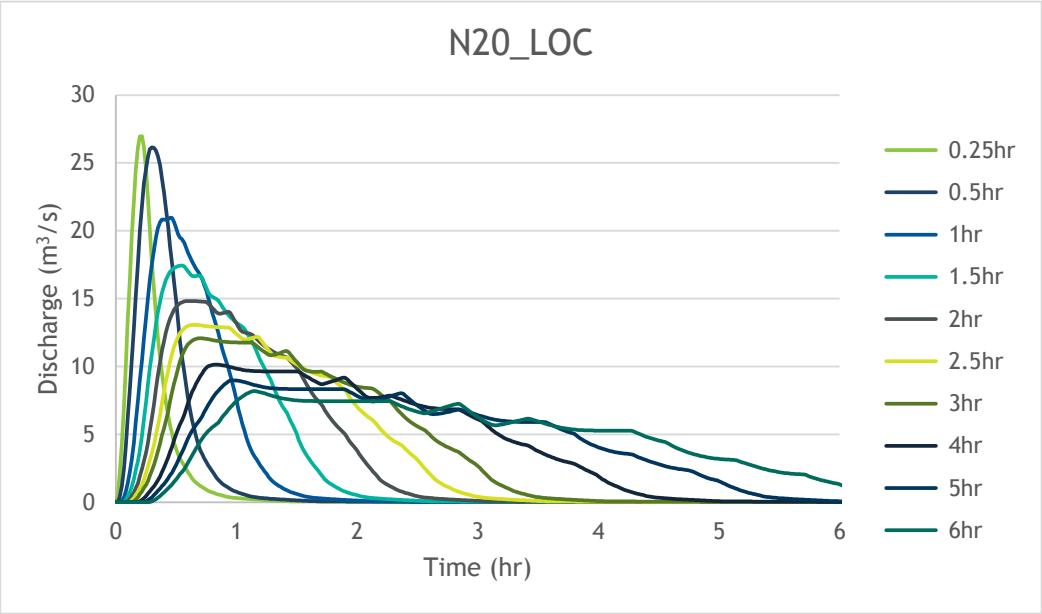

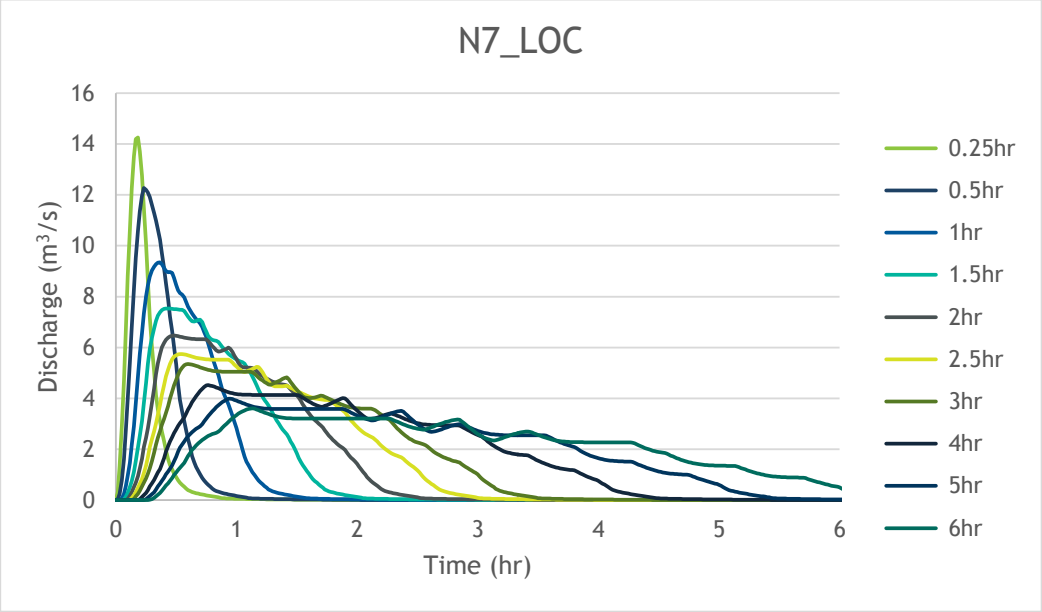

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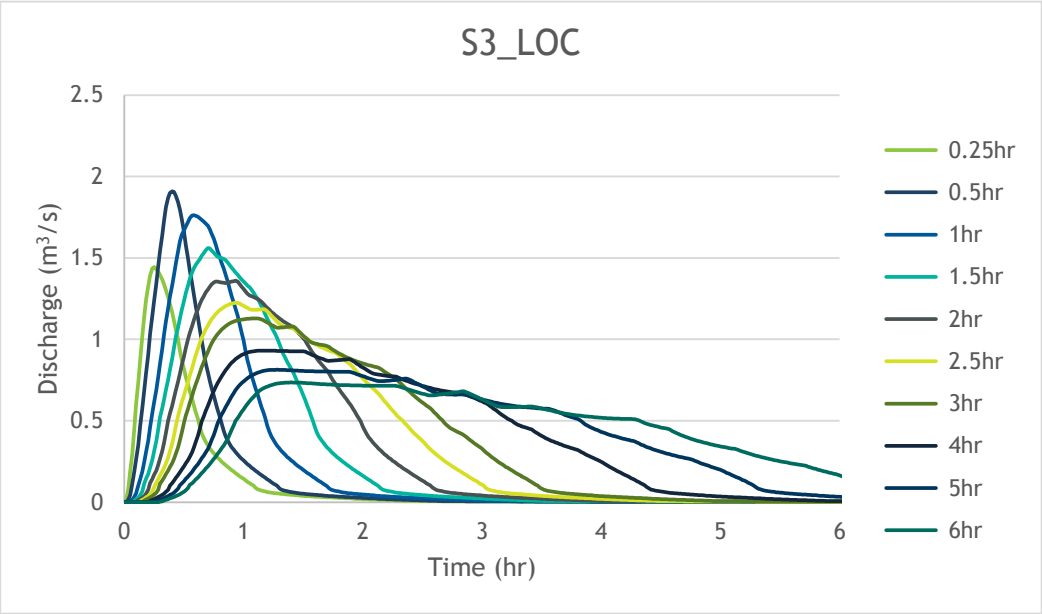

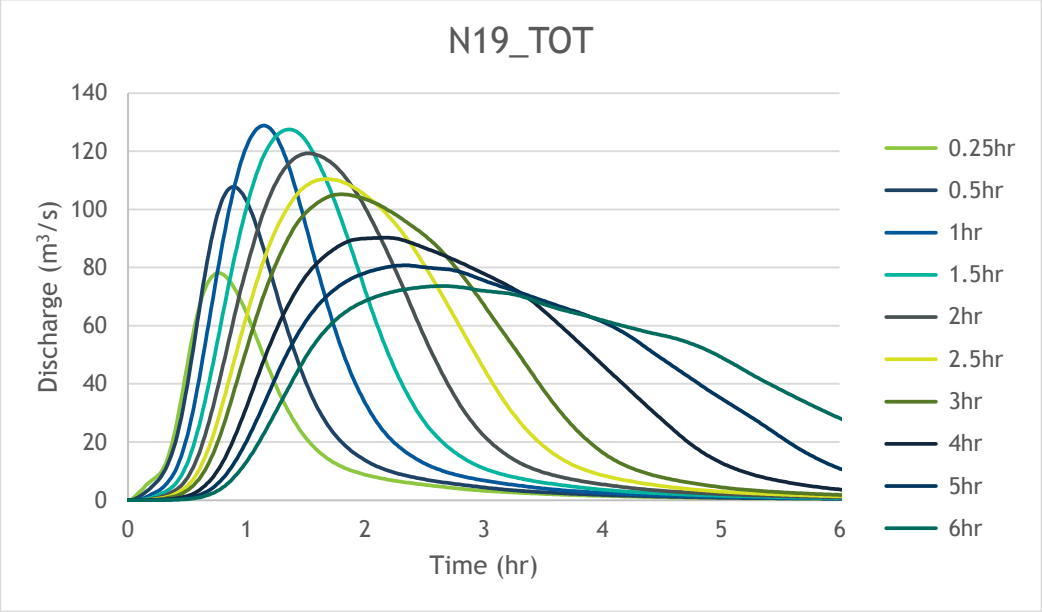

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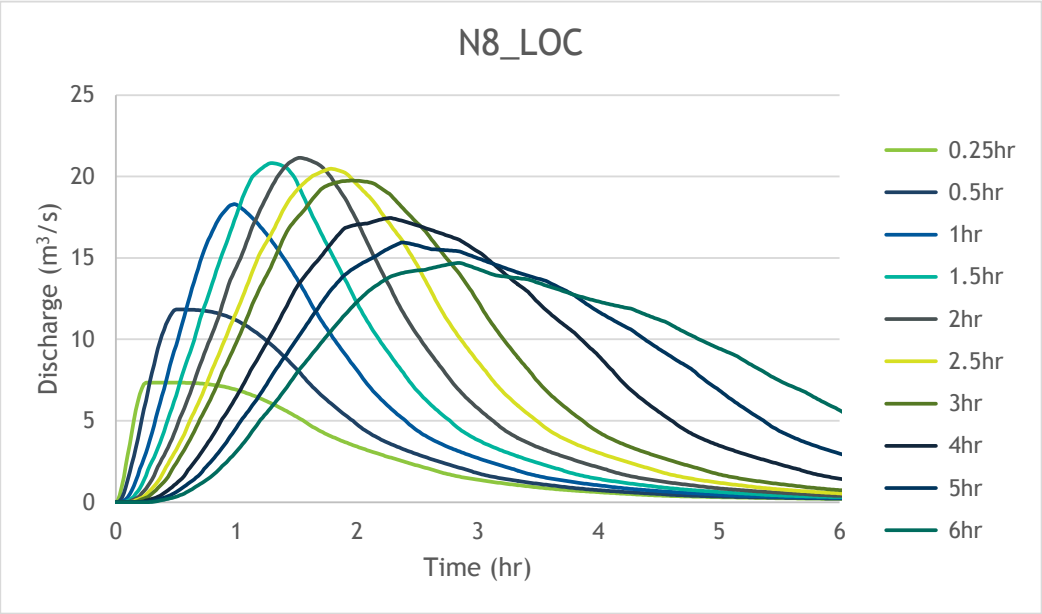

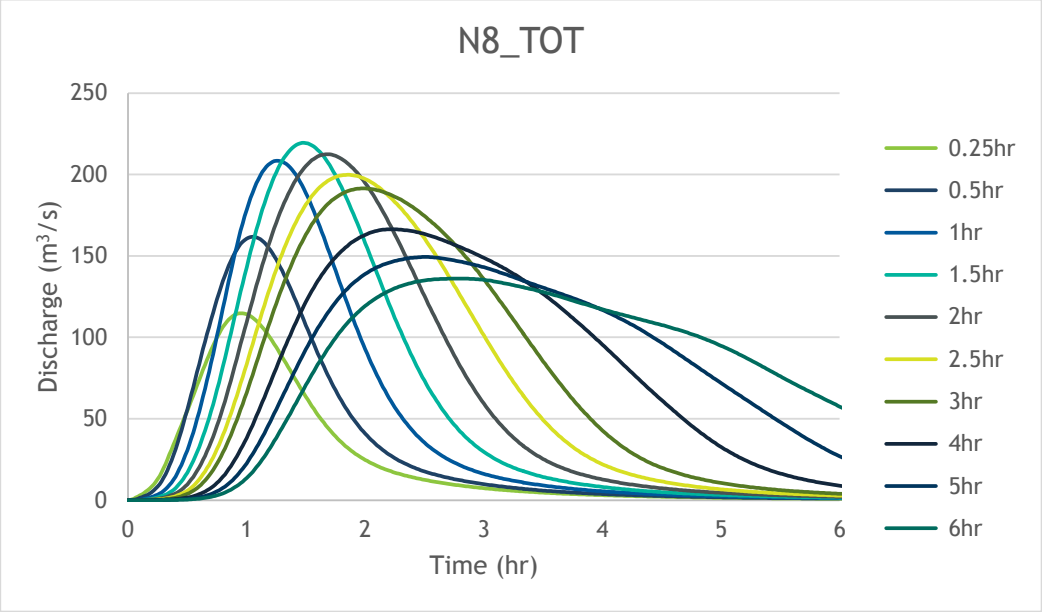

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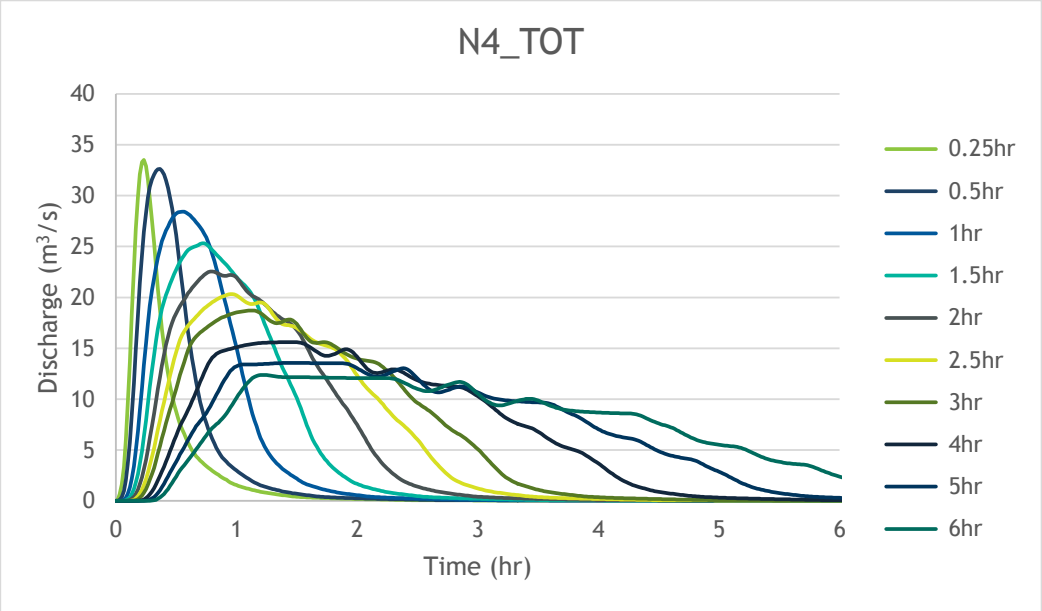
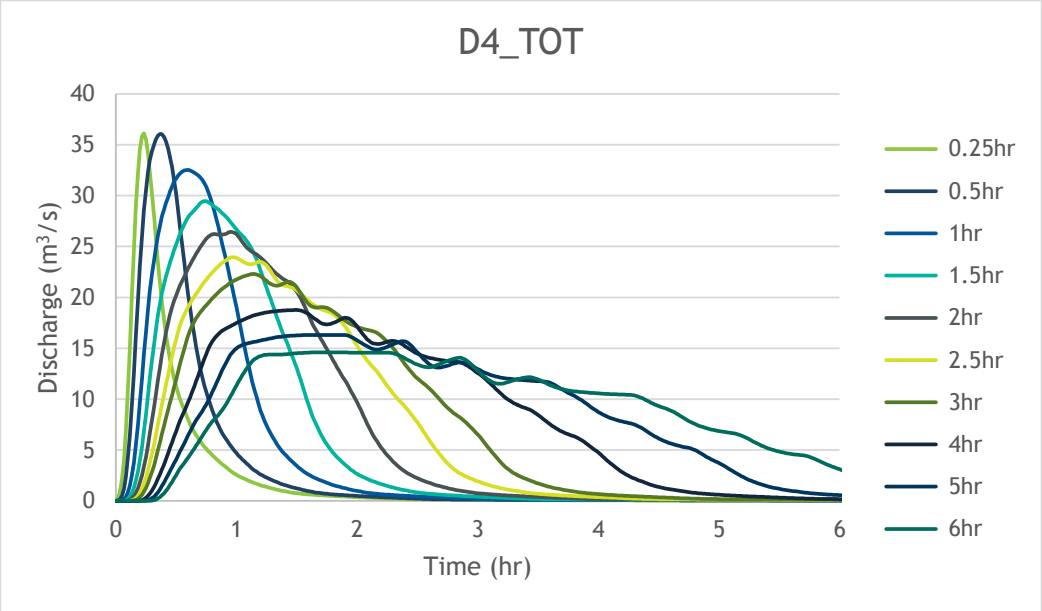
Appendix C - 1-in-100,000 AEP hydrographs





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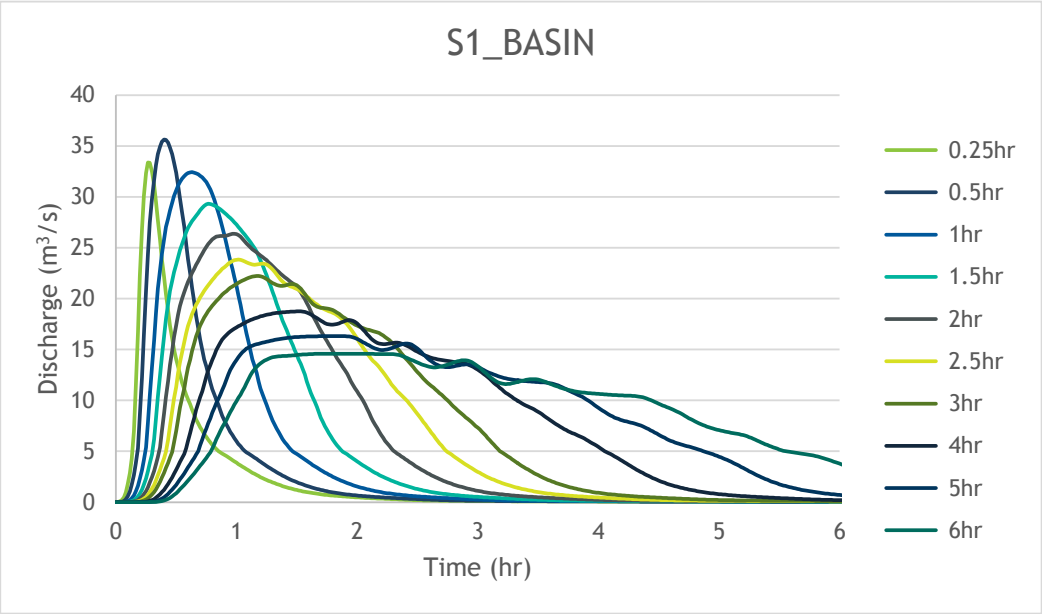

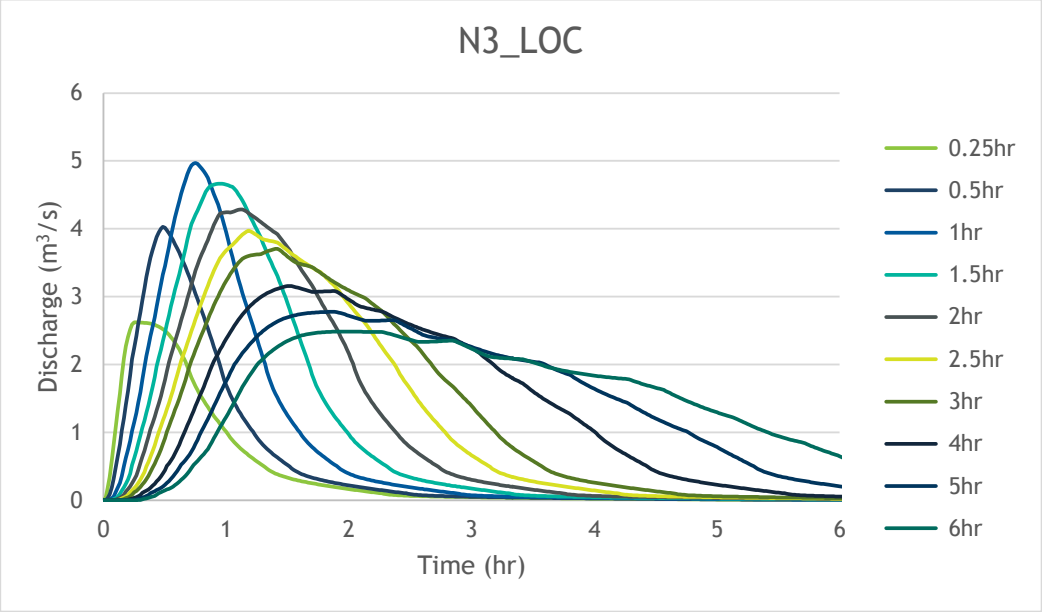

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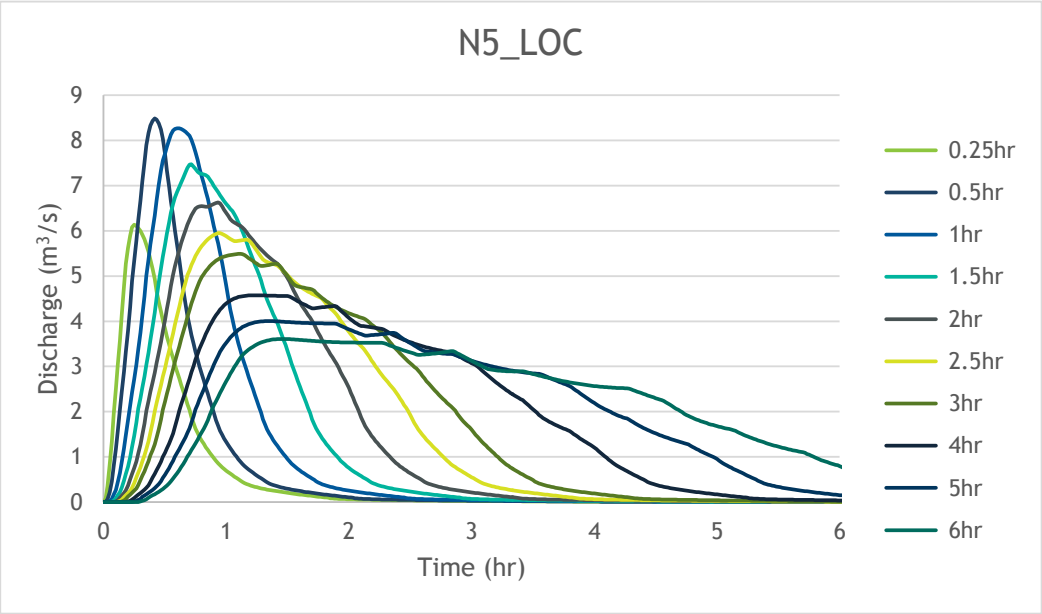

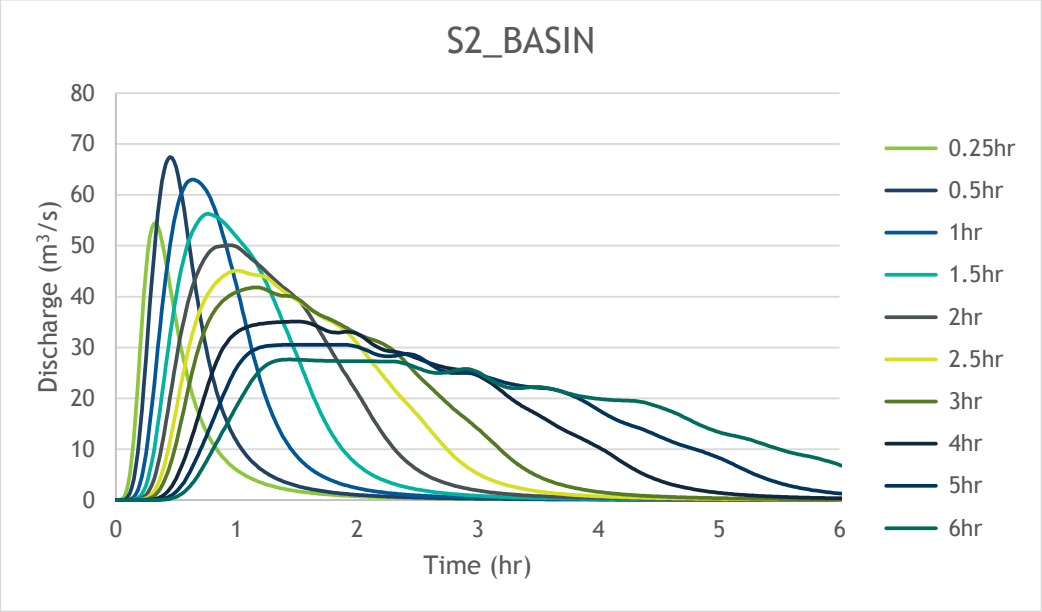

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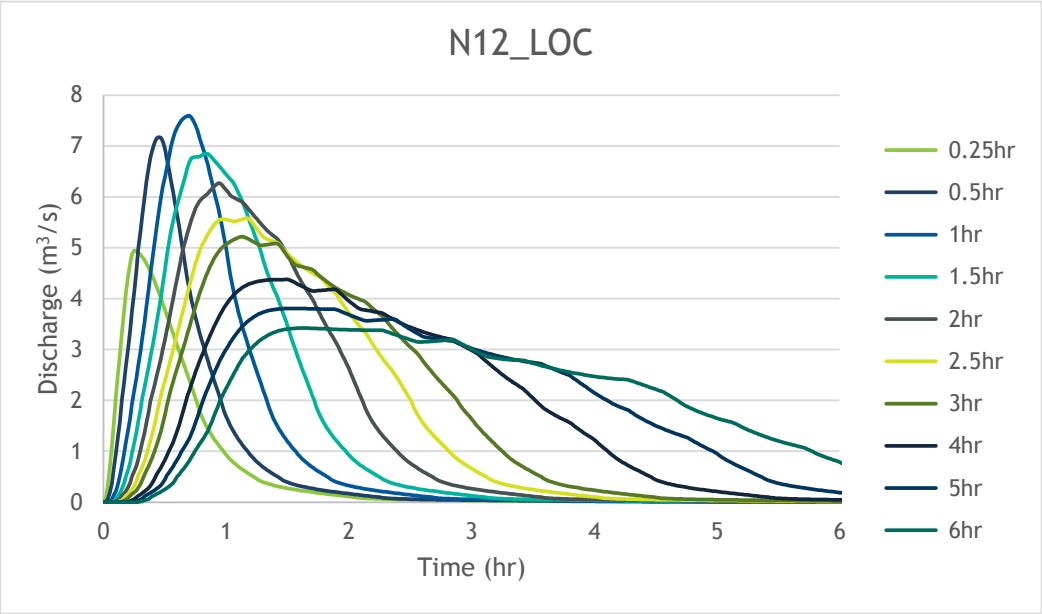

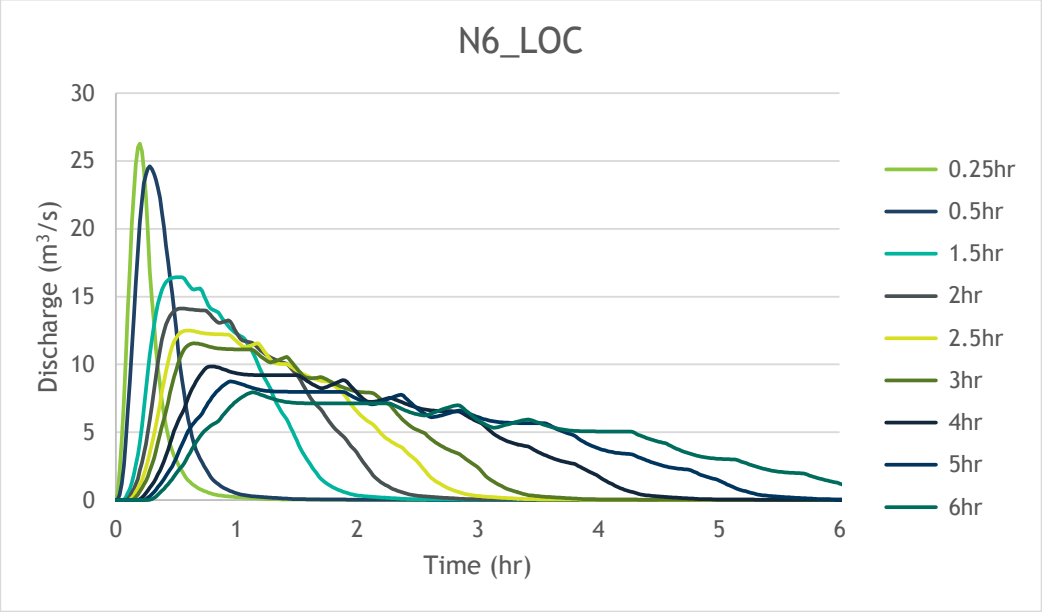

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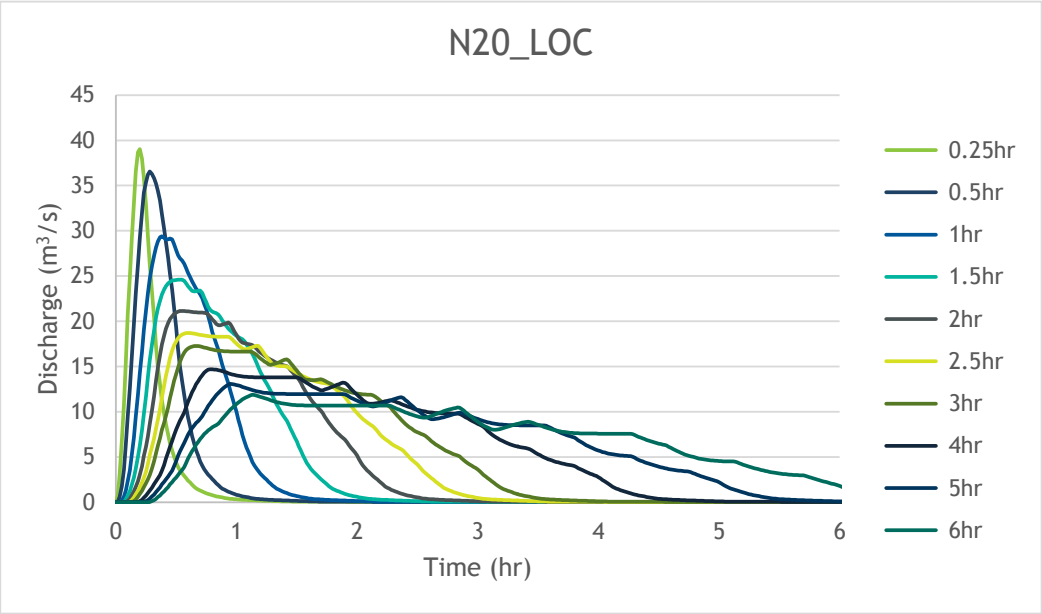

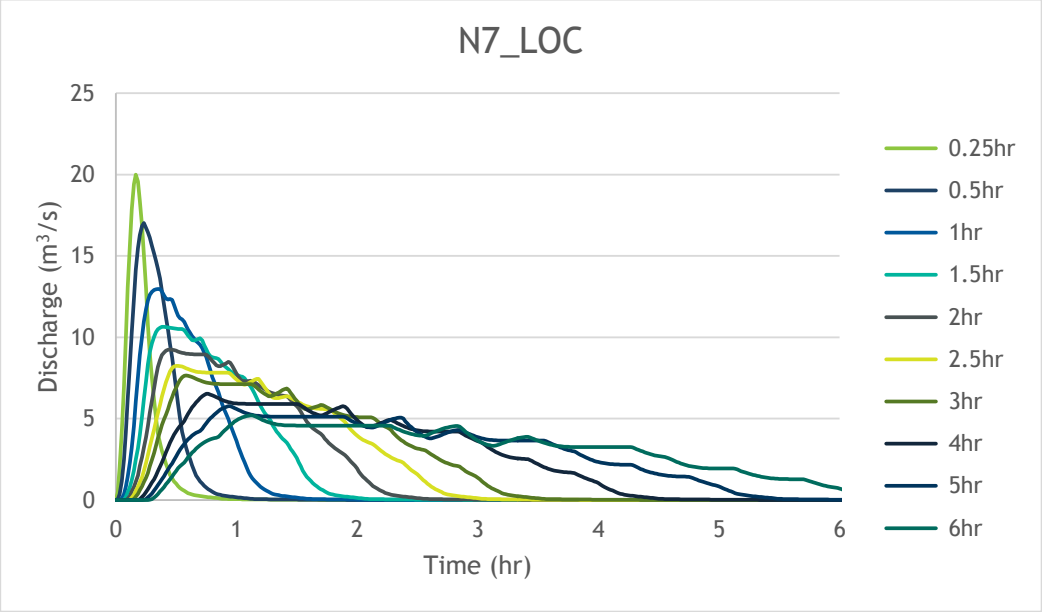

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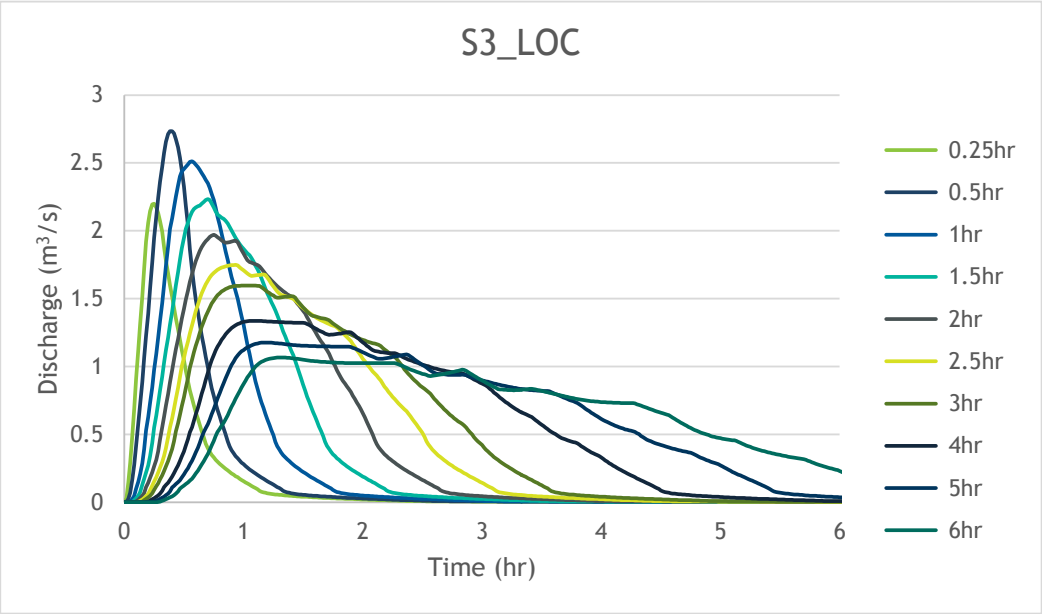

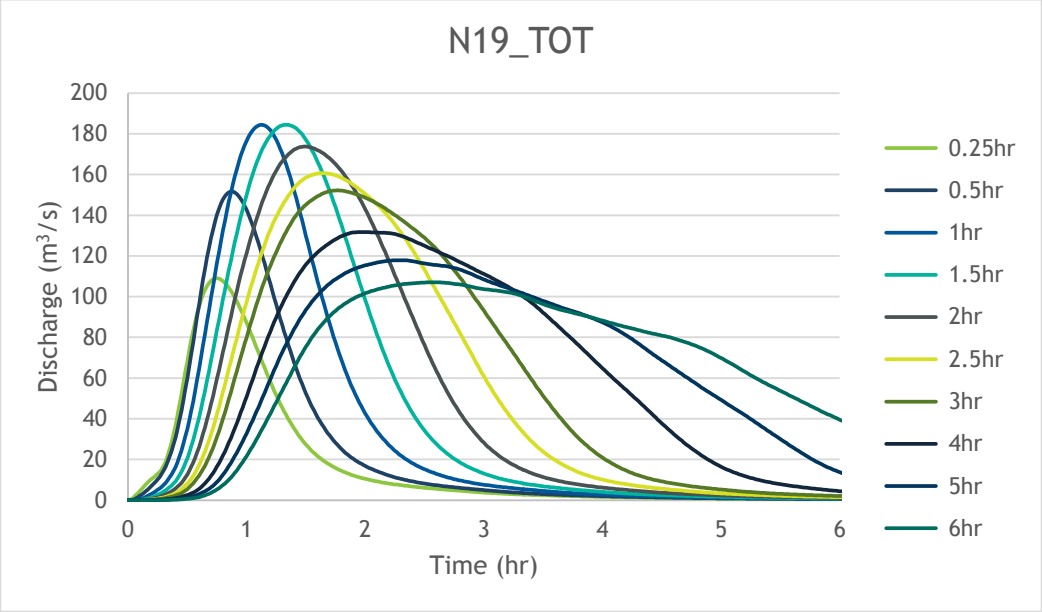

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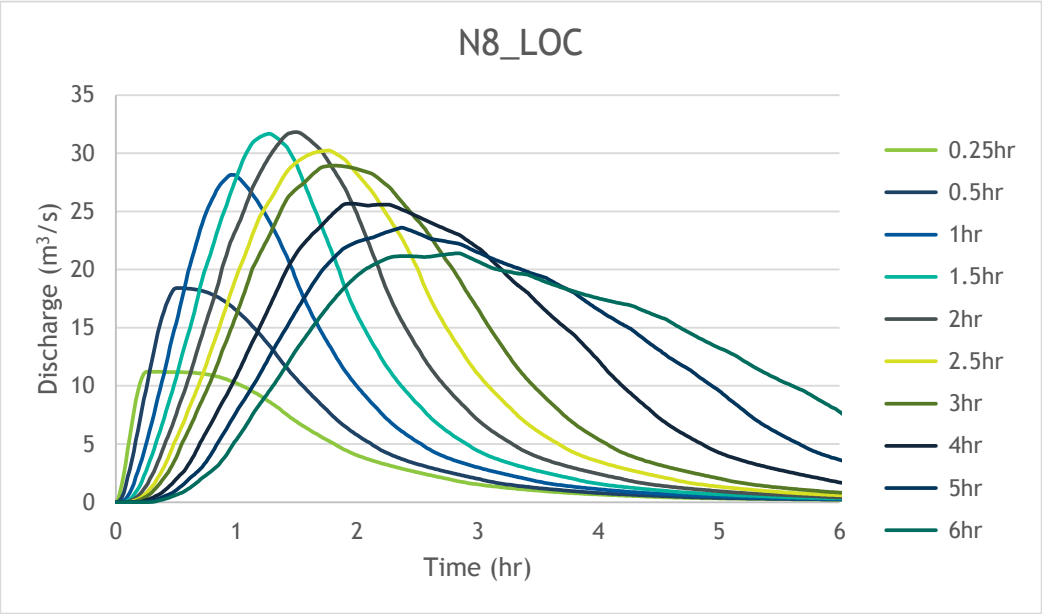

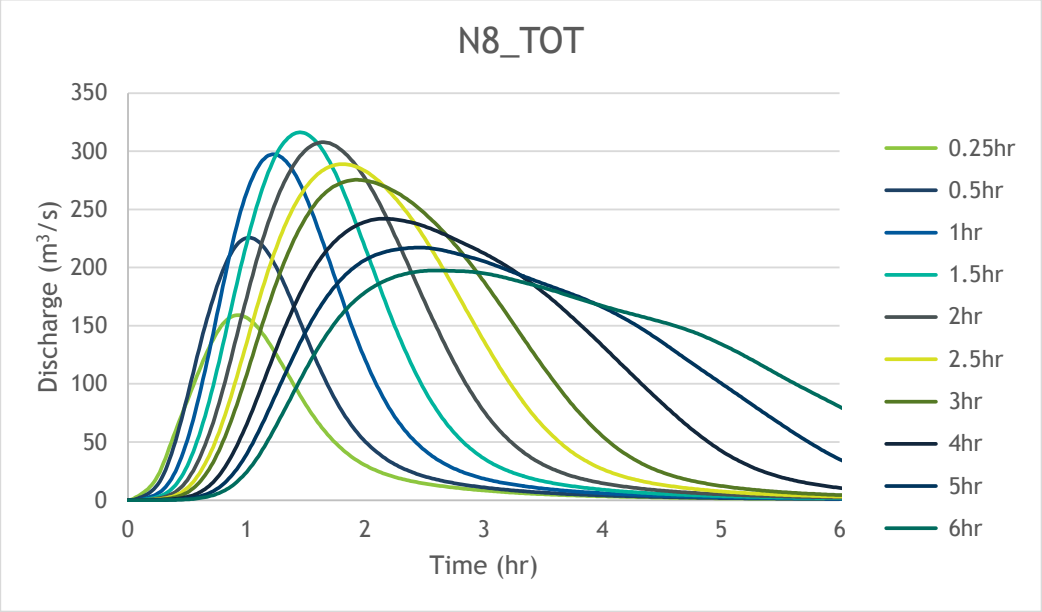

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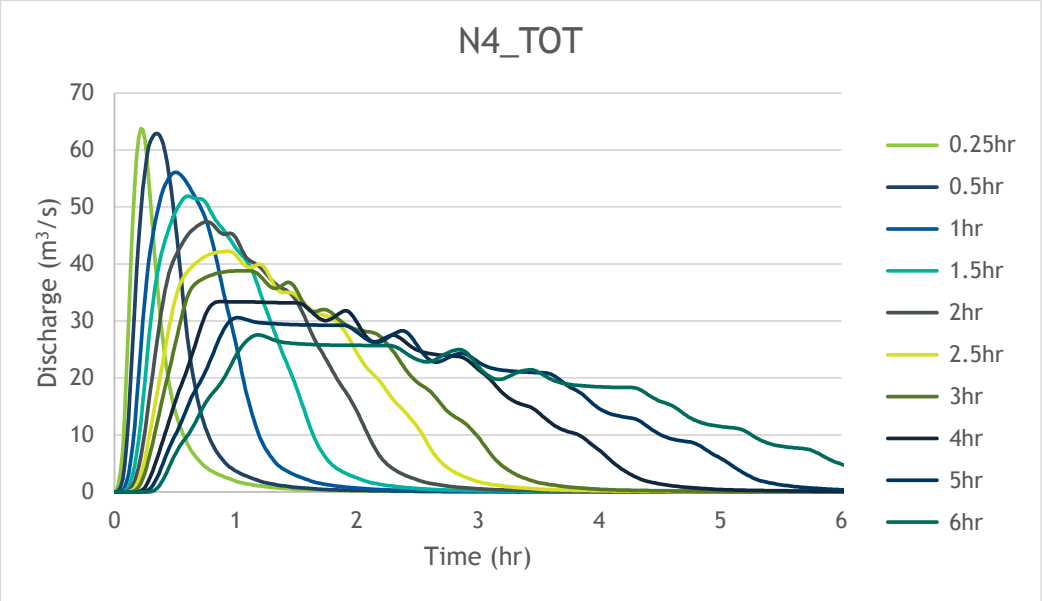
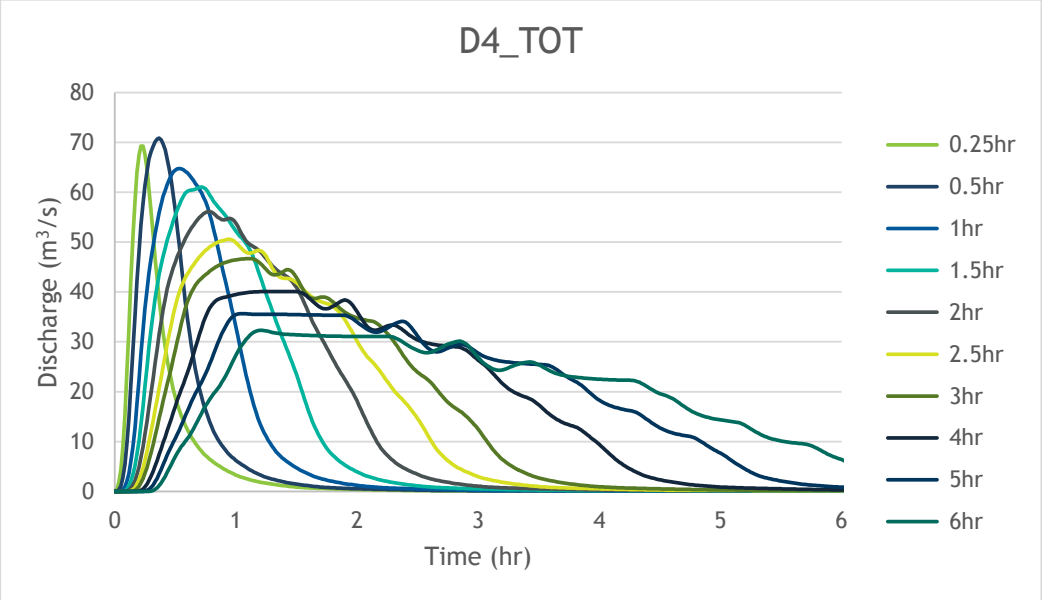
Version: 1, Version Date: 13/07/2018

Appendix D - **PMF hydrographs**





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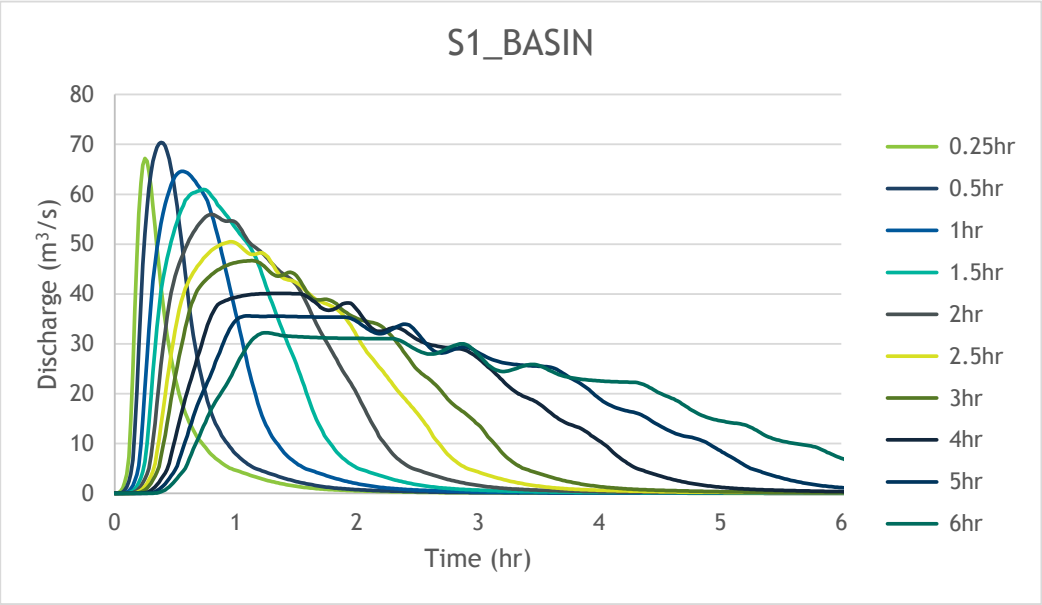

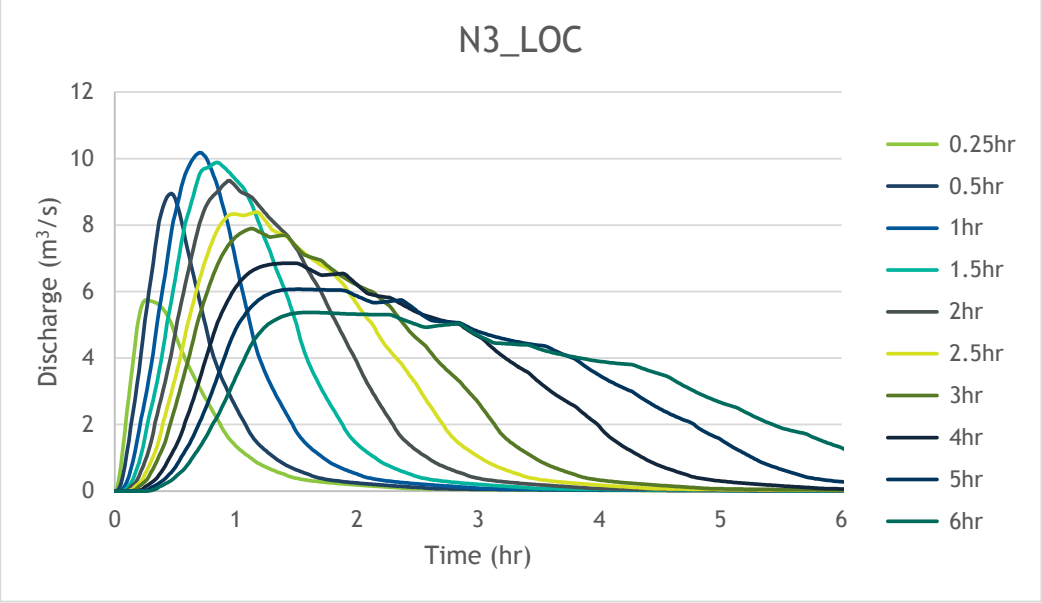

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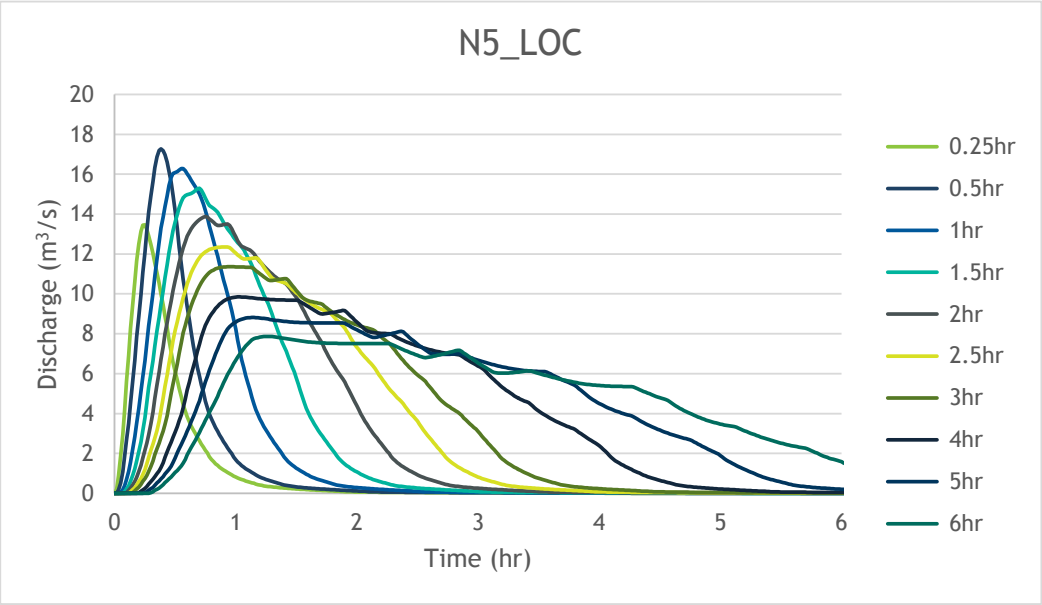

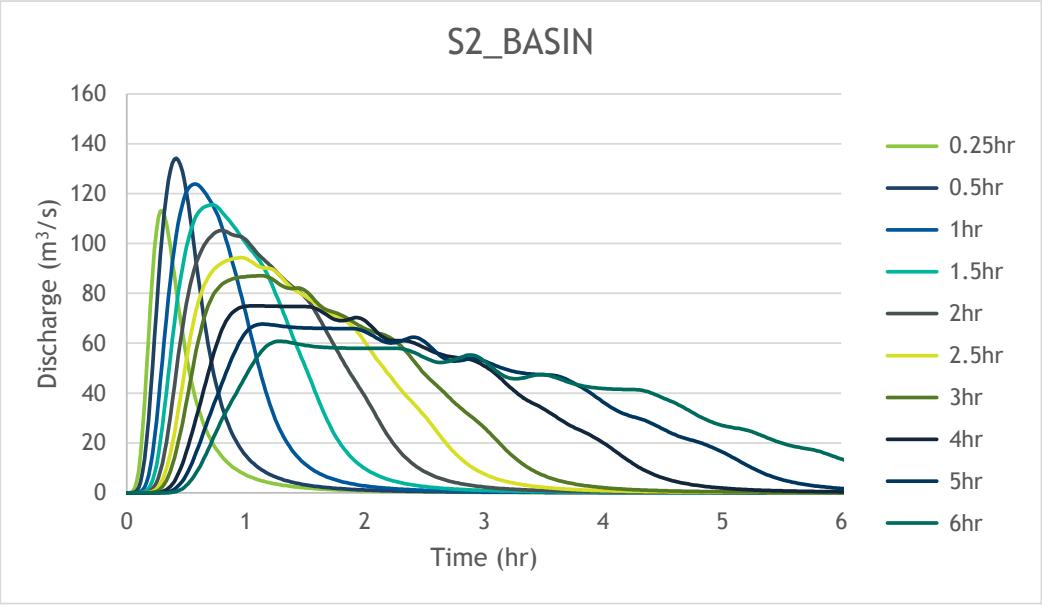

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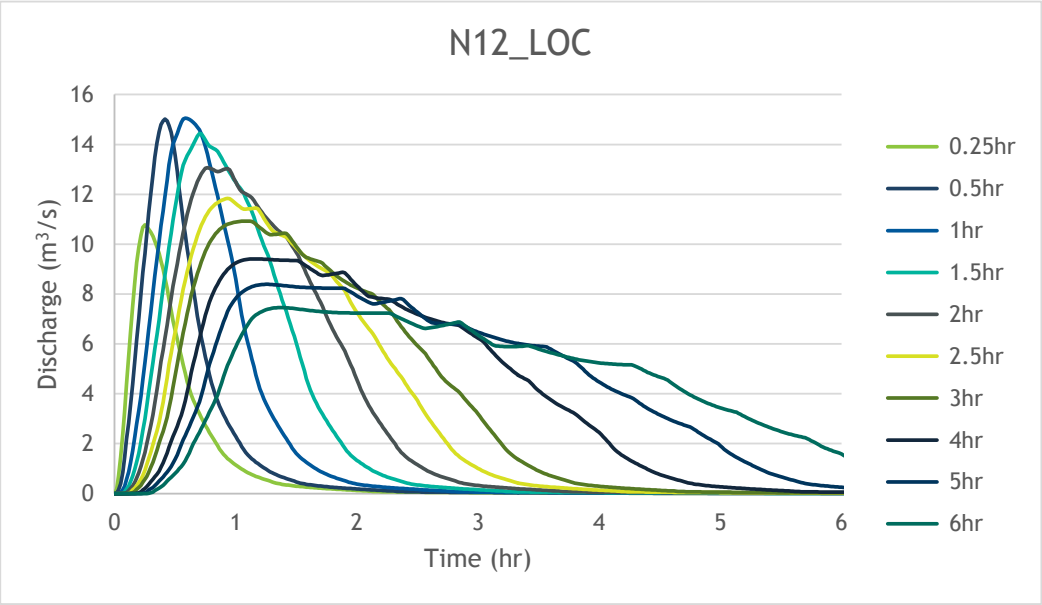

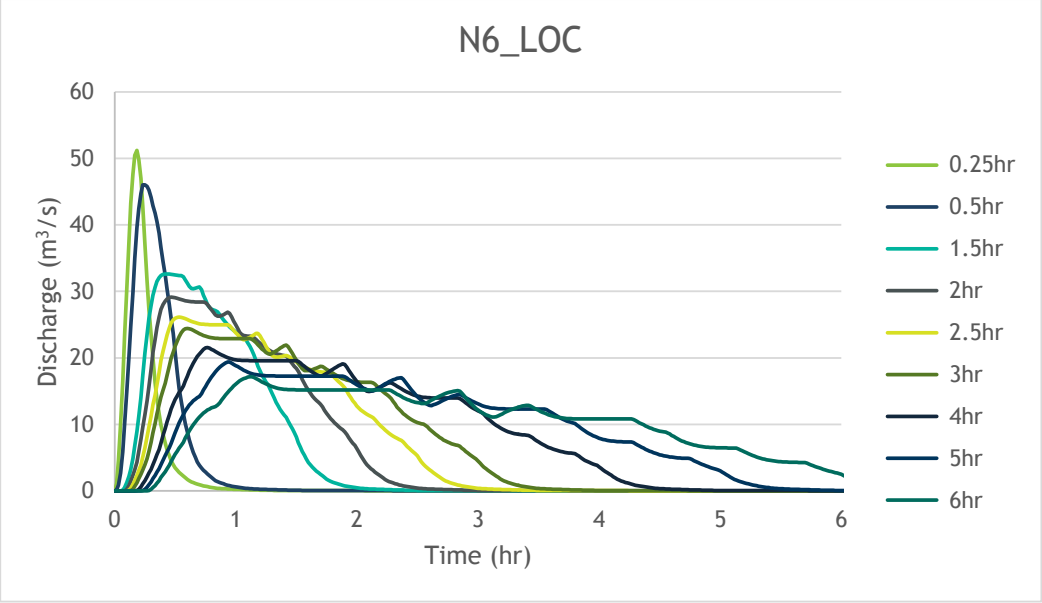

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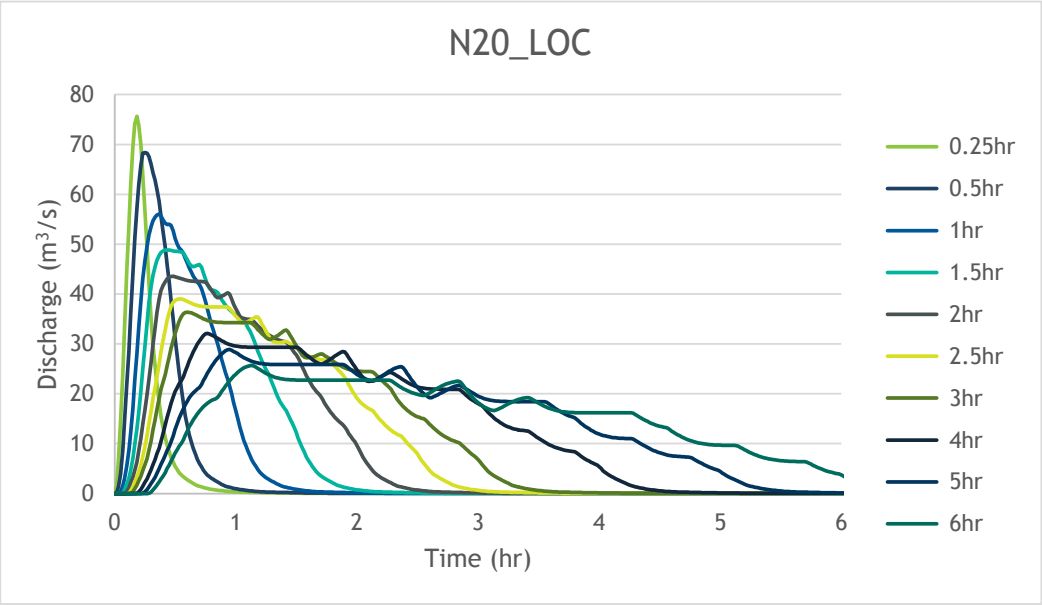

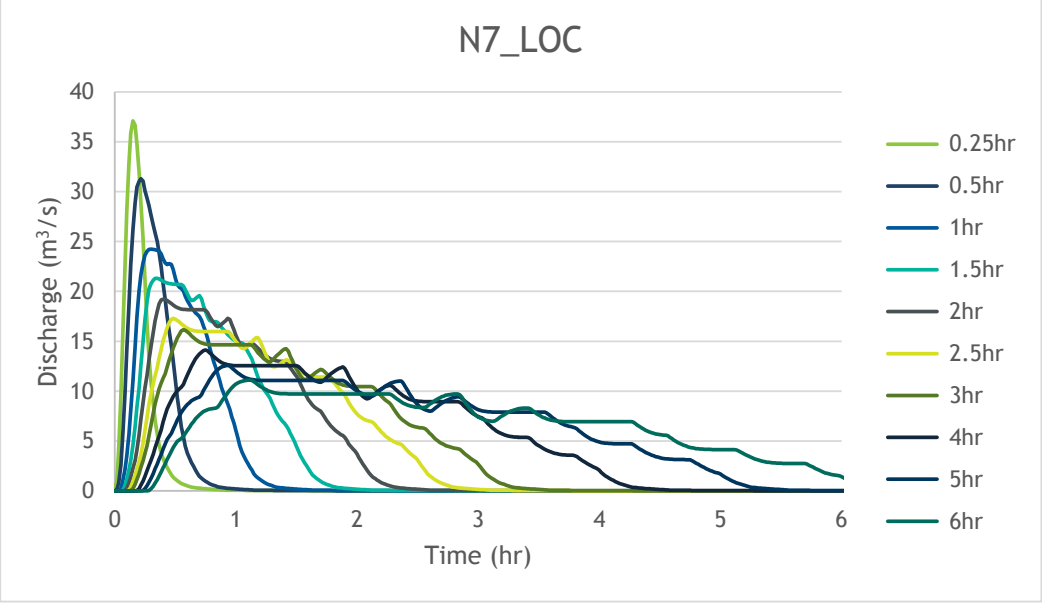

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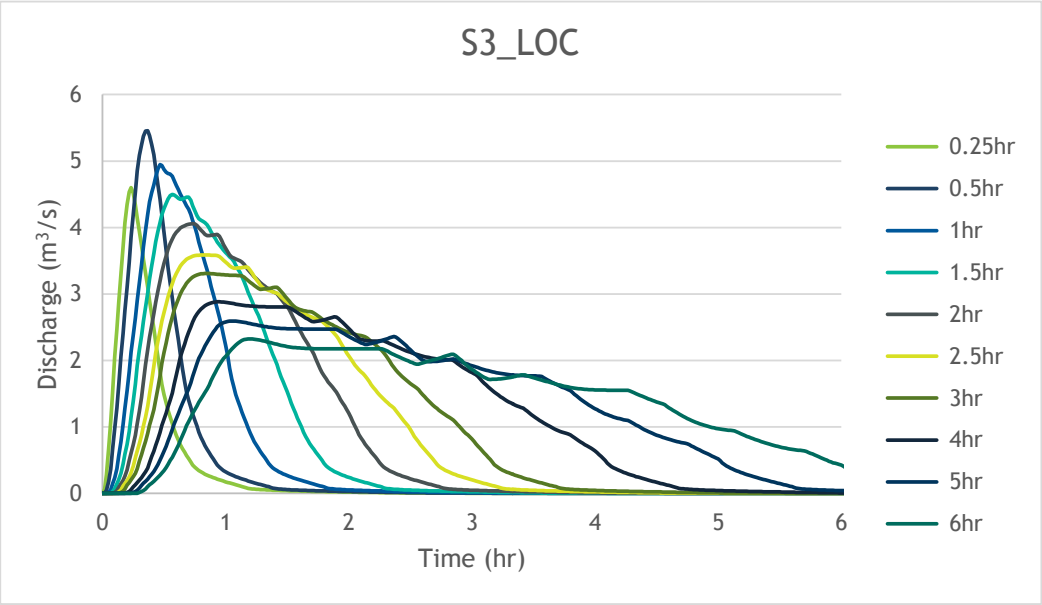

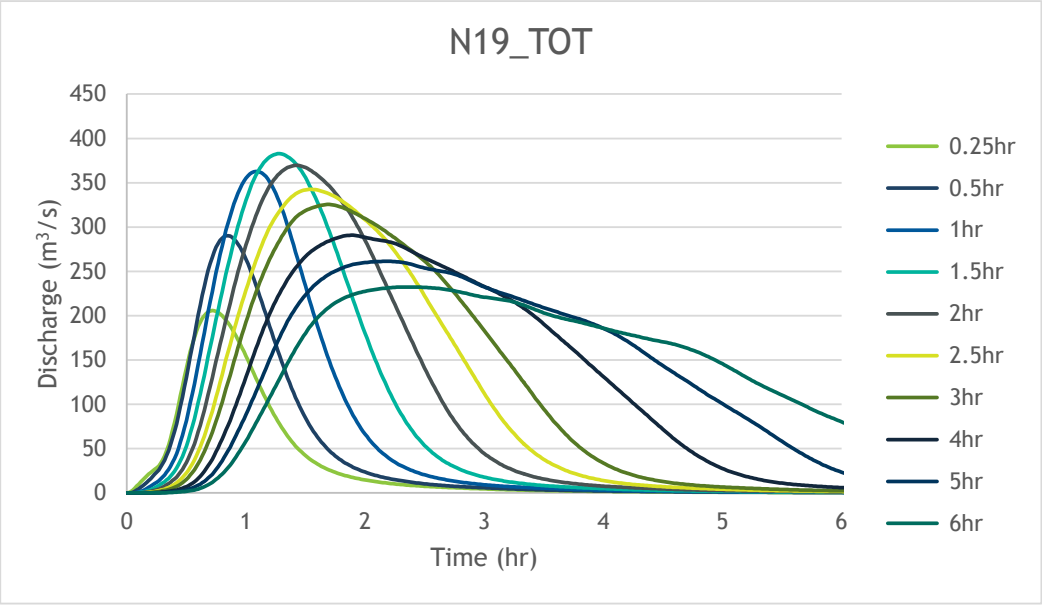

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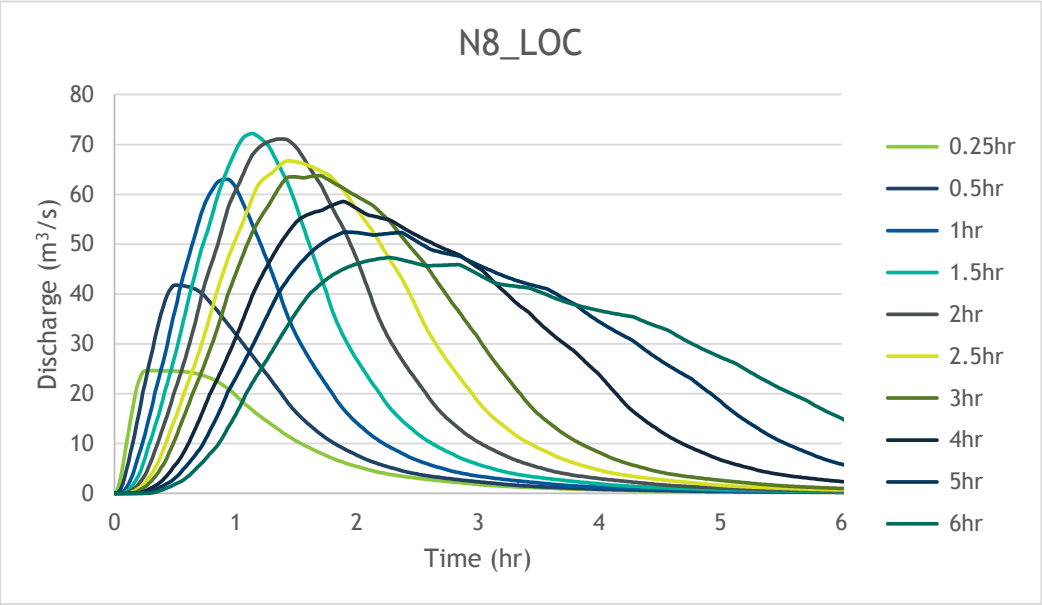

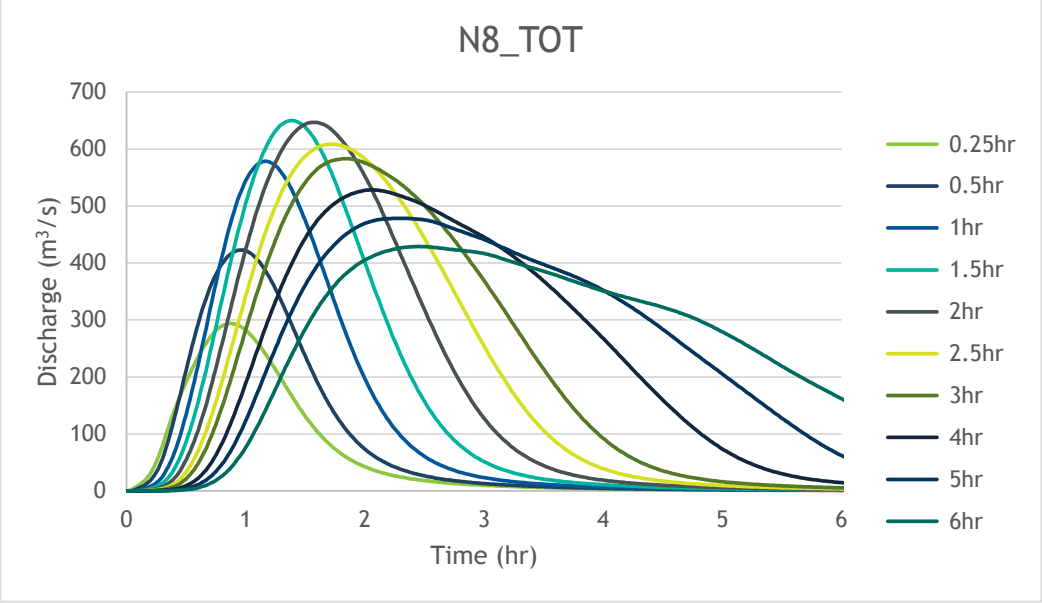

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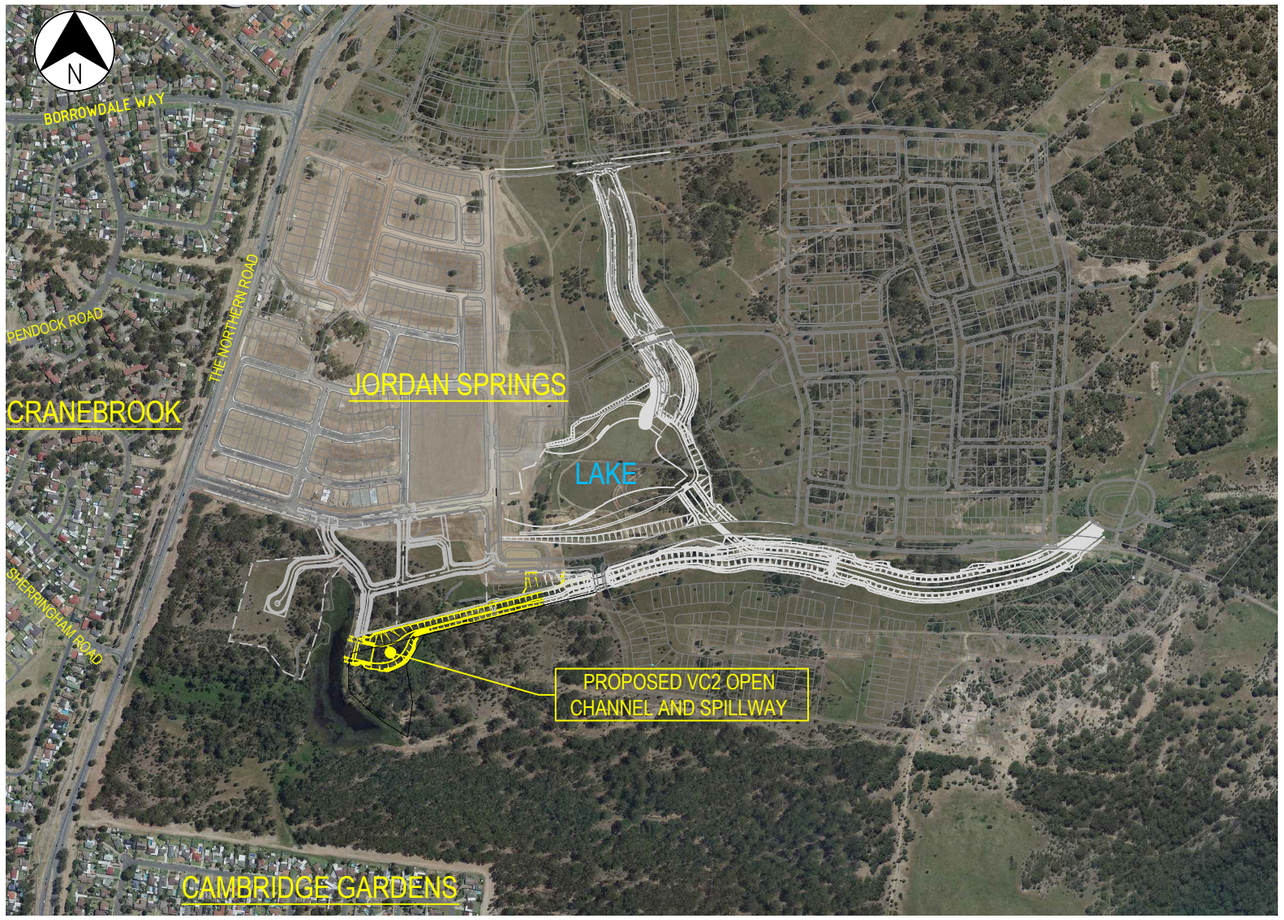
Version: 1, Version Date: 13/07/2018

JORDAN SPRINGS
VC2 OPEN CHANNEL AND SPILLWAY-STAGE 1
FINAL - C.C. PLANS



DRAWING INDEX

DRAWING No	DRAWING TITLE
IA016600-JCC-DG-1001	COVER SHEET AND DRAWING INDEX
IA016600-JCC-DG-1002	VC2 OPEN CHANNEL GENERAL NOTES
IA016600-JCC-DG-1010	VC2 OPEN CHANNEL LAYOUT PLAN - SHEET 1 OF 2
IA016600-JCC-DG-1011	VC2 OPEN CHANNEL LAYOUT PLAN - SHEET 2 OF 2
IA016600-JCC-DG-1012	VC2 OPEN CHANNEL SETOUT PLAN - SHEET 1 OF 2
IA016600-JCC-DG-1013	VC2 OPEN CHANNEL SETOUT PLAN - SHEET 2 OF 2
IA016600-JCC-DG-1014	VC2 OPEN CHANNEL SETOUT TABLES
IA016600-JCC-DG-1021	BULK EARTHWORKS PLAN - SHEET 1 0F 2
IA016600-JCC-DG-1022	BULK EARTHWORKS PLAN - SHEET 2 0F 2
IA016600-JCC-DG-1031	LONGITUDINAL SECTIONS MC10 (OPEN CHANNEL) - SHEET 1 OF 2
IA016600-JCC-DG-1032	LONGITUDINAL SECTIONS MC10 (OPEN CHANNEL) - SHEET 2 OF 2
IA016600-JCC-DG-1033	LONGITUDINAL SECTIONS MC11 (MAINTENANCE ACCESS ROAD) - SHEET 1 OF 3
IA016600-JCC-DG-1034	LONGITUDINAL SECTIONS MC11 (MAINTENANCE ACCESS ROAD) - SHEET 2 OF 3
IA016600-JCC-DG-1035	LONGITUDINAL SECTIONS MC11 (MAINTENANCE ACCESS ROAD) - SHEET 3 OF 3
IA016600-JCC-DG-1036	LONGITUDINAL SECTIONS MC12 (RETAINING WALL) - SHEET 1 OF 1
IA016600-JCC-DG-1041	TYPICAL SECTION AND DETAIL
IA016600-JCC-DG-1051	CROSS SECTIONS - SHEET 1 OF 4
IA016600-JCC-DG-1052	CROSS SECTIONS - SHEET 2 OF 4
IA016600-JCC-DG-1053	CROSS SECTIONS - SHEET 3 OF 4
IA016600-JCC-DG-1054	CROSS SECTIONS - SHEET 4 OF 4
IA016600-JCC-DG-1061	SPILLWAY SLAB DETAILS
IA016600-JCC-DG-1062	STRUCTURAL DETAILS
IA016600-JCC-DG-1071	EROSION AND SEDIMENT CONTROL PLAN (ESCP) - SHEET 1 OF 2
IA016600-JCC-DG-1072	EROSION AND SEDIMENT CONTROL PLAN (ESCP) - SHEET 2 0F 2
IA016600-JCC-DG-1073	EROSION AND SEDIMENT CONTROL PLAN "CLEAN" RUNOFF DIVERSION DRAIN - SHEET 1 0F 2
IA016600-JCC-DG-1074	EROSION AND SEDIMENT CONTROL PLAN "CLEAN" RUNOFF DIVERSION DRAIN - SHEET 2 0F 2
IA016600-JCC-DG-1075	EROSION AND SEDIMENT CONTROL PLAN CROSS SECTIONS OF "CLEAN" RUNOFF DIVERSION DRAIN
IA016600-JCC-DG-1076	EROSION AND SEDIMENT CONTROL DETAILS

SCALE 1:5000 (A1) 50 0 50 100 150 200 250
SCALE 1:10000 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL, REISSUED FOR CC APPROVAL
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	02.11.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

JACOBS
A.C.N 001 024 095
Jacobs Group (Australia) Pty Ltd
100 Christie Street
St Leonards, SYDNEY, NSW 2065
AUSTRALIA
Tel: +61 2 9928 2100
Fax: +61 2 9928 2500
Web: www.jacobs.com

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	02.11.15	02.11.15

TITLE: COVER SHEET AND DRAWING INDEX

SCALE	DRAWING No	REV
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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES

1. ALL WORKS TO BE CARRIED OUT SHALL BE IN ACCORDANCE WITH THE CURRENT APPLICABLE AUSTRALIAN STANDARDS, AND VC2/3 OPEN CHANNEL CONSTRUCTION TECHNICAL SPECIFICATION (JACOBS NOV 2015).

2. THERE ARE NO KNOWN SHALLOW UTILITIES IN THE OPEN CHANNEL AREA; HOWEVER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN IN THE FIELD THE ACTUAL LOCATION AND LEVELS OF ANY UNDERGROUND SERVICES OR ANY OTHER FEATURES LIKELY TO BE AFFECTED BY THE WORKS OR AFFECT THE WORKS. THE CONTRACTOR SHALL CONTACT 'DIAL-BEFORE-YOU-DIG' (WHERE APPLICABLE) AND / OR LIAISE WITH RELEVANT AUTHORITIES AND UNDERTAKE ANY NECESSARY FIELD INVESTIGATIONS AND SATISFY THEMSELVES TO THE ACTUAL LOCATION OF ANY EXISTING SERVICES WHETHER INDICATED OR NOT INDICATED ON THE DRAWINGS. EXISTING SERVICES ARE TO BE MARKED AND PROTECTED AT ALL TIMES.

3. THE CONTRACTOR MUST FOLLOW ALL AUTHORITIES 'DUTY OF CARE' WHEN WORKING IN THE VICINITY OF ANY SERVICES. ALL DAMAGE TO ANY EXISTING SERVICES IS TO BE RECTIFIED AND VERIFIED WITH THE AUTHORITY REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.

4. TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE PROVIDED IN ACCORDANCE WITH THE CURRENT AS1742.3-2002 AND RMS PUBLICATION 'TRAFFIC CONTROL AT WORKSITES' (2010). ALL TRAFFIC MOVEMENTS (INCLUDING PEDESTRIAN WHERE IDENTIFIED ON SITE) ARE TO BE MAINTAINED THROUGHOUT THE COURSE OF THE WORKS. A TRAFFIC MANAGEMENT PLAN IS TO BE PREPARED BY THE CONTRACTOR, AND TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. THE CLIENT MAY PROVIDE AN EXISTING TRAFFIC MANAGEMENT PLAN FOR THE CONTRACTOR TO IMPLEMENT.

5. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS, SERVICES AND STRUCTURES ON SITE PRIOR TO COMMENCEMENT OF WORKS. ALL EXCAVATION AND BACKFILL / FILL SHALL BE CARRIED OUT NEATLY TO LINES, LEVELS AND GRADES WHERE SPECIFIED / NOTED ON THE DRAWINGS. LEVELS SHOWN ON THE PLANS AND PROVIDED IN THE MODEL ARE PRIMARILY FINISHED LEVELS. ADDITIONAL EXCAVATION WILL BE REQUIRED BEYOND THESE FINISHED LEVELS.

6. ALL SETOUT DETAILS HAVE BEEN BASED FROM THE SURVEY DATA SUPPLIED BY THE CLIENT THROUGH THEIR SURVEYOR ENGAGED FOR THE PROJECT. WITH LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD) AND COORDINATES TO MAP GRID AUSTRALIA (MGA ZONE 56).

7. THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR. LEVELS ARE BE TO AUSTRALIAN HEIGHT DATUM (AHD). COORDINATES ARE TO MAP GRID AUSTRALIA (MGA).

8. ON COMPLETION OF THE WORKS ALL DISTURBED AREAS OUTSIDE OF THE WORKS SHALL BE RESTORED TO ORIGINAL CONDITION, INCLUDING BUT NOT LIMITED TO FOOTPATHS, PAVEMENTS, GRAVEL AND GRASSED / LANDSCAPED AREAS (U.N.O)

9. CONTRACTOR TO OBTAIN ALL NECESSARY AUTHORITY APPROVALS WHERE REQUIRED, INCLUDING LOCAL GOVERNMENT (PENRITH CITY COUNCIL) AND ANY OTHER NSW STATE GOVERNMENT AUTHORITY.

10. WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.

11. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER THESE SERVICES.

12. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS AND MOUNDS AS REQUIRED TO ENSURE THAT AT ALL TIMES EXPOSED SURFACES ARE FREE DRAINING AND WHERE NECESSARY EXCAVATE TEMPORARY SUMPS AND PROVIDE PUMPING EQUIPMENT TO DRAIN EXPOSED AREAS.

13. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE TO THE DETAILS SHOWN ON THE DRAWINGS WITH MATERIAL TESTING, INSPECTION REQUIREMENTS AND CONSTRUCTION TESTING IN ACCORDANCE WITH THE SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF THE WORKS OUTLINING TESTING REQUIREMENTS, MINIMUM TEST FREQUENCIES AND REQUIRED HOLD / WITNESS POINTS. INSPECTION AND TEST PLANS ARE TO BE PREPARED TO MEET THE MINIMUM TEST FREQUENCIES AND STANDARDS OUTLINED ON THE DRAWINGS AND IN THE SPECIFICATION.

14. THE CONTRACTOR SHALL REINSTATE ANY EXISTING STRUCTURE DISTURBED BY THE PROPOSED WORKS TO THE SATISFACTION OF THE SUPERINTENDENT.

15. ALL UNDERGROUND SERVICES THAT CONFLICT WITH THE WORKS SHALL BE RELOCATED / LOWERED TO THE SATISFACTION OF THE SUPERINTENDENT PRIOR TO ANY EXCAVATION. UNDERGROUND SERVICES SHALL BE PROTECTED AT ALL TIMES DURING THE COURSE OF THE PROJECT TO AVOID DISRUPTION TO THE WORKS.

16. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE REQUIREMENTS OF PENRITH CITY COUNCIL.

17. ALL FILLING SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS 3798 AND PENRITH CITY COUNCIL'S DESIGN GUIDELINES AND CONSTRUCTION SPECIFICATION FOR CIVIL WORKS.

18. THESE DRAWINGS ARE FOR THE PROPOSED OPEN CHANNEL, INCLUSIVE OF THE SPILLWAY, MAINTENANCE ACCESS PATH AND RETAINING WALL. LANDSCAPING / ARCHITECTURAL DRAWINGS ARE CONTAINED IN A SEPARATE SET OF DRAWINGS BY OTHERS.

19. THE CONTRACTOR SHALL COMPLY WITH ALL THE REQUIREMENTS OF THE LATEST VERSION OF THE LEND LEASE WATERWAYS OPERATIONS AND MANAGEMENT MANUAL. THE LATEST VERSION IS TO BE OBTAINED FROM LEND LEASE.

20. SAFETY SIGNS ARE TO BE ERECTED AT ALL LOCATIONS SHOWN ON THE PLAN (IA016600-ECC-DG-1010 & IA016600-ECC-DG-1011). MINIMUM SIGN HEIGHT FROM THE UNDERSIDE OF THE SIGN TO FSL IS TO BE 2m.

21. ALL VISIBLE CONCRETE AT ALL DRAINAGE CULVERTS WILL BE PAINTED WITH PROTECTIVE COATING DULUX MIO 'FERRADOR 810' OR APPROVED EQUIVALENT (SYDNEY HARBOUR BRIDGE COLOUR).

22. THE 12d MODEL DIGITAL DATA IS PROVIDED FOR INFORMATION ONLY.
ONLY INFORMATION THAT HAS BEEN FORMALLY ISSUED IN THE FORM OF A HARD COPY DRAWING WITH APPROVING SIGNATURE OR ELECTRONIC FILE WITH AN ENCRYPTED DIGITAL SIGNATURE MAY BE RELIED UPON FOR ACCURACY OR CONFORMITY. ANY PARTY SEEKING TO USE THIS DATA MUST FIRST VERIFY THE ACCURACY AND CURRENT STATUS OF THE INFORMATION IN RELATION TO THE FORMALLY ISSUED DRAWINGS. JACOBS ACCECPTS NO LIABILITY OR RESPONSIBILITY WHATSOEVER FOR ANY FAULTS, ERRORS OR OMISSIONS OF INFORMATION OF INFORMATION CONTAINED IN THIS DATA. THIS DATA MUST NOT BE PASSED ONTO A 3RD PARTY WITHOUT THE PRIOR WRITTEN PERMISSION OF JACOBS.

EROSION AND SEDIMENT CONTROL NOTES

1. ALL SOIL AND WATER MANAGEMENT WORKS SHALL BE IN ACCORDANCE WITH THE GUIDELINES IN "MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION (CURRENT EDITION)", BEST MANAGEMENT PRACTICES, SPECIFICATIONS AND ALL OTHER PROJECT REQUIREMENTS.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT ALL NECESSARY WORKS TO MINIMISE THE POTENTIAL FOR SOIL EROSION, WATER POLLUTION AND SEDIMENT TRANSPORT TO DOWNSLOPE LANDS AND WATERWAYS.

3. ALL SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE INSTALLED PRIOR TO ANY SITE DISTURBANCE AND SHALL BE MAINTAINED TO ENSURE SATISFACTORY PERFORMANCE DURING AND AFTER THE WORKS.

4. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.

5. NO DENUDED AREAS SHALL BE LEFT UNPROTECTED MORE THAN 15 DAYS.

6. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN PROGRESSIVELY AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF VARIOUS SECTIONS OF WORK, OTHERWISE TEMPORARY EROSION PROTECTION OF EXPOSED AREAS INCLUDING BATTERS SHALL BE REQUIRED.

7. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS AND KERBS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.

8. WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.

9. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE AREAS THEY ARE PROTECTING ARE REHABILITATED.

10. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIR AND OR

MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, IN PARTICULAR SEDIMENT COLLECTED AT SEDIMENT FENCES / BARRIERS AND TRAPS ARE TO BE REMOVED.

EARTHWORKS NOTES

1. STRIP, REMOVE AND DISPOSE TO AN APPROVED DUMP SITE ALL ROOT-AFFECTED SOILS AND DELETERIOUS SOILS.

2. REMOVE AND DISPOSE TO AN APPROVED DUMP SITE ALL UNSUITABLE MATERIAL WHICH CAN NOT BE REUSED ON SITE FOR THE PROPOSED WORKS.

3. GENERAL LANDSCAPED AREAS THAT ARE NOT DESCRIBED OR INCLUDED IN THE LANDSCAPE ARCHITECT'S PLANS INCLUDING ALL BATTERS AND DISTURBED AREAS SHALL BE SPREAD WITH 150mm MINIMUM TOPSOIL AND GRASSED/TURFED TO MATCH THE EXISTING GROUND COVER OF THE SITE. ALL GENERAL LANDSCAPED AREAS WITH A SLOPE OF 1(V):6(H) OR STEEPER SHALL BE STABILISED WITH EROSION CONTROL NETTING JUTEMASTER FM OR APPROVED EQUAL. NETTING SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS TO ENSURE NETTING IS SECURELY FIXED IN PLACE TO PREVENT EROSION.

4. THE CONTRACTOR IS TO OBTAIN ALL BULK EARTHWORKS DATA FROM THE SUPPLIED 3D MODEL (12da).

MAINTENANCE ACCESS ROAD

1. THE CONCRETE MAINTENANCE ACCESS PATH SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROFILE SHOWN & THE SPECIFICATIONS. REFER TO DRAWING IA016600-ECC-DG-0062.

CONCRETE NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600.

2. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY THE SITE SUPERINTENDENT.

3. CONCRETE DIMENSIONS SHOWN DO NOT INCLUDE THICKNESSES OF ANY APPLIED FINISHES.

4. CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF COUNCIL/SUPERINTENDENT.

5. CURING OF ALL CONCRETE SHALL BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 7 DAYS, AND PREVENTION OF LOSS OF MOISTURE FOR A TOTAL OF 14 DAYS FOLLOWED BY A GRADUAL DRYING OUT. APPROVED SPRAYED ON CURING COMPOUNDS (MIN 90% MOISTURE RETENTION TO AS 3999) MAY BE USED WHERE NO OTHER FINISHES ARE PROPOSED. POLYTHENE SHEETING OR WET HESSIAN MAY BE USED IF PROTECTED FROM WIND AND TRAFFIC.

6. A BOND BREAKING MATERIAL SHALL BE PLACED BETWEEN CONTACTING SURFACES AT CONTRACTION JOINTS GROOVE. REINFORCEMENT SHALL NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS UNLESS SHOWN IN DETAIL.

7. THE SITE SUPERINTENDENT SHALL BE GIVEN A MINIMUM OF 24 HOURS NOTICE FOR REINFORCEMENT INSPECTION AND CONCRETE SHALL NOT BE DELIVERED UNTIL FINAL APPROVAL IS OBTAINED

8. CONCRETE SHALL CONFORM TO THE FOLLOWING:

LOCATION	STRENGTH MPa	SLUMP mm	AGGREGATE mm
CONCRETE SPILLWAY AND WEIR STRUCTURES	40	80	20
ACCESS ROAD	32	80	20

9. MINIMUM CLEAR COVER TO THE REINFORCEMENT INCLUDING TIES SHALL BE AS FOLLOWS:
   - IN CONTACT WITH GROUND
     - 50mm (WITH MEMBRANE)
     - 60mm (WITHOUT MEMBRANE)
   - FORMED AND EXPOSED SURFACE
     - 40mm
   - IN CONTACT WITH CONCRETE SURFACE
     - 20mm

10. COVER SHALL BE OBTAINED BY THE USE OF NON METALLIC APPROVED BAR CHAIRS. CHAIRS SHALL BE SPACED AT 800mm CENTRES MAXIMUM.

11. ALL CONCRETE WORKS SHALL BE MECHANICALLY VIBRATED. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.

12. ALL FABRIC FOR SLABS ON GROUND MUST BE IN PLACE BEFORE CONCRETING COMMENCES.

13. THE CONTRACTOR SHALL ENSURE EXTRA CARE OF THE COMPLETED WORKS TO AVOID DAMAGE BY PLANT AND EQUIPMENT.

14. NO HOLES, CHASES OR EMBEDMENT OF PIPES, UNLESS SHOWN ON THE DRAWINGS.

15. CONSTRUCTION TOLERANCES SHALL BE IN ACCORDANCE WITH AS3600.

16. ALL FORMWORKS USED ON SITE SHALL BE COATED WITH AN APPROVED RELEASING AGENT PRIOR TO THE POURING OF CONCRETE.

17. 25mm CHAMFERS & FILLETS SHALL BE PROVIDED TO ALL EXPOSED EDGES AND CORNERS UNLESS NOTED OTHERWISE

REINFORCEMENT NOTES

1. REINFORCEMENT WHERE SHOWN IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.

2. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE SITE SUPERINTENDENT.

3. FABRIC SHALL BE LAPPED 2 TRANSVERSE WIRES PLUS 50mm.
FABRIC SPLICE DETAILS:



4. REINFORCEMENT SPLICES: UNLESS NOTED OTHERWISE ON THE DRAWINGS ALL SPLICES SHALL CONFORM TO THE FOLLOWING TABLE:-

BAR DIAMETER	SLABS, BEAMS AND WALLS	
	'A'	'B'
N12	500	600
N16	650	800

'A' DENOTES <= 300mm OF CONCRETE CAST BELOW BAR
'B' DENOTES > 300mm OF CONCRETE CAST BELOW BAR
INCREASE LAP LENGTHS SHOWN IN THE ABOVE TABLE BY 20% WHERE 3 BARS ARE SHOWN AS BUNDLED TOGETHER

5. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:-
N DENOTES GRADE 500 NORMAL DUCTILITY DEFORMED BAR TO AS4671.
R DENOTES GRADE 250 NORMAL DUCTILITY PLAIN ROUND BAR TO AS4671.
SL DENOTES GRADE 500 LOW DUCTILITY WELDED SQUARE MESH TO AS 4671.
RL DENOTES GRADE 500 LOW DUCTILITY WELDED RECTANGULAR MESH TO AS 4671.

ROCK LINING

1. ROCK IS TO BE HARD, DENSE, DURABLE, RESISTANT TO WEATHERING AND ANGULAR IN SHAPE. IT SHALL BE FREE FROM OVERBURDEN, SPOIL SHALE AND ORGANIC MATTER. ROCK THAT IS LAMINATED, FRACTURED, POROUS, CONTAINS ACID SULPHATE OR OTHERWISE PHYSICALLY WEAK WILL BE UNACCEPTABLE . THE ROCKS MUST HAVE A WET STRENGTH OF AT LEAST 100kN AND A MAXIMUM WET/DRY STRENGTH VARIATION OF 35%. ROCK LINING IS TO BE PLACED OVER A 200mm DEEP LAYER OF DGS40 MATERIAL OVER THE GEOTEXTILE.

2. THE THICKNESS OF THE ROCK LINING IN THE OPEN CHANNEL SHALL BE TWICE THE D50 STONE SIZE SPECIFIED ON THE DRAWING D50=500mm.

3. THE STONES SHALL BE REASONABLY WELL GRADED THROUGHOUT THE ROCK LINING LAYER THICKNESS. EACH LOAD OF ROCK SHOULD BE REASONABLY WELL GRADED FROM THE SMALLEST TO THE MAXIMUM SPECIFIED. D10 SHALL BE 0.5xD50 AND D90 SHALL BE 1.35xD50. STONES SMALLER THAN THE SPECIFIED D10 ARE NOT TO EXCEED 20% BY WEIGHT.

4. AN APPROXIMATE GUIDE TO STONE SHAPE IS THAT THE BREADTH OR THICKNESS OF A SINGLE STONE SHOULD BE NOT LESS THAN ONE-THIRD ITS LENGTH. ROUND MATERIAL CAN BE USED AS RIP-RAP PROVIDED IT IS NOT PLACED ON SLOPES GREATER THAN 3H:1V.

5. GEOTEXTILE FILTER FABRIC SHALL UNDERLIE ALL ROCK LINING AND SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION AND THE MANUFACTURER'S REQUIREMENTS UNLESS NOTED OTHERWISE.

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UTILITY INFORMATION SHOWN ON THESE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, IT'S SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING DIAL BEFORE YOU DIG '1100'. CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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Fax: +61 2 9928 2500
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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

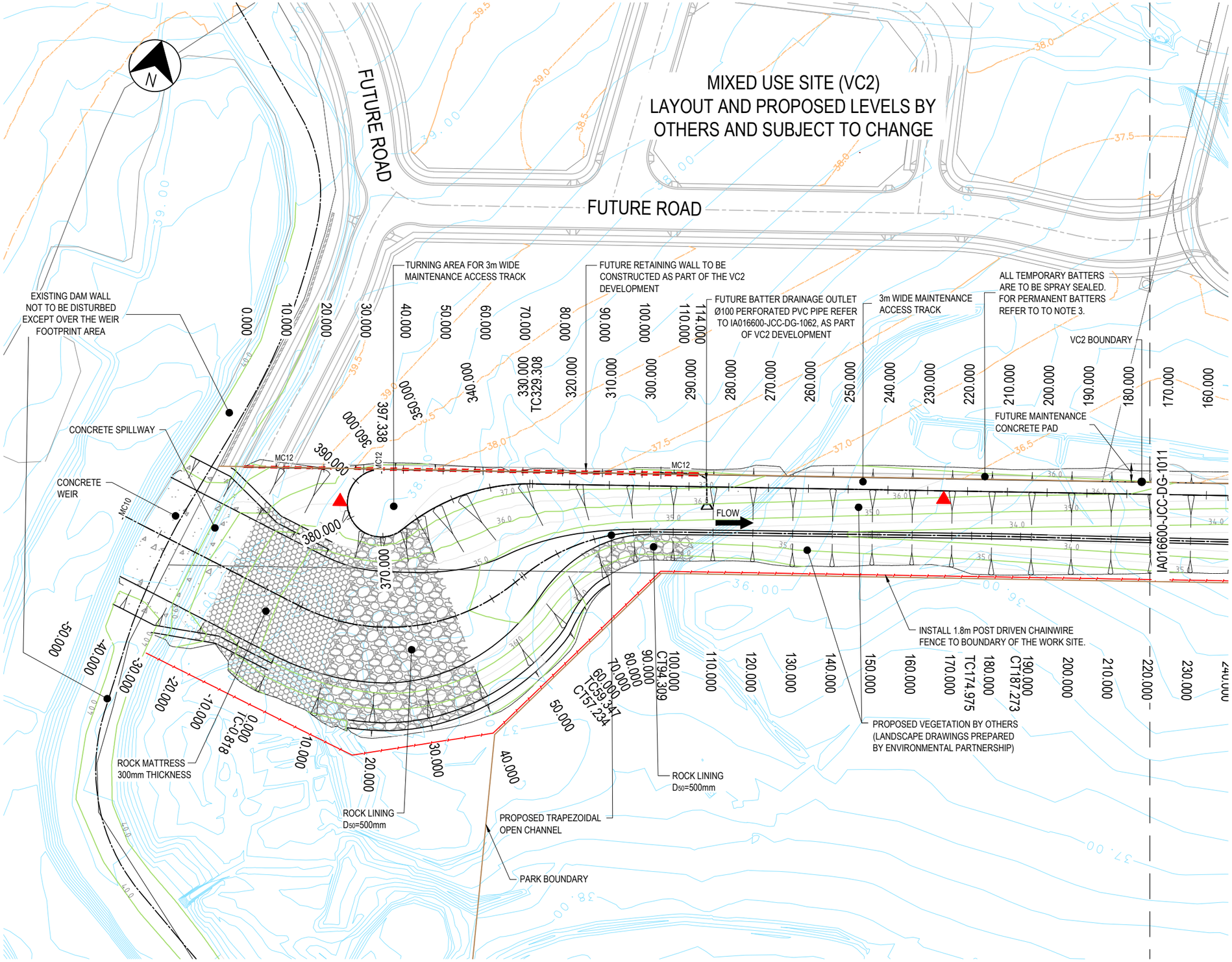
TITLE: VC2 OPEN CHANNEL GENERAL NOTES

SCALE	DRAWING No	REV
N.T.S.	IA016600-JCC-DG-1002	B

DATE: 7/12/2015 3:35:29 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1002.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

MIXED USE SITE (VC2)
LAYOUT AND PROPOSED LEVELS BY OTHERS AND SUBJECT TO CHANGE



LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT
- MINOR DESIGN CONTOUR
- PARK AND VC2 BOUNDARY LINES
- EXISTING SURFACE CONTOUR
- VC2 PROPOSED CONTOURS (BY OTHERS, SUBJECT TO CHANGE)
- POST AND CABLE FENCE
- FUTURE RETAINING WALL
- 1.8m POST DRIVEN CHAINWIRE FENCE
- CONCRETE
- ROCK MATTRESS
- ROCK LINING
- FLOODING WARNING SIGN

NOTE:

1. THIS ROCK LINING HAS BEEN PROVIDED FOR PROTECTION OF THE BANK FROM EXTERNAL RUNOFF FOR THE PARK AREA.
2. THE SELECTION OF BATTERS/RETAINING WALLS WILL BE SUBJECT TO CONSTRUCTION STAGING.
3. ALL PERMANENT BATTERS THAT GRADE TOWARDS THE PATH/ ACCESS TRACK ARE TO BE TURFED.
4. THE MAXIMUM DEPTH OF DISTURBANCE OVER THE WEIR AND THE SPILLWAY AREA IS TO BE LIMITED TO THE UNDERSIDE OF THE PROPOSED LINING (CONCRETE, ROCK MATTRESS)

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
5 0 5 10 15 20 25

REV	DATE	DRAWN	REV'D	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL IISUE FO CC APPROVAL (CHAINWIRE FENCE ADDED)
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: VC2 OPEN CHANNEL LAYOUT PLAN SHEET 1 OF 2

SCALE	DRAWING No	REV
1:500	IA016600-JCC-DG-1010	C

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

JORDAN SPRINGS LAKE

N

REMOVE EXISTING CONCRETE FOOTPATH SHOWN IN BLUE (1.5m WIDE),POST AND CABLE FENCE OFFSITE. THE CONCRETE WASTE IS TO BE REUSED ON SITE AS SUB-BASE MATERIAL FOR THE ACCESS TRACK, SUBJECT TO CRUSHING AND APPROVAL BY THE SUPERINTENDENT.

FUTURE MAINTENANCE CONCRETE PAD

ALL TEMPORARY BATTERS ARE TO BE SPRAY SEALED. FOR PERMANENT BATTERS REFER TO TO NOTE 3.

3m WIDE MAINTENANCE ACCESS TRACK CONNECTS TO ROAD 1

CONCRETE MAINTENANCE PLATFORM FOR VC2 GROSS POLLUTANT TRAP BY OTHERS, SUBJECT TO CHANGE

VC2 BOUNDARY

LAKESIDE PARADE

190.000 180.000 170.000 160.000 150.000 140.000 130.000 120.000 110.000 100.000 90.000 80.000 CT72.163 70.000 60.000 TC58.453 50.000 40.000 30.000 TC18.414 20.000 CT21.577 CT13.031 10.000 TC3.000 0.000 TC7.747 CT5.105

NEW RELOCATED POST CABLE FENCE (300mm FROM EDGE OF FOOTPATH)

IA016600-JCC-DG-1010

FLOW

JUBILEE DRIVE

210.000 220.000 230.000 240.000 250.000 260.000 270.000 280.000 290.000 300.000

LIMIT OF WORKS

REMOVE EXISTING POST AND CABLE (SHOWN IN RED)

REPLACE EXISTING KERB AND GUTTER WITH HEAVY DUTY LAYBACK TO PENRITH CITY COUNCIL ENGINEERING CONSTRUCTION SPECIFICATION FOR CIVIL WORKS 2013 OR LATEST VERSION. MATCH TO EXISTING LEVELS. EXISTING PEDESTRIAN RAMP TO BE RETAINED

INSTALL 3 REMOVABLE BOLLARDS. REFER TO EP DRAWING 2914.LA.D03 SECTION 05 FOR DETAILS.

PARK BOUNDARY

PROPOSED TRAPEZOIDAL OPEN CHANNEL

TIE INTO EXISTING LEVELS. TIE IN LAYOUT AND LEVELS TO BE CHECKED PRIOR TO THE COMMENCEMENT OF WORKS AND DISCREPANCIES TO BE IDENTIFIED , DOCUMENTED AND SENT TO THE SUPERINTENDENT BEFORE ANY WORKS PROCEED.

INSTALL 1.8m POST DRIVEN CHAINWIRE FENCE TO BOUNDARY OF THE WORK SITE.

JORDAN SPRINGS EAST WEST OPEN CHANNEL DESIGN REFER TO SEPARATE CC DRAWING No.s EN02754-C-601 TO C-657

LEGEND

- MAJOR DESIGN CONTOUR WITH HEIGHT (34.0)
- MINOR DESIGN CONTOUR
- PARK AND VC2 BOUNDARY LINES
- EXISTING SURFACE CONTOUR (39.0)
- VC2 PROPOSED CONTOURS (BY OTHERS, SUBJECT TO CHANGE) (39.0)
- POST AND CABLE FENCE
- FUTURE RETAINING WALL
- 1.8m POST DRIVEN CHAINWIRE FENCE
- CONCRETE
- ROCK MATTRESS
- ROCK LINING
- FLOODING WARNING SIGN

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SCALE 1:500 (A1)
SCALE 1:1000 (A3)
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REV	DATE	DRAWN	REVD	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL (CHAINWIRE FENCE ADDED)
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: VC2 OPEN CHANNEL LAYOUT PLAN SHEET 2 OF 2

SCALE	DRAWING No	REV
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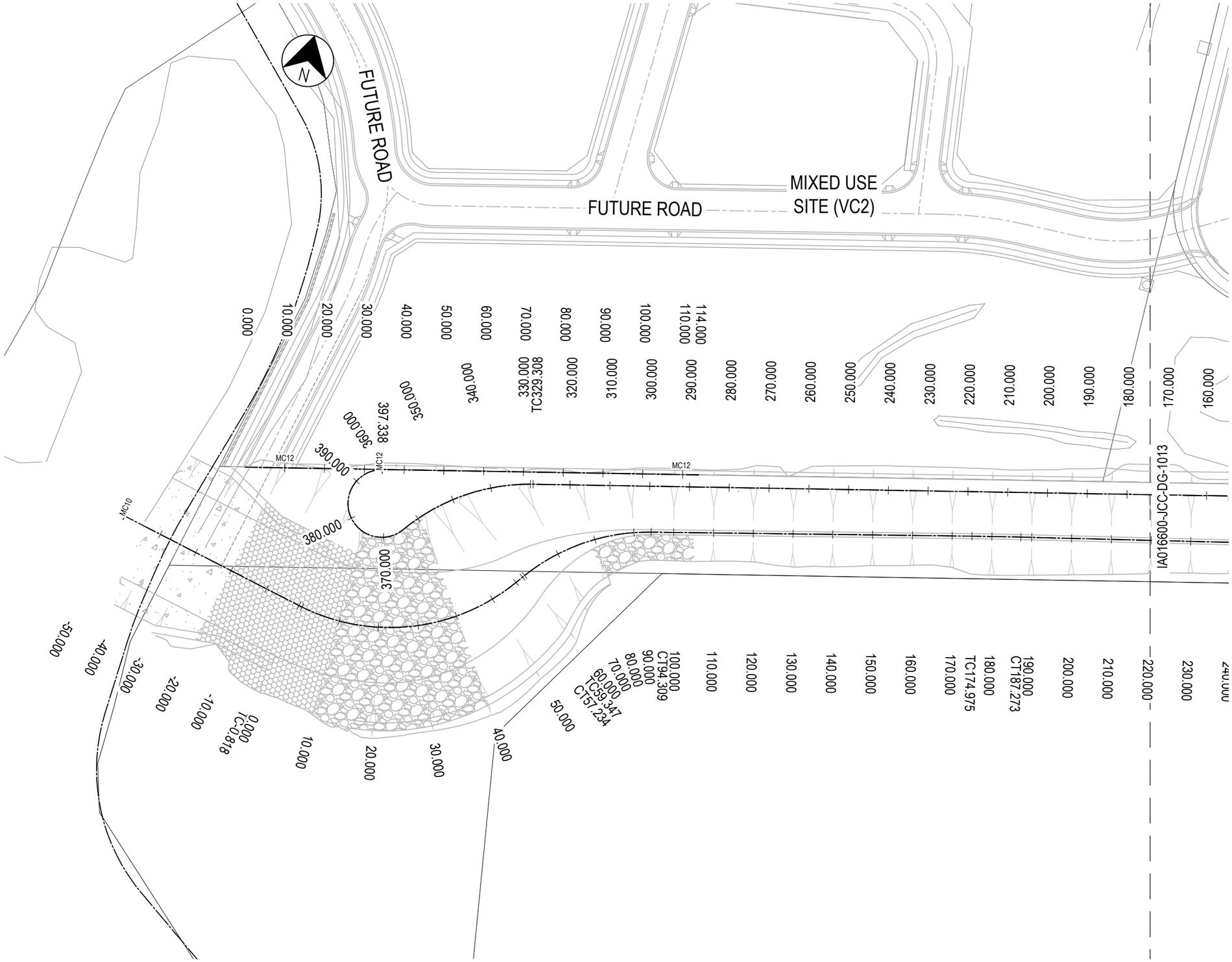
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



NOTES

1. FOR ALL SETOUT TABLES, REFER TO DRG IA016600-JCC-DG-1014.
2. FOR FINISHED SURFACE LEVELS REFER TO 12d MODEL.

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
5 0 5 10 15 20 25

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
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DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: VC2 OPEN CHANNEL SETOUT PLAN SHEET 1 OF 2

SCALE	DRAWING No	REV
1:500	IA016600-JCC-DG-1012	B

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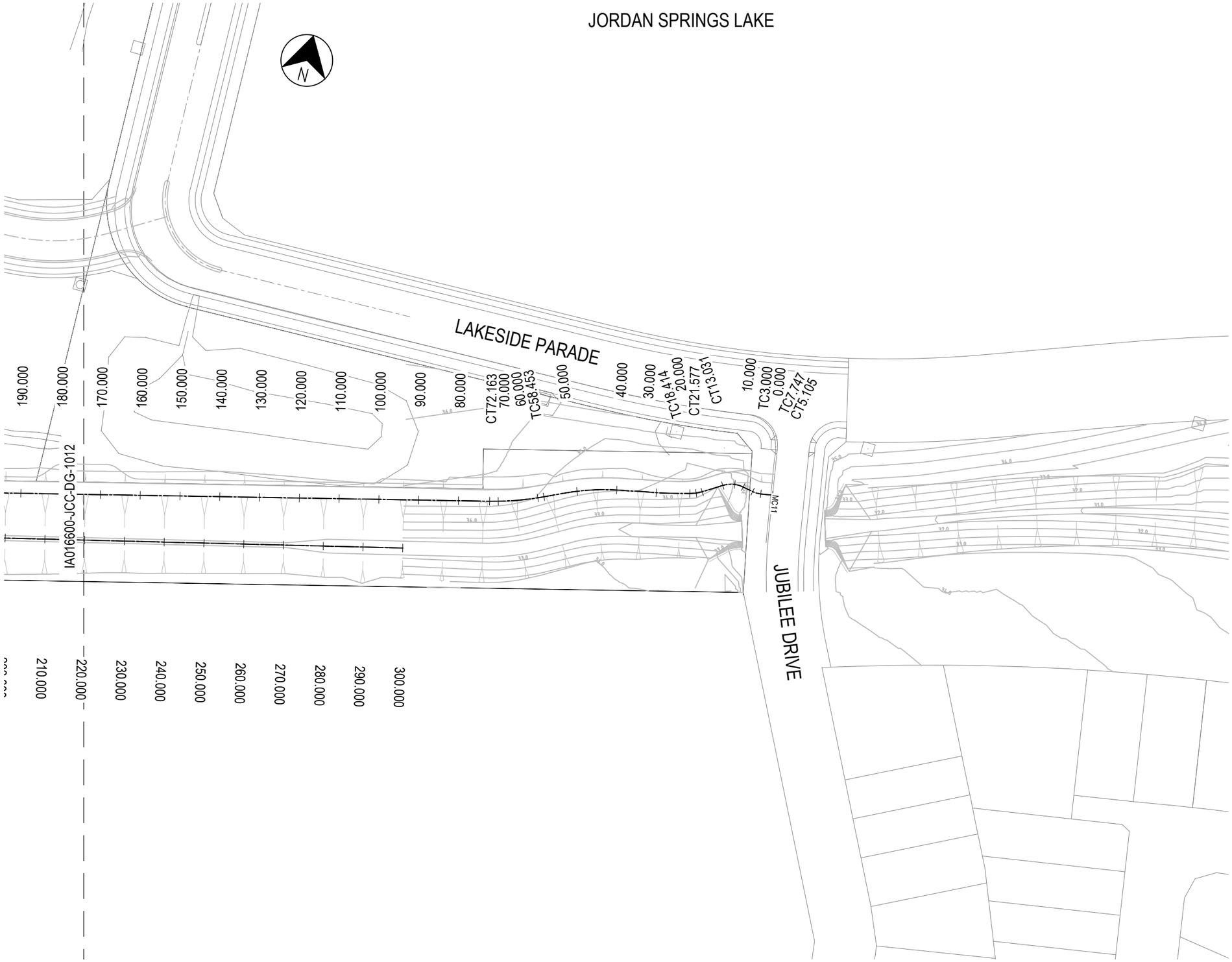
Version: 1, Version Date: 13/07/2018



NOTES

1. FOR ALL SETOUT TABLES, REFER TO DRG IA016600-JCC-DG-1014.
2. FOR FINISHED SURFACE LEVELS REFER TO 12d MODEL.

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SCALE 1:1000 (A3)
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REV	DATE	DRAWN	REV'D	APP'D	REVISION
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S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: VC2 OPEN CHANNEL SETOUT PLAN
SHEET 2 OF 2

SCALE	DRAWING No	REV
1:500	IA016600-JCC-DG-1013	B

DATE: 7/12/2015 3:37:58 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVRP\projects\EN04189\Deliverables\Drawings\Civil\Dwgs\IA016600 - Open Channel Extensons\IA016600-DR-1012-1013.dwg

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Version: 1, Version Date: 13/07/2018

CONTROL LINE MC10 SETOUT (OPEN CHANNEL)				
CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
-50.079	289050.693	6265448.870	347°48'52.96"	
-0.818	289098.845	6265438.472	347°48'52.96	-50.000
57.234	289150.021	6265458.195	54°20'13.60"	
59.347	289151.253	6265459.911	54°20'13.60"	50.000
94.309	289179.549	6265479.217	14°16'22.60"	
174.975	289257.725	6265499.105	14°16'22.60"	1000.000
187.273	289269.662	6265502.063	13°34'05.98"	
300.000	289379.242	6265528.510		

CONTROL LINE MC11 SETOUT (MAINTENANCE ACCESS ROAD)				
CHAINAGE	EASTING	NORTHING	BEARING	RADIUS
0.000	289465.576	6265565.410	189°06'33.47"	
3.000	289462.614	6265564.935	189°06'33.47"	6.000
5.105	289460.520	6265564.969	169°00'44.22"	
7.747	289457.926	6265565.473	169°00'44.22"	-7.000
13.031	289452.856	6265564.521	212°15'31.09"	
18.414	289448.303	6265561.648	212°15'31.09"	10.000
21.577	289445.408	6265560.407	194°08'12.13"	
24.102	289442.959	6265559.790	193°36'34.52"	
29.007	289438.192	6265558.636	190°24'34.72"	
33.916	289433.364	6265557.749	192°43'37.72"	
34.310	289432.980	6265557.662	192°41'01.61"	
34.659	289432.640	6265557.586	192°39'47.59"	
36.802	289430.549	6265557.116	189°19'11.00"	
37.321	289430.037	6265557.032	190°31'40.45"	
39.318	289428.073	6265556.667	192°26'42.81"	
41.320	289426.118	6265556.235	194°21'45.06"	
43.327	289424.174	6265555.738	196°16'47.20"	
45.337	289422.245	6265555.174	198°11'49.22"	
47.351	289420.331	6265554.545	200°06'51.14"	
49.370	289418.435	6265553.851	202°01'52.95"	
51.393	289416.560	6265553.092	203°56'54.65"	
53.420	289414.708	6265552.269	205°27'36.55"	
54.592	289413.650	6265551.766	205°15'06.11"	
58.453	289410.158	6265550.118	205°15'06.11"	70.000
72.163	289397.266	6265545.518	194°01'47.17"	
329.308	289147.791	6265483.179	194°01'47.17"	-50.000
364.630	289119.204	6265463.702	234°30'18.92"	8.500
380.984	289105.259	6265463.851	124°16'03.05"	8.500
397.338	289110.223	6265476.884		

CONTROL LINE MC12 SETOUT (RETAINING WALL)			
CHAINAGE	EASTING	NORTHING	BEARING
0.000	289076.719	6265468.563	
114.000	289187.319	6265496.200	14°01'47.17"

NOTES

1. COORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA ZONE 56).
2. LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
3. CONTROL LINE SCHEDULES PROVIDE HORIZONTAL GEOMETRY ONLY.

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER | REFERENCE DRAWING TITLE

DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THESE DRAWINGS
IA016600-DM-EAST-WEST-OPEN-CHANNEL.12da

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS,VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

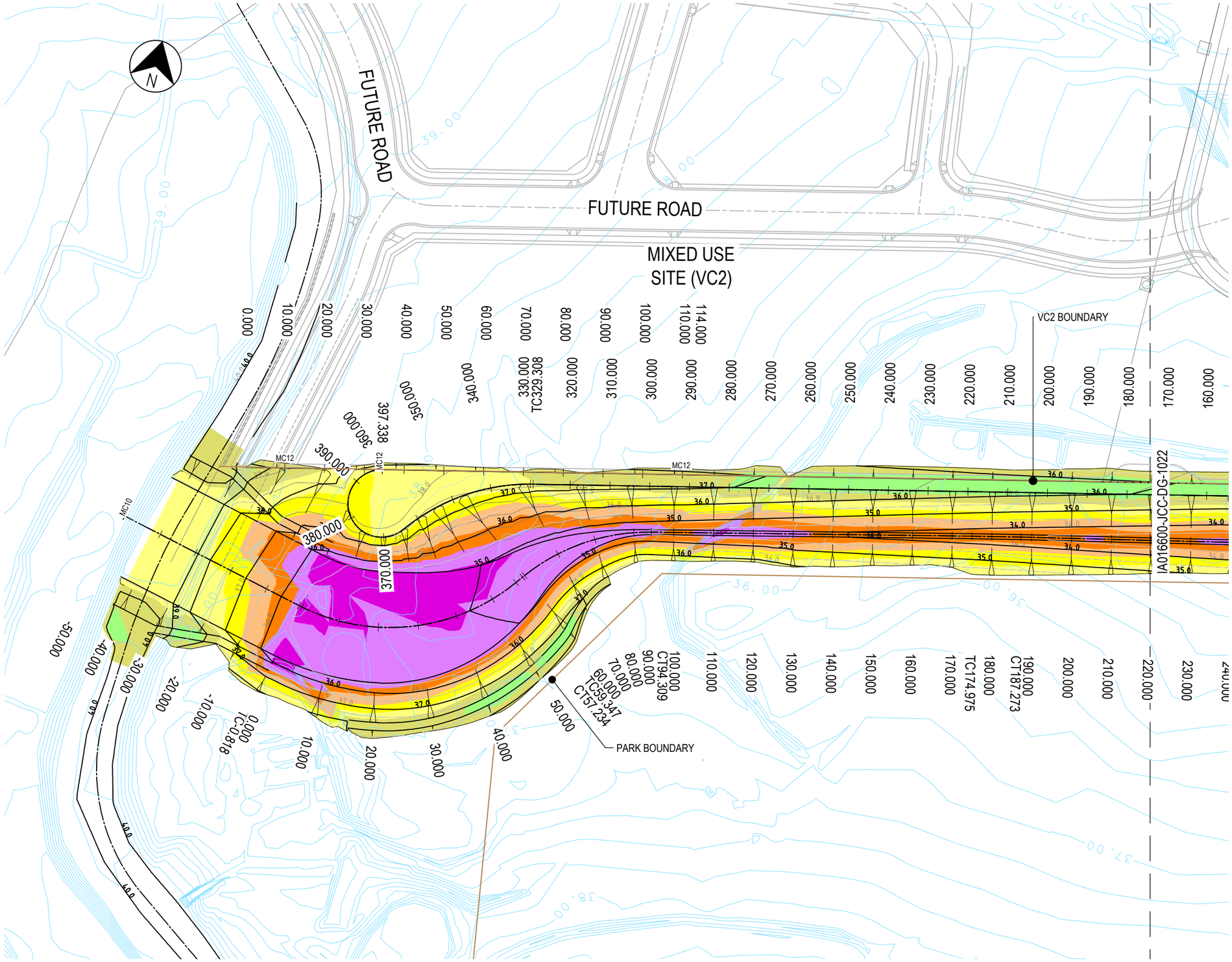
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: OPEN CHANNEL EXTENSION SETOUT TABLES

SCALE	DRAWING No	REV
N.T.S.	IA016600-JCC-DG-1014	B

DATE: 7/12/2015 3:38:14 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\EN\RI\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1014.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LEGEND

EXISTING CONTOURS

DESIGN CONTOURS

BULK EARTHWORKS DEPTH LEGEND

LOWER VALUE (m)		UPPER VALUE (m)
-3	to	-2.5
-2.5	to	-2
-2	to	-1.5
-1.5	to	-1
-1	to	-0.5
-0.5	to	0
0	to	0.5
0.5	to	1

NEGATIVE VALUES REPRESENT CUT
POSITIVE VALUES REPRESENT FILL

SCALE 1:500 (A1)
SCALE 1:1000 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.10.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	02.11.15	G.S.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

lendlease

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS,VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
G.S.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	02.11.15	02.11.15

TITLE
VC2 OPEN CHANNEL LAYOUT PLAN
BULK EARTHWORKS PLAN
SHEET 1 OF 2

SCALE	DRAWING No	REV
1:500	IA016600-JCC-DG-1021	B

DATE: 7/12/2015 3:39:03 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extenson\IA016600-DR-1021-1022.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

JORDAN SPRINGS LAKE

LAKESIDE PARADE

JUBILEE DRIVE

VC2 BOUNDARY

PARK BOUNDARY

IA016600-JCC-DG-1021

190.000 180.000 170.000 160.000 150.000 140.000 130.000 120.000 110.000 100.000 90.000 80.000 CT72.163 70.000 60.000 TC58.453 50.000 40.000 30.000 TC18.414 20.000 CT21.577 CT13.031 10.000 TC3.000 0.000 TC7.747 CT5.105

210.000 220.000 230.000 240.000 250.000 260.000 270.000 280.000 290.000 300.000

LEGEND

EXISTING CONTOURS

DESIGN CONTOURS

BULK EARTHWORKS DEPTH LEGEND

LOWER VALUE (m)		UPPER VALUE (m)
-3	to	-2.5
-2.5	to	-2
-2	to	-1.5
-1.5	to	-1
-1	to	-0.5
-0.5	to	0
0	to	0.5
0.5	to	1

NEGATIVE VALUES REPRESENT CUT
POSITIVE VALUES REPRESENT FILL

SCALE 1:500 (A1)
SCALE 1:1000 (A3)

5 0 5 10 15 20 25

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	02.11.15	G.S.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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Web: www.jacobs.com

CLIENT	LEND LEASE
PROJECT	JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1
DRAWN G.S.	DRAWING CHECK S.G.
DESIGNED G.D.	DESIGN REVIEW J.C.
REVIEWED J.C. DATE 02.11.15	APPROVED E.D. DATE 02.11.15

TITLE
VC2 OPEN CHANNEL LAYOUT PLAN
BULK EARTHWORKS PLAN
SHEET 2 OF 2

SCALE	DRAWING No	REV
1:500	IA016600-JCC-DG-1022	B

DATE: 7/12/2015 3:39:14 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1021-1022.dwg

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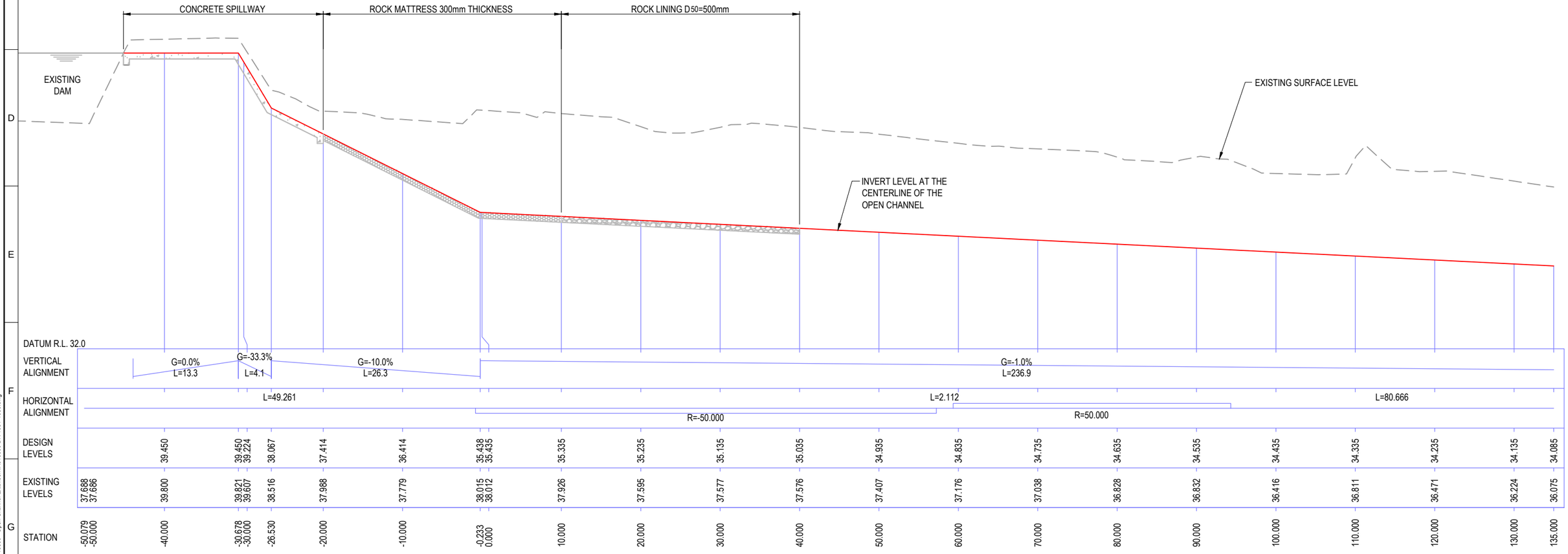
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC10

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER | REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

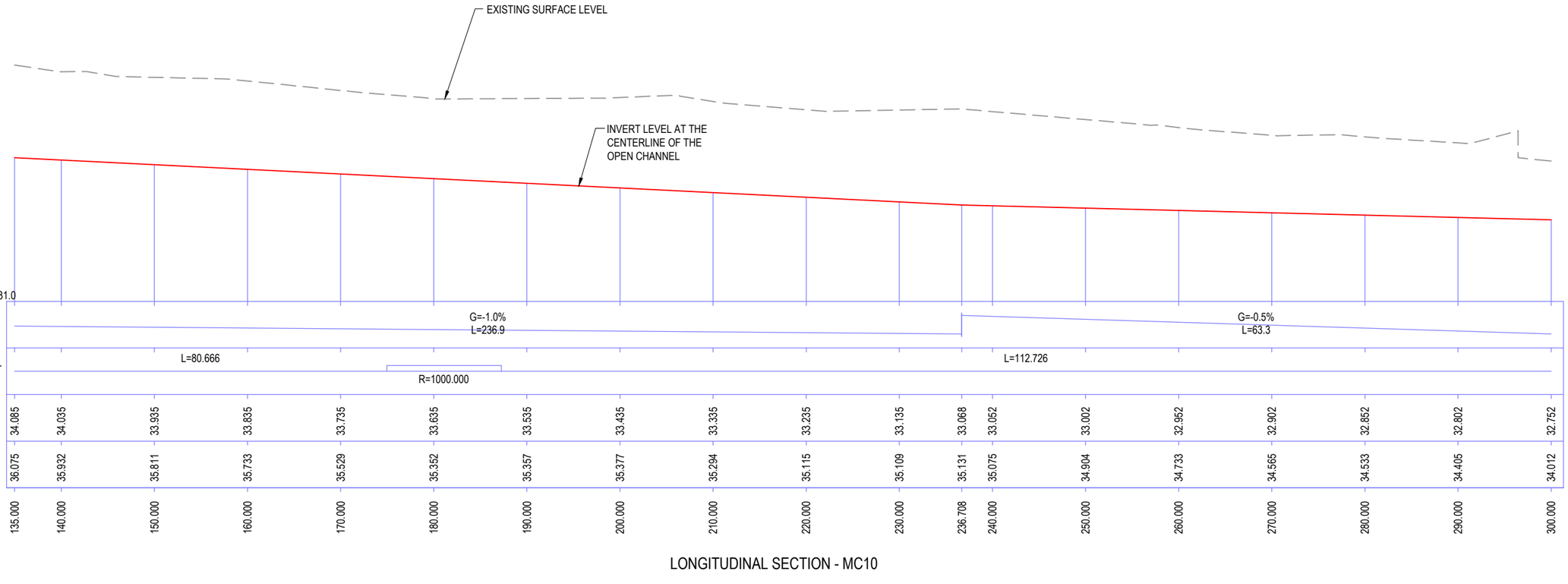
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: LONGITUDINAL SECTION MC10 (OPEN CHANNEL) SHEET 1 OF 2

SCALE: AS SHOWN | DRAWING No: IA016600-JCC-DG-1031 | REV: B

DATE: 7/12/2015 3:39:41 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC10

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

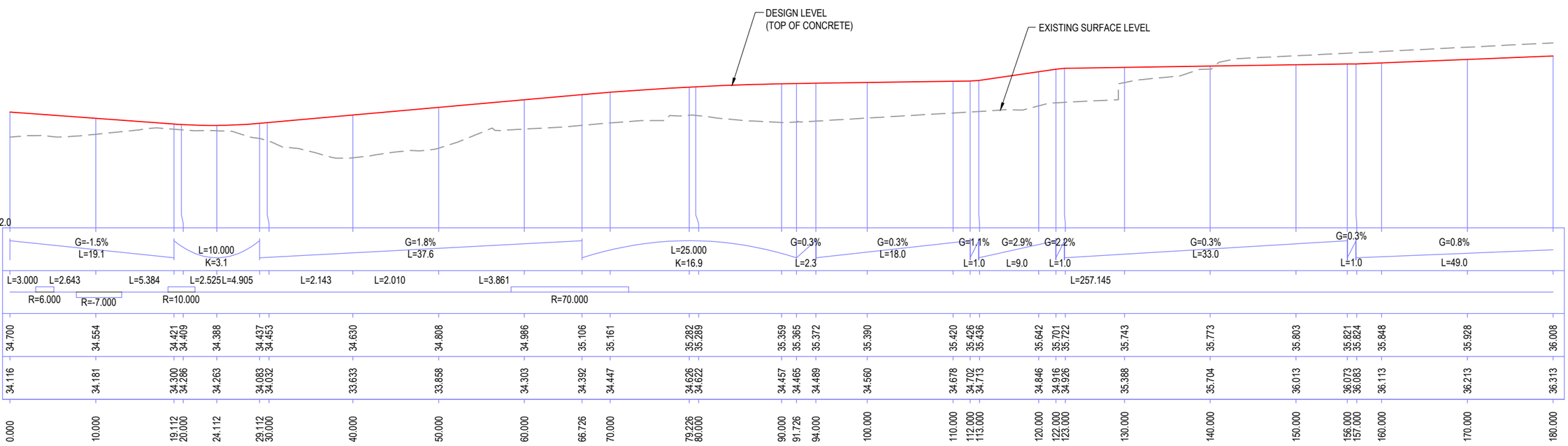
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: LONGITUDINAL SECTION MC10 (OPEN CHANNEL) SHEET 2 OF 2

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1032	B

DATE: 7/12/2015 3:39:50 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC11

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

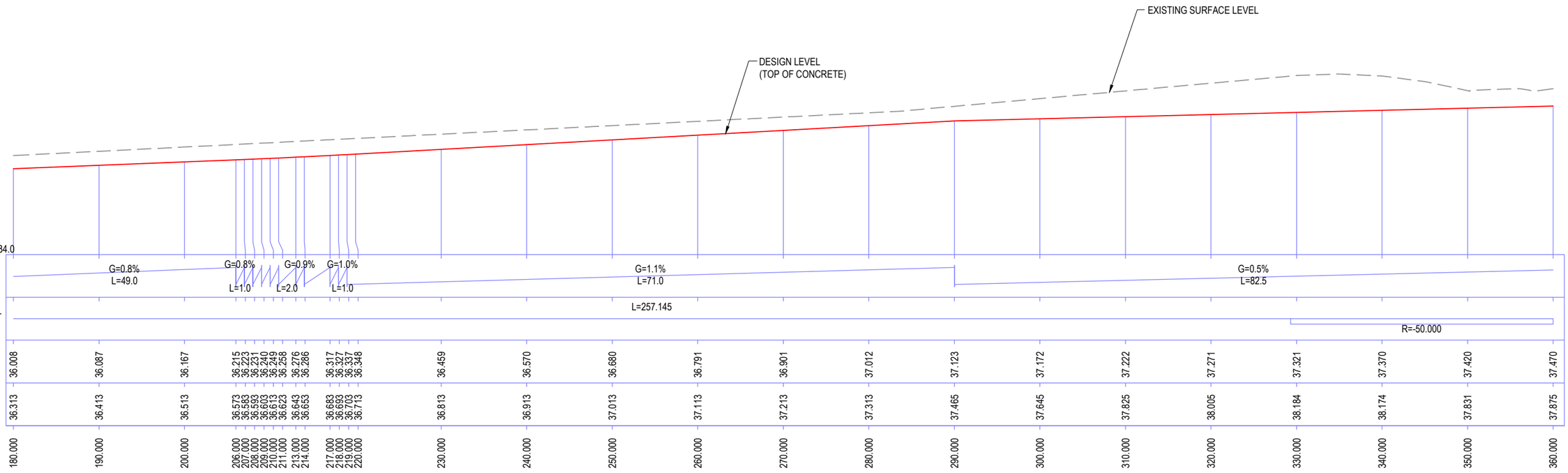
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: LONGITUDINAL SECTION MC11 (MAINTENANCE ACCESS ROAD) SHEET 1 OF 3

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1033	B

DATE: 7/12/2015 3:40:11 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC11

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

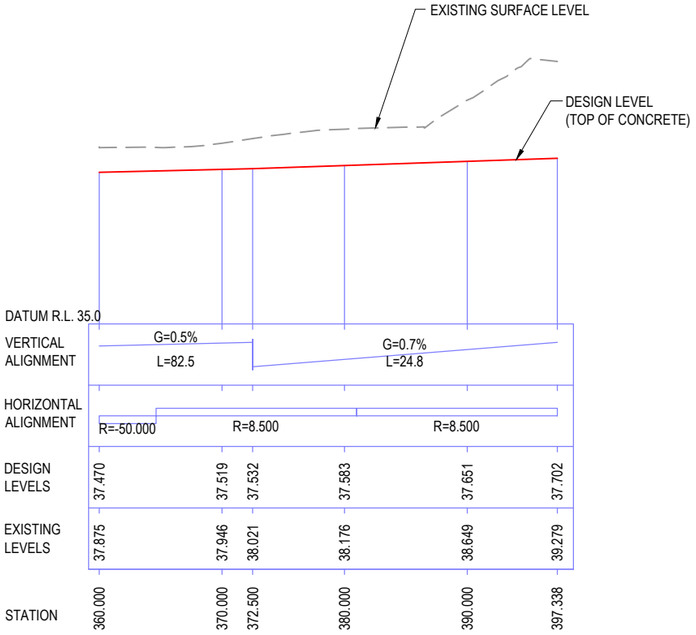
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	22.10.15	22.10.15

TITLE: LONGITUDINAL SECTION MC11 (MAINTENANCE ACCESS ROAD) SHEET 2 OF 3

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1034	B

DATE: 7/12/2015 3:40:19 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC11

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)
2.5 0 2.5 5 7.5 10 12.5
0.5 0 0.5 1 1.5 2 2.5

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	S.R.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

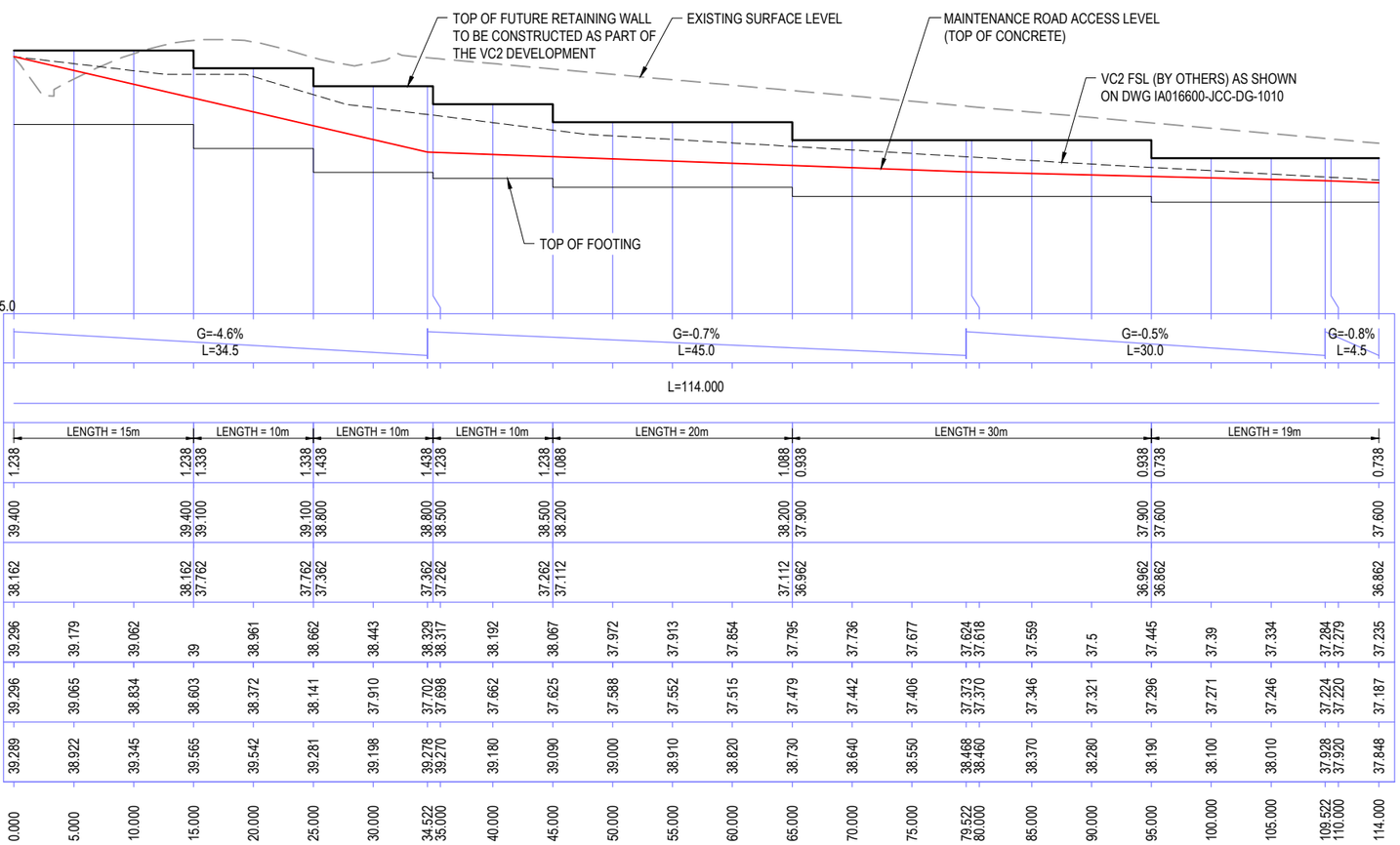
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: LONGITUDINAL SECTION MC11 (MAINTENANCE ACCESS ROAD) SHEET 3 OF 3

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1035	B

DATE: 7/12/2015 3:40:27 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LONGITUDINAL SECTION - MC12

NOTES

1. FOR RETAINING WALL REFER TO STRUCTURAL DETAILS ON DRAWING IA016600-JCC-DG-1062. ALSO REFER TO DRAWING IA016600-JCC-DG-1041.

HORIZ. 1:250 (A1) 1:500 (A3)
VERT. 1:50 (A1) 1:100 (A3)
2.5 0 2.5 5 7.5 10 12.5
0.5 0 0.5 1 1.5 2 2.5

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER | REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

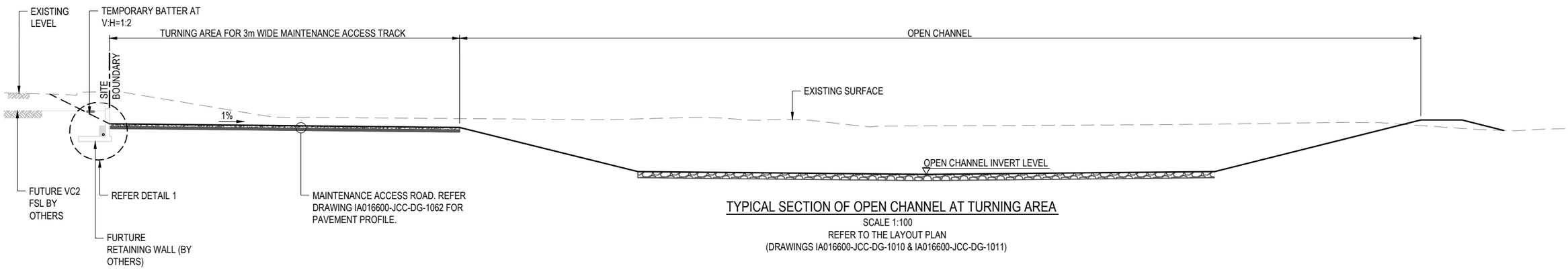
TITLE: LONGITUDINAL SECTION MC12 (FUTURE RETAINING WALL) SHEET 1 OF 1

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1036	B

DATE: 7/12/2015 3:40:34 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1031-1036.dwg

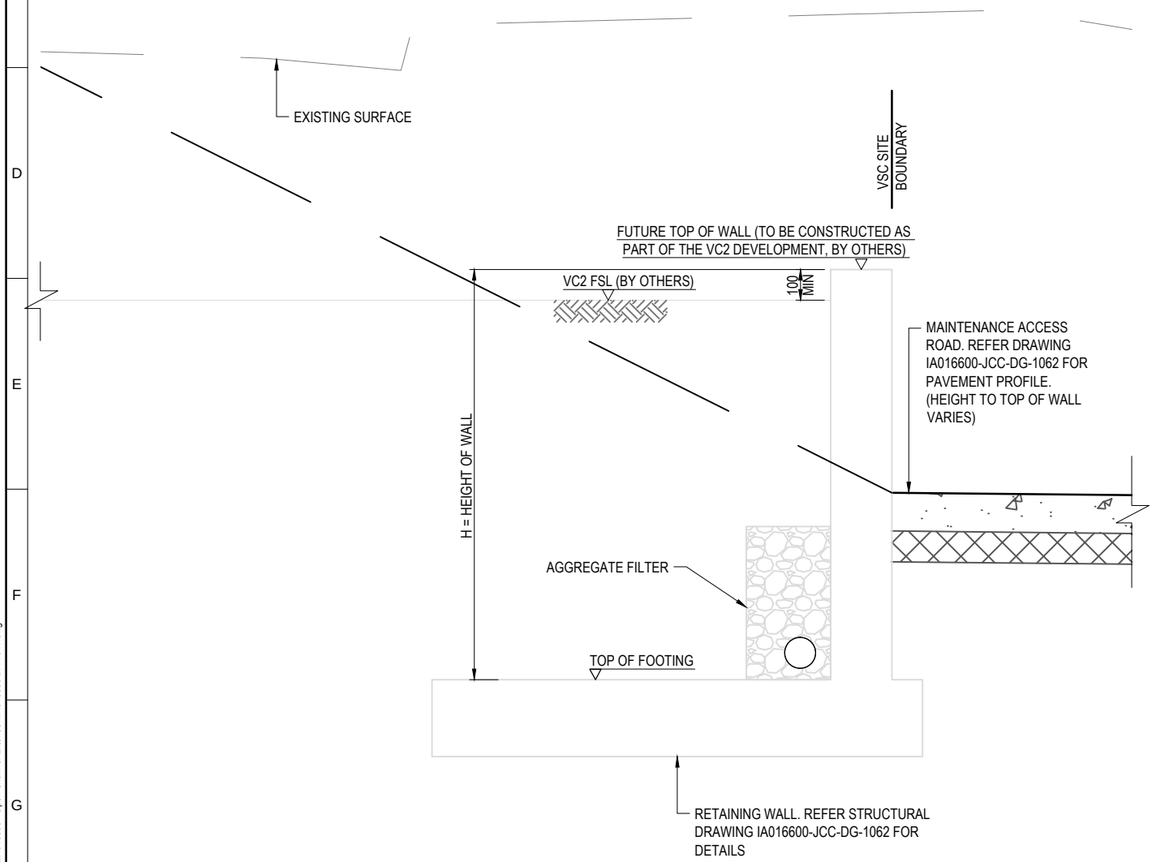
A1

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



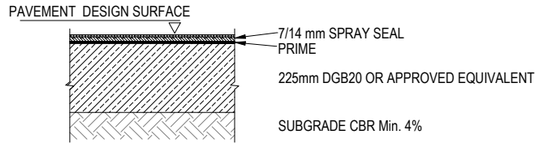
TYPICAL SECTION OF OPEN CHANNEL AT TURNING AREA

SCALE 1:100
REFER TO THE LAYOUT PLAN
(DRAWINGS IA016600-JCC-DG-1010 & IA016600-JCC-DG-1011)



DETAIL 1 TYPICAL (RETAINING WALL)

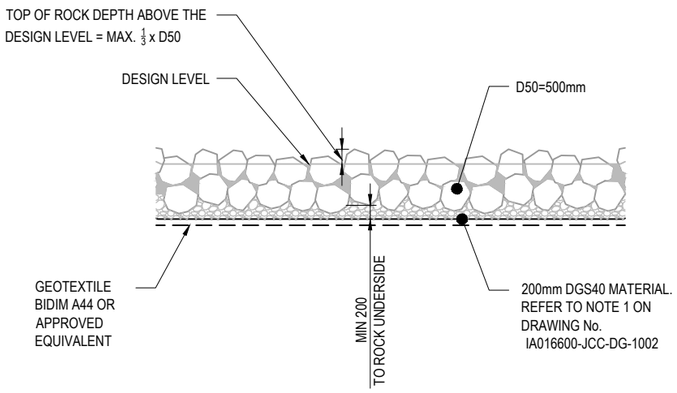
SCALE 1:10



MAINTENANCE ACCESS GRANULAR TRACK PAVEMENT PROFILE

SCALE 1:10

REFER TO THE LAYOUT PLAN (DRAWINGS IA016600-ECC-DG-1010 & IA016600-ECC-DG-1011) FOR EXTENT OF PAVEMENT.



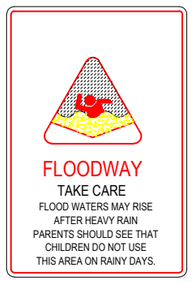
ROCK LINING TYPICAL SECTION

NOT TO SCALE

NOTES

GENERAL:

1. WHERE ACCESS TRACK CONNECTS TO EXISTING STREETS, THE KERB & GUTTER SHALL BE BROKEN OUT AND REPLACED WITH HEAVY DUTY LAYBACK TO PENRITH CITY COUNCIL ENGINEERING CONSTRUCTION SPECIFICATION FOR CIVIL WORKS 2013 (OR LATEST REVISION). MATCH TO EXISTING LEVELS.



FLOODWAY, NO SWIMMING, NO DIVING WARNING SIGNS

EACH SIGN SHALL HAVE 3 FACES, MOUNTED IN A TRIANGULAR ARRAY. SIGN POSTS ARE TO BE Ø65 GMS PIPE, SET IN CONCRETE (Ø250 POST HOLE 600mm DEEP). POST TO BE OFFSET MIN 3.0m FROM EDGE OF WATER - UNDERSIDE OF SIGN TO BE INSTALLED 2m ABOVE FSL. 'NO SWIMMING' & 'NO DIVING' SIGNS NOT SHOWN ABOVE

REFER ALSO TO BLACKTOWN CITY COUNCIL STANDARD DRAWING A(BS)114S

SCALE 1:10 (A1) SCALE 1:20 (A3) 0.1 0 0.1 0.2 0.3 0.4 0.5

SCALE 1:100 (A1) SCALE 1:200 (A3) 1 0 1 2 3 4 5

REV	DATE	DRAWN	REV'D	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL (PAVEMENT PROFILE UPDATED)
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT	LEND LEASE
PROJECT	JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1
DRAWN S.R.	DRAWING CHECK S.G.
REVIEWED J.C. DATE 22.10.15	APPROVED E.D. DATE 22.10.15
DESIGNED G.D.	DESIGN REVIEW J.C.

TITLE	TYPICAL SECTION AND DETAIL
SCALE	AS SHOWN
DRAWING No.	IA016600-JCC-DG-1041
REV	C

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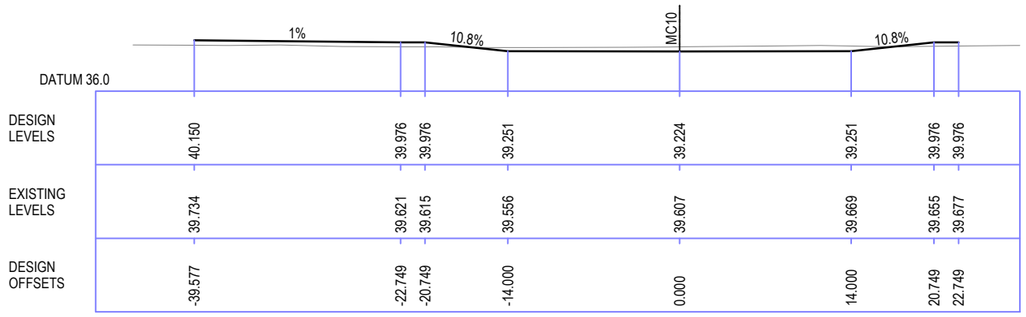
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



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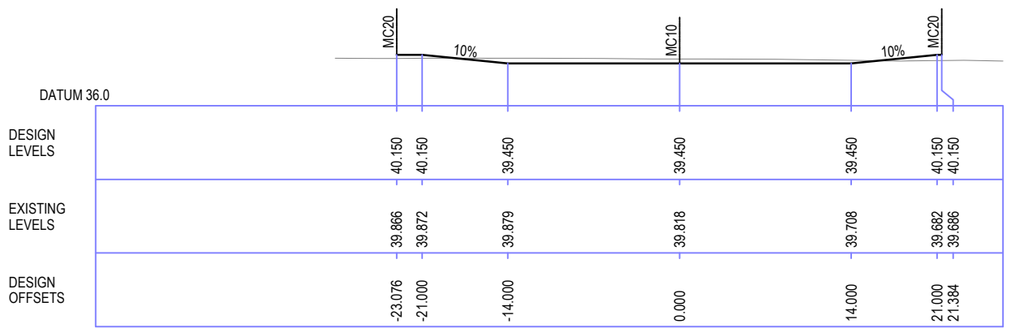

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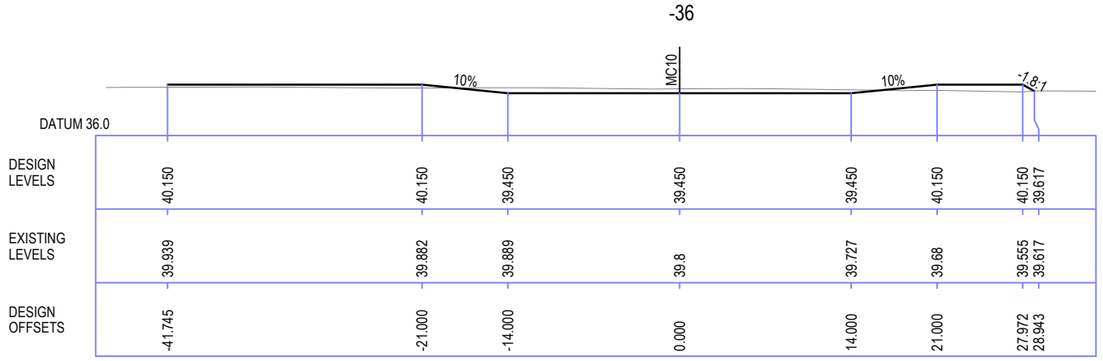

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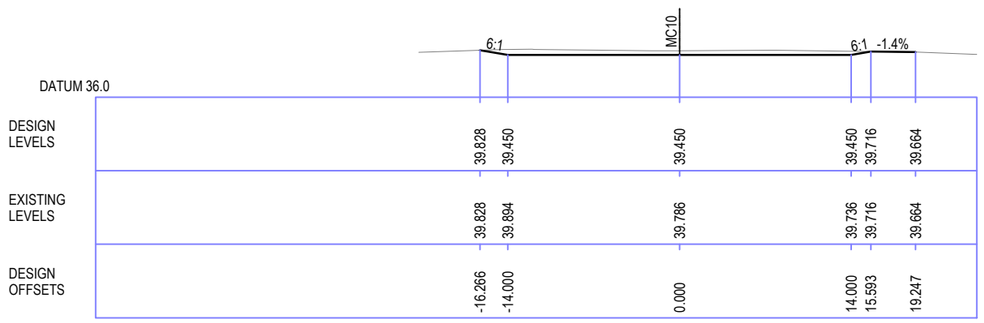

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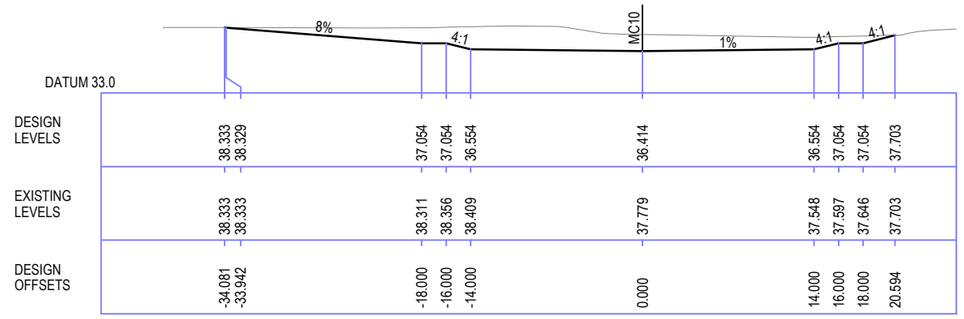

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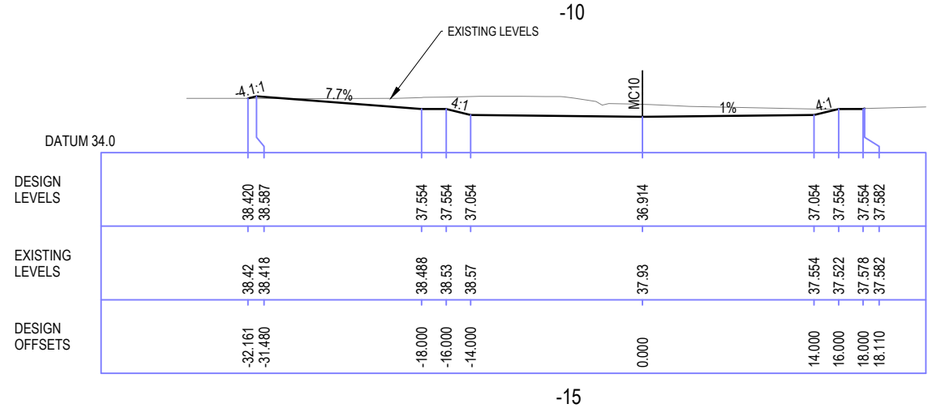

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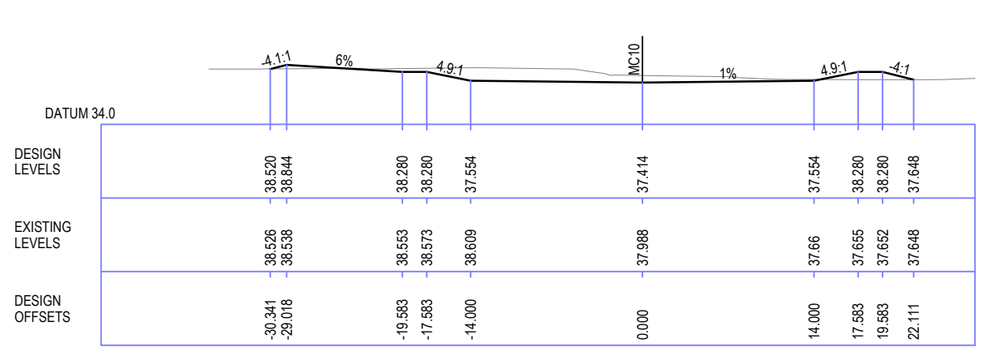

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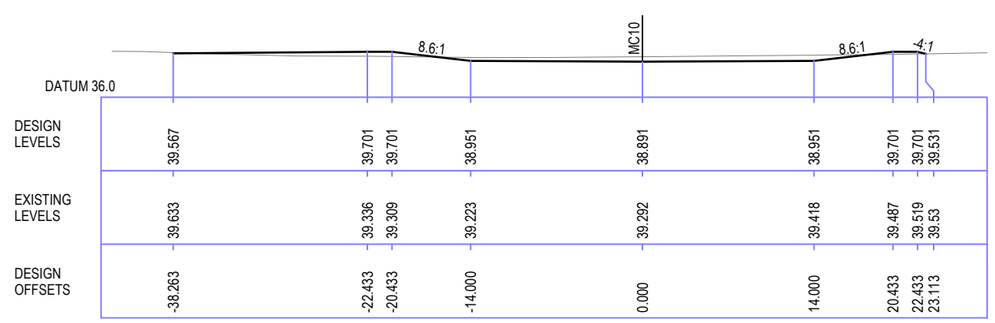

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VERT 1:250 (A1)
HORIZ 1:500 (A1)
VERT 1:500 (A1)

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REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

lendlease

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Fax: +61 2 9928 2500
Web: www.jacobs.com

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	22.10.15	22.10.15

TITLE: CROSS SECTIONS SHEET 1 OF 4

SCALE	DRAWING No	REV
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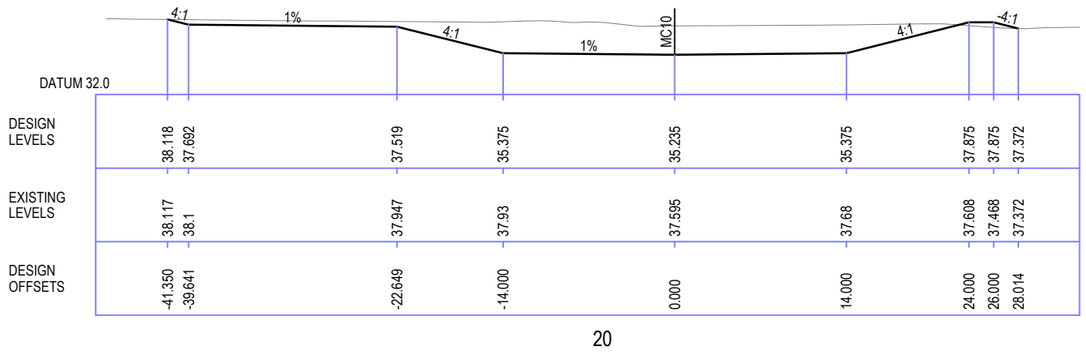
Version: 1, Version Date: 13/07/2018



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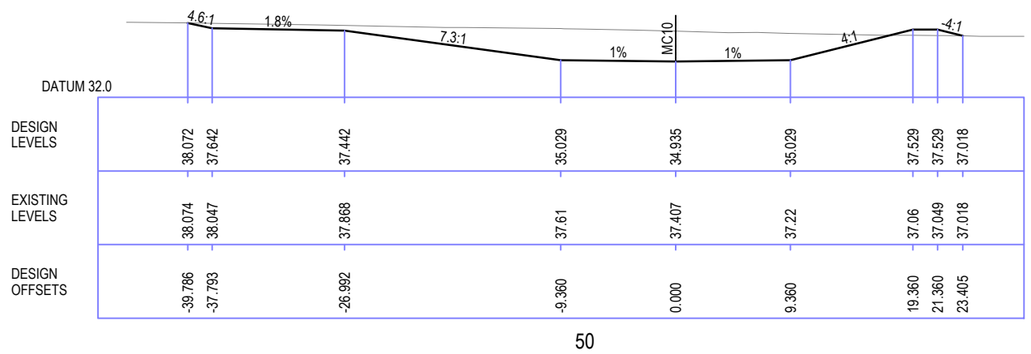

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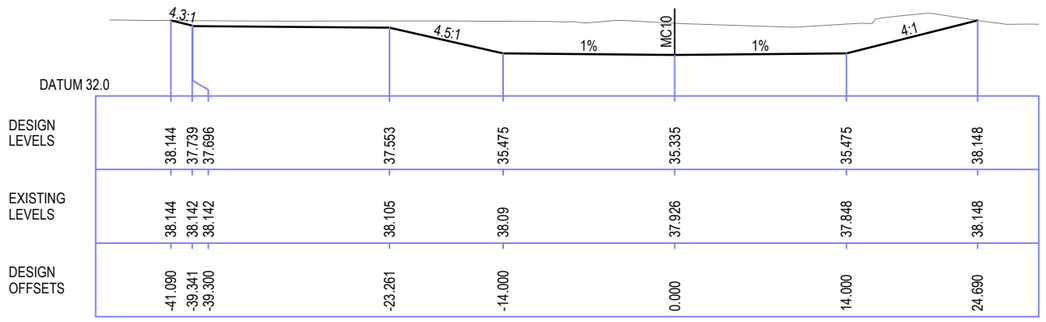

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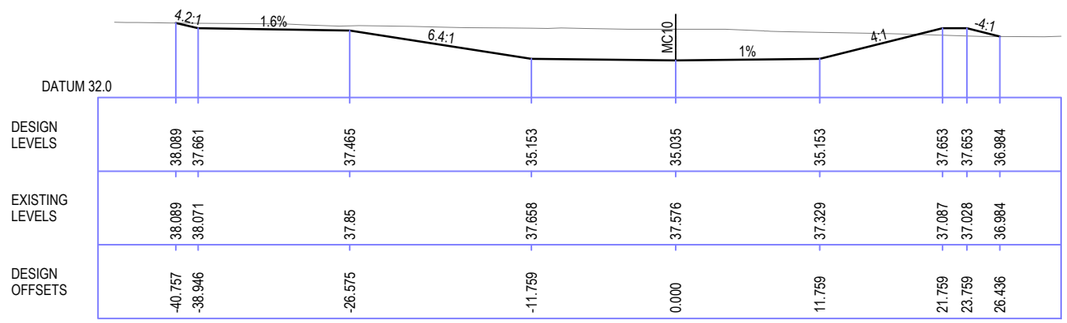

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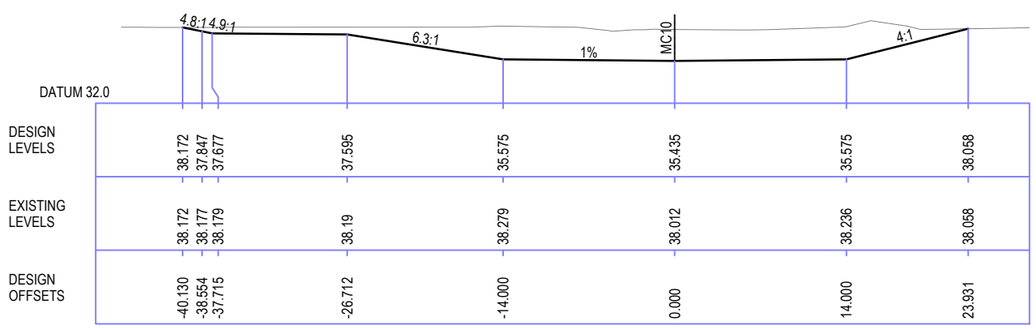

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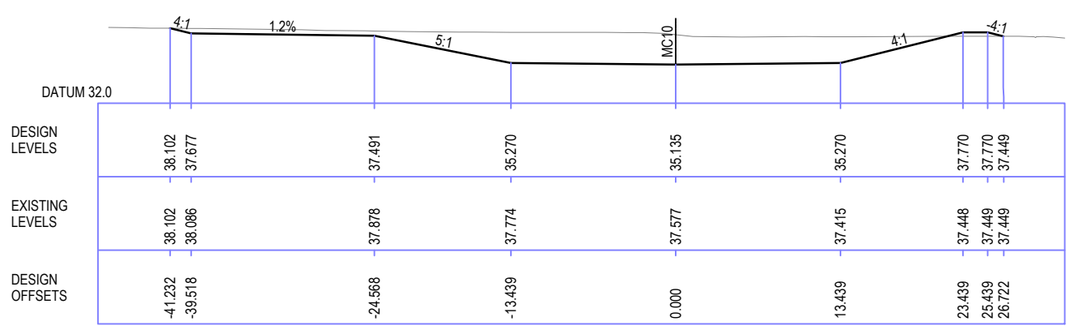

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HORIZ 1:500 (A1)
VERT 1:500 (A1)

2.5 0 2.5 5 7.5 10 12.5

REV	DATE	DRAWN	REV'D	APP'D	REVISION
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A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

lendlease

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CLIENT	LEND LEASE
PROJECT	JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE
CROSS SECTIONS SHEET 2 OF 4

SCALE	DRAWING No	REV
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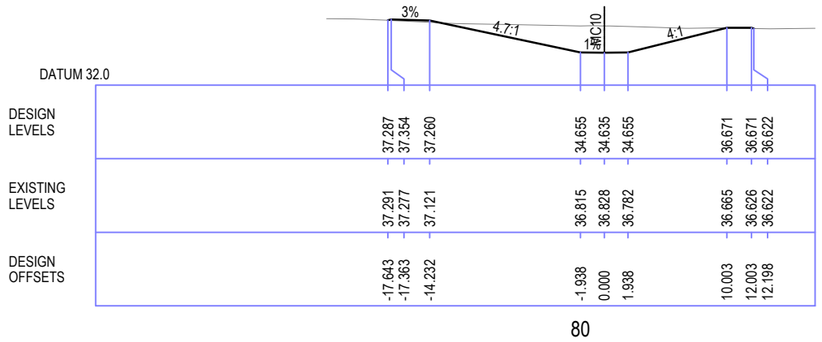
Version: 1, Version Date: 13/07/2018



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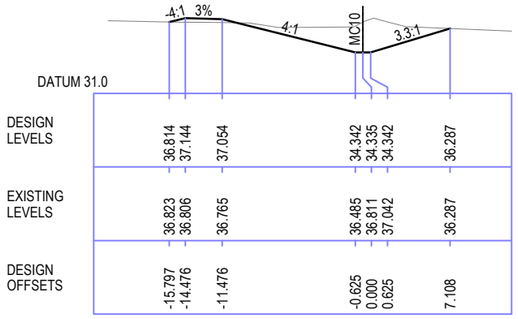

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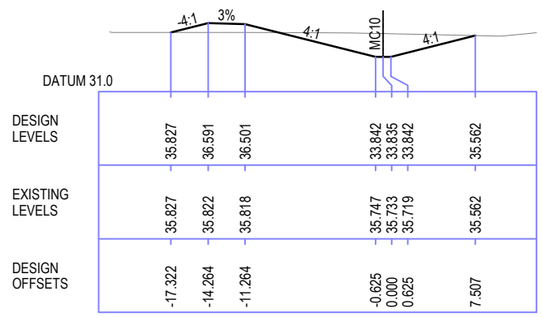

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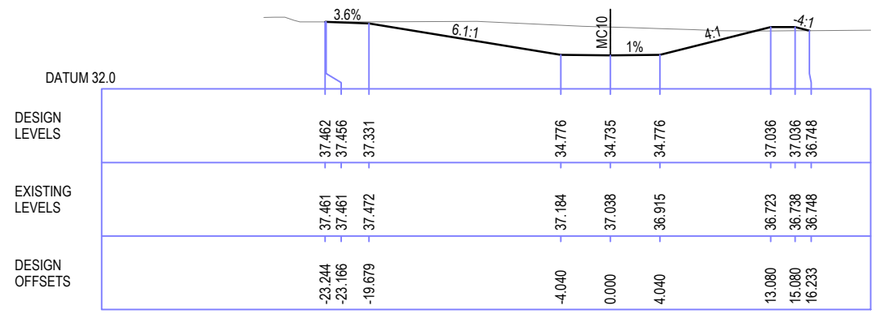

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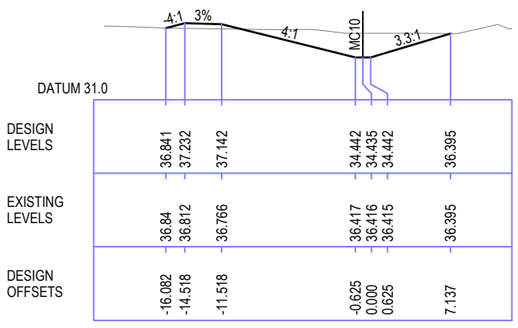

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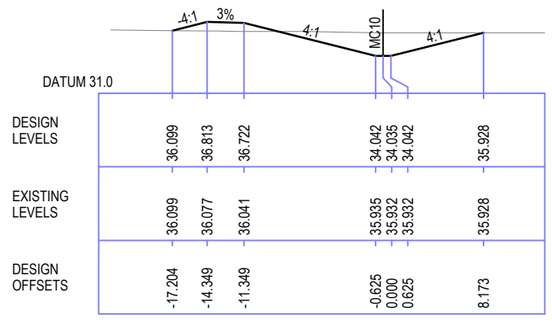

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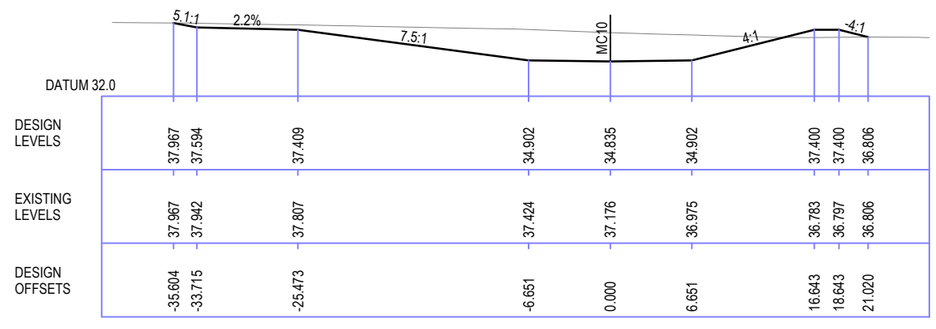

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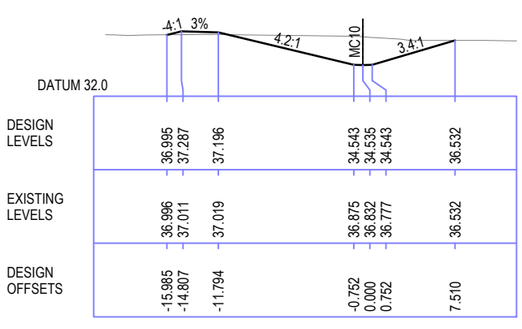

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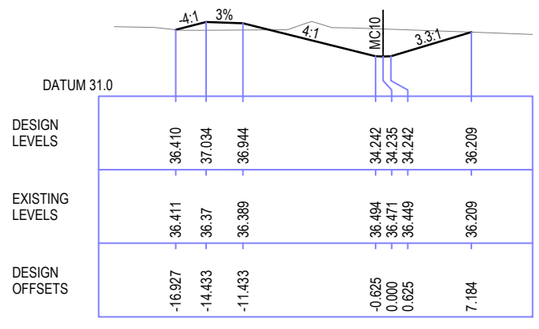

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REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15.	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	22.10.15	22.10.15

TITLE: CROSS SECTIONS SHEET 3 OF 4

SCALE	DRAWING No	REV
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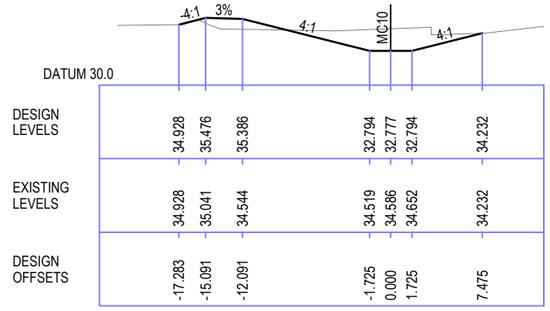
Version: 1, Version Date: 13/07/2018



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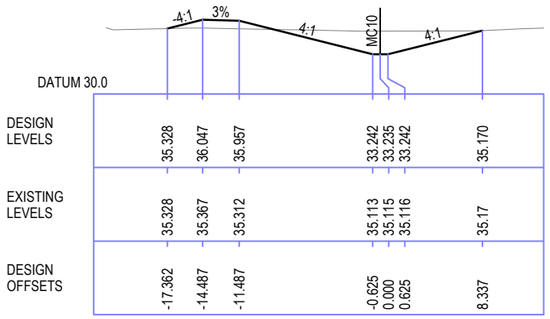

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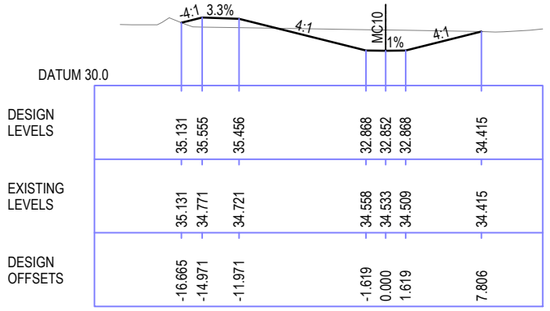

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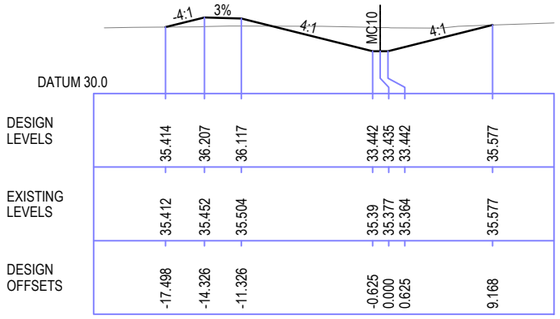

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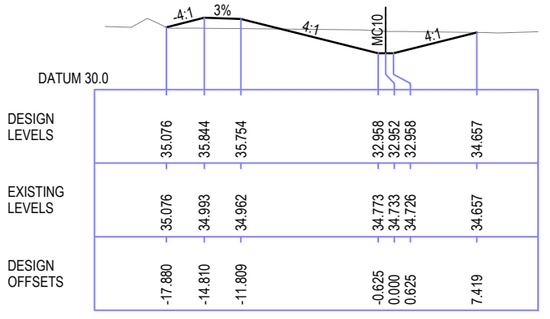

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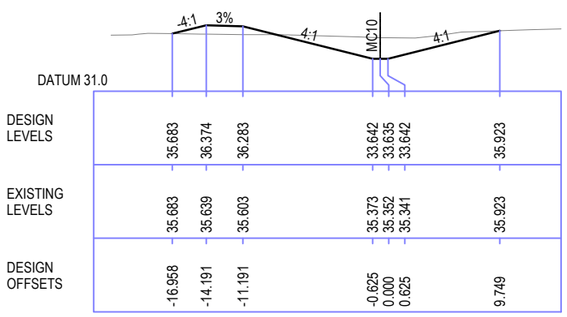

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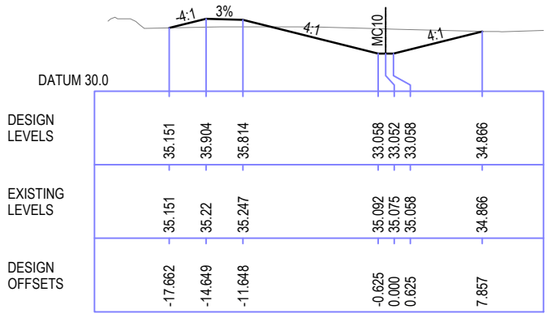

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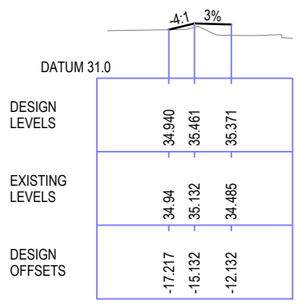

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REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
S.R.	S.G.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
G.D.	J.C.		

TITLE: CROSS SECTIONS
SHEET 4 OF 4

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1054	B

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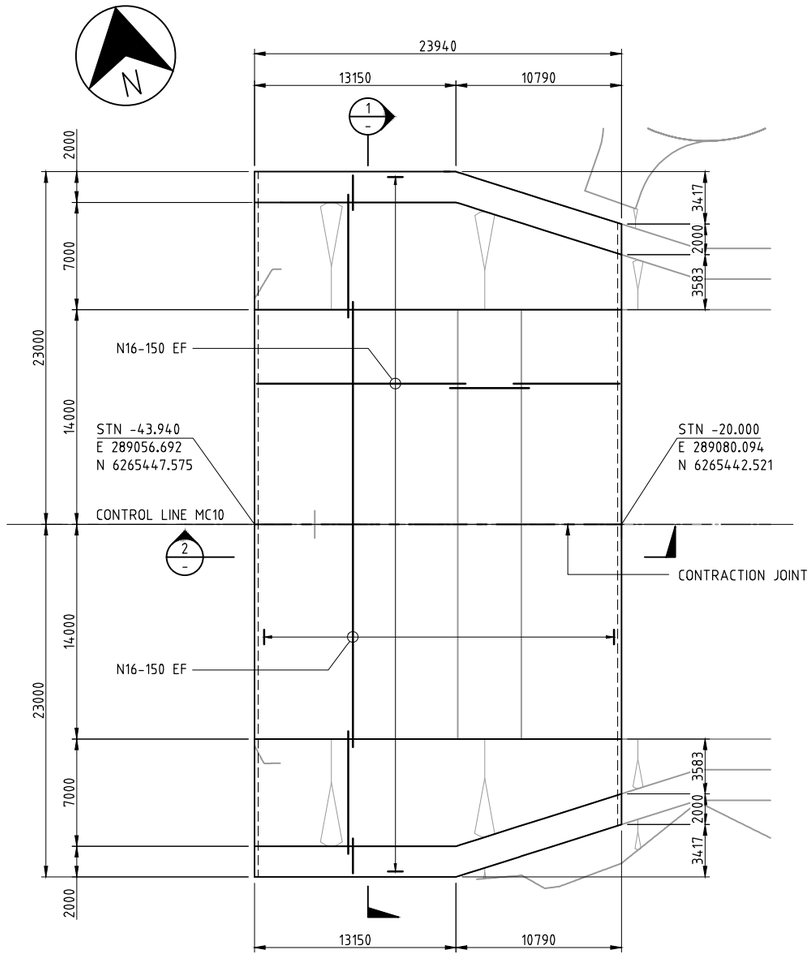
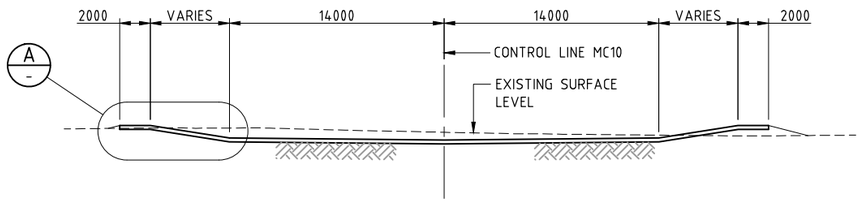


PLAN - CONCRETE
SCALE 1 : 200



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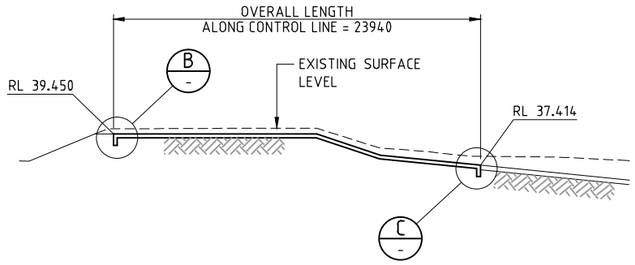


SECTION 2
SCALE 1:200

GENERAL NOTES

1. DESIGN LOADING: T44

CONCRETE NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600.
2. NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY THE SITE SUPERINTENDENT.
3. CONCRETE DIMENSIONS SHOWN DO NOT INCLUDE THICKNESSES OF ANY APPLIED FINISHES.
4. CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL COUNCIL/SUPERINTENDENT.
5. CURING OF ALL CONCRETE SHALL BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 7 DAYS, AND PREVENTION OF LOSS OF MOISTURE FOR A TOTAL OF 14 DAYS FOLLOWED BY A GRADUAL DRYING OUT. APPROVED SPRAYED ON CURING COMPOUNDS (MIN 90% MOISTURE RETENTION TO AS 3999) MAY BE USED WHERE NO OTHER FINISHES ARE PROPOSED. POLYTHENE SHEETING OR WET HESSIAN MAY BE USED IF PROTECTED FROM WIND AND TRAFFIC.
6. A BOND BREAKING MATERIAL SHALL BE PLACED BETWEEN CONTACTING SURFACES AT CONTRACTION JOINTS GROOVE. REINFORCEMENT SHALL NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS UNLESS SHOWN IN DETAIL.
7. THE SITE SUPERINTENDENT SHALL BE GIVEN A MINIMUM OF 24 HOURS NOTICE FOR REINFORCEMENT INSPECTION AND CONCRETE SHALL NOT BE DELIVERED UNTIL FINAL APPROVAL IS OBTAINED
8. CONCRETE SHALL CONFORM TO THE FOLLOWING:

LOCATION	STRENGTH MPa	SLUMP mm	AGGREGATE mm
SPILLWAY SLAB	40	80	20

9. MINIMUM CLEAR COVER TO THE REINFORCEMENT INCLUDING TIES SHALL BE AS FOLLOWS:
   - IN CONTACT WITH GROUND
     - 50mm (WITH MEMBRANE)
     - 70mm (WITHOUT MEMBRANE)
   - FORMED AND EXPOSED SURFACE
     - 40mm
     - IN CONTACT WITH CONCRETE SURFACE
     - 20mm
10. COVER SHALL BE OBTAINED BY THE USE OF NON METALLIC APPROVED BAR CHAIRS. CHAIRS SHALL BE SPACED AT 800mm CENTRES MAXIMUM.
11. ALL CONCRETE WORKS SHALL BE MECHANICALLY VIBRATED. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.
12. THE CONTRACTOR SHALL ENSURE EXTRA CARE OF THE COMPLETED WORKS TO AVOID DAMAGE BY PLANT AND EQUIPMENT.
13. NO HOLES, CHASES OR EMBEDMENT OF PIPES, UNLESS SHOWN ON THE DRAWINGS.
14. CONSTRUCTION TOLERANCES SHALL BE IN ACCORDANCE WITH AS3600.
15. ALL FORMWORKS USED ON SITE SHALL BE COATED WITH AN APPROVED RELEASING AGENT PRIOR TO THE POURING OF CONCRETE.
16. 25mm CHAMFERS & FILLETS SHALL BE PROVIDED TO ALL EXPOSED EDGES AND CORNERS UNLESS NOTED OTHERWISE

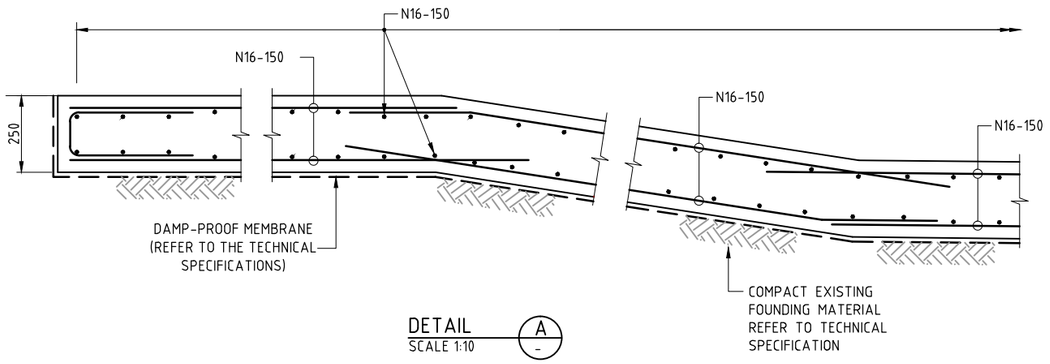
REINFORCEMENT NOTES

1. REINFORCEMENT WHERE SHOWN IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.
2. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE SITE SUPERINTENDENT.
3. REINFORCEMENT SPLICES: UNLESS NOTED OTHERWISE ON THE DRAWINGS ALL SPLICES SHALL CONFORM TO THE FOLLOWING TABLE:-

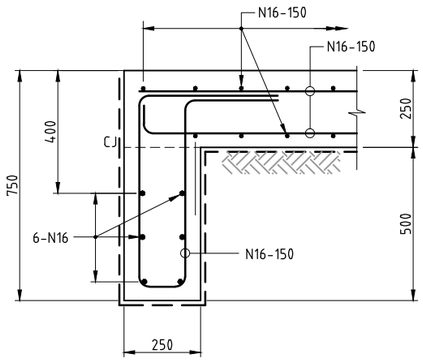
BAR DIAMETER	SLABS	
	'A'	'B'
N12	500	600
N16	650	800

'A' DENOTES <= 300mm OF CONCRETE CAST BELOW BAR
'B' DENOTES > 300mm OF CONCRETE CAST BELOW BAR
INCREASE LAP LENGTHS SHOWN IN THE ABOVE TABLE BY 20% WHERE 3 BARS ARE SHOWN AS BUNDLED TOGETHER

4. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:-
   N DENOTES GRADE 500 NORMAL DUCTILITY DEFORMED BAR TO AS4671.
   R DENOTES GRADE 250 NORMAL DUCTILITY PLAIN ROUND BAR TO AS4671.



DETAIL A
SCALE 1:10



DETAIL B
SCALE 1:10

DETAIL C SIMILAR. OPPOSITE HAND

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	22.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER | REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
D.G.	I.C.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
H.N.	J.C.		

TITLE: SPILLWAY SLAB DETAILS

SCALE	DRAWING No	REV
AS SHOWN	IA016600-JCC-DG-1061	B

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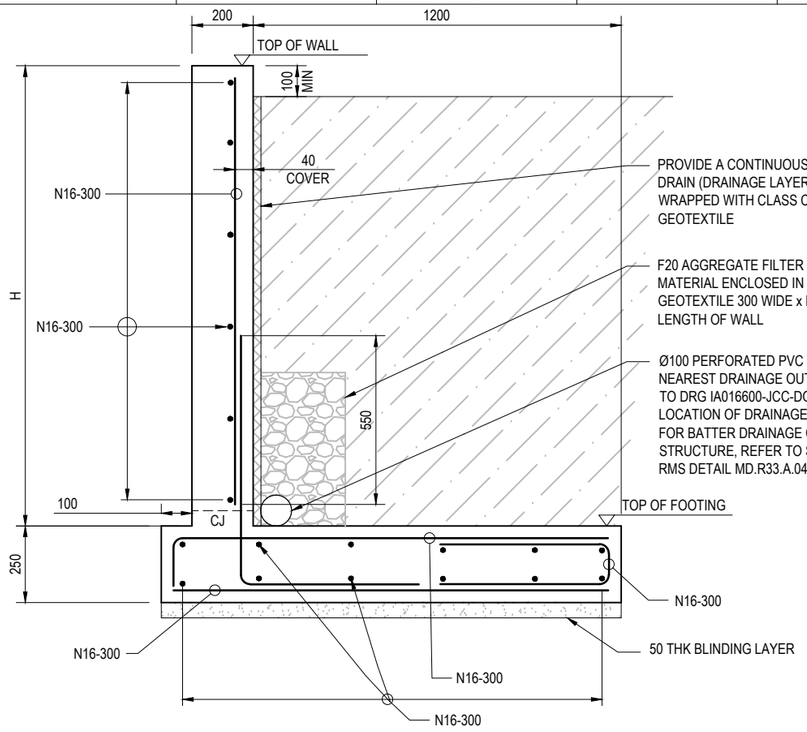
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

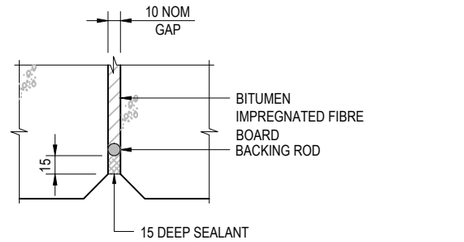


TYPICAL CROSS SECTION OF A RETAINING WALL

(TO BE CONSTRUCTED AS PART OF VC2 DEVELOPMENT, FUTURE LEVELS BY OTHERS)

SCALE : 1:10

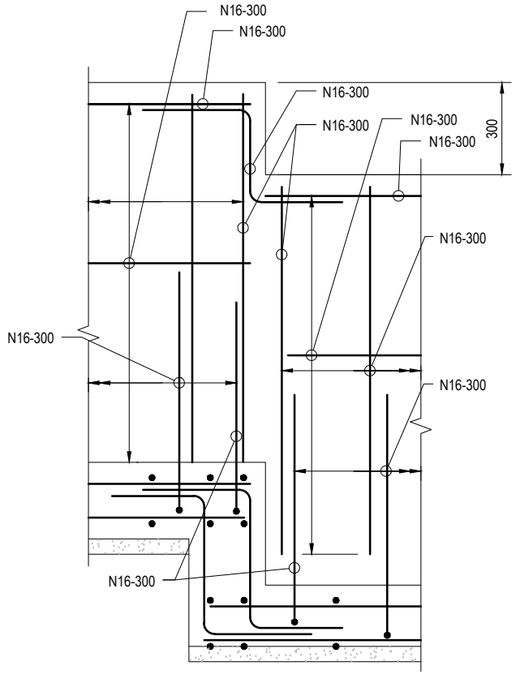
NOTE: FOR DIMENSION "H", WALL ELEVATION AND RLs REFER TO DRG IA016600-JCC-DG-1036



TYPICAL EXPANSION JOINT (EJ) DETAIL

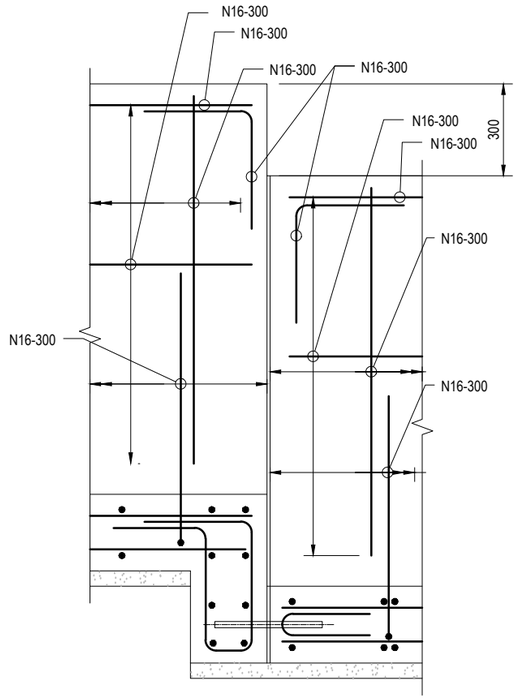
0 25 50 75 100 150

SCALE 1:2.5



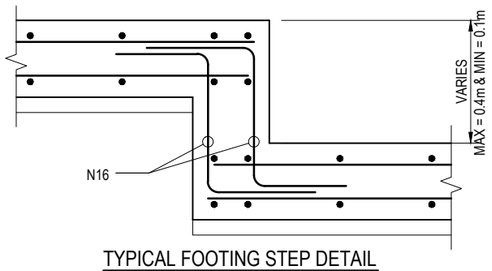
TYPICAL REINFORCEMENT AT WALL STEP

SCALE : 1:10



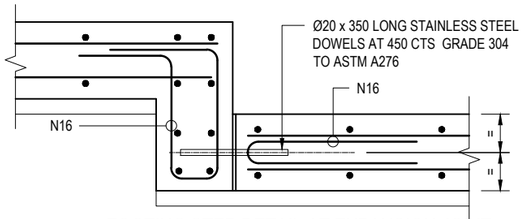
TYPICAL WALL STEP REINFORCEMENT AT EXPNASION JOINT

SCALE : 1:10



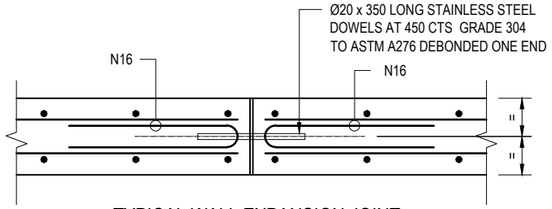
TYPICAL FOOTING STEP DETAIL

SCALE : 1:10



FOOTING STEP DETAIL AT EXPANSION JOINT

SCALE : 1:10



TYPICAL WALL EXPANSION JOINT

SCALE : 1:10

NOTES

STRUCTURAL:

CONCRETE NOTES:

1. CONCRETE EXPOSURE CLASSIFICATION: B1.
2. DESIGN LIFE OF 50 YEARS TO AS3600.
3. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
4. BLINDING CONCRETE TO BE 20MPa.
5. EXPANSION JOINTS (EJ) TO BE AT EVERY 30m MAX.
6. EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE
7. CJ DENOTES CONSTRUCTION JOINT.
8. NO BACKFILL SHALL BE PLACED AGAINST STRUCTURES WITHIN 21 DAYS AFTER PLACING CONCRETE, UNLESS THE CONCRETE STRENGTH IS VERIFIED TO HAVE REACHED 28 DAY STRENGTH.
9. FILTER MATERIAL SHALL CONFORM TO RMS SPECIFICATION R3580.
10. FLUSHING POINT OF SUBSOIL PIPE SHALL BE PROVIDED IN ACCORDANCE WITH RMS STANDARD DRAWINGS MD.R33.A03.A AND MD.R33.A05.A.2
11. COMPACTION EQUIPMENT USED TO COMPACT THE CRUSHED ROCK BACKFILL MATERIAL BEHIND THE WALL SHALL BE LIMITED TO A PEDESTRIAN ROLLER OR PLATE COMPACTOR FOR A MINIMUM WIDTH OF 1000mm OR H/3, WHICHEVER IS GREATER. THE LEVEL OF COMPACTION TO BE ACHIEVED SHALL BE IN ACCORDANCE WITH B30 AND R44.

REINFORCEMENT NOTES

12. UNLESS NOTED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTHS OF LAPS SHALL BE AS FOLLOWS:

BAR SIZE:	N12	N16	N20	N24	N28	N32	N36
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR:	400	500	-	-	-	-	-
b) OTHER BARS:	300	400	-	-	-	-	-

WHERE MORE THAN 50% OF ADJACENT BARS ARE LAPPED IN ANY ONE CROSS SECTION, ON ANY FACE, THE LENGTHS SHOWN ABOVE SHALL BE INCREASED BY 30%

13. REINFORCEMENT TRIMMER BARS AND N12 CLOSURE BARS (IE: U-BARS) ARE TO BE PROVIDED AT ALL OPENINGS WHERE MAIN REINFORCEMENT HAS BEEN CURTAILED. SIZE OF TRIMMER BAR TO MATCH MAIN REINFORCEMENT. IF REINFORCEMENT IS PROVIDED ON EACH FACE, ONE TRIMMER BAR IS TO BE PROVIDED ON EACH FACE.

FOUNDATION:

14. THE BACKFILL AT THE BACK OF WALL IS CONSIDERED TO BE FLAT WITH A FRICTION ANGLE Ø = 30 DEGREES.
15. THE MINIMUM FOUNDATION BEARING PRESSURE TO SATISFY FACTORED ULTIMATE LIMIT STATE IS 150KPa.
16. WHERE WALL IS FOUNDED ON CLASS V ROCK, PROVDE 50 MIN BLINDING LAYER
17. WHERE WALL IS FOUNDED ON ENGINEERED FILL, FILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH B30 AND R44
18. WHERE WALL IS TO BE FOUNDED ON A COMBINATION OF RESIDUAL SOIL AND FILL, RIP, RECONDITION AND RECOMPACT IN ACCORDANCE WITH B30 AND R44
19. FOUNDATION IS TO BE PROOF ROLLED WITH REMOVAL OF ALL UNSUITABLE MATERIAL AND APPROVED BY SUITABLY QUALIFIED GEOTECHNICAL ENGINEER

DESIGN CRITERIA:

20. SURCHARGE LOADING CONSIDERED = 10kPa.
21. THE BACKFILL IS ASSUMED TO BE FULLY DRAINED.

0 100 200 400 600mm

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	30.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC INFORMATION ONLY
A	21.10.15	S.R.	G.D.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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CLIENT: LEND LEASE

PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL SPILLWAY STAGE 1

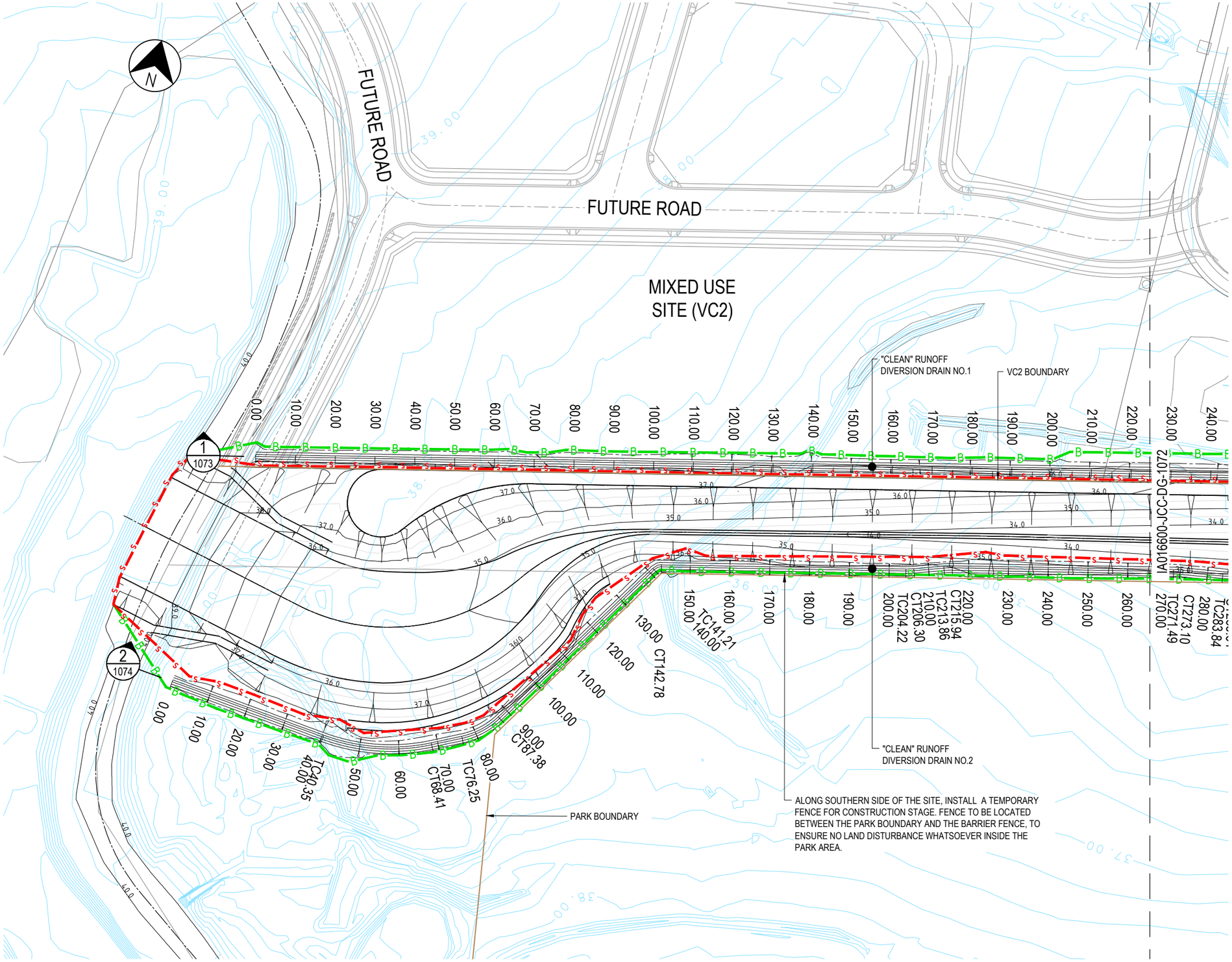
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
D.G.	I.C.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 21.10.15	DATE 21.10.15
S.D.	J.C.		

TITLE: STRUCTURAL DETAILS OF THE PROPOSED VC2 FUTURE RETAINING WALL

SCALE: AS SHOWN | DRAWING No: IA016600-JCC-DG-1062 | REV: B

DATE: 7/12/2015 3:42:19 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1062.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LEGEND

- DESIGN CONTOURS
- EXISTING SURFACE CONTOURS
- PARK BOUNDARY
- SEDIMENT FENCE
- BARRIER FENCE (ATF)
- SHAKER PAD/STABILIZED ENTRANCE. (REFER TO SD 6-14)
- TOP SOIL STOCKPILE WITH SEDIMENT FENCE (LOCATION INDICATIVE ONLY-NTS.) (REFER TO SD 4-1). APPROXIMATE LOCATION AS SHOWN.

NOTES:

1. THE SEQUENCE OF CONSTRUCTION SHALL BE AS FOLLOWS:
   - A) IDENTIFY LOCATION OF ALL PROPOSED EROSION AND SEDIMENT CONTROL MEASURES ON SITE.
   - B) INSTALLATION OF BARRIER AND SEDIMENT FENCES.
   - C) INSTALLATION OF ALL REMAINING EROSION AND SEDIMENT CONTROLS, INCLUDING STABILISED ENTRANCE.
   - D) CLEARING AND REGRADING OF THE OPEN CHANNEL AND SPILLWAY SITE, TO BULK EARTHWORKS PLAN AND DETAILS.

2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS FOR "EROSION AND SEDIMENT CONTROL DCP AND CODE OF PRACTICE" ON DEVELOPMENT SITES OF PENRITH CITY COUNCIL AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE 'BLUE BOOK', SOILS AND CONSTRUCTION LANDCOM 2004, DECCW 2008 VOLUMES 1 AND 2, AND ANY ADDITIONAL REQUIREMENTS BY PENRITH CITY COUNCIL.

3. REFER TO ALL TYPICAL SWMP DETAILS IN BLUE BOOK (EG; SD6-3) FOR CONSTRUCTION DETAILS. ALSO REFER TO MOST RELEVENT TYPICAL DETAILS 0N DRAWING IA016600-JCC-DG-0076.

4. WIND EROSION CONTROLS (NOT SHOWN ON THIS PLAN) SHALL BE CONSTRUCTED AS REQUIRED BY THE SITE SUPERINTENDENT. REFER TO SD6-15 TYPICAL DETAIL ON DRAWING IA016600-JCC-DG-0076.

5. ESCP DETAILS ON THIS LAYOUT ARE SCHEMATIC ONLY. ANY ADDITIONAL INFORMATION REQUIRED IS TO BE OBTAINED FROM THE SITE SUPERINTENDENT. ADDITIONAL CONTROLS AND CHANGES TO THIS PLAN MAY BE NECESSARY DURING THE PROCESS OF IMPLEMENTATION OF THE ESCP. ONGOING INSPECTIONS BY A QUALIFIED SUPERINTENDENT ARE REQUIRED TO PROVIDE RELEVANT CHANGES, AS REQUIRED. THE ESCP IDENTIFIES THE EROSION AND SEDIMENT CONTROLS NEEDED ON SITE, BUT ARE NOT CONSTRUCTION DRAWINGS. REFERENCE NEEDS TO BE MADE TO TYPICAL DETAILS IN THE BLUE BOOK.

6. PROVIDE TEMPORARY, BIODEGRADABLE JUTE MESH LINING FOR ALL BATTERS.

7. IF STRAW BALES ARE USED IN CONJUNCTION AND IN ADDITION TO SEDIMENT FENCES, THE STRAW BALES SHALL BE WEED FREE.

8. ALL DISTURBED AND REGRADED AREAS INCLUDING EMBANKMENTS THAT ARE EXPOSED FOR LONGER THAN 2 WEEKS, SHALL BE REHABILITATED AS SOON AS POSSIBLE BY HYDROSEEDING OR AS DIRECTED BY THE SITE SUPERINTENDENT.

9. THIS EROSION AND SEDIMENT CONTROL PLAN IS FOR THE OPEN CHANNEL AND SPILLWAY ONLY.

10. TEMPORARY SEDIMENTATION BASIN NOT REQUIRED PROVIDED THE MAXIMUM DISTURBANCE AREA FOR CONSTRUCTION STAGING IS NOT LARGER THAN 0.75 HECTARES.

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
5 0 5 10 15 20 25

REV	DATE	DRAWN	REV'D	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL (NOTE 10 ADDED)
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	06.11.15	G.S.	C.M.	J.C.	DRAFT ISSUED FOR LEND LEASE REVIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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Web: www.jacobs.com

CLIENT: LEND LEASE
PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
G.S.	C.M.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE	DATE
G.D.	J.C.	06.11.15	06.11.15

TITLE: EROSION AND SEDIMENT CONTROL PLAN (ESCP) SHEET 1 OF 2

SCALE	DRAWING No	REV
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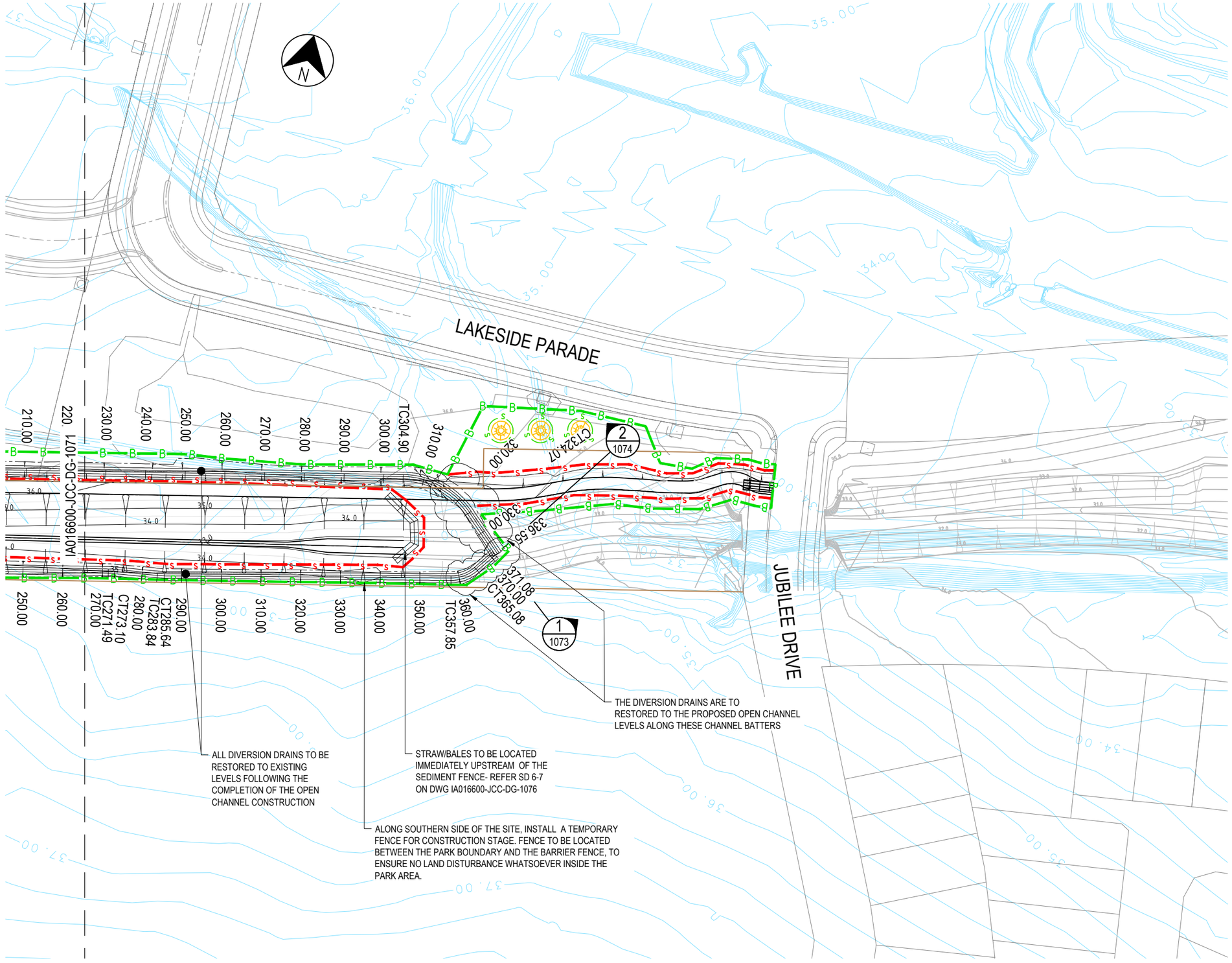
Version: 1, Version Date: 13/07/2018



LEGEND

- DESIGN CONTOURS
- EXISTING SURFACE CONTOURS
- PARK BOUNDARY
- SEDIMENT FENCE
- BARRIER FENCE (ATF)
- SHAKER PAD/STABILIZED ENTRANCE. (REFER TO SD 6-14)
- TOP SOIL STOCKPILE WITH SEDIMENT FENCE (LOCATION INDICATIVE ONLY-NTS.) (REFER TO SD 4-1). APPROXIMATE LOCATION AS SHOWN.

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
5 0 5 10 15 20 25

REV	DATE	DRAWN	REVD	APP'D	REVISION
C	08.04.16	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL (NOTE 10 ADDED)
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
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CLIENT	LEND LEASE
PROJECT	JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1
DRAWN	G.S.
DRAWING CHECK	C.M.
REVIEWED	J.C.
APPROVED	E.D.
DESIGNED	G.D.
DESIGN REVIEW	J.C.
DATE	06.11.15
DATE	06.11.15

TITLE
EROSION AND SEDIMENT CONTROL PLAN (ESCP)
SHEET 2 OF 2

SCALE	DRAWING No.	REV
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LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1071-1072.dwg

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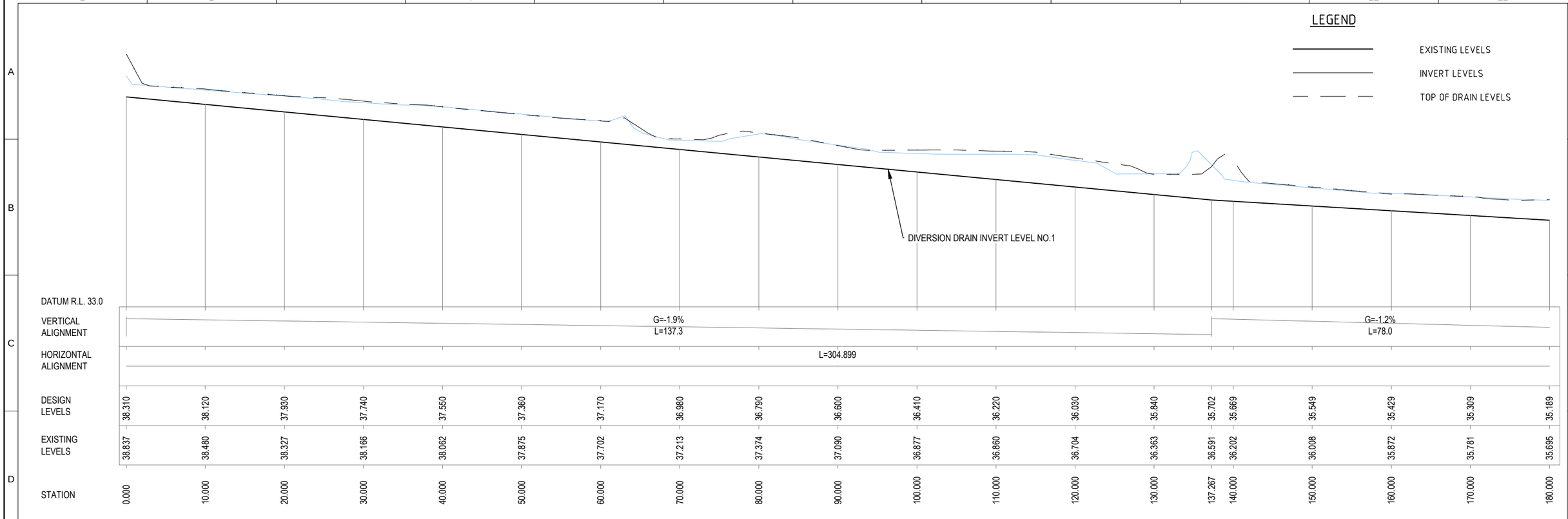
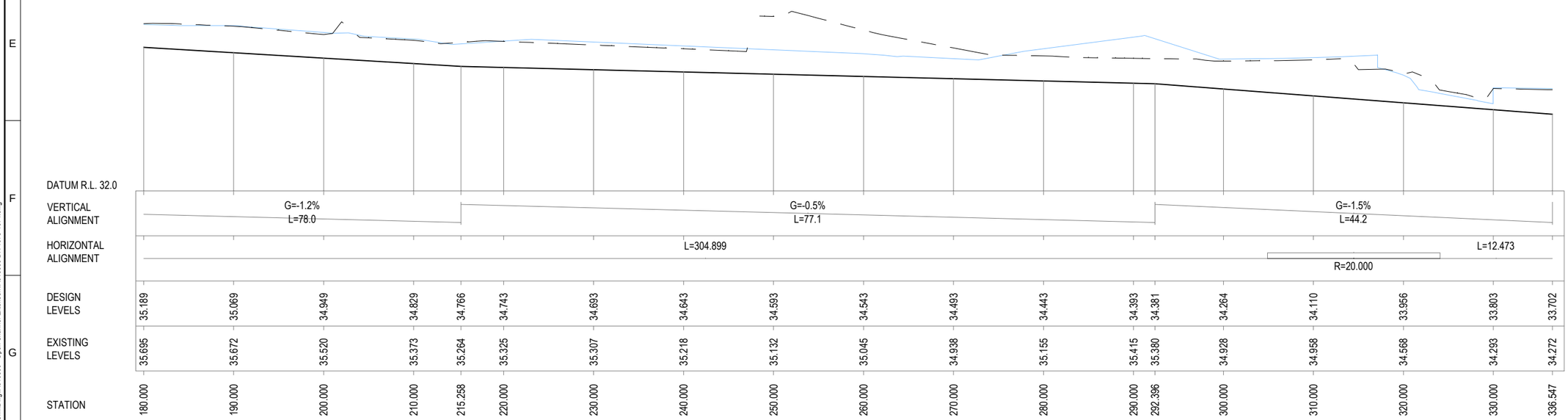


LONGITUDINAL SECTION - 1



LONGITUDINAL SECTION - 1

HORIZ. 1:500
VERT. 1:100
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1 0 1 AT A3 2

REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
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PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
G.S.	C.M.	J.C.	E.D.
DESIGNED	DESIGN REVIEW	DATE 06/11/15	DATE 06/11/15
G.D.	J.C.		

TITLE: EROSION AND SEDIMENT CONTROL PLAN (ESCP) "CLEAN" RUNOFF DIVERSION DRAINS SHEET 1 0F 2

SCALE: SHOWN | DRAWING No: IA016600-JCC-DG-1073 | REV: B

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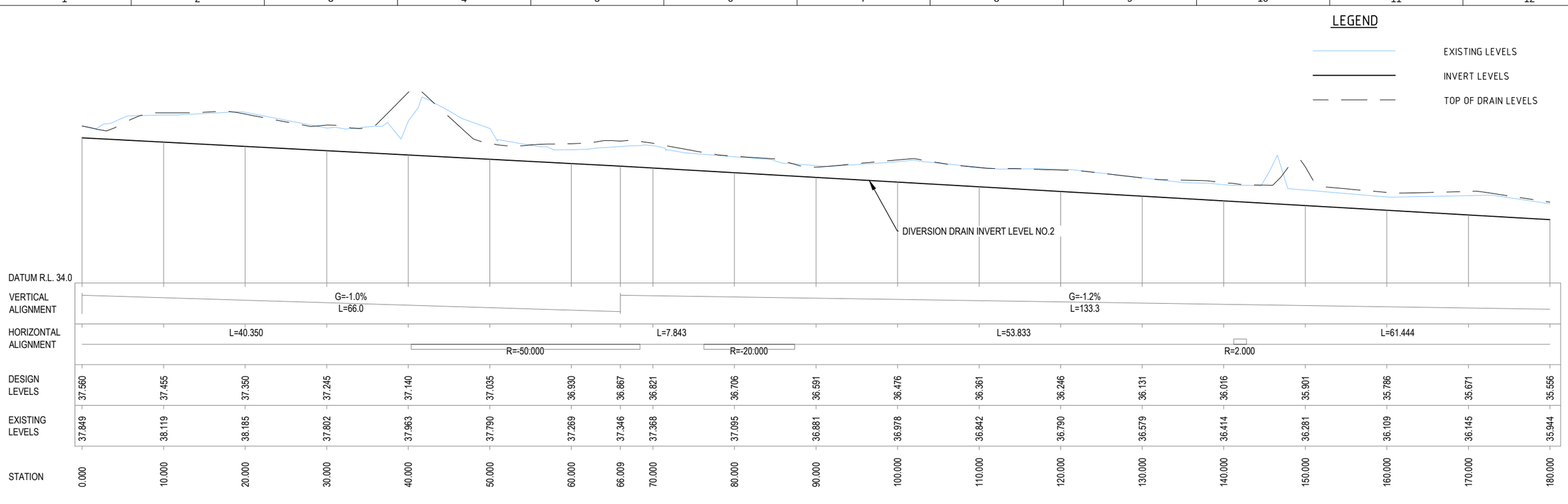

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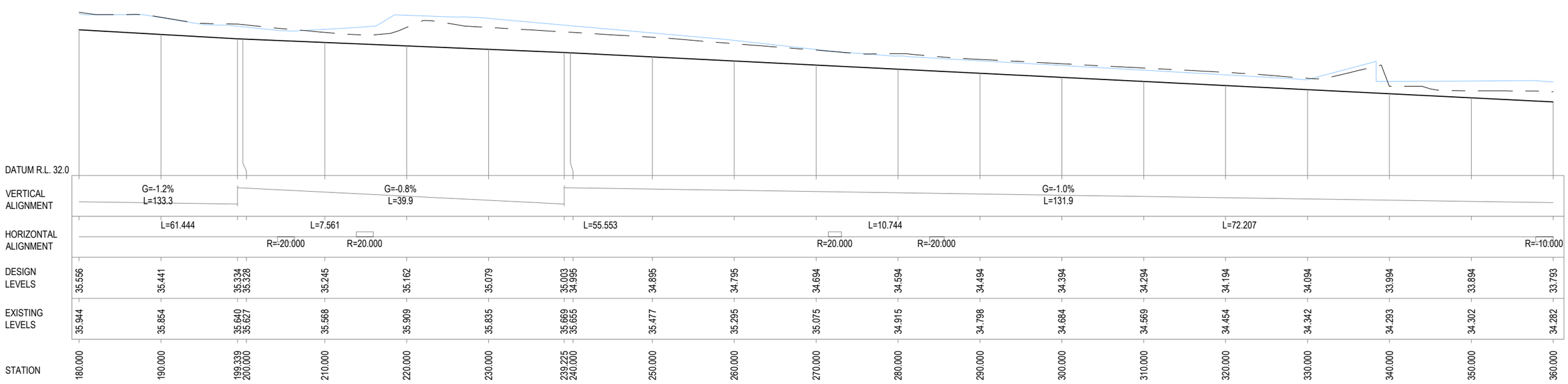

LONGITUDINAL SECTION - 2

JOINS LONG SECTION ON SHEET IA016600-JCC-DG-1075

HORIZ. 1:500
VERT. 1:100
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REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	12.11.15	G.S.	G.D.	J.C.	FINAL ISSUE FOR CC APPROVAL
A	06/11/15	G.S.	C.M.	J.C.	DRAFT ISSUE FOR LEND LEASE REWIEW

DRAWING NUMBER	REFERENCE DRAWING TITLE

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PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

DRAWN	DRAWING CHECK	REVIEWED	APPROVED
G.S.	C.M.	J.C.	E.D.
DESIGNED	DESIGN REVIEW		
G.D.	J.C.	DATE 06/11/15	DATE 06/11/15

TITLE: EROSION AND SEDIMENT CONTROL PLAN (ESCP) "CLEAN" RUNOFF DIVERSION DRAINS SHEET 2 OF 2

SCALE: SHOWN
DRAWING No: IA016600-JCC-DG-1074
REV: B

A1

DATE: 8/12/2015 1:54:22 PM LOGIN NAME: SUTHERLAND, GRANT
LOCATION: I:\ENVR\Projects\EN04189\Deliverables\Drawings\Civil\Dwg\IA016600 - Open Channel Extension\IA016600-DR-1073-1074.dwg

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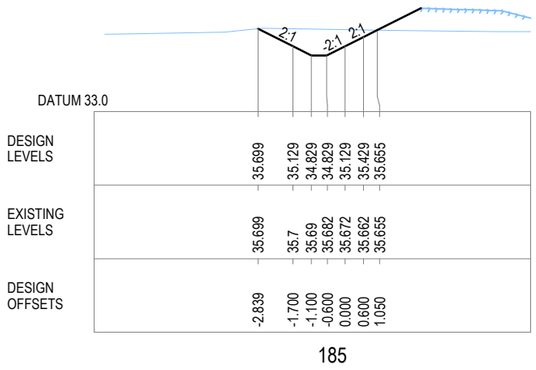
Version: 1, Version Date: 13/07/2018



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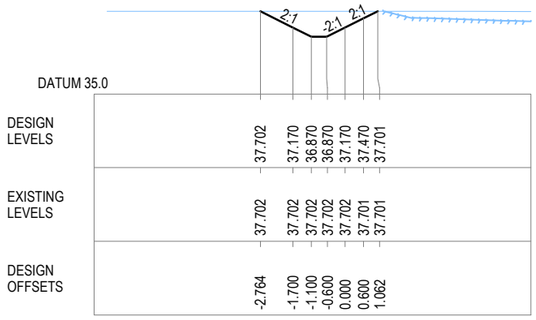

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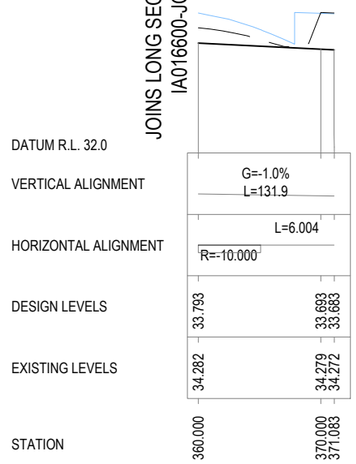

LONGITUDINAL SECTION - 2
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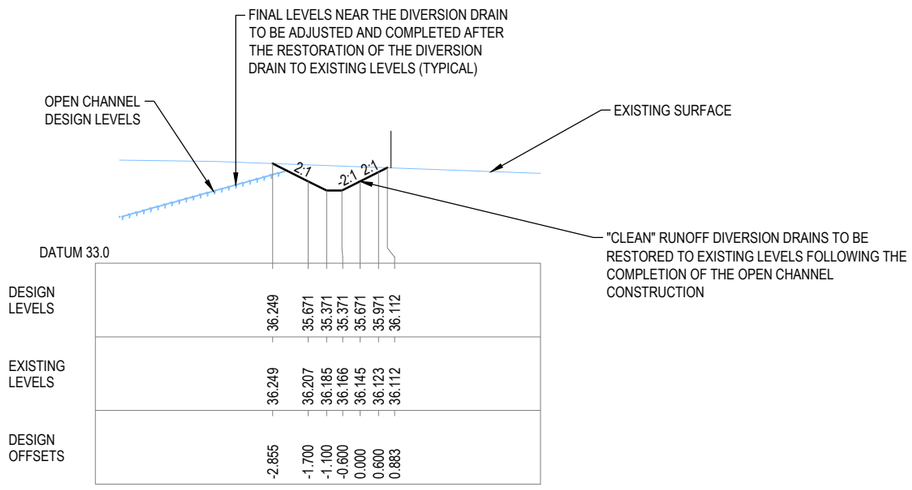

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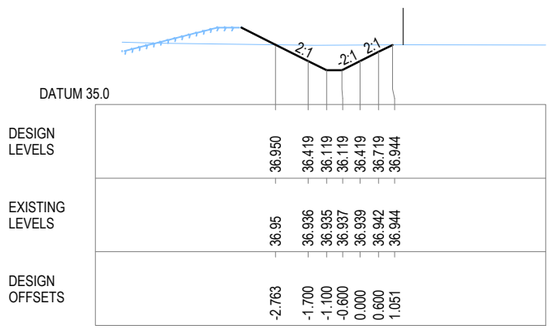

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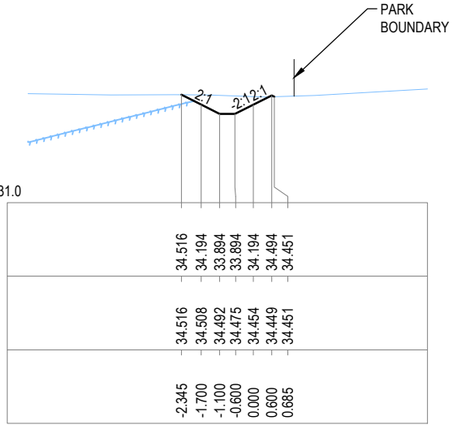

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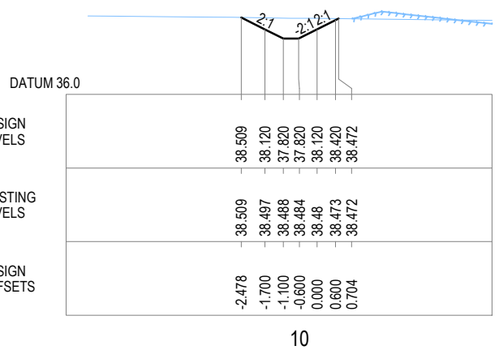

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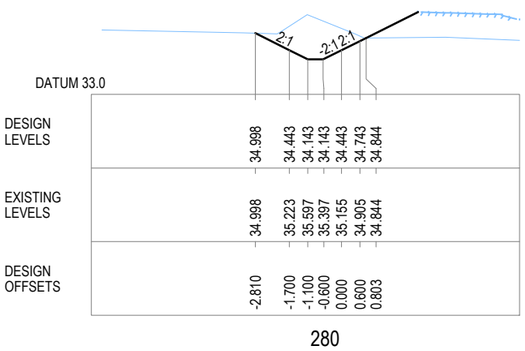

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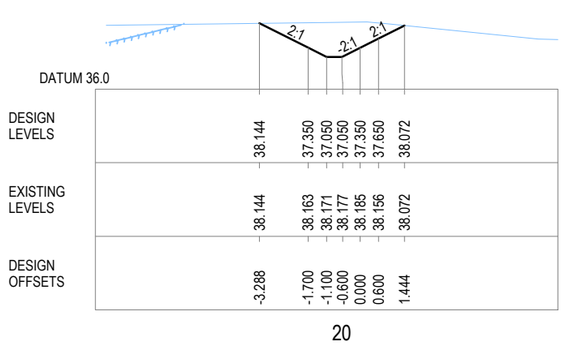

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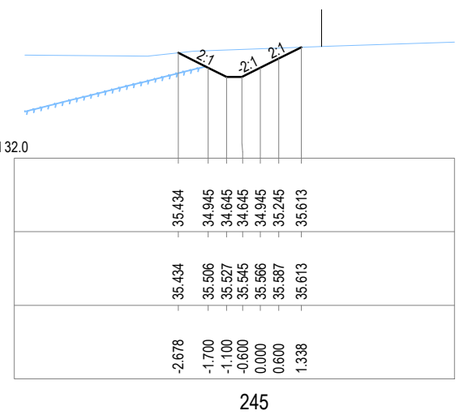

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(DIVERSION DRAIN NO.1)

SECTION 2
(DIVERSION DRAIN NO.2)

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VERT. 1:100

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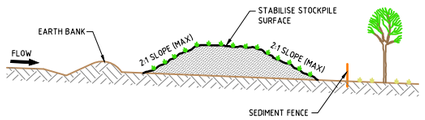
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

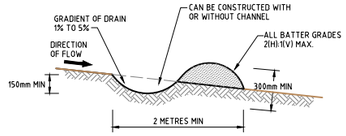
STOCKPILES — SD 4-1



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 TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

EARTH BANK (LOW FLOW) — SD 5-5

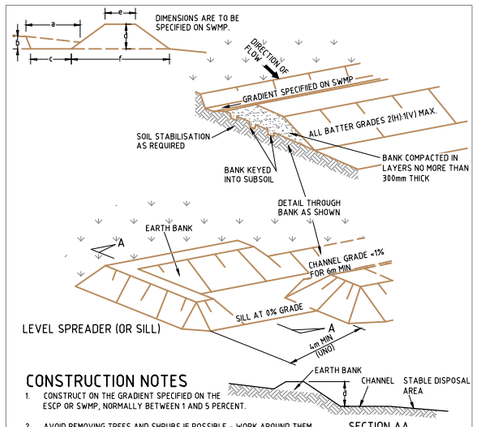


NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 PERCENT AND 5 PERCENT.
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 THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

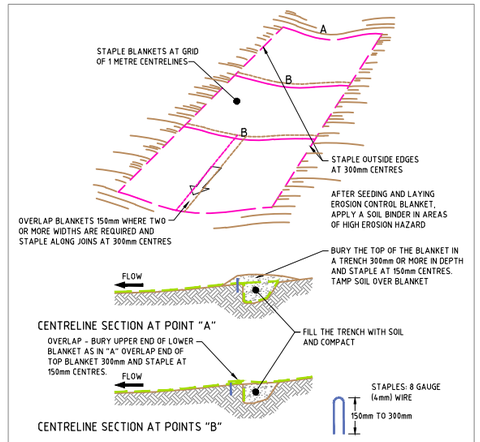
EARTH BANK (HIGH FLOWS) — SD 5-6



CONSTRUCTION NOTES

1. CONSTRUCT ON THE GRADIENT SPECIFIED ON THE ESCP OR SWMP, NORMALLY BETWEEN 1 AND 5 PERCENT.
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, AT THE DIMENSIONS SHOWN ON THE SWMP.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION FOLLOWING TABLE 5.2 IN LANDCOM (2004).
7. WHERE DISCHARGING TO ERODIBLE LANDS, ENSURE THEY OUTLET THROUGH A PROPERLY CONSTRUCTED LEVEL SPREADER.
8. CONSTRUCT THE LEVEL SPREADER AT THE GRADIENT SPECIFIED ON THE ESCP OR SWMP, NORMALLY LESS THAN 1 PERCENT OR LEVEL.
9. WHERE POSSIBLE, ENSURE THEY DISCHARGE WATERS ONTO EITHER STABILISED OR UNDISTURBED DISPOSAL SITES WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED. APPROVAL MIGHT BE REQUIRED TO DISCHARGE INTO OTHER SUBCATCHMENTS.

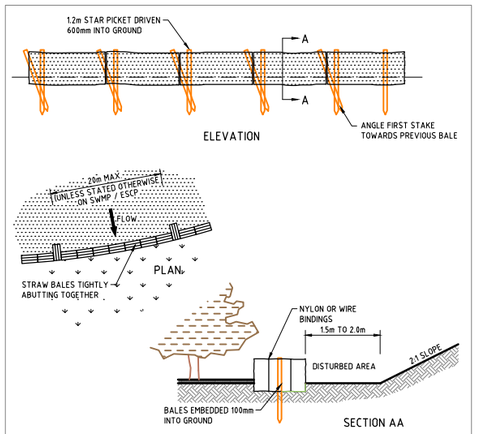
RECP : CONCENTRATED FLOW — SD 5-7



CONSTRUCTION NOTES

1. REMOVE ANY ROCKS, CLODS, STICKS OR GRASS FROM THE SURFACE BEFORE LAYING MATTING.
2. ENSURE THAT TOPSOIL IS AT LEAST 75mm DEEP.
3. COMPLETE FERTILISING AND SEEDING BEFORE LAYING THE MATTING.
4. ENSURE FABRIC WILL BE CONTINUOUSLY IN CONTACT WITH THE SOIL BY GRADING THE SURFACE CAREFULLY FIRST.
5. LAY THE FABRIC IN "SHINGLE -FASHION", WITH THE END OF EACH UPSTREAM ROLL OVERLAPPING THOSE DOWNSTREAM. ENSURE EACH ROLL IS ANCHORED PROPERLY AT ITS UPSLOPE END (STANDARD DRAWING 5-7B).
6. ENSURE THAT THE FULL WIDTH OF FLOW IN THE CHANNEL IS COVERED BY THE MATTING UP TO THE DESIGN STORM EVENT, USUALLY IN THE 10 YEAR ARI TIME OF CONCENTRATION STORM EVENT.
7. DIVERT WATER FROM THE STRUCTURE WALL UNTIL VEGETATION IS STABILISED PROPERLY.

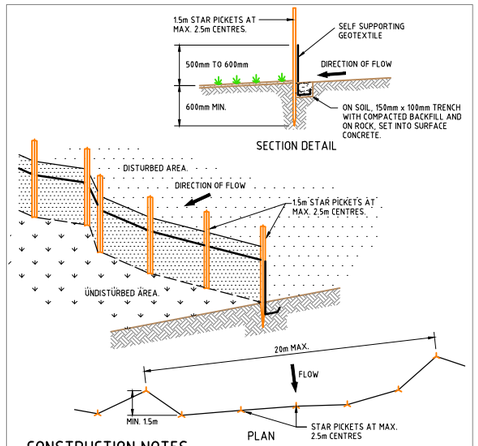
STRAW BALE FILTER — SD 6-7



CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO THE GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2m STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED ANT THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

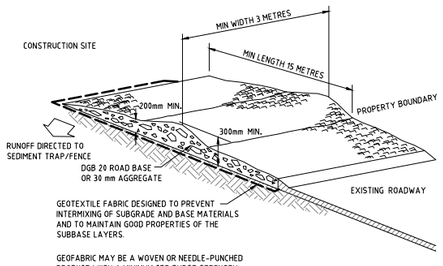
SEDIMENT FENCE — SD 6-8



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10 YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WIT A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

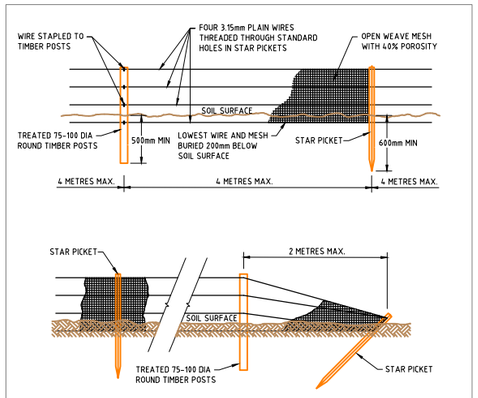
STABILISED SITE ACCESS — SD 6-14



CONSTRUCTION NOTES

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

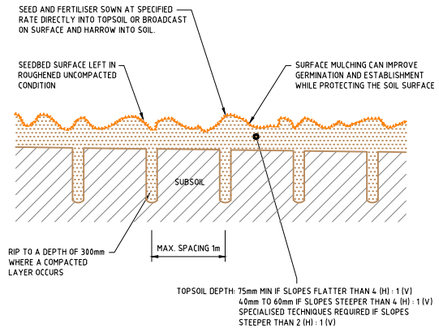
CONTROL OF WIND EROSION — SD 6-15



CONSTRUCTION NOTES

1. INSTALL THE FENCE TO THE HEIGHT SPECIFIED IN THE ESCP / SWMP.
2. CUT A CHANNEL 200mm DEEP ALONG THE FENCE LINE.
3. PLACE WIRE AND LIGHT RESISTANT, OPEN-WEAVE POLYMER MESH WITH A 40 PERCENT POROSITY ON THE PREVAILING WIND SIDE OF THE FENCE.
4. FASTEN THE MESH TO ALL WIRES USING RING FASTENERS AT 100mm TO 150mm INTERVALS ON TOP WIRE AND 300mm INTERVALS ON OTHER WIRES.
5. USE ONE 75mm TO 100mm DIAMETER TREATED ROUND TIMBER POST EVERY 20 METRES.
6. WHERE STAR PICKETS ARE USED, ENSURE THEY ARE FITTED WITH SAFETY CAPS.

SEEDBED PREPARATION — SD 7-1



CONSTRUCTION NOTES

1. LOOSEN COMPACTED SOIL BEFORE SOWING ANY SEED. IF NECESSARY, RIP THE SOIL TO A DEPTH OF 300mm. AVOID ROTARY HOE CULTIVATION.
2. WORK THE GROUND ONLY AS MUCH AS NECESSARY TO ACHIEVE THE DESIRED TILTH AND PREPARE A GOOD SEEDBED..
3. AVOID CULTIVATION IN VERY WET OR VERY DRY CONDITIONS.
4. CULTIVATE ON OR CLOSE TO THE CONTOUR WHERE POSSIBLE, NOT UP AND DOWN THE SLOPE.

NOTE

ALL DETAILS SHOWN ON THIS DRAWING ARE REFERENCED FROM 'THE BLUE BOOK' - MANAGING URBAN STORMWATER (MUS): SOILS AND CONSTRUCTION BY LANDCOM. IT IS THE RESPONSIBILTY OF THE CONTRACTOR ON SITE TO HAVE THE LATEST PUBLICATION.

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PROJECT: JORDAN SPRINGS, VC2 OPEN CHANNEL AND SPILLWAY STAGE 1

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DESIGNED	DESIGN REVIEW	DATE 22.10.15	DATE 22.10.15
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Jordan Springs Western Precinct Development – Lend Lease



Upstream Extended East/West Open Channel Report

- 23 April 2013

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Jordan Springs Western Precinct Development

Upstream Extended East/West Open Channel Report

- 23 April 2013

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Project manager:	John Constandopoulos
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Name of project:	Jordan Springs Precinct Development
Name of document:	Upstream Extended East / West Open Channel Report
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Executive summary

This report provides an understanding of flood events in the region of development lots VC2 and VC3 of the Lend Lease's Jordan Springs residential development, Sydney. The investigated study area is a drainage corridor located between the southern perimeter of the Jordan Springs development and a regional park.

Hydraulic modelling using the HEC-RAS model assesses the 1% Annual Exceedance Probability Event (AEP) (commonly known as the 1 in 100 year flood) and its behaviour in the existing situation. The results show that without mitigation flooding would extend into lots VC2 and VC3.

The hydraulic modelling assesses two mitigation options: filling to raise the level of lots VC2 and VC3, and a proposed channel that would be an upstream extension to the previously designed East – West open channel.

The results demonstrate that filling and raising VC2 and VC3 would prevent inundation of lots VC2 and VC3. However, the drainage corridor would be mostly inundated and the flood waters would extend slightly further into the regional park than the existing situation

Hydraulic modelling results of the upstream extension to the East – West open show that it would provide protection against inundation with adequate freeboard to VC2 and VC3. Some out of bank flow would still occur in the regional park to the south of the channel, but this is not deemed to be an issue. The proposed channel would also meet the key objective of minimising land take in the drainage corridor in order to maximise available land for lots VC2 and VC3.

This would allow the current southern development boundary for lots VC2 and VC3 to be extended by 10m south towards the proposed channel.

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1. Introduction

1.1. Background

As part of the Jordan Springs residential development at Jordan Springs, Sydney, Lend Lease has recently developed the trunk drainage design. The trunk drainage network comprises two open channels: the North –South channel that carries flows into the constructed Jordan Springs Lake, and the East – West channel that follows a west-east course to drain to the proposed East Lake. The layout of the trunk drainage network is shown in **Figure 1**.

1.2. Purpose

The purpose of this report is to investigate flood behaviour *upstream* of the proposed East – West channel, in order to provide an understanding of flooding impacts on Lend Lease's development lots VC2 and VC3.

This report has been prepared to summarise the work undertaken for a hydraulic assessment of the existing flowpath in the Western Precinct, Jordan Springs. It provides an understanding of the existing flood extents and an explanation of two options investigated to alleviate flood risk to the VC2 and VC3 lots, including raising lots VC2 and VC3 by filling, and an upstream extension to the proposed East – West open channel. Details of the hydraulic modelling method, adopted modelling parameters and results are provided.

1.3. Study area

The investigated study area is a drainage corridor located between the southern perimeter of the Jordan Springs development and a regional park. Runoff from the urban Cranebrook catchment is collected in an existing pond upstream of the study area. Spill from the existing pond currently flows into a natural channel that would then be formalised within the proposed downstream East – West channel before flowing to the East Lake.

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- **Figure 1 - Trunk Drainage Layout for the proposed North - South and East –West open channels**



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2. Hydraulic modelling

2.1. Objective

The objective of the hydraulic assessment was to:

1) Investigate the extent of the 1% AEP flood (commonly referred to as the 1 in 100 year flood) on the Lend Lease lots VC2 and VC3
2) Review the extent of the 1% AEP flood with the proposed filling and raising of lots VC2 and VC3
3) Size an upstream extension to the East – West open channel to adequately accommodate the 1% AEP flood, with adequate freeboard, whilst maximising available land spaces for lots VC2 and VC3.

A number of design criteria are to be met to satisfy Council requirements. These are presented below.

2.2. Design criteria

Design criteria have been agreed with Penrith City Council and are stated below.

1) Open channels must contain the 1% AEP peak water level with a minimum freeboard of 0.5m on the northern side.
2) Water depth in the channel should not exceed 1.5m the 1% AEP flood.

2.3. HEC-RAS set up

2.3.1. Overview

Hydraulic models of the trunk drainage system have been developed in HEC-RAS (V 4.1.0). Cross sections at 10m intervals were extracted from the 12D CAD model and inputted into HEC-RAS.

The models are steady state, meaning they model peak flows for the 100 year ARI event, rather than a full event flow hydrograph which is considered to be acceptable. The models are run in a mixed flow regime to allow adequate representation of subcritical and supercritical flows in the model.

2.3.2. Model parameters

Manning's n values were previously selected in consultation with the landscape architects for the East – West channel design. A Manning's n value of 0.07 was selected based on the final open channels being heavily vegetated and landscaped. To ensure consistency with previous work, the same value has been adopted.

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2.3.3. Flow distribution

Peak flows were extracted from the work undertaken for the downstream East – West open channel design, which developed an XP-RAFTS hydrology model for the site. The XP-RAFTS model was used to determine the required sizing of the East – West channel. Details of the hydrology model can be found in previous reports *(St Marys Stage 1 Western Precinct Detention requirements – March 2010 and St Marys Stage 3 Western Precinct Detention Requirements – November 2011)*.

Peak flows of 13.2 m^3/s and a downstream surface water level of 1.5m were inputted to the HEC-RAS model.

2.3.4. Channel sizing

Channels were sized by modifying the bottom width and slope of the channel, with the following design requirements:

- 1:4 channel side slopes for safety and to maximise vegetation growth
- 1m width between the channel and the southern boundary for maintenance access
- No supercritical flow
- Flow velocities less than 1.5m/s by selecting appropriate long slopes
- Minimising land take within the drainage corridor

The key constraint for sizing the channel was the available width of the drainage corridor. The design objective was to size the channel adequately whilst maximizing available space for lots VC2 and VC3.

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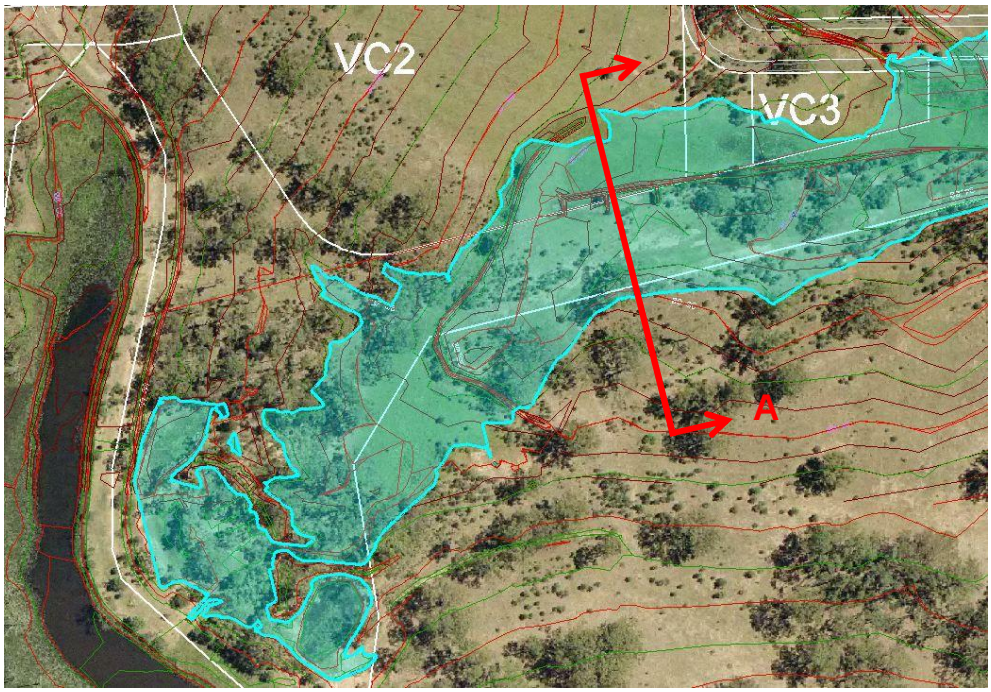
3. Results

3.1. Existing flood extents

HEC-RAS was used to determine the extent of flooding during a 1%AEP flood. The results are shown in **Figure 2**, indicating that without any mitigation, inundation would affect both lots VC2 and VC3, as well as the majority of the drainage corridor. Inundation would also extend into the regional park.

- **Figure 2 - 1% AEP flood extent without any mitigation**



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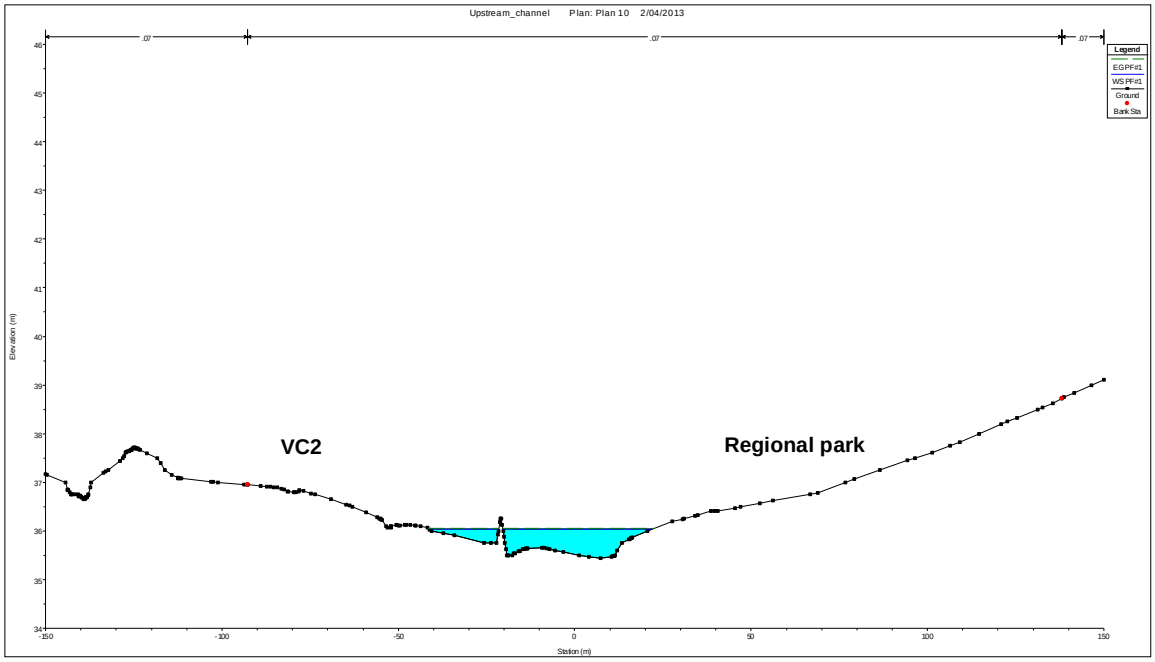
- **Figure 3 – HEC-RAS cross section through A-A showing ground profile and exsting flood extent (not to scale)**



3.2. Filling VC2 and VC3

The extent of the 1% AEP flood after backfilling and raising lots VC2 and VC3 is shown in **Figure 4**. The designed fill would protect lots VC2 and VC3. However, the drainage corridor would be mostly inundated and the flood waters would extend slightly further into the regional park than the existing situation. **Figure 5** demonstrates the difference between the two flood extents.

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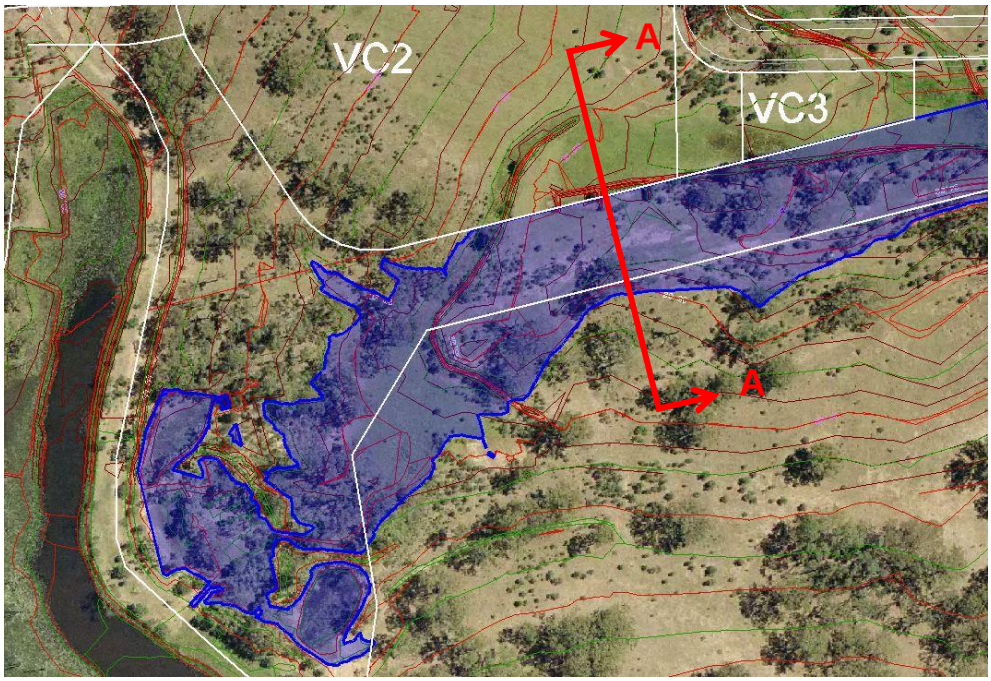
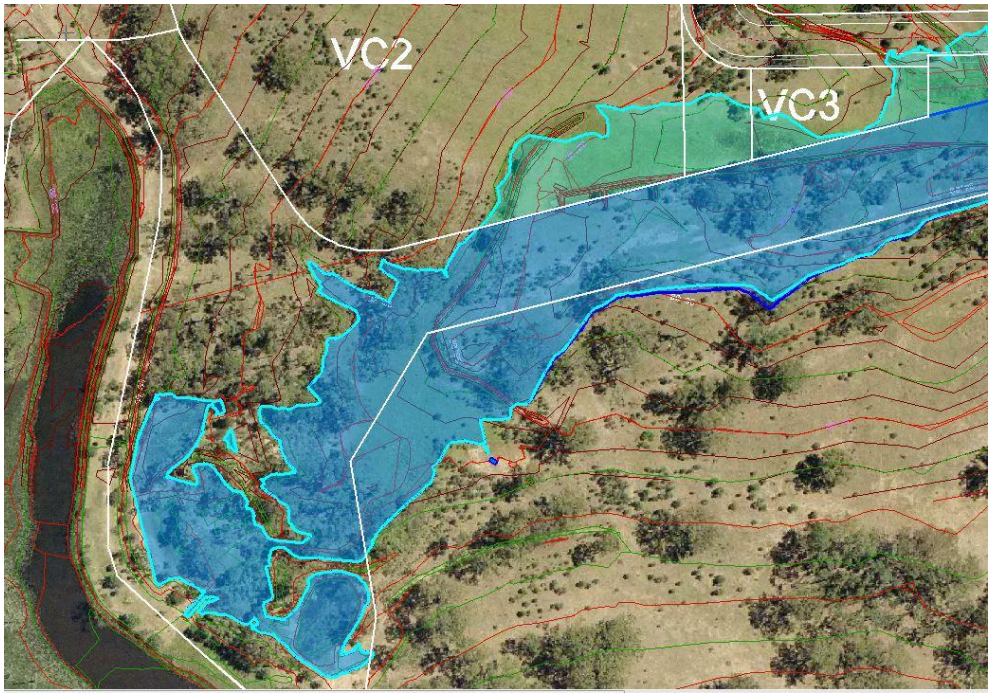
- **Figure 4 - 1%AEP flood extent with levee**



- **Figure 5 – Comparison of 1%AEP flood extent s in existing situation (light blue) and with levee (dark blue)**



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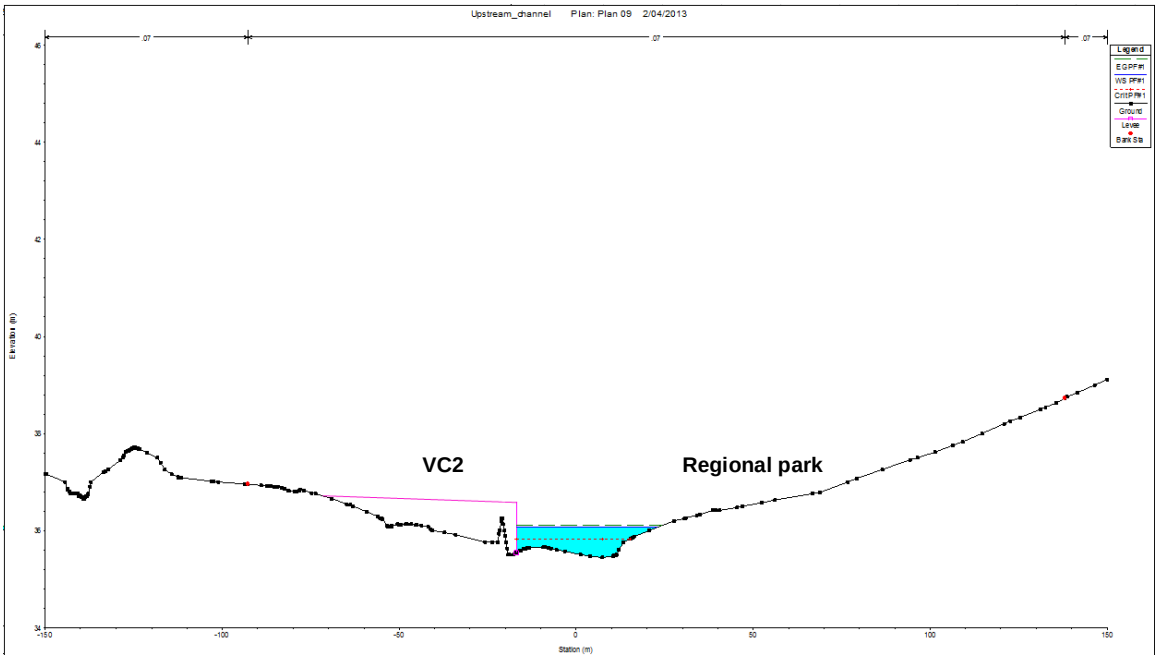
An example cross section through A-A is given in **Figure 6** showing the proposed levee and the revised flood extent. In this location flood waters would rise slightly and extend further into the regional park in comparison to the existing situation.

- **Figure 6 – HEC-RAS cross section through A-A showing levee and revised flood extent at VC2 (not to scale)**



3.3. Constructed channel

In order to investigate further containment of the 1% AEP flood, a 318 m upstream extension to the proposed East-West channel was designed in 12D and modelled in HEC-RAS. Some minor design amendments were made to the proposed East – West open channel to effectively tie in the extended upstream reach.

As per the design requirements, the channel was sized to contain the 1% AEP flood with 0.5 m freeboard to lots VC2 and VC3, with channel batters of 1:4 and with maximum water depth of 1.5m. The long gradient and lateral location of the channel were investigated with the purpose of maximising the land area available for VC2 and VC3. The best result has been achieved by:

- Locating the new channel on the southern edge of the drainage corridor providing a distance of 10m between the top of the channel and the current boundary of lots VC2 and VC3. **This means that the current VC2 and VC3 boundaries can be shifted to the south by 10m.**
- Changing the long gradient at one location from 0.5% to 1% to suit the local topography

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- Changing the channel base width at one location to account of the change in channel gradient.

The physical channel details are given in **Table 1**.

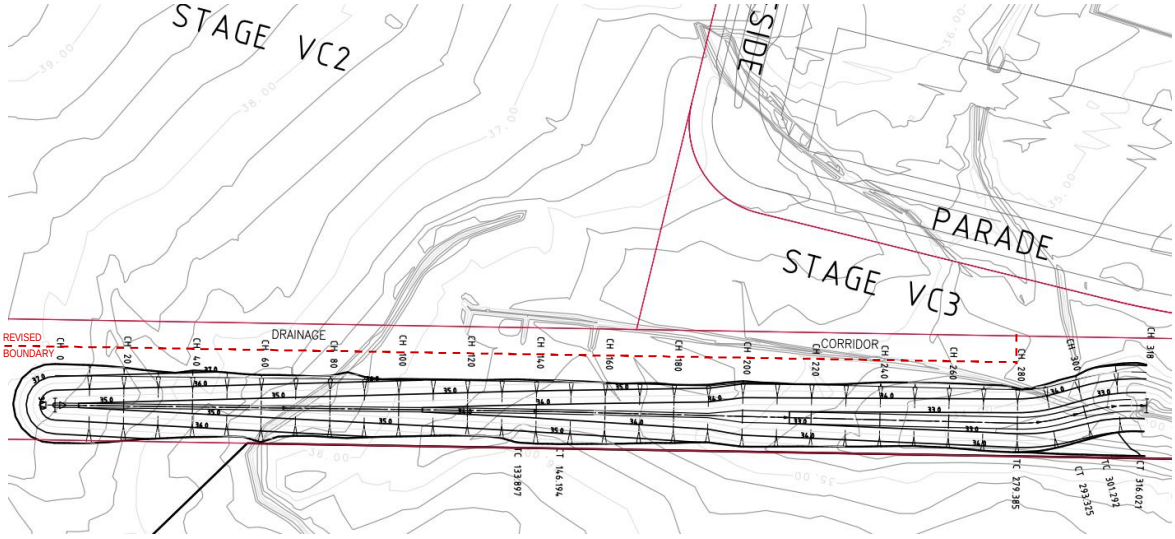
- **Table 1 - Upstream channel details**

Chainage (m)	Distance from current VC2 and VC3 boundary	Distance from regional park boundary*	Base width (m)	Long gradient
0 - 190	10m (minimum)	1m	1.25	1.0%
190 - 200	10m (minimum)	1m	Transition	1.0%
200 - 318	10m (minimum)	1m	3.45	0.5%

*There is a minor encroachment on the regional park boundary at the far western end of the channel that would be resolved during detailed design through localised steepening of the channel batter slope.

An overview of the design is shown in **Figure 7**. The dashed line shows the potential revised boundary for VC2 and VC3. This provides an additional 10m of width to the lots. A larger plan of the designed upstream channel is included in Appendix A.

- **Figure 7 – Overview plan of designed upstream channel (not to scale)**



HEC-RAS modelling was undertaken to check the 1% AEP flood extent for the proposed upstream design. It demonstrated that the flood water would be fully contained within the designed channel on the development side of the channel, thus protecting lots VC2 and VC3 from inundation. On the southern side of the channel, some flood water would flow to the regional park, which is not considered to be an issue. The proposed grading and bund downstream of the area provides a safe

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passage for the flood waters to return to the channel. The results are shown in **Table 2** with key outputs of water depth, freeboard and flow velocities. It shows that the channel design meets the design criteria identified in Section 2.3.4. A long section plot of maximum water levels is provided in Figure 8 and a representative cross section through A-A is provided in **Figure 9**.

Table 2 – Representative HEC-RAS modelling results

Channel cross section	HEC-RAS cross section label*	Channel slope	1% AEP water depth (m)	Flow velocity (m/s)	Freeboard to lots VC2 / VC3 (m)	Freeboard to regional park (m)
0	1197.59	1%	1.50	1.23	0.50	1.09
20	1177.59	1%	1.50	1.23	0.50	0.87
40	1157.59	1%	1.50	1.23	0.50	0.54
60	1137.59	1%	1.50	1.23	0.50	0.80
80	1117.59	1%	1.50	1.23	0.50	0.43
100	1097.59	1%	1.50	1.23	0.50	0.31
120	1077.59	1%	1.49	1.23	0.51	0.19
140[#]	1057.59	1%	1.49	1.24	0.51	0.71
160	1037.59	1%	1.48	1.25	0.52	0.60
180	1017.59	1%	1.45	1.30	0.55	0.45
200	997.59	0.5%	1.48	0.95	0.52	0.28
220	977.59	0.5%	1.48	0.96	0.52	0.14
240	957.59	0.5%	1.47	0.97	0.53	0.15
260	937.59	0.5%	1.46	0.98	0.54	0.00
280	917.59	0.5%	1.44	1.00	0.56	0.23
300	897.60	0.5%	1.36	1.10	0.64	0.22

*For model reference only

[#] This cross section is represented by A-A in the previous figures

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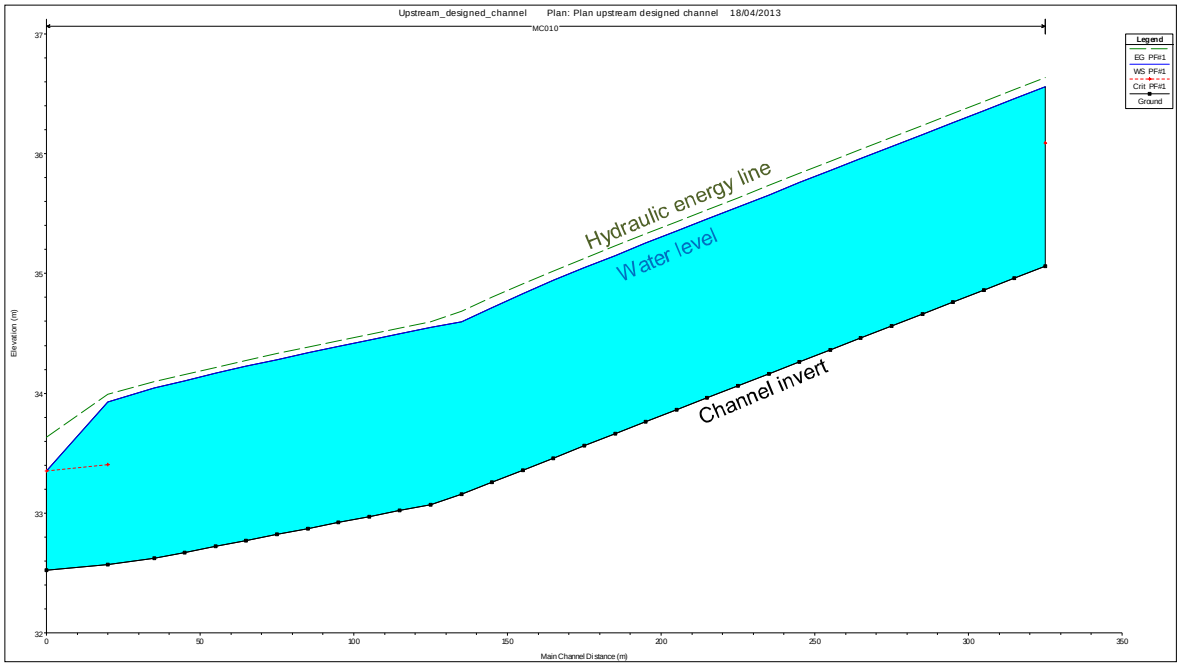
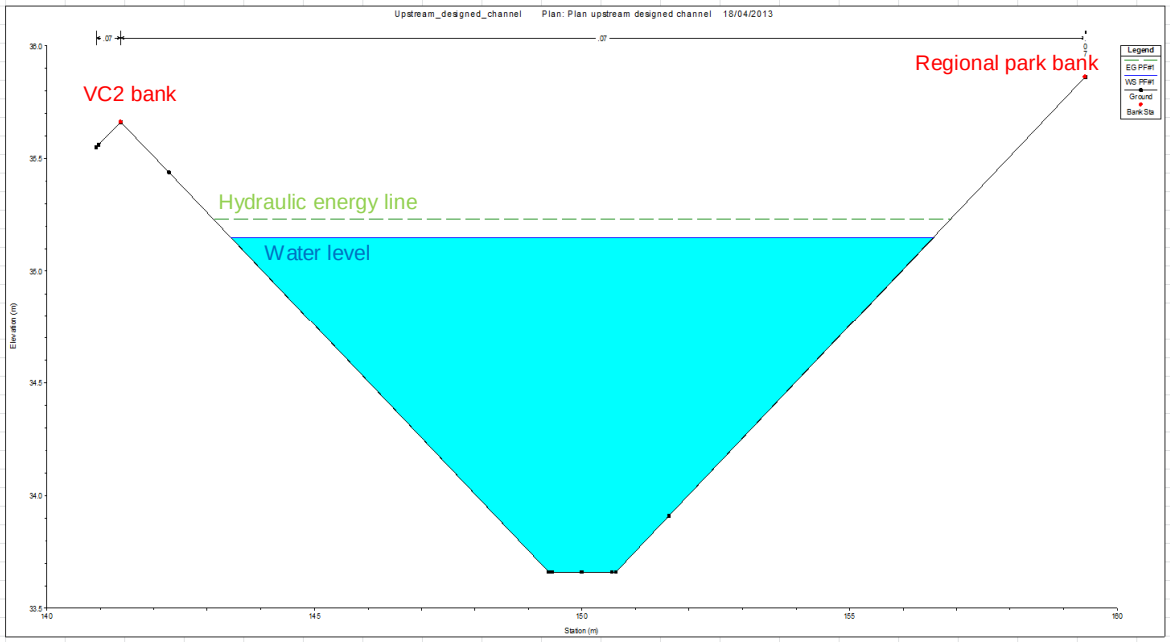
- **Figure 8 – Long section of upstream channel showing 1% AEP water level (not to scale)**



- **Figure 9 – Cross section at A-A of upstream channel showing 1% AEP water level (not to scale)**



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4. Further work

There is a minor encroachment on the regional park boundary at the far western end of the channel. This would be resolved during detailed design through localised steepening of the channel batter slope in this area.

Following review of this report, there may be scope to further increase the distance of the proposed VC2/VC3 boundary from 10m away from the current development boundary (as proposed in this report) to somewhere in the order of 12m to a maximum of 15m.

It is currently not known whether a fence will be erected along the boundary of the regional park. It should be noted that a fence in this location could exacerbate flooding of the development (to the south of the previously designed East – West channel). Therefore, from a flooding perspective, it is not recommended that fence is erected on the boundary of the regional park.

A preliminary safety-in-design assessment has been undertaken for this work and is included in Appendix D. This would also be reviewed and updated during detailed design.

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5. Conclusion

This report provides an understanding of the current extent of flooding in the region of lots VC2 and VC3 of the Jordan Springs residential development at St Marys, Sydney.

The hydraulic modelling presented assesses the 1% AEP flood and its behaviour in the existing situation, and assesses two options: the cases of a proposed fill and proposed channel. The results demonstrate that the designed channel would provide protection against inundation with adequate freeboard to VC2 and VC3. Some out of bank flow would still occur in the regional park to the south of the channel, but this is not deemed to be an issue.

The proposed channel would allow the current boundary for lots VC2 and VC3 to be extended by 10m south towards the proposed upstream channel.

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Appendix A Upstream channel plan

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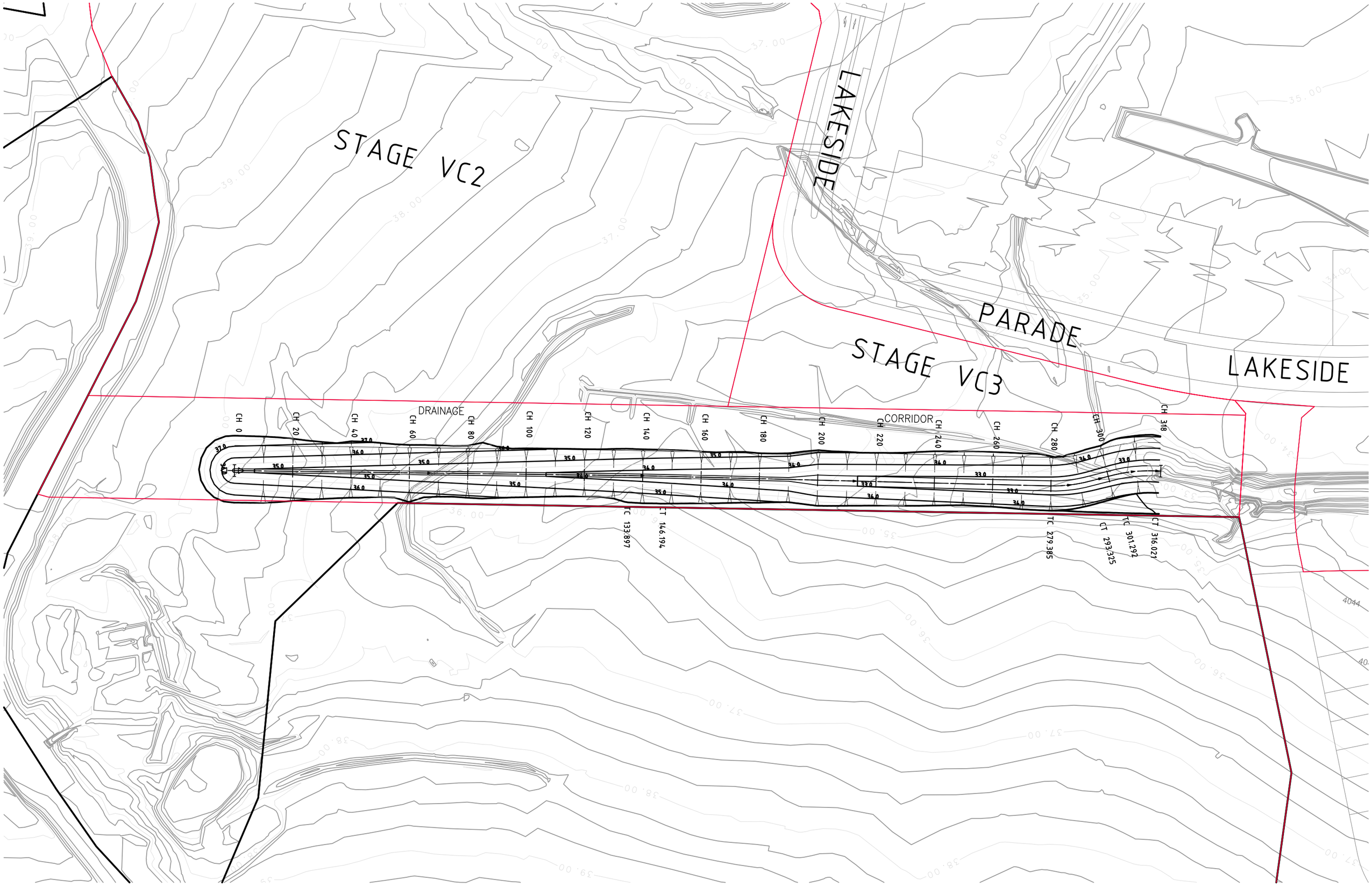

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Appendix B Upstream channel profile

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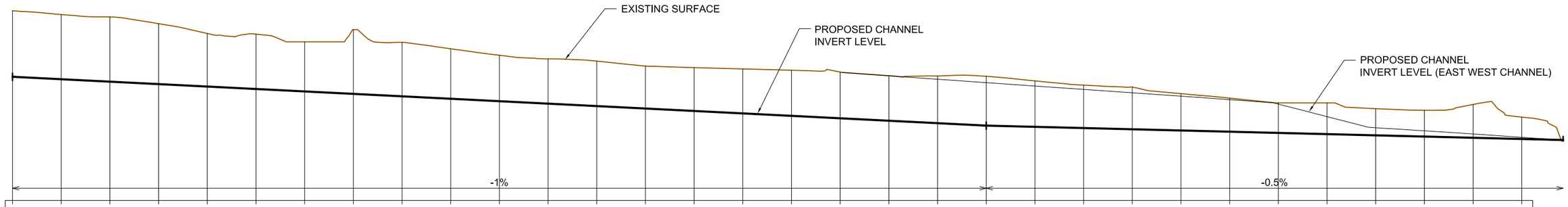

DATUM R.L. 30.0

STATION	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
0.000	35.069	37.774
10.000	34.969	37.620
20.000	34.869	37.519
30.000	34.769	37.245
40.000	34.669	36.845
50.000	34.569	36.815
60.000	34.469	36.500
70.000	34.369	37.000
80.000	34.268	36.478
90.000	34.168	36.216
100.000	34.068	35.952
110.000	33.968	35.802
120.000	33.868	35.710
130.000	33.768	35.507
140.000	33.668	35.446
150.000	33.568	35.391
160.000	33.468	35.338
170.000	33.368	35.263
180.000	33.268	35.113
190.000	33.168	35.102
200.000	33.068	35.090
210.000	33.018	34.898
220.000	32.968	34.728
230.000	32.918	34.646
240.000	32.868	34.376
250.000	32.818	34.194
260.000	32.768	34.000
270.000	32.718	34.000
280.000	32.668	33.754
290.000	32.618	33.699
300.000	32.569	33.934
310.000	32.519	33.415

CONTROL MC10 - EAST WEST CHANNEL EXTENSION

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Appendix C Upstream channel cross sections

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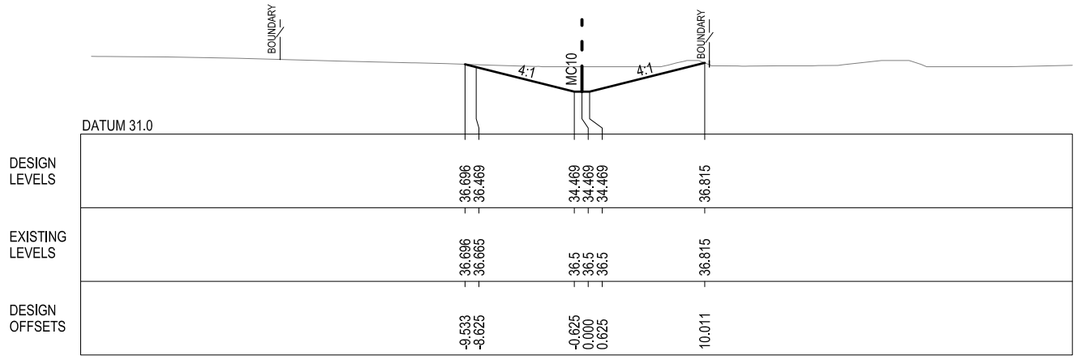

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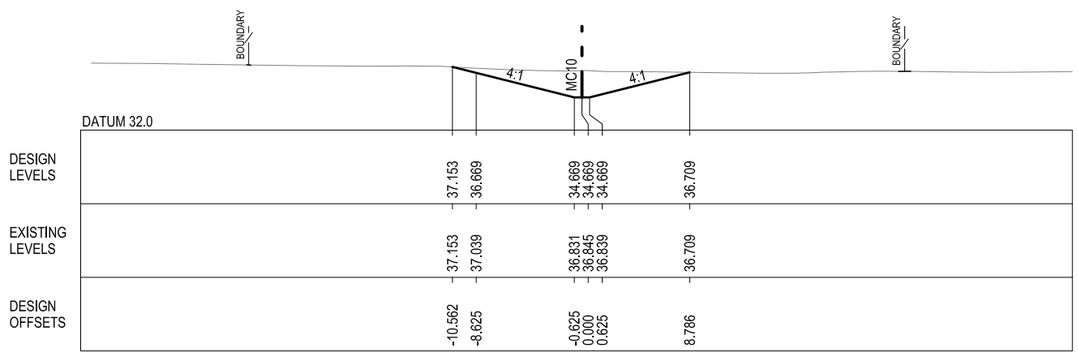

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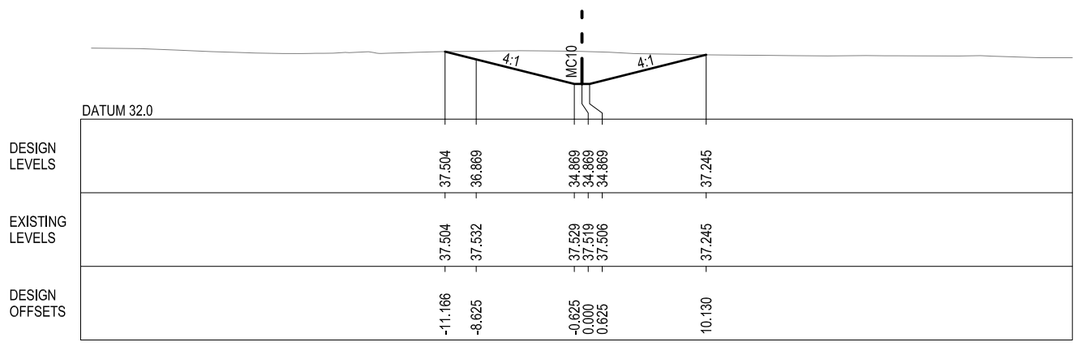

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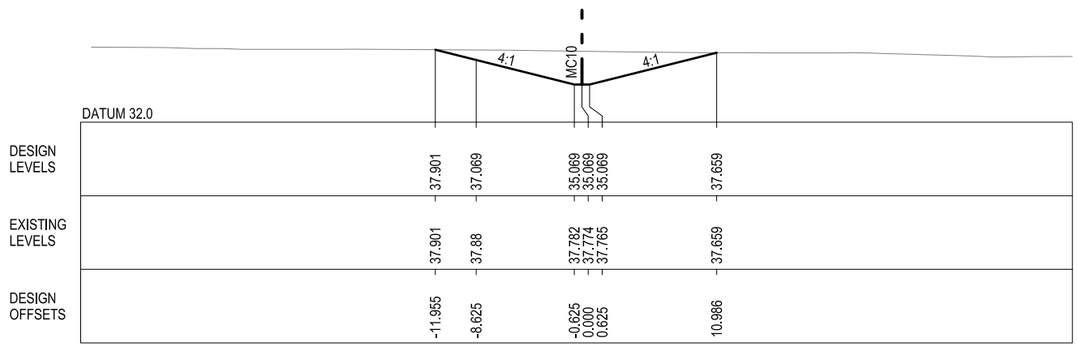

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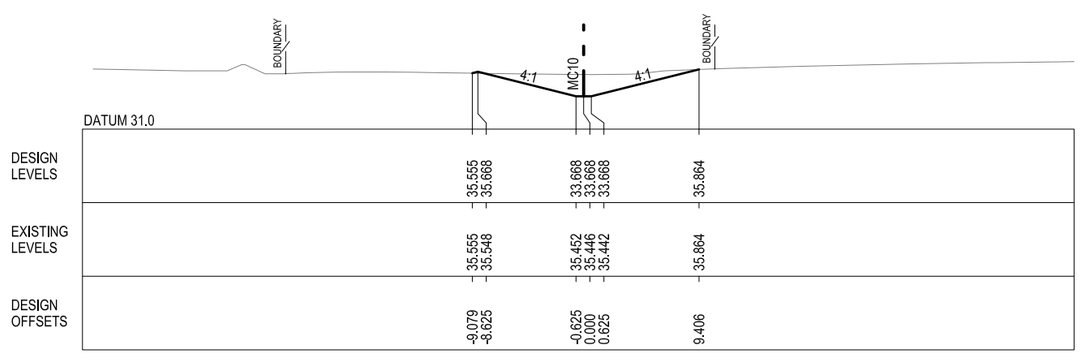

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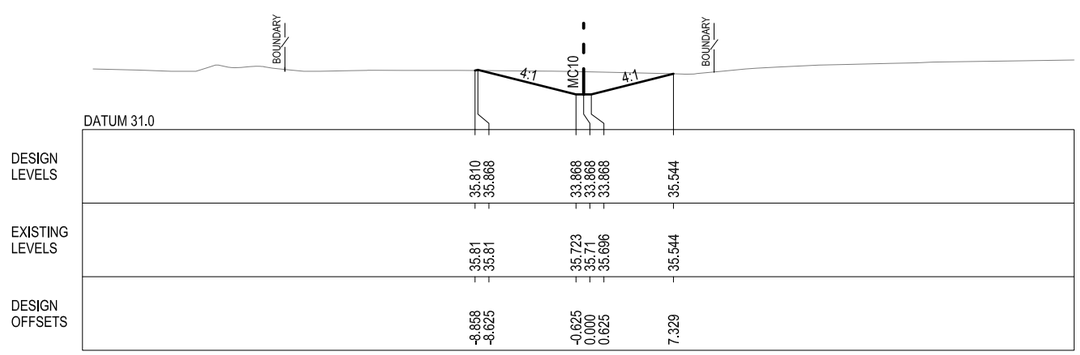

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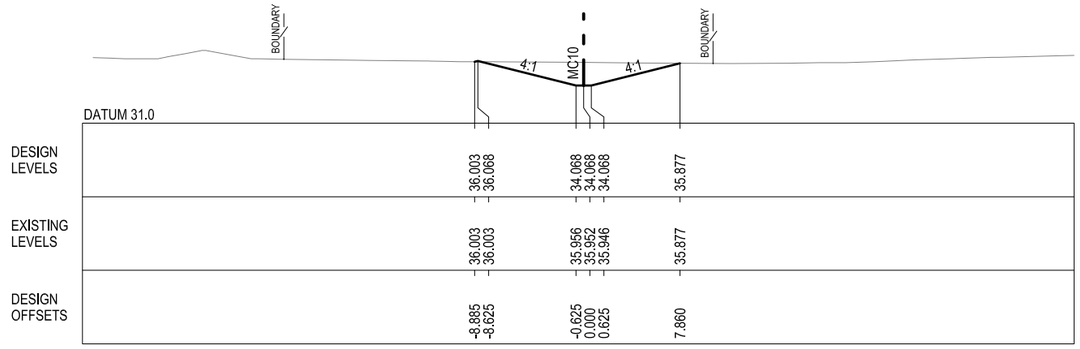

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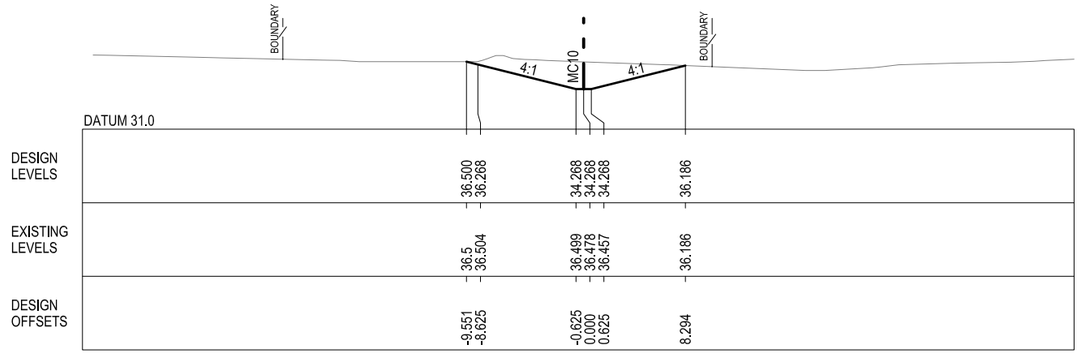

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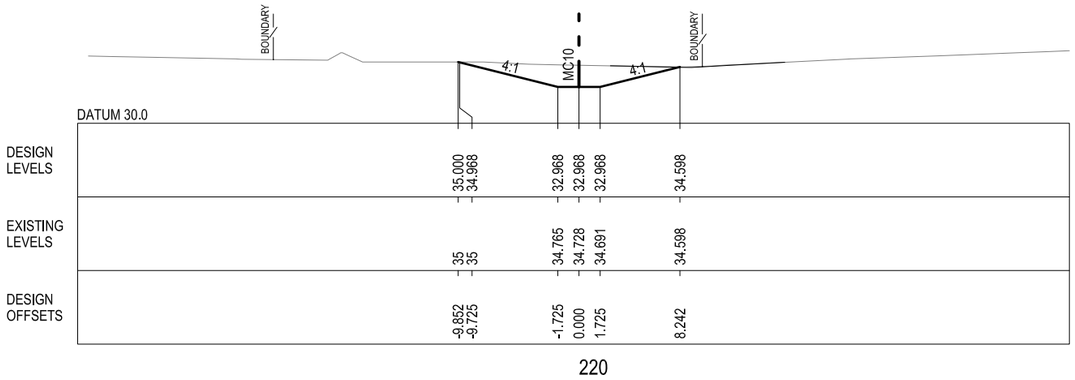

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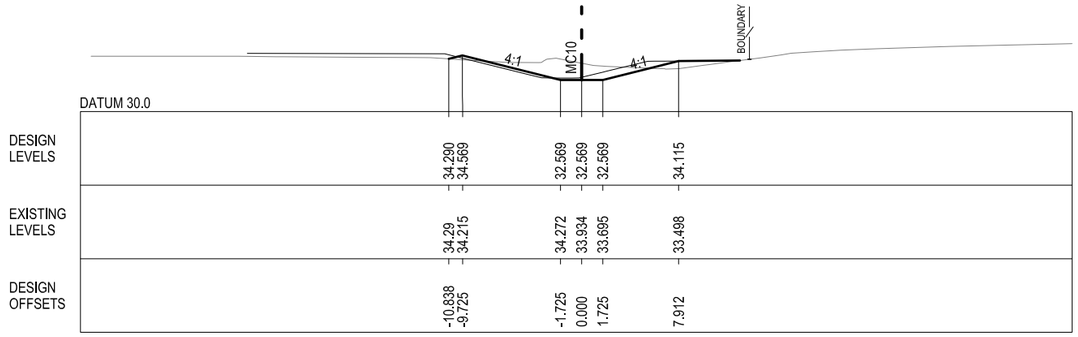

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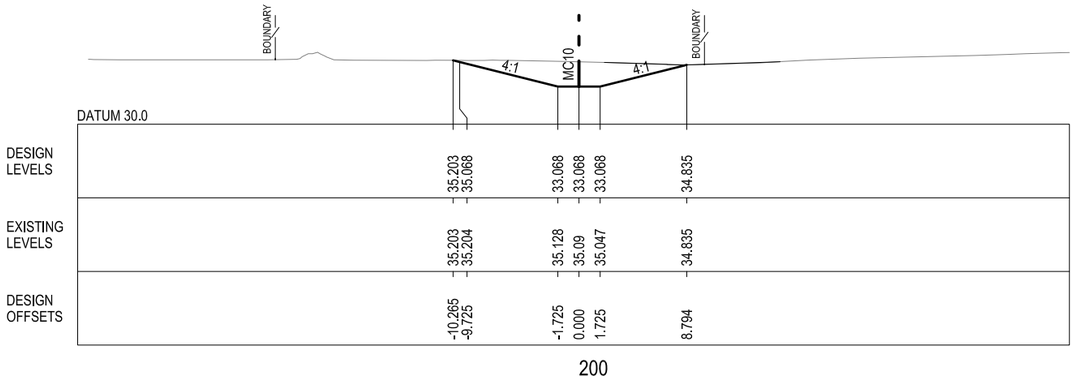

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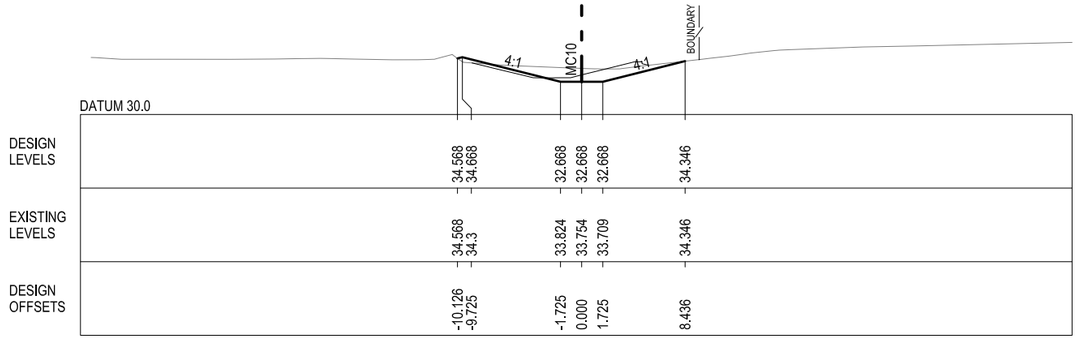

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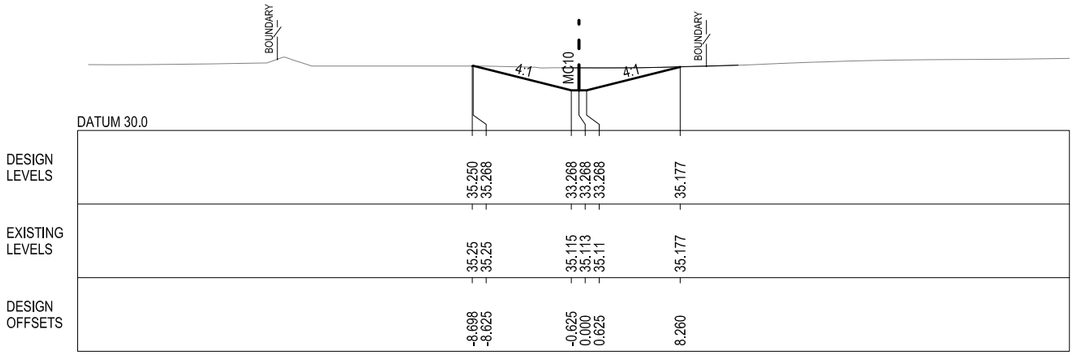

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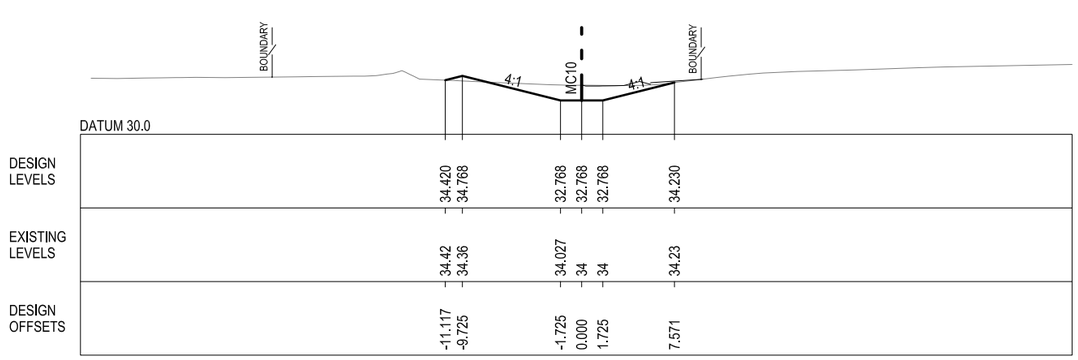

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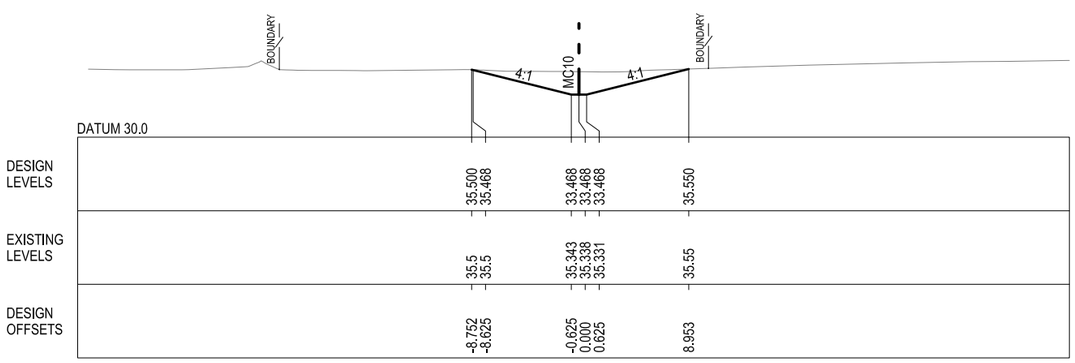

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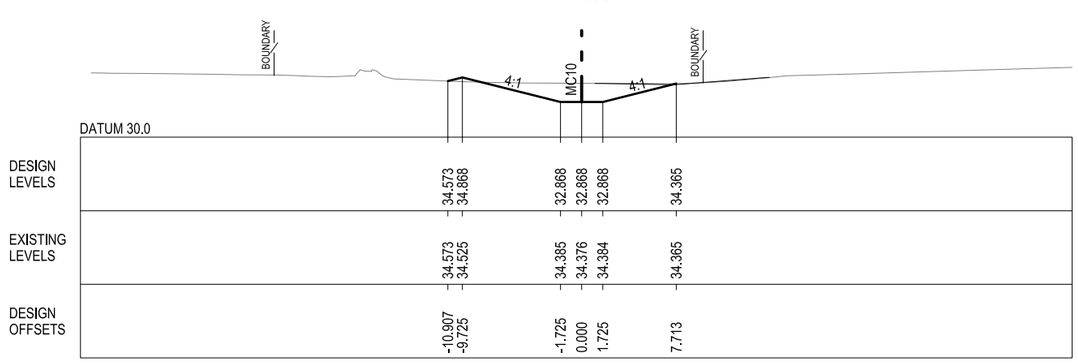

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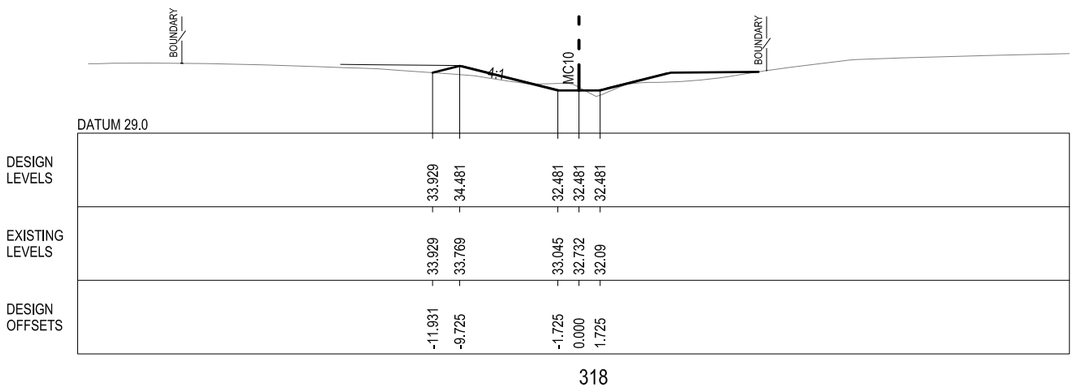

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Appendix D Safety in design assessment

A preliminary assessment has been undertaken to review the key hazards associated with the maintenance and operation of the upstream channel and to provide design solutions to mitigate these. A summary is given in **Table D - 1**.

Table D - 1 Safety hazards and mitigation measures that have been incorporated into the design

Hazard	Design management
Restricted access between top of bank and boundary fence potentially leading to someone falling into the channel	1m distance between top of channel and boundary fence has been included in the design
Inability for someone to exit the channel if they enter or fall in	1:4 side slopes on have been designed to improve ability for people to exit the channel
Slippery side slopes causing people to fall into the channel or making it difficult for someone to exit the channel	Channel side slopes would be vegetated
Deep water during high rainfall events	Channel has been designed so that the water depth would not exceed 1.5m in a 1% AEP event. During detailed design, safety signage would be incorporated the design to indicate flood danger.

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GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS.
2. SURVEY MARKS:–
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT–HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:– THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:–
    a) INTERALLOTMENT DRAINS (C.D.L.) – 1.5m WIDE MINIMUM (UP TO 300mm dia
    b) ALL OTHER PIPES – 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON–COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED – DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

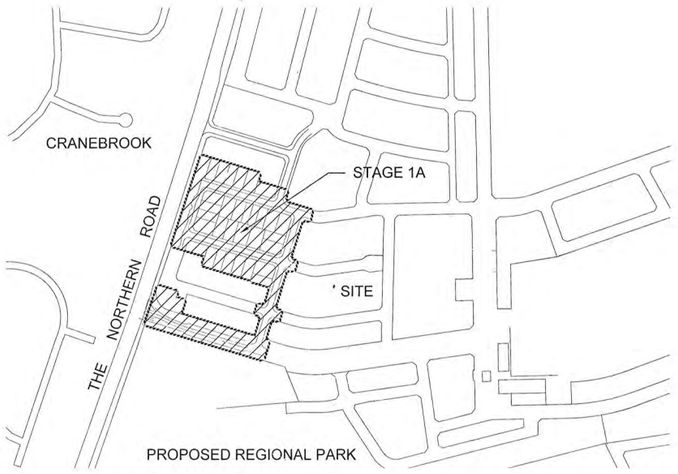
PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

STAGE 1A
ROAD & DRAINAGE WORKS

COUNCIL REF: DA09/0809



LEGEND

PROPOSED	DESCRIPTION	EXISTING
600ø	R.C. STORMWATER PIPELINE	
600ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150ø	COMMON DRAINAGE LINE	150ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS – BENCH MARKS	▲
◘	STATE SURVEY MARKS	
○	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

INDEX

PLAN No.	DESCRIPTION	PLAN No.	DESCRIPTION
8634/CC1	COVER SHEET, GENERAL NOTES, INDEX & LEGEND	8634/CC26	DRAINAGE LONGITUDINAL SECTIONS LINE No.22, 23, 38, 39, 40, 41, 43, 47 & 68
8634/CC2	SITE STAGING / BULK EARTHWORKS PLAN	8634/CC27	PIT SCHEDULE
8634/CC3	SETOUT PLAN	8634/CC28	DRAINAGE CALCULATIONS (1 OF 3)
8634/CC4	PLAN (1 OF 3)	8634/CC29	DRAINAGE CALCULATIONS (2 OF 3)
8634/CC5	PLAN (2 OF 3)	8634/CC30	DRAINAGE CALCULATIONS (3 OF 3)
8634/CC6	PLAN (3 OF 3)	8634/CC31	SOIL & WATER MANAGEMENT PLAN
8634/CC7	ROAD No.1 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS	8634/CC32	SOIL & WATER MANAGEMENT NOTE & DETAILS
8634/CC8	ROAD No.2 & 4 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS	8634/CC33	NORTHERN & SOUTHERN BASIN CATCHMENT PLAN & DRAINAGE CALCULATIONS
8634/CC9	ROAD No.5, 6, 7 & 8 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS	8634/CC34	BASIN SOIL & WATER MANAGEMENT DETAILS
8634/CC10	ROAD No.1 CROSS SECTIONS	8634/CC35	SEDIMENT/DETENTION BASIN SOUTH SECTIONS A-A & B-B
8634/CC11	ROAD No.1 & 2 CROSS SECTIONS	8634/CC36	SEDIMENT/DETENTION BASIN SOUTH TYPICAL BASIN SECTIONS
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8634/CC13	ROAD No.4 CROSS SECTIONS	8634/CC38	TREE MANAGEMENT PLAN
8634/CC14	ROAD No.4 CROSS SECTIONS	8634/CC39	SPECIAL DRAINAGE PITS 1/1, 2/1, 3/1, 4/1 & 5/1
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8634/CC17	ROAD No.8 CROSS SECTIONS	8634/CC42	SPECIAL DRAINAGE PITS 3/2, 4/2, 5/2, 6/2. 7/2, 8/2 & 9/2
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8634/CC25	DRAINAGE LONGITUDINAL SECTIONS LINE No.7, 8, 9, 15, 16, 17, 18, 19, 20, 21 & 22	8634/CC50	SPECIAL DRAINAGE PIT STRUCTURAL NOTES & TYPICAL BOX CULVERT BASE SLAB DETAIL

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au DIAL1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

This plan/document relates to DA No: 090809 CCX No: 100012
Environmental Planning & Assessment Act
Enid Hausfeld
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Thomas
REGISTERED SURVEYOR

SURVEYED BY:
WHELANS INSITES PTY LTD

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NOT FOR CONSTRUCTION
SIGNED S. Anderson DATE 06/05/2010

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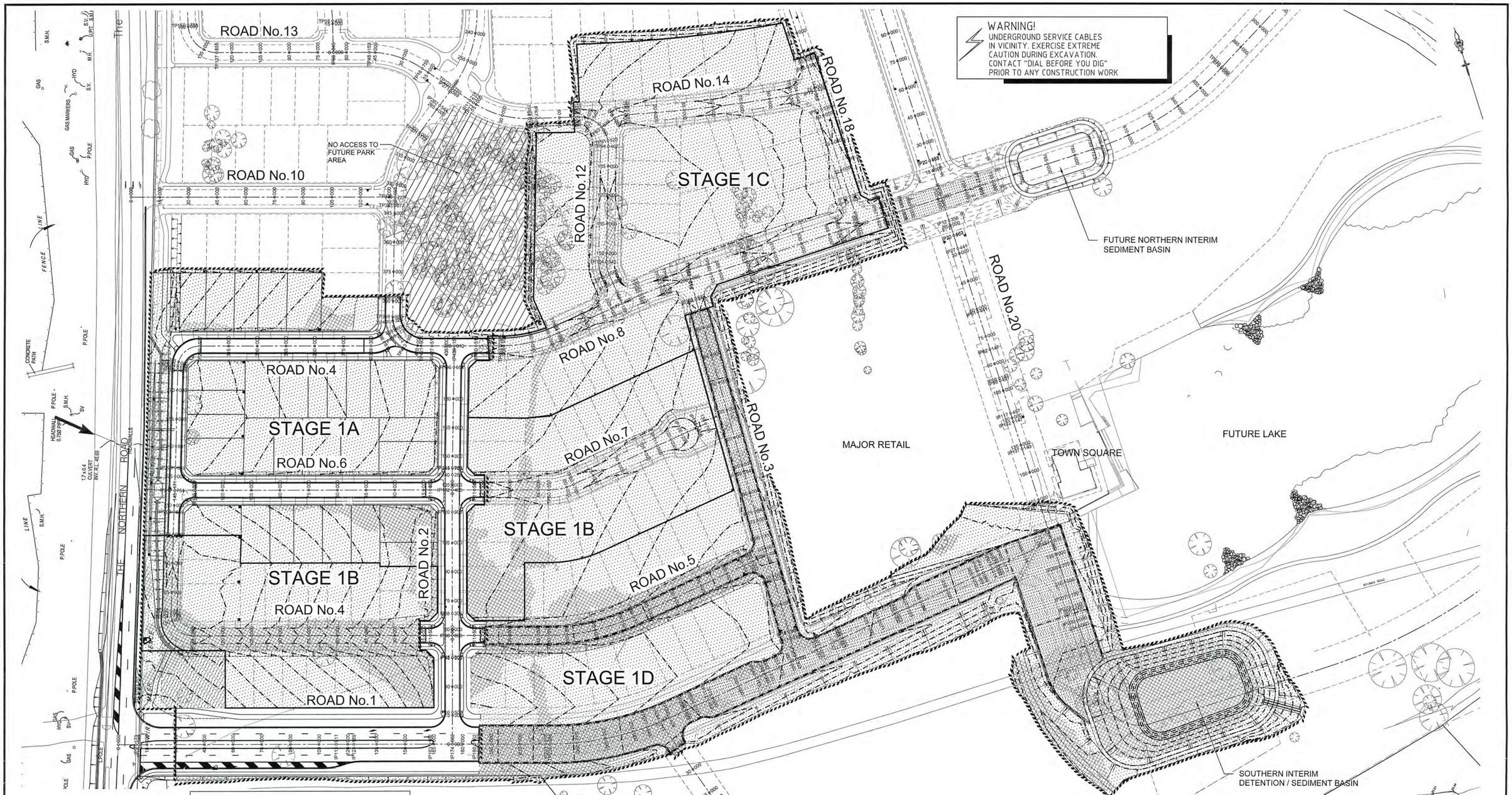
DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1A
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8634CC1 D
FILE No. 8634CC1
SHEET 1 OF 51 SHEETS

Plotted: 7 May 2010 10:47:41 AM File Name: J:\8634\DWG - Engineering Construction Plans\Stage

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LEGEND

- ASSOCIATE STAGE 1A WORK
- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- BOXING OF ROADS FOR OVERLAND FLOW PATH
- SITE CUT
- SITE FILL

NOTES:

1. STAGE 1A TO INCLUDE CONSTRUCTION OF SOUTHERN INTERIM DETENTION / SEDIMENT BASIN.
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1A TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO SOUTHERN INTERIM DETENTION / SEDIMENT BASIN
3. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
4. BULK EARTHWORKS FOR STAGES 1B, 1C & 1D TO BE COMPLETED AS PART OF 1A.

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CCX No: 100012 Environmental Planning & Assessment Act Eric Hemfield PENRITH CITY COUNCIL

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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SIGNED S. Anderson DATE 06/05/2010

AMENDMENT	DATE	BY
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COUNCIL AMENDMENTS	MAR 2010	AM
ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
FIRST ISSUE	FEB 2010	AM

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DRAWN N.W.
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SCALES: 1:1000

JORDAN SPRINGS
STAGE 1A
SITE STAGING / BULK EARTHWORKS PLAN

PLAN No. 8634CC2 D
FILE No. 8634CC2
SHEET 2 OF 51 SHEETS

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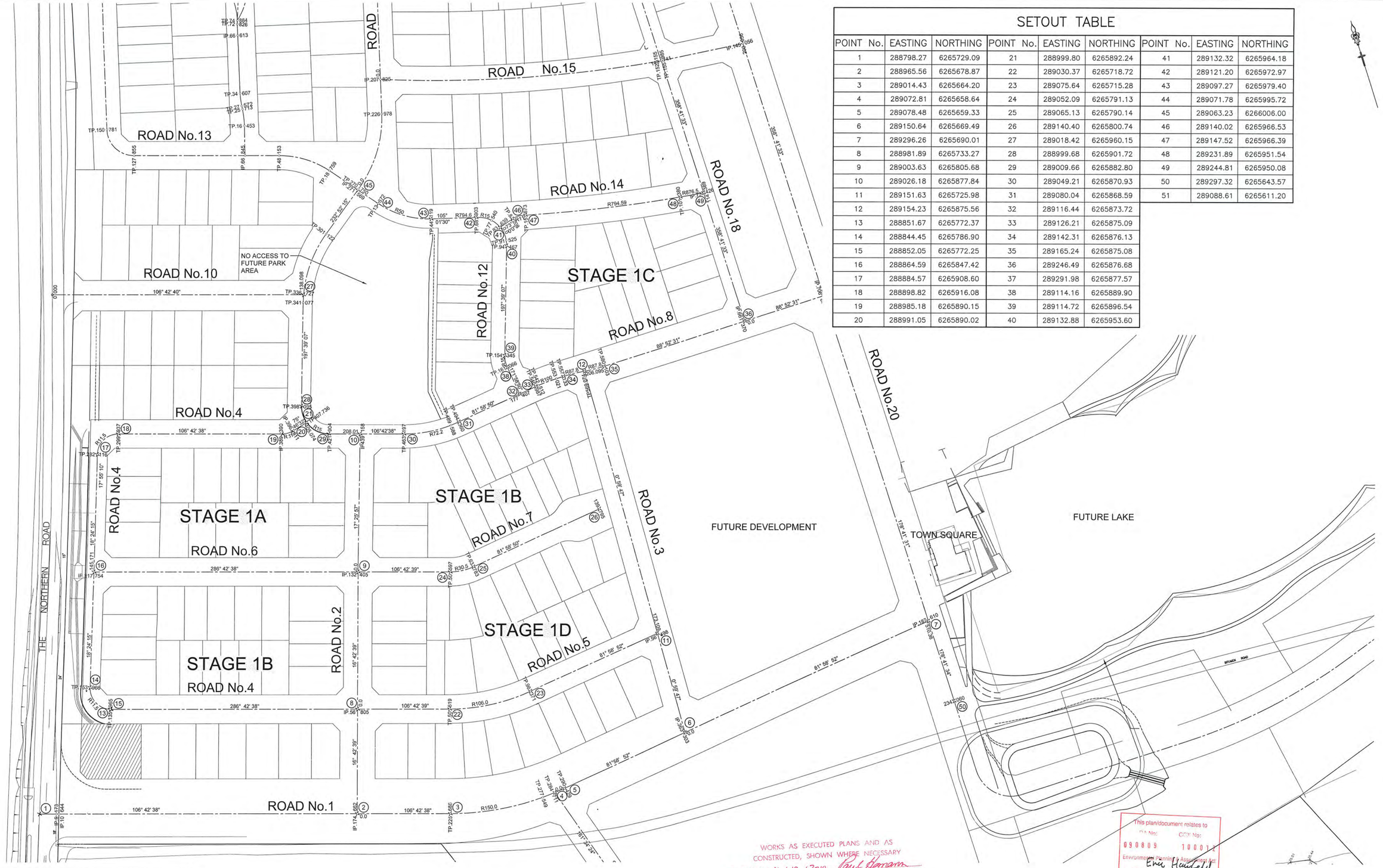
Version: 1, Version Date: 13/07/2018



SETOUT TABLE

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
1	288798.27	6265729.09	21	288999.80	6265892.24	41	289132.32	6265964.18
2	288965.56	6265678.87	22	289030.37	6265718.72	42	289121.20	6265972.97
3	289014.43	6265664.20	23	289075.64	6265715.28	43	289097.27	6265979.40
4	289072.81	6265658.64	24	289052.09	6265791.13	44	289071.78	6265995.72
5	289078.48	6265659.33	25	289065.13	6265790.14	45	289063.23	6266006.00
6	289150.64	6265669.49	26	289140.40	6265800.74	46	289140.02	6265966.53
7	289296.26	6265690.01	27	289018.42	6265960.15	47	289147.52	6265966.39
8	288981.89	6265733.27	28	288999.68	6265901.72	48	289231.89	6265951.54
9	289003.63	6265805.68	29	289009.66	6265882.80	49	289244.81	6265950.08
10	289026.18	6265877.84	30	289049.21	6265870.93	50	289297.32	6265643.57
11	289151.63	6265725.98	31	289080.04	6265868.59	51	289088.61	6265611.20
12	289154.23	6265875.56	32	289116.44	6265873.72			
13	288851.67	6265772.37	33	289126.21	6265875.09			
14	288844.45	6265786.90	34	289142.31	6265876.13			
15	288852.05	6265772.25	35	289165.24	6265875.08			
16	288864.59	6265847.42	36	289246.49	6265876.68			
17	288884.57	6265908.60	37	289291.98	6265877.57			
18	288898.82	6265916.08	38	289114.16	6265889.90			
19	288985.18	6265890.15	39	289114.72	6265896.54			
20	288991.05	6265890.02	40	289132.88	6265953.60			

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1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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DATUM: AHD ORIGIN:

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JORDAN SPRINGS
STAGE 1A
SETOUT PLAN

PLAN No. 8634CC3 D
FILE No. 8634CC3
SHEET 3 OF 51 SHEETS

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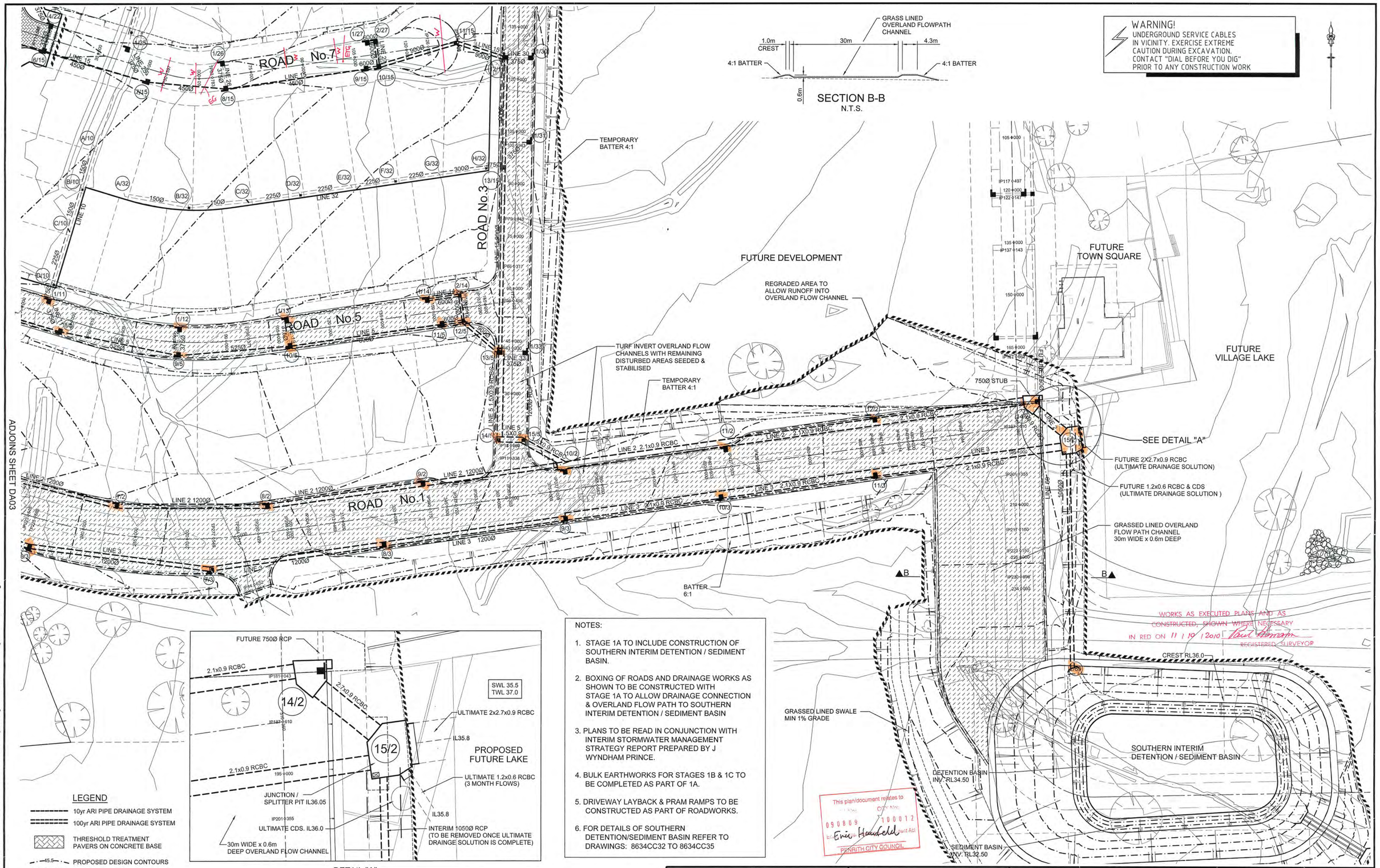

DETAIL "A"
SCALE 1:250

LEGEND

- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- THRESHOLD TREATMENT PAVERS ON CONCRETE BASE
- 45.5 PROPOSED DESIGN CONTOURS
- ASSOCIATE STAGE 1A WORK
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1A

NOTES:

1. STAGE 1A TO INCLUDE CONSTRUCTION OF SOUTHERN INTERIM DETENTION / SEDIMENT BASIN.
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1A TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO SOUTHERN INTERIM DETENTION / SEDIMENT BASIN
3. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
4. BULK EARTHWORKS FOR STAGES 1B & 1C TO BE COMPLETED AS PART OF 1A.
5. DRIVEWAY LAYBACK & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS.
6. FOR DETAILS OF SOUTHERN DETENTION/SEDIMENT BASIN REFER TO DRAWINGS: 8634CC32 TO 8634CC35

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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SCALES: 1:500

JORDAN SPRINGS
STAGE 1A
PLAN (2 OF 3)

PLAN No. 8634CC5 D
FILE No. 8634CC5
SHEET 5 OF 51 SHEETS

Plotted: 7 May 2010 10:50:10 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC5.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

EXISTING TELSTRA LINE (DISUSED)
DESIGN CONTOURS OMITTED FOR CLARITY
1.2m WIDE GRASS COVERED SWALE
EMERGENCY OVERFLOW WEIR WIDTH = 7.1m RL46.00
RL45.55
ROCK WALL 0.5m HIGH MAX
RL45.735
RL46.107
RL46.307
SPLITTER PIT TO CONVEY FLOWS EVENLY IN BOTH OUTLETS
LINE 3 1200Ø
LINE 2 1200Ø
CREST RL47.0
CREST RL46.3
1m WIDE CREST
CREST RL46.383
0.5m HIGH ROCK WALL
RL46.1
CREST RL46.55
CREST RL46.583
GRASSED LINED SWALE MIN. 1% GRADE.
TEMPORARY GUIDE POSTS
LIMIT OF STAGE 1A ROAD CONSTRUCTION
BATTER 6:1
EXISTING WATER LINE (DISUSED)
TEMPORARY BATTER 4:1
ROAD No.1
ROAD No.4
ROAD No.6
ROAD No.2
ROAD No.10
ROAD No.8
ROAD No.5
ROAD No.7
1001 1002 1003 1004 1005 1006 1007 1098 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031
KR 1 KR 2 KR 3 KR 4 KR 5 KR 6 KR 7 KR 8 KR 9 KR 10 KR 11 KR 12 KR 13 KR 14 KR 15 KR 16
LINE 1 1650Ø
LINE 2 1200Ø
LINE 3 1200Ø
LINE 8 375Ø
LINE 15 375Ø
LINE 19 375Ø
LINE 19 150Ø
LINE 20 375Ø
LINE 22 375Ø
LINE 23 375Ø
LINE 34 375Ø
LINE 38 375Ø
LINE 39 150Ø
LINE 41 375Ø
LINE 42 375Ø
LINE 43 525Ø
525Ø STUB
375Ø STUB
EASEMENT FOR DRAINAGE
ADJOINS SHEET DA04

NOTES:

1. STAGE 1A TO INCLUDE CONSTRUCTION OF SOUTHERN INTERIM DETENTION / SEDIMENT BASIN.
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LEGEND

- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- THRESHOLD TREATMENT PAVERS ON CONCRETE BASE
- PROPOSED DESIGN CONTOURS
- STAGE 1A WORK
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1A

NOTE: E - ELECTRICAL CROSSING
T - TELSTRA CROSSING [AUS(c) FOR COMMS]
G - GAS CROSSING
W - WATER CROSSING

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010
REGISTERED SURVEYOR

TAIL OUT DRAIN
BASE WIDTH = 2.0m
LONGITUDINAL GRADE = 0.5%
BATTER SLOPES = 4h:1v

SECTION A-A
N.T.S.
NORTHERN ROAD BOUNDARY 1.2m TURF 7.1m WIDE OVERFLOW WIER TOW 45.779 RL45.772 1.2sq GRATED SURFACE INLET PIT BOW 45.279 1050Ø 100yr ARI DRAINAGE PIPE PROPOSED ROAD No.4 REFER TO LANDSCAPE ARCHITECT FOR PLANTING

NOTE: REFER TO DWG: 8634CC32 FOR TYPICAL STACKED ROCK WALL DETAIL.

SECTION B-B
N.T.S.
NORTHERN ROAD BOUNDARY 1.2m TURF 1.0m WIDE CREST RL46.387 RL45.745 1050Ø 100yr ARI DRAINAGE PIPE PROPOSED ROAD No.4 REFER TO LANDSCAPE ARCHITECT FOR PLANTING ROCK RETAINING WALL MAX. HEIGHT 0.5m REFER DWG. 8634CC32 FOR DETAIL

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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Environmental Planning and Assessment Act
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E			
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C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:500

JORDAN SPRINGS
STAGE 1A
PLAN (1 OF 3)

PLAN No. 8634CC4 D
FILE No. 8634CC4
SHEET 4 OF 51 SHEETS

Plotted: 7 May 2010 10:49:22 AM File Name: J:\8634\DCC - Engineering Construction Plans\Stage - 1A\8634CC4.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

ROAD No.10

ROAD No.12

ROAD No.14

ROAD No.12

ROAD No.18

ROAD No.20

ROAD No.8

ROAD No.7

Stage 1C

LOCATION OF CATCH DRAIN TO BE DETERMINED ON SITE TO MINIMISE IMPACT TO EXISTING TREES

PROVIDE TEMPORARY 675Ø RCP STORMWATER PIT TO DISCHARGE STAGE 1A STORMWATER LINE TO TAIL OUT DRAIN

TAIL OUT DRAIN
BASE WIDTH = 2.0m
LONGITUDINAL GRADE = 0.5%
BATTER SLOPES = 4h:1v

TAILOUT DRAINAGE TO BE TURFED

15m WIDE LEVEL SPREADER

ADJOINS SHEET DA03

LEGEND

- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- THRESHOLD TREATMENT PAVERS ON CONCRETE BASE
- 45.5 PROPOSED DESIGN CONTOURS
- ASSOCIATE STAGE 1A WORK
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1A

NOTES:

1. STAGE 1A TO INCLUDE CONSTRUCTION OF SOUTHERN INTERIM DETENTION / SEDIMENT BASIN.
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1A TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO SOUTHERN INTERIM DETENTION / SEDIMENT BASIN
3. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
4. BULK EARTHWORKS FOR STAGES 1B & 1C TO BE COMPLETED AS PART OF 1A.
5. DRIVEWAY LAYBACK & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS.
6. FOR DETAILS OF SOUTHERN DETENTION/SEDIMENT BASIN REFER TO DRAWINGS: 8634CC32 TO 8634CC35

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Bonanno REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CCX No: 100012 Environmental Planning & Assessment Act Eric Hendell PENRITH CITY COUNCIL

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
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SCALES: 1:500

JORDAN SPRINGS
STAGE 1A
PLAN (3 OF 3)

PLAN No. 8634CC6 D
FILE No. 8634CC6
SHEET 6 OF 51 SHEETS

Plotted: 7 May 2010 10:50:47 AM File Name: J\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC6.dwg

Document Set ID: 8291178
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THRESHOLD TREATMENT DESIGN

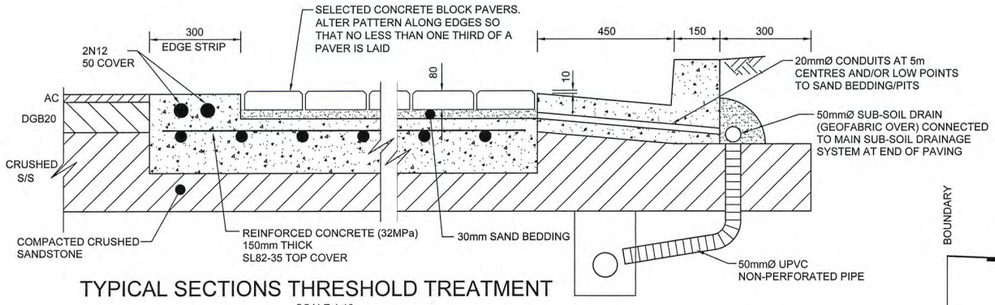
80mm MINIMUM THICKNESS PAVERS

30mm MINIMUM THICKNESS SAND

150mm REINFORCED CONCRETE BASE WITH SL82 MESH

300mm CONCRETE EDGE

NOTE: THRESHOLD TREATMENT TO SIT ON -75mm CRUSHED SANDSTONE SUB-BASE, TRIMMED TO SUIT THRESHOLD TREATMENT DEPTH.



TYPICAL SECTIONS THRESHOLD TREATMENT

SCALE 1:10

PAVEMENT DESIGN - ROAD 1 - 2×10^6

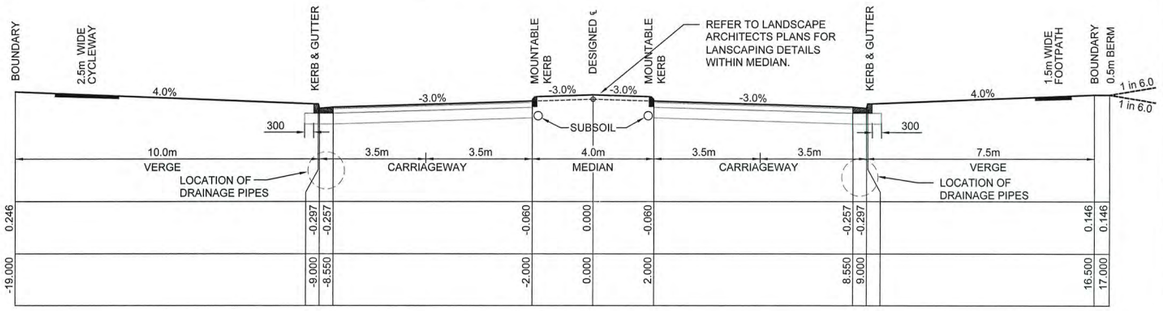
GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10) (IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

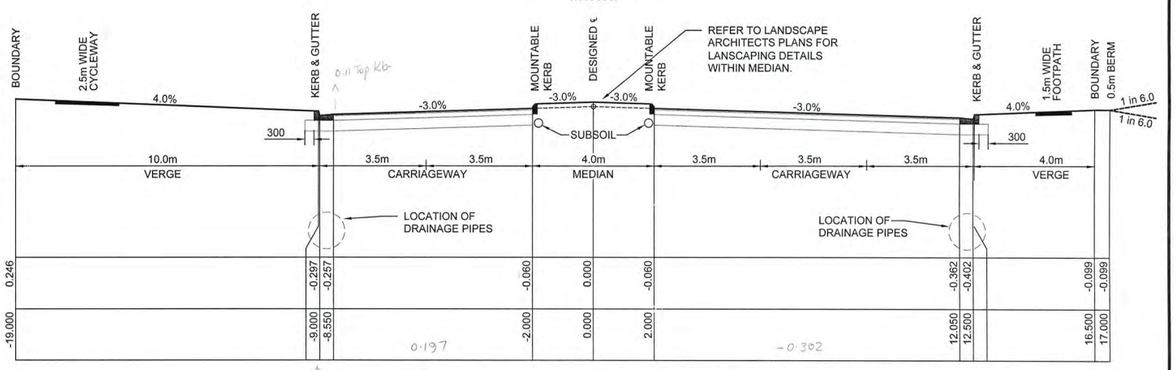
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

350mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE



TYPICAL CROSS SECTION ROAD No.1
CH 123.19 TO 188.462

1:100 NAT

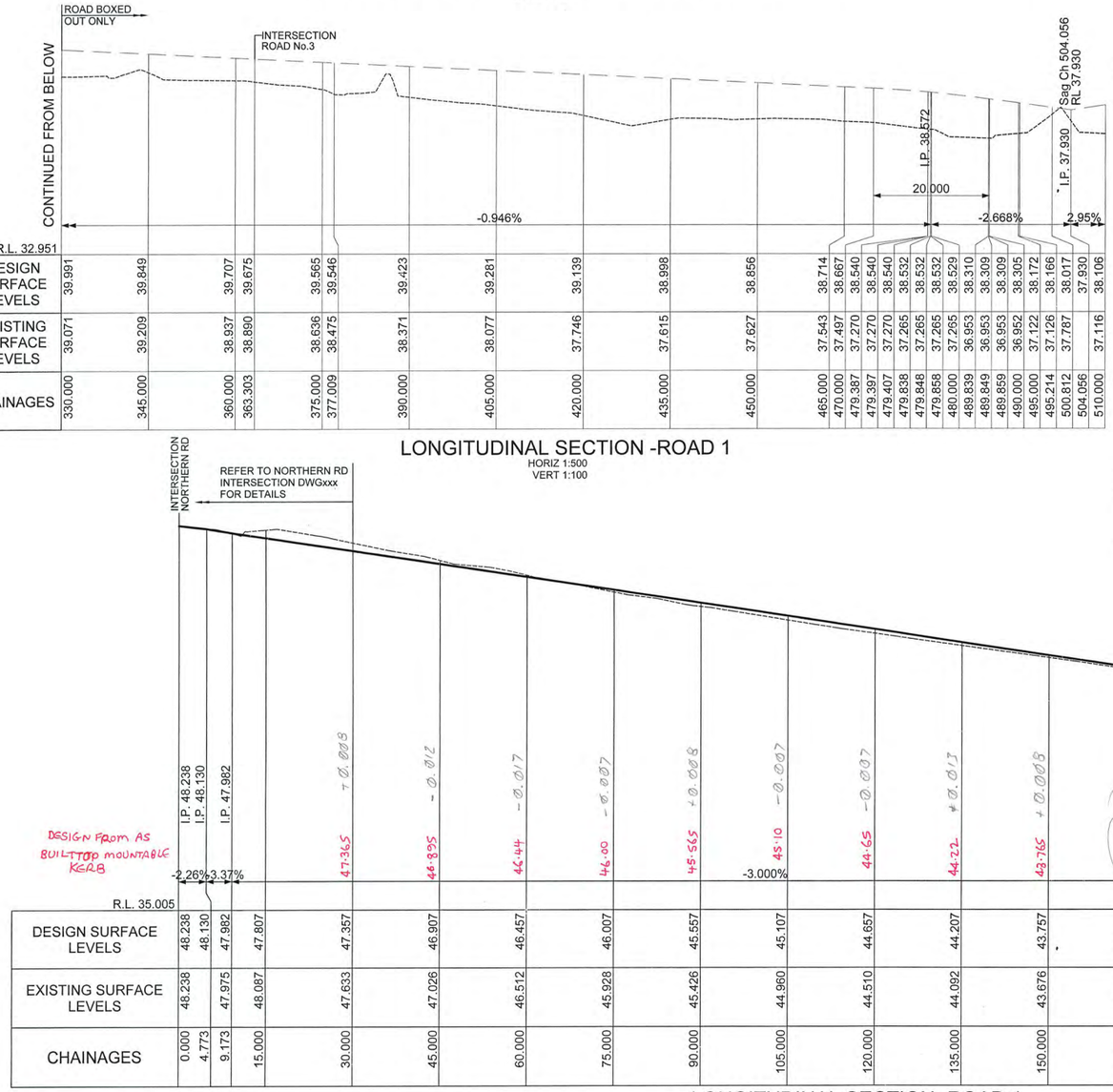


TYPICAL CROSS SECTION ROAD No.1
CH 0.00 TO 113.911

1:100 NAT

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Bowman REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CCX No: 100012 Environmental Planning & Assessment Act Eric Haubold PENRITH CITY COUNCIL



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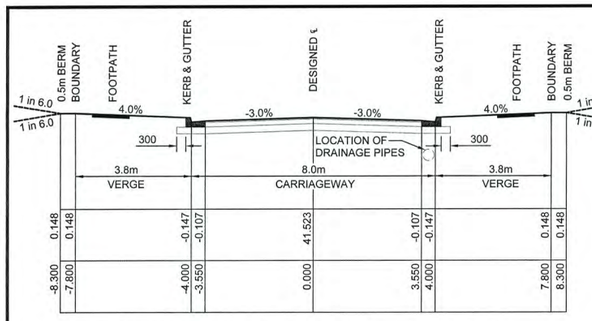

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CH 56.805 TO 208.010
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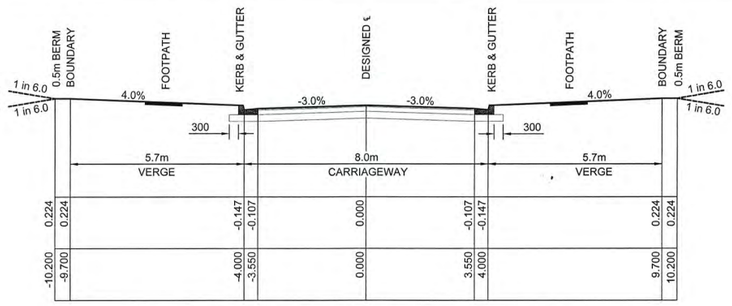

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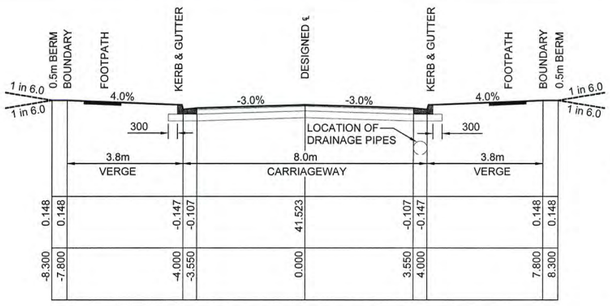
CH 0.00 TO 56.805
1:100 NAT



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CH 283.554 TO 405.868
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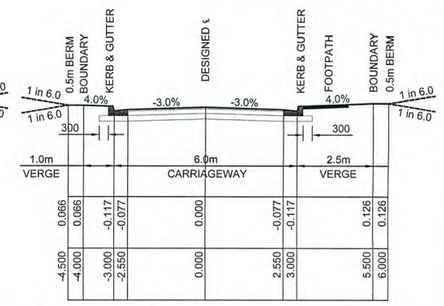


TYPICAL CROSS SECTION ROAD No.4
CH 195.000 TO 283.554
1:100 NAT

PAVEMENT DESIGN - ROAD 2 - $2x10^5$

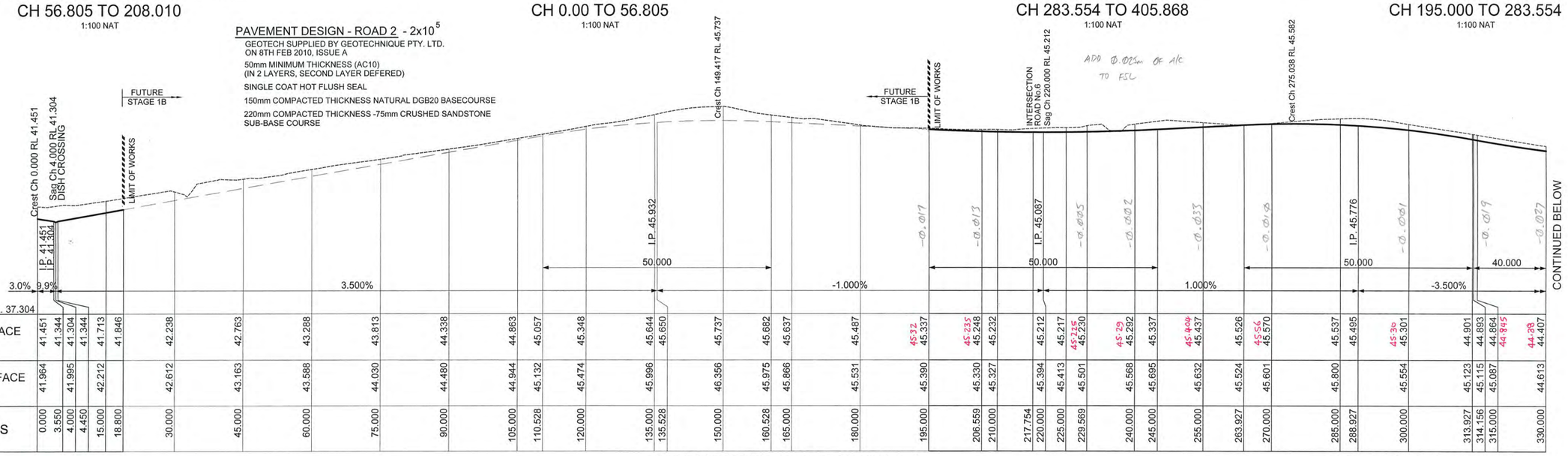
GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD.
ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE



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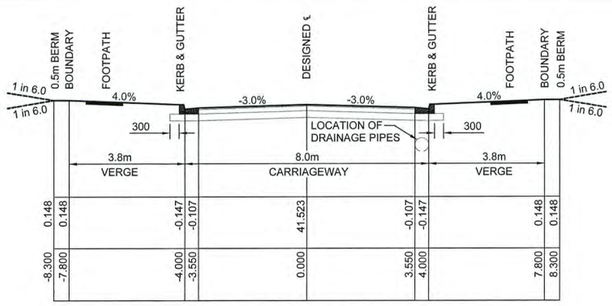

TYPICAL CROSS SECTION ROAD No. 5 & 7

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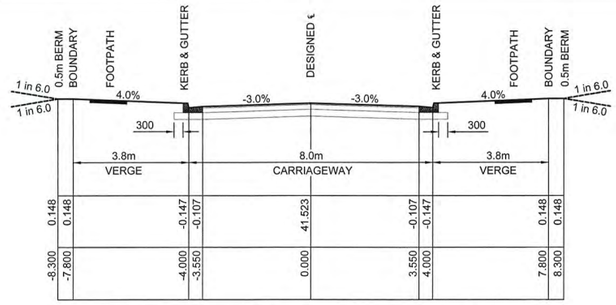

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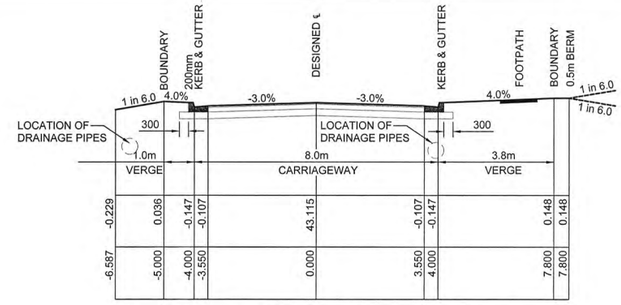


TYPICAL CROSS SECTION ROAD No.8

1:100 NAT

PAVEMENT DESIGN - ROAD 8 - $2x10^5$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10) (IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE (SUBJECT TO SOIL TEST)

PAVEMENT DESIGN - ROAD 5,6 & 7 - $5x10^4$

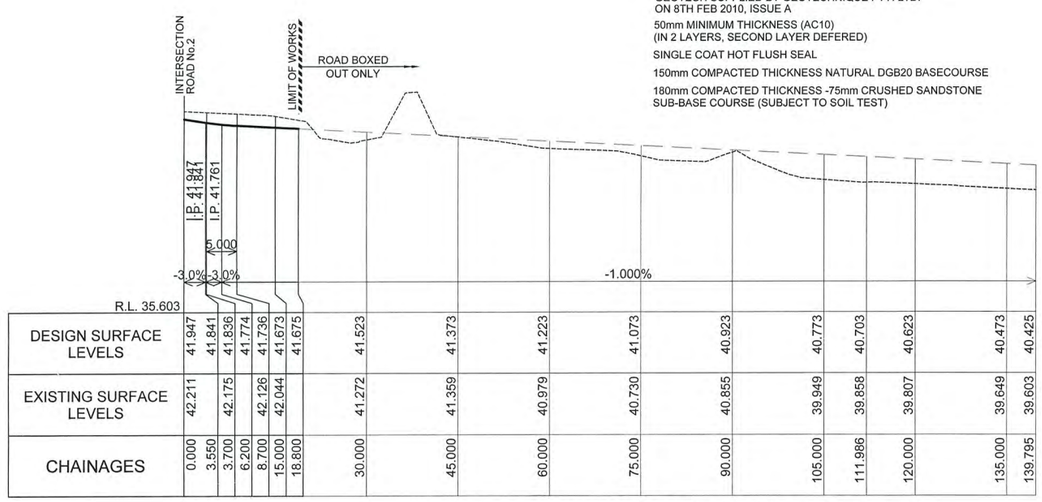
GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10) (IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE (SUBJECT TO SOIL TEST)



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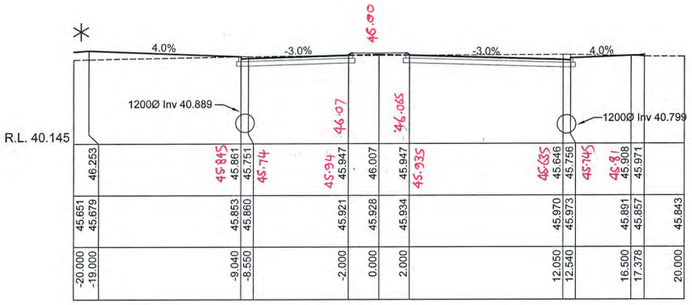
✳ SEE PLAN FOR LOT LEVELS.



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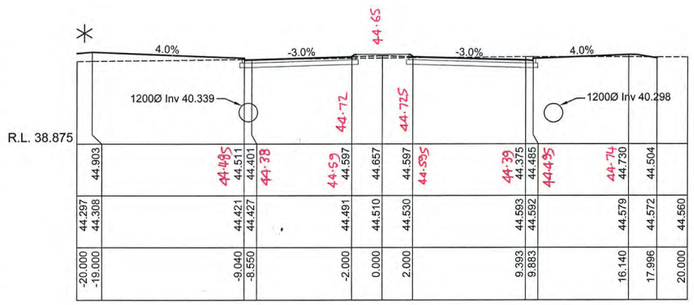

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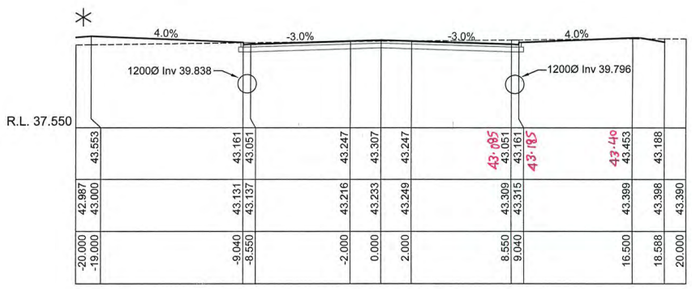

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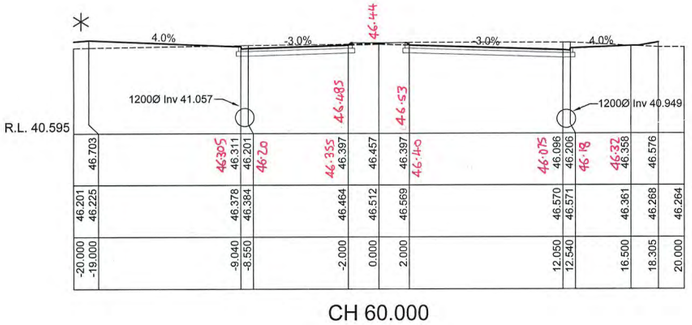

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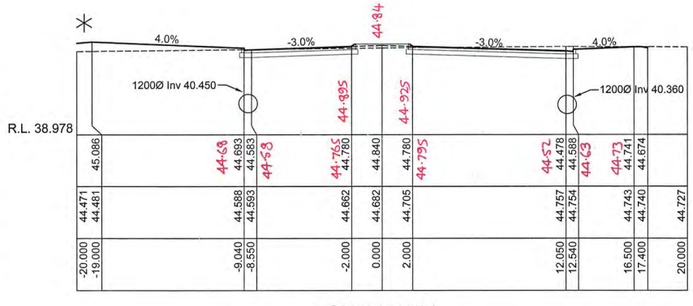
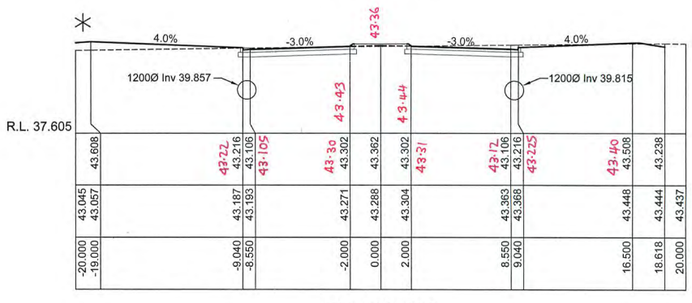
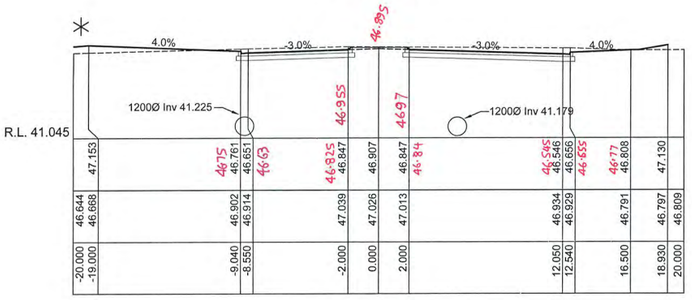


CH 113.911



CH 163.162



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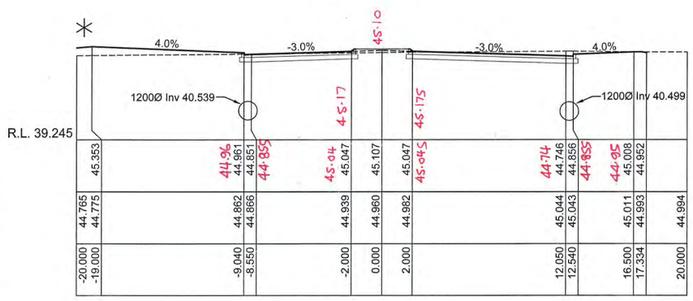

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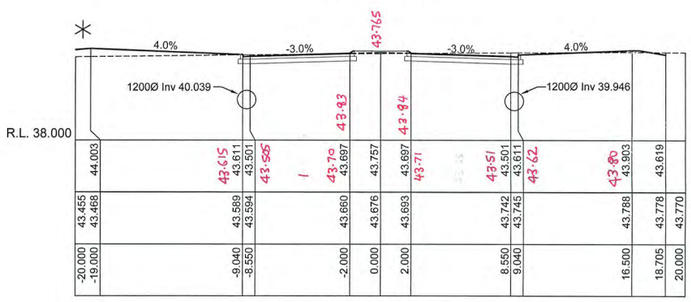
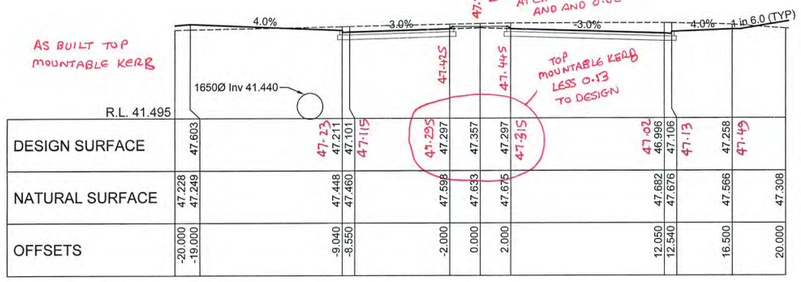


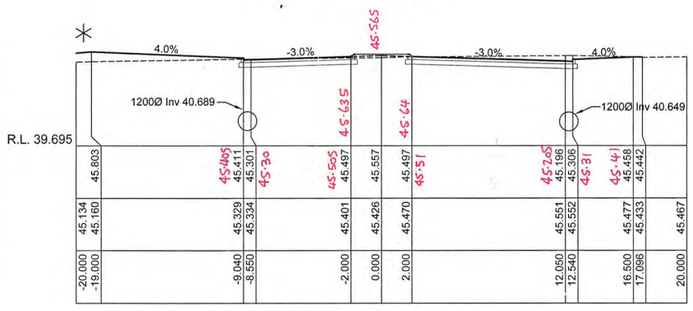
CH 150.000

AS BUILT TOP MOUNTABLE KERB



CH 30.000

TYPICAIL FOR ROAD 1 X-SECTIONS



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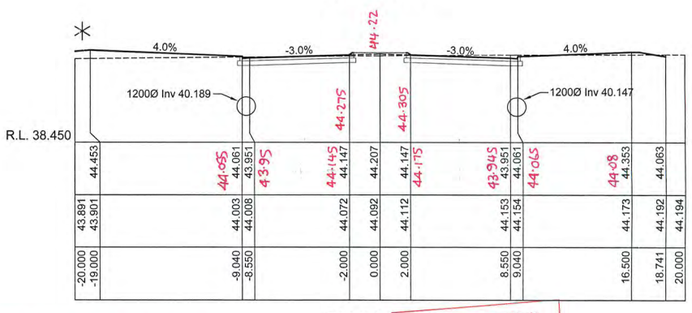

CH 135.000

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Environmental Planning & Assessment Act
Eric Hansdell
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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SIGNED S. Anderson DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1A
ROAD No.1 CROSS SECTIONS

PLAN No. 8634CC10 D
FILE No. 8634CC10
SHEET 10 OF 51 SHEETS

Plotted: 7 May 2010 10:51:41 AM File Name: J:\8634\DCC - Engineering Construction Plans\Stage - 1A\8634CC10.dwg

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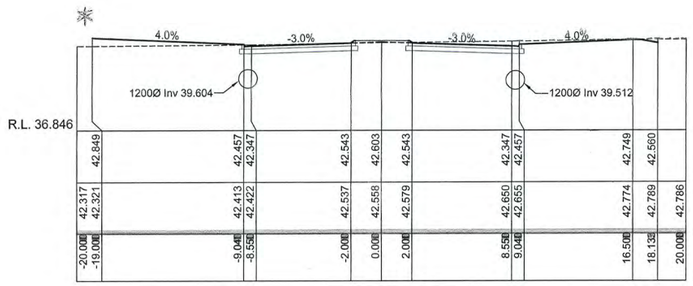

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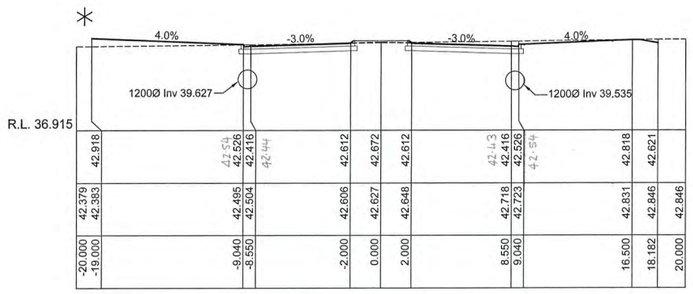

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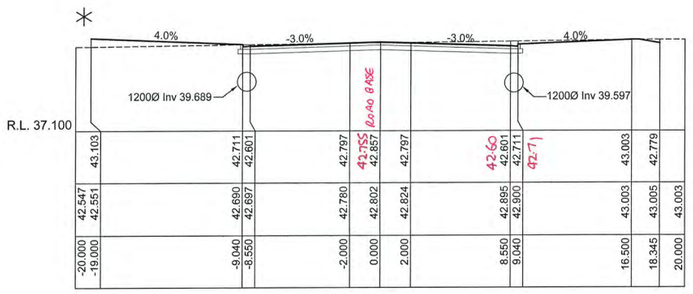

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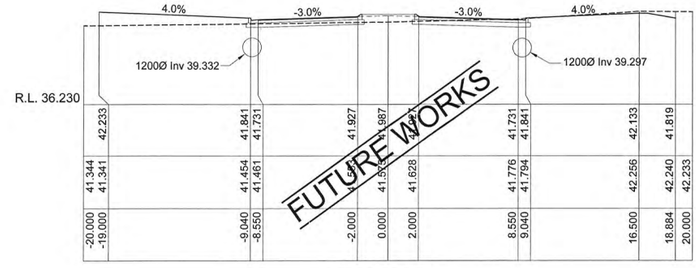

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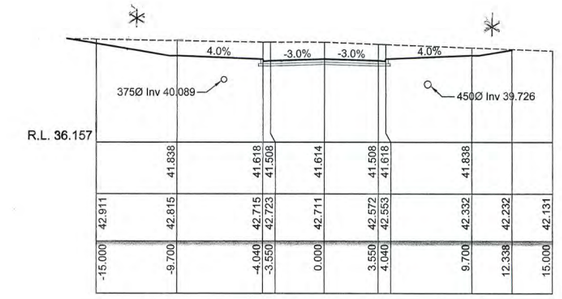

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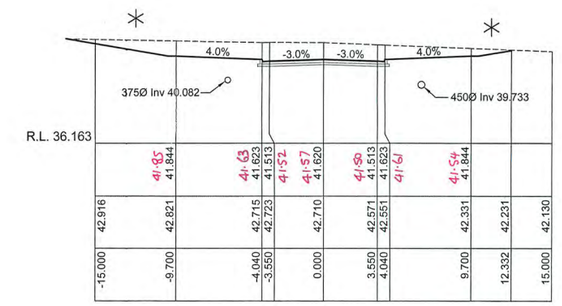

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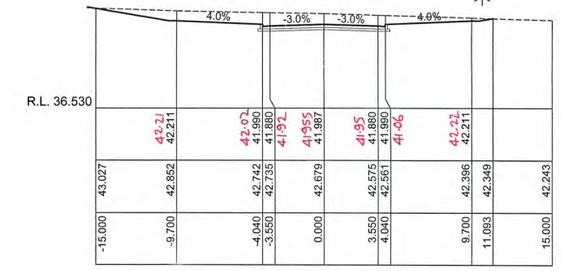

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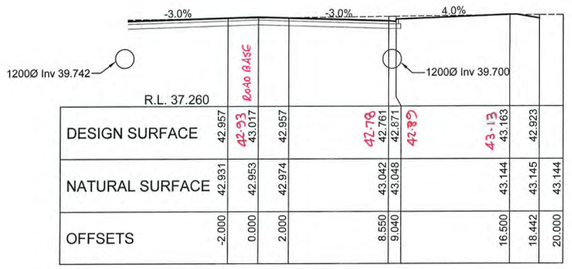

CH 174.662
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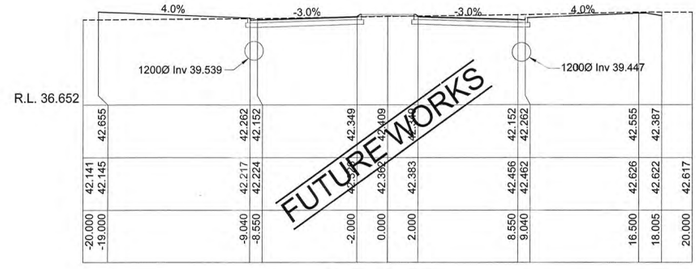
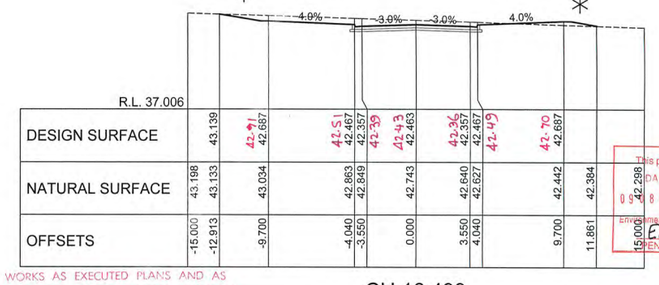


CH 195.000



CH 16.499
ROAD 2

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 11/10/2010 Paul Hannam
REGISTERED SURVEYOR

This plan/document relates to
DA No: CCX No:
09/0809 100012
Environmental Planning & Assessment Act
Eric Hemsfield
HENRITH CITY COUNCIL

✳ SEE PLAN FOR LOT LEVELS.

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

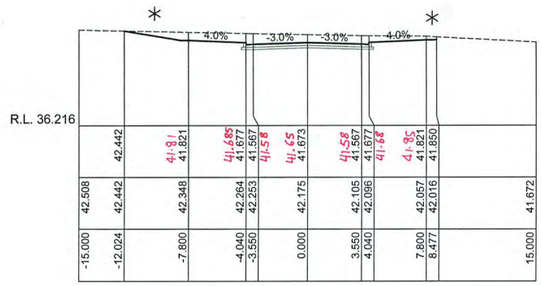
JORDAN SPRINGS
STAGE 1A
ROAD No.1 & 2 CROSS SECTIONS

PLAN No. 8634CC11 D
FILE No. 8634CC11
SHEET 11 OF 51 SHEETS

Plotted: 7 May 2010 10:51:55 AM File Name: J:\8634DICC - Engineering Construction Plans\Stage - 1A\8634CC11.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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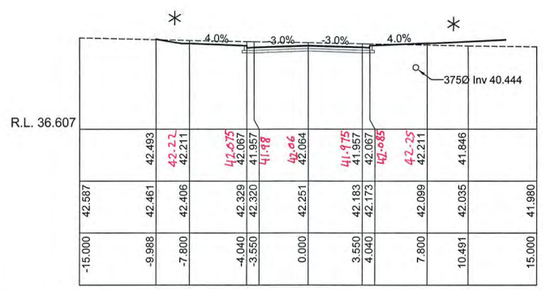

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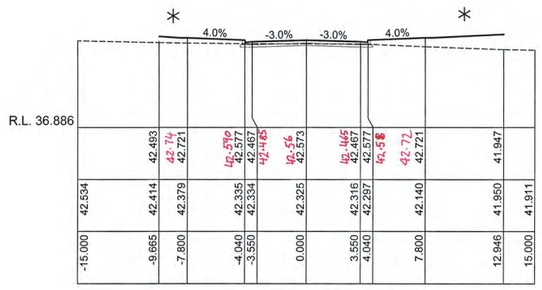

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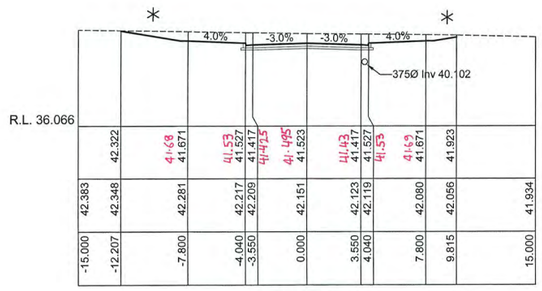

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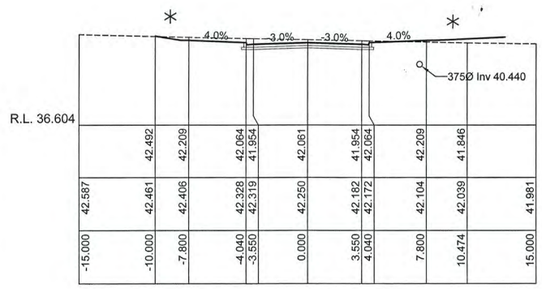

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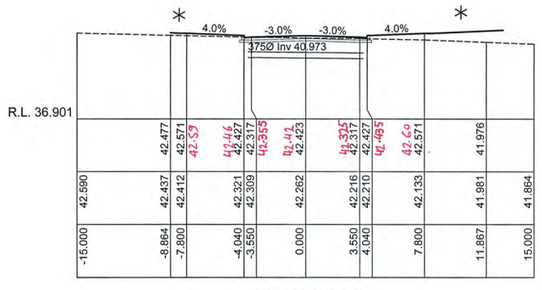

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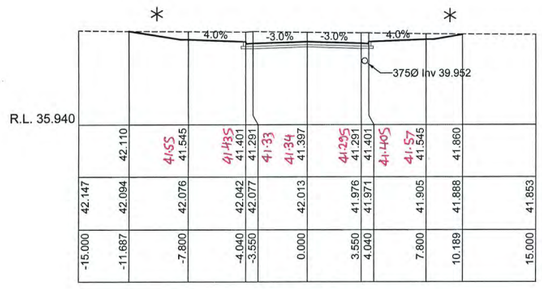

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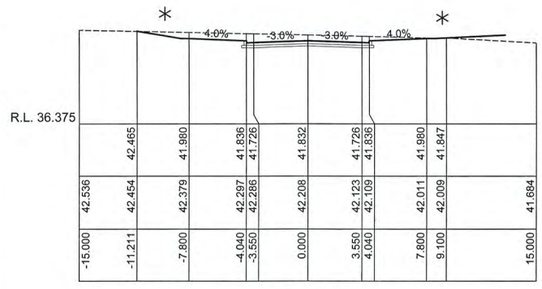

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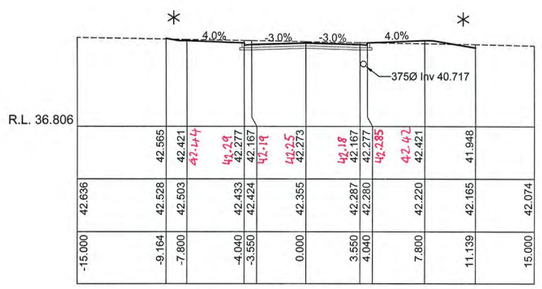

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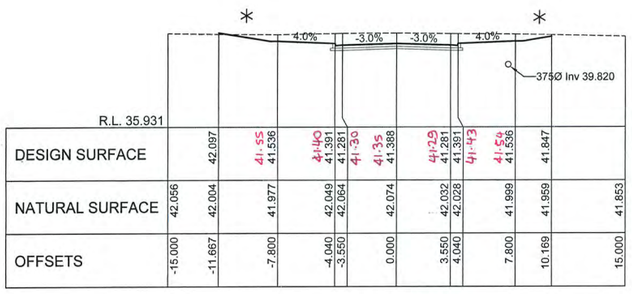
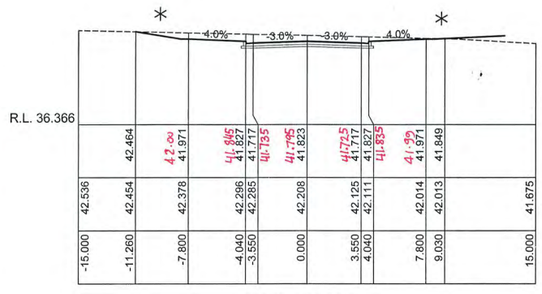


CH 68.305
ROAD 2



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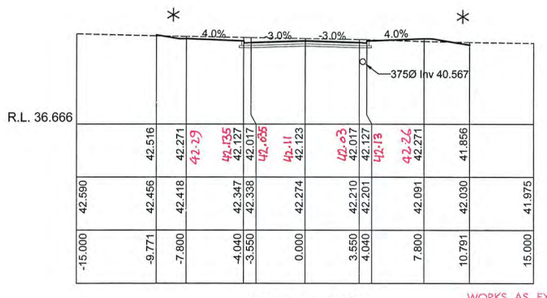

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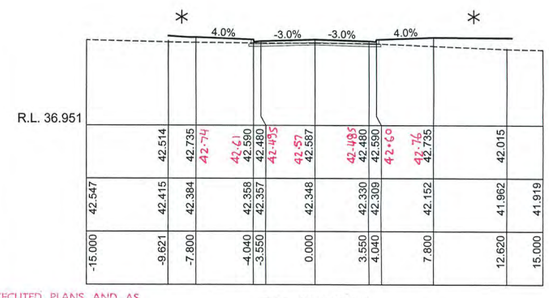

CH 196.364

This plan/document relates to
DA No: 090809 CCX No: 100012
Environmental Planning & Assessment Act
Enid Hendfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 4/10/2010 Paul Homann
REGISTERED SURVEYOR

1:200 (AT A1)
4 2 0 4 8 12 16 20
METRES

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
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E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1A
ROAD No.2 CROSS SECTIONS

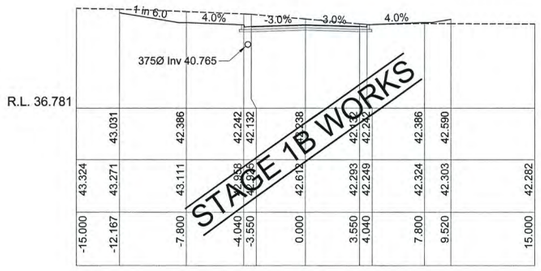
PLAN No. 8634CC12 D
FILE No. 8634CC12
SHEET 12 OF 51 SHEETS

Plotted: 7 May 2010 10:52:11 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC12.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

SEE TYPICAL SECTIONS SHEET CC3

SEE PLAN FOR LOT GRADING



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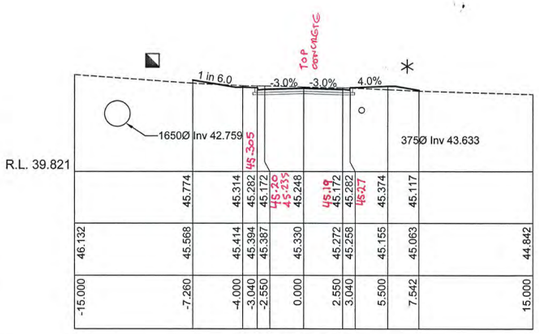

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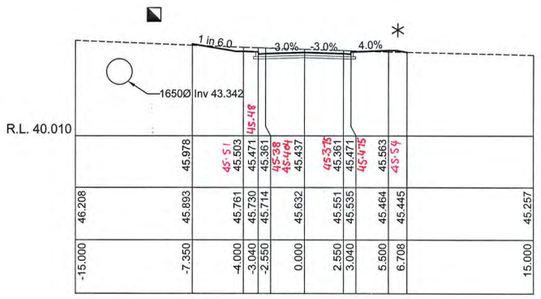

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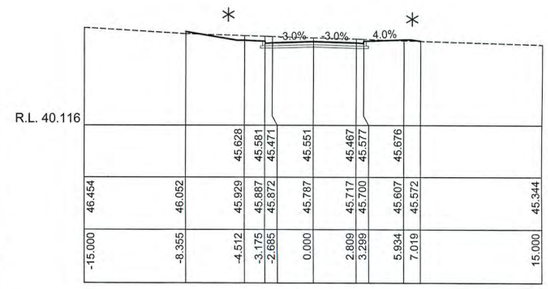

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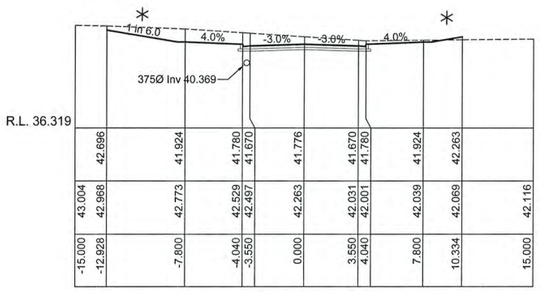

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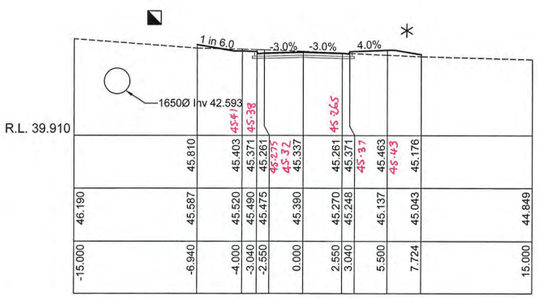

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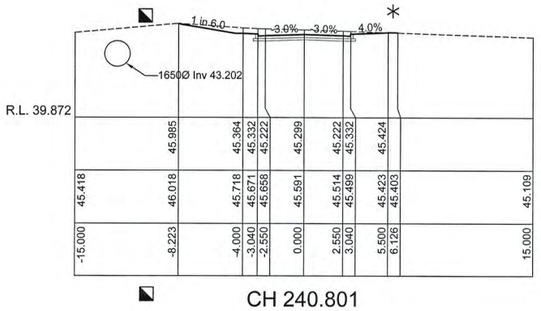

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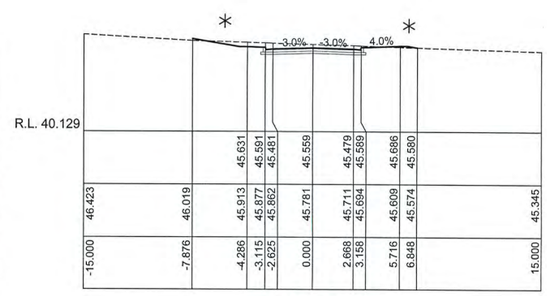

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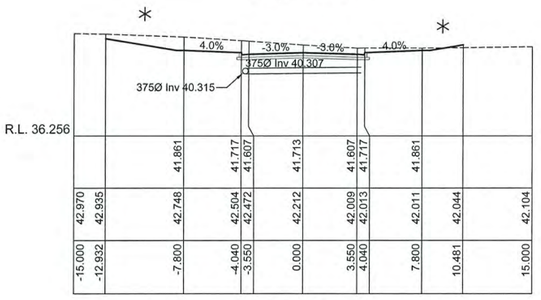

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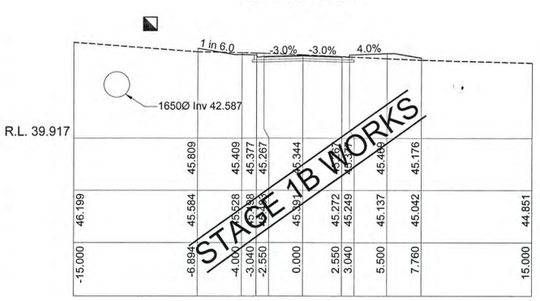

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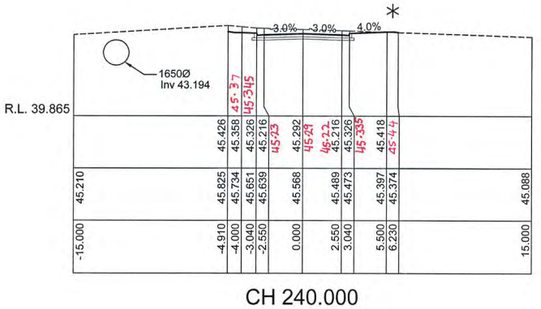

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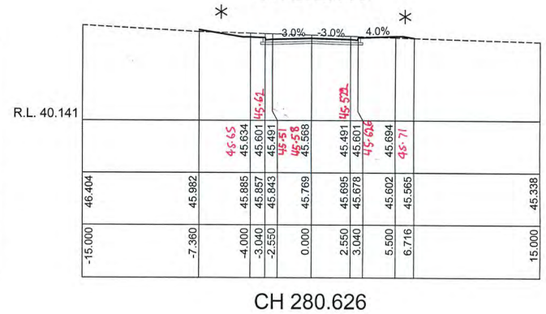

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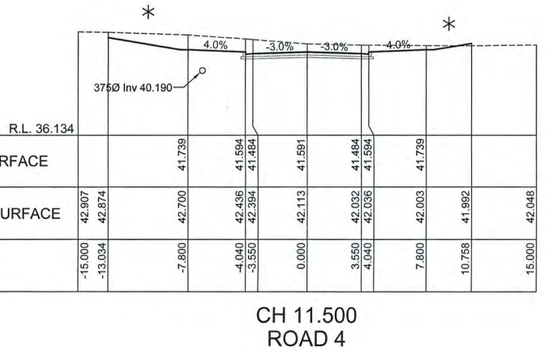
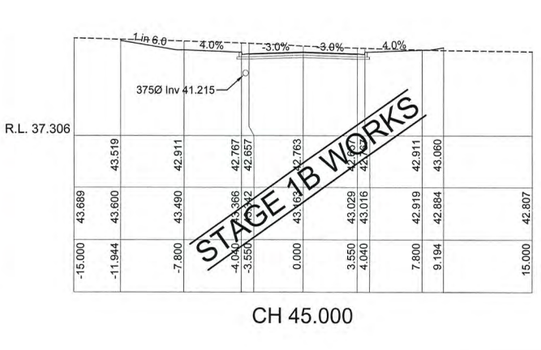


CH 11.500
ROAD 4



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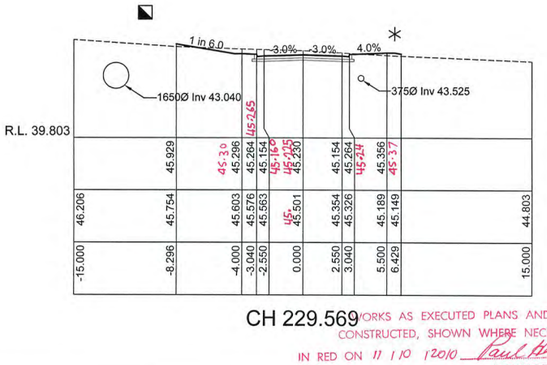
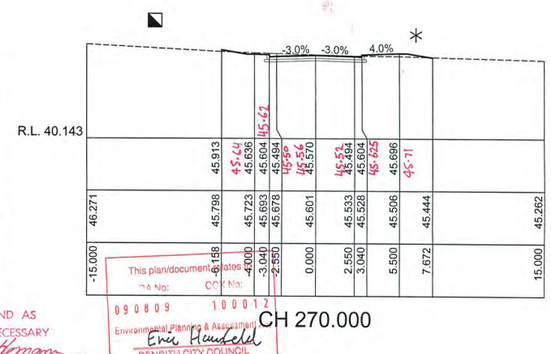


CH 229.569



CH 270.000

1:200 (AT A1)

4 2 0 4 8 12 16 20

METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: CC/ No: 090809 100012 Environmental Planning & Assessment Eric Hendeld PENRITH CITY COUNCIL

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SIGNED S. Anderson DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:1000

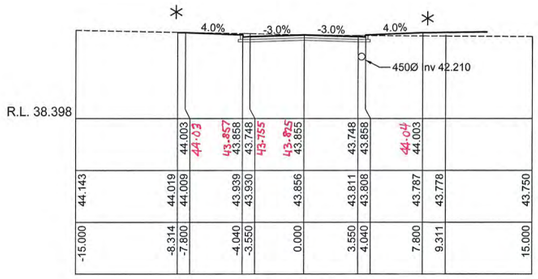
JORDAN SPRINGS
STAGE 1A
ROAD No.4 CROSS SECTIONS

PLAN No. 8634CC13 D
FILE No. 8634CC13
SHEET 13 OF 51 SHEETS

Plotted: 7 May 2010 10:52:30 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC13.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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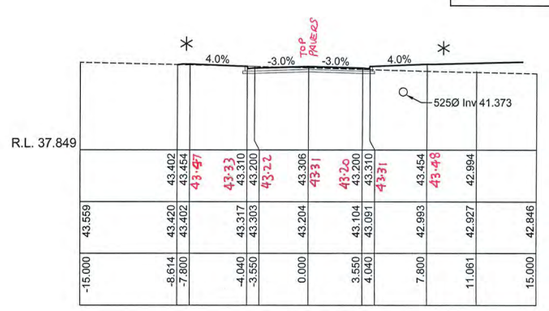
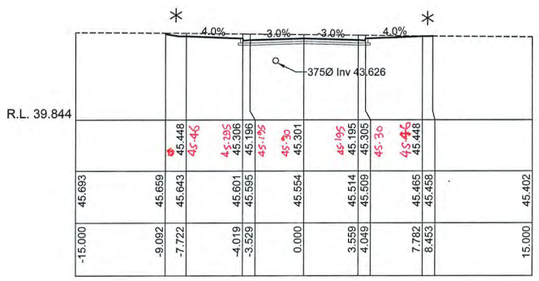


CH 396.042



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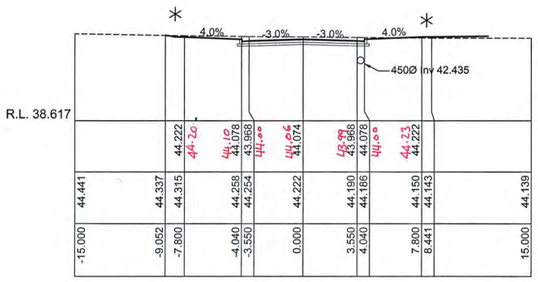

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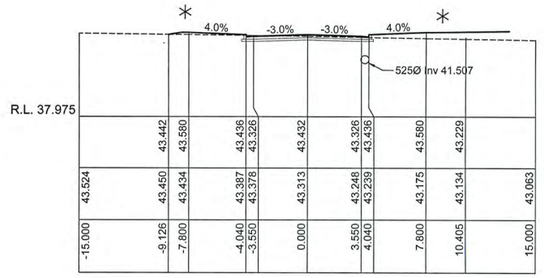

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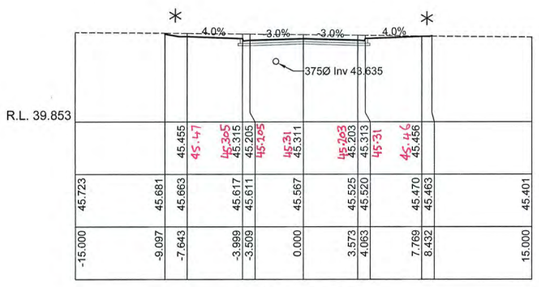
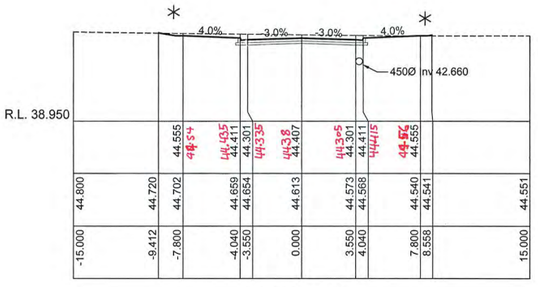


CH 299.590



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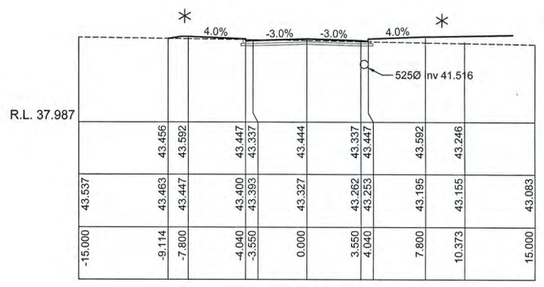

CH 389.389

R.L. 40.097										
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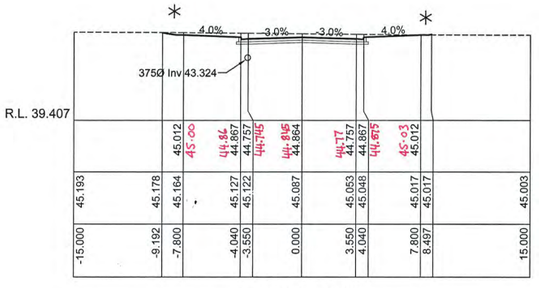
OFFSETS	-15.000	-9.227	-4.909	-3.330	-2.840	0.000	2.997	3.487	6.234	7.208	15.000

CH 285.000
ROAD 4



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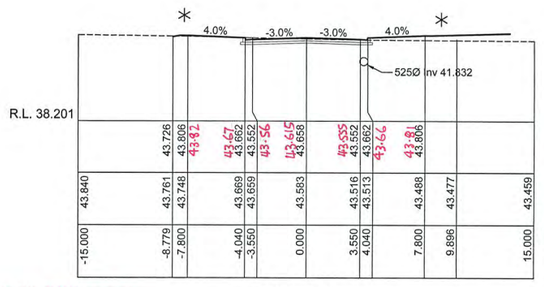

CH 375.000

This plan/document relates to
DA No: CCX No:
090809 100012
Environmental Planning & Assessment Act
Eric Hendfeld
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Bowman REGISTERED SURVEYOR

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M. DRAWN N.W. CHECKED K.N.
DATUM: AHD ORIGIN: SCALES: 1:500

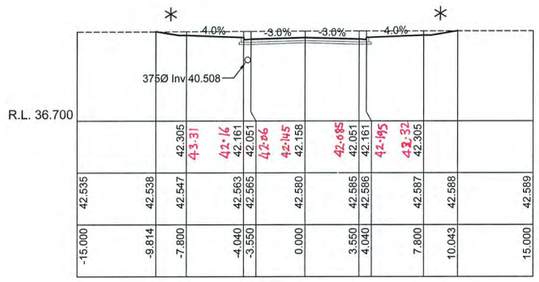
JORDAN SPRINGS
STAGE 1A
ROAD No.4 CROSS SECTIONS

PLAN No. 8634CC14 D
FILE No. 8634CC14
SHEET 14 OF 51 SHEETS

Plotted: 7 May 2010 10:52:44 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC14.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



	42.535	42.538	42.547		42.563	42.565	42.580		42.585	42.586	42.587	42.588	42.589
			42.305	43.31	42.161	42.051	42.158	42.085	42.051	42.161	42.305		
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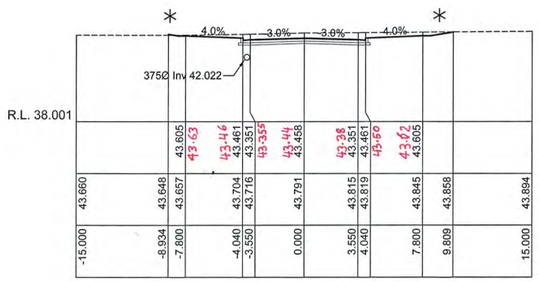
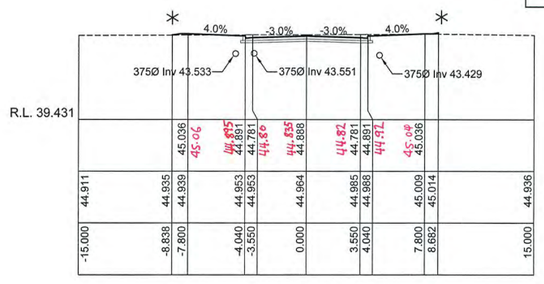
CH 15.000



	43.660	43.648	43.657		43.704	43.716	43.791		43.815	43.819	43.845	43.858	43.894
			43.605	43.63	43.461	43.351	43.355	43.44	43.458	43.351	43.605		
-15.000	-8.934	-7.800		-4.040	-3.550	0.000		3.550	4.040		7.800	9.809	15.000

CH 75.000



	44.911	44.935	44.939		44.963	44.963	44.964		44.985	44.988	45.009	45.014	44.936
			45.036	45.06	44.891	44.781	44.888	44.82	44.781	44.891	45.038		
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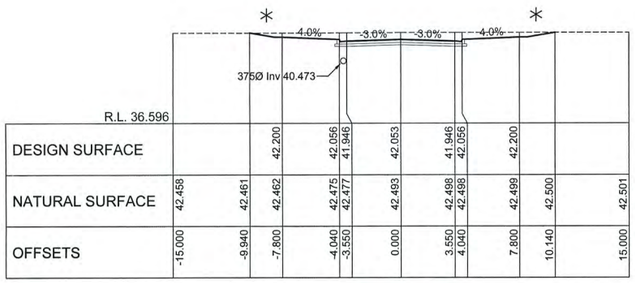
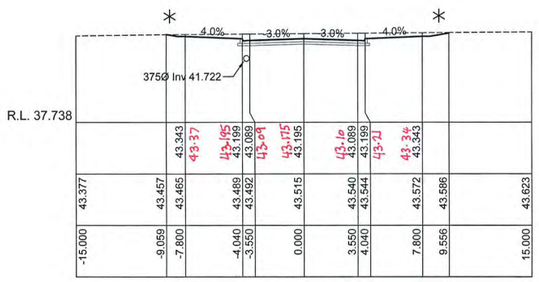
CH 134.327



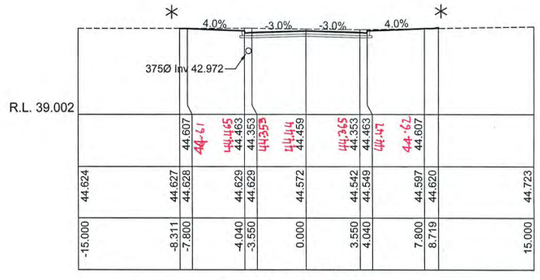
DESIGN SURFACE			42.200		42.056	41.946	42.053		41.946	42.056	42.200		
NATURAL SURFACE	42.458	42.461	42.462		42.475	42.477	42.493		42.498	42.498	42.499	42.500	42.501
OFFSETS	-15.000	-9.940	-7.800		-4.040	-3.550	0.000		3.550	4.040	7.800	10.140	15.000

CH 11.501
ROAD 6



	43.377	43.457	43.465		43.489	43.492	43.515		43.540	43.544	43.572	43.586	43.623
			43.343	43.37	43.199	43.089	43.09	43.175	43.195	43.089	43.343		
-15.000	-9.059	-7.800		-4.040	-3.550	0.000		3.550	4.040		7.800	9.556	15.000

CH 60.000



	44.624	44.627	44.628		44.629	44.629	44.572		44.542	44.549	44.597	44.620	44.723
			44.607	44.61	44.463	44.353	44.459	44.345	44.353	44.463	44.607		
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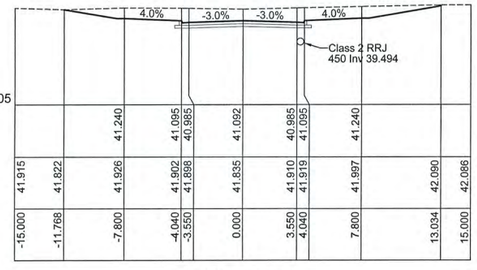
CH 120.000



	41.915	41.822	41.926		41.902	41.898	41.835		41.910	41.919	41.997	42.090	42.086
			41.240		41.095	40.985	41.092	40.985	41.095	41.240			
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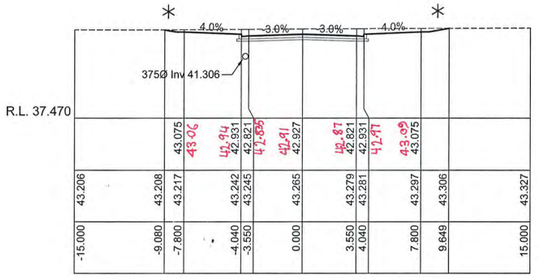
CH 16.000



	43.206	43.208	43.217		43.242	43.245	43.265		43.279	43.281	43.297	43.306	43.327
			43.075	43.06	42.931	42.821	42.927	42.821	42.931	42.971	43.075		
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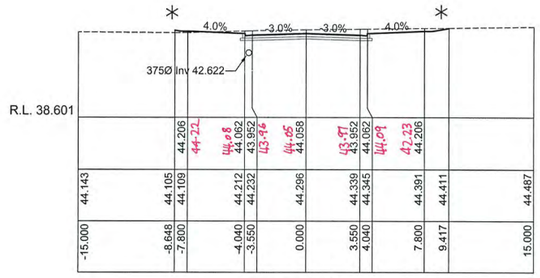
CH 45.000



	44.143	44.105	44.109		44.212	44.232	44.296		44.339	44.345	44.391	44.411	44.487
			44.206	44.22	44.062	43.962	44.058	43.962	44.062	44.091	44.206		
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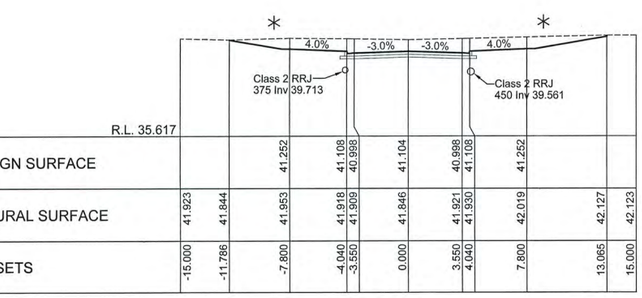
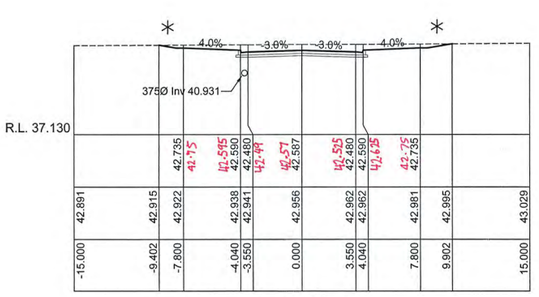
CH 105.000



DESIGN SURFACE			41.252		41.108	40.998	41.104		40.998	41.108	41.252		
NATURAL SURFACE	41.923	41.844	41.953		41.918	41.909	41.846		41.921	41.930	42.019	42.127	42.123
OFFSETS	-15.000	-11.786	-7.800		-4.040	-3.550	0.000		3.550	4.040	7.800	13.065	15.000

CH 15.000
ROAD 5



	42.891	42.915	42.922		42.938	42.941	42.956		42.962	42.962	42.981	42.985	43.029
			42.735	42.75	42.590	42.480	42.49	42.37	42.587	42.590	42.735		
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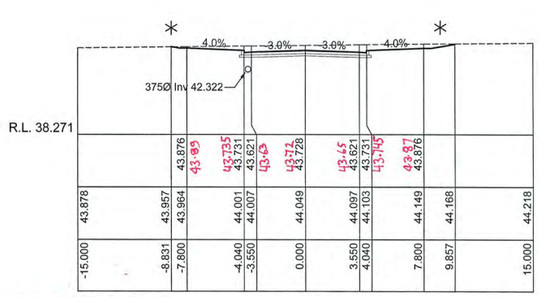
CH 30.000



	43.878	43.957	43.964		44.001	44.007	44.049		44.097	44.103	44.149	44.168	44.218
			43.876	43.85	43.731	43.621	43.728	43.65	43.731	43.745	43.876		
-15.000	-8.831	-7.800		-4.040	-3.550	0.000		3.550	4.040		7.800	9.857	15.000

CH 90.000

This plan/document relates to
DA No: 090809 CCX No: 100012
Environmental Planning and Assessment Act
Ervin Hawkesbury
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Homann REGISTERED SURVEYOR

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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SIGNED S. Anderson DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

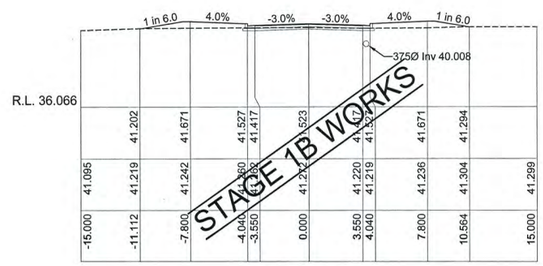
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1A
ROAD No.5 & 6 CROSS SECTIONS

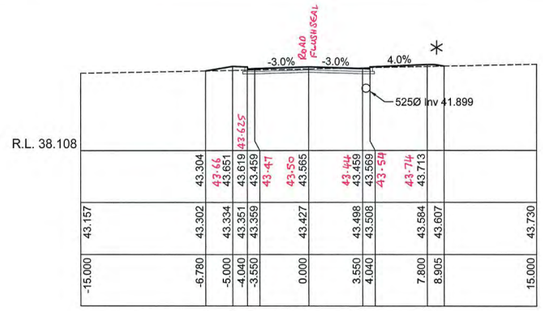
PLAN No. 8634CC15 D
FILE No. 8634CC15
SHEET 15 OF 51 SHEETS

Plotted: 7 May 2010 10:52:58 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC15.dwg

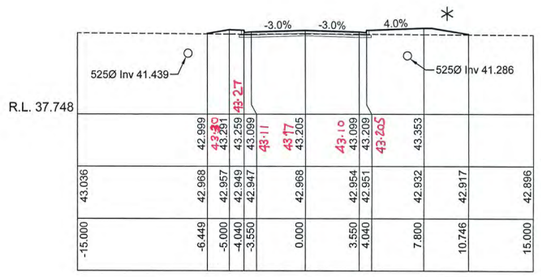
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



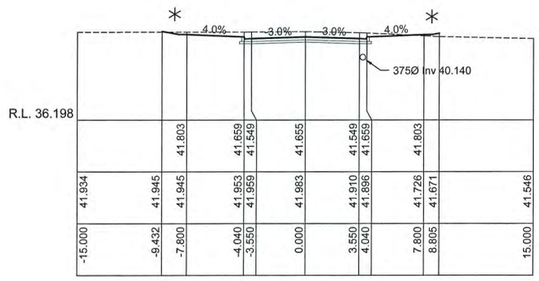
CH 30.000



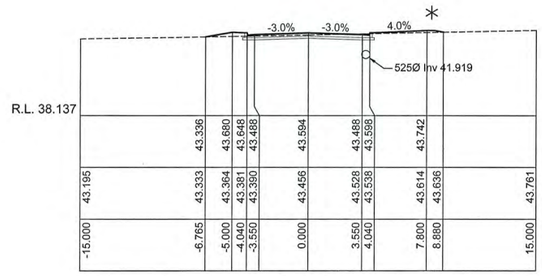
CH 390.000



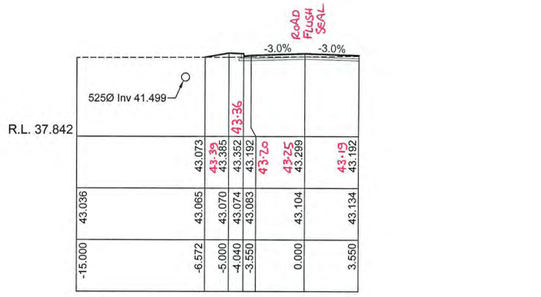
CH 413.998



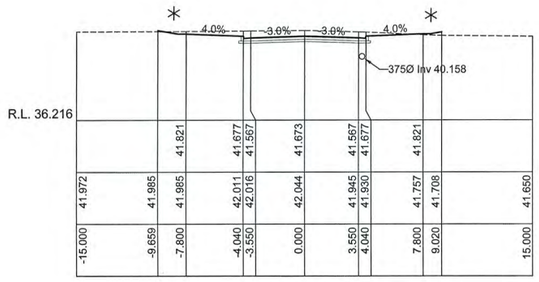
CH 16.800



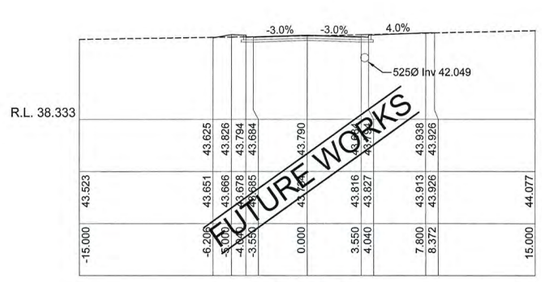
CH 388.040



CH 407.736



CH 15.000



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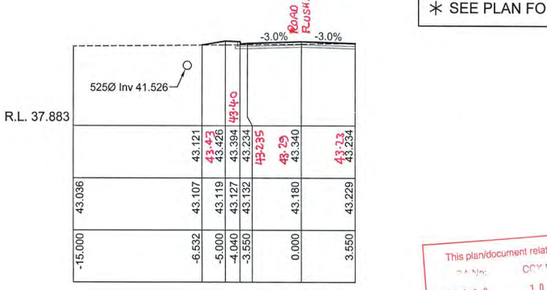
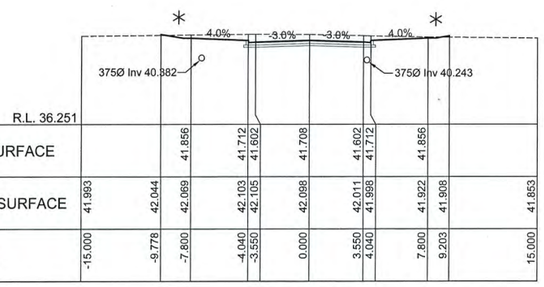
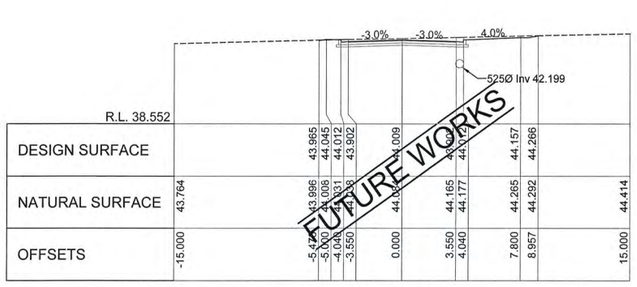


CH 405.000



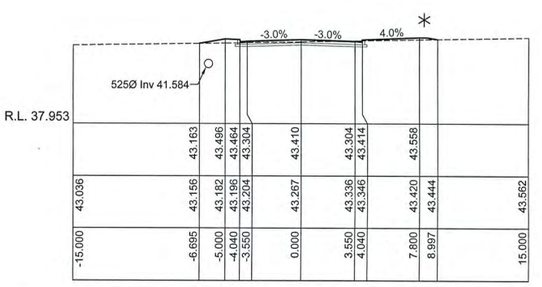
DESIGN SURFACE			41.856	41.712	41.708	41.602	41.712	41.856			
NATURAL SURFACE	41.993	42.044	42.069	42.103	42.098	42.098	42.011	41.998	41.922	41.908	41.853
OFFSETS	-15.000	-9.778	-7.800	-4.040	-3.550	0.000	3.550	4.040	7.800	9.203	15.000

CH 11.500
ROAD 7



DESIGN SURFACE			43.965	44.045	44.012	43.902	44.009	44.157	44.266		
NATURAL SURFACE	43.764		43.996	44.006	44.031	44.056	44.009	44.165	44.177	44.265	44.292	44.414
OFFSETS	-15.000		-5.447	-5.000	-4.040	-3.550	0.000	3.550	4.040	7.800	8.957	15.000

CH 360.000
ROAD 8



CH 400.328

* SEE PLAN FOR LOT GRADING

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/1/10 / 2010
Paul Homann
REGISTERED SURVEYOR

This plan/document relates to DA No: CC No:
090809 100012
Environmental Planning & Assessment Act
Ewen Hendekl
PENRITH CITY COUNCIL

1:200 (AT A1)
4 2 0 4 8 12 16 20
METRES

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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

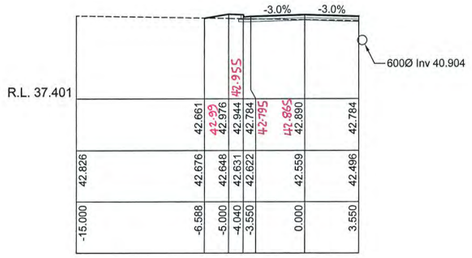
JORDAN SPRINGS
STAGE 1A
ROAD No.7 & 8 CROSS SECTIONS

PLAN No. 8634CC16 D
FILE No. 8634CC16
SHEET 16 OF 51 SHEETS

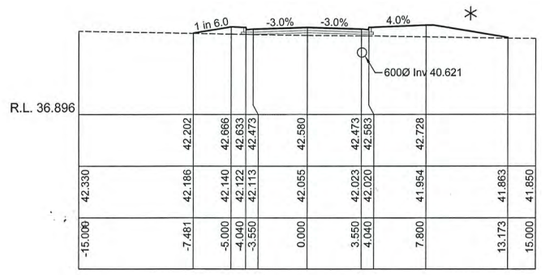
Plotted: 7 May 2010 10:53:14 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC16.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

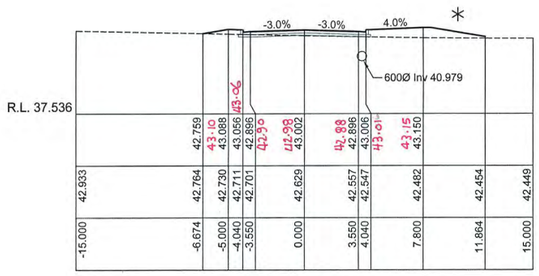
* SEE PLAN FOR LOT GRADING



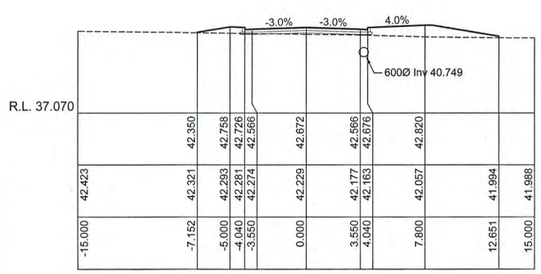
CH 435.000



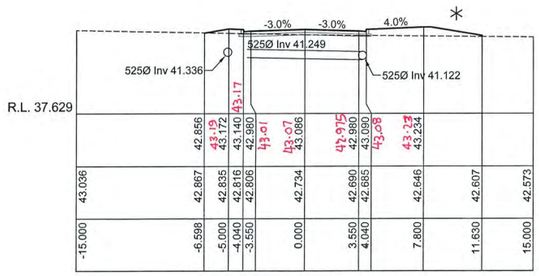
CH 457.860



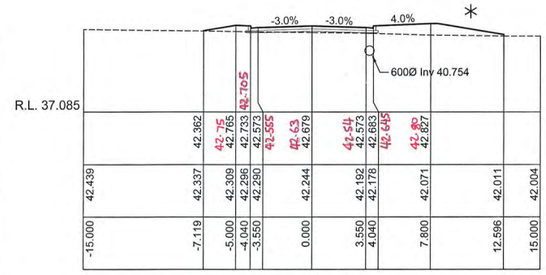
CH 427.512



CH 450.514



CH 421.904



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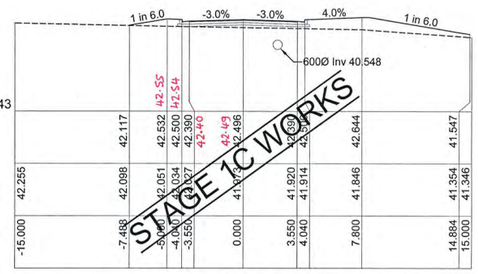

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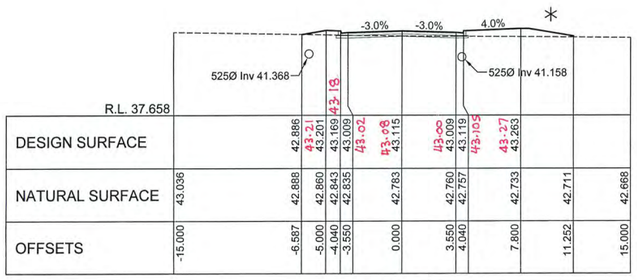

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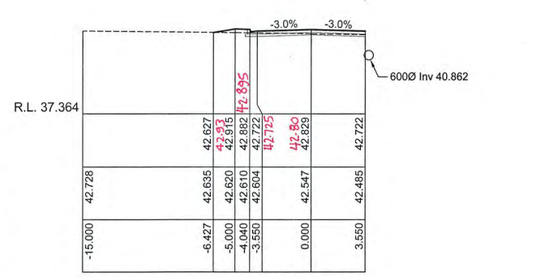
ROAD 8



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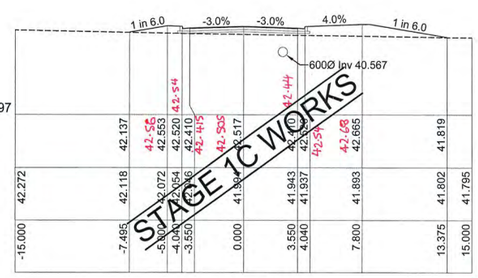

CH 463.197

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Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

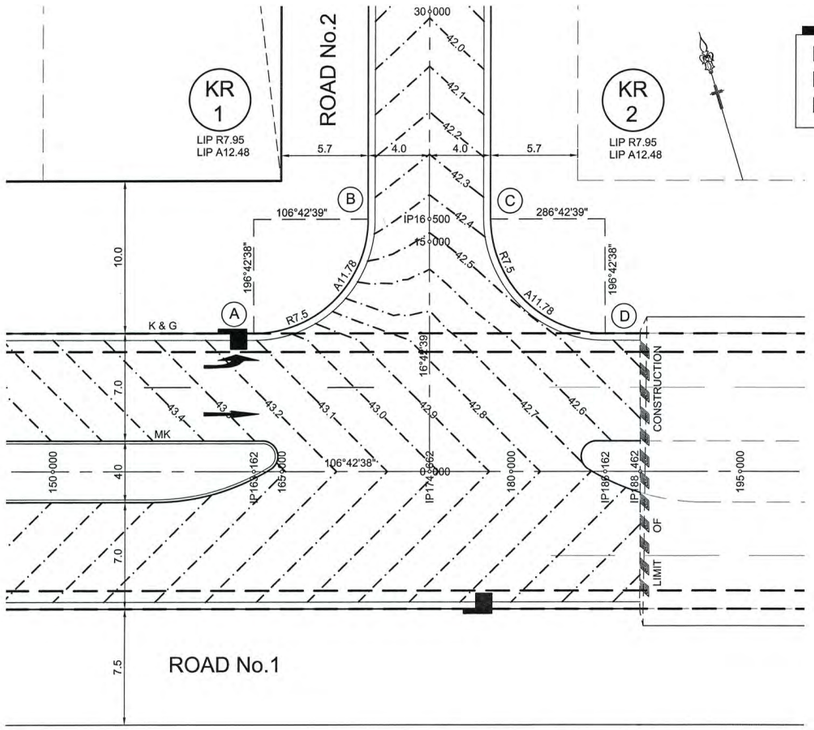
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1A
ROAD No.8 CROSS SECTIONS

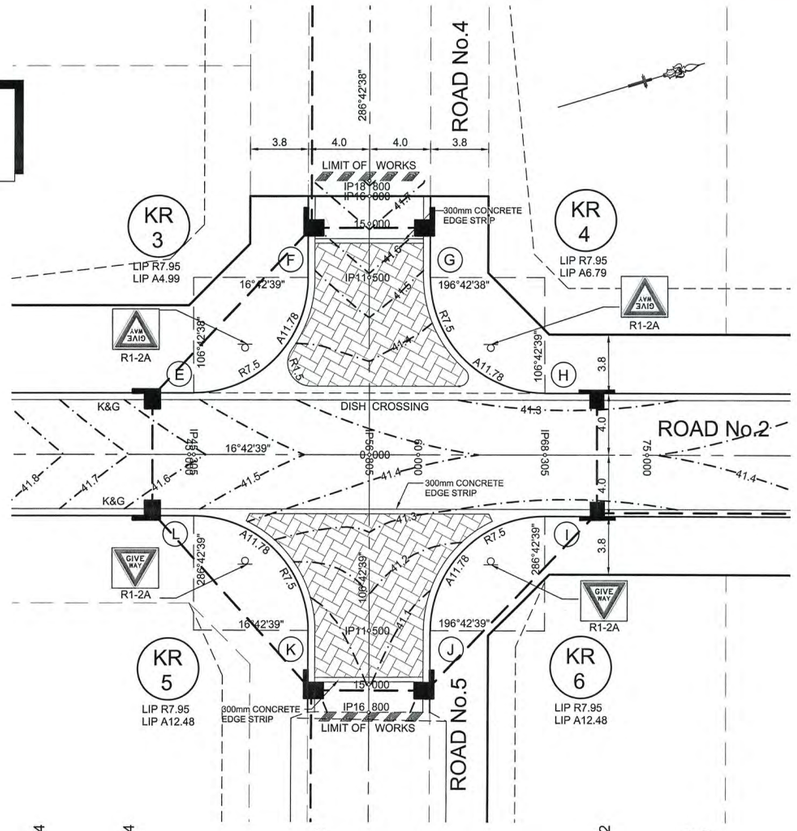
PLAN No. 8634CC17 D
FILE No. 8634CC17
SHEET 17 OF 51 SHEETS

Plotted: 7 May 2010 10:53:27 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC17.dwg

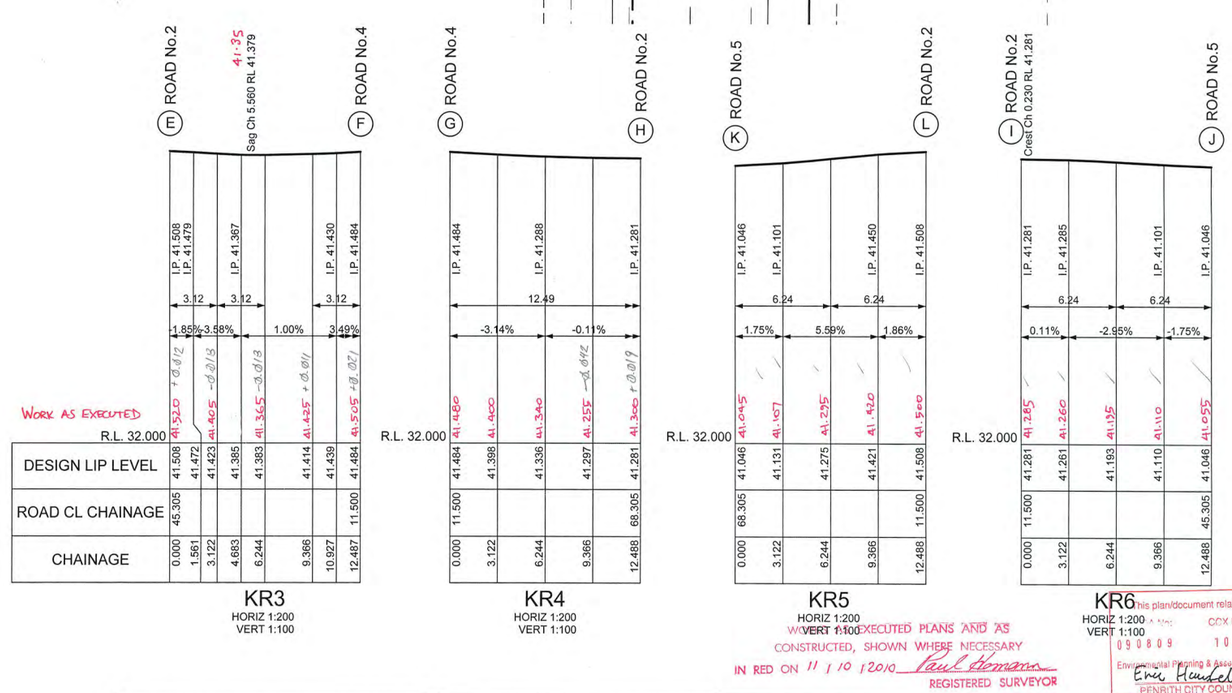
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER







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Environmental Planning & Assessment Act
Eric Hendeles
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DRAWN N.W.
CHECKED K.N.

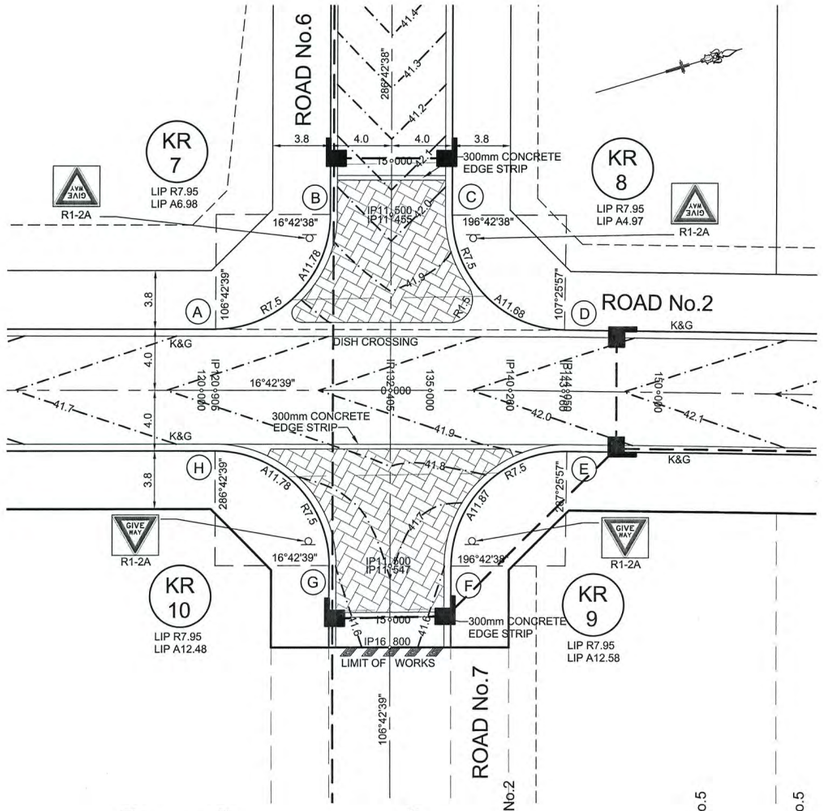
DATUM: AHD ORIGIN:
SCALES:
L.S. 1:200 H
1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1A
KERB RETURNS No.1, 2, 3, 4, 5 & 6

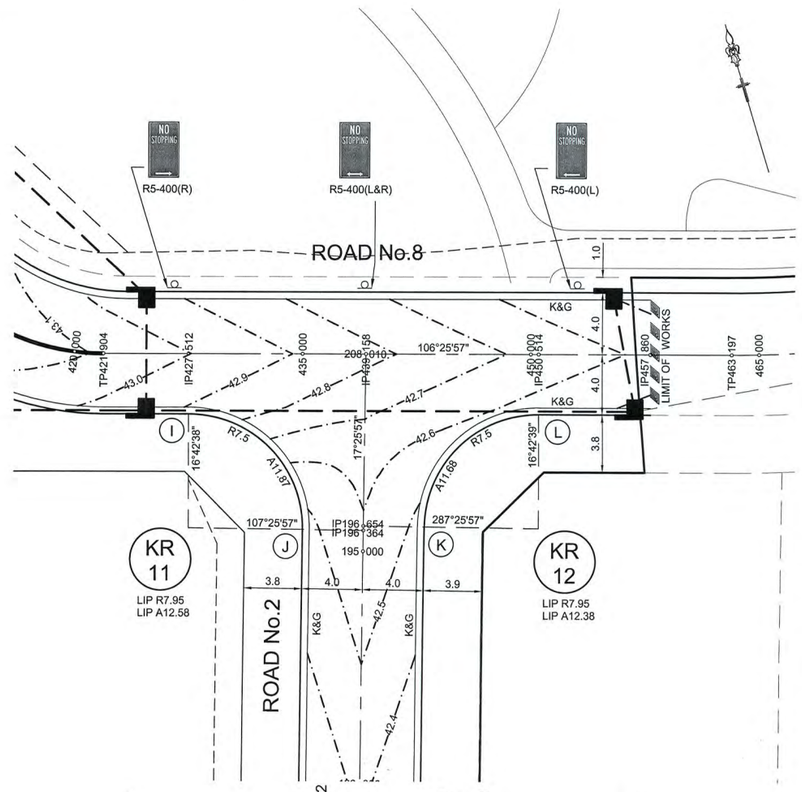
PLAN No. 8634CC18 D
FILE No. 8634CC18
SHEET 18 OF 51 SHEETS

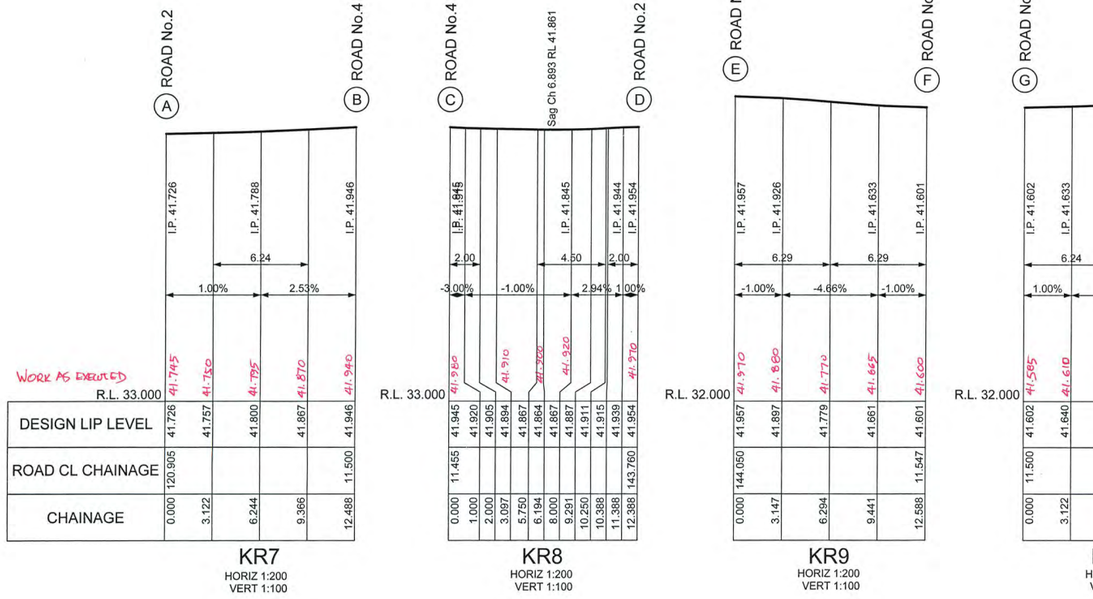
Plotted: 7 May 2010 10:54:00 AM File Name: J:\8634\DCC - Engineering Construction Plans\Stage - 1A\8634CC18.dwg

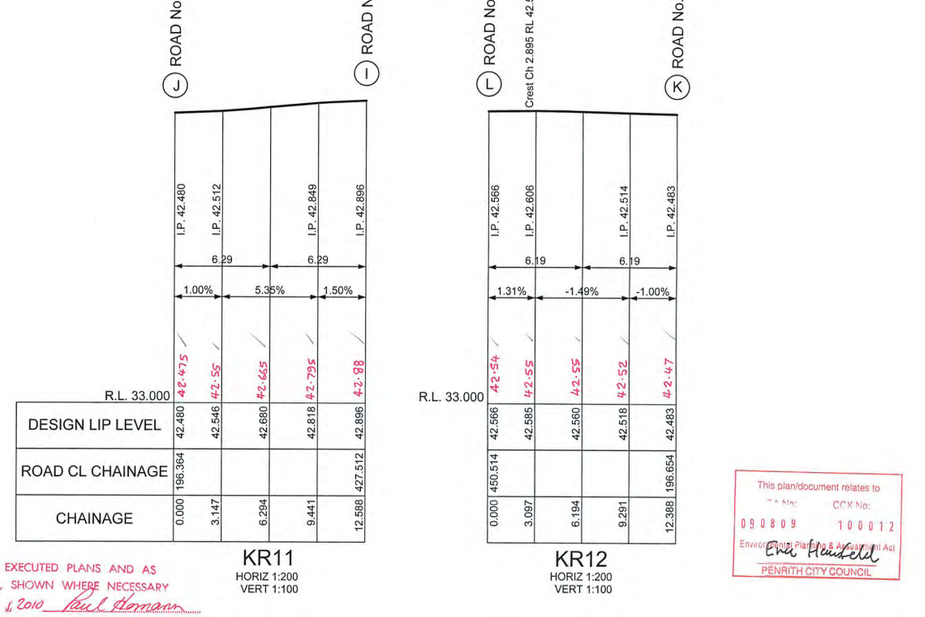
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER







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REGISTERED SURVEYOR

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PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1A
KERB RETURNS No.7, 8, 9, 10, 11 & 12

PLAN No. 8634CC19 D
FILE No. 8634CC19
SHEET 19 OF 51 SHEETS

Plotted: 7 May 2010 10:54:34 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC19.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

NOTE
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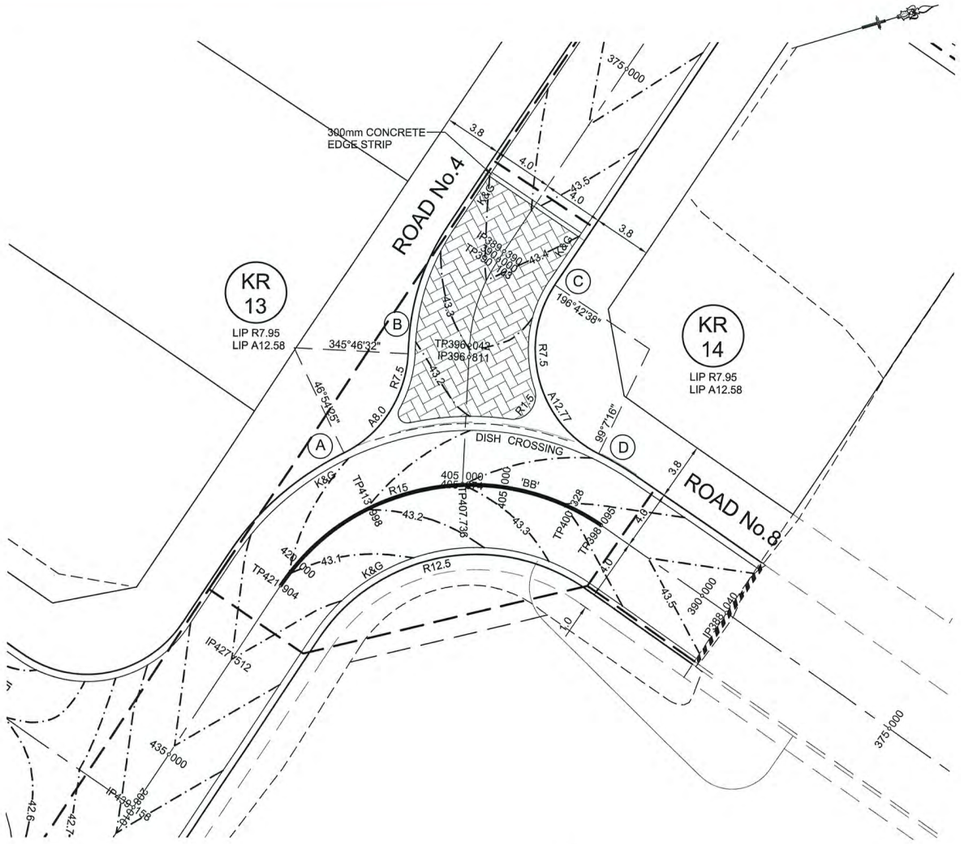
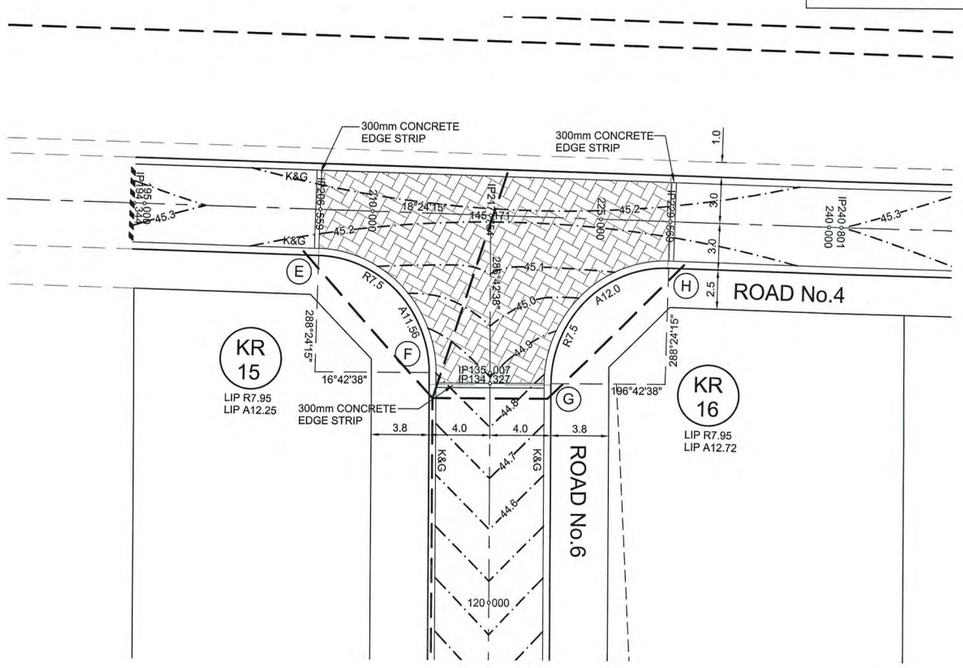
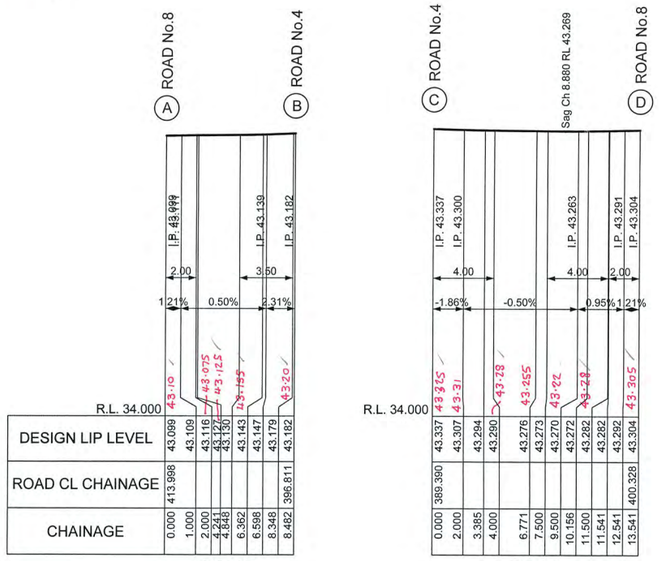
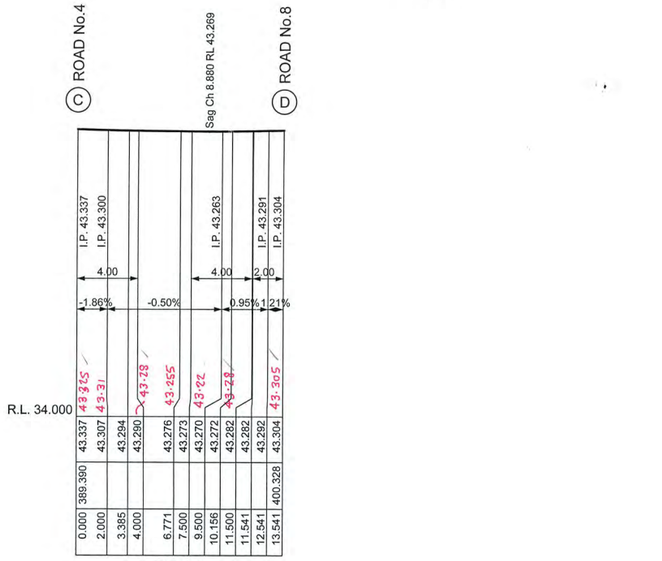
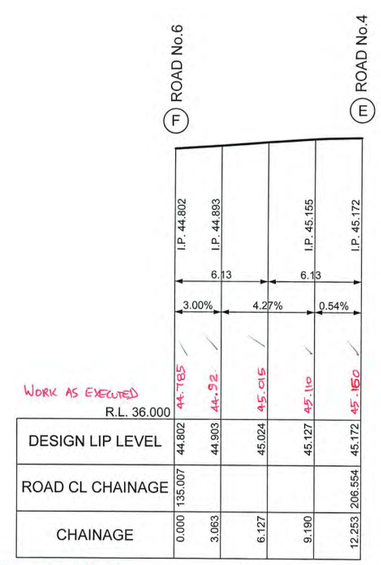
LIP OF GUTTER

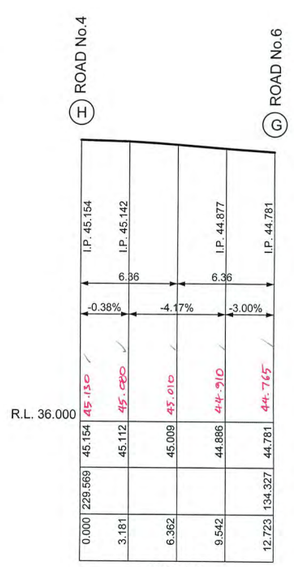












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Paul Hannan
REGISTERED SURVEYOR

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090809 100017
Environmental Planning
Eric Hemfield
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DRAWN N.W.
CHECKED K.N.

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SCALES:
L.S. 1:200 H
1:100 V
(A1)

JORDAN SPRINGS
STAGE 1A
KERB RETURNS No.13, 14, 15 & 16

PLAN No. 8634CC20 D
FILE No. 8634CC20
SHEET 20 OF 51 SHEETS

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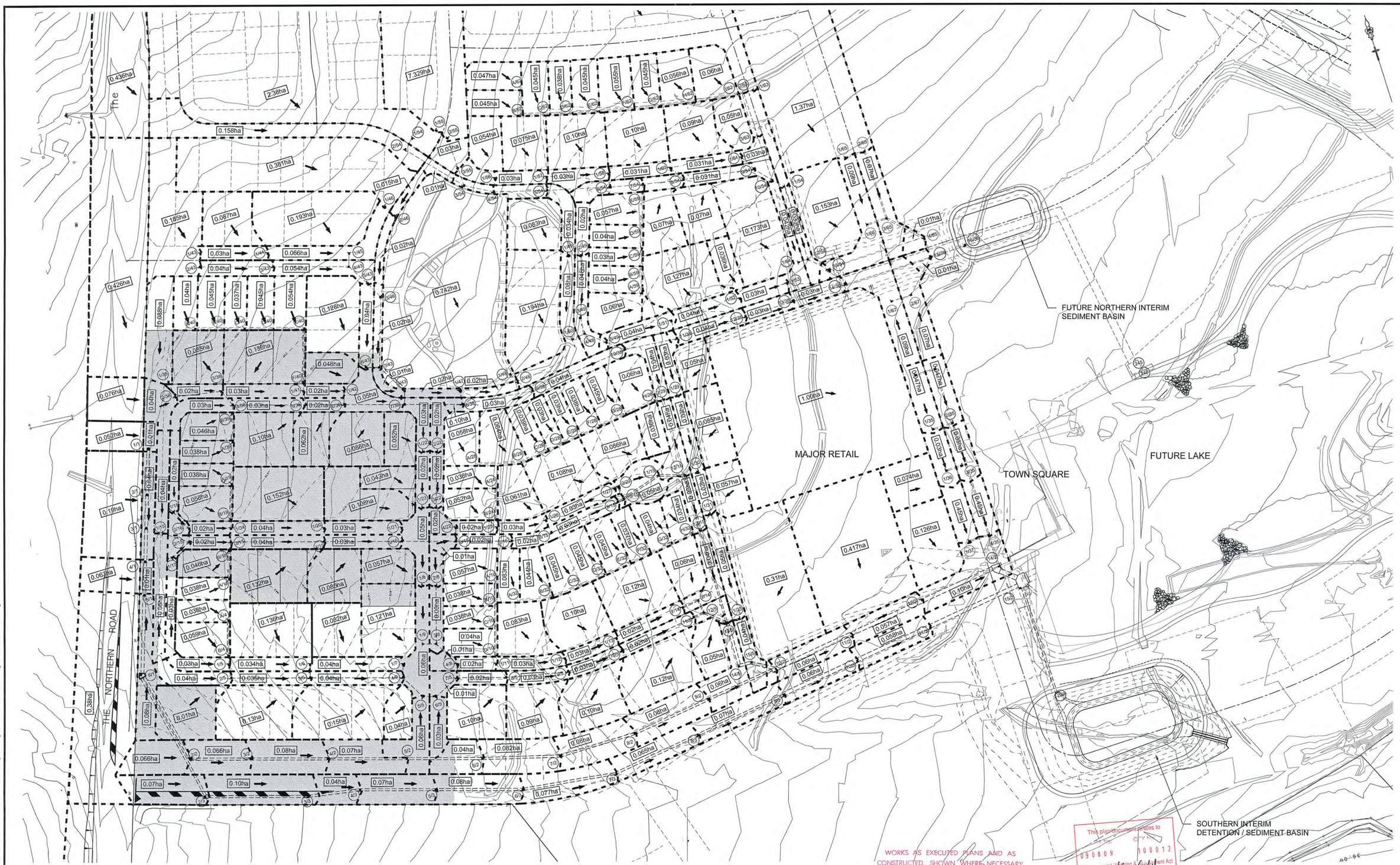
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100

METRES

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SCALES: 1:1000

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JORDAN SPRINGS
STAGE 1A
CATCHMENT PLAN

PLAN No. 8634CC21 D
FILE No. 8634CC21
SHEET 21 OF 51 SHEETS

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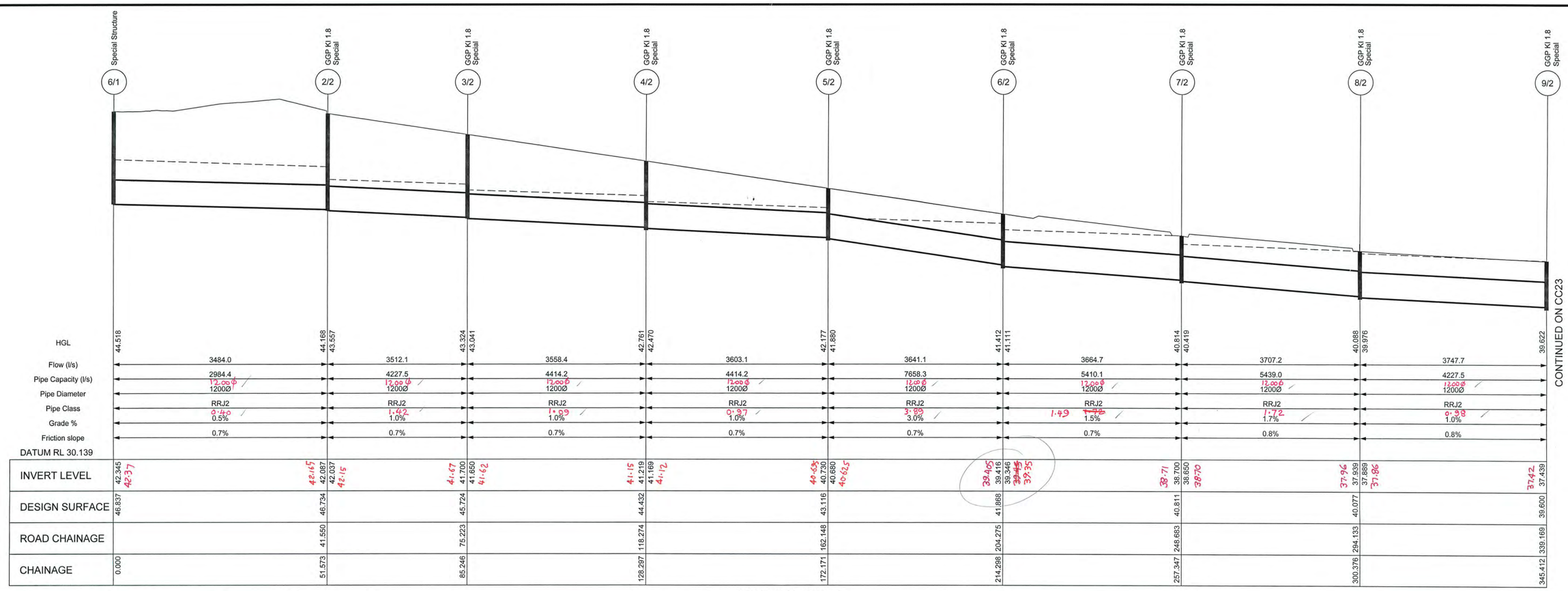
Version: 1, Version Date: 13/07/2018



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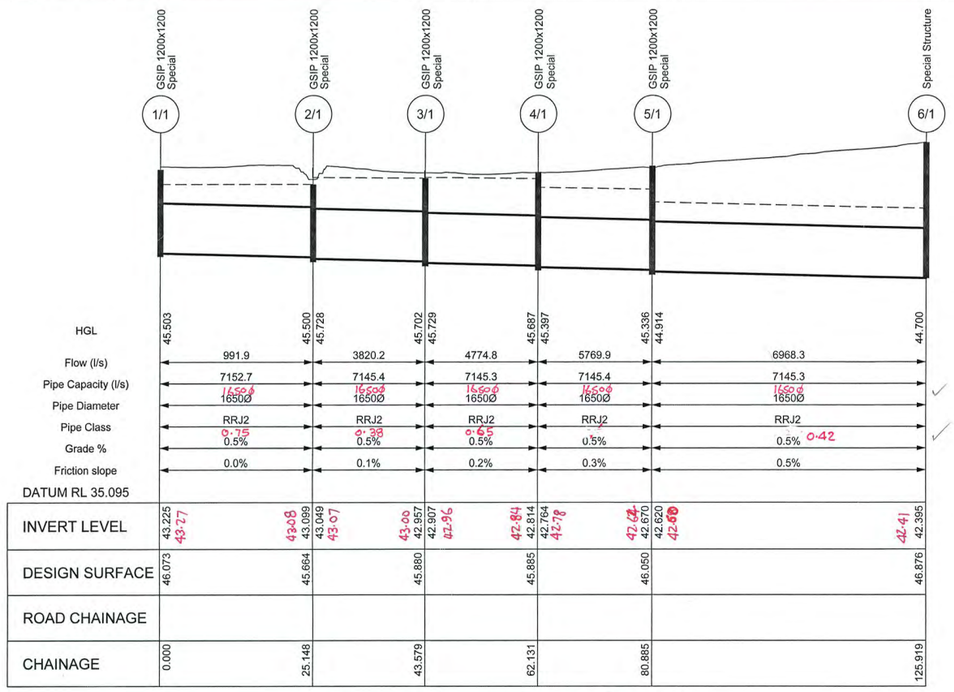

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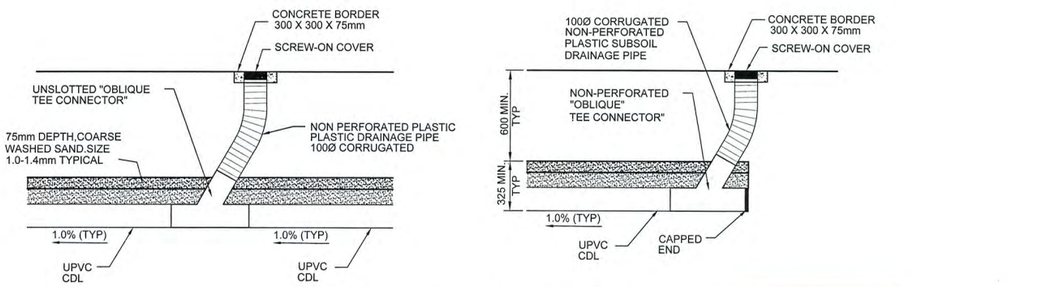

CLEANING EYE/SUBSOIL DETAIL

SCALE 1:20

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IN RED ON 11/10/2010 Paul Homann
REGISTERED SURVEYOR

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Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
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1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1A
DRAINAGE LONGITUDINAL SECTIONS
LINE No.1 & 2

PLAN No. 8634CC22 D
FILE No. 8634CC22
SHEET 22 OF 51 SHEETS

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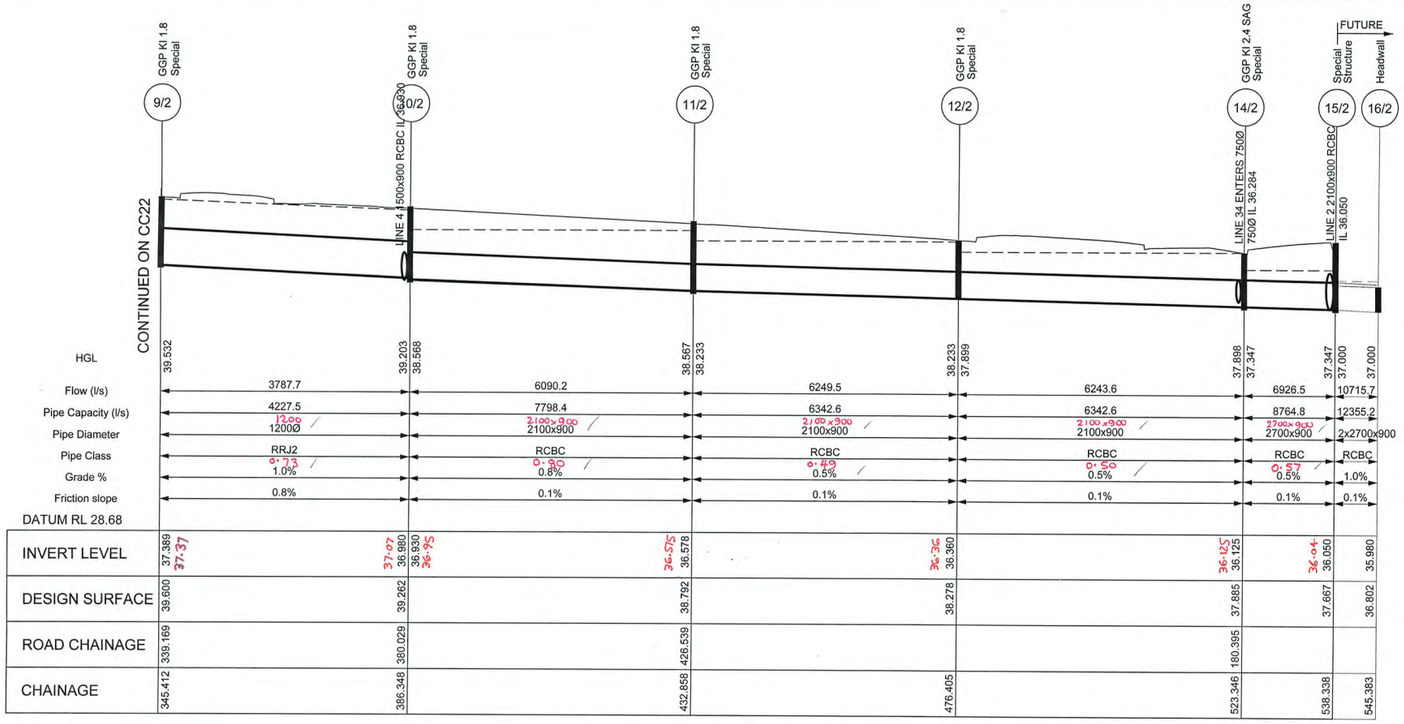
Version: 1, Version Date: 13/07/2018



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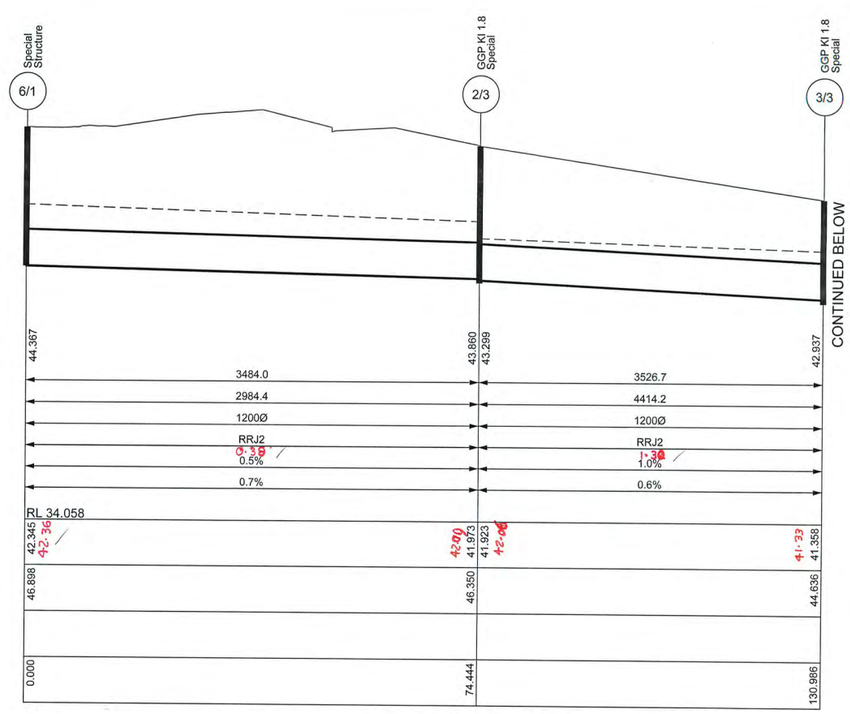

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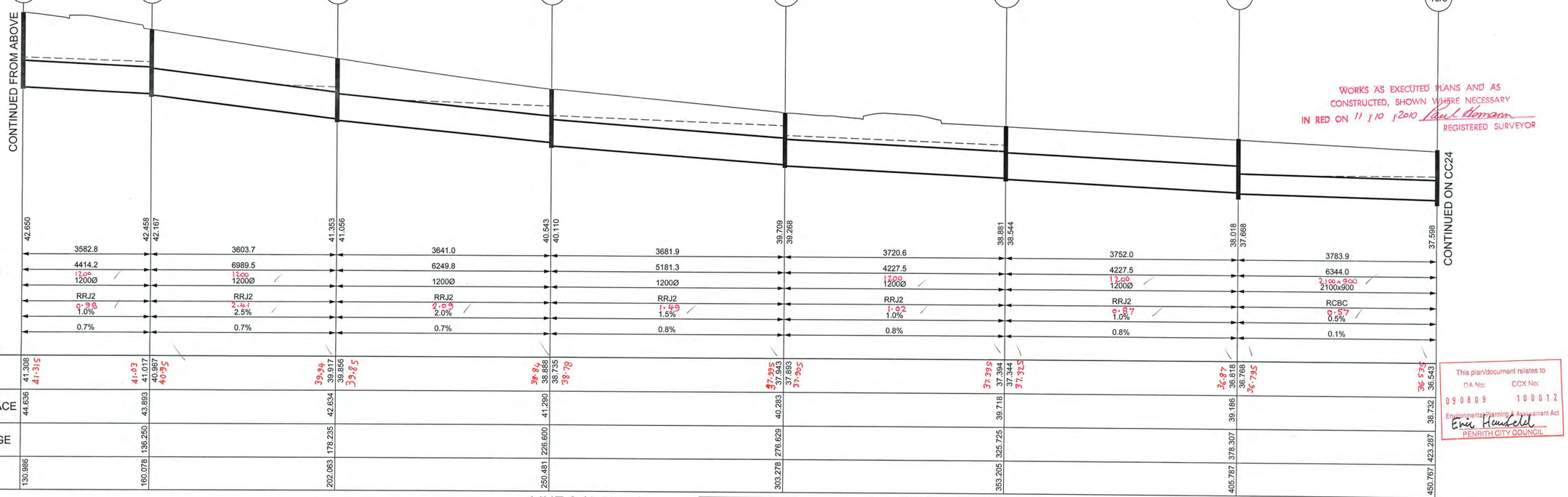

LINE 3 (1:100yr)

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Environmental Planning & Assessment Act
Eric Hendekk
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

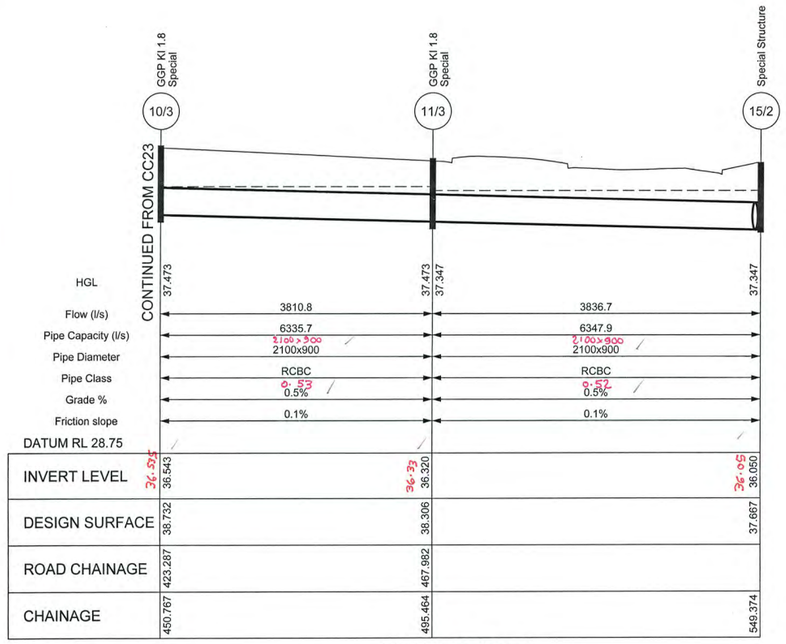
DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:500 H 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1A
DRAINAGE LONGITUDINAL SECTIONS
LINE No.2 & 3

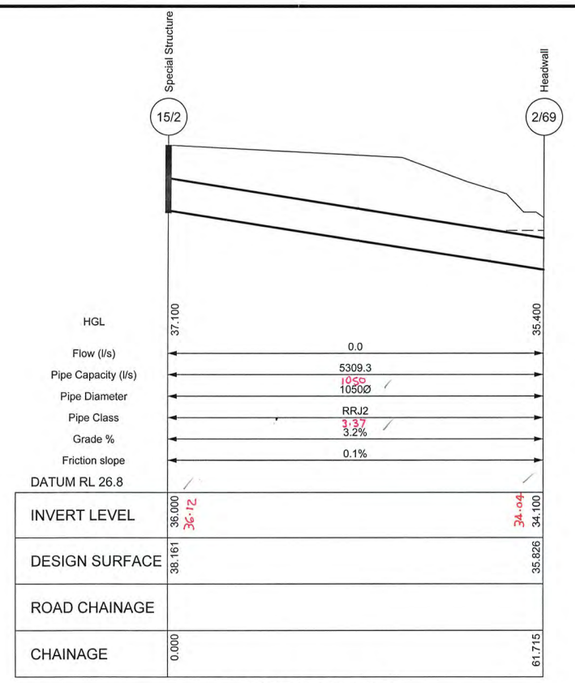
PLAN No. 8634CC23 D
FILE No. 8634CC23
SHEET 23 OF 51 SHEETS

Plotted: 7 May 2010 10:56:02 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC23.dwg

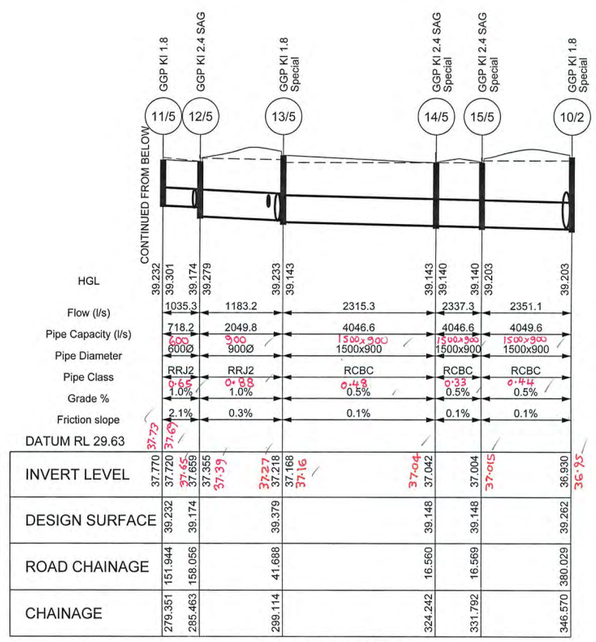
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



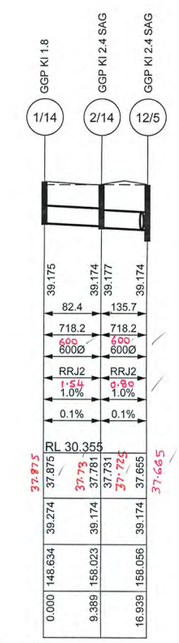
LINE 3 (1:100yr)



LINE 69 (1:10yr)



LINE 5 (1:100yr)



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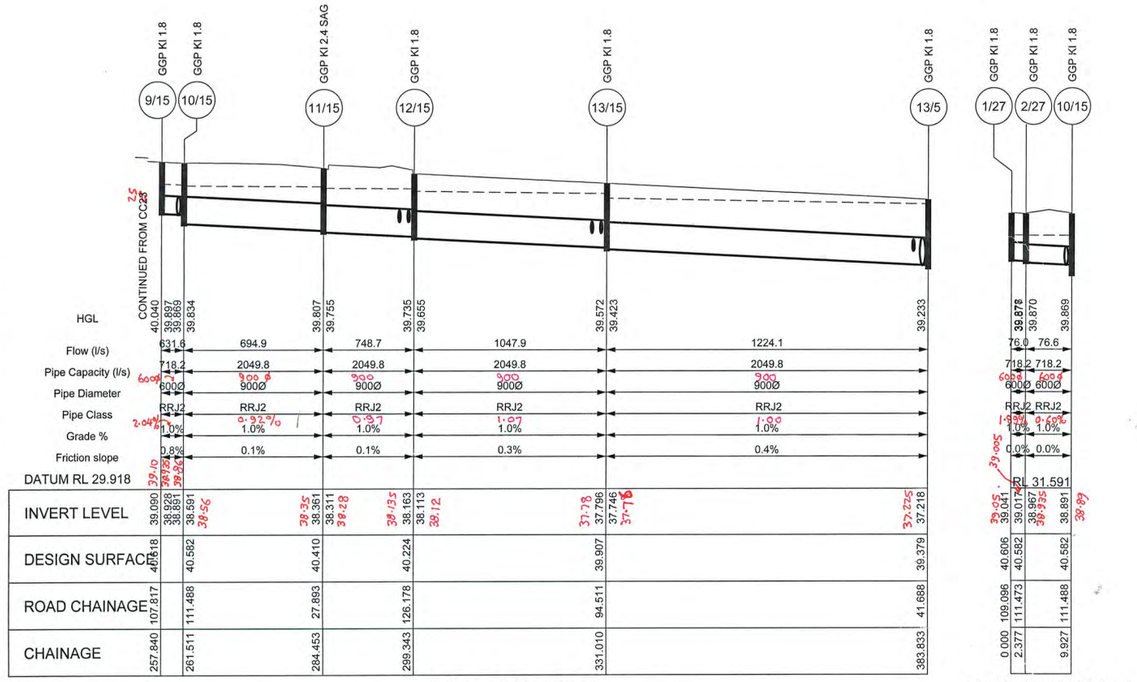
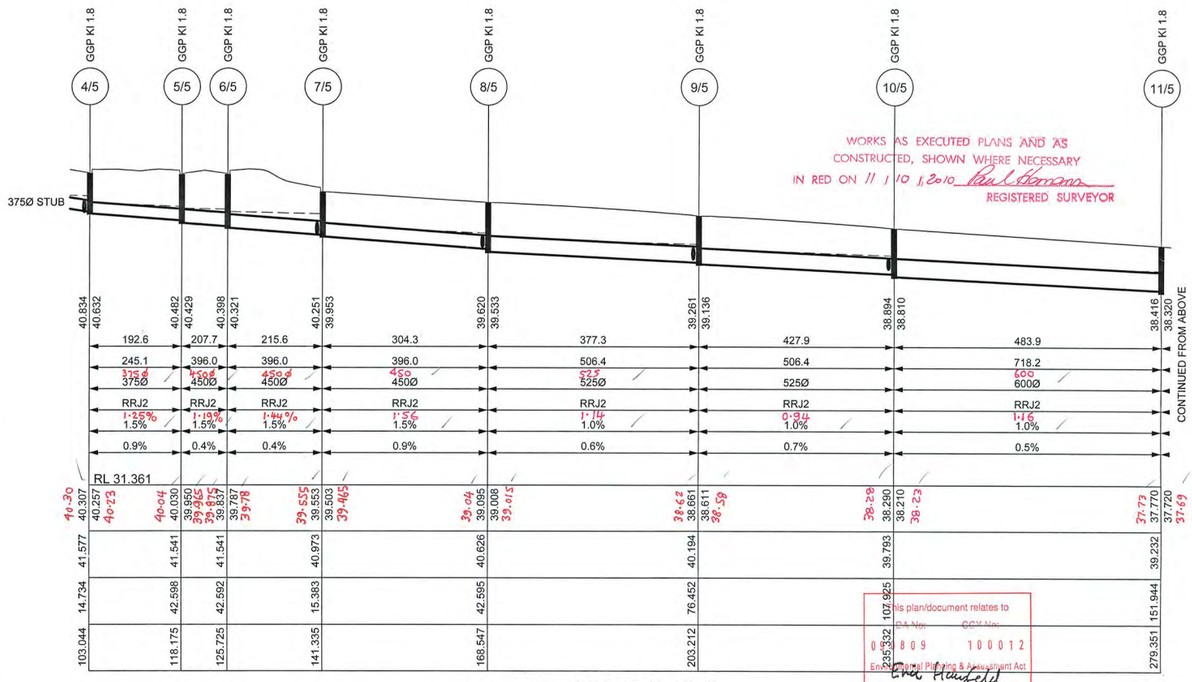


LINE 15 (1:100yr)

LINE 27 (1:100yr)



LINE 5 (1:10yr)

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 1/10/2010
REGISTERED SURVEYOR

This plan/document relates to DA No: CCV No: 08 09 10 00 12
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
(AT A1)

CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

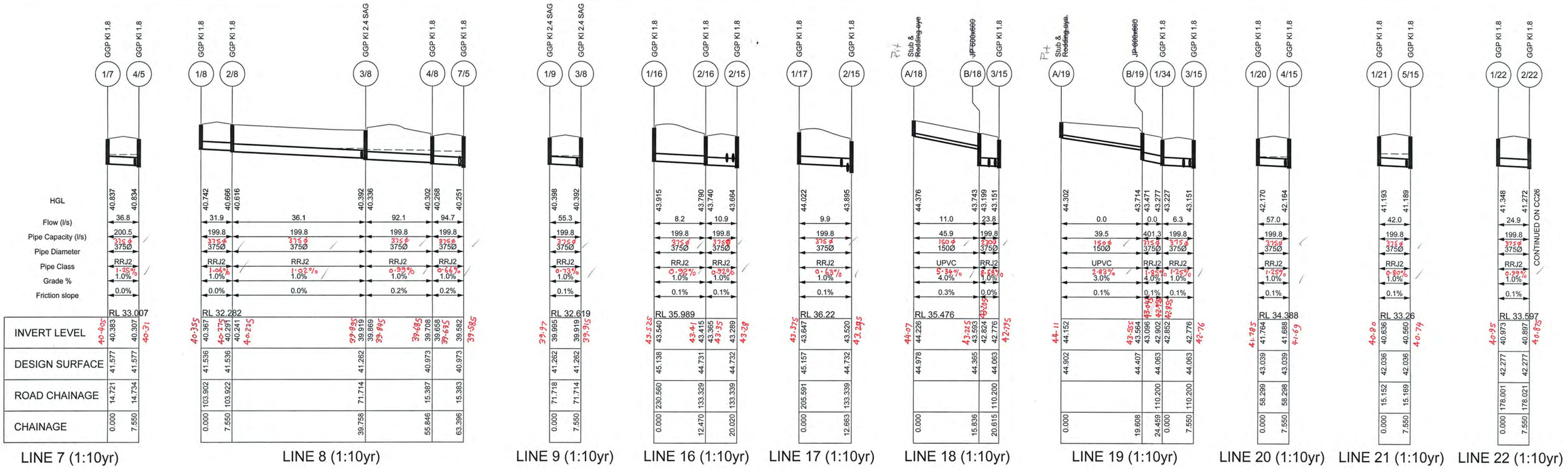
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

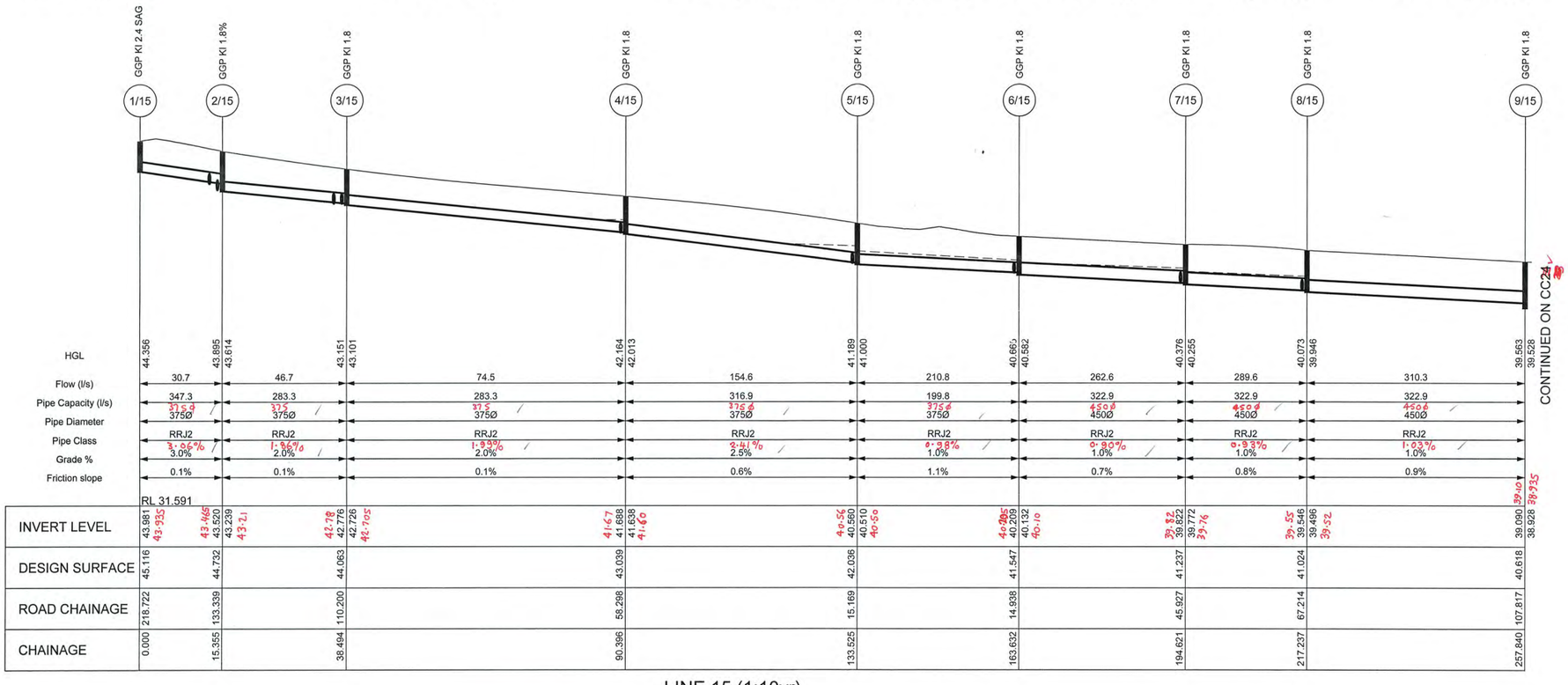
JORDAN SPRINGS
STAGE 1A
DRAINAGE LONGITUDINAL SECTIONS
LINE No.3, 5, 14, 15, 27 & 69

PLAN No. 8634CC24 D
FILE No. 8634CC24
SHEET 24 OF 51 SHEETS

Plotted: 7 May 2010 10:56:15 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC24.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018





1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Thomann REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CCX No: 100012 Environmental Planning & Assessment Act. Kate Hendfield PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
F			
E			
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DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
(AT A1)

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

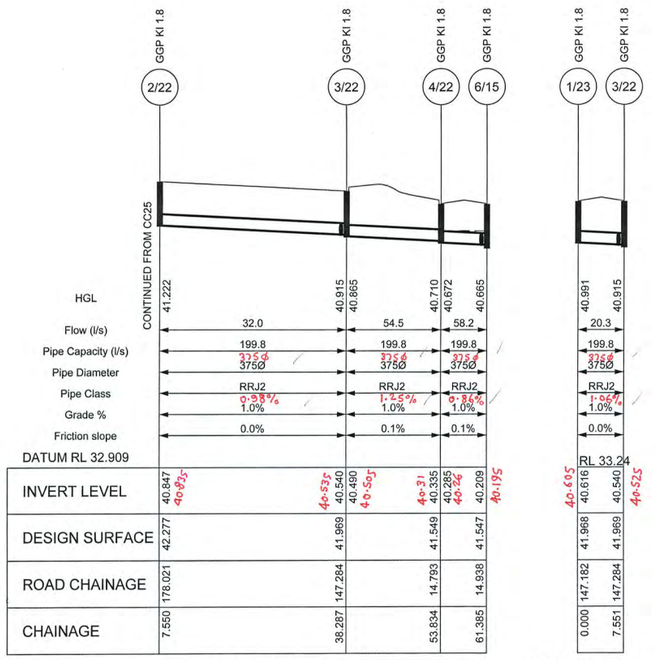
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
DRAINAGE LONGITUDINAL SECTIONS
LINE No.7, 8, 9, 15, 16, 17, 18, 19, 20, 21 & 22

PLAN No. 8634CC25 D
FILE No. 8634CC25
SHEET 25 OF 51 SHEETS

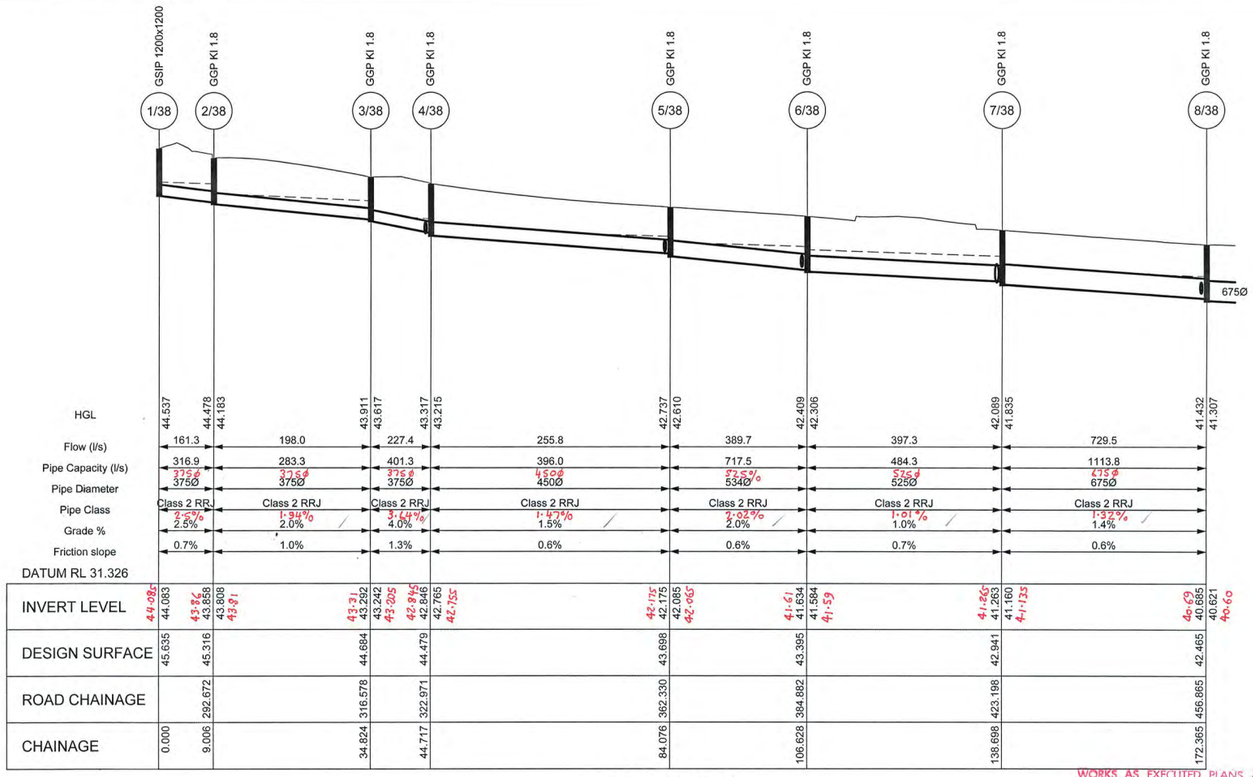
Plotted: 7 May 2010 10:56:28 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC25.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LINE 22 (1:10yr)

LINE 23 (1:10yr)



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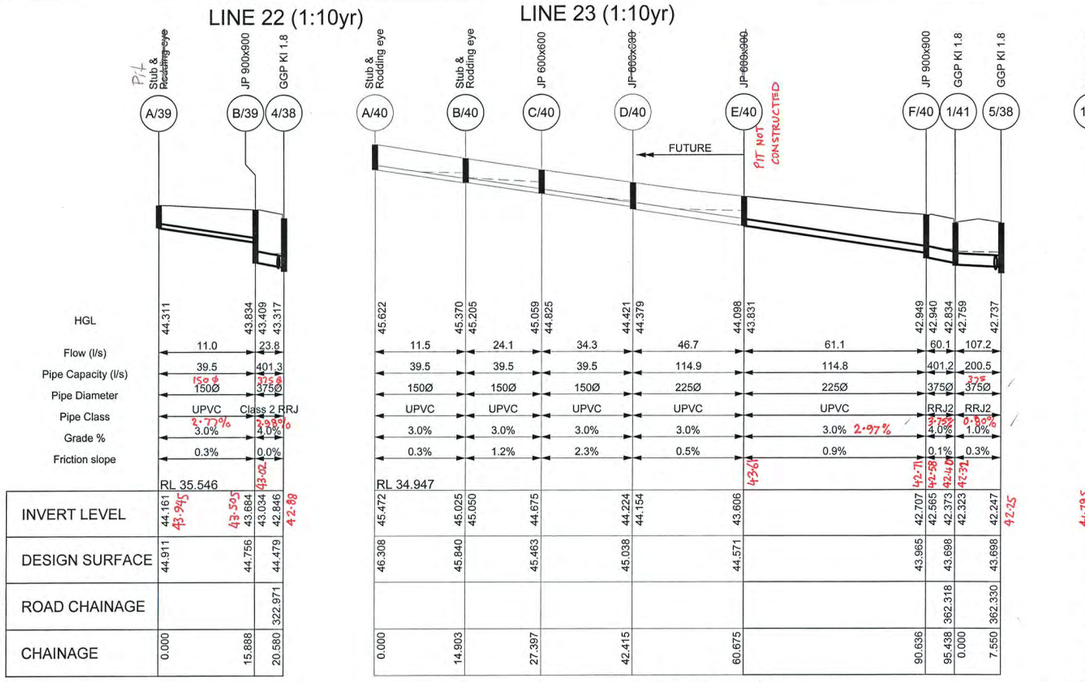
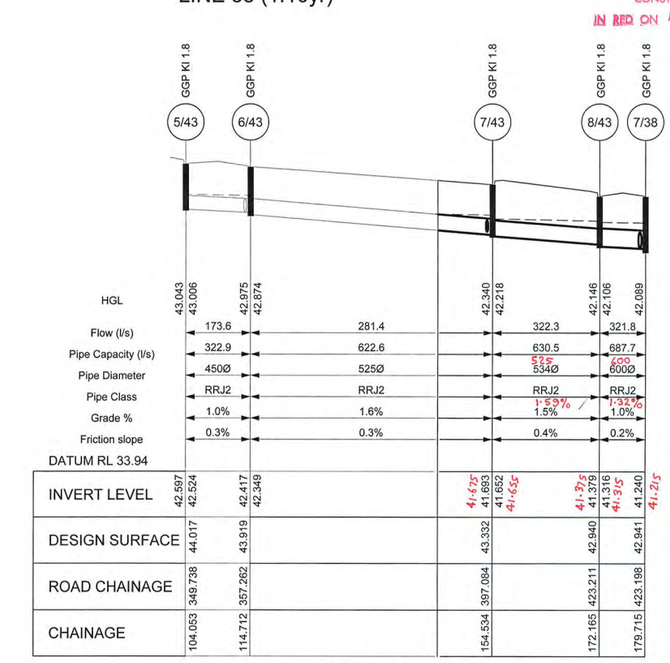


LINE 39 (1:10yr)

LINE 40 (1:10yr)

LINE 41 (1:10yr)



LINE 43 (1:10yr)

LINE 47 (1:10yr)

LINE 68 (1:10yr)

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Brown REGISTERED SURVEYOR

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

ISSUE	AMENDMENT	DATE	BY
F			
E			
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DRAWN N.W.
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DATUM: AHD ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
(AT A1)

CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
DRAINAGE LONGITUDINAL SECTIONS
LINE No.22, 23, 38, 39, 40, 41, 43, 47 & 68

PLAN No. 8634CC26 D
FILE No. 8634CC26
SHEET 26 OF 51 SHEETS

Plotted: 7 May 2010 10:56:41 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC26.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Pit Lid Level	Road Name	Road Chainage	Road CL Offset	Easting	Northing	Comment
		(mm)	(m)	(mm)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	
1/1	GSIP 1200x1200 Special			1650	43.225	2.762	45.987				288867.87	6265896.098	SEE PIT DETAIL
2/1	GSIP 1200x1200 Special	1650	43.099	1650	43.049	2.451	45.500				288859.95	6265872.229	SEE PIT DETAIL
3/1	GSIP 1200x1200 Special	1650	42.957	1650	42.907	2.795	45.702				288854.11	6265854.747	SEE PIT DETAIL
4/1	GSIP 1200x1200 Special	1650	42.814	1650	42.764	3.139	45.903				288848.31	6265837.127	SEE PIT DETAIL
5/1	GSIP 1200x1200 special	1650	42.670	1650	42.620	3.488	46.108				288842.39	6265819.332	SEE PIT DETAIL
6/1	Special Structure			1200	42.345	4.492	46.837				288829.47	6265775.906	SEE PIT DETAIL
2/2	GGP KI 1.8 Special	1200	42.087	1200	42.037	4.697	46.734	ROAD 1	41.55	-8.77	288840.59	6265725.546	SEE PIT DETAIL
3/2	GGP KI 1.8 Special	1200	41.700	1200	41.650	4.074	45.724	ROAD 1	75.22	-8.77	288872.84	6265715.864	SEE PIT DETAIL
4/2	GGP KI 1.8 Special	1200	41.219	1200	41.169	3.263	44.432	ROAD 1	118.27	-8.77	288914.07	6265703.485	SEE PIT DETAIL
5/2	GGP KI 1.8 Special	1200	40.730	1200	40.680	2.436	43.116	ROAD 1	162.15	-8.77	288956.09	6265690.870	SEE PIT DETAIL
6/2	GGP KI 1.8 Special	1200	39.416	1200	39.346	2.523	41.868	ROAD 1	204.28	-8.77	288996.44	6265678.757	SEE PIT DETAIL
7/2	GGP KI 1.8 Special	1200	38.700	1200	38.650	2.164	40.814	ROAD 1	248.68	-8.45	289038.04	6265667.664	SEE PIT DETAIL
8/2	GGP KI 1.8 Special	1200	37.939	1200	37.889	2.199	40.088	ROAD 1	294.13	-7.77	289081.06	6265667.543	SEE PIT DETAIL
9/2	GGP KI 1.8 Special	1200	37.439	1200	37.389	2.232	39.622	ROAD 1	339.17	-7.78	289125.66	6265673.826	SEE PIT DETAIL
10/2	GGP KI 1.8 Special	1200	36.980	2100x900	36.930	2.396	39.326	ROAD 1	380.03	-5.27	289166.47	6265677.050	SEE PIT DETAIL
		1500x900	36.930										
11/2	GGP KI 1.8 Special	2100x900	36.578	2100x900	36.578	2.301	38.879	ROAD 1	426.54	-5.28	289212.52	6265683.538	SEE PIT DETAIL
12/2	GGP KI 1.8 Special	2100x900	36.360	2100x900	36.360	1.918	38.278				289255.23	6265692.073	SEE PIT DETAIL
14/2	GGP KI 2.4 SAG Special	750	36.284	2700x900	36.125	1.774	37.898	ROAD 21	180.40	-5.77	289301.87	6265697.353	SEE PIT DETAIL
		2100x900	36.125										
15/2	Special Structure	2100x900	36.050	2700x900	36.050	2.216	38.266				289308.75	6265684.032	SEE PIT DETAIL
		2700x900	36.050										
2/3	GGP KI 1.8 Special	1200	41.973	1200	41.923	4.427	46.350				288843.45	6265702.710	SEE PIT DETAIL
3/3	GGP KI 1.8 Special	1200	41.358	1200	41.308	3.328	44.636				288897.54	6265686.259	SEE PIT DETAIL
4/3	GGP KI 1.8 Special	1200	41.017	1200	40.967	2.926	43.893	ROAD 1	136.25	8.78	288926.24	6265681.508	SEE PIT DETAIL
5/3	GGP KI 1.8 Special	1200	39.917	1200	39.856	2.777	42.634	ROAD 1	178.23	8.77	288966.45	6265669.435	SEE PIT DETAIL
6/3	GGP KI 1.8 Special	1200	38.888	1200	38.735	2.555	41.290	ROAD 1	226.60	8.81	289012.82	6265655.481	SEE PIT DETAIL
7/3	GGP KI 1.8 Special	1200	37.943	1200	37.893	2.390	40.283	ROAD 1	276.83	9.25	289065.19	6265649.797	SEE PIT DETAIL
8/3	GGP KI 1.8 Special	1200	37.394	1200	37.344	2.411	39.755	ROAD 1	325.73	8.37	289114.60	6265655.958	SEE PIT DETAIL
9/3	GGP KI 1.8 Special	1200	36.818	2100x900	36.768	2.481	39.249	ROAD 1	378.31	8.38	289166.67	6265663.293	SEE PIT DETAIL
10/3	GGP KI 1.8 Special	2100x900	36.543	2100x900	36.543	2.274	38.817	ROAD 1	423.29	8.38	289211.21	6265669.568	SEE PIT DETAIL
11/3	GGP KI 1.8 Special	2100x900	36.320	2100x900	36.320	2.080	38.400	ROAD 1	467.98	7.95	289255.41	6265676.226	SEE PIT DETAIL
4/5	GGP KI 1.8	375	40.307	375	40.257	1.320	41.577	ROAD 4	14.73	-3.77	288966.69	6265733.894	
		375	40.307										
5/5	GGP KI 1.8	375	40.030	450	39.950	1.591	41.541	ROAD 2	42.60	-3.78	288974.19	6265720.752	
6/5	GGP KI 1.8	450	39.837	450	39.787	1.754	41.541	ROAD 2	42.59	3.78	288981.42	6265718.575	
7/5	GGP KI 1.8	450	39.553	450	39.503	1.470	40.973	ROAD 5	15.38	3.78	288995.54	6265725.234	
		375	39.582										
8/5	GGP KI 1.8	450	39.095	525	39.008	1.618	40.626	ROAD 5	42.60	3.78	289021.60	6265717.410	
		375	39.168										
9/5	GGP KI 1.8	525	38.661	525	38.611	1.583	40.194	ROAD 5	76.45	3.77	289055.59	6265710.592	
		375	38.771										
10/5	GGP KI 1.8	525	38.290	600	38.210	1.583	39.793	ROAD 5	107.93	3.77	289087.61	6265713.151	
		375	38.450										
11/5	GGP KI 1.8	600	37.770	600	37.720	1.512	39.232	ROAD 5	151.94	3.77	289131.19	6265719.292	
12/5	GGP KI 2.4 SAG	600	37.659	900	37.355	1.820	39.174	ROAD 5	158.06	3.78	289137.25	6265720.145	
		600	37.655										
13/5	GGP KI 1.8 Special	900	37.218	1500x900	37.168	2.211	39.379	ROAD 3	41.69	-3.77	289147.59	6265711.241	SEE PIT DETAIL
		375	37.688										
		900	37.218										
14/5	GGP KI 2.4 SAG Special	1500x900	37.042	1500x900	37.042	2.101	39.143	ROAD 3	16.56	-3.78	289147.16	6265686.117	SEE PIT DETAIL
15/5	GGP KI 2.4 SAG Special	1500x900	37.004	1500x900	37.004	2.136	39.140	ROAD 3	16.57	3.78	289154.71	6265685.994	SEE PIT DETAIL
1/7	GGP KI 1.8			375	40.383	1.194	41.577	ROAD 4	14.72	3.78	288968.88	6265741.122	
1/8	GGP KI 1.8			375	40.367	1.169	41.536	ROAD 2	103.90	-3.77	288991.82	6265779.467	
2/8	GGP KI 1.8	375	40.291	375	40.241	1.295	41.536	ROAD 2	103.92	3.78	288999.05	6265777.315	
3/8	GGP KI 2.4 SAG	375	39.919	375	39.869	1.393	41.262	ROAD 2	71.71	3.77	288989.79	6265746.467	
		375	39.919										
4/8	GGP KI 1.8	375	39.708	375	39.658	1.316	40.973	ROAD 5	15.39	-3.77	288997.71	6265732.464	
1/9	GGP KI 2.4 SAG			375	39.995	1.267	41.262	ROAD 2	71.72	-3.78	288982.56	6265748.642	

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Pit Lid Level	Road Name	Road Chainage	Road CL Offset	Easting	Northing	Comment
		(mm)	(m)	(mm)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	
1/14	GGP KI 1.8			600	37.875	1.399	39.274	ROAD 5	148.63	-3.77	289126.86	6265726.307	
2/14	GGP KI 2.4 SAG	600	37.781	600	37.731	1.444	39.174	ROAD 5	158.02	-3.78	289136.16	6265727.616	
1/15	GGP KI 2.4 SAG			375	43.981	1.135	45.116	ROAD 4	218.72	-2.78	288862.26	6265849.217	
2/15	GGP KI 1.8	375	43.520	375	43.239	1.493	44.732	ROAD 6	133.34	-3.78	288874.83	6265840.405	
		375	43.520										
		375	43.289										
3/15	GGP KI 1.8	375	42.776	375	42.726	1.337	44.063	ROAD 6	110.20	-3.78	288897.00	6265833.751	
		375	42.776										
		375	42.776										
4/15	GGP KI 1.8	375	41.688	375	41.638	1.400	43.039	ROAD 6	58.30	-3.78	288946.71	6265818.828	
		375	41.688										
5/15	GGP KI 1.8	375	40.560	375	40.510	1.526	42.036	ROAD 6	15.17	-3.77	288988.01	6265806.426	
		375	40.560										
6/15	GGP KI 1.8	375	40.209	450	40.132	1.415	41.547	ROAD 7	14.94	3.78	289016.85	6265797.770	
		375	40.209										
7/15	GGP KI 1.8	450	39.822	450	39.772	1.465	41.237	ROAD 7	45.93	3.77	289046.53	6265788.859	
		375	39.847										
8/15	GGP KI 1.8	450	39.546	450	39.496	1.528	41.024	ROAD 7	67.21	3.78	289069.06	6265786.881	
		375	39.569										
9/15	GGP KI 1.8	450	39.090	600	38.928	1.691	40.618	ROAD 7	107.82	3.77	289109.26	6265792.546	
10/15	GGP KI 1.8	600	38.891	900	38.591	1.991	40.582	ROAD 7	111.49	3.78	289112.90	6265793.058	
		600	38.891										
11/15	GGP KI 2.4 SAG	900	38.361	900	38.311	2.099	40.410	CDS1	27.89	0.23	289134.78	6265799.940	
12/15	GGP KI 1.8	900	38.163	900	38.113	2.111	40.224	ROAD 3	126.18	-3.78	289149.06	6265795.718	
		375	38.653										
		375	38.653										
13/15	GGP KI 1.8	900	37.796	900	37.746	2.161	39.907	ROAD 3	94.51	-3.78	289148.51	6265764.056	
		375	38.286										
		375	38.286										
1/16	GGP KI 1.8			375	43.540	1.598	45.138	ROAD 4	230.56	2.77	288871.26	6265858.698	
2/16	GGP KI 1.8	375	43.415	375	43.365	1.367	44.731	ROAD 6	133.33	3.78	288877.01	6265847.633	
1/17	GGP KI 1.8			375	43.647	1.510	45.157	ROAD 4	205.59	2.77	288863.38	6265835.006	
B/18	~~JP 600x600~~	150	43.593	375	42.824	1.542	44.365				288894.88	6265829.466	
A/18	Stub & Rodding Eye			150	44.226	0.752	44.978				288890.37	6265814.285	
B/19	~~JP 600x600~~	150	43.564	375	43.096	1.311	44.407				288900.74	6265845.572	
A/19	Stub & Rodding Eye			150	44.152	0.750	44.902				288906.73	6265864.242	
1/34	GGP KI 1.8	375	42.902	375	42.852	1.211	44.063	ROAD 6	110.20	3.78	288899.17	6265840.983	
1/20	GGP KI 1.8			375	41.764	1.275	43.039	ROAD 6	58.30	3.77	288948.88	6265826.059	
1/21	GGP KI 1.8			375	40.636	1.400	42.036	ROAD 6	15.15	3.78	288990.20	6265813.653	
1/22	GGP KI 1.8			375	40.973	1.304	42.277	ROAD 2	178.00	-3.78	289013.59	6265850.342	
2/22	GGP KI 1.8	375	40.897	375	40.847	1.429	42.277	ROAD 2	178.02	3.78	289020.80	6265848.100	
3/22	GGP KI 1.8	375	40.540	375	40.490	1.479	41.969	ROAD 2	147.28	3.77	289011.59	6265818.774	
		375	40.540										
4/22	GGP KI 1.8	375	40.335	375	40.285	1.264	41.549	ROAD 7	14.79	-3.77	289018.88	6265805.042	
1/23	GGP KI 1.8			375	40.616	1.353	41.968	ROAD 2	147.18	-3.78	289004.36	6265820.939	
1/27	GGP KI 1.8			600	39.041	1.565	40.606	ROAD 7	109.10	-3.78	289109.48	6265800.200	
2/27	GGP KI 1.8	600	39.017	600	38.967	1.615	40.582	ROAD 7	111.47	-3.78	289111.83	6265800.532	
1/38	GSIP 1200x1200			375	44.083	1.552	45.635				288889.24	6265928.368	
2/38	GGP KI 1.8	375	43.858	375	43.808	1.508	45.316	ROAD 4	292.67	-3.75	288890.43	6265919.441	
3/38	GGP KI 1.8	375	43.292	375	43.242	1.442	44.684	ROAD 4	316.58	-3.78	288915.85	6265914.908	
4/38	GGP KI 1.8	375	42.846	450	42.765	1.714	44.479	ROAD 4	322.97	3.77	288919.80	6265905.839	
		375	42.846										
5/38	GGP KI 1.8	450	42.175	525	42.085	1.613	43.698	ROAD 4	362.33	3.77	288957.50	6265894.522	
		375	42.247										
6/38	GGP KI 1.8	525	41.634	525	41.584	1.811	43.395	ROAD 4	384.88	3.78	288979.10	6265888.037	
		375	41.744										
7/38	GGP KI 1.8	525	41.263	675	41.160	1.781	42.941	ROAD 8	423.20	3.78	289009.81	6265878.816	
		600	41.240										
8/38	GGP KI 1.8	675	40.685	675	40.621	1.844	42.465	ROAD 8	456.86	3.77	289042.06	6265869.135	
B/39	JP 900x900	375	40.861	375	43.034	1.722	44.756				288918.43	6265901.350	
A/39	Stub & Rodding Eye			150	44.161	0.750	44.911				288913.86	6265886.136	
E/40	JP 600x900	225	43.606	225	43.606	0.965	44.571				288970.08	6265934.918	
F/40	JP 900x900	225	42.707	375	42.565	1.400	43.965				288961.05	6265906.352	
1/41	GGP KI 1.8	375	42.373	375	42.323	1.375	43.698	ROAD 4	362.32	-3.77	288959.66	6265901.756	
1/42	GGP KI 1.8			375	41.820	1.577	43.396	ROAD 4	384.83	-3.77	288981.22	6265895.282	
1/43	GGP KI 1.8			375	45.087	1.526	46.612	ROAD 10	41.14	-3.78	288926.64	6265991.647	
7/43	GGP KI 1.8	375	41.802	525	41.652	1.681	43.332	ROAD 8	397.08	-3.77	289003.58	6265901.537	
		525	-1.119										
8/43	GGP KI 1.8	525	41.379	600	41.316	1.625	42.940	ROAD 8	423.21	-3.77	289011.99	6265886.043	
1/47	GGP KI 1.8			375	40.938	1.545	42.483	ROAD 8	455.44	-3.77	289042.86	6265876.776	

This plan/document relates to
DA No: 090809 CCX No: 100012
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010
REGISTERED SURVEYOR

Plotted: 7 May 2010 10:56:48 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC27.dwg

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
PIT SCHEDULE

PLAN No. 8634CC27 D
FILE No. 8634CC27
SHEET 27 OF 51 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDRAULICS DESIGN TABLE - MAJOR - 4 Return Period: 100yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
2/1 1/1	6.000	0.062	991.9	25.148	1650	0.012	0.5	45.503	35.870	4.500	0.046	0.01	0.45	7152.71	0.932	
3/1 2/1	6.932	0.285	3820.2	18.431	1650	0.012	0.5	45.728	158.211	1.928	0.295	0.15	1.73	7145.36	0.177	
4/1 3/1	7.110	0.285	4774.8	18.552	1650	0.012	0.5	45.945	156.842	0.600	0.143	0.24	2.16	7145.35	0.143	
5/1 4/1	7.253	0.358	5769.9	18.755	1650	0.012	0.5	45.894	195.938	0.937	0.327	0.35	2.62	7145.43	0.120	
6/1 5/1	7.372	0.807	6968.3	45.033	1650	0.012	0.5	44.914	438.340	1.805	0.919	0.51	3.16	7145.34	0.238	
2/2 6/1	6.000	0.000	3484.0	51.573	1200	0.012	0.5	45.994	0.000	2.500	1.210	0.48	3.08	2984.41	0.279	
3/2 2/2	6.279	0.049	3512.1	33.673	1200	0.012	1.0	44.561	28.077	2.200	1.082	0.49	3.11	4227.47	0.181	
4/2 3/2	6.460	0.131	3558.4	43.051	1200	0.012	1.0	43.683	74.422	1.365	0.645	0.47	3.04	4414.17	0.236	
5/2 4/2	6.695	0.212	3603.1	43.874	1200	0.012	1.0	42.706	119.085	1.436	0.696	0.48	3.08	4414.17	0.237	
6/2 5/2	6.933	0.283	3641.1	42.127	1200	0.012	3.0	41.880	157.148	1.078	0.533	0.49	3.11	7658.32	0.225	
7/2 6/2	7.158	0.329	3664.7	43.048	1200	0.012	1.5	41.111	180.683	0.721	0.361	0.50	3.13	5410.13	0.229	
8/2 7/2	7.387	0.411	3707.2	43.029	1200	0.012	1.7	40.419	223.169	0.800	0.439	0.55	3.28	5438.95	0.219	
9/2 8/2	7.606	0.491	3747.7	45.036	1200	0.012	1.0	39.976	263.699	0.800	0.448	0.56	3.31	4227.47	0.227	
10/2 9/2	7.832	0.572	3787.7	40.936	1200	0.012	1.0	39.532	303.693	0.729	0.417	0.57	3.35	4227.47	0.204	
11/2 10/2	11.826	5.812	6090.2	46.510	2100x900	0.013	0.8	38.568	2606.185	1.200	0.636	0.53	3.22	7798.37	0.081	
12/2 11/2	11.907	6.182	6249.5	43.547	2100x900	0.013	0.5	38.233	2765.550	0.600	0.335	0.56	3.31	6342.61	0.074	
14/2 12/2	11.981	6.182	6243.6	46.941	2100x900	0.013	0.5	37.899	2759.587	0.600	0.334	0.56	3.30	6342.61	0.080	
15/2 14/2	12.061	7.730	6926.5	14.992	2700x900	0.013	0.5	37.347	3442.503	2.200	0.912	0.41	2.85	8764.84	0.023	
16/2 15/2	12.084	8.421	10715.7	7.046	2700x900	0.013	1.0	37.000	3747.694	1.400	0.347	0.25	2.20	12355.19	0.007	
2/3 6/1	6.000	0.000	3484.0	74.444	1200	0.012	0.5	45.227	0.000	2.500	1.210	0.48	3.08	2984.41	0.403	
3/3 2/3	6.403	0.075	3526.7	56.542	1200	0.012	1.0	43.699	42.724	2.200	1.022	0.46	3.02	4414.17	0.312	
4/3 3/3	6.715	0.176	3582.8	29.092	1200	0.012	1.0	42.781	98.769	1.161	0.556	0.48	3.06	4414.17	0.158	
5/3 4/3	6.873	0.215	3603.7	41.985	1200	0.012	2.5	42.167	119.734	0.871	0.422	0.48	3.08	6989.53	0.227	
6/3 5/3	7.100	0.285	3641.0	48.419	1200	0.012	2.0	41.056	156.965	1.062	0.526	0.49	3.11	6249.78	0.259	
7/3 6/3	7.359	0.364	3681.9	52.797	1200	0.012	1.5	40.156	197.921	0.800	0.433	0.54	3.26	5181.34	0.270	
8/3 7/3	7.630	0.441	3720.6	49.926	1200	0.012	1.0	39.313	236.560	0.800	0.442	0.55	3.29	4227.47	0.253	
9/3 8/3	7.883	0.506	3752.0	52.582	1200	0.012	1.0	38.544	267.961	0.681	0.382	0.56	3.32	4227.47	0.264	
10/3 9/3	8.147	0.574	3783.9	44.980	2100x900	0.013	0.5	37.668	299.865	0.646	0.132	0.20	2.00	6344.02	0.224	
11/3 10/3	8.371	0.633	3810.8	44.697	2100x900	0.013	0.5	37.473	326.846	0.600	0.124	0.21	2.02	6335.72	0.221	
15/2 11/3	8.592	0.691	3836.7	53.910	2100x900	0.013	0.5	37.347	352.656	0.600	0.126	0.21	2.03	6347.88	0.265	
12/5 11/5	9.240	2.101	1035.3	6.112	600	0.012	1.0	39.301	1035.297	0.600	0.384	0.64	3.54	718.23	0.029	
13/5 12/5	9.268	2.405	1183.2	13.651	900	0.012	1.0	39.279	1183.167	0.600	0.101	0.17	1.82	2049.81	0.125	
14/5 13/5	11.610	5.131	2315.3	25.128	1500x900	0.013	0.5	39.143	2315.308	0.600	0.090	0.15	1.72	4046.58	0.115	
15/5 14/5	11.725	5.197	2337.3	7.550	1500x900	0.013	0.5	39.140	2337.278	2.202	0.337	0.15	1.73	4046.58	0.034	
10/2 15/5	11.760	5.233	2351.1	14.778	1500x900	0.013	0.5	39.203	2351.127	0.606	0.094	0.15	1.74	4049.60	0.067	
2/14 1/14	6.000	0.142	82.4	9.389	600	0.012	1.0	39.175	82.419	4.500	0.018	0.00	0.28	718.23	0.555	
12/5 2/14	6.555	0.240	135.7	7.550	600	0.012	1.0	39.177	135.745	2.197	0.024	0.01	0.46	718.23	0.271	
10/15 9/15	10.213	1.346	631.6	3.671	600	0.012	1.0	39.899	631.638	0.600	0.143	0.24	2.16	718.23	0.028	
11/15 10/15	10.242	1.481	694.9	22.943	900	0.012	1.0	39.836	694.920	0.600	0.035	0.06	1.07	2049.81	0.358	
12/15 11/15	10.599	1.612	748.7	14.889	900	0.012	1.0	39.758	748.745	0.750	0.051	0.07	1.15	2049.81	0.216	
13/15 12/15	10.815	2.270	1047.9	31.667	900	0.012	1.0	39.659	1047.924	0.600	0.079	0.13	1.61	2049.81	0.328	
13/5 13/15	11.143	2.677	1224.1	52.823	900	0.012	1.0	39.423	1224.127	0.844	0.153	0.18	1.88	2049.81	0.468	
2/27 1/27	6.000	0.131	76.0	2.377	600	0.012	1.0	39.880	76.035	4.500	0.016	0.00	0.26	718.23	0.152	
10/15 2/27	6.152	0.133	76.6	7.550	600	0.012	1.0	39.872	76.648	2.196	0.008	0.00	0.26	718.23	0.480	

HYDRAULICS DESIGN TABLE- 6 Return Period: 20yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
2/29 1/29	6.000	0.077	33.6	7.550	375	0.012	1.0	39.706	33.582	4.500	0.021	0.00	0.30	199.82	0.414	
12/15 2/29	7.334	0.406	167.3	43.597	375	0.012	1.0	39.464	167.261	2.052	0.240	0.12	1.51	199.82	0.480	
12/15 1/30	6.000	0.104	45.7	7.550	375	0.012	1.0	39.104	45.723	4.500	0.039	0.01	0.41	199.82	0.304	
13/15 1/31	6.000	0.066	29.1	10.607	375	0.012	1.0	38.767	29.133	4.500	0.016	0.00	0.26	199.82	0.670	
13/5 1/33	6.000	0.043	18.9	7.550	375	0.012	1.0	38.139	18.903	4.500	0.007	0.00	0.17	199.82	0.735	

HYDRAULICS DESIGN TABLE- 6 Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
B/4 A/4	6.000	0.000	0.0	19.658	150	0.009	1.0	44.826	0.000	4.500	0.000	0.00	0.00	22.17	0.000	
1/5 B/4	6.000	0.000	0.0	4.753	375	0.012	4.0	44.178	0.000	4.500	0.000	0.00	0.00	401.26	0.000	
2/5 1/5	6.000	0.023	8.6	7.686	375	0.012	1.0	43.938	8.572	2.200	0.001	0.00	0.08	199.82	1.651	
3/5 2/5	7.651	0.119	41.6	43.775	375	0.012	3.5	43.811	41.639	2.184	0.016	0.01	0.38	375.24	1.935	
4/5 3/5	9.586	0.382	120.5	51.583	375	0.012	3.0	42.229	120.484	1.632	0.099	0.06	1.09	347.28	0.788	
5/5 4/5	10.374	0.631	192.6	15.130	375	0.012	1.5	40.632	192.566	1.302	0.202	0.16	1.74	245.09	0.145	
6/5 5/5	10.519	0.683	207.7	7.550	450	0.012	1.5	40.429	207.692	0.600	0.052	0.09	1.31	396.00	0.096	
7/5 6/5	10.615	0.711	215.6	15.611	450	0.012	1.5	40.321	215.588	0.821	0.077	0.09	1.36	396.00	0.192	
8/5 7/5	10.807	1.010	304.3	27.212	450	0.012	1.5	39.953	304.302	1.595	0.298	0.19	1.91	396.00	0.237	
9/5 8/5	11.044	1.260	377.3	34.665	525	0.012	1.0	39.533	377.253	0.600	0.087	0.14	1.68	506.40	0.343	
10/5 9/5	11.387	1.444	427.9	32.119	525	0.012	1.0	39.136	427.884	0.672	0.125	0.19	1.91	506.40	0.280	
11/5 10/5	11.667	1.646	483.9	44.019	600	0.012	1.0	38.810	483.892	0.600	0.084	0.14	1.66	718.23	0.443	
3/5 1/6	6.000	0.134	50.8	7.550	375	0.012	1.0	42.355	50.774	4.500	0.049	0.01	0.46	199.82	0.274	
4/5 1/7	6.000	0.098	36.8	7.550	375	0.012	1.0	40.837	36.844	4.500	0.026	0.01	0.33	200.49	0.377	
2/8 1/8	6.000	0.085	31.9	7.550	375	0.012	1.0	40.742	31.940	4.500	0.019	0.00	0.29	199.82	0.435	
3/8 2/8	6.435	0.098	36.1	32.208	375	0.012	1.0	40.616	36.148	2.204	0.012	0.01	0.33	199.82	1.640	
4/8 3/8	8.075	0.269	92.1	16.088	375	0.012	1.0	40.336	92.087	1.554	0.055	0.04	0.83	199.82	0.322	
7/5 4/8	8.397	0.282	94.7	7.550	375	0.012	1.0	40.268	94.690	0.892	0.033	0.04	0.86	199.82	0.147	
3/8 1/9	6.000	0.147	55.3	7.550	375	0.012	1.0	40.396	55.349	4.500	0.058	0.01	0.50	199.82	0.251	
1/11 D/10	6.639	0.142	52.0	4.722	375	0.012	4.0	39.876	51.963	0.600	0.007	0.01	0.47	401.26	0.167	
D/19 C/10	6.360	0.102	37.7	15.916	225	0.009	5.0	40.672	37.735	0.600	0.028	0.05	0.95	149.50	0.280	
C/10 B/10	6.225	0.073	27.1	12.433	150	0.009	1.0	40.881	27.124	1.465	0.176	0.12	1.53	22.17	0.135	
B/10 A/10	6.000	0.044	16.4	12.546	150	0.009	1.0	41.129	16.444	4.500	0.199	0.04	0.93	22.17	0.225	
8/5 1/11	6.807	0.157	56.9	9.367	375	0.012	1.0	39.637	56.948	0.859	0.012	0.01	0.52	199.82	0.303	
9/5 1/12	6.000	0.090	33.8	7.550	375	0.012	1.0	39.264	33.836	4.500	0.022	0.00	0.31	199.82	0.411	
10/5 1/13	6.000	0.098	37.1	7.550	375	0.012	1.0	38.901	37.050	4.500	0.026	0.01	0.34	199.82	0.375	
2/15 1/15	6.000	0.081	30.7	15.355	375	0.012	3.0	44.356	30.662	4.500	0.018	0.00	0.28	347.28	0.922	
3/15 2/15	10.057	0.152	46.7	23.139	375	0.012	2.0	43.614	46.747	1.165	0.011	0.01	0.42	283.25	0.911	
4/15 3/15	10.968	0.248	74.5	51.902	375	0.012	2.0	43.101	74.487	0.622	0.014	0.02	0.67	283.25	1.283	
5/15 4/15	12.251	0.535	154.6	43.129	375	0.012	2.5	42.013	154.585	1.504	0.150	0.10	1.40	316.88	0.514	
6/15 5/15	12.764	0.741	210.8	30.107	375	0.012	1.0	41.000	210.792	1.018	0.189	0.19	1.91	199.82	0.263	
7/15 6/15	13.027	0.930	262.6	30.989	450	0.012	1.0	40.582	262.602	0.600	0.083	0.14	1.65	322.91	0.313	
8/15 7/15	13.340	1.036	289.6	22.615	450	0.012	1.0	40.255	289.558	0.716	0.121	0.17	1.82	322.91	0.207	
9/15 8/15	13.547	1.117	310.3	40.603	450	0.012	1.0	39.946	310.349	0.651	0.126	0.19	1.95	322.91	0.347	
2/16 1/16	6.000	0.022	8.2	12.470	375	0.012	1.0	43.915	8.242	4.500	0.001	0.00	0.07	199.82	2.785	
2/15 2/16	8.785	0.033	10.9	7.550	375	0.012	1.0	43.740	10.925	1.385	0.001	0.00	0.10	199.82	1.272	
2/15 1/17	6.000	0.026	9.9	12.663	375	0.012	1.0	44.022	9.891	4.500	0.002	0.00	0.09	199.82	2.357	
3/15 B/18	6.425	0.064	23.8	4.780	375	0.012	1.0	43.199	23.759	0.600	0.001	0.00	0.22	199.82	0.370	
B/18 A/18	6.000	0.029	11.0	15.836	150	0.009	4.0	44.376	10.963	4.500	0.088	0.02	0.62	45.88	0.425	
1/34 B/19	6.000	0.000	0.0	4.851	375	0.012	4.0	43.471	0.000	0.600	0.000	0.00	0.00	401.26	0.000	
B/19 A/19	6.000	0.000	0.0	19.608	150	0.009	3.0	44.302	0.000	4.500	0.000	0.00	0.00	39.50	0.000	
3/15 1/34	6.000	0.017	6.3	7.550	375	0.012	1.0	43.227	6.264	2.200	0.000	0.00	0.06	199.82	2.219	
4/15 1/20	6.000	0.151	57.0	7.550	375	0.012	1.0	42.170	57.038	4.500	0.061	0.01	0.52	199.82	0.244	
5/15 1/21	6.000	0.111	42.0	7.550	375	0.012	1.0	41.193	42.037	4.500	0.033	0.01	0.38	199.82	0.331	
2/22 1/22	6.000	0.066	24.9	7.550	375	0.012	1.0	41.348	24.892	4.500	0.012	0.00	0.23	199.82	0.558	
3/22 2/22	6.558	0.087	32.0	30.737	375	0.012	1.0	41.222	31.963	2.203	0.009	0.00	0.29	199.82	1.770	
4/22 3/22	8.328	0.162	54.5	15.547	375	0.012	1.0	40.865	54.505	1.577	0.020	0.01	0.49	199.82	0.525	
6/15 4/22	8.854	0.177	58.2	7.551	375	0.012	1.0	40.672	58.188	0.929	0.013	0.01	0.53	199.82	0.239	
3/22 1/23	6.000	0.054	20.3	7.551	375	0.012	1.0	40.991	20.318	4.500	0.008	0.00	0.18	199.82	0.684	
B/24 A/24	6.000	0.029	11.0	17.844	150	0.009	3.0	41.481	10.963	4.500	0.088	0.02	0.62	39.50	0.479	
1/25 B/24	6.479	0.069	25.4	4.764	375	0.012	1.0	40.432	25.392	0.600	0.002	0.00	0.23	199.82	0.345	
7/15 1/25	6.825	0.084	30.7	11.173	375	0.012	1.0	40.378	30.690	1.216	0.005	0.00	0.28	199.82	0.670	
8/15 1/26	6.000	0.066	24.9	7.550	375	0.012	1.0	40.074	24.851	4.500	0.012	0.00	0.23	199.82	0.559	
E/28 D/28	6.878	0.146	52.9	9.947	225	0.009	1.0	41.248	52.879	0.759	0.068	0.09	1.33	64.75	0.125	
D/28 C/28	6.729	0.123	44.9	10.057	225	0.009	1.0	41.367	44.890	1.019	0.066	0.07	1.13	64.75	0.148	
H/28 G/28	7.279	0.232	82.5	18.730	300	0.009	2.0	40.651	82.547	0.600	0.042	0.07	1.17	198.24	0.267	
G/28 F/28	7.138	0.198	70.8	15.010	225	0.009	1.0	40.871	70.810	0.725	0.117	0.16	1.78	64.73	0.140	
C/28 B/28	6.434	0.093	34.5	15.370	225	0.009	1.0	41.480	34.494	1.217	0.047	0.04	0.87	64.75	0.295	
F/28 E/28	7.002	0.169	60.8	12.473	225	0.009	1.0	41.099	60.819	0.688	0.082	0.12	1.53	64.75	0.136	
2/29 H/28	7.546	0.278	97.5	4.843	375	0.012	4.0	39.708	97.549	0.600	0.024	0.04	0.88	401.26	0.091	
B/28 A/28	6.000	0.044	16.7	24.659	150	0.009	1.0	41.672	16.732	4.500	0.206	0.05	0.95	22.19	0.434	
2/29 1/29	6.000	0.073	27.5	7.550	375	0.012	1.0	39.622	27.530	4.500	0.014	0.00	0.25	199.82	0.505	
12/15 2/29	7.638	0.387	135.1	43.597	375	0.012	1.0	39.464	135.067	2.054	0.157	0.08	1.22	199.82	0.594	
12/15 1/30	6.000	0.099	37.5	7.550	375	0.012	1.0	39.104	37.483	4.500	0.026	0.01	0.34	199.82	0.371	
13/15 1/31	6.000	0.063	23.9	10.607	375	0.012	1.0	38.767	23.883	4.500	0.011	0.00	0.22	199.82	0.818	
D/32 C/32	6.720	0.097	35.4	15.015	225	0.009	1.0	40.274	35.425	0.600	0.024	0.04	0.89	64.75	0.281	
G/32 F/32	7.351	0.194	68.7	12.740	225	0.009	1.0	39.746	68.726	0.720	0.110	0.15	1.73	64.75	0.123	
13/15 H/32	7.675	0.250	87.3	4.755	375	0.012	4.0	38.851	87.339	0.600	0.019	0.03	0.79	401.26	0.100	
E/32 D/32	7.001	0.131	47.3	15.013	225	0.009	1.0	40.148	47.337	1.080	0.078	0.07	1.19	64.75	0.210	
B/32 A/32	6.000	0.029	11.0	18.655	150	0.009	1.0	40.688	10.963	4.500	0.088	0.02	0.62	22.17	0.501	
F/32 E/32	7.211	0.166	59.1	12.492	225	0.009	1.0	39.961	59.117	0.918	0.104	0.11	1.49	64.75	0.140	
C/32 B/32	6.501	0.063	23.1	17.194	150	0.009	1.0	40.484	23.111	1.766	0.154	0.09	1.31	22.17	0.219	
H/32 G/32	7.474	0.225	79.1	13.500	300	0.009	3.0	39.565	79.070	0.600	0.038	0.06	1.12	244.32	0.201	
13/5 1/33	6.000	0.041	15.5	7.550	375	0.012	1.0	38.139	15.496	4.500	0.005	0.00	0.14	199.82	0.897	
2/35 1/35	6.000	0.941	355.5	11.550	600	0.012	1.0	38.551	355.496	4.500	0.340	0.08	1.22	718.23	0.158	
3/35 2/35	6.158	0.982	368.3	24.321	750	0.012	3.2	38.435	368.294	2.509	0.084	0.03	0.81	2303.94	0.499	
4/35 3/35	7.055	1.136	408.3	41.188	750	0.012	0.6	37.599	408.323	0.707	0.029	0.04	0.90	1018.44	0.763	
1/42 4/35	7.817	1.296	448.9	18.190	750	0.012	1.0	37.216	448.862	0.778	0.041	0.05	1.02	1235.00	0.298	
3/35 1/36	6.000	0.110	41.6	9.017	600	0.012	0.7	37.665	41.645	4.500	0.005	0.00	0.14	611.51	1.055	
4/35 1/37	6.000	0.137	51.7	11.686	600	0.012	1.0	37.329	51.742	4.500	0.007	0.00	0.18	715.57	1.100	
2/38 1/38	6.000	0.427	161.3	9.006	375	0.012	2.5	44.537	161.306	0.450	0.049	0.11	1.46	316.88	0.103	
3/38 2/38	6.103	0.526	198.0	25.819	375	0.012	2.0	44.183	197.952	1.797	0.294	0.16	1.79	283.25	0.240	

This plan/document relates to
DA No: 090809 CCX No: 100012
Environmental Planning and Assessment Act
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Bowman REGISTERED SURVEYOR

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
DRAINAGE CALCULATIONS (1 OF 3)

PLAN No. 8634CC28 D
FILE No. 8634CC28
SHEET 28 OF 51 SHEETS

Plotted: 7 May 2010 10:57:09 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC28.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDRAULICS DESIGN TABLE- 6 Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
4/38 3/38	6.343	0.611	227.4	9.893	375	0.012	4.0	43.617	227.356	1.360	0.294	0.22	2.06	401.26	0.080	
5/38 4/38	6.790	0.703	255.8	39.359	450	0.012	1.5	43.215	255.808	0.768	0.101	0.13	1.61	396.00	0.408	
6/38 5/38	7.523	1.109	389.7	22.552	525	0.012	2.0	42.610	389.685	0.820	0.127	0.15	1.74	717.51	0.216	
7/38 6/38	8.480	1.187	397.3	32.070	525	0.012	1.0	42.306	397.333	0.600	0.103	0.17	1.84	484.28	0.291	
8/38 7/38	9.577	2.311	729.5	33.667	675	0.012	1.4	41.835	729.532	1.200	0.254	0.21	2.04	1113.76	0.275	
4/38 B/39	6.427	0.064	23.8	4.692	375	0.012	4.0	43.409	23.758	0.600	0.001	0.00	0.22	401.26	0.364	
B/39 A/39	6.000	0.029	11.0	15.888	150	0.009	3.0	44.311	10.963	4.500	0.088	0.02	0.62	39.50	0.427	
B/40 A/40	6.000	0.031	11.5	14.903	150	0.009	3.0	45.622	11.540	4.500	0.098	0.02	0.65	39.50	0.380	
F/40 E/40	6.921	0.169	61.1	29.961	225	0.009	3.0	43.831	61.058	2.218	0.267	0.12	1.54	114.84	0.325	
C/40 B/40	6.380	0.065	24.1	12.494	150	0.009	3.0	45.205	24.093	1.741	0.165	0.09	1.36	39.51	0.153	
1/41 F/40	7.246	0.169	60.1	4.802	375	0.012	4.0	42.940	60.105	0.600	0.009	0.02	0.54	401.18	0.147	
E/40 D/40	6.662	0.128	46.7	18.260	225	0.009	3.0	44.379	46.712	0.600	0.042	0.07	1.17	114.87	0.259	
D/40 C/40	6.533	0.093	34.3	15.018	150	0.009	3.0	44.825	34.334	1.215	0.234	0.19	1.94	39.53	0.129	
5/38 1/41	7.393	0.303	107.2	7.550	375	0.012	1.0	42.759	107.198	1.571	0.076	0.05	0.97	200.49	0.130	
6/38 1/42	6.000	0.015	5.6	7.550	375	0.012	1.0	42.409	5.605	4.500	0.001	0.00	0.05	199.82	2.480	
2/43 1/43	6.000	0.146	55.3	7.553	375	0.012	1.0	45.462	55.277	4.500	0.058	0.01	0.50	199.82	0.252	
3/43 2/43	6.252	0.146	54.6	40.787	375	0.012	2.5	45.336	54.638	2.257	0.028	0.01	0.49	316.88	1.374	
4/43 3/43	7.626	0.269	94.2	41.844	375	0.012	3.0	44.266	94.200	1.399	0.052	0.04	0.85	347.28	0.818	
5/43 4/43	8.443	0.522	174.9	13.869	375	0.012	1.0	43.149	174.922	1.583	0.203	0.13	1.58	200.05	0.146	
6/43 5/43	8.589	0.522	173.6	10.659	450	0.012	1.0	43.006	173.601	0.600	0.036	0.06	1.09	322.91	0.163	
7/43 6/43	8.752	0.853	281.4	39.822	525	0.012	1.6	42.874	281.361	1.174	0.101	0.09	1.30	622.59	0.511	
8/43 7/43	9.263	1.004	322.3	17.632	525	0.012	1.5	42.218	322.288	1.161	0.123	0.11	1.44	630.49	0.204	
7/38 8/43	9.467	1.013	321.8	7.550	600	0.012	1.0	42.106	321.779	0.600	0.040	0.07	1.14	687.73	0.111	
3/43 1/44	6.000	0.092	34.7	8.146	375	0.012	1.0	44.397	34.660	4.500	0.023	0.01	0.31	199.82	0.433	
4/43 1/45	6.000	0.205	77.4	7.553	375	0.012	1.0	43.363	77.439	4.500	0.113	0.03	0.70	200.45	0.180	
2/46 1/46	6.000	0.301	113.8	7.758	450	0.012	1.0	43.469	113.840	4.500	0.118	0.03	0.72	322.91	0.181	
6/43 2/46	6.181	0.314	117.8	45.243	450	0.012	1.0	43.341	117.799	1.186	0.033	0.03	0.74	328.40	1.018	
8/38 1/47	6.000	0.014	5.3	7.683	375	0.012	1.0	41.432	5.275	4.500	0.001	0.00	0.05	199.82	2.681	
7/43 1/68	6.000	0.130	49.1	7.550	375	0.012	1.0	42.345	49.126	4.500	0.045	0.01	0.44	200.49	0.283	

HYDROLOGIC DESIGN TABLE - MAJOR - 4 Return Period: 100 Location: Cranebrook

Pit No.	Land Use	Pit Type	Catchment Overland Flow Length	Catchment Overland Flow Slope	Catchment Overland Flow Roughness "n"	Catchment Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Single Catchment Area	Pit Effective Area	Total Area	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)
1/1		GSIP 1200x1200						6.00	209.0	0.951		0.062	0.065	6	35.9		986.2				399.485		2/1	956.000
	Park					6.00		6.00		0.753		0.010	0.013											
	Road					6.00		6.00		1.000		0.052	0.052											
2/1		GSIP 1200x1200						6.00	209.0	0.954		0.223	0.234	6	129.5	586.7	3402.9				1121.768	586.681	3/1	2706.000
	Park					6.00		6.00		0.753		0.033	0.044											
	Road					6.00		6.00		1.000		0.190	0.190											
3/1		GSIP 900x900					209.0									2281.1	3237.1				229.500	2281.141	4/1	956.000
4/1		GSIP 1200x1200						6.00	209.0	0.955		0.074	0.077	6	42.7	3007.6	4000.2				1286.219	3007.641	5/1	956.000
	Park					6.00		6.00		0.753		0.011	0.014											
	Road					6.00		6.00		1.000		0.063	0.063											
5/1		GSIP 1200x1200						6.00	209.0	0.958		0.448	0.468	6	260.2	2714.0	3895.1				1257.280	2713.972	6/1	956.000
	Park					6.00		6.00		0.753		0.060	0.080											
	Road					6.00		6.00		1.000		0.388	0.388											
1/2		Special_All flow					209.0														0.000			
2/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.049	0.049	6	28.4		28.4		1.008	0.057	13.801		3/2	
3/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.082	0.082	6	47.6		62.3		1.530	0.072	25.675	14.646		
																14.6							4/2	
4/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.081	0.081	6	47.0	36.6	83.6		1.742	0.079	32.080	36.576	5/2	
5/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.071	0.071	6	41.2	51.5	85.6		1.761	0.079	32.694	44.428	6/2	
6/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.046	0.046	6	26.7	53.0	66.8		1.607	0.075	27.042	40.100	7/2	
7/2	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.082	0.082	6	47.6	39.8	75.0		1.822	0.081	29.486	27.349	8/2	
8/2	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.080	0.080	6	46.4	45.5	82.3		2.101	0.090	32.205	35.906	9/2	
9/2	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.081	0.081	6	47.0	50.1	90.5		2.309	0.096	34.637	43.522	10/2	
10/2	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.007	0.007	6	4.1	55.9	24.1		1.261	0.064	11.842	20.029		
																20.2							11/2	

HYDROLOGIC DESIGN TABLE - MAJOR - 4 Return Period: 100 Location: Cranebrook

Pit No.	Land Use	Pit Type	Catchment Overland Flow Length	Catchment Overland Flow Slope	Catchment Overland Flow Roughness "n"	Catchment Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Single Catchment Area	Pit Effective Area	Total Area	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)
11/2		GGP KI 1.8 1%						6.00	209.0	1.000		0.370	0.370	6	214.8	12.3	41.3		1.660	0.076	18.961	7.257		
	Road					6.00		6.00		1.000		0.060	0.060											
	Commercial					6.00		6.00		1.000		0.310	0.310											
12/2		GGP KI 1.8 1%							209.0													0.000		
14/2	Road	GGP KI 2.4 SAG				6.00		6.00	209.0	1.000		0.100	0.100	6	58.1	11.8	69.9		Sag	0.208	34.947	11.838		
15/2		Special Structure							209.0								29.1				14.560	29.121		
																38.1						16/2		
1/3		Special_All flow							209.0													0.000		
2/3	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.075	0.075	6	43.5		43.5				19.740		3/3	
3/3	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.101	0.101	6	58.6	23.8	82.4				31.731	23.802	4/3	
4/3	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.039	0.039	6	22.6	50.7	73.3		1.656	0.076	29.005	50.707	5/3	
5/3	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.070	0.070	6	40.6	44.3	73.3		1.656	0.076	28.996	32.681	6/3	
6/3	Road	GGP KI 1.8 2%				6.00		6.00	209.0	1.000		0.079	0.079	6	45.9	44.3	75.3		1.753	0.079	29.598	29.464	7/3	
7/3	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.077	0.077	6	44.7	45.7	85.1		2.046	0.088	33.044	40.445	8/3	
8/3	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.065	0.065	6	37.7	52.1	79.2		2.183	0.092	31.274	41.510	9/3	
9/3	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.068	0.068	6	39.5	48.0	75.6		2.144	0.091	30.175	36.105	10/3	
10/3	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.059	0.059	6	34.3	45.4	68.5		2.046	0.088	28.052	34.253	11/3	
11/3	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.058	0.058	6	33.7	40.5	65.2		2.007	0.087	27.062	31.536	15/2	
11/5		GGP KI 1.8 1%						6.00	209.0	0.933		0.158	0.169	6	91.6	71.8	163.3		2.769	0.110	52.930	71.760	12/5	
	Road					6.00		6.00		1.000		0.034	0.034											
	Lot					6.00		6.00		0.916		0.124	0.135											
12/5		GGP KI 2.4 SAG						6.00	209.0	0.939		0.064	0.068	6	37.1	110.4	90.6		Sag	0.269	45.307	53.563		
	Road					6.00		6.00		1.000		0.018	0.018			53.6							13/5	
	Lot					6.00		6.00		0.916		0.046	0.050											
13/5	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.003	0.003	6	1.7	45.3	10.7		0.795	0.050	5.370	8.999		
																14.0							14/5	
																9.0								
14/5	Road	GGP KI 2.4 SAG				6.00		6.00	209.0	1.000		0.066	0.066	6	38.3	5.4	43.7		Sag	0.130	21.843	5.370	15/5	
15/5	Road	GGP KI 2.4 SAG				6.00		6.00	209.0	1.000		0.036	0.036	6	20.9	21.8	40.5		Sag	0.120	20.247	19.594	10/2	
1/14		GGP KI 1.8 1%						6.00	209.0	0.934		0.142	0.152	6	82.4		82.4		2.092	0.089	32.226		2/14	
	Road					6.00		6.00		1.000		0.032	0.032											
	Lot					6.00		6.00		0.916		0.110	0.120											
2/14		GGP KI 2.4 SAG						6.00	209.0	0.952		0.098	0.103	6	56.9	50.2	107.1		Sag	0.318	53.563	50.193	12/5	
	Road					6.00		6.00		1.000		0.044	0.044											
	Lot					6.00		6.00		0.916		0.054	0.059											
10/15	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.003	0.003	6	1.7	19.9	27.7		1.343	0.067	13.473	25.976		
																26.0							11/15	
11/15		GGP KI 2.4 SAG						6.00	209.0	0.948		0.131	0.138	6	75.9	14.2	77.1		Sag	0.229	38.551	1.161	12/15	
	Road					6.00		6.00		1.000		0.052	0.052											
	Lot					6.00		6.00		0.916		0.079	0.086											
12/15		GGP KI 1.8 1%						6.00	209.0	0.964		0.080	0.083	6	46.4	38.6	58.5		1.902	0.084	24.985	12.092		
	Road					6.00		6.00		1.000		0.047	0.047			40.2							13/15	
	Lot					6.00		6.00		0.916		0.033	0.036			12.1								
13/15	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.031	0.031	6	18.0	33.5	18.0		1.101	0.060	8.999			
																23.8							13/5	
1/27		GGP KI 1.8 1%						6.00	209.0	0.935		0.131	0.140	6	76.0		76.0		2.131	0.090	30.310		2/27	
	Road					6.00		6.00		1.000		0.032	0.032											
	Lot					6.00		6.00		0.916		0.099	0.108											
2/27	Road	GGP KI 1.8 1%				6.00		6.00	209.0	1.000		0.002	0.002	6	1.2	45.7	46.9		1.711	0.078	20.910	45.724	10/15	

HYDROLOGIC DESIGN TABLE - 6 Return Period: 20 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)
1/29		GGP KI 1.8 1%						6.00	158.0	0.880	0.087	0.077	6	33.6		33.6	1.000	1.460	0.070	15.933		2/29	
	Road					6.00		6.00		0.916	0.031	0.028											
	Med Density					6.00		6.00		0.859	0.056	0.048											
2/29	Road	GGP KI 1.8 1%				6.00		6.00	158.0	0.916	0.041	0.038	6	16.5	17.6	16.5	1.000	1.024	0.057	8.245			
																						12/15	
1/30		GGP KI 1.8 1%						6.00	158.0	0.875	0.119	0.104	6	45.7		45.7	1.000	1.695	0.077	20.503		12/15	
	Road					6.00		6.00		0.916	0.034	0.031											
	Med Density					6.00		6.00		0.859	0.085	0.073											
1/31		GGP KI 1.8 1%						6.00	158.0	0.873	0.076	0.066	6	29.1		29.1	1.000	1.382	0.068	14.110		13/15	
	Road					6.00		6.00		0.916	0.019	0.017											
	Med Density					6.00		6.00		0.859	0.057	0.049											
1/33	Road	GGP KI 1.8 1%				6.00		6.00	158.0	0.916	0.047	0.043	6	18.9		18.9	1.000	1.109	0.060	9.451		13/5	

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 1/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CC/V No: 100012
Environmental Planning and Assessment Act
Erica Hendfield
PENRITH CITY COUNCIL

Plotted: 7 May 2010 10:57:43 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC29.dwg

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
DRAINAGE CALCULATIONS (2 OF 3)

PLAN No. 8634CC29 D
FILE No. 8634CC29
SHEET 29 OF 51 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDROLOGIC DESIGN TABLE - 6 Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
		(m)	(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
A/4		Stub							136.0											0.000				
B/4		JP 600x600							136.0											0.000		1/5		
1/5	Road	GGP KI 1.8 3%				6.00		6.00	136.0	0.873	0.026	0.023	6	8.6		8.6	3.409	0.422	0.038	4.286		2/5		
2/5		GGP KI 1.8 3%						6.00	136.0	0.695	0.139	0.097	6	36.5	4.3	40.8	3.500	1.196	0.062	18.770	4.286	3/5		
	Road					6.00		6.00		0.873	0.036	0.031												
	Lot					6.00		6.00		0.764	0.004	0.003												
	Park					6.00		6.00		0.627	0.099	0.062												
3/5		GGP KI 1.8 3%						6.00	136.0	0.786	0.163	0.128	6	48.4	22.0	76.9	3.500	1.635	0.076	30.578	28.503			
	Road					6.00		6.00		0.873	0.034	0.030			28.5							4/5		
	Lot					6.00		6.00		0.764	0.129	0.099												
4/5		**GGP KI 1.8 3%**						**6.00**	**136.0**	**0.788**	**0.193**	**0.152**	**6**	**57.3**	**46.3**	**76.9**	**3.500**	**1.635**	**0.076**	**30.580**	**19.606**			
	Road					6.00		6.00		0.873	0.040	0.035			19.6							5/5		
	Lot					6.00		6.00		0.764	0.153	0.117												
5/5	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.060	0.052	6	19.8	46.4	66.1	2.061	1.711	0.078	26.841	46.353	6/5		
6/5	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.032	0.028	6	10.6	39.3	49.8	2.061	1.499	0.071	21.946	39.295	7/5		
7/5	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3	27.9	18.0	1.275	0.992	0.056	9.021	11.778			
															11.8							8/5		
8/5		GGP KI 1.8 1%						6.00	136.0	0.784	0.120	0.094	6	35.5	9.0	38.3	1.275	1.499	0.071	17.831	2.802			
	Road					6.00		6.00		0.873	0.022	0.019			2.8							9/5		
	Lot					6.00		6.00		0.764	0.098	0.075												
9/5		GGP KI 1.8 1%						6.00	136.0	0.788	0.119	0.094	6	35.4	20.5	53.2	1.275	1.734	0.079	23.136	17.801			
	Road					6.00		6.00		0.873	0.027	0.024			17.8							10/5		
	Lot					6.00		6.00		0.764	0.092	0.070												
10/5		GGP KI 1.8 1%						6.00	136.0	0.784	0.133	0.104	6	39.4	30.1	59.1	1.275	1.812	0.081	25.195	19.730			
	Road					6.00		6.00		0.873	0.025	0.022			19.7							11/5		
	Lot					6.00		6.00		0.764	0.108	0.082												
1/6		GGP KI 1.8 3%						6.00	136.0	0.786	0.171	0.134	6	50.8		50.8	3.500	1.343	0.067	22.271		3/5		
	Road					6.00		6.00		0.873	0.035	0.031												
						6.00		6.00		0.764	0.136	0.104												
1/7		GGP KI 1.8 3%						6.00	136.0	0.799	0.122	0.098	6	36.8		36.8	3.500	1.148	0.061	17.238		4/5		
	Road					6.00		6.00		0.873	0.040	0.035												
	Lot					6.00		6.00		0.764	0.082	0.063												
1/8		GGP KI 1.8 1%						6.00	136.0	0.813	0.104	0.085	6	31.9		31.9	1.000	1.444	0.070	15.276		2/8		
	Road					6.00		6.00		0.873	0.047	0.041												
	Lot					6.00		6.00		0.764	0.057	0.044												
2/8	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9	16.7	21.6	1.000	1.187	0.062	10.724	16.664	3/8		
3/8	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.029	0.025	6	9.6	10.9	37.2	0.145	Sag	0.111	18.618	27.674			
															27.7							4/8		
4/8	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6	18.6	23.2	1.275	1.177	0.062	11.455	18.618	7/5		
1/9		GGP KI 2.4 SAG						6.00	136.0	0.801	0.183	0.147	6	55.3		55.3	0.145	Sag	0.164	27.674		3/8		
	Road					6.00		6.00		0.873	0.062	0.054												
	Lot					6.00		6.00		0.764	0.121	0.092												
D/10	Lot	JP 600x600				6.00		6.00	136.0	0.873	0.046	0.040	6	15.2						0.000		1/11		
C/10	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		D/10		
B/10	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		C/10		
A/10	Lot	Stub				6.00		6.00	136.0	0.764	0.057	0.044	6	16.4		0.0						B/10		
1/11	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.017	0.015	6	5.6		5.6	1.275	0.412	0.037	2.802		8/5		
1/12		GGP KI 1.8 1%						6.00	136.0	0.793	0.113	0.090	6	33.8		33.8	1.275	1.406	0.069	16.034		9/5		
	Road					6.00		6.00		0.873	0.030	0.026												
	Lot					6.00		6.00		0.764	0.083	0.063												
1/13		GGP KI 1.8 1%						6.00	136.0	0.785	0.125	0.098	6	37.1		37.1	1.275	1.482	0.071	17.320		10/5		
	Road					6.00		6.00		0.873	0.024	0.021												
	Lot					6.00		6.00		0.764	0.101	0.077												
1/15		GGP KI 2.4 SAG						6.00	136.0	0.873	0.093	0.081	6	30.7		30.7	0.051	Sag	0.091	15.331		2/15		
	Road					6.00		6.00		0.873	0.051	0.045												
	Road					6.00		6.00		0.873	0.042	0.037												
2/15	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.013	0.011	6	4.3	15.3	8.5	3.000	0.412	0.037	4.245	4.204			
															4.9							3/15		
															4.2									
3/15	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9	4.2	5.9	2.601	0.361	0.032	2.967				
															3.1							4/15		
4/15		GGP KI 1.8 1%						6.00	136.0	0.789	0.172	0.136	6	51.3	3.0	83.8	1.750	1.959	0.085	32.653	32.575			
	Lot					6.00		6.00		0.764	0.132	0.101			32.6							5/15		
	Road					6.00		6.00		0.873	0.040	0.035												
5/15		GGP KI 1.8 2%						6.00	136.0	0.795	0.119	0.095	6	35.7	51.2	58.6	3.000	1.482	0.071	24.567	22.824			
	Road					6.00		6.00		0.873	0.034	0.030			22.8							6/15		
	Lot					6.00		6.00		0.764	0.085	0.065												
6/15	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6	34.0	12.1	1.000	0.835	0.052	6.052	7.489			
															7.5							7/15		
7/15	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.024	0.021	6	7.9	6.1	10.9	1.000	0.835	0.052	5.440	2.967			
															3.0							8/15		
8/15	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9	5.4	18.6	1.000	1.070	0.059	9.301	12.668			
															12.7							9/15		
1/16	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.025	0.022	6	8.2		8.2	0.422	0.835	0.052	4.121		2/16		
2/16	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.013	0.011	6	4.3	4.1	8.4	3.000	0.422	0.038	4.204	4.121	2/15		
1/17	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.030	0.026	6	9.9		9.9	0.576	0.835	0.052	4.945		2/15		
B/18	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000		3/15		
A/18	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/18		
B/19		JP 600x600							136.0											0.000		1/34		
A/19		Stub							136.0											0.000				
1/34	Road	GGP KI 1.8 2%				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3		6.3	2.601	0.369	0.033	3.132		3/15		
1/20		GGP KI 1.8 1%						6.00	136.0	0.786	0.192	0.151	6	57.0		57.0	1.750	1.656	0.076	24.463		4/15		
	Road					6.00		6.00		0.873	0.040	0.035												
	Lot					6.00		6.00		0.764	0.152	0.116												
1/21		GGP KI 1.8 2%						6.00	136.0	0.789	0.141	0.111	6	42.0		42.0	3.000	1.265	0.064	19.213		5/15		
	Road					6.00		6.00		0.873	0.033	0.029												
	Lot					6.00		6.00		0.764	0.108	0.082												
1/22		GGP KI 1.8 1%						6.00	136.0	0.804	0.082	0.066	6	24.9		24.9	1.000	1.291	0.065	12.202		2/22		
	Road					6.00		6.00		0.873	0.030	0.026												
	Lot					6.00		6.00		0.764	0.052	0.040												
2/22	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.024	0.021	6	7.9	12.7	20.6	1.000	1.148	0.061	10.272	12.691	3/22		
3/22	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.024	0.021	6	7.9	10.3	18.1	1.000	1.070	0.059	9.044	10.175			
															10.2							4/22		
4/22	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9	9.0	15.0	1.000	0.948	0.055	7.489	9.044	6/15		
1/23		GGP KI 1.8 1%						6.00	136.0	0.803	0.067	0.054	6	20.3		20.3	1.000	1.177	0.062	10.143		3/22		
	Road					6.00		6.00		0.873	0.024	0.021												
	Lot					6.00		6.00		0.764	0.043	0.033												
A/24	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/24		
B/24	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.052	0.040	6	15.0						0.000		1/25		

HYDROLOGIC DESIGN TABLE - 6 Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
		(m)	(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
1/25	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9		5.9	1.000	0.490	0.041	2.967		7/15		
1/26		GGP KI 1.8 1%						6.00	136.0	0.793	0.083	0.066	6	24.9		24.9	1.000	1.253	0.064	12.183		8/15		
	Road					6.00		6.00		0.873	0.022	0.019												
	Lot					6.00		6.00		0.764	0.061	0.047												
		GGP KI 1.8 1%																						
		JP 600x600																						
C/32	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		D/32		
F/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000		G/32		
H/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.034	0.026	6	9.8						0.000		13/15		
D/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		E/32		
A/32	lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/32		
E/32	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		F/32		
B/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.044	0.034	6	12.7						0.000		C/32		
G/32	Lot	Stub				6.00		6.00	136.0	0.764	0.040	0.031	6	11.5						0.000		H/32		
1/35		GGP KI 1.8 1%						6.00	136.0	0.899	1.047	0.941	6	355.5		15.5	1.929	0.835	0.052	7.748		2/35		
	Road					6.00		6.00		0.873	0.047	0.041												
	Commercial					6.00		6.00		0.900	1.000	0.900												
2/35	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.047	0.041	6	15.5	7.7	23.2	1.927	1.053	0.058	11.460	7.748	3/35		
3/35	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5	11.8	24.7				12.127	8.242			
															8.2							4/35		
4/35	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.027	0.024	6	8.9	12.6	13.4	2.000	0.730	0.048	6.676	4.451			
															4.5							14/2		
1/36		GGP KI 1.8 1%						6.00	136.0	0.889	0.124	0.110	6	41.6		16.5	2.000	0.835	0.052	8.242		3/35		
	Road					6.00		6.00		0.873	0.050	0.044												
	Commercial					6.00		6.00		0.900	0.074	0.067												
1/37		GGP KI 1.8 1%						6.00	136.0	0.895	0.153	0.137	6	51.7		8.9	2.000	0.532	0.042	4.451		4/35		
	Road					6.00		6.00		0.873	0.027	0.024												
	Commercial					6.00		6.00		0.900	0.126	0.113												
1/38		GSIP 1200x1200						6.00	136.0	0.831	0.514	0.427	6	161.3		0.0				0.000		2/38		
	Park					6.00		6.00		0.627	0.088	0.055												
	Road					6.00		6.00		0.873	0.426	0.372												
2/38		GGP KI 1.8 1%						6.00	136.0	0.873	0.114	0.099	6	37.6		37.1	1.587	1.402	0.069	17.331		3/38		
	Road					6.00		6.00		0.873	0.038	0.033												
	Road					6.00		6.00		0.873	0.076	0.066												
3/38		GGP KI 1.8 3%						6.00	136.0	0.787	0.108	0.085	6	32.1	19.7	51.9	3.367	1.368	0.068	22.648	19.746	4/38		
	Lot					6.00		6.00		0.764	0.085	0.065												
	Road					6.00		6.00		0.873	0.023	0.020												
4/38	Road	GGP KI 1.8 3%				6.00		6.00	136.0	0.873	0.031	0.027	6	10.2	29.2	10.2	3.017	0.448	0.040	5.110				
																						5/38		
5/38		GGP KI 1.8 1%						6.00	136.0	0.789	0.131	0.103	6	39.0	5.1	67.5	1.310	1.910	0.084	27.759	28.503			
	Road					6.00		6.00		0.873	0.030	0.026										6/38		
	Lot					6.00		6.00		0.764	0.101	0.077												
6/38		GGP KI 1.8 1%						6.00	136.0	0.788	0.080	0.063	6	23.8	39.8	26.6	1.600	1.187	0.062	12.981	2.802			
	Road					6.00		6.00		0.873	0.018	0.016										7/38		
	Lot					6.00		6.00		0.764	0.062	0.047												
7/38		GGP KI 1.8 1%						6.00	136.0	0.803	0.138	0.111	6	41.9	13.6	52.3	1.500	1.656	0.076	22.812	10.449			
	Lot					6.00		6.00		0.764	0.088	0.067										8/38		
	Road					6.00		6.00		0.873	0.050	0.044												
8/38	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.008	0.007	6	2.6	29.5	5.3	1.227	0.422	0.038	2.638	2.638			
															2.6							9/38		
B/39	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000		4/38		
A/39	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/39		
A/40	Lot	Stub				6.00		6.00	136.0	0.764	0.040	0.031	6	11.5						0.000		B/40		
E/40	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.054	0.041	6	15.6		0.0				0.000		F/40		
B/40	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		C/40		
F/40		JP 600x600							136.0											0.000		1/41		
D/40	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		E/40		
C/40	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000		D/40		
1/41		GGP KI 1.8 1%						6.00	136.0	0.786	0.171	0.134	6	50.8		50.8	1.310	1.673	0.077	22.271		5/38		
	Road					6.00		6.00		0.873	0.035	0.031												
	Lot					6.00		6.00		0.764	0.136	0.104												
1/42	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.017	0.015	6	5.6		5.6	1.597	0.412	0.037	2.802		6/38		
1/43	Combined	GGP KI 1.8 3%				6.00		6.00	136.0	0.791	0.185	0.146	6	55.3		55.3	3.092	1.444	0.070	23.847		2/43		
2/43		GGP KI 1.8 3%							136.0						31.4	31.4	3.092	1.070	0.059	15.072	31.430	3/43		
3/43	Road	GGP KI 1.8 3%				6.00		6.00	136.0	0.873	0.038	0.031	6	11.9	16.4	30.2	3.092	1.031	0.057	14.566	18.296			
															18.3							4/43		
4/43	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.054	0.047	6	17.8	15.6	56.5	3.092	Sag	0.168	28.262	38.719			
															38.7							5/43		
5/43		GGP KI 1.8 1%							136.0						28.3	28.3	1.247	1.304	0.066	13.718	28.262	1/68		
6/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3	39.0	45.2	1.341	1.596	0.074	20.332	38.970	7/43		
7/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.024	0.021	6	7.9	37.1	32.8	1.500	1.329	0.066	15.626	24.902			
															24.9							8/43		
8/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.011	0.010	6	3.6	17.2	20.8	1.500	1.024	0.057	10.367	17.189	7/38		
1/44		GGP KI 1.8 3%						6.00	136.0	0.791	0.116	0.092	6	34.7		34.7	3.092	1.139	0.061	16.364		3/43		
	Road					6.00		6.00		0.873	0.029	0.025												
	Lot					6.00		6.00		0.764	0.087	0.066												
1/45		GGP KI 2.4 SAG						6.00	136.0	0.791	0.259	0.205	6	77.4		77.4	3.092	Sag	0.230	38.719		4/43		
	Road					6.00		6.00		0.873	0.066	0.058												
	Lot					6.00		6.00		0.764	0.193	0.147												
1/46	Combined	GGP KI 1.8 1%				6.00		6.00	136.0	0.791	0.381	0.301	6	113.8	97.9	97.9	1.000	2.359	0.097	36.480	97.920	2/46		
2/46	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9	61.4	66.4	1.000	2.016	0.087	27.416	61.440	6/43		
1/47	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.016	0.014	6	5.3		5.3	1.245	0.412	0.037	2.638		8/38		
1/68		GGP KI 1.8 1%						6.00	136.0	0.788	0.165	0.130	6	49.1	14.5	63.7	1.500	1.812	0.081	26.601	14.544	7/43		
	Road					6.00		6.00		0.873	0.037	0.032												
	Lot					6.00		6.00		0.764	0.128	0.098												

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Edmann REGISTERED SURVEYOR

This plan/document relates to DA No: COX No: 090809 100012 Environmental Planning and Assessment Act Eric Hendekeld PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

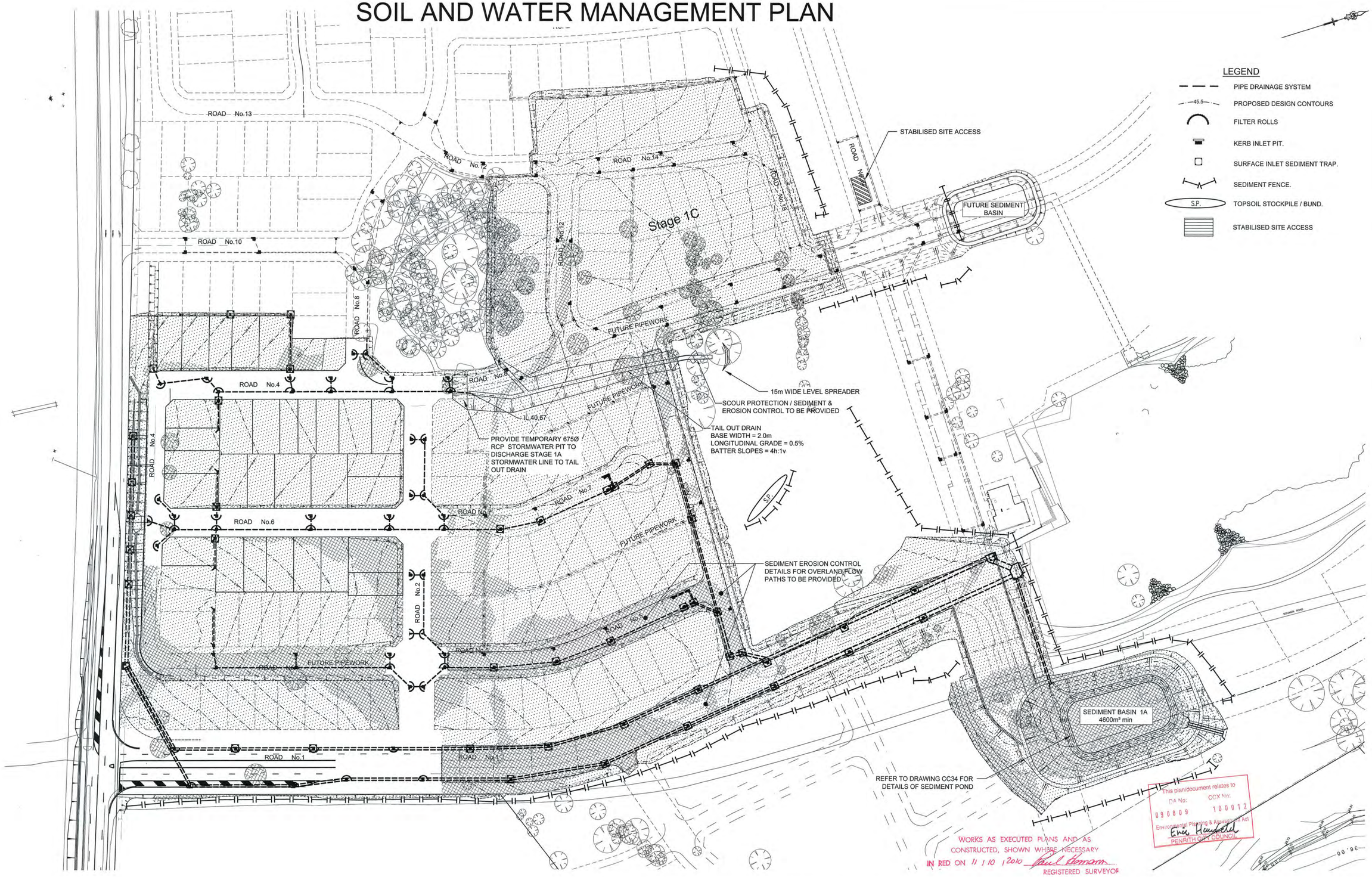
THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

| ISSUE | AMEN

SOIL AND WATER MANAGEMENT PLAN



This plan/document relates to DA No: 090809 CCX No: 100012
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010
REGISTERED SURVEYOR

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1A
SOIL & WATER MANAGEMENT PLAN

PLAN No. 8634CC31 D
FILE No. 8634CC31
SHEET 31 OF 51 SHEETS

Plotted: 7 May 2010 10:59:09 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC31.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

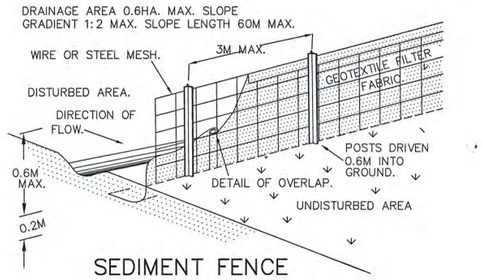
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

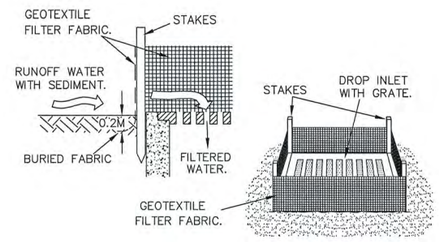
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

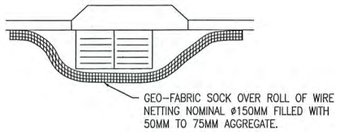
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

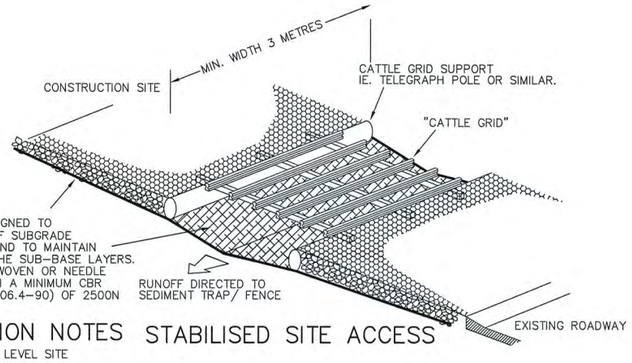


SEDIMENT FENCE
N.T.S.



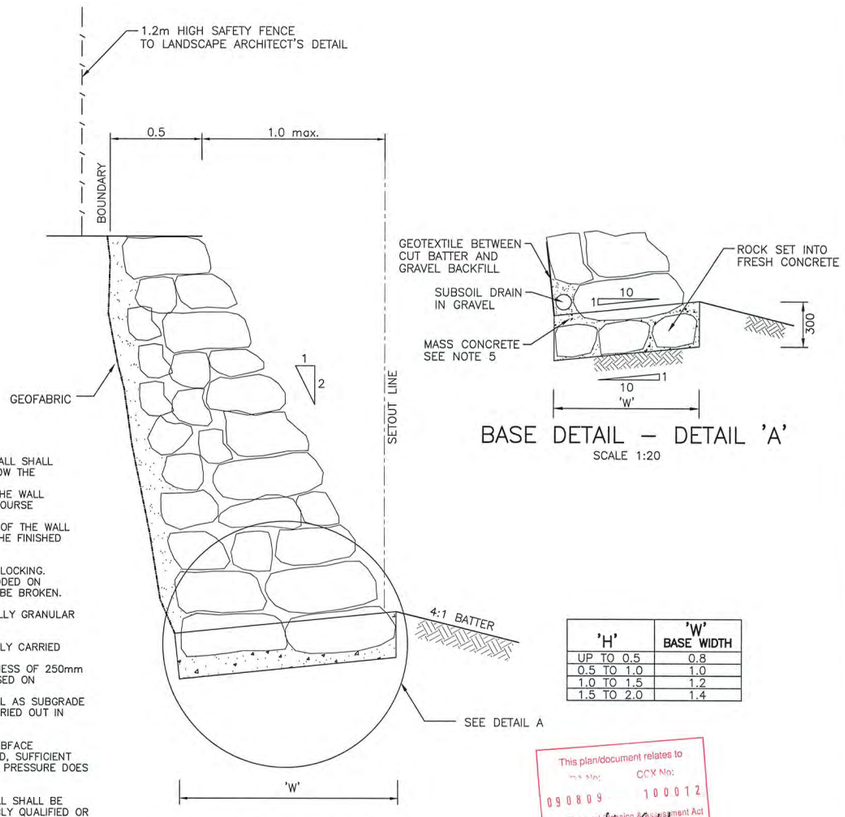
GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.





CONSTRUCTION NOTES STABILISED SITE ACCESS

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.



BASE DETAIL - DETAIL 'A'
SCALE 1:20

'H'	'W' BASE WIDTH
UP TO 0.5	0.8
0.5 TO 1.0	1.0
1.0 TO 1.5	1.2
1.5 TO 2.0	1.4

ROCK RETAINING WALL
SCALE 1:25

ROCK RETAINING WALL NOTES:

1. NATURE OF FOUNDATION:
   THE WALL MAY BE PLACED ON SUITABLE SOIL FOUNDATIONS. SUITABLE FOUNDING SOILS WOULD NORMALLY BE RESIDUAL SANDSTONE OR OTHER DENSE CLAYEY SANDS. CLEAN SANDS, SILTY SANDS OR HIGH CLAY CONTENT SOILS SUCH AS RESIDUAL SHALE ARE GENERALLY UNACCEPTABLE AS FOUNDING MATERIALS FOR ROCK RETAINING WALLS.
2. DRAINAGE:
   DRAINAGE OF THE WALL FOUNDATION SHALL BE ACHIEVED BY INSTALLING A CONTINUOUS 150mm DIAMETER SUBSOIL DRAIN AT THE REAR OF THE WALL WHERE THE WALL FOUNDATION CONSISTS OF SOIL OR WHERE THE WALL HEIGHT EXCEEDS 3m.
   ALL SURFACE RUNOFF SHALL BE DIRECTED AWAY FROM THE BACK OF THE WALL SO AS TO PREVENT INFILTRATION OF SUCH SURFACE RUNOFF INTO THE GRANULAR BACKFILL.
   IN THE CASE OF WALLS FOUNDED ON SOIL THE SURFACE RUNOFF SHALL BE DIRECTED SO AS TO PREVENT EROSION AND POSSIBLE UNDERCUTTING ALONG THE TOE OF THE WALL.
3. MATERIALS:
   MATERIALS USED FOR CONSTRUCTION OF THE WALL SHALL BE LARGE, COMPETENT BOULDERS, IN GENERAL AT LEAST 0.5 SQUARE METRES IN PLAN AREA.
4. FOUNDATION PREPARATION - ROCK:
   WHERE THE WALL IS FOUNDED ON BEDROCK THE PREPARATION OF THE FOUNDATION SHALL INCLUDE THE REMOVAL OF ALL LOOSE ROCK AND SOIL. ANY IRREGULARITIES IN THE LEVEL OF THE BEDROCK SHALL BE FILLED WITH MASS CONCRETE.
5. FOUNDATION PREPARATION - SOIL:
   FOR HEIGHTS UP TO 2.0m EXCAVATE AT LEAST 300mm TO EXPOSE FIRM, NATURAL UNDISTURBED GROUND, AT LEAST 150KPa SLOPE TRENCH AT 1:10 BACK INTO CUT. PLACE FIRST LAYER OF ROCKS DIRECTLY ONTO BASE OF TRENCH, THEN COVER WITH 15 MPA MASSCONCRETE UP TO AT LEAST THE LEVEL OF FINISHED GROUND AT THE TOE OF WALL.
   FOR HEIGHTS BETWEEN 2.0m AND 4.0m EXCAVATE TO DIMENSIONS AS PER SECTION. ENSURE BEARING ON FIRM, NATURAL , UNDISTURBED GROUND AT LEAST 150 KPa. PLACE REINFORCEMENT AND CONCRETE AS PER SECTION DETAIL. PLACE FIRST LAYER OF ROCK INTO FRESH CONCRETE, CONTINUE WITH ROCK PLACEMENT WHEN CONCRETE HAS CURED.
6. FOUNDATION DEPTH:
   WHERE THE WALL IS TO BE FOUNDED ON BEDROCK THE BASE OF THE WALL SHALL BE NOTCHED IN SOUND, INSITU ROCK A MINIMUM DEPTH OF 100mm BELOW THE FINISHED SURFACE LEVEL AT THE TOE OF THE WALL.
   WHERE ADDITIONAL RESISTANCE TO SLIDING IS REQUIRED THE BASE OF THE WALL SHALL BE LAID INTO THE FOUNDATION ROCK BY CONCRETING THE BASECOURSE OF BOULDERS.
   WHERE THE WALL IS TO BE FOUNDED ON A COMPACTED SOIL THE BASE OF THE WALL SHALL BE AT A LEVEL WHICH IS A MINIMUM DEPTH OF 400mm BELOW THE FINISHED LEVEL AT THE TOE OF THE WALL.
7. PLACEMENT OF ROCK:
   ROCK IS TO BE PLACED TO ENSURE THAT INDIVIDUAL BLOCKS ARE INTERLOCKING. TO ACHIEVE THIS, BLOCKS SHOULD BE LAID ROUGHLY COURSED AND BEDDED ON THEIR BROADEST BASES. ALL VERTICAL JOINTS BETWEEN BLOCKS SHALL BE BROKEN.
8. BACKFILL - MATERIALS:
   MATERIAL USED FOR BACKFILLING BEHIND THE WALL SHALL BE ESSENTIALLY GRANULAR CONSISTING OF RIPPED SANDSTONE OR GRAVELLY MATERIAL.
9. BACKFILL - COMPACTION:
   ANY COMPACTION OF FILL PLACED BEHIND THE WALL SHALL BE CAREFULLY CARRIED OUT TO MINIMISE THE INDUCED LATERAL STRESS AGAINST THE WALL.
   ALL FILL SHOULD BE PLACED IN LAYERS WITH A MAXIMUM LOOSE THICKNESS OF 250mm AND COMPACTED TO A DRY DENSITY RATIO OF NOT LESS THAN 95% BASED ON STANDARD COMPACTION.
   WHERE PAVEMENT CONSTRUCTION IS TO TAKE PLACE USING THE BACKFILL AS SUBGRADE MATERIAL, NEAR SURFACE COMPACTION OF THE BACKFILL SHALL BE CARRIED OUT IN ACCORDANCE WITH PAVEMENT COMPACTION REQUIREMENTS.
10. DRAINAGE:
    WHERE THE POTENTIAL EXISTS FOR SIGNIFICANT SURFACE RUNOFF OR SUBFACE GROUNDWATER FLOW OR WHERE A FREE DRAINAGE BACKFILL IS NOT USED, SUFFICIENT DRAINAGE MEASURES SHALL BE INCORPORATED TO ENSURE THAT WATER PRESSURE DOES NOT DEVELOP IN THE MATERIAL RETAINED BY THE WALL.
11. SLOPE STABILITY:
    WHERE REQUIRED THE OVERALL STABILITY OF THE SLOPE AND ROCK WALL SHALL BE EVALUATED. SUCH AN EVALUATION SHALL BE CARRIED OUT BY A SUITABLY QUALIFIED OR EXPERIENCED GEOTECHNICAL ENGINEER PRIOR TO COMMENCING PLACEMENT OF THE WALL ROCK.
12. APPURTENANT STRUCTURE:
    WHERE PIPES ARE TO PASS THROUGH OR BENEATH THE ROCK WALL THEY SHALL BE ENCASED IN CONCRETE TO ENSURE THAT THE BASE OF THE WALL FOUNDED IN COMPETENT MATERIAL.

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: CCV No: 090809 100012
Environmental Planning & Assessment Act
Eric Hounsell
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N.T.S.

JORDAN SPRINGS
STAGE 1A
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8634CC32 D
FILE No. 8634CC32
SHEET 32 OF 51 SHEETS

Plotted: 7 May 2010 10:59:15 AM File Name: J:\8634DI\CC - Engineering Construction Plans\Stage - 1A\8634CC32.dwg

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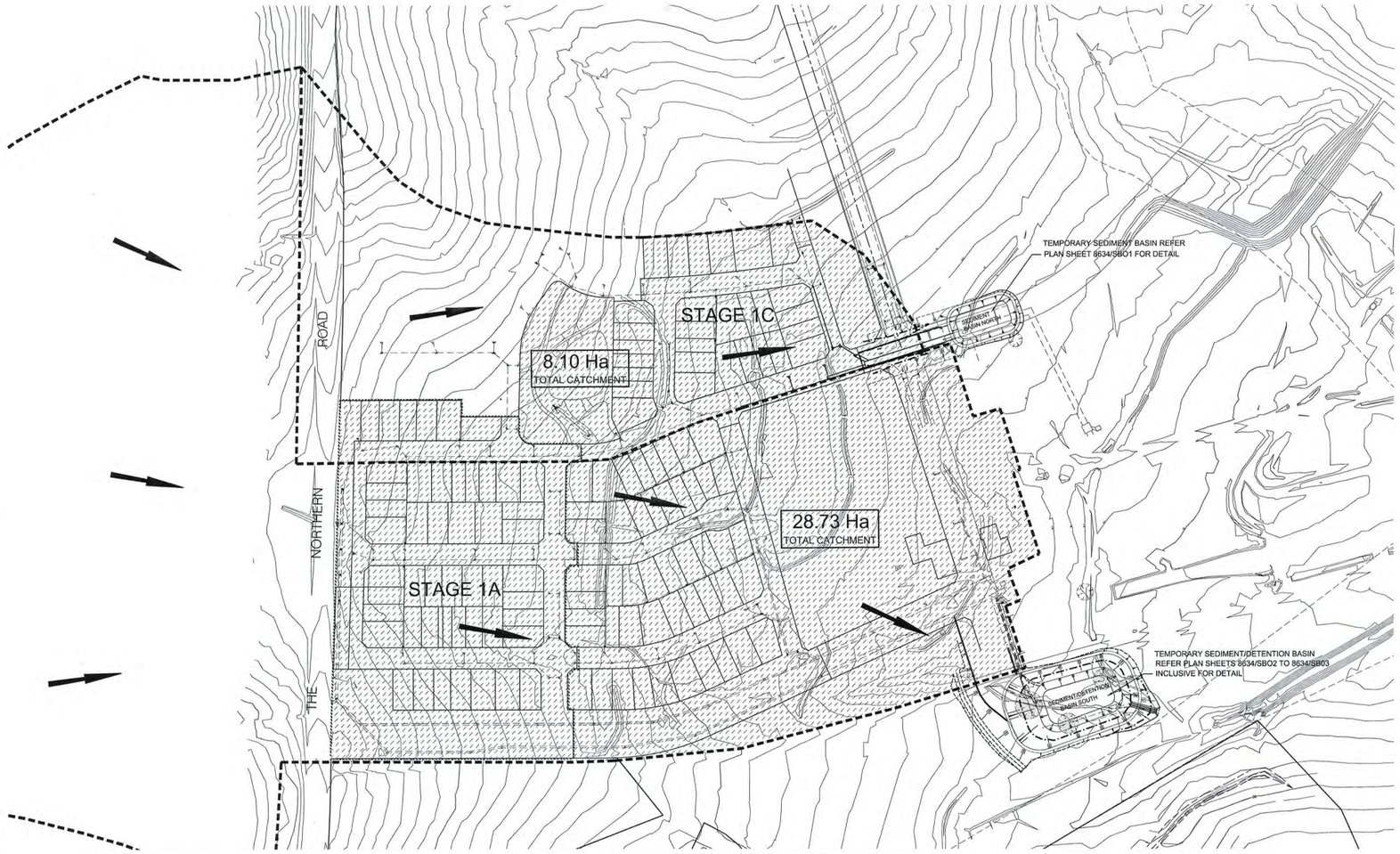
Version: 1, Version Date: 13/07/2018



STAGE 1C

SEDIMENT BASIN NORTH
VOLUME CALCULATIONS (TYPE D SOILS)

BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

SETTLING ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 75th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED FROM THE FOLLOWING:

$V = 10 * Cv * A * R$ (75th ile,5day) m^3

where

10 = CONVERSION FACTOR

Cv = 0.5 = THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5 DAY PERIOD.

R = 21.8 = IS THE 5 DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80 PERCENT OF RAINFALL EVENTS (SEE TABLE IN SEC.6.3.3 "MANAGING URBAN STORMWATER SOILS & CONSTRUCTION" 4th edition).

A = 8.1ha = AREA OF TOTAL CATCHMENT (ha)

$V = (10 \times 0.5 \times 8.1 \times 21.8) = 883m^3$

SEDIMENT STORAGE ZONE VOLUME

THE SEDIMENT STORAGE ZONE VOLUME CAN BE CALCULATED AS BEING EQUAL TO THE AVERAGE 2 MONTH SOIL LOSS FROM THE DISTURBED AREAS OF THE CATCHMENT. THIS VOLUME (V) IS DETERMINED BY THE REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE):

$V = 0.17 * A * (R * K * Ls * P * C) / 1.3$ m^3

where

0.17 = A FACTOR CONVERTING ANNUAL ESTIMATED SOIL LOSS TO THE 2 MONTH SOIL LOSS

R = 2,330 = RUSLE R FACTOR
K = 0.038 = RUSLE K FACTOR
Ls = 0.69 = RUSLE Ls FACTOR
P = 1.3 = RUSLE P FACTOR
C = 1 = RUSLE C FACTOR

(APPENDIX A "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION" 4th edition.)

1.3 = A FACTOR TO CONVERT TONNES TO CUBIC METRES BASED ON A TYPICAL DENSITY OF SATURATED SEDIMENT OF 1.3

THIS SITE IS ASSUMED TO BE IN A SOIL LANDSCAPE OF PENRITH WITH A K FACTOR OF 0.038

A = 8.1 = THE DISTURBED AREA (ha)

$V = 0.17 \times 8.1 \times (2330 \times 0.038 \times 0.69 \times 1.3 \times 1) / 1.3 = 84\ m^3$

LESS THAN 50% OF SETTLING ZONE AND THEREFORE:

SEDIMENT BASIN VOLUME REQUIRED = $883m^3 + 84m^3$

$V = 967\ m^3$

VOLUME AVAILABLE $1080m^3$

STAGE 1A & 1B

SEDIMENT BASIN SOUTH
VOLUME CALCULATIONS (TYPE D SOILS)

BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

SETTLING ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 75th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED FROM THE FOLLOWING:

$V = 10 * Cv * A * R$ (75th ile,5day) m^3

where

10 = CONVERSION FACTOR

Cv = 0.5 = THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5 DAY PERIOD.

R = 21.8 = IS THE 5 DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80 PERCENT OF RAINFALL EVENTS (SEE TABLE IN SEC.6.3.3 "MANAGING URBAN STORMWATER SOILS & CONSTRUCTION" 4th edition).

A = 28.73ha = AREA OF TOTAL CATCHMENT (ha)

$V = (10 \times 0.5 \times 28.73 \times 21.8) = 3132m^3$

SEDIMENT STORAGE ZONE VOLUME

THE SEDIMENT STORAGE ZONE VOLUME CAN BE CALCULATED AS BEING EQUAL TO THE AVERAGE 2 MONTH SOIL LOSS FROM THE DISTURBED AREAS OF THE CATCHMENT. THIS VOLUME (V) IS DETERMINED BY THE REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE):

$V = 0.17 * A * (R * K * Ls * P * C) / 1.3$ m^3

where

0.12 = A FACTOR CONVERTING ANNUAL ESTIMATED SOIL LOSS TO THE 2 MONTH SOIL LOSS

R = 2,330 = RUSLE R FACTOR
K = 0.038 = RUSLE K FACTOR
Ls = 1.22 = RUSLE Ls FACTOR
P = 1.3 = RUSLE P FACTOR
C = 1 = RUSLE C FACTOR

(APPENDIX A "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION" 4th edition.)

1.3 = A FACTOR TO CONVERT TONNES TO CUBIC METRES BASED ON A TYPICAL DENSITY OF SATURATED SEDIMENT OF 1.3

THIS SITE IS ASSUMED TO BE IN A SOIL LANDSCAPE OF PENRITH WITH A K FACTOR OF 0.038

A = 11.22 = THE DISTURBED AREA (ha)

$V = 0.17 \times 11.22 \times (2330 \times 0.038 \times 1.22 \times 1.3 \times 1) / 1.3 = 145\ m^3$

LESS THAN 50% OF SETTLING ZONE AND THEREFORE:

SEDIMENT BASIN VOLUME REQUIRED = $3132m^3 + 206m^3$

$V = 3338\ m^3$

VOLUME AVAILABLE $3619m^3$

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11 / 10 / 2010 Paul Norman REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 CCX No: 100012 Environmental Planning and Assessment Act PENRITH CITY COUNCIL

1:2000 (AT A1)

50 0 50 100 150 200 METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:500

JORDAN SPRINGS
STAGE 1A
NORTHERN & SOUTHERN BASIN
CATCHMENT PLAN & DRAINAGE CALCULATIONS

PLAN No. 8634CC33 D
FILE No. 8634CC33
SHEET 33 OF 51 SHEETS

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Version: 1, Version Date: 13/07/2018

NOTE:
ALL DISTURBED AREAS
TO BE GRASS SEEDED.

TEMPORARY DRAINAGE LINE
REFER PLAN SHEET 8634CC22
FOR DESIGN DETAIL

CONSTRUCT TEMPORARY SEDIMENT/DETENTION BASIN

SED. BASIN COMPONENT:
BASE RL = 32.00
TOP RL = 34.00
DEPTH = 2.00 m
VOLUME = 3342 cu.m

DETENTION COMPONENT:
BASE RL = 34.00
TOP RL = 36.00
TWL 1:100yr = 35.4
DEPTH = 2.00 m
VOLUME = 7075 cu.m

30m WIDE X 0.6m DEEP
OVERLAND FLOW CHANNEL

PROVIDE INLET WITH PACKED
ROCK SCOUR PROTECTION TO
SUIT DESIGN 1050Ø RCP

OUTLET INV RL.34.1
34.065

RL36.0

2.0m

1:4
BATTER

DETENTION BASE RL34.0

1V:5H
BATTER

RL36.0

B

A

PROVIDE 1.8m BLACK CHAIN
WIRE FENCE & POSTS
WITH DOUBLE GATES.

EXISTING
TREE

1V:3H CUT
BATTER

54.5

SEDIMENT BASE
RL 32.0

1:4
BATTER

PROVIDE 5m WIDE SPILLWAY RL35.40 WITH
ROLLED EROSION CONTROL PRODUCTS (RECP)
SHEET FLOW TREATMENT

EXTENT

34.5

INLET
INV.RL34.50
34.465

5.0

3 X 8250
RC PIPES @ 4%

20.0

ZONE

34.0

33.5

33.0

0.6%

OUTLET
INV.RL33.50

EXISTING
TREE

54.8

35.0

1V:1H
BATTER

PROVIDE RECP SHEET
FLOW TREATMENT

A

RL36.0

OUTLET
INV.RL33.70
33.71

CONSTRUCT TAILOUT DRAIN
IN EXISTING MATERIALS
(GRASS LINED)

1V:5H
BATTER

RL36.0

GRASS LINED
SWALE MIN. 1%

2.0m

B

35.0

RIPARIAN

34.0

33.5

33.5

35.0

WORKS AS EXECUTED PLANS AND AS
CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 11 / 10 / 2010
REGISTERED SURVEYOR

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CCX No: 100012
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:250 (AT A1)

5 0 5 10 15 20 25
METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1A
SEDIMENT/DETENTION BASIN SOUTH
DETAIL PLAN

PLAN No. 8634CC34 D
FILE No. 8634CC34
SHEET 34 OF 51 SHEETS

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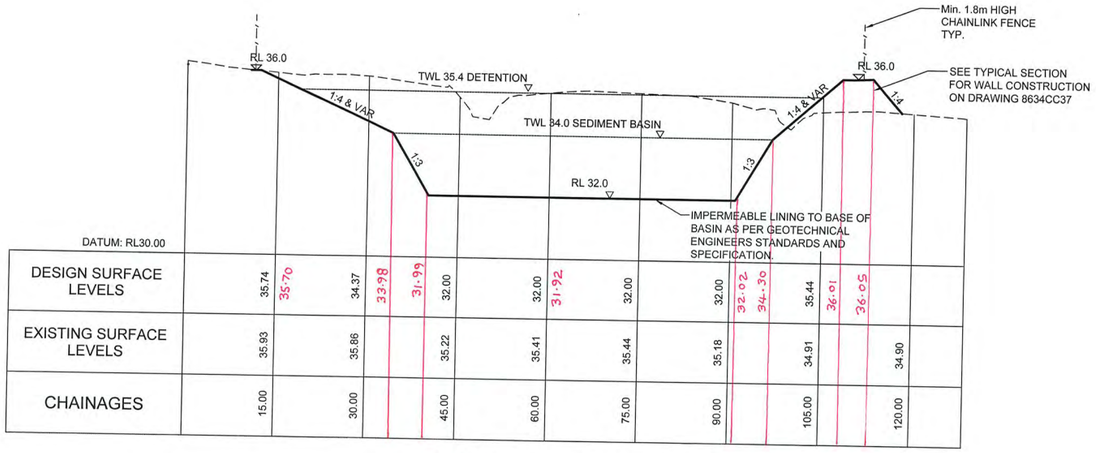
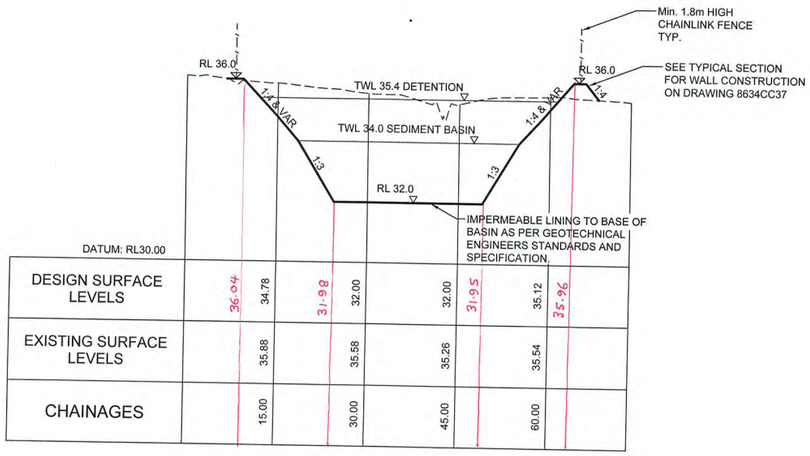


DESIGN SURFACE LEVELS	35.74	35.70	34.37	33.98	31.99	32.00	32.00	31.92	32.00	32.00	32.02	34.30	35.44	36.01	36.05
EXISTING SURFACE LEVELS	35.93		35.86			35.22	35.41		35.44	35.18			34.91		34.90
CHAINAGES	15.00		30.00			45.00	60.00		75.00	90.00			105.00		120.00

LONGITUDINAL SECTION A-A



DESIGN SURFACE LEVELS	36.04	34.78	31.98	32.00	32.00	31.95	35.12	35.96	
EXISTING SURFACE LEVELS		35.88		35.58	35.26		35.54		
CHAINAGES		15.00		30.00	45.00		60.00		

LONGITUDINAL SECTION B-B

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010
Paul Thomson
REGISTERED SURVEYOR

This plan/document relates to
DA No: 090809 CCX No: 100012
Environmental Planning and Assessment Act
Eric Plumfield
PENRITH CITY COUNCIL

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:250

CLIENT: Delfin Lend Lease

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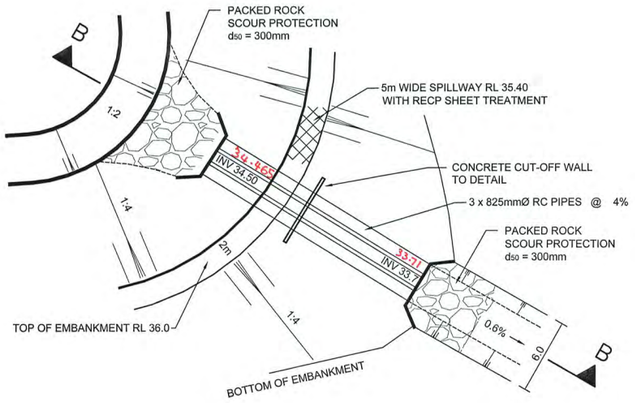
JORDAN SPRINGS
STAGE 1A
SEDIMENT/DETENTION BASIN SOUTH
SECTIONS A-A & B-B

PLAN No. 8634CC35 D
FILE No. 8634CC35
SHEET 35 OF 51 SHEETS

Plotted: 7 May 2010 10:59:49 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC35.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



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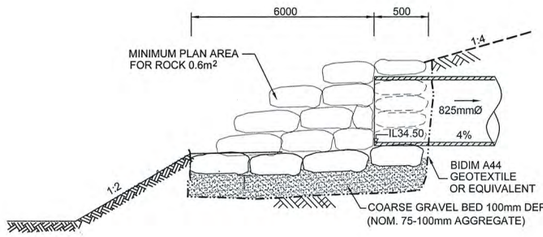

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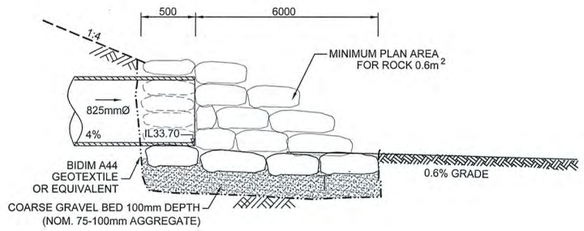
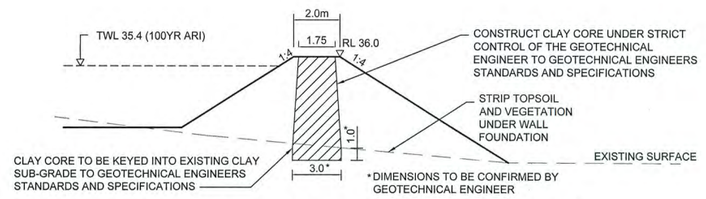
NTS



TYPICAL HEADWALL
OUTLET
NTS

SECTION B-B



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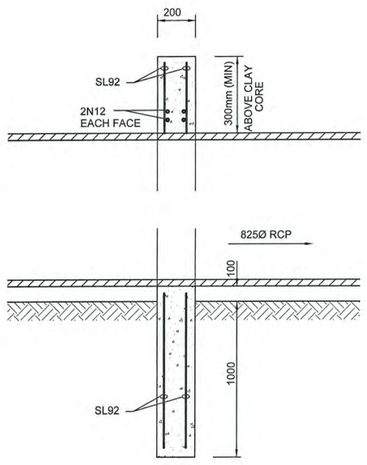

SECTION A-A
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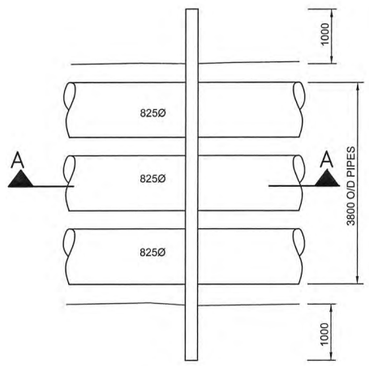

PLAN
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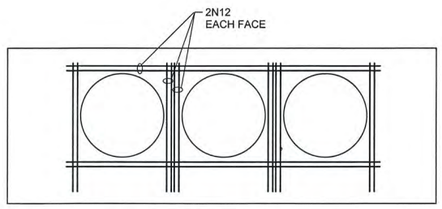

TYPICAL DETAIL
TRIMMER BARS
N.T.S

CONCRETE CUT-OFF WALL
STRUCTURE

1:250 5 0 5 10 15 20 25
METRES

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DEVELOPMENT STAGES OF SEDIMENT/DETENTION BASIN

STAGE 1: THE SEDIMENT/DETENTION BASIN IS TO BE FORMED PRIOR TO ROAD & DEVELOPMENT CONSTRUCTION AND IS TO REMAIN IN PLACE FOR THE ENTIRE DURATION WHEN CONSTRUCTION IS BEING CARRIED OUT WITHIN THE CATCHMENT.

STAGE 2: WHEN ALL UPSTREAM BUILDING ACTIVITIES HAVE BEEN COMPLETED THE SEDIMENTATION POND IS TO BE FULLY DECOMMISSIONED.

THE SEDIMENTATION POND HAS BEEN DESIGNED TO CAPTURE AND TREAT RUNOFF FROM UP TO 16 HECTARES OF CONCURRENTLY DISTURBED CATCHMENT WITHIN THE 61 HECTARES OF TOTAL CATCHMENT.

REFER TO INTERIM STORMWATER MANAGEMENT STRATEGY REPORT BY J.WYNDHAM PRINCE FOR NOTES RELEVANT TO THE OPERATION OF THE SEDIMENTATION POND.

EMBANKMENT NOTES

1. CONSTRUCT A CLAY CORE MINIMUM 3.0 m THICK, UNDER STRICT CONTROL OF THE GEOTECHNICAL ENGINEER, DESIGNED AND CONSTRUCTED TO GEOTECHNICAL ENGINEERS STANDARDS AND SPECIFICATIONS.
2. FORM EMBANKMENT AND WEIR WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL INCLUDING EXCAVATION FOR KEY AS DIRECTED.
3. COMPACT EXISTING CLAY SUB-GRADE AND EMBANKMENT MATERIAL IN 300mm DEEP LAYERS TO 98% (+2% -1%) STANDARD COMPACTION.
4. REFER TO DETAILS AT RIGHT FOR WEIR OVERFLOW FINISHING.
5. GRASS ALL SURFACES (OTHER THAN ROCK) WITH APPROVED TURF (COUCH).
6. ALL PIPES TO BE RUBBER RING JOINT WITHOUT LIFTING HOLES.
7. BACKFILLING AROUND PIPES SHALL BE WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL AND COMPACTED TO 98% (+2% -1%) STANDARD COMPACTION.

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:500 H
1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1A
SEDIMENT/DETENTION BASIN SOUTH
TYPICAL BASIN SECTIONS

PLAN No. 8634CC36 D
FILE No. 8634CC36
SHEET 36 OF 51 SHEETS

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Document Set ID: 8291178
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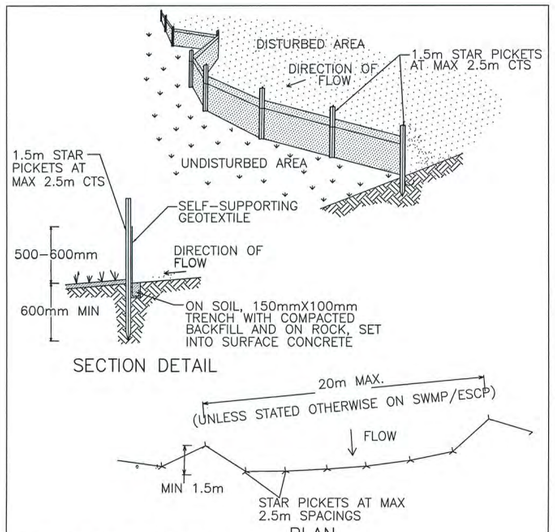


SECTION DETAIL

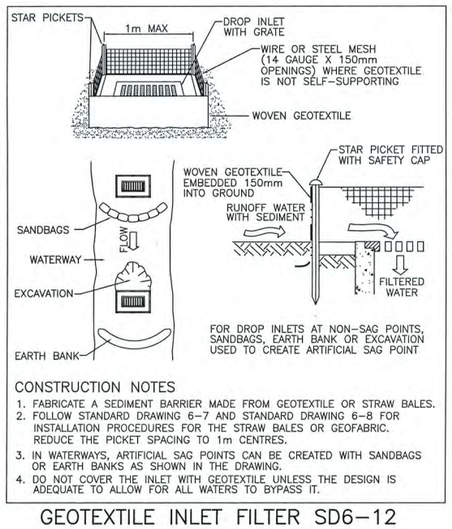
PLAN

CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS A 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 STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150-MM DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE SD6-8

N.T.S.

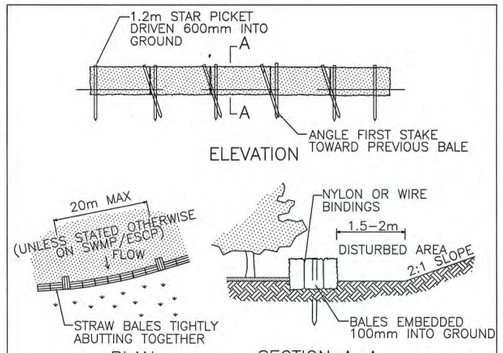


CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1m CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER SD6-12

N.T.S.

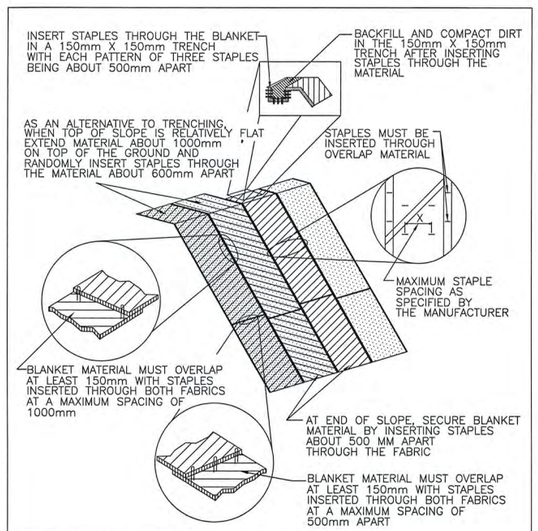


CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75-100mm AND ANCHOR WITH TWO 1.2m STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1-2m DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

STRAW BALE FILTER SD6-7

N.T.S.

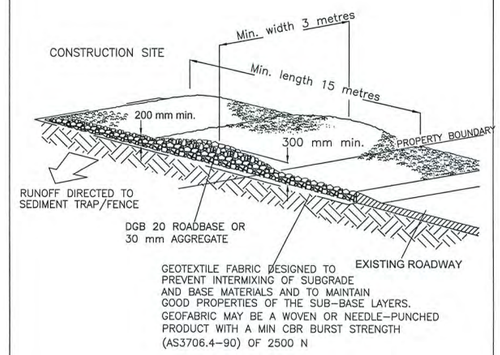


CONSTRUCTION NOTES

1. REMOVE ANY ROCKS, CLODS, STICKS OR GRASS FROM THE GROUND SURFACE BEFORE LAYING THE MATTING.
2. SPREAD TOPSOIL TO AT LEAST 75 MM DEPTH.
3. WHERE APPROPRIATE, COMPLETE FERTILISING AND SEEDING ON A PROPERLY PREPARED SEEDBED (STANDARD DRAWING 7-1) BEFORE LAYING THE MATTING.
4. ENSURE THE FABRIC CAN BE CONTINUOUSLY IN CONTACT WITH THE SOIL BY GRADING THE SURFACE CAREFULLY FIRST.
5. LAY THE MATTING IN "SHINGLE-FASHION" WITH THE ENDS OF EACH UPSTREAM ROLL OVERLAPPING THE NEXT ROLL DOWNSLOPE.
6. ENSURE SUFFICIENT STAPLES ARE USED TO MAINTAIN A GOOD CONTACT BETWEEN THE SOIL AND THE MATTING.

RECP:SHEET FLOW SD5-2

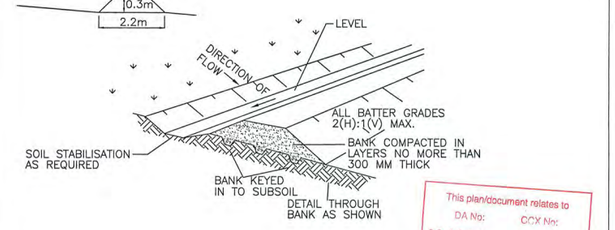
N.T.S.



CONSTRUCTION NOTES

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

STABILISED SITE ACCESS SD 6-14



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Environmental Planning and Assessment Act
Eric Hansford
PENRITH CITY COUNCIL

CONSTRUCTION NOTES

1. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
2. BUILD THE DRAINS WITH TRAPEZOIDAL CROSS SECTIONS, AT THE DIMENSIONS SHOWN ON THE DESIGN.
3. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
4. COMPLETE TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION FOLLOWING TABLE 5.2 IN LANDCOM (2004).
5. WHERE DISCHARGING TO ERODIBLE LANDS, ENSURE THEY OUTLET THROUGH A PROPERLY CONSTRUCTED LEVEL SPREADER.
6. CONSTRUCT THE LEVEL SPREADER AT THE LEVEL.
7. WHERE POSSIBLE, ENSURE THEY DISCHARGE WATERS ONTO EITHER STABILISED OR UNDISTURBED DISPOSAL SITES WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED. APPROVAL MIGHT BE REQUIRED TO DISCHARGE INTO OTHER SUBCATCHMENTS.

EARTH BANK (HIGH FLOWS) SD 5-6 (LEVEL SPREADER)

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DESIGNED A.M. DRAWN N.W. CHECKED K.N.

DATUM: AHD ORIGIN: SCALES: AS SHOWN

JORDAN SPRINGS
STAGE 1A
SEDIMENT/DETENTION BASIN SOUTH
BASIN SOIL & WATER MANAGEMENT DETAILS

PLAN No. 8634CC37 D
FILE No. 8634CC37
SHEET 37 OF 51 SHEETS

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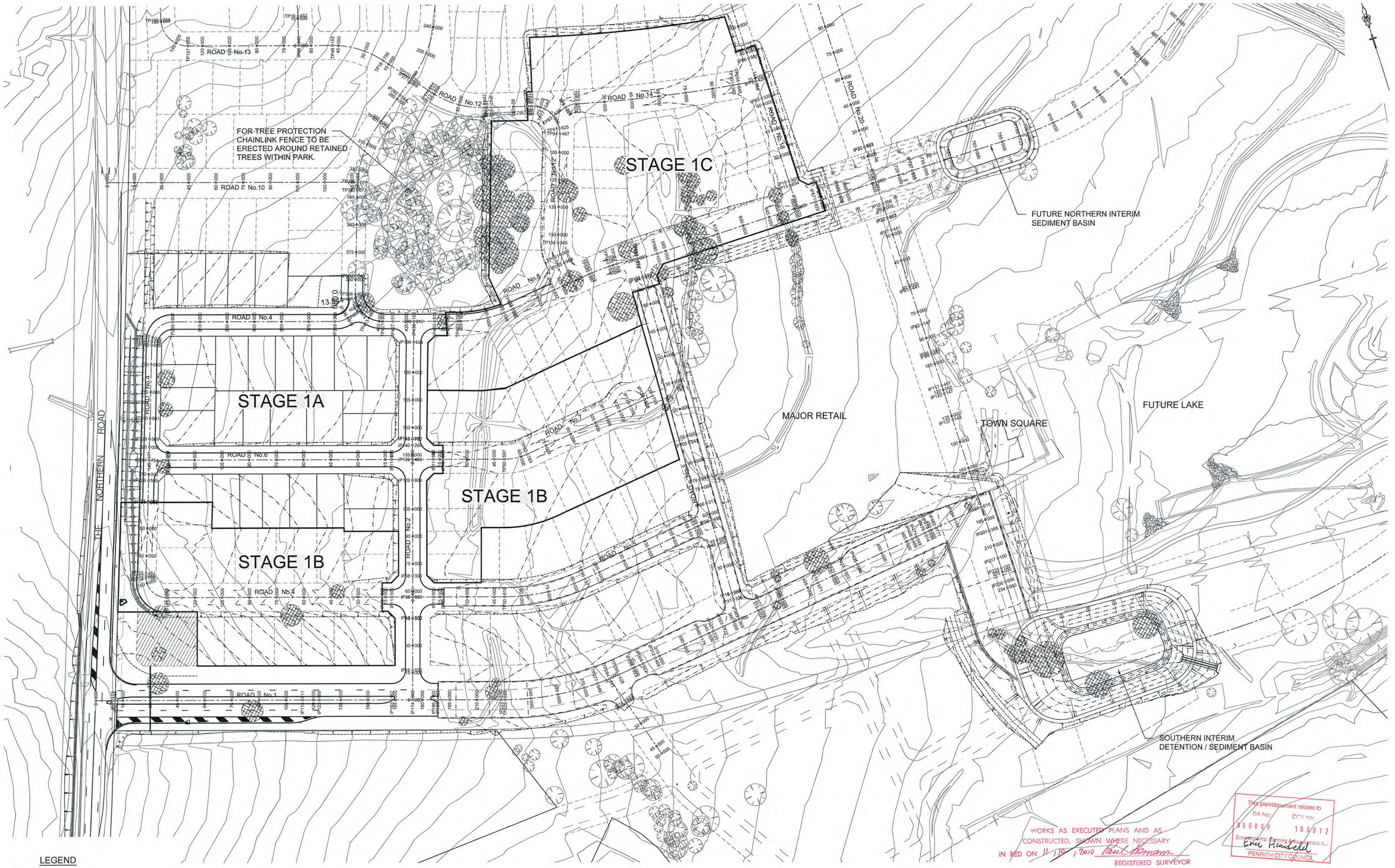

LEGEND

TREES TO BE REMOVED

TREES TO BE RETAINED

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N.T.S.

JORDAN SPRINGS
STAGE 1A
TREE MANAGEMENT PLAN

PLAN No. 8634CC38 D
FILE No. 8634CC38
SHEET 38 OF 51 SHEETS

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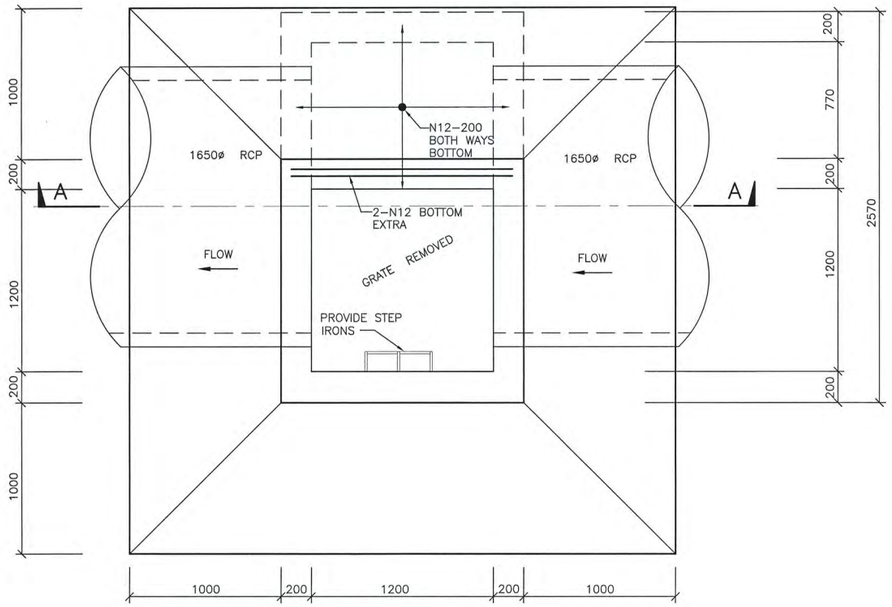
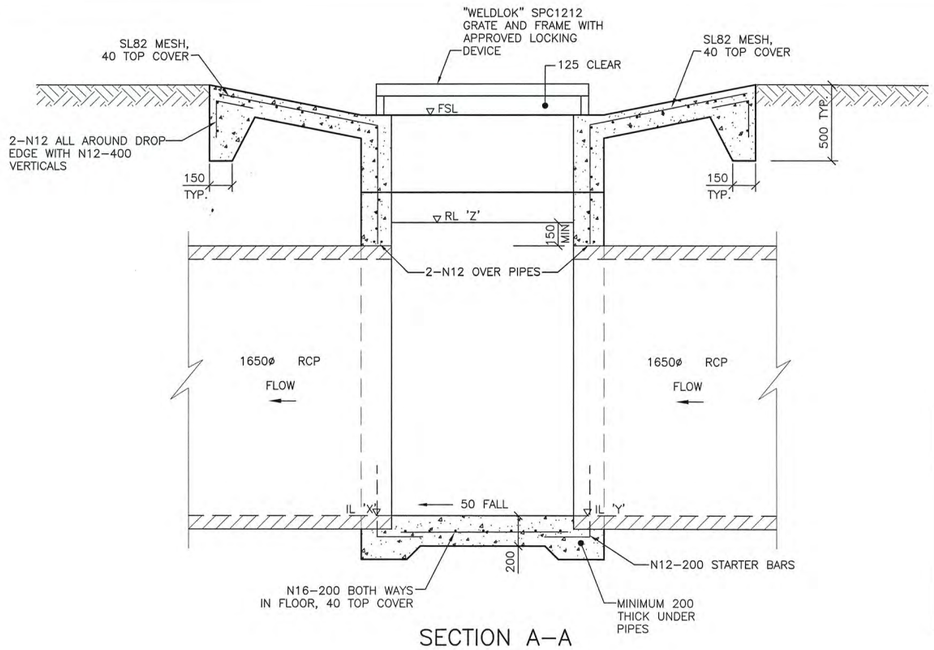


PLAN
SCALE 1:20



SECTION A–A
SCALE 1:20

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4/1	42.672	42.722	44.64	45.921
5/1	43.434	42.484	44.40	46.116

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

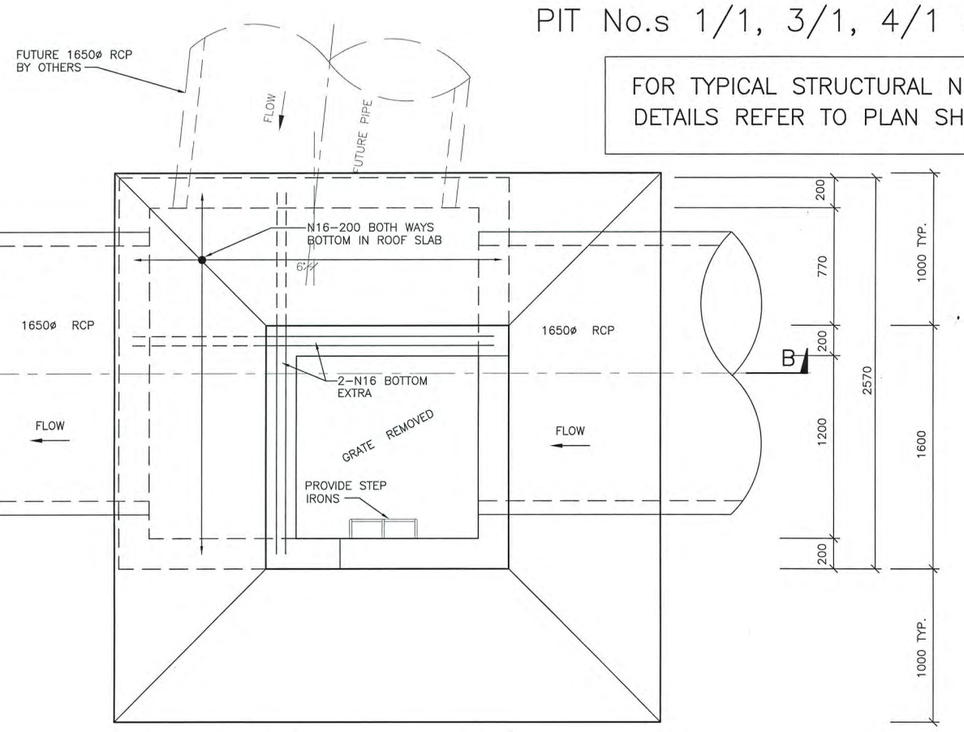
..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

PIT No.s 1/1, 3/1, 4/1 & 5/1

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8634/CC49



PLAN

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SCALE 1:20

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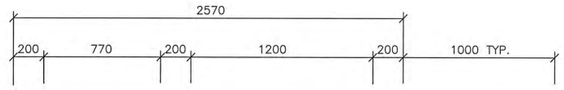

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
1:20 (AT A1)

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

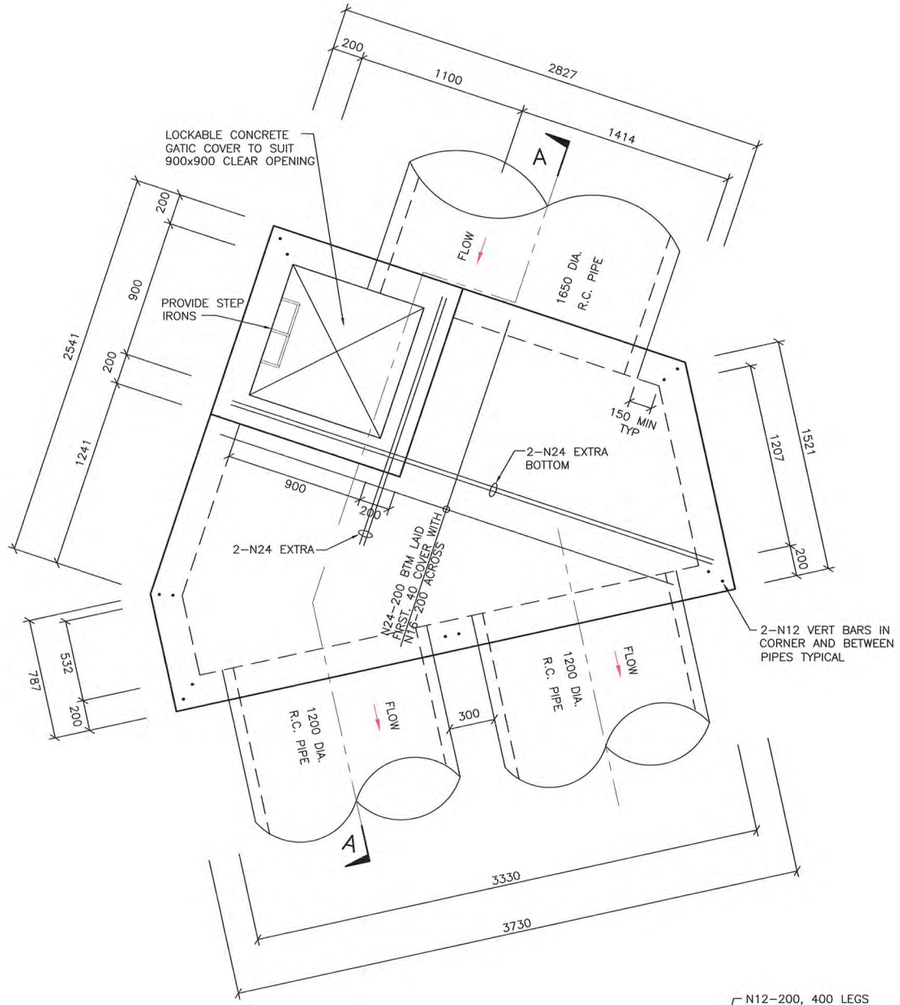
JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS
1/1, 2/1, 3/1, 4/1 & 5/1

PLAN No. 8634CC39 D
FILE No. 8634CC39
SHEET 39 OF 51 SHEETS

Plotted: 7 May 2010 11:00:51 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC39.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8634/CC49



PLAN PIT 6/1

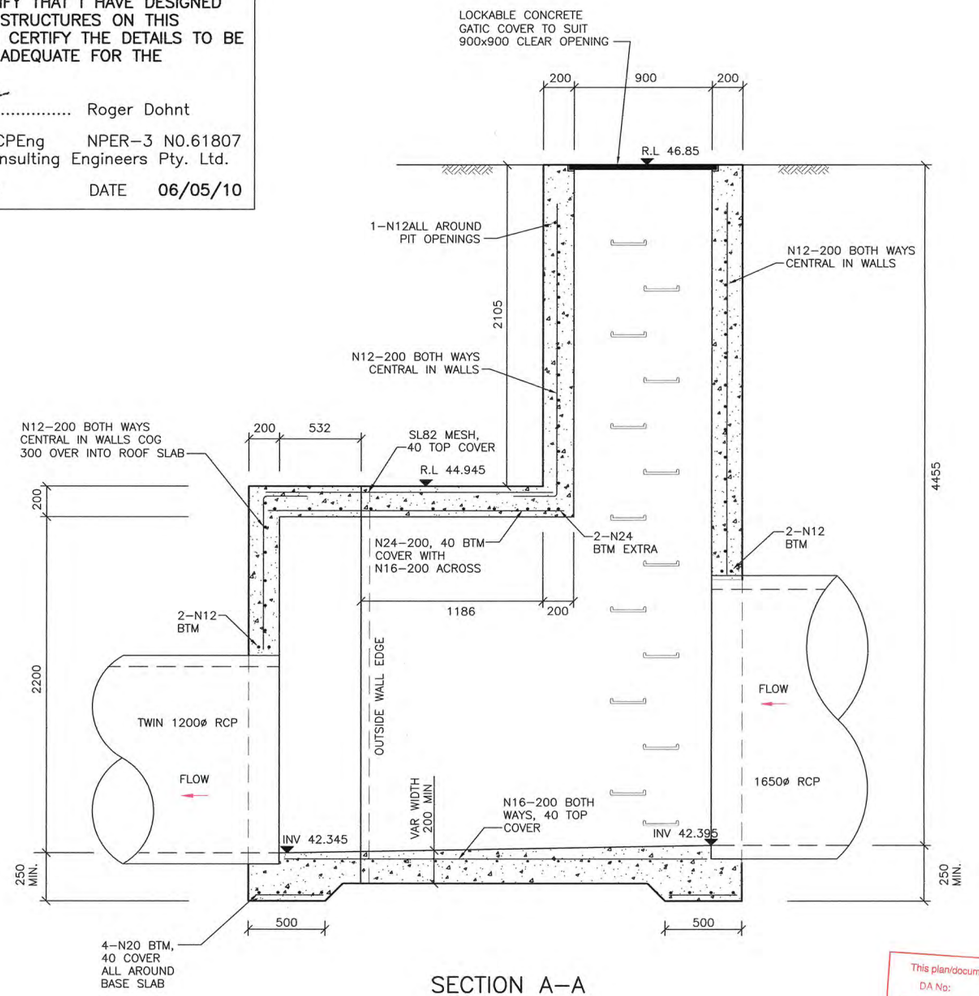
SCALE 1:20

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

..... Roger Dohnt

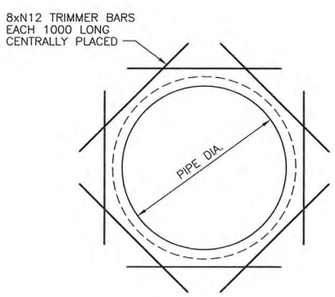
BE,MIE, Aust., CPEng NPER-3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10



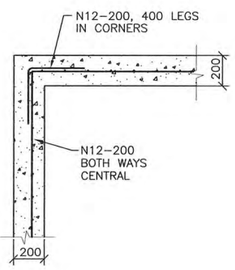
SECTION A-A

SCALE 1:20



ADDITIONAL REINFORCEMENT AROUND PIPES – TYPICAL

N.T.S



TYPICAL PLAN DETAIL PIT CORNER

N.T.S

1:20 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

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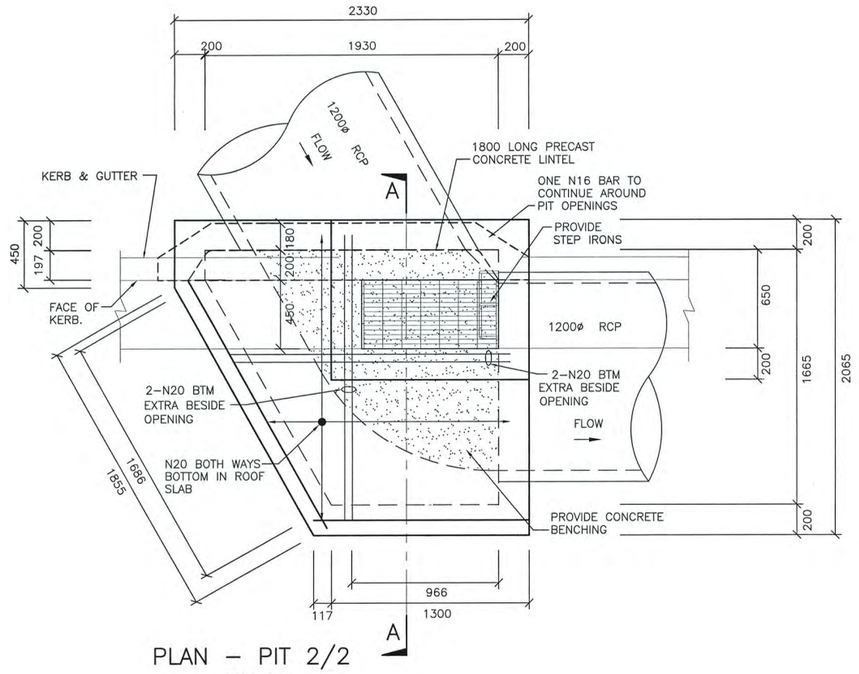
JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 6/1

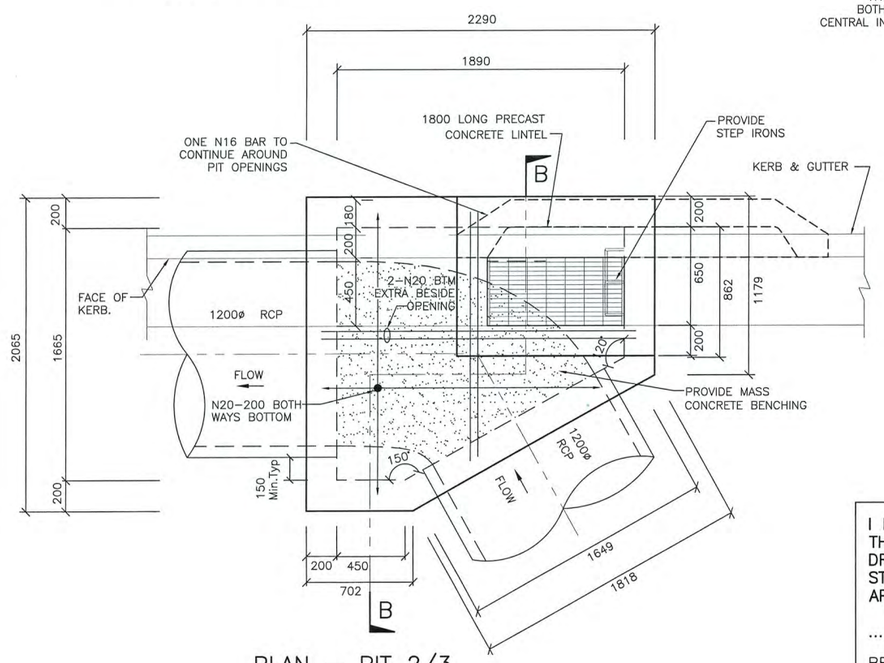
PLAN No. 8634CC40 D
FILE No. 8634CC40
SHEET 40 OF 51 SHEETS

Plotted: 7 May 2010 2:34:55 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC40.dwg



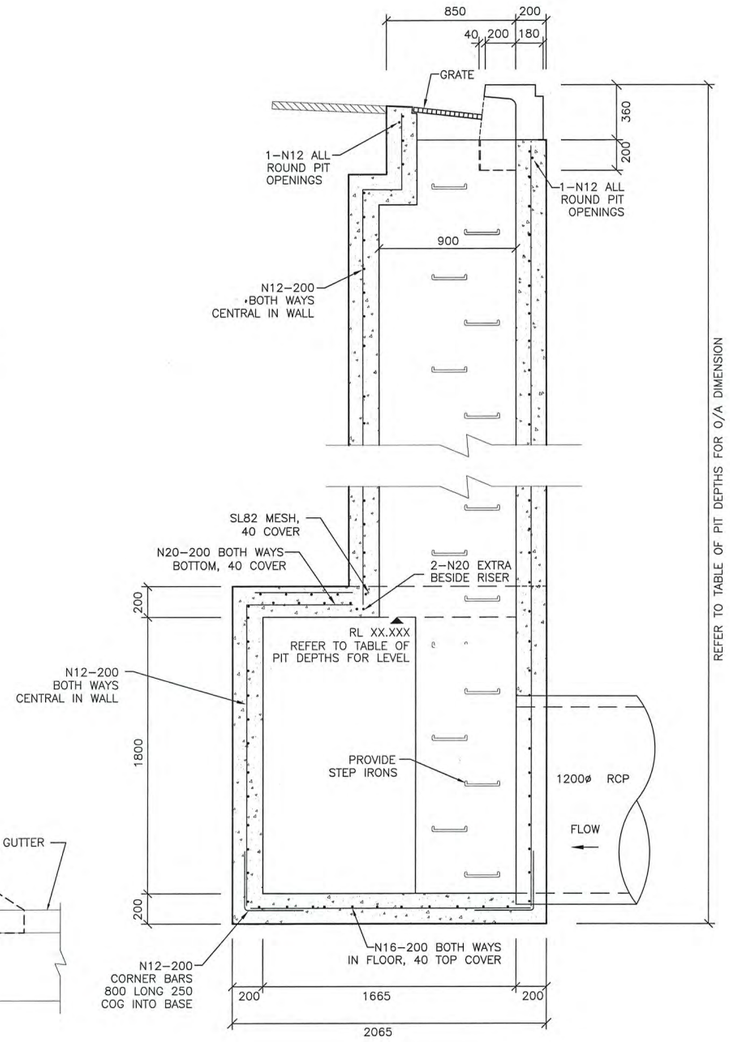
PLAN – PIT 2/2

SCALE 1:20



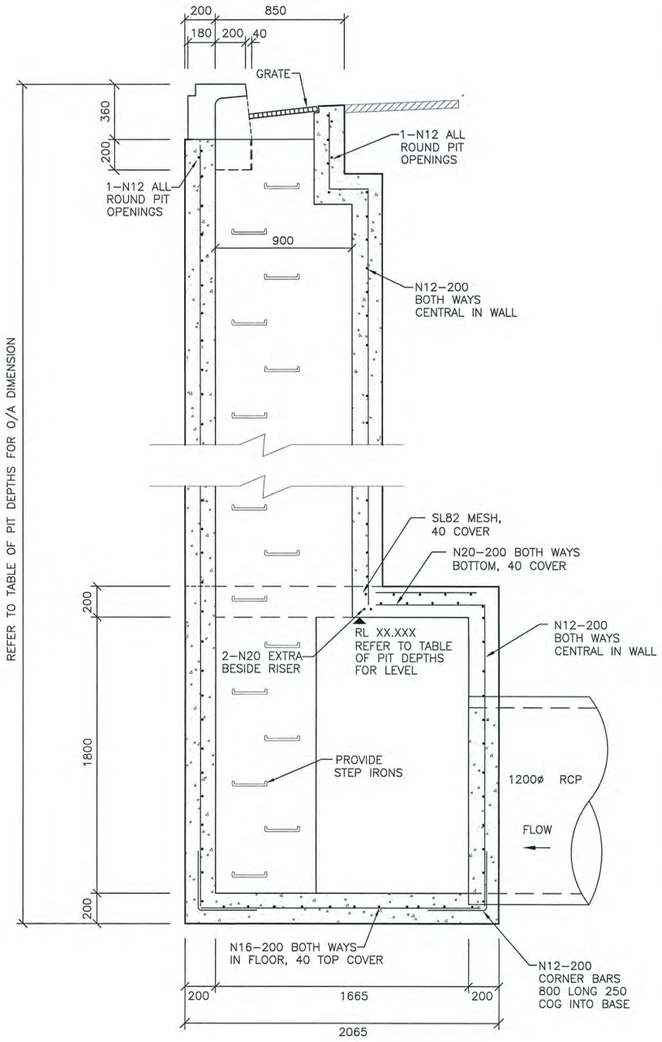
PLAN – PIT 2/3

SCALE 1:20



SECTION A–A FOR PIT 2/2

SCALE 1:20



SECTION B–B FOR PIT 2/3

SCALE 1:20

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..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 NO.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

SCHEDULE OF PIT DEPTHS					
PIT No.	TOP OF KB RL	INLET INV. RL	OUTLET INV. RL	PIT DEPTH TO OUTLET INV.	RL XX.XXX
2/2	46.864	42.087	42.037	4.827 m	43.887
2/3	46.480	41.973	41.923	4.557 m	43.773

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8634/CC49

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This plan/document relates to DA No: 090809 CCC No: 100012 Environmental Planning and Assessment Act
Eric Hendfield
PENRITH CITY COUNCIL

1:20 (AT A1) 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

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DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 2/2 & 2/3
STRUCTURAL NOTES & TYPICAL DETAILS

PLAN No. 8634CC41 D
FILE No. 8634CC41
SHEET 41 OF 51 SHEETS

Plotted: 7 May 2010 11:01:03 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC41.dwg

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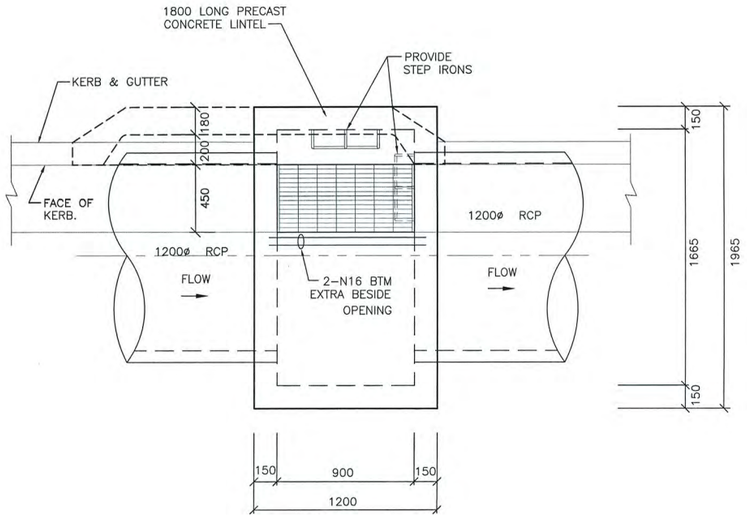
Version: 1, Version Date: 13/07/2018



PLAN – PITS 5/2, 6/2, 8/2 & 9/2

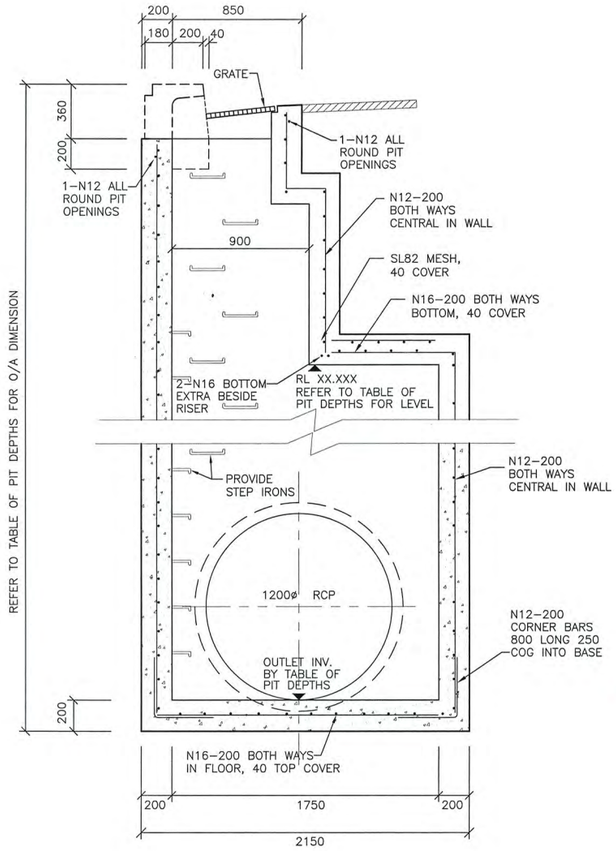
SCALE 1:20

NOTE:

FOR PITS 5/2, 6/2, 7/2, 8/2, 9/2 REFER TO PENRITH CITY COUNCIL STANDARDS – PLAN No.S801 FOR TYPICAL REINFORCEMENT AND SECTIONAL DETAIL

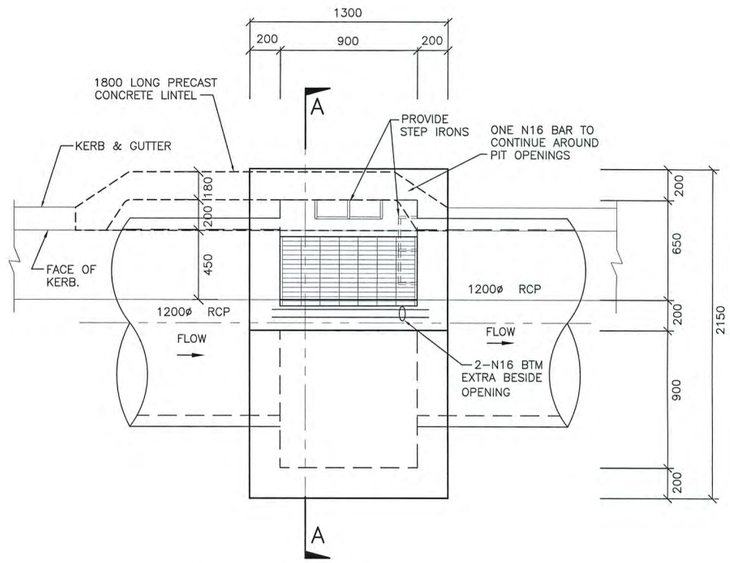
FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8634/CC49

SCHEDULE OF PIT DEPTHS					
PIT No.	TOP OF KB RL	INLET INV. RL	OUTLET INV. RL	PIT DEPTH TO OUTLET INV.	RL XX.XXX
3/2	45.854	41.700	41.650	4.204 m	43.65
4/2	44.562	41.219	41.169	3.393 m	43.169
5/2	43.246	40.730	40.680	2.566 m	42.536
6/2	41.998	39.416	39.346	2.652 m	41.288
7/2	40.941	38.700	38.650	2.291 m	40.231
8/2	40.207	37.939	37.889	2.318 m	39.497
9/2	39.730	37.439	37.389	2.341 m	39.02



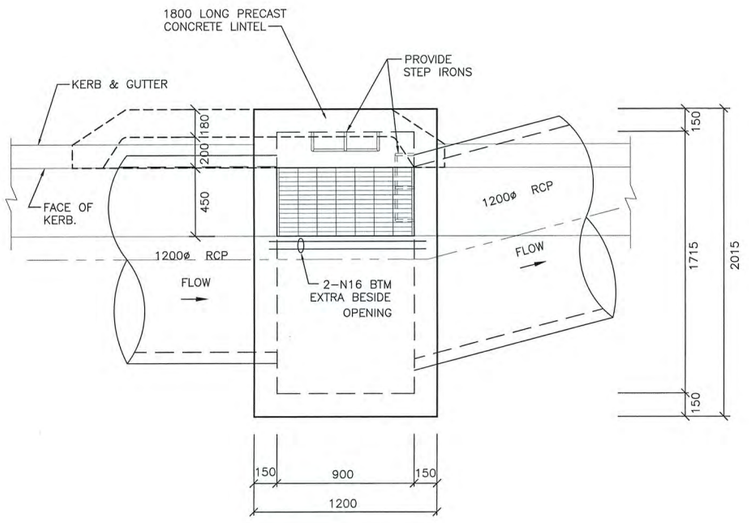
SECTION A–A FOR PITS 3/2 & 4/2

SCALE 1:20



PLAN – PITS 3/2, 4/2

SCALE 1:20



PLAN – PIT 7/2

SCALE 1:20

1:20 (AT A1) 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

R Dohnt ..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

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A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS
3/2, 4/2, 5/2, 6/2, 7/2, 8/2 & 9/2

PLAN No. 8634CC42 D
FILE No. 8634CC42
SHEET 42 OF 51 SHEETS

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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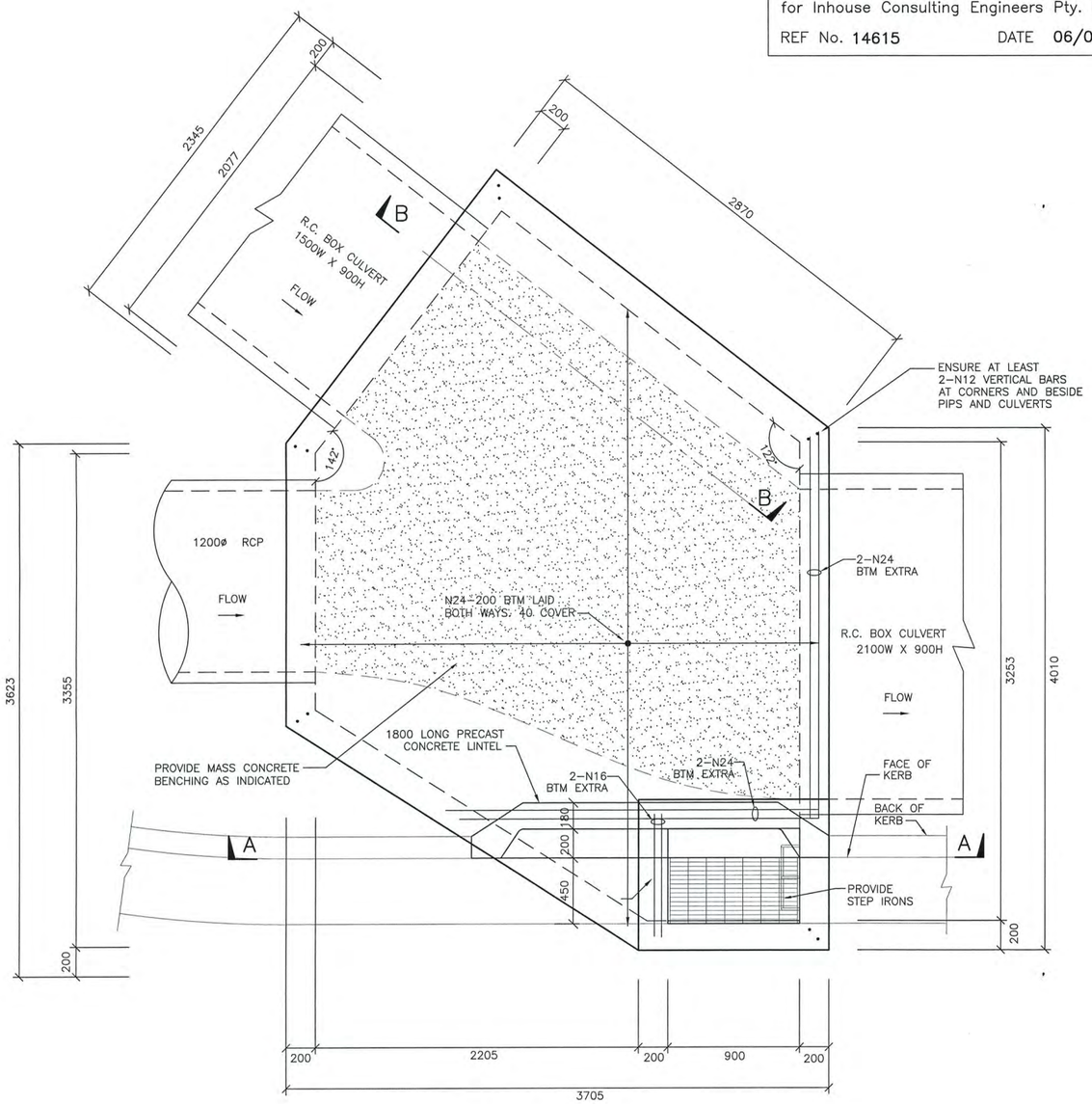
..... Roger Dohnt

BE,MIE, Aust., CPEng NPER-3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10



PLAN PIT 10/2

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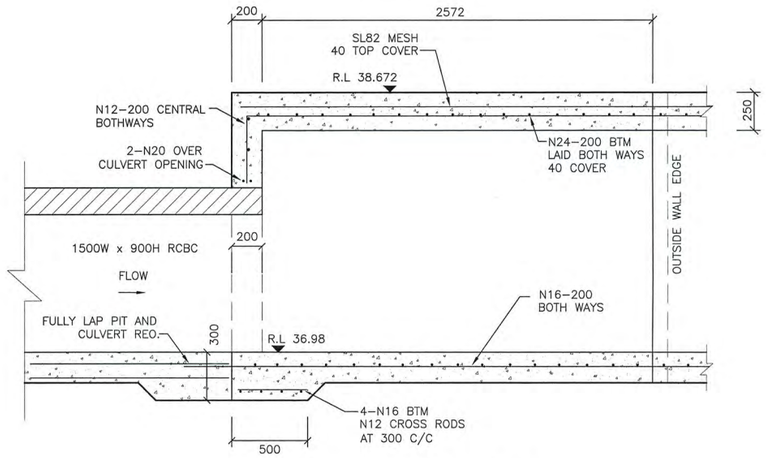
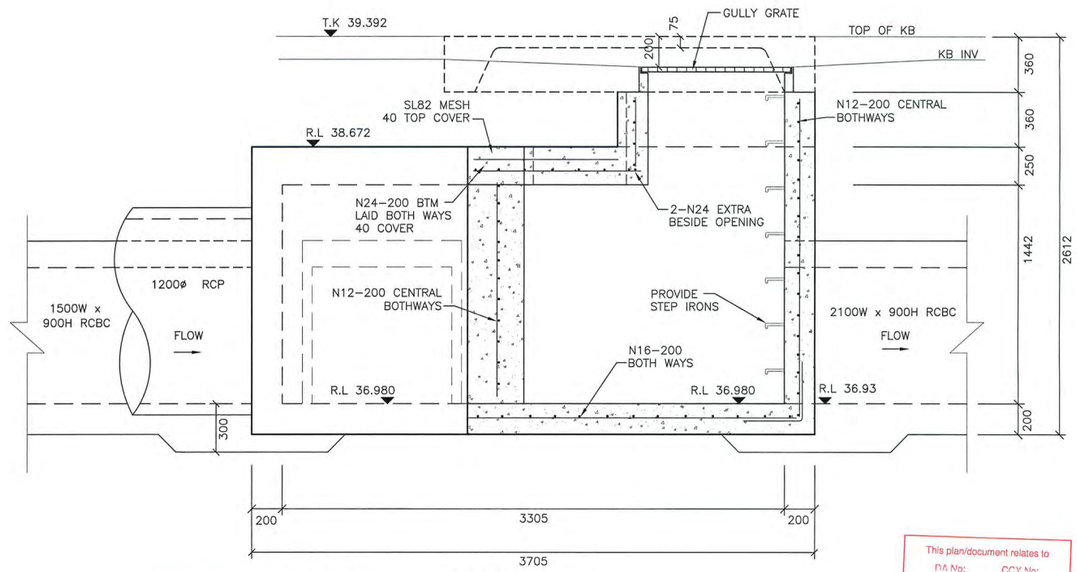


SECTION B-B

SCALE 1:20



SECTION A-A

SCALE 1:20

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1:20 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 10/2

PLAN No. 8634CC43 D
FILE No. 8634CC43
SHEET 43 OF 51 SHEETS

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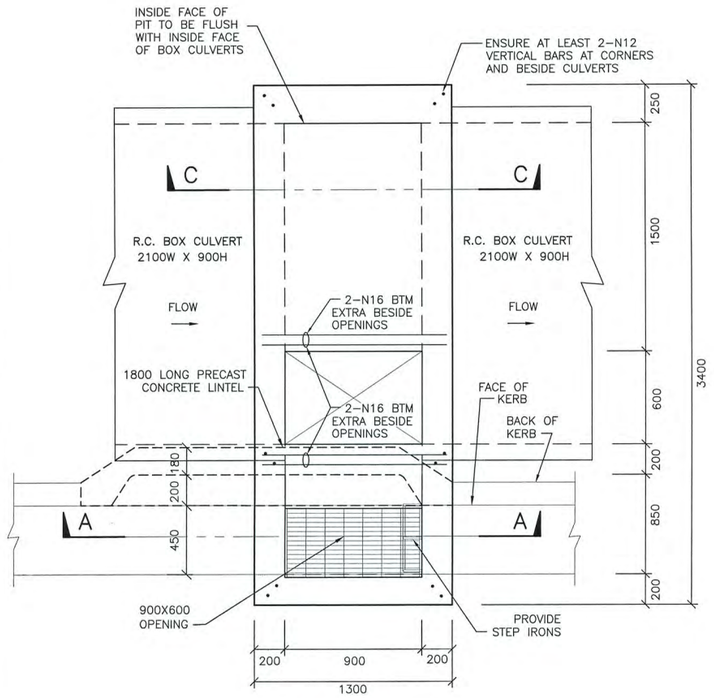
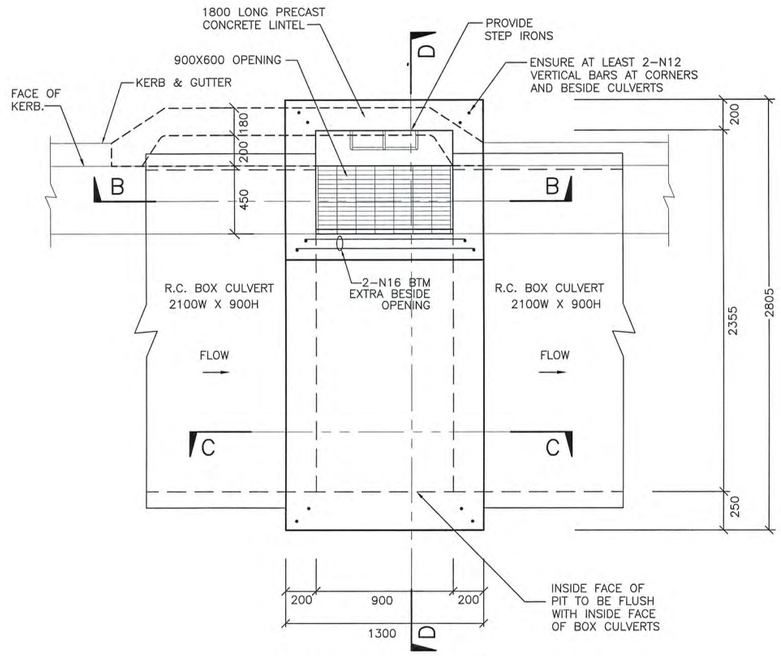


PLAN PIT 11/2

SCALE 1:20



PLAN – PIT 12/2

SCALE 1:20

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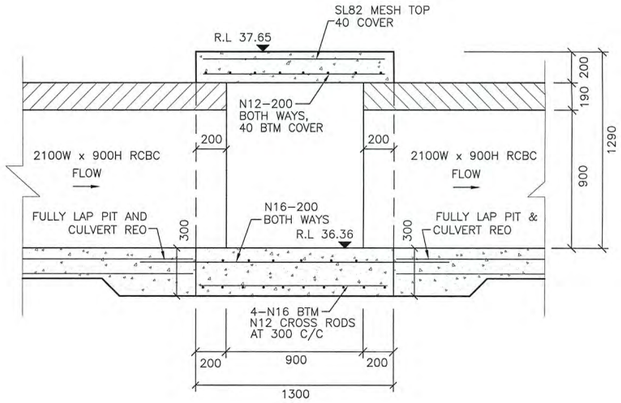
..... Roger Dohnt

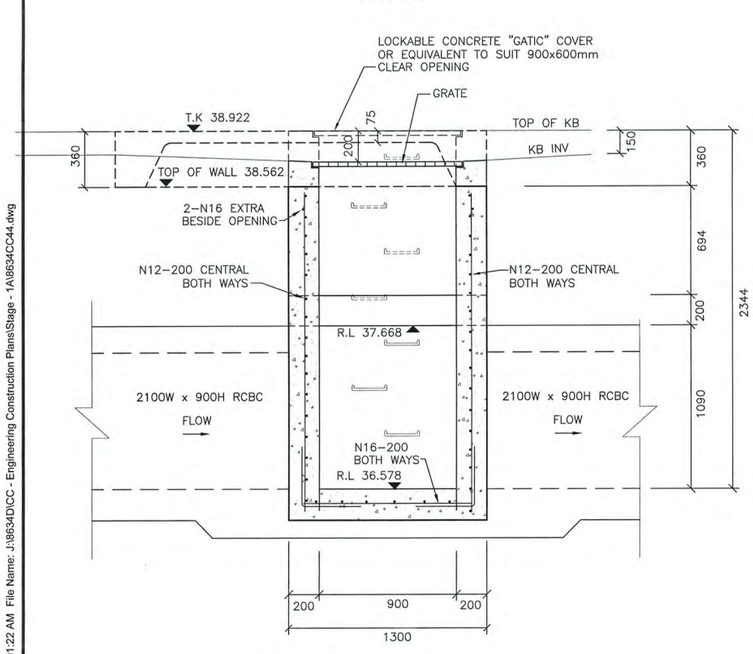
BE,MIE, Aust., CPEng NPER–3 NO.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. **14615** DATE **06/05/10**



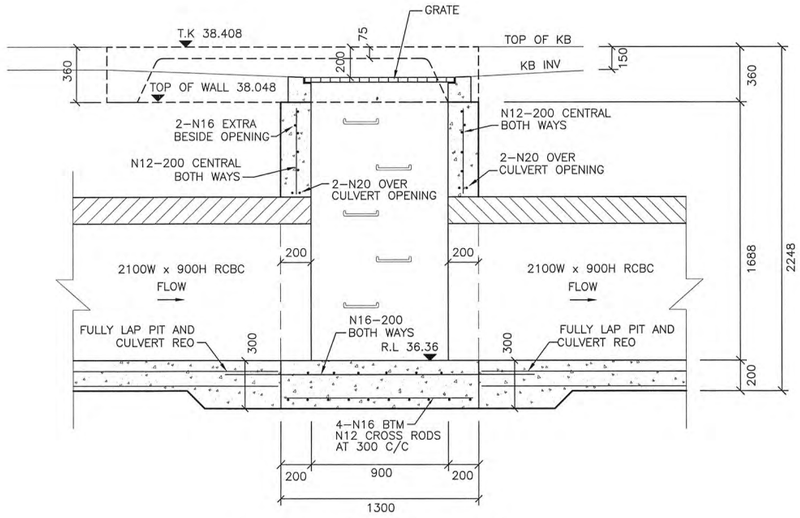
SECTION C–C PIT 11/2 & 12/2

SCALE 1:20



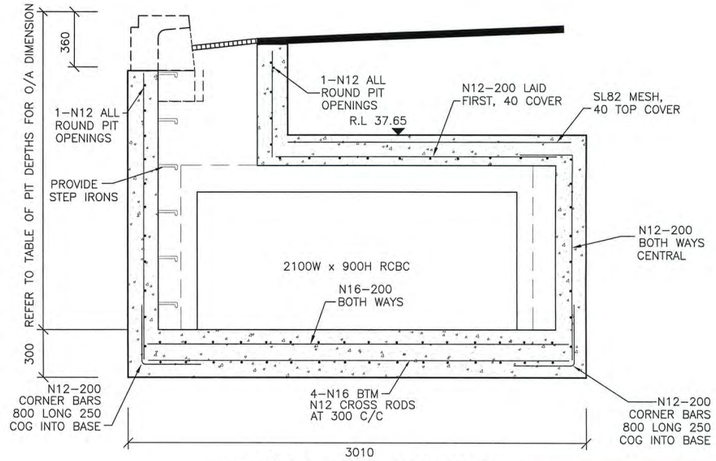
SECTION A–A – PIT 11/2

SCALE 1:20



SECTION B–B PIT 12/2

SCALE 1:20



SECTION D–D PIT 12/2

SCALE 1:20

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Environmental Planning & Assessment Act

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FOR TYPICAL STRUCTURAL NOTES, SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC49

1:20 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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CLIENT: Delfin Lend Lease

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 11/2 & 12/2

PLAN No. 8634CC44 D
FILE No. 8634CC44
SHEET 44 OF 51 SHEETS

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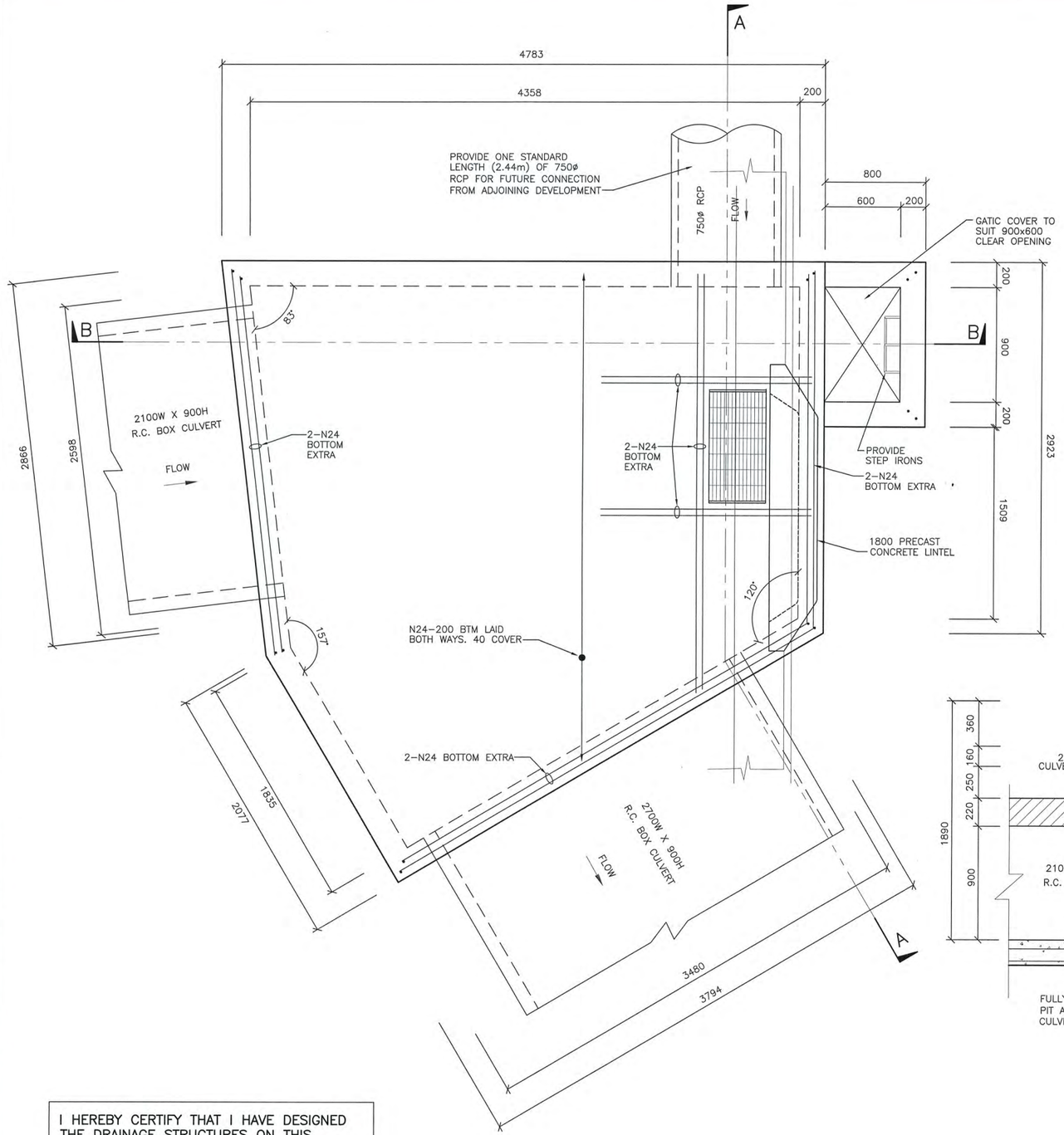
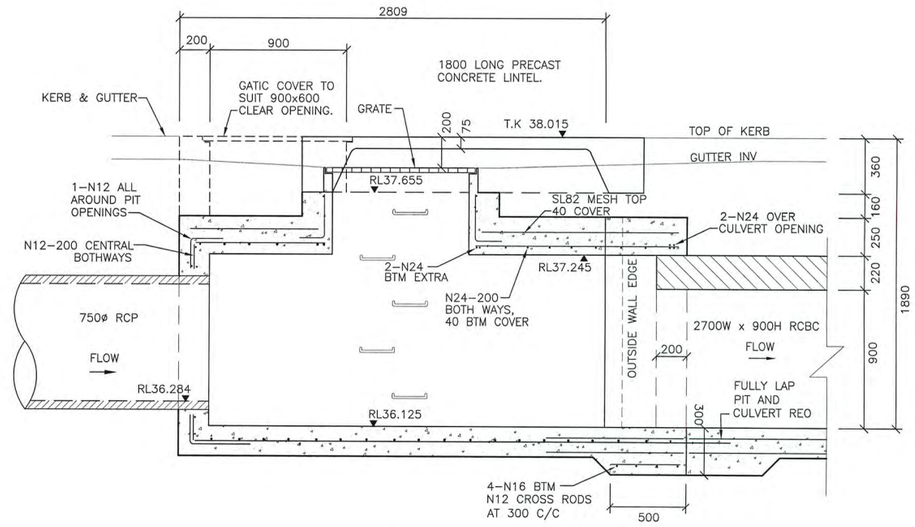
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



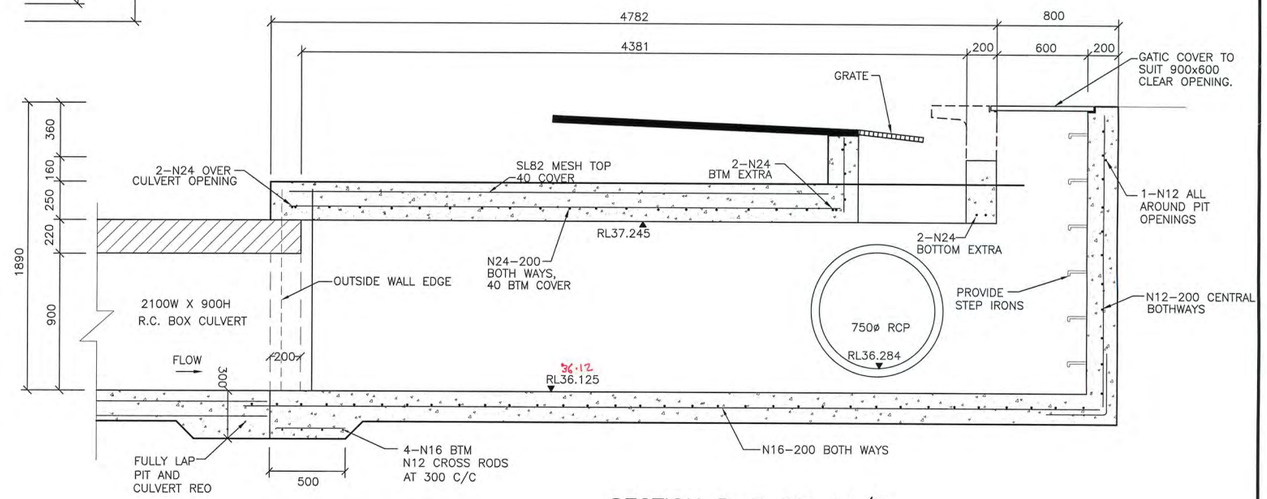
PLAN – PIT 14/2

SCALE 1:20



SECTION A–A PIT 14/2

SCALE 1:20



SECTION B–B PIT 14/2

SCALE 1:20

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Bowman REGISTERED SURVEYOR

FOR TYPICAL STRUCTURAL NOTES; SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC49

This plan/document relates to
DA No: 090809 CCV No: 100012
Environmental Planning & Assessment Act
Ewa Henderson
PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
1:20 (AT A1)

CLIENT: Delfin Lend Lease

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ISSUED FOR TENDER
NOT FOR CONSTRUCTION
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 14/2

PLAN No. 8634CC45 D
FILE No. 8634CC45
SHEET 45 OF 51 SHEETS

Plotted: 7 May 2010 11:01:28 AM File Name: J\8634\DICC - Engineering Construction Plans\Stage - 1A\8634CC45.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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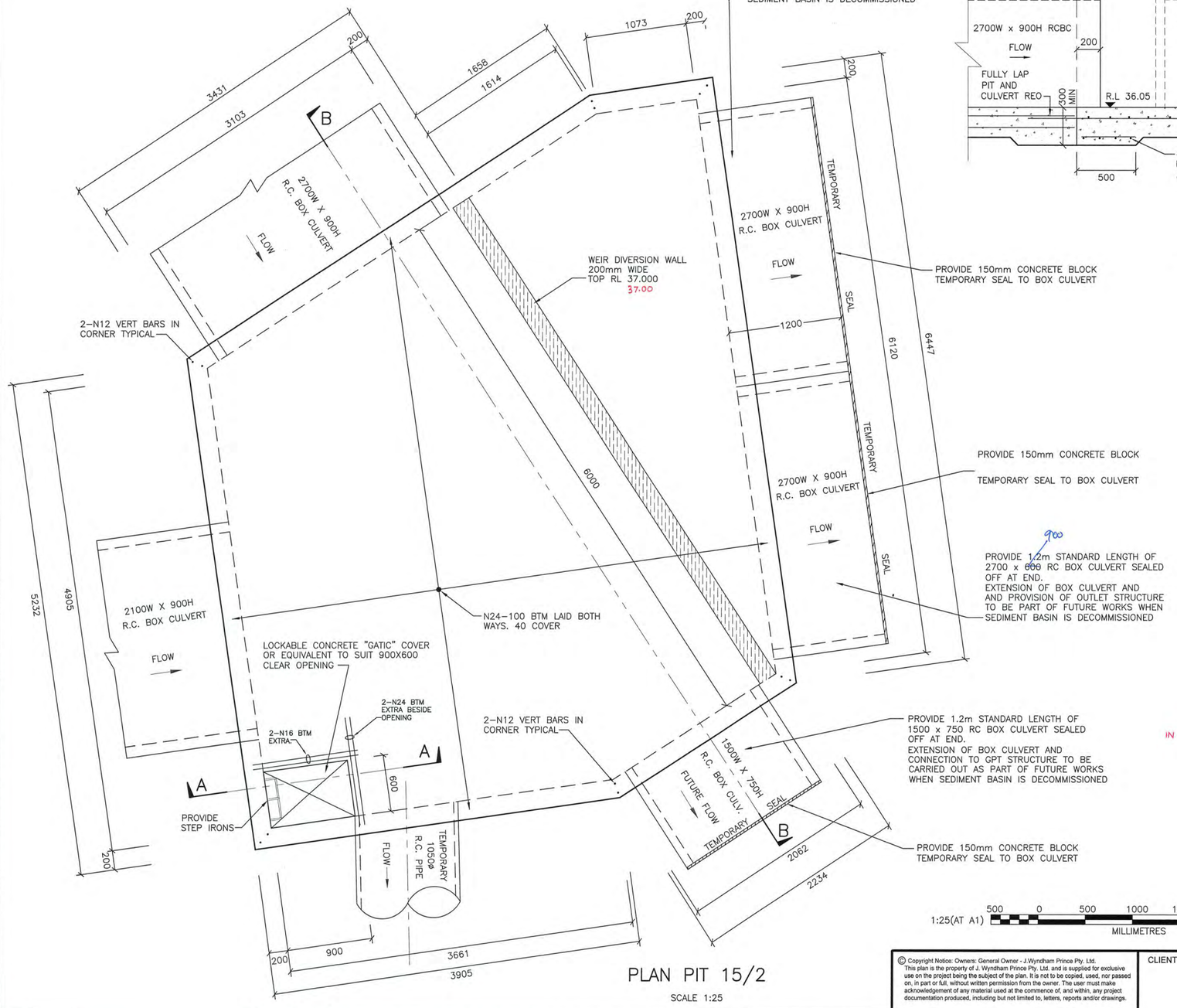
RDohnt ..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

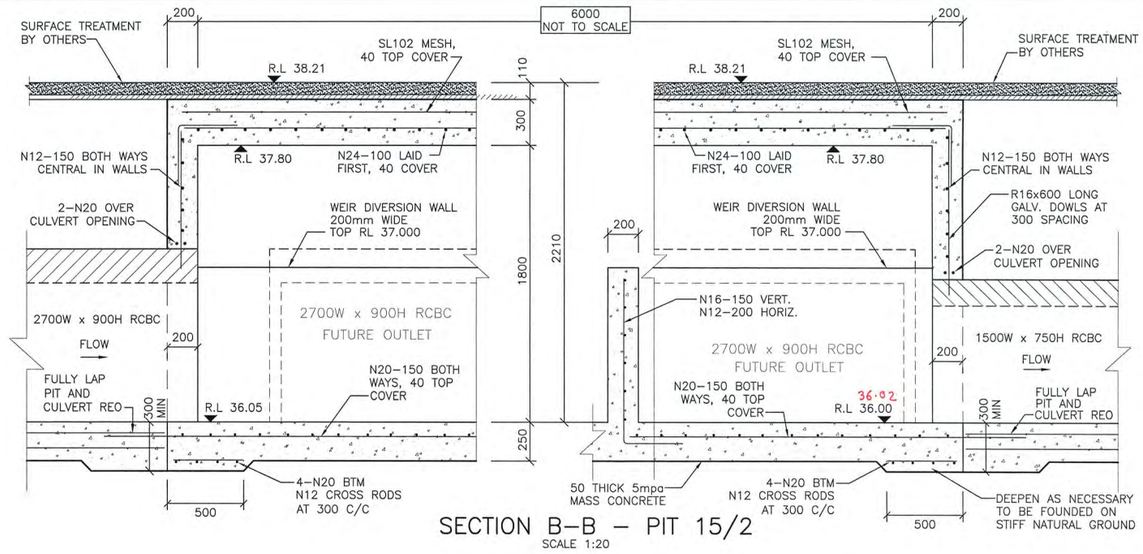
REF No. 14615 DATE 06/05/10

FOR TYPICAL STRUCTURAL NOTES; SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC49



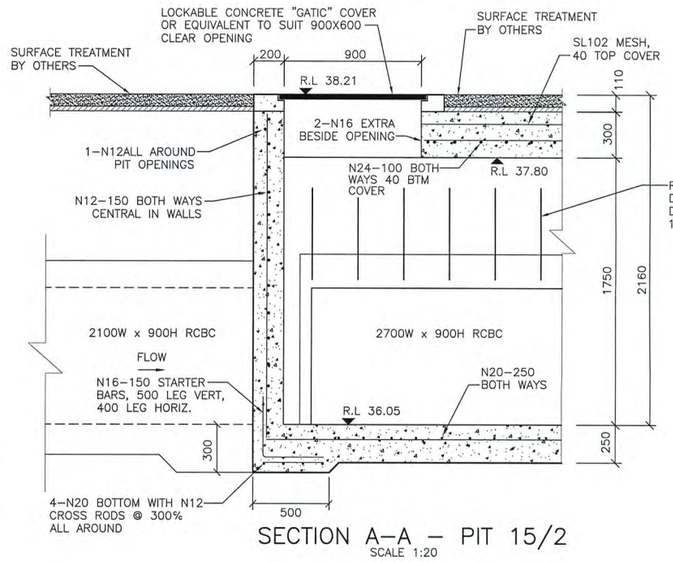
PLAN PIT 15/2

SCALE 1:25



SECTION B–B – PIT 15/2

SCALE 1:20



SECTION A–A – PIT 15/2

SCALE 1:20

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This plan/document relates to DA No: 09080 CCX No: 10007 2
Environmental Planning & Assessment Act
Erin Hounsfield
PENRITH CITY COUNCIL

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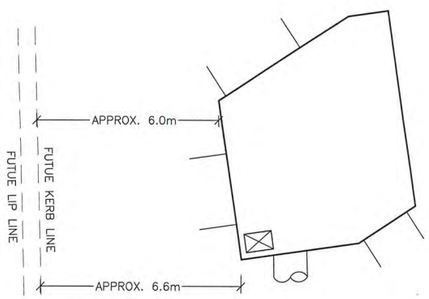

LOCALITY PLAN – PIT No.15/2

SCALE 1:100

ISSUE	AMENDMENT	DATE	BY
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E			
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DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

CLIENT: Delfin Lend Lease

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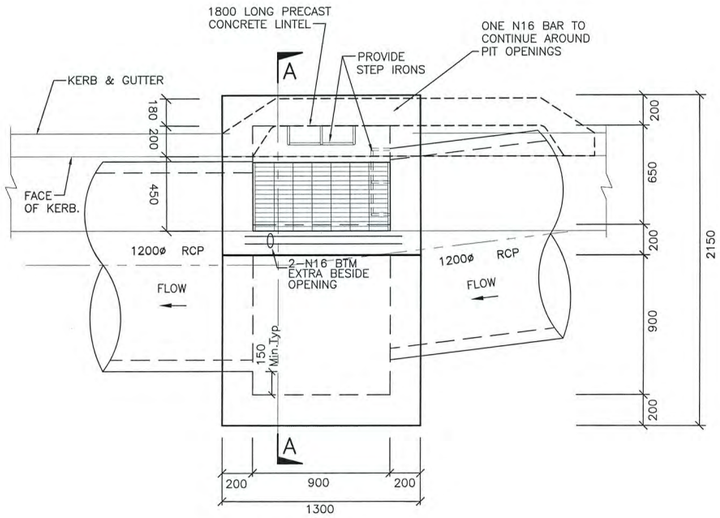
JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS 15/2

PLAN No. 8634CC46 D
FILE No. 8634CC46
SHEET 46 OF 51 SHEETS

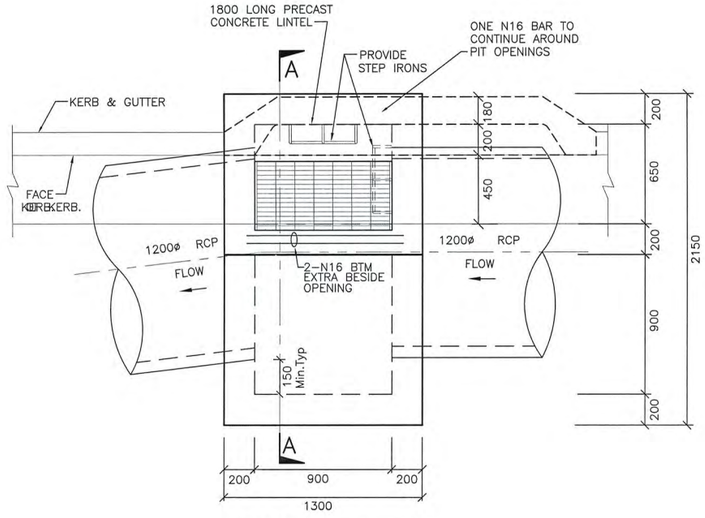
Plotted: 7 May 2010 11:01:35 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC46.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



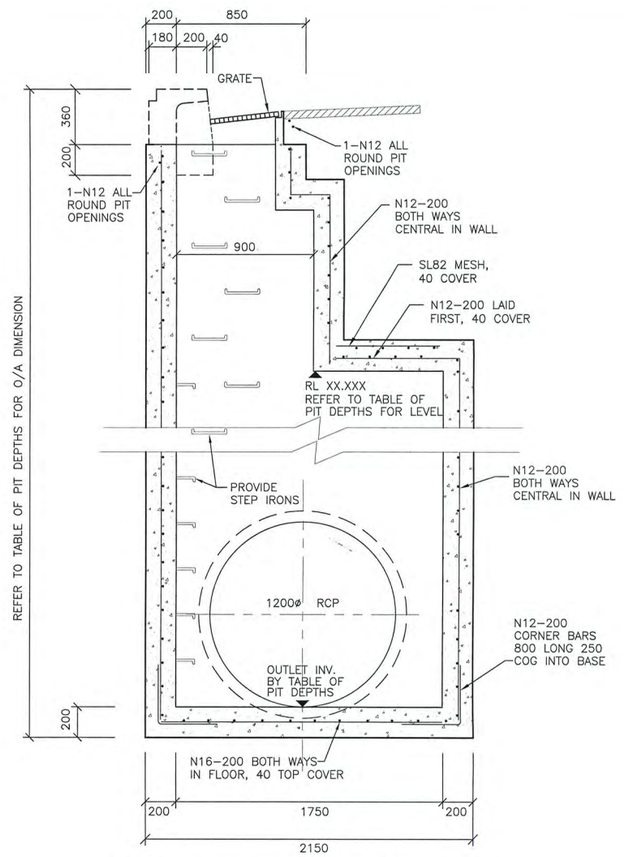
PLAN – PIT 4/3

SCALE 1:20



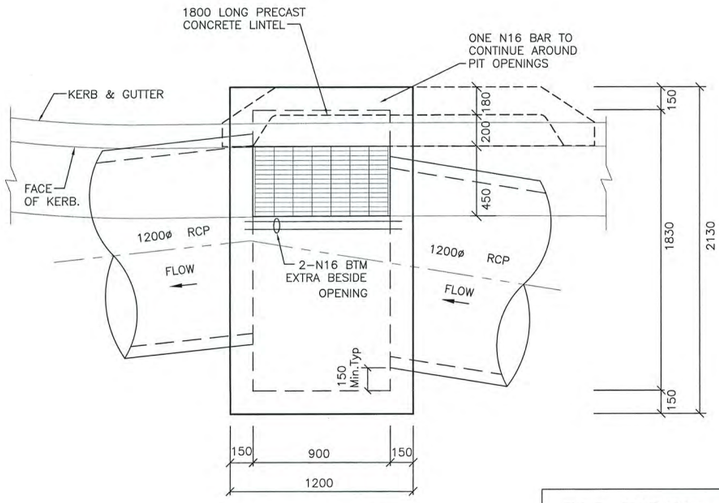
PLAN – PIT 3/3

SCALE 1:20



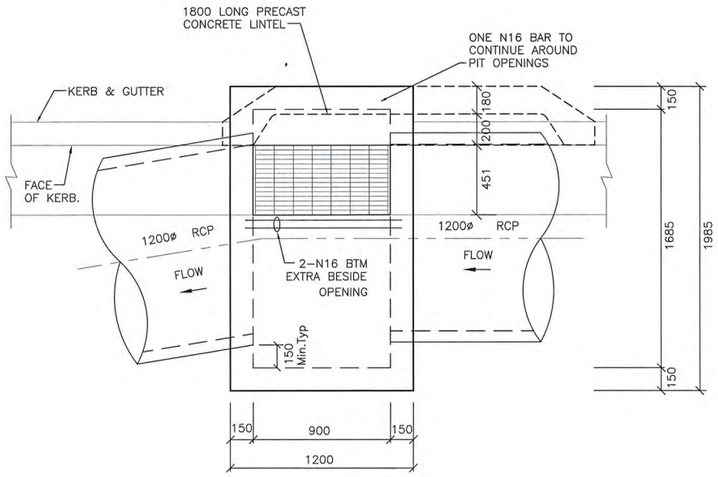
SECTION A–A – PITS 3/3 & 4/3

SCALE 1:20



PLAN – PIT 7/3

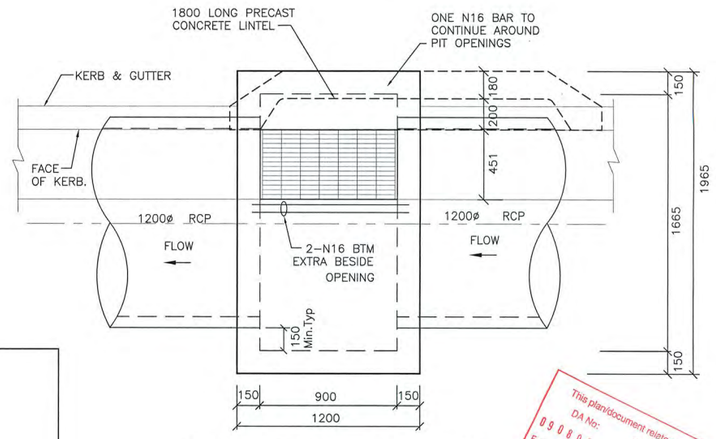
SCALE 1:20



PLAN – PITS 6/3

SCALE 1:20

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8634/CC49



PLAN – PITS 5/3 & 8/3

SCALE 1:20

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REGISTERED SURVEYOR

This plan/document relates to DA No: 090809 100912
Endorsement Plan & Approval Act
PENRITH CITY COUNCIL

1:20 (AT A1) 400 200 0 400 800 1200 1600 2000 MILLIMETRES

SCHEDULE OF PIT DEPTHS

PIT No.	TOP OF KB RL	INLET INV. RL	OUTLET INV. RL	PIT DEPTH TO OUTLET INV.	RL. XX.XXX
3/3	44.766	41.358	41.308	3.458 m	43.308
4/3	44.023	41.017	40.967	3.056 m	42.967
5/3	42.764	39.917	39.856	2.908 m	
6/3	41.420	38.888	38.735	2.685 m	
7/3	40.413	37.943	37.893	2.520 m	
8/3	39.848	37.394	37.344	2.504 m	

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..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

NOTE:
FOR PITS 5/3, 6/3, 7/3 & 8/3 REFER TO PENRITH CITY COUNCIL STANDARDS – PLAN No.S801 FOR TYPICAL REINFORCEMENT AND SECTIONAL DETAIL

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

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CLIENT: Delfin Lend Lease

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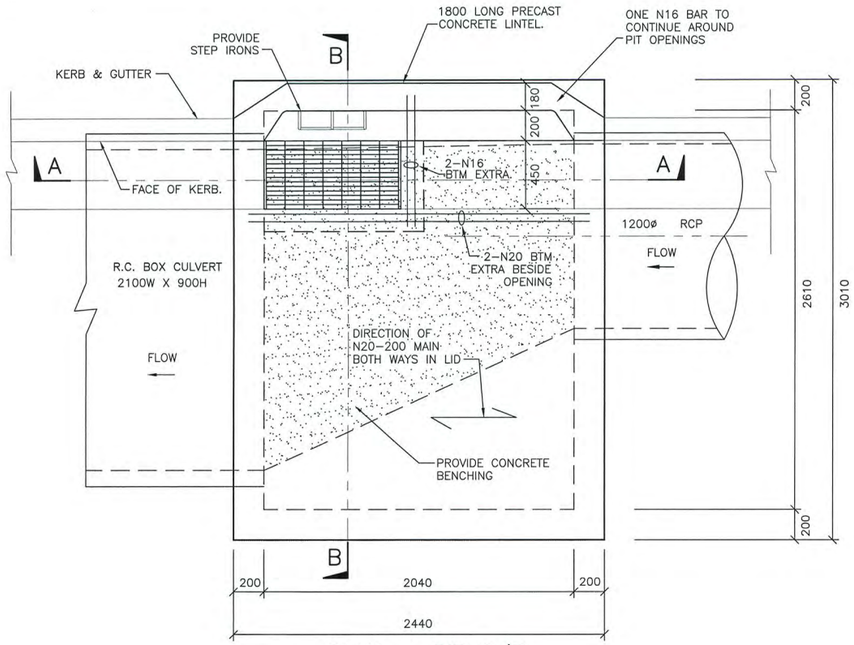
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS
3/3, 4/3, 5/3, 6/3, 7/3 & 8/3

PLAN No. 8634CC47 D
FILE No. 8634CC47
SHEET 47 OF 51 SHEETS

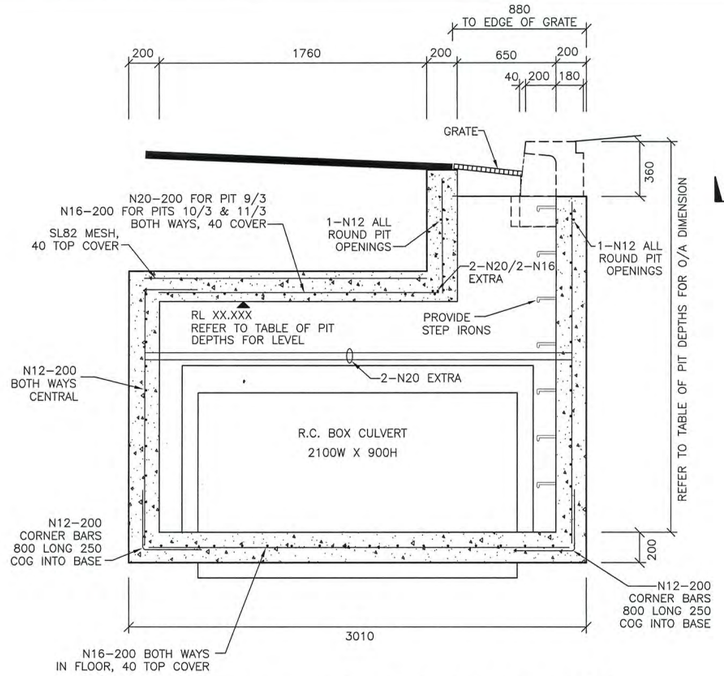
Plotted: 7 May 2010 11:01:41 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC47.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



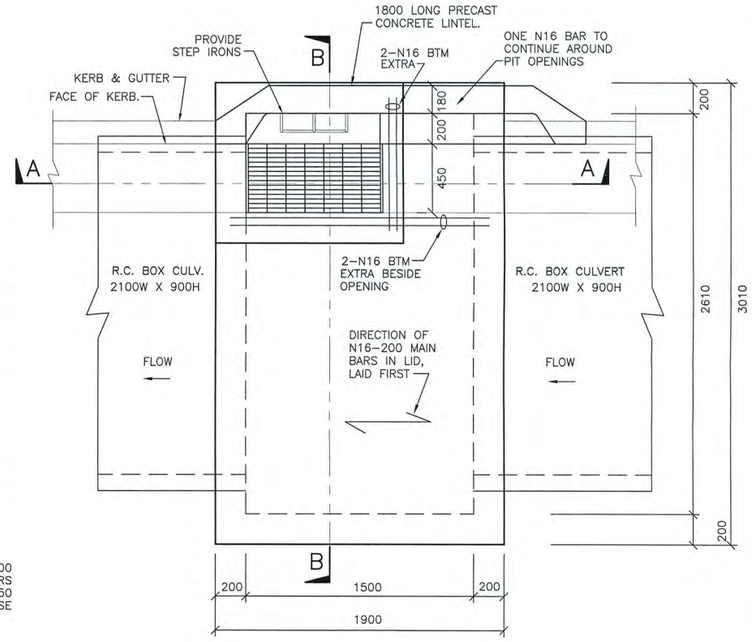
PLAN – PIT 9/3

SCALE 1:20



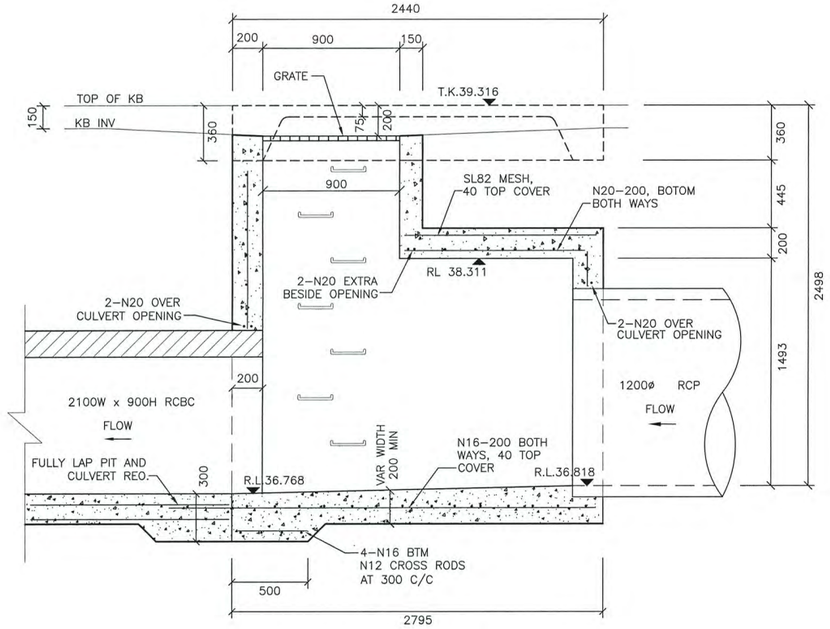
SECTION B–B – PITS 9/3, 10/3 & 11/3

SCALE 1:20



PLAN – PITS 10/3 & 11/3

SCALE 1:20



SECTION A–A – PIT 9/3

SCALE 1:20

SCHEDULE OF PIT DEPTHS					
PIT No.	TOP OF KB RL	INLET INV. RL	OUTLET INV. RL	PIT DEPTH TO OUTLET INV.	RL XX.XXX
9/3	39.316	36.818	36.768	2.548 m	38.311
10/3	38.862	36.543	36.543	2.319 m	37.633
11/3	38.436	36.320	36.320	2.116 m	37.410

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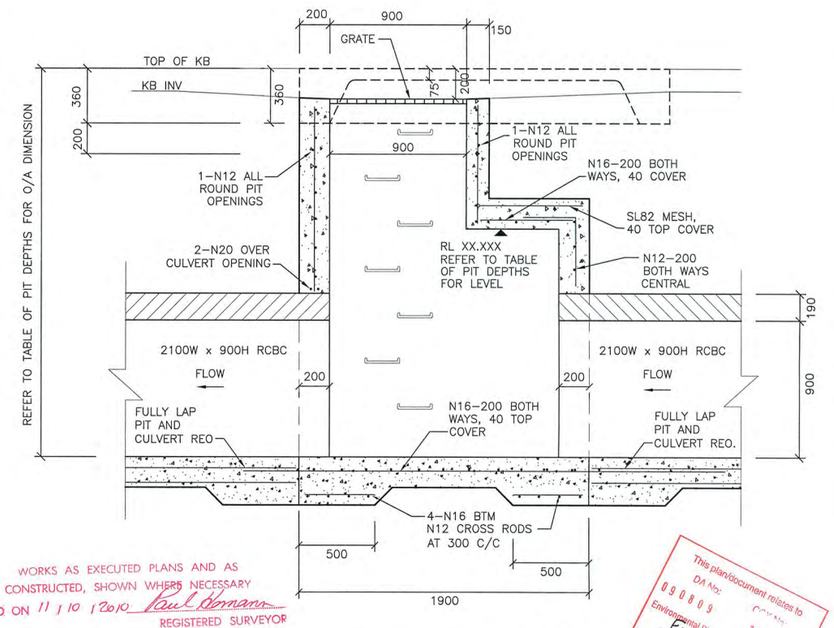
..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

FOR TYPICAL STRUCTURAL NOTES; SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC49



WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Bonnano REGISTERED SURVEYOR

SECTION A–A – PITS 10/3 & 11/3

SCALE 1:20

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Environmental Planning & Assessment Act
PENRITH CITY COUNCIL
Erin Haubold

400 200 0 400 800 1200 1600 2000
1:20 MILLIMETRES

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NOT FOR CONSTRUCTION
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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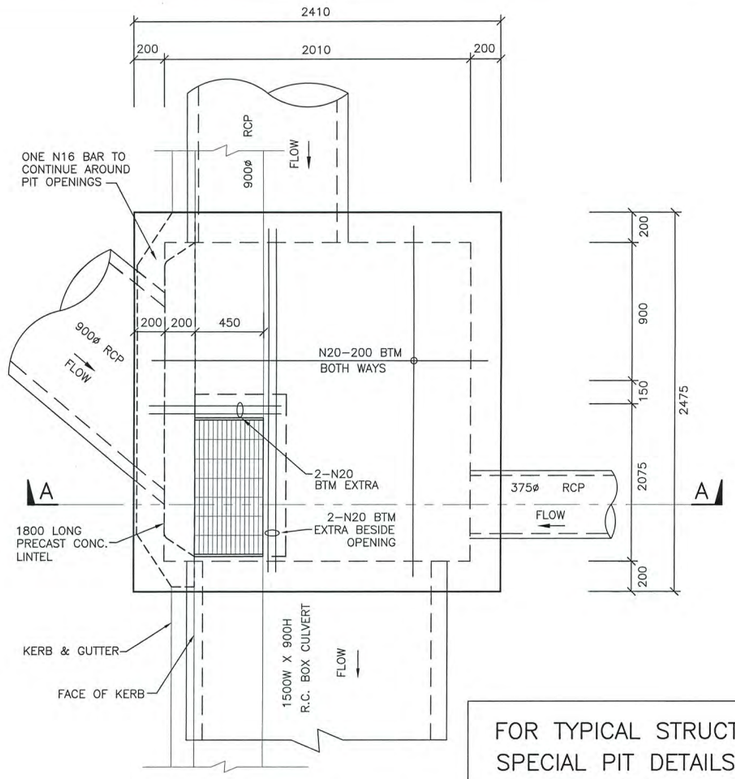
DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS
9/3, 10/3 & 11/3

PLAN No. 8634CC48 D
FILE No. 8634CC48
SHEET 48 OF 51 SHEETS

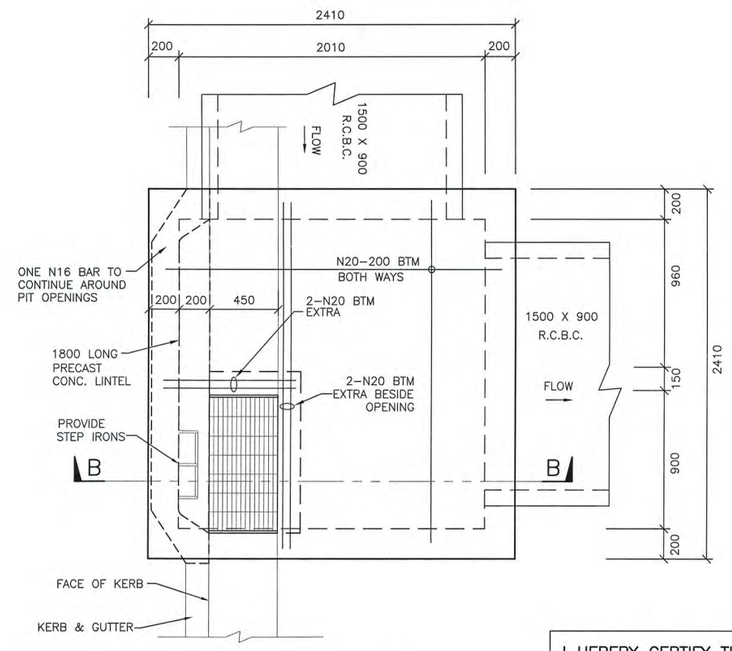
Plotted: 7 May 2010 11:01:48 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC48.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



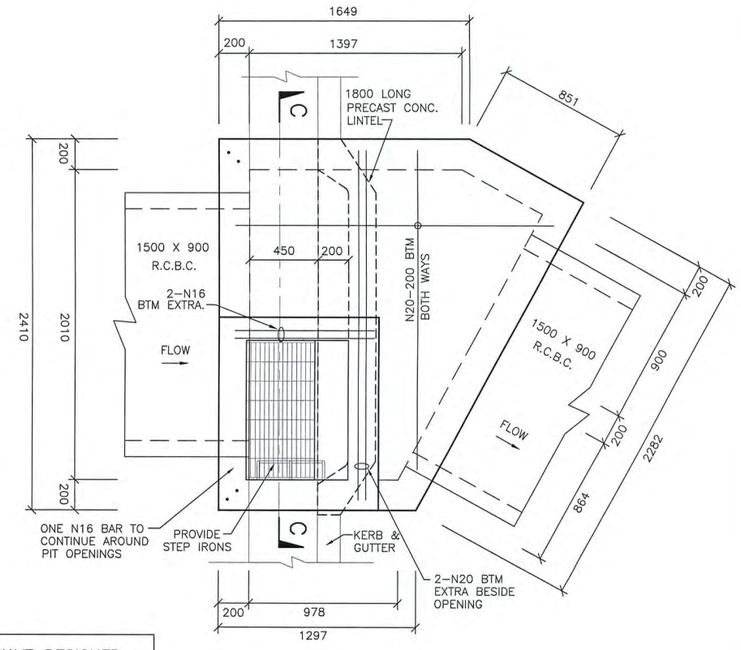
PLAN – PIT 13/5

SCALE 1:20



PLAN – PIT 14/5

SCALE 1:20



PLAN – PIT 15/5

SCALE 1:20

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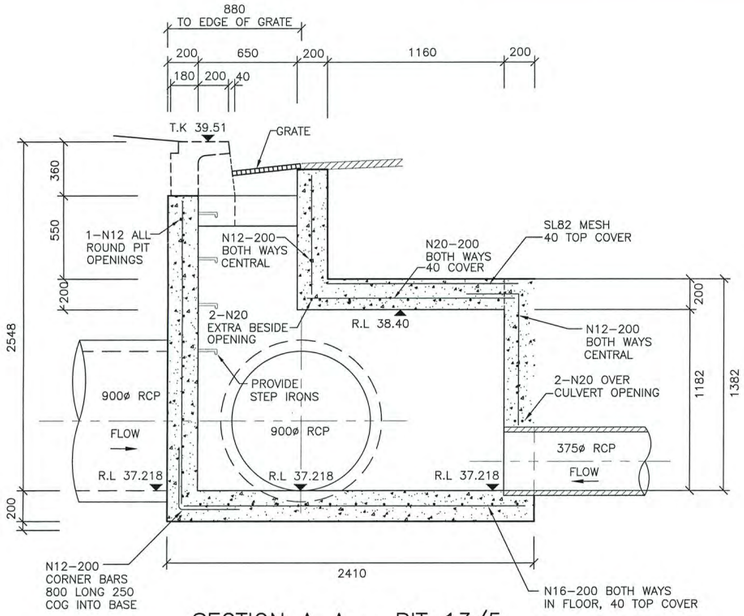
..... Roger Dohnt

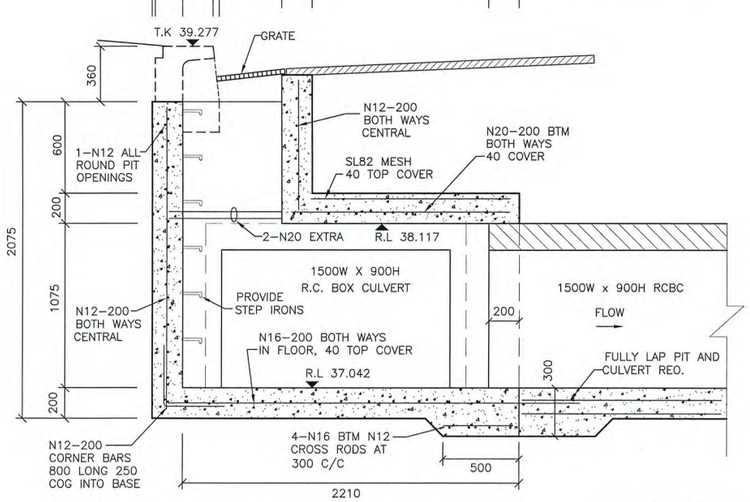
BE,MIE, Aust., CPEng NPER-3 NO.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. **14615** DATE **06/05/10**



SECTION A–A – PIT 13/5

SCALE 1:20



SECTION B–B – PIT 14/5

SCALE 1:20

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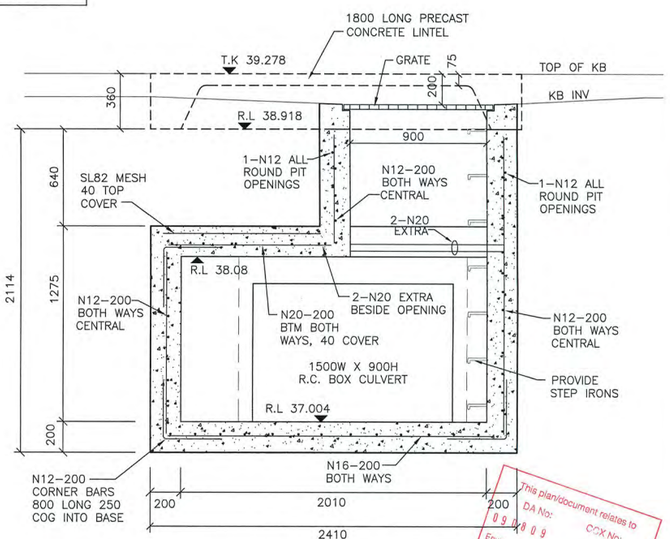
IN RED ON 11/10/2010 Paul Romans
REGISTERED SURVEYOR



SECTION C–C – PIT 15/5

SCALE 1:20

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Environmental Planning & Assessment Act
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1:20 (AT A1) 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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SIGNED S. Anderson DATE 06/05/2010

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P 02 4720 3300 **F** 02 4721 7638 **W** www.jwprince.com.au **E** jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PITS
13/5, 14/5 & 15/5

PLAN No. 8634CC49 D
FILE No. 8634CC49
SHEET 49 OF 51 SHEETS

Plotted: 7 May 2010 11:01:54 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC49.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

STRUCTURAL NOTES FOR ALL SPECIAL PITS

GENERAL

1.1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 3600 AND OTHER RELEVANT CODES.

1.2 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

CONCRETE

2.1 CONCRETE QUALITY

ELEMENT	CONCRETE STRENGTH F'c	MAX. AGGREGATE SIZE	MAX. SLUMP	CEMENT TYPE
SLABS	40MPa	20mm	75mm	GB
WALLS	40MPa	20mm	75mm	GB
BLINDING SLABS	5MPa	20mm	75mm	GB

2.2 NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.

2.3 CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE 40mm TO ALL SURFACES UNLESS NOTED OTHERWISE.

2.4 CONSTRUCTION JOINTS NOT INDICATED SHALL BE LOCATED AND FORMED TO THE APPROVAL OF COUNCIL'S ENGINEER.

2.5 A BOND BREAKING MATERIAL IS TO BE PLACED BETWEEN CONTACTING SURFACES AT CONSTRUCTION JOINTS.

2.6 NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.

2.7 UNLESS SHOWN OTHERWISE ALL EXTERNAL AND RE-ENTRANT CORNERS SHALL BE CHAMFERED 25mm.

2.8 SLABS TO BE CURED AND KEPT MOIST FOR 7 DAYS MINIMUM.

2.9 NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35 DEGREES CELSIUS OR FALLS BELOW 5 DEGREES CELSIUS.

REINFORCEMENT

3.1 REINFORCEMENT STEEL QUALITY:

REINFORCEMENT TYPE	GRADE	SAA CODE	SYMBOL
WELDING GRADE DEFORMED	500	AS 4671	N
PLAIN ROUND	230	AS 1302	R
FABRIC	500	AS 4671	SL, RL, L

3.2 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE POSITION.

3.3 ALL REINFORCEMENT SHALL BE SECURELY TIED AND POSITIONED ACCURATELY BY MEANS OF STEEL OR PLASTIC CHAIRS OR OTHER APPROVED ACCESSORIES. MASONRY BLOCKS WILL NOT BE PERMITTED.

3.4 PROVIDE COUNCIL'S ENGINEER WITH 24 HOURS NOTICE OF REINFORCEMENT BEING READY FOR INSPECTION. NO CONCRETE IS TO BE POURED WITHOUT APPROVAL OF COUNCIL'S ENGINEER.

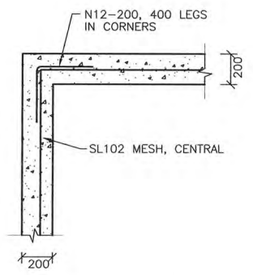
3.5 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION INDICATED. THE APPROVAL OF COUNCIL'S ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICE.

3.6 WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS INDICATED ON THE STRUCTURAL DRAWINGS OR WITH WRITTEN APPROVAL OF COUNCIL'S ENGINEER.

3.7 MINIMUM LAP OF REINFORCEMENT SHALL BE AS SHOWN IN TABLE 13.1.2.2(A) OF AS 3600 UNLESS SHOWN OTHERWISE. LAPS FOR MESH SHALL BE 1.5 TIMES THE NOMINAL WIRE SPACING OR APPROVED EQUIVALENT.

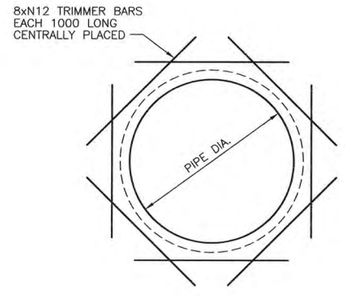
3.8 REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.

3.9 MINIMUM RADIUS FOR BENDS IN REINFORCEMENT TO BE 4 BAR DIAMETERS (DB) UNLESS NOTED OTHERWISE.



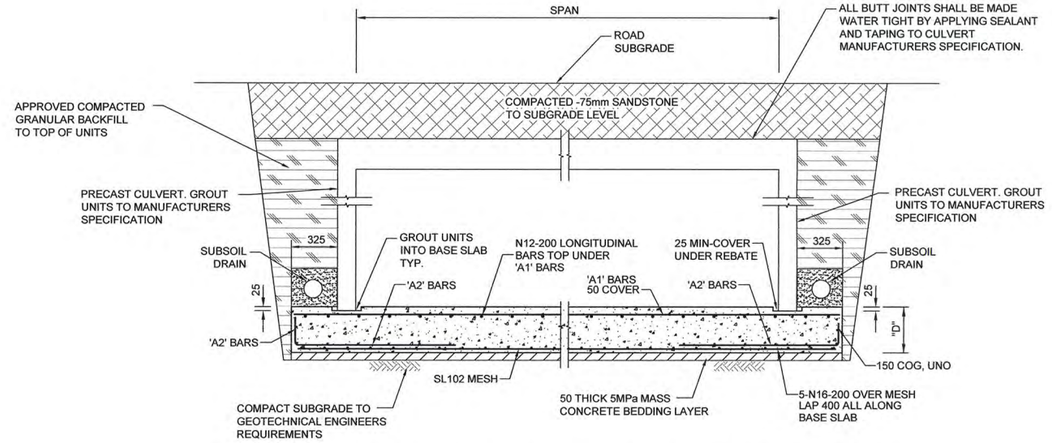
TYPICAL PLAN DETAIL PIT CORNER

N.T.S



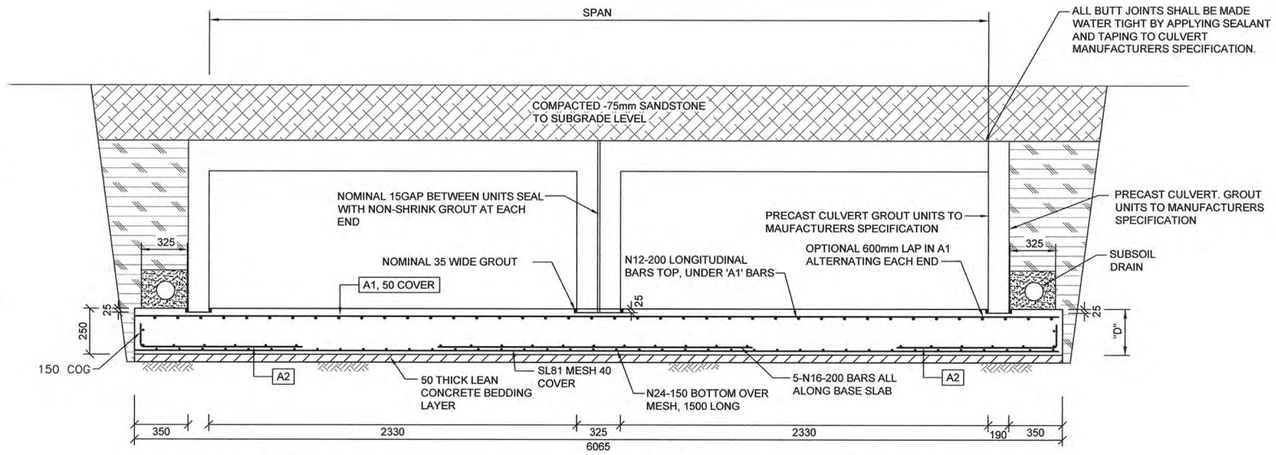
ADDITIONAL REINFORCEMENT AROUND PIPES – TYPICAL

N.T.S



TYPICAL BOX CULVERT BASE SLAB DETAIL–SINGLE CELL

SCALE NTS



TYPICAL SECTION – BASE SLAB FOR CULVERTS–TWIN CELLS

SCALE 1:20

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Romans REGISTERED SURVEYOR

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

..... Roger Dohnt

BE,MIE, Aust., CPEng NPER-3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. **14615** DATE **06/05/10**

BASE SLAB DIMENSIONS

SPAN (mm)	"D" (mm)	'A1'	'A2'
1200 (FUTURE)	200	N12–150	NOT REQUIRED
1500	200	N16–150	NOT REQUIRED
2100	225	N20–150	N12–150, 900 LONG & NO COG
2700	250	N20–150	N16–150, 900 LONG & 150 COG
4200	350	N24–150	N20–150, 1500 LONG & 200 COG
2X2700	250	N20–150	N20–150, 900 LONG & 150 COG

This plan/document relates to DA No: 09/0809 COX No: 100012 Environmental Planning & Assessment Act PENRITH CITY COUNCIL

1:20 400 200 0 400 800 1200 1600 2000 MILLIMETRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR TENDER
NOT FOR CONSTRUCTION
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20 (AT A1)

JORDAN SPRINGS
STAGE 1A
SPECIAL DRAINAGE PIT STRUCTURAL NOTES
TYPICAL BOX CULVERT BASE SLAB DETAIL

PLAN No. 8634CC50 D
FILE No. 8634CC50
SHEET 50 OF 51 SHEETS

Plotted: 7 May 2010 3:15:50 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1A\8634CC50.dwg

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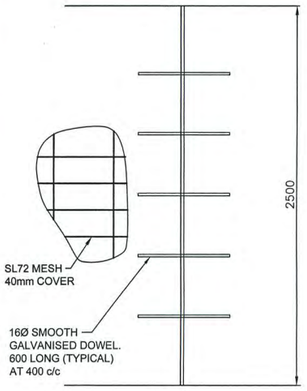
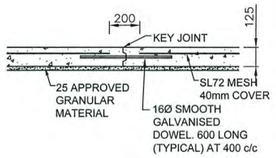
Version: 1, Version Date: 13/07/2018



PLAN



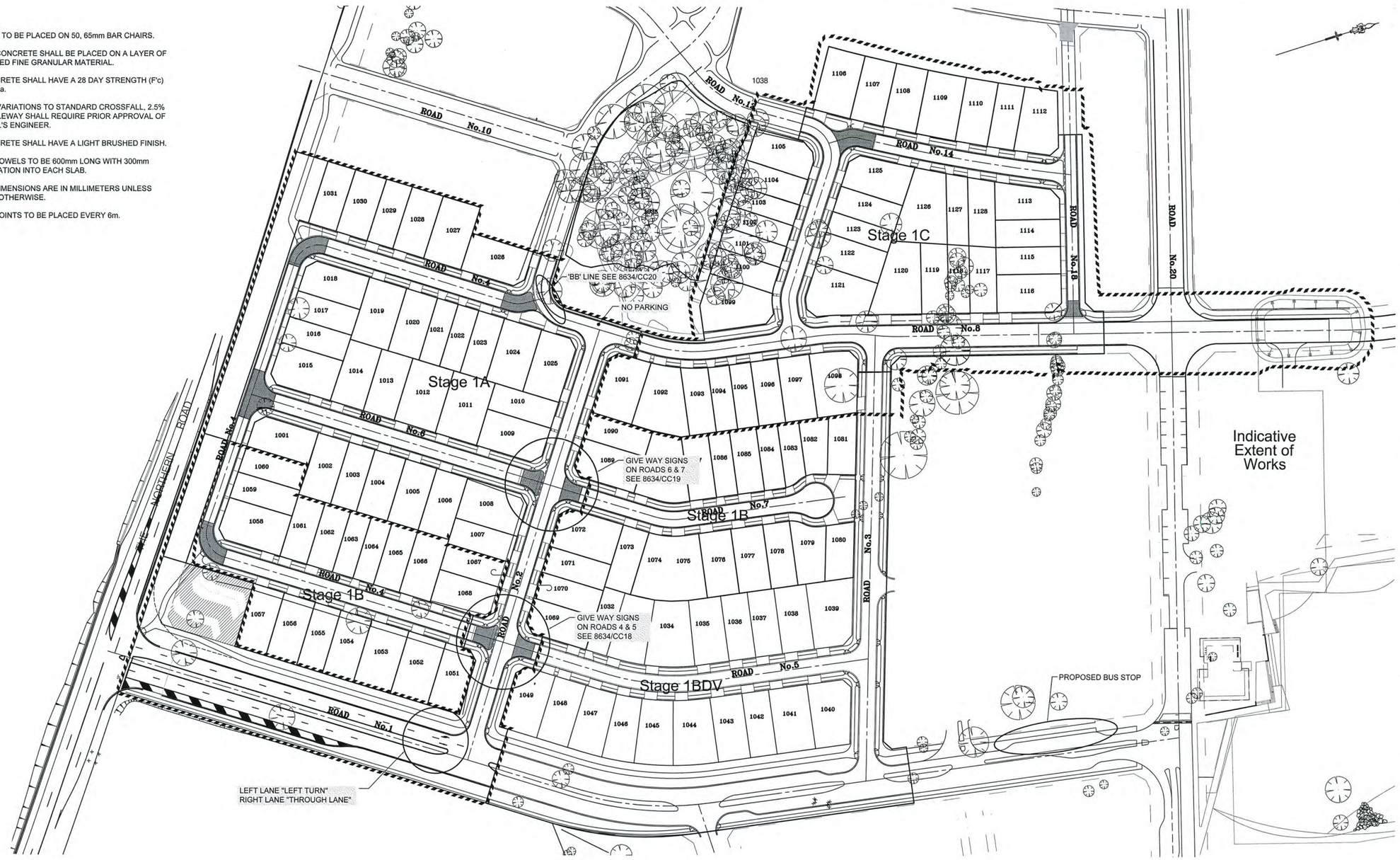
CROSS SECTION

SHARED CYCLE/FOOTWAY TYPICAL DETAIL

NTS

NOTE:

1. MESH TO BE PLACED ON 50, 65mm BAR CHAIRS.
2. THE CONCRETE SHALL BE PLACED ON A LAYER OF APPROVED FINE GRANULAR MATERIAL.
3. CONCRETE SHALL HAVE A 28 DAY STRENGTH (F'c) OF 20MPa.
4. ANY VARIATIONS TO STANDARD CROSSFALL, 2.5% ON CYCLEWAY SHALL REQUIRE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
5. CONCRETE SHALL HAVE A LIGHT BRUSHED FINISH.
6. ALL DOWELS TO BE 600mm LONG WITH 300mm PENETRATION INTO EACH SLAB.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
8. KEY JOINTS TO BE PLACED EVERY 6m.



WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

LEGEND

- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- THRESHOLD TREATMENT PAVERS ON CONCRETE BASE
- 45.5 PROPOSED DESIGN CONTOURS
- STAGE 1A WORK
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1A

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 11/10/2010 Paul Homann REGISTERED SURVEYOR

ISSUE	AMENDMENT	DATE	BY
F			
E			
A	SHEET ADDED AT COUNCILS REQUEST	MAY 2010	
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED D.P.
DRAWN D.P.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: AS SHOWN (AT A1)

CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1A
SIGNAGE AND LINEMARKING PLAN
SHARED CYCLE/ FOOTWAY TYPICAL DETAIL

PLAN No. 8634CC51 A
FILE No. 8634CC51
SHEET 51 OF 51 SHEETS

Plotted: 7 May 2010 11:02:30 AM File Name: J:\8634DI\CC - Engineering Construction Plans\Stage - 1A\8634CC51.dwg

Document Set ID: 8291178
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GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS.
2. SURVEY MARKS:–
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT–HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:– THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:–
    a) INTERALLOTMENT DRAINS (C.D.L.) – 1.5m WIDE MINIMUM (UP TO 300mm dia)
    b) ALL OTHER PIPES – 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON–COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED – DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

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UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

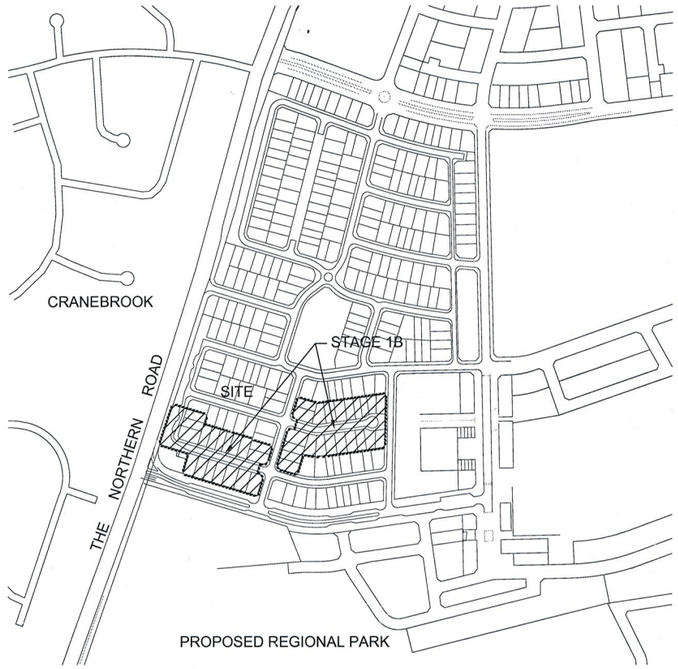
PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

STAGE 1B
ROAD & DRAINAGE WORKS

COUNCIL REF: DA09/0811



LEGEND

PROPOSED	DESCRIPTION	EXISTING
600ø	R.C. STORMWATER PIPELINE	
600ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150ø	COMMON DRAINAGE LINE	150ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS – BENCH MARKS	▲
◘	STATE SURVEY MARKS	
o	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

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8634/CC112	PIT SCHEDULE & DRAINAGE CALCULATIONS
8634/CC113	SOIL & WATER MANAGEMENT PLAN
8634/CC114	SOIL & WATER MANAGEMENT NOTES & DETAILS

This plan/document relates to
DA No: 090811 CCX No: 100010
Environmental Planning and Assessment Act
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6 / 10 / 2010 Paul Homann
REGISTERED SURVEYOR

SURVEYED BY:
WHELANS INSITES PTY LTD

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

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JORDAN SPRINGS
STAGE 1B
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8634CC100 D
FILE No. 8634CC100
SHEET 1 OF 15 SHEETS

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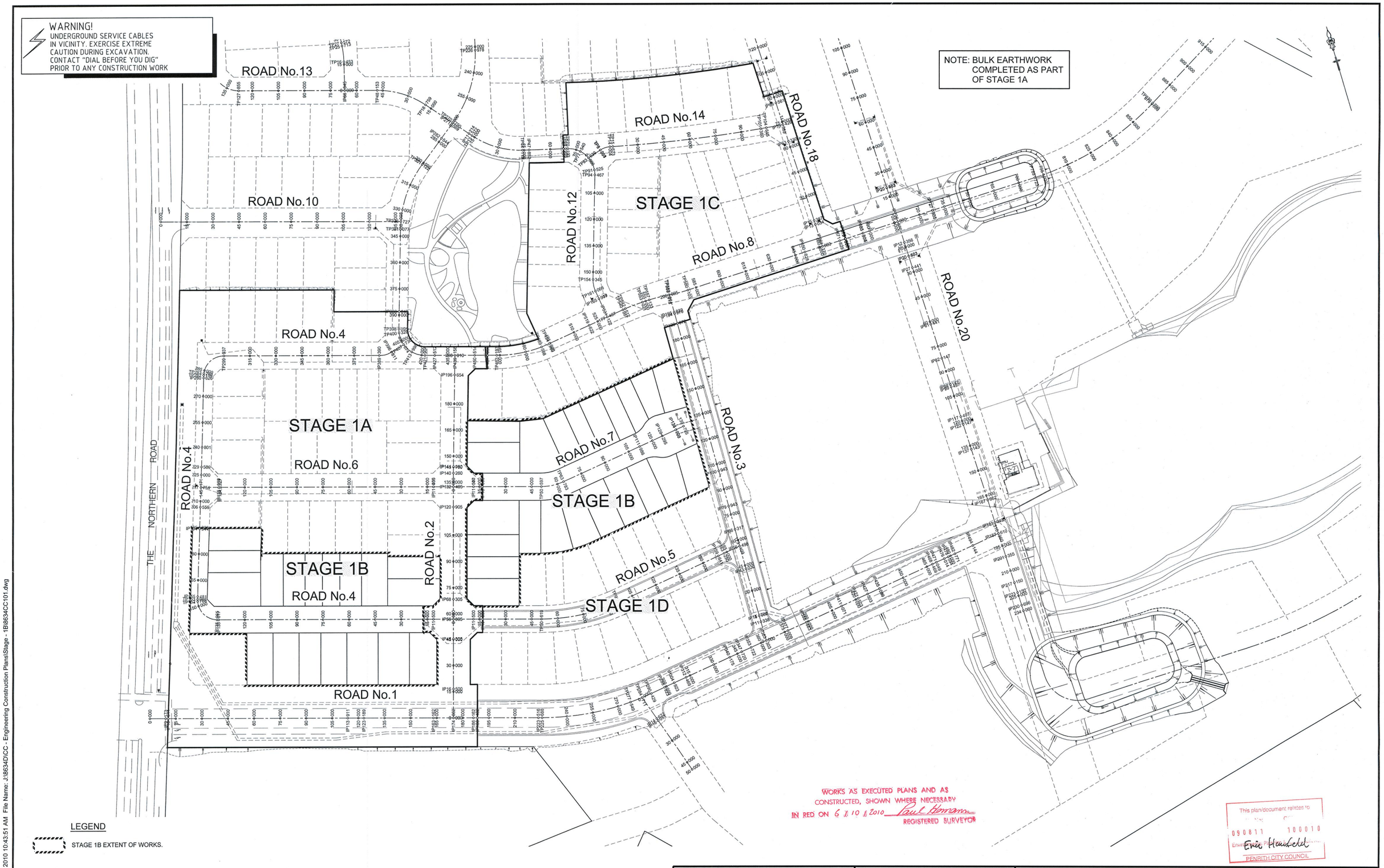

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C	COUNCIL AMENDMENTS	MAR 2010	AM
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:1000

CLIENT: Delfin Lend Lease

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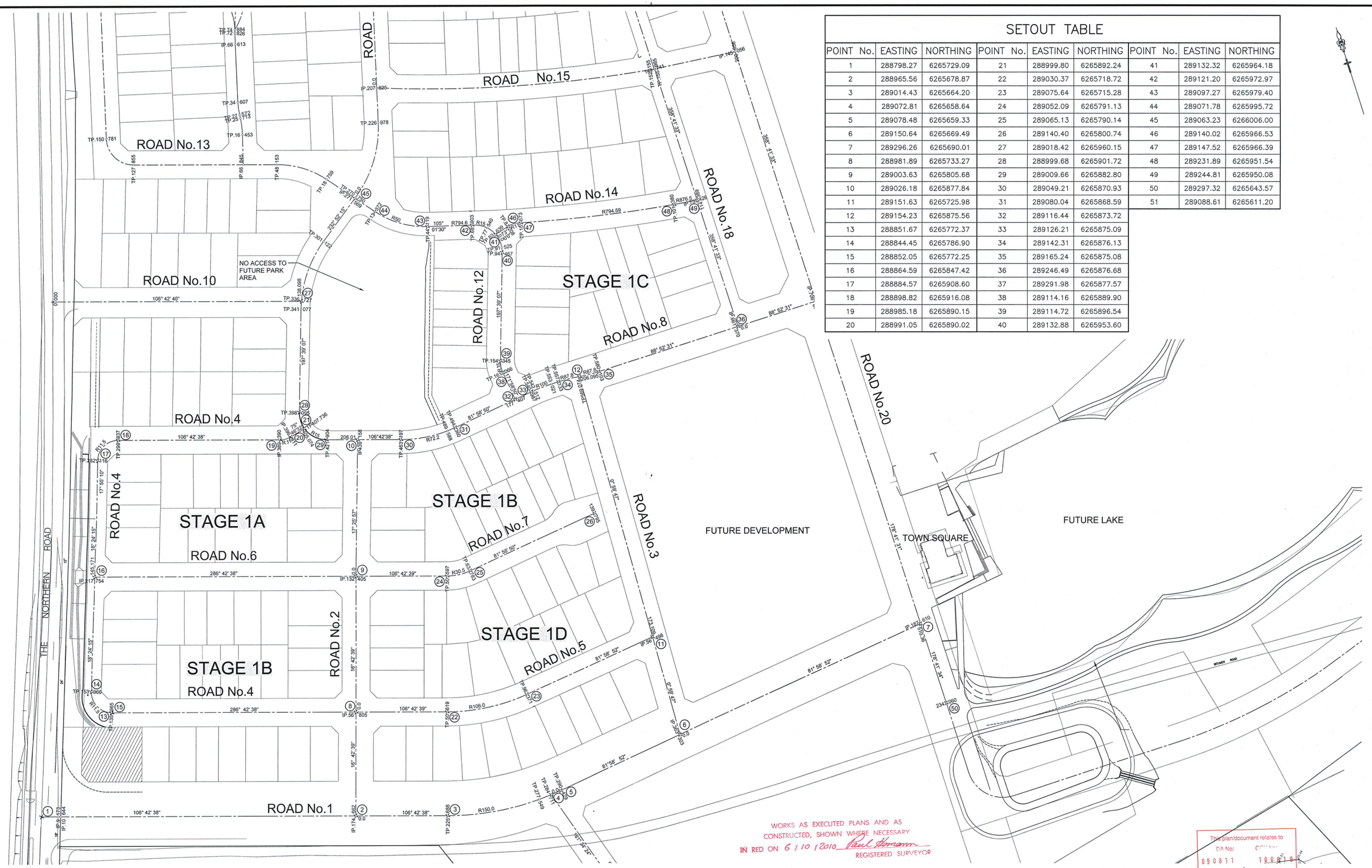
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1B
SITE STAGING

PLAN No. 8634CC101 D
FILE No. 8634CC101
SHEET 2 OF 15 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



SETOUT TABLE

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
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3	289014.43	6265664.20	23	289075.64	6265715.28	43	289097.27	6265979.40
4	289072.81	6265658.64	24	289052.09	6265791.13	44	289071.78	6265995.72
5	289078.48	6265659.33	25	289065.13	6265790.14	45	289063.23	6266006.00
6	289150.64	6265669.49	26	289140.40	6265800.74	46	289140.02	6265966.53
7	289296.26	6265690.01	27	289018.42	6265960.15	47	289147.52	6265966.39
8	288981.89	6265733.27	28	288999.68	6265901.72	48	289231.89	6265951.54
9	289003.63	6265805.68	29	289009.66	6265882.80	49	289244.81	6265950.08
10	289026.18	6265877.84	30	289049.21	6265870.93	50	289297.32	6265643.57
11	289151.63	6265725.98	31	289080.04	6265868.59	51	289088.61	6265611.20
12	289154.23	6265875.56	32	289116.44	6265873.72			
13	288851.67	6265772.37	33	289126.21	6265875.09			
14	288844.45	6265786.90	34	289142.31	6265876.13			
15	288852.05	6265772.25	35	289165.24	6265875.08			
16	288864.59	6265847.42	36	289246.49	6265876.68			
17	288884.57	6265908.60	37	289291.98	6265877.57			
18	288898.82	6265916.08	38	289114.16	6265889.90			
19	288985.18	6265890.15	39	289114.72	6265896.54			
20	288991.05	6265890.02	40	289132.88	6265953.60			

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6/10/2010 Paul Hamann REGISTERED SURVEYOR

This plan/document relates to DA No: 090811 1008/10 Environment & Planning PLANS Enric Hendfeld PENRITH CITY COUNCIL

WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
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D	COUNCIL AMENDMENTS	MAY 2010	AM
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1B
SETOUT PLAN

PLAN No. 8634CC102 D
FILE No. 8634CC102
SHEET 3 OF 15 SHEETS

Plotted: 7 May 2010 10:43:59 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1B\8634CC102.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

WARNING!
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THE NORTHERN ROAD

ROAD No.11

ROAD No.6

ROAD No.4

ROAD No.2

ROAD No.7

ROAD No.3

ROAD No.5

ROAD No.1

EMERGENCY OVERLAND FLOWPATH.

CDS 1

1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090

1057 1056 1055 1054 1053 1052 1051

LINE 4 1500Ø
LINE 4 3750
LINE 5 3750
LINE 10 1500
LINE 15 450Ø
LINE 15 600Ø
LINE 15 900Ø
LINE 18 1500
LINE 24 375Ø 225Ø
LINE 27 600Ø
LINE 32 225Ø

NOT CONSTRUCTED

NOW BEING CONSTRUCTED 1/11/10

1-03 BOY TO SLOPE JUNCTION

BITUMEN ROAD

LEGEND

- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- THRESHOLD TREATMENT PAVERS ON CONCRETE BASE
- 45.5 DESIGN CONTOURS
- EXTENT OF STAGE 1B WORKS

NOTES:
- DRIVEWAY LAYBACKS & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS.
- BULK EARTHWORKS COMPLETED AS PART OF STAGE 1A.

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: 090811 CC'K No: 100010
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:500

CLIENT: Delfin Lend Lease

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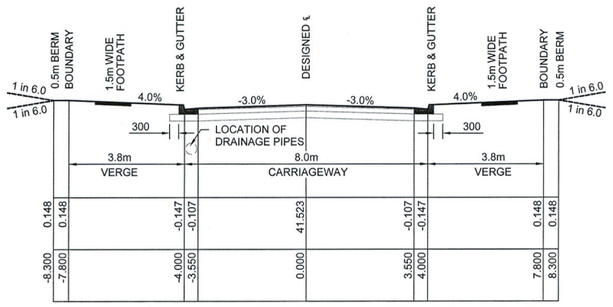
JORDAN SPRINGS
STAGE 1B
PLAN

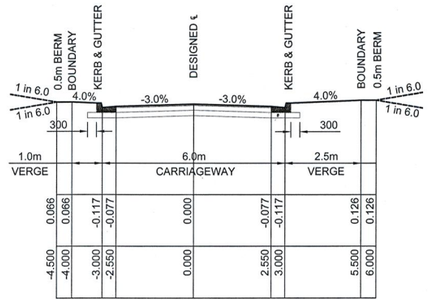
PLAN No. 8634CC103 D
FILE No. 8634CC103
SHEET 4 OF 15 SHEETS

Plotted: 7 May 2010 10:44:20 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1B\8634CC103.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



TYPICAL CROSS SECTION ROAD No.4
CH 17.800 TO 135.017
1:100 NAT



TYPICAL CROSS SECTION ROAD No.4
CH 155.481 TO 194.344
1:100 NAT

PAVEMENT DESIGN - ROAD 4 - $5x10^4$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD.
ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE (SUBJECT TO SOIL TEST)

THRESHOLD TREATMENT DESIGN

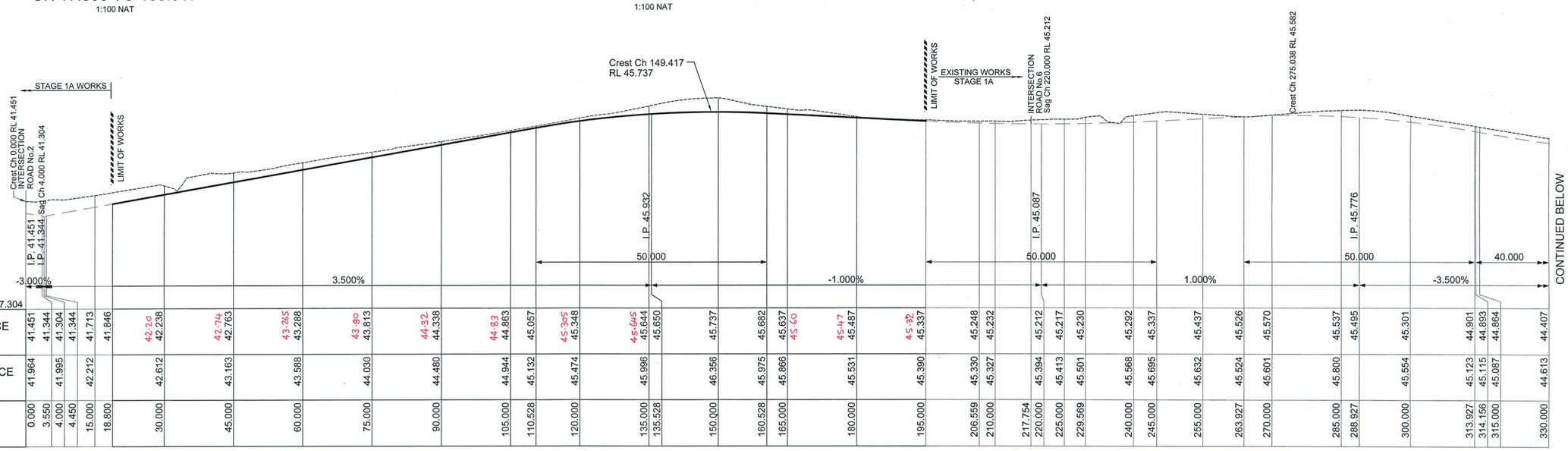
80mm MINIMUM THICKNESS PAVERS

30mm MINIMUM THICKNESS SAND

150mm REINFORCED CONCRETE BASE WITH SL82 MESH

300mm CONCRETE EDGE

NOTE: THRESHOLD TREATMENT TO SIT ON -75mm CRUSHED SANDSTONE SUB-BASE, TRIMMED TO SUIT THRESHOLD TREATMENT DEPTH.



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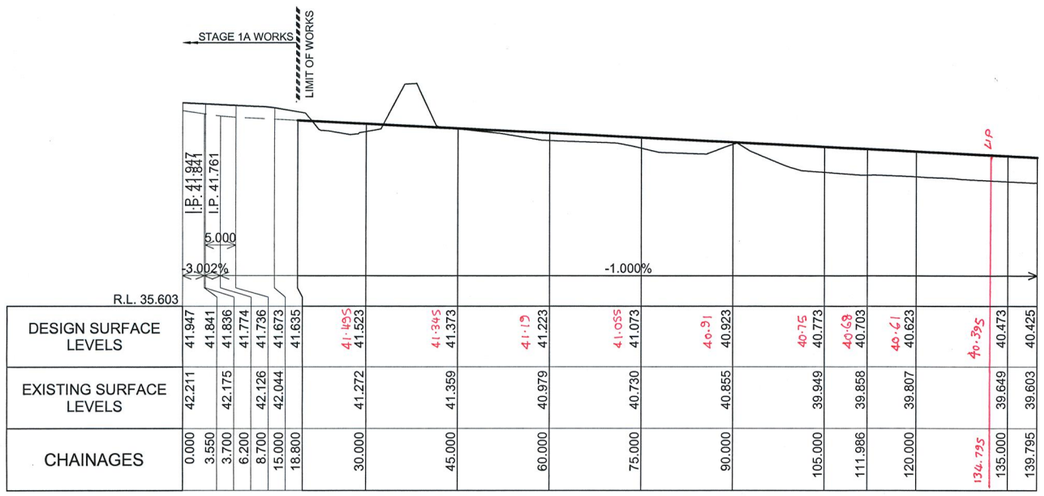
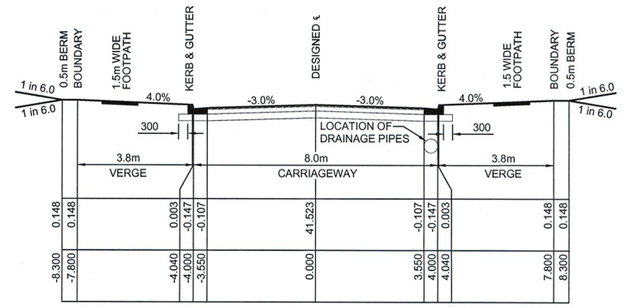


R.L. 35.603													
DESIGN SURFACE LEVELS	41.947	41.841	41.836	41.774	41.736	41.673	41.635	41.495 41.523	41.395 41.373	41.179 41.223	41.055 41.073	40.991 40.923	40.795 40.773
EXISTING SURFACE LEVELS	42.211	42.175	42.126	42.044				41.272	41.359	40.979	40.730	40.855	39.949
CHAINAGES	0.000	3.550	3.700	6.200	8.700	15.000	18.800	30.000	45.000	60.000	75.000	90.000	105.000

DESIGN SURFACE LEVELS	40.769 40.703	40.671 40.623	40.395 40.473	40.425									
EXISTING SURFACE LEVELS	39.858	39.807		39.649	39.603								
CHAINAGES	111.986	120.000	134.795	135.000	139.795								

LONGITUDINAL SECTION -ROAD 7

HORIZ 1:500
VERT 1:100



TYPICAL CROSS SECTION ROAD No. 7
CH 18.800 TO END

1:100 NAT

PAVEMENT DESIGN - ROAD 7 - $5x10^4$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD.
ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE (SUBJECT TO SOIL TEST)

NOTE : CENTRELINE LEVELS ON FIRST BITUMEN SEAL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No. 090811 CC No. 100010
Environmental Planning & Assessment Act
Erin Mansfield
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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SIGNED S. Adams DATE 06/05/2010

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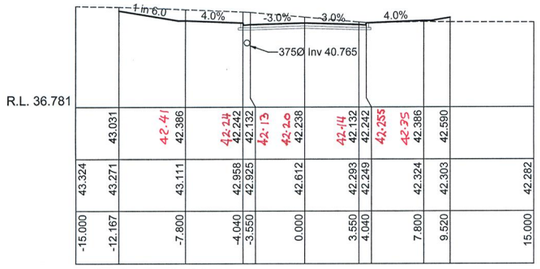
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: AS SHOWN @ A1

JORDAN SPRINGS
STAGE 1B
ROAD No.7 LONGITUDINAL SECTIONS & & TYPICAL CROSS SECTIONS

PLAN No. 8634CC105 D
FILE No. 8634CC105
SHEET 6 OF 15 SHEETS

Plotted: 7 May 2010 10:44:31 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1B\8634CC105.dwg
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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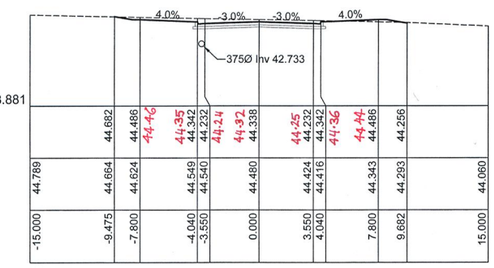

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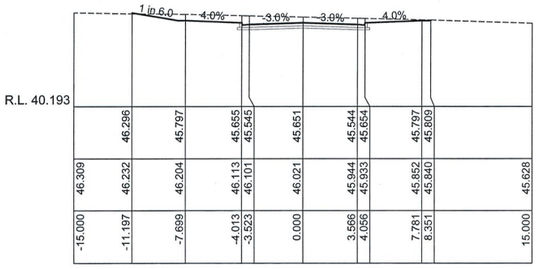

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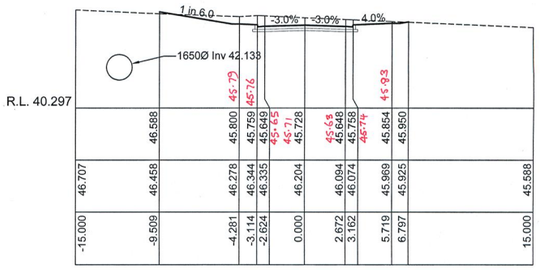

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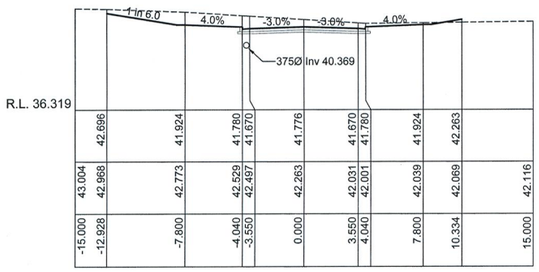

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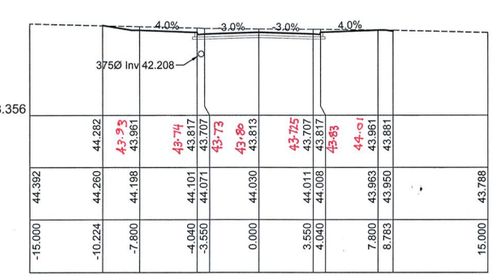

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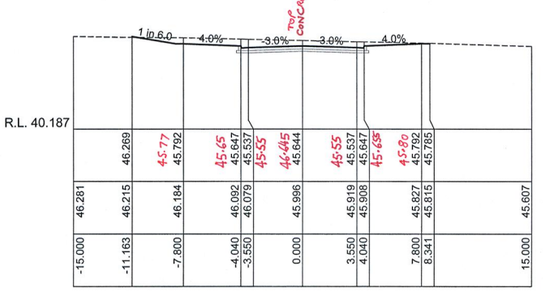

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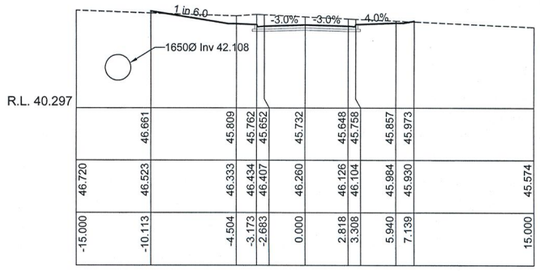

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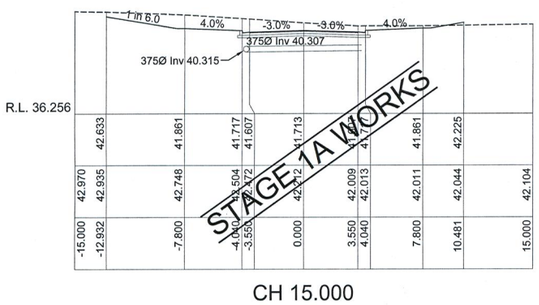

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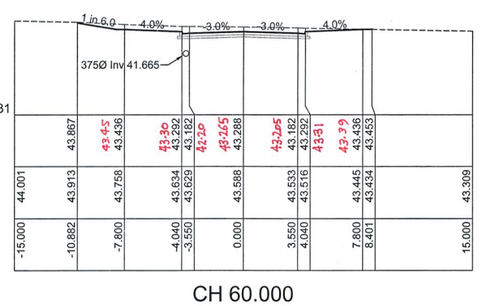

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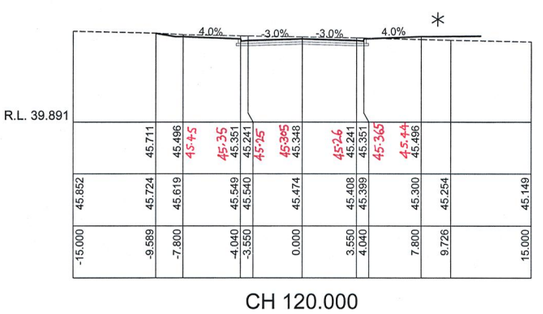

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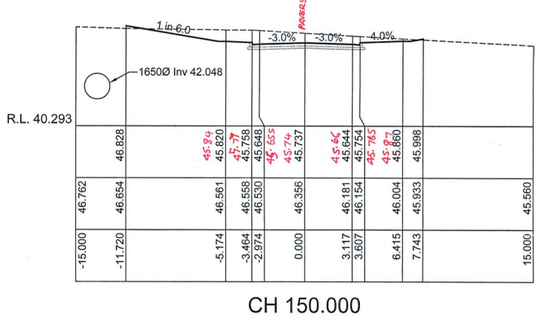

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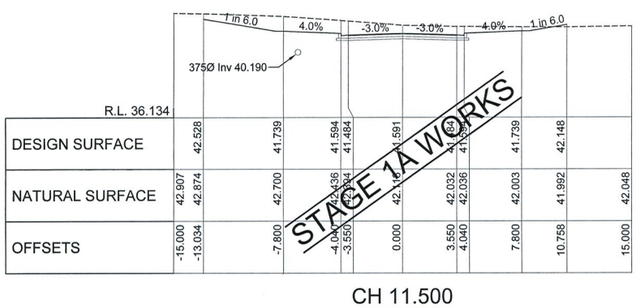
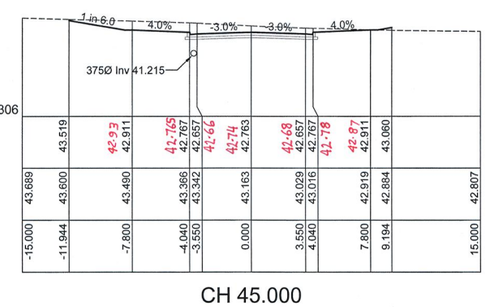


CH 11.500
ROAD 4



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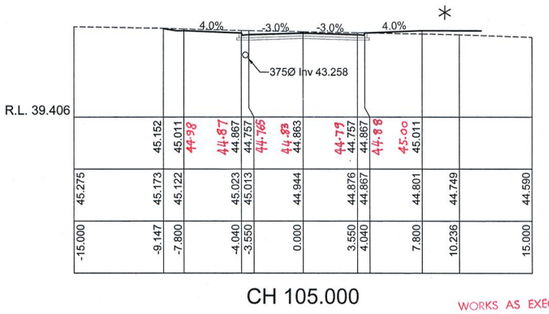

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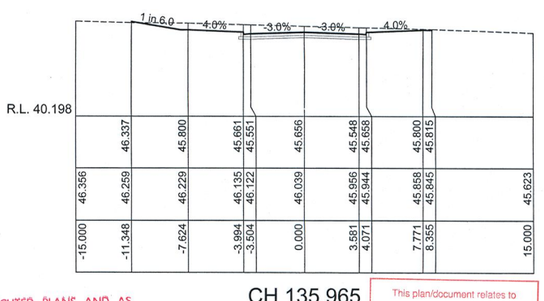

CH 135.965

NOTE : CENTRELINE LEVELS ON FIRST BITUMEN SEAL

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Paul Hamann
REGISTERED SURVEYOR

This plan/document relates to DA No. 090811 100010
Environmental Planning & Assessment Act
Eric Hendell
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

JORDAN SPRINGS
STAGE 1B
ROAD No.4 CROSS SECTIONS

PLAN No. 8634CC106 D
FILE No. 8634CC106
SHEET 7 OF 15 SHEETS

Plotted: 7 May 2010 10:44:43 AM File Name: J:\8634\D\CC - Engineering Construction Plans\Stage - 1B\8634CC106.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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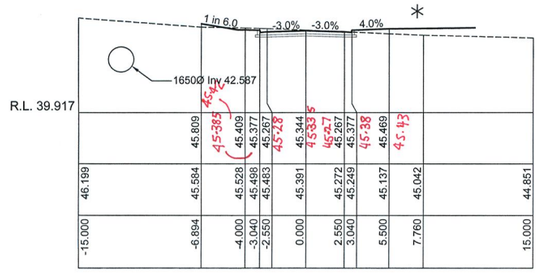

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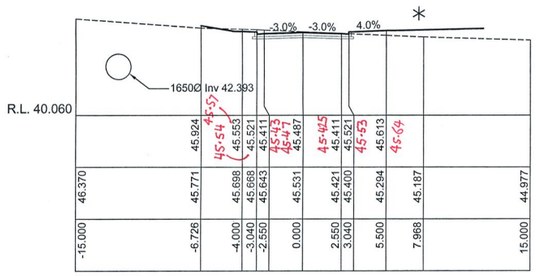

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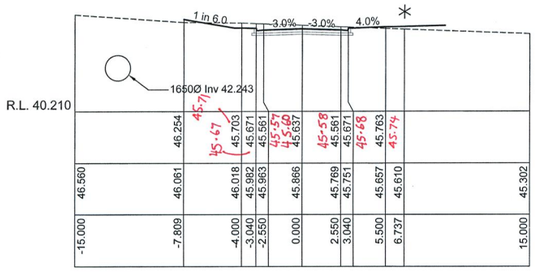

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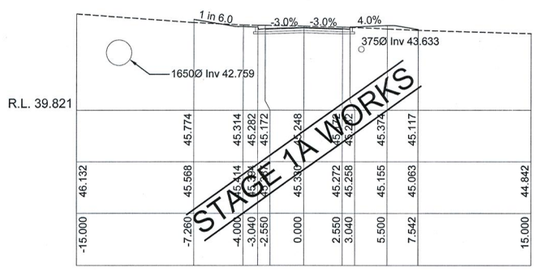
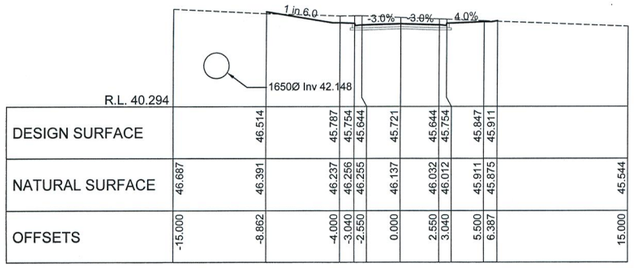
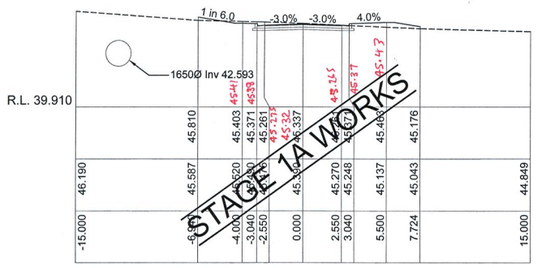


CH 206.559



CH 155.481
ROAD 4



CH 195.000

NOTE: CENTRELINE LEVELS ON FIRST BITUMEN SEAL

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IN RED ON 6 / 10 / 2010 Paul Hannam
REGISTERED SURVEYOR

This plan/document relates to
DA No: 090811 CC No: 100010
Environmental Planning & Assessment Act
Eric Hindfeld
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

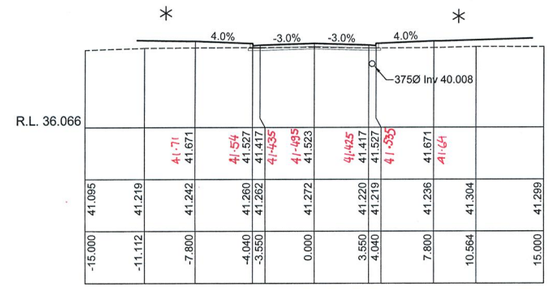
JORDAN SPRINGS
STAGE 1B
ROAD No.4 CROSS SECTIONS

PLAN No. 8634CC107 D
FILE No. 8634CC107
SHEET 8 OF 15 SHEETS

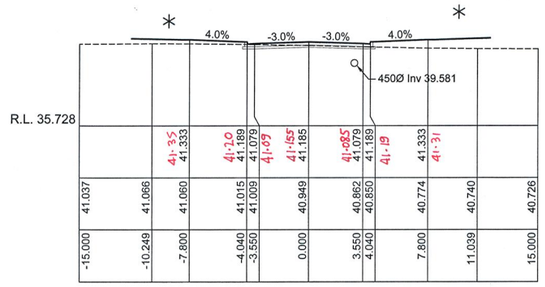
Plotted: 7 May 2010 10:44:49 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1B\8634CC107.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

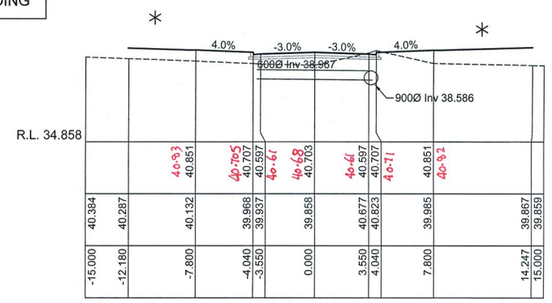
* SEE PLAN FOR LOT GRADING



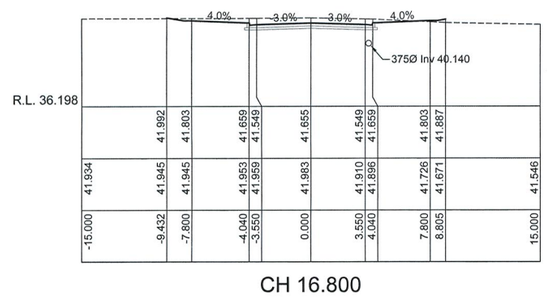
CH 30.000



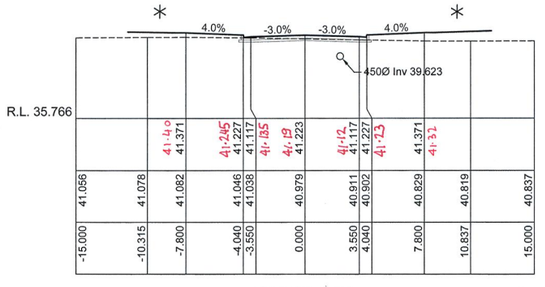
CH 63.783



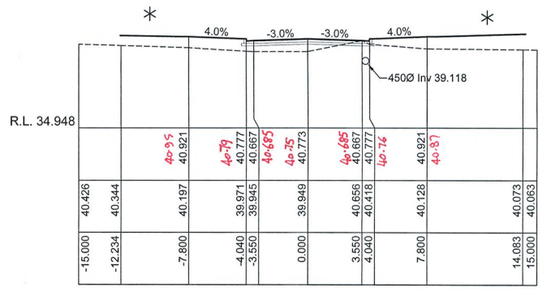
CH 111.986



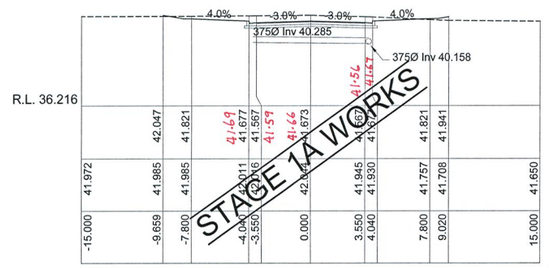
CH 16.800



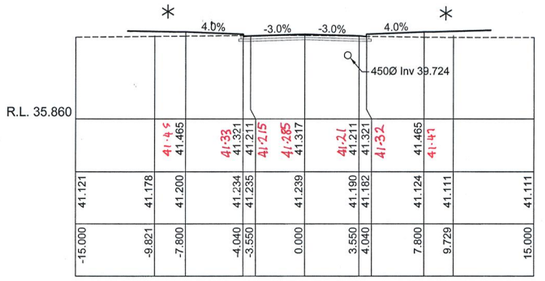
CH 60.000



CH 105.000



CH 15.000



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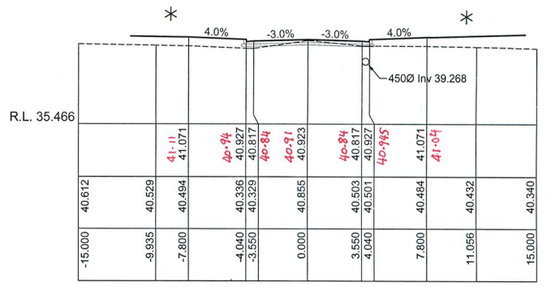

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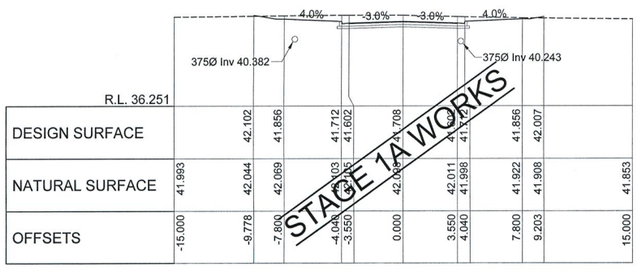
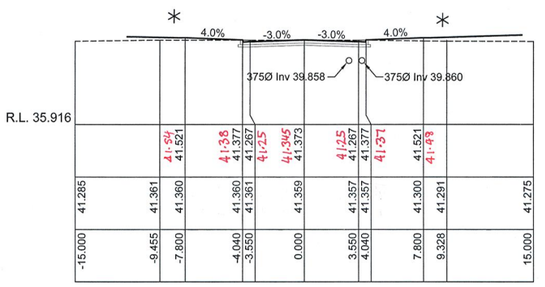
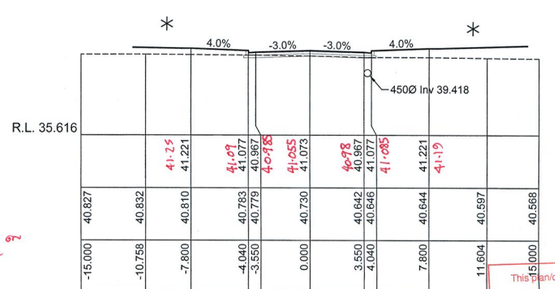


CH 11.500
ROAD 7



CH 45.000



CH 75.000

NOTE: CENTRELINE LEVELS ON FIRST BITUMEN SEAL

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REGISTERED SURVEYOR

This plan/document relates to
DA No: COX No:
090811 100010
Environmental Planning & Assessment Act
Enid Hendrick
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT
AT A1

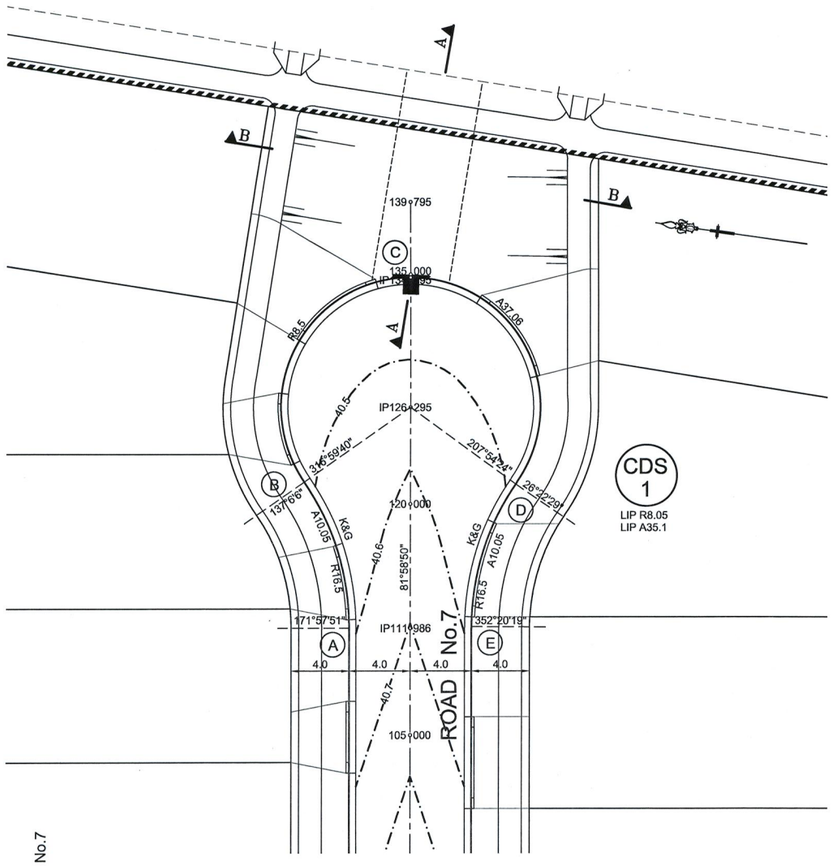
JORDAN SPRINGS
STAGE 1B
ROAD No.7 CROSS SECTIONS

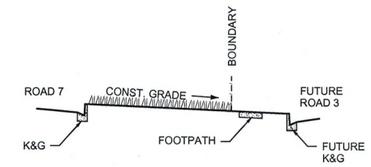
PLAN No. 8634CC108 D
FILE No. 8634CC108
SHEET 9 OF 15 SHEETS

Plotted: 7 May 2010 10:44:59 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1B\8634CC108.dwg

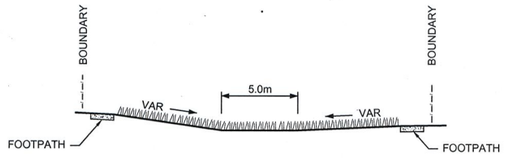
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER

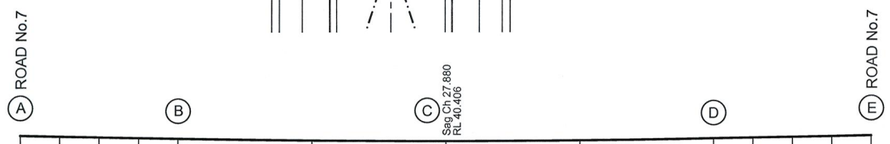




SECTION A-A
HORIZ 1:200
VERT 1:40



SECTION B-B
HORIZ 1:200
VERT 1:40



WORK AS EXECUTED
R.L. 31.405

	40.61	40.565	40.560	40.540	40.515	40.450	40.395	40.440	40.495	40.525	40.560	40.480	40.61
DESIGN LIP LEVEL	40.597	40.571	40.545	40.519	40.493	40.428	40.406	40.428	40.493	40.519	40.545	40.571	40.597
ROAD CL CHAINAGE	111.986						134.795						111.986
CHAINAGE	0.000	2.582	5.165	7.747	10.329	19.104	27.880	36.655	45.430	48.012	50.595	53.177	55.759

CDS1
HORIZ 1:200
VERT 1:100

1:40 (AT A1) 1 0 1 2 3 4 METRES

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6/10/2010 Paul Homann REGISTERED SURVEYOR

This plan/document relates to
DA No: 090811 100010
Environmental Planning & Assessment Act
Eric Hausfeld
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1B
CUL-DE-SAC DETAILS

PLAN No. 8634CC109 D
FILE No. 8634CC109
SHEET 10 OF 15 SHEETS

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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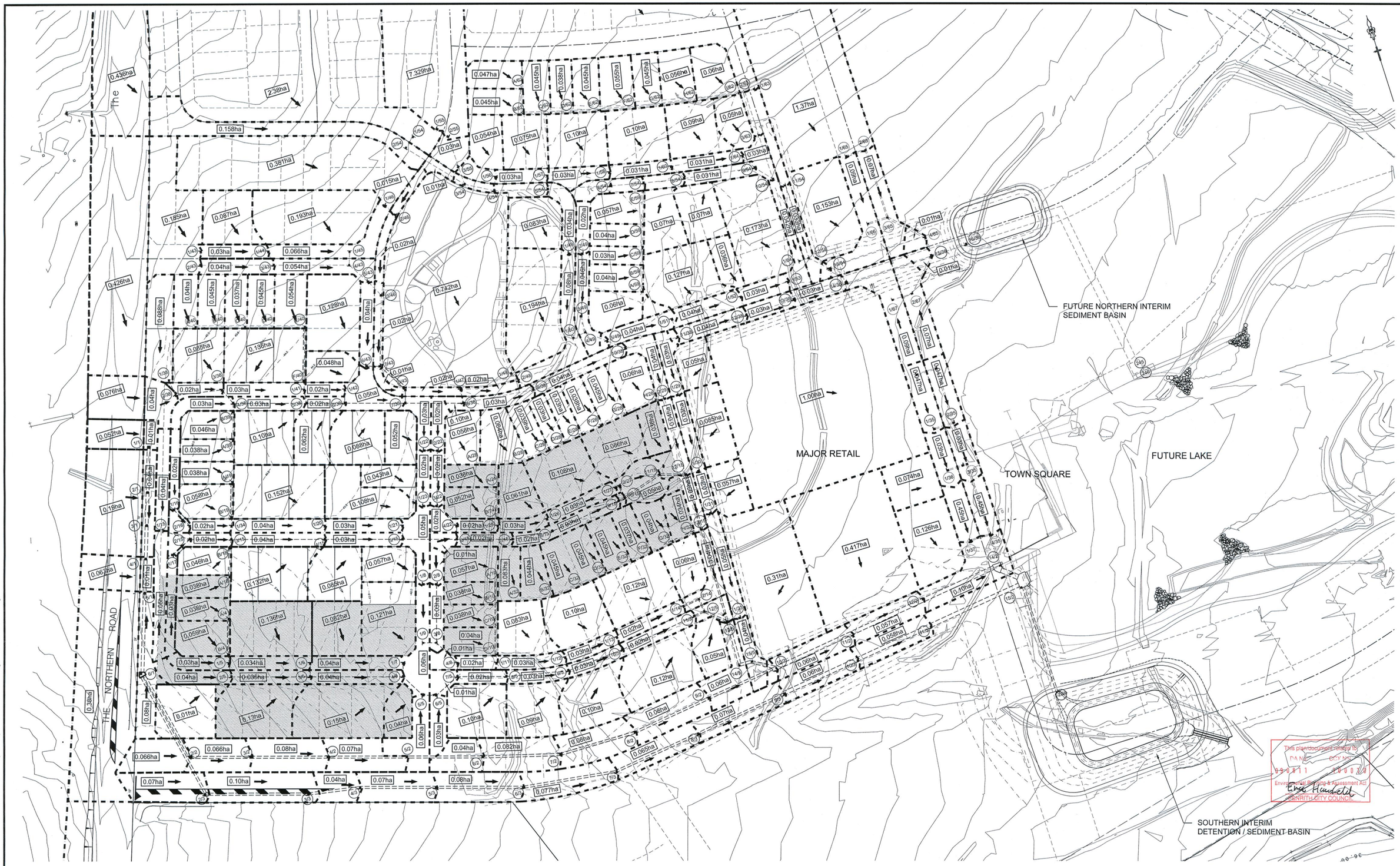
DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:200 H 1:100 V (AT A1)

Plotted: 7 May 2010 10:45:14 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1B\8634CC109.dwg



WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
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1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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JORDAN SPRINGS
STAGE 1B
CATCHMENT PLAN

PLAN No. 8634CC110 D
FILE No. 8634CC110
SHEET 11 OF 15 SHEETS

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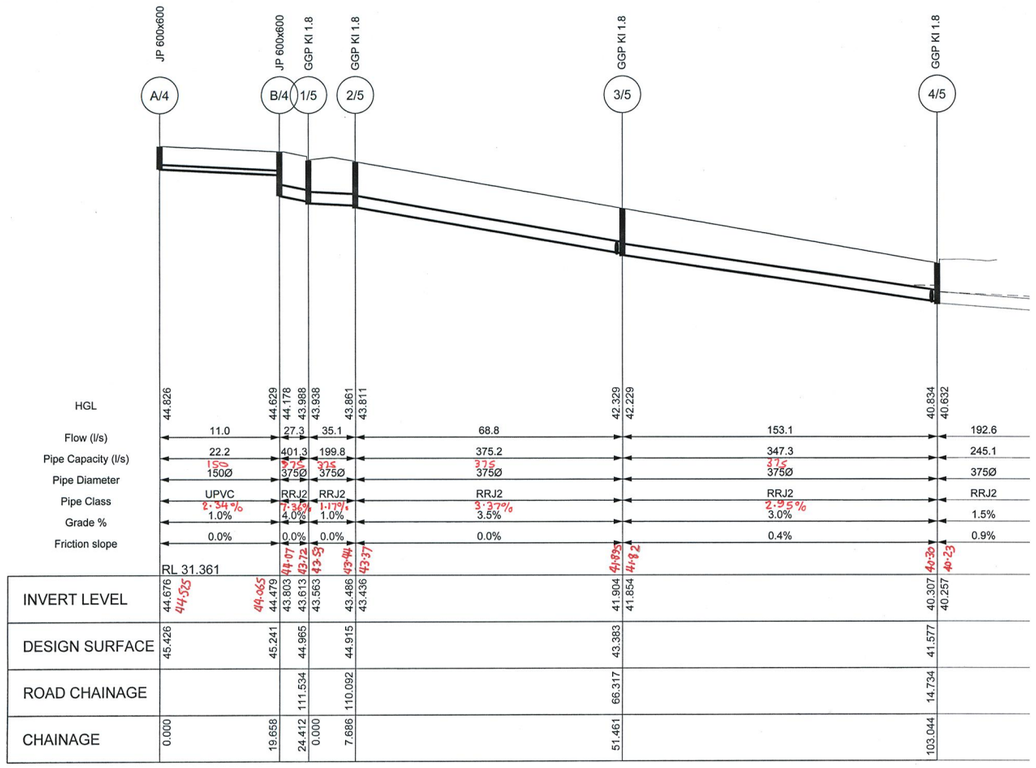
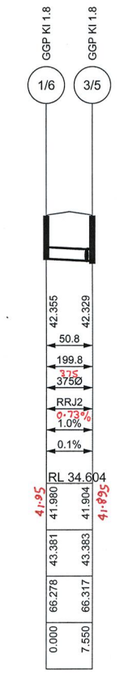
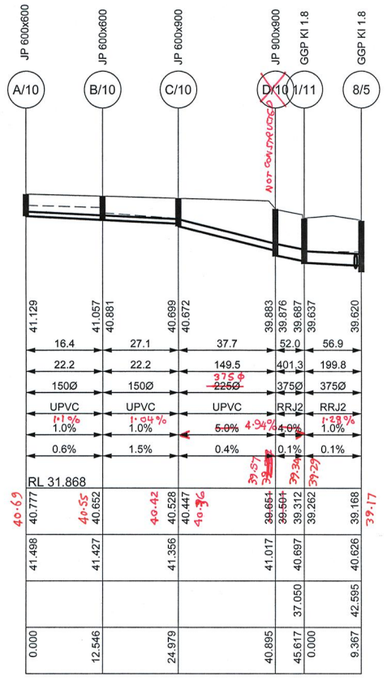
Version: 1, Version Date: 13/07/2018



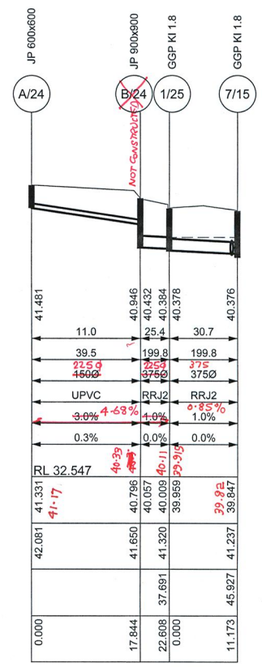
LINES 4 & 5 (10 yr)



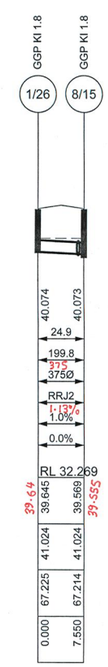
LINE 6 (10 yr)



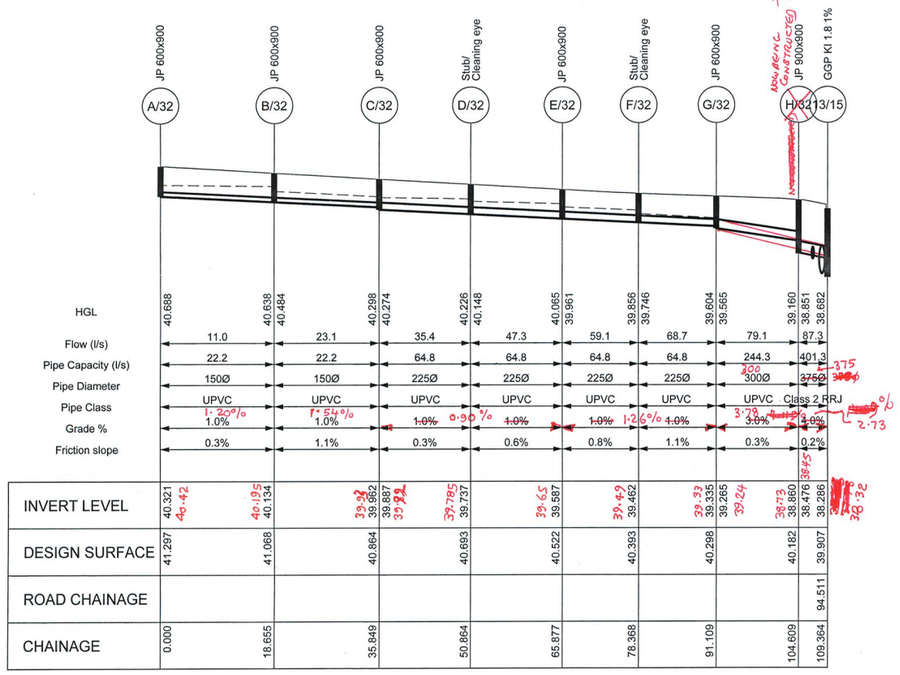
LINES 10 & 11 (10 yr)



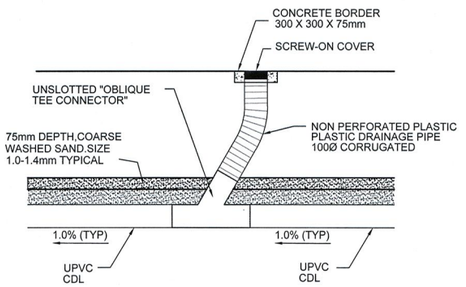
LINES 24 & 25 (10 yr)

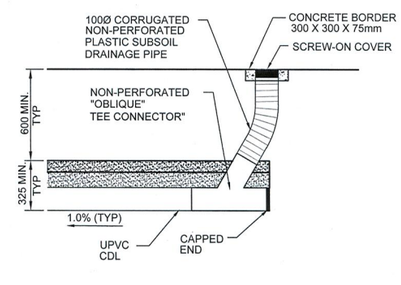


LINE 26 (10 yr)



LINES 32 (10 yr)





CLEANING EYE/SUBSOIL DETAIL
SCALE 1:20

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This plan/document relates to DA No: 090811 100010 Environmental Planning & Assessment Act Erica Hendfield PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:500 H 1:100 V AT A1

JORDAN SPRINGS
STAGE 1B
DRAINAGE LONGITUDINAL SECTIONS
LINE No.4, 5, 6, 10, 11, 24, 25, 26 & 32

PLAN No. 8634CC111 D
FILE No. 8634CC111
SHEET 12 OF 15 SHEETS

Plotted: 7 May 2010 10:45:42 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1B\8634CC111.dwg
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDRAULICS DESIGN TABLE- 6 Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
B/4 A/4	6.000	0.029	0.0	19.658	150	0.009	1.0	44.826	0.000	4.500	0.000	0.00	0.00	22.17	0.000	
1/5 B/4	6.000	0.074	0.0	4.753	375	0.012	4.0	44.178	0.000	0.600	0.000	0.00	0.00	401.26	0.000	
2/5 1/5	6.000	0.097	8.6	7.686	375	0.012	1.0	43.938	8.572	2.200	0.001	0.00	0.08	199.82	1.651	
3/5 2/5	7.651	0.193	41.6	43.775	375	0.012	3.5	43.811	41.639	2.184	0.016	0.01	0.38	375.24	1.935	
4/5 3/5	9.586	0.382	120.5	51.583	375	0.012	3.0	42.229	120.484	1.632	0.099	0.06	1.09	347.28	0.788	
3/5 1/6	6.000	0.134	50.8	7.550	375	0.012	1.0	42.355	50.774	4.500	0.049	0.01	0.46	199.82	0.274	
1/11 D/10	6.639	0.142	52.0	4.722	375	0.012	4.0	39.876	51.963	0.600	0.007	0.01	0.47	401.26	0.167	
D/10 C/10	6.360	0.102	37.7	15.916	225	0.009	5.0	40.672	37.735	0.600	0.028	0.05	0.95	149.50	0.280	
C/10 B/10	6.225	0.073	27.1	12.433	150	0.009	1.0	40.881	27.124	1.465	0.176	0.12	1.53	22.17	0.135	
B/10 A/10	6.000	0.044	16.4	12.546	150	0.009	1.0	41.129	16.444	4.500	0.199	0.04	0.93	22.17	0.225	
7/15 6/15	13.027	0.930	262.6	30.989	450	0.012	1.0	40.582	262.602	0.600	0.083	0.14	1.65	322.91	0.313	
8/15 7/15	13.340	1.036	289.6	22.615	450	0.012	1.0	40.255	289.558	0.716	0.121	0.17	1.82	322.91	0.207	
9/15 8/15	13.547	1.117	310.3	40.603	450	0.012	1.0	39.946	310.349	0.651	0.126	0.19	1.95	322.91	0.347	
B/24 A/24	6.000	0.029	11.0	17.844	150	0.009	3.0	41.481	10.963	4.500	0.088	0.02	0.62	39.50	0.479	
1/25 B/24	6.479	0.069	25.4	4.764	375	0.012	1.0	40.432	25.392	0.600	0.002	0.00	0.23	199.82	0.345	
7/15 1/25	6.825	0.084	30.7	11.173	375	0.012	1.0	40.378	30.690	1.216	0.005	0.00	0.28	199.82	0.670	
8/15 1/26	6.000	0.066	24.9	7.550	375	0.012	1.0	40.074	24.851	4.500	0.012	0.00	0.23	199.82	0.559	
D/32 C/32	6.720	0.097	35.4	15.015	225	0.009	1.0	40.274	35.425	0.600	0.024	0.04	0.89	64.75	0.281	
G/32 F/32	7.351	0.194	68.7	12.740	225	0.009	1.0	39.746	68.726	0.720	0.110	0.15	1.73	64.75	0.123	
13/15 H/32	7.675	0.250	87.3	4.755	375	0.012	4.0	38.851	87.339	0.600	0.019	0.03	0.79	401.26	0.100	
E/32 D/32	7.001	0.131	47.3	15.013	225	0.009	1.0	40.148	47.337	1.080	0.078	0.07	1.19	64.75	0.210	
B/32 A/32	6.000	0.029	11.0	18.655	150	0.009	1.0	40.688	10.963	4.500	0.088	0.02	0.62	22.17	0.501	
F/32 E/32	7.211	0.166	59.1	12.492	225	0.009	1.0	39.961	59.117	0.918	0.104	0.11	1.49	64.75	0.140	
C/32 B/32	6.501	0.063	23.1	17.194	150	0.009	1.0	40.484	23.111	1.766	0.154	0.09	1.31	22.17	0.219	
H/32 G/32	7.474	0.225	79.1	13.500	300	0.009	3.0	39.565	79.070	0.600	0.038	0.06	1.12	244.32	0.201	

HYDROLOGIC DESIGN TABLE - 6 Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
		(m)	(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	
A/4		JP 600x600							136.0											0.000				
B/4		JP 600x600							136.0											0.000		1/5		
1/5	Road	GGP KI 1.8 3%				6.00		6.00	136.0	0.873	0.026	0.023	6	8.6		8.6	3.409	0.422	0.038	4.286		2/5		
2/5		GGP KI 1.8 3%						6.00	136.0	0.695	0.139	0.097	6	36.5	4.3	40.8	3.500	1.196	0.062	18.770	4.286	3/5		
	Road					6.00		6.00		0.873	0.036	0.031												
	Lot					6.00		6.00		0.764	0.004	0.003												
	Park					6.00		6.00		0.627	0.099	0.062												
3/5		GGP KI 1.8 3%						6.00	136.0	0.786	0.163	0.128	6	48.4	22.0	76.9	3.500	1.635	0.076	30.578	28.503			
	Road					6.00		6.00		0.873	0.034	0.030			28.5							4/5		
	Lot					6.00		6.00		0.764	0.129	0.099												
4/5		GGP KI 1.8 3%						6.00	136.0	0.786	0.193	0.152	6	57.3	46.3	76.9	3.500	1.635	0.076	30.580	19.606			
	Road					6.00		6.00		0.873	0.040	0.035			19.6							5/5		
	Lot					6.00		6.00		0.764	0.153	0.117												
1/6		GGP KI 1.8 3%						6.00	136.0	0.786	0.171	0.134	6	50.8		50.8	3.500	1.343	0.067	22.271		3/5		
	Road					6.00		6.00		0.873	0.035	0.031												
						6.00		6.00		0.764	0.136	0.104												
D/10	Lot	JP 900x900				6.00		6.00	136.0	0.873	0.046	0.040	6	15.2						0.000		1/11		
C/10	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		D/10		
B/10	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		C/10		
A/10	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.057	0.044	6	16.4		0.0				0.000		B/10		
7/15	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.024	0.021	6	7.9	6.1	10.9	1.000	0.835	0.052	5.440	2.967			
															3.0							8/15		
8/15	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9	5.4	18.6	1.000	1.070	0.059	9.301	12.668			
															12.7							9/15		
	Lot					6.00		6.00		0.764	0.043	0.033												
A/24	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/24		
B/24	Lot	JP 900x900				6.00		6.00	136.0	0.764	0.052	0.040	6	15.0						0.000		1/25		
1/25	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9		5.9	1.000	0.490	0.041	2.967		7/15		
1/26		GGP KI 1.8 1%						6.00	136.0	0.793	0.083	0.066	6	24.9		24.9	1.000	1.253	0.064	12.183		8/15		
	Road					6.00		6.00		0.873	0.022	0.019												
	Lot					6.00		6.00		0.764	0.061	0.047												
		GGP KI 1.8 1%																						
C/32	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		D/32		
F/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000		G/32		
H/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.034	0.026	6	9.8						0.000		13/15		
D/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		E/32		
A/32	lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		B/32		
E/32	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		F/32		
B/32	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.044	0.034	6	12.7						0.000		C/32		
G/32	Lot	Stub				6.00		6.00	136.0	0.764	0.040	0.031	6	11.5						0.000		H/32		

PIT SCHEDULE & SETOUT - 1

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Pit Lid Level	Road Name	Road Chainage	Road CL Offset	Easting	Northing	Comment
		(mm)	(m)	(mm)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	
A/4	JP 600x600			150	44.676	0.750	45.426				288883.17	6265792.341	
B/4	JP 600x600	150	44.479	375	43.803	1.438	45.241				288877.53	6265773.509	
1/5	GGP KI 1.8 3%	375	43.613	375	43.563	1.402	44.965	ROAD 4	111.53	3.77	288876.15	6265768.959	
2/5	GGP KI 1.8 3%	375	43.486	375	43.436	1.479	44.915	ROAD 4	110.09	-3.77	288875.36	6265761.313	
3/5	GGP KI 1.8 3%	375	41.904	375	41.854	1.528	43.383	ROAD 4	66.32	-3.78	288917.29	6265748.726	
		375	41.904										
1/6	GGP KI 1.8 3%			375	41.980	1.402	43.381	ROAD 4	66.28	3.77	288919.50	6265755.946	
D/10	JP 900x900	225	39.651	375	39.501	1.516	41.017				289019.82	6265730.756	
B/10	JP 600x600	150	40.652	150	40.652	0.774	41.427				289027.99	6265757.905	
C/10	Stub	150	40.528	225	40.447	0.909	41.356				289024.40	6265746.000	
A/10	JP 600x900			150	40.777	0.721	41.498				289031.58	6265769.924	
7/15	GGP KI 1.8 1%	375	39.849	450	39.772	1.465	41.237	ROAD 7	45.93	3.77	289046.53	6265788.859	
		375	39.847										
8/15	GGP KI 1.8 1%	450	39.546	450	39.496	1.528	41.024	ROAD 7	67.21	3.78	289069.06	6265786.881	
		375	39.569										
9/15	GGP KI 1.8 1%	450	39.090	600	38.928	1.691	40.618	ROAD 7	107.82	3.77	289109.26	6265792.546	
10/15	GGP KI 1.8 1%	600	38.891	900	38.591	1.991	40.582	ROAD 7	111.49	3.78	289112.90	6265793.058	
		600	38.891										
11/15	GGP KI 2.4 SAG	900	38.361	900	38.311	2.099	40.410	CDS1	27.89	0.23	289134.78	6265799.940	
A/18	Stub			150	44.226	0.752	44.978				288890.37	6265814.285	
A/24	JP 600x600			150	41.331	0.750	42.081				289047.04	6265820.184	
B/24	JP 900x900	150	40.796	375	40.057	1.594	41.650				289041.91	6265803.095	
1/25	GGP KI 1.8 1%	375	40.009	375	39.959	1.361	41.320	ROAD 7	37.69	-3.77	289040.81	6265798.458	
1/26	GGP KI 1.8 1%			375	39.645	1.380	41.024	ROAD 7	67.22	-3.77	289068.02	6265794.359	
1/27	GGP KI 1.8 1%			600	39.041	1.565	40.606	ROAD 7	109.10	-3.78	289109.48	6265800.200	
2/27	GGP KI 1.8 1%	600	39.017	600	38.967	1.615	40.582	ROAD 7	111.47	-3.78	289111.83	6265800.532	
F/32	Stub	225	39.462	225	39.462	0.930	40.393				289117.78	6265760.161	
G/32	JP600x900	225	39.335	300	39.265	1.033	40.298				289130.40	6265761.928	
A/32	JP 600x900			150	40.321	0.977	41.297				289040.18	6265755.994	
E/32	Stub	225	39.587	225	39.587	0.935	40.522				289105.41	6265758.419	
H/32	JP 900x900	300	38.860	375	38.476	1.705	40.182				289143.76	6265763.807	
C/32	Stub	150	39.962	225	39.887	0.977	40.864				289075.66	6265754.300	
B/32	JP 600x900	150	40.134	150	40.134	0.934	41.068				289058.54	6265752.725	
D/32	Stub	225	39.737	225	39.737	0.956	40.693				289090.54	6265756.333	

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 6/10/2010 Paul Thomann
REGISTERED SURVEYOR

This plan/document relates to DA No: C...
090811 100010
Environmental Planning & Assessment Act
Eric Hendfeld
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	AM
A	FIRST ISSUE	FEB 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

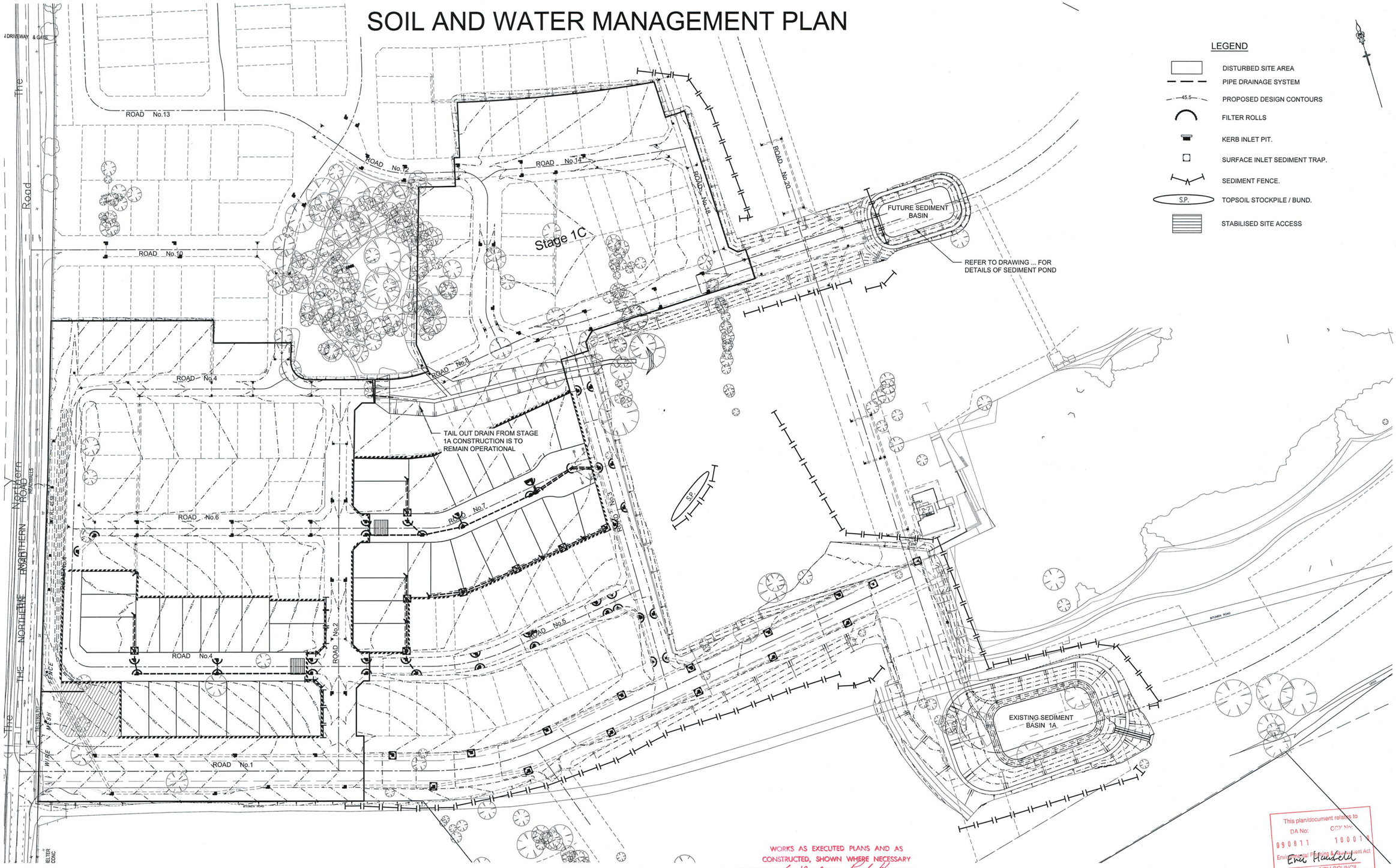
JORDAN SPRINGS
STAGE 1B
PIT SCHEDULE & DRAINAGE CALCULATIONS

PLAN No. 8634CC112 D
FILE No. 8634CC112
SHEET 13 OF 15 SHEETS

Plotted: 7 May 2010 10:45:49 AM File Name: J:\8634DICC - Engineering Construction Plans\Stage - 1B\8634CC112.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

SOIL AND WATER MANAGEMENT PLAN



LEGEND

- DISTURBED SITE AREA
- PIPE DRAINAGE SYSTEM
- 45.5 PROPOSED DESIGN CONTOURS
- FILTER ROLLS
- KERB INLET PIT.
- SURFACE INLET SEDIMENT TRAP.
- SEDIMENT FENCE.
- S.P. TOPSOIL STOCKPILE / BUND.
- STABILISED SITE ACCESS

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6 / 10 / 2010 Paul Homan REGISTERED SURVEYOR

This plan/document relates to DA No: 090811 CCV No: 100017 Environmental Planning & Assessment Act Eric Hazlett PENRITH CITY COUNCIL

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
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DESIGNED A.M. DRAWN N.W. CHECKED K.N.

DATUM: AHD ORIGIN:

SCALES: 1:1000

JORDAN SPRINGS
STAGE 1B
SOIL & WATER MANAGEMENT PLAN

PLAN No. 8634CC113 D

FILE No. 8634CC113

SHEET 14 OF 15 SHEETS

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

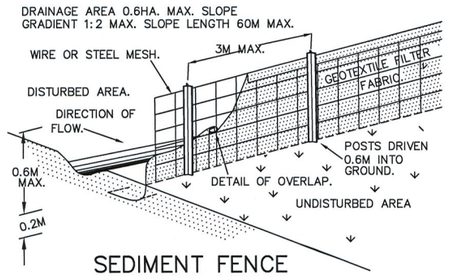
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

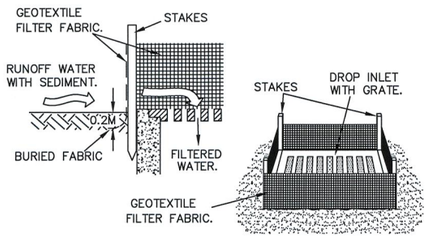
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO
5. A POINT NOMINATED BY THE ENGINEER.

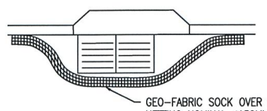
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.



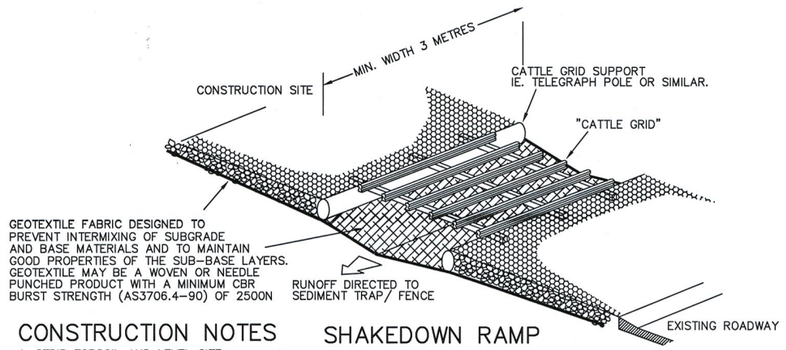
SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.



GEO-FABRIC SOCK OVER ROLL OF WIRE NETTING NOMINAL ø150MM FILLED WITH 50MM TO 75MM AGGREGATE.



SHAKEDOWN RAMP

CONSTRUCTION NOTES
1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 6/10/2010 Paul Thomas REGISTERED SURVEYOR

This plan/document relates to DA No: 090811 CC/ Nos: 100010
Environmental Planning & Assessment Act
Erica Hounsfield
PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
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A	FIRST ISSUE	FEB 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

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SIGNED..... DATE 06/05/2010

JORDAN SPRINGS
STAGE 1B
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8634CC114 D
FILE No. 8634CC114
SHEET 15 OF 15 SHEETS

Plotted: 7 May 2010 10:46:17 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1B\8634CC114.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS".
2. SURVEY MARKS:–
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT–HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:– THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:–
    a) INTERALLOTMENT DRAINS (C.D.L.) – 1.5m WIDE MINIMUM (UP TO 300mm dia
    b) ALL OTHER PIPES – 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON–COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED – DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

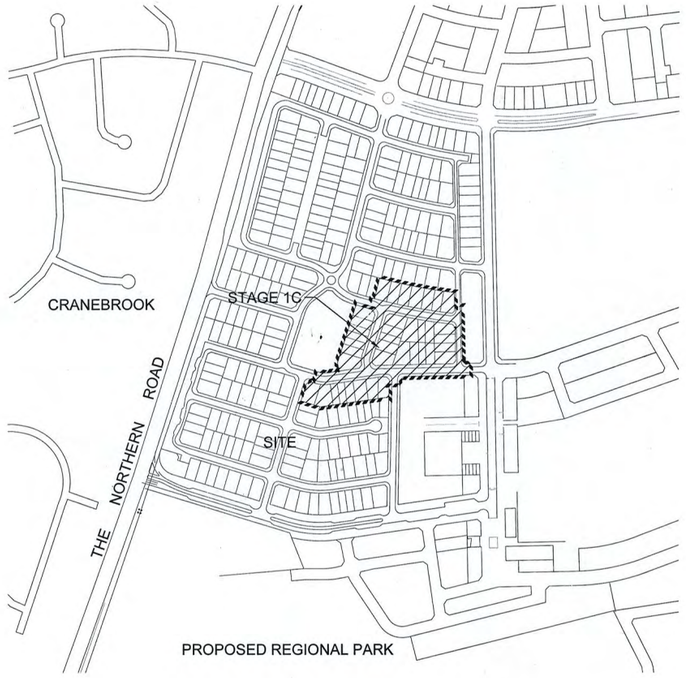
PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDAN SPRINGS

STAGE 1C
ROAD & DRAINAGE WORKS

COUNCIL REF: DA09/0812



WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
REGISTERED SURVEYOR

This plan/document relates to
DA No: 09081203 CCX No: 100011
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

SURVEYED BY:
WHELANS INSITES PTY LTD

LEGEND

PROPOSED	DESCRIPTION	EXISTING
600ø	R.C. STORMWATER PIPELINE	
600ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150ø	COMMON DRAINAGE LINE	150ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS – BENCH MARKS	▲
◘	STATE SURVEY MARKS	
○	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

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PLAN No.	DESCRIPTION
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8634/CC151	SITE STAGING / BULK EARTHWORKS PLAN
8634/CC152	SETOUT PLAN
8634/CC153	PLAN
8634/CC154	ROAD No.3 & 8 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8634/CC155	ROAD No.12, 14 & 18 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8634/CC156	ROAD No.12 CROSS SECTIONS
8634/CC157	ROAD No.12 & 14 CROSS SECTIONS
8634/CC158	ROAD No.18 CROSS SECTIONS
8634/CC159	ROAD No.3 & 8 CROSS SECTIONS
8634/CC160	ROAD No.8 CROSS SECTIONS
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8634/CC173	SEDIMENT BASIN NORTH DETAIL PLAN
8634/CC174	SPECIAL DRAINAGE PITS 11/54 & 12/54
8634/CC175	SPECIAL DRAINAGE PITS 13/38 & 14/38
8634/CC176	SPECIAL DRAINAGE PITS 13/54 & 15/38
8634/CC177	SPECIAL DRAINAGE PIT STRUCTURAL NOTES & TYPICAL BOX CULVERT BASE SLAB DETAIL

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SIGNED S. Anderson DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1C
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8634CC150 D
FILE No. 8634CC150
SHEET 1 OF 28 SHEETS

Plotted: 7 May 2010 10:26:54 AM File Name: J:\8634\DWG - Engineering Construction Plans\Stage - 1C\8634CC150.dwg

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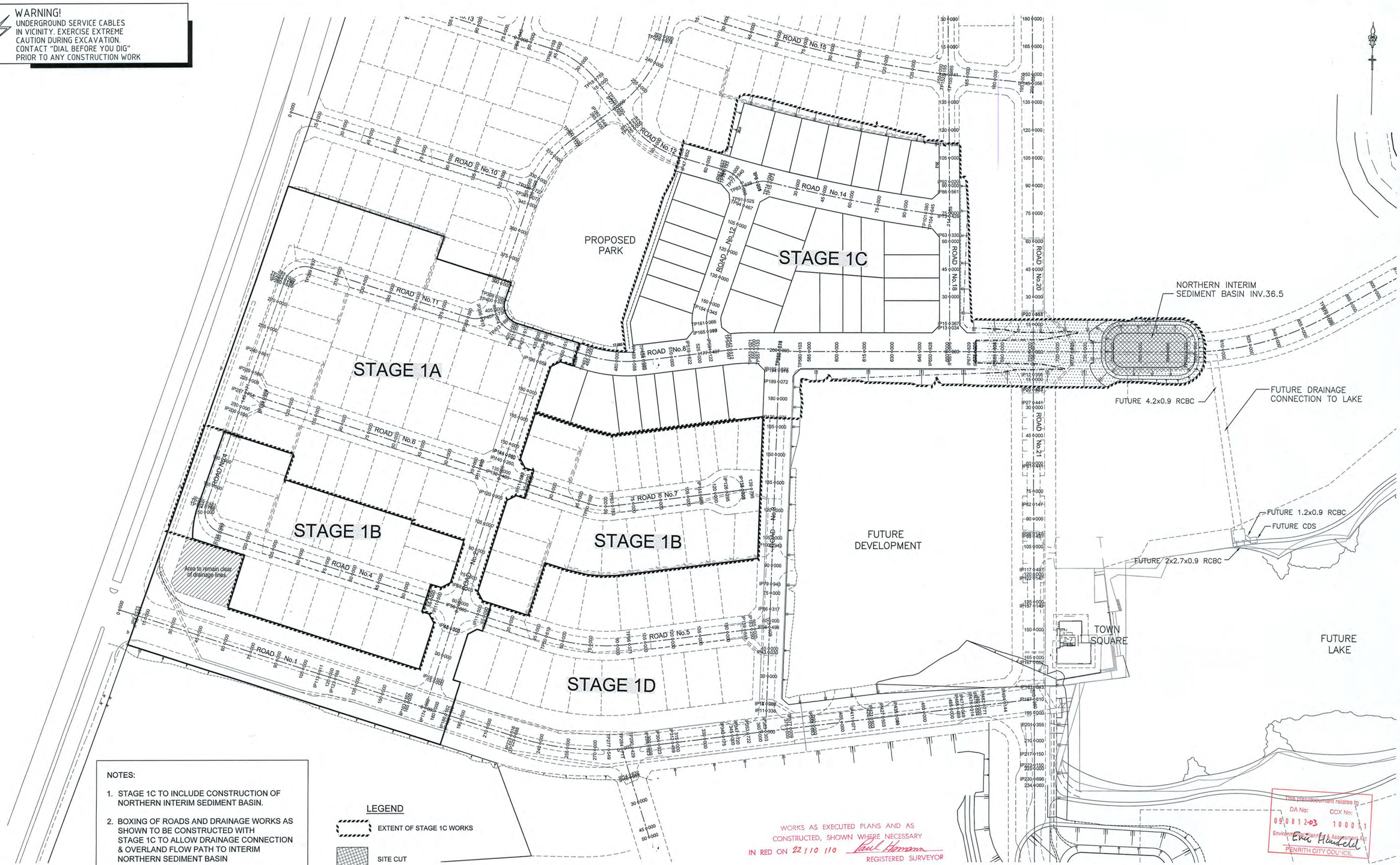

NOTES:

1. STAGE 1C TO INCLUDE CONSTRUCTION OF NORTHERN INTERIM SEDIMENT BASIN.
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1C TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO INTERIM NORTHERN SEDIMENT BASIN
3. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.

LEGEND

- EXTENT OF STAGE 1C WORKS
- SITE CUT
- SITE FILL

1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: 09/0812/03 CCX No: 1000171 Environmental Planning & Assessment Act PENRITH CITY COUNCIL

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SCALES: 1:1000

JORDAN SPRINGS
STAGE 1C
SITE STAGING / BULK EARTHWORKS PLAN

PLAN No. 8634CC151 D
FILE No. 8634CC151
SHEET 2 OF 28 SHEETS

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SETOUT TABLE

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
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2	288965.56	6265678.87	22	289030.37	6265718.72	42	289121.20	6265972.97
3	289014.43	6265664.20	23	289075.64	6265715.28	43	289097.27	6265979.40
4	289072.81	6265658.64	24	289052.09	6265791.13	44	289071.78	6265995.72
5	289078.48	6265659.33	25	289065.13	6265790.14	45	289063.23	6266006.00
6	289150.64	6265669.49	26	289140.40	6265800.74	46	289140.02	6265966.53
7	289296.26	6265690.01	27	289018.42	6265960.15	47	289147.52	6265966.39
8	288981.89	6265733.27	28	288999.68	6265901.72	48	289231.89	6265951.54
9	289003.63	6265805.68	29	289009.66	6265882.80	49	289244.81	6265950.08
10	289026.18	6265877.84	30	289049.21	6265870.93	50	289297.32	6265643.57
11	289151.63	6265725.98	31	289080.04	6265868.59	51	289088.61	6265611.20
12	289154.23	6265875.56	32	289116.44	6265873.72			
13	288851.67	6265772.37	33	289126.21	6265875.09			
14	288844.45	6265786.90	34	289142.31	6265876.13			
15	288852.05	6265772.25	35	289165.24	6265875.08			
16	288864.59	6265847.42	36	289246.49	6265876.68			
17	288884.57	6265908.60	37	289291.98	6265877.57			
18	288898.82	6265916.08	38	289114.16	6265889.90			
19	288985.18	6265890.15	39	289114.72	6265896.54			
20	288991.05	6265890.02	40	289132.88	6265953.60			

ROAD No.15
ROAD No.13
ROAD No.14
ROAD No.18
ROAD No.10
ROAD No.12
ROAD No.8
ROAD No.4
ROAD No.20
ROAD No.3
ROAD No.7
ROAD No.6
ROAD No.2
ROAD No.5
ROAD No.1
THE NORTHERN ROAD
STAGE 1A
STAGE 1B
STAGE 1C
STAGE 1D
NO ACCESS TO FUTURE PARK AREA
FUTURE DEVELOPMENT
TOWN SQUARE
FUTURE LAKE
BROWN ROAD

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Bowman
REGISTERED SURVEYOR

This plan/document relates to DA No: 09081203 COX No: 100011
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1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1C
SETOUT PLAN

PLAN No. 8634CC152 D
FILE No. 8634CC152
SHEET 3 OF 28 SHEETS

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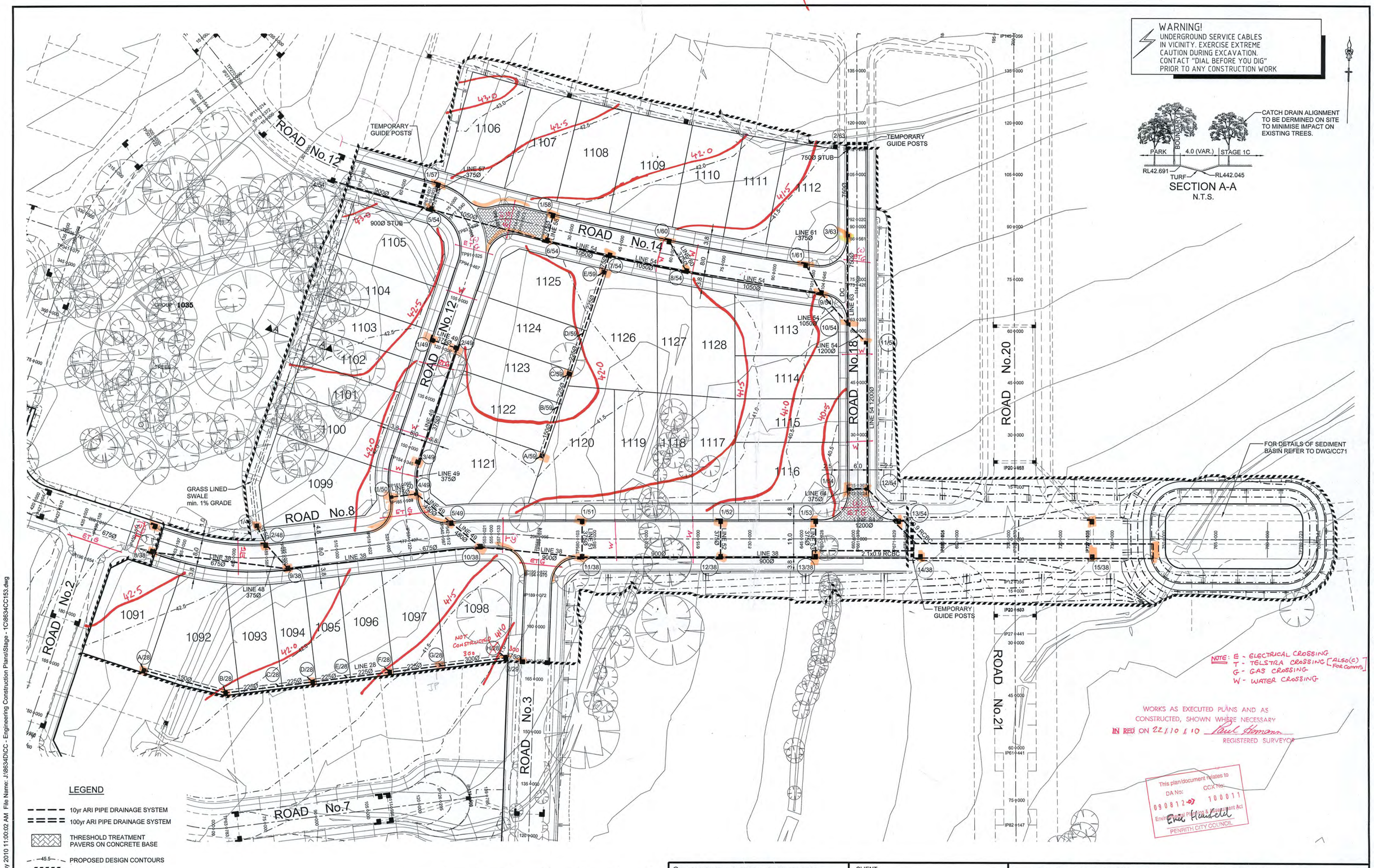

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DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
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JORDAN SPRINGS
STAGE 1C
PLAN

PLAN No. 8634CC153 D
FILE No. 8634CC153
SHEET 4 OF 28 SHEETS

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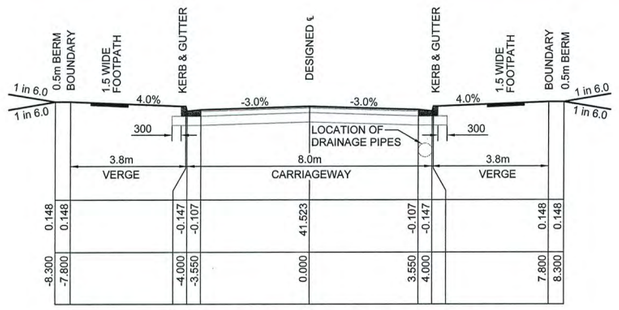
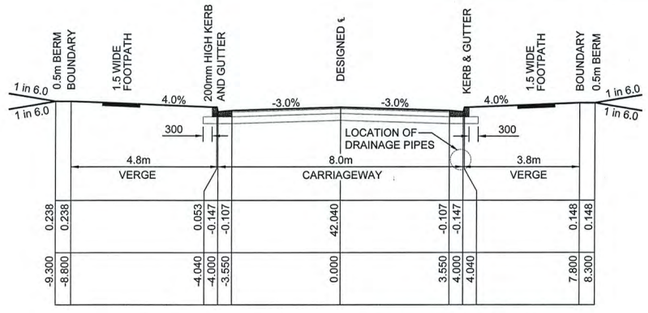
Version: 1, Version Date: 13/07/2018



TYPICAL CROSS SECTION ROAD No.3

1:100 NAT



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CH 457.860 TO 489.588

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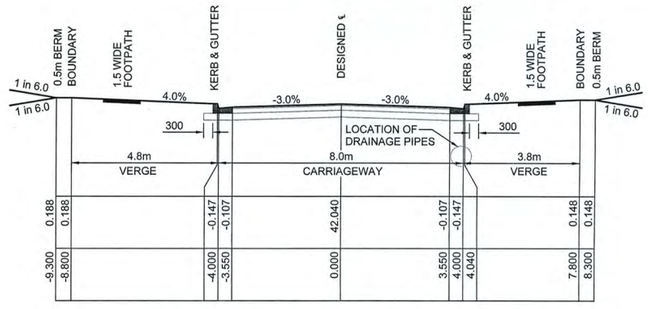

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CH 489.588 TO 557.133

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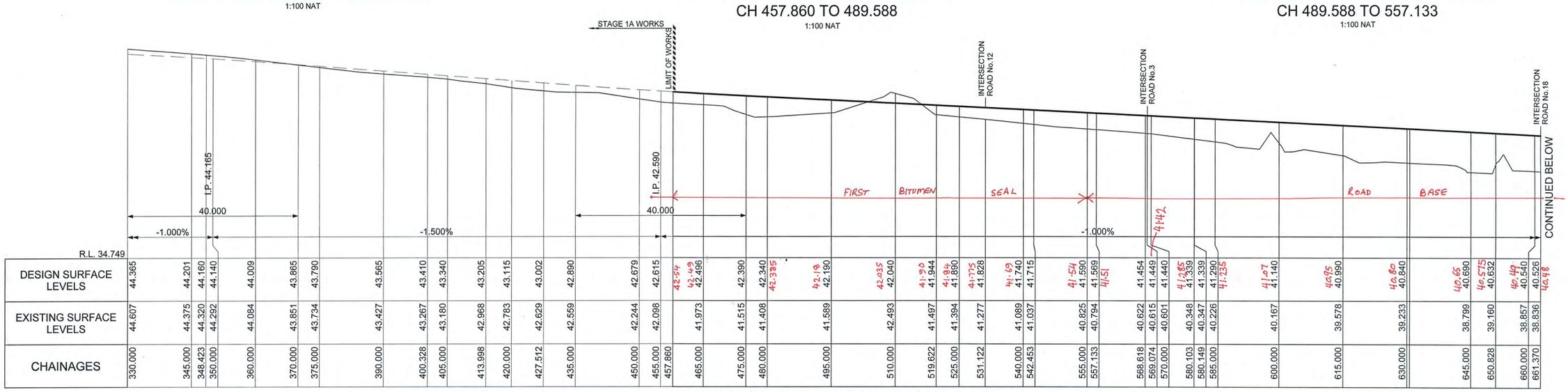


LONGITUDINAL SECTION -ROAD 8

HORIZ 1:500
VERT 1:100

PAVEMENT DESIGN - ROAD 3 - $1x10^6$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10) (IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

300mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

PAVEMENT DESIGN - ROAD 8 - $2x10^5$

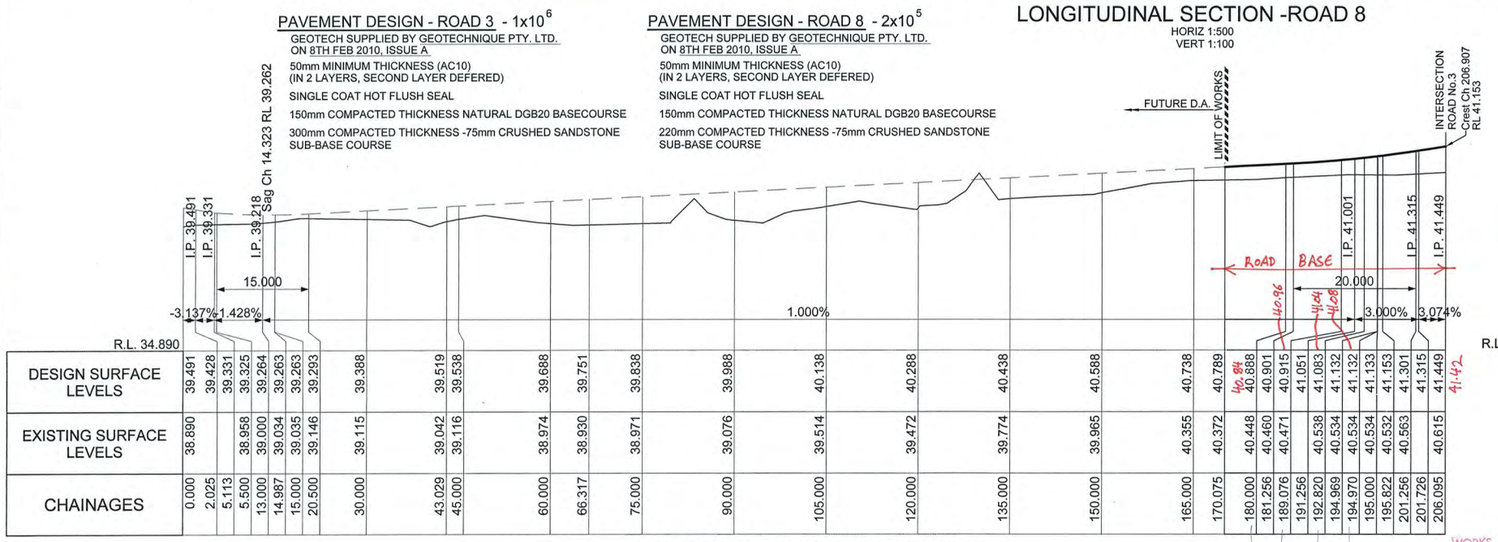
GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10) (IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

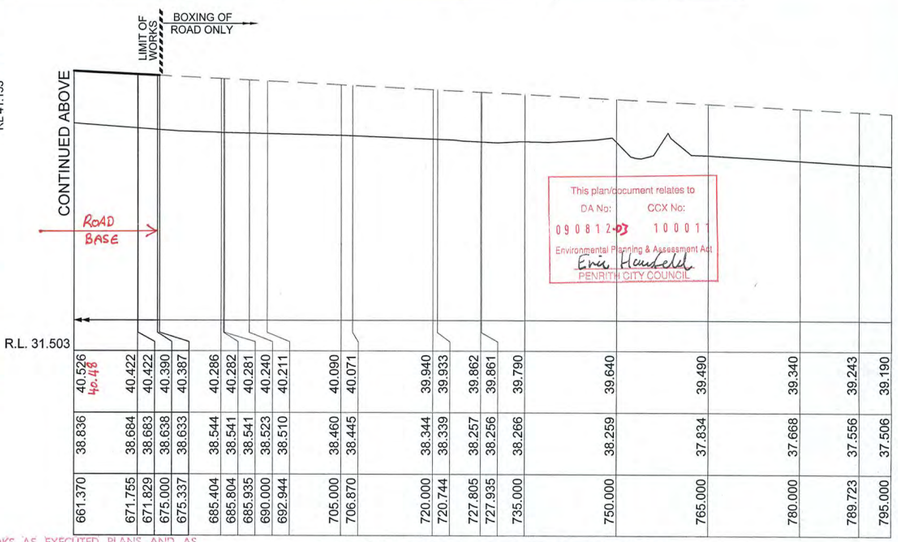
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE



LONGITUDINAL SECTION -ROAD 3

HORIZ 1:500
VERT 1:100



LONGITUDINAL SECTION -ROAD 8

HORIZ 1:500
VERT 1:100

This plan/document relates to DA No: 09081203 CCX No: 100011
Environmental Planning & Assessment Act
Erin Hounsfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10 Paul Homann REGISTERED SURVEYOR

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50' METRES

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SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH

P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:

SCALES: AS SHOWN AT A1

JORDAN SPRINGS
STAGE 1C

ROAD No.3 & 8 LONGITUDINAL SECTIONS & & TYPICAL CROSS SECTIONS

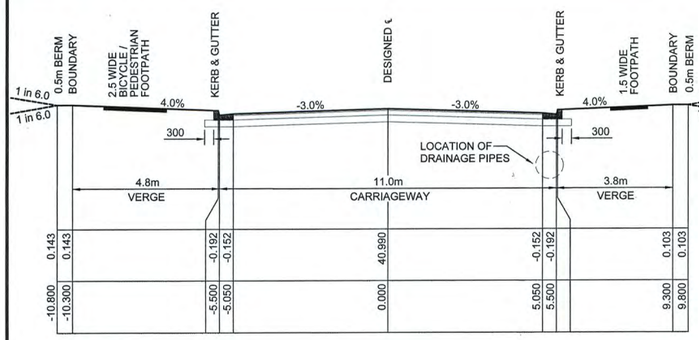
PLAN No. 8634CC154 D

FILE No. 8634CC154

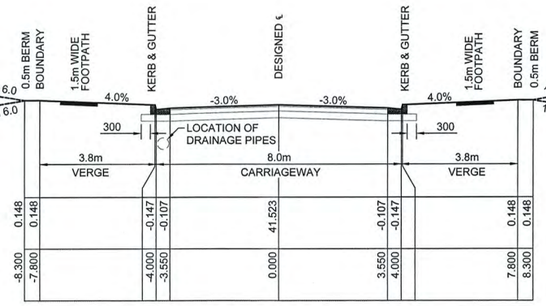
SHEET 5 OF 28 SHEETS

Plotted: 7 May 2010 11:00:13 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC154.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



TYPICAL CROSS SECTION ROAD No.8
CH 580.103 TO 661.370
1:100 NAT



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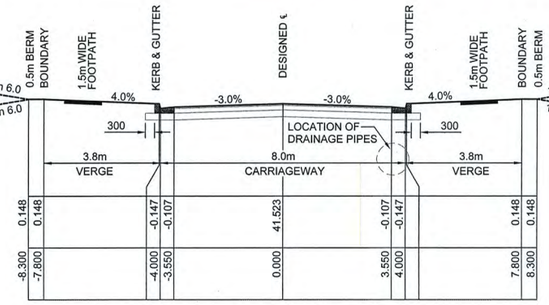

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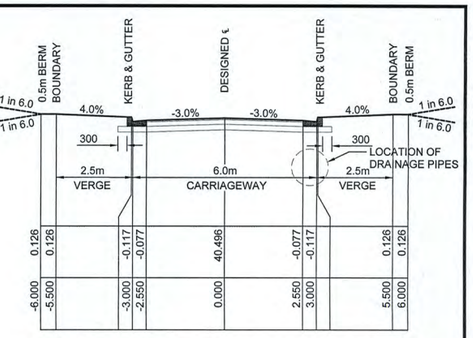


TYPICAL CROSS SECTION ROAD No. 18
1:100 NAT

PAVEMENT DESIGN - ROAD 12 - $2x10^5$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD.
ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

PAVEMENT DESIGN - ROADS 14 & 18 - $5x10^4$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD.
ON 8TH FEB 2010, ISSUE A

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

THRESHOLD TREATMENT DESIGN

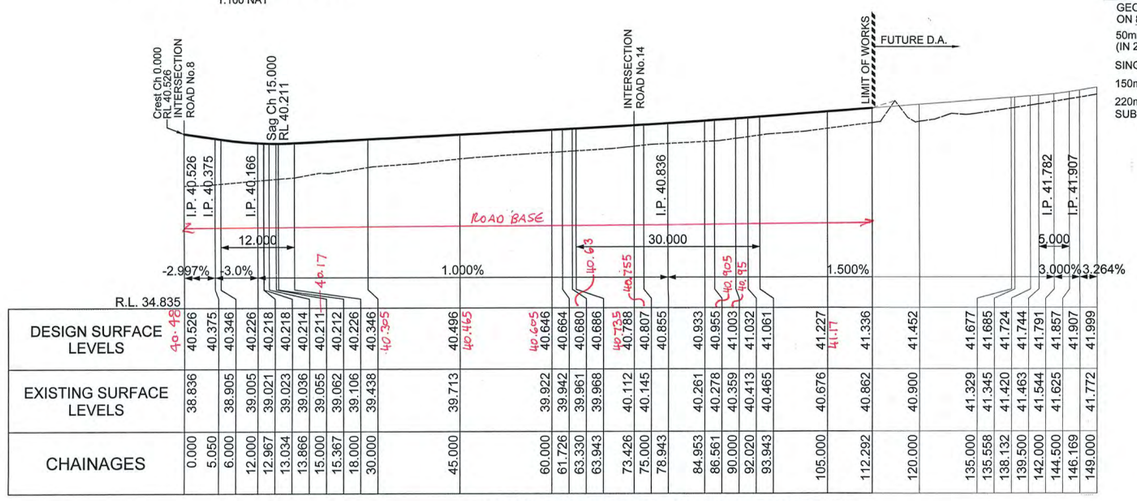
80mm MINIMUM THICKNESS PAVERS

30mm MINIMUM THICKNESS SAND

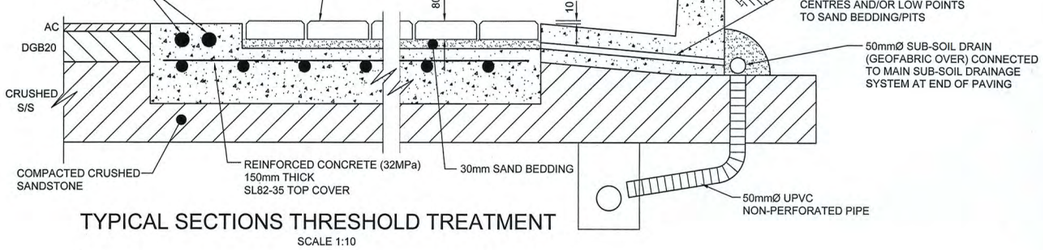
150mm REINFORCED CONCRETE BASE WITH SL82 MESH

300mm CONCRETE EDGE

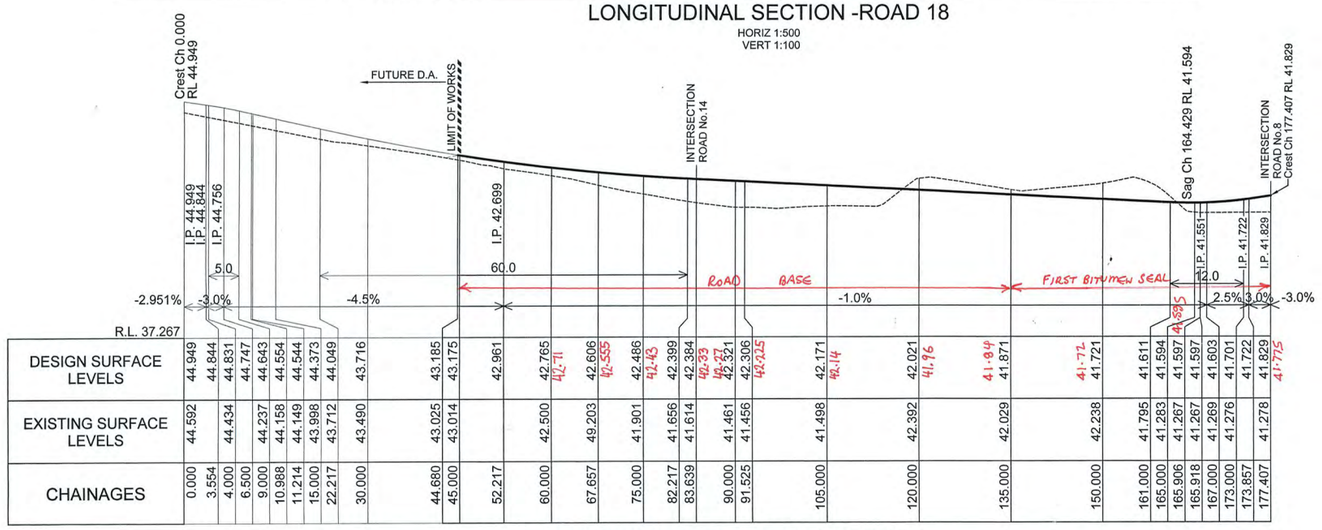
NOTE: THRESHOLD TREATMENT TO SIT ON -75mm CRUSHED SANDSTONE SUB-BASE, TRIMMED TO SUIT THRESHOLD TREATMENT DEPTH.



LONGITUDINAL SECTION -ROAD 18
HORIZ 1:500
VERT 1:100



TYPICAL SECTIONS THRESHOLD TREATMENT
SCALE 1:10



LONGITUDINAL SECTION -ROAD 12
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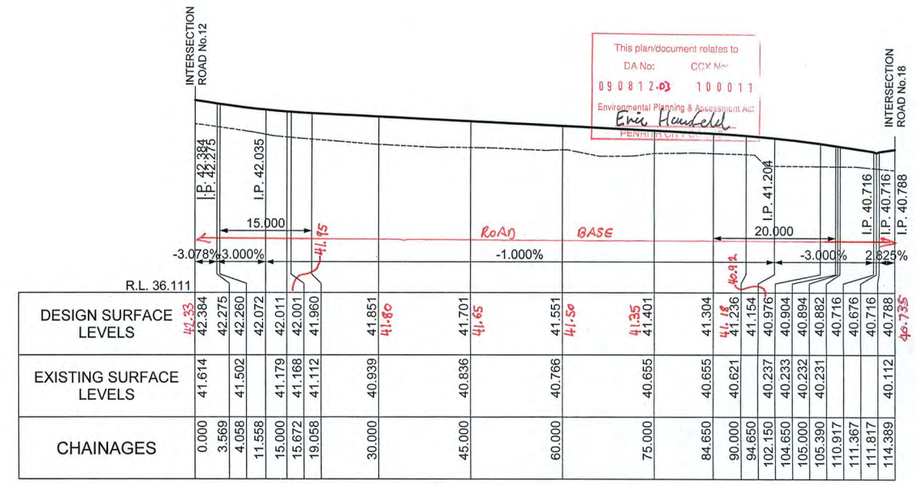
VERT 1:100



WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Homann
REGISTERED SURVEYOR

LONGITUDINAL SECTION -ROAD 14
HORIZ 1:500
VERT 1:100

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: AS SHOWN AT A1

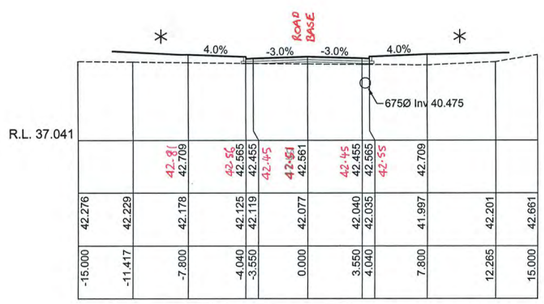
JORDAN SPRINGS
STAGE 1C
ROAD No.12, 14 & 18 LONGITUDINAL SECTIONS & & TYPICAL CROSS SECTIONS

PLAN No. 8634CC155 D
FILE No. 8634CC155
SHEET 6 OF 28 SHEETS

Plotted: 7 May 2010 11:00:24 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC155.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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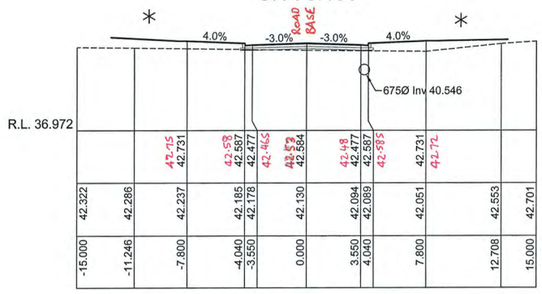

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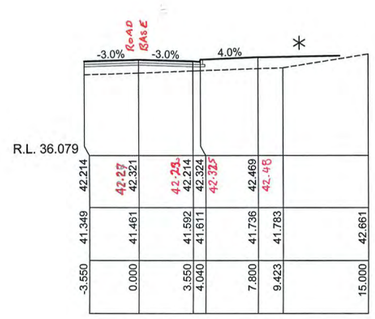

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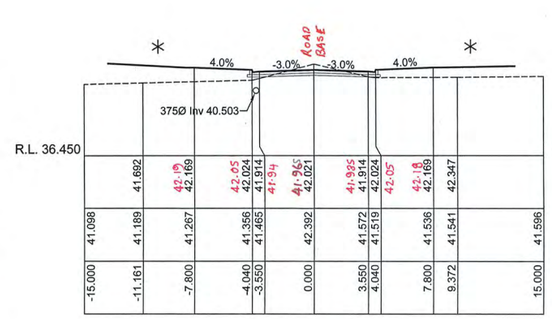

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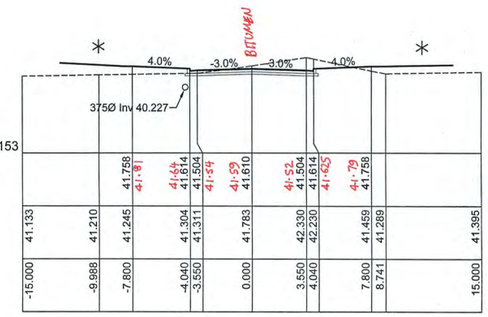

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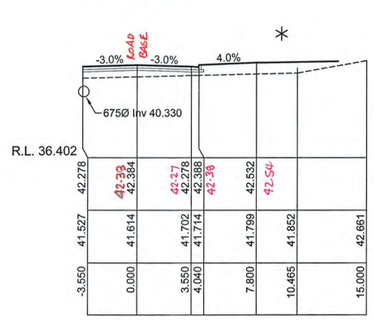

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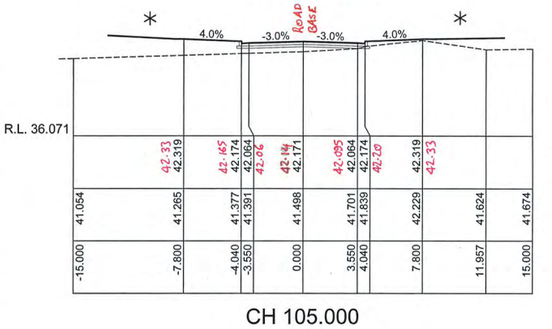

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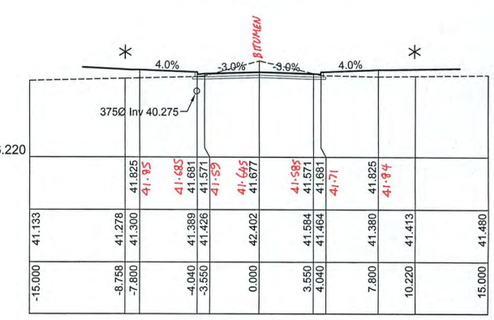

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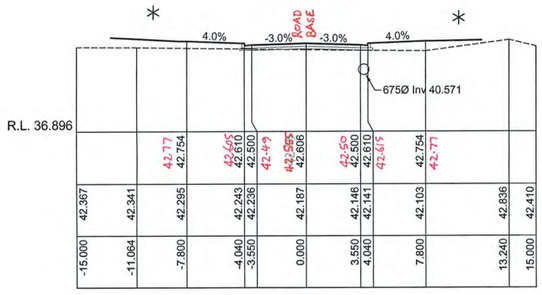

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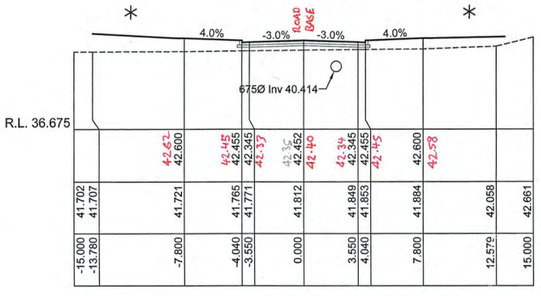

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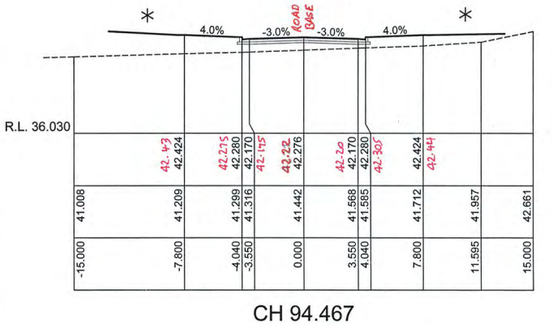

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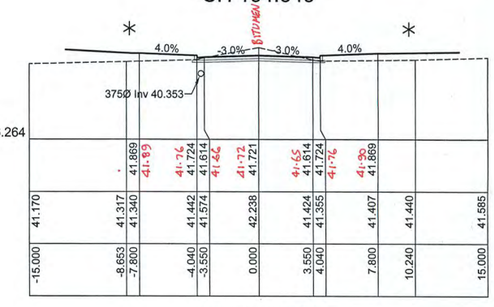

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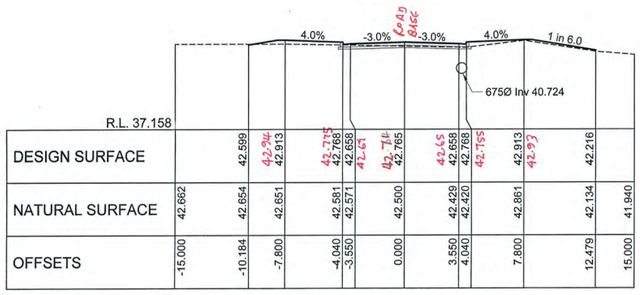
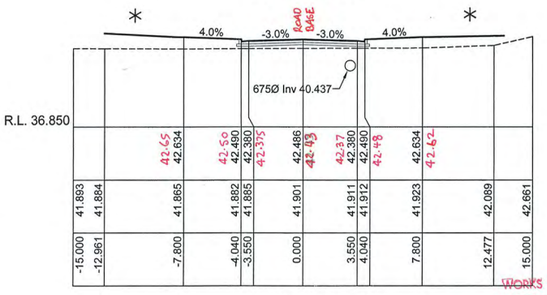


CH 60.000
ROAD 12



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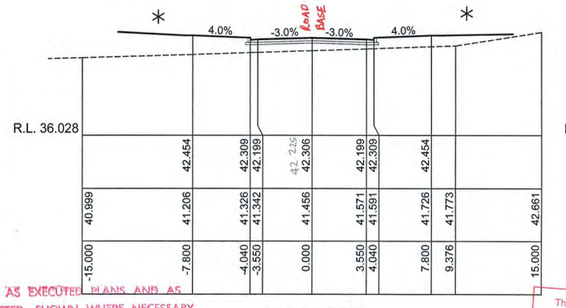

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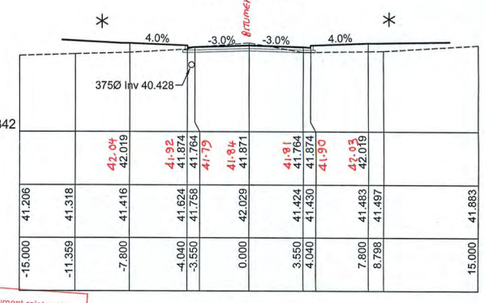

CH 135.000

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IN RED ON 22 / 10 / 10
Paul Homann
REGISTERED SURVEYOR

This plan/document relates to
DA No: 09081203 CCX No: 100011
ENVIRONMENTAL PLANNING & ASSESSMENT
BLUE MOUNTAINS CITY COUNCIL

1:200 (AT A1)
4 2 0 4 8 12 16 20
METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: C.S. 1:200 NAT AT A1

JORDAN SPRINGS
STAGE 1C
ROAD No.12 CROSS SECTIONS

PLAN No. 8634CC156 D
FILE No. 8634CC156
SHEET 7 OF 28 SHEETS

Plotted: 7 May 2010 11:00:42 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC156.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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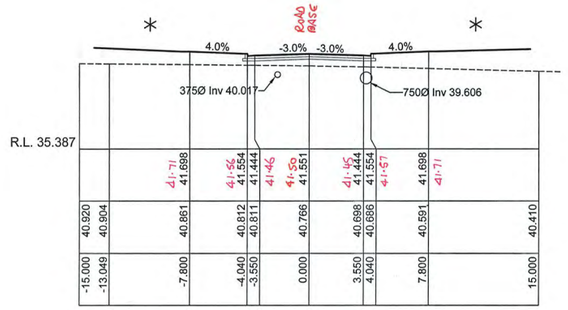

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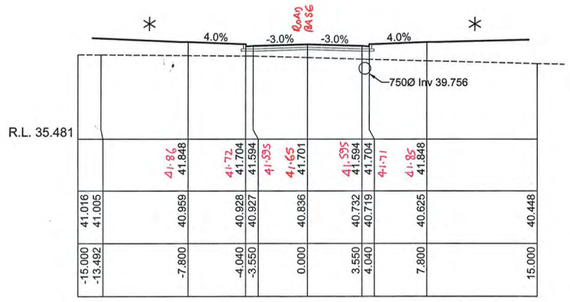

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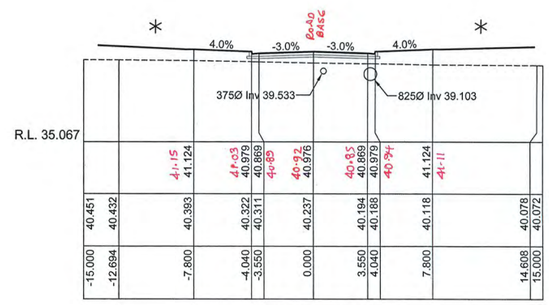

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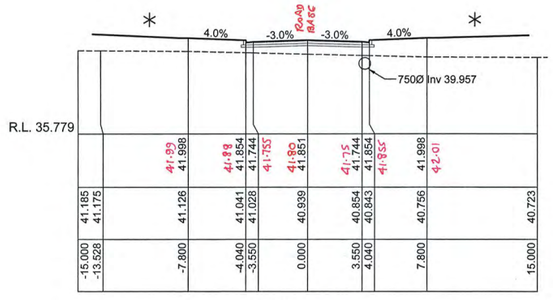

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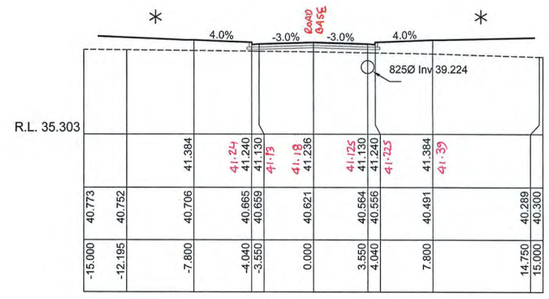

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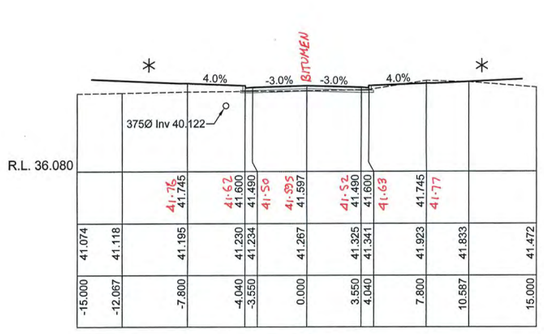
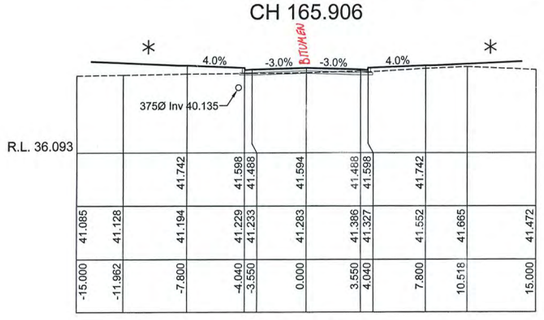


CH 165.906



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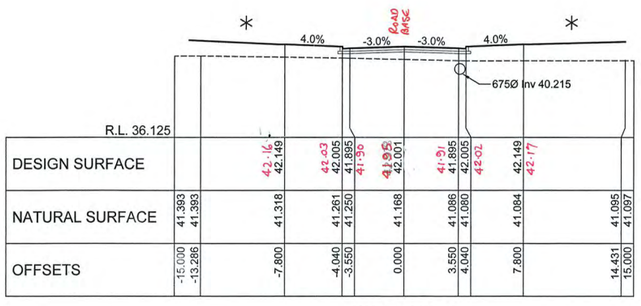
ROAD 12



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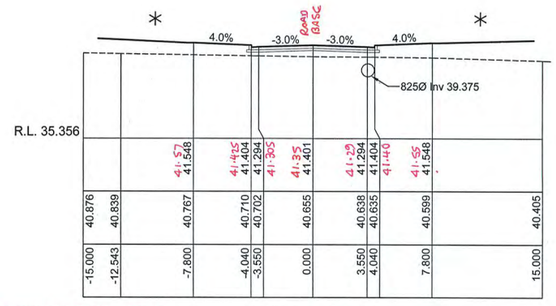

CH 75.000

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22 / 10 / 10
Paul Romans
REGISTERED SURVEYOR

This plan/document relates to DA No: 090812.03 CCX No: 100071
Environmental Planning & Assessment Act
Eric Hansell
PENRITH CITY COUNCIL

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

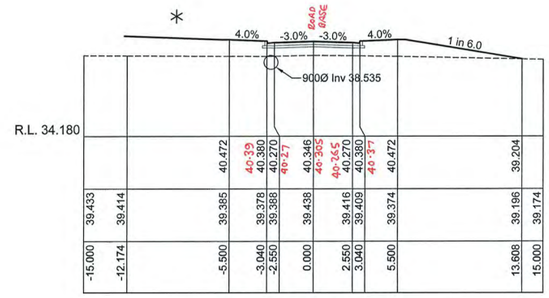
JORDAN SPRINGS
STAGE 1C
ROAD No.12 & No.14 CROSS SECTIONS

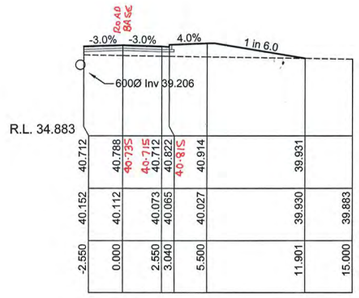
PLAN No. 8634CC157 D
FILE No. 8634CC157
SHEET 8 OF 28 SHEETS

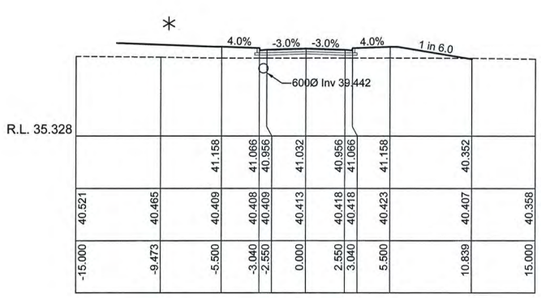
Plotted: 7 May 2010 11:00:53 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1C\8634CC157.dwg

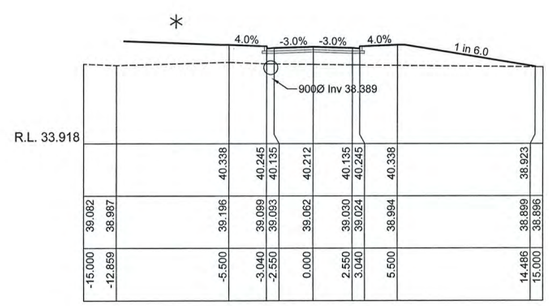
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

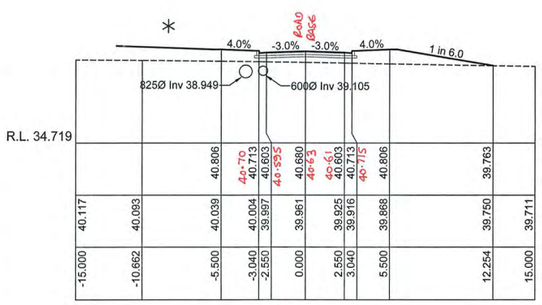
* SEE PLAN FOR LOT GRADING

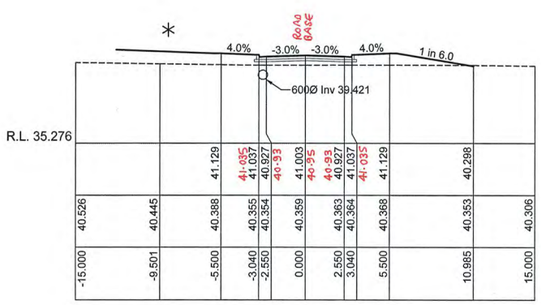


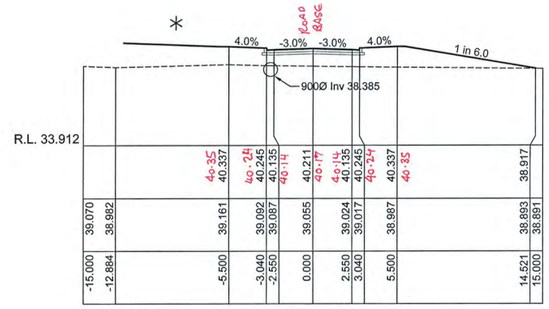


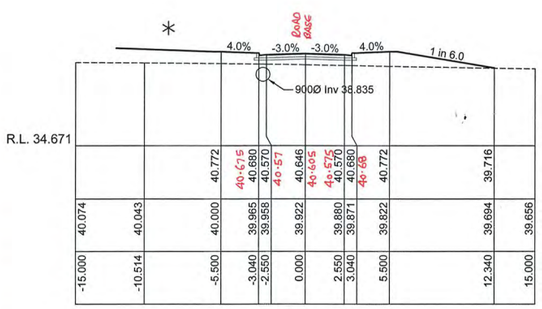


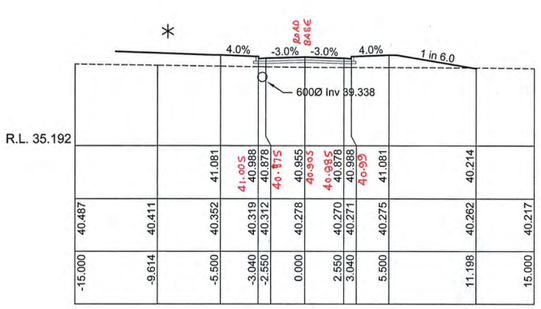


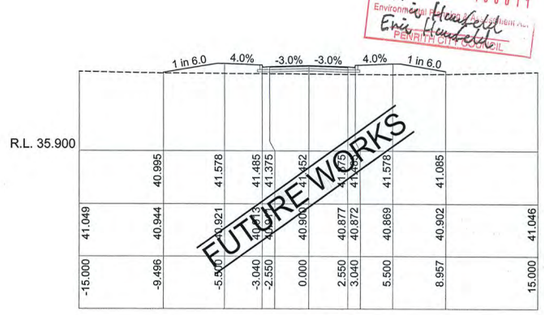


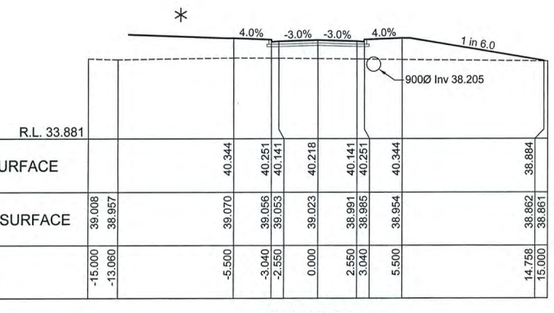


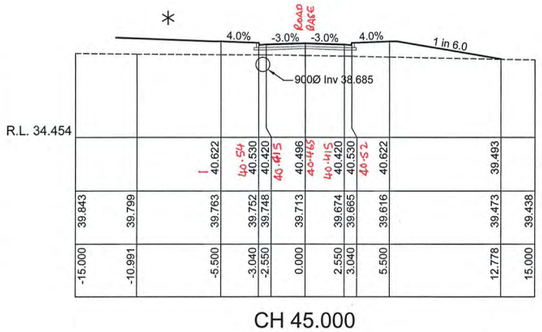


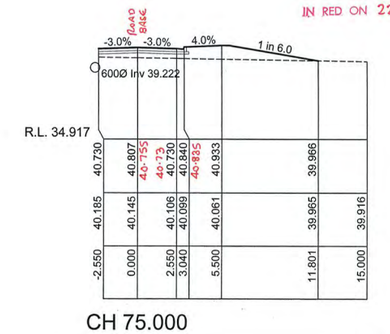


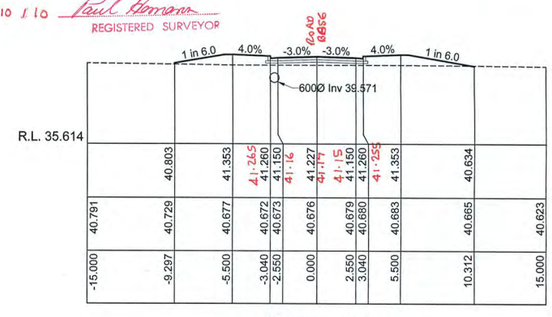












1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
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J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M. DRAWN N.W. CHECKED K.N.

DATUM: AHD ORIGIN:

SCALES: C.S. 1:200 NAT AT A1

JORDAN SPRINGS
STAGE 1C
ROAD No.18 CROSS SECTIONS

PLAN No. 8634CC158 D
FILE No. 8634CC158
SHEET 9 OF 28 SHEETS

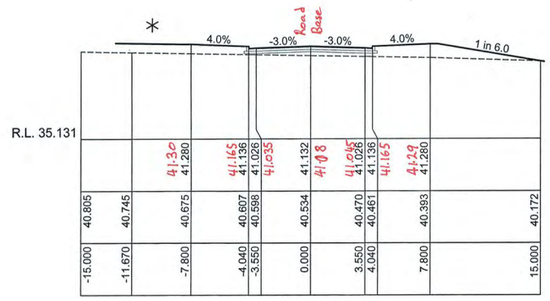
This plan/document retained for DA No: 09.0812.03 1000111 Environmental Health Officer Penrith City Council

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10 Paul Homann REGISTERED SURVEYOR

Plotted: 7 May 2010 11:01:07 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC158.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

✳ SEE PLAN FOR LOT GRADING



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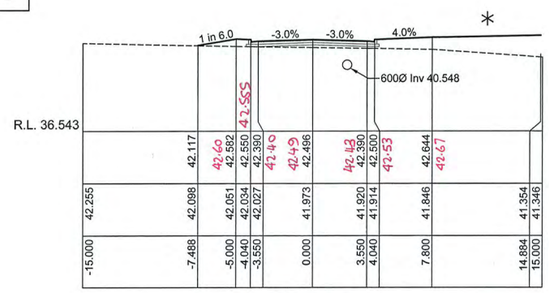

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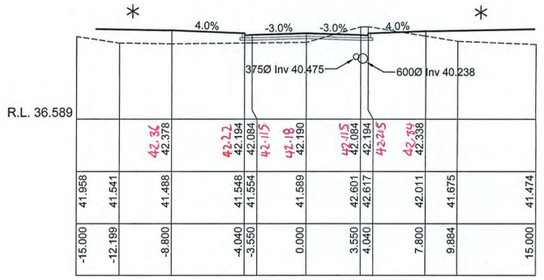

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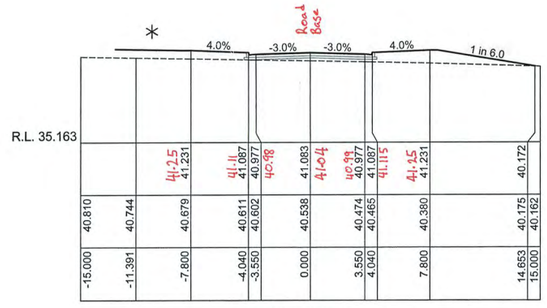

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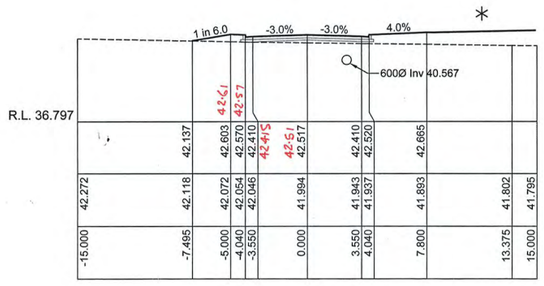

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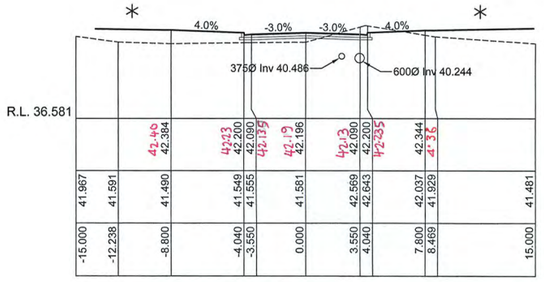

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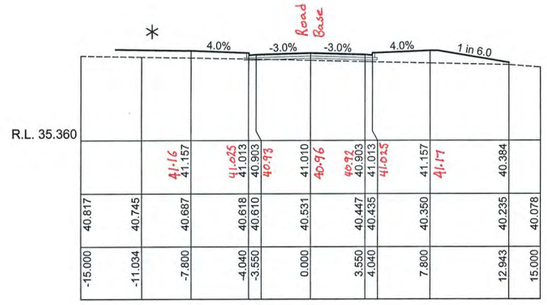

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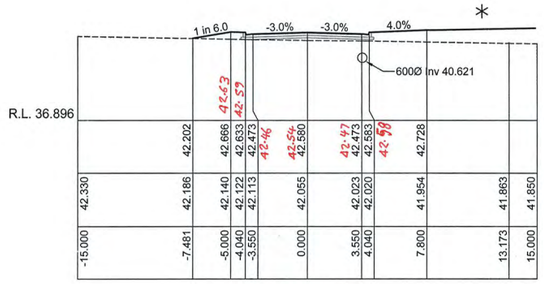

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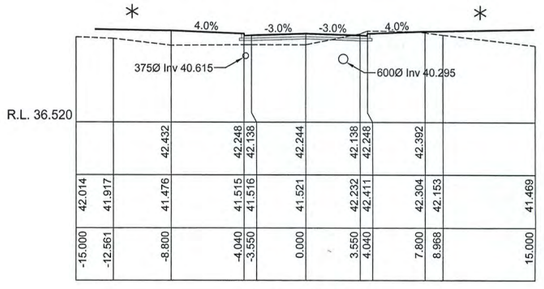

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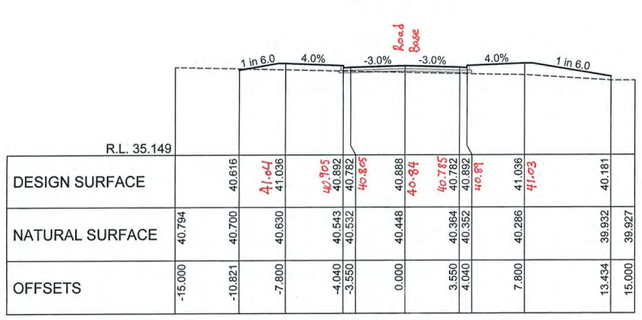
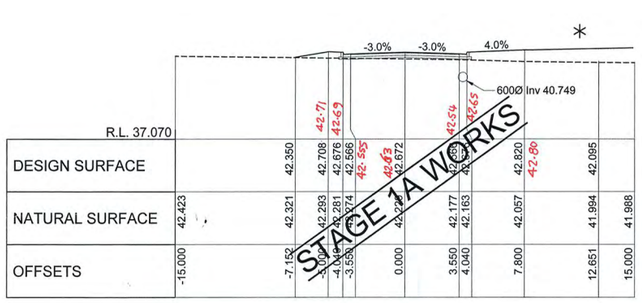


CH 180.000
ROAD 3



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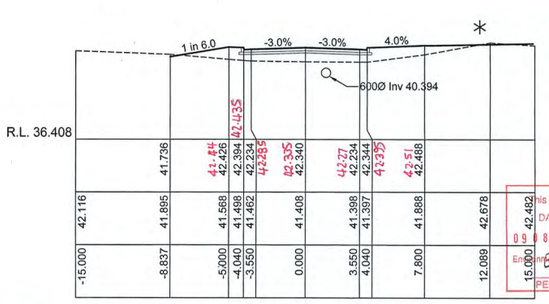
STAGE 1A WORKS



CH 480.000

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Ahmann
REGISTERED SURVEYOR

This plan/document relates to
DA No: 09/0812/03 CC'X No: 100011
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

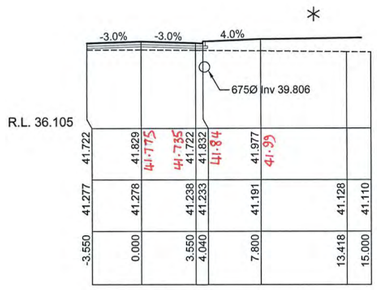
JORDAN SPRINGS
STAGE 1C
ROAD No.3 & 8 CROSS SECTIONS

PLAN No. 8634CC159 D
FILE No. 8634CC159
SHEET 10 OF 28 SHEETS

Plotted: 7 May 2010 11:01:21 AM File Name: J:\8634\DCC - Engineering Construction Plans\Stage - 1C\8634CC159.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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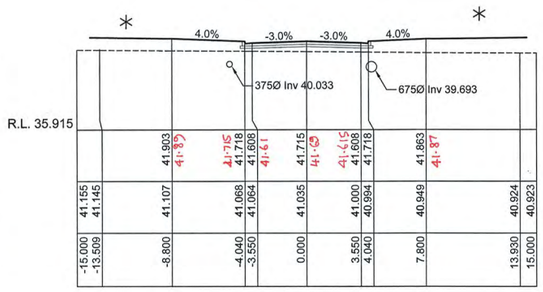

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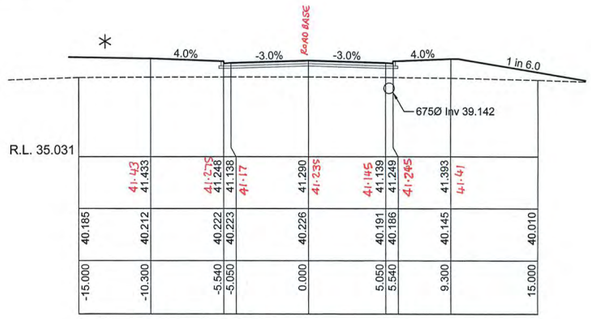

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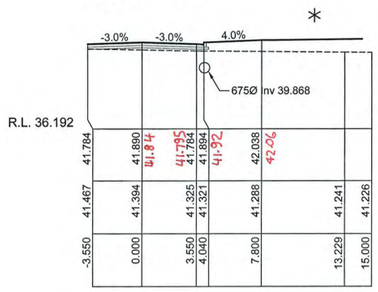

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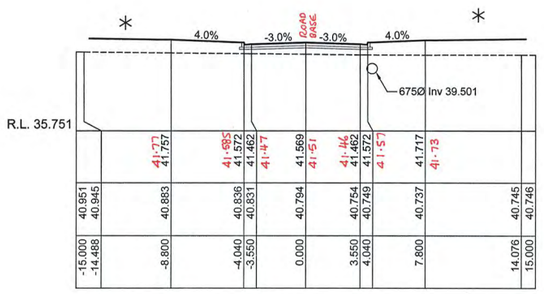

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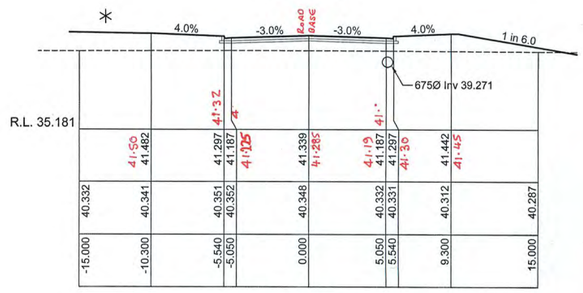

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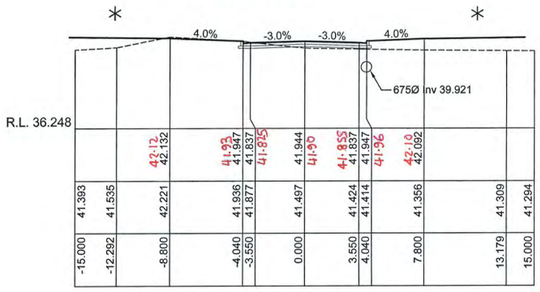

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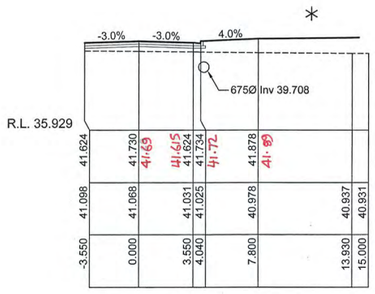

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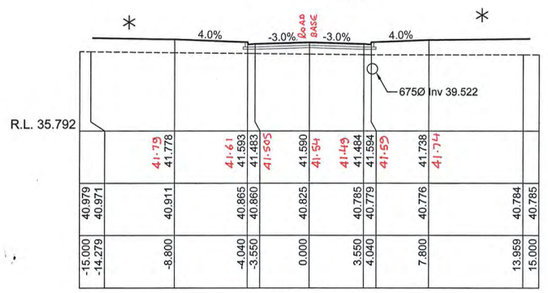

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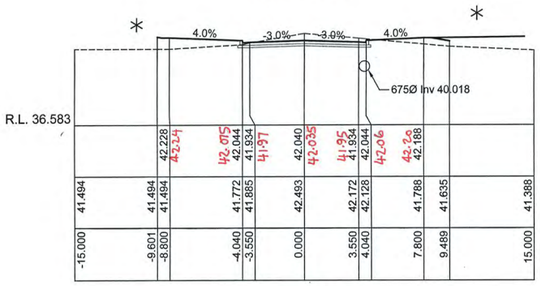

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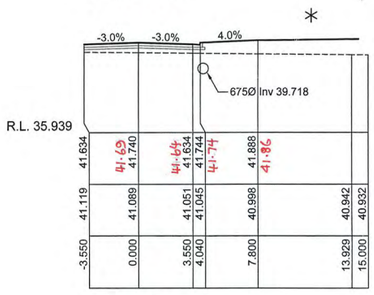

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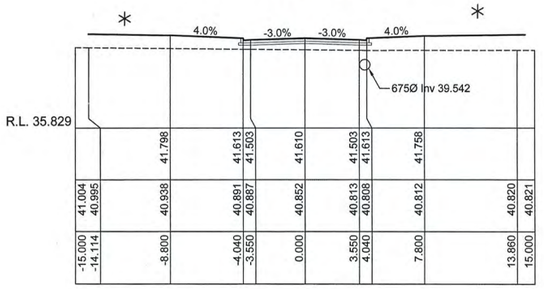

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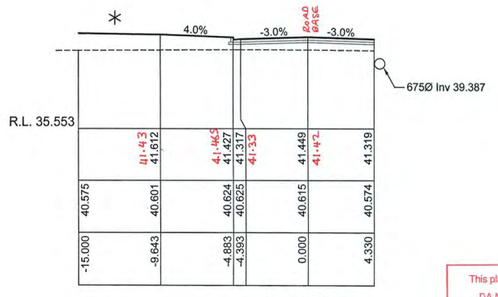

CH 569.074

This plan/document relates to
DA No: 090812.03 CC No: 100011
Environmental Planning & Assessment Act
Erwin Hinkfeld
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/7/10 & 10
Paul Homann
REGISTERED SURVEYOR

1:200 (AT A1)
4 2 0 4 8 12 16 20
METRES

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ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

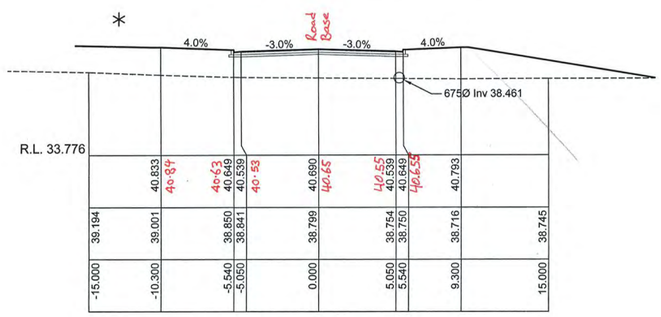
JORDAN SPRINGS
STAGE 1C
ROAD No.8 CROSS SECTIONS

PLAN No. 8634CC160 D
FILE No. 8634CC160
SHEET 11 OF 28 SHEETS

Plotted: 7 May 2010 11:01:33 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC160.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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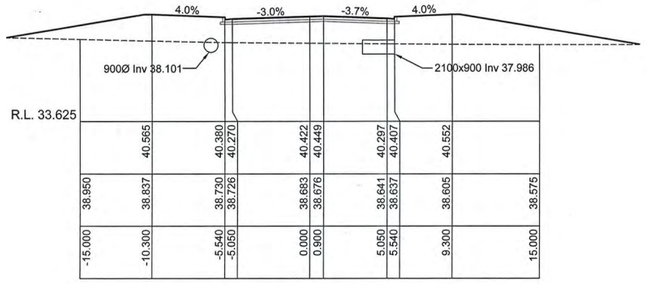

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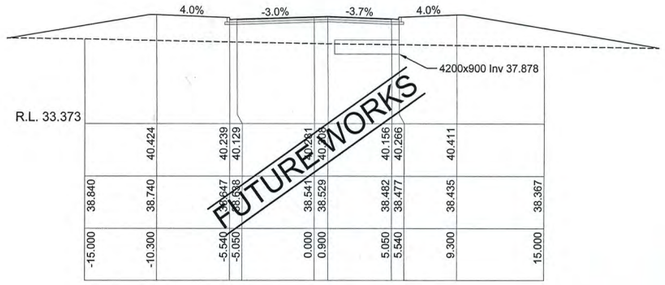

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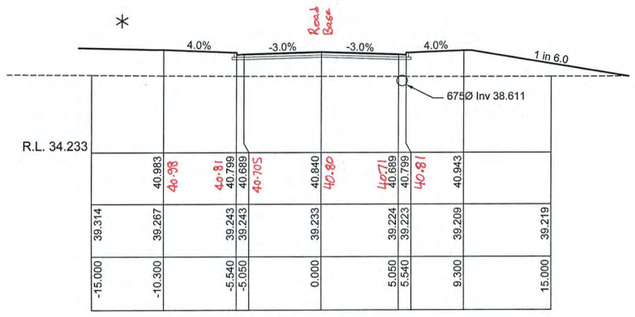

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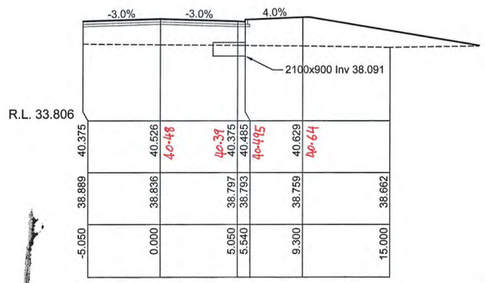

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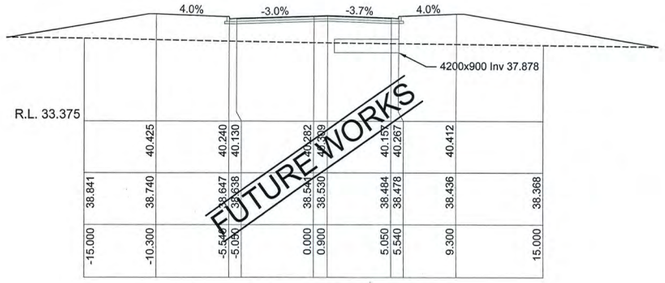

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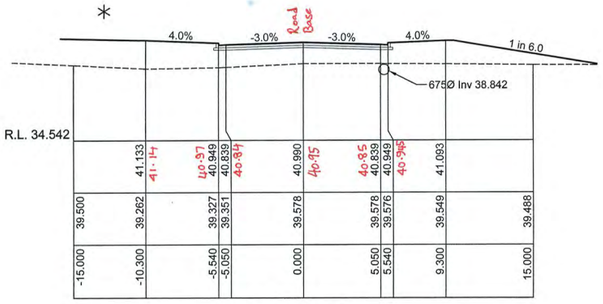

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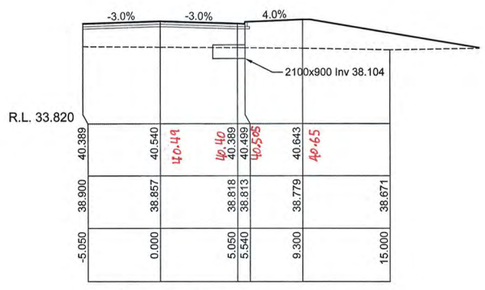

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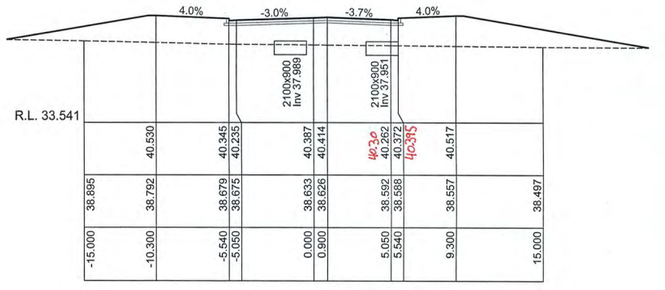

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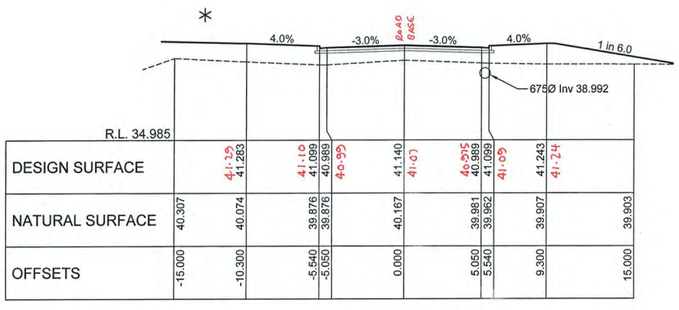

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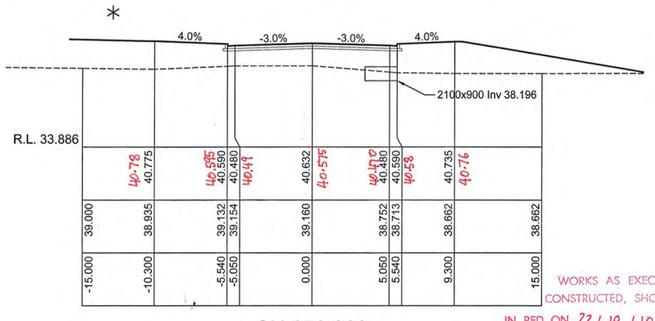

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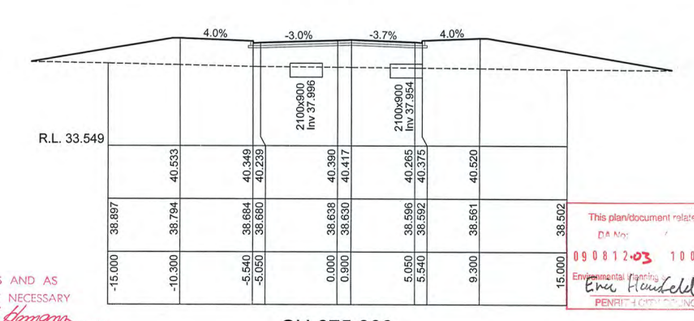

CH 675.000

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22.10.10
Paul Bowman
REGISTERED SURVEYOR

This plan/document relates to DA No: 090812-03 100011
Environmental Planning
Eric Heusfeld
PENRITH CITY COUNCIL

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

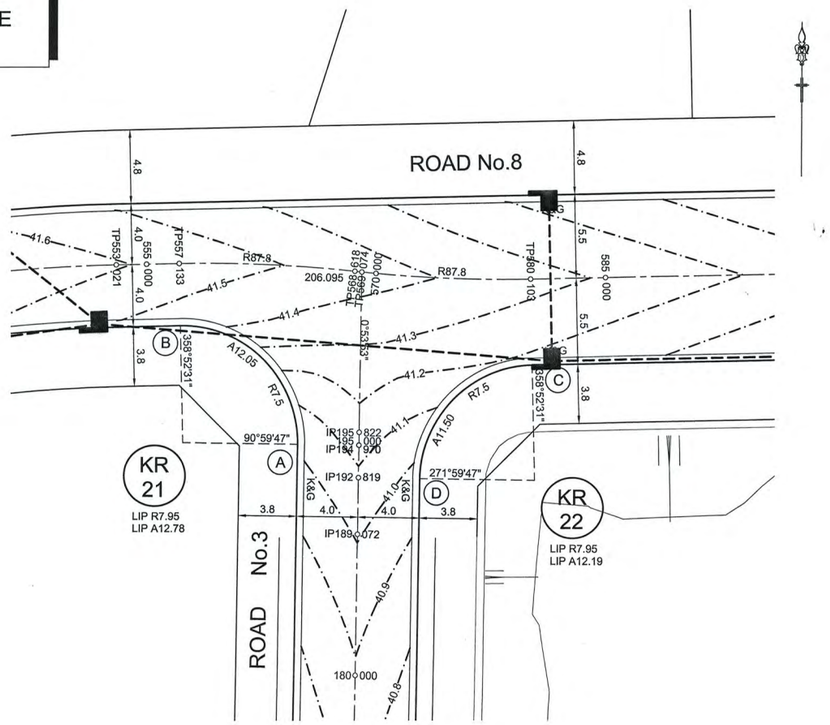
JORDAN SPRINGS
STAGE 1C
ROAD No.8 CROSS SECTIONS

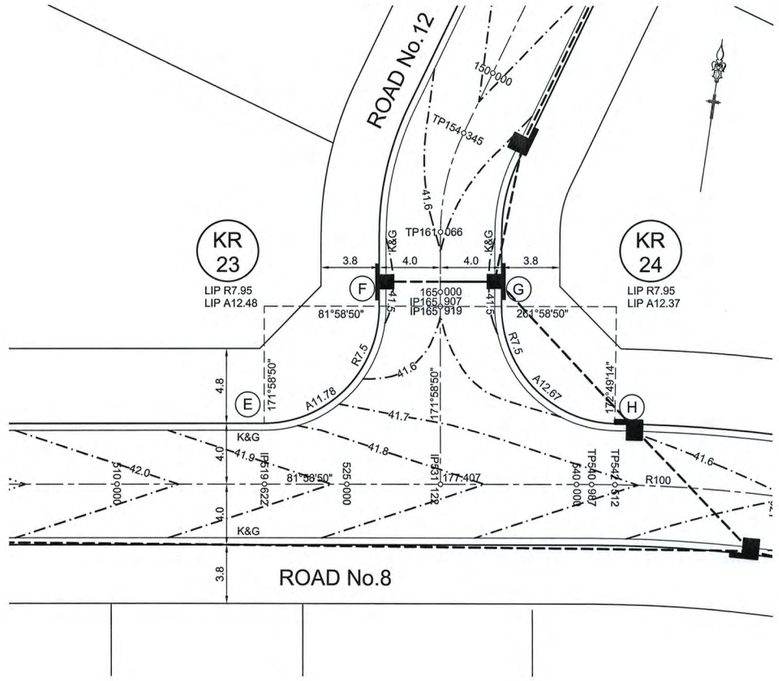
PLAN No. 8634CC161 D
FILE No. 8634CC161
SHEET 12 OF 28 SHEETS

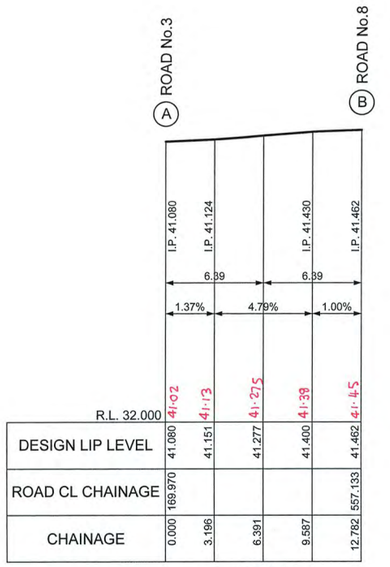
Plotted: 7 May 2010 11:01:45 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1C\8634CC161.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER







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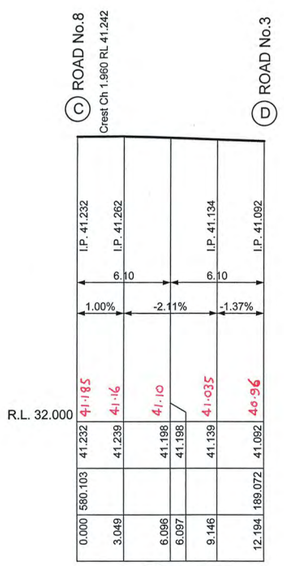
VERT 1:100



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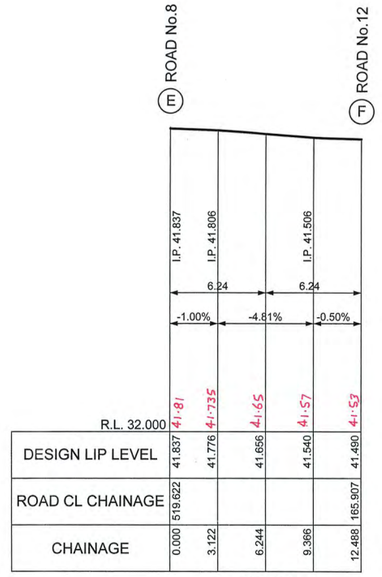

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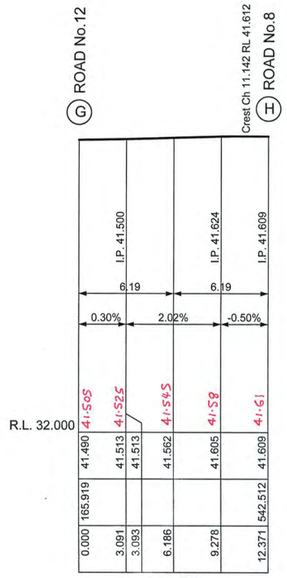
VERT 1:100



KR24
HORIZ 1:200
VERT 1:100

WORKS AS EXECUTED PLANS AND AS
CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 22 / 10 / 10 Paul Thomann
REGISTERED SURVEYOR

This plan/document relates to
DA No: 090812-03 CCX No: 100011
Environmental Planning & Assessment Act
Eric Hemfield
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
L.S. 1:200 H
1:100 V
AT A1

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

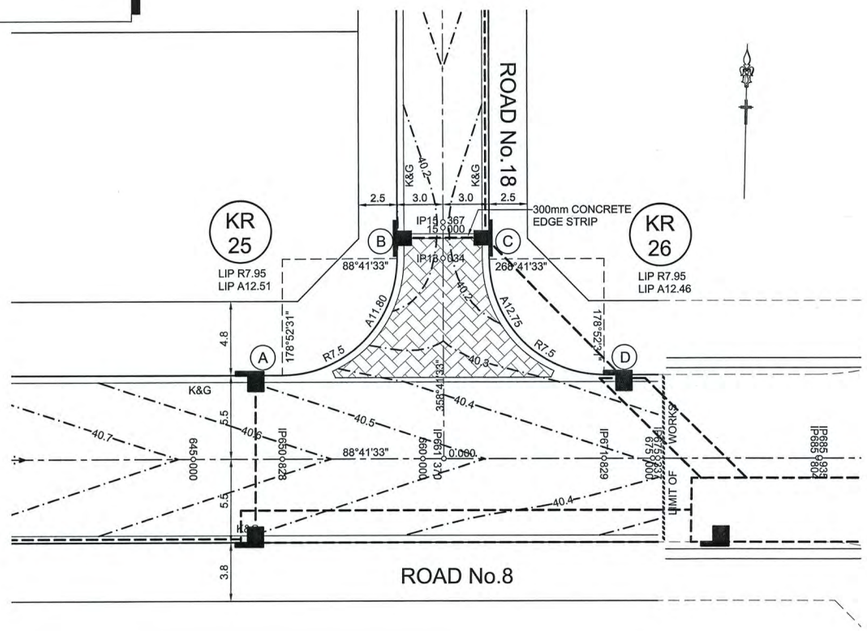
JORDAN SPRINGS
STAGE 1C
KERB RETURNS No.21, 22, 23 & 24

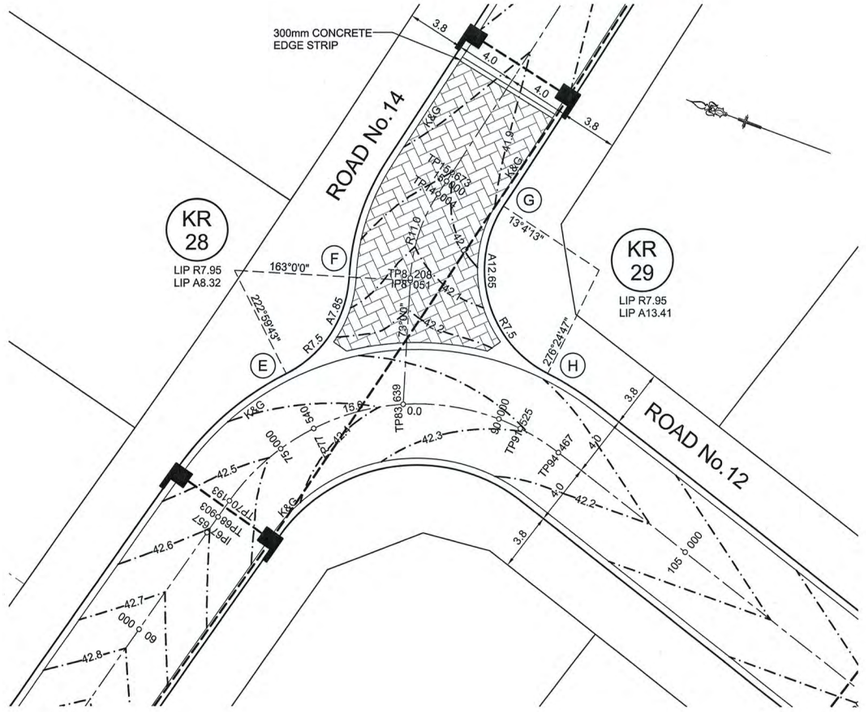
PLAN No. 8634CC162 D
FILE No. 8634CC162
SHEET 13 OF 28 SHEETS

Plotted: 7 May 2010 11:02:07 AM File Name: J:\8634\D\CC - Engineering Construction Plans\Stage - 1C\8634CC162.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER

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LIP A8.32
KR 29
LIP R7.95
LIP A13.41
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73°4'13"
218°2'47"
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R11.0
A12.65
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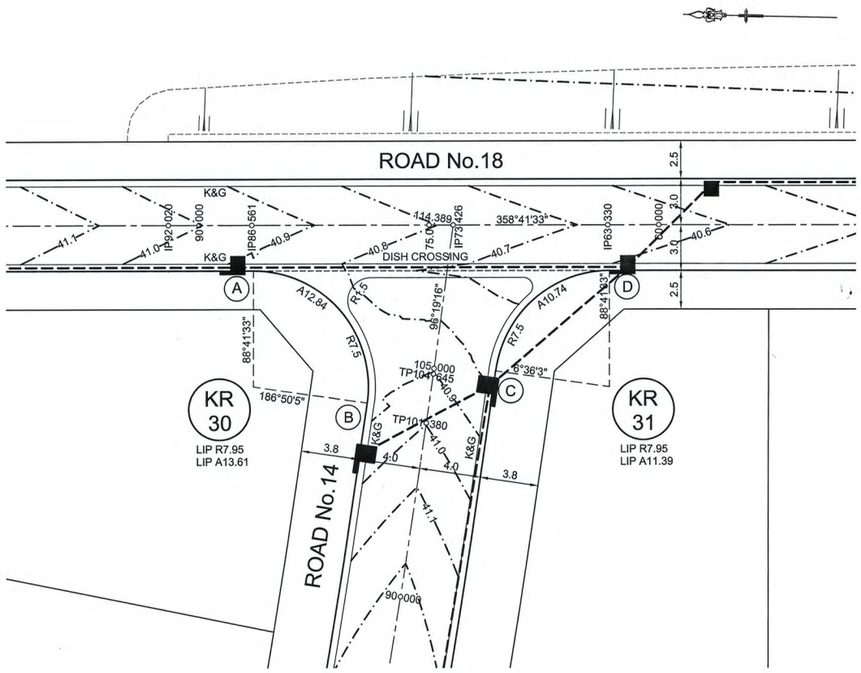
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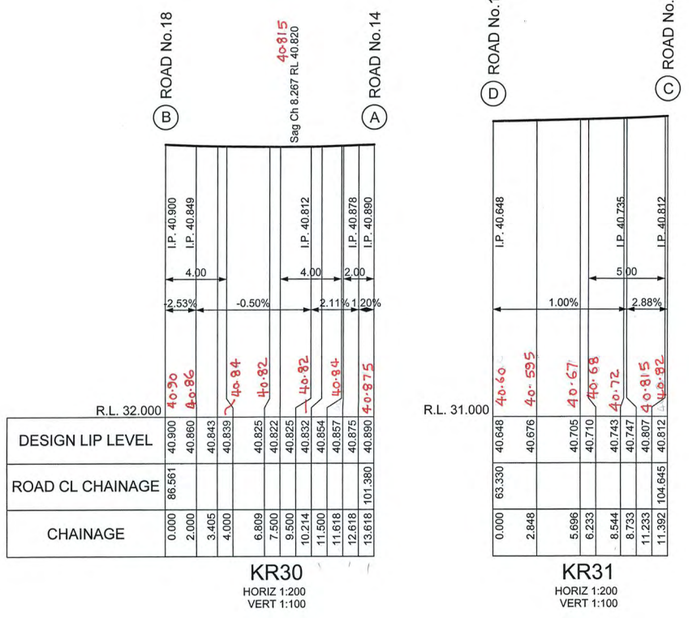
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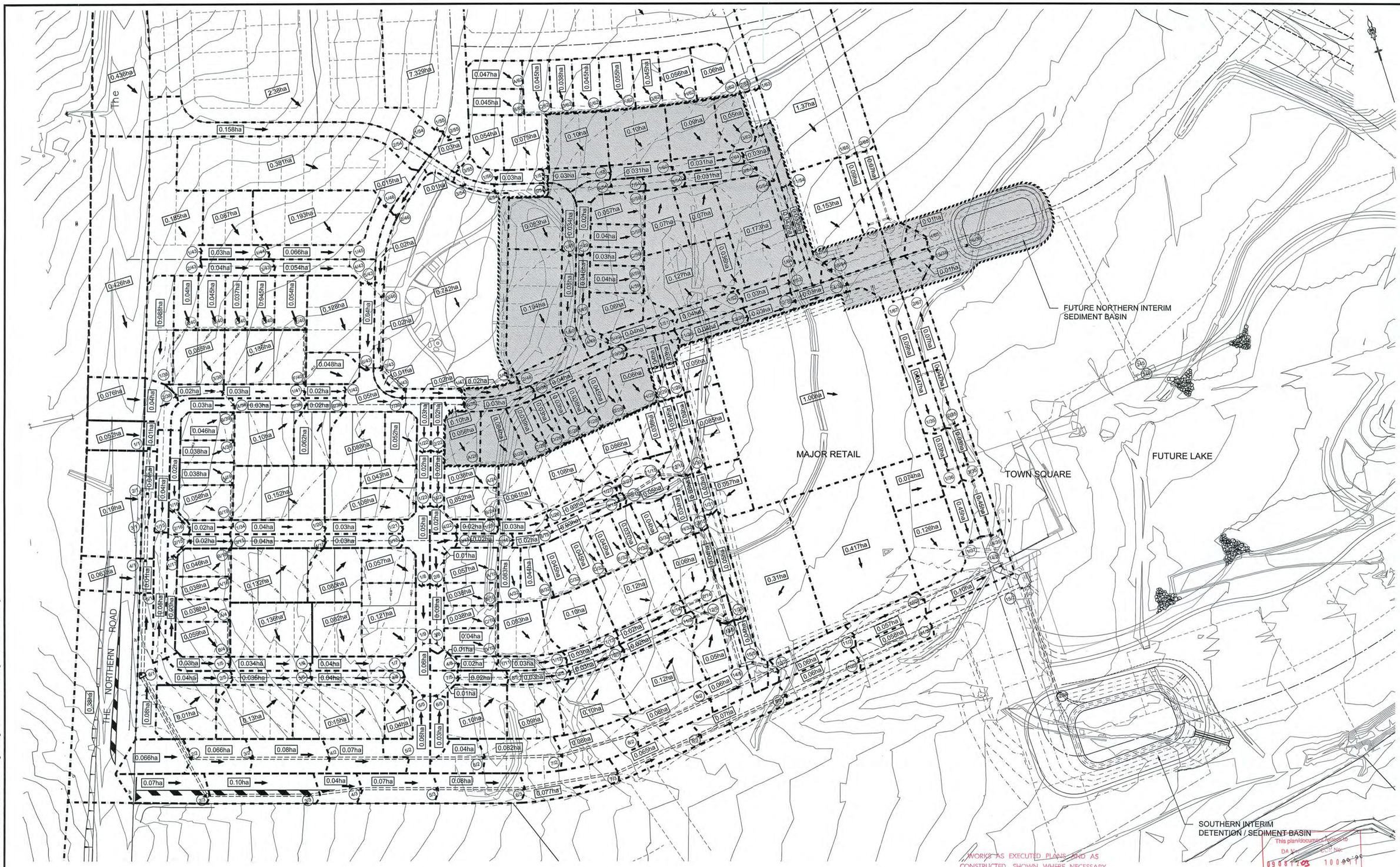

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METRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10

Paul Thomann
REGISTERED SURVEYOR

This plan/document is/forms part of DA No: 09081205 CC No: 10090-96

Environmental Planning & Assessment Act

Erin Hendell
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
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D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
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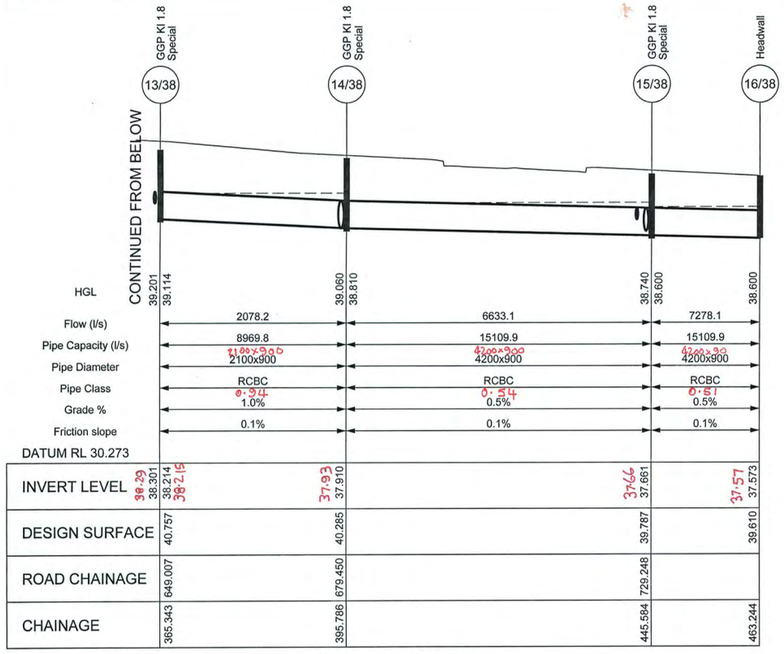
JORDAN SPRINGS
STAGE 1C
CATCHMENT PLAN

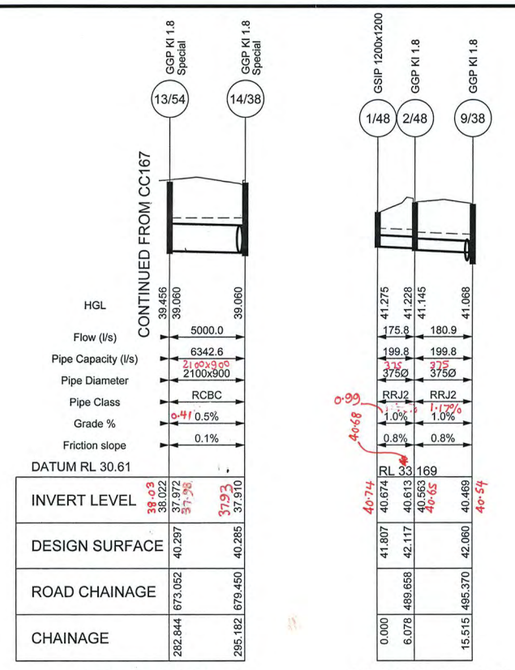
PLAN No. 8634CC165 D
FILE No. 8634CC165
SHEET 16 OF 28 SHEETS

Plotted: 7 May 2010 11:03:13 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC165.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

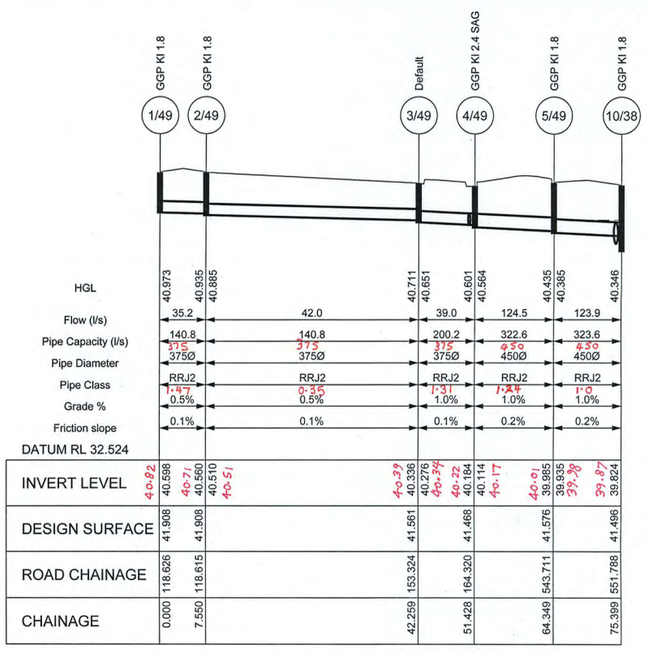


LINE 38 (1:100yr)

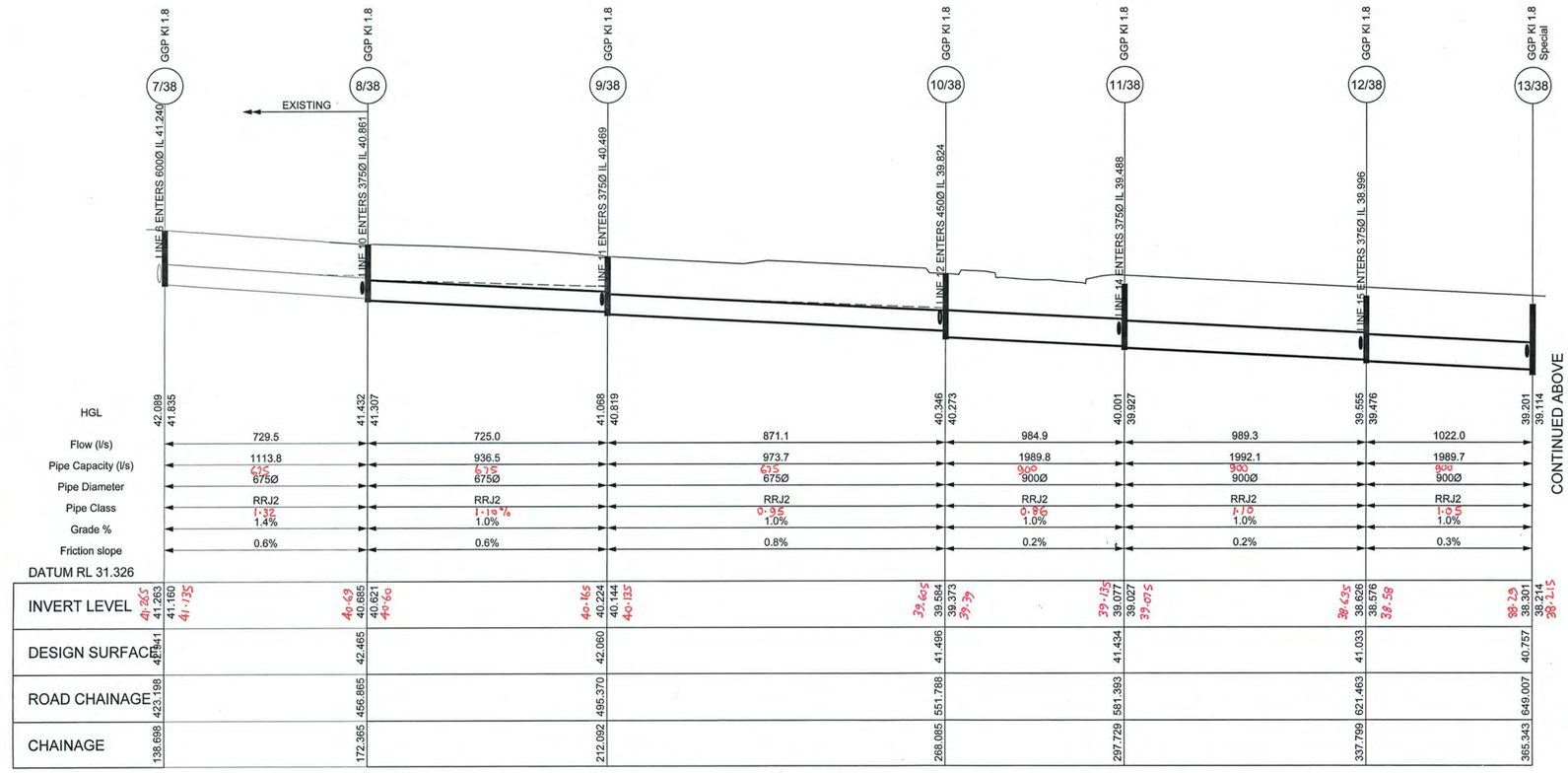


LINE 54 (1:100yr)

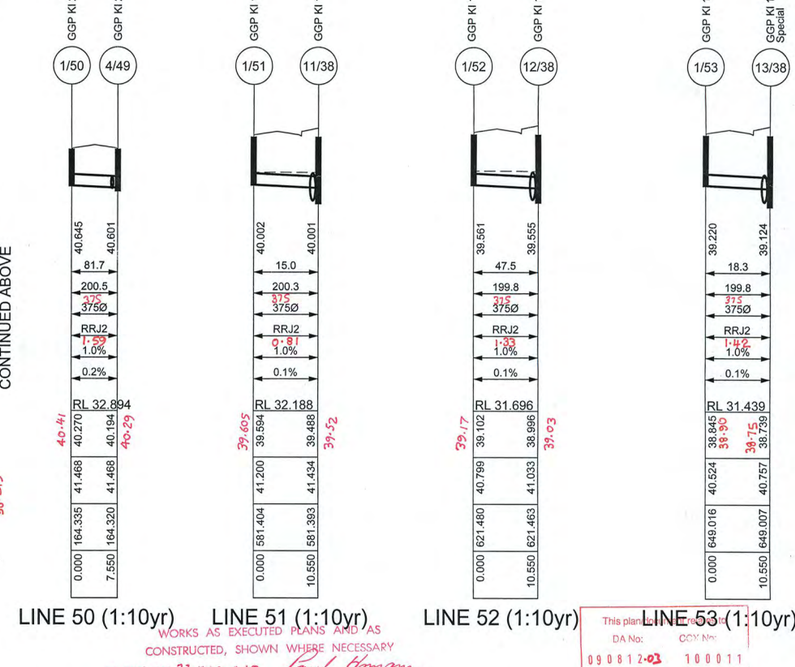
LINE 48 (1:10yr)



LINE 49 (1:10yr)



LINE 38 (1:10yr)



LINE 50 (1:10yr) LINE 51 (1:10yr) LINE 52 (1:10yr) LINE 53 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22 / 10 / 10 Paul Thomas REGISTERED SURVEYOR

This plan is approved for DA No: 09 0812-03 COW No: 100011 Environmental Planning & Assessment Act

ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

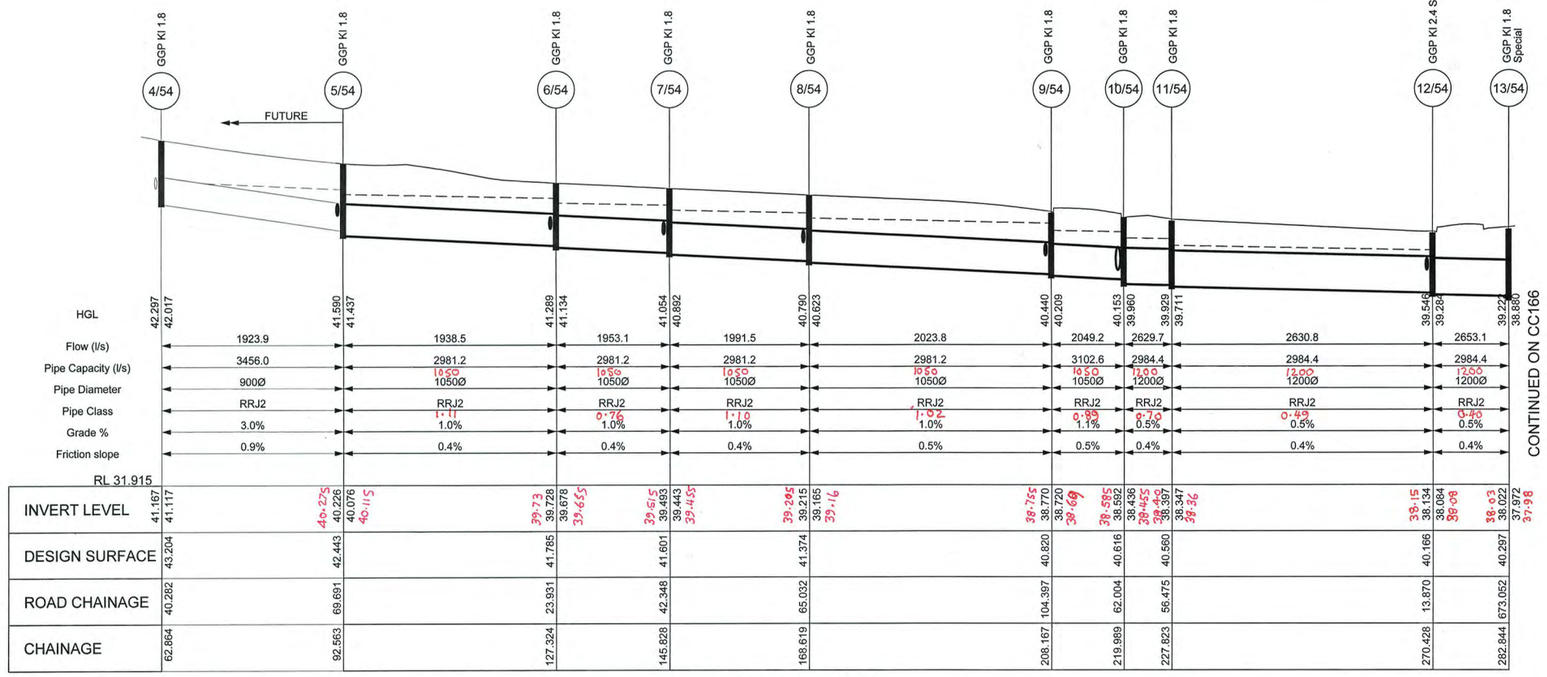
DATUM: AHD ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
AT A1

JORDAN SPRINGS
STAGE 1C
DRAINAGE LONGITUDINAL SECTIONS
LINE No.38, 48, 49, 50, 51, 52, 53 & 54

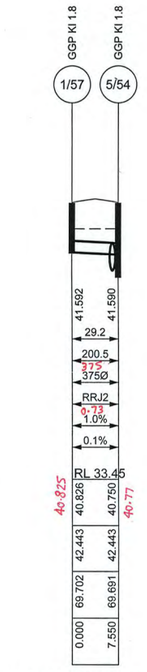
PLAN No. 8634CC166 D
FILE No. 8634CC166
SHEET 17 OF 28 SHEETS

Plotted: 7 May 2010 11:03:24 AM File Name: J:\8634\DICC - Engineering Construction Plans\Stage - 1C\8634CC166.dwg

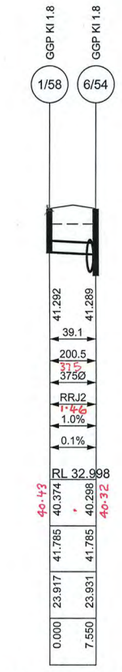
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



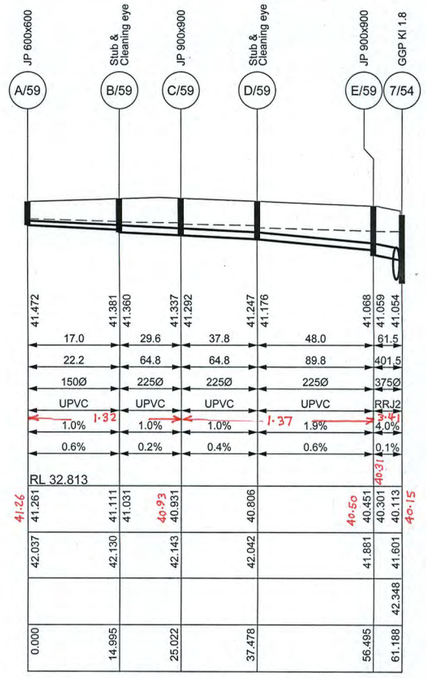
LINE 54 (1:10yr)



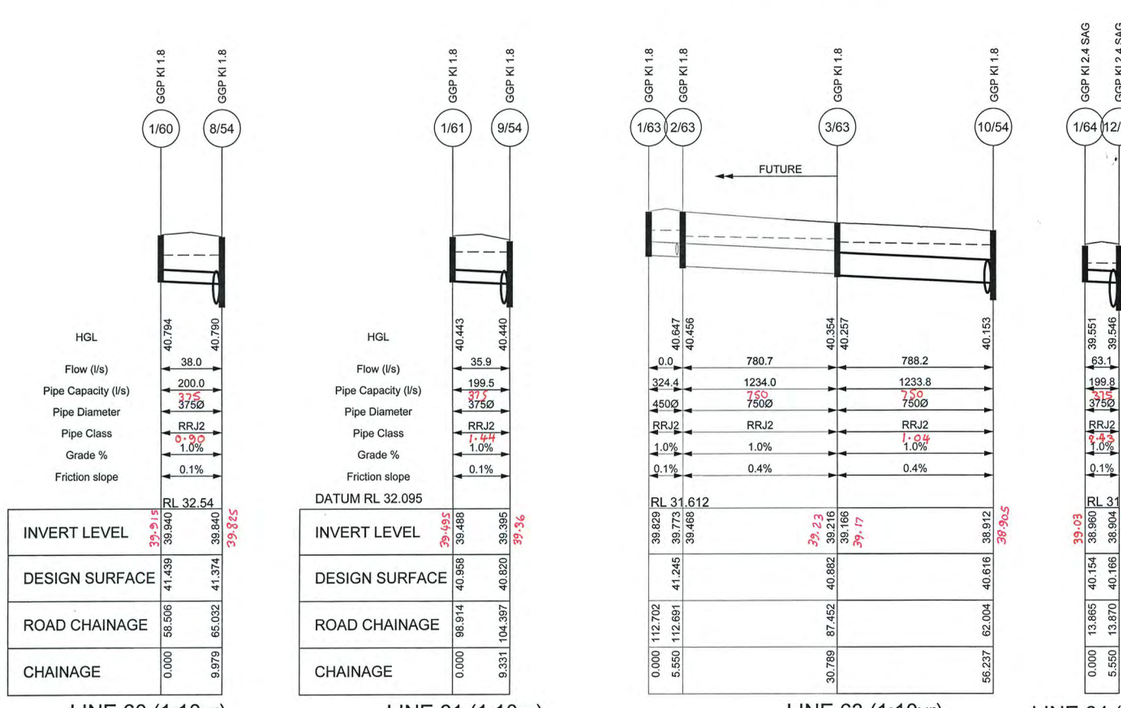
LINE 57 (1:10yr)



LINE 58 (1:10yr)



LINE 59 (1:10yr)

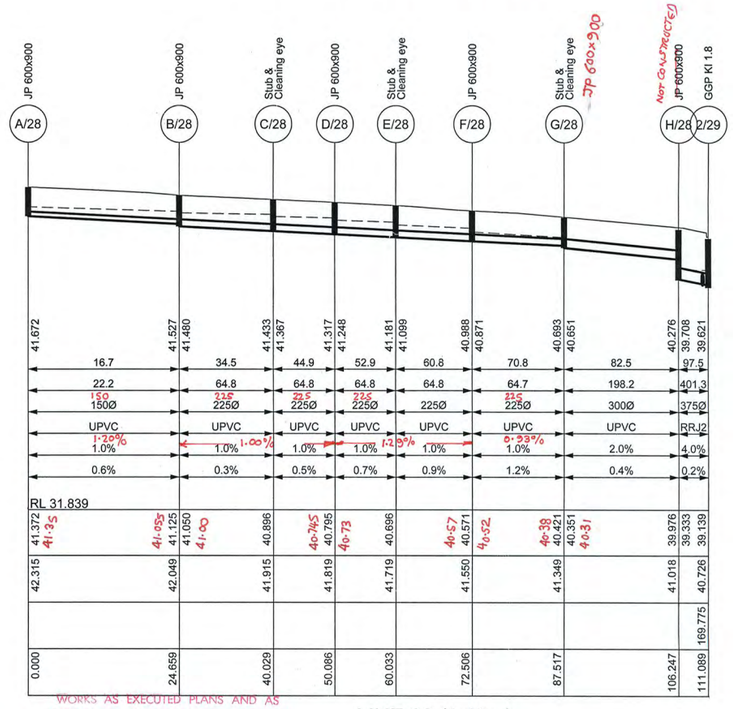


LINE 60 (1:10yr)

LINE 61 (1:10yr)

LINE 63 (1:10yr)

LINE 64 (1:10yr)



LINE 28 (1:10yr)

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Hanson
REGISTERED SURVEYOR

This plan/document relates to DA No: 090812-03 CCX No: 100017
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES
1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
AT A1

JORDAN SPRINGS
STAGE 1C
DRAINAGE LONGITUDINAL SECTIONS
LINE No.28, 54, 57, 58, 59, 60, 61, 63 & 64

PLAN No. 8634CC167 D
FILE No. 8634CC167
SHEET 18 OF 28 SHEETS

Plotted: 7 May 2010 11:03:36 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC167.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Pit Lid Level	Road Name	Road Chainage	Road CL Offset	Easting	Northing	Comment
		(mm)	(m)	(mm)	(m)	(m)	(m)		(m)	(m)	(m)	(m)	
D/28	JP 600x900	225	40.795	225	40.795	1.023	41.819				289089.48	6265832.507	
C/28	Stub & Cleaning eye	225	40.896	225	40.896	1.020	41.915				289079.52	6265831.080	
G/28	Stub & Cleaning eye	225	40.421	300	40.351	0.980	41.331				289126.54	6265837.718	
F/28	JP 600x900	225	40.571	225	40.571	0.979	41.550				289111.68	6265835.621	
B/28	JP 600x900	150	41.125	225	41.050	1.000	42.049				289064.30	6265828.972	
E/28	Stub & Cleaning eye	225	40.696	225	40.696	1.023	41.719				289099.33	6265833.883	
H/28	JP 600x900	300	39.976	375	39.333	1.617	40.950				289145.09	6265840.333	
A/28	JP 600x900			150	41.372	0.943	42.315				289040.37	6265834.933	
9/38	GGP KI 1.8	675	40.224	675	40.144	1.916	42.060	ROAD 8	495.37	3.78	289081.57	6265864.990	
		375	40.469										
10/38	GGP KI 1.8	675	39.584	900	39.373	2.123	41.496	ROAD 8	551.79	3.77	289137.09	6265872.246	
		450	39.824										
11/38	GGP KI 1.8	900	39.077	900	39.027	2.128	41.155	ROAD 8	581.39	5.27	289166.63	6265869.833	
		375	39.488										
12/38	GGP KI 1.8	900	38.626	900	38.576	2.178	40.754	ROAD 8	621.46	5.27	289206.69	6265870.619	
		375	38.996										
13/38	GGP KI 1.8 Special	900	38.301	2100x900	38.214	2.264	40.478	ROAD 8	649.01	5.27	289234.23	6265871.160	SEE PIT DETAIL
		375	38.739										
14/38	GGP KI 1.8 Special	2100x900	37.910	4200x900	37.910	2.291	40.201	ROAD 8	679.45	5.28	289264.67	6265871.757	SEE PIT DETAIL
		2100x900	37.910										
15/38	GGP KI 1.8 Special	375	38.191	4200x900	37.661	2.015	39.676	ROAD 8	729.25	5.27	289314.46	6265872.734	SEE PIT DETAIL
		750	37.811										
		4200x900	37.661										
1/48	GSIP 1200x1200			375	40.674	1.133	41.807				289072.26	6265877.231	
2/48	GGP KI 1.8	375	40.613	375	40.563	1.554	42.117	ROAD 8	489.66	-3.78	289075.08	6265871.848	
1/49	GGP KI 1.8			375	40.598	1.310	41.908	ROAD 12	118.63	3.77	289121.95	6265931.720	
2/49	GGP KI 1.8	375	40.560	375	40.510	1.399	41.908	ROAD 12	118.61	-3.77	289129.15	6265929.441	
3/49	Default	375	40.336	375	40.276	1.285	41.561	ROAD 12	153.32	-3.78	289118.63	6265896.367	
4/49	GGP KI 2.4 SAG	375	40.184	450	40.114	1.354	41.468	ROAD 12	164.32	-3.78	289118.35	6265887.201	
		375	40.194										
5/49	GGP KI 1.8	450	39.985	450	39.935	1.641	41.576	ROAD 8	543.71	-3.78	289128.49	6265879.186	
1/50	GGP KI 2.4 SAG			375	40.270	1.198	41.468	ROAD 12	164.34	3.78	289110.88	6265886.133	
1/51	GGP KI 1.8			375	39.594	1.560	41.154	ROAD 8	581.40	-5.27	289166.44	6265880.381	
1/52	GGP KI 1.8			375	39.102	1.652	40.754	ROAD 8	621.48	-5.27	289206.50	6265881.167	
1/53	GGP KI 1.8			375	38.845	1.634	40.478	ROAD 8	649.02	-5.27	289234.04	6265881.708	
5/54	GGP KI 1.8	900	40.226	1050	40.076	2.368	42.443	ROAD 12	69.69	3.78	289120.99	6265969.122	
		375	40.750										
6/54	GGP KI 1.8	1050	39.728	1050	39.678	2.107	41.785	ROAD 14	23.93	3.77	289154.76	6265960.876	
		375	40.298										
7/54	GGP KI 1.8	1050	39.493	1050	39.443	2.158	41.601	ROAD 14	42.35	3.78	289172.87	6265957.089	
		375	40.113										
8/54	GGP KI 1.8	1050	39.215	1050	39.165	2.208	41.374	ROAD 14	65.03	3.77	289195.29	6265953.002	
		375	39.840										
9/54	GGP KI 1.8	1050	38.770	1050	38.720	2.065	40.785	ROAD 14	104.40	3.77	289234.45	6265947.435	
		375	39.395										
10/54	GGP KI 1.8	750	38.912	1200	38.436	2.203	40.639	ROAD 18	62.00	-2.78	289242.30	6265938.601	
		1050	38.592										
11/54	GGP KI 1.8	1200	38.397	1200	38.347	2.168	40.515	ROAD 18	56.48	2.78	289247.98	6265933.200	
12/54	GGP KI 2.4 SAG special	375	38.904	1200	38.084	2.033	40.117	ROAD 18	13.87	2.77	289248.95	6265890.606	SEE PIT DETAIL
		1200	38.134										
13/54	GGP KI 1.8 Special	1200	38.022	2100x900	37.972	2.266	40.238	ROAD 8	673.05	-5.27	289258.07	6265882.179	SEE PIT DETAIL
1/57	GGP KI 1.8			375	40.826	1.617	42.443	ROAD 12	69.70	-3.78	289122.95	6265976.413	
1/58	GGP KI 1.8			375	40.374	1.411	41.785	ROAD 14	23.92	-3.77	289156.37	6265968.251	
C/59	JP 900x900	225	40.931	225	40.931	1.212	42.143				289161.89	6265922.629	
B/59	Stub & Cleaning eye	150	41.111	225	41.031	1.098	42.130				289158.86	6265913.071	
A/59	JP 600x600			150	41.261	0.776	42.037				289154.32	6265898.780	
E/59	JP 900x900	225	40.451	375	40.301	1.580	41.881				289171.46	6265952.612	
D/59	Stub & Cleaning eye	225	40.806	225	40.806	1.236	42.042				289165.67	6265934.497	
1/60	GGP KI 1.8			375	39.940	1.499	41.439	ROAD 14	58.51	-3.78	289190.14	6265961.548	
1/61	GGP KI 1.8			375	39.488	1.445	40.933	ROAD 14	98.91	-3.78	289229.91	6265955.587	
3/63	GGP KI 1.8	750	39.216	750	39.166	1.705	40.871	ROAD 18	87.45	-2.78	289241.72	6265964.042	
1/64	GGP KI 2.4 SAG			375	38.960	1.158	40.117	ROAD 18	13.87	-2.77	289243.40	6265890.474	
1/68	GGP KI 1.8			375	41.878	1.454	43.332	ROAD 8	397.11	3.78	288996.38	6265903.798	

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WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10 Paul Homann REGISTERED SURVEYOR

This plan/document relates to DA No: 09081203 CCX No: 100011 Environmental Planning & Assessment Act. Eric Hendfield PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
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J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS

PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1C
PIT SCHEDULE

PLAN No. 8634CC168 D
FILE No. 8634CC168
SHEET 19 OF 28 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDROLOGIC DESIGN TABLE - MAJOR - 4 Return Period: 100 Location: Cranebrook

Pit No.	Land Use	Pit Type	Catchment Overland Flow Length	Catchment Overland Flow Slope	Catchment Overland Flow Roughness "n"	Catchment Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Single Catchment Area	Pit Effective Area	Total Area	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
			(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
13/38	Road	GGP Kl 1.8 1%				6.00		6.00	209.0	1.000		0.022	0.022	6	12.8	41.5	30.1		1.421	0.069	14.549	17.351			
																17.4							14/38		
14/38	Road	GGP Kl 1.8 1%				6.00		6.00	209.0	1.000		0.020	0.020	6	11.6	15.6	39.2		1.441	0.076	18.167	27.556			
																30.6							15/38		
15/38	Road	GGP Kl 1.8 1%				6.00		6.00	209.0	1.000		0.014	0.014	6	8.1		39.2		1.578	0.074	18.186	31.087			
																33.8							16/38		
																31.1									
13/54	Road	GGP Kl 1.8 1%				6.00		6.00	209.0	1.000		0.006	0.006	6	3.5	50.5	53.9		1.835	0.082	23.379	50.456	14/38		
3/65	Road	GGP Kl 2.4 SAG				6.00		6.00	209.0	1.000		0.061	0.061	6	35.4		104.9		Sag	0.311	52.427	69.440			
																69.4							4/65		
4/65	Road	GGP Kl 1.8 1%				6.00		6.00	209.0	1.000		0.004	0.004	6	2.3	52.4	54.7		1.643	0.084	23.662	52.427	15/38		
1/66		GGP Kl 2.4 SAG						6.00	209.0	0.989		0.239	0.242	6	138.9		138.9		Sag	0.412	69.440		3/65		
	Med Density					6.00		6.00		0.982		0.150	0.153												
	Road					6.00		6.00		1.000		0.089	0.089												

HYDRAULICS DESIGN TABLE - MAJOR - 4 Return Period: 100yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
14/38 13/38	8.906	4.141	2078.2	30.443	2100x900	0.013	1.0	39.114	2078.215	0.600	0.037	0.06	3.27	8969.81	0.155	
15/38 14/38	16.029	16.856	6633.1	49.798	4200x900	0.013	0.5	38.810	6633.119	1.591	0.250	0.16	10.43	15109.86	0.080	
16/38 15/38	16.108	18.544	7278.1	17.660	4200x900	0.013	0.5	38.600	7278.127	0.738	0.140	0.19	11.44	15109.86	0.026	
14/38 13/54	16.002	12.695	5000.0	12.338	2100x900	0.013	0.5	39.060	4999.963	1.109	0.396	0.36	7.86	6342.61	0.026	
2/65 1/65	6.000	1.209	701.8	11.325	675	0.012	0.5	39.749	701.800	4.500	0.883	0.20	1.96	663.12	0.096	
3/65 2/65	6.096	1.209	698.6	39.319	750	0.012	0.5	39.404	698.649	2.207	0.282	0.13	1.58	872.30	0.414	
4/65 3/65	6.511	1.509	855.2	23.634	750	0.012	0.5	39.037	855.225	1.255	0.240	0.19	1.94	871.40	0.203	
15/38 4/65	6.714	1.513	849.2	10.552	750	0.012	0.5	38.790	849.154	0.708	0.133	0.19	1.92	873.41	0.091	
3/65 1/66	6.000	0.239	138.9	11.325	675	0.012	0.5	39.279	138.880	4.500	0.033	0.01	0.38	689.22	0.501	

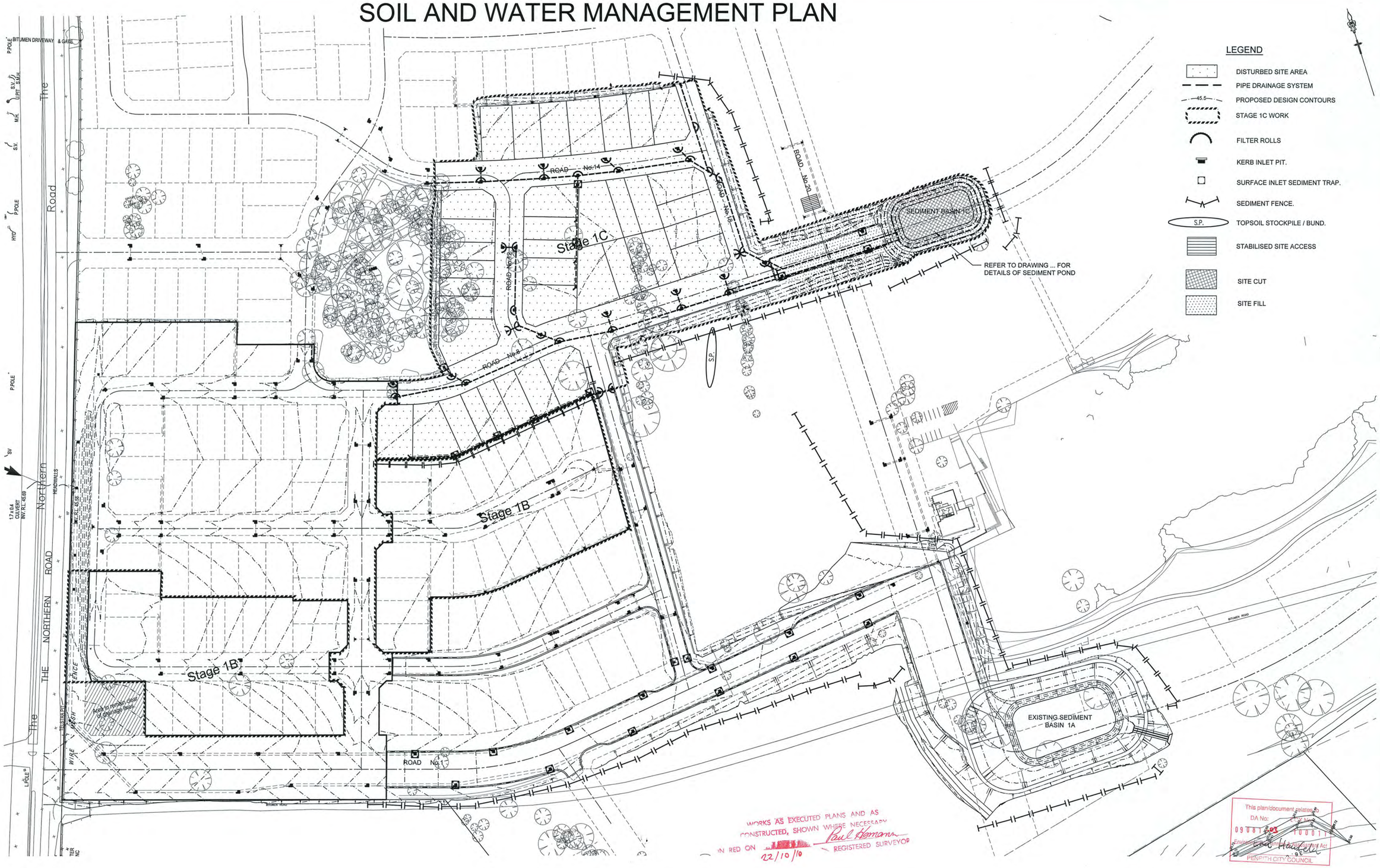
HYDRAULICS DESIGN TABLE- 6 Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
E/28 D/28	6.878	0.146	52.9	9.947	225	0.009	1.0	41.248	52.879	0.759	0.068	0.09	1.33	64.75	0.125	
D/28 C/28	6.729	0.123	44.9	10.057	225	0.009	1.0	41.367	44.890	1.019	0.066	0.07	1.13	64.75	0.148	
H/28 G/28	7.279	0.232	82.5	18.730	300	0.009	2.0	40.651	82.547	0.600	0.042	0.07	1.17	198.24	0.267	
G/28 F/28	7.138	0.198	70.8	15.010	225	0.009	1.0	40.871	70.810	0.725	0.117	0.16	1.78	64.73	0.140	
C/28 B/28	6.434	0.093	34.5	15.370	225	0.009	1.0	41.480	34.494	1.217	0.047	0.04	0.87	64.75	0.295	
F/28 E/28	7.002	0.169	60.8	12.473	225	0.009	1.0	41.099	60.819	0.688	0.082	0.12	1.53	64.75	0.136	
2/29 H/28	7.546	0.278	97.5	4.843	375	0.012	4.0	39.708	97.549	0.600	0.024	0.04	0.88	401.26	0.091	
B/28 A/28	6.000	0.044	16.7	24.659	150	0.009	1.0	41.672	16.732	4.500	0.206	0.05	0.95	22.19	0.434	
9/38 B/38	9.853	2.332	725.0	39.726	675	0.012	1.0	41.307	725.000	0.600	0.126	0.21	2.03	936.52	0.327	
10/38 9/38	10.180	2.839	871.1	55.993	675	0.012	1.0	40.819	871.080	0.873	0.249	0.29	2.36	973.75	0.395	
11/38 10/38	10.574	3.246	984.9	29.644	900	0.012	1.0	40.273	984.913	0.600	0.073	0.12	1.55	1989.84	0.319	
12/38 11/38	10.893	3.291	989.3	40.070	900	0.012	1.0	39.927	989.275	0.600	0.074	0.12	1.56	1992.09	0.429	
13/38 12/38	11.323	3.442	1022.0	27.544	900	0.012	1.0	39.476	1021.971	0.600	0.079	0.13	1.61	1989.74	0.286	
2/48 1/48	6.000	0.465	175.8	6.078	375	0.012	1.0	41.275	175.840	4.500	0.582	0.13	1.59	199.83	0.064	
9/38 2/48	6.064	0.480	180.9	9.437	375	0.012	1.0	41.145	180.914	0.600	0.082	0.14	1.64	199.82	0.096	
2/49 1/49	6.000	0.093	35.2	7.550	375	0.012	0.5	40.973	35.154	4.500	0.023	0.01	0.32	140.84	0.395	
3/49 2/49	6.395	0.113	42.0	34.709	375	0.012	0.5	40.885	41.961	2.202	0.016	0.01	0.38	140.84	1.523	
4/49 3/49	7.918	0.113	39.0	9.169	375	0.012	1.0	40.651	38.970	0.600	0.004	0.01	0.35	200.16	0.433	
5/49 4/49	8.351	0.369	124.5	12.920	450	0.012	1.0	40.564	124.505	1.196	0.037	0.03	0.78	322.85	0.275	
10/38 5/49	8.626	0.373	123.9	11.050	450	0.012	1.0	40.385	123.900	0.600	0.019	0.03	0.78	323.63	0.236	
4/49 1/50	6.000	0.216	81.7	7.550	375	0.012	1.0	40.645	81.684	4.500	0.126	0.03	0.74	200.49	0.170	
11/38 1/51	6.000	0.040	15.0	10.550	375	0.012	1.0	40.002	15.043	4.500	0.004	0.00	0.14	200.30	1.291	
12/38 1/52	6.000	0.126	47.5	10.550	375	0.012	1.0	39.561	47.518	4.500	0.042	0.01	0.43	199.82	0.409	
13/38 1/53	6.000	0.048	18.3	10.550	375	0.012	1.0	39.220	18.298	4.500	0.006	0.00	0.17	199.82	1.061	
6/54 5/54	15.488	7.425	1938.5	34.760	1050	0.012	1.0	41.437	1938.540	0.600	0.153	0.26	2.24	2981.23	0.259	
7/54 6/54	15.747	7.545	1953.1	18.504	1050	0.012	1.0	41.134	1953.084	0.600	0.156	0.26	2.26	2981.23	0.137	
8/54 7/54	15.883	7.729	1991.5	22.791	1050	0.012	1.0	40.892	1991.453	0.600	0.162	0.27	2.30	2981.23	0.165	
9/54 8/54	16.049	7.898	2023.8	39.548	1050	0.012	1.0	40.623	2023.791	0.600	0.167	0.28	2.34	2981.23	0.282	
10/54 9/54	16.331	8.073	2049.2	11.822	1050	0.012	1.1	40.209	2049.164	0.809	0.231	0.29	2.37	3102.60	0.083	
11/54 10/54	16.414	10.390	2629.7	7.834	1200	0.012	0.5	39.960	2629.672	0.699	0.193	0.28	2.33	2984.41	0.056	
12/54 11/54	16.470	10.414	2630.8	42.605	1200	0.012	0.5	39.711	2630.821	0.790	0.218	0.28	2.33	2984.41	0.305	
13/54 12/54	16.775	10.613	2653.1	12.416	1200	0.012	0.5	39.284	2653.054	0.932	0.262	0.28	2.35	2984.41	0.088	
14/38 13/54	16.863	10.618	2646.3	12.338	2100x900	0.013	0.5	38.880	2646.298	1.107	0.111	0.10	4.16	6342.61	0.049	
2/55 1/55	15.000	4.997	1325.6	7.675	750	0.012	1.0	44.466	1325.650	3.585	1.647	0.46	3.00	1235.00	0.043	
3/55 2/55	15.043	4.997	1323.8	17.441	825	0.012	3.0	44.190	1323.815	0.600	0.188	0.31	2.48	2751.90	0.117	
3/54 3/55	15.160	4.997	1318.8	10.471	825	0.012	2.2	43.882	1318.764	0.600	0.186	0.31	2.47	2338.17	0.071	
4/54 1/56	6.000	0.041	15.6	7.554	375	0.012	1.0	42.297	15.578	4.500	0.005	0.00	0.14	200.43	0.893	
5/54 1/57	6.000	0.077	29.2	7.550	375	0.012	1.0	41.592	29.220	4.500	0.016	0.00	0.26	200.49	0.476	
6/54 1/58	6.000	0.104	39.1	7.550	375	0.012	1.0	41.292	39.111	4.500	0.029	0.01	0.35	200.49	0.355	
D/59 C/59	6.484	0.102	37.8	12.456	225	0.009	1.0	41.292	37.799	0.970	0.045	0.05	0.95	64.75	0.218	
C/59 B/59	6.259	0.079	29.6	10.027	225	0.009	1.0	41.360	29.645	0.717	0.020	0.03	0.75	64.75	0.224	
B/59 A/59	6.000	0.045	17.0	14.995	150	0.009	1.0	41.472	17.021	4.500	0.213	0.05	0.96	22.17	0.259	
7/54 E/59	6.964	0.170	61.5	4.693	375	0.012	4.0	41.059	61.482	0.600	0.009	0.02	0.56	401.55	0.141	
E/59 D/59	6.702	0.131	48.0	19.017	225	0.009	1.9	41.176	48.020	0.961	0.071	0.07	1.21	89.79	0.262	
8/54 1/60	6.000	0.101	38.0	9.979	375	0.012	1.0	40.794	38.039	4.500	0.027	0.01	0.34	200.03	0.483	
9/54 1/61	6.000	0.095	35.9	9.331	375	0.012	1.0	40.443	35.896	4.500	0.024	0.01	0.33	199.49	0.478	
2/63 1/63	6.000	0.000	0.0	5.550	450	0.012	1.0	40.647	0.000	4.500	0.000	0.00	0.00	324.37	0.000	
3/63 2/63	7.722	2.244	780.7	25.239	750	0.012	1.0	40.456	780.653	1.201	0.191	0.16	1.77	1234.04	0.238	
10/54 3/63	7.960	2.293	788.2	25.448	750	0.012	1.0	40.257	788.179	0.600	0.097	0.16	1.78	1233.83	0.238	
12/54 1/64	6.000	0.167	63.1	5.550	375	0.012	1.0	39.551	63.097	4.500	0.075	0.02	0.57	199.82	0.162	
2/67 1/67	6.000	0.078	29.3	11.550	375	0.012	1.0	38.968	29.343	4.500	0.016	0.00	0.27	199.82	0.725	
15/38 2/67	6.725	0.141	51.3	23.623	375	0.012	1.0	38.802	51.314	1.741	0.019	0.01	0.46	199.82	0.847	
7/43 1/68	6.000	0.130	49.1	7.550	375	0.012	1.0	42.345	49.126	4.500	0.045	0.01	0.44	200.49	0.283	

HYDROLOGIC DESIGN TABLE - 6 Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
			(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	
D/28	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000		E/28		
C/28	Lot	Stub				6.00		6.00	136.0	0.764	0.039	0.030	6	11.3						0.000		D/28		
G/28	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		H/28		
F/28	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		G/28		
B/28	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.064	0.049	6	18.5		0.0				0.000		C/28		
E/28	Lot	Stub				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000		F/28		
H/28	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.060	0.046	6	17.3						0.000		2/29		
A/28	Lot	Stub				6.00		6.00	136.0	0.764	0.058	0.044	6	16.7						0.000		B/28		
9/38	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.031	0.027	6	10.2	2.6	13.0	1.000	0.914	0.054	6.512	2.802			
															2.8							10/38		
10/38	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.039	0.034	6	12.9	6.5	28.0	1.000	1.343	0.067	13.594	15.128			
															15.1							11/38		
11/38	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.005	0.004	6	1.6	14.4	9.2	1.000	0.679	0.047	4.585	7.521			
															7.5							12/38		
12/38	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.029	0.025	6	9.6	4.6	35.9	1.000	1.539	0.073	16.879	26.387			
															26.4							13/38		
		GGP Kl 1.8 1%																						
1/48	Park	GSIP 200x1200				6.00		6.00	136.0	0.627	0.742	0.465	6	175.8						0.000		2/48		
2/48	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.017	0.015	6	5.6		5.6	1.000	0.490	0.041	2.802		9/38		
1/49		GGP Kl 1.8 1%						6.00	136.0	0.795	0.117	0.093	6	35.2	11.1	46.3	1.000	1.714	0.078	20.688	11.097	2/49		
	Road					6.00		6.00		0.873	0.034	0.030												
	Lot					6.00		6.00		0.764	0.083	0.063												
2/49	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.023	0.020	6	7.6	25.6	33.1	1.000	1.482	0.071	15.759	25.563	3/49		
3/49		Default							136.0						17.4	17.4	1.000	1.024	0.057	9400.000	17.388	4/49		
4/49	Road	GGP Kl 2.4 SAG				6.00		6.00	136.0	0.873	0.046	0.040	6	15.2		56.0	0.032	Sag	0.166	28.004	40.842			
															40.8							5/49		
5/49	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.004	0.003	6	1.3	28.0	29.3	1.000	1.406	0.069	14.195	28.004	10/38		
1/50		GGP Kl 2.4 SAG						6.00	136.0	0.795	0.272	0.216	6	81.7		81.7	0.027	Sag	0.243	40.842		4/49		
	Road					6.00		6.00		0.873	0.078	0.068												
	Lot					6.00		6.00		0.764	0.194	0.148												
1/51		GGP Kl 1.8 1%						6.00	136.0	0.847	0.047	0.040	6	15.0		15.0	1.000	0.962	0.055	7.521		11/38		
	Road					6.00		6.00		0.873	0.036	0.031												
	Lot					6.00		6.00		0.764	0.011	0.008												
1/52		GGP Kl 1.8 1%						6.00	136.0	0.786	0.160	0.126	6	47.5		47.5	1.000	1.735	0.079	21.131		12/38		
	Road					6.00		6.00		0.873	0.033	0.029												
	Lot					6.00		6.00		0.764	0.127	0.097												
1/53		GGP Kl 1.8 1%						6.00	136.0	0.807	0.060	0.048	6	18.3		18.3	1.000	1.111	0.060	9.149		13/38		
	Road					6.00		6.00		0.873	0.024	0.021												
	Lot					6.00		6.00		0.764	0.036	0.027												
5/54	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.021	0.018	6	6.9	5.9	22.0	1.731	1.031	0.057	10.898	15.071			
															15.1							1/49		
6/54	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3	21.0	27.2	1.000	1.343	0.067	13.254	20.967	7/54		
7/54	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9	14.0	4.9	1.000	0.422	0.038	2.473				
																						8/54		
8/54		GGP Kl 1.8 1%						6.00	136.0	0.786	0.087	0.068	6	25.8	2.5	46.2	1.000	1.714	0.078	20.657	20.324			
	Road					6.00		6.00		0.873	0.018	0.016			20.3							9/54		
	Lot					6.00		6.00		0.764	0.069	0.053												
9/54		GGP Kl 1.8 2%						6.00	136.0	0.797	0.101	0.081	6	30.4	25.5	49.5	2.975	1.382	0.068	21.808	19.038			
	Road					6.00		6.00		0.873	0.031	0.027			19.0							10/54		
	Lot					6.00		6.00		0.764	0.070	0.053												
10/54	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.027	0.024	6	8.9	9.2	36.5	1.000	1.544	0.073	17.118	27.644			
															4.6							1/64		
															27.6									
11/54	Road	GGP Kl 1.8 1%				6.00		6.00	136.0	0.873	0.028	0.024	6	9.2		9.2	1.000	0.679	0.047	4.616		10/54		
12/54	Road	GGP Kl 2.4 SAG				6.00		6.00	136.0	0.873	0.036	0.031	6	11.9	41.3	53.1	0.377	Sag	0.158	26.566	41.262	13/54		
1/55	Combined	Direct Connection				15.00		15.00	95.5	0.682	7.329	4.997	15	1325.6			1.000	0.211	0.019	0.000		2/55		
2/55		GGP Kl 1.8 1%							136.0								1.000	0.206	0.018	0.000		3/55		
3/55		GGP Kl 1.8 4%							136.0								4.500	0.103	0.009	0.000		3/54		
1/56	Lot	GGP Kl 1.8 3%				6.00		6.00	136.0	0.764	0.054	0.041	6	15.6		15.6	3.432	0.643	0.046	7.789		4/54		
1/57		GGP Kl 1.8 1%						6.00	136.0	0.789	0.098	0.077	6	29.2		29.2	1.730	1.215	0.063	14.149		5/54		
	Road					6.00		6.00		0.873	0.023	0.020												
	Lot					6.00		6.00		0.764	0.075	0.057												
1/58		GGP Kl 1.8 1%						6.00	136.0	0.790	0.131	0.104	6	39.1		39.1	1.000	1.596	0.074	18.144		6/54		
	Road					6.00		6.00		0.873	0.032	0.028												
	Lot					6.00		6.00		0.764	0.099	0.076												
C/59	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000		D/59		
B/59	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		C/59		
A/59	Lot	Stub				6.00		6.00	136.0	0.764	0.059	0.045	6	17.0						0.000		B/59		
E/59	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.051	0.039	6	14.7						0.000		7/54		
D/59	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		E/59		
1/60		GGP Kl 1.8 1%						6.00	136.0	0.787	0.128	0.101	6	38.0		38.0	1.000	1.558	0.073	17.716		8/54		
	Road					6.00		6.00		0.873	0.027	0.024												
	Lot					6.00		6.00		0.764	0.101	0.077												
1/61		GGP Kl 1.8 2%						6.00	136.0	0.792	0.120	0.095	6	35.9		35.9	2.426	1.215	0.063	16.859		9/54		
	Road					6.00		6.00		0.873	0.031	0.027												
	Lot					6.00		6.00		0.764	0.089	0.068												
1/63		GGP Kl 1.8 1%							136.0								1.500	0.211	0.019	0.000				
2/63	Combined	Default				7.00		7.00	129.8	0.736	2.590	1.907	7	687.4			1.500	0.164	0.015	9400.000				
																						3/63		
3/63		GGP Kl 1.8 1%						6.00	136.0	0.788	0.062	0.049	6	18.5		18.5	1.392	0.998	0.056	9.232		10/54		
	Road					6.00		6.00		0.873	0.014	0.012												
	Lot					6.00		6.00		0.764	0.048	0.037												
1/64		GGP Kl 2.4 SAG						6.00	136.0	0.784	0.213	0.167	6	63.1	19.4	82.5	0.378	Sag	0.245	41.262	19.428	12/54		
	Road					6.00		6.00		0.873	0.040	0.035												
	Lot					6.00		6.00		0.764	0.173	0.132												
1/67	Road	GGP Kl 2.4 SAG				6.00		6.00	136.0	0.873	0.089	0.078	6	29.3		29.3	0.043	Sag	0.087	14.672		2/67		
2/67	Road	GGP Kl 2.4 SAG				6.00		6.00	136.0	0.873	0.072	0.063	6	23.7	14.7	38.4	0.044	Sag	0.114	19.205	14.672	15/38		
1/68		GGP Kl 1.8 1%						6.00	136.

SOIL AND WATER MANAGEMENT PLAN



1:1000 (AT A1) 20 10 0 10 20 30 40 50 60 70 80 90 100 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1C
SOIL & WATER MANAGEMENT PLAN

PLAN No. 8634CC170 D
FILE No. 8634CC170
SHEET 21 OF 28 SHEETS

Plotted: 7 May 2010 11:04:38 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC170.dwg

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL–OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

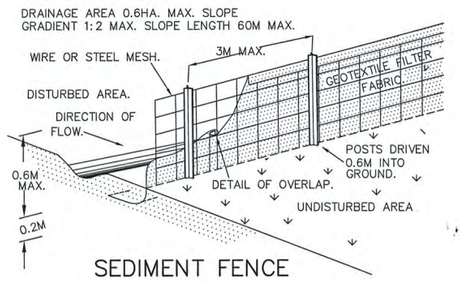
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

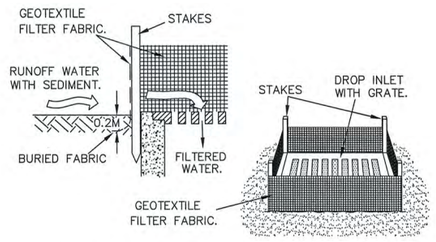
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " –4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

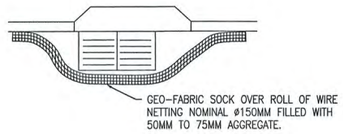
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK: –
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

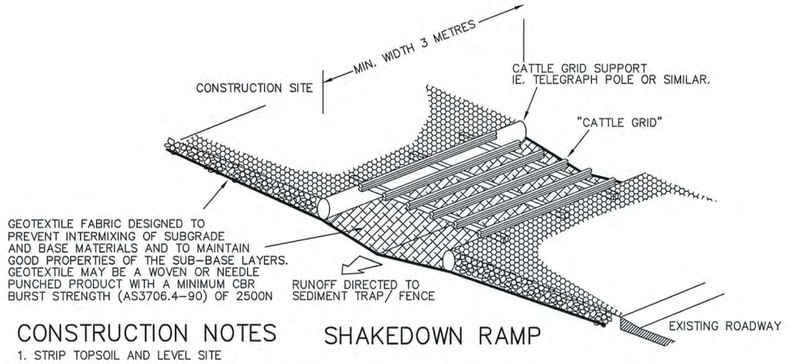


SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.





CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE–PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

SHAKEDOWN RAMP

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Homann
REGISTERED SURVEYOR

This plan/document relates to
DA No: 090812.03 CCX No: 100011
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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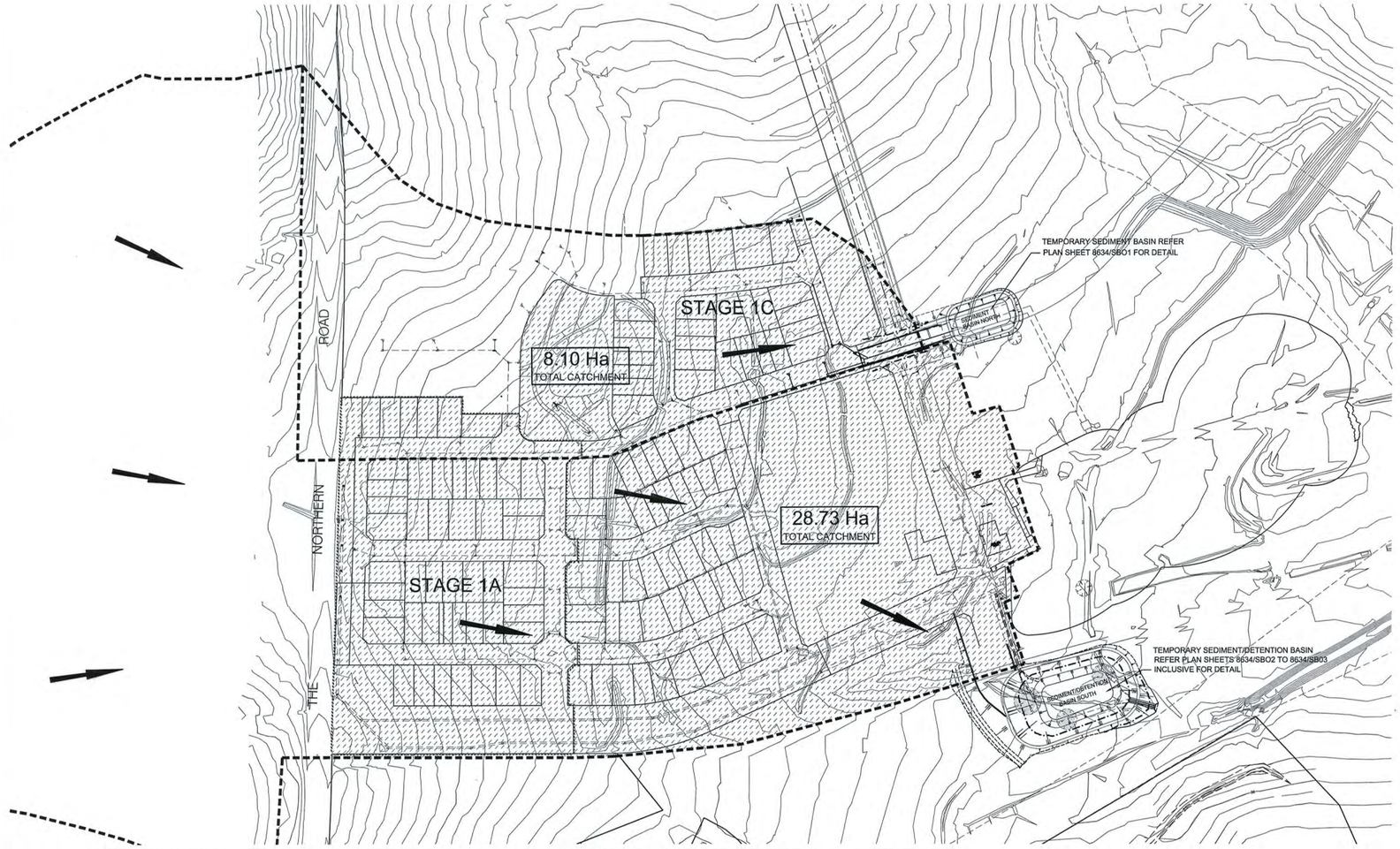
DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N.T.S.

JORDAN SPRINGS
STAGE 1C
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8634CC171 D
FILE No. 8634CC171
SHEET 22 OF 28 SHEETS

Plotted: 7 May 2010 11:04:45 AM File Name: J:\8634DICC - Engineering Construction Plans\Stage - 1C\8634CC171.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



STAGE 1C

SEDIMENT BASIN NORTH
VOLUME CALCULATIONS (TYPE D SOILS)

BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

SETTLING ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 75th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED FROM THE FOLLOWING:

$V = 10 * Cv * A * R$ (75th ile,5day) m^3

where

10 = CONVERSION FACTOR

Cv = 0.5 = THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5 DAY PERIOD.

R = 21.8 = IS THE 5 DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80 PERCENT OF RAINFALL EVENTS (SEE TABLE IN SEC.6.3.3 "MANAGING URBAN STORMWATER SOILS & CONSTRUCTION" 4th edition).

A = 8.1ha = AREA OF TOTAL CATCHMENT (ha)

$V = (10 \times 0.5 \times 8.1 \times 21.8) = 883m^3$

SEDIMENT STORAGE ZONE VOLUME

THE SEDIMENT STORAGE ZONE VOLUME CAN BE CALCULATED AS BEING EQUAL TO THE AVERAGE 2 MONTH SOIL LOSS FROM THE DISTURBED AREAS OF THE CATCHMENT. THIS VOLUME (V) IS DETERMINED BY THE REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE):

$V = 0.17 * A * (R * K * Ls * P * C) / 1.3$ m^3

where

0.17 = A FACTOR CONVERTING ANNUAL ESTIMATED SOIL LOSS TO THE 2 MONTH SOIL LOSS

R = 2,330 = RUSLE R FACTOR
K = 0.038 = RUSLE K FACTOR
Ls = 0.69 = RUSLE Ls FACTOR
P = 1.3 = RUSLE P FACTOR
C = 1 = RUSLE C FACTOR

APPENDIX A "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION" 4th edition.

1.3 = A FACTOR TO CONVERT TONNES TO CUBIC METRES BASED ON A TYPICAL DENSITY OF SATURATED SEDIMENT OF 1.3

THIS SITE IS ASSUMED TO BE IN A SOIL LANDSCAPE OF PENRITH WITH A K FACTOR OF 0.038

A = 8.1 = THE DISTURBED AREA (ha)

$V = 0.17 \times 8.1 \times (2330 \times 0.038 \times 0.69 \times 1.3 \times 1) / 1.3 = 84\ m^3$

LESS THAN 50% OF SETTLING ZONE AND THEREFORE:

SEDIMENT BASIN VOLUME REQUIRED = $883m^3 + 84m^3$

$V = 967\ m^3$

VOLUME AVAILABLE $1080m^3$

STAGE 1A

SEDIMENT BASIN SOUTH
VOLUME CALCULATIONS (TYPE D SOILS)

BASIN VOLUME = SETTLING ZONE VOLUME + SEDIMENT STORAGE ZONE VOLUME

SETTLING ZONE VOLUME

THE SETTLING ZONE VOLUME FOR TYPE D SOILS IS CALCULATED TO PROVIDE CAPACITY TO CONTAIN ALL RUNOFF EXPECTED FROM UP TO THE 75th PERCENTILE RAINFALL EVENT. THE SETTLING ZONE VOLUME (V) CAN BE DETERMINED FROM THE FOLLOWING:

$V = 10 * Cv * A * R$ (75th ile,5day) m^3

where

10 = CONVERSION FACTOR

Cv = 0.5 = THE VOLUMETRIC RUNOFF COEFFICIENT, DEFINED AS THAT PORTION OF RAINFALL THAT RUNS OFF AS STORMWATER OVER THE 5 DAY PERIOD.

R = 21.8 = IS THE 5 DAY TOTAL RAINFALL DEPTH (mm) WHICH IS NOT EXCEEDED IN 80 PERCENT OF RAINFALL EVENTS (SEE TABLE IN SEC.6.3.3 "MANAGING URBAN STORMWATER SOILS & CONSTRUCTION" 4th edition).

A = 28.73ha = AREA OF TOTAL CATCHMENT (ha)

$V = (10 \times 0.5 \times 28.73 \times 21.8) = 3132m^3$

SEDIMENT STORAGE ZONE VOLUME

THE SEDIMENT STORAGE ZONE VOLUME CAN BE CALCULATED AS BEING EQUAL TO THE AVERAGE 2 MONTH SOIL LOSS FROM THE DISTURBED AREAS OF THE CATCHMENT. THIS VOLUME (V) IS DETERMINED BY THE REVISED UNIVERSAL SOIL LOSS EQUATION (RUSLE):

$V = 0.17 * A * (R * K * Ls * P * C) / 1.3$ m^3

where

0.12 = A FACTOR CONVERTING ANNUAL ESTIMATED SOIL LOSS TO THE 2 MONTH SOIL LOSS

R = 2,330 = RUSLE R FACTOR
K = 0.038 = RUSLE K FACTOR
Ls = 1.22 = RUSLE Ls FACTOR
P = 1.3 = RUSLE P FACTOR
C = 1 = RUSLE C FACTOR

APPENDIX A "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION" 4th edition.

1.3 = A FACTOR TO CONVERT TONNES TO CUBIC METRES BASED ON A TYPICAL DENSITY OF SATURATED SEDIMENT OF 1.3

THIS SITE IS ASSUMED TO BE IN A SOIL LANDSCAPE OF PENRITH WITH A K FACTOR OF 0.038

A = 11.22 = THE DISTURBED AREA (ha)

$V = 0.17 \times 11.22 \times (2330 \times 0.038 \times 1.22 \times 1.3 \times 1) / 1.3 = 145\ m^3$

LESS THAN 50% OF SETTLING ZONE AND THEREFORE:

SEDIMENT BASIN VOLUME REQUIRED = $3132m^3 + 206m^3$

$V = 3338\ m^3$

VOLUME AVAILABLE $3619m^3$

LEGEND

- KERB INLET PIT
- CATCH DRAIN
- SEDIMENT FENCE
- STRAW BALE FILTER
- GEOTEXTILE INLET FILTER
- DISTURBED AREA
- STABILISED SITE ACCESS
- TREES TO BE REMOVED

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Homann
REGISTERED SURVEYOR

This plan/document relates to DA No: 090812-03 COX No: 100011
Environmental Planning & Assessment Act
Eric Hendeli
PENRITH CITY COUNCIL

1:2000 (AT A1) 50 0 50 100 150 200 METRES

ISSUE	AMENDMENT	DATE	BY
F			
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20

CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1C
NORTHERN & SOUTHERN BASINS
CATCHMENT PLAN & CALCULATIONS

PLAN No. 8634CC172 D
FILE No. 8634CC172
SHEET 23 OF 28 SHEETS

Plotted: 7 May 2010 11:04:52 AM File Name: J:\8634\DCC - Engineering Construction Plans\Stage - 1C\8634CC172.dwg

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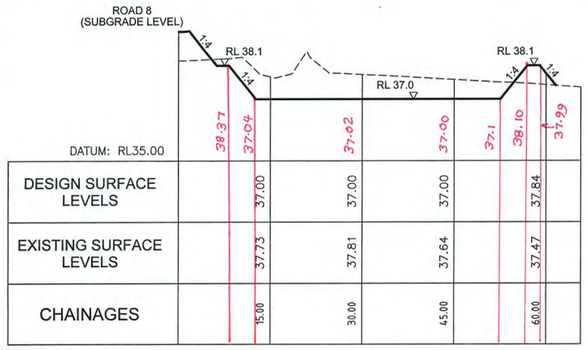

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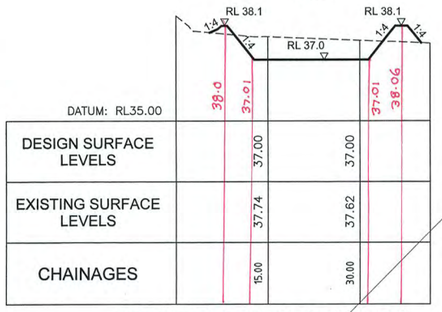
LONGITUDINAL SECTION A-A

1:500 H
1:100 V



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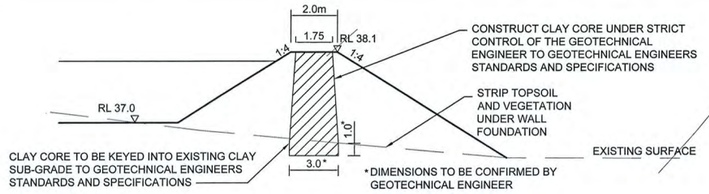
LONGITUDINAL SECTION B-B

1:500 H
1:100 V



TYPICAL SECTION THROUGH EMBANKMENT WALL

NTS

PLAN

1:200

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
IN RED ON 22/10/10 Paul Homann
REGISTERED SURVEYOR

This plan/document relates to
DA No: 090812/03 CCX No: 100011
Environmental Planning & Assessment Act
Erica Hansell
PENRITH CITY COUNCIL

EMBANKMENT NOTES

1. CONSTRUCT A CLAY CORE MINIMUM 3.0 m THICK, UNDER STRICT CONTROL OF THE GEOTECHNICAL ENGINEER, DESIGNED AND CONSTRUCTED TO GEOTECHNICAL ENGINEERS STANDARDS AND SPECIFICATIONS.
2. FORM EMBANKMENT AND WEIR WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL INCLUDING EXCAVATION FOR KEY AS DIRECTED.
3. COMPACT EXISTING CLAY SUB-GRADE AND EMBANKMENT MATERIAL IN 300mm DEEP LAYERS TO 98% (+2% -1%) STANDARD COMPACTION.
4. REFER TO DETAILS AT RIGHT FOR WEIR OVERFLOW FINISHING.
5. GRASS ALL SURFACES (OTHER THAN ROCK) WITH APPROVED TURF (COUCH).
6. ALL PIPES TO BE RUBBER RING JOINT WITHOUT LIFTING HOLES.
7. BACKFILLING AROUND PIPES SHALL BE WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL AND COMPACTED TO 98% (+2% -1%) STANDARD COMPACTION.

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: AS SHOWN

JORDAN SPRINGS
STAGE 1C
SEDIMENT/DETENTION BASIN NORTH
DETAIL PLAN

PLAN No. 8634CC173 D
FILE No. 8634CC173
SHEET 24 OF 28 SHEETS

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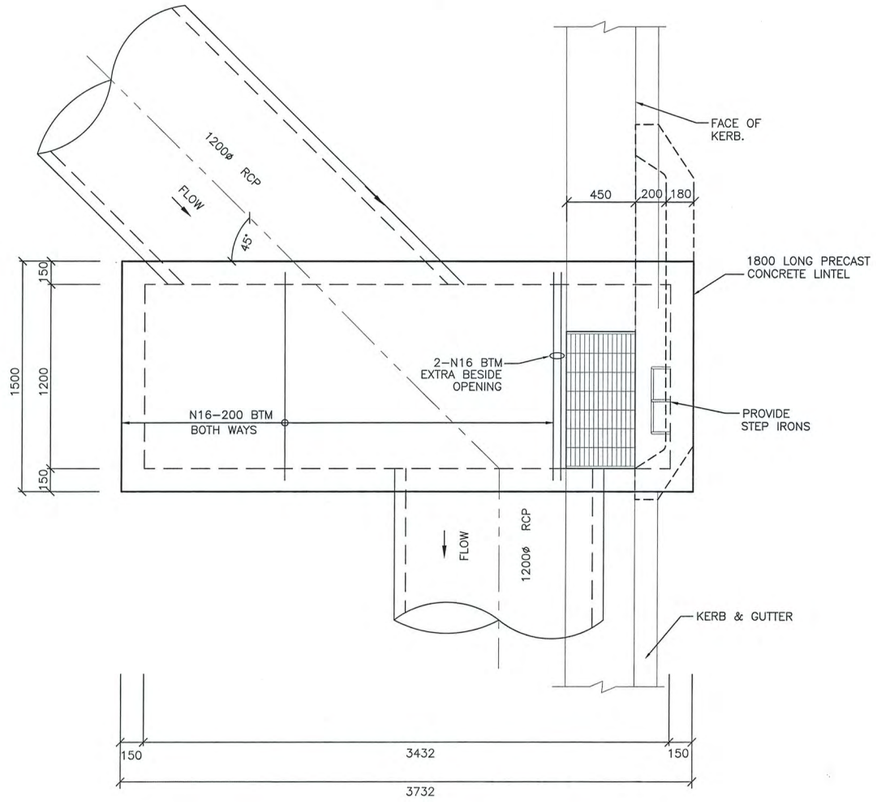

PLAN – PIT 11/54

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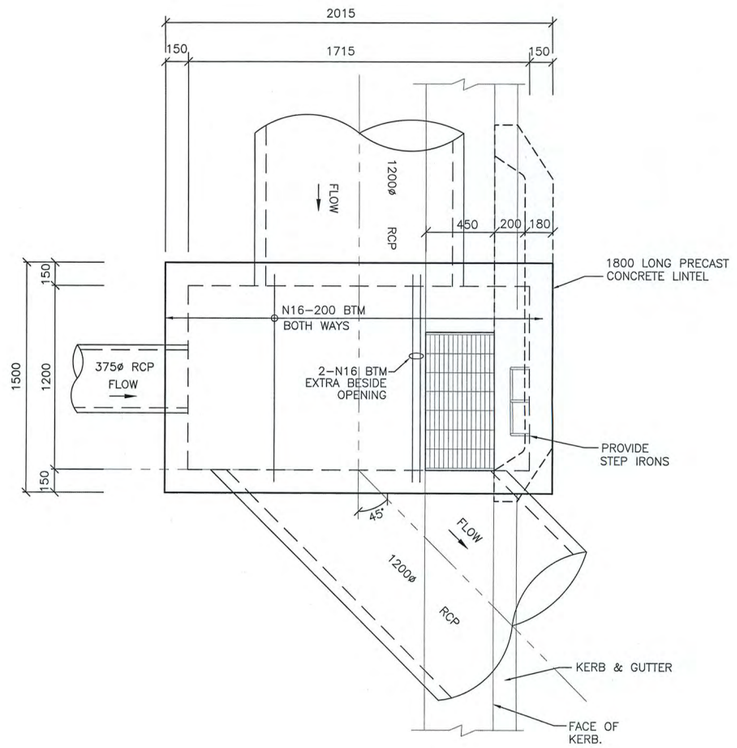

PLAN – PIT 12/54

SCALE 1:20

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT PIT DETAILS REFER TO PLAN SHEET 8634/CC175

NOTE:
FOR PITS 11/54 & 12/54
REFER TO PENRITH CITY COUNCIL STANDARDS – PLAN No.S801 FOR TYPICAL REINFORCEMENT AND SECTIONAL DETAIL

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

This plan/document relates to
DA No: 090812/03 CCX No: 100011
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
REGISTERED SURVEYOR

1:20 (AT A1) 400 200 0 400 800 1200 1600 2000
MILLIMETRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 06/05/2010

ISSUE	AMENDMENT	DATE	BY
F			
E			
D	COUNCIL AMENDMENTS	MAY 2010	AM
C	COUNCIL AMENDMENTS	MAR 2010	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	FEB 2010	A.M.
A	FIRST ISSUE	FEB 2010	A.M.

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1C
SPECIAL DRAINAGE PITS 11/54 & 12/54

PLAN No. 8634CC174 D
FILE No. 8634CC174
SHEET 25 OF 28 SHEETS

Plotted: 7 May 2010 11:05:07 AM File Name: J:\8634DICC - Engineering Construction Plans\Stage - 1C\8634CC174.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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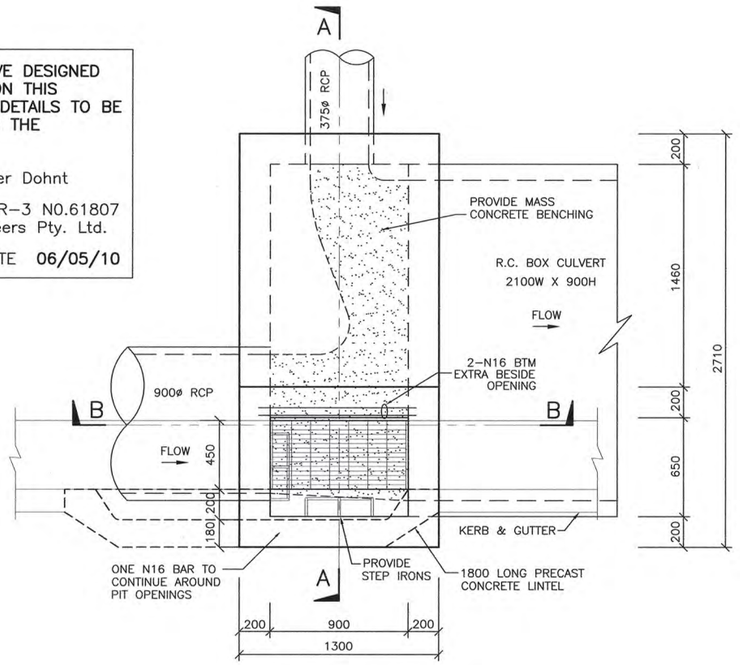
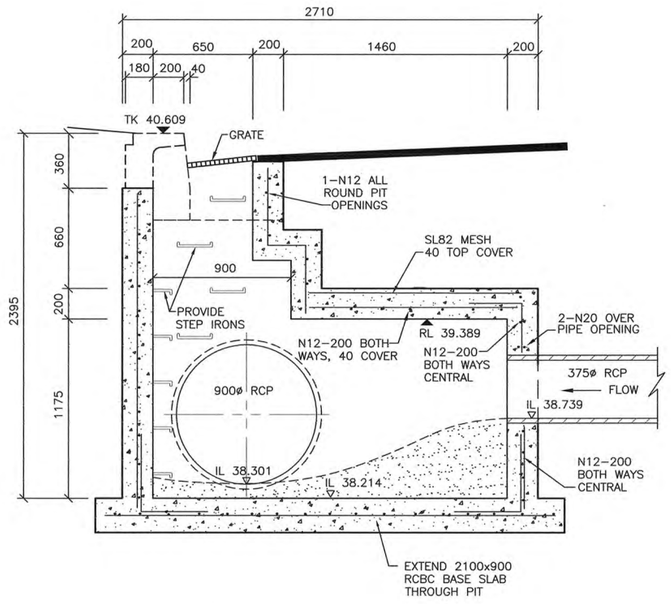
R.Dohnt ..... Roger Dohnt

BE,MIE, Aust., CPEng NPER-3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

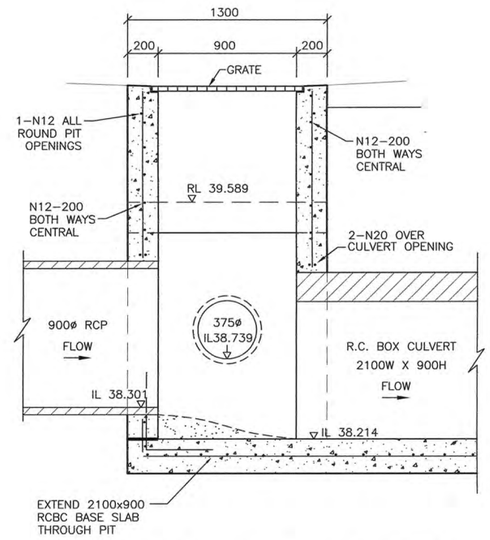
REF No. **14615** DATE **06/05/10**



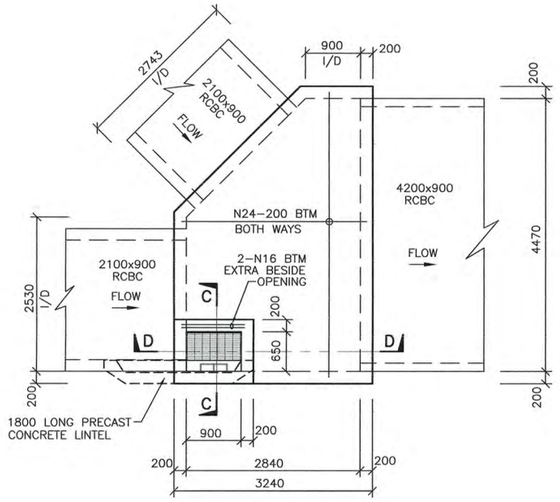
PLAN – PIT 13/38
SCALE 1:20



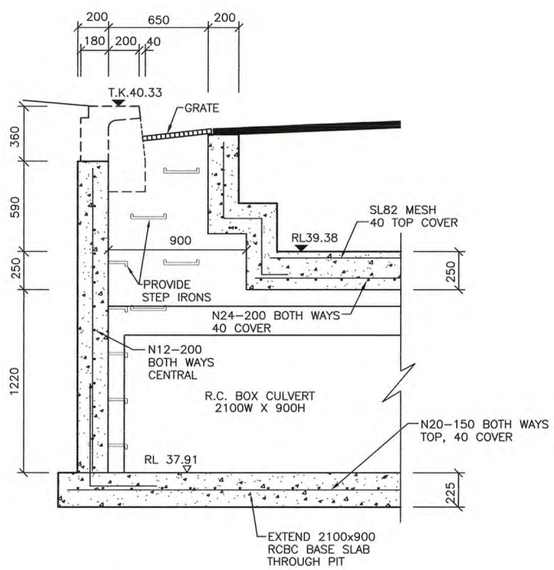
SECTION A–A – PIT 13/38
SCALE 1:20



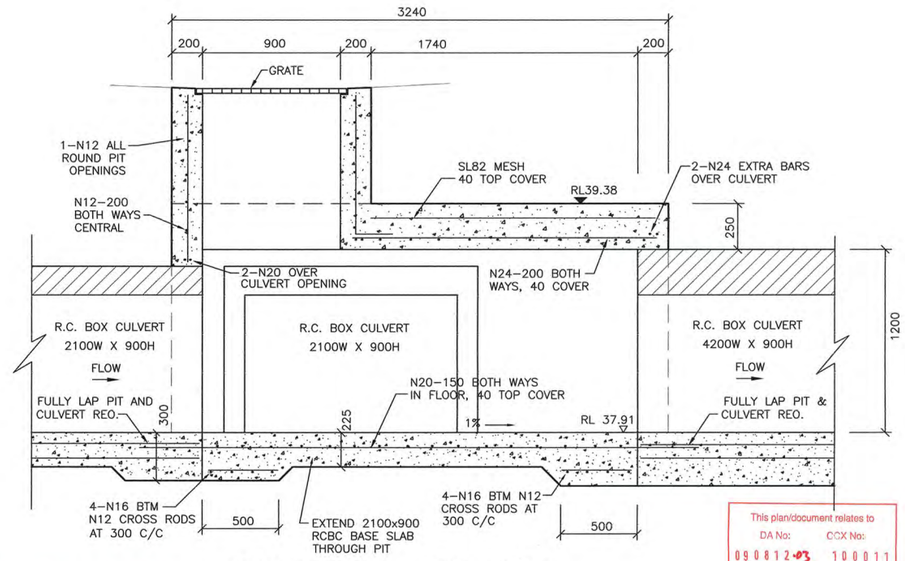
SECTION B–B – PIT 13/38
SCALE 1:20



PLAN – PIT 14/38
SCALE 1:50



SECTION C–C – PIT 14/38
SCALE 1:20



SECTION D–D – PIT 14/38
SCALE 1:20

FOR TYPICAL STRUCTURAL NOTES; SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC175

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10
Paul Thomson
REGISTERED SURVEYOR

This plan/document relates to DA No: 090812-03 CCX No: 100011
Environmental Planning & Assessment Act
Eric Hounsell
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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SIGNED..... DATE 06/05/2010

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1C
SPECIAL DRAINAGE PITS 13/38 & 14/38

PLAN No. 8634CC175 D
FILE No. 8634CC175
SHEET 26 OF 28 SHEETS

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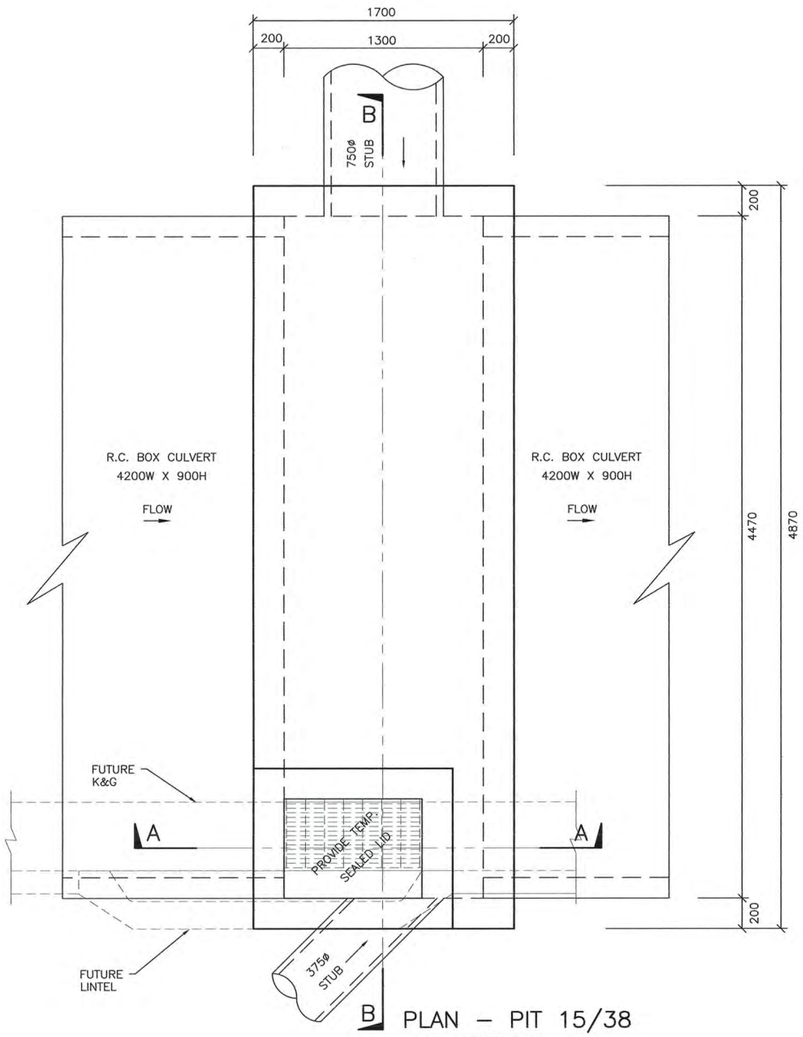
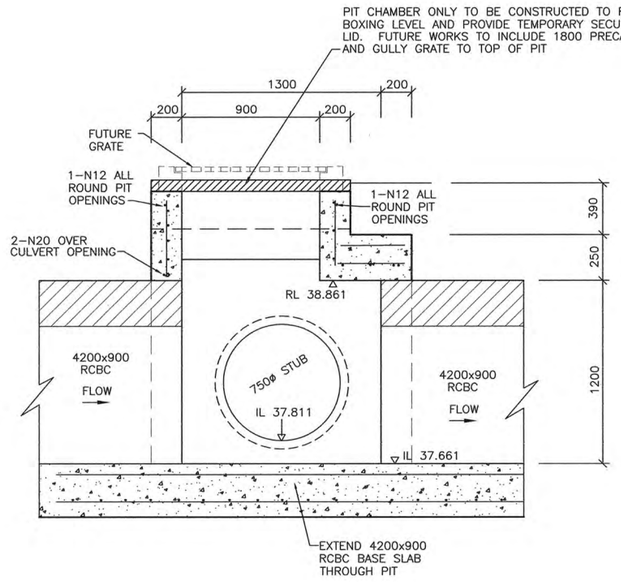


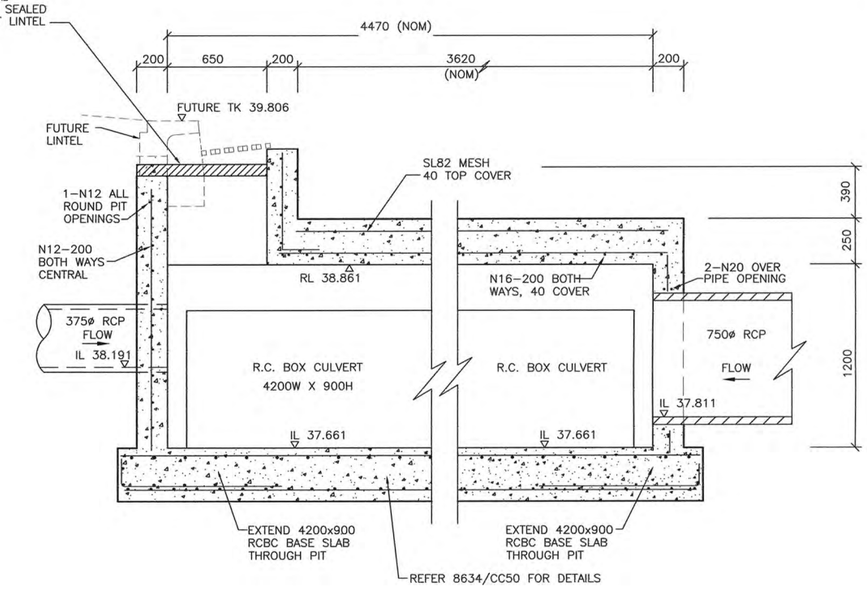
PLAN – PIT 15/38

SCALE 1:20



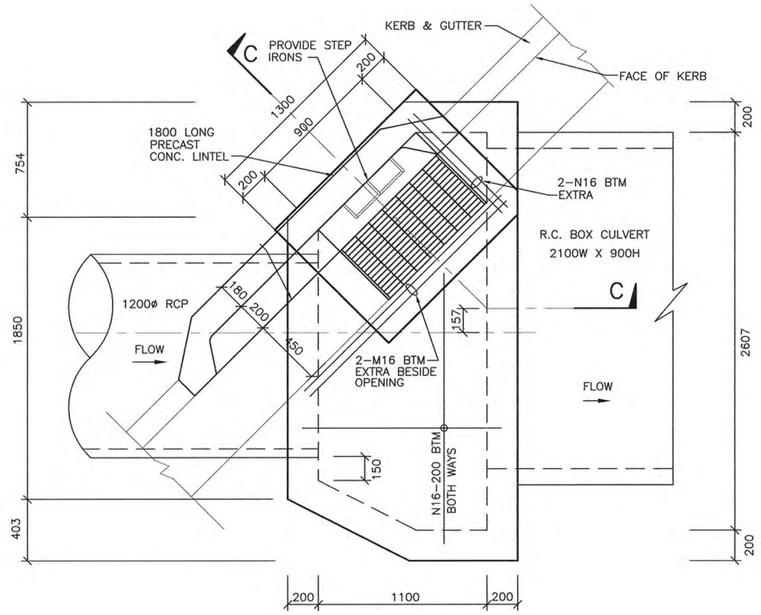
SECTION A–A – PIT 15/38

SCALE 1:20



SECTION B–B – PIT 15/38

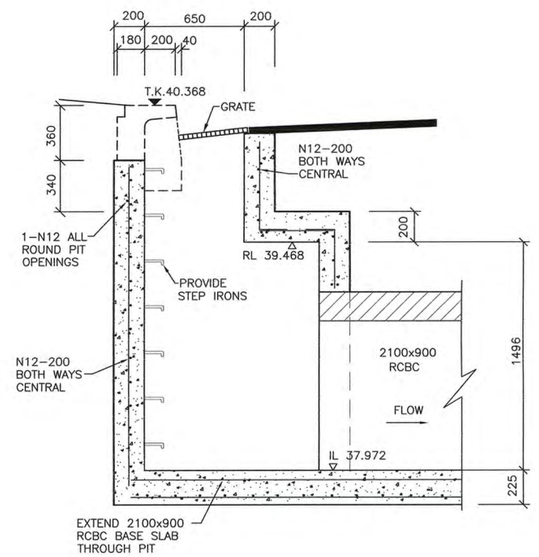
SCALE 1:20



PLAN

PLAN – PIT 13/54

SCALE 1:20



SECTION C–C – PIT 13/54

SCALE 1:20

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..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. **14615** DATE **06/05/10**

FOR TYPICAL STRUCTURAL NOTES; SPECIAL PIT DETAILS AND BOX CULVERT FLOOR SLAB REFER TO PLAN SHEET 8634/CC175

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/10/10 Paul Bonnin REGISTERED SURVEYOR

This plan/document relates to DA No: 09081203 CCX No: 100011
Environmental Planning & Assessment Act
Eric Headdell
PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
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E			
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:20

CLIENT: Delfin Lend Lease

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ISSUED FOR TENDER
NOT FOR CONSTRUCTION
SIGNED S. Anderson DATE 06/05/2010

JORDAN SPRINGS
STAGE 1C
SPECIAL DRAINAGE PITS 13/54 & 15/38

PLAN No. 8634CC176 D
FILE No. 8634CC176
SHEET 27 OF 28 SHEETS

Plotted: 7 May 2010 3:01:01 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC176.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

STRUCTURAL NOTES FOR ALL SPECIAL PITS

GENERAL

1.1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 3600 AND OTHER RELEVANT CODES.

1.2 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

CONCRETE

2.1 CONCRETE QUALITY

ELEMENT	CONCRETE STRENGTH F'c	MAX. AGGREGATE SIZE	MAX. SLUMP	CEMENT TYPE
SLABS	40MPa	20mm	75mm	GB
WALLS	40MPa	20mm	75mm	GB
BLINDING SLABS	5MPa	20mm	75mm	GB

2.2 NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.

2.3 CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE 40mm TO ALL SURFACES UNLESS NOTED OTHERWISE.

2.4 CONSTRUCTION JOINTS NOT INDICATED SHALL BE LOCATED AND FORMED TO THE APPROVAL OF COUNCIL'S ENGINEER.

2.5 A BOND BREAKING MATERIAL IS TO BE PLACED BETWEEN CONTACTING SURFACES AT CONSTRUCTION JOINTS.

2.6 NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.

2.7 UNLESS SHOWN OTHERWISE ALL EXTERNAL AND RE-ENTRANT CORNERS SHALL BE CHAMFERED 25mm.

2.8 SLABS TO BE CURED AND KEPT MOIST FOR 7 DAYS MINIMUM.

2.9 NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35 DEGREES CELSIUS OR FALLS BELOW 5 DEGREES CELSIUS.

REINFORCEMENT

3.1 REINFORCEMENT STEEL QUALITY:

REINFORCEMENT TYPE	GRADE	SAA CODE	SYMBOL
WELDING GRADE DEFORMED	500	AS 4671	N
PLAIN ROUND	230	AS 1302	R
FABRIC	500	AS 4671	SL, RL, L

3.2 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE POSITION.

3.3 ALL REINFORCEMENT SHALL BE SECURELY TIED AND POSITIONED ACCURATELY BY MEANS OF STEEL OR PLASTIC CHAIRS OR OTHER APPROVED ACCESSORIES. MASONRY BLOCKS WILL NOT BE PERMITTED.

3.4 PROVIDE COUNCIL'S ENGINEER WITH 24 HOURS NOTICE OF REINFORCEMENT BEING READY FOR INSPECTION. NO CONCRETE IS TO BE POURED WITHOUT APPROVAL OF COUNCIL'S ENGINEER.

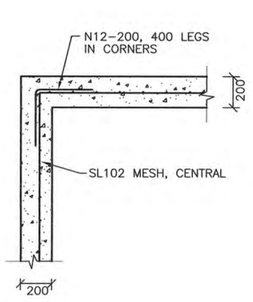
3.5 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION INDICATED. THE APPROVAL OF COUNCIL'S ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICE.

3.6 WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS INDICATED ON THE STRUCTURAL DRAWINGS OR WITH WRITTEN APPROVAL OF COUNCIL'S ENGINEER.

3.7 MINIMUM LAP OF REINFORCEMENT SHALL BE AS SHOWN IN TABLE 13.1.2.2(A) OF AS 3600 UNLESS SHOWN OTHERWISE. LAPS FOR MESH SHALL BE 1.5 TIMES THE NOMINAL WIRE SPACING OR APPROVED EQUIVALENT.

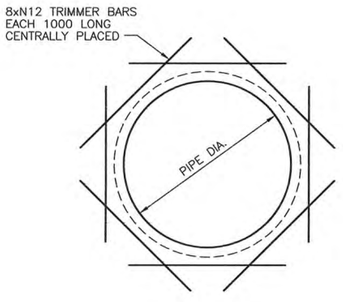
3.8 REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.

3.9 MINIMUM RADIUS FOR BENDS IN REINFORCEMENT TO BE 4 BAR DIAMETERS (DB) UNLESS NOTED OTHERWISE.



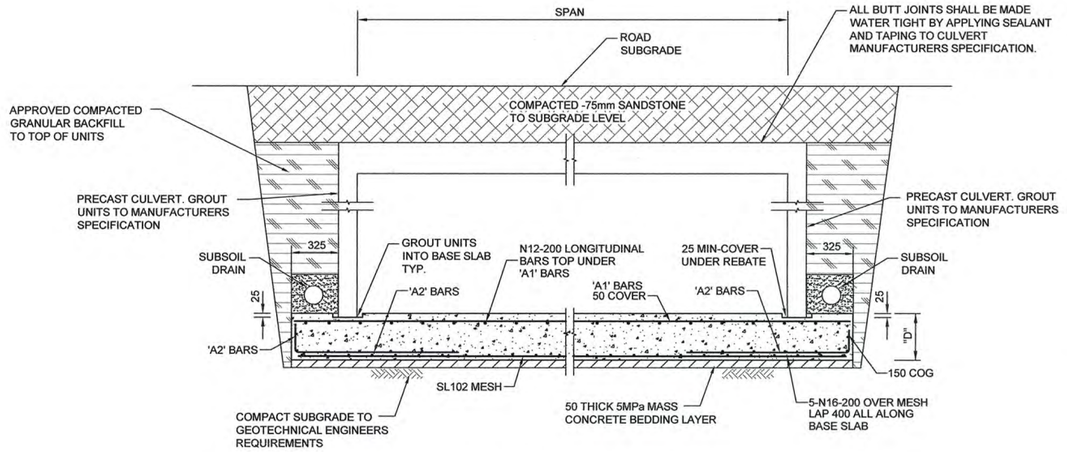
TYPICAL PLAN DETAIL PIT CORNER

N.T.S



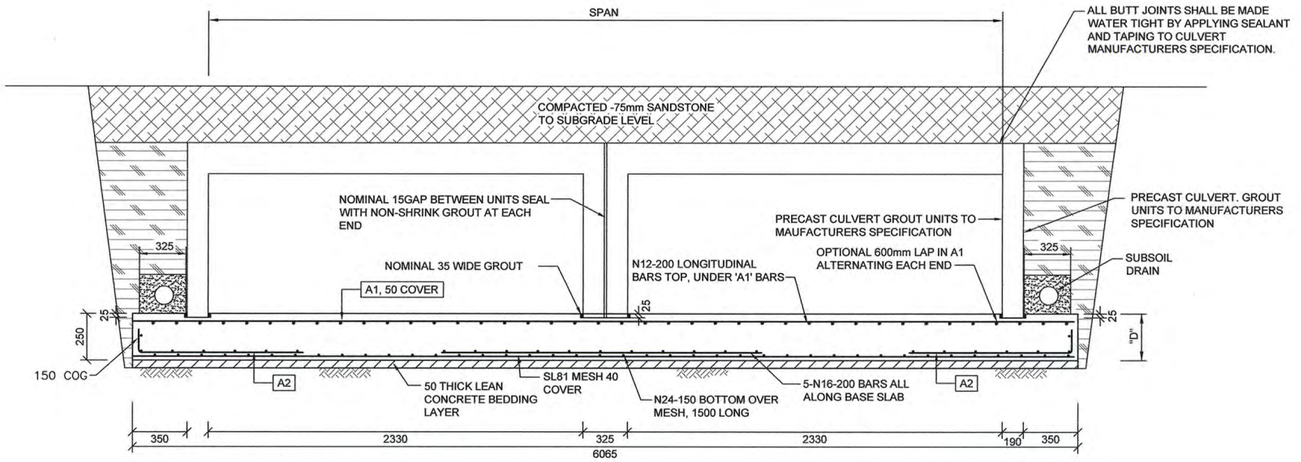
ADDITIONAL REINFORCEMENT AROUND PIPES – TYPICAL

N.T.S



TYPICAL BOX CULVERT BASE SLAB DETAIL–SINGLE CELL

SCALE NTS



TYPICAL SECTION – BASE SLAB FOR CULVERTS–TWIN CELLS

SCALE 1:20

BASE SLAB DIMENSIONS

SPAN (mm)	"D" (mm)	'A1'	'A2'
1200 (FUTURE)	200	N12–150	NOT REQUIRED
1500	200	N16–150	NOT REQUIRED
2100	225	N20–150	N12–150, 900 LONG & NO COG
2700	250	N20–150	N16–150, 900 LONG & 150 COG
4200	350	N24–150	N20–150, 1500 LONG & 200 COG
2X2700	250	N20–150	N20–150, 900 LONG & 150 COG

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

R.P.Dohnt ..... Roger Dohnt

BE,MIE, Aust., CPEng NPER-3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615 DATE 06/05/10

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22 / 10 / 10
Paul Thomas
REGISTERED SURVEYOR

This plan/document relates to D.A. No: CCV No:
090812-D 100011
Environmental Planning and Assessment Act
Eric Heinsfeld
PENRITH CITY COUNCIL

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1C
SPECIAL DRAINAGE PIT STRUCTURAL NOTES
TYPICAL BOX CULVERT BASE SLAB DETAIL

PLAN No. 8634CC177 D
FILE No. 8634CC177
SHEET 28 OF 28 SHEETS

Plotted: 7 May 2010 3:20:35 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1C\8634CC177.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS"
2. SURVEY MARKS:–
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT–HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:– THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:–
    a) INTERALLOTMENT DRAINS (C.D.L.) – 1.5m WIDE MINIMUM (UP TO 300mm dia)
    b) ALL OTHER PIPES – 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON–COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED – DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au
DIAL 1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

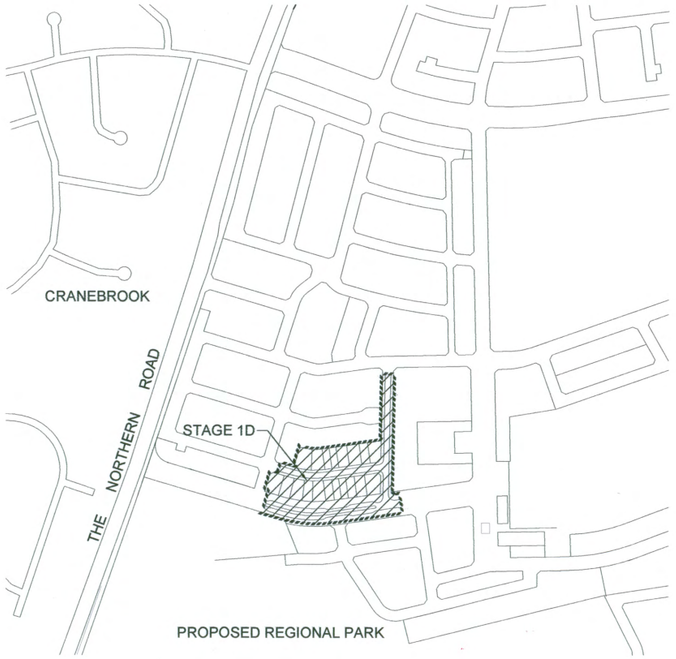
PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

STAGE 1D
ROAD & DRAINAGE WORKS

COUNCIL REF: DA 10/1262



LEGEND

PROPOSED	DESCRIPTION	EXISTING
600ø	R.C. STORMWATER PIPELINE	
600ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150ø	COMMON DRAINAGE LINE	150ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS – BENCH MARKS	▲
◘	STATE SURVEY MARKS	
o	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

- GENERAL NOTES 1 & 15 AMENDED
- KERB RETURN 32 & 33 DELETED
- SHEETS RE-NUMBERED

C

INDEX

PLAN No.	DESCRIPTION
8634/CC200	COVER SHEET, GENERAL NOTES, INDEX & LEGEND
8634/CC201	SITE STAGING
8634/CC202	SETOUT PLAN
8634/CC203	PLAN
8634/CC204	ROAD No.1 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8634/CC205	ROAD No.3 & 5 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8634/CC206	ROAD No.1 CROSS SECTIONS
8634/CC207	ROAD No.1 CROSS SECTIONS
8634/CC208	ROAD No.1 CROSS SECTIONS
8634/CC209	ROAD No.3 CROSS SECTIONS
8634/CC210	ROAD No.3 CROSS SECTIONS
8634/CC211	ROAD No.5 CROSS SECTIONS
8634/CC212	KERB RETURNS No. 17, 18, 19 & 20
8634/CC213	CATCHMENT PLAN
8634/CC214	DRAINAGE LONGITUDINAL SECTIONS LINE No. 13, 29, 30, 31 & 33 PIT SCHEDULE & DRAINAGE CALCULATIONS
8634/CC215	SOIL & WATER MANAGEMENT PLAN
8634/CC216	SOIL & WATER MANAGEMENT NOTES & DETAILS

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10 Paul Homann REGISTERED SURVEYOR

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Eric Hendeles
PENRITH CITY COUNCIL

SURVEYED BY:
WHELANS INSITES PTY LTD

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C	COUNCIL AMENDMENTS AS NOTED	01-06-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1D
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8634CC200 C
FILE No. 8634CC200
SHEET 1 OF 17 SHEETS

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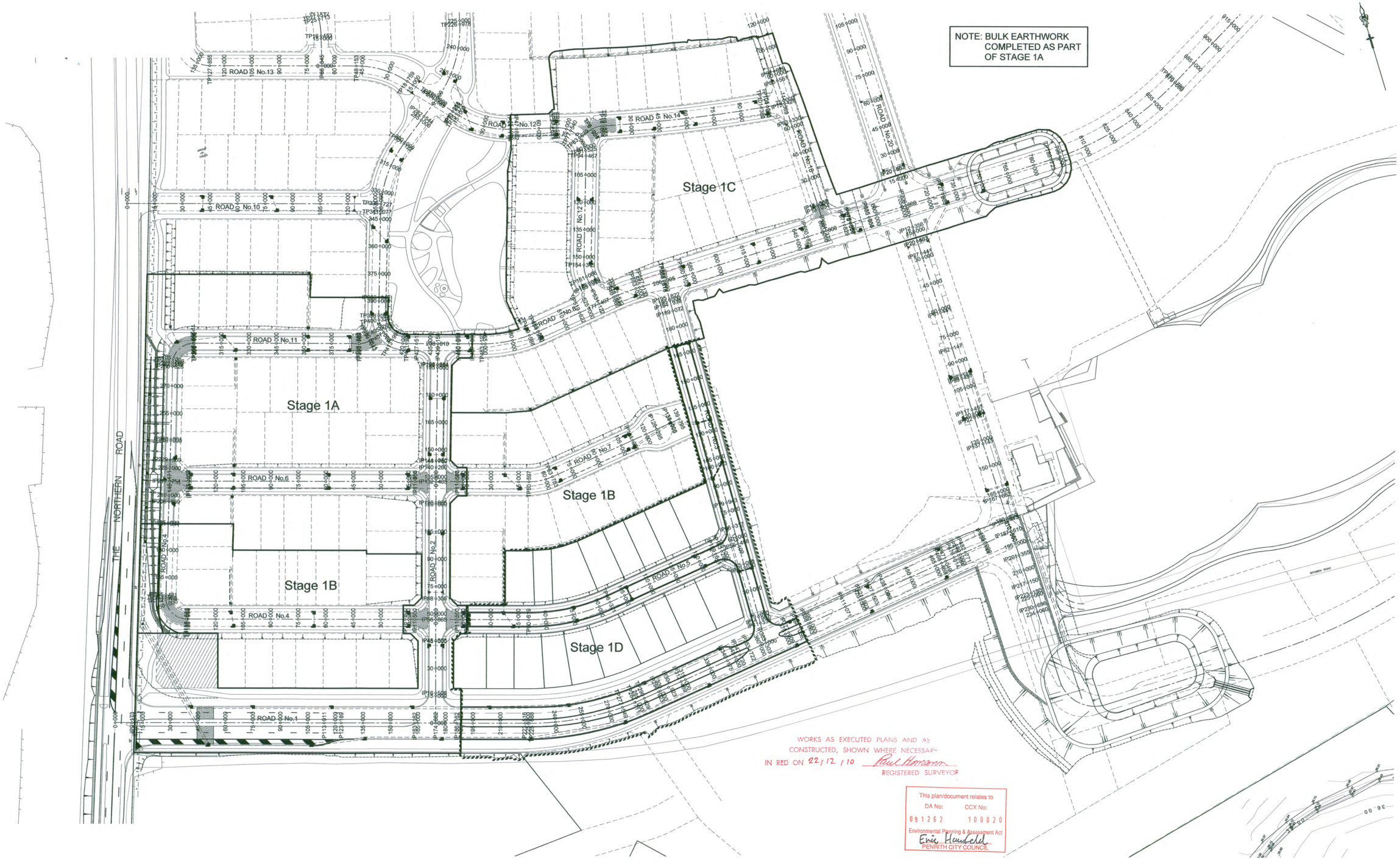
Version: 1, Version Date: 13/07/2018



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DRAWN N.W.
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JORDAN SPRINGS
STAGE 1D
SITE STAGING

PLAN No. 8634CC201 B
FILE No. 8634CC201
SHEET 2 OF 17 SHEETS

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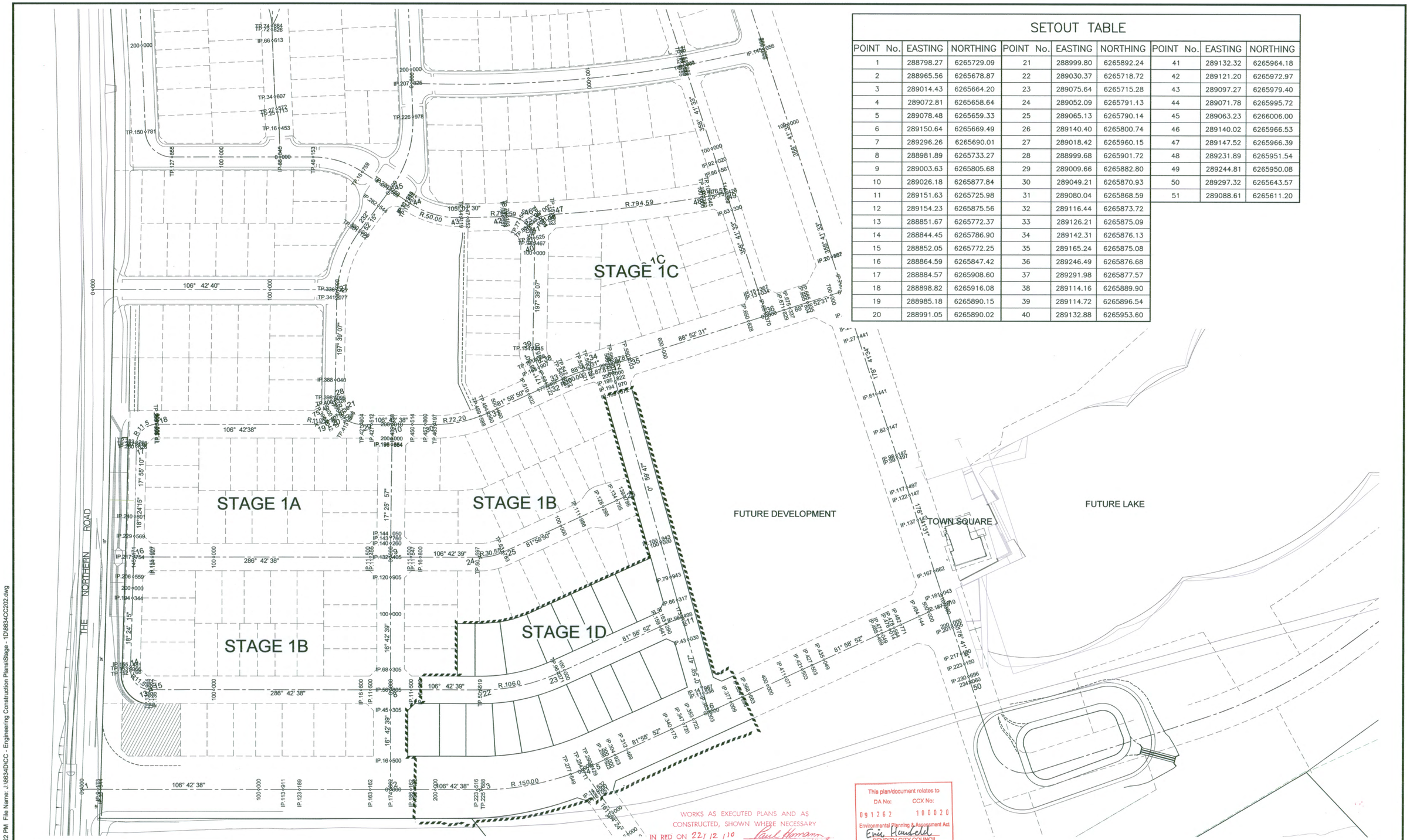

SETOUT TABLE

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
1	288798.27	6265729.09	21	288999.80	6265892.24	41	289132.32	6265964.18
2	288965.56	6265678.87	22	289030.37	6265718.72	42	289121.20	6265972.97
3	289014.43	6265664.20	23	289075.64	6265715.28	43	289097.27	6265979.40
4	289072.81	6265658.64	24	289052.09	6265791.13	44	289071.78	6265995.72
5	289078.48	6265659.33	25	289065.13	6265790.14	45	289063.23	6266006.00
6	289150.64	6265669.49	26	289140.40	6265800.74	46	289140.02	6265966.53
7	289296.26	6265690.01	27	289018.42	6265960.15	47	289147.52	6265966.39
8	288981.89	6265733.27	28	288999.68	6265901.72	48	289231.89	6265951.54
9	289003.63	6265805.68	29	289009.66	6265882.80	49	289244.81	6265950.08
10	289026.18	6265877.84	30	289049.21	6265870.93	50	289297.32	6265643.57
11	289151.63	6265725.98	31	289080.04	6265868.59	51	289088.61	6265611.20
12	289154.23	6265875.56	32	289116.44	6265873.72			
13	288851.67	6265772.37	33	289126.21	6265875.09			
14	288844.45	6265786.90	34	289142.31	6265876.13			
15	288852.05	6265772.25	35	289165.24	6265875.08			
16	288864.59	6265847.42	36	289246.49	6265876.68			
17	288884.57	6265908.60	37	289291.98	6265877.57			
18	288898.82	6265916.08	38	289114.16	6265889.90			
19	288985.18	6265890.15	39	289114.72	6265896.54			
20	288991.05	6265890.02	40	289132.88	6265953.60			

WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

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SIGNED S. Anderson DATE 01/06/10

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F			
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JORDAN SPRINGS
STAGE 1D
SETOUT PLAN

PLAN No. 8634CC202 B
FILE No. 8634CC202
SHEET 3 OF 17 SHEETS

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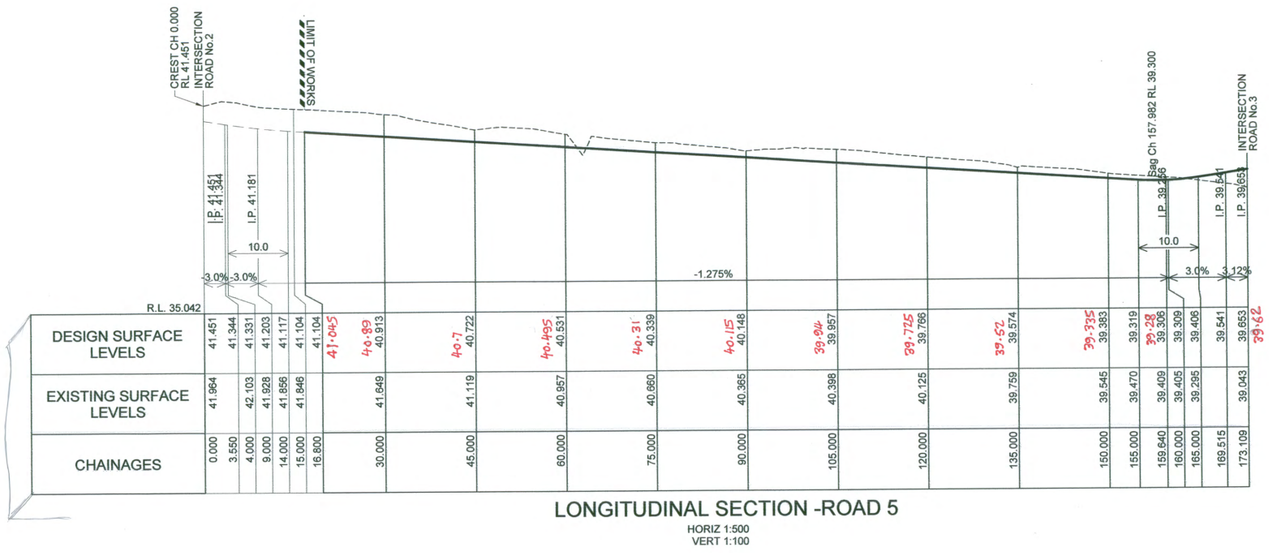
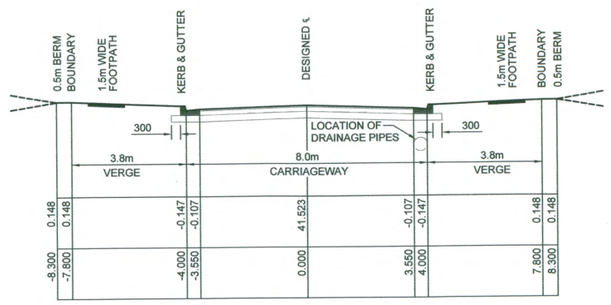


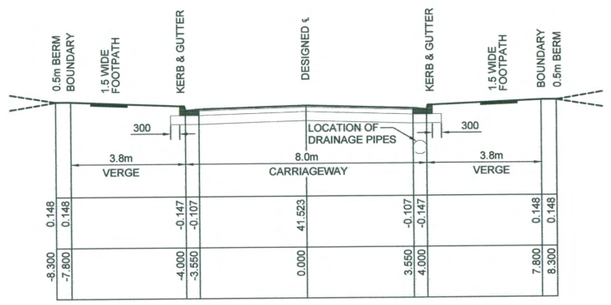
LONGITUDINAL SECTION -ROAD 5

HORIZ 1:500
VERT 1:100



TYPICAL CROSS SECTION ROAD No. 5

1:100 NAT



TYPICAL CROSS SECTION ROAD No.3

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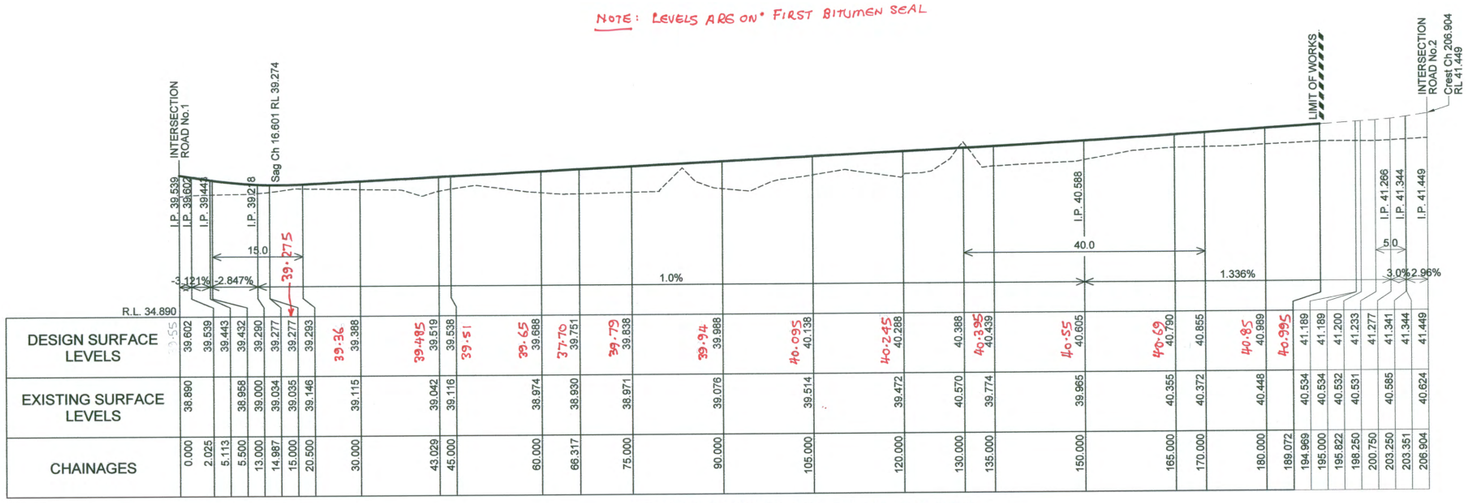
NOTE: LEVELS ARE ON* FIRST BITUMEN SEAL



LONGITUDINAL SECTION -ROAD 3

HORIZ 1:500
VERT 1:100

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22 / 12 / 10 Paul Hamann REGISTERED SURVEYOR

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Erin Hendekel
PENRITH CITY COUNCIL

PAVEMENT DESIGN - ROAD 5 - $5x10^4$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A
50mm MINIMUM THICKNESS (AC10) (2 LAYERS, SECOND LAYER DEFERED)
SINGLE COAT HOT FLUSH SEAL
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE
180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

PAVEMENT DESIGN - ROAD 3 - $1x10^6$

GEOTECH SUPPLIED BY GEOTECHNIQUE PTY. LTD. ON 8TH FEB 2010, ISSUE A
50mm MINIMUM THICKNESS (AC10) (2 LAYERS, SECOND LAYER DEFERED)
SINGLE COAT HOT FLUSH SEAL
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE
300mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECH TESTING & VERIFICATION

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 01/06/10

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B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: AS SHOWN AT A1

JORDAN SPRINGS
STAGE 1D
ROAD No.3 & 5 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS

PLAN No. 8634CC205 B
FILE No. 8634CC205
SHEET 6 OF 17 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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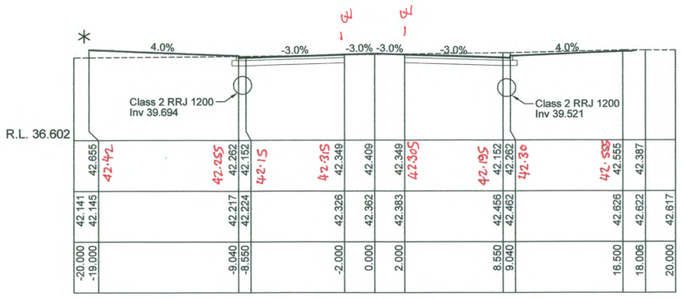
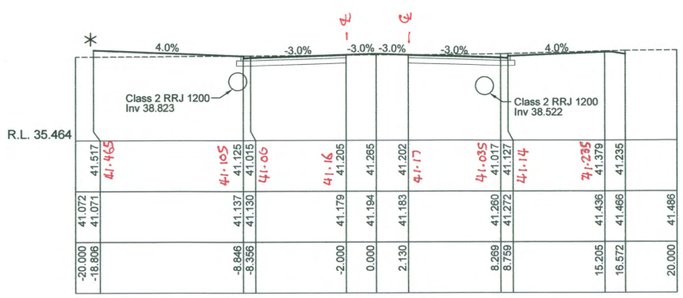
* SEE PLAN FOR LOT GRADING



CH 195.000



CH 240.000

NOTE: ℄ LEVELS ON FIRST BITUMEN SEAL

- CROSS SECTIONS 225 TO 277.492 AMENDED.

C

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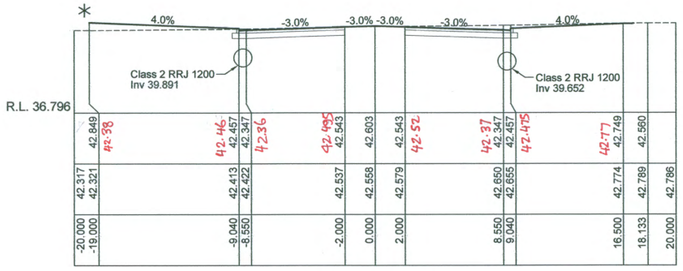
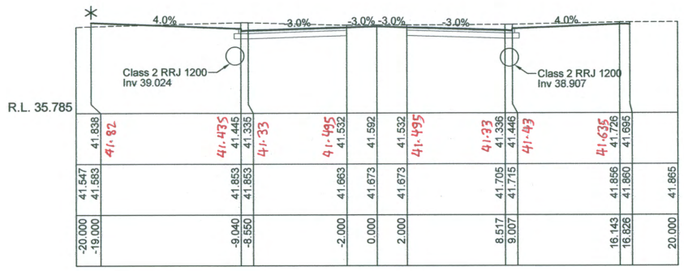
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Eric Hounsell
PENRITH CITY COUNCIL



CH 188.462



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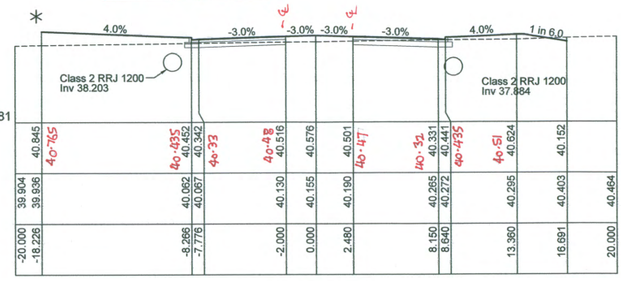
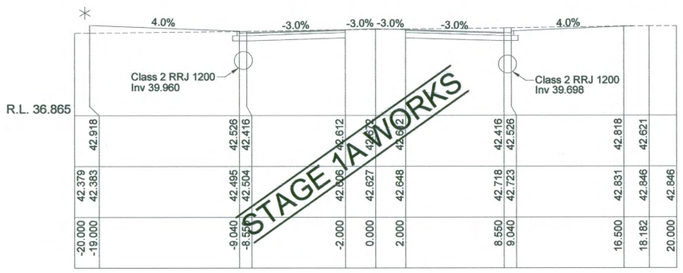
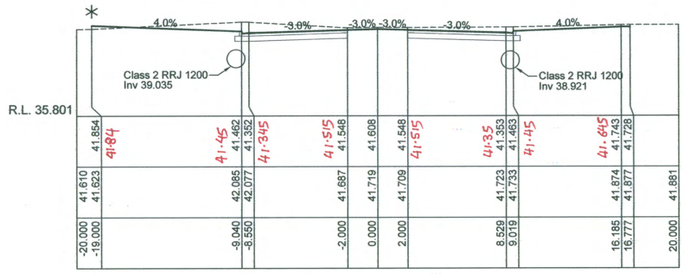


CH 277.492



CH 186.162



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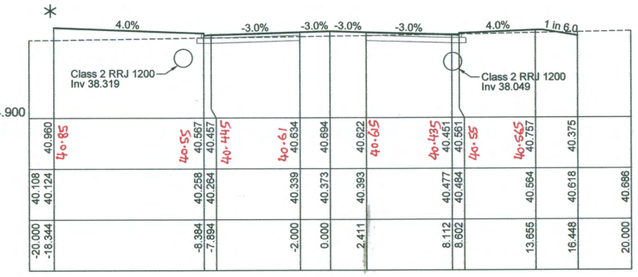

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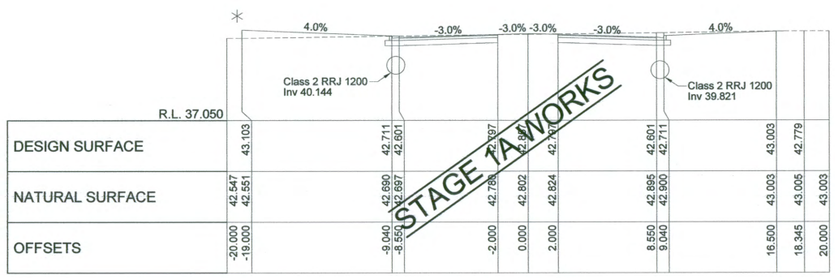
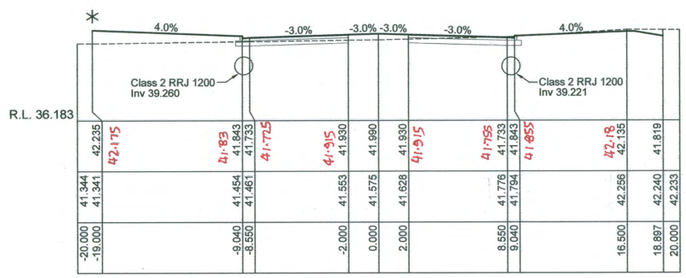


CH 180.000
ROAD No.1



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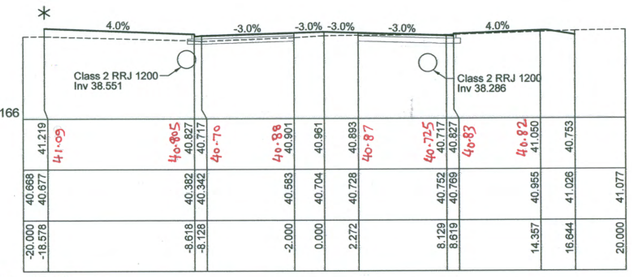

CH 255.000

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Hannam
REGISTERED SURVEYOR

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT
AT A1

CLIENT: Delfin Lend Lease

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JORDAN SPRINGS
STAGE 1D
ROAD No.1 CROSS SECTIONS

PLAN No. 8634CC206 C
FILE No. 8634CC206
SHEET 7 OF 17 SHEETS

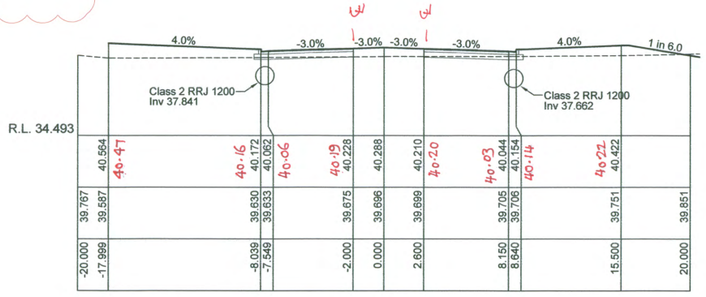
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

- CROSS SECTIONS 284.711 TO 304.923 AMENDED.

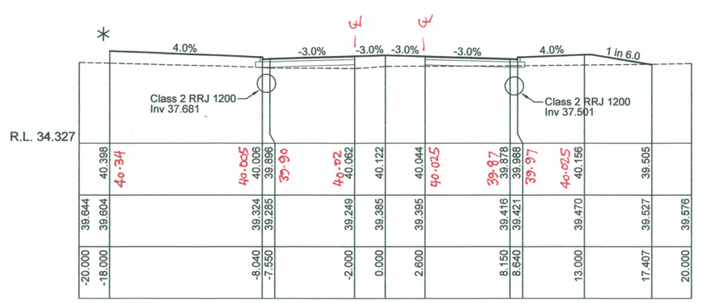
C

NOTE: ℄ LEVELS ARE ON FIRST BITUMEN SEAL

* SEE PLAN FOR LOT GRADING



CH 298.923



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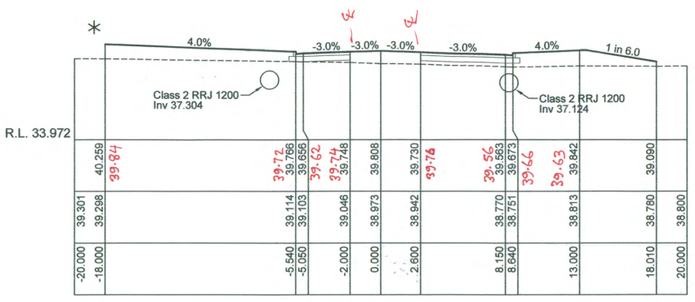

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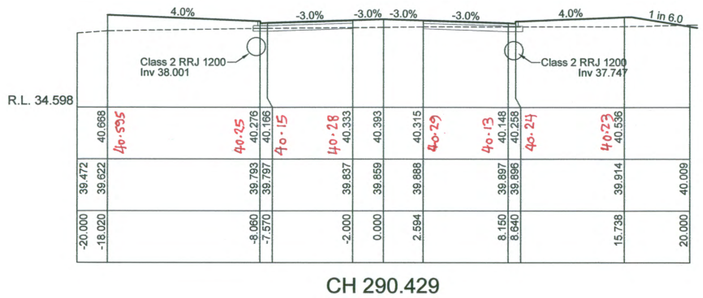

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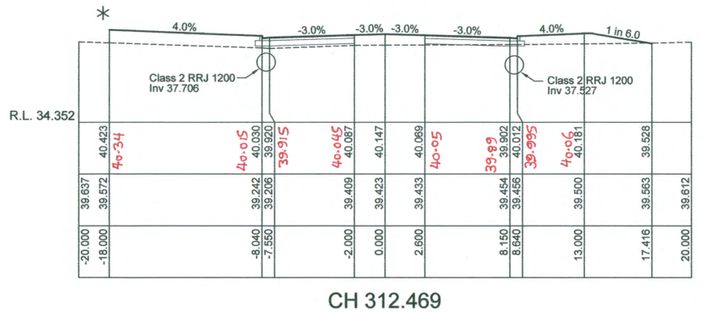

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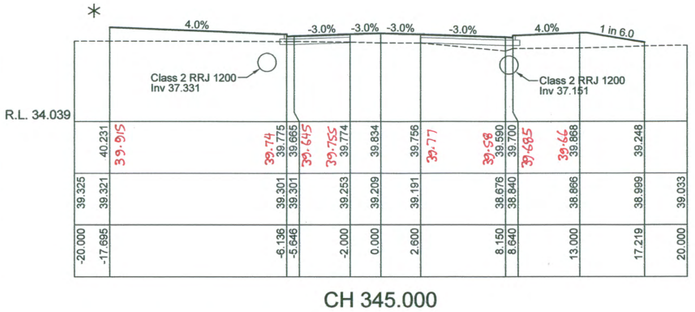

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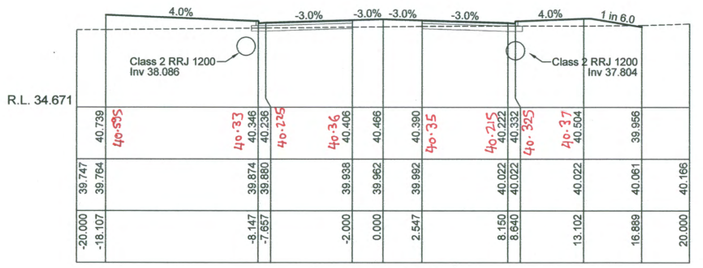

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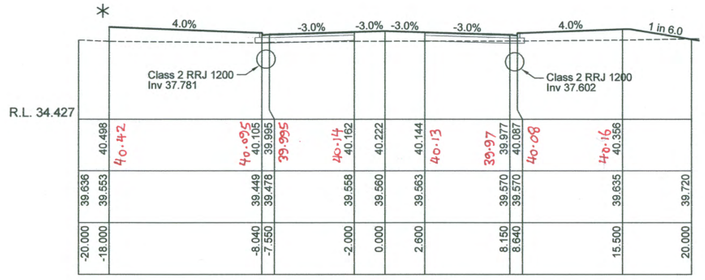

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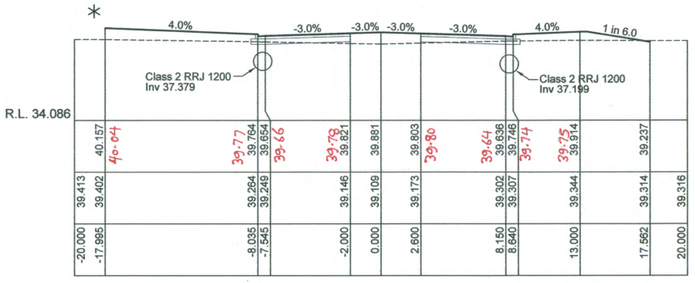

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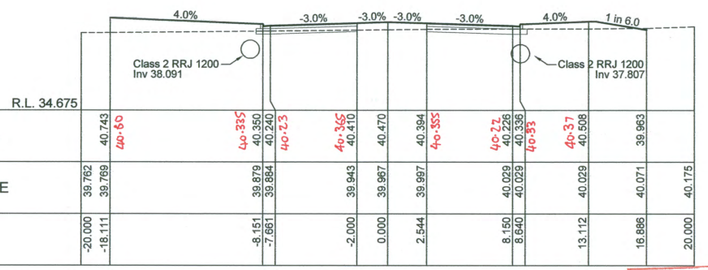

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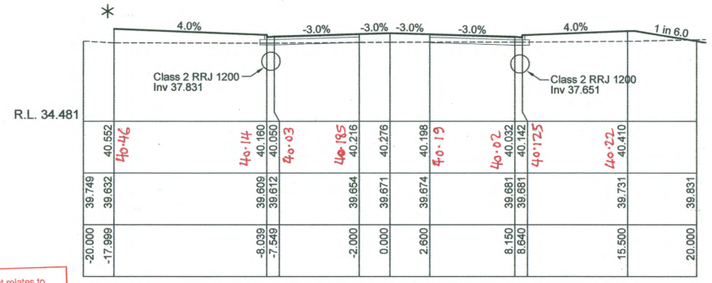

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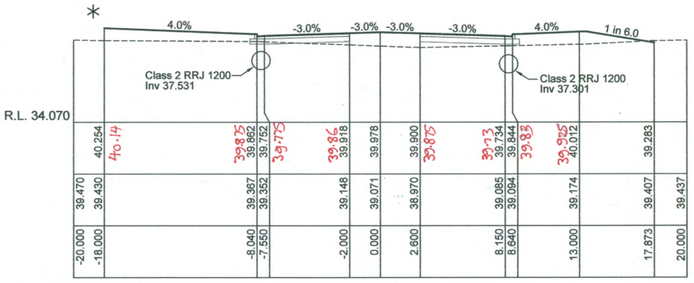

CH 330.000

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Erin Hendfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Romans
REGISTERED SURVEYOR

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
F			
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D			
C			
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

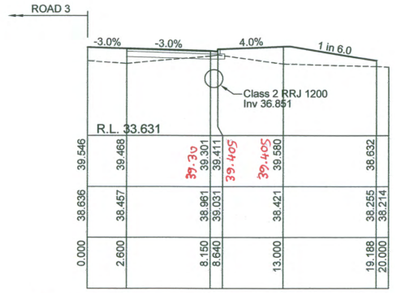
JORDAN SPRINGS
STAGE 1D
ROAD No.1 CROSS SECTIONS

PLAN No. 8634CC207 B
FILE No. 8634CC207
SHEET 8 OF 17 SHEETS

Plotted: 1 Jun 2010 3:43:19 PM File Name: J:\8634DICC - Engineering Construction Plans\Stage - 1D\8634CC207.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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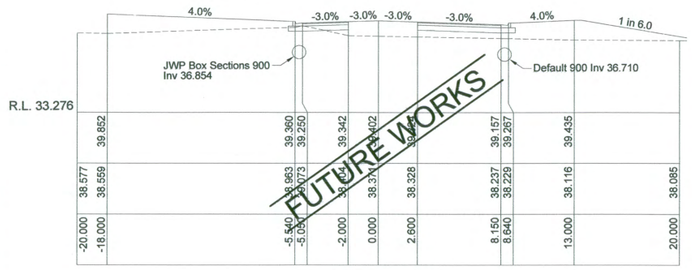

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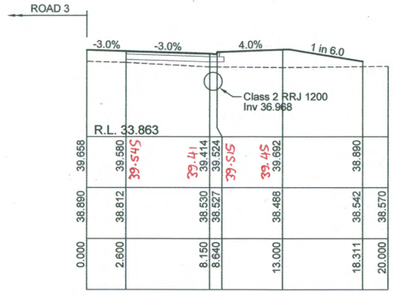

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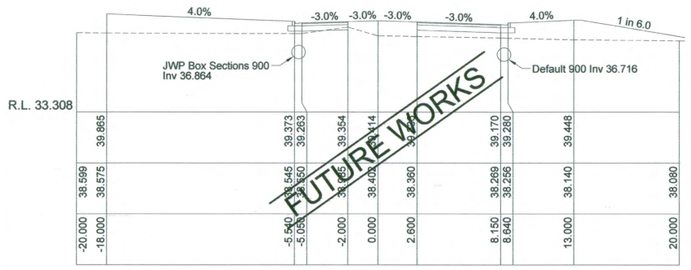

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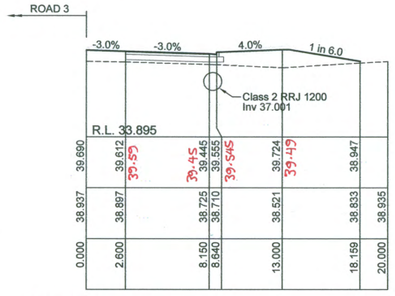

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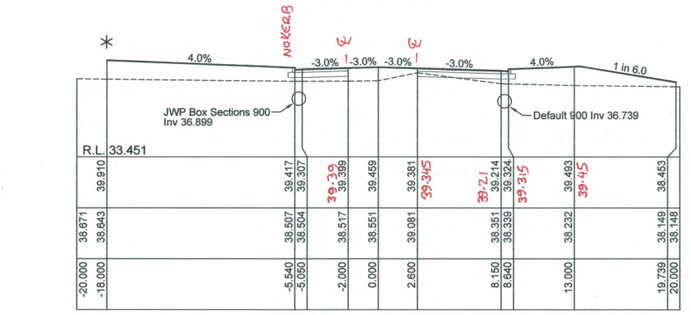

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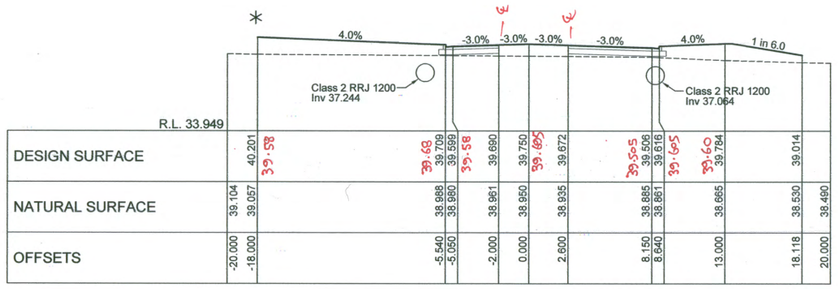

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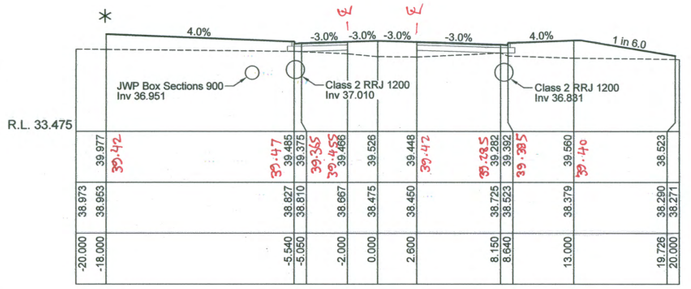

CH 377.009

NOTE: ℄ LEVELS ARE ONE FIRST BITUMEN SEAL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10 Paul Hamann REGISTERED SURVEYOR

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Erin Hemfeld
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

JORDAN SPRINGS
STAGE 1D
ROAD No.1 CROSS SECTIONS

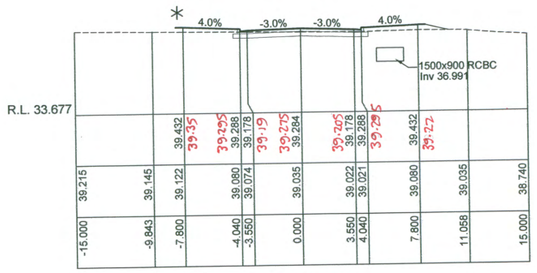
PLAN No. 8634CC208 B
FILE No. 8634CC208
SHEET 9 OF 17 SHEETS

Plotted: 1 Jun 2010 3:43:42 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC208.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING

NOTE: CENTRELINE LEVELS ARE TO FIRST BITUMEN SEAL



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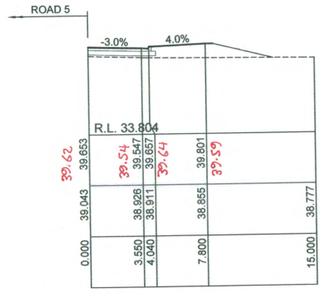

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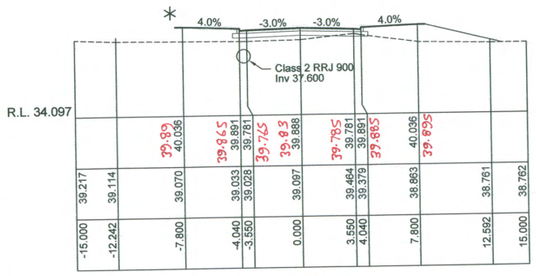

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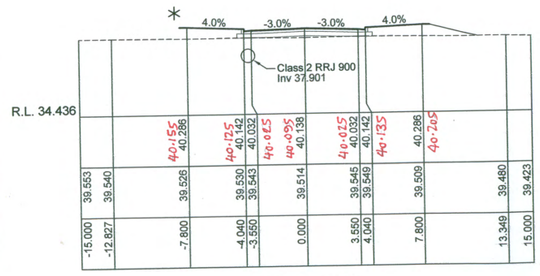

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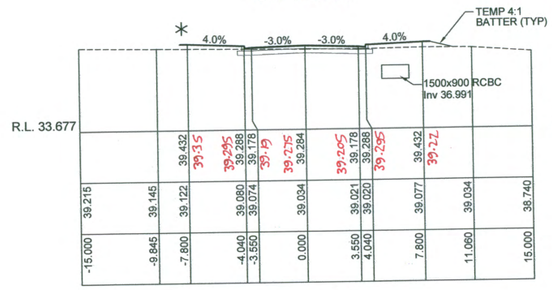

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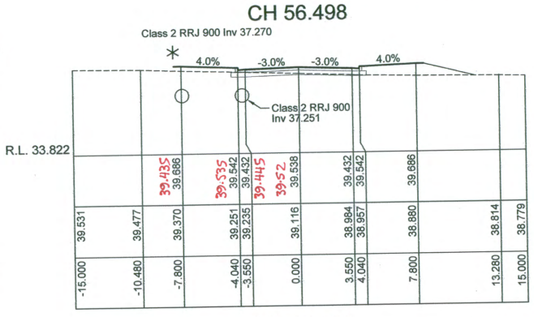

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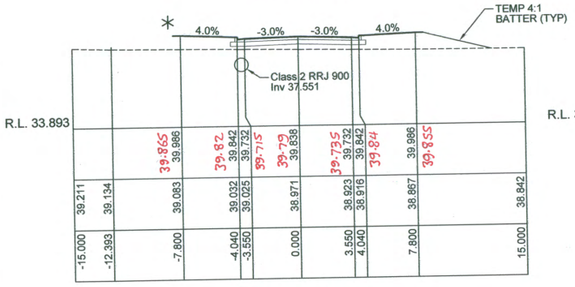

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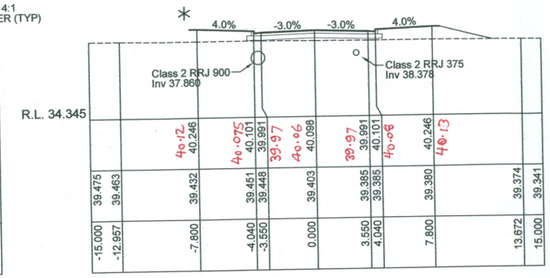

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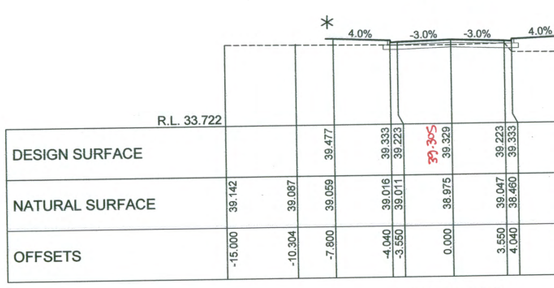

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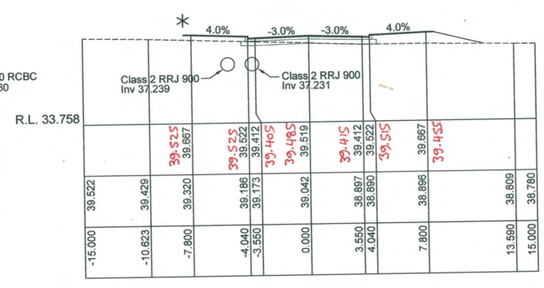
ROAD No.3



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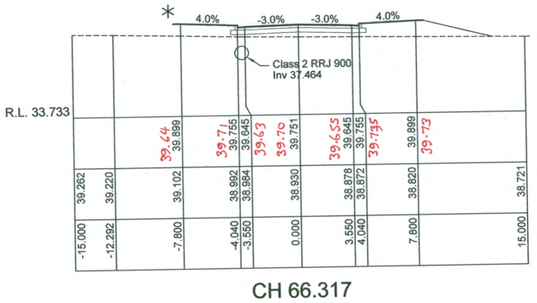

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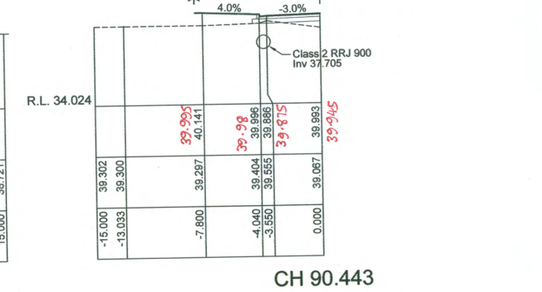

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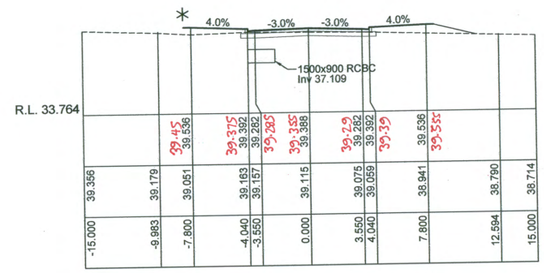

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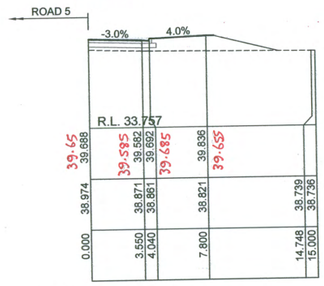

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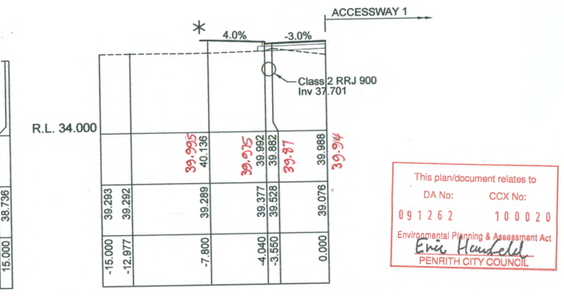

CH 90.000

This plan/document relates to
DA No: 09 1262 CCX No: 100020
Environmental Planning & Assessment Act
Erica Hemfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Thomson
REGISTERED SURVEYOR

1:200 (AT A1)
4 2 0 4 8 12 16 20
METRES

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SIGNED S. Anderson DATE 01/06/10

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: C.S. 1:200 NAT AT A1

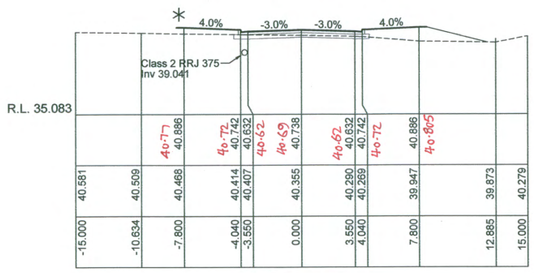
JORDAN SPRINGS
STAGE 1D
ROAD No.3 CROSS SECTIONS

PLAN No. 8634CC209 B
FILE No. 8634CC209
SHEET 10 OF 17 SHEETS

Plotted: 1 Jun 2010 3:44:03 PM File Name: J:\8634\D\CC - Engineering Construction Plans\Stage - 1D\8634CC209.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

✳ SEE PLAN FOR LOT GRADING



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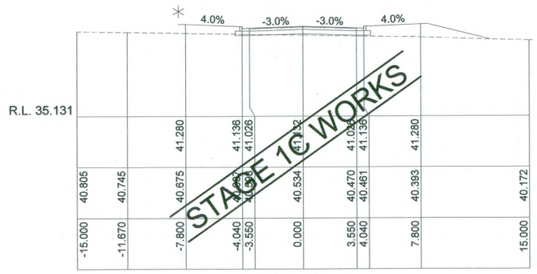

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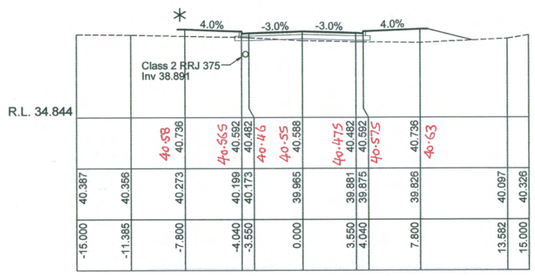

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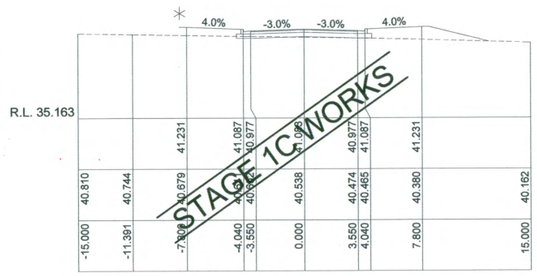
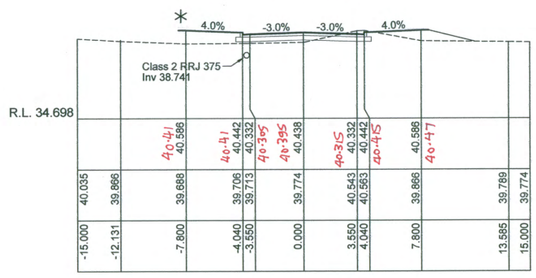


CH 192.820

NOTE: CENTRELINE LEVELS ARE ON FIRST BITUMEN SEAL



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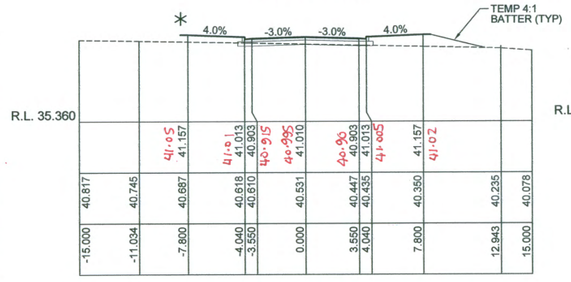

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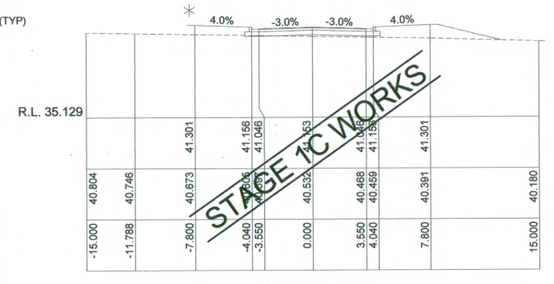
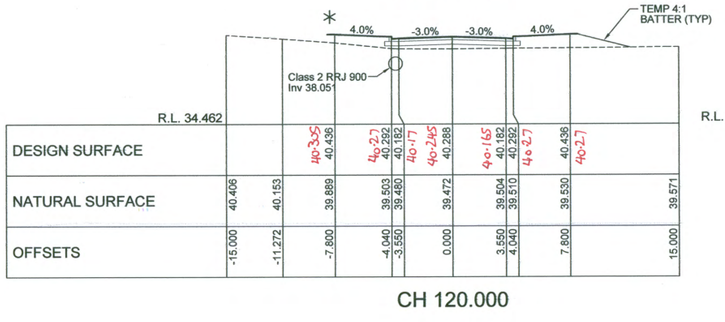
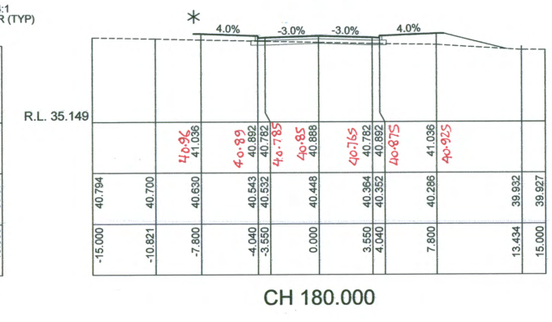


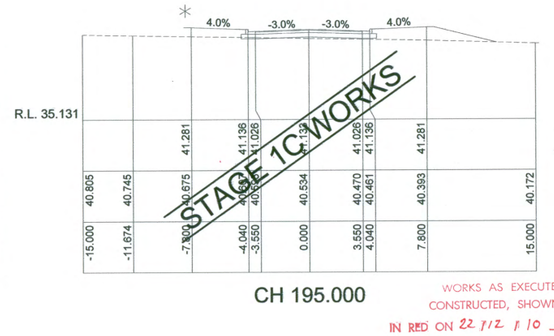
CH 195.822



CH 120.000



CH 180.000



CH 195.000

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Thomas
REGISTERED SURVEYOR

This plan/document relates to
DA No: 09126 2 CCX No: 100020
Environmental Planning & Assessment Act
Eric Hemsfield
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C			
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

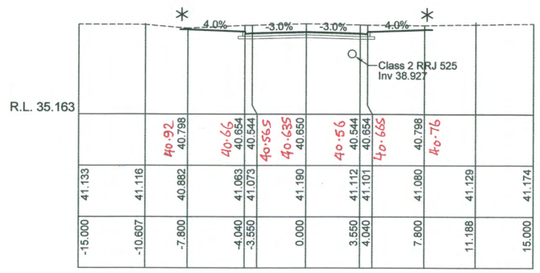
JORDAN SPRINGS
STAGE 1D
ROAD No.3 CROSS SECTIONS

PLAN No. 8634CC210 B
FILE No. 8634CC210
SHEET 11 OF 17 SHEETS

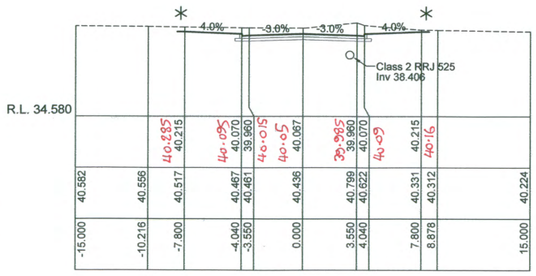
Plotted: 1 Jun 2010 3:44:25 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC210.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



CH 50.619



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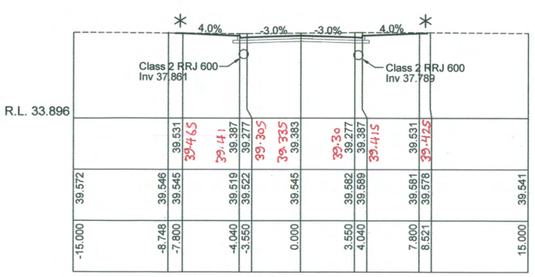
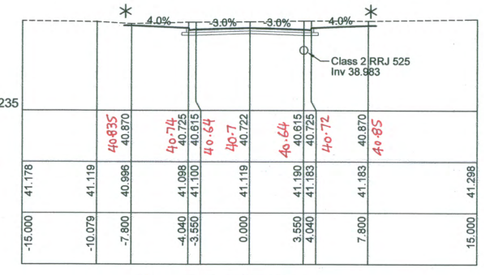
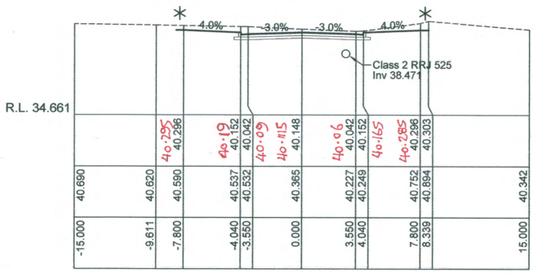


CH 150.000

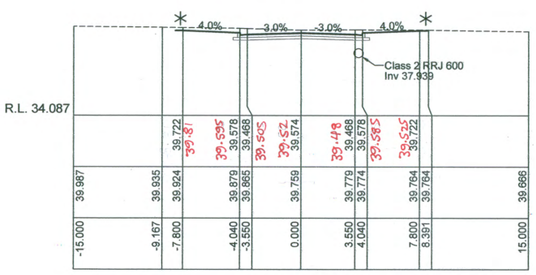
NOTE: CENTRELINE LEVELS ARE ON FIRST BITUMEN SEAL



CH 45.000

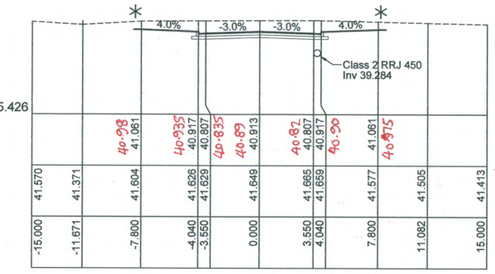


CH 90.000

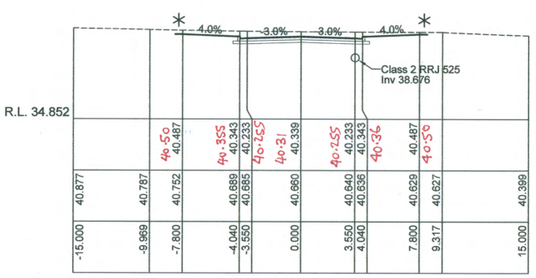


CH 135.000

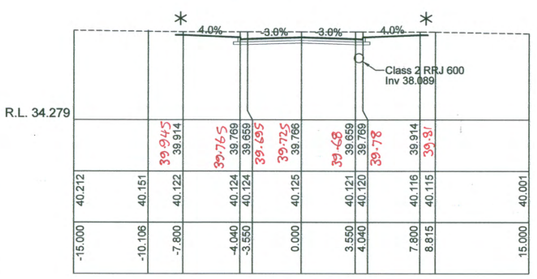
This plan/document relates to
DA No: 09 12 62 CCX No: 10 00 20
Environmental Planning & Assessment Act
Ener Hemfield
PENRITH CITY COUNCIL



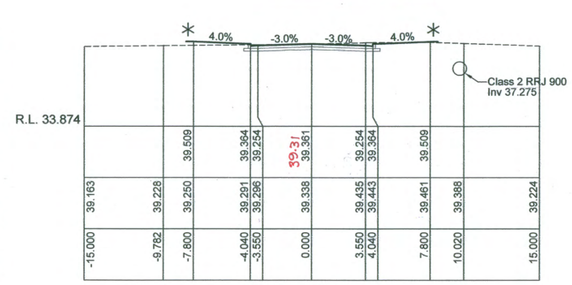
CH 30.000



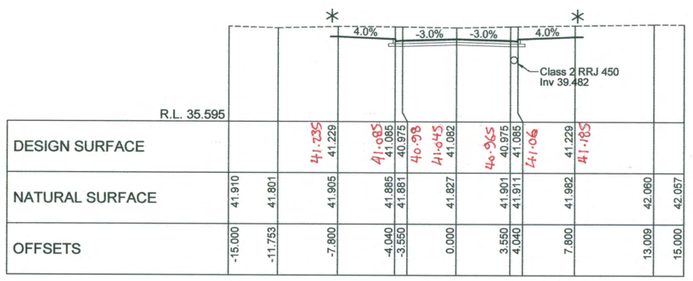
CH 75.000



CH 120.000



CH 163.290



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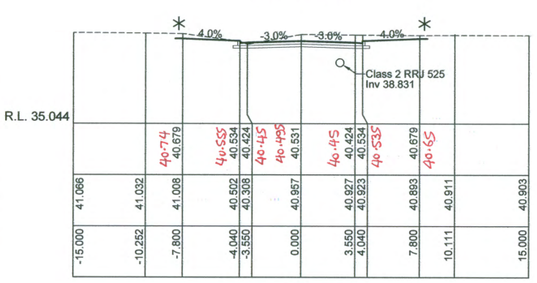
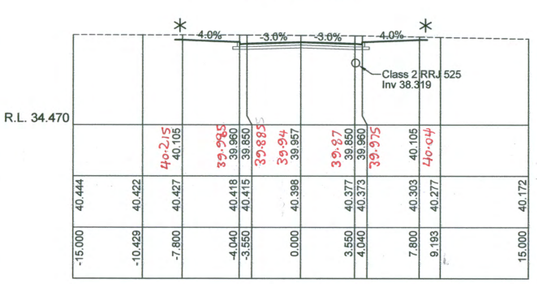
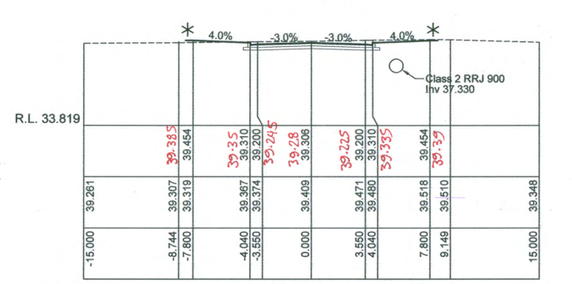


CH 60.000



CH 105.000



CH 159.640

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Hamann
REGISTERED SURVEYOR

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C			
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT AT A1

CLIENT: Delfin Lend Lease

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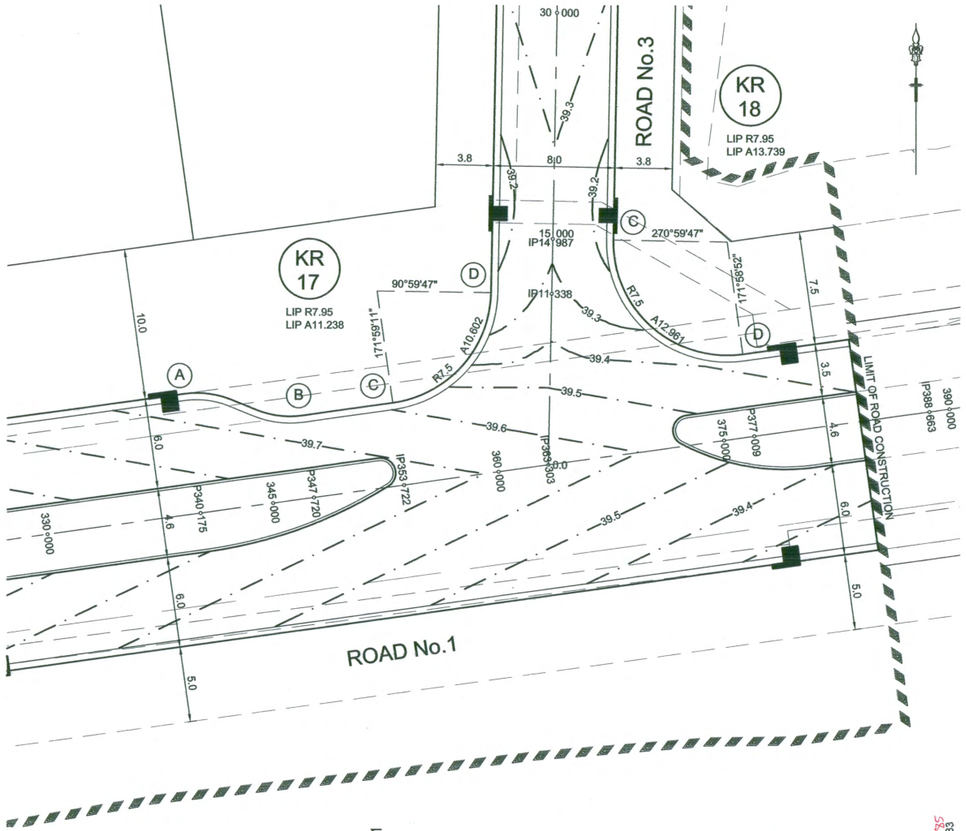
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Adams DATE 01/06/10

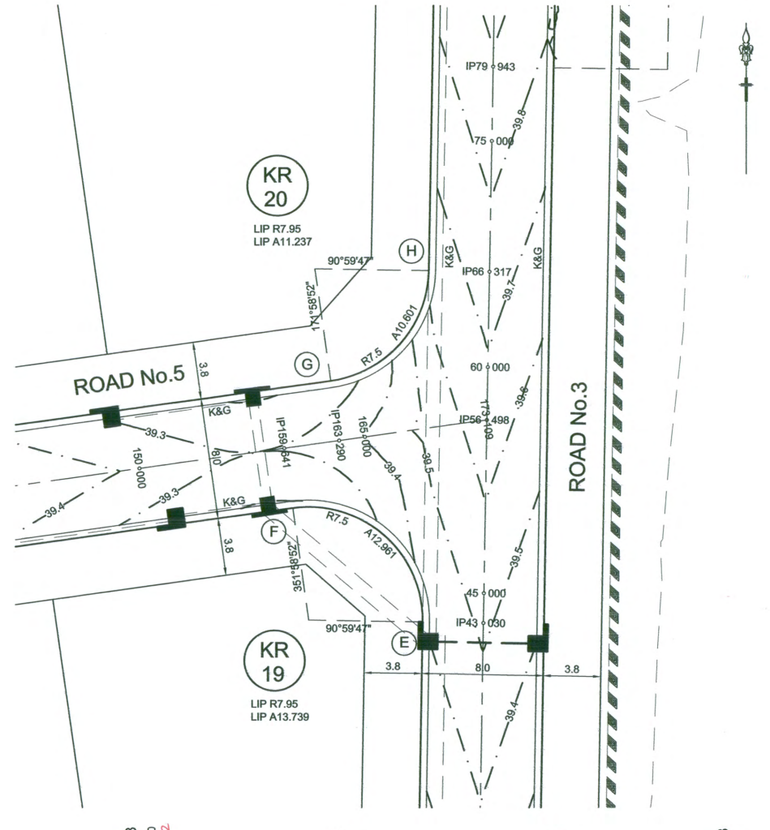
JORDAN SPRINGS
STAGE 1D
ROAD No.5 CROSS SECTIONS

PLAN No. 8634CC211 B
FILE No. 8634CC211
SHEET 12 OF 17 SHEETS

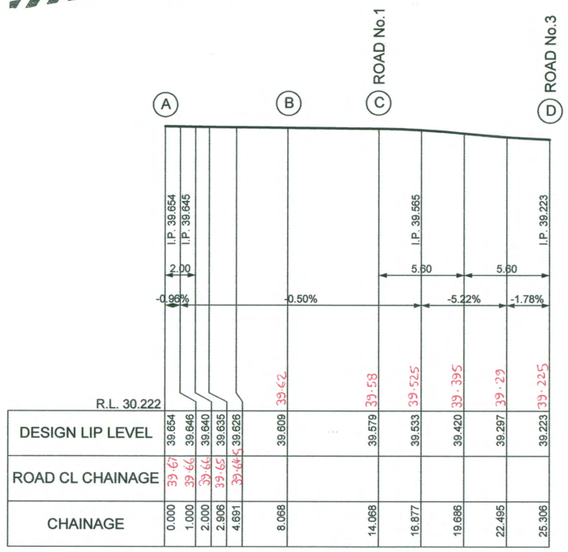
Plotted: 1 Jun 2010 3:44:46 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC211.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

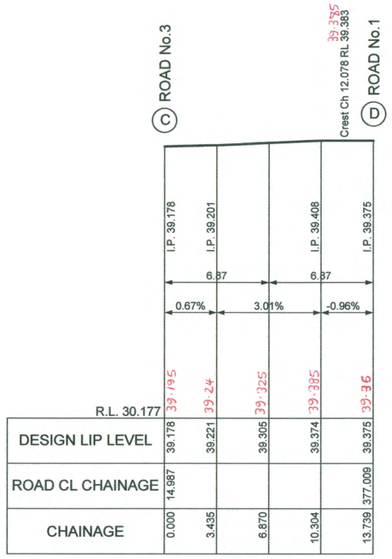




NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER



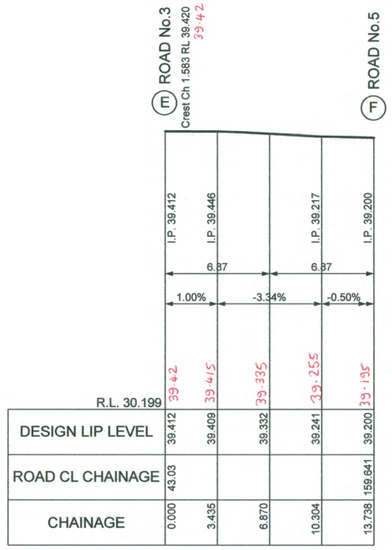
KR17
HORIZ 1:200
VERT 1:100



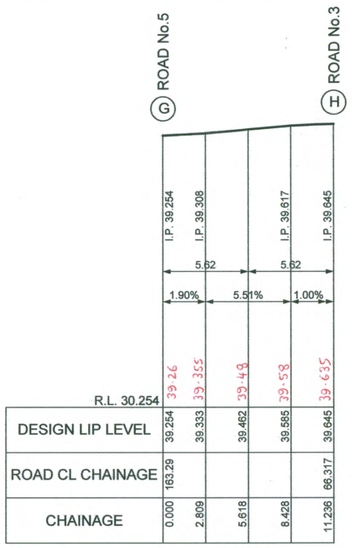
KR18
HORIZ 1:200
VERT 1:100

- KR17 EXTENDED & PLAN AMENDED TO SUIT.
- ROAD 1 MEDIAN SHAPE ADJUSTED.

C



KR19
HORIZ 1:200
VERT 1:100



KR20
HORIZ 1:200
VERT 1:100

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Eric Hendfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Homann
REGISTERED SURVEYOR

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C	COUNCIL AMENDMENTS AS NOTED	01-06-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
L.S. 1:200 H
1:100 V
AT A1

CLIENT: Delfin Lend Lease

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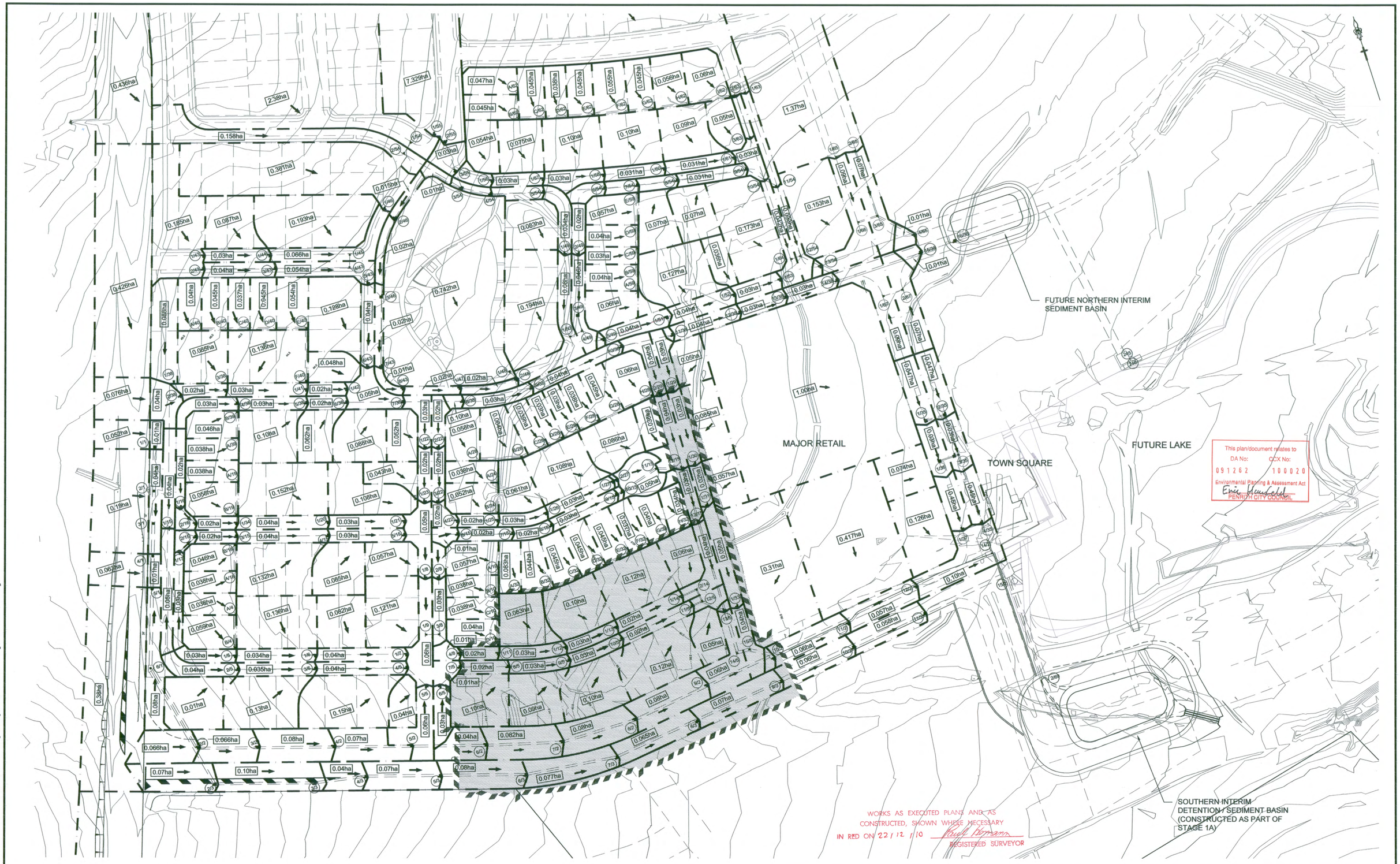
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

JORDAN SPRINGS
STAGE 1D
KERB RETURNS No.17, 18, 19 & 20

PLAN No. 8634CC212 C
FILE No. 8634CC212
SHEET 13 OF 17 SHEETS

Plotted: 1 Jun 2010 3:45:23 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC212.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

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ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C			
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES:
1:1000

CLIENT: Delfin Lend Lease

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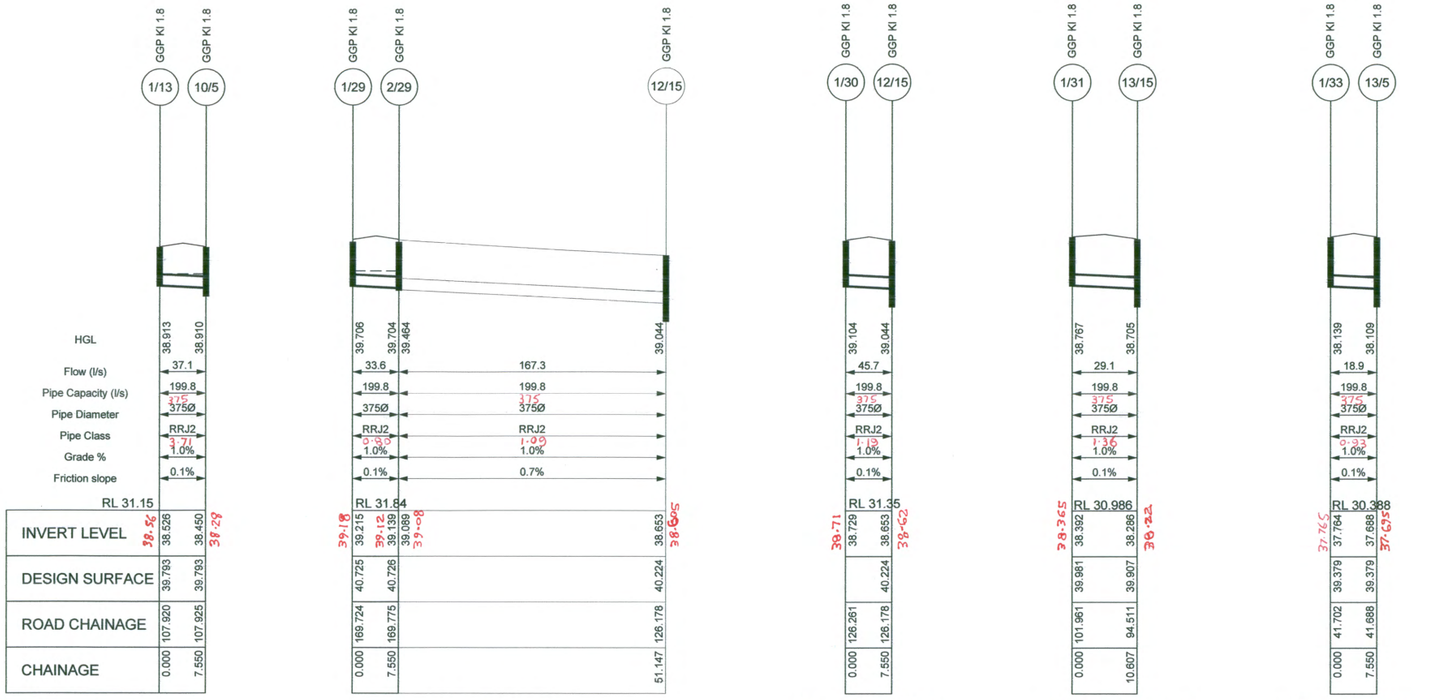
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

JORDAN SPRINGS
STAGE 1D
CATCHMENT PLAN

PLAN No. 8634CC213 B
FILE No. 8634CC213
SHEET 14 OF 17 SHEETS

Plotted: 4 Jun 2010 10:45:25 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC213.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LINE 13 (1:10yr)

LINE 29 (1:20yr)

LINE 30 (1:20yr)

LINE 31 (1:20yr)

LINE 33 (1:20yr)

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Pit Lid Level	Road Name	Road Chainage	Road CL Offset	Easting	Northing
		(mm)	(m)	(mm)	(m)	(m)	(m)		(m)	(m)	(m)	(m)
1/13	GGP KI 1.8			375	38.526	1.268	39.793	ROAD 5	107.92	-3.77	289086.55	6265720.627
1/29	GGP KI 1.8			375	39.215	1.445	40.659	ROAD 3	169.72	3.77	289157.37	6265839.126
1/30	GGP KI 1.8			375	38.729	1.496	40.224	ROAD 3	126.26	3.78	289156.61	6265795.670
1/31	GGP KI 1.8			375	38.392	1.589	39.981	ROAD 3	101.96	3.78	289156.19	6265771.373
1/33	GGP KI 1.8			375	37.764	1.615	39.379	ROAD 3	41.70	3.77	289155.14	6265711.123

NOTES:
- RESIDENTIAL DRAINAGE DESIGNED TO 10 YEAR ARI.
- COMMERCIAL DRAINAGE DESIGNED TO 20 YEAR ARI.

- LINE 29 SHOWN AS EXISTING BETWEEN PITS 2/29 & 12/15.

C

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY
INI RED ON 22/12/10 Paul Hossain REGISTERED SURVEYOR

This plan/document relates to
DA No: 091262 CCX No: 100020
Environmental Planning & Assessment Act
Eileen Mendelski PENRITH CITY COUNCIL

HYDRAULICS DESIGN TABLE- 6 Return Period: 20yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
2/29 1/29	6.000	0.077	33.6	7.550	375	0.012	1.0	39.706	33.582	4.500	0.021	0.00	0.30	199.82	0.414	
12/15 2/29	7.334	0.406	167.3	43.597	375	0.012	1.0	39.464	167.261	2.052	0.240	0.12	1.51	199.82	0.480	
12/15 1/30	6.000	0.104	45.7	7.550	375	0.012	1.0	39.104	45.723	4.500	0.039	0.01	0.41	199.82	0.304	
13/15 1/31	6.000	0.066	29.1	10.607	375	0.012	1.0	38.767	29.133	4.500	0.016	0.00	0.26	199.82	0.670	
13/5 1/33	6.000	0.043	18.9	7.550	375	0.012	1.0	38.139	18.903	4.500	0.007	0.00	0.17	199.82	0.735	

HYDROLOGIC DESIGN TABLE - 6 Return Period: 20 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
		(m)	(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
1/29		GGP KI 1.8 1%						6.00	158.0	0.880	0.087	0.077	6	33.6		33.6	1.000	1.460	0.070	15.933		2/29		
	Road					6.00		6.00		0.916	0.031	0.028												
	Med Density					6.00		6.00		0.859	0.056	0.048												
2/29	Road	GGP KI 1.8 1%				6.00		6.00	158.0	0.916	0.041	0.038	6	16.5	17.6	16.5	1.000	1.024	0.057	8.245				
																						12/15		
1/30		GGP KI 1.8 1%						6.00	158.0	0.875	0.119	0.104	6	45.7		45.7	1.000	1.695	0.077	20.503		12/15		
	Road					6.00		6.00		0.916	0.034	0.031												
	Med Density					6.00		6.00		0.859	0.085	0.073												
1/31		GGP KI 1.8 1%						6.00	158.0	0.873	0.076	0.066	6	29.1		29.1	1.000	1.382	0.068	14.110		13/15		
	Road					6.00		6.00		0.916	0.019	0.017												
	Med Density					6.00		6.00		0.859	0.057	0.049												
1/33	Road	GGP KI 1.8 1%				6.00		6.00	158.0	0.916	0.047	0.043	6	18.9		18.9	1.000	1.109	0.060	9.451		13/5		

HYDRAULICS DESIGN TABLE- 6 Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time	Comments
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)	
10/5 1/13	6.000	0.098	37.1	7.550	375	0.012	1.0	38.901	37.050	4.500	0.026	0.01	0.34	199.82	0.375	

HYDROLOGIC DESIGN TABLE - 6 Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Pit C Factor	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Bypass Flow to Pit	Bypass Pit	Pit Specified Inflows	Comments
		(m)	(m)	(%)		(min)	(m)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
1/13		GGP KI 1.8 1%						6.00	136.0	0.785	0.125	0.098	6	37.1		37.1	1.275	1.482	0.071	17.320		10/5		
	Road					6.00		6.00		0.873	0.024	0.021												
	Lot					6.00		6.00		0.764	0.101	0.077												

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C	COUNCIL AMENDMENTS AS NOTED	01-06-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:500 H 1:100 V AT A1

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

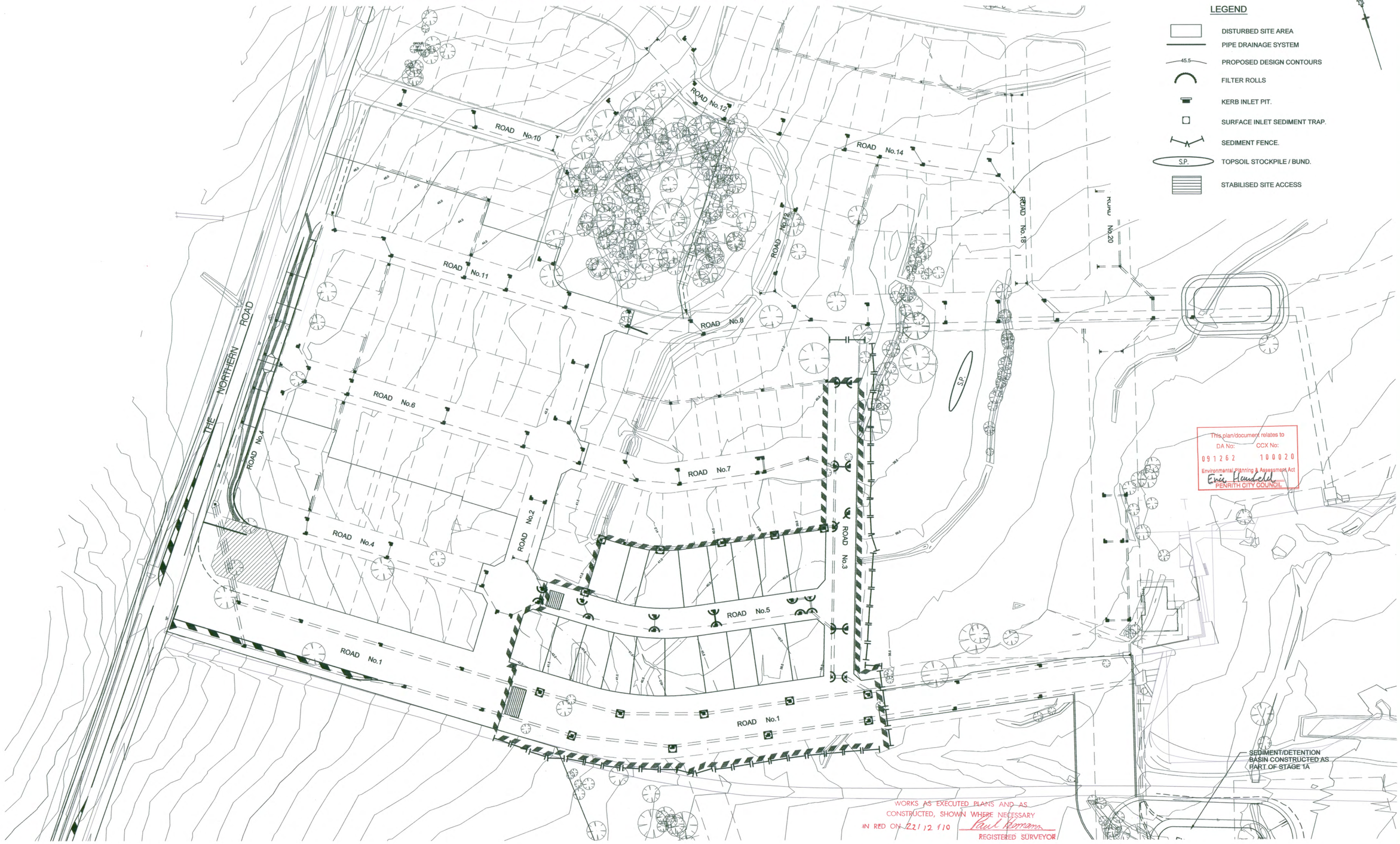
JORDAN SPRINGS
STAGE 1D
DRAINAGE LONGITUDINAL SECTION LINE No.13,29,30,31 & 33
PIT SCHEDULE & DRAINAGE CALCULATIONS

PLAN No. 8634CC214 C
FILE No. 8634CC214
SHEET 15 OF 17 SHEETS

Plotted: 1 Jun 2010 3:46:26 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC214.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

SOIL AND WATER MANAGEMENT PLAN



This plan/document relates to
DA No: 09 12 62 CCX No: 10 00 20
Environmental Planning & Assessment Act
Erin Hendfield
PENRITH CITY COUNCIL

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10
Paul Kinnan
REGISTERED SURVEYOR

1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
F			
E			
D			
C			
B	ISSUED FOR CONSTRUCTION APPROVAL	APR 2010	A.M.
A	ISSUED FOR CLIENT REVIEW	MAR 2010	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.

DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1D
SOIL & WATER MANAGEMENT PLAN

PLAN No. 8634CC215 B
FILE No. 8634CC215
SHEET 16 OF 17 SHEETS

Plotted: 4 Jun 2010 10:50:03 AM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC215.dwg

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

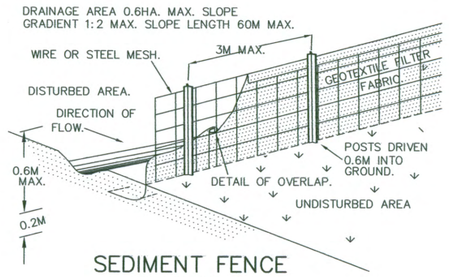
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

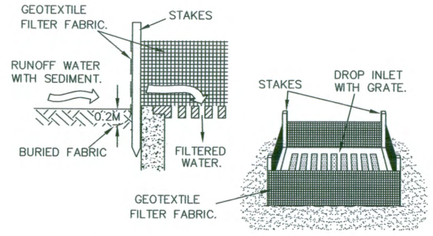
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

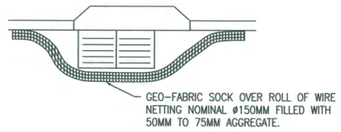
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

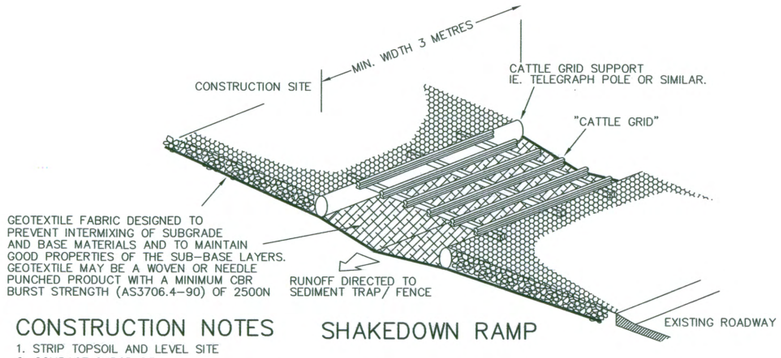


SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.





SHAKEDOWN RAMP

CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

WORKS AS EXECUTED PLANS AND AS CONSTRUCTED, SHOWN WHERE NECESSARY IN RED ON 22/12/10 Paul Hamann REGISTERED SURVEYOR

This plan/document relates to DA No: 091262 CCX No: 100020 Environmental Planning & Assessment Act Eric Plumfield PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Adams DATE 01/06/10

ISSUE	AMENDMENT	DATE	BY
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DESIGNED A.M.
DRAWN N.W.
CHECKED K.N.
DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1D
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8634CC216 B
FILE No. 8634CC216
SHEET 17 OF 17 SHEETS

Plotted: 1 Jun 2010 3:47:25 PM File Name: J:\8634D\CC - Engineering Construction Plans\Stage - 1D\8634CC216.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS.
2. SURVEY MARKS:–
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT–HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:– THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:–
    a) INTERALLOTMENT DRAINS (C.D.L.) – 150mm dia. –1.5m WIDE MINIMUM
       – 225mm & 300mm dia. –2.0m WIDE MINIMUM
       – 375mm TO 600mm dia. –2.5m WIDE MINIMUM
       – 675mm & 750mm dia. –3.0m WIDE MINIMUM
    b) PIPED DRAINAGE – 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON–COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED – DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au DIAL1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

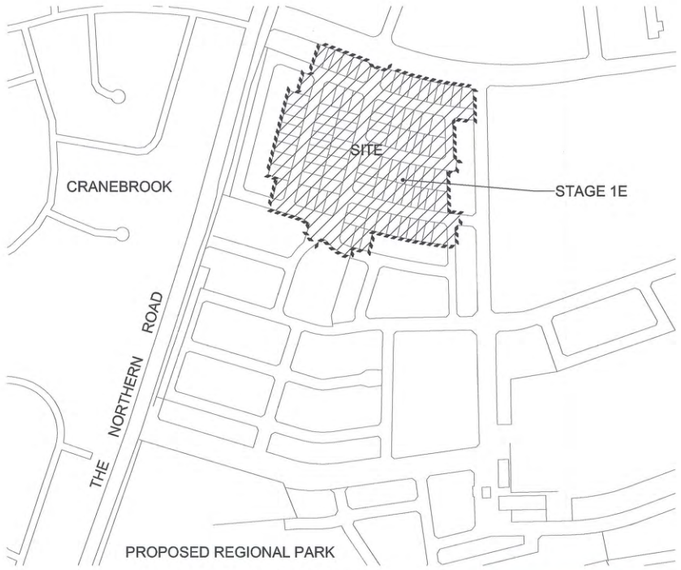
STAGE 1E

(SUB-STAGES 1Ea, 1Eb & 1Ec)

DEVELOPMENT APPLICATION

PROPOSED ROAD & DRAINAGE WORKS

COUNCIL REF: DA 10/0790



This plan/document relates to
DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
Erin Hendfield
PENRITH CITY COUNCIL

SURVEYED BY:
WHELANS INSITES PTY LTD

LEGEND

PROPOSED	DESCRIPTION	EXISTING
600ø	R.C. STORMWATER PIPELINE	
600ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150ø	COMMON DRAINAGE LINE	150ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
	KERB INLET PIT BUILT TO SUBGRADE LEVEL (LINTEL IN FUTURE WORKS)	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS – BENCH MARKS	▲
◘	STATE SURVEY MARKS	
○	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

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ISSUE	AMENDMENT	DATE	BY
D	8953CC46 DESCRIPTION AMENDED	20-12-10	AM
C	INDEX AMENDED	01-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

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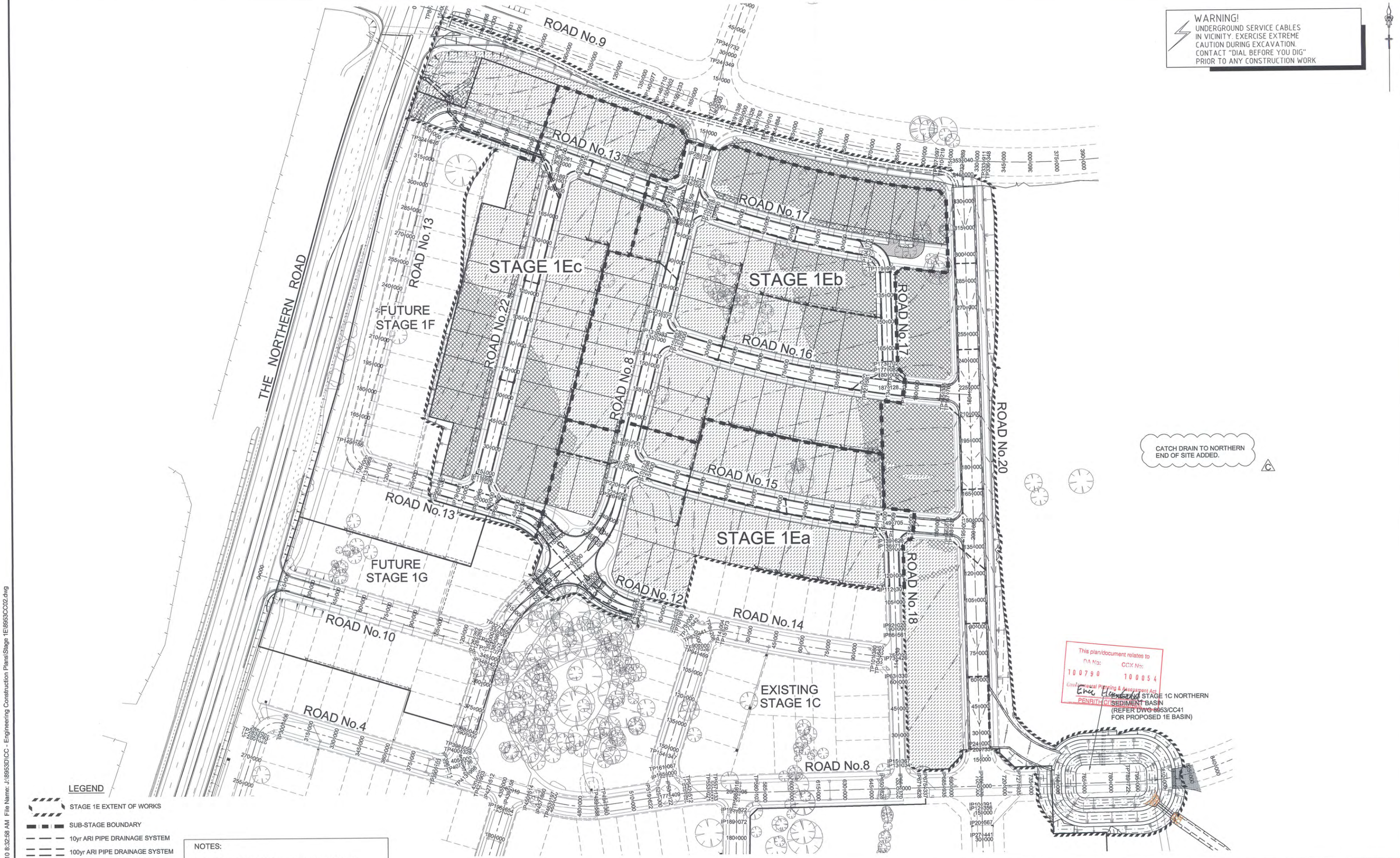
SIGNED S. Anderson DATE 01/12/10

JORDAN SPRINGS
STAGE 1E
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8953CC01 D
FILE No. 8953CC01
SHEET 1 OF 46 SHEETS

Plotted: 21 Dec 2010 8:32:43 AM File Name: J:\8953\DC\C - Engineering Construction Plans\Stage 1E\8953CC01.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



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ISSUE	AMENDMENT	DATE	BY
C	NORTHERN CATCH DRAIN ADDED	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1E
SITE STAGING / BULK EARTHWORKS PLAN

PLAN No. 8953CC02 C
FILE No. 8953CC02
SHEET 2 OF 46 SHEETS

Plotted: 21 Dec 2010 8:32:58 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC02.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018


ROAD No.9
ROAD No.13
ROAD No.17
ROAD No.16
ROAD No.15
ROAD No.12
ROAD No.14
ROAD No.10
ROAD No.4
ROAD No.8
ROAD No.18
ROAD No.20
ROAD No.22
THE NORTHERN ROAD
STAGE 1Ec
STAGE 1Eb
STAGE 1Ea
FUTURE STAGE 1F
FUTURE STAGE 1G
EXISTING STAGE 1C
R470
R568.4
R643.4
R719
R15.0
R850
R950
110°13'46"
106°42'38"
106°42'40"
232°56'15"
14°16'53"
17°39'07"
172°41'32"
358°41'33"
187.128
353.040
149.705
114.389
IP73 426
IP20 567
IP220 755
IP229 975
IP207 826
IP131 933
TP1611 067
TP1541 347
TP1494 370
TP1494 409
TP1494 122
TP1483 191
TP1421 803
TP1398 095
TP1398 096
TP1398 097
TP1398 098
TP1398 099
TP1398 100
TP1398 101
TP1398 102
TP1398 103
TP1398 104
TP1398 105
TP1398 106
TP1398 107
TP1398 108
TP1398 109
TP1398 110
TP1398 111
TP1398 112
TP1398 113
TP1398 114
TP1398

- PITS 1/70, 2/70 & 4/70 AMENDED, PIT 3/70 DELETED.
- NORTHERN CATCH DRAIN ADDED.
- BUND WALL AROUND SUBSTATION ADDED.
- NS LABELS ADDED

WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

FUTURE CULVERT CONNECTION PART OF FUTURE NORTHERN ROAD UPGRADE.

EXISTING HEADWALL (TAILOUT TO CATCH DRAIN AT MIN. 1%). UPGRADE OF CULVERTS PART OF FUTURE NORTHERN ROAD UPGRADE.

TEMPORARY BATTER 4:1

TEMPORARY GRASS LINED CATCH DRAIN MIN. 1%

FUTURE ROUNDABOUT

TEMPORARY GRASS LINED CATCH DRAIN MIN. 1%

TEMPORARY BATTER 4:1

PROPOSED GRASS LINED CATCH DRAIN. SEE DWG. 8953CC40 FOR DETAILS

TEMPORARY GUIDE POSTS

BOX ROAD No.20 FOR USE AS OVERLAND FLOW PATH

BUND WALL AROUND SUBSTATION

LIMIT OF STAGE 1E ROAD CONSTRUCTION

6:1 BATTER

500YR SURCHARGE PIT

- PRAM RAMP LOCATIONS AMENDED AT KERB RETURN No.s 66, 67, 68, 69, 70, 71, 74, 75, 78 & 79

BOX PART ROAD No.13 FOR USE AS OVERLAND FLOW PATH

TEMPORARY GUIDE POSTS

100YR SURCHARGE PITS

GRADE TO EXISTING AT MIN. 1%

CONSTRUCT CONCRETE DRIVEWAY, MIN. 150mm THICK WITH SL82 MESH. FINISH TO LANDSCAPE ARCHITECTS DETAILS

TEMPORARY BATTER 4:1

BOX PART ROAD No.16 FOR USE AS OVERLAND FLOW PATH

LIMIT OF STAGE 1E ROAD CONSTRUCTION

TEMPORARY GUIDE POSTS

FUTURE STAGE 1F

ADJOINS SHEET CC05

ROAD No.9
ROAD No.13
ROAD No.8
ROAD No.22
ROAD No.17
ROAD No.20
ROAD No.16

1:500 (AT A1)
10 0 10 20 30 40 50
METRES

LEGEND

- STAGE 1E EXTENT OF WORKS
- SUB-STAGE BOUNDARY
- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- 45.5 PROPOSED DESIGN CONTOURS
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1E
- PAVED THRESHOLD
- DRIVEWAY LAYBACK
- PRAM RAMP

NOTES:
1. STAGE 1E TO INCLUDE CONSTRUCTION OF INTERIM DETENTION / SEDIMENT BASIN. REFER DWG 8953/CC41 FOR DETAILS
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1E TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO PROPOSED INTERIM DETENTION / SEDIMENT BASIN.
3. FOR DRIVEWAY SETOUT DETAILS REFER DWG. 8953/43
4. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
5. DRIVEWAY LAYBACKS, FOOTPATHS & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS. DRAINAGE HOUSE CONNECTIONS TO BE INSTALLED FROM LOT BOUNDARY TO KERB PRIOR TO FOOTPATH BEING CONSTRUCTED.

Plotted: 21 Jan 2011 2:21:55 PM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC04.dwg

ISSUE	AMENDMENT	DATE	BY
F	AMENDED AS NOTED	19/01/11	NW
E	AMENDEMENTS AS NOTED	24-12-10	AM
D	AMENDMENTS AS NOTED	01-12-10	AM
C	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
B	EASEMENT WIDTHS UPDATED	08-10-10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:500

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 21/01/11

JORDAN SPRINGS
STAGE 1E
PLAN (1 OF 3)

PLAN No. 8953CC04 F
FILE No. 8953CC04
SHEET 4 OF 46 SHEETS

This plan/document relates to DA No: 10/0390 CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

ADJOINS SHEET CC04

ADJOINS SHEET CC06

ROAD No.13

ROAD No.16

ROAD No.8

ROAD No.22

ROAD No.15

ROAD No.12

ROAD No.14

ROAD No.10

ROAD No.18

NORTHERN ROAD

THE

FUTURE STAGE 1F

FUTURE STAGE 1G

EXISTING STAGE 1C

LIMIT OF STAGE 1E ROAD CONSTRUCTION

TEMPORARY GUIDE POSTS

TEMPORARY BATTER 4:1

TEMPORARY 4:1 BATTER

BOX ROAD No.20 FOR USE AS OVERLAND FLOW PATH

6:1 BATTER

BATTERS 6:1

LEGEND

- STAGE 1E EXTENT OF WORKS
- SUB-STAGE BOUNDARY
- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- PROPOSED DESIGN CONTOURS
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1E
- PAVED THRESHOLD
- DRIVEWAY LAYBACK
- PRAM RAMP

WARNING!
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NOTES:

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1:500 (AT A1) 10 0 10 20 30 40 50 METRES

This plan/document relates to DA No: 10/0790 CCX No: 10/0054
Environmental Planning & Assessment Act
Eric Hendriks
PENRITH CITY COUNCIL

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 21/01/11

ISSUE	AMENDMENT	DATE	BY
G	DRIVEWAY LOCATION AMENDED	27-01-11	AM
F	AMENDED AS NOTED	19-01-11	NW
E	DRIVEWAY LOCATIONS AMENDED	24-12-10	AM
D	NS LABELS ADDED	01-12-10	AM
C	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM

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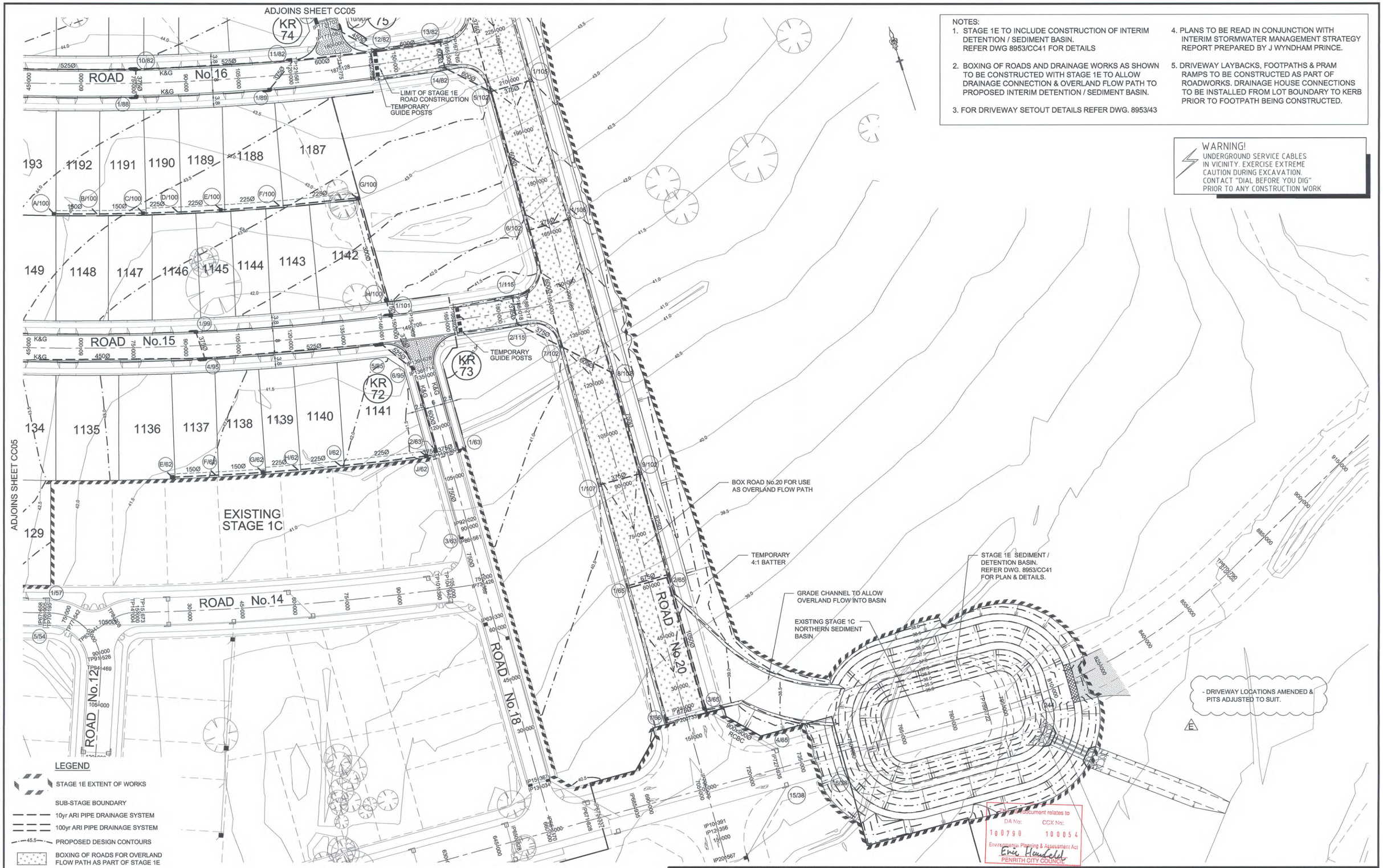
DATUM: ORIGIN:
SCALES: 1:500

JORDAN SPRINGS
STAGE 1E
PLAN (2 OF 3)

PLAN No. 8953CC05 G
FILE No. 8953CC05
SHEET 5 OF 46 SHEETS

Plotted: 27 Jan 2011 9:32:02 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC05.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



NOTES:

1. STAGE 1E TO INCLUDE CONSTRUCTION OF INTERIM DETENTION / SEDIMENT BASIN. REFER DWG 8953/CC41 FOR DETAILS
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1E TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO PROPOSED INTERIM DETENTION / SEDIMENT BASIN.
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4. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
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ISSUE	AMENDMENT	DATE	BY
E	DRIVEWAY LOCATIONS AMENDED	24-12-10	AM
D	NS LABELS ADDED	01-12-10	AM
C	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
B	EASEMENT WIDTHS UPDATED	08-10-10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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SCALES: 1:500

CLIENT: Delfin Lend Lease

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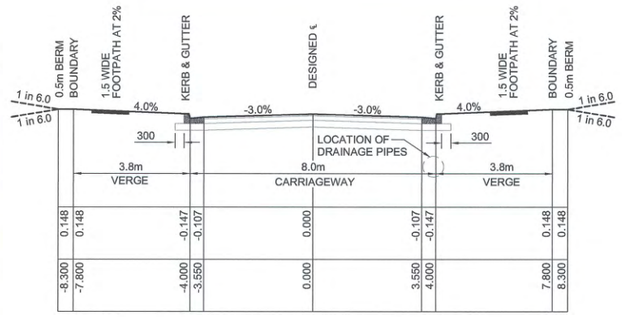
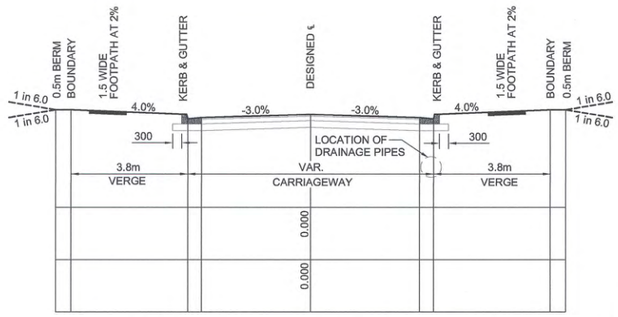
JORDAN SPRINGS
STAGE 1E
PLAN (3 OF 3)

PLAN No. 8953CC06 E
FILE No. 8953CC06
SHEET 6 OF 46 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



TYPICAL CROSS SECTION ROAD No.8
CH 22.866 TO 226.975
1:100 NAT



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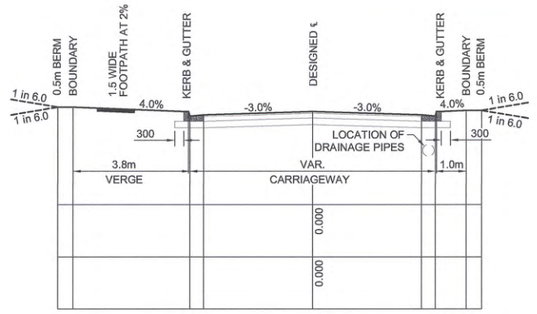
CH 226.975 TO 291.354
1:100 NAT



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CH 17.692 TO 44.121
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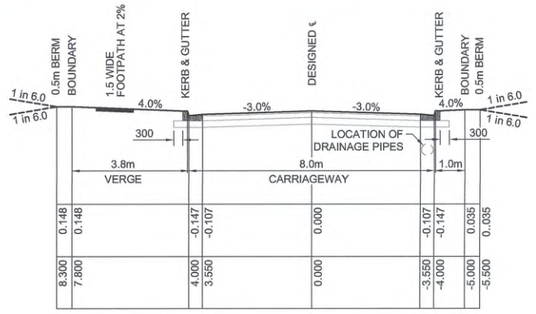

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CH 44.121 TO 47.854
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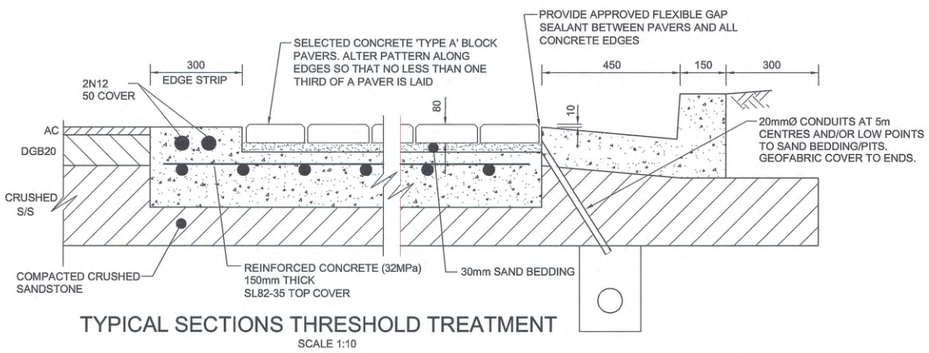
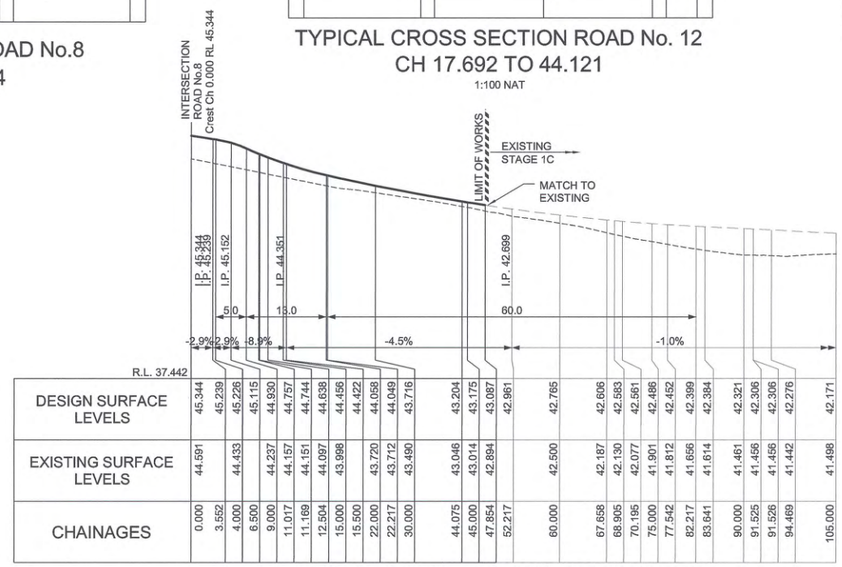


TYPICAL SECTIONS THRESHOLD TREATMENT
SCALE 1:10

- FOOTPATHS SHOWN 2%
- THRESHOLD DETAIL AMENDED

C



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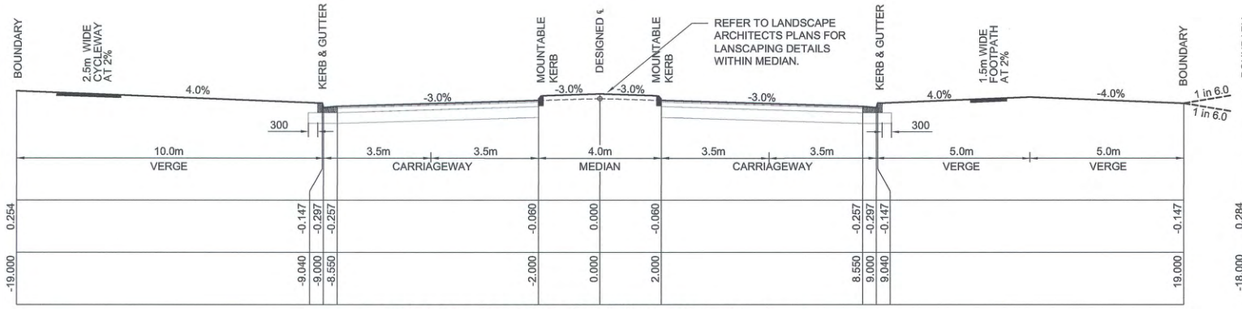
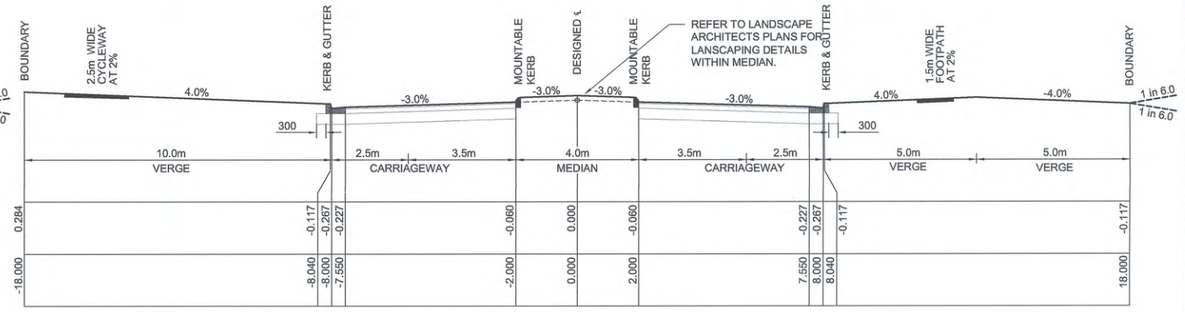
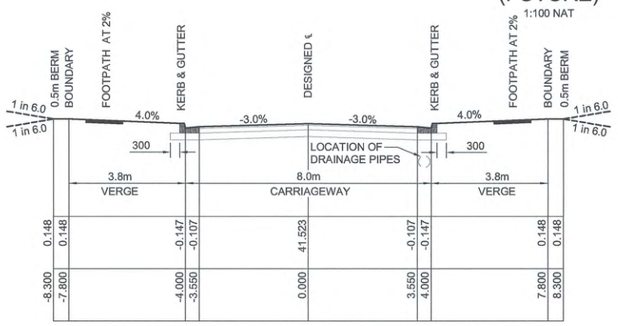


TYPICAL CROSS SECTION ROAD No.9
CH 177.528 TO 321.889
(FUTURE)



TYPICAL CROSS SECTION ROAD No.9
CH 0.00 TO 177.528
(FUTURE)
1:100 NAT



TYPICAL CROSS SECTION ROAD No.15
CH 0.000 TO 166.929
1:100 NAT

PAVEMENT DESIGN - ROAD No.15 - 5x10 ^{4}

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

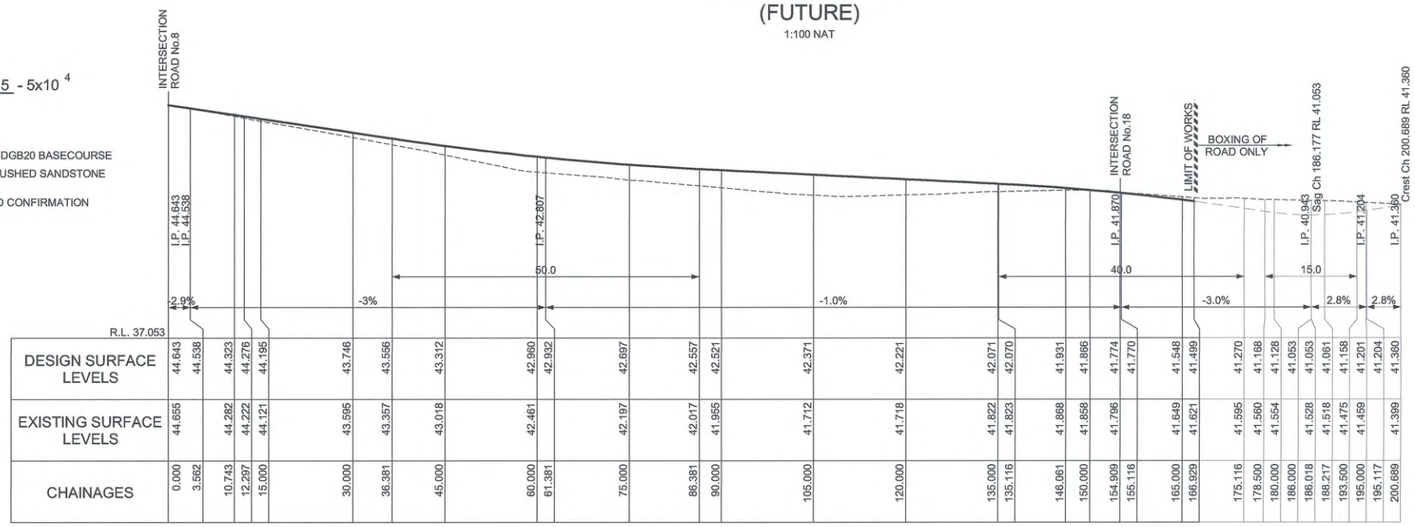
SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

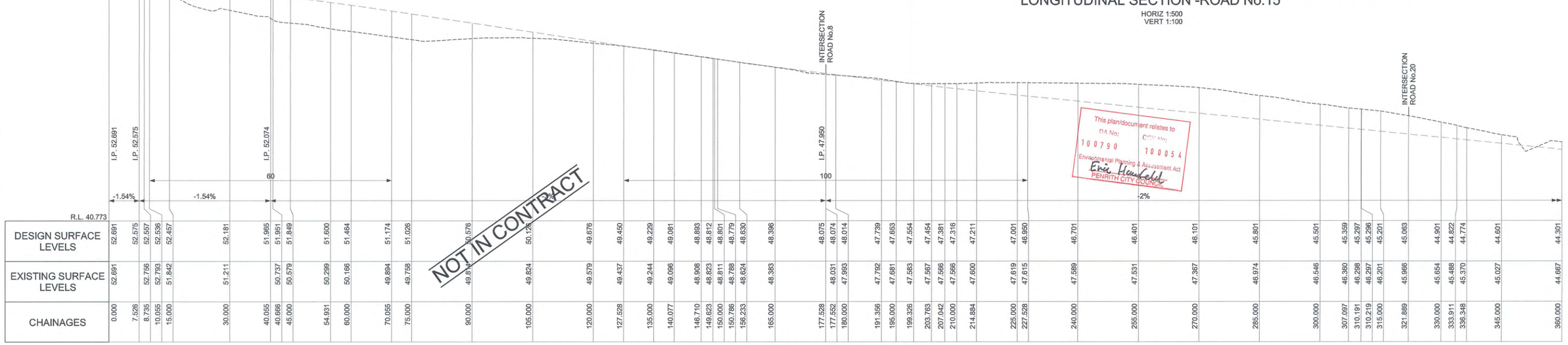
220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION

- FOOTPATHS SHOWN 2%



LONGITUDINAL SECTION -ROAD No.15
HORIZ 1:500
VERT 1:100



LONGITUDINAL SECTION - FUTURE ROAD No.9
HORIZ 1:500
VERT 1:100

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	FOOTPATHS SHOWN 2%	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: AS AHOWN @ A1

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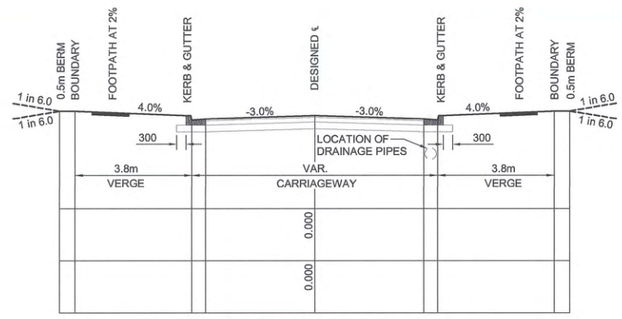
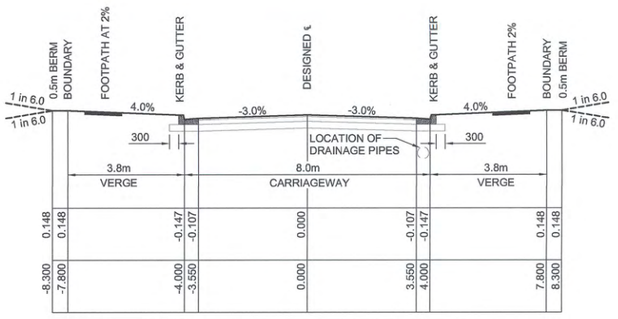
JORDAN SPRINGS
STAGE 1E
ROAD No.9 & 15 LONGITUDINAL SECTIONS
& TYPICAL CROSS SECTIONS

PLAN No. 8953CC08 C
FILE No. 8953CC08
SHEET 8 OF 46 SHEETS

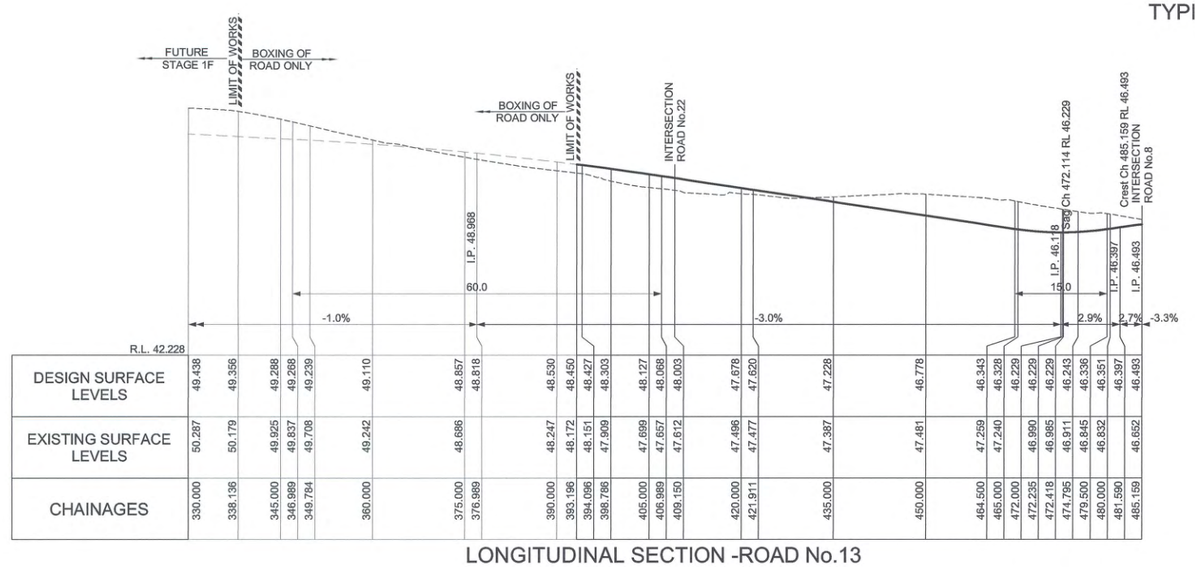
Plotted: 21 Dec 2010 8:33:20 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC08.dwg
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



TYPICAL CROSS SECTION ROAD No.13
CH 20.542 TO 56.060
1:100 NAT



TYPICAL CROSS SECTION ROAD No.13
CH 56.060 TO 90.504
CH 393.196 TO 485.159
1:100 NAT



LONGITUDINAL SECTION -ROAD No.13

PAVEMENT DESIGN - ROAD No.13 - 5x10 5

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

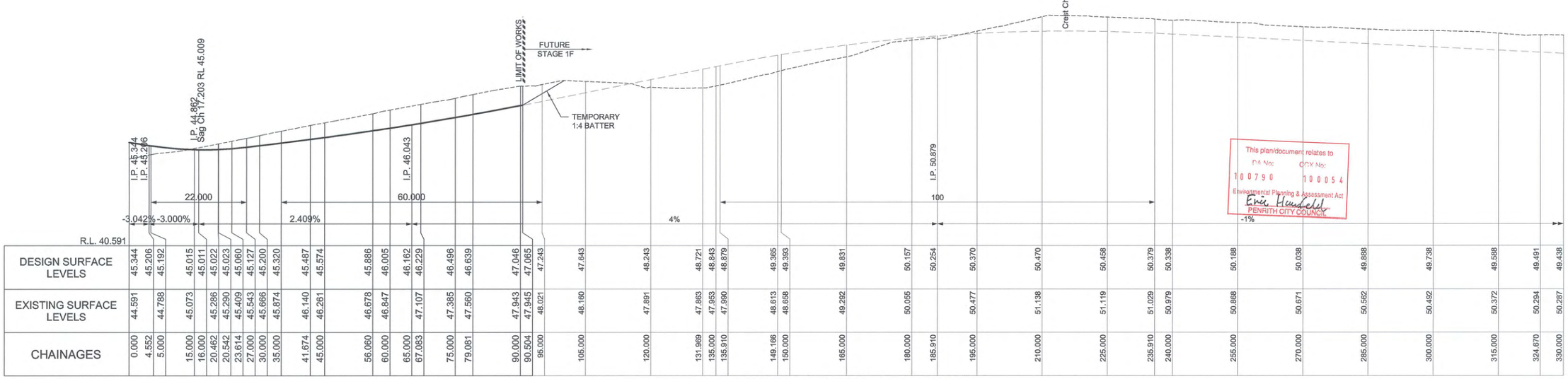
SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION

- FOOTPATHS SHOWN 2%



LONGITUDINAL SECTION -ROAD No.13

This plan/document relates to
DA No: 10790 CDC No: 100054
Environmental Planning & Assessment Act
Eric Hemfield
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	FOOTPATHS SHOWN 2%	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: AS AHOWN @ A1

JORDAN SPRINGS
STAGE 1E
ROAD No.13 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS

PLAN No. 8953CC09 C
FILE No. 8953CC09
SHEET 9 OF 46 SHEETS

Plotted: 21 Dec 2010 8:33:24 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC09.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

PAVEMENT DESIGN - ROAD No.16 - 5x10 [4]

50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION

PAVEMENT DESIGN - ROAD No.17 - 5x10 [4]

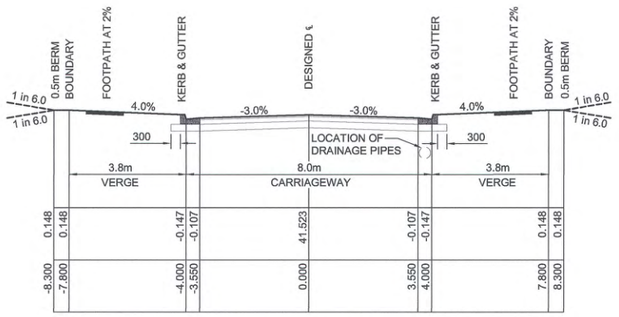
50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

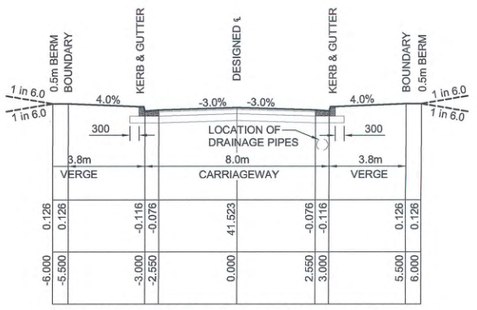
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

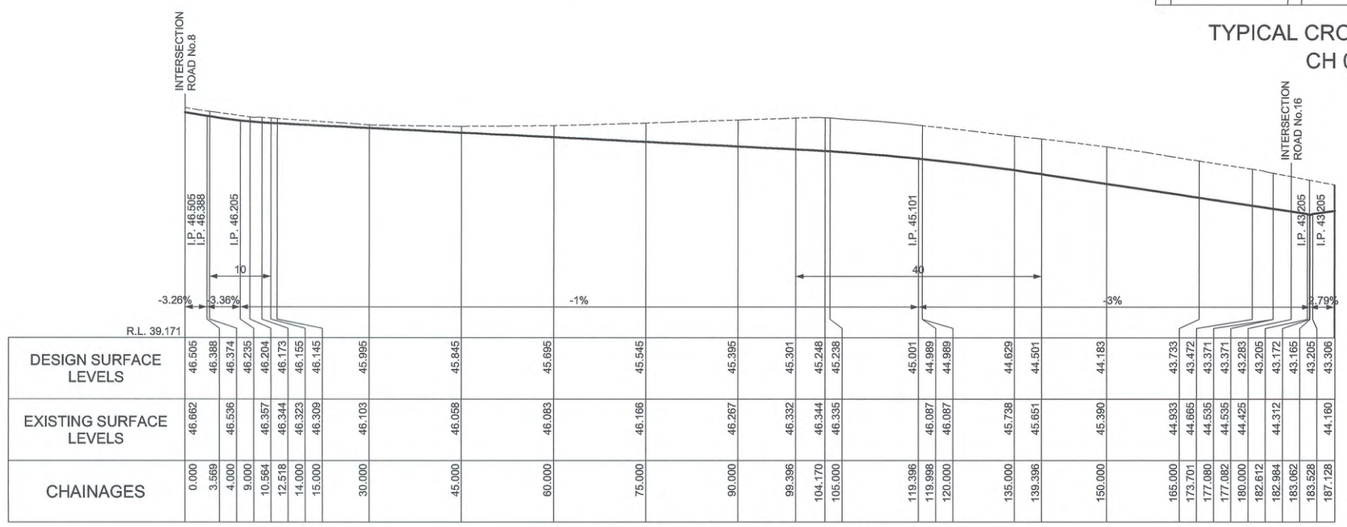
SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION



TYPICAL CROSS SECTION ROAD No.16
CH 0.000 TO 142.715
1:100 NAT

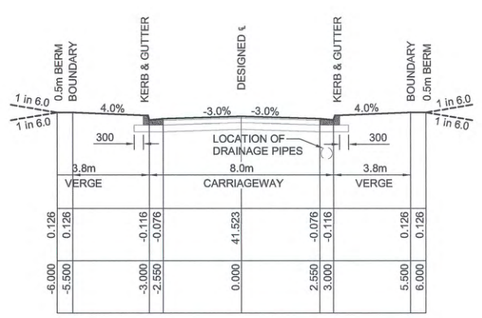


TYPICAL CROSS SECTION ROAD No.17
CH 0.000 TO 187.128
1:100 NAT



LONGITUDINAL SECTION -ROAD No.17
HORIZ 1:500
VERT 1:100

- FOOTPATHS SHOWN 2%



TYPICAL CROSS SECTION ROAD No.18
CH 60.000 TO 112.307
1:100 NAT

PAVEMENT DESIGN - ROAD No.18 - 5x10 [4]

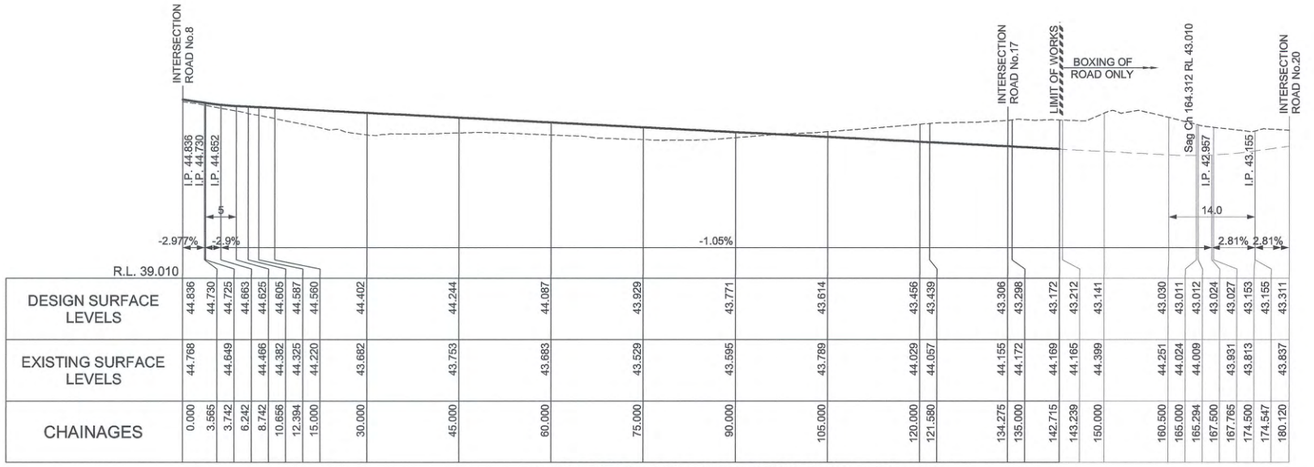
50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

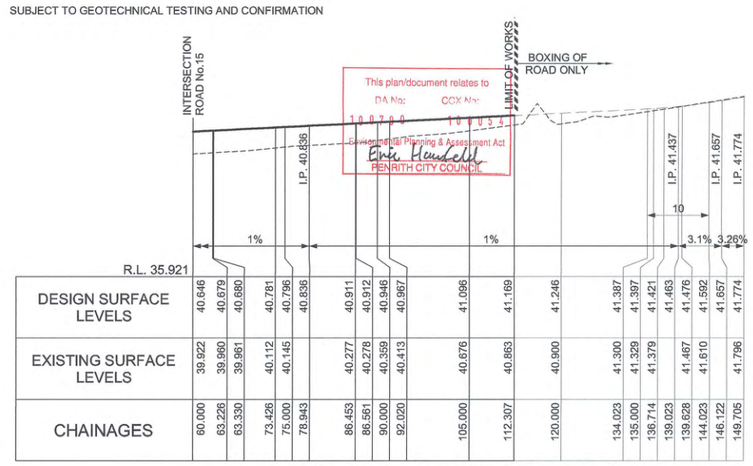
150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

180mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION



LONGITUDINAL SECTION -ROAD No.16
HORIZ 1:500
VERT 1:100



LONGITUDINAL SECTION -ROAD No.18
HORIZ 1:500
VERT 1:100

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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SIGNED S. Anderson DATE 01/12/10

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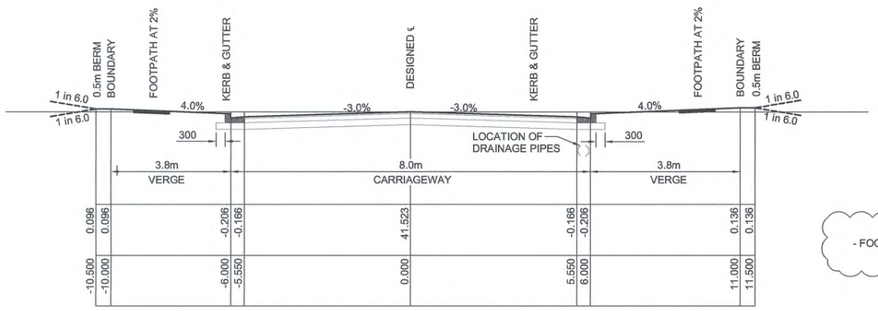
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: AS AHOWN @ A1

JORDAN SPRINGS
STAGE 1E
ROAD No.16, 17 & 18 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS

PLAN No. 8953CC10 C
FILE No. 8953CC10
SHEET 10 OF 46 SHEETS

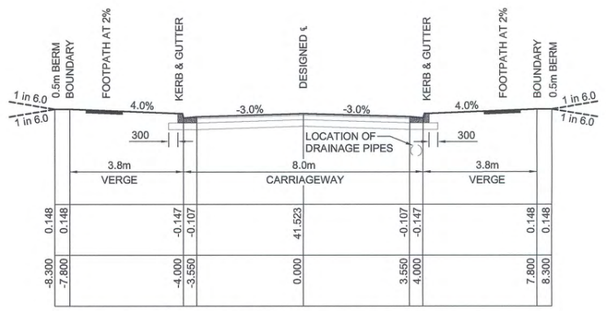
Plotted: 21 Dec 2010 8:33:28 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC10.dwg
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



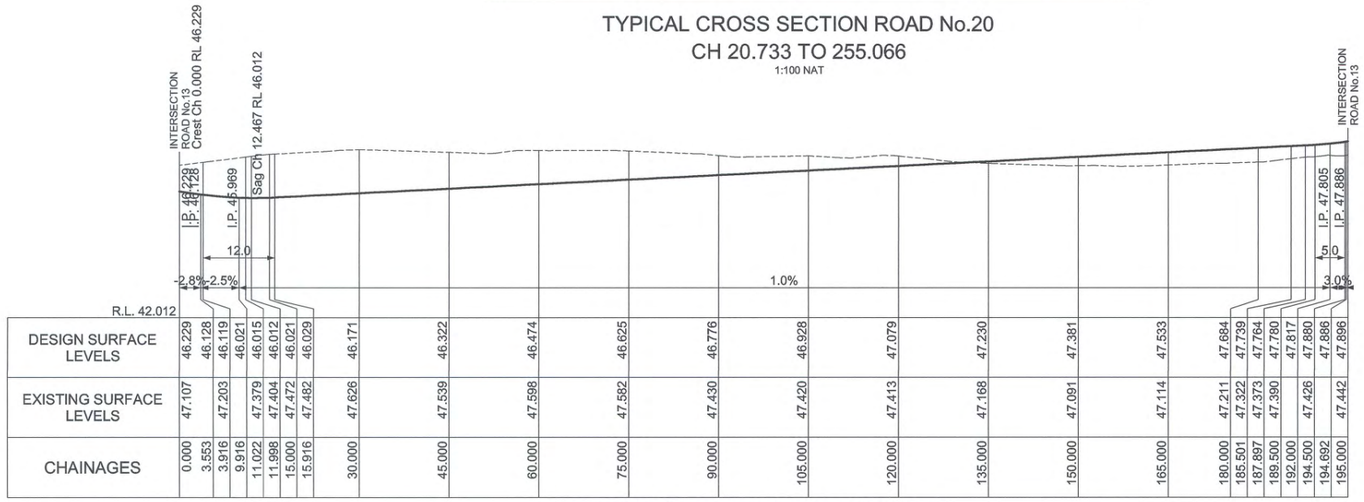
- FOOTPATHS SHOWN 2%

C

TYPICAL CROSS SECTION ROAD No.20
CH 20.733 TO 255.066
1:100 NAT



TYPICAL CROSS SECTION ROAD No.22
CH 0.000 TO 195.000
1:100 NAT



CHAINAGES	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
0.000	46.229	47.107
3.553	46.128	47.203
3.916	46.119	47.203
9.916	46.021	47.379
11.022	46.015	47.404
11.998	46.012	47.472
15.000	46.021	47.482
15.916	46.029	47.626
30.000	46.171	47.539
45.000	46.322	47.598
60.000	46.474	47.582
75.000	46.625	47.430
90.000	46.776	47.420
105.000	46.928	47.413
120.000	47.079	47.168
135.000	47.230	47.091
150.000	47.381	47.114
165.000	47.533	47.211
180.000	47.684	47.322
185.501	47.739	47.373
187.897	47.764	47.390
189.500	47.780	
192.000	47.817	
194.500	47.880	47.426
194.692	47.886	
195.000	47.896	47.442

LONGITUDINAL SECTION -ROAD No.22
HORIZ 1:500
VERT 1:100

PAVEMENT DESIGN - ROAD No.22 - $5x10^4$

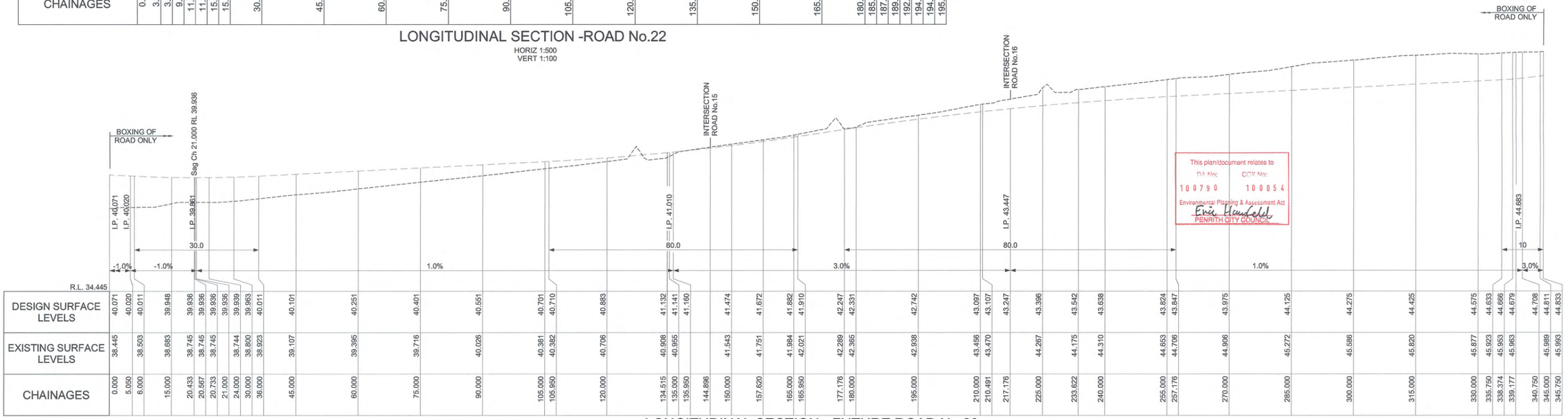
50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION



CHAINAGES	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS
0.000	40.071	38.445
5.050	40.020	38.503
6.000	40.011	38.683
15.000	39.948	38.745
20.433	39.936	38.745
20.567	39.936	38.745
20.733	39.936	38.744
21.000	39.936	38.744
24.000	39.939	38.800
30.000	39.963	38.923
36.000	40.011	
45.000	40.101	39.107
60.000	40.251	39.395
75.000	40.401	39.716
90.000	40.551	40.026
105.000	40.701	40.361
105.950	40.710	40.382
120.000	40.883	40.706
134.515	41.132	40.908
135.000	41.141	40.955
135.950	41.160	
144.896		
150.000	41.474	41.543
157.620	41.672	41.751
165.000	41.882	41.984
165.950	41.910	42.021
177.176	42.247	42.289
180.000	42.331	42.365
195.000	42.742	42.938
210.000	43.097	43.456
210.491	43.107	43.470
217.176	43.247	
225.000	43.396	44.267
233.622	43.542	44.175
240.000	43.638	44.310
255.000	43.824	44.653
257.176	43.847	44.706
270.000	43.975	44.906
285.000	44.125	45.272
300.000	44.275	45.586
315.000	44.425	45.820
330.000	44.575	45.877
335.750	44.633	45.923
338.374	44.666	45.963
339.177	44.679	45.963
340.790	44.708	
345.000	44.811	45.989
345.750	44.833	45.993

LONGITUDINAL SECTION - FUTURE ROAD No.20 (BOXING ONLY)
HORIZ 1:500
VERT 1:100

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	FOOTPATHS SHOWN 2%	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: AS AHOWN @ A1

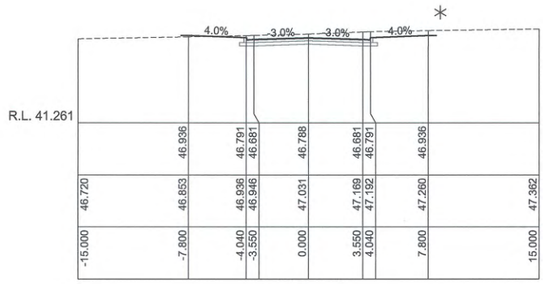
JORDAN SPRINGS
STAGE 1E
ROAD No.20 & 22 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS

PLAN No. 8953CC11 C
FILE No. 8953CC11
SHEET 11 OF 46 SHEETS

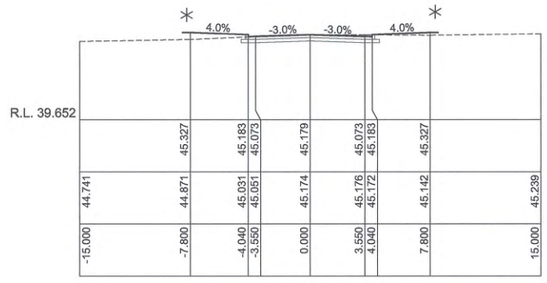
Plotted: 21 Dec 2010 8:33:31 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC11.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

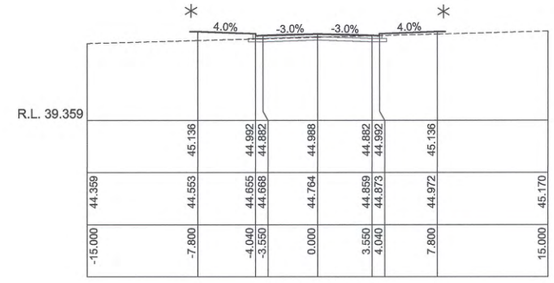
* SEE PLAN FOR LOT GRADING



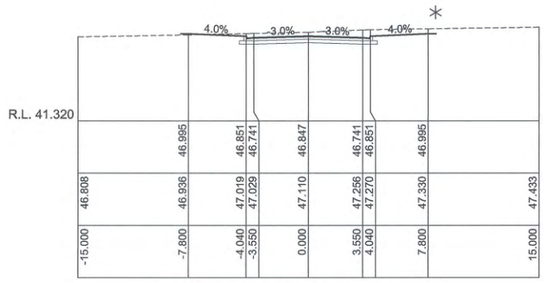
CH 45.502



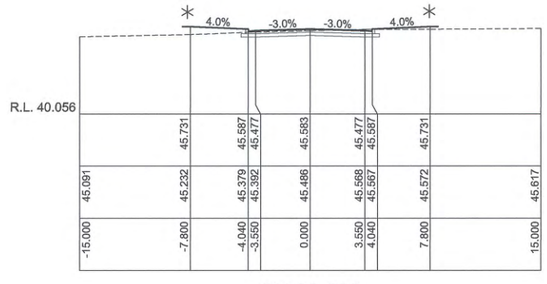
CH 105.000



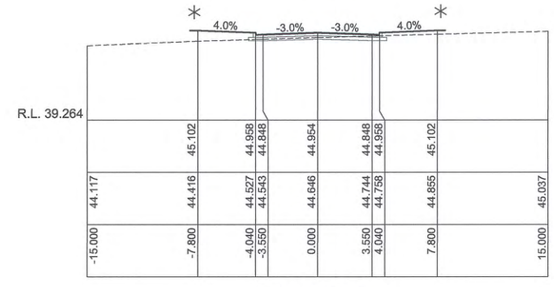
CH 165.000



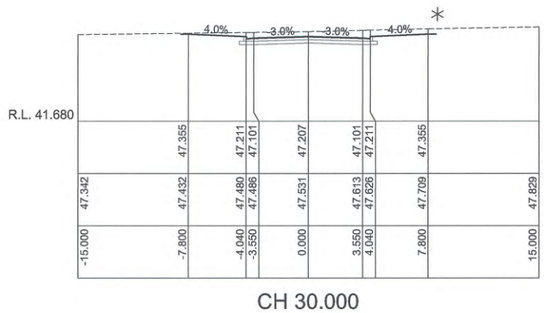
CH 43.298



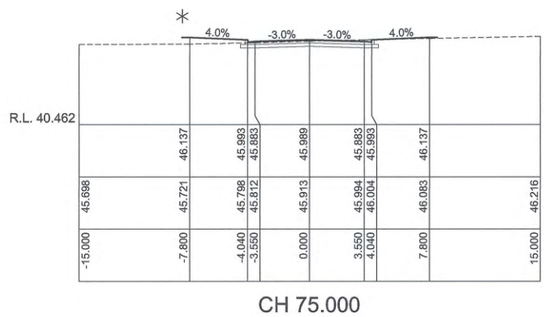
CH 90.000



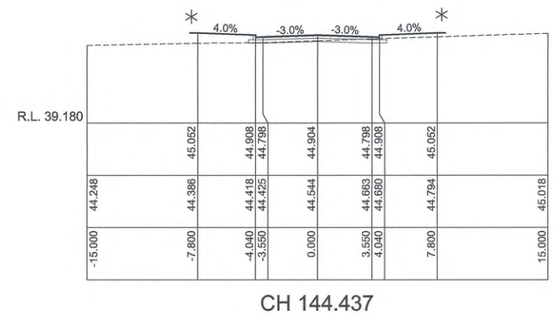
CH 150.000



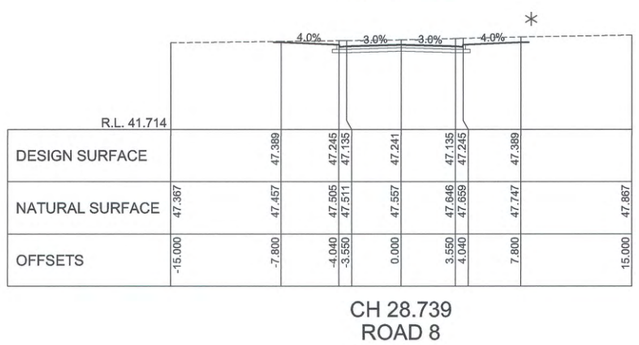
CH 30.000



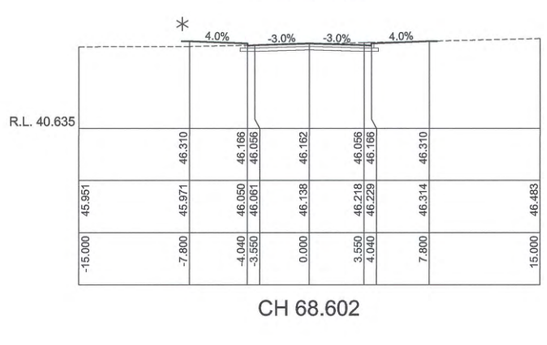
CH 75.000



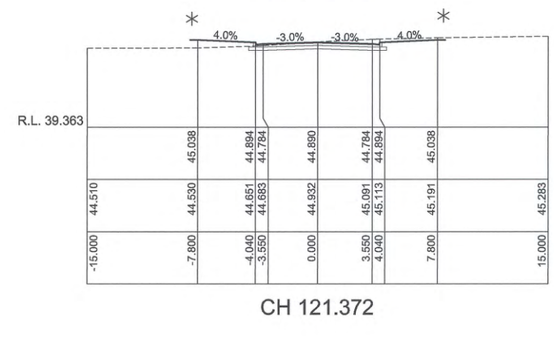
CH 144.437



CH 28.739
ROAD 8



CH 68.602



CH 121.372

This plan/document relates to
DA No: 100790 CCV No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

This plan/document relates
DA No: 100790 100054
Environmental Planning &
PENRITH CITY CO

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

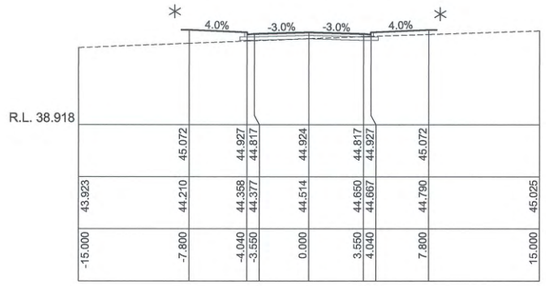
JORDAN SPRINGS
STAGE 1E
ROAD No.8 CROSS SECTIONS

PLAN No. 8953CC12 B
FILE No. 8953CC12
SHEET 12 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:38 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC12.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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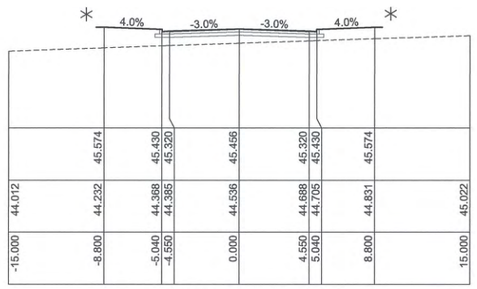

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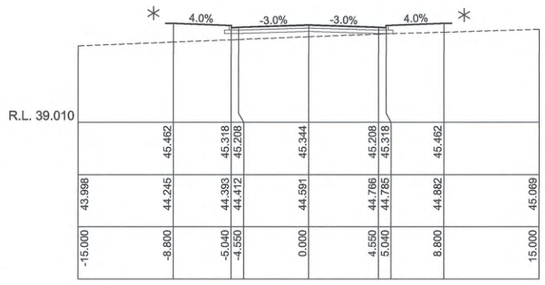

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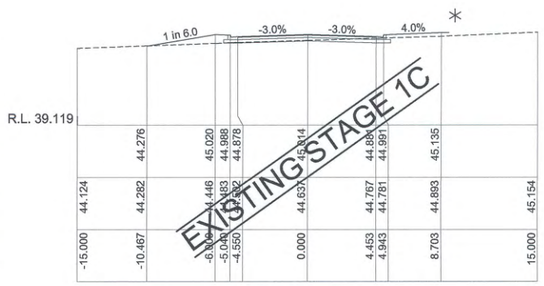

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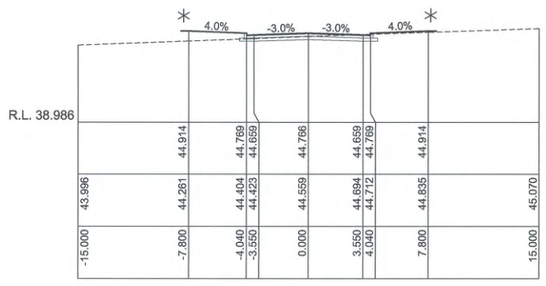

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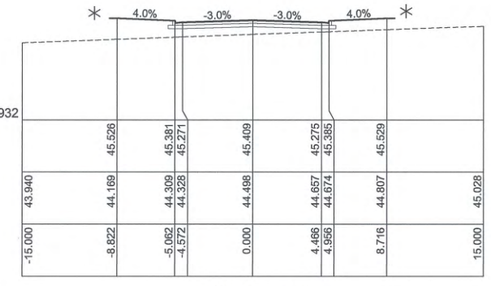

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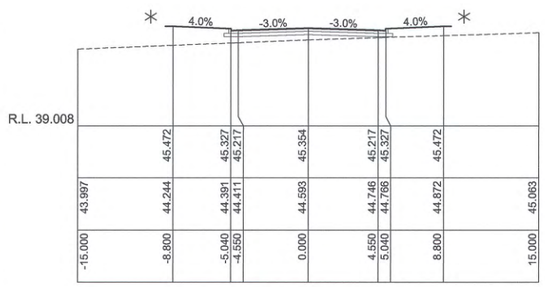

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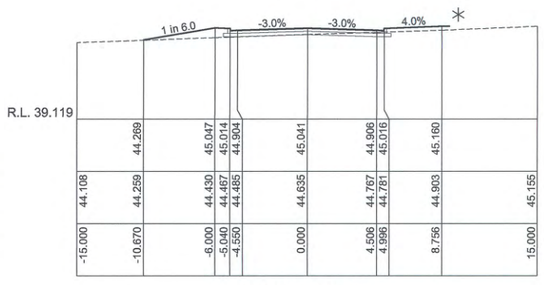

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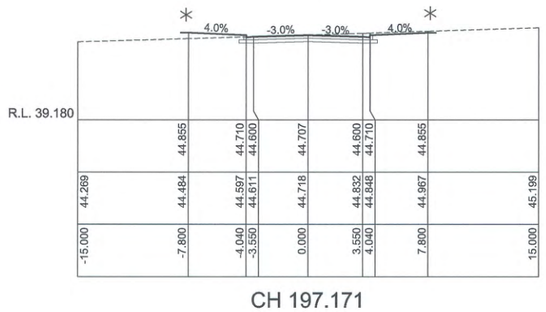

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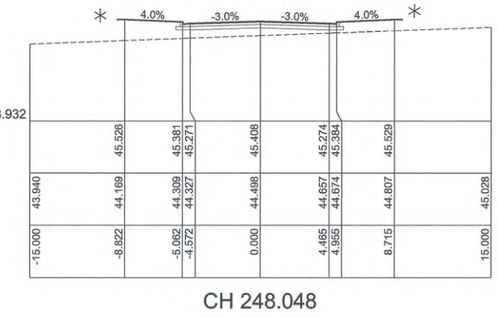

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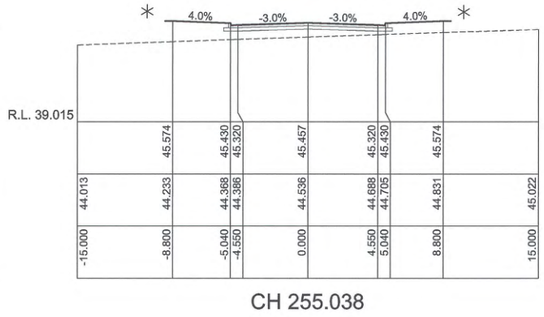

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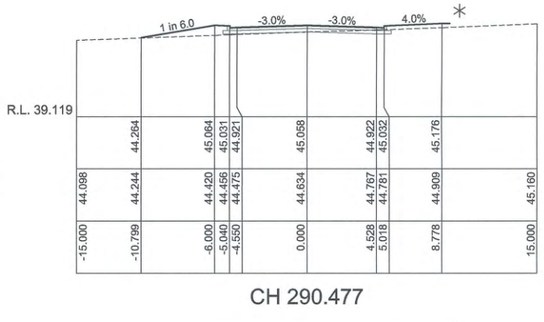

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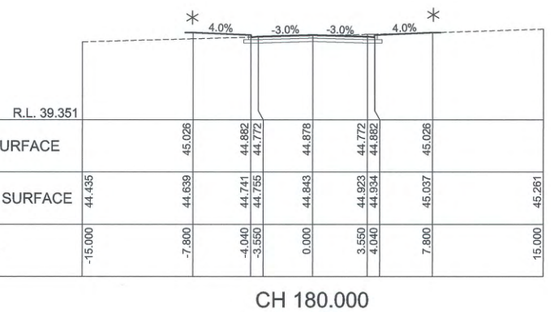

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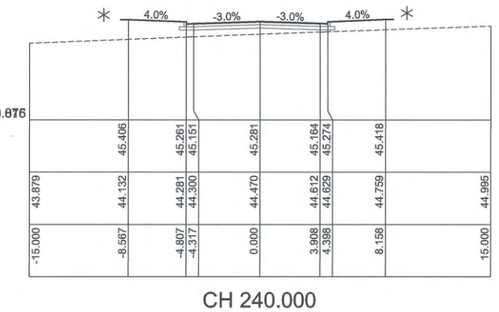
ROAD 8



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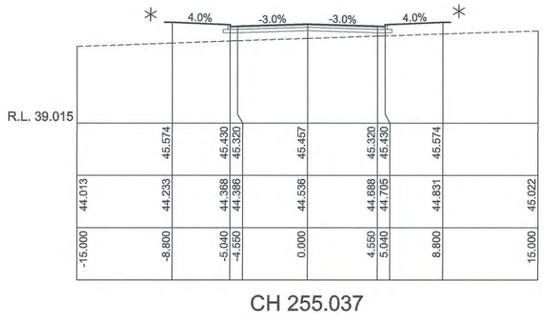

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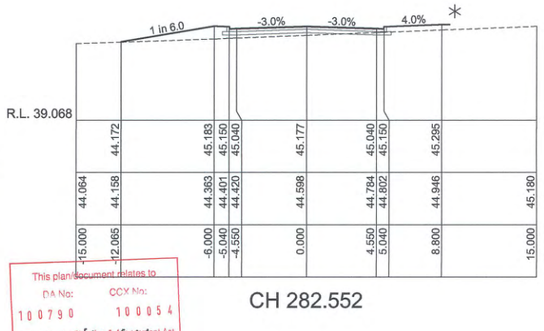

CH 282.552

This plan/document relates to
DA No: 10079 0 CCV No: 10005 4
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1)

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1E
ROAD No.8 & 13 CROSS SECTIONS

PLAN No. 8953CC13 B
FILE No. 8953CC13
SHEET 13 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:42 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC13.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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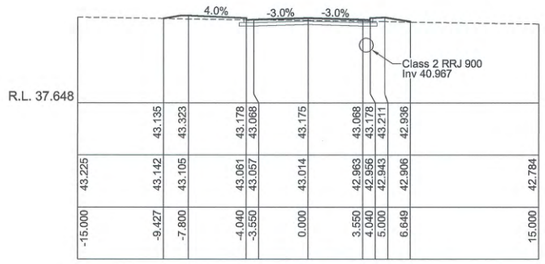

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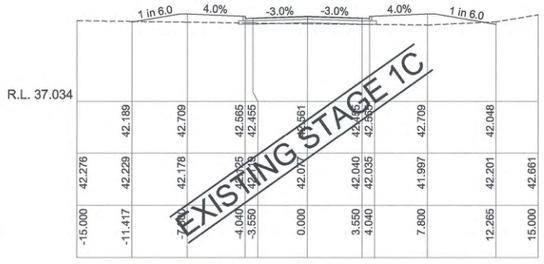

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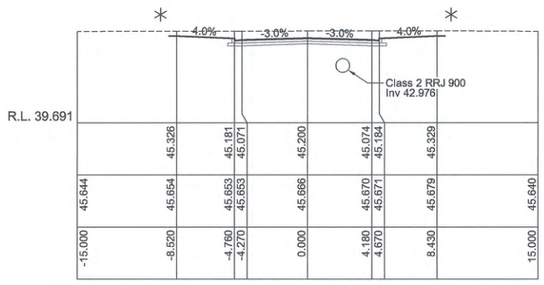

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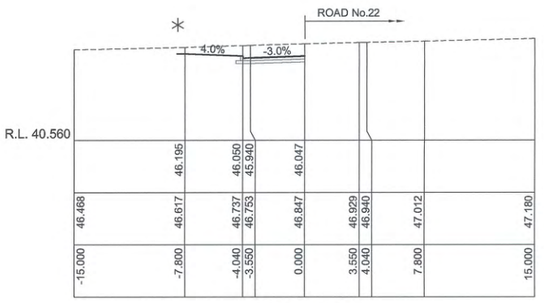

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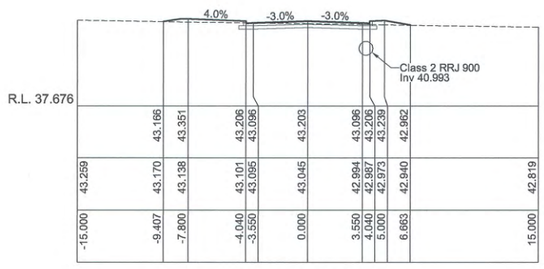

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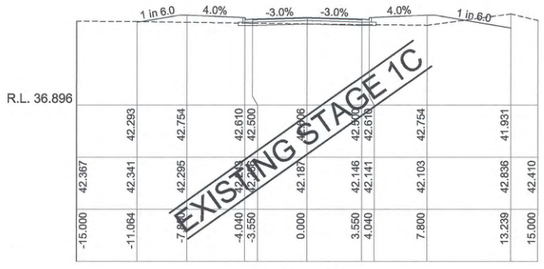

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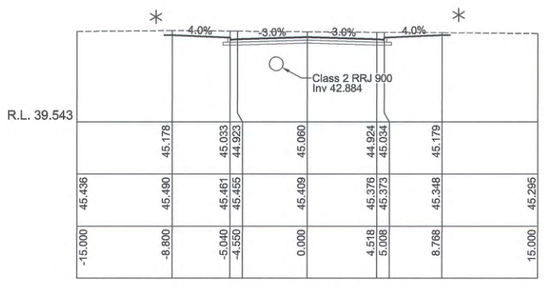

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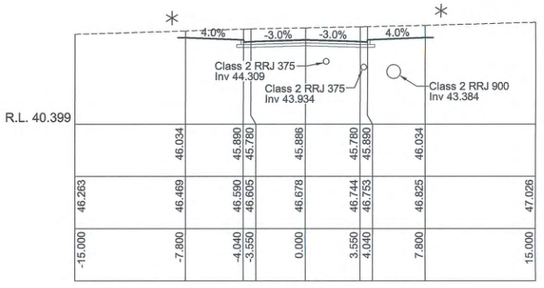

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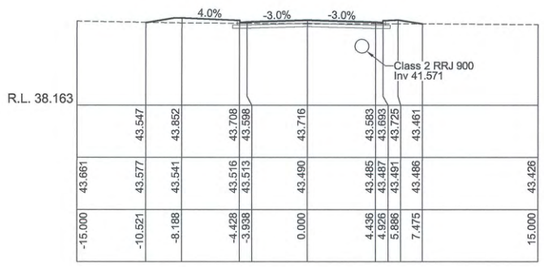

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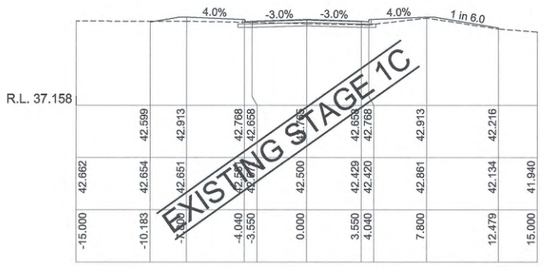

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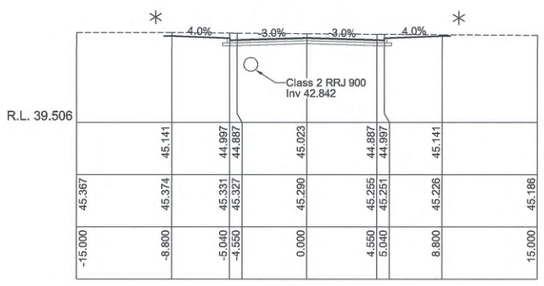

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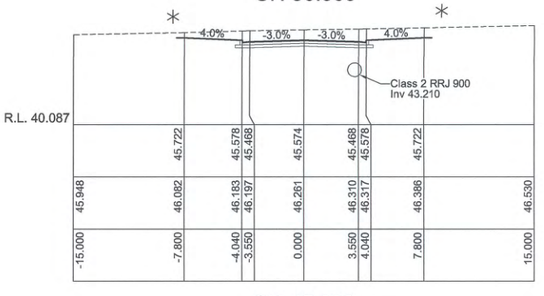

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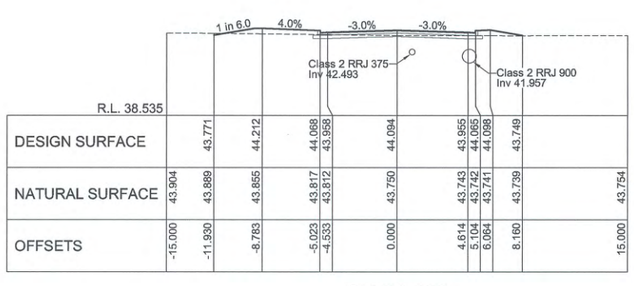

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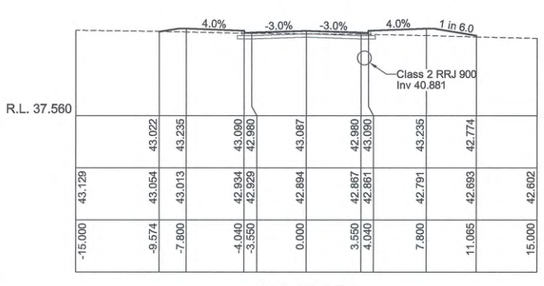
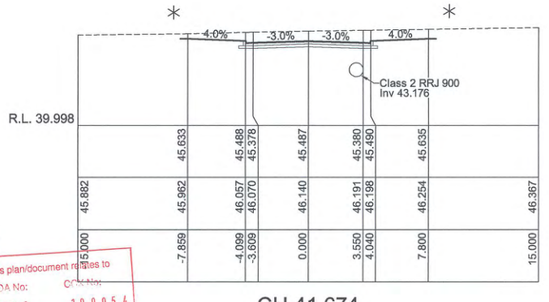


CH 47.854



CH 12.213
ROAD 13



CH 41.674

This plan/document relates to
DA No: 10790 CC No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1)

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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

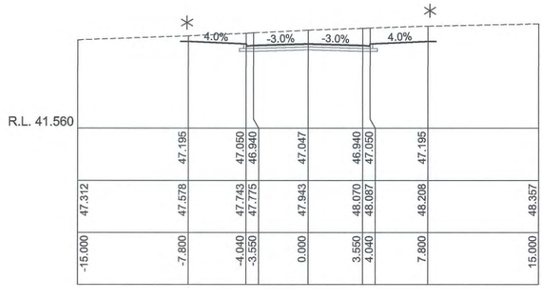
JORDAN SPRINGS
STAGE 1E
ROAD No.13 & 12 CROSS SECTIONS

PLAN No. 8953CC14 B
FILE No. 8953CC14
SHEET 14 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:46 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC14.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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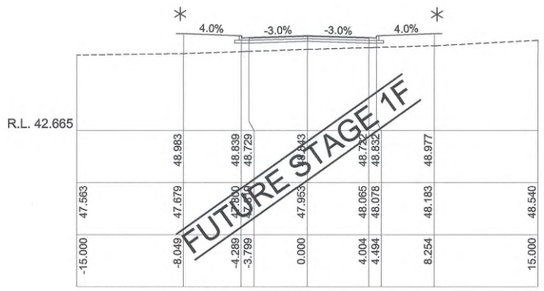

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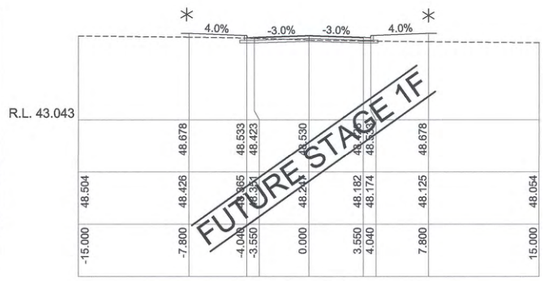

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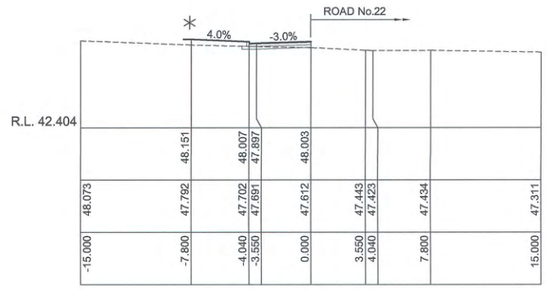

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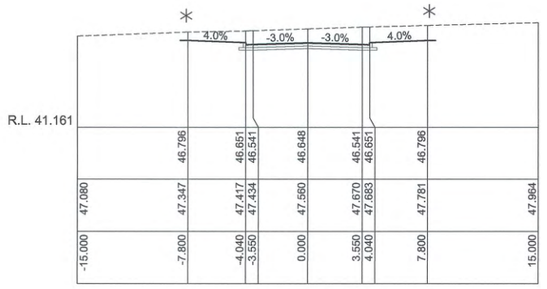

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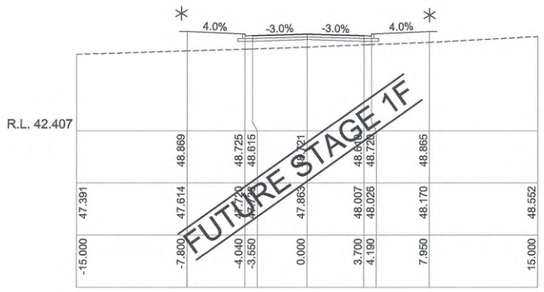

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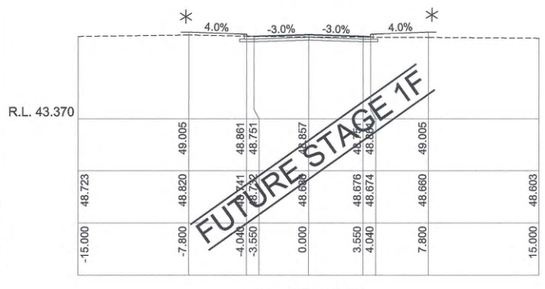

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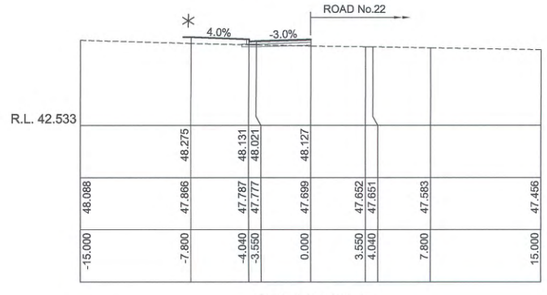

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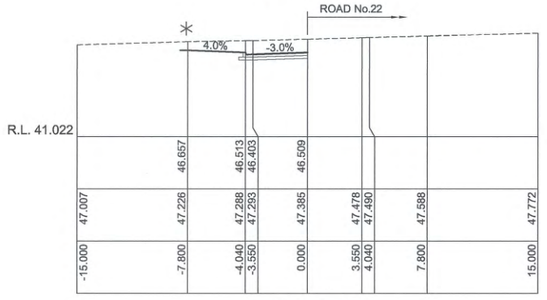

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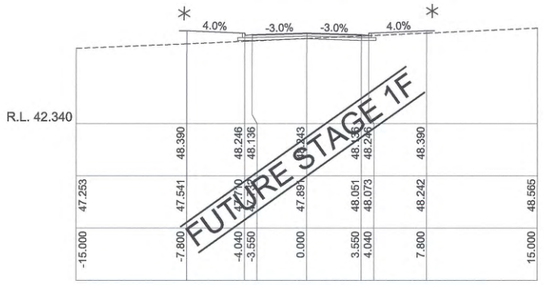

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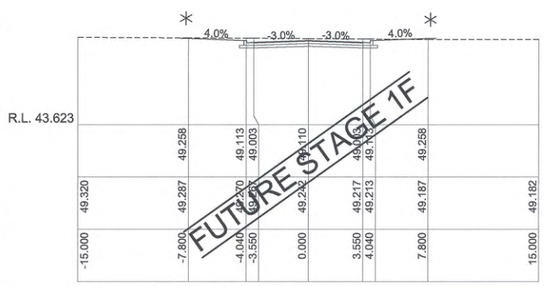

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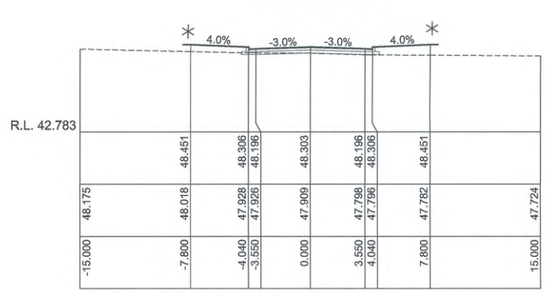

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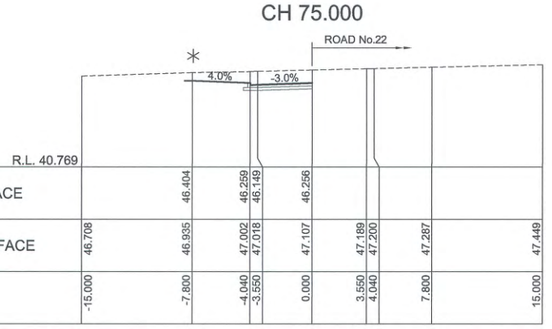

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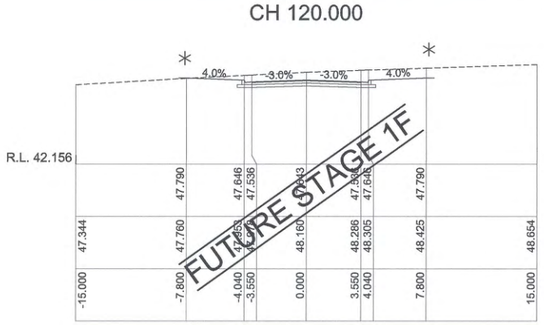

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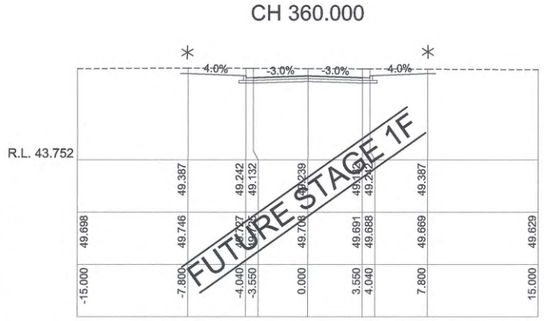

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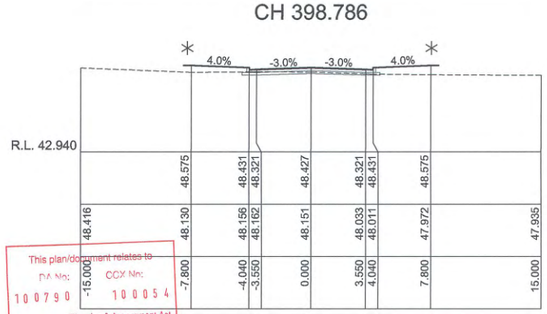

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Environmental Planning & Assessment Act
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CH 394.096

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

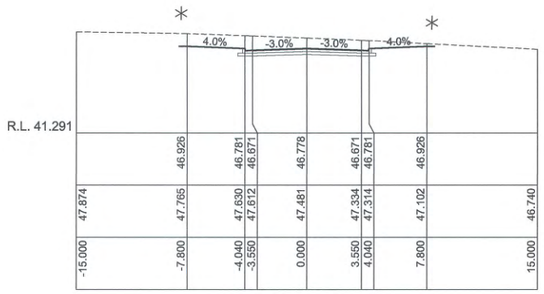
JORDAN SPRINGS
STAGE 1E
ROAD No.13 CROSS SECTIONS

PLAN No. 8953CC15 B
FILE No. 8953CC15
SHEET 15 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:49 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC15.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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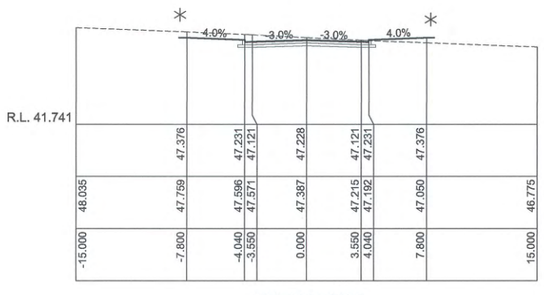

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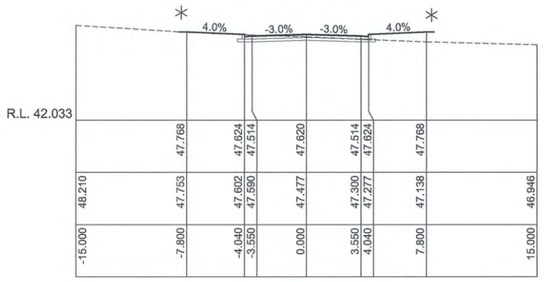

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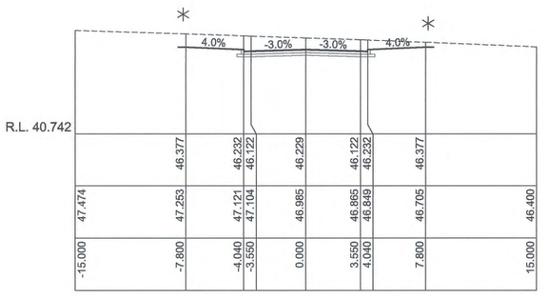

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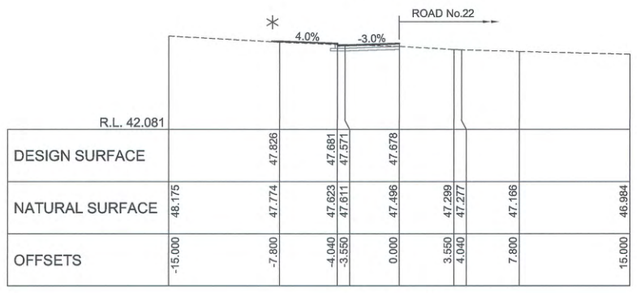

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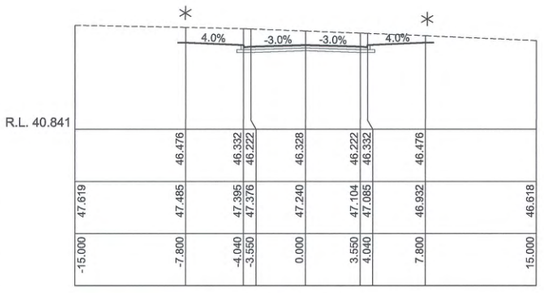
ROAD 13



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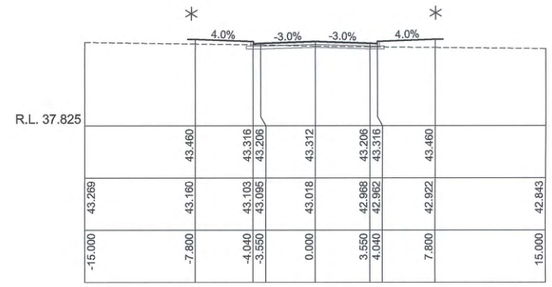

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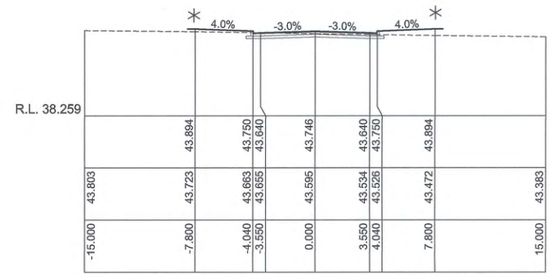

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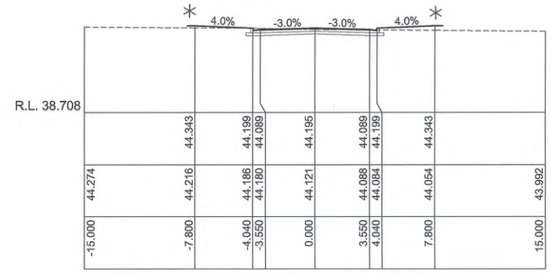

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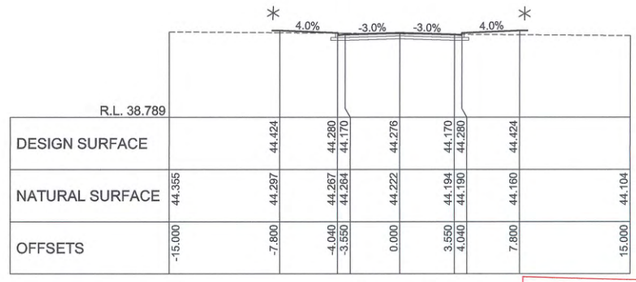

CH 12.297
ROAD 15

This plan/document relates to
DA No: 100790 CCV No: 100054
Environmental Planning & Assessment Act
Eric Hemfield
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
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CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

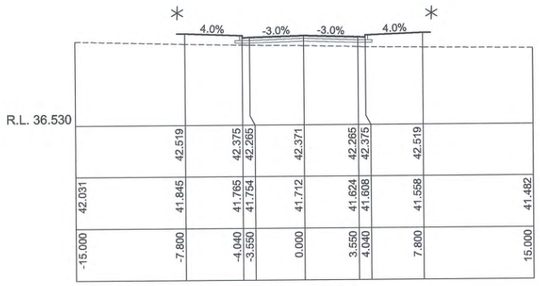
JORDAN SPRINGS
STAGE 1E
ROAD No.13 & 15 CROSS SECTIONS

PLAN No. 8953CC16 B
FILE No. 8953CC16
SHEET 16 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:53 PM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC16.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

✳ SEE PLAN FOR LOT GRADING



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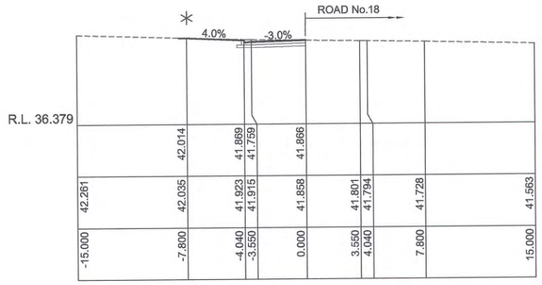

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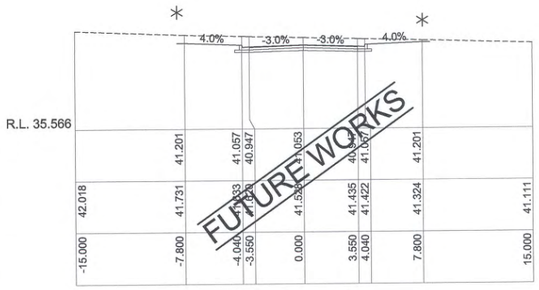

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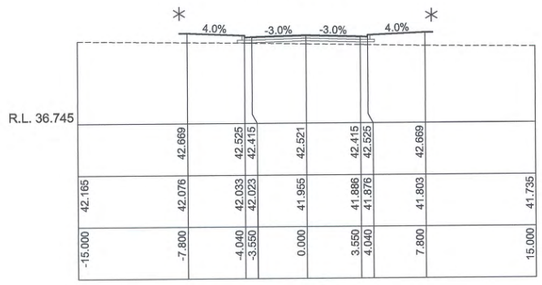

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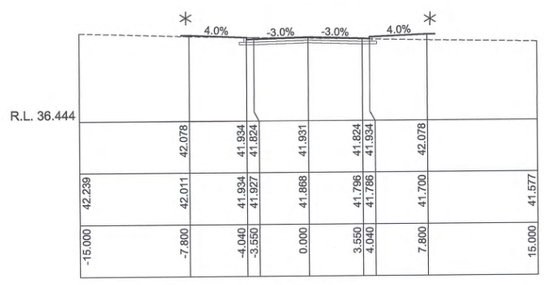

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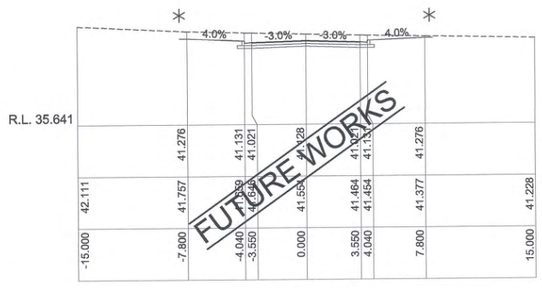

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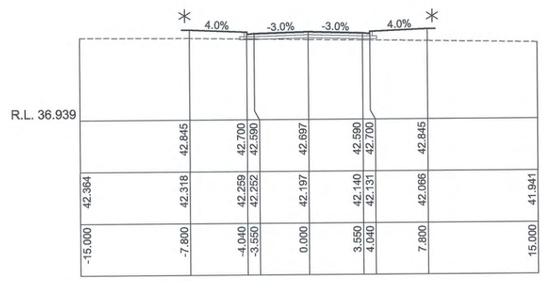

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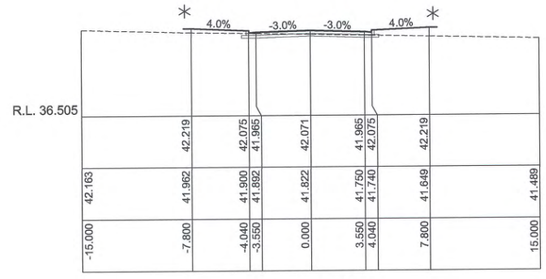

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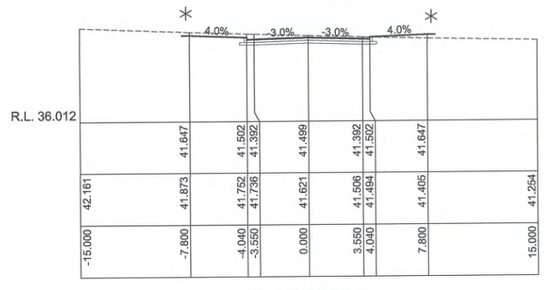

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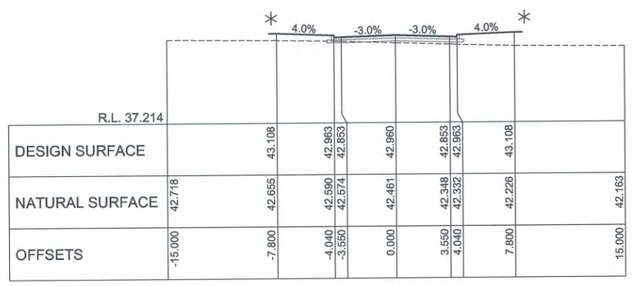
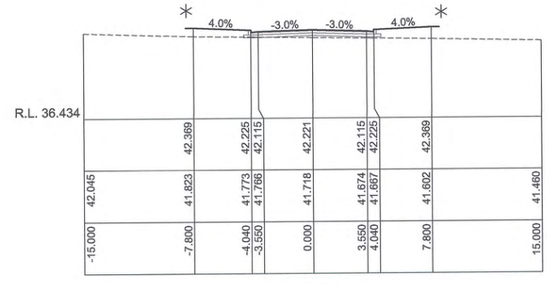


CH 60.000
ROAD 15



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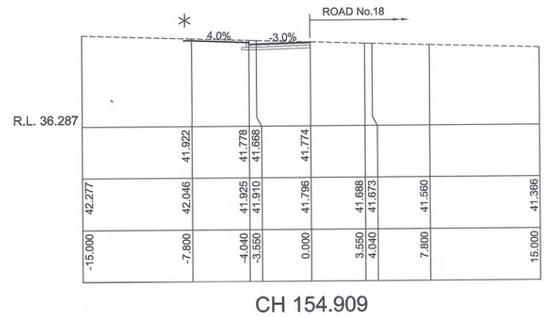

CH 154.909

This plan/document relates to
DA No: 100790 COX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
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SCALES: C.S. 1:200 NAT (AT A1)

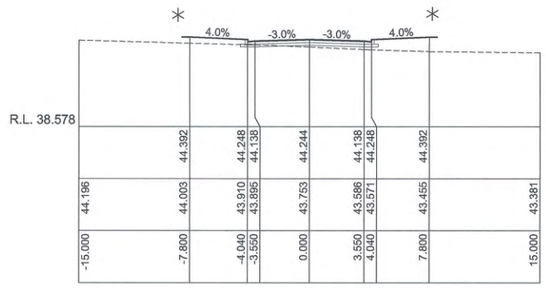
JORDAN SPRINGS
STAGE 1E
ROAD No.15 CROSS SECTIONS

PLAN No. 8953CC17 B
FILE No. 8953CC17
SHEET 17 OF 44 SHEETS

Plotted: 21 Dec 2010 3:09:57 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC17.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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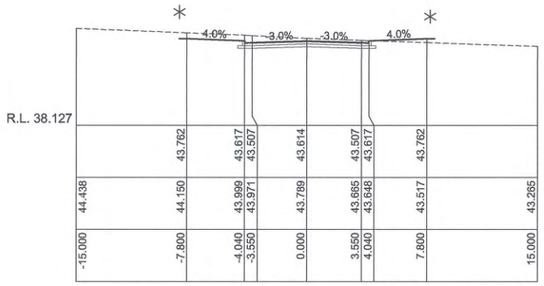

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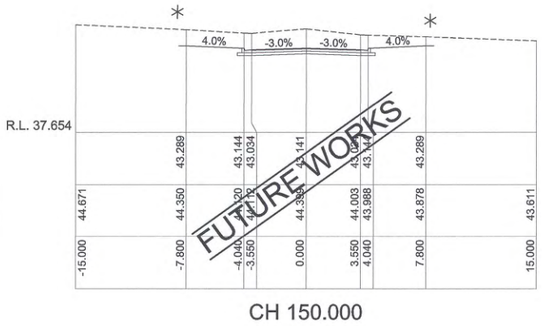

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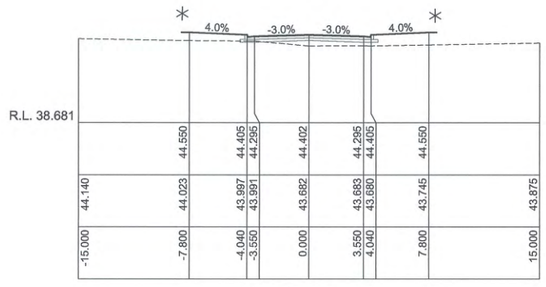

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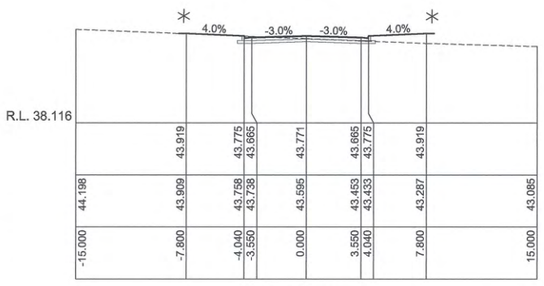

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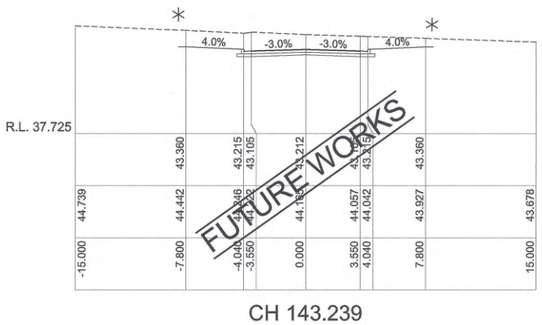

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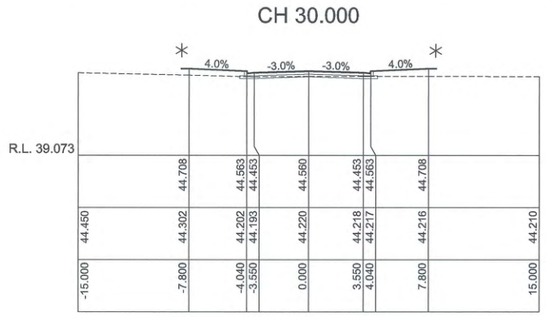

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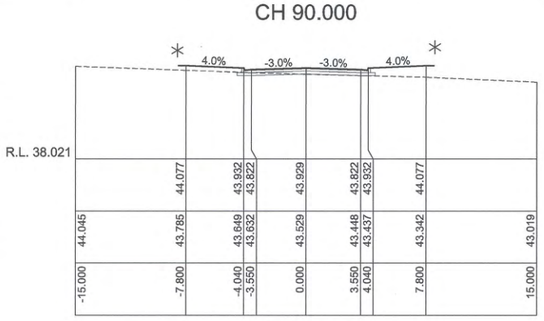

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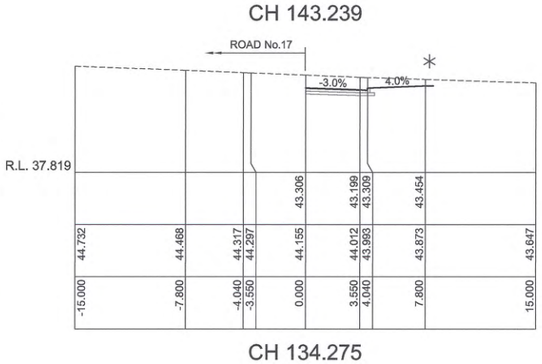
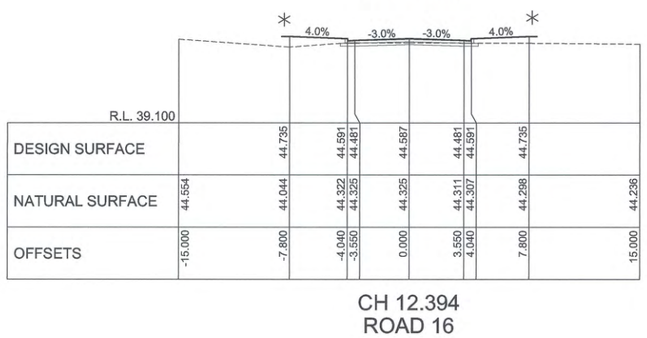
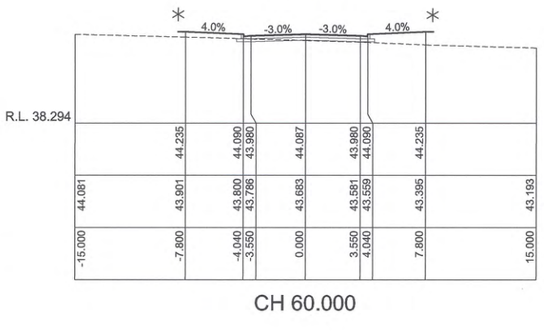


CH 134.275

This plan/document relates to
DA No: 10790 CMX No: 100054
Environmental Planning & Assessment Act
Erin Hemsley
PENRITH CITY COUNCIL



CH 12.394
ROAD 16



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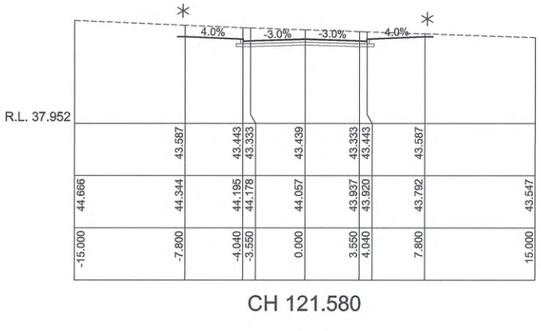

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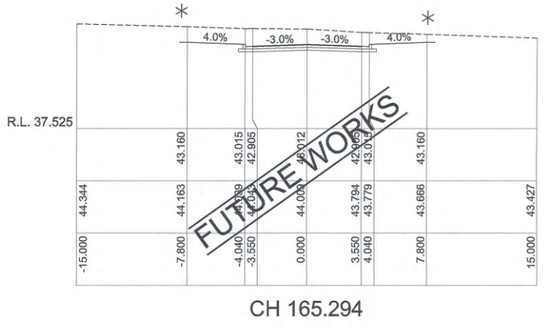

CH 165.294

1:200 (AT A1)

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JORDAN SPRINGS
STAGE 1E
ROAD No.16 CROSS SECTIONS

PLAN No. 8953CC18 B
FILE No. 8953CC18
SHEET 18 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:00 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC18.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

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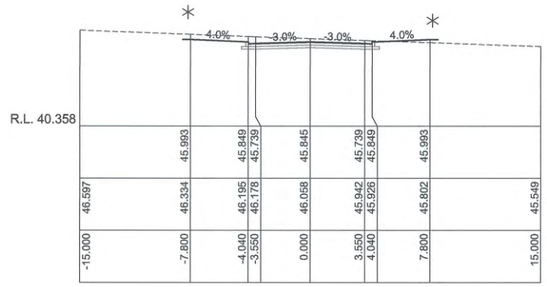

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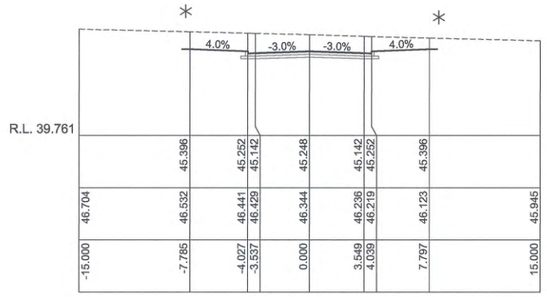

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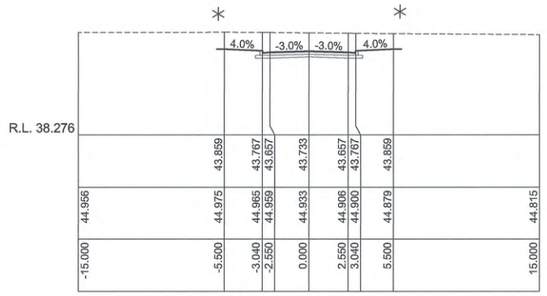

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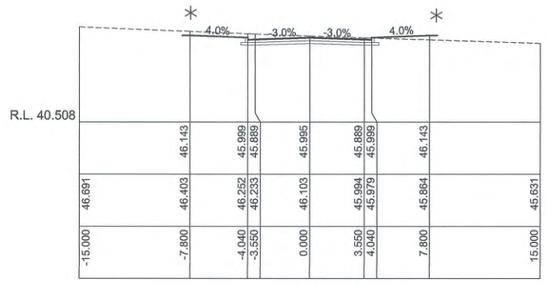

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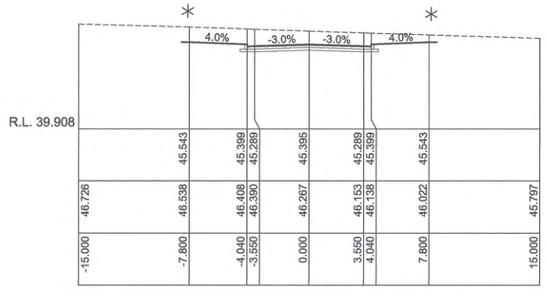
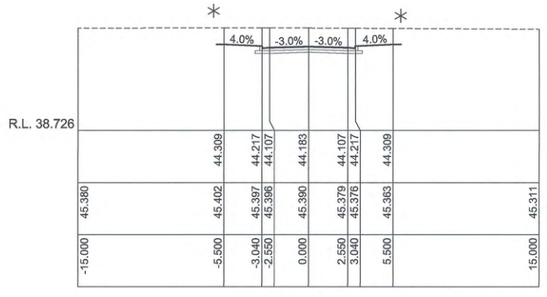


CH 90.000



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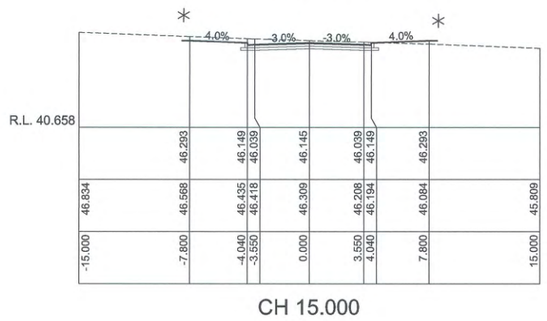

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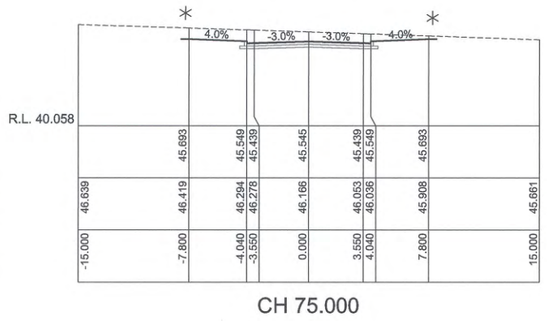

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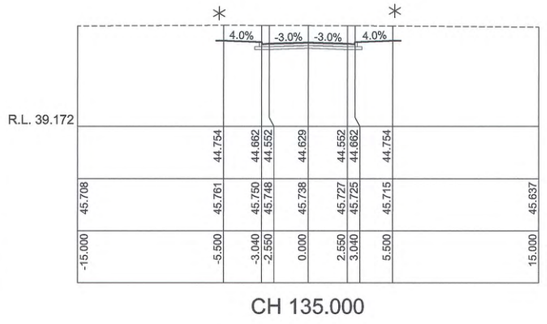

CH 135.000

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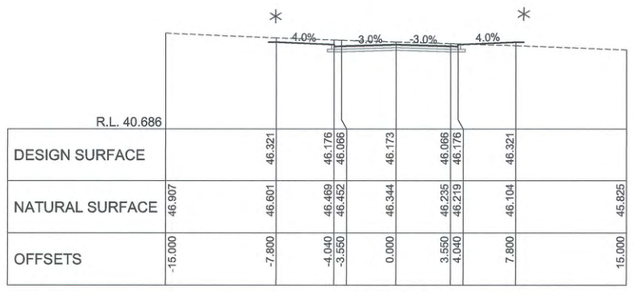
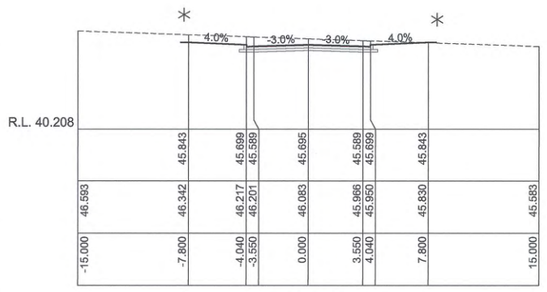
DA No: 10079O CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL



CH 12.518
ROAD 17



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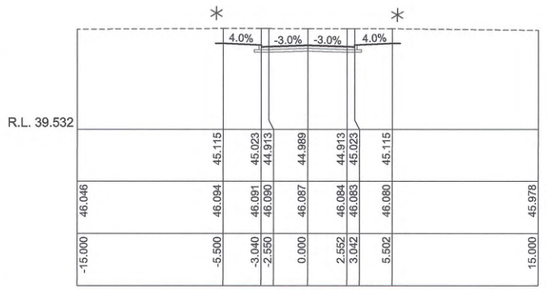

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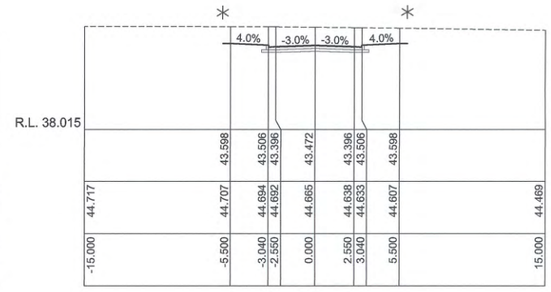

CH 173.701

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DRAWN N.D.W.
CHECKED M.S.
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SCALES: C.S. 1:200 NAT (AT A1)

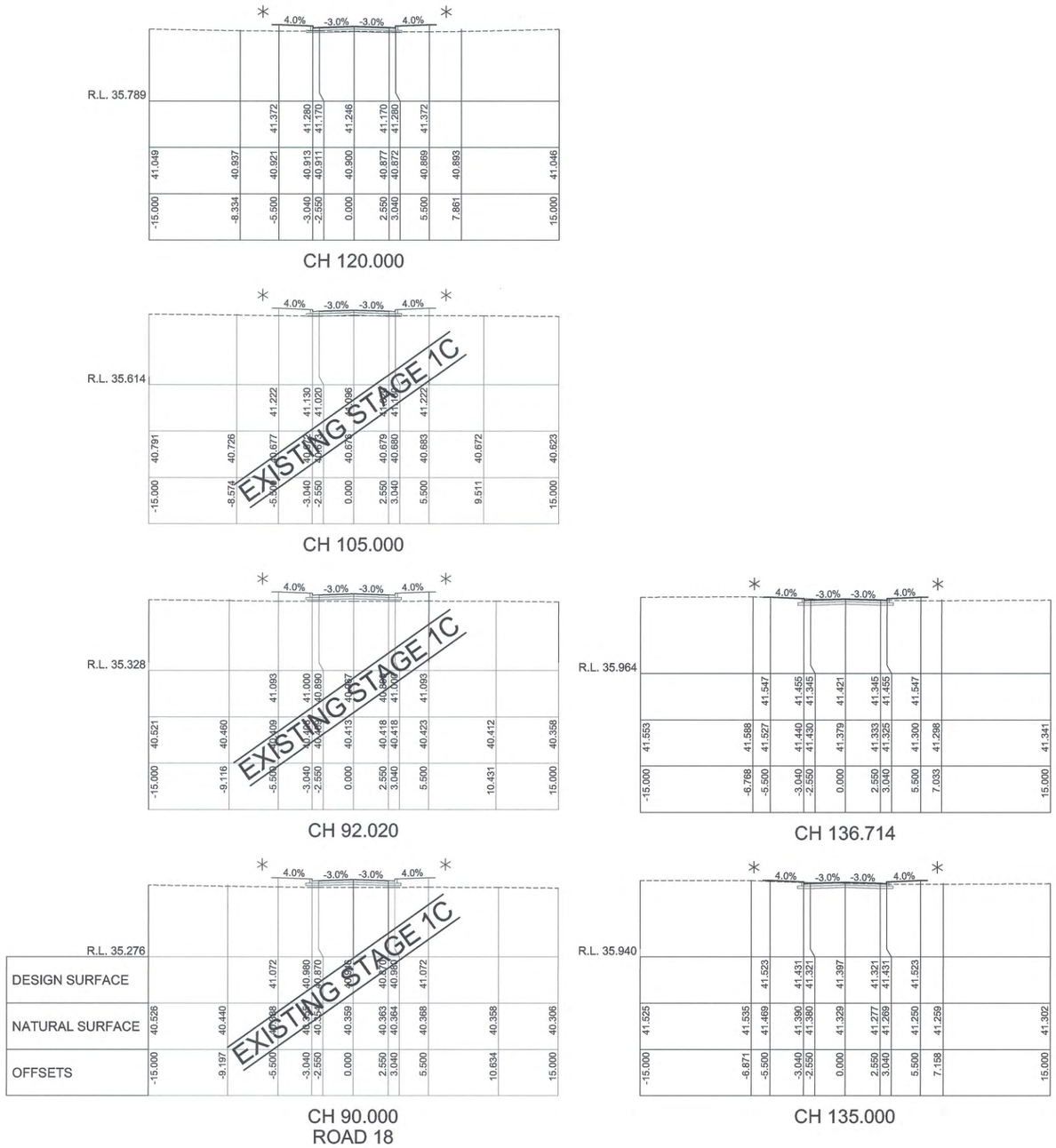
JORDAN SPRINGS
STAGE 1E
ROAD No.17 CROSS SECTIONS

PLAN No. 8953CC19 B
FILE No. 8953CC19
SHEET 19 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:04 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC19.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING



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Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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SIGNED S. Anderson DATE 01/12/10

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DRAWN N.D.W.
CHECKED M.S.
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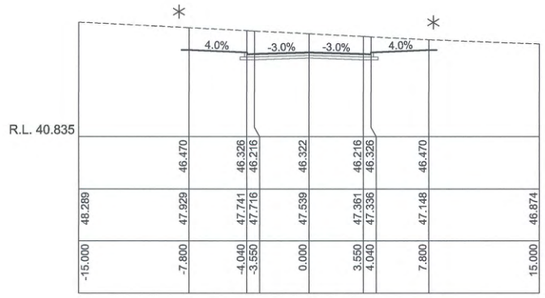
SCALES: C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1E
ROAD No.18 CROSS SECTIONS

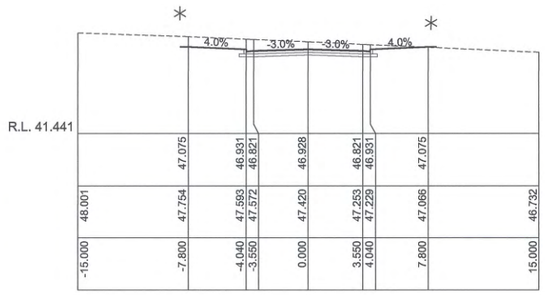
PLAN No. 8953CC20 B
FILE No. 8953CC20
SHEET 20 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:08 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC20.dwg

✳ SEE PLAN FOR LOT GRADING



CH 45.000



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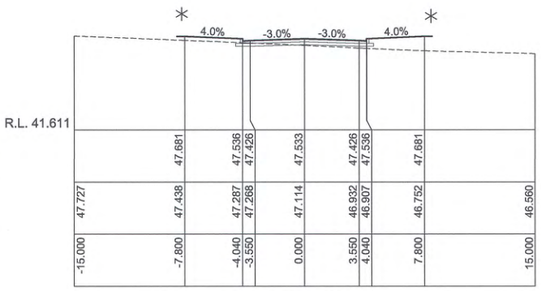

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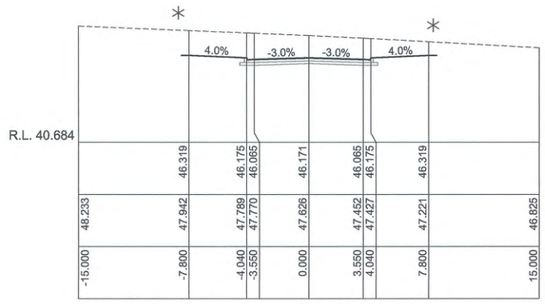

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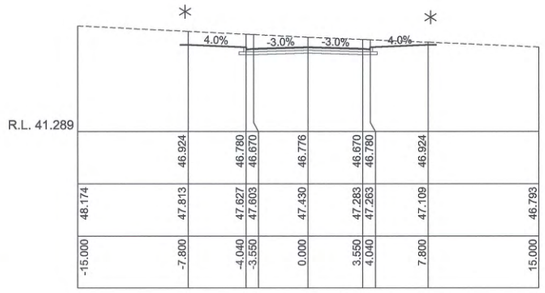

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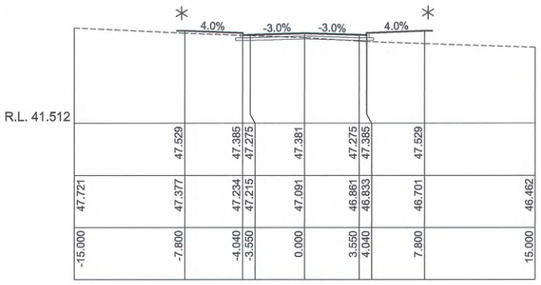

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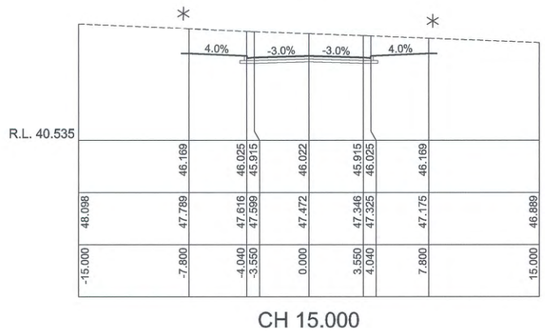

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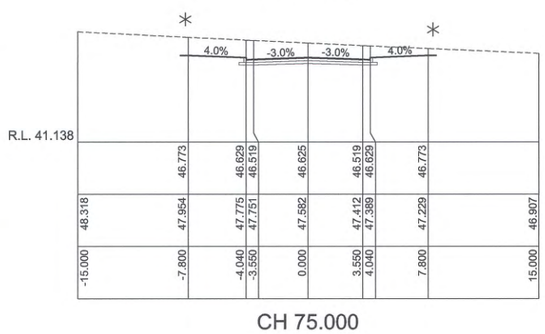

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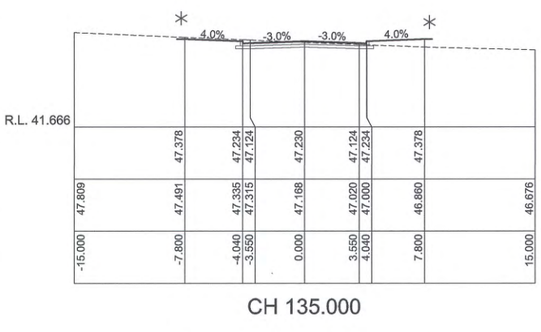

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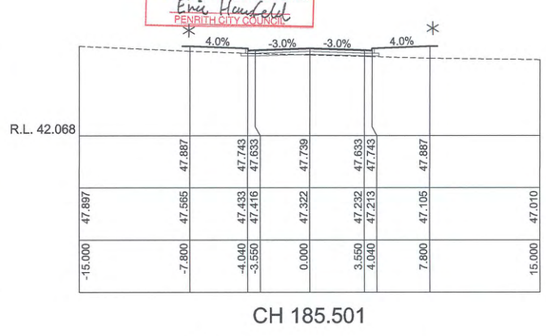

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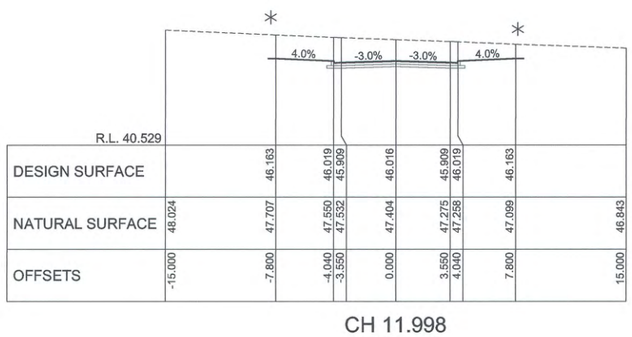
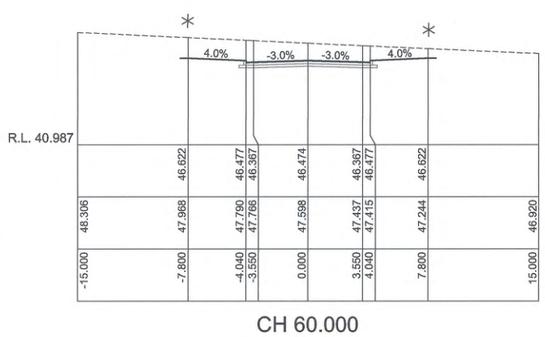


CH 11.998
ROAD 22



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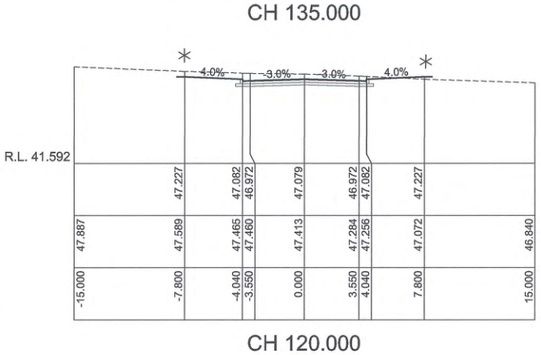

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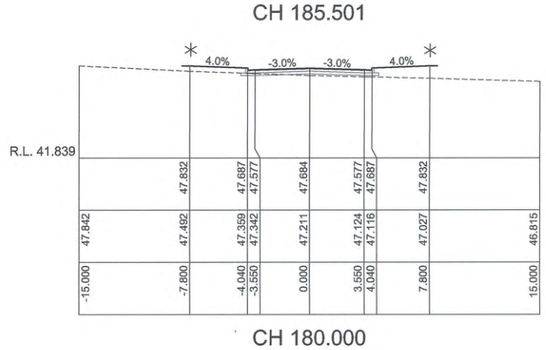

CH 180.000

This plan/document relates to
DA No. 10790 CC No. 100054
Environmental Planning & Assessment Act
Eric Hemsfield
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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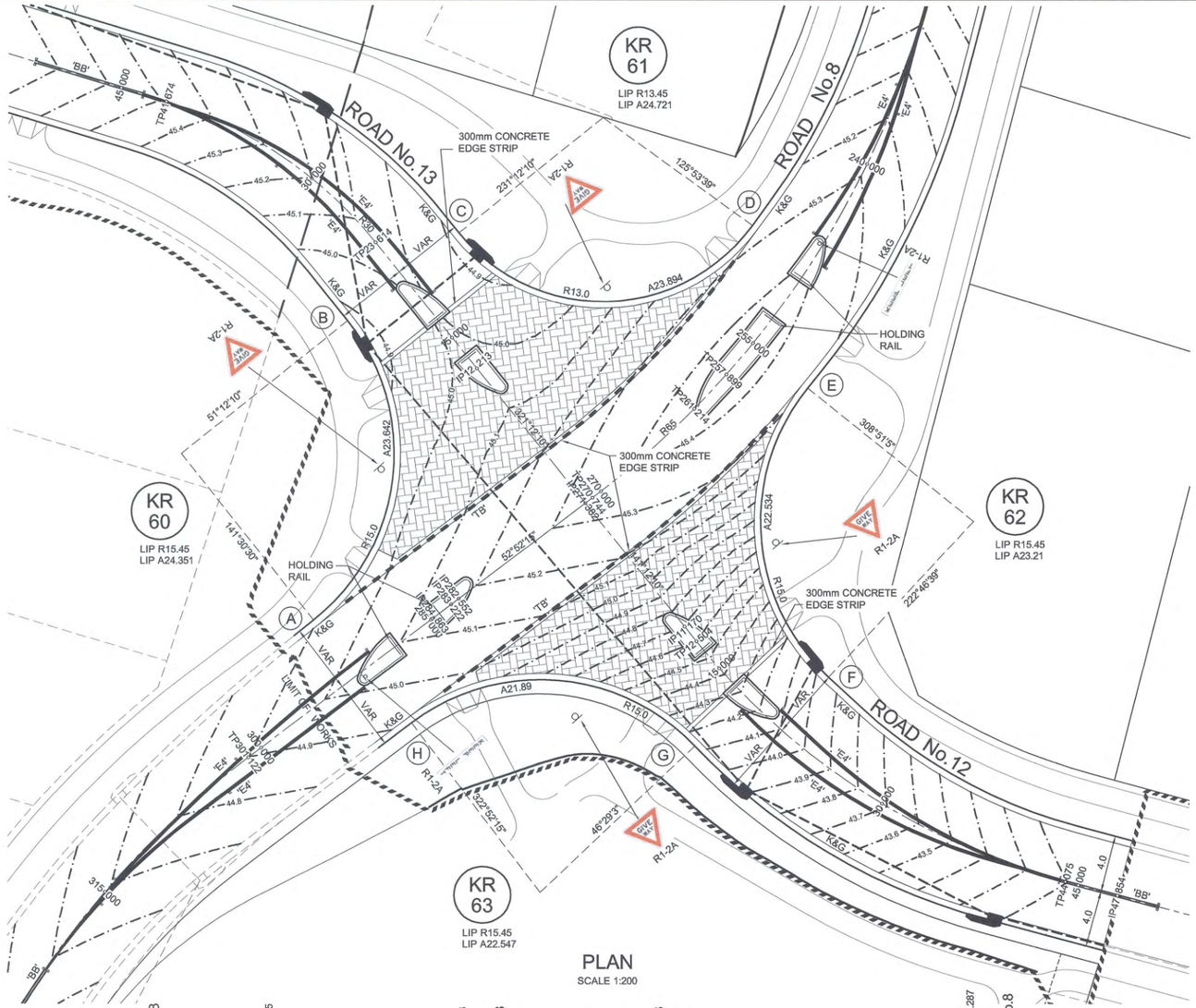
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1E
ROAD No.22 CROSS SECTIONS

PLAN No. 8953CC21 B
FILE No. 8953CC21
SHEET 21 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:11 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC21.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



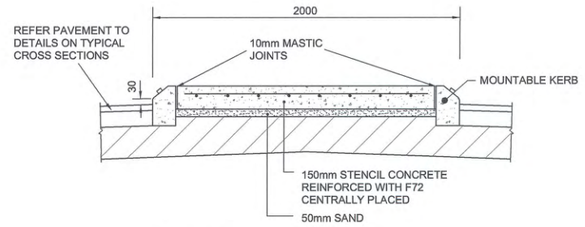
PLAN
SCALE 1:200

- FOOTPATHS & PRAM RAMPS SHOWN
- PEDESTRIAN REFUGE DETAIL ADDED
- LINEMARKING MODIFIED & ADDED

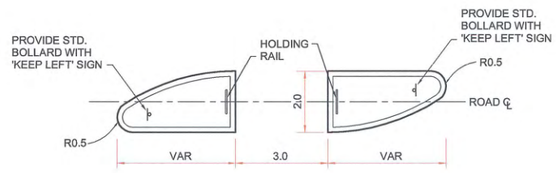
C

NOTE
KERB RETURN LEVELS ARE LIP OF GUTTER

NOTE
MEDIAN ISLAND TO BE CONCRETE INFILL



REFUGE ISLAND DETAIL
SCALE 1:20



TYPICAL DETAIL PEDESTRIAN REFUGE
SCALE 1:100

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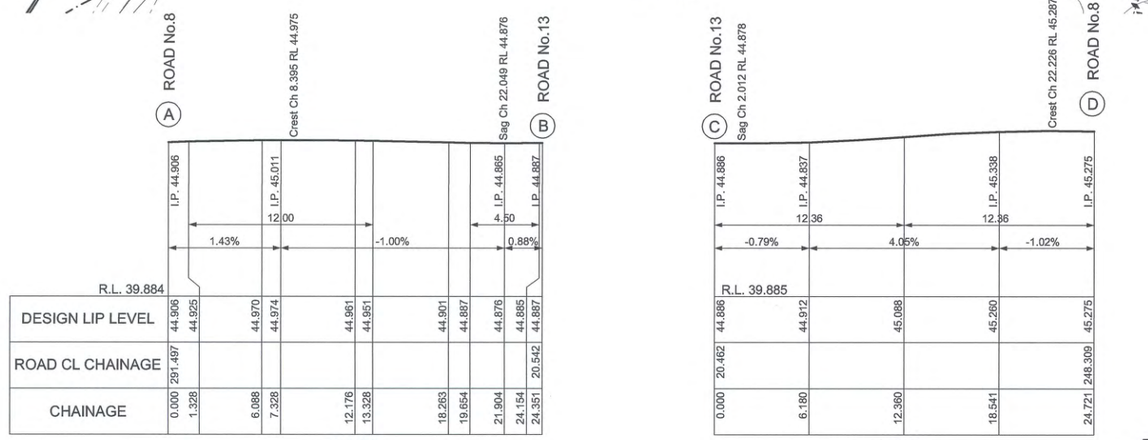
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL





1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES
1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	AMENDMENTS AS NOTED	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:200 H, 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1E
KERB RETURNS No.60, 61, 62 & 63

PLAN No. 8953CC22 C
FILE No. 8953CC22
SHEET 22 OF 46 SHEETS

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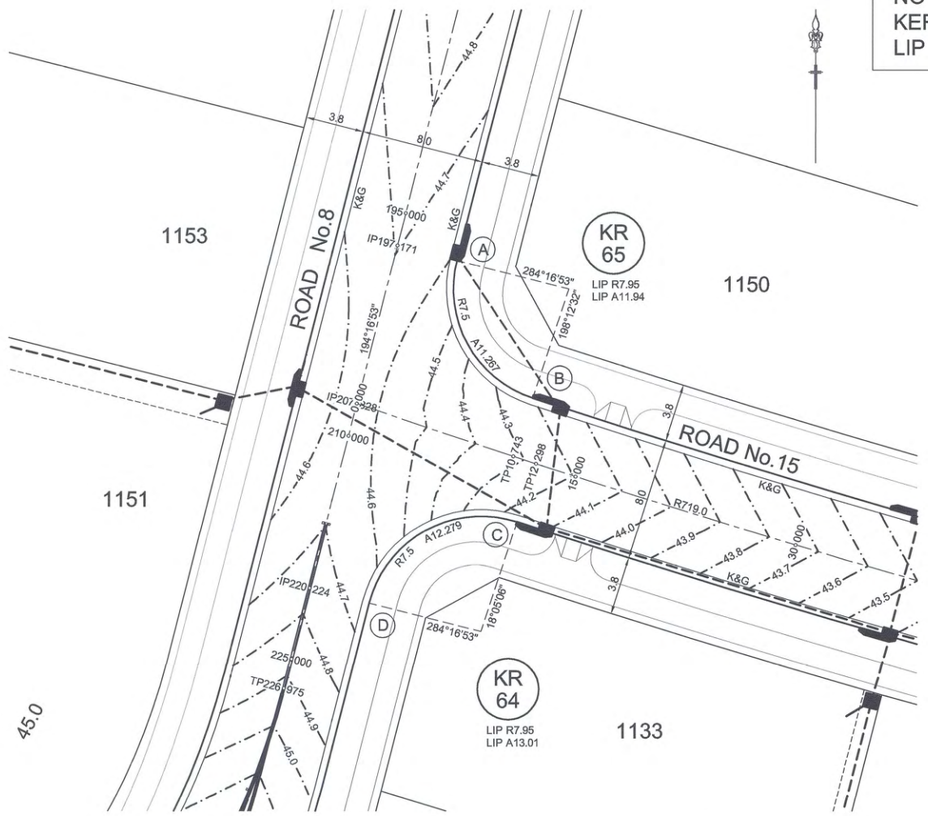
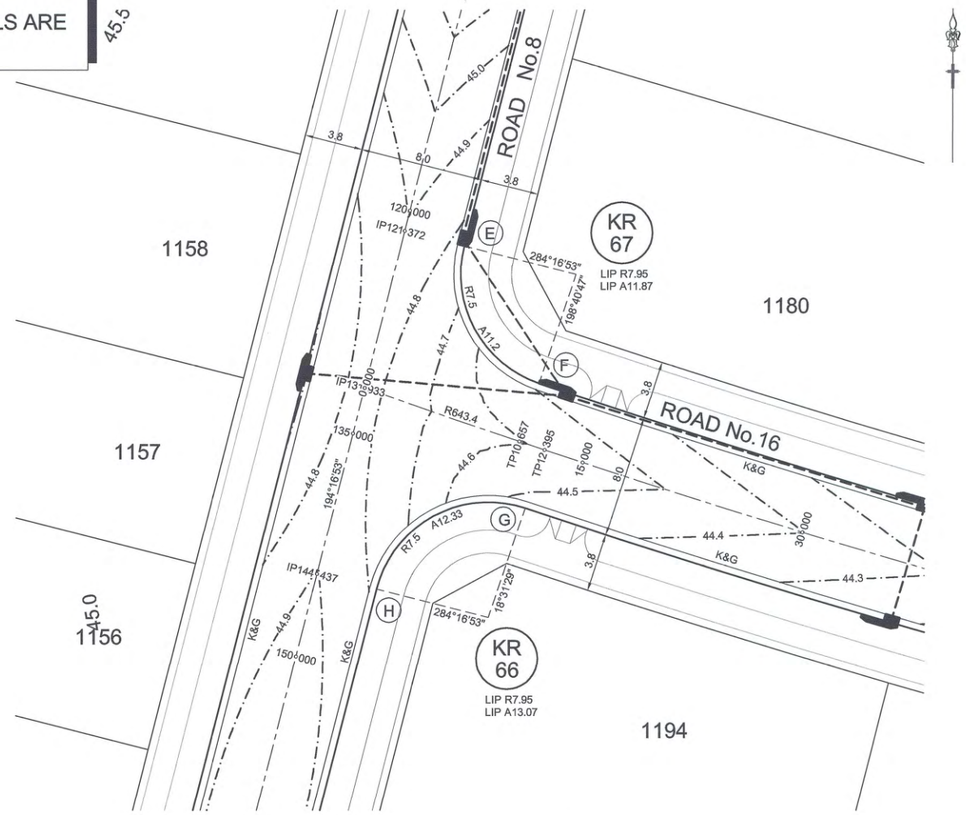
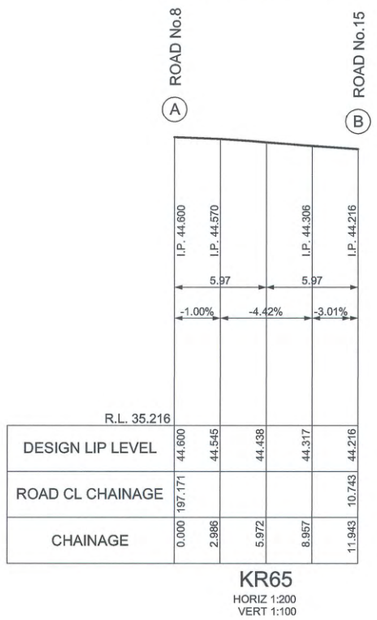
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

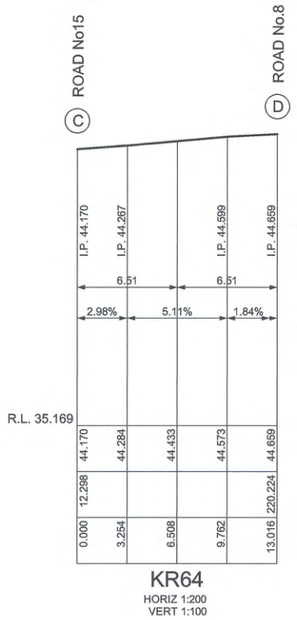
NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER







KR65
HORIZ 1:200
VERT 1:100



KR64
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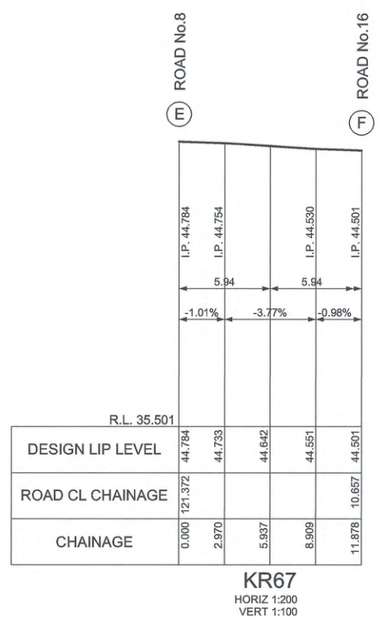

KR67
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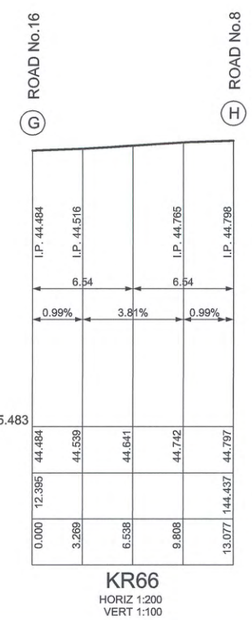
VERT 1:100



KR66
HORIZ 1:200
VERT 1:100

This plan/document relates to
DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:200 H 1:100 V (AT A1)

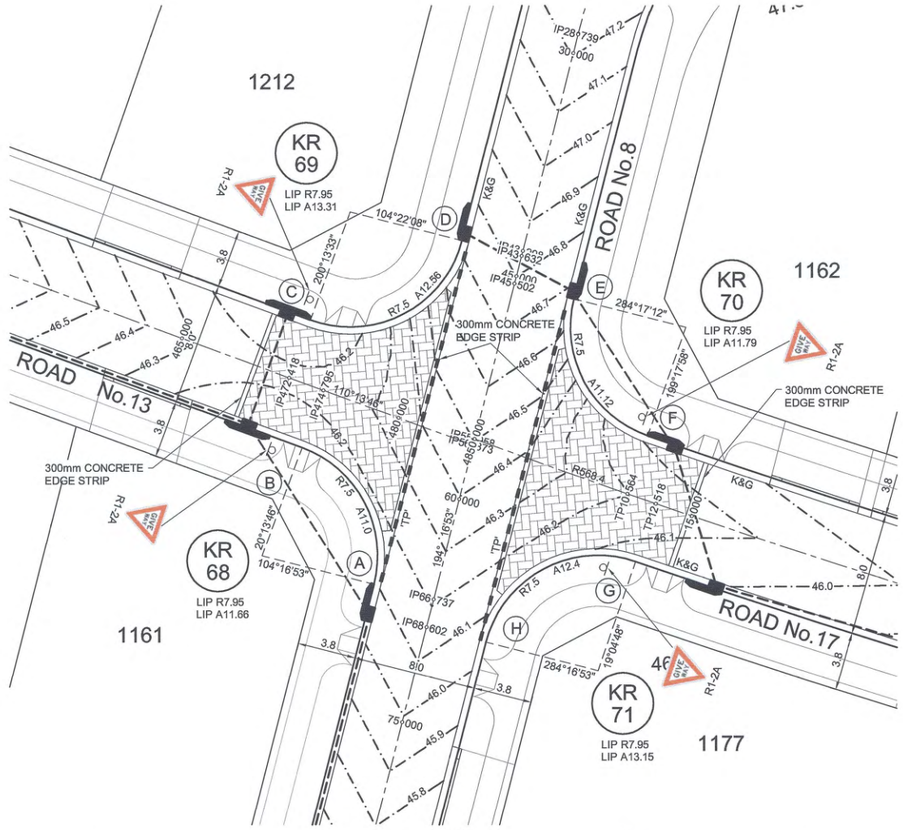
JORDAN SPRINGS
STAGE 1E
KERB RETURNS No.64, 65, 66 & 67

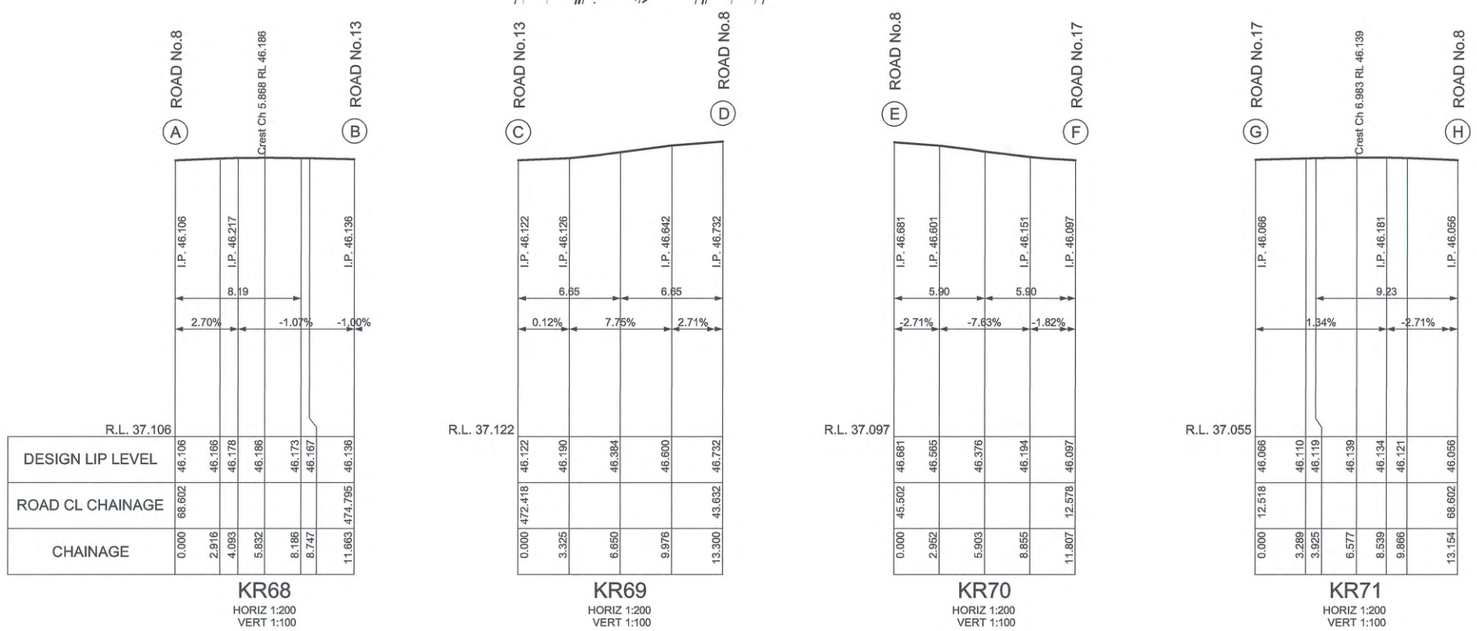
PLAN No. 8953CC23 B
FILE No. 8953CC23
SHEET 23 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:24 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC23.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER





	I.P. 46.106	I.P. 46.217			I.P. 46.136
DESIGN LIP LEVEL	46.106	46.166	46.178	46.186	46.173	46.167	46.136
ROAD CL CHAINAGE	68.602						474.795
CHAINAGE	0.000	2.916	4.093	5.832	8.186	8.747	11.863

	I.P. 46.122	I.P. 46.126	I.P. 46.842	I.P. 46.732
DESIGN LIP LEVEL	46.122	46.190	46.384	46.600	46.732
ROAD CL CHAINAGE	472.418				43.632
CHAINAGE	0.000	3.325	6.650	9.976	13.300

	I.P. 46.681	I.P. 46.601	I.P. 46.151	I.P. 46.097
DESIGN LIP LEVEL	46.681	46.565	46.376	46.194	46.097
ROAD CL CHAINAGE	45.502				12.578
CHAINAGE	0.000	2.952	5.903	8.855	11.807

	I.P. 46.066	I.P. 46.181	I.P. 46.056
DESIGN LIP LEVEL	46.066	46.110	46.119	46.139	46.134	46.121	46.056
ROAD CL CHAINAGE	12.518						68.602
CHAINAGE	0.000	3.289	3.925	6.577	8.539	9.866	13.154

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES
1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

This plan/document relates to
DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:200 H 1:100 V (AT A1)

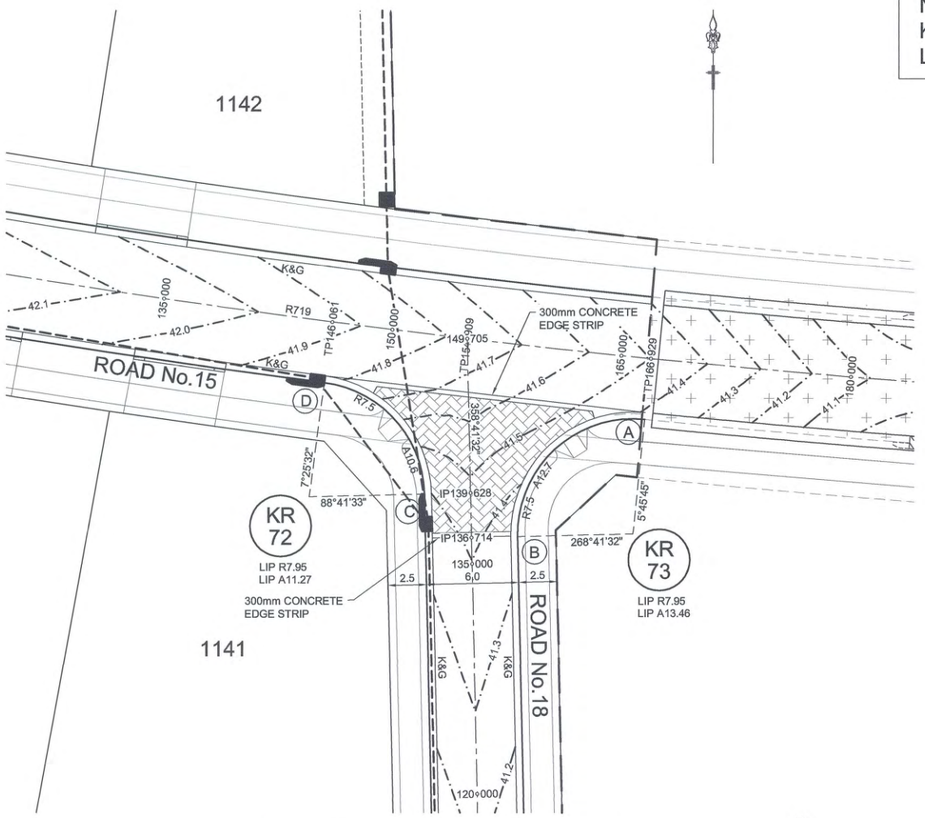
JORDAN SPRINGS
STAGE 1E
KERB RETURNS No.68, 69, 70 & 71

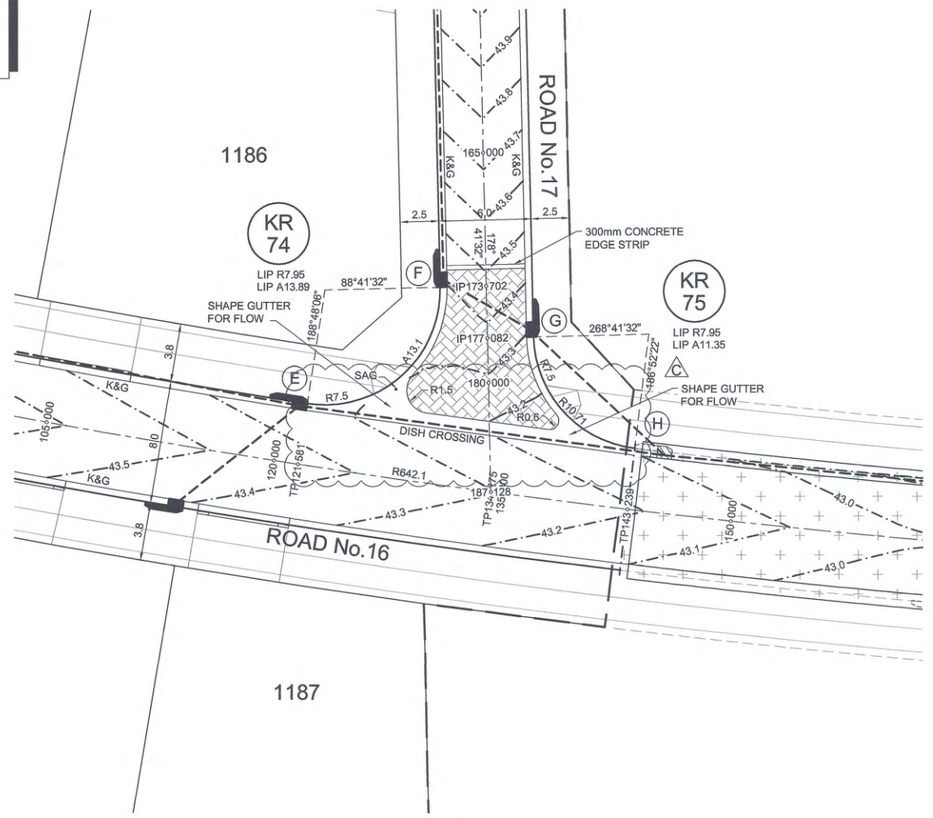
PLAN No. 8953CC24 B
FILE No. 8953CC24
SHEET 24 OF 44 SHEETS

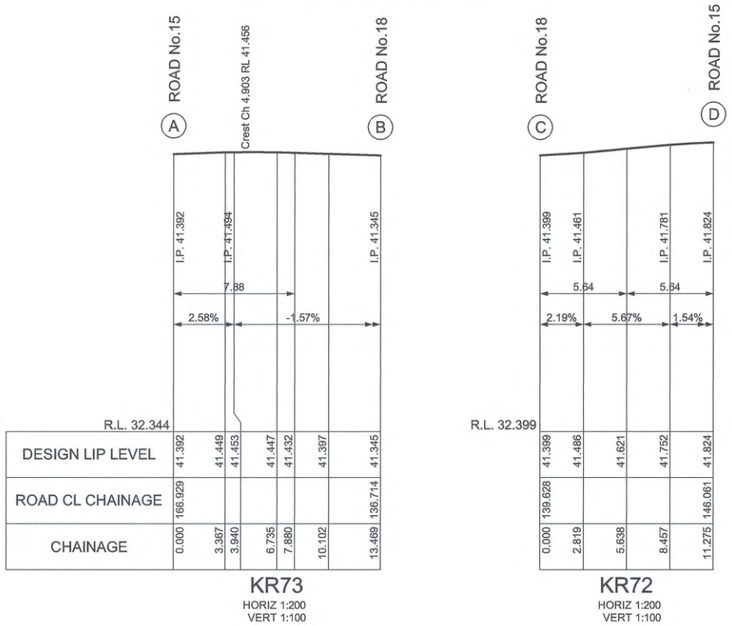
Plotted: 21 Dec 2010 3:10:35 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC24.dwg

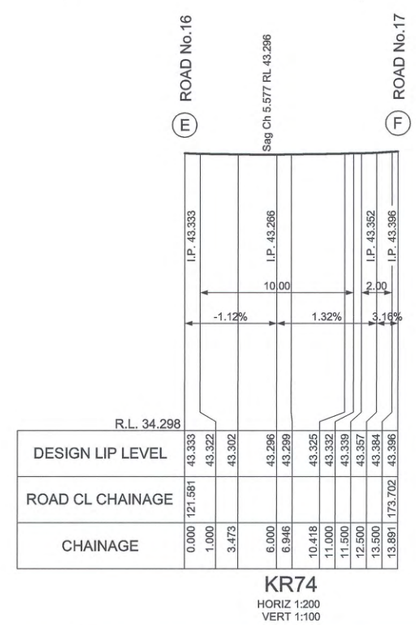
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

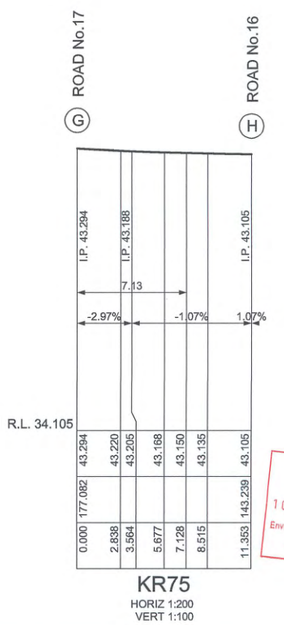
NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER











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1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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ISSUE	AMENDMENT	DATE	BY
C	DISH CROSSING AMENDED, NOTES ADDED	20-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.

DATUM: ORIGIN:
SCALES:
L.S. 1:200 H
1:100 V
(AT A1)

CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

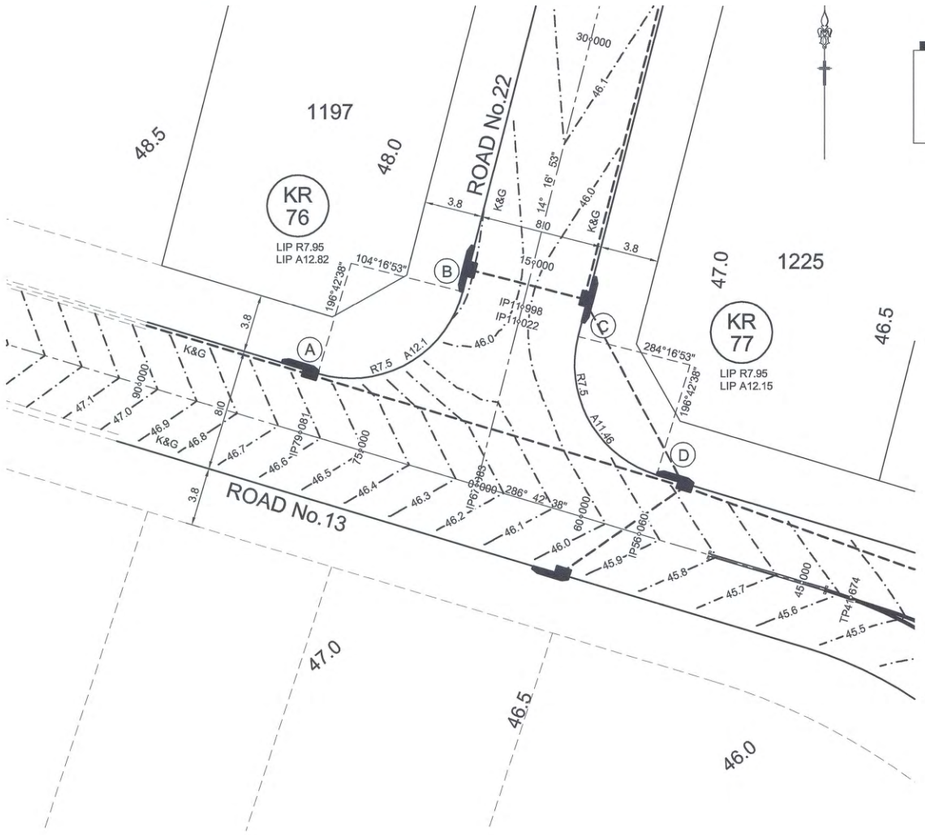
JORDAN SPRINGS
STAGE 1E
KERB RETURNS No.72, 73, 74 & 75

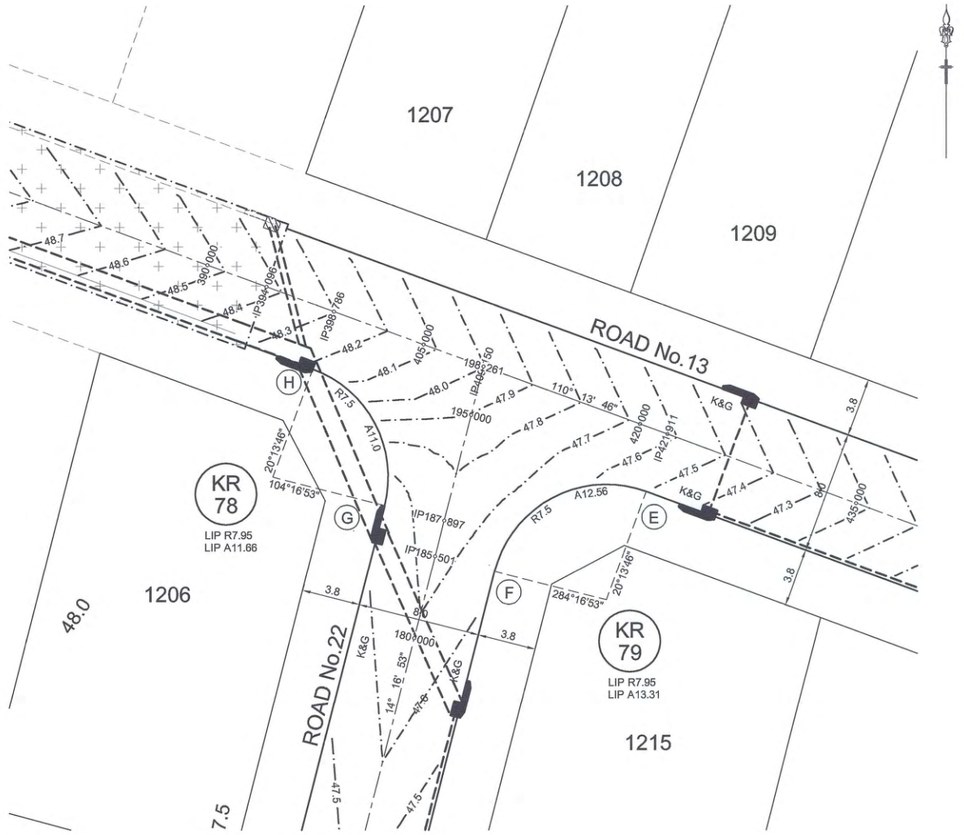
PLAN No. 8953CC25 C
FILE No. 8953CC25
SHEET 25 OF 46 SHEETS

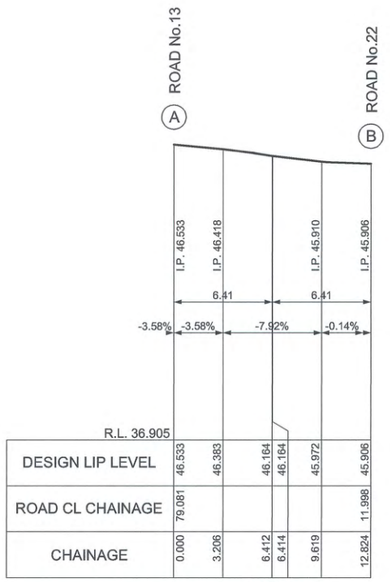
Plotted: 21 Dec 2010 8:33:54 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC25.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

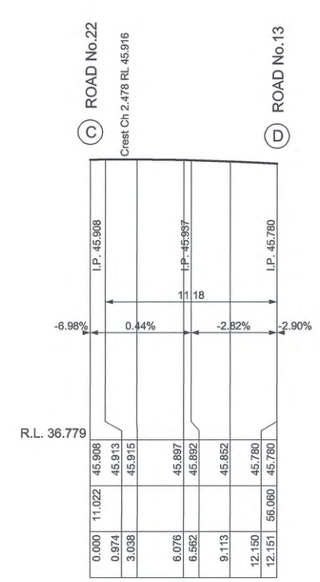
NOTE
KERB RETURN LEVELS ARE
LIP OF GUTTER



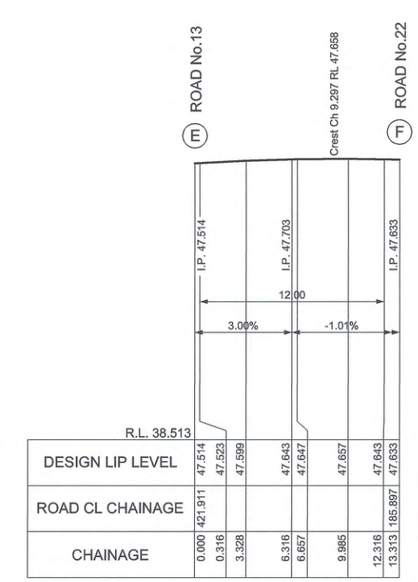




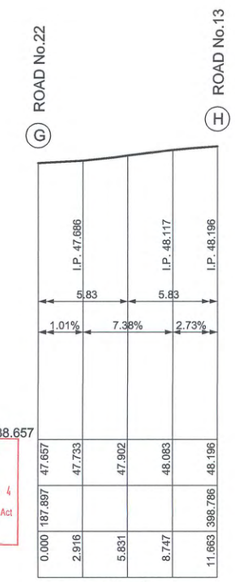
KR76
HORIZ 1:200
VERT 1:100



KR77
HORIZ 1:200
VERT 1:100



KR79
HORIZ 1:200
VERT 1:100



KR78
HORIZ 1:200
VERT 1:100

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CCX No: 100054
Environmental Planning & Assessment Act
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1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES:
L.S. 1:200 H
1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1E
KERB RETURNS No.76, 77, 78 & 79

PLAN No. 8953CC26 B
FILE No. 8953CC26
SHEET 26 OF 44 SHEETS

Plotted: 21 Dec 2010 3:10:46 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC26.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED. S. Anderson DATE. 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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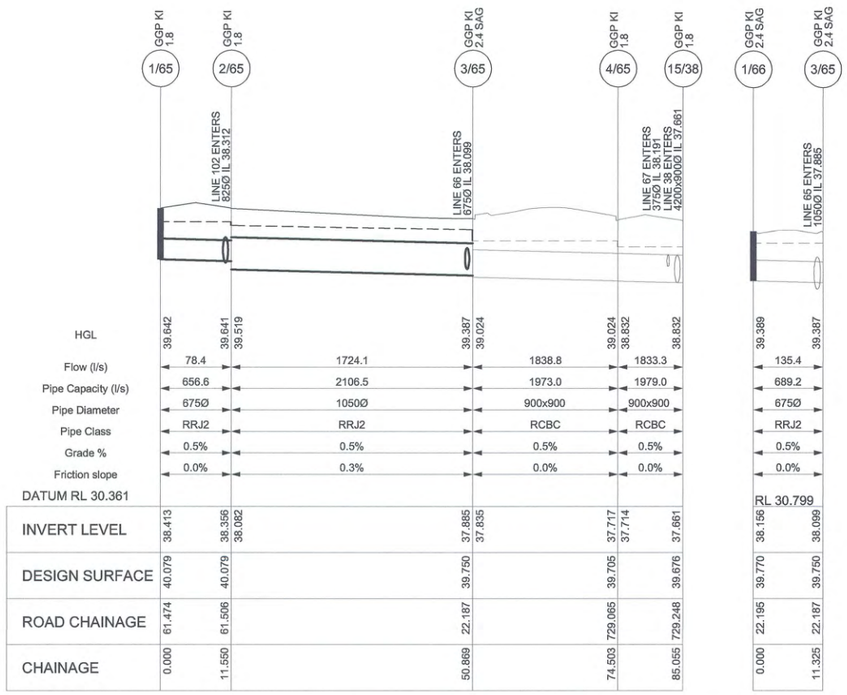
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1E
CATCHMENT PLAN

PLAN No. 8953CC27 B
FILE No. 8953CC27
SHEET 27 OF 44 SHEETS

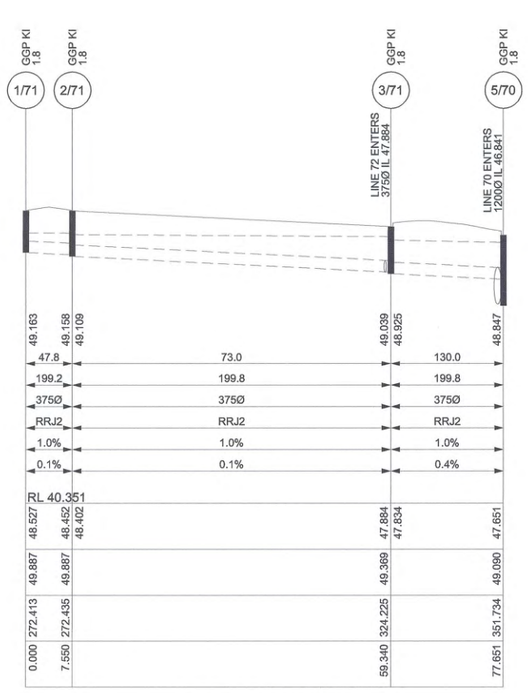
Plotted: 21 Dec 2010 3:10:56 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC27.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

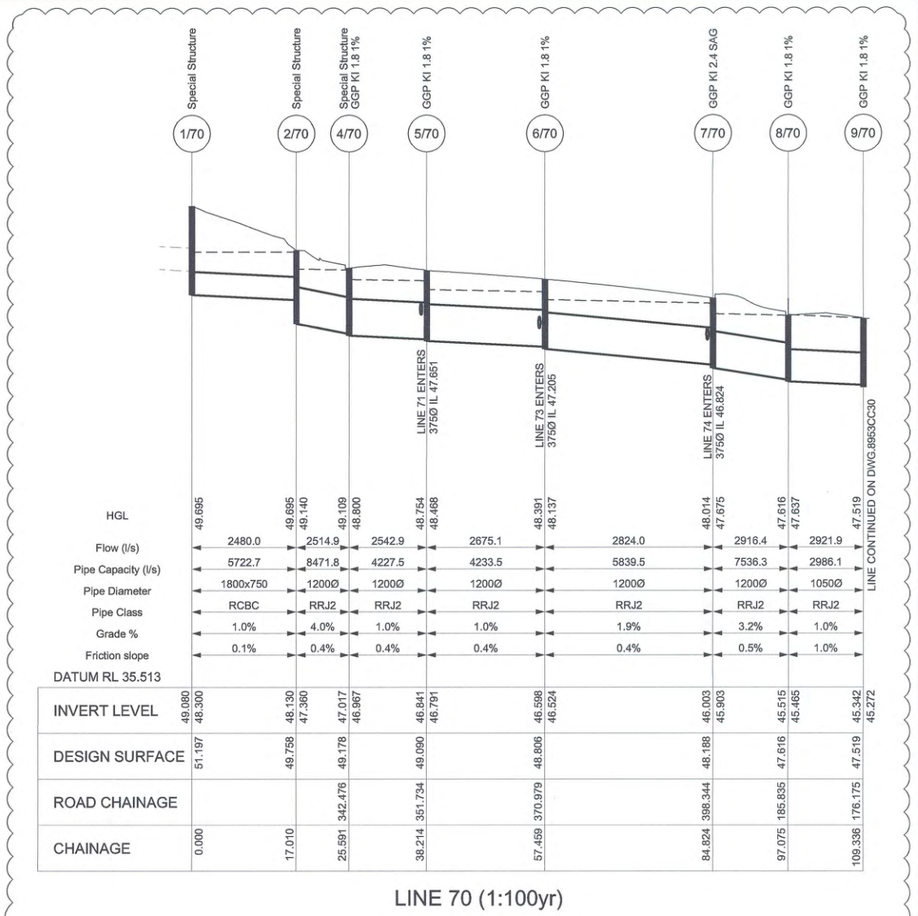


LINE 65 (1:100yr)

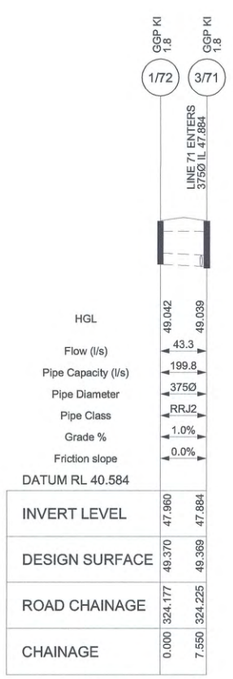
LINE 66 (1:100yr)



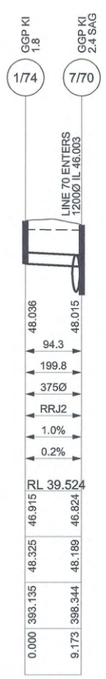
LINE 71 (1:100yr)



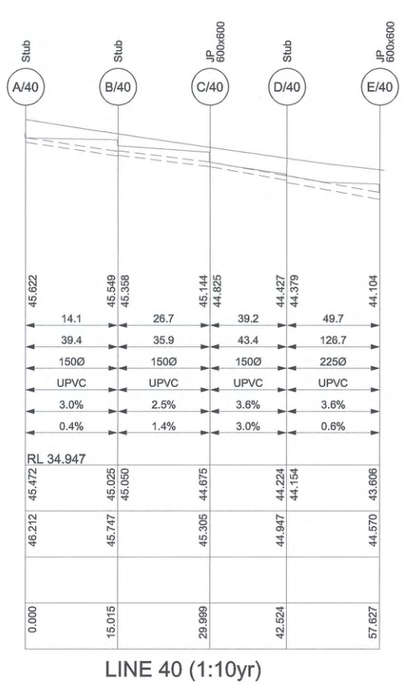
LINE 70 (1:100yr)



LINE 72 (1:100yr)



LINE 74 (1:100yr)



LINE 40 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

This plan/document relates to
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Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	LONG SECTIONS AMENDED AS NOTED	01-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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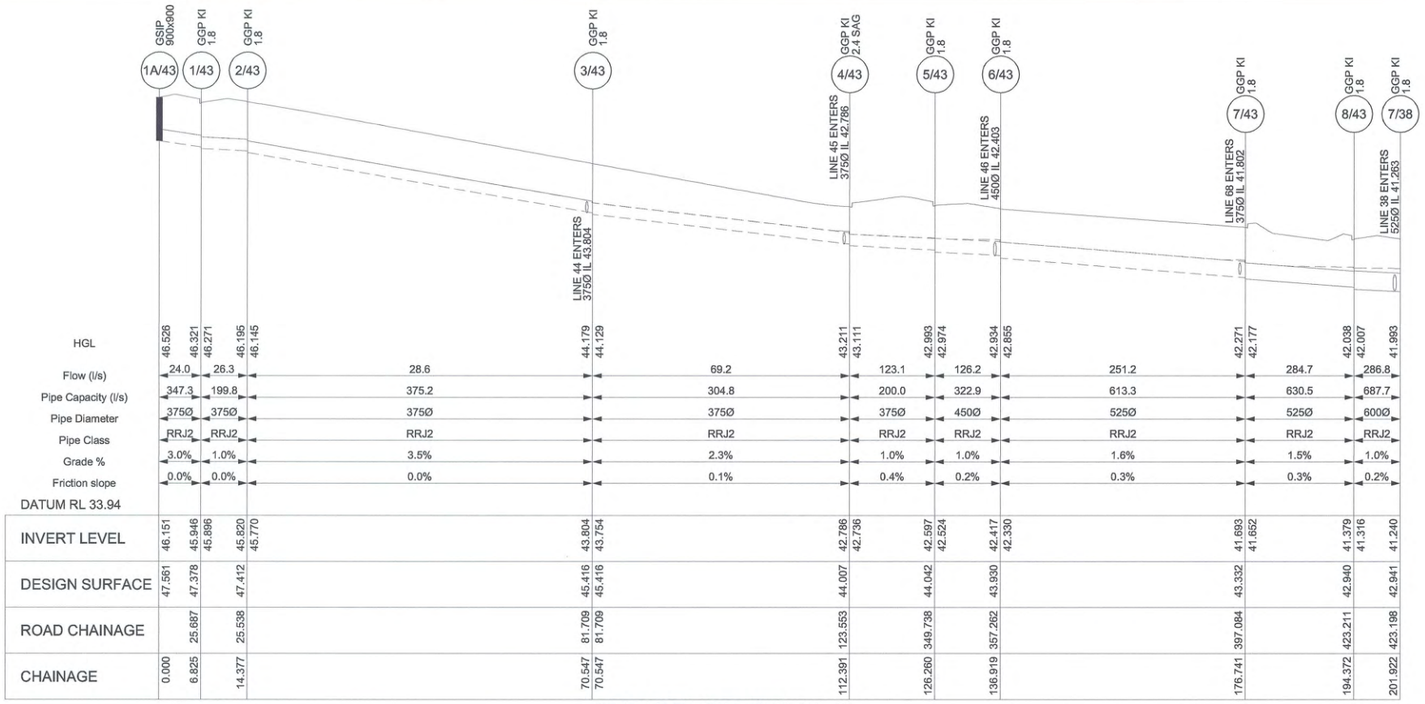
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:500 H 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.65, 66, 70, 71, 72, 74 & 40

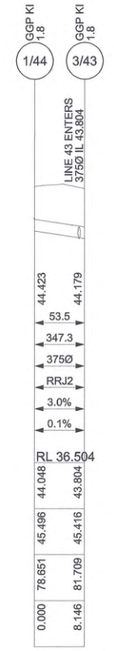
PLAN No. 8953CC28 C
FILE No. 8953CC28
SHEET 28 OF 46 SHEETS

Plotted: 21 Dec 2010 3:11:00 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC28.dwg

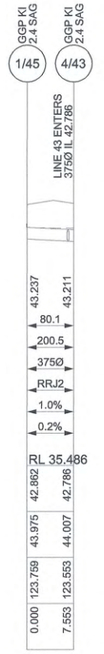
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



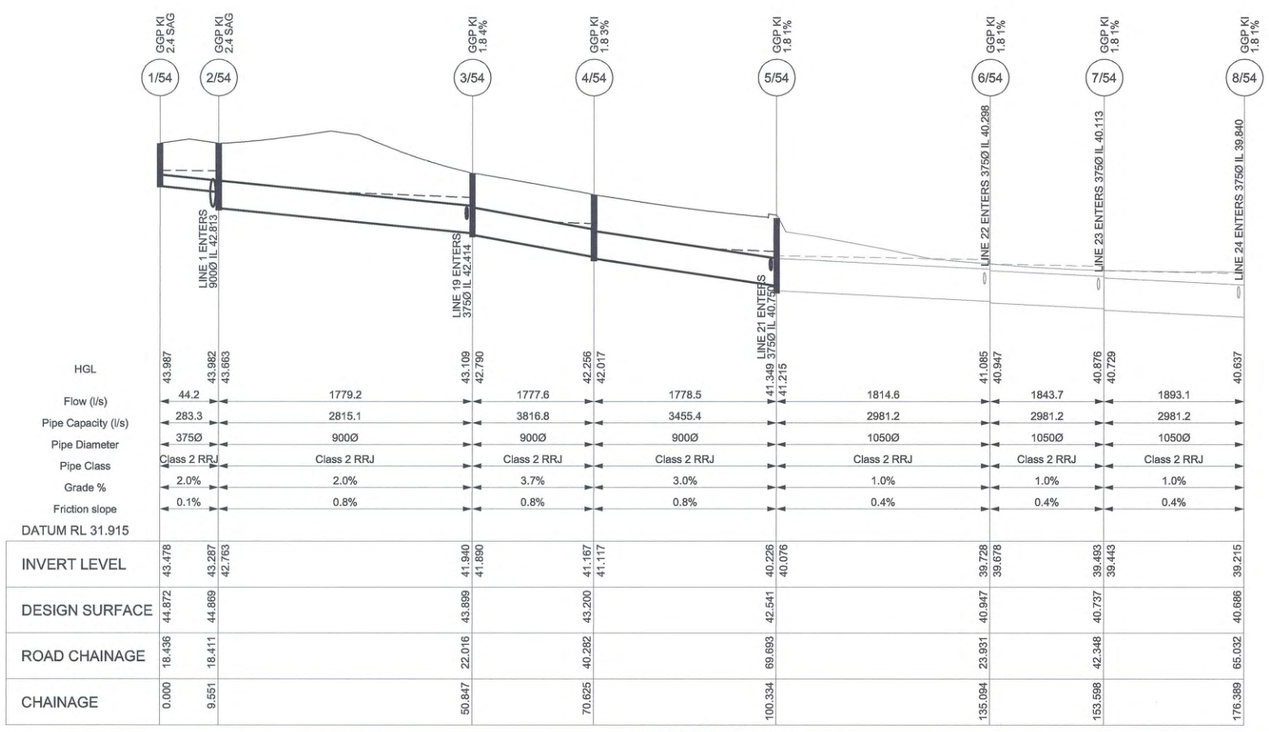
FUTURE LINE 43 (1:10yr)



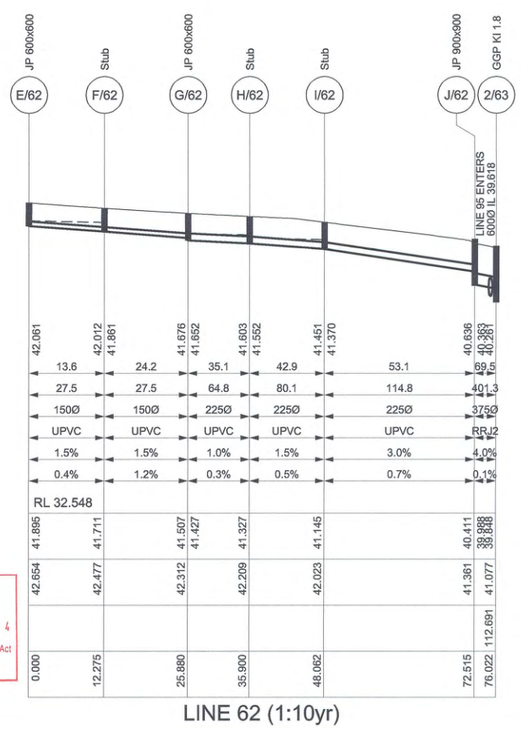
FUTURE LINE 44 (1:10yr)



FUTURE LINE 45 (1:10yr)



LINE 54 (1:10yr)



LINE 62 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

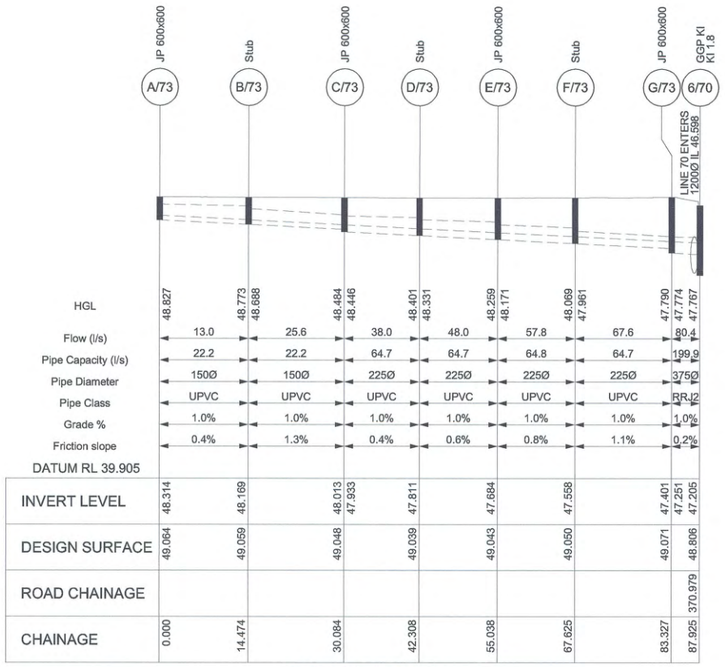
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:500 H, 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.43, 44, 45, 54 & 62

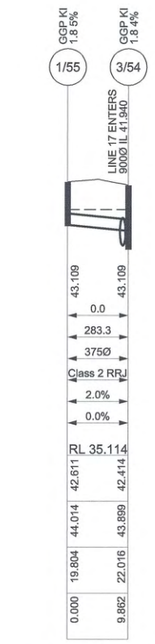
PLAN No. 8953CC29 B
FILE No. 8953CC29
SHEET 29 OF 44 SHEETS

Plotted: 21 Dec 2010 3:11:03 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC29.dwg

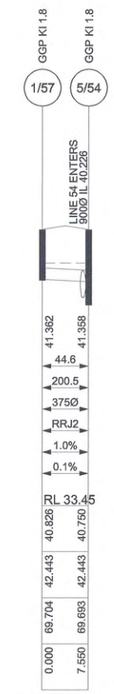
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



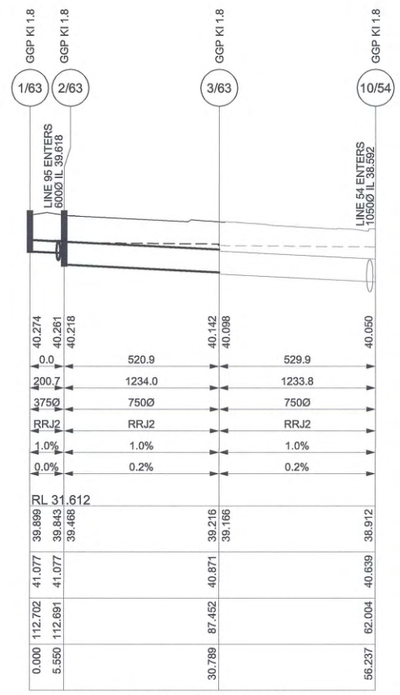
LINE 73 (1:10yr)



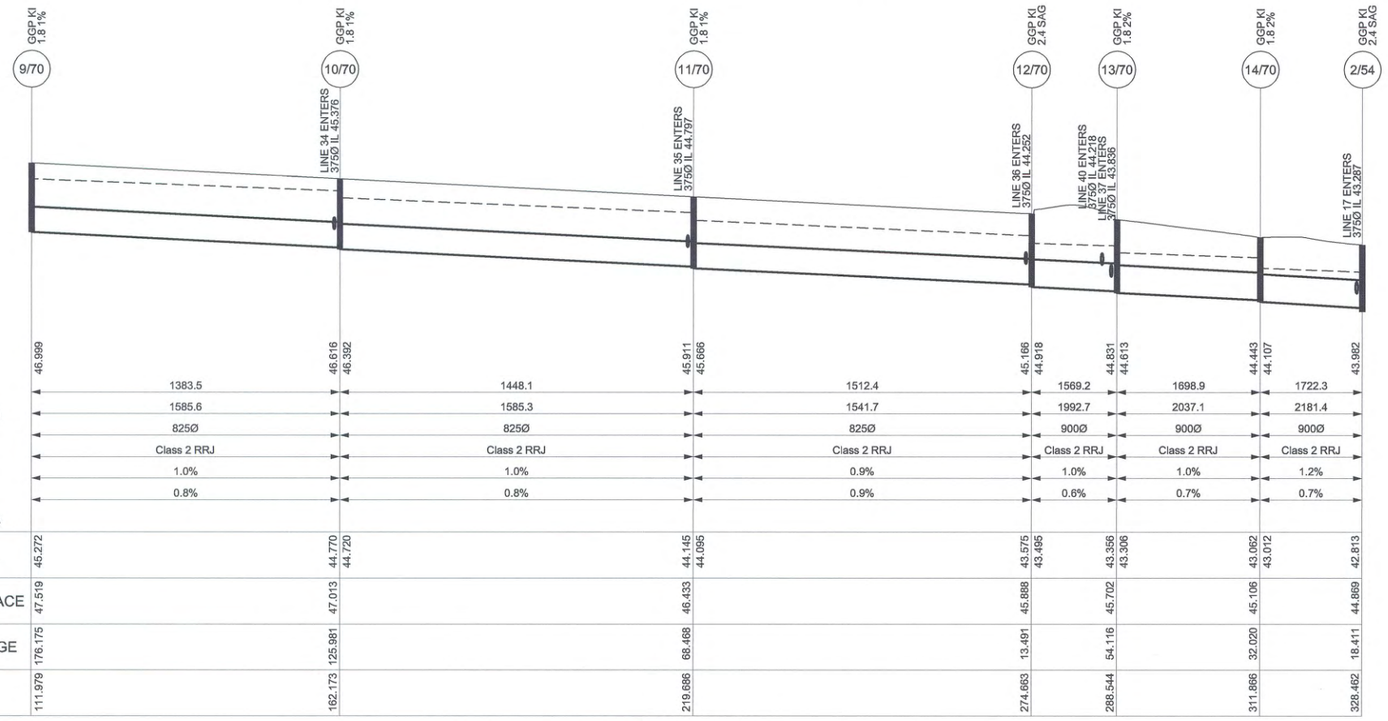
LINE 55 (1:10yr)



LINE 57 (line 1:10yr)



LINE 63 (1:10yr)



LINE 70 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

This plan/document relates to
CCV No:
100790 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

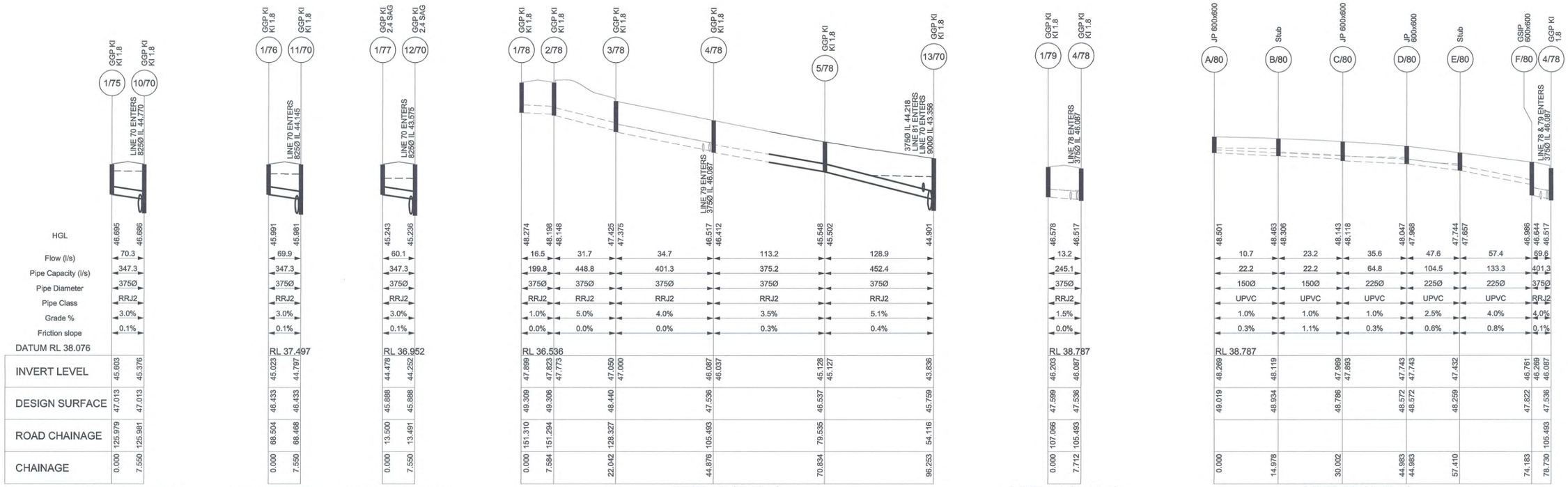
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.73, 55, 57, 63 & 70

PLAN No. 8953CC30 B
FILE No. 8953CC30
SHEET 30 OF 44 SHEETS

Plotted: 21 Dec 2010 3:11:07 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC30.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



This plan/document relates to
DA No: 100790
CCX No: 100054
Environmental Planning & Assessment Act
Eric Neufeld
PENRITH CITY COUNCIL

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SIGNED S. Anderson DATE 01/12/10

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SCALES:
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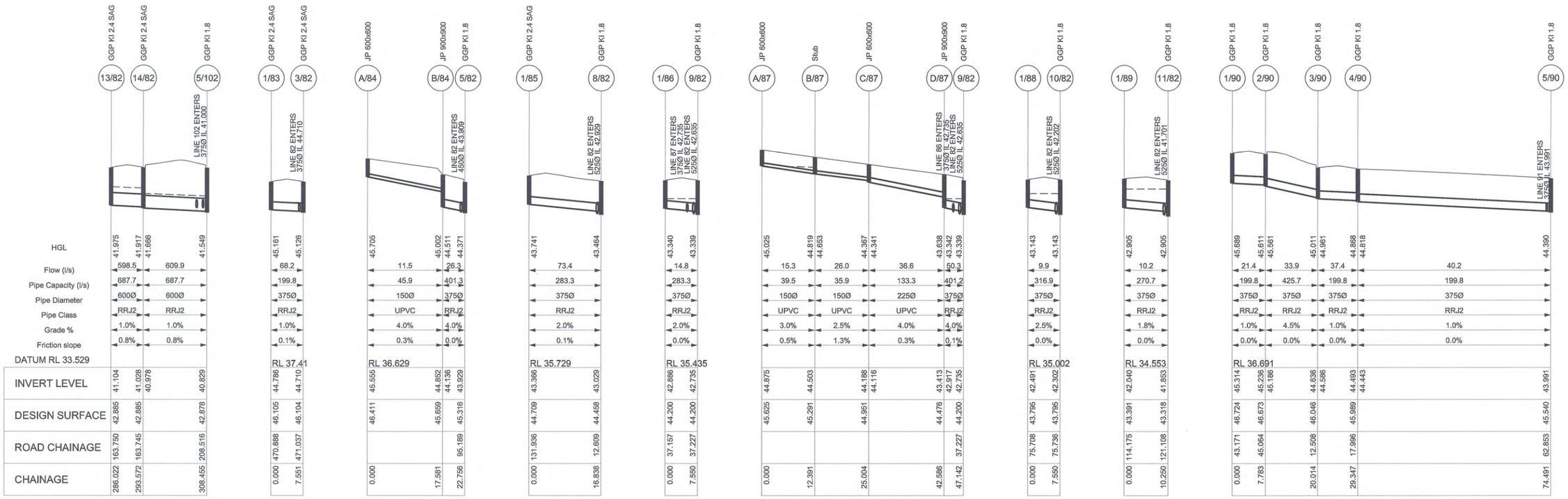
1:100 V
(AT A1)

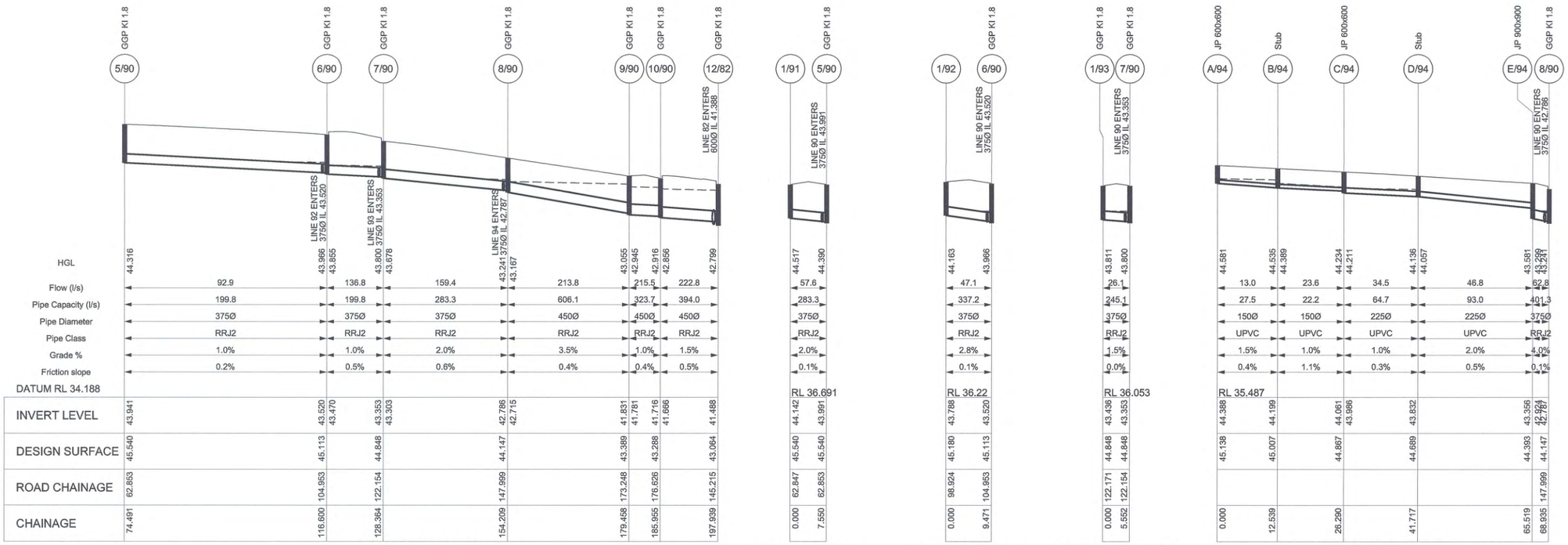
JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.75, 76, 78, 79, 80, 81 & 82

PLAN No. 8953CC31 B
FILE No. 8953CC31
SHEET 31 OF 44 SHEETS

Plotted: 21 Dec 2010 3:11:11 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC31.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018





1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:500 H, 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.82, 83, 84, 85, 86, 87, 88, 90, 91, 92, 93 & 94

PLAN No. 8953CC32 B
FILE No. 8953CC32
SHEET 32 OF 44 SHEETS

This plan/document relates to DA No: 100790 CC's No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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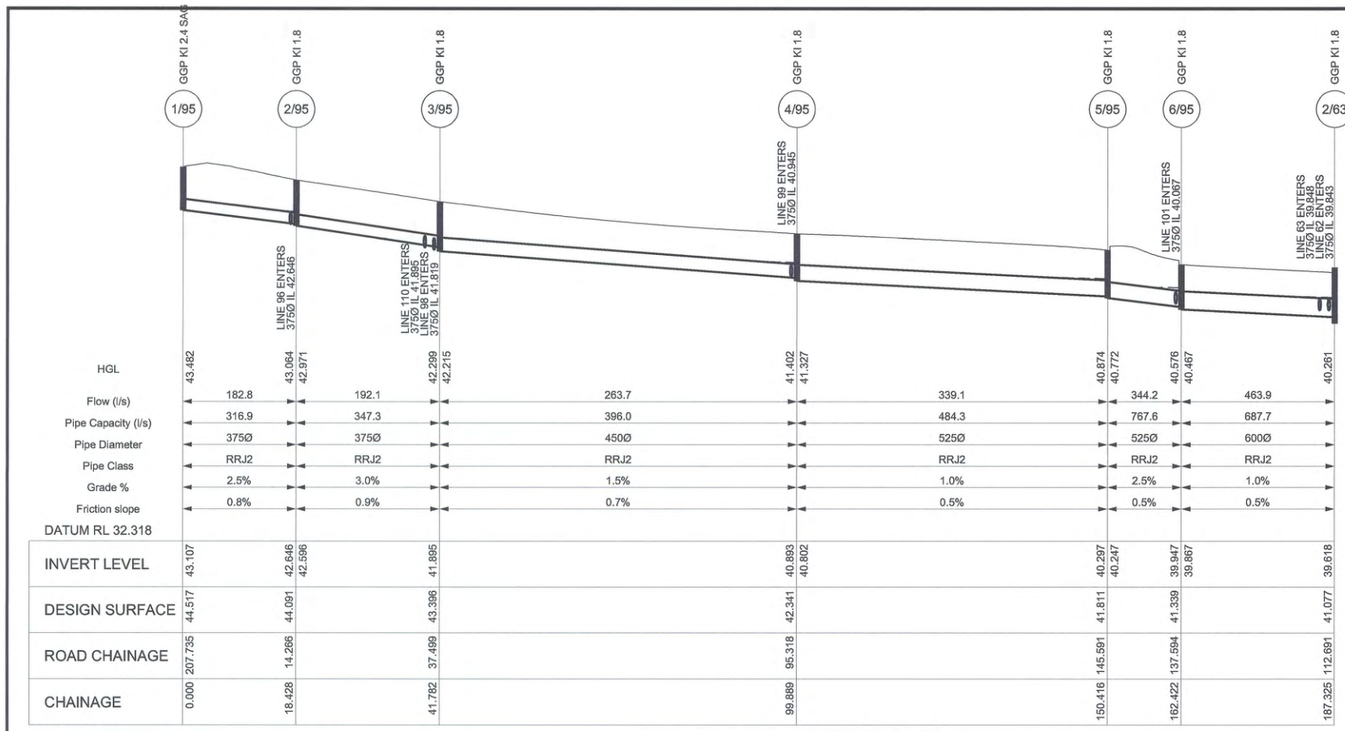
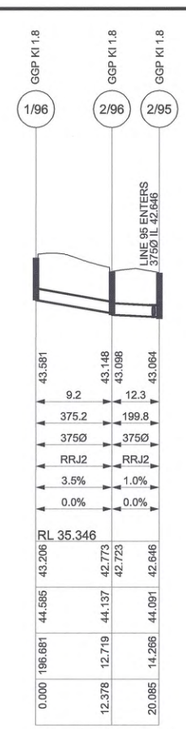
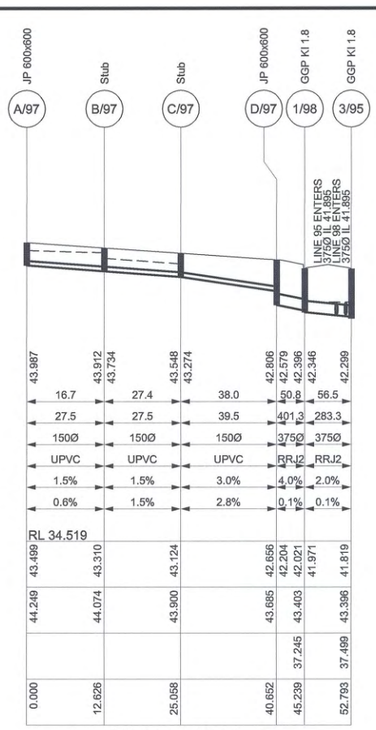
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



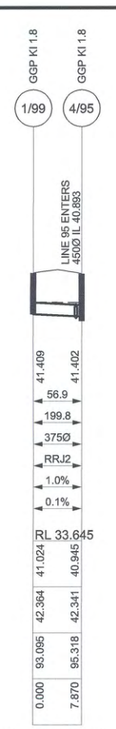
LINE 95 (1:10yr)



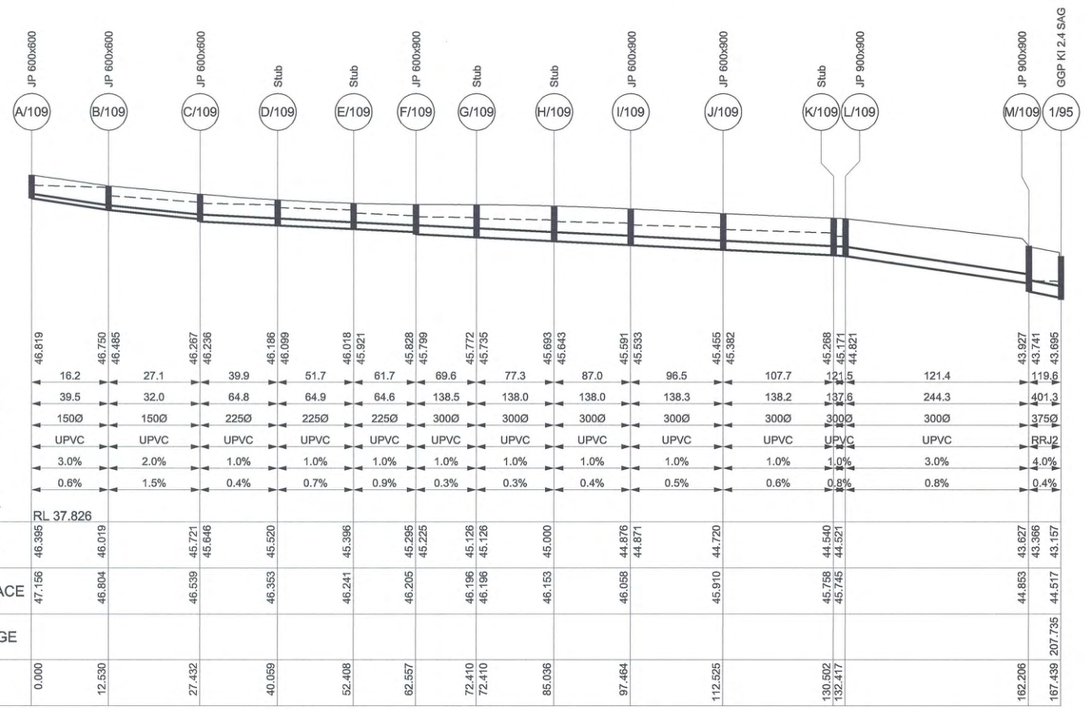
LINE 96 (1:10yr)



LINE 97 (1:10yr)



LINE 99(1:10yr)



LINE 109 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
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A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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CHECKED M.S.
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SCALES: L.S. 1:500 H, 1:100 V (AT A1)

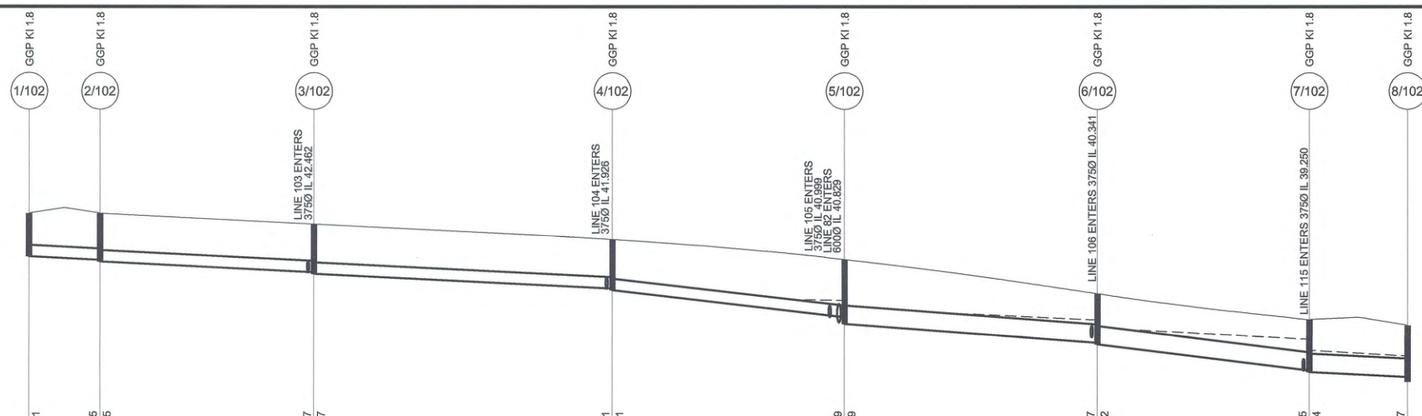
JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.95, 96, 97, 99 & 109

PLAN No. 8953CC33 B
FILE No. 8953CC33
SHEET 33 OF 44 SHEETS

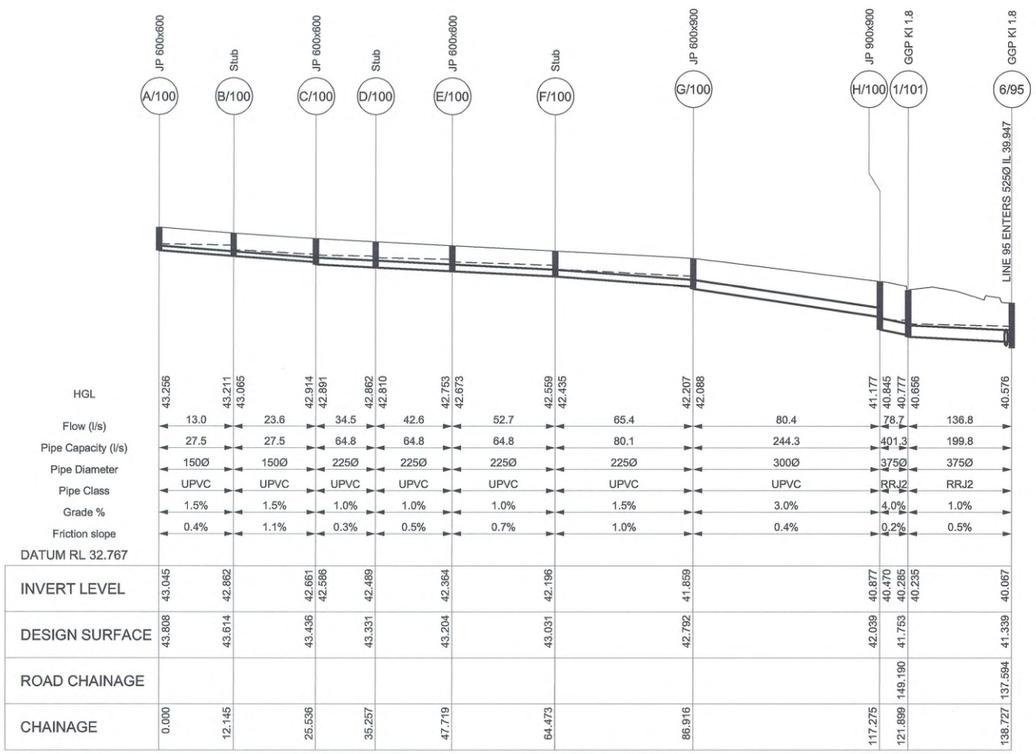
This plan/document relates to DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
Enid Hendrick
PENRITH CITY COUNCIL

Plotted: 21 Dec 2010 3:11:18 PM File Name: J:\8953\DOC - Engineering Construction Plans\Stage 1E\8953CC33.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

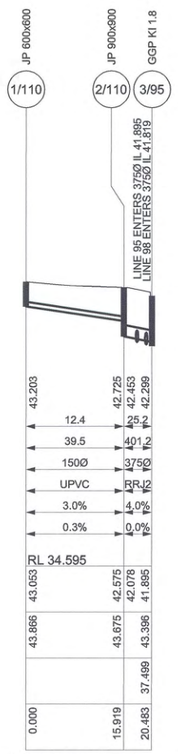

GGP KI 1.8
1/102
2/102
3/102
4/102
5/102
6/102
7/102
8/102
LINE 103 ENTERS 375Ø IL 42.462
LINE 104 ENTERS 375Ø IL 41.926
LINE 105 ENTERS 375Ø IL 41.600
LINE 62 ENTERS 600Ø IL 40.829
LINE 106 ENTERS 375Ø IL 40.341
LINE 115 ENTERS 375Ø IL 39.250

| | | |



HGL	43.256	43.211 / 43.065		42.914 / 42.891	42.862 / 42.810	42.753 / 42.673		42.559 / 42.435	42.207 / 42.088		41.177 / 40.845	40.777 / 40.656	40.576
Flow (l/s)		13.0	23.6	34.5	42.6	52.7		65.4	80.4		78.7	136.8	
Pipe Capacity (l/s)		27.5	27.5	64.8	64.8	64.8		80.1	244.3		401.3	199.8	
Pipe Diameter		150Ø	150Ø	225Ø	225Ø	225Ø		225Ø	300Ø		375Ø	375Ø	
Pipe Class		UPVC	UPVC	UPVC	UPVC	UPVC		UPVC	UPVC		RRJ2	RRJ2	
Grade %		1.5%	1.5%	1.0%	1.0%	1.0%		1.5%	3.0%		4.0%	1.0%	
Friction slope		0.4%	1.1%	0.3%	0.5%	0.7%		1.0%	0.4%		0.2%	0.5%	
DATUM RL 32.767													
INVERT LEVEL	43.045	42.862		42.661 / 42.586	42.489	42.364		42.196	41.859		40.877 / 40.470	40.285 / 40.235	40.067
DESIGN SURFACE	43.808	43.614		43.436	43.331	43.204		43.031	42.792		42.039	41.753	41.339
ROAD CHAINAGE												149.190	137.594
CHAINAGE	0.000	12.145		25.536	35.257	47.719		64.473	86.916		117.275	121.899	138.727

LINE 100 (1:10yr)



HGL	43.203	42.725	42.453 / 42.299
Flow (l/s)		12.4	25.2
Pipe Capacity (l/s)		39.5	401.2
Pipe Diameter		150Ø	375Ø
Pipe Class		UPVC	RRJ2
Grade %		3.0%	4.0%
Friction slope		0.3%	0.0%
DATUM RL 34.595			
INVERT LEVEL	43.053	42.575	42.078 / 41.895
DESIGN SURFACE	43.866	43.675	43.396
ROAD CHAINAGE			37.499
CHAINAGE	0.000	15.919	20.483

LINE 110 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 01/12/10

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J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.

DATUM: ORIGIN:
SCALES:
L.S. 1:500 H
1:100 V
(AT A1)

JORDAN SPRINGS
STAGE 1E
DRAINAGE LONGITUDINAL SECTIONS
LINE No.100 & 110

PLAN No. 8953CC35 B
FILE No. 8953CC35
SHEET 35 OF 44 SHEETS

This plan/document relates to DA No: 10079 CCV No: 10054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

Plotted: 21 Dec 2010 3:11:26 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC35.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Road Name	Road Chainage	Easting	Northing
		(mm)	(m)	(mm)	(m)	(m)		(m)	(m)	(m)
B/108	Stub	150	46.718	150	46.718	0.796			288949.18	6266020.969
F/108	Stub	225	44.550	225	44.550	0.914			289004.76	6266004.336
A/108	JP 600x600			150	47.212	0.773			288937.39	6266024.565
C/108	JP 600x600	150	46.214	150	46.214	0.819			288961.26	6266017.331
G/108	JP 600x600	225	44.098	375	43.624	1.444			289033.80	6265995.657
E/108	JP 600x600	150	45.074	225	44.999	0.907			288990.44	6266008.851
D/108	Stub	150	45.619	150	45.619	0.851			288975.54	6266013.145
1/46	GGP KI 1.8	375	43.389	375	43.339	1.188	ROAD 8	301.14	289037.38	6265991.164
2/46	GGP KI 1.8	375	43.226	450	43.146	1.297	ROAD 8	309.60	289035.92	6265979.937
		375	38.477	375	38.427		ROAD 21	22.17	289298.26	6265855.540
2/70	Special Structure	1800x750	48.130	1200	47.360	2.398			288994.48	6266268.270
10/70	GGP KI 1.8	825	44.770	825	44.720	2.293	ROAD 22	125.98	289044.16	6266162.624
		375	45.376							
1/70	Special Structure			1800x750	48.30	2.897			288981.86	6266279.869
5/70	GGP KI 1.8	1200	46.841	1200	46.791	2.299	ROAD 13	351.73	289003.22	6266250.208
		375	47.651							
12/70	GGP KI 2.4 SAG	825	43.575	900	43.495	2.393	ROAD 22	13.49	289016.48	6266053.906
		375	44.252							
9/70	GGP KI 1.8	1050	45.342	825	45.272	2.247	ROAD 22	176.18	289056.61	6266211.562
4/70	GGP KI 1.8 Special Structure	1200	47.017	1200	46.967	2.210	ROAD 13	342.48	288994.90	6266259.699
7/70	GGP KI 1.8	1200	46.093	1200	45.903	2.286	ROAD 13	398.34	289046.96	6266234.091
		375	46.824							
11/70	GGP KI 1.8	825	44.145	825	44.095	2.338	ROAD 22	68.47	289029.97	6266106.910
		375	44.797							
13/70	GGP KI 1.8	900	43.356	900	43.306	2.396	ROAD 13	54.12	289023.00	6266041.650
		375	43.836							
		375	44.218							
14/70	GGP KI 1.8	900	43.062	900	43.012	2.094	ROAD 13	32.02	289044.95	6266033.764
6/70	GGP KI 1.8	1200	46.596	1200	46.524	2.282	ROAD 13	370.98	289021.28	6266243.554
		375	47.205							
8/70	GGP KI 1.8	1200	45.515	1050	45.465	2.151	ROAD 22	185.84	289051.68	6266222.786
B/40	Stub	150	45.025	150	45.050				288939.28	6265947.180
C/40	JP 600x600	150	44.675	150	44.675				288943.82	6265942.860
D/40	Stub	150	44.224	225	44.154				288955.62	6265939.273
F/40	JP 600x600	225	42.707	375	42.565				288961.05	6265906.352
A/40	Stub			150	46.472				288914.88	6265961.459
E/40	JP 600x600	225	43.606	225	43.606				288970.08	6265934.918
1A/43	GSIP 900x900			375	46.151	1.410			288913.75	6266002.641
1/43	GGP KI 1.8	375	45.946	375	45.896		ROAD 10	25.69	288911.85	6265998.086
2/43	GGP KI 1.8	375	45.820	375	45.770		ROAD 10	25.54	288909.53	6265988.898
3/43	GGP KI 1.8	375	43.804	375	43.754		ROAD 10	81.71	288963.33	6265972.748
		375	43.804							
4/43	GGP KI 2.4 SAG	375	42.786	375	42.736		ROAD 10	123.55	289003.41	6265960.716
		375	42.786							
5/43	GGP KI 1.8	375	42.597	450	42.524		ROAD 8	349.74	289010.74	6265948.944
6/43	GGP KI 1.8	450	42.403	525	42.330		ROAD 8	357.26	289015.65	6265939.484
		450	42.417							
1/44	GGP KI 1.8			375	44.048		ROAD 10	78.85	288962.58	6265980.859
1/45	GGP KI 2.4 SAG			375	42.882		ROAD 10	123.76	289005.78	6265967.888
1/54	GGP KI 2.4 SAG			375	43.478	1.393	ROAD 13	18.44	289055.55	6266023.478
2/54	GGP KI 2.4 SAG	375	43.287	900	42.763	2.106	ROAD 13	18.41	289048.12	6266017.474
		900	42.813							
3/54	GGP KI 1.8 5%	900	41.940	900	41.890	2.009	ROAD 12	22.02	289074.71	6265985.876
		375	42.414							
4/54	GGP KI 1.8	900	41.167	900	41.117	2.083	ROAD 12	40.28	289092.30	6265976.821
5/54	GGP KI 1.8	900	40.220	1050	40.070	2.368	ROAD 12	69.69	289120.99	6265969.122
		375	40.750							
1/55	GGP KI 1.8 6%			375	42.611	1.403	ROAD 12	19.80	289079.43	6265994.535
1/57	GGP KI 1.8			375	40.826	1.617	ROAD 12	69.70	289122.95	6265976.413
2/63	GGP KI 1.8	375	39.843	750	39.468	1.778	ROAD 18	112.69	289241.14	6265989.275
		375	39.848							
		600	39.818							
J/62	JP 900x900	225	40.411	375	39.988	1.491			289237.66	6265989.677
H/62	Stub	225	41.327	225	41.327	0.882			289201.39	6265994.716
F/62	Stub	150	41.711	150	41.711	0.776			289178.20	6265999.191
E/62	JP 600x600			150	41.895	0.769			289166.16	6266001.592
G/62	JP 600x600	150	41.507	225	41.427	0.893			289191.53	6265996.490
I/62	Stub	225	41.145	225	41.145	0.886			289213.43	6265992.959
2/65	GGP KI 1.8			675	38.410	1.666	ROAD 20	61.47	289294.87	6265939.995
2/65	GGP KI 1.8	675	38.356	1050	38.082		ROAD 20	61.51	289296.35	6265939.191
		825	38.312							
3/65	GGP KI 2.4 SAG	1050	37.885	900x900	37.835		ROAD 20	22.19	289297.25	6265899.862
		675	38.099							
1/66	GGP KI 2.4 SAG			675	38.156	1.614	ROAD 20	22.19	289285.93	6265899.632
1/71	GGP KI 1.8			375	48.527	1.360	ROAD 13	272.41	288966.43	6266194.343
3/71	GGP KI 1.8	375	47.884	375	47.834	1.535	ROAD 13	324.23	288986.53	6266242.891
		375	47.884							
2/71	GGP KI 1.8	375	48.452	375	48.402	1.485	ROAD 13	272.44	288973.75	6266192.502
1/72	GGP KI 1.8			375	47.960	1.410	ROAD 13	324.18	288979.20	6266244.507
C/73	JP 600x900	150	48.013	225	47.933	1.115			289007.06	6266187.488
B/73	Stub	150	48.189	150	48.189	0.890			289003.17	6266172.370
G/73	JP 900x900	225	47.401	375	47.251	1.820			289020.16	6266239.095
E/73	JP 900x900	225	47.884	225	47.684	1.359			289013.18	6266211.680
F/73	Stub	225	47.558	225	47.558	1.492			289016.29	6266223.876
D/73	Stub	225	47.811	225	47.811	1.228			289010.01	6266199.351
A/73	JP 600x600			150	48.314	0.750			288999.59	6266158.346
1/74	GGP KI 1.8			375	46.915	1.410	ROAD 13	393.14	289044.24	6266243.167
1/75	GGP KI 1.8			375	45.603	1.410	ROAD 22	125.98	289036.84	6266164.500
1/76	GGP KI 1.8			375	45.023	1.410	ROAD 22	68.50	289022.66	6266108.773
1/77	GGP KI 2.4 SAG			375	44.478	1.410	ROAD 22	13.50	289009.17	6266055.777
3/78	GGP KI 1.8	375	47.050	375	47.000	1.439	ROAD 13	128.33	288951.95	6266083.089
2/78	GGP KI 1.8	375	47.823	375	47.773	1.532	ROAD 13	151.29	288943.90	6266075.096
4/78	GGP KI 1.8	375	46.087	375	46.037	1.499	ROAD 13	105.49	288973.79	6266056.423
		375	46.087							
		375	46.087							
1/78	GGP KI 1.8			375	47.899	1.410	ROAD 13	151.31	288938.55	6266076.982
5/78	GGP KI 1.8	375	45.128	375	45.127	1.410	ROAD 13	79.54	288998.65	6266048.959
1/79	GGP KI 1.8			375	46.203	1.396	ROAD 13	107.07	288979.11	6266049.644
B/80	Stub	150	48.119	150	48.119	0.815			288989.40	6266118.235
D/80	JP 600x900	225	47.743	225	47.743	0.829			288982.00	6266089.155
F/80	JP 600x900	225	46.776	375	46.629	1.193			288974.82	6266060.853
E/80	Stub	225	47.432	225	47.432	0.827			288978.93	6266077.114
C/80	JP 600x600	150	47.969	225	47.893	0.893			288985.72	6266103.669
A/80	JP 600x600			150	48.268	0.750			288993.16	6266139.751
3/81	GGP KI 1.8			375	44.498	1.384	ROAD 13	60.13	289014.17	6266036.405
2/82	GGP KI 1.8	375	45.880	375	45.830	1.535	ROAD 13	426.22	289073.12	6266224.452
9/82	GGP KI 1.8	525	42.635	525	42.585	1.615	ROAD 16	37.23	289147.55	6266126.529
		375	42.735							
		375	42.735							
10/82	GGP KI 1.8	525	42.202	525	42.152	1.643	ROAD 16	75.74	289184.59	6266116.881
		375	42.302							
1/82	GGP KI 1.8			375	45.955	1.410	ROAD 13	426.19	289075.70	6266231.545
3/82	GGP KI 2.4 SAG	375	44.710	375	44.660	1.444	ROAD 13	471.04	289115.17	6266208.956
		375	44.710							
11/82	GGP KI 1.8	525	41.701	600	41.628	1.690	ROAD 16	121.11	289228.88	6266108.381
		375	41.853							

- PIT 7/70 PIT TYPE CHANGED.
- SOME PIT CO-ORDINATES ADJUSTED TO SUIT NEW DRIVEWAY LOCATIONS.

C

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Road Name	Road Chainage	Easting	Northing
		(mm)	(m)	(mm)	(m)	(m)		(m)	(m)	(m)
11/82	GGP KI 1.8	525	41.701	600	41.628	1.690	ROAD 16	121.11	289228.88	6266108.381
		375	41.853							
6/82	GGP KI 1.8	450	43.727	450	43.677	1.517	ROAD 8	99.68	289122.70	6266164.714
5/82	GGP KI 1.8	450	43.909	450	43.859	1.457	ROAD 8	95.19	289116.49	6266170.929
		375	43.929							
8/82	GGP KI 1.8	525	42.929	525	42.879	1.579	ROAD 16	12.61	289124.20	6266133.851
		375	43.029							
13/82	GGP KI 2.4 SAG	600	41.154	600	41.104	1.781	ROAD 16	163.75	289270.95	6266103.259
7/82	GGP KI 1.8	450	43.254	525	43.176	1.593	ROAD 8	120.86	289117.47	6266144.192
14/82	GGP KI 2.4 SAG	600	41.028	600	40.978	1.906	ROAD 16	163.75	289270.28	6266095.739
4/82	GGP KI 1.8	375	44.513	450	44.438	1.595	ROAD 8	68.72	289123.02	6266196.577
12/82	GGP KI 1.8	600	41.388	600	41.338	1.726	ROAD 16	145.21	289252.62	6266105.144
		450	41.488							
1/83	GGP KI 2.4 SAG			375	44.786	1.320	ROAD 13	470.89	289117.64	6266216.091
B/84	JP 900x900	150	44.852	375	44.138	1.523			289112.74	6266174.495
A/84	JP 600x600			150	45.555	0.856			289085.89	6266178.803
1/85	GGP KI 2.4 SAG			375	43.366	1.344	ROAD 8	131.94	289107.43	6266135.318
1/86	GGP KI 1.8			375	42.886	1.314	ROAD 16	37.16	289145.36	6266119.302
B/87	Stub	150	44.503	150	44.503	0.788			289156.09	6266160.215
D/87	JP 900x900	225	43.417	375	42.917	1.559			289148.89	6266130.939
C/87	JP 600x600	150	44.188	225	44.116	0.835			289153.00	6266147.986
A/87	JP 600x600			150	44.875	0.750			289159.17	6266172.216
1/88	GGP KI 1.8			375	42.491	1.304	ROAD 16	75.71	289182.88	6266109.527
1/89	GGP KI 1.8			375	42.040	1.350	ROAD 16	114.17	289220.36	6266102.097
9/90	GGP KI 1.8	450	41.831	450	41.781	1.608	ROAD 17	173.25	289238.24	6266116.573
8/90	GGP KI 1.8	375	42.786	450	42.715	1.432	ROAD 17	148.00	289237.66	6266141.816
		375	42.787							
7/90	GGP KI 1.8	375	43.353	375	43.303	1.545	ROAD 17	122.15	289237.07	6266167.654
		375	43.353							
4/90	GGP KI 1.8	375	44.493	375	44.443	1.546	ROAD 17	18.00	289147.05	6266197.932
6/90	GGP KI 1.8	375	43.520	375	43.470	1.643	ROAD 17	104.95	289230.15	6266177.164
		375	43.520							
10/90	GGP KI 1.8	450	41.716	450	41.666	1.622	ROAD 17	176.63	289243.86	6266113.323
5/90	GGP KI 1.8	375	43.991	375	43.941	1.599	ROAD 17	62.85	289188.93	6266185.810
		375	43.991							
3/90	GGP KI 1.8	375	44.636	375	44.586	1.460	ROAD 17	12.51	289142.83	6266207.367
1/90	GGP KI 1.8			375	45.314	1.410	ROAD 8	43.17	289129.34	6266221.335
2/90	GGP KI 1.8	375	45.236	375	45.186	1.487	ROAD 8	45.06	289136.19	6266217.633
1/91	GGP KI 1.8			375	44.142	1.398	ROAD 17	62.85	289190.76	6266193.137
1/92	GGP KI 1.8			375	43.788	1.392	ROAD 17	98.92	289225.77	6266185.579
1/93	GGP KI 1.8			375	43.438	1.412	ROAD 17	122.17	289242.62	6266167.763
D/94	Stub	225	43.832	225	43.832	0.857			289210.88	6266146.841
B/94	Stub	150	44.199	150	44.199	0.808			289182.39	6266152.962
A/94	JP 600x600			150	44.388	0.750			289170.27	6266156.154
C/94	JP 600x600	150	44.061	225	43.986	0.881			289195.79	6266149.852
E/94	JP 900x900	225	43.356	375	42.924	1.470			289234.32	6266142.514
4/95	GGP KI 1.8	450	40.893	525	40.802	1.539	ROAD 15	95.32	289183.50	6266032.060
		375	40.945							
3/95	GGP KI 1.8	375	41.895	450	41.765	1.631	ROAD 15	37.50	289127.06	6266045.893
		375	41.819							
		375	41.895							
2/95	GGP KI 1.8	375	42.646	375	42.596	1.495	ROAD 15	14.27	289104.73	6266052.722
		375	42.646							
6/95	GGP KI 1.8	525	39.947	600	39.867	1.472	ROAD 18	137.59	289240.58	6266014.171
		375	40.067							
5/95	GGP KI 1.8	525	40.297	525	40.247	1.564	ROAD 15	145.59	289233.34	6266023.750
1/95	GGP KI 2.4 SAG	375	43.157	375	43.107	1.410	ROAD 8	207.74	289088.73	6266061.861
1/96	GGP KI 1.8			375	43.206	1.379	ROAD 8	196.68	289098.77	6266070.711
2/96	GGP KI 1.8	375	42.773	375	42.723	1.414	ROAD 15	12.72	289105.59	6266060.381
C/97	Stub	150	43.124	150	43.124	0.776			289133.82	6266072.793
1/98	GGP KI 1.8	375	42.021	375	41.971	1.433	ROAD 15	37.24	289128.91	6266053.218
D/97	JP 600x600	150	42.656	375	42.204	1.480			289129.98	6266057.679
B/97	Stub	150	43.310	150	43.310	0.764			289136.86	6266084.847
A/97	JP 600x600			150	43.499	0.750			289140.00	6266097.075
1/99	GGP KI 1.8			375	41.024	1.340	ROAD 15	93.09	289182.83	6266039.902
I/109	JP 600x900	300	44.876	300	44.871	1.187			289063.33	6266102.271
M/109	JP 900x900	300	43.627	375	43.366	1.487			289083.57	6266060.953
D/109	Stub	225	45.520	225	45.520	0.833			289077.90	6266157.899
C/109	Stub	300	45.126	300	45.126	1.070			289069.52	6266126.549
L/109	JP 900x900	300	44.521	300	44.521	1.224			289054.73	6266068.393
K/109	Stub	300	44.540	300	44.540	1.218			289055.18	6266070.253
A/109	JP 600x600			150	46.395	0.761			289072.15	6266187.664
F/109	JP 600x900	225	45.295	300	45.225	0.980			289071.94	6266130.098
C/109	JP 600x600	150	45.721	225	45.646	0.893			289080.62	6266170.134
E/109	Stub	225	45.396	225	45.396	0.845			289074.46	6266145.929
B/109	JP 600x600	150	46.019	150	46.019	0.785			289084.29	6266184.577
H/109	Stub	300	45.000	300	45.000	1.153			289068.41	6266114.312
J/109	JP 600x900	300	44.720	300	44.720	1.190			289059.63	6266087.672
7/102	GGP KI 1.8	600	39.250	600	39.200	1.715	ROAD 20	132.93	289283.18	6266010.330
		375	39.250							
3/102	GGP KI 1.8	375	42.462	375	42.412	1.625	ROAD 20	294.84	289279.48	6266172.198
		375	42.462							
8/102	GGP KI 1.8	600	39.040	750	38.888	1.837	ROAD 20	121.89	289294.97	6265999.556
1/102	GGP KI 1.8			375	42.976	1.410	ROAD 20	329.70	289290.23	6266207.314
2/102	GGP KI 1.8	375	42.860	375	42.810	1.575	ROAD 20	329.66	289278.89	6266207.015
5/102	GGP KI 1.8	600	40.829	600	40.779	2.099	ROAD 20	208.52	289281.45	6266085.899
		375	41.000							
		375	40.999							
4/102	GGP KI 1.8	375	41.926	375	41.876	1.660	ROAD 20	246.28	289280.59	6266123.649
		375	41.926							
6/102	GGP KI 1.8	600	40.162	600	40.112	1.655	ROAD 20	167.40	289282.39	6266044.797
		375	40.341							
9/102	GGP KI 1.8	750	38.587	825	38.494	1.888	ROAD 20	91.80	289295.66	6265969.475
		375	38.544							
1/103	GGP KI 1.8			375	42.635	1.402	ROAD 20	294.82	289291.03	6266172.447
1/104	GGP KI 1.8			375	42.157	1.379	ROAD 20	246.27	289292.14	6266123.902
1/105	GGP KI 1.8			375	41.577	1.301	ROAD 20	208.50	289293.00	6266086.144
1/106	GGP KI 1.8			375	40.457	1.310	ROAD 20	167.38	289293.94	6266045.041
1/107	GGP KI 1.8			375	38.972	1.410	ROAD 20	91.79	289284.11	6265969.209
1/115	GGP KI 2.4 SAG			375	39.521	1.410	ROAD 15	184.53	289272.84	6266027.247
2/115	GGP KI 2.4 SAG	375	39.446	375	39.396	1.535	ROAD 15	184.61	289272.35	6266019.713
H/100	JP 900x900	300	40.877	375	40.470	1.569			289237.84	6266035.403
B/100	Stub	150	42.862	150	42.862	0.752			289163.68	6266079.691
C/100	JP 600x600	150	42.661	225	42.586	0.850			289176.72	6266076.641
D/100	Stub	225	42.489	225	42.489	0.842			289186.22	6266074.567
G/100	JP 600x900	225	41.859	300	41.788	1.004			289237.11	6266065.754
E/100	JP 600x600	225	42.364	225	42.364	0.840			289198.43	6266072.096
F/100	Stub	225	42.196	225	42.196	0.835			289214.91	6266069.101
A/100	JP 600x600			150	43.045	0.763			289151.92	6266082.742
1/101	GGP KI 1.8	375	40.285	375	40.235	1.518	ROAD 15	149.19	289237.87	6266030.780
1/110	JP 600x600			150	43.053	0.813			289121.80	6266026.106
2/110	JP 900x900	150	42.575	375	42.078	1.597			289125.66	6266041.551

This plan/document relates to DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
C	AMENDMENTS AS NOTED	24-12-10	AM
B	PIT SCHEDULE UPDATED	01-12-10	AM
A	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1E
PIT SCHEDULE

PLAN No. 8953CC36 C
FILE No. 8953CC36
SHEET 36 OF 46 SHEETS

Plotted: 24 Dec 2010 12:05:29 PM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC36.dwg

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Version: 1, Version Date: 13/07/2018

HYDRAULICS DESIGN TABLE Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream to Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)
C/108 B/108	6.274	0.064	23.9	12.609	150	0.009	4.0	47.076	23.928	1.585	0.148	0.09	1.35	45.89	0.155
G/108 F/108	6.821	0.196	71.3	30.120	225	0.009	1.5	44.775	71.346	0.817	0.134	0.16	1.79	80.08	0.280
B/108 A/108	6.000	0.035	13.3	12.333	150	0.009	4.0	47.362	13.271	4.500	0.129	0.03	0.75	45.88	0.274
D/108 C/108	6.429	0.093	34.5	14.882	150	0.009	4.0	46.690	34.502	1.238	0.241	0.19	1.95	45.88	0.127
1/46 G/108	7.100	0.231	83.0	5.868	375	0.012	4.0	44.047	82.992	0.600	0.017	0.03	0.75	401.26	0.130
F/108 E/108	6.654	0.162	59.3	14.961	225	0.009	3.0	45.224	59.323	0.600	0.068	0.11	1.49	114.84	0.167
E/108 D/108	6.556	0.128	46.9	15.563	150	0.009	3.5	45.942	46.947	1.120	0.403	0.36	2.66	42.81	0.098
2/46 1/46	7.231	0.533	189.9	11.322	375	0.012	1.0	43.744	189.871	1.942	0.293	0.15	1.72	199.82	0.110
6/43 2/46	7.340	0.546	193.5	45.243	450	0.012	1.6	43.596	193.496	0.600	0.045	0.08	1.22	414.45	0.620
11/70 10/70	10.667	0.952	1448.1	57.513	825	0.012	1.0	46.461	288.086	0.600	0.225	0.37	2.71	1585.28	0.354
2/70 1/70	6.000	0.000	1160.0	17.010	1800x750	0.013	1.0	49.050	0.000	4.500	0.170	0.04	0.86	5722.73	0.108
8/70 5/70	9.374	0.315	1260.5	19.245	1200	0.012	1.0	47.991	100.542	1.000	0.063	0.06	1.11	4233.53	0.288
13/70 12/70	11.345	1.379	1589.2	13.881	900	0.012	1.0	44.987	409.238	0.800	0.248	0.31	2.47	1992.69	0.094
10/70 9/70	10.344	0.732	1383.5	50.194	825	0.012	1.0	47.068	223.510	0.600	0.205	0.34	2.59	1585.56	0.323
5/70 4/70	6.245	0.092	1194.3	12.623	1200	0.012	1.0	48.167	34.290	1.200	0.068	0.06	1.06	4227.47	0.199
8/70 7/70	10.048	0.708	1378.1	12.252	1200	0.012	3.2	47.443	218.118	1.004	0.076	0.08	1.22	7536.31	0.168
4/70 2/70	6.108	0.05	1178.9	8.581	1200	0.012	4.0	48.560	18.864	2.200	0.122	0.06	1.04	8471.81	0.137
12/70 11/70	11.021	1.176	1512.4	54.977	825	0.012	0.9	45.736	352.369	0.600	0.245	0.41	2.83	1541.73	0.324
14/70 13/70	11.439	1.821	1698.9	24.372	900	0.012	1.0	44.683	538.943	0.600	0.218	0.36	2.67	1992.48	0.152
2/54 14/70	11.591	1.908	1722.2	19.923	900	0.012	1.0	44.131	562.175	1.000	0.374	0.37	2.71	1990.16	0.123
7/70 6/70	9.662	0.553	1333.9	27.365	1200	0.012	1.9	47.724	173.865	0.600	0.043	0.07	1.18	5839.51	0.387
9/70 8/70	10.216	0.721	1380.8	12.260	1050	0.012	1.0	47.300	220.840	1.000	0.130	0.13	1.59	2986.05	0.128
C/40 B/40	6.313	0.072	26.7	14.984	150	0.009	2.5	45.358	26.728	1.641	0.191	0.12	1.51	35.94	0.165
D/40 C/40	6.478	0.108	39.2	12.525	150	0.009	3.6	44.825	39.219	1.271	0.319	0.25	2.22	43.44	0.094
E/40 D/40	6.572	0.135	49.7	15.103	225	0.009	3.6	44.379	49.720	0.600	0.048	0.08	1.25	126.72	0.201
1/41 F/40	7.095	0.170	60.8	4.802	375	0.012	4.0	42.940	60.823	0.600	0.009	0.02	0.55	401.18	0.145
B/40 A/40	6.000	0.037	14.1	15.015	150	0.009	3.0	45.622	14.136	4.500	0.147	0.03	0.80	39.35	0.313
F/40 E/40	6.773	0.170	61.8	29.961	225	0.009	3.0	43.831	61.769	2.218	0.273	0.12	1.55	114.84	0.321
5/38 1/41	7.240	0.304	108.3	7.550	375	0.012	1.0	42.761	108.276	1.569	0.077	0.05	0.98	200.49	0.128
6/38 1/42	6.000	0.015	5.6	7.550	375	0.012	1.0	42.313	5.605	4.500	0.001	0.00	0.05	199.82	2.480
1/43 1A/43	20.000	0.108	24.0	6.825	375	0.012	3.0	46.526	23.977	4.500	0.011	0.00	0.22	347.28	0.524
2/43 1/43	20.000	0.118	26.3	7.551	375	0.012	1.0	46.271	26.304	0.600	0.002	0.00	0.24	199.82	0.528
3/43 2/43	20.000	0.129	28.6	56.171	375	0.012	3.5	46.145	28.631	2.233	0.008	0.00	0.26	375.24	3.611
4/43 3/43	20.000	0.311	69.2	41.844	375	0.012	2.3	44.129	69.189	1.748	0.035	0.02	0.63	304.76	1.113
5/43 4/43	20.000	0.554	123.1	13.889	375	0.012	1.0	43.111	123.081	1.575	0.100	0.06	1.11	200.05	0.207
6/43 5/43	20.000	0.568	126.2	10.659	450	0.012	1.0	42.974	126.184	0.600	0.019	0.03	0.79	322.91	0.224
7/43 6/43	20.000	1.130	251.2	39.822	525	0.012	1.6	42.855	251.162	1.149	0.079	0.07	1.16	613.33	0.572
3/43 1/44	6.000	0.141	53.5	8.146	375	0.012	3.0	44.423	53.453	4.500	0.054	0.01	0.48	347.28	0.281
4/43 1/45	6.000	0.212	80.1	7.553	375	0.012	1.0	43.237	80.076	4.500	0.121	0.03	0.73	200.45	0.174
2/54 1/54	6.000	0.117	44.2	7.922	375	0.012	3.0	43.986	44.221	4.500	0.037	0.01	0.40	347.28	0.330
3/54 2/54	11.714	2.108	1778.7	31.146	900	0.012	2.6	43.663	618.737	0.800	0.319	0.40	2.80	3242.92	0.186
4/54 3/54	11.899	2.117	1778.2	24.111	900	0.012	3.0	42.790	618.170	0.800	0.319	0.40	2.80	3456.02	0.144
5/54 4/54	12.043	2.128	1778.6	29.699	900	0.012	3.0	42.017	618.594	0.600	0.239	0.40	2.80	3456.02	0.177
6/54 5/54	12.220	2.264	1814.8	34.760	1050	0.012	1.0	41.224	654.789	0.600	0.134	0.22	2.10	2981.23	0.276
3/54 1/55	6.000	0.000	0.0	7.587	375	0.012	3.0	43.109	0.000	4.500	0.000	0.00	0.00	347.59	0.000
5/54 1/57	6.000	0.118	44.6	7.550	375	0.012	1.0	41.362	44.592	4.500	0.037	0.01	0.40	200.49	0.312
3/63 2/63	11.348	1.756	520.9	25.239	750	0.012	1.0	40.218	520.906	0.600	0.043	0.07	1.18	1234.04	0.357
2/63 1/63	6.000	0.000	0.0	5.550	375	0.012	1.0	40.274	0.000	4.500	0.000	0.00	0.00	200.72	0.000
2/63 J/62	7.115	0.194	69.5	3.508	375	0.012	4.0	40.363	69.522	0.600	0.012	0.02	0.63	401.26	0.093
I/62 H/62	6.621	0.117	42.9	12.162	225	0.009	1.5	41.552	42.878	0.863	0.051	0.06	1.08	80.08	0.188
G/62 F/62	6.287	0.085	24.2	13.604	150	0.009	1.5	41.861	24.221	1.573	0.151	0.10	1.37	27.47	0.165
F/62 E/62	6.000	0.036	13.6	12.275	150	0.009	1.5	42.061	13.559	4.500	0.135	0.03	0.77	27.46	0.267
H/62 G/62	6.432	0.095	35.1	10.020	225	0.009	1.0	41.652	35.062	0.600	0.024	0.04	0.88	64.75	0.189
J/62 I/62	6.809	0.146	53.1	24.453	225	0.009	3.0	41.370	53.052	0.894	0.081	0.09	1.33	114.84	0.305
2/65 1/65	6.000	0.114	43.0	11.550	675	0.012	0.5	39.159	42.985	4.500	0.003	0.00	0.12	656.58	1.603
3/65 2/65	16.768	3.255	813.9	39.319	1050	0.012	0.5	39.132	813.917	0.600	0.027	0.05	0.94	2106.51	0.697
4/65 3/65	17.465	3.506	855.7	23.634	900x900	0.013	0.5	38.735	855.664	1.402	0.080	0.06	1.06	1972.99	0.293
3/65 1/66	6.000	0.198	74.8	11.325	675	0.012	0.5	38.831	74.759	4.500	0.009	0.00	0.20	689.22	0.930
1/66 G/108	7.100	0.231	83.0	5.868	375	0.012	4.0	44.902	26.593	4.500	0.013	0.00	0.24	199.15	0.523
F/108 E/108	6.654	0.162	59.3	14.961	225	0.009	3.0	45.224	59.323	0.600	0.068	0.11	1.49	114.84	0.167
E/108 D/108	6.556	0.128	46.9	15.563	150	0.009	3.5	45.942	46.947	1.120	0.403	0.36	2.66	42.81	0.098
2/46 1/46	7.231	0.533	189.9	11.322	375	0.012	1.0	43.744	189.871	1.942	0.293	0.15	1.72	199.82	0.110
6/43 2/46	7.340	0.546	193.5	45.243	450	0.012	1.6	43.596	193.496	0.600	0.045	0.08	1.22	414.45	0.620
11/70 10/70	10.667	0.952	1448.1	57.513	825	0.012	1.0	46.461	288.086	0.600	0.225	0.37	2.71	1585.28	0.354
2/70 1/70	6.000	0.000	1160.0	17.010	1800x750	0.013	1.0	49.050	0.000	4.500	0.170	0.04	0.86	5722.73	0.108
8/70 5/70	9.374	0.315	1260.5	19.245	1200	0.012	1.0	47.991	100.542	1.000	0.063	0.06	1.11	4233.53	0.288
13/70 12/70	11.345	1.379	1589.2	13.881	900	0.012	1.0	44.987	409.238	0.800	0.248	0.31	2.47	1992.69	0.094
10/70 9/70	10.344	0.732	1383.5	50.194	825	0.012	1.0	47.068	223.510	0.600	0.205	0.34	2.59	1585.56	0.323
5/70 4/70	6.245	0.092	1194.3	12.623	1200	0.012	1.0	48.167	34.290	1.200	0.068	0.06	1.06	4227.47	0.199
8/70 7/70	10.048	0.708	1378.1	12.252	1200	0.012	3.2	47.443	218.118	1.004	0.076	0.08	1.22	7536.31	0.168
4/70 2/70	6.108	0.05	1178.9	8.581	1200	0.012	4.0	48.560	18.864	2.200	0.122	0.06	1.04	8471.81	0.137
12/70 11/70	11.021	1.176	1512.4	54.977	825	0.012	0.9	45.736	352.369	0.600	0.245	0.41	2.83	1541.73	0.324
14/70 13/70	11.439	1.821	1698.9	24.372	900	0.012	1.0	44.683	538.943	0.600	0.218	0.36	2.67	1992.48	0.152
2/54 14/70	11.591	1.908	1722.2	19.923	900	0.012	1.0	44.131	562.175	1.000	0.374	0.37	2.71	1990.16	0.123
7/70 6/70	9.662	0.553	1333.9	27.365	1200	0.012	1.9	47.724	173.865	0.600	0.043	0.07	1.18	5839.51	0.387
9/70 8/70	10.216	0.721	1380.8	12.260	1050	0.012	1.0	47.300	220.840	1.000	0.130	0.13	1.59	2986.05	0.128
C/40 B/40	6.313	0.072	26.7	14.984	150	0.009	2.5	45.358	26.728	1.641	0.191	0.12	1.51	35.94	0.165
D/40 C/40	6.478	0.108	39.2	12.525	150	0.009	3.6	44.825	39.219	1.271	0.319	0.25	2.22	43.44	0.094
E/40 D/40	6.572	0.135	49.7	15.103	225	0.009	3.6	44.379	49.720	0.600	0.048	0.08	1.25	126.72	0.201
1/41 F/40	7.095	0.170	60.8	4.802	375	0.012	4.0	42.940	60.823	0.600	0.009	0.02	0.55	401.18	0.145
B/40 A/40	6.000	0.037	14.1	15.015	150	0.009	3.0	45.622	14.136	4.500	0.147	0.03	0.80	39.35	0.313
F/40 E/40	6.773	0.170	61.8	29.961	225	0.009	3.0	43.831	61.769	2.218	0.273	0.12	1.55	114.84	0.321
5/38 1/41	7.240	0.304	108.3	7.550	375	0.012	1.0	42.761	108.276	1.569	0.077	0.05	0.98	200.49	0.128
6/38 1/42	6.000	0.015	5.6	7.550	375	0.012	1.0	42.313	5.605	4.500	0.001	0.00	0.05	199.82	2.480
1/43 1A/43	20.000	0.108	24.0	6.825	375	0.012	3.0	46.526	23.977	4.500	0.011	0.00	0.22	347.28	0.524
2/43 1/43	20.000	0.118	26.3	7.551	375	0.012	1.0	46.271	26.304	0.600	0.002	0.00	0.24	199.82	0.528
3/43 2/43	20.000	0.129	28.6	56.171	375	0.012	3.5	46.145	28.631	2.233	0.008	0.00	0.26	375.24	3.611
4/43 3/43	20.000	0.311	69.2	41.844	375	0.012	2.3	44.129	69.189	1.748	0.035	0.02	0.63	304.76	1.113
5/43 4/43	20.000	0.554	123.1	13.889	375	0.012	1.0	43.111	123.081	1.575	0.100	0.06	1.11	200.05	0.207
6/43 5/43	20.000	0.568	126.2	10.659	450	0.012	1.0	42.974	126.184	0.600	0.019	0.03	0.79	322.91	0.224
7/43 6/43	20.000	1.130	251.2	39.822	525	0.012	1.6	42.855	251.162	1.149	0.079	0.07	1.16	613.33	0.572
3/43 1/44	6.000	0.141	53.5	8.146	375	0.012	3.0	44.423	53.453	4.500	0.054	0.01	0.48	347.28	0.281
4/43 1/45	6.000	0.212	80.1	7.553	375	0.012	1.0	43.237	80.076	4.500	0.121	0.03	0.73	200.45	0.174
2/54 1/54	6.000	0.117	44.2	7.922	375	0.012	3.0	43.986	44.221	4.500	0.037	0.01	0.40	347.28	0.330
3/54 2/54	11.714	2.108	1778.7	31.146	900	0.012	2.6	43.663	618.737	0.800	0.319	0.40	2.80	3242.92	0.186
4/54 3/54	11.899	2.117	1778.2	24.111	900	0.012	3.0	42.790	618.170	0.800	0.319	0.40	2.80	3456.02	0.144
5/54 4/54	12.043	2.128	1778.6	29.699	900	0.012	3.0	42.017	618.594	0.600	0.239	0.40	2.80	3456.02	0.177
6/54 5/54	12.220	2.264	1814.8	34.760	1050	0.012	1.0	41.224	654.789	0.600	0.134	0.22	2.10	2981.23	0.276
3/54 1/55	6.000	0.000	0.0	7.587	375	0.012	3.0	43.109	0.000	4.500	0.000	0.00	0.00	347.59	0.000
5/54 1/57	6.000	0.118	44.6	7.550	375	0.012	1.0	41.362	44.592	4.500	0.037	0.01	0.40	200.49	0.312
3/63 2/63	11.348	1.756	520.9	25.239	750	0.012	1.0	40.218	520.906	0.600	0.043	0.07	1.18	1234.04	0.357
2/63 1/63	6.000	0.000	0.0	5.550	375	0.012	1.0	40.274	0.000	4.500	0.000	0.00	0.00	200.72	0.000
2/63 J/62	7.115	0.194	69.5	3.508	375	0.012	4.0	40.363	69.522	0.600	0.012	0.02	0.63	401.26	0.093
I/62 H/62	6.621	0.117	42.9	12.162	225	0.009	1.5	41.552	42.878	0.863	0.051	0.06	1.08	80.08	0.188
G/62 F/62	6.287	0.085	24.2	13.604	150	0.009	1.5	41.861	24.221	1.573	0.151	0.10	1.37	27.47	0.165
F/62 E/62	6.000	0.036	13.6	12.275	150	0.009	1.5	42.061	13.559	4.500	0.135	0.03	0.77	27.46	0.267
H/62 G/62	6.432	0.095	35.1	10.020	225	0.009	1.0	41.652	35.062	0.600	0.024	0.04	0.88	64.75	0.189
J/62 I/62	6.809	0.146	53.1	24.453	225	0.009	3.0	41.370	53.052	0.894	0.081	0.09	1.33	114.84	0.305
2/65 1/65	6.000	0.114	43.0	11.550	675	0.012	0.5	39.159	42.985	4.500	0.003	0.00	0.12	656.58	1.603
3/65 2/65	16.768	3.255	813.9	39.319	1050	0.012	0.5	39.132	813.917	0.600	0.027	0.05	0.94	2106.51	0.697
4/65 3/65	17.465	3.506	855.7	23.634	900x900	0.013	0.5	38.735	855.664	1.402	0.080	0.06	1.06	1972.99	0.293
3/65 1/66	6.000	0.198	74.8	11.325	675	0.012	0.5	38.831	74.759	4.500	0.009	0.00	0.20	689.22	0.930
2/71 1/71	6.000	0.070	26.6	7.550	375	0.012	1.0	48.902	26.593	4.500	0.013	0.00	0.24	199.15	0.523
5/70 3/71	8.880	0.208	68.3	18.311	375	0.012	1.0	48.209	68.288	1.602	0.031	0.02	0.62	199.82	0.494
3/71 2/71	6.523	0.110	40.4	51.790	375	0.012	1.0	48.777	40.434	2.197	0.015	0.01	0.37	199.84	2.358
3/71 1/72	6.000	0.064	24.1	7.550	375	0.012	1.0	48.335	24.089	4.500	0.011	0.00	0.22	199.82	0.577
D/73 C/73	6.508	0.103	38.0	12.224	225	0.009	1.0	48.446	38.037	0.800	0.037	0.05	0.96	64.68	0.213
C/73 B/73	6.328	0.069	25.6	15.609	150	0.009	1.0	48.688	25.572	0.800	0.085	0.11	1.45	22.17	0.180
6/70 G/73	7.195	0.225	80.4	4.598	375	0.012	1.0	47.774	80.430	0.600	0.016	0.03	0.73	199.86	0.105
F/73 E/73	6.897	0.160	57.8	12.586	225	0.009	1.0	48.171	57.809	0.823	0.089	0.11	1.45	64.79	0.144
G/73 F/73	7.041	0.188	67.6	15.703	225	0.009	1.0	47.961	67.573	0.736	0.108	0.15	1.70	64.74	0.154
E/73 D/73	6.721	0.131	48.0	12.731	225	0.009	1.0	48.331	47.976	0.943	0.070	0.07	1.21	64.67	0.176
B/73 A/73	6.000	0.034	13.0	14.474	150	0.009	1.0	48.827	12.982	4.500	0.124	0.03	0.73	22.17	0.328
7/70 1/74	6.000	0.137	51.6	9.173	375	0.012	1.0	47.525	51.640	4.500	0.050	0.01	0.47	199.82	0.327
10/70 1/75	6.000	0.186	70.3	7.550	375	0.012	3.0	46.695	70.309	4.500	0.093	0.02	0.64	347.28	0.198
11/70 1/76	6.000	0.185	69.9	7.550	375	0.012	3.0	45.991	69.896	4.500	0.092	0.02	0.63	347.28	0.199
12/70 1/77	6.000	0.159	60.1	7.550	375	0.012	3.0	45.243	60.088	4.500	0.068	0.02	0.54	347.28	0.231
4/78 3/78	7.687	0.099	34.7	22.834	375	0.012	4.0	47.375	34.672	0.905	0.005	0.01	0.31	401.26	1.212
3/78 2/78	6.847	0.087	31.7	14.458	375	0.012	5.0	48.148	31.887	1.796	0.008	0.00	0.29	448.81	0.840
5/78 4/78	8.899	0.346	113.2	25.958	375	0.012	3.5	46.412	113.167	1.955	0.105	0.05	1.02	375.24	0.422
2/78 1/78	6.000	0.044	16.5	7.584	375	0.012	1.0	48.274	16.485	4.500	0.005	0.00	0.15	199.82	0.847
13/70 5/78	9.321	0.403	128.9	25.419	375	0.012	5.1	45.502	128.933	0.659	0.046	0.07	1.17	452.40	0.363
4/78 1/79	6.000	0.035	13.2	7.712	375	0.012	1.5	46.578	13.188	4.500	0.003	0.00	0.12	245.09	1.076
C/80 B/80	6.413	0.063	23.2	15.024	150	0.009	1.0	48.306	23.207	1.777	0.156	0.09	1.31	22.15	0.191
E/80 D/80	6.883	0.131	47.6	12.427	225	0.009	2.5	47.968	47.608	1.080	0.079	0.07	1.20	104.48	0.173
4/78 F/80	7.249	0.195	69.6	4.547	375	0.012	4.0	46.644	69.613	0.600	0.012	0.02	0.63	401.26	0.120
F/80 E/80	7.056	0.160	57.4	16.772	225	0.009	4.0	47.657	57.369	0.823	0.087	0.11	1.44	133.26	0.194
D/80 C/80	6.604	0.097	35.6	14.981	225	0.009	1.0	48.118	35.621	0.600	0.025	0.04	0.90	64.75	0.279
B/80 A/80	6.000	0.028	10.7	14.978	150	0.009	1.0	48.501	10.674	4.500	0.084	0.02	0.60	22.17	0.413
13/70 1/81	6.000	0.032	12.2	9.323	375	0.012	3.0	44.902	12.199	4.500	0.003	0.00	0.11	347.28	1.407
3/82 2/82	6.328	0.123	45.6	44.815	375	0.012	2.5	46.205	45.583	2.194	0.019	0.01	0.41	316.88	1.810
10/82 9/82	10.215	0.878	289.0	38.277	525	0.012	1.0	43.262	268.985	0.979	0.077	0.08	1.24	484.28	0.513
11/82 10/82	10.728	1.003	303.1	45.096	525	0.012	1.0	43.083	303.066	0.600	0.060	0.10	1.40	484.28	0.537
2/82 1/82	6.000	0.112	42.3	7.550	375	0.012	1.0	46.330	42.326	4.500	0.034	0.01	0.38	199.82	0.328
4/82 3/82	8.138	0.341	116.3	14.658	375	0.012	1.0	45.035	116.321	1.600	0.091	0.06	1.05	200.11	0.232
12/82 11/82	11.265	1.159	344.9	23.964	600	0.012	1.0	42.860	344.861	0.600	0.046	0.08	1.22	688.25	0.327
7/82 6/82	9.133	0.464	150.0	21.176	450	0.012	2.0	44.127	150.041	1.277	0.058	0.05	0.94	457.62	0.374
6/82 5/82	8.970	0.437	142.5	8.785	450	0.012	1.5	44.309	142.531	1.519	0.082	0.04	0.90	396.00	0.163
9/82 8/82	9.801	0.684	213.4	24.472	525	0.012	1.0	43.404	213.368	1.201	0.080	0.05	0.99	484.28	0.414
14/82 13/82	11.834	2.046	598.5	7.550	600	0.012	1.0	41.975	598.507	2.000	0.457	0.23	2.12	687.73	0.059
8/82 7/82	9.507	0.478	151.5	12.335	525	0.012	2.0	43.701	151.452	0.600	0.015	0.02	0.70	686.18	0.294
5/102 14/82	11.894	2.089	609.9	14.883	600	0.012	1.0	41.666	609.948	1.060	0.252	0.24	2.16	687.73	0.115
5/82 4/82	8.370	0.348	117.0	26.468	450	0.012	2.0	44.888	117.002	0.600	0.017	0.03	0.74	457.62	0.600
13/82 12/82	11.683	1.958	575.2	18.426	600	0.012	1.0	42.561	575.202	1.125	0.237	0.21	2.03	687.73	0.151

HYDRAULICS DESIGN TABLE Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream to Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time

HYDROLOGIC DESIGN TABLE Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Runoff Coeff. C	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Flow	Flow to Bypass Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(min)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(l/s)	(l/s)		(l/s)
E/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
F/73	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
D/73	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
A/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
1/74		GGP KI 1.8						6.00	136.0	0.786	0.174	0.137	6	51.8		51.6	2.538	1.444	0.070	44.984			
	Road					6.00		6.00		0.873	0.035	0.031											
	Lot					6.00		6.00		0.764	0.139	0.106											
1/75		GGP KI 1.8						6.00	136.0	0.785	0.237	0.186	6	70.3		70.3	1.008	2.054	0.088	57.185	13.124	1/76	
	Road					6.00		6.00		0.873	0.047	0.041											
	Lot					6.00		6.00		0.764	0.190	0.145											
1/78		GGP KI 1.8						6.00	136.0	0.873	0.212	0.185	6	69.9	13.1	83.0	1.008	2.207	0.093	64.812	18.208	1/77	
	Road					6.00		6.00		0.873	0.045	0.039											
	Lot					6.00		6.00		0.873	0.167	0.146											
1/77		GGP KI 2.4 SAG						6.00	136.0	0.795	0.200	0.159	6	60.1	18.2	78.5	0.202	Sag	0.233	78.455			
	Road					6.00		6.00		0.873	0.058	0.051			0.2								
	Lot					6.00		6.00		0.764	0.142	0.108											
3/78	**Road**	**GGP KI 1.8**				**6.00**		**6.00**	**136.0**	**0.873**	**0.014**	**0.012**	**6**	**4.6**		**4.6**	**4.000**	**0.316**	**0.028**	**4.616**		**5/78**	
2/78	**Road**	**GGP KI 1.8**				**6.00**		**6.00**	**136.0**	**0.873**	**0.050**	**0.044**	**6**	**16.5**		**16.5**	**3.231**	**0.679**	**0.047**	**16.485**		**3/78**	
4/78	**Road**	**GGP KI 1.8**				**6.00**		**6.00**	**136.0**	**0.873**	**0.018**	**0.016**	**6**	**5.9**		**5.9**	**4.000**	**0.389**	**0.033**	**5.935**			
1/78	**Road**	**GGP KI 1.8**				**6.00**		**6.00**	**136.0**	**0.873**	**0.050**	**0.044**	**6**	**16.5**		**16.5**	**3.230**	**0.719**	**0.048**	**16.485**		**1/79**	
5/78		**GGP KI 1.8**						**6.00**	**136.0**	**0.794**	**0.072**	**0.057**	**6**	**21.6**		**21.6**	**3.485**	**0.835**	**0.052**	**21.436**	**0.160**	**1/77**	
	Road					**6.00**		**6.00**		**0.873**	**0.020**	**0.017**											
	Lot					**6.00**		**6.00**		**0.764**	**0.052**	**0.040**											
1/79	**Road**	**GGP KI 1.8**				**6.00**		**6.00**	**136.0**	**0.873**	**0.040**	**0.035**	**6**	**13.2**		**13.2**	**4.000**	**0.490**	**0.041**	**13.188**		**1/81**	
B/80	**Lot**	**Stub**				**6.00**		**6.00**	**136.0**	**0.764**	**0.045**	**0.034**	**6**	**13.0**						**0.000**			
D/80	**Lot**	**JP 600x600**				**6.00**		**6.00**	**136.0**	**0.764**	**0.045**	**0.034**	**6**	**13.0**						**0.000**			
F/80	**Lot**	**GSIP 600x600**				**6.00**		**6.00**	**136.0**	**0.764**	**0.047**	**0.036**	**6**	**13.6**		**0.0**				**0.000**			
E/80	**Lot**	**Stub**				**6.00**		**6.00**	**136.0**	**0.764**	**0.037**	**0.028**	**6**	**10.7**						**0.000**			
C/80	**Lot**	**JP 600x600**				**6.00**		**6.00**	**136.0**	**0.764**	**0.045**	**0.034**	**6**	**13.0**						**0.000**			
A/80	**Lot**	**JP 600x600**				**6.00**		**6.00**	**136.0**	**0.764**	**0.037**	**0.028**	**6**	**10.7**						**0.000**			
1/81	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.037	0.032	6	12.2		12.2	2.820	0.566	0.043	12.199		2/54	
2/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.012	0.010	6	4.0		4.0	3.000	0.316	0.028	3.956		3/82	
9/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3		6.3	1.051	0.490	0.041	6.264		10/82	
10/82		GGP KI 1.8						6.00	136.0	0.790	0.126	0.099	6	37.6		37.6	1.051	1.558	0.073	35.089	2.517	11/82	
	Road					6.00		6.00		0.873	0.030	0.026											
	Lot					6.00		6.00		0.764	0.096	0.073											
1/82		GGP KI 1.8						6.00	136.0	0.783	0.143	0.112	6	42.3		42.3	3.000	1.253	0.064	38.828	3.698	1/83	
	Road					6.00		6.00		0.873	0.026	0.023											
	Lot					6.00		6.00		0.764	0.117	0.089											
3/82	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.044	0.038	6	14.5		14.5	0.425	Sag	0.043	14.507			
11/82		GGP KI 1.8						6.00	136.0	0.787	0.164	0.129	6	48.8	2.5	51.3	1.051	1.787	0.080	44.890	6.382	12/82	
	Road					6.00		6.00		0.873	0.035	0.031											
	Lot					6.00		6.00		0.764	0.129	0.099											
8/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.031	0.027	6	10.2		10.2	2.707	0.490	0.041	10.221		7/82	
5/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.021	0.018	6	6.9		6.9	2.707	0.396	0.035	6.924		1/85	
8/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	1.051	0.412	0.037	4.616		9/82	
13/82		GGP KI 2.4 SAG						6.00	136.0	0.842	0.105	0.088	6	33.4	0.3	46.3	0.155	Sag	0.137	46.283			
	Road					6.00		6.00		0.873	0.045	0.039			12.6								
	Med Density					6.00		6.00		0.818	0.060	0.049											
7/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.016	0.014	6	5.3		5.3	1.053	0.412	0.037	5.275		8/82	
14/82	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.049	0.043	6	16.2		16.2	0.156	Sag	0.048	16.155			
4/82	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.007	0.006	6	2.3		2.3	2.707	0.264	0.023	2.308		5/82	
12/82		GGP KI 1.8						6.00	136.0	0.815	0.053	0.043	6	16.3		22.7	1.051	1.215	0.063	22.432			
	Road					6.00		6.00		0.873	0.025	0.022									0.270	13/82	
	Lot					6.00		6.00		0.764	0.028	0.021			6.4								
1/83		GGP KI 2.4 SAG						6.00	136.0	0.788	0.229	0.181	6	88.2	3.7	72.0	0.483	Sag	0.214	72.048			
	Road					6.00		6.00		0.873	0.052	0.045			0.1								
	Lot					6.00		6.00		0.764	0.177	0.135											
B/84	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.053	0.040	6	15.3						0.000			
A/84	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.040	0.031	6	11.5						0.000			
1/85		GGP KI 2.4 SAG						6.00	136.0	0.786	0.247	0.194	6	73.4		73.4	0.026	Sag	0.218	73.359			
	Road					6.00		6.00		0.873	0.051	0.045											
	Lot					6.00		6.00		0.764	0.196	0.150											
1/86	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.045	0.039	6	14.8		14.8	1.051	0.914	0.054	14.836		1/88	
B/87	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
D/87	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.051	0.039	6	14.7						0.000			
C/87	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
A/87	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.053	0.040	6	15.3						0.000			
1/88	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.030	0.026	6	9.9		9.9	1.051	0.679	0.047	9.891		1/89	
1/89	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.031	0.027	6	10.2		10.2	1.051	0.757	0.049	10.221		14/82	
9/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	3.000	0.316	0.028	4.616		12/82	
8/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	3.000	0.316	0.028	4.616		9/90	
7/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.009	0.008	6	3.0		3.0	2.138	0.316	0.028	2.987		8/90	
4/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.012	0.010	6	4.0		4.0	1.000	0.422	0.038	3.956		5/90	
6/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.033	0.029	6	10.9		10.9	1.278	0.679	0.047	10.880		7/90	
10/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.030	0.026	6	9.9	1.7	11.6	3.000	0.512	0.042	11.637		12/82	
5/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.035	0.031	6	11.5		11.5	1.000	0.835	0.052	11.539		6/90	
3/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9		4.9	1.353	0.412	0.037	4.945		1/91	
1/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.065	0.057	6	21.4		21.4	2.707	0.914	0.054	21.287	0.143	1/83	
2/90	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.041	0.036	6	13.5		13.5	2.707	0.643	0.046	13.518		3/90	
1/91		GGP KI 1.8						6.00	136.0	0.786	0.194	0.152	6	57.8		57.6	1.000	1.902	0.084	49.302	8.272	1/92	
	Road					6.00		6.00		0.873	0.039	0.034											
	Lot					6.00		6.00		0.764	0.155	0.118											
1/92		GGP KI 1.8						6.00	136.0	0.784	0.159	0.125	6	47.1	8.3	55.3	1.000	1.856	0.082	47.736	7.601	1/93	
	Road					6.00		6.00		0.873	0.029	0.025											
	Lot					6.00		6.00		0.764	0.130	0.099											
1/93		GGP KI 1.8						6.00	136.0	0.796	0.088	0.069	6	26.1	7.6	33.7	2.139	1.240	0.064	31.984	1.746	10/90	
	Road					6.00		6.00		0.873	0.018	0.016											
	Lot					6.00		6.00		0.764	0.070	0.053											
D/94	Lot	Stub				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
B/94	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
A/94	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
C/94	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.039	0.030	6	11.3						0.000			
E/94	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.061	0.047	6	17.6						0.000			

HYDROLOGIC DESIGN TABLE Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Runoff Coeff. C	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Flow	Flow to Bypass Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(min)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(l/s)	(l/s)		(l/s)
4/95		GGP KI 1.8						6.00	136.0	0.798	0.144	0.115	6	43.4		43.4	1.000	1.656	0.076	39.378	4.019	5/95	
	Road					6.00		6.00		0.873	0.045	0.039											
	Lot					6.00		6.00		0.764	0.099	0.076											
3/95	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9		5.9	2.948	0.369	0.033	5.935		4/95	
2/95	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.049	0.043	6	16.2		16.2	2.993	0.879	0.047	16.155		3/95	
6/95	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.011	0.010	6	3.6		3.6	1.752	0.328	0.029	3.627			
5/95	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.039	0.034	6	12.9	4.0	16.9	1.524	0.914	0.054	16.877		6/95	
1/95		GGP KI 2.4 SAG						6.00	136.0	0.799	0.228	0.181	6	68.2		68.2	0.095	Sag	0.203	68.248			
	Road					6.00		6.00		0.873	0.074	0.065											
	Lot					6.00		6.00		0.764	0.152	0.116											
1/96	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.028	0.024	6	9.2		9.2	1.000	0.843	0.048	9.232		2/96	
2/96	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	2.993	0.309	0.027	4.616		1/98	
C/97	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
1/98	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.019	0.017	6	6.3		6.3	2.958	0.361	0.032	6.264		1/99	
D/97	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
B/97	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
A/97	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.058	0.044	6	16.7						0.000			
1/99		GGP KI 1.8						6.00	136.0	0.786	0.191	0.151	6	56.9		56.9	1.000	1.883	0.083	48.812	8.082	1/101	
	Road					6.00		6.00		0.873	0.043	0.038											
	Lot					6.00		6.00		0.764	0.148	0.113											
I/109	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
M/109		JP 600x900							136.0											0.000			
D/109	Lot	JP 600x600				6.00		6.00	136.0	0.873	0.038	0.033	6	12.5						0.000			
G/109	Lot	Stub				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000			
L/109		JP 600x600							136.0											0.000			
K/109	Lot	Stub				6.00		6.00	136.0	0.764	0.056	0.043	6	16.2						0.000			
A/109	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.056	0.043	6	16.2						0.000			
F/109	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000			
C/109	Lot	Stub				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
E/109	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
B/109	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.039	0.030	6	11.3						0.000			
H/109	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
J/109	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
7/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.008	0.007	6	2.8		2.6	1.899	0.290	0.026	2.638		1/107	
3/102		GGP KI 1.8						6.00	136.0	0.789	0.150	0.118	6	44.7		44.7	1.000	1.898	0.077	40.301	4.415	4/102	
	Road					6.00		6.00		0.873	0.035	0.031											
	Lot					6.00		6.00		0.764	0.115	0.088											
8/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5		16.5	1.531	0.914	0.054	16.485		9/102	
1/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.020	0.017	6	6.6		6.6	1.000	0.523	0.042	6.594		1/103	
2/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.036	0.031	6	11.9		11.9	1.000	0.838	0.052	11.868		3/102	
5/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.008	0.007	6	2.6		2.6	2.216	0.290	0.026	2.638		6/102	
4/102		GGP KI 1.8						6.00	136.0	0.831	0.206	0.171	6	64.7	4.4	69.1	1.272	1.940	0.085	58.448	12.631	13/82	
	Road					6.00		6.00		0.873	0.048	0.042											
	Med Density					6.00		6.00		0.818	0.158	0.129											
6/102		GGP KI 1.8						6.00	136.0	0.829	0.203	0.168	6	63.6		63.6	3.000	1.537	0.073	53.155	10.436	1/115	
	Road					6.00		6.00		0.873	0.041	0.036											
	Med Density					6.00		6.00		0.818	0.162	0.133											
9/102	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.033	0.029	6	10.9		10.9	1.000	0.835	0.052	10.880		2/65	
1/103	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.039	0.034	6	12.9		12.9	1.000	0.835	0.052	12.858		1/104	
1/104	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.053	0.046	6	17.5		17.5	1.273	0.992	0.056	17.474		1/105	
1/105	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.042	0.037	6	13.8		13.8	2.217	0.679	0.047	13.847		1/106	
1/106	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.045	0.039	6	14.8		14.8	3.000	0.679	0.047	14.836		8/102	
1/107		GGP KI 1.8						6.00	136.0	0.832	0.165	0.137	6	51.8		51.8	1.000	1.805	0.081	45.292	6.554	1/65	
	Road					6.00		6.00		0.873	0.041	0.036											
	Med Density					6.00		6.00		0.818	0.124	0.101											
1/115		GGP KI 2.4 SAG						6.00	136.0	0.841	0.133	0.112	6	42.2	13.8	66.4	0.642	Sag	0.197	66.439			
	Road					6.00		6.00		0.873	0.055	0.048			10.4								
	Med Density					6.00		6.00		0.818	0.078	0.064											
2/115	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.028	0.024	6	9.2		9.2	0.612	Sag	0.027	9.232			
H/100		JP 600x900							136.0											0.000			
B/100	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
C/100	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.039	0.030	6	11.3						0.000			
D/100	Lot	Stub				6.00		6.00	136.0	0.764	0.030	0.023	6	8.7						0.000			
G/100	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.058	0.044	6	16.7						0.000			
E/100	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
F/100	Lot	Stub				6.00		6.00	136.0	0.764	0.048	0.037	6	13.8						0.000			
A/100	Lot	JP 600x900				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
1/101		GGP KI 1.8						6.00	136.0	0.786	0.215	0.169	6	63.8	8.1	71.9	1.704	1.844	0.082	58.140	13.760	1/115	
	Road					6.00		6.00		0.873	0.044	0.038											
	Lot					6.00		6.00		0.764	0.171	0.131											
1/110	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.043	0.033	6	12.4						0.000			
2/110	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			

This plan/document relates to
DA No: 08/0790 10/0054
Environmental Planning & Assessment Act
Erwin Handfield
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lead

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.

DATUM: ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1E
DRAINAGE CALCULATIONS (2 OF 2)

PLAN No. 8953CC38 B
FILE No. 8953CC38
SHEET 38 OF 44 SHEETS

Plotted: 21 Dec 2010 3:11:35 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC38.dwg

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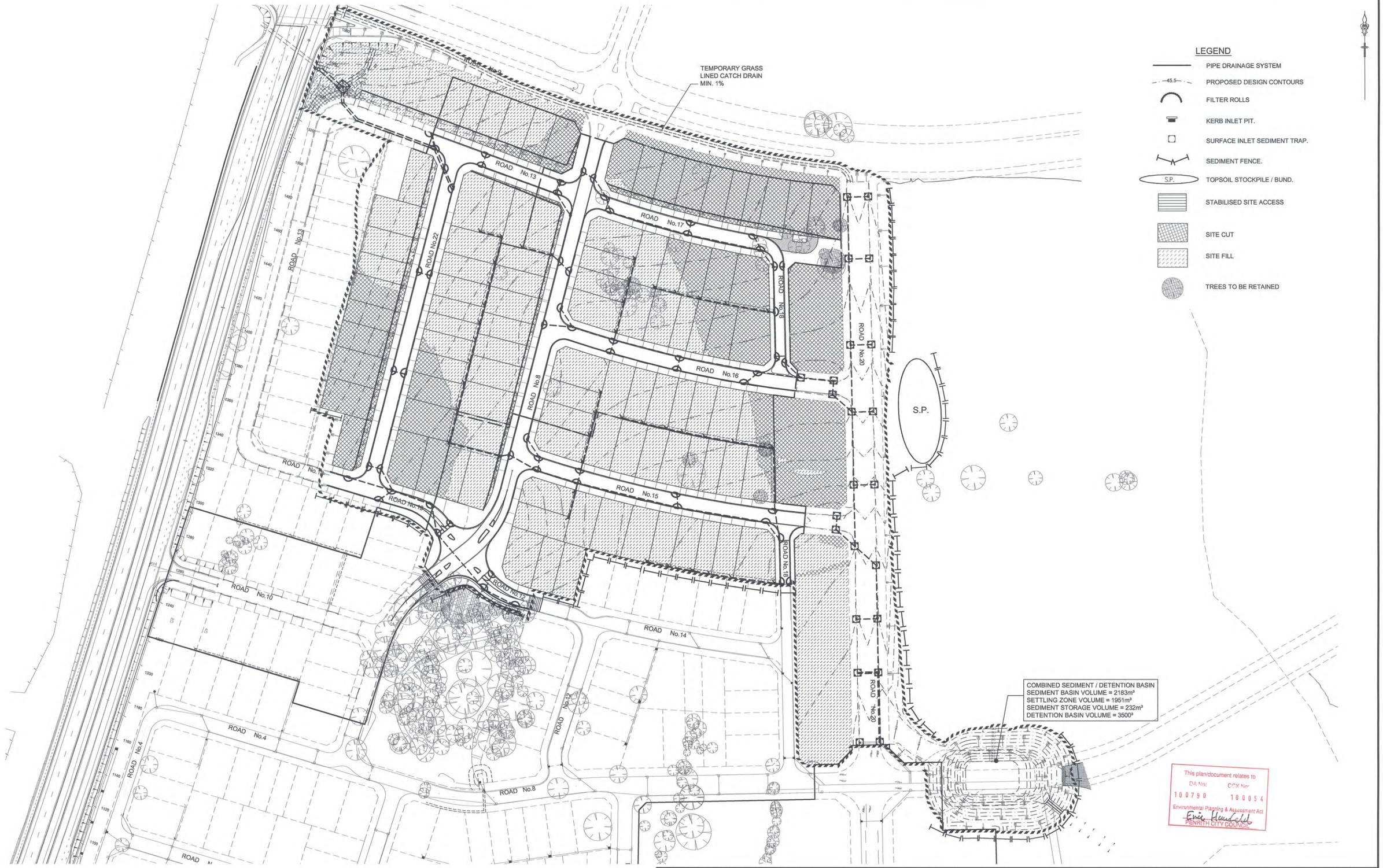
Version: 1, Version Date: 13/07/2018


TEMPORARY GRASS LINED CATCH DRAIN MIN. 1%
COMBINED SEDIMENT / DETENTION BASIN
SEDIMENT BASIN VOLUME = 2183m³
SETTLING ZONE VOLUME = 1951m³
SEDIMENT STORAGE VOLUME = 232m³
DETENTION BASIN VOLUME = 3500³
S.P.
ROAD No.9
ROAD No.13
ROAD No.22
ROAD No.17
ROAD No.18
ROAD No.20
ROAD No.16
ROAD No.8
ROAD No.15
ROAD No.12
ROAD No.14
ROAD No.10
ROAD No.4
ROAD No.3
ROAD No.1
ROAD No.2
ROAD No.5
ROAD No.6
ROAD No.7
ROAD No.11
ROAD No.19
ROAD No.21
ROAD No.23
ROAD No.24
ROAD No.25
ROAD No.26
ROAD No.27
ROAD No.28
ROAD No.29
ROAD No.30
ROAD No.31
ROAD No.32
ROAD No.33
ROAD No.34
ROAD No.35
ROAD No.36
ROAD No.37
ROAD No.38
ROAD No.39
ROAD No.40
ROAD No.41
ROAD No.42
ROAD

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

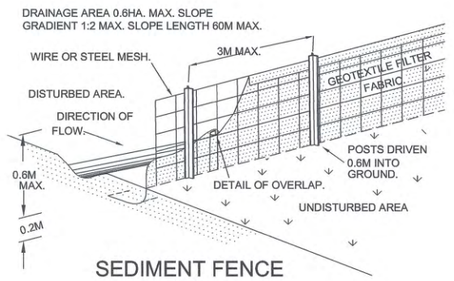
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

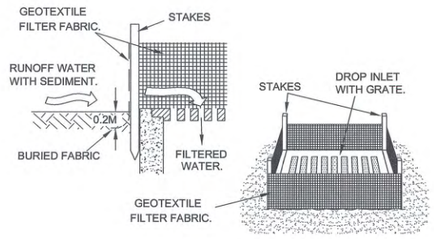
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

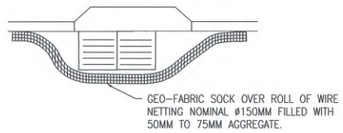
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

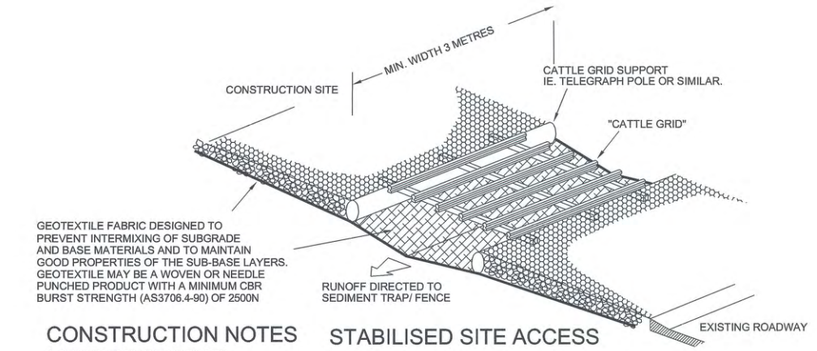


SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.

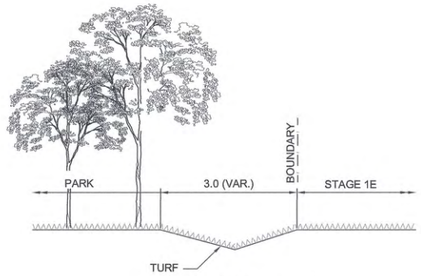




CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

STABILISED SITE ACCESS



TYPICAL CATCH DRAIN DETAIL
N.T.S.

This plan/document relates to
DA No: 100790 CCX No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
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A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N.T.S.

JORDAN SPRINGS
STAGE 1E
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8953CC40 B
FILE No. 8953CC40
SHEET 40 OF 44 SHEETS

Plotted: 21 Dec 2010 3:11:49 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC40.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

FUTURE ROADS TO BE EARTH FORMED ONLY TO SUBGRADE BOXING LEVELS. EASE ROAD FORMATION GRADING TO TEMPORARY SEDIMENT POND TOP OF BANK RL 38.10.

B

2.0

2.2

PROVIDE 1.8m BLACK CHAIN WIRE FENCE & POSTS WITH DOUBLE GATES.

1V:4H BATTER

40.0m

18.65m

ROAD No.8

A

1V:4H CUT BATTER

1V:3H BATTER

PROVIDE INLET WITH PACKED ROCK SCOUR PROTECTION

INLET INV.RL37.0

PROVIDE 8m WIDE SPILLWAY RL38.0 WITH ROLLED EROSION CONTROL PRODUCTS (RECP) SHEET FLOW TREATMENT

A

3 X 825ϕ RC PIPES @

1.0%

1V:4H BATTER

PROVIDE OUTLET WITH PACKED ROCK SCOUR PROTECTION

PROVIDE INLET WITH PACKED ROCK SCOUR PROTECTION TO SUIT DESIGN 4200mm X 1800mm RC BOX CULVERT

EXISTING TREE

OUTLET INV.RL36.9

1.0%

FUTURE DRAINAGE

B

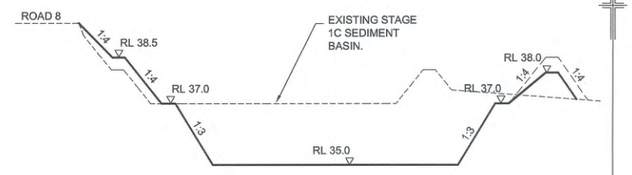
TOWN SQUARE

PLAN
1:200

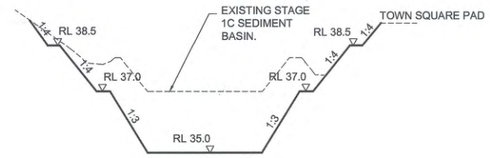
CONSTRUCT TAILOUT DRAIN IN EXISTING MATERIALS (GRASS LINED)

TAILOUT DRAIN OUTLET

DETENTION COMPONENT:



LONGITUDINAL SECTION A-A
1:500 H
1:100 V



LONGITUDINAL SECTION B-B
1:500 H
1:100 V

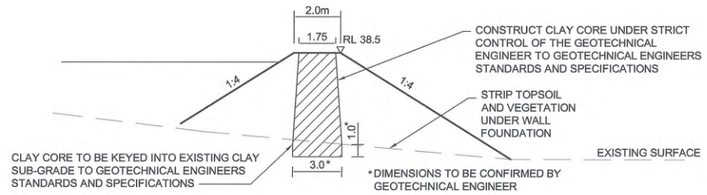
NOTE:
1. EXISTING STAGE 1C SEDIMENT BASIN TO BE EXPANDED AND RECONFIGURED AS SEDIMENT / DETENTION BASIN FOR EXISTING STAGE 1C AS WELL AS PROPOSED STAGES 1E, 1F & 1G.

CONSTRUCT TEMPORARY SEDIMENT/DETENTION BASIN

SED. BASIN COMPONENT:

BASE RL = 35.00
TOP RL = 37.00
DEPTH = 2.00 m
VOLUME = 2183 cu.m

BASE RL = 37.00
TOP RL = 38.50
TWL 1:100yr = 38.5
DEPTH = 1.5 m
VOLUME = 3500 cu.m



TYPICAL SECTION THROUGH EMBANKMENT WALL
NTS

EMBANKMENT NOTES

1. CONSTRUCT A CLAY CORE MINIMUM 3.0 m THICK, UNDER STRICT CONTROL OF THE GEOTECHNICAL ENGINEER, DESIGNED AND CONSTRUCTED TO GEOTECHNICAL ENGINEERS STANDARDS AND SPECIFICATIONS.
2. FORM EMBANKMENT AND WEIR WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL INCLUDING EXCAVATION FOR KEY AS DIRECTED.
3. COMPACT EXISTING CLAY SUB-GRADE AND EMBANKMENT MATERIAL IN 300mm DEEP LAYERS TO 98% (+2% -1%) STANDARD COMPACTION.
4. REFER TO DETAILS AT RIGHT FOR WEIR OVERFLOW FINISHING.
5. GRASS ALL SURFACES (OTHER THAN ROCK) WITH APPROVED TURF (COUCH).
6. ALL PIPES TO BE RUBBER RING JOINT WITHOUT LIFTING HOLES.
7. BACKFILLING AROUND PIPES SHALL BE WITH SELECTED MATERIAL TO THE GEOTECHNICAL ENGINEERS APPROVAL AND COMPACTED TO 98% (+2% -1%) STANDARD COMPACTION.

This plan/document relates to
DA No: 100790
CCX No: 100054
Environmental Planning & Assessment Act
Eric Hemsell
PENRITH CITY COUNCIL

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

ISSUE	AMENDMENT	DATE	BY
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:250

CLIENT: Delfin Lend Lease

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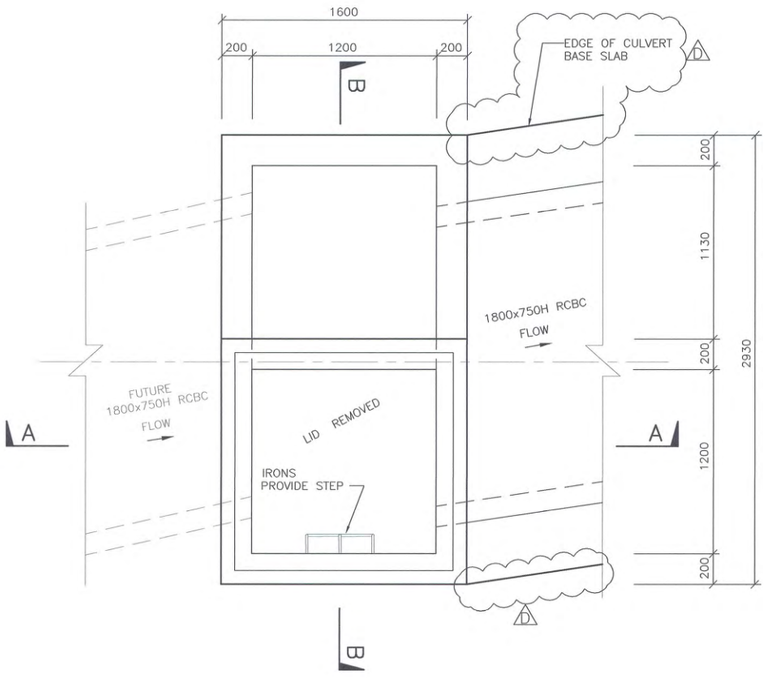
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 01/12/10

JORDAN SPRINGS
STAGE 1E
SEDIMENT / DETENTION BASIN
PLAN, SECTIONS & DETAILS

PLAN No. 8953CC41 B
FILE No. 8953CC41
SHEET 41 OF 44 SHEETS

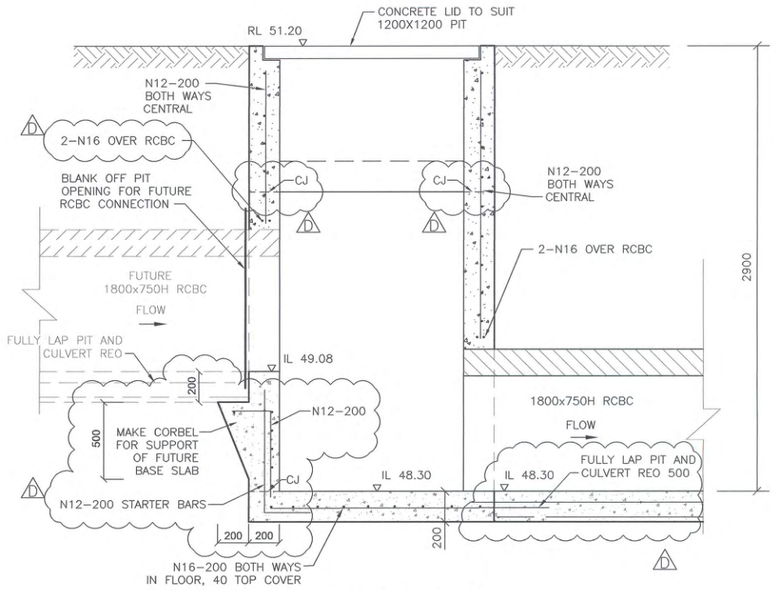
Plotted: 21 Dec 2010 3:11:59 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1E\8953CC41.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



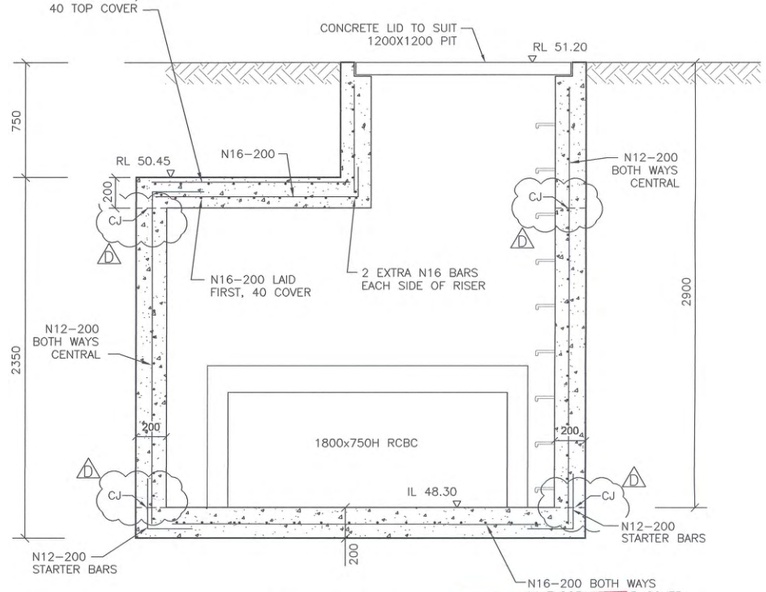
PIT STRUCTURE 1/70
PLAN
SCALE 1:20

NOTE: PIT STRUCTURE AND INLET RCBC TO BE CO-ORDINATED WITH PROPOSED NORTHERN ROAD UPGRADE WORKS.

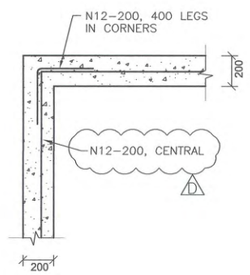


SECTION A–A
SCALE 1:20

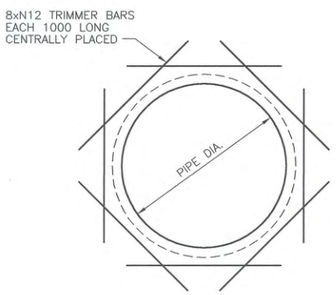
NOTE
CJ – CONSTRUCTION JOINT



SECTION B–B
SCALE 1:20



TYPICAL PLAN DETAIL
PIT CORNER
N.T.S



ADDITIONAL REINFORCEMENT
AROUND PIPES – TYPICAL
N.T.S

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615/E DATE 21/01/11

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8953/CC43

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 21/01/11

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS SHOWN	20-01-11	NW
C	PIT STRUCTURE 3/70 DELETED, 1/70 ADDED	01-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR STRUCTURAL REVIEW	11-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1E
SPECIAL DRAINAGE STRUCTURE 1/70

PLAN No. 8953CC42 D
FILE No. 8953CC42
SHEET 42 OF 46 SHEETS

This plan/document relates to DA No: 10079O CCX No: 100054
Environmental Planning & Assessment Act
Enda Henderson
PENRITH CITY COUNCIL

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

STRUCTURAL NOTES FOR ALL SPECIAL PITS

GENERAL

1.1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS 3600 AND OTHER RELEVANT CODES.
1.2 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

CONCRETE

2.1 CONCRETE QUALITY

ELEMENT	CONCRETE STRENGTH F'c	MAX. AGGREGATE SIZE	MAX. SLUMP	CEMENT TYPE
SLABS	40MPa	20mm	75mm	GB
WALLS	40MPa	20mm	75mm	GB
BLINDING SLABS	5MPa	20mm	75mm	GB

2.2 NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.
2.3 CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE 40mm TO ALL SURFACES UNLESS NOTED OTHERWISE.
2.4 CONSTRUCTION JOINTS NOT INDICATED SHALL BE LOCATED AND FORMED TO THE APPROVAL OF COUNCIL'S ENGINEER.
2.5 A BOND BREAKING MATERIAL IS TO BE PLACED BETWEEN CONTACTING SURFACES AT CONSTRUCTION JOINTS.
2.6 NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS UNLESS APPROVED IN WRITING BY COUNCIL'S ENGINEER.
2.7 UNLESS SHOWN OTHERWISE ALL EXTERNAL AND RE-ENTRANT CORNERS SHALL BE CHAMFERED 25mm.
2.8 SLABS TO BE CURED AND KEPT MOIST FOR 7 DAYS MINIMUM.
2.9 NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35 DEGREES CELSIUS OR FALLS BELOW 5 DEGREES CELSIUS.

REINFORCEMENT

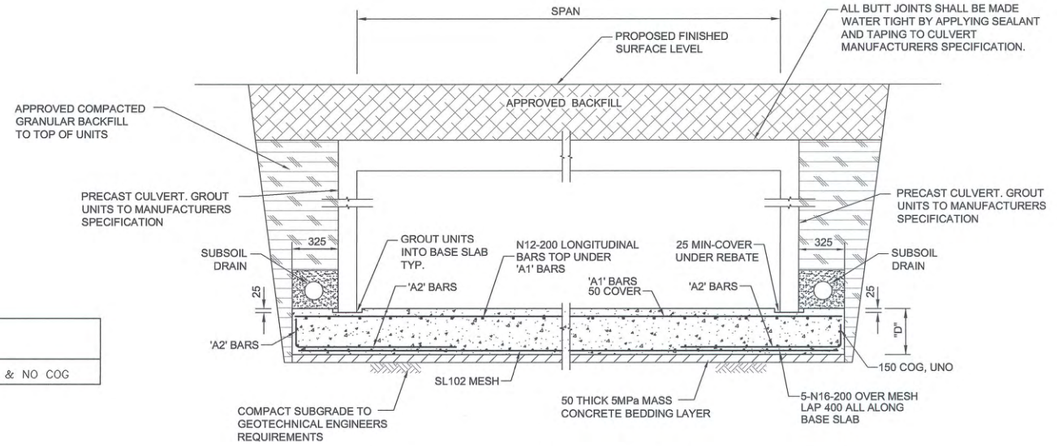
3.1 REINFORCEMENT STEEL QUALITY:

REINFORCEMENT TYPE	GRADE	SAA CODE	SYMBOL
WELDING GRADE DEFORMED	500	AS 4671	N
PLAIN ROUND	230	AS 1302	R
FABRIC	500	AS 4671	SL, RL, L

3.2 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE POSITION.
3.3 ALL REINFORCEMENT SHALL BE SECURELY TIED AND POSITIONED ACCURATELY BY MEANS OF STEEL OR PLASTIC CHAIRS OR OTHER APPROVED ACCESSORIES. MASONRY BLOCKS WILL NOT BE PERMITTED.
3.4 PROVIDE COUNCIL'S ENGINEER WITH 24 HOURS NOTICE OF REINFORCEMENT BEING READY FOR INSPECTION. NO CONCRETE IS TO BE POURED WITHOUT APPROVAL OF COUNCIL'S ENGINEER.
3.5 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION INDICATED. THE APPROVAL OF COUNCIL'S ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICE.
3.6 WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS INDICATED ON THE STRUCTURAL DRAWINGS OR WITH WRITTEN APPROVAL OF COUNCIL'S ENGINEER.
3.7 MINIMUM LAP OF REINFORCEMENT SHALL BE AS SHOWN IN TABLE 13.1.2.2(A) OF AS 3600 UNLESS SHOWN OTHERWISE. LAPS FOR MESH SHALL BE 1.5 TIMES THE NOMINAL WIRE SPACING OR APPROVED EQUIVALENT.
3.8 REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.
3.9 MINIMUM RADIUS FOR BENDS IN REINFORCEMENT TO BE 4 BAR DIAMETERS (DB) UNLESS NOTED OTHERWISE.

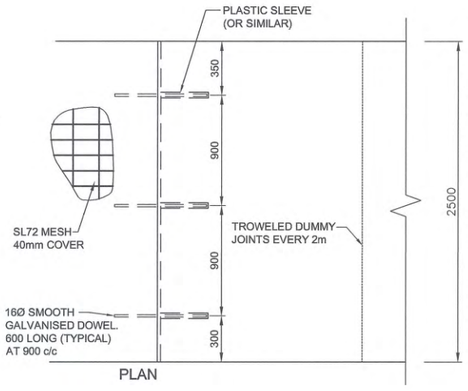
BASE SLAB DIMENSIONS

SPAN (mm)	"D" (mm)	'A1'	'A2'
1800	200	N16-150	N16-150, 900 LONG & NO COG



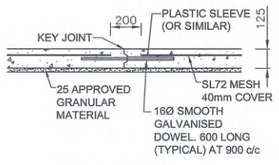
TYPICAL BOX CULVERT BASE SLAB DETAIL-SINGLE CELL

SCALE NTS



PLAN

NOTE:
1. MESH TO BE PLACED ON 50, 65mm BAR CHAIRS.
2. THE CONCRETE SHALL BE PLACED ON A LAYER OF APPROVED FINE GRANULAR MATERIAL.
3. CONCRETE SHALL HAVE A 28 DAY STRENGTH (F'c) OF 20MPa.
4. ANY VARIATIONS TO STANDARD CROSSFALL, 2.0% ON CYCLEWAY SHALL REQUIRE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
5. CONCRETE SHALL HAVE A LIGHT BRUSHED FINISH.
6. ALL DOWELS TO BE 600mm LONG WITH 300mm PENETRATION INTO EACH SLAB.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
8. KEY JOINTS TO BE PLACED EVERY 6m.
9. TROWELED DUMMY JOINTS EVERY 2m



CROSS SECTION

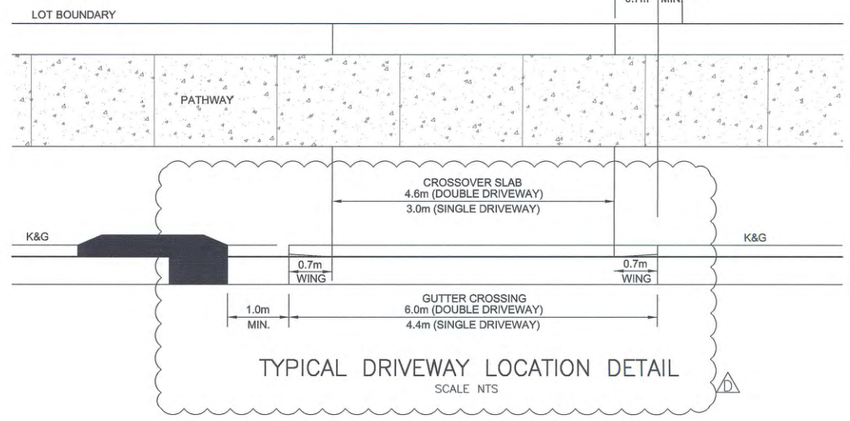
NOTE: CONTROL JOINTS TO HAVE FULL DEPTH MASTIC OR SIMILAR ADHERED TO BACK

SHARED CYCLE/FOOTWAY TYPICAL DETAIL

NTS

NOTE:
1. * MINIMUM DRIVEWAY OFFSETS FROM SIDE BOUNDARY:
   - 0.4m FOR STANDARD LOTS
   - 0.1m FOR ZERO BOUNDARY LOTS
2. DRAINAGE PITS TO BE LOCATED MINIMUM 1.0m FROM EDGE OF DRIVEWAY.
3. LAYBACKS TO BE CONSTRUCTED ON PRIMARY DRIVEWAY FRONTAGE FOR CORNER LOTS UNLESS OTHERWISE NOTED ON ENGINEERING PLANS.
4. REFER TO PENRITH CITY COUNCIL SPECIFICATIONS FOR DETAILS.
5. WATER SERVICES TO BE LOCATED WITHIN 0.6m ENVELOPE FROM SIDE BOUNDARY

This plan/document relates to DA No: CCX No: 100790 100854
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL



TYPICAL DRIVEWAY LOCATION DETAIL

SCALE NTS

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..... Roger Dohnt

BE,MIE, Aust., CPEng NPER-3 NO.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615/E DATE 21/01/11

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS SHOWN	20-01-11	NW
C	AMENDMENTS AS NOTED	24-12-10	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM
A	ISSUED FOR CLIENT REVIEW	05-10-10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES:

CLIENT: Delfin Lend Lease

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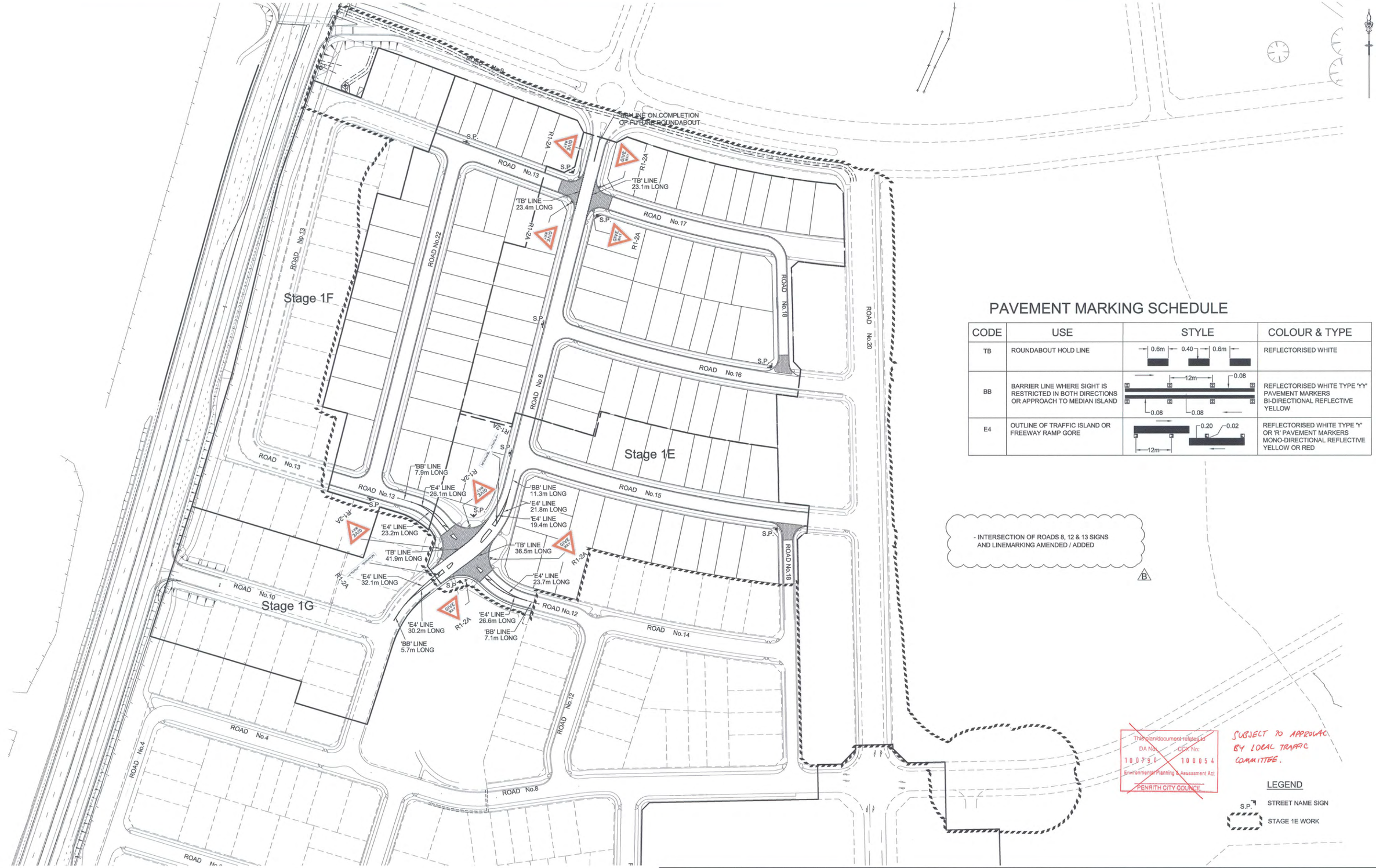
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 21/01/11

JORDAN SPRINGS
STAGE 1E
SPECIAL DRAINAGE STRUCTURE
NOTES & DETAILS, CYCLEWAY / FOOTWAY DETAIL

PLAN No. 8953CC43 D
FILE No. 8953CC43
SHEET 43 OF 46 SHEETS

Plotted: 21 Jan 2011 2:22:18 PM File Name: J:\8953\DJCC - Engineering Construction Plans\Stage 1E\8953CC43.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



PAVEMENT MARKING SCHEDULE

CODE	USE	STYLE	COLOUR & TYPE
TB	ROUNDABOUT HOLD LINE	0.8m, 0.40, 0.6m	REFLECTORISED WHITE
BB	BARRIER LINE WHERE SIGHT IS RESTRICTED IN BOTH DIRECTIONS OR APPROACH TO MEDIAN ISLAND	12m, 0.08, 0.08, 0.08	REFLECTORISED WHITE TYPE 'YY' PAVEMENT MARKERS BI-DIRECTIONAL REFLECTIVE YELLOW
E4	OUTLINE OF TRAFFIC ISLAND OR FREEWAY RAMP GORE	0.20, 0.02, 12m	REFLECTORISED WHITE TYPE 'Y' OR 'R' PAVEMENT MARKERS MONO-DIRECTIONAL REFLECTIVE YELLOW OR RED

- INTERSECTION OF ROADS 8, 12 & 13 SIGNS AND LINEMARKING AMENDED / ADDED

B

This plan/document relates to DA No: 10079.0 CC's No: 100054 Environmental Planning & Assessment Act PENRITH CITY COUNCIL

SUBJECT TO APPROVAL BY LOCAL TRAFFIC COMMITTEE.

LEGEND

S.P. STREET NAME SIGN

STAGE 1E WORK

1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100

METRES

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 01/12/10

ISSUE	AMENDMENT	DATE	BY
B	SIGNS AND LINEMARKING AMENDED / ADDED	20-12-10	AM
A	ISSUED FOR CONSTRUCTION APPROVAL	08/11/10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:1000 (AT A1)

JORDAN SPRINGS
STAGE 1E
SIGNAGE & LINEMARKING PLAN

PLAN No. 8953CC44 B
FILE No. 8953CC44
SHEET 44 OF 46 SHEETS

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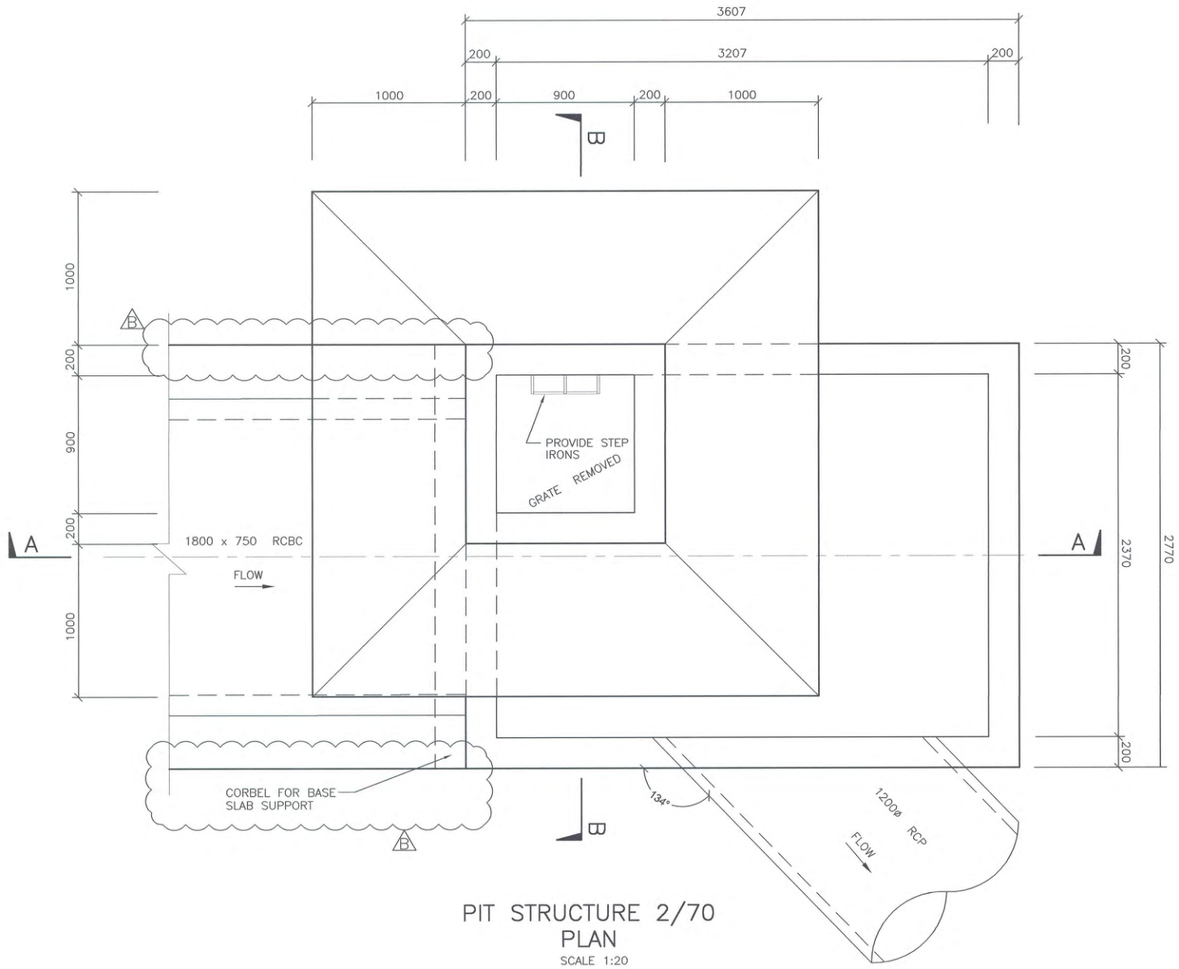
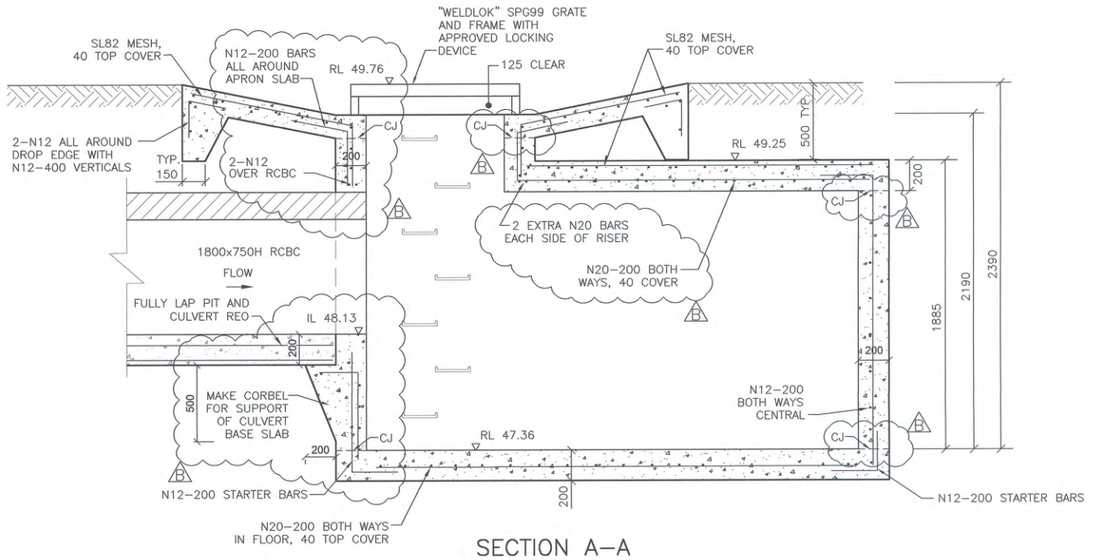
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

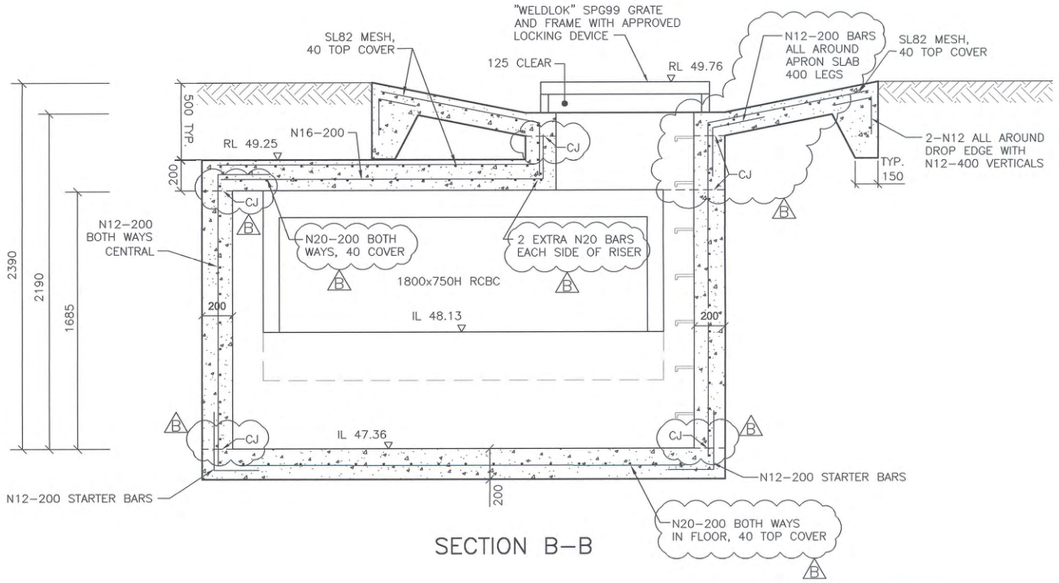


PIT STRUCTURE 2/70
PLAN
SCALE 1:20

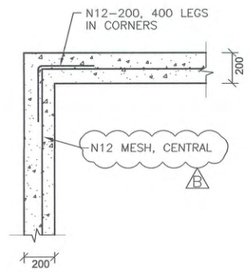


SECTION A–A
SCALE 1:20

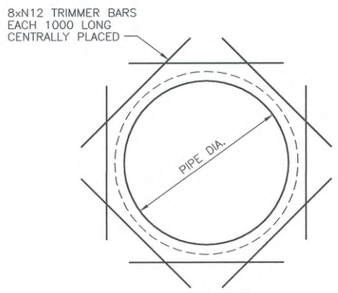
NOTE
CJ – CONSTRUCTION JOINT



SECTION B–B



TYPICAL PLAN DETAIL
PIT CORNER
N.T.S



ADDITIONAL REINFORCEMENT
AROUND PIPES – TYPICAL
N.T.S

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..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

REF No. 14615/E DATE 21/01/11

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8953/CC43

This plan/document relates to
DA No: 10790 CCV No: 100054
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:20 400 200 0 400 800 1200 1600 2000
MILLIMETRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED..... DATE 21/01/11

ISSUE	AMENDMENT	DATE	BY
B	AMENDMENTS AS SHOWN	20-01-11	NW
A	ISSUED FOR CONSTRUCTION APPROVAL	01-12-10	

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DRAWN _____
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DATUM: ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1E
SPECIAL DRAINAGE STRUCTURE 2/70

PLAN No. 8953CC45 B
FILE No. 8953CC45
SHEET 45 OF 46 SHEETS

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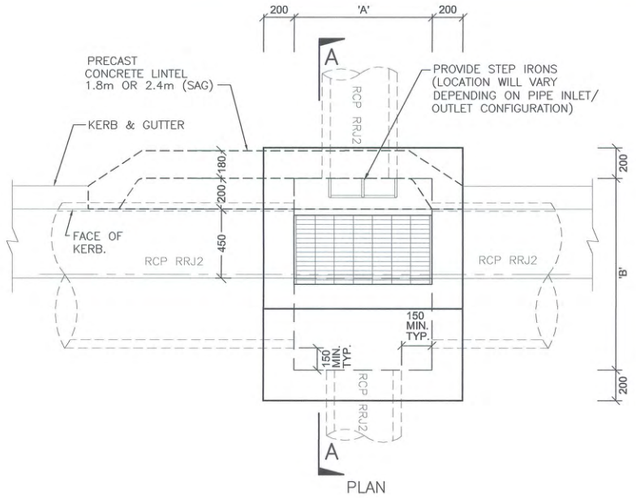
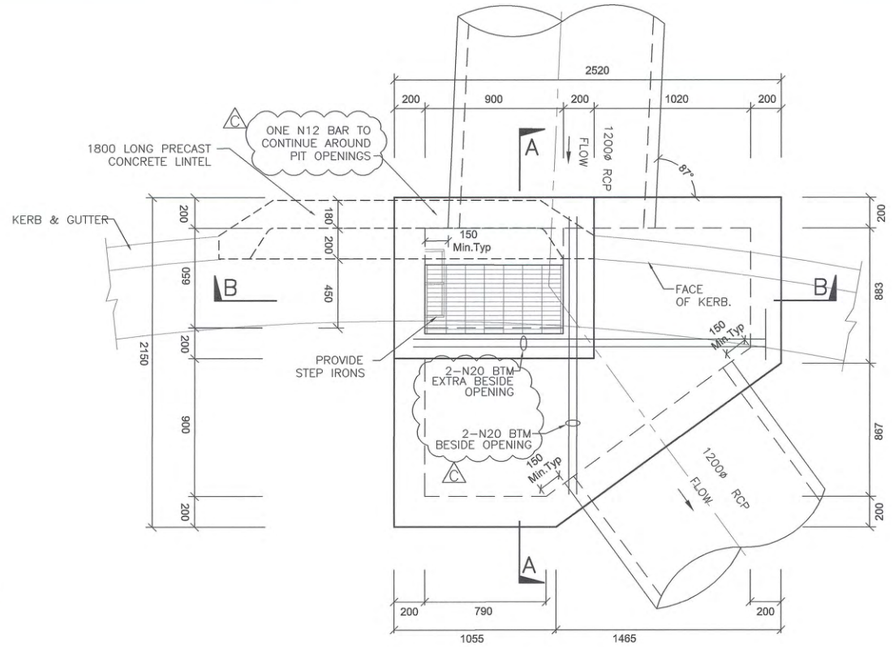


PLAN

PIT DIMENSION SCHEDULE			
PIT No.	LENGTH 'A'	WIDTH 'B'	DEPTH 'C'
5/70	900	1900	2299
6/70	900	1670	2282
7/70	900	2240	2286
8/70	2250	2240	2151
9/70	900	2250	2247
10/70	900	1250	2293
11/70	900	1250	2338
12/70	900	1800	2393
13/70	1800	1350	2396
14/70	900	1800	2094

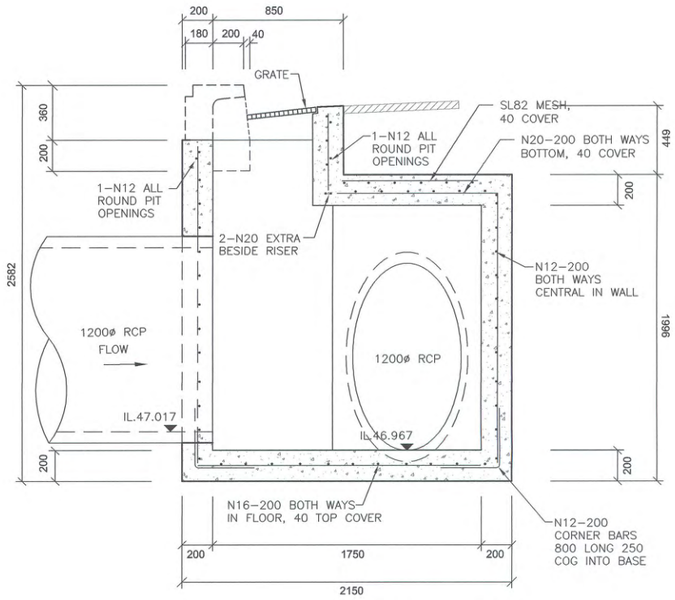
NOTES:

1. REFER TO PIT SCHEDULE & SETOUT TABLE ON DRAWING 8953CC36 FOR ALL PIT SETOUT, PIPE DIAMETERS AND INVERT LEVELS
2. ALLOW MIN. 150mm CLEARANCE FROM PIPE TO PIT WALL.
3. ALLOW MIN. 2000mm CLEARANCE ABOVE PIPE TO PIT ROOF FOR EXTENDED CHAMBERS.



PLAN – PIT 4/70

SCALE 1:20



SECTION A–A – PIT 4/70

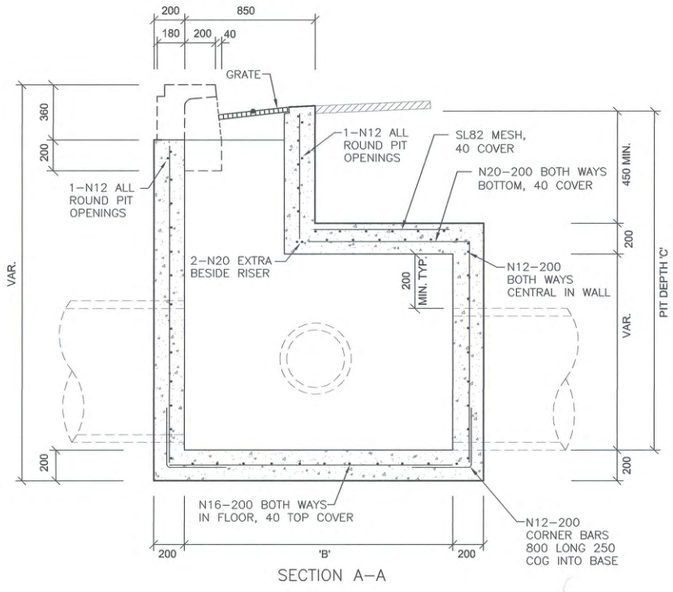
SCALE 1:20

I HEREBY CERTIFY THAT I HAVE DESIGNED THE DRAINAGE STRUCTURES ON THIS DRAWING AND I CERTIFY THE DETAILS TO BE STRUCTURALLY ADEQUATE FOR THE APPLICATION.

R.P. Dohnt ..... Roger Dohnt

BE,MIE, Aust., CPEng NPER–3 N0.61807
for Inhouse Consulting Engineers Pty. Ltd.

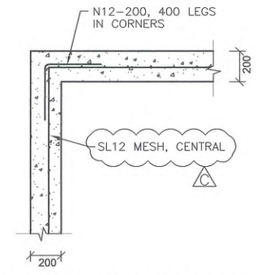
REF No. 14615/E DATE 21/01/11



SECTION A–A

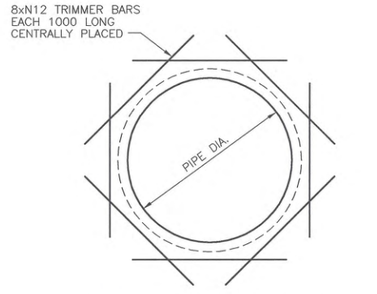
TYPICAL DETAIL FOR PITS OVER 2m

SCALE 1:20



TYPICAL PLAN DETAIL PIT CORNER

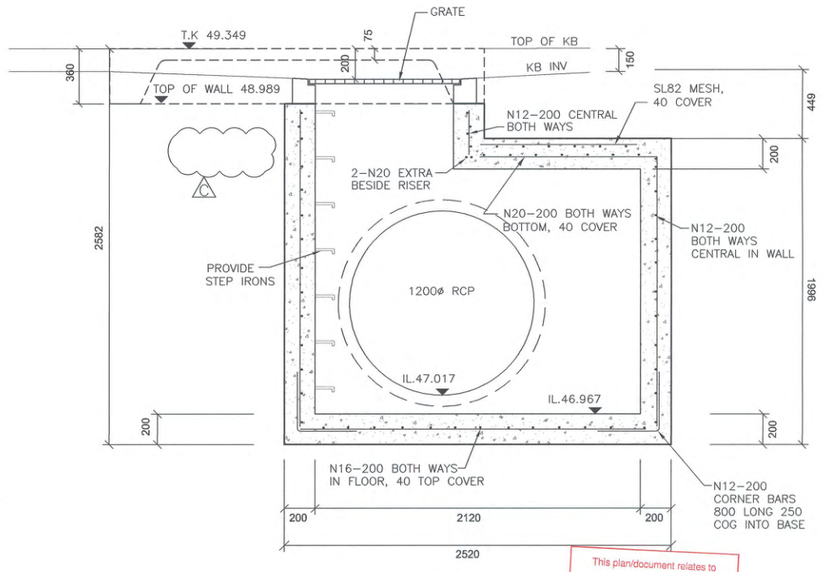
N.T.S



ADDITIONAL REINFORCEMENT AROUND PIPES – TYPICAL

N.T.S

FOR TYPICAL STRUCTURAL NOTES & SPECIAL PIT DETAILS REFER TO PLAN SHEET 8953/CC43



SECTION B–B – PIT 4/70

SCALE 1:20

This plan/document relates to DA No: 10054 CCX No:
Environmental Planning and Assessment Act
PENRITH CITY COUNCIL

400 200 0 400 800 1200 1600 2000
1:20 MILLIMETRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL

SIGNED S. Anderson DATE 21/01/11

ISSUE	AMENDMENT	DATE	BY
C	AMENDMENTS AS SHOWN	20-01-11	NW
B	TYPICAL DETAIL FOR PITS OVER 2m ADDED	20-12-10	AM
A	ISSUED FOR CONSTRUCTION APPROVAL	01-12-10	

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED _____
DRAWN _____
CHECKED _____

DATUM: ORIGIN:
SCALES: 1:20

JORDAN SPRINGS
STAGE 1E
SPECIAL DRAINAGE STRUCTURE 4/70

PLAN No. 8953CC46 C
FILE No. 8953CC46
SHEET 46 OF 46 SHEETS

Plotted: 21 Jan 2011 2:22:26 PM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1E\8953CC46.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS".
2. SURVEY MARKS:-
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT-HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:- THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:-
    a) INTERALLOTMENT DRAINS (C.D.L.) - 150mm dia. -1.5m WIDE MINIMUM
       - 225mm & 300mm dia. -2.0m WIDE MINIMUM
       - 300mm TO 600mm dia. -2.5m WIDE MINIMUM
       - 675mm & 750mm dia. -3.0m WIDE MINIMUM
    b) PIPED DRAINAGE - 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au DIAL1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

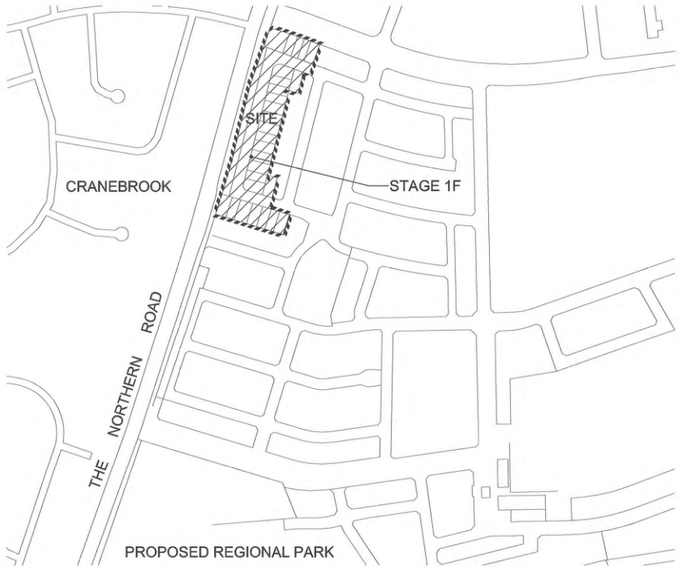
PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

STAGE 1F
CONSTRUCTION CERTIFICATE
PROPOSED ROAD & DRAINAGE WORKS

COUNCIL REF: DA10/0888



LEGEND

PROPOSED	DESCRIPTION	EXISTING
600Ø	R.C. STORMWATER PIPELINE	
600Ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150Ø	COMMON DRAINAGE LINE	150Ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
	KERB INLET PIT BUILT TO SUBGRADE LEVEL (LINTEL IN FUTURE WORKS)	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS - BENCH MARKS	▲
◘	STATE SURVEY MARKS	
○	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

INDEX

PLAN No.	DESCRIPTION
8953/CC50	COVER SHEET, GENERAL NOTES, INDEX & LEGEND
8953/CC51	SITE STAGING / BULK EARTHWORKS PLAN
8953/CC52	SETOUT PLAN
8953/CC53	PLAN
8953/CC54	ROAD No.13 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8953/CC55	ROAD No.13 CROSS SECTIONS
8953/CC56	ROAD No.13 CROSS SECTIONS
8953/CC57	CATCHMENT PLAN
8953/CC58	(NOT USED)
8953/CC59	DRAINAGE LONGITUDINAL SECTIONS LINE No.70, 71, 72, 73, 74, 78, 79, 80, 108 & 121
8953/CC60	PIT SCHEDULE & DRAINAGE CALCULATIONS
8953/CC61	TYPICAL CYCLEWAY/FOOTPATH & DRIVEWAY LOCATION DETAILS
8953/CC62	SOIL & WATER MANAGEMENT PLAN TREE MANAGEMENT PLAN
8953/CC63	SOIL & WATER MANAGEMENT NOTES & DETAILS
8953/CC64	SIGNAGE & LINEMARKING PLAN

This plan/document relates to DA No: 10088 CCX No: 110003
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

SURVEYED BY:
WHELANS INSITES PTY LTD

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/01/11

ISSUE	AMENDMENT	DATE	BY
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1F
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8953CC50 B
FILE No. 8953CC50
SHEET 1 OF 14 SHEETS

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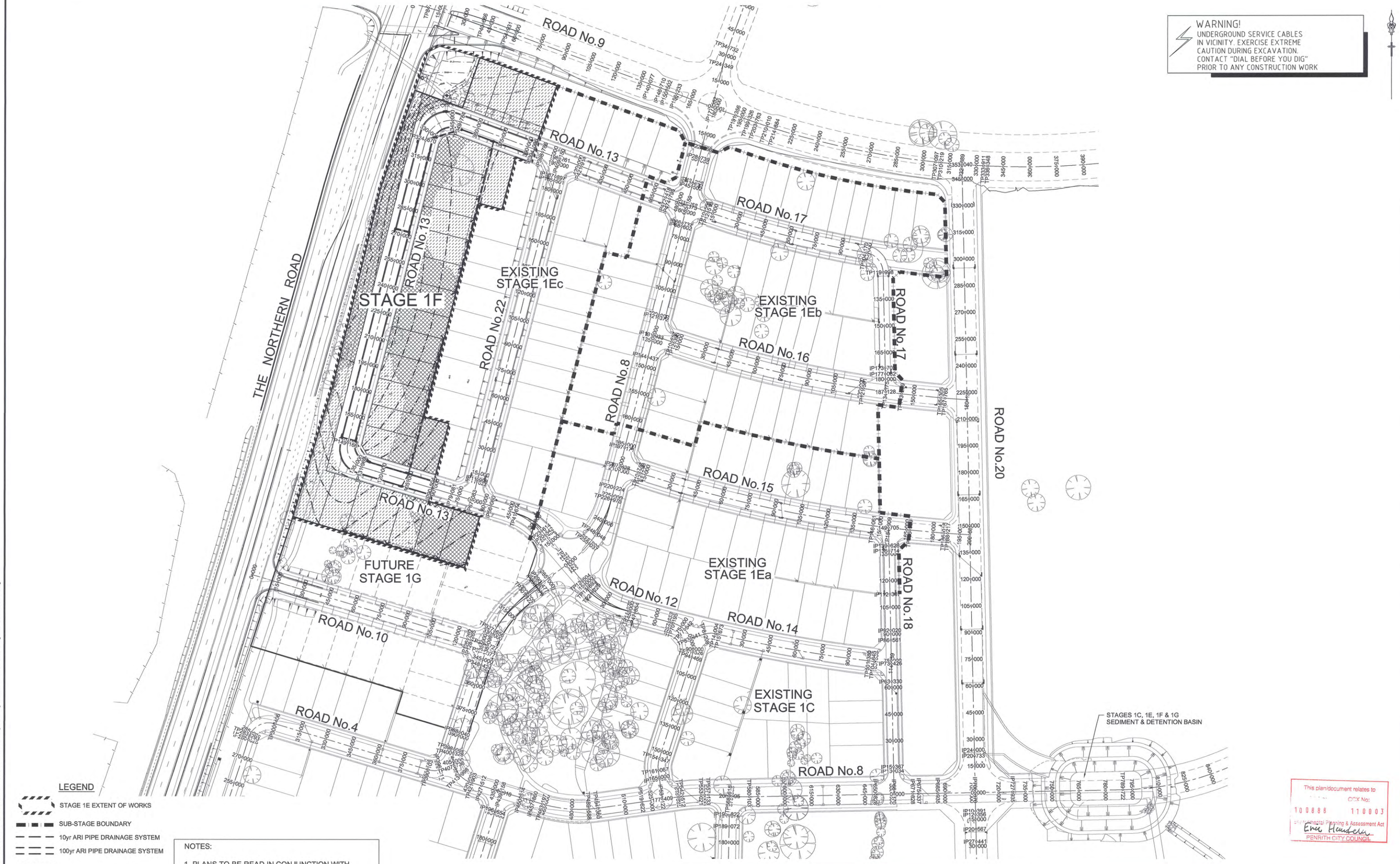
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

LEGEND

- STAGE 1E EXTENT OF WORKS
- SUB-STAGE BOUNDARY
- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- SITE CUT
- SITE FILL

NOTES:

1. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.

1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

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Environmental Planning & Assessment Act
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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/01/11

ISSUE	AMENDMENT	DATE	BY
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
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SCALES: 1:1000

JORDAN SPRINGS
STAGE 1F
SITE STAGING / BULK EARTHWORKS PLAN

PLAN No. 8953CC51 B
FILE No. 8953CC51
SHEET 2 OF 14 SHEETS

Plotted: 29 Jan 2011 12:24:33 PM File Name: J:\8953\DICC - Engineering Construction Plans\Stage 1F\8953CC51.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018


ROAD No.9
110°13'46"
ROAD No.13
110°13'46"
ROAD No.17
R568.4
ROAD No.6
R643.4
ROAD No.15
R719
ROAD No.12
ROAD No.14
ROAD No.10
ROAD No.4
ROAD No.8
ROAD No.18
ROAD No.20
ROAD No.22
ROAD No.13
ROAD No.17
THE NORTHERN ROAD
STAGE 1Ec
STAGE 1Eb
STAGE 1F
STAGE 1Ea
FUTURE
STAGE 1G
EXISTING
STAGE 1C
R470
R15.0
R50.0
R55.0
R65.0
353.040
198.261
187.128
286°42'38"
106°42'40"
194°16'53"
14°16'53"
194°17'12"
178°41'32"
358°41'33"
IP324 670
IP1311 935
IP1311 936
IP1311 937
IP1311 938
IP1311 939
IP1311 940
IP1311 941
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IP1311 954
IP1311

WARNING!
UNDERGROUND SERVICE CABLES IN VICINITY. EXERCISE EXTREME CAUTION DURING EXCAVATION. CONTACT "DIAL BEFORE YOU DIG" PRIOR TO ANY CONSTRUCTION WORK

REFER TO LANDSCAPE ARCHITECTS PLANS FOR LANDSCAPING DETAILS BETWEEN ROAD BOUNDARY AND STAGE BOUNDARY.

FUTURE CULVERT CONNECTION AS PART OF NORTHERN ROAD UPGRADE.

BOUNDARY WILL REQUIRE ADJUSTMENT TO SUIT FUTURE INTERSECTION GEOMETRY.

EXISTING HEADWALL.

PROPOSED NOISE WALL (BY OTHERS)

THE NORTHERN ROAD

ROAD No.13

ROAD No.10

ROAD No.22

ROAD No.9

FUTURE STAGE 1G

EXISTING STAGE 1E

CONSTRUCT INTERIM TAILOUT DRAIN FOR CDL. MIN. 0.5% TO EXIST SURFACE.

CONSTRUCT INTERIM TAILOUT TO CATCH DRAIN. FUTURE CULVERT CONNECTION TO PIT 1/70.

PROPOSED NOISE WALL (BY OTHERS)

500YR SURCHARGE PIT

BUND MOUND

CATCH DRAIN

PROPOSED SUBSTATION

BATTER 6:1

1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251

LEGEND

- STAGE 1E EXTENT OF WORKS
- SUB-STAGE BOUNDARY
- 10yr ARI PIPE DRAINAGE SYSTEM
- 100yr ARI PIPE DRAINAGE SYSTEM
- 45.5 PROPOSED DESIGN CONTOURS
- BOXING OF ROADS FOR OVERLAND FLOW PATH AS PART OF STAGE 1E

NOTES:

1. PIPED DRAINAGE FROM FUTURE UPGRADE OF THE NORTHERN ROAD TO CONNECT WITH FUTURE STAGE 1G PIT 1A/43
2. BOXING OF ROADS AND DRAINAGE WORKS AS SHOWN TO BE CONSTRUCTED WITH STAGE 1E TO ALLOW DRAINAGE CONNECTION & OVERLAND FLOW PATH TO PROPOSED INTERIM DETENTION / SEDIMENT BASIN.
3. FOR DRIVEWAY SETOUT DETAILS REFER DWG. 8953/62
4. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
5. DRIVEWAY LAYBACKS, FOOTPATHS & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS. DRAINAGE HOUSE CONNECTIONS TO BE INSTALLED FROM LOT BOUNDARY TO KERB PRIOR TO FOOTPATH BEING CONSTRUCTED.

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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CLIENT: Delfin Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/01/11

ISSUE	AMENDMENT	DATE	BY
C	PRAM RAMP LOCATIONS AMENDED	25/01/11	NW
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: 1:500

JORDAN SPRINGS
STAGE 1F
PLAN

PLAN No. 8953CC53 C
FILE No. 8953CC53
SHEET 4 OF 14 SHEETS

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Version: 1, Version Date: 13/07/2018

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PAVEMENT DESIGN - ROAD No.13 - 5x10 ^{4}

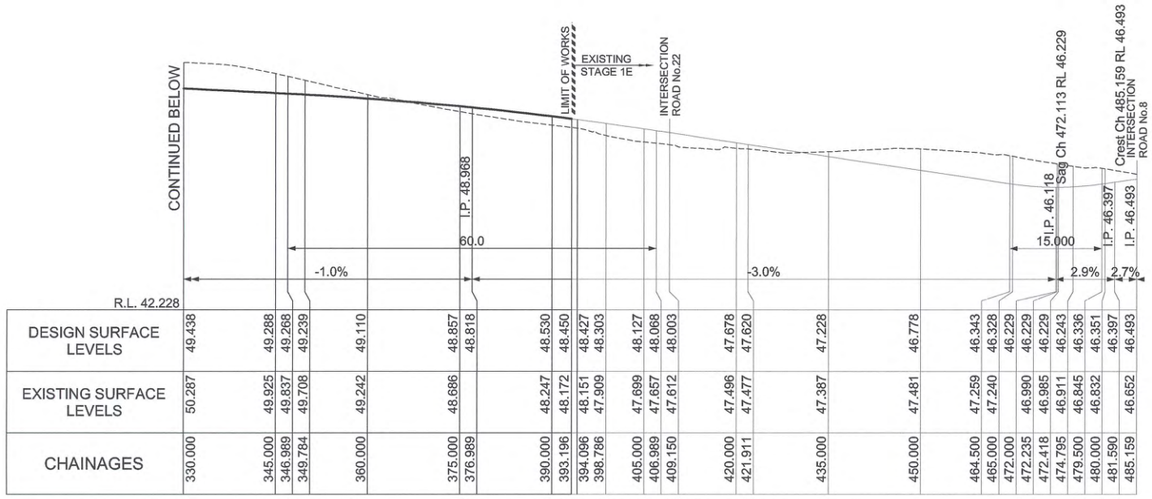
50mm MINIMUM THICKNESS (AC10)
(IN 2 LAYERS, SECOND LAYER DEFERED)

SINGLE COAT HOT FLUSH SEAL

150mm COMPACTED THICKNESS NATURAL DGB20 BASECOURSE

220mm COMPACTED THICKNESS -75mm CRUSHED SANDSTONE SUB-BASE COURSE

SUBJECT TO GEOTECHNICAL TESTING AND CONFIRMATION



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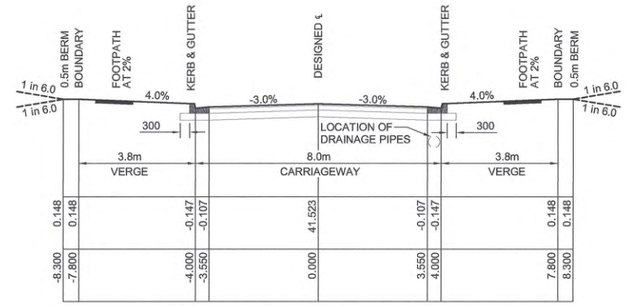
EXISTING SURFACE LEVELS	50.287	49.925	49.837	49.708	49.242	48.686		48.247	48.172	48.151	47.909	47.699	47.657	47.612	47.496	47.477	47.387	47.481	47.259	47.240	46.990	46.985	46.911	46.845	46.832		46.652	
DESIGN SURFACE LEVELS	49.438	49.288	49.268	49.239	49.110	48.857	48.818	48.530	48.450	48.427	48.303	48.127	48.068	48.003	47.678	47.620	47.228	46.778	46.343	46.328	46.229	46.229	46.229	46.243	46.336	46.351	46.397	46.493

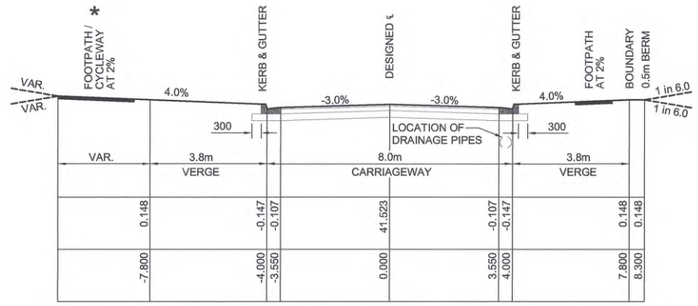
LONGITUDINAL SECTION -ROAD No.13

SCALE 1:100 (VERT)
1:500 (HORIZ)



TYPICAL CROSS SECTION ROAD No.13
CH 90.504 TO 149.166
CH 345.000 TO 393.196

1:100 NAT



TYPICAL CROSS SECTION ROAD No.13
CH 149.166 TO 345.000

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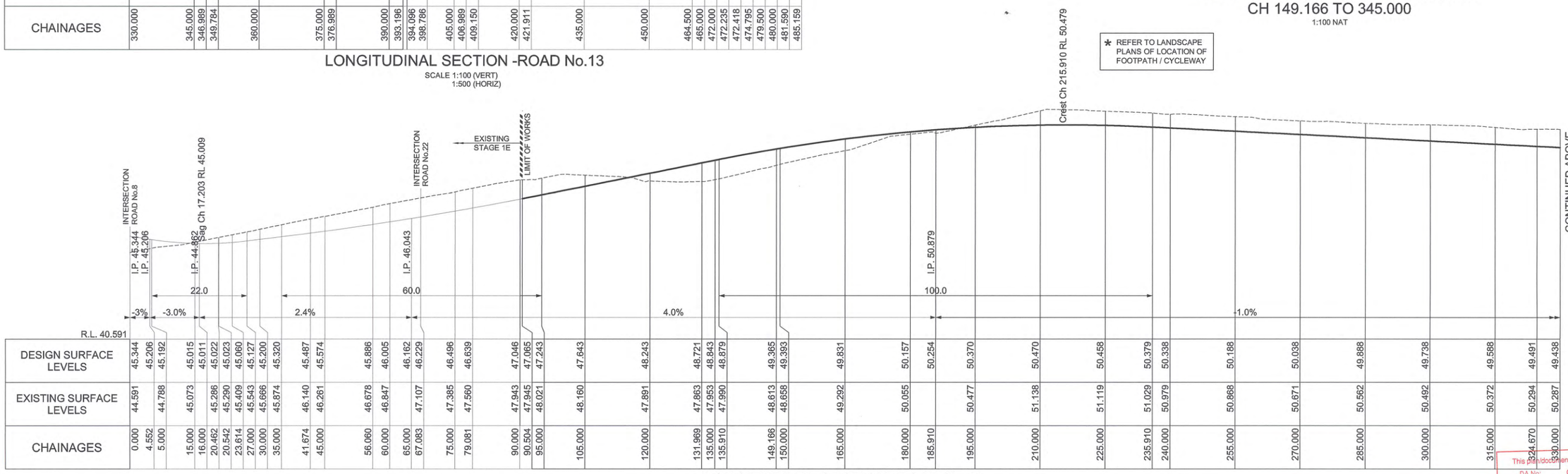
* REFER TO LANDSCAPE PLANS OF LOCATION OF FOOTPATH / CYCLEWAY



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EXISTING SURFACE LEVELS	44.591		44.788	45.073		45.286	45.290	45.409	45.543	45.666	45.874	46.140	46.261	46.678	46.847		47.107	47.385	47.560	47.943	47.945	48.021	48.160	47.891	47.863	47.953	47.990	48.613	48.658	49.292	50.055		50.477	51.138	51.119	51.029	50.979	50.868	50.671	50.562	50.492	50.372	50.294	50.287
DESIGN SURFACE LEVELS	45.344	45.206	45.192	45.015	45.011	45.022	45.023	45.060	45.127	45.200	45.320	45.487	45.574	45.886	46.005	46.162	46.229	46.496	46.639	47.046	47.065	47.243	47.643	48.243	48.721	48.843	48.879	49.365	49.393	49.831	50.157	50.254	50.370	50.470	50.458	50.379	50.338	50.188	50.038	49.888	49.738	49.588	49.491	49.438

LONGITUDINAL SECTION -ROAD No.13

SCALE 1:100 (VERT)
1:500 (HORIZ)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

This plan/document relates to
DA No: 100888
CCX No: 110003
Environmental Planning & Assessment Act
Plan Version: 1 Date: 28/01/11

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SIGNED S. Anderson DATE 28/01/11

ISSUE	AMENDMENT	DATE	BY
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

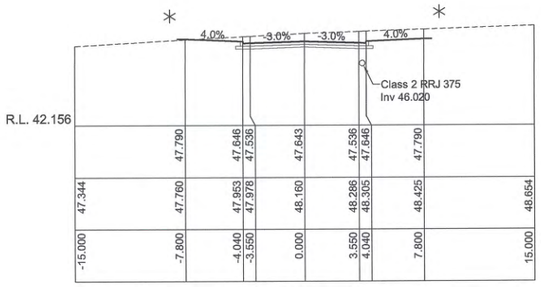
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: AS SHOWN @ A1

JORDAN SPRINGS
STAGE 1F
ROAD No.13 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS

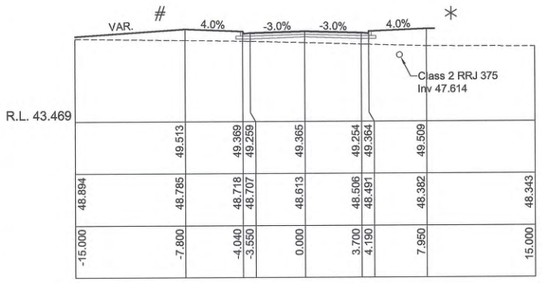
PLAN No. 8953CC54 B
FILE No. 8953CC54
SHEET 5 OF 14 SHEETS

* SEE PLAN FOR LOT GRADING

\# GRADE TO EXISTING AT SITE BOUNDARY



CH 105.000



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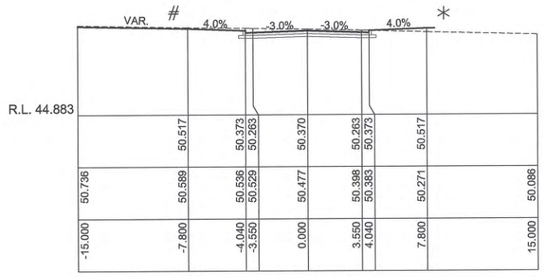

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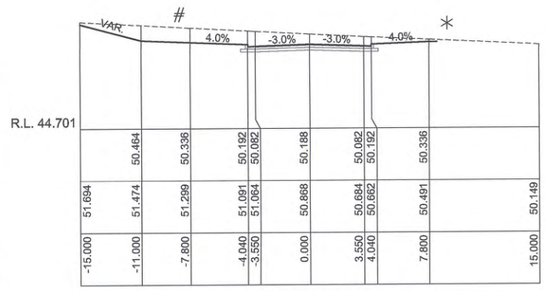

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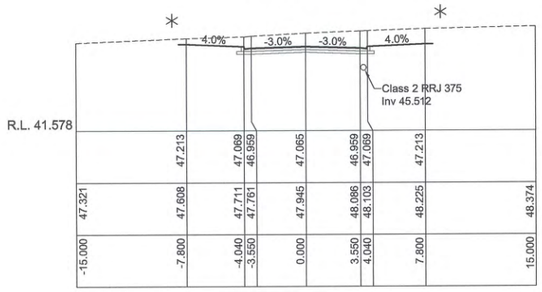

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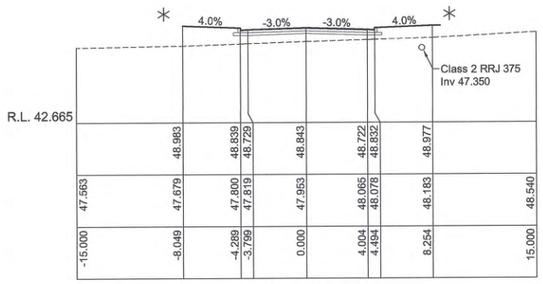

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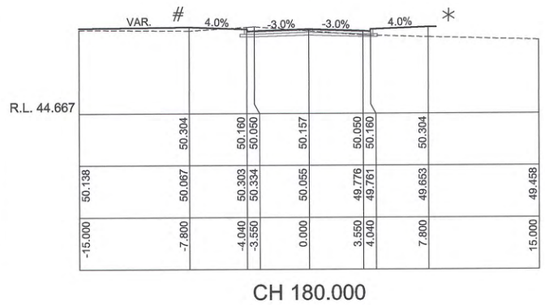

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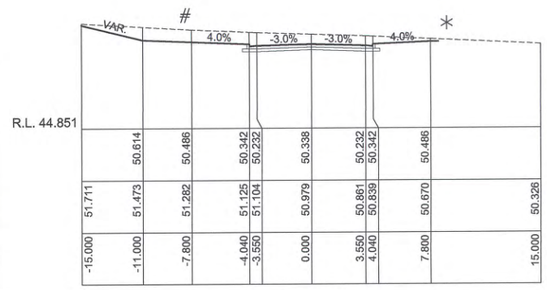

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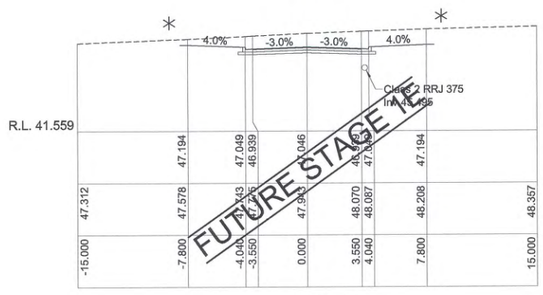

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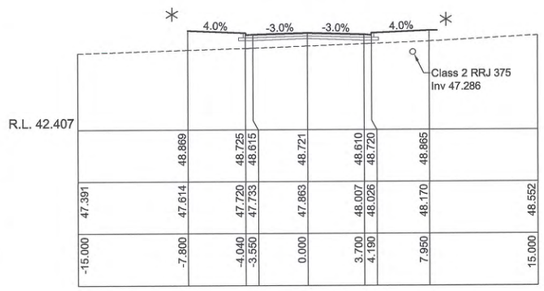

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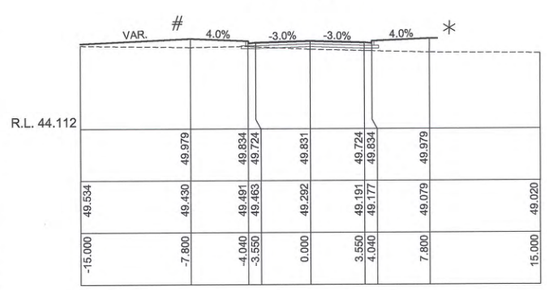

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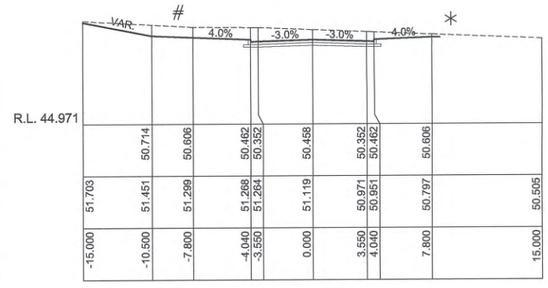

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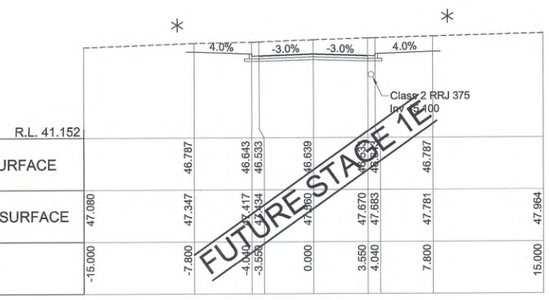
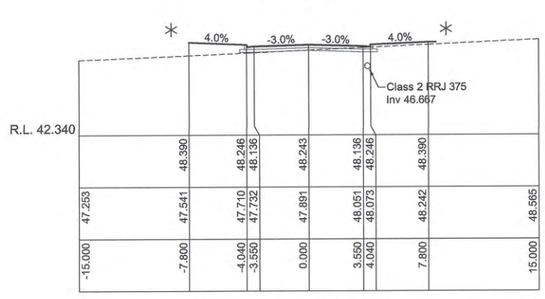


CH 79.081
ROAD 13



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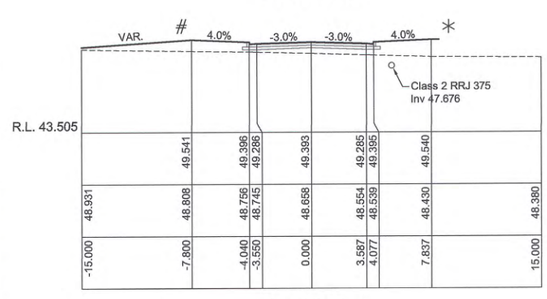

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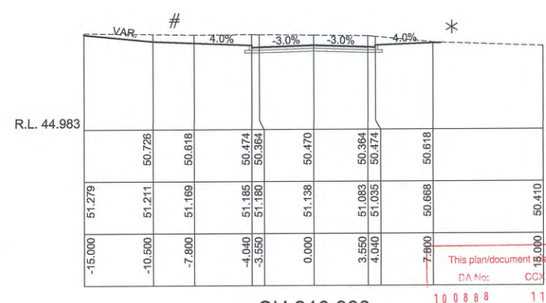

CH 210.000

This plan/document relates to
DA No: 100888 CC No: 110003
Environmental Planning & Assessment Act
Eric Hansfield
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUE	AMENDMENT	DATE	BY
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1F
ROAD No.13 CROSS SECTIONS

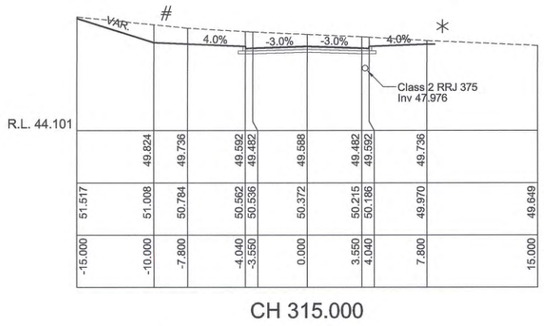
PLAN No. 8953CC55 B
FILE No. 8953CC55
SHEET 6 OF 14 SHEETS

Plotted: 28 Jan 2011 12:25:04 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1F\8953CC55.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

* SEE PLAN FOR LOT GRADING

GRADE TO EXISTING AT SITE BOUNDARY



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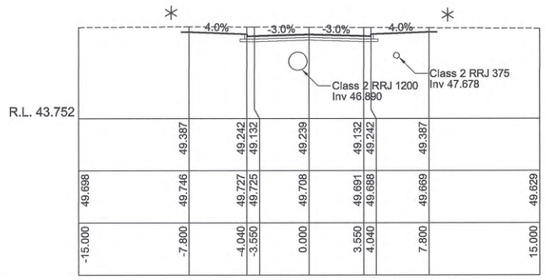
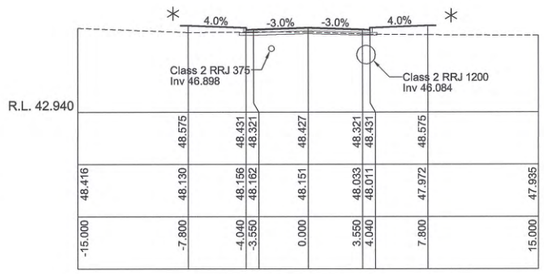
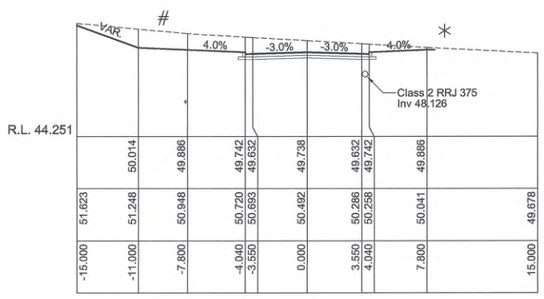


CH 349.784



CH 394.096



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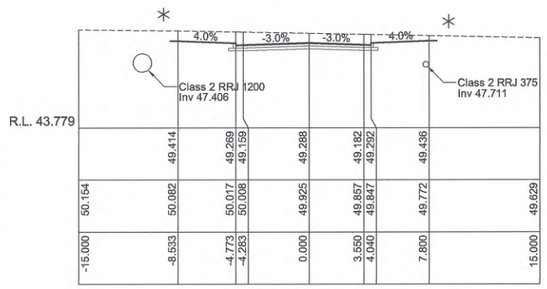

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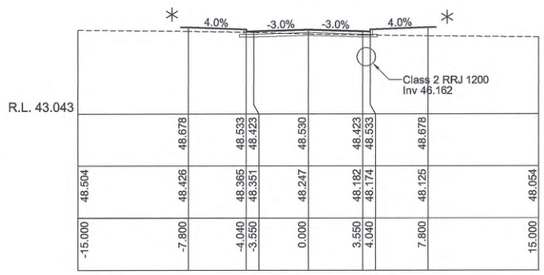

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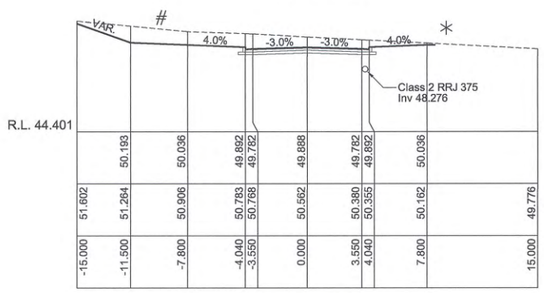

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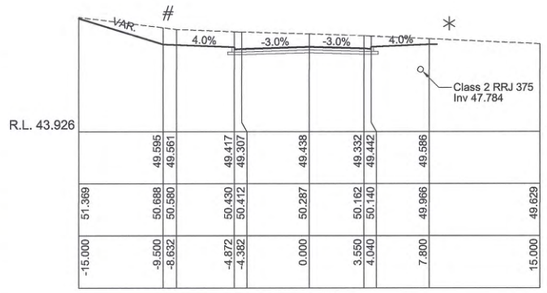

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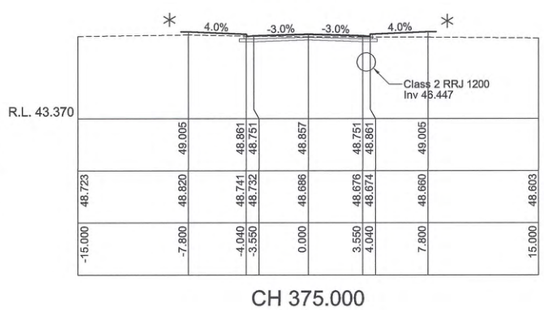

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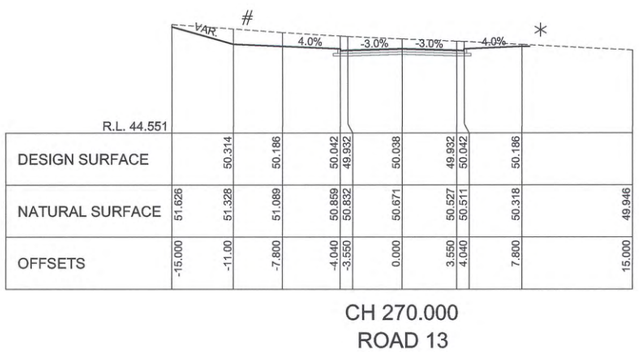
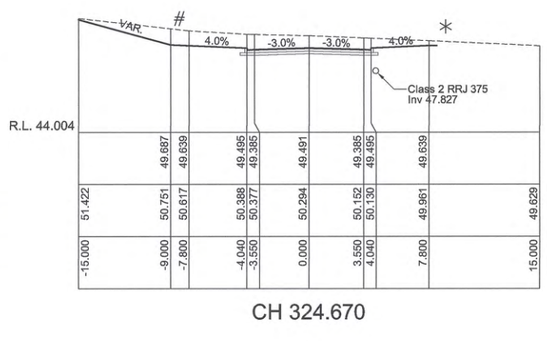


CH 270.000
ROAD 13



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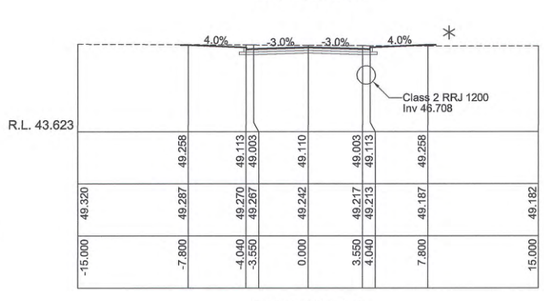

CH 360.000



EXISTING STAGE 1E

CH 398.786

This plan/document relates to
DA No: CCX No:
100888 110003
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.

DATUM: AHD ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

CLIENT: Delfin Lend Lease

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SIGNED S. Anderson DATE 28/01/11

JORDAN SPRINGS
STAGE 1F
ROAD No.13 CROSS SECTIONS

PLAN No. 8953CC56 B
FILE No. 8953CC56
SHEET 7 OF 14 SHEETS

Plotted: 28 Jan 2011 12:25:08 PM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1F\8953CC56.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1F
CATCHMENT PLAN

PLAN No. 8953CC57 B
FILE No. 8953CC57
SHEET 8 OF 14 SHEETS

Plotted: 28 Jan 2011 12:25:17 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1F\8953CC57.dwg

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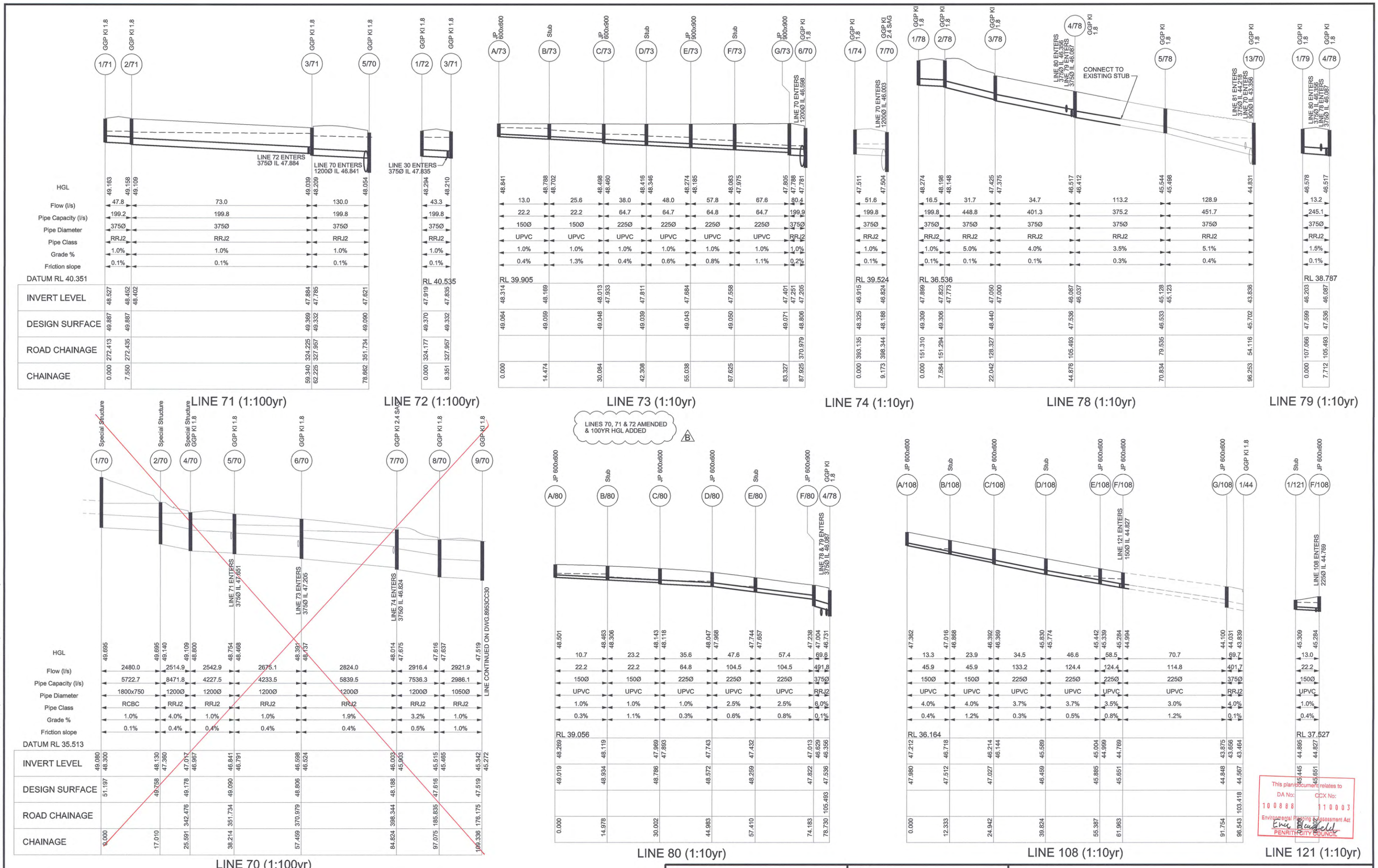

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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SIGNED S. Anderson DATE 28/01/11

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A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

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PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: L.S. 1:500 H 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1F
DRAINAGE LONGITUDINAL SECTIONS
LINE No.70, 71, 72 73, 74, 78, 79, 80, 108 & 121

PLAN No. 8953CC59 B
FILE No. 8953CC59
SHEET 9 OF 14 SHEETS

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Document Set ID: 8291178
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PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Road Name	Road Chainage	Easting	Northing
		(mm)	(m)	(mm)	(m)	(m)		(m)	(m)	(m)
B/108	Stub	150	46.718	150	46.718	0.794			288949.18	6268020.969
F/108	JP 600X600	225	44.769	225	44.769	0.882			288996.72	6268006.707
A/108	JP 600x600			150	47.212	0.773			288937.39	6268024.565
C/108	JP 600x600	150	46.214	225	46.144	0.883			288961.26	6268017.331
G/108	JP 600x600	225	43.875	375	43.868	1.192			288997.08	6268078.321
E/108	JP 600x600	225	45.004	225	44.999	0.886			288990.44	6268008.851
D/108	Stub	225	45.549	225	45.549	0.910			288975.54	6268013.145
1/121	Stub			150	44.895	0.55			289003.24	6266004.784
2/70	Special Structure	1800x750	47.815	1200	47.365	2.279			288991.07	6266267.791
10/70	GGP KI 1.8	825	44.770	825	44.720	2.293	ROAD 22	125.98	289044.23	6266162.919
		375	45.376							
1/70	Special Structure			1800x750	47.980	2.423			288980.93	6266280.852
5/70	GGP KI 1.8	1200	46.841	1200	46.791	2.299	ROAD 13	351.73	289003.22	6266250.208
		375	47.651							
12/70	GGP KI 2.4 SAG	825	43.575	900	43.495	2.393	ROAD 22	13.49	289016.48	6266053.906
		375	44.252							
9/70	GGP KI 1.8	1050	45.342	825	45.272	2.247	ROAD 22	176.18	289056.61	6266211.562
4/70	GGP KI 1.8 Special Structure	1200	46.997	1200	46.924	2.186	ROAD 13	348.69	289002.75	6266258.552
7/70	GGP KI 2.4 SAG	1200	46.003	1200	45.903	2.286	ROAD 13	398.34	289046.96	6266234.091
		375	46.824							
11/70	GGP KI 1.8	825	44.145	825	44.095	2.338	ROAD 22	88.47	289030.04	6266107.184
		375	44.797							
13/70	GGP KI 1.8	900	43.356	900	43.306	2.396	ROAD 13	54.12	289023.00	6266041.850
		375	43.836							
		375	44.218							
14/70	GGP KI 1.8	900	43.062	900	43.012	2.094	ROAD 13	32.02	289044.95	6266033.764
6/70	GGP KI 1.8	1200	46.598	1200	46.524	2.282	ROAD 13	370.98	289021.28	6266243.554
		375	47.205							
8/70	GGP KI 1.8	1200	45.515	1050	45.465	2.151	ROAD 22	185.84	289051.68	6266222.786
1/71	GGP KI 1.8			375	48.527	1.360	ROAD 13	272.41	288966.43	6266194.343
3/71	GGP KI 1.8	375	47.835	375	47.735	1.547	ROAD 13	327.96	288987.50	6266245.420
		375	47.835							
2/71	GGP KI 1.8	375	48.452	375	48.402	1.485	ROAD 13	272.44	288973.75	6266192.502
1/72	GGP KI 1.8			375	47.960	1.410	ROAD 13	324.18	288979.20	6266244.507
C/73	JP 600x900	150	48.013	225	47.933	1.115			289007.06	6266187.488
B/73	Stub	150	48.189	150	48.189	0.890			289003.17	6266172.370
G/73	JP 900x900	225	47.401	375	47.251	1.820			289020.19	6266239.095
E/73	JP 900x900	225	47.684	225	47.684	1.359			289013.18	6266211.680
F/73	Stub	225	47.558	225	47.558	1.492			289016.29	6266223.876
D/73	Stub	225	47.811	225	47.811	1.228			289010.01	6266199.351
A/73	JP 600x600			150	48.314	0.750			288999.59	6266158.346
3/78	GGP KI 1.8	375	47.050	375	47.000	1.439	ROAD 13	128.33	288951.95	6266063.089
2/78	GGP KI 1.8	375	47.823	375	47.773	1.532	ROAD 13	151.29	288943.90	6266075.096
4/78	GGP KI 1.8	375	46.087	375	46.037	1.499	ROAD 13	105.49	288973.79	6266056.423
		375	46.087							
		375	46.087							
1/78	GGP KI 1.8			375	47.899	1.410	ROAD 13	151.31	288936.55	6266076.982
1/79	GGP KI 1.8	375	45.128	375	45.078	1.396	ROAD 13	107.07	288970.11	6266049.644
B/80	Stub	150	48.119	150	48.119	0.815			288989.40	6266118.235
D/80	JP 600x600	225	47.743	225	47.743	0.829			288982.00	6266089.155
F/80	JP 600x900	225	46.776	375	46.629	1.193			288974.82	6266060.853
E/80	Stub	225	47.432	225	47.432	0.827			288978.93	6266077.114
C/80	JP 600x600	150	47.969	225	47.893	0.893			288985.72	6266103.669
A/80	JP 600x600			150	48.269	0.750			288993.09	6266132.750

HYDRAULICS DESIGN TABLE Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream to Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pipe Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)
C/108 B/108	6.274	0.064	23.9	12.609	150	0.009	4.0	46.868	23.928	1.585	0.148	0.09	1.35	45.89	0.155
G/108 F/108	7.011	0.196	72.3	29.731	225	0.009	4.0	44.994	71.899	1.800	0.390	0.16	1.79	114.80	0.276
B/108 A/108	6.000	0.035	13.3	12.333	150	0.009	4.0	47.362	13.271	4.500	0.129	0.03	0.75	45.88	0.274
D/108 C/108	6.429	0.093	34.5	14.882	225	0.009	4.0	46.390	34.502	0.600	0.023	0.04	0.87	133.23	0.286
1/46 G/108	7.100	0.231	83.0	5.868	375	0.012	4.0	44.047	82.992	0.600	0.017	0.03	0.75	401.26	0.130
F/108 E/108	6.936	0.162	58.5	6.576	225	0.009	3.5	45.339	58.529	0.932	0.103	0.11	1.47	124.38	0.074
E/108 D/108	6.715	0.128	46.6	15.563	225	0.009	3.5	45.774	46.595	0.800	0.056	0.07	1.17	124.41	0.221
F/108 1/121	6.000	0.034	13.0	6.802	150	0.009	1.0	45.309	12.982	4.500	0.124	0.03	0.73	22.17	0.154
11/70 10/70	10.687	0.952	1448.1	57.513	825	0.012	1.0	46.461	288.086	0.600	0.225	0.37	2.71	1585.28	0.354
2/70 1/70	6.000	0.000	1160.0	16.536	1800x750	0.013	1.0	46.730	0.000	4.500	0.095	0.02	0.64	8269.26	0.105
6/70 5/70	9.374	0.315	1260.5	19.245	1200	0.012	1.0	47.991	100.542	1.000	0.063	0.06	1.11	4233.53	0.288
13/70 12/70	11.345	1.379	1569.2	13.881	900	0.012	1.0	44.987	409.236	0.600	0.246	0.31	2.47	1992.69	0.094
10/70 9/70	10.344	0.732	1383.5	50.194	825	0.012	1.0	47.068	229.610	0.600	0.205	0.34	2.59	1585.58	0.323
5/70 4/70	6.392	0.092	1194.1	8.357	1200	0.012	1.0	48.124	34.056	1.200	0.068	0.06	1.06	4212.92	0.132
8/70 7/70	10.048	0.708	1378.1	12.252	1200	0.012	3.2	47.443	218.118	1.004	0.076	0.08	1.22	7536.31	0.168
12/70 11/70	11.021	1.176	1512.4	54.977	1200	0.012	0.8	45.736	352.389	0.600	0.245	0.41	2.83	1541.73	0.324
14/70 13/70	11.439	1.821	1686.9	24.372	900	0.012	1.0	44.683	538.943	0.600	0.216	0.36	2.67	1992.48	0.152
2/54 14/70	11.591	1.908	1722.2	19.923	900	0.012	1.0	44.131	582.175	1.000	0.374	0.37	2.71	1990.16	0.123
7/70 6/70	9.662	0.553	1333.9	27.365	1200	0.012	1.9	47.724	173.865	0.600	0.043	0.07	1.16	5839.51	0.387
9/70 8/70	10.216	0.721	1380.8	12.260	1050	0.012	1.0	47.300	220.840	1.000	0.130	0.13	1.59	2986.05	0.128
2/71 1/71	6.000	0.070	26.6	7.550	375	0.012	1.0	48.902	26.593	4.500	0.013	0.00	0.24	199.15	0.523
5/70 3/71	8.880	0.208	68.3	18.311	375	0.012	1.0	48.209	68.288	1.602	0.031	0.02	0.62	199.82	0.494
3/71 2/71	6.523	0.110	40.4	51.790	375	0.012	1.0	48.777	40.434	2.197	0.015	0.01	0.37	199.84	2.358
3/71 1/72	6.000	0.064	24.1	7.550	375	0.012	1.0	48.335	24.089	4.500	0.011	0.00	0.22	199.82	0.577
D/73 C/73	6.508	0.103	38.0	12.224	225	0.009	1.0	48.446	38.037	0.800	0.037	0.05	0.98	64.68	0.213
C/73 B/73	6.328	0.069	25.6	15.609	150	0.009	1.0	48.688	25.572	0.800	0.085	0.11	1.45	22.17	0.180
6/70 G/73	7.195	0.225	80.4	4.598	375	0.012	1.0	47.774	80.430	0.600	0.016	0.03	0.73	199.86	0.105
F/73 E/73	6.897	0.160	57.8	12.586	225	0.009	1.0	48.171	57.809	0.823	0.089	0.11	1.45	64.79	0.144
G/73 F/73	7.041	0.188	67.6	15.703	225	0.009	1.0	47.961	67.573	0.736	0.108	0.15	1.70	64.74	0.154
E/73 D/73	6.721	0.131	48.0	12.731	225	0.009	1.0	48.331	47.976	0.943	0.070	0.07	1.21	64.87	0.176
B/73 A/73	6.000	0.034	13.0	14.474	150	0.009	1.0	48.827	12.982	4.500	0.124	0.03	0.73	22.17	0.328
7/70 1/74	6.000	0.137	51.6	9.173	375	0.012	1.0	47.525	51.640	4.500	0.050	0.01	0.47	199.82	0.327
4/78 3/78	7.687	0.099	34.7	22.834	375	0.012	4.0	47.375	34.672	0.905	0.005	0.01	0.31	401.26	1.212
3/78 2/78	6.847	0.087	31.7	14.458	375	0.012	5.0	48.148	31.687	1.796	0.008	0.00	0.29	448.81	0.840
5/78 4/78	8.899	0.346	113.2	25.958	375	0.012	3.5	46.412	113.167	1.955	0.105	0.05	1.02	375.24	0.422
2/78 1/78	6.000	0.044	16.5	7.584	375	0.012	1.0	48.274	16.485	4.500	0.005	0.00	0.15	199.82	0.847
13/78 5/78	9.201	0.432	139.9	25.418	375	0.012	6.1	46.558	139.833	0.668	0.048	0.07	1.17	482.40	0.363
4/78 1/79	6.000	0.035	13.2	7.712	375	0.012	1.5	48.578	13.188	4.500	0.003	0.00	0.12	245.09	1.076
C/80 B/80	6.413	0.063	23.2	15.024	150	0.009	1.0	48.306	23.207	1.777	0.156	0.09	1.31	22.15	0.191
E/80 D/80	6.883	0.131	47.6	12.427	225	0.009	2.5	47.968	47.608	1.080	0.079	0.07	1.20	104.48	0.173
4/78 F/80	7.249	0.195	69.6	4.547	375	0.012	4.0	48.644	69.613	0.600	0.012	0.02	0.83	401.26	0.120
F/80 E/80	7.056	0.160	57.4	16.772	225	0.009	4.0	47.657	57.369	0.823	0.087	0.11	1.44	133.26	0.194
D/80 C/80	6.604	0.097	35.6	14.981	225	0.009	1.0	48.118	35.621	0.600	0.025	0.04	0.90	64.75	0.279
B/80 A/80	6.000	0.028	10.7	14.978	150	0.009	1.0	48.501	10.674	4.500	0.084	0.02	0.60	22.17	0.413

HYDROLOGIC DESIGN TABLE Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Runoff Coeff. C	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Flow to Bypass Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(min)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(l/s)	(l/s)		(l/s)
B/108	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
F/108	Lots	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
A/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
C/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
G/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
E/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
D/108	Lots	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
1/121	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
2/70	Park	Special Structure				6.00		6.00	136.0	0.827	0.028	0.018	6	8.6		0.0				0.000	0.000	4/70	
10/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.039	0.034	6	12.9		12.9	1.008	0.835	0.052	12.858		11/70	
1/70		Special Structure							136.0							1160.0				1160.000			1160.000
5/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.017	0.015	6	5.6		5.6	1.158	0.422	0.038	5.605		6/70	
12/70	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5		16.5	0.199	Sag	0.049	16.485			
9/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.013	0.011	6	4.3		4.3	1.008	0.422	0.038	4.286		10/70	
4/70		GGP KI 1.8						6.00	136.0	0.757	0.055	0.042	6	15.7	0.0	16.1	1.057	1.024	0.057	16.132			
	Park					6.00		6.00		0.627	0.028	0.016										1/74	
	Road					6.00		6.00		0.873	0.029	0.025			0.4								
7/70	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.021	0.018	6	6.9		6.9	2.712	Sag	0.021	6.924			
11/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.045	0.039	6	14.8		14.8	1.008	0.992	0.058	14.836		12/70	
13/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.008	0.007	6	2.6		2.6	2.637	0.284	0.023	2.638		14/70	
14/70		GGP KI 1.8						6.00	136.0	0.783	0.111	0.087	6	32.8		32.8	2.000	1.226	0.063	31.277		1/54	
	Road					6.00		6.00		0.873	0.020	0.017											
	Lot					6.00		6.00		0.764	0.052	0.040											
	Lot					6.00		6.00		0.784	0.039	0.030											
6/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9		4.9	1.800	0.369	0.033	4.945		7/70	
8/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	1.008	0.412	0.037	4.616		1/75	
1/71		GGP KI 1.8				6.00		6.00	136.0	0.741	0.095	0.070	6	26.6		26.6	1.000	1.329	0.066	25.933			
	Park					6.00		6.00		0.627	0.051	0.032											
	Road					6.00		6.00		0.873	0.044	0.038											
3/71	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.040	0.035	6	13.2		13.2	1.000	0.914	0.054	13.188		5/70	
2/71	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.045	0.039	6	14.8		14.8	1.000	0.992	0.056	14.836			
1/72		GGP KI 1.8				6.00		6.00	136.0	0.741	0.086	0.064	6	24.1		24.1	1.000	1.253	0.064	23.680	0.409	4/70	
	Park					6.00		6.00		0.627	0.046	0.029											
	Road					6.00		6.00		0.873	0.040	0.035											
C/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
B/73	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
G/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.049	0.037	6	14.1						0.000			
E/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
F/73	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
D/73	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
A/73	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
3/78	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	4.000	0.316	0.028	4.616		5/78	
2/78	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5		16.5	3.231	0.679	0.047	16.485		3/78	
4/78	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9		5.9	4.000	0.369	0.033	5.935			
1/78	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5		16.5	3.230	0.719	0.048	16.485		1/79	
5/78		GGP KI 1.8						6.00	136.0	0.794	0.072	0.057	6	21.6		21.6	3.485	0.835	0.052	21.436	0.160	1/77	
	Road					6.00		6.00		0.873	0.020	0.017											
	Lot					6.00		6.00		0.764	0.052	0.040											
1/79	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.040	0.035	6	13.2		13.2	4.000	0.490	0.041	13.188		1/81	
B/80	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
D/80	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
F/80	Lot	GSIP 600x600				6.00		6.00	136.0	0.764	0.047	0.036	6	13.6		0.0				0.000			
E/80	Lot	Stub				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			
C/80	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
A/80	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.037	0.028	6	10.7						0.000			

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Environmental Planning & Assessment Act
Eric Hendfeldt
PENRITH CITY COUNCIL

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SIGNED: S. Anderson DATE: 28/01/11

ISSUE	AMENDMENT	DATE	BY
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

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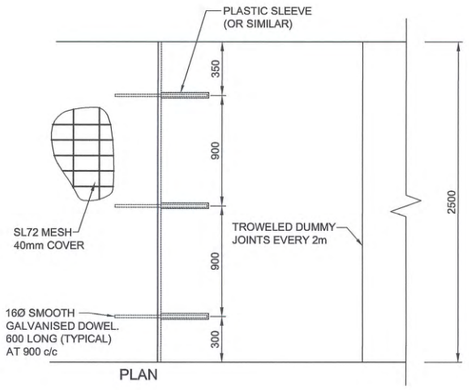
DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1F
PIT SCHEDULE & DRAINAGE CALCULATIONS

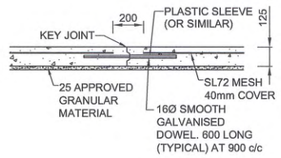
PLAN No. 8953CC60 B
FILE No. 8953CC60
SHEET 10 OF 14 SHEETS

Plotted: 28 Jan 2011 12:25:25 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1F\8953CC60.dwg
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



PLAN

NOTE:
1. MESH TO BE PLACED ON 50, 65mm BAR CHAIRS.
2. THE CONCRETE SHALL BE PLACED ON A LAYER OF APPROVED FINE GRANULAR MATERIAL.
3. CONCRETE SHALL HAVE A 28 DAY STRENGTH (F'c) OF 20MPa.
4. ANY VARIATIONS TO STANDARD CROSSFALL, 2.0% ON CYCLEWAY SHALL REQUIRE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
5. CONCRETE SHALL HAVE A LIGHT BRUSHED FINISH.
6. ALL DOWELS TO BE 600mm LONG WITH 300mm PENETRATION INTO EACH SLAB.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
8. KEY JOINTS TO BE PLACED EVERY 6m.
9. TROWELED DUMMY JOINTS EVERY 2m



CROSS SECTION

NOTE: CONTROL JOINTS TO HAVE FULL DEPTH MASTIC OR SIMILAR ADHERED TO BACK

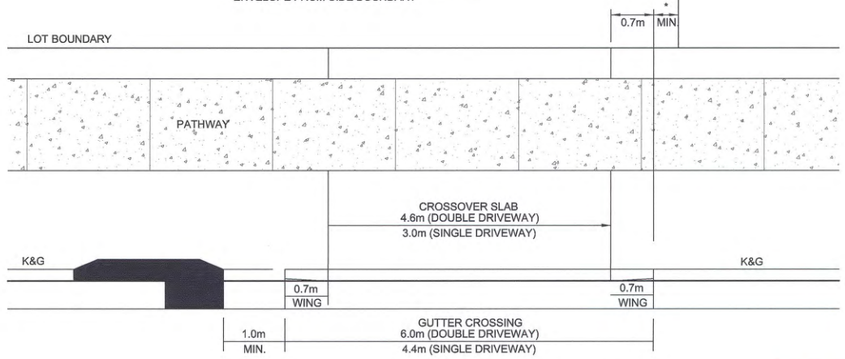
SHARED CYCLE/FOOTWAY TYPICAL DETAIL

NTS

- TYPICAL DRIVEWAY DETAIL NOTES AMENDED
- TYPICAL DRIVEWAY LOCATION DETAIL AMENDED

C

NOTE:
1. * MINIMUM DRIVEWAY OFFSETS FROM SIDE BOUNDARY:
   - 0.4m FOR STANDARD LOTS
   - 0.1m FOR ZERO BOUNDARY LOTS
2. DRAINAGE PITS TO BE LOCATED MINIMUM 1.0m FROM EDGE OF DRIVEWAY.
3. LAYBACKS TO BE CONSTRUCTED ON PRIMARY DRIVEWAY FRONTAGE FOR CORNER LOTS UNLESS OTHERWISE NOTED ON ENGINEERING PLANS.
4. REFER TO PENRITH CITY COUNCIL SPECIFICATIONS FOR DETAILS.
5. WATER SERVICES TO BE LOCATED WITHIN 0.6m ENVELOPE FROM SIDE BOUNDARY



TYPICAL DRIVEWAY LOCATION DETAIL

SCALE NTS

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PENRITH CITY COUNCIL

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ISSUE	AMENDMENT	DATE	BY
D	SHEET 61 REMOVED, SHEET NUMBERS AMENDED	25-01-11	NW
C	AMENDMENTS AS NOTED	20-01-11	NW
B	PRELIMINARY COUNCIL ISSUE	24/12/10	AM
A	ISSUED FOR CLIENT REVIEW	17/11/10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: AHD ORIGIN:
SCALES: N/A

CLIENT: Delfin Lend Lease

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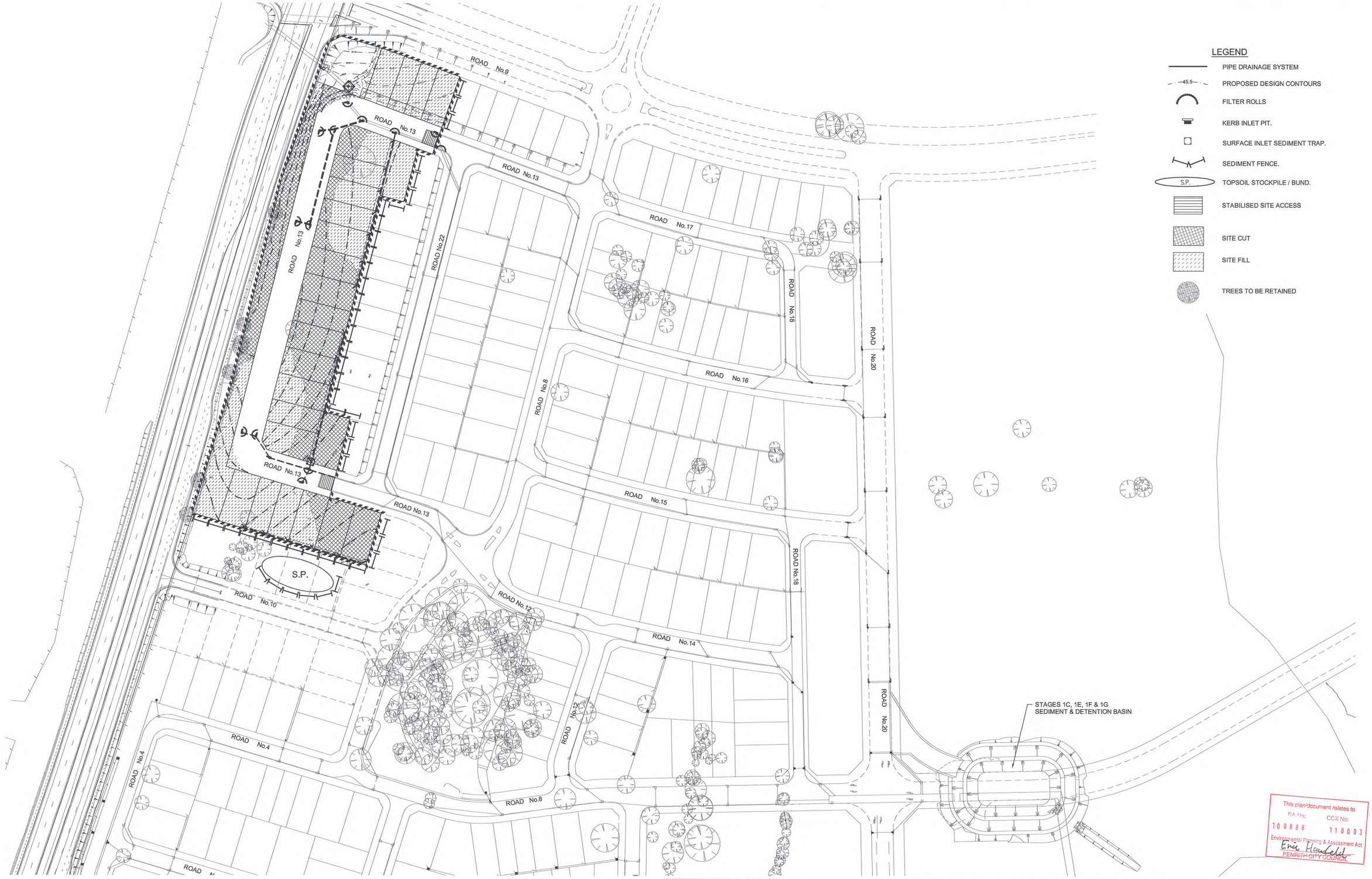
SIGNED S. Anderson DATE 28/01/11

JORDAN SPRINGS
STAGE 1F
TYPICAL CYCLEWAY/FOOTWAY & DRIVEWAY LOCATION DETAILS

PLAN No. 8953CC61 D
FILE No. 8953CC61
SHEET 11 OF 14 SHEETS

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



LEGEND

- PIPE DRAINAGE SYSTEM
- 45.5 PROPOSED DESIGN CONTOURS
- FILTER ROLLS
- KERB INLET PIT.
- SURFACE INLET SEDIMENT TRAP.
- SEDIMENT FENCE.
- S.P. TOPSOIL STOCKPILE / BUND.
- STABILISED SITE ACCESS
- SITE CUT
- SITE FILL
- TREES TO BE RETAINED

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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SIGNED S. Anderson DATE 28/01/11

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JORDAN SPRINGS STAGE 1F

SOIL & WATER MANAGEMENT PLAN TREE MANAGEMENT PLAN

PLAN No. 8953CC62
FILE No. 8953CC62
SHEET 12 OF 14 SHEETS

Plotted: 28 Jan 2011 12:25:38 PM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1F\8953CC62.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY".AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

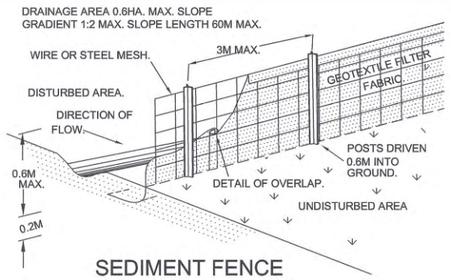
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

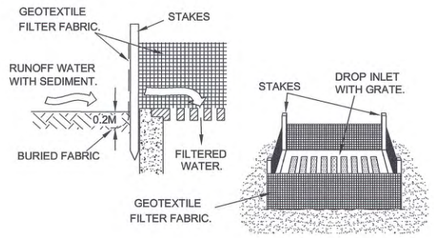
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

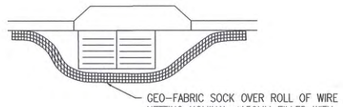
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

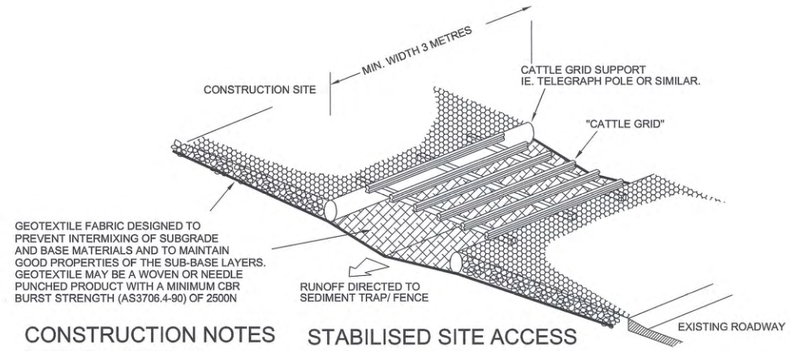


SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.

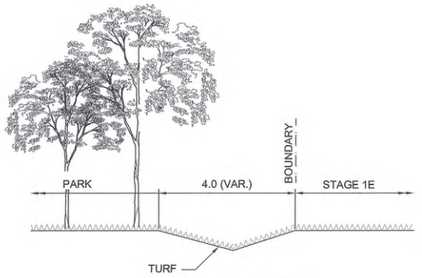




CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

STABILISED SITE ACCESS



TYPICAL CATCH DRAIN DETAIL
N.T.S.

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1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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JORDAN SPRINGS
STAGE 1F
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8953CC63 C
FILE No. 8953CC63
SHEET 13 OF 14 SHEETS

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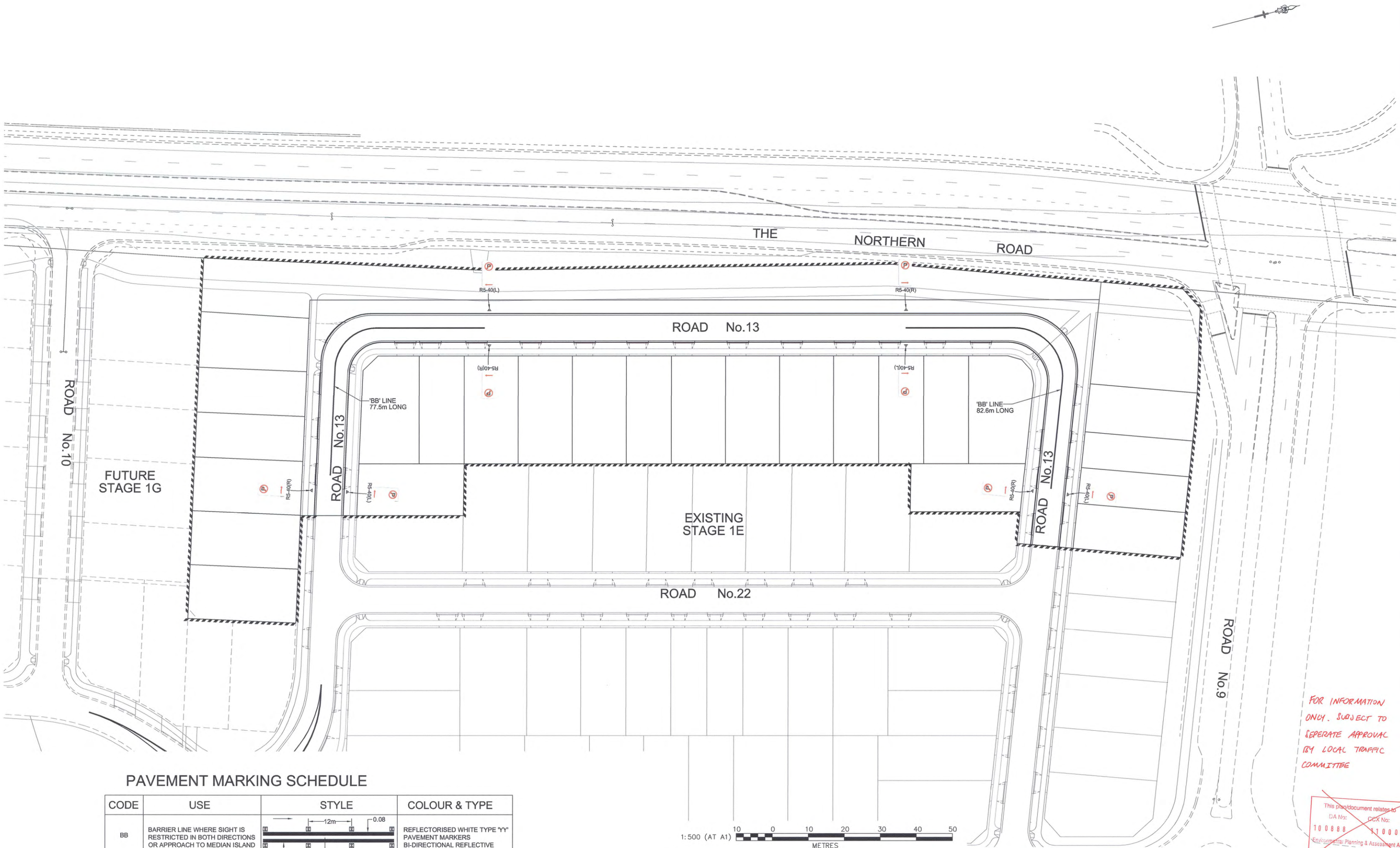

PAVEMENT MARKING SCHEDULE

CODE	USE	STYLE	COLOUR & TYPE
BB	BARRIER LINE WHERE SIGHT IS RESTRICTED IN BOTH DIRECTIONS OR APPROACH TO MEDIAN ISLAND	12m, 0.08, 0.08, 0.08	REFLECTORISED WHITE TYPE 'YY' PAVEMENT MARKERS BI-DIRECTIONAL REFLECTIVE YELLOW

FOR INFORMATION ONLY. SUBJECT TO SEPERATE APPROVAL BY LOCAL TRAFFIC COMMITTEE

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JORDAN SPRINGS
STAGE 1F
SIGNAGE & LINEMARKING PLAN

PLAN No. 8953CC64 A
FILE No. 8953CC64
SHEET 14 OF 14 SHEETS

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Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL WORKS ARE TO BE IN ACCORDANCE WITH PENRITH COUNCILS "STANDARD SPECIFICATION FOR ENGINEERING WORKS.
2. SURVEY MARKS:-
   a) STATE SURVEY MARKS SHOWN THUS ◘ SHALL BE SET IN TOP OF THE KERB AS IT IS BEING LAID, BY THE CONTRACTOR, IN THE INDICATED LOCATIONS. MARKS SHALL BE SUPPLIED BY THE PROJECT SURVEYOR.
   b) SURVEY MARKS SHOWN THUS ▲ SHALL BE RETAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE SUPERINTENDENT MUST BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
3. THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST IF NECESSARY.
4. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS. TO BE PROVIDED PRIOR TO THE APPROVAL OF THE PLANS.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO ADJOINING PROPERTIES.
6. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL'S ENGINEER.
7. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY SUITABLE STURDY APPROVED PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.
8. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES OUT-HOUSES, CAR BODIES AND DEBRIS ETC.
9. PUBLIC RESERVE AREAS SHALL BE CLEARED OF UNDERGROWTH, IMPROVEMENTS AND FENCES AS DIRECTED BY THE ENGINEER.
10. FILLING IS TO BE FROM A NOMINATED SOURCE, OF SOUND CLEAN MATERIAL, FREE FROM LARGE ROCK, STUMPS, CONTAMINATED MATTER, INDUSTRIAL AND BUILDING WASTE, ORGANIC MATTER AND OTHER DEBRIS. PLACING OF FILLING ON THE PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE COUNCIL.
11. SITE FILL AREAS:- THE CONTRACTOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
12. ALL SITE FILLING TO BE COMPACTED TO 95% STANDARD COMPACTION AND SHALL BE CONTROLLED BY A REGISTERED SOIL LABORATORY IN ACCORDANCE WITH COUNCIL'S "WORKS SPECIFICATION".
13. ALL SITE REGRADING AREAS SHALL BE GRADED AT A MINIMUM 1% TO THE ENGINEERS REQUIREMENTS
14. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
15. ALL DRAINAGE LINES THROUGH LOTS SHALL BE CONTAINED WITHIN THE FOLLOWING EASEMENTS:-
    a) INTERALLOTMENT DRAINS (C.D.L.) - 150mm dia. -1.5m WIDE MINIMUM
       - 225mm & 300mm dia. -2.0m WIDE MINIMUM
       - 300mm TO 600mm dia. -2.5m WIDE MINIMUM
       - 675mm & 750mm dia. -3.0m WIDE MINIMUM
    b) PIPED DRAINAGE - 2.5m WIDE MINIMUM
16. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND AND HAVE 3m OF SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
17. VEHICULAR CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER WHERE SHOWN.
18. PRAM CROSSINGS SHALL BE CONSTRUCTED IN KERB AND GUTTER IN ACCORDANCE WITH COUNCIL'S STANDARD DRAWING.
19. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
20. ALL INTERALLOTMENT DRAINAGE LINES SHALL BE LAID AT A MINIMUM GRADE OF 1% UNLESS OTHERWISE INDICATED.
21. DRAINAGE LINES ON PLANS ARE DIAGRAMMATIC ONLY AND PIPE CENTRELINES SHALL ENTER AND EXIT PITS AT THE CENTRE OF THE RESPECTIVE PIT WALLS.
22. DIMENSIONS OF ANY DETAIL SHALL NOT BE SCALED - DIMENSIONS, IF IN DOUBT, SHALL BE VERIFIED BY THE SUPERINTENDENT.
23. ALL CONSTRUCTION AND RESTORATION WORK ON COUNCIL'S ROAD AND FOOTPATH AREA ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED DRAWINGS AND COUNCIL'S STANDARD SPECIFICATIONS.

SURVEY SET OUT INFORMATION NOTES:

1. ALL SITE SET OUT AND CONTROL POINTS ARE TO MGA COORDINATES AND AHD.
2. THE INFORMATION DETAILED ON THE CERTIFIED CONSTRUCTION CERTIFICATE PLANS TAKES PRECEDENCE OVER ALL ASSOCIATED ELECTRONIC FILES PROVIDED. THE ORDER OF PRIORITY FOR USE OF CONSTRUCTION CERTIFICATE PLANS & ASSOCIATED ELECTRONIC FILES PROVIDED IS AS FOLLOWS:
   i. CERTIFIED CONSTRUCTION CERTIFICATE DRAWINGS
   ii. 2D DRAFTING BASE (ELECTRONIC FILE)
   iii. 3D DTM (ELECTRONIC FILE) IF PROVIDED
3. ANY DISCREPANCY BETWEEN ANY OF THE INFORMATION CONTAINED WITHIN THESE FILES IS TO BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT WHO WILL SEEK CLARIFICATION AND ISSUE INSTRUCTIONS ON THE APPROPRIATE COURSE OF ACTION.

www.dialbeforeyoudig.com.au DIAL 1100 BEFORE YOU DIG

UTILITIES SHOWN ARE DIAGRAMMATIC ONLY, CONTRACTORS ARE RESPONSIBLE TO LOCATE AND AVOID DAMAGE TO THEM AS SPECIFIED BY EACH UTILITIES EXCAVATION GUIDE LINES & STANDARDS.

NOTE: UTILITIES SHOWN MAY NOT INCLUDE ALL SERVICES AFFECTED AREAS

SURVEYED BY:
WHELANS INSITES PTY LTD

PENRITH CITY COUNCIL

JORDAN SPRINGS

JORDANSPRINGS

STAGE 1G
DEVELOPMENT APPLICATION
PROPOSED ROAD & DRAINAGE WORKS

COUNCIL REF: DA 10/0887



LEGEND

PROPOSED	DESCRIPTION	EXISTING
600Ø	R.C. STORMWATER PIPELINE	
600Ø	R.C. STORMWATER PIPELINE (OUTSIDE OF CONTRACT)	
150Ø	COMMON DRAINAGE LINE	150Ø CDL
①	KERB INLET PITS	
②	OTHER PITS	
③	HEADWALL	
	KERB INLET PIT BUILT TO SUBGRADE LEVEL (LINTEL IN FUTURE WORKS)	
IK	INTEGRAL KERB	
37.5	CONTOURS	37.5
	EXTENT OF WORKS	
	SURVEY MARKS - BENCH MARKS	▲
	STATE SURVEY MARKS	
	RECOVERY PEGS	
	TREES	
	THRESHOLD TREATMENT PAVERS ON CONCRETE BASE	
	FILL	
	CUT	
	BOXING OF ROADS FOR OVERLAND FLOW PATH	

INDEX

PLAN No.	DESCRIPTION
8953/CC101	COVER SHEET, GENERAL NOTES, INDEX & LEGEND
8953/CC102	SITE STAGING / BULK EARTHWORKS PLAN
8953/CC103	SETOUT PLAN
8953/CC104	PLAN
8953/CC105	ROAD No.8 & 10 LONGITUDINAL SECTIONS & TYPICAL CROSS SECTIONS
8953/CC106	ROAD No.8 CROSS SECTIONS
8953/CC107	ROAD No.10 CROSS SECTIONS
8953/CC108	KERB RETURNS No.88 & 89 CYCLE/FOOTWAY & TYPICAL DRIVEWAY LOCATION DETAILS
8953/CC109	CATCHMENT PLAN
8953/CC110	DRAINAGE LONGITUDINAL SECTIONS LINE No.40, 43, 44, 45, 46 & 108
8953/CC111	PIT SCHEDULE & DRAINAGE CALCULATIONS
8953/CC112	SOIL & WATER MANAGEMENT PLAN TREE MANAGEMENT PLAN
8953/CC113	SOIL & WATER MANAGEMENT NOTES & DETAILS
8953/CC114	SIGN POSTING PLAN

This plan/document relates to
DA No: 10 0887 CCX No: 11 0039
Environmental Planning and Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- ROAD No.10 WIDENED AND INTERSECTION WITH ROADS ADJUSTED.
- CYCLEWAY REMOVED
- KERB RETURN RADII INCREASED
- DRAINAGE ADJUSTED TO SUIT
- SIGNAGE AND LINEMARKING CHANGED
- GRADING ADJUSTED TO SUIT

C

ISSUE	AMENDMENT	DATE	BY
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N/A

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SIGNED S. Anderson DATE 22/11/11

JORDAN SPRINGS
STAGE 1G
COVER SHEET, GENERAL NOTES, INDEX & LEGEND

PLAN No. 8953/CC101 C
FILE No. 8953CC101
SHEET 1 OF 14 SHEETS

Plotted: 12 Dec 2011 9:01:10 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1G\8953CC101.dwg

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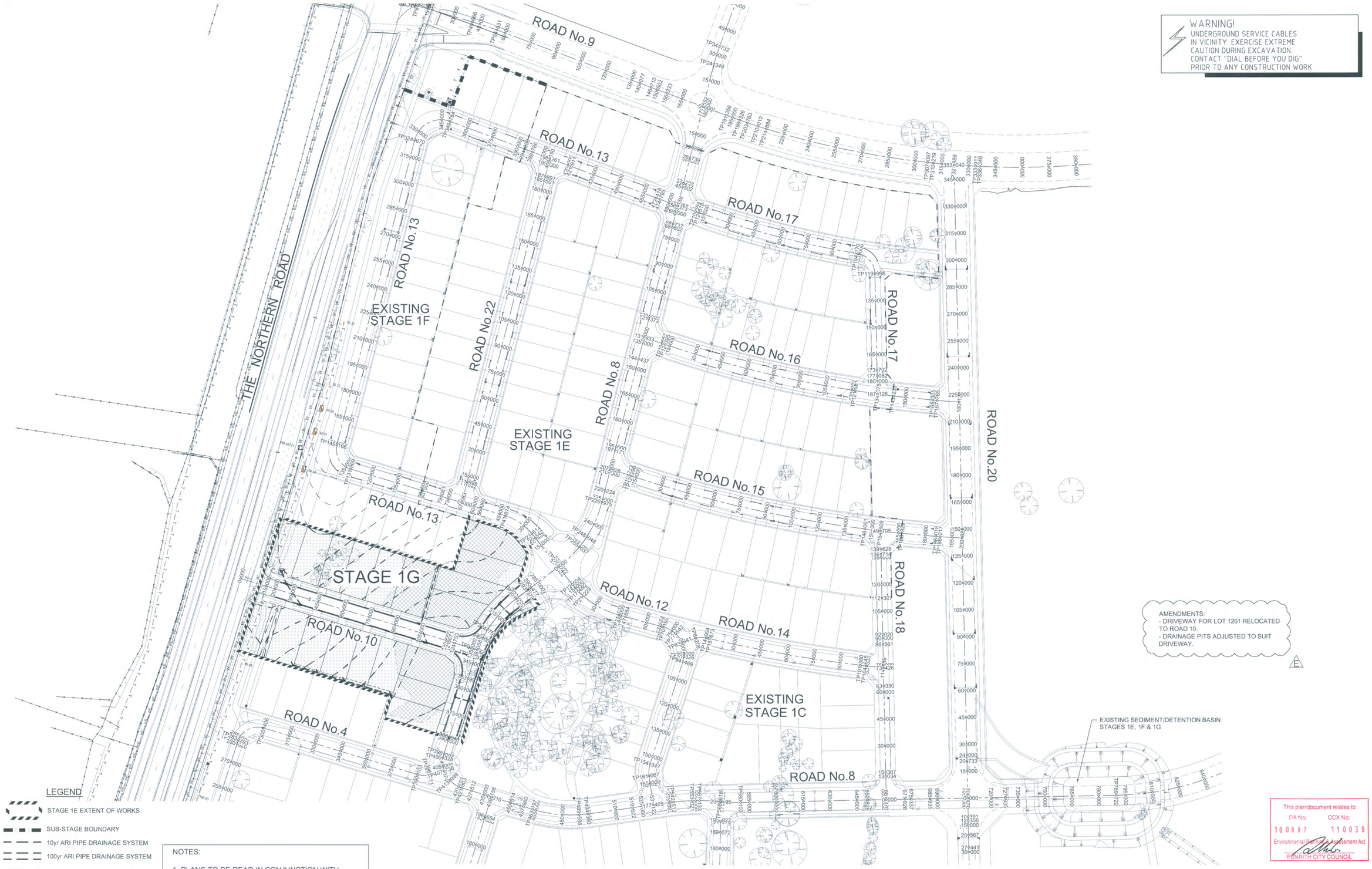

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SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
E	AMENDMENTS AS NOTED	28/11/11	AM
D	DESIGN MODIFIED AS NOTED	21/11/11	AM
C	NOTE AMENDED	01-03-11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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JORDAN SPRINGS
STAGE 1G
SITE STAGING / BULK EARTHWORKS PLAN

PLAN No. 8953/CC102 E
FILE No. 8953CC102
SHEET 2 OF 14 SHEETS

Plotted: 12 Dec 2011 9:01:27 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1G\8953CC102.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018


ROAD No.9
ROAD No.13
ROAD No.17
ROAD No.6
ROAD No.8
ROAD No.15
ROAD No.12
ROAD No.14
ROAD No.10
ROAD No.4
ROAD No.22
ROAD No.20
ROAD No.18
THE NORTHERN ROAD
EXISTING STAGE 1F
EXISTING STAGE 1E
EXISTING STAGE 1E
STAGE 1G
EXISTING STAGE 1C
110°13'46"
R470
R568.4
R643.4
R719
R15.0
R50.0
R55.0
R30.0
R11.2
184°17'12"
14°16'53"
184°16'53"
178°41'32"
358°41'33"
286°42'38"
106°42'40"
197°39'07"
353.040
187.128
149.705
198.261
144.861
144.004
83.641
358.414
358.426
358.370
358.369
358.360
358.361
358.358
358.357
358.356
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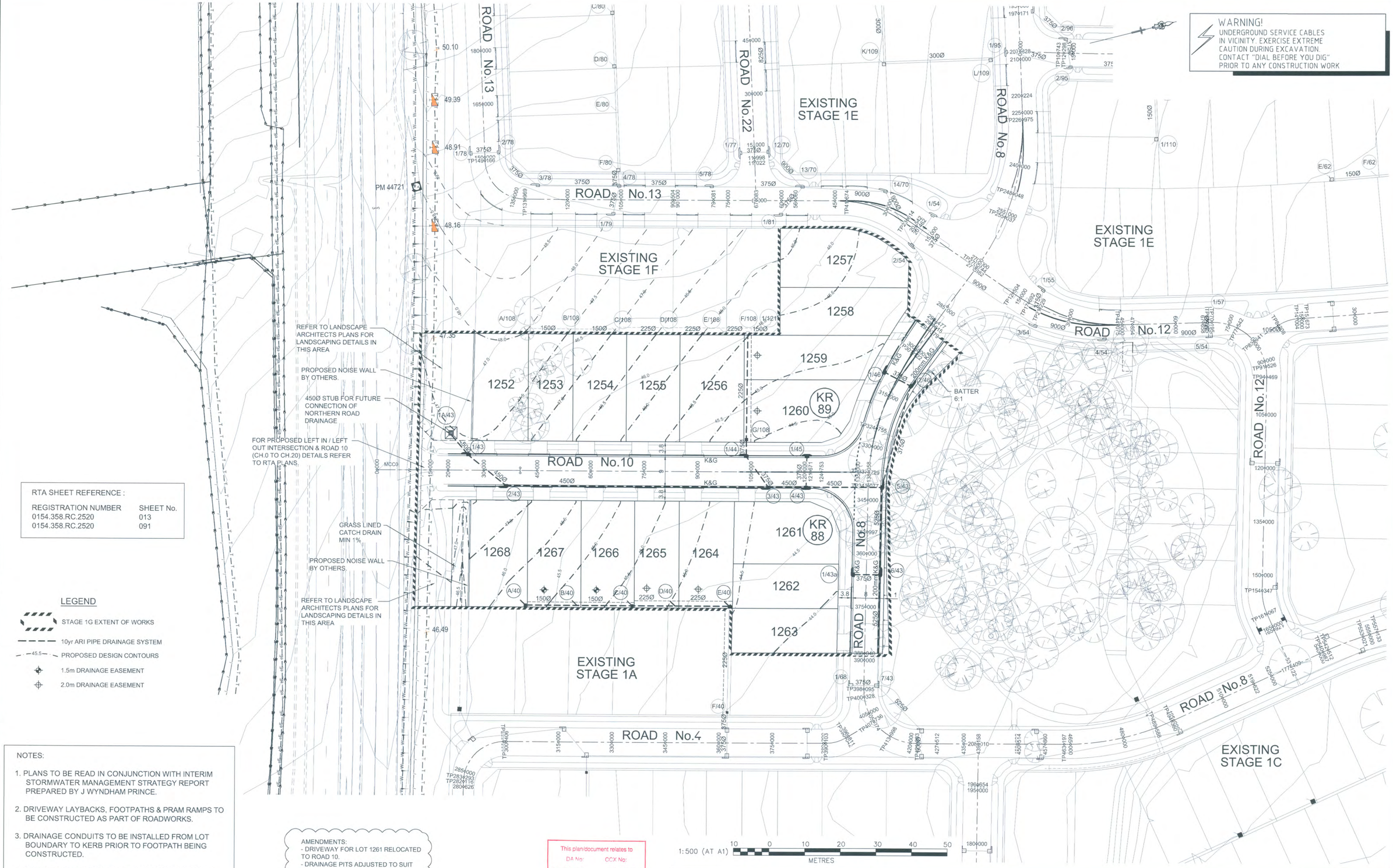
358.319



RTA SHEET REFERENCE :

REGISTRATION NUMBER	SHEET No.
0154.358.RC.2520	013
0154.358.RC.2520	091

LEGEND

- STAGE 1G EXTENT OF WORKS
- 10yr ARI PIPE DRAINAGE SYSTEM
- 45.5 PROPOSED DESIGN CONTOURS
- 1.5m DRAINAGE EASEMENT
- 2.0m DRAINAGE EASEMENT

NOTES:

1. PLANS TO BE READ IN CONJUNCTION WITH INTERIM STORMWATER MANAGEMENT STRATEGY REPORT PREPARED BY J WYNDHAM PRINCE.
2. DRIVEWAY LAYBACKS, FOOTPATHS & PRAM RAMPS TO BE CONSTRUCTED AS PART OF ROADWORKS.
3. DRAINAGE CONDUITS TO BE INSTALLED FROM LOT BOUNDARY TO KERB PRIOR TO FOOTPATH BEING CONSTRUCTED.
4. REFER TO RTA PLANS FOR LINEMARKING, SIGNAGE AND TRAFFIC MANAGEMENT FOR NORTHERN ROAD AND ROAD No.10 INTERSECTION.

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS ADJUSTED TO SUIT DRIVEWAY.

F

This plan/document relates to
DA No: 100887 CCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

ISSUE	AMENDMENT	DATE	BY
F	AMENDMENTS AS NOTED	28/11/11	AM
E	DESIGN MODIFIED AS NOTED	21/11/11	AM
D	U-RAILS ADDED FOR PEDESTRIAN DIVERSION	26-08-11	VG
C	AMENDMENTS AS NOTED	01-03-11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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CHECKED M.S.
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SCALES: 1:500

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SIGNED S. Anderson DATE 28/11/11

JORDAN SPRINGS
STAGE 1G
PLAN

PLAN No. 8953/CC104 F
FILE No. 8953CC104
SHEET 4 OF 14 SHEETS

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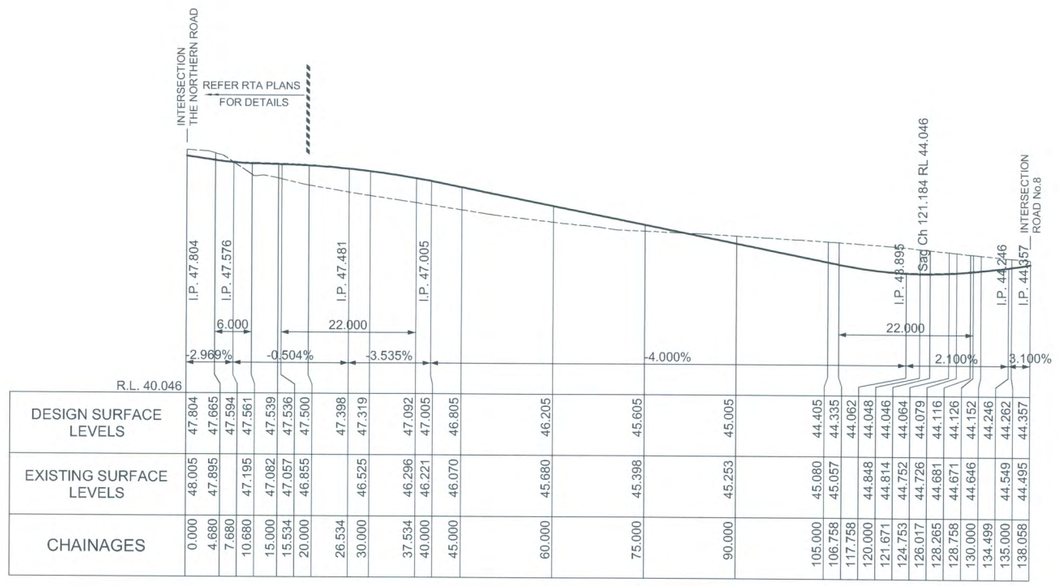
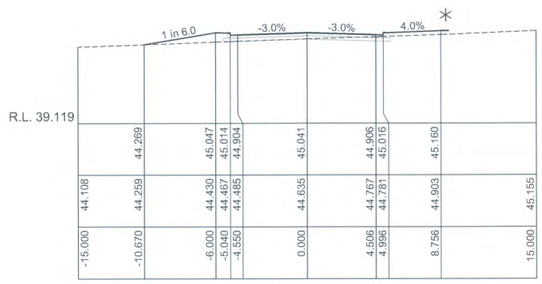

INTERSECTION THE NORTHERN ROAD
REFER RTA PLANS FOR DETAILS
I.P. 47.804
I.P. 47.576
I.P. 47.481
I.P. 47.005
I.P. 43.895
Sag Ch 121.184 RL 44.046
I.P. 44.246
I.P. 44.357
INTERSECTION ROAD No.8
6.000
22.000
22.000
+2.969%
-0.504%
-3.535%
-4.000%
2.100%
3.100%
R.L. 40.046

| | | |

AMENDMENTS:
- ROAD No.10 CONFIGURATION CHANGED
- KERB RETURN RADII INCREASED
- ROAD No.8 CROSS SECTIONS AMENDED TO SUIT

C

✳ SEE PLAN FOR LOT GRADING



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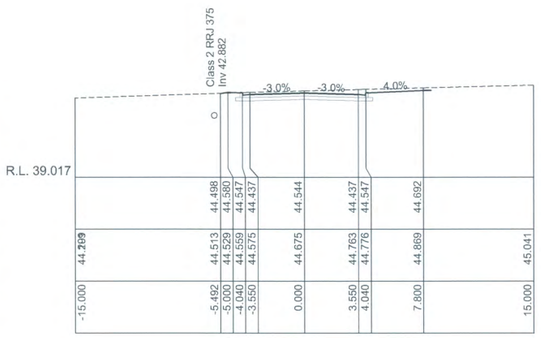

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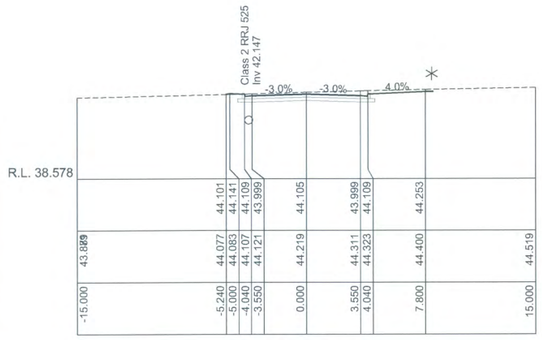

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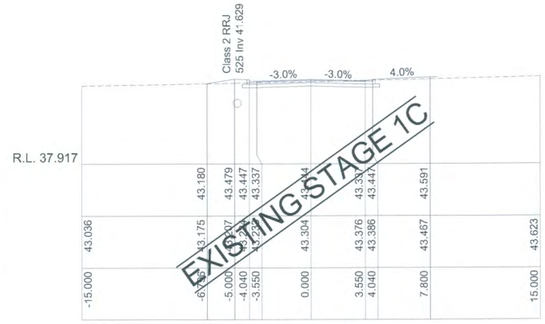

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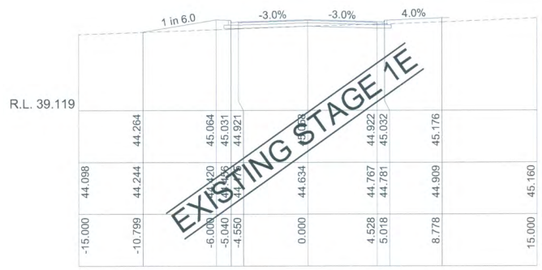

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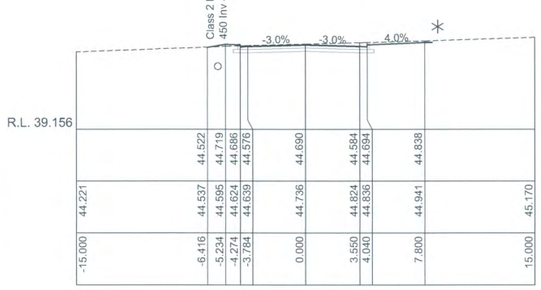

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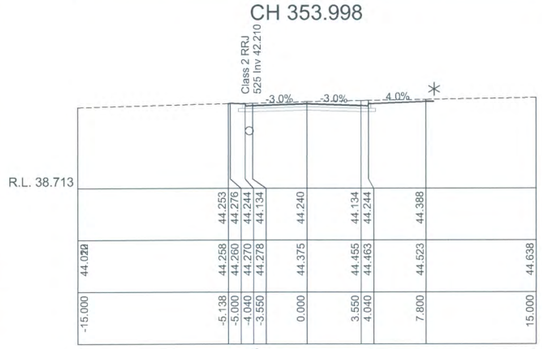

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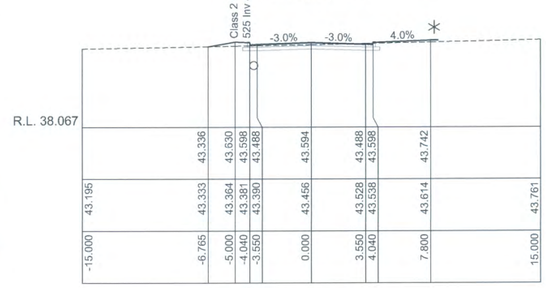

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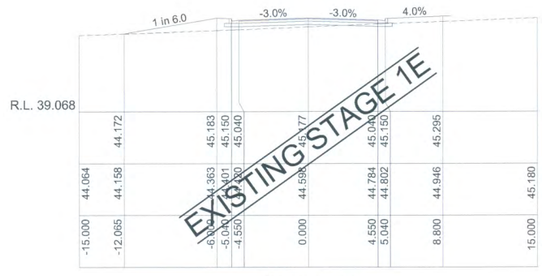

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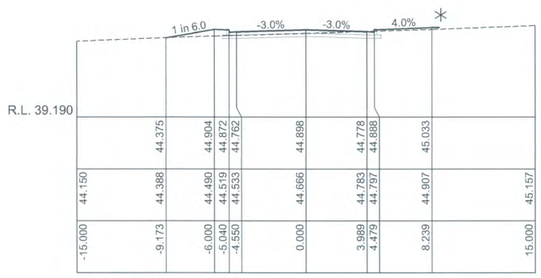

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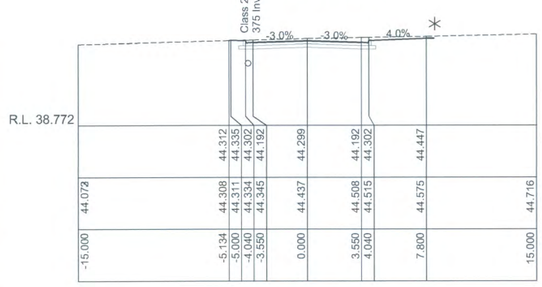

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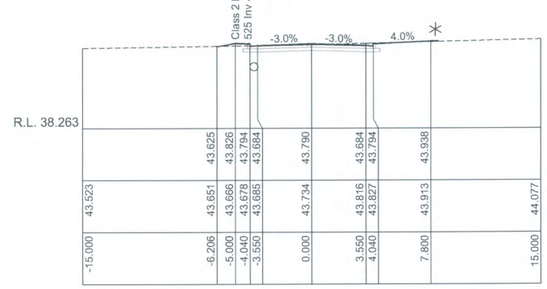

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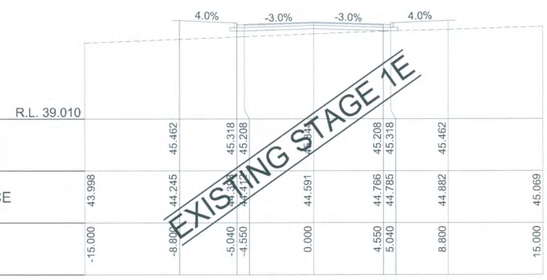

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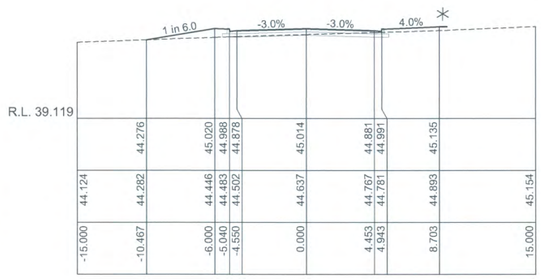

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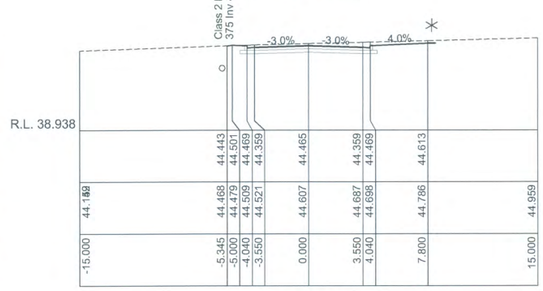

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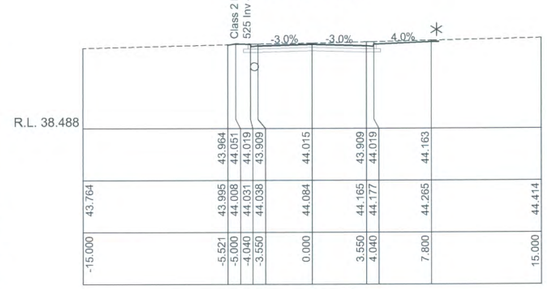

CH 360.000

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DA No: 1008 87 CCX No: 110039
Environmental Planning & Assessment Act
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1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES:
C.S. 1:200 NAT (AT A1)

JORDAN SPRINGS
STAGE 1G
ROAD No.8 CROSS SECTIONS

PLAN No. 8953/CC106 C
FILE No. 8953CC106
SHEET 6 OF 14 SHEETS

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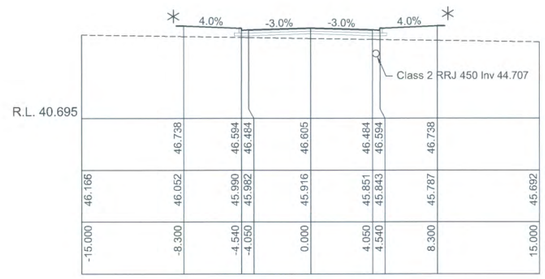
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

✳ SEE PLAN FOR LOT GRADING



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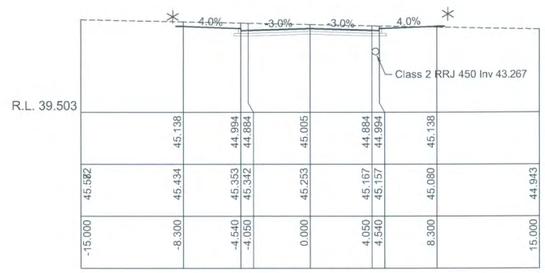

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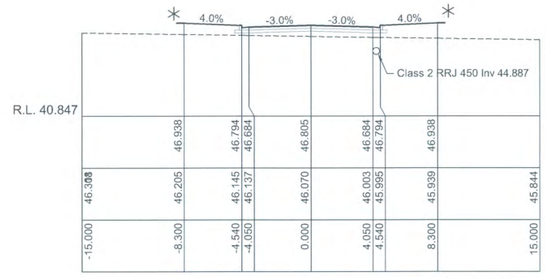

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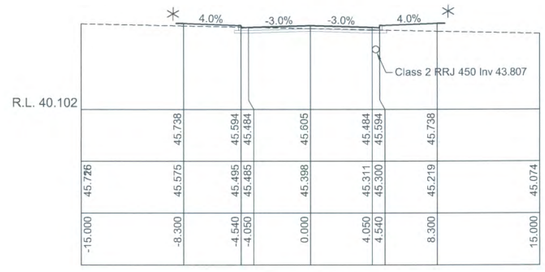
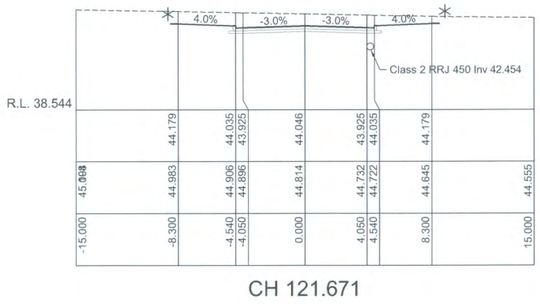


CH 75.000

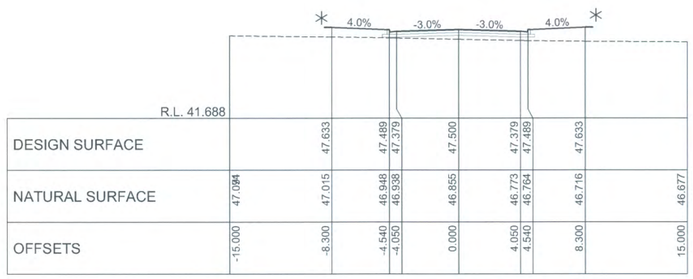


CH 121.671

CH 30.000

CH 65.000

CH 120.000



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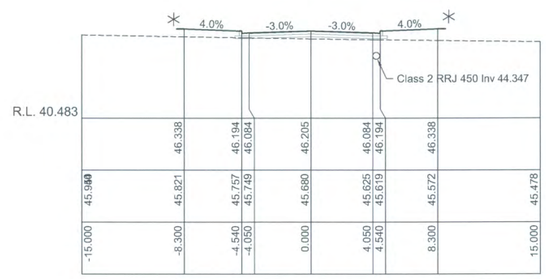
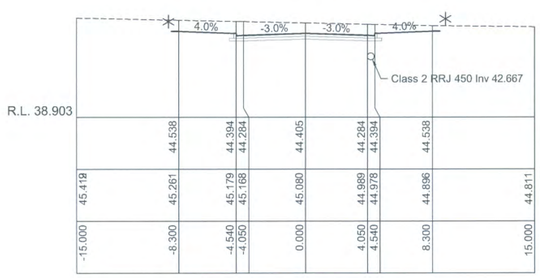


CH 60.000



CH 105.000

This plan/document relates to
DA No: 100887 CCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- ROAD No.10 CONFIGURATION CHANGED
- KERB RETURN RADII INCREASED
- ROAD No.10 CROSS SECTIONS AMENDED TO SUIT

C

1:200 (AT A1)

4 2 0 4 8 12 16 20
METRES

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ISSUE	AMENDMENT	DATE	BY
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
PO Box 4366 PENRITH WESTFIELD NSW 2750 DX 8032 PENRITH
P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: C.S. 1:200 NAT (AT A1)

CLIENT: Lend Lease

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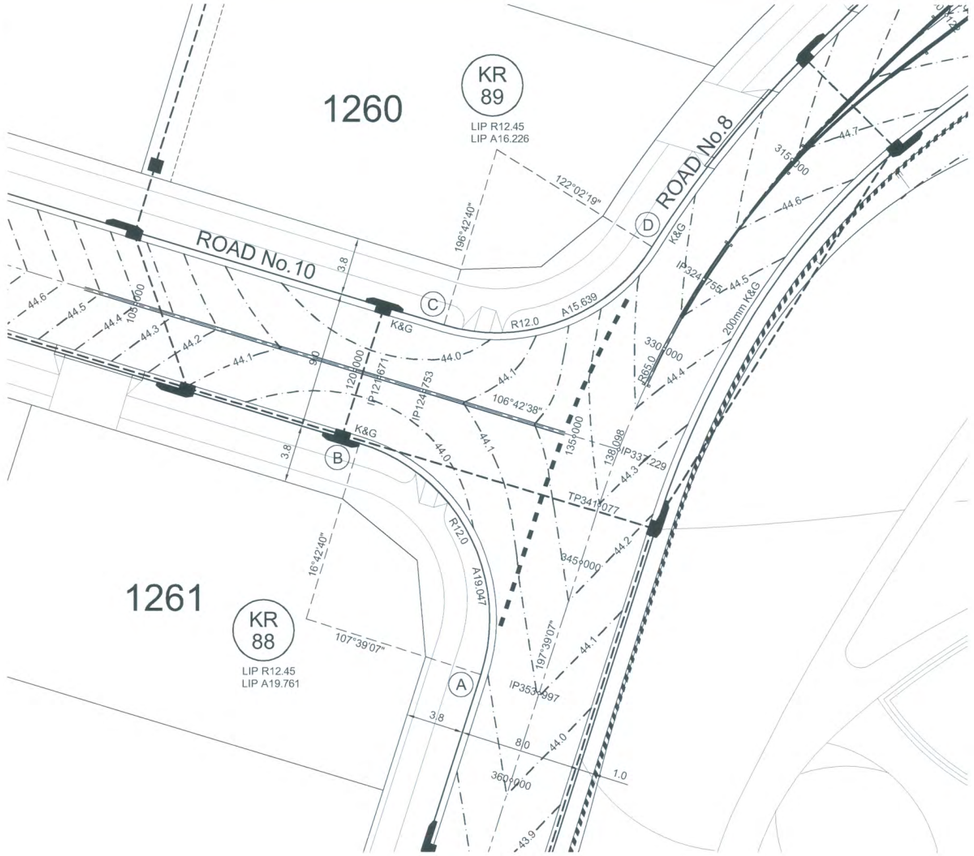
ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

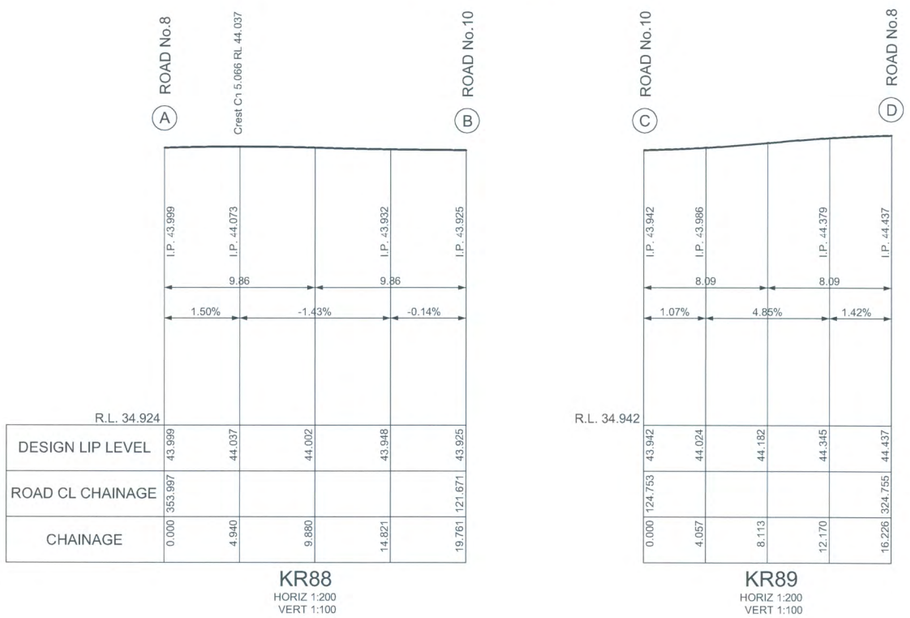
JORDAN SPRINGS
STAGE 1G
ROAD No.10 CROSS SECTIONS

PLAN No. 8953/CC107 C
FILE No. 8953CC107
SHEET 7 OF 14 SHEETS

Plotted: 12 Dec 2011 9:02:29 AM File Name: J:\8953\D\CC - Engineering Construction Plans\Stage 1G\8953CC107.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018





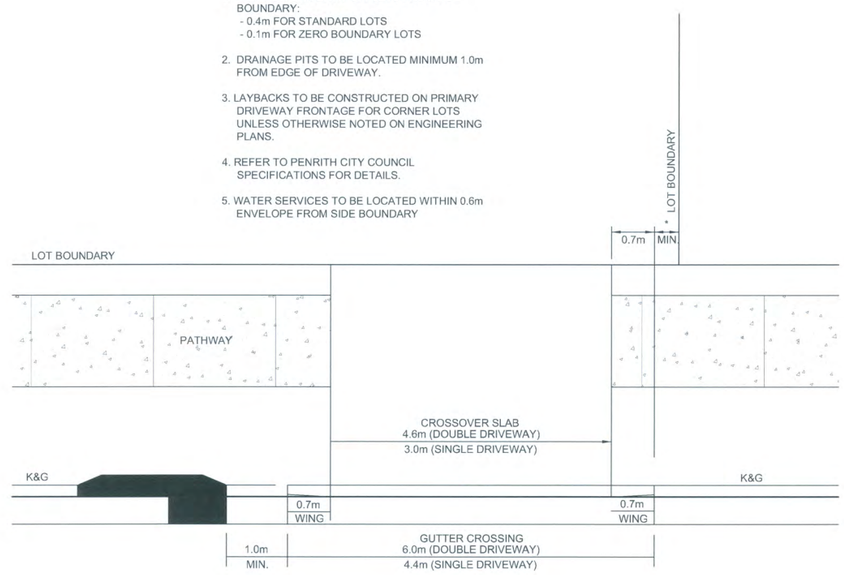
KR88
HORIZ 1:200
VERT 1:100

KR89
HORIZ 1:200
VERT 1:100

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:200 (AT A1) 4 2 0 4 8 12 16 20 METRES

NOTE:
1. * MINIMUM DRIVEWAY OFFSETS FROM SIDE BOUNDARY:
   - 0.4m FOR STANDARD LOTS
   - 0.1m FOR ZERO BOUNDARY LOTS
2. DRAINAGE PITS TO BE LOCATED MINIMUM 1.0m FROM EDGE OF DRIVEWAY.
3. LAYBACKS TO BE CONSTRUCTED ON PRIMARY DRIVEWAY FRONTAGE FOR CORNER LOTS UNLESS OTHERWISE NOTED ON ENGINEERING PLANS.
4. REFER TO PENRITH CITY COUNCIL SPECIFICATIONS FOR DETAILS.
5. WATER SERVICES TO BE LOCATED WITHIN 0.6m ENVELOPE FROM SIDE BOUNDARY



TYPICAL DRIVEWAY LOCATION DETAIL
SCALE NTS

This plan/document relates to
DA No: 10887 CCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS ADJUSTED TO SUIT DRIVEWAY.

E

ISSUE	AMENDMENT	DATE	BY
E	AMENDMENTS AS NOTED	28/11/11	AM
D	SHARED PATHWAY DETAIL REMOVED	22/11/11	AM
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:200

CLIENT: Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

JORDAN SPRINGS
STAGE 1G
KERB RETURNS No.88 & 89
CYCLE/FOOTWAY & TYPICAL DRIVEWAY LOCATION DETAILS

PLAN No. 8953/CC108 E
FILE No. 8953CC108
SHEET 8 OF 14 SHEETS

Plotted: 12 Dec 2011 9:02:43 AM File Name: J:\8953\DCC - Engineering Construction Plans\Stage 1G\8953CC108.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS ADJUSTED. CATCHMENT BOUNDARIES ADJUSTED TO SUIT.

D

THE NORTHERN ROAD

1:1000 (AT A1)

20 10 0 10 20 30 40 50 60 70 80 90 100
METRES

This plan/document relates to
DA No: 10087 OCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS NOTED	28/11/11	AM
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

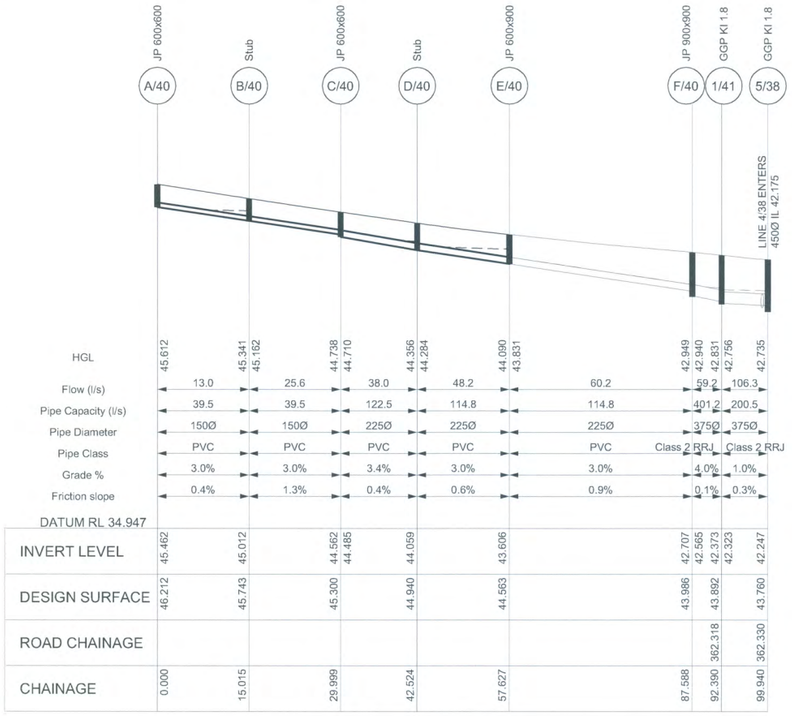
DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1G
CATCHMENT PLAN

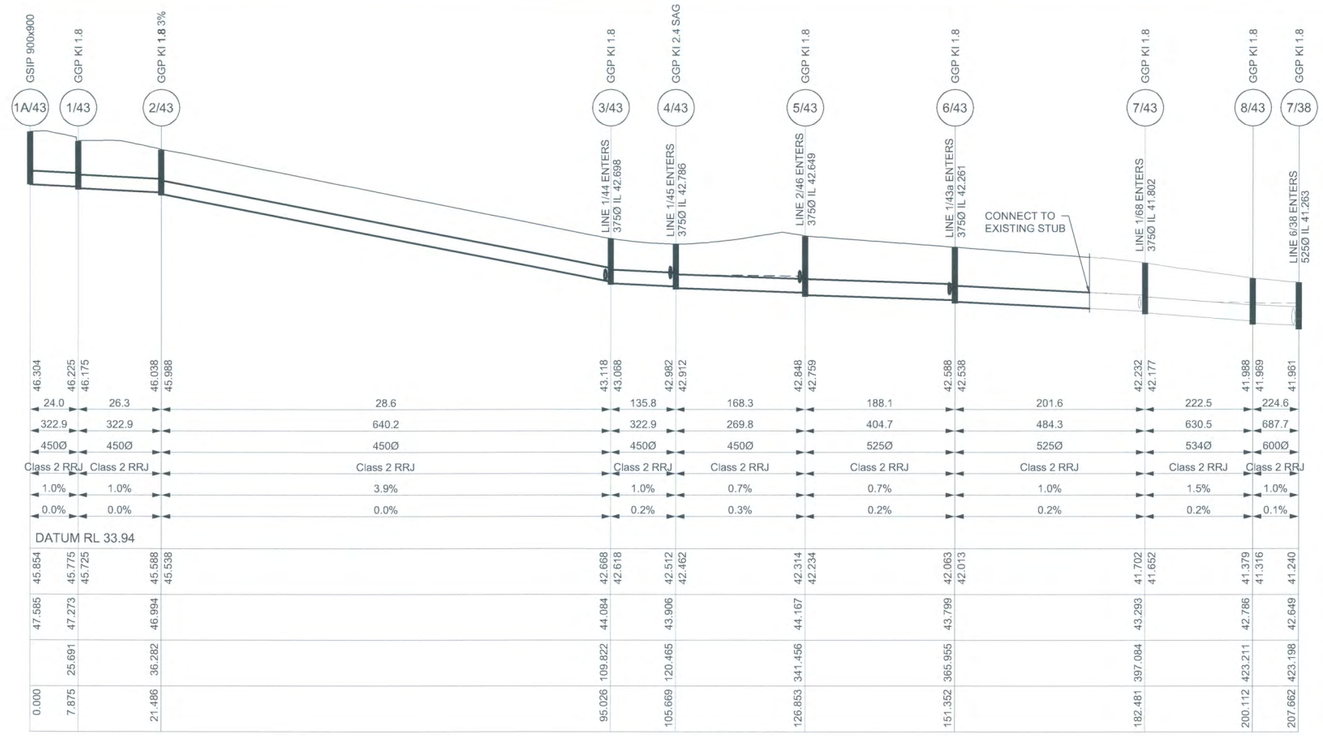
PLAN No. 8953/CC109 D
FILE No. 8953CC109
SHEET 9 OF 14 SHEETS

Plotted: 12 Dec 2011 9:02:57 AM File Name: J:\8953\DCC - Engineering Construction Plans\Stage 1G\8953CC109.dwg

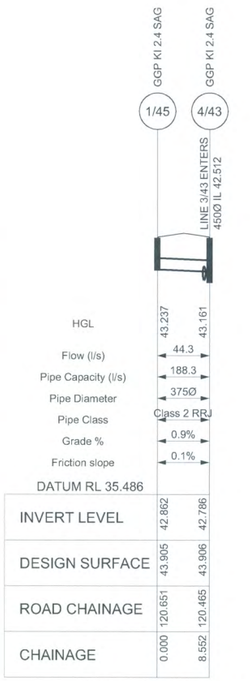
Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



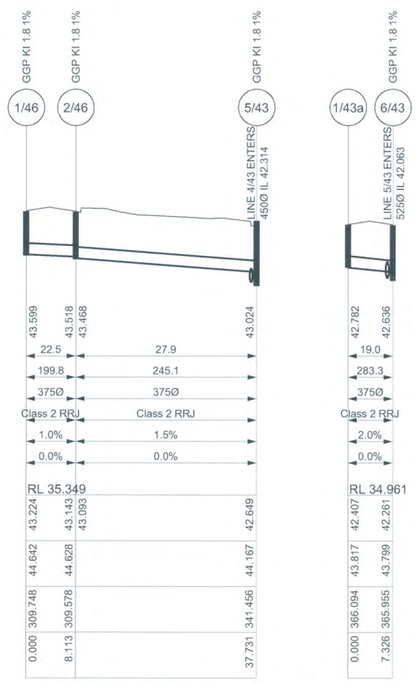
LINE 40 (1:10yr)



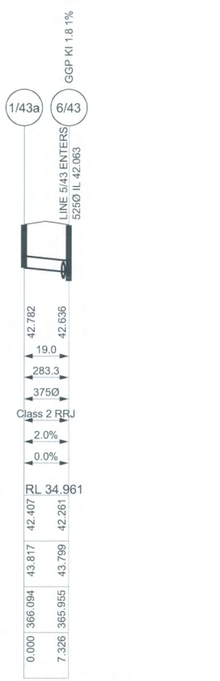
LINE 43 (1:10yr)



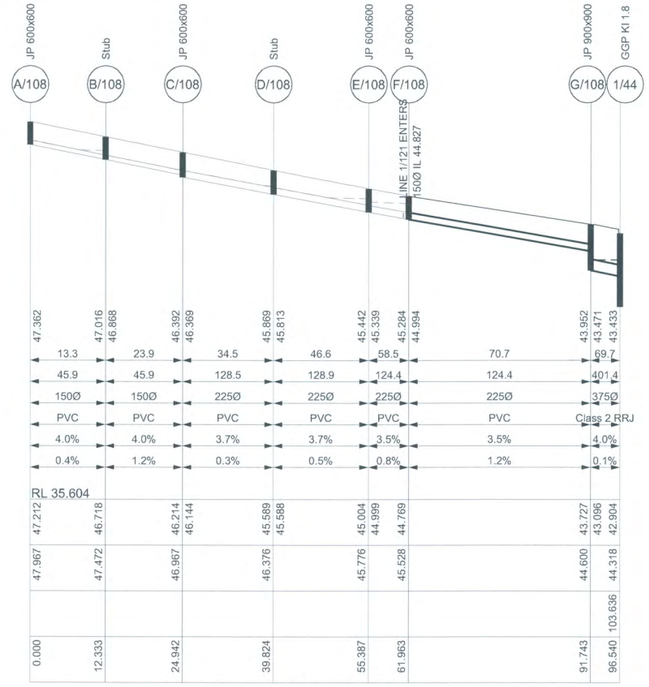
LINE 45 (1:10yr)



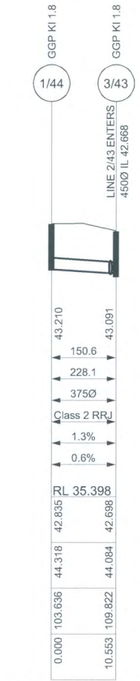
LINE 46 (1:10yr)



LINE 43a (1:10yr)



LINE 108 (1:10yr)



LINE 44 (1:10yr)

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS ADJUSTED TO SUIT DRIVEWAY.
- DRAINAGE LONG SECTIONS AMENDED.

D

This plan/document relates to
DA No: 10087 CCX No: 11003
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

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CLIENT: Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS NOTED	28/11/11	AM
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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P 02 4720 3300 F 02 4721 7638 W www.jwprince.com.au E jwp@jwprince.com.au

DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: L.S. 1:500 H, 1:100 V (AT A1)

JORDAN SPRINGS
STAGE 1G
DRAINAGE LONGITUDINAL SECTIONS
LINE No.40, 43, 44, 45, 46 & 108

PLAN No. 8953/CC110 D
FILE No. 8953CC110
SHEET 10 OF 14 SHEETS

Plotted: 12 Dec 2011 9:03:07 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1G\8953CC110.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

HYDRAULICS DESIGN TABLE Return Period: 10yrs Location: Cranebrook

Pipe Connecting Pits (Downstream to Upstream)	Pipe Upstream Tc	Total Upstream Effective Area	Pipe Design Flow	Pipe Length	Pipe Diameter	Mannings n	Pipe Slope	Pipe HGL	Pipe Computed Flow	Pit Loss Coefficient	Pit Head Loss	Pipe Velocity Head	Pipe Velocity	Pipe HGL Capacity	Pipe Flow Time
			(l/s)	(m)	(mm)		%	(m)	(m/s)	Ku	(m)	(m)	(m/s)	(m)	(mins)
C/108 B/108	6.274	0.064	23.9	12.609	150	0.009	4.0	47.076	23.928	1.585	0.148	0.09	1.35	45.89	0.155
F/108 G/108	7.011	0.196	70.7	29.780	225	0.009	3.5	44.994	70.699	1.800	0.290	0.16	1.78	124.38	0.279
B/108 A/108	6.000	0.035	13.3	12.333	150	0.009	4.0	47.362	13.271	4.500	0.129	0.03	0.75	45.88	0.274
D/108 C/108	6.429	0.093	34.5	14.882	150	0.009	4.0	46.690	34.502	1.238	0.241	0.19	1.95	45.88	0.127
1/46 G/108	7.100	0.231	83.0	5.868	375	0.012	4.0	44.047	82.992	0.600	0.017	0.03	0.75	401.26	0.130
F/108 E/108	6.654	0.162	59.3	14.961	225	0.009	3.0	45.224	59.323	0.600	0.068	0.11	1.49	114.84	0.167
E/108 D/108	6.556	0.128	46.9	15.563	150	0.009	3.5	45.942	46.947	1.120	0.403	0.36	2.66	42.81	0.098
1/46 2/46	6.000	0.060	22.5	8.113	375	0.012	1.0	43.599	22.549	4.500	0.010	0.00	0.20	199.82	0.662
2/46 5/43	6.662	0.076	27.9	29.619	375	0.012	1.5	43.468	27.891	1.934	0.006	0.00	0.25	245.09	1.955
3/70 2/70	6.105	0.018	1166.6	13.184	1200	0.012	1.0	48.565	6.603	1.000	0.054	0.05	1.03	4230.08	0.213
11/70 10/70	10.667	0.952	1448.1	57.513	825	0.012	1.0	46.461	288.086	0.600	0.225	0.37	2.71	1585.28	0.354
2/70 1/70	6.000	0.000	1160.0	16.536	2400x750	0.013	1.0	48.730	0.000	4.500	0.095	0.02	0.64	8269.28	0.105
6/70 5/70	9.374	0.315	1260.5	19.245	1200	0.012	1.0	47.991	100.542	1.000	0.063	0.06	1.11	4233.53	0.288
13/70 12/70	11.345	1.379	1569.2	13.881	900	0.012	1.0	44.987	409.238	0.800	0.248	0.31	2.47	1992.69	0.094
10/70 9/70	10.344	0.732	1383.5	50.194	825	0.012	1.0	47.068	223.510	0.800	0.205	0.34	2.59	1585.56	0.323
5/70 4/70	6.392	0.092	1194.1	8.357	1200	0.012	1.0	48.124	34.056	1.200	0.068	0.06	1.06	4212.92	0.132
8/70 7/70	10.048	0.708	1378.1	12.252	1200	0.012	3.2	47.443	218.118	1.004	0.076	0.08	1.22	7536.31	0.168
4/70 3/70	6.318	0.050	1178.7	4.648	1200	0.012	4.0	48.383	18.681	1.200	0.066	0.06	1.04	8473.97	0.074
12/70 11/70	11.021	1.176	1512.4	54.977	825	0.012	0.9	45.736	352.369	0.600	0.245	0.41	2.83	1541.73	0.324
14/70 13/70	11.439	1.821	1698.9	24.372	900	0.012	1.0	44.683	538.943	0.600	0.218	0.36	2.67	1992.48	0.152
2/54 14/70	11.591	1.908	1722.2	19.923	900	0.012	1.0	44.131	562.175	1.000	0.374	0.37	2.71	1990.16	0.123
7/70 6/70	9.662	0.553	1333.9	27.365	1200	0.012	1.9	47.724	173.865	0.600	0.043	0.07	1.18	5839.51	0.387
9/70 8/70	10.216	0.771	1390.8	12.260	1050	0.012	1.0	47.300	220.840	1.000	0.130	0.13	1.59	2886.96	0.128
B/40 C/40	6.341	0.069	25.6	14.984	150	0.009	3.0	45.162	25.558	1.684	0.180	0.11	1.45	39.50	0.173
C/40 D/40	6.513	0.103	38.0	12.525	225	0.009	3.4	44.710	38.027	0.600	0.028	0.05	0.96	122.55	0.218
D/40 E/40	6.732	0.132	48.2	15.103	225	0.009	3.0	44.284	48.231	0.957	0.072	0.08	1.21	114.84	0.208
1/41 F/40	7.095	0.170	60.8	4.802	375	0.012	4.0	42.940	60.823	0.600	0.009	0.02	0.55	401.18	0.145
A/40 B/40	6.000	0.034	13.0	15.015	150	0.009	3.0	45.612	12.982	4.500	0.124	0.03	0.73	39.50	0.341
F/40 E/40	6.773	0.170	61.8	29.961	225	0.009	3.0	43.831	61.769	2.218	0.273	0.12	1.55	114.84	0.321
5/38 1/41	7.240	0.304	108.3	7.550	375	0.012	1.0	42.761	108.276	1.569	0.077	0.05	0.98	200.49	0.128
6/38 1/42	6.000	0.015	5.6	7.550	375	0.012	1.0	42.313	5.605	4.500	0.001	0.00	0.05	199.82	2.480
1A/43 1/43	20.000	0.108	24.0	7.875	450	0.012	1.0	46.304	23.977	4.500	0.005	0.00	0.15	322.91	0.871
1/43 2/43	20.000	0.118	26.3	8.552	450	0.012	1.0	46.175	26.304	0.929	0.001	0.00	0.17	322.91	0.862
1/43a 6/43	6.000	0.050	19.0	7.326	375	0.012	2.0	42.782	19.040	4.500	0.007	0.00	0.17	283.25	0.708
3/43 4/43	20.000	0.611	135.8	16.864	450	0.012	1.0	43.131	135.785	2.291	0.085	0.04	0.85	322.91	0.329
4/43 5/43	20.000	0.757	168.3	21.184	450	0.012	0.7	42.912	168.270	1.219	0.070	0.06	1.06	269.79	0.334
5/43 6/43	20.000	0.846	188.1	24.499	525	0.012	0.7	42.759	188.100	2.293	0.088	0.04	0.87	404.66	0.470
6/43 7/43	20.000	0.907	201.6	31.129	525	0.012	1.0	42.538	201.628	0.661	0.029	0.04	0.93	484.28	0.557
7/43 8/43	20.000	1.001	222.5	17.632	525	0.012	1.5	42.177	222.452	1.097	0.055	0.05	0.99	630.49	0.296
8/43 7/38	20.000	1.011	224.6	7.550	600	0.012	1.0	41.969	224.586	0.600	0.019	0.03	0.79	687.73	0.158
1/44 3/43	7.416	0.426	150.6	8.550	375	0.012	1.0	43.265	150.577	1.771	0.168	0.09	1.36	199.82	0.105
1/45 4/43	6.000	0.117	44.3	8.552	375	0.012	0.9	43.237	44.345	4.500	0.037	0.01	0.40	188.28	0.355
2/54 1/54	6.000	0.117	44.2	7.922	375	0.012	3.0	43.986	44.221	4.500	0.037	0.01	0.40	347.28	0.330
3/54 2/54	11.714	2.108	1778.7	31.146	900	0.012	2.6	43.663	618.737	0.800	0.319	0.40	2.80	3242.92	0.186
4/54 3/54	11.899	2.117	1778.2	24.111	900	0.012	3.0	42.790	618.170	0.800	0.319	0.40	2.80	3456.02	0.144

PIT SCHEDULE & SETOUT

Pit No.	Pit Type	Inlet Diameter	Inlet Invert RL	Outlet Diameter	Outlet Invert RL	Pit Depth	Road Name	Road Chainage	Easting	Northing
		(mm)	(m)	(mm)	(m)	(m)		(m)	(m)	(m)
B/108	Stub	150	46.718	150	46.718	0.750			289048.18	6266004.960
F/108	Stub	225	44.550	225	44.550	0.914			289004.76	6266004.336
A/108	JP 600x600			150	47.212	0.773			288937.39	6266024.565
C/108	JP 600x600	150	46.547	150	46.547	0.800			288975.54	6266013.145
G/108	JP 900x900	225	43.727	375	43.096	1.504			288987.90	6265978.264
E/108	JP 600x600	150	45.074	225	44.359	0.807			288965.44	6266000.833
D/108	Stub	150	45.619	150	45.619	0.851			288975.54	6266013.145
1/46	GGP KI 1.8			375	43.224	1.418	ROAD 8	309.75	289030.50	6265985.205
2/46	GGP KI 1.8	375	43.143	375	43.093	1.535	ROAD 8	309.58	289036.32	6265979.554
B/40	Stub	150	45.012	150	45.012				288929.28	6265947.188
C/40	JP 600x600	150	44.562	225	44.485				288943.62	6265942.860
D/40	Stub	225	44.059	225	44.059				288955.62	6265939.273
F/40	JP 600x600	225	42.707	375	42.555				288951.06	6265899.579
A/40	JP 600x600			150	45.462				288914.88	6265951.459
E/40	JP 600x900	225	43.606	225	43.606				288970.08	6265934.918
1A/43	GSIP 900x900			450	45.854	1.731			288908.88	6266003.38
1/43	GGP KI 1.8	450	45.775	450	45.725		ROAD 10	25.69	288911.85	6265996.086
2/43	GGP KI 1.8	450	45.588	450	45.538		ROAD 10	36.28	288919.53	6265984.852
3/43	GGP KI 1.8	450	42.668	450	42.618		ROAD 10	109.82	288989.97	6265963.706
		375	42.758							
4/43	GGP KI 2.4 SAG	450	42.512	450	42.462		ROAD 10	120.47	289000.16	6265960.646
		375	42.786							
5/43	GGP KI 1.8	450	42.314	525	42.234		ROAD 8	341.46	289020.45	6265954.546
6/43	GGP KI 1.8	525	42.063	525	42.013		ROAD 8	365.96	289013.02	6265931.201
		450	42.417							
1/44	GGP KI 1.8			375	42.844		ROAD 10	103.64	288986.50	6265973.674
1/45	GGP KI 2.4 SAG			375	42.862		ROAD 10	120.65	289002.80	6265968.782
1/54	GGP KI 2.4 SAG						ROAD 13	18.41	289048.12	6266017.474
2/54	GGP KI 2.4 SAG	375	43.287	900	42.763	2.106	ROAD 13	18.41	289048.12	6266017.474
		900	42.813							
3/54	GGP KI 1.8 5%	900	41.940	900	41.890	2.009	ROAD 12	22.02	289074.71	6265985.876
		375	42.414							
4/54	GGP KI 1.8	900	41.167	900	41.117	2.083	ROAD 12	40.28	289092.30	6265976.821
5/54	GGP KI 1.8	900	40.226	1050	40.076	2.368	ROAD 12	69.69	289120.99	6265969.122
		375	40.750							
1/43a	GGP KI 1.8			375	42.407	1.410	ROAD 8	366.09	289006.00	6265933.289

HYDROLOGIC DESIGN TABLE Return Period: 10 Location: Cranebrook

Pit No.	Land Use	Pit Type	Overland Flow Length	Overland Flow Slope	Overland Flow Roughness "n"	Overland Flow Time	Gutter Flow Time	Pit Tc (with Gutter)	Rainfall Intensity	Runoff Coeff. C	Total Area	C.A.	Adopted Pit Tc	Total Catchment Flow	Bypass Flow Received	Total Flow to Pit	Gutter Slope	Gutter Flow Width	Pit Gutter Flow Depth	Pit Inlet Inflow	Flow to Bypass Pit	Bypass Pit	Pit Specified Inflows
			(m)	(%)		(min)	(min)	(min)	(mm/hr)		(Ha)	(Ha)	(min)	(l/s)	(l/s)	(l/s)	(%)	(m)	(m)	(l/s)	(l/s)		(l/s)
B/108	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
F/108	Lots	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
A/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.046	0.035	6	13.3						0.000			
C/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000			
G/108		JP 600x600							136.0				6							0.000			
E/108	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
D/108	Lots	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000			
1/46		GGP KI 1.8 1%						6.00	136.0	0.806	0.075	0.060	6	22.8		22.8	1.500	1.031	0.057	22.549	0.283	1/45	
	Road					6.00		6.00		0.873	0.029	0.025											
	Lot					6.00		6.00		0.764	0.046	0.035											
2/46	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.018	0.016	6	5.9		5.9	1.500	0.399	0.035	5.935		6/43	
2/70	Park	Special Structure				6.00		6.00	136.0	0.627	0.028	0.018	6	6.6		0.0				0.000	0.000	4/70	
10/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.039	0.034	6	12.9		12.9	1.008	0.835	0.052	12.858		11/70	
1/70		Special Structure							136.0							1160.0				1160.000			1160.000
5/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.017	0.015	6	5.6		5.6	1.158	0.422	0.038	5.605		8/70	
12/70	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.050	0.044	6	16.5		16.5	0.199	Sag	0.049	16.485			
9/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.013	0.011	6	4.3		4.3	1.008	0.422	0.038	4.286		10/70	
4/70		GGP KI 1.8						6.00	136.0	0.757	0.055	0.042	6	15.7	0.0	16.1	1.057	1.024	0.057	16.132			
	Park					6.00		6.00		0.627	0.026	0.016										1/74	
	Road					6.00		6.00		0.873	0.029	0.025			0.4								
7/70	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.021	0.018	6	6.9		6.9	2.712	Sag	0.021	6.924			
3/70	Park	GSIP 900x900				6.00		6.00	136.0	0.627	0.052	0.033	6	12.3						0.000		4/70	
11/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.045	0.039	6	14.8		14.8	1.008	0.992	0.056	14.836		12/70	
13/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.008	0.007	6	2.6		2.6	2.637	0.264	0.023	2.638		14/70	
14/70		GGP KI 1.8						6.00	136.0	0.783	0.111	0.087	8	32.8		32.8	2.000	1.226	0.063	31.277		1/54	
	Road					6.00		6.00		0.873	0.020	0.017											
	Lot					6.00		6.00		0.764	0.052	0.040											
	Lot					6.00		6.00		0.764	0.039	0.030											
6/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9		4.9	1.800	0.389	0.033	4.945		7/70	
8/70	Road	GGP KI 1.8				6.00		6.00	136.0	0.873	0.014	0.012	6	4.6		4.6	1.008	0.412	0.037	4.616		1/75	
A/40	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		B/40	
B/40	Lot	Stub				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		C/40	
C/40	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		D/40	
D/40	Lot	Stub				6.00		6.00	136.0	0.764	0.038	0.029	6	11.0						0.000		E/40	
E/40	Lot	JP 600x600				6.00		6.00	136.0	0.764	0.045	0.034	6	13.0						0.000		F/40	
1A/43		GSIP 900x900						20.00	80.0	0.137	0.787	0.108	20	24.0		0.0				0.000			
	Park		140.79	2.4	0.200	29.57		29.57		0.627	0.172	0.108											
	Road		203.90	1.7	0.013	5.91		5.91		0.000	0.615	0.000											
1/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.012	0.010	6	4.0		4.0	1.903	0.341	0.030	3.956	0.000	1/44	
1/43a		GGP KI 1.8 1%						6.00	136.0	0.788	0.064	0.050	6	19.0		19.0	1.500	0.914	0.054	19.040			
	Road					6.00		6.00		0.873	0.014	0.012											
	Lot					6.00		6.00		0.764	0.050	0.038											
2/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.012	0.010	6	4.0		4.0	1.877	0.316	0.028	3.956	0.000	3/43	
3/43	Road	GGP KI 1.8 3%				6.00		6.00	136.0	0.873	0.064	0.056	6	21.1	0.0	21.1	4.000	0.679	0.047	20.991	0.110	4/43	
4/43	Road	GGP KI 2.4 SAG				6.00		6.00	136.0	0.873	0.033	0.029	6	10.9	0.1	11.0	0.199	Sag	0.004	10.990			
5/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.015	0.013	6	4.9		4.9	1.500	0.361	0.032	4.945		1/68	
6/43	Road	GGP KI 1.8 1%				6.00		6.00	136.0	0.873	0.012	0.010	6	4.0		4.0	1.500	0.309	0.027	3.956	0.000	7/43	
1/44		GGP KI 1.8 3%						6.00	136.0	0.788	0.292	0.230	6	86.9	0.0	86.9	4.000	1.619	0.075	66.459	20.459	1/45	
	Road					6.00		6.00		0.873	0.065	0.057											
	Lot					6.00		6.00		0.764	0.227	0.173											
1/45		GGP KI 2.4 SAG						6.00	136.0	0.799	0.147	0.117	6	44.3	20.5	65.1	0.148	Sag	0.022	65.087			
	Road					6.00		6.00		0.873	0.047	0.041			0.3								
	Lot					6.00		6.00		0.764	0.100	0.076											
1/54		GGP KI 2.4 SAG						6.00	136.0	0.796	0.147	0.117	6	44.2		44.2	0.080	Sag	0.131	44.221			
	Road					6.00		6.00		0.873	0.044	0.038											
	Lot					6.00		6.00		0.764	0.103	0.079											
F/40		JP 600x600							136.0											0.000		1/41	

This plan/document relates to
DA No: 100887 CCX No: 110039
Environmental Planning and Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS ADJUSTED TO SUIT DRIVEWAY.

D

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS NOTED	28/11/11	AM
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N/A

JORDAN SPRINGS
STAGE 1G
PIT SCHEDULE & DRAINAGE CALCULATIONS

PLAN No. 8953/CC111 D
FILE No. 8953CC111
SHEET 11 OF 14 SHEETS

Plotted: 12 Dec 2011 9:03:16 AM File Name: J:\8953\DCC - Engineering Construction Plans\Stage 1G\8953CC111.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



This plan/document relates to
DA No: 10887 CCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- DRAINAGE PITS & FILTER ROLLS ADJUSTED TO SUIT DRIVEWAY.

E

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES

1:500 (AT A1) 10 0 10 20 30 40 50 METRES

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

ISSUE	AMENDMENT	DATE	BY
E	AMENDMENTS AS NOTED	28/11/11	AM
D	DESIGN MODIFIED AS NOTED	21/11/11	AM
C	NOTE ADDED	01-03-11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: 1:1000

JORDAN SPRINGS
STAGE 1G
SOIL & WATER MANAGEMENT PLAN
TREE MANAGEMENT PLAN

PLAN No. 8953/CC112 E
FILE No. 8953CC112
SHEET 12 OF 14 SHEETS

Plotted: 12 Dec 2011 9:03:31 AM File Name: J:\8953D\CC - Engineering Construction Plans\Stage 1G\8953CC112.dwg

Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

GENERAL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING REVEGETATION AND STORAGE OF SOIL AND TOPSOIL, SHALL BE IMPLEMENTED TO THE REQUIREMENTS OF THE "ENVIRONMENT PROTECTION AUTHORITY" AND "DEPT OF LAND AND WATER CONSERVATION".
2. TOPSOIL FROM ALL AREAS TO BE DISTURBED SHALL BE STOCKPILED AND LATER RESPREAD TO AID REVEGETATION IN THOSE AREAS.
3. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILIZED AS EARLY AS POSSIBLE DURING DEVELOPMENT.
4. SEDIMENT TRAPS SHALL BE CONSTRUCTED AROUND ALL SAG PITS OR AS SHOWN CONSISTING OF A 300mm x 300mm DEEP TRENCH. SPECIAL PITS AS DETAILED.
5. ALL TAIL-OUT DRAINS SHALL BE GRASSED AND TRAPEZOIDAL IN SECTION. STRAW BALES SHALL BE PLACED AS A SEDIMENT CONTROL DEVICE WHERE REQUIRED.
6. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING DEVELOPMENT CONFINING ACCESS WHERE POSSIBLE TO PROPOSED OR EXISTING ROAD ALIGNMENTS. AREAS TO BE LEFT UNDISTURBED SHALL BE MARKED OFF.
7. ROADS SHALL BE PAVED AS EARLY AS POSSIBLE AFTER FORMATION.
8. DISTURBANCE OF VEGETATION SHALL BE LIMITED TO FILL AREAS, ROADWAYS AND DRAINAGE LINES. NO LOT GRADING SHALL BE CARRIED OUT IN UNDISTURBED AREAS WITHOUT CONSULTATION WITH COUNCIL'S ENGINEER.
9. ALL DISTURBED AREAS SHALL BE REVEGETATED WITHIN 20 WORKING DAYS FROM THE CONCLUSION OF LAND SHAPING
10. ALL SEDIMENT BASINS AND TRAPS SHALL BE CLEANED WHEN THE STRUCTURES ARE A MAXIMUM 30% FULL OF SOLID MATERIALS, INCLUDING DURING THE MAINTENANCE PERIOD.
11. A STRIP OF TURF, 1.2m WIDE, BEHIND AND FOR THE TOTAL LENGTH OF ALL KERBS SHALL BE PROVIDED.

STOCKPILE NOTES:

1. SPOIL AND TOPSOIL STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE LINES AND AREAS WHERE WATER MAY CONCENTRATE.
2. IF STOCKPILES ARE TO BE IN PLACE FOR LONGER THAN 30 DAYS THEN THEY SHALL BE STABILIZED BY COVERING WITH A MULCH OR WITH TEMPORARY VEGETATION.
3. FOLLOWING CONSTRUCTION, TOPSOIL SHALL BE RESPREAD TO A MINIMUM DEPTH OF 100mm ON THE BARE SOIL SURFACES AND REVEGETATE.

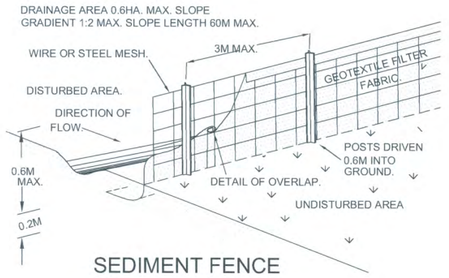
SEDIMENTATION CONTROL DEVICES:

1. ALL STRAW BALES SHALL BE BOUND WITH WIRE. STRAW BALES SHALL BE PLACED END TO END IN A SINGLE ROW AND EMBEDDED INTO THE SOIL TO A DEPTH OF 100mm. EACH BALE SHALL BE SECURELY ANCHORED WITH TWO STEEL STAKES DRIVEN 450mm INTO THE GROUND AND LOCATED ON THE BALE CENTRE LINE.
2. SILT FENCES SHALL BE CONSTRUCTED BY STRETCHING A FILTER FABRIC (PROPEX OR SIMILAR) BETWEEN POSTS AT AN AVERAGE SEPERATION OF 2m CENTRES. FABRIC SHALL BE BURIED 150mm ALONG ITS LOWER EDGE.

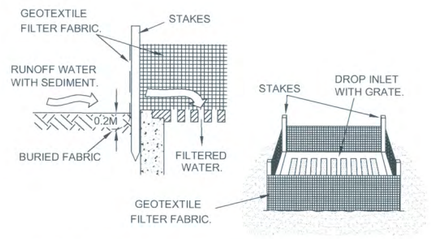
SPECIAL NOTES:

1. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE.
2. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE GUIDELINES SET OUT IN "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION " -4th EDITION AND THE ACCOMPANYING ROAD AND DRAINAGE PLANS..
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT.
4. MANAGEMENT DEVICES SHALL BE MAINTAINED ON A REGULAR BASIS.
5. WHERE CLEANING IS REQUIRED, THE SEDIMENT SHALL BE REMOVED TO A POINT NOMINATED BY THE ENGINEER.

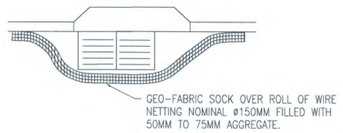
   PRIOR TO THE COMMENCEMENT OF ANY EARTHWORKS, AND AFTER THE ROAD CENTRELINES HAVE BEEN PEGGED AND/OR PERMANENTLY MARKED, THE SITE MUST BE INSPECTED BY COUNCIL'S REPRESENTATIVE AND THE APPLICANT'S REPRESENTATIVE TO IDENTIFY AND APPROPRIATELY MARK:-
   a) THE TREES TO BE RETAINED.
   b) ALL TREES TO BE LEFT UNDISTURBED AND TO BE CORDONED OFF.
6. NO TREES SHALL BE REMOVED WITHOUT COUNCIL'S CLEARANCE.

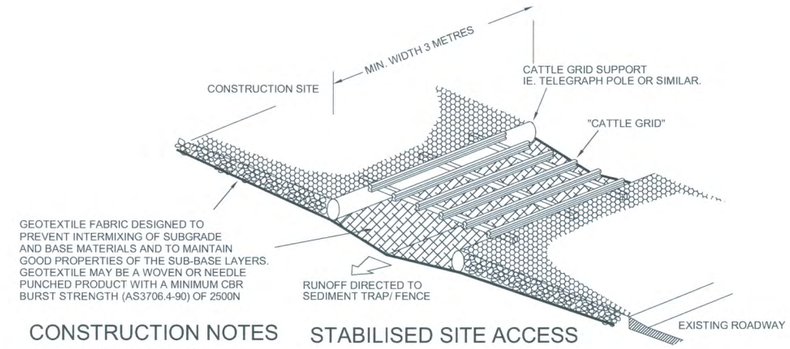


SEDIMENT FENCE
N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.
N.T.S.

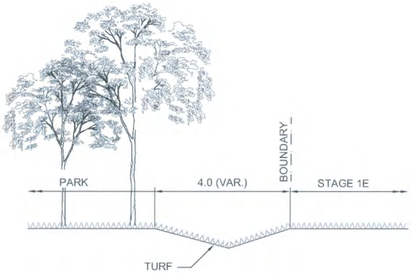




CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE
2. COMPACT SUBGRADE
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE
4. CONSTRUCT 200MM THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30MM AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.

STABILISED SITE ACCESS



TYPICAL CATCH DRAIN DETAIL
N.T.S.

This plan/document relates to
DA No: 10087 CCX No: 110039
Environmental Planning & Assessment Act
PENRITH CITY COUNCIL

AMENDMENTS:
- ROAD No.10 CONFIGURATION CHANGED
- KERB RETURN RADII INCREASED
- DRAINAGE ADJUSTED TO SUIT
- SIGNAGE AND LINEMARKING CHANGED
- GRADING ADJUSTED TO SUIT

C

1:100 (AT A1) 2 1 0 1 2 3 4 5 6 7 8 9 10 METRES
1:500 (AT A1) 10 0 10 20 30 40 50 METRES

ISSUE	AMENDMENT	DATE	BY
C	DESIGN MODIFIED AS NOTED	21/11/11	AM
B	ISSUED FOR CONSTRUCTION APPROVAL	22/02/11	AM
A	ISSUED FOR CLIENT REVIEW	18/11/10	AM

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N.T.S

CLIENT: Lend Lease

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS PART OF AN APPROVED CONSTRUCTION CERTIFICATE.

ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

JORDAN SPRINGS
STAGE 1G
SOIL & WATER MANAGEMENT NOTES & DETAILS

PLAN No. 8953/CC113 C
FILE No. 8953CC113
SHEET 13 OF 14 SHEETS

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018



SUPPLEMENTARY RTA DRAWINGS

Pavement Linemarking and Dimensions	MD.R60.A01.A.1
Details of Transverse Lines	MD.R60.A0.A
Details of Chevron Layout	MD.R60.A03.A
Pavement Arrows for Through and Turning Lanes at Urban and Rural Junctions	MD.R60.C01.A

AMENDMENTS:
- DRIVEWAY FOR LOT 1261 RELOCATED TO ROAD 10.
- SIGNS ADJUSTED TO SUIT.

D

NOTES

1. This traffic scheme, including speed posting,is to be submitted to the local traffic committee, prior to any works commencing.
2. All pavement markings, chevrons and reflectors are to be in accordance with R.T.A. standard drawings MD.R60 and Australian Standards.
3. All signs to be in accordance with current Australian Standard; AS 1743 - Road Signs and Council's specification unless otherwise shown.
4. Road signs are size 'A', unless otherwise shown. Locate outside of clear zones.
5. Speed zoning and directional signposting, other than shown to be submitted to the regional traffic committee.
6. All new pavement markings are to be installed in white, reflective, thermoplastic paint.
7. Kerbside lane widths include the width of the gutter.
8. Pavement markings that form no part of the final works are to be removed by sand blasting or other method as approved by the Project Manager.
9. All measurements are in meters unless otherwise shown.

FOR INFORMATION PURPOSES ONLY
SUBJECT TO SEPERATE APPROVAL BY THE LOCAL TRAFFIC COMMITTEE.

ISSUE	AMENDMENT	DATE	BY
D	AMENDMENTS AS NOTED	28/11/11	AM
C	SIGNAGE AND NOTES AMENDED	22/11/11	AM
B	DESIGN MODIFIED AS NOTED	21/11/11	AM
A	ISSUED FOR CONSTRUCTION APPROVAL	28/08/11	VG

J. WYNDHAM PRINCE CONSULTING CIVIL INFRASTRUCTURE ENGINEERS & PROJECT MANAGERS
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DESIGNED A.M.
DRAWN N.D.W.
CHECKED M.S.
DATUM: ORIGIN:
SCALES: N.T.S

CLIENT: Lend Lease

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ISSUED FOR CONSTRUCTION APPROVAL
SIGNED S. Anderson DATE 28/11/11

JORDAN SPRINGS
STAGE 1G
SIGN POSTING PLAN

PLAN No. 8953/CC114 D
FILE No. 8953CC114
SHEET 14 OF 14 SHEETS

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Document Set ID: 8291178
Version: 1, Version Date: 13/07/2018

Civil Hydraulic Mechanical Electrical Sustainability Façades Environmental Structural

Report Details

Project:	Proposed Subdivision and Retirement Village Jordan Springs Penrith
Project Ref:	SY180157
File Location:	Y:\SYDNEY 2018\SY180157 - Jordan Springs\E - Reports\E02 - Flood Study Subdivision and Retirement Village\SY180157_E02_Jordan Springs Subdvision and Retirement Village Flood Study_[A].docx

Revision History

Revision	Report Status	Prepared	Reviewed	Issue Date
A	Issued for Approval	L Gitzel	A Brien	28/06/2018

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Structural Civil Hydraulic Mechanical Electrical Sustainability Façades Environmental

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1 Introduction

Northrop Consulting Engineers have undertaken a flood study in the vicinity of a proposed residential subdivision and retirement village at Jordan Springs near Penrith, New South Wales. The study was undertaken to support a Development Application submission to Penrith City Council and the purpose of this correspondence is to outline the catchment and proposed development, methodology used in the analysis, and discuss the implications for the development due to flooding.

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2 Locality and Catchment

The subject site is located on Lots 3990 and 3991 DP 1190132 and is bounded by Jordan Springs Boulevard to the north, The Northern Road to the west, the “Secret Garden” dam and outlet channel to the south, and Lakeside Parade to the east. A locality plan is presented in Appendix A - Figure A1.

The site is a mixture of bare earth and grass with sparse mature trees. Vegetation tends to be thicker adjacent to the dam and in the gully line to the south. Photos representing the site and dam are presented below in Figure 1.



Figure 1 - Photos showing the Secret Garden Dam looking south (L), Lot 3990 looking north (R) and Lot 3991 looking east (bottom)

The site falls generally to the east at approximately two percent with elevations ranging from 35.3m AHD adjacent to the south-eastern corner of the subject site to 42.7m AHD at the western boundary.

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Immediately to the south and west, surrounding the site, is parkland to be dedicated to the Office of Environment and Heritage (OEH). Elevations range up to approximately 52m AHD with slopes in the order of two to five percent. Vegetation is typically mature trees with sparse under canopy coverage. Photos taken in the vicinity of the subject site are presented in Figure 2 overleaf.

Upstream of the site is largely existing residential subdivisions. There was no significant riparian corridors or storage observed during site inspection. Two catchments are located upstream of The Northern Road, one draining directly to the dam and another upstream of the completed stages of Jordan Springs. This second catchment is captured in a number of large inlet pits and piped along Jordan Springs Boulevard. It was included in the analysis to determine whether there was any spill from this catchment into the vicinity of the subject site. A plan showing catchments considered is presented in Appendix A - Figure A2.



Figure 2 - Photos showing the vegetation typical of the vicinity of the subject site

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3 Proposed Development and Target Objectives

The proposed development consists of a 31-lot residential subdivision and associated road network to the west of the “Secret Garden” Dam; as well as a retirement village consisting of townhouse and apartment style dwellings to the east. Lot 3991 is proposed to be subdivided into two lots to facilitate a future Residential Aged Care Facility (RACF) on the corner of Jordan Springs Boulevard and Lakeside Parade.

A diversion swale is proposed around the western side of the residential precinct to direct flows from the upstream catchment around the subject site. A twin 750mm culvert crossing is proposed in the north-eastern corner of the residential precinct to direct flows from the upstream catchment into the “Secret Garden” dam. Flows from the retirement village and future RACF are expected to discharge into the drainage channel to the south. Minor works are also proposed in the road reserve of Jordan Springs Boulevard to remove the crossover from the current temporary carpark and reinstate kerb and gutter and footpath.

The proposed layout is presented below in Figure 3.

A pre-DA meeting was held with Council 20 March and the minutes are attached in Appendix B. The flooding requirements are outlined below:

- The applicant is to ensure all roads and lots are above the top water level of the 1% Annual Exceedance Probability (AEP) of the adjoining lake. All future habitable floor levels for all lots shall be a minimum of 0.5m above the 1%AEP top water level of the lake.

In addition, the following requirements are noted from Penrith Development Control Plan 2014 (DCP):

- Consider impacts on watercourses riparian corridors and wetlands (C11 Clause 5);
- Council will not support development in floodway or areas of high flood hazard (C11 Clause 5);
- Flood free access can be provided (C11 Clause 5); and
- Minor filling may be permitted provided – water levels are not increased by more than 100mm, velocities are not increased by more than 10%, flows are not redistributed by more than 15%, cumulative fill potential is low and the flood liability of surrounding buildings is not increased (C3 Clause 14).

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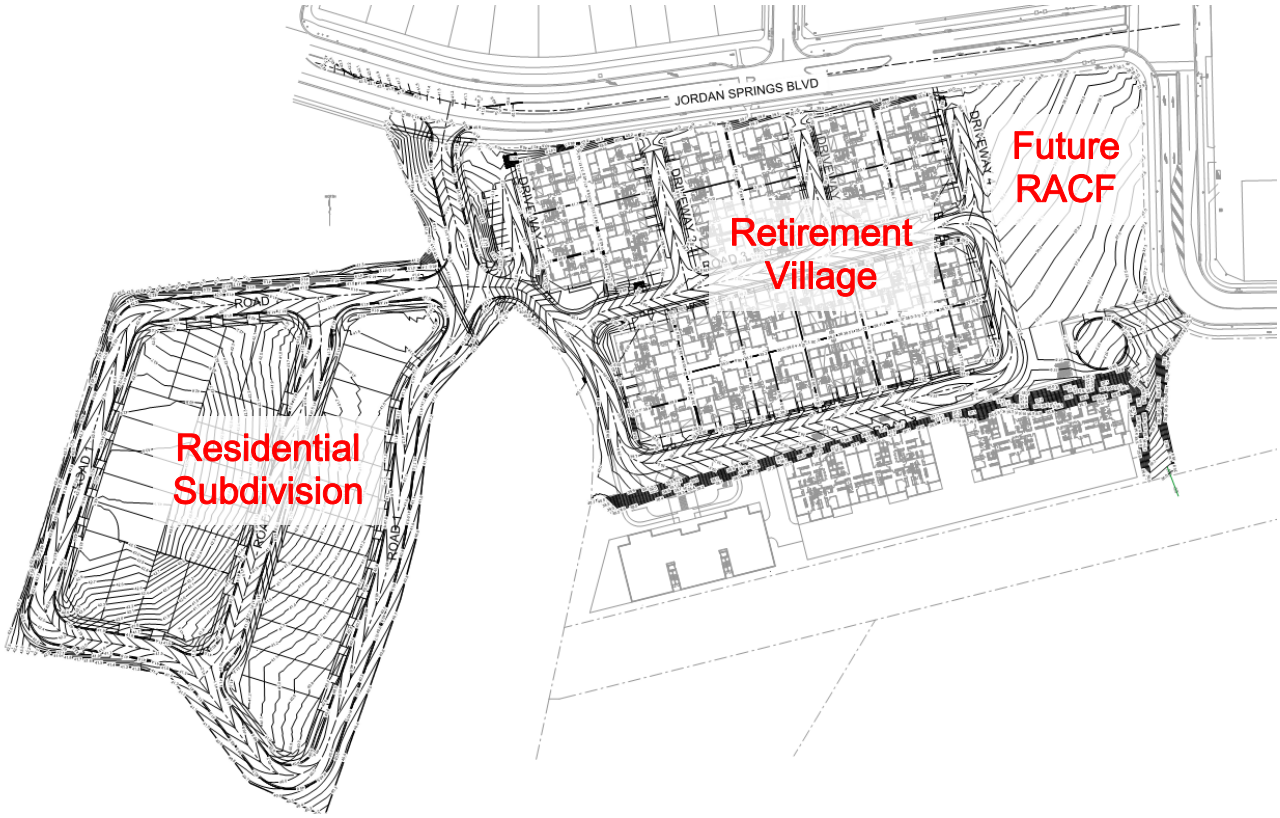

Figure 3 - Layout

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4 Methodology

Our assessment was undertaken through the following methodology:

- Desktop review of previous investigations undertaken in the vicinity of the subject site. These studies are described briefly below in Section 5;
- Desktop review of available information including previous design plans and detailed survey. These sources are described briefly below in Section 5;
- Site visit to ground truth catchment extents and roughness and determine expected flood behaviour. This was undertaken in fine weather on 4 April 2018;
- Construction of a one dimensional hydrological and hydraulic model to estimate the critical storm durations in accordance with Australian Rainfall and Runoff (ARR) 2016;
- Using critical durations determined above, a broader two-dimensional hydraulic model was constructed to test the impact of flows from the subdivision to the north;
- The model was amended to reflect the proposed development; and
- The results of the assessment have been reported herein.

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5 Previous Investigations and Available Data

5.1 Jordan Springs Western Precinct Development – Lend Lease – Upstream Extended East/West Open Channel Report – SKM (Jacobs) April 2013

SKM completed an assessment of the east/west channel located downstream of the "Secret Garden" dam. The peak flow in the 1% AEP was determined as 13.2m³/s from previous studies and HEC-RAS was used for the hydraulic analysis of the channel.

No hydraulic structures were included downstream in Jubilee Drive and a tailwater of 1.5 metres was adopted. A roughness of n=0.07 was used assuming developed low height vegetation within the channel.

The report determined the channel had sufficient capacity to convey the 1% AEP along the east reach, with minor spill to the west. This was to be resolved during detailed design. A detailed design report was not available for review.

5.2 Extreme Flood Discharge Estimation for Old Earthern Dam, Jordan Springs, Penrith – WRM Water + Environment, June 2015

Extreme rainfall and dam levels and outflow were determined as part of this assessment for the 1 in 10,000 AEP, 1 in 100,000 AEP and PMP (Probable Maximum Precipitation).

PMP rainfall estimates were undertaken using the Bureau of Meteorology (BoM) Generalised Short Duration Method (GSDM). Interpolation of other extreme rainfall events between the 1%AEP and PMF was undertaken in accordance with ARR methods (Pilgrim, 1998).

The spillway discharge curve was developed using HEC-RAS and detailed survey data available at the time. It is understood the dam embankment has been modified since this was undertaken.

A RAFTS model using Laurenson hydrology was used to estimate the peak discharges and dam levels in the events considered. Dam levels for the 1 in 10,000 AEP, 1 in 100,000 AEP and PMF were estimated at 39.82m AHD, 39.87m AHD and 39.99m AHD respectively.

5.3 Jordan Springs Old Dam Dambreak and Potential Loss of Life Study – NSW Government Public Works, August 2015

NSW Public Works undertook MIKEFLOOD 2D modelling on the dam to determine the dam break flood behaviour. It appears that data was based on the 2015 dam condition which has been modified in the interim.

Population at risk (PAR) and potential loss of life (PLL) assessments were undertaken which determined a Sunny Day Consequence Category (SDCC) or Very Low and a Flood Consequence Category (FCC) of Low. The Acceptable Flood Capacity (AFC) for the dam was determined to be the 1 in 100 AEP or 1% AEP event.

This report recommended a new spillway at 700mm below the dam crest with 300mm freeboard in the 1%AEP to the dam crest.

5.4 Jordan Springs Old Dam Safety Assessment – Dam Upgrade Drawings (ref 123-456 Drawings 01 to 03 rev A) – NSW Government Water Solutions, July 2016

Further to the recommendations of the above report, NSW Government Water Solutions documented construction drawings to raise the top of the dam embankment to 40.15m AHD and provide a 28-metre-wide concrete spillway at 39.45m AHD battering to the crest at approximately 1:8H. Recommendations to reduce seepage were also documented.

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5.5 LiDAR Survey Data – LPI, February 2017

LAS points were used as a base for the hydraulic model surface representing the roads in the existing subdivision to the north and parkland surrounding the development.

5.6 Existing Surface Contours – Jacobs, February 2010

Contours used in the Jacobs channel design drawings were used in the gully line to the west of the dam (and south of the development) as they appeared to provide a more realistic representation of the observed topography.

5.7 Jordan Springs VC2 Open Channel and Spillway Stage 1 (ref IA016600-JCC_DG) Jacobs, April 2016

Contours for the spillway and channel were stitched into the surface to represent recent changes in this area.

5.8 Detail and Level Survey Part of Jordan Springs Boulevard, Lakeside Parade and Jubilee Drive, Jordan Springs – SDG Land Development Solutions, January 2018

Detailed survey triangles were provided for the aforementioned streets along with the northern embankment of the dam and the new concrete spillway.

5.9 Stage 1A – 1G Work as Executed Drawings – J. Wyndam Prince, April 2010

These plan sets were used to interpret pipe and culvert sizes along Jordan Springs Boulevard to the crossing with The Northern Road and within the subdivision draining towards the subject site.

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6 Hydrology

The hydrological model was developed in XP-STORM using Laurenson hydrology. This is the same engine used by XP-RAFTS in the previous studies.

For the 1D only model, it was assumed that there would be no contribution from the northern subdivision to the dam. This assumption was made due to the large underground infrastructure in Jordan Springs Boulevard and contours indicating the carriageway would form a cut-off. This assumption was tested in the 2D model. All links were idealised as large trapezoidal channels with ten metre base width and n = 0.05 roughness to simulate the attenuation prior to reaching the dam.

6.1 Rainfall and Loss Parameters

Rainfall, temporal pattern and loss data has been downloaded from the ARR data hub for a location over Jordan Springs at 33.737 degrees S, 150.738 degrees E. Rainfall depth is presented below in Table 1.

Table 1 - Rainfall depth

Duration (min)	50% AEP (mm)	1%AEP (mm)
10	12.3	32.7
15	15.4	40.9
20	17.6	46.8
25	19.3	51.2
30	20.7	54.7
45	23.9	62.4
60	26.2	67.8
90	29.6	75.9
120	32.4	82.5
180	36.9	93.7
270	42.6	108
360	47.4	121
540	55.8	145
720	63	166

Pre burst rainfall of approximately four percent of the total depth is also applied in the 15 minutes prior to the burst occurring. This reduces the initial loss to represent antecedent conditions.

The ARR data hub recommends an initial loss of 47mm for rural areas and specifies preburst rainfall depending on event duration. Due to the magnitude of pre-burst rainfall (in the order of 2mm) and densely packed surface conditions observed on-site, urban loss parameters have been adopted per the parameters outlined in Table 3.

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6.2 Dam Storage

The dam storage assumed a standing water level of 39.5m AHD and a 25-metre spillway at this level based on detailed survey. The stage storage relationship was estimated using the following surface areas presented in Table 2.

Table 2 – Secret Garden dam storage relationship

Level (m AHD)	Surface area (ha)
39.5	1.58
40.0	2.96
40.5	4.34

6.3 RAFTS Parameters

Other hydrological parameters are presented below in Table 3. In the absence of gauge data for calibration, the coefficient was calculated from a combination of these parameters. The RAFTS exponent was left at the default 0.715 for the 1% AEP and 50% AEP and changed to 0.999 for the PMF.

Table 3 – RAFTS parameters (*developed, #existing)

Catch	Area	Initial Loss	Continuing Loss	Impervious	Manning's n	Slope
	ha	mm	mm/hour	percent	-	m/m
C1	8.451	5	2.5	0	0.035	0.03
C2	6.703	5	2.5	0	0.035	0.04
C3	5.04	5	2.5	0	0.035	0.025
C4	10.428	5	2.5	0	0.035	0.035
C4	8.293	1	0	100	0.015	0.04
C5	4.323	5	2.5	0	0.035	0.05
C6	2.071	5	2.5	0	0.035	0.02
C7	4.121	5	2.5	0	0.035	0.021
C8	4.028	5	2.5	0	0.035	0.04
C8	6.042	1	0	100	0.015	0.03
C9#	3.743	5	2.5	0	0.035	0.02
C9*	0.749	1	0	100	0.015	0.02
C9*	2.994	5	2.5	0	0.035	0.02
C10*	0.437	5	2.5	0	0.035	0.02
C10#	2.184	5	2.5	0	0.035	0.02

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Catch	Area	Initial Loss	Continuing Loss	Impervious	Manning's n	Slope
	ha	mm	mm/hour	percent	-	m/m
C10*	1.747	1	0	100	0.015	0.02
C11	1.706	5	2.5	0	0.035	0.04
C12	1.175	5	2.5	0	0.035	0.04
C13	0.618	5	2.5	0	0.035	0.04
C14	0.04	5	2.5	0	0.035	0.02
C14	0.162	1	0	100	0.015	0.02
C15	0.055	5	2.5	0	0.035	0.02
C15	0.219	1	0	100	0.015	0.02
C16	0.033	5	2.5	0	0.035	0.02
C16	0.132	1	0	100	0.015	0.02
C17	0.046	5	2.5	0	0.035	0.02
C17	0.184	1	0	100	0.015	0.02
C18	0.018	5	2.5	0	0.035	0.025
C18	0.07	1	0	100	0.015	0.025
C19	0.024	5	2.5	0	0.035	0.025
C19	0.097	1	0	100	0.015	0.025
C20	0.04	5	2.5	0	0.035	0.03
C20	0.162	1	0	100	0.015	0.03
C21	0.06	5	2.5	0	0.035	0.03
C21	0.242	1	0	100	0.015	0.03
C22	6.613	5	2.5	0	0.035	0.04
C22	9.92	1	0	100	0.015	0.035
C23	0.465	5	2.5	0	0.035	0.015
C23	1.862	1	0	100	0.015	0.015
C24	0.345	5	2.5	0	0.035	0.014
C24	1.379	1	0	100	0.015	0.014
C25	0.252	5	2.5	0	0.035	0.04
C25	1.007	1	0	100	0.015	0.04

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Catch	Area	Initial Loss	Continuing Loss	Impervious	Manning's n	Slope
	ha	mm	mm/hour	percent	-	m/m
C26	0.264	5	2.5	0	0.035	0.016
C26	1.058	1	0	100	0.015	0.016
C27	0.267	5	2.5	0	0.035	0.03
C27	1.067	1	0	100	0.015	0.03
C28	0.249	5	2.5	0	0.035	0.025
C28	0.998	1	0	100	0.015	0.025
C29	0.318	5	2.5	0	0.035	0.02
C29	1.27	1	0	100	0.015	0.02
C30	0.345	5	2.5	0	0.035	0.025
C30	1.381	1	0	100	0.015	0.025
C31	0.540	5	2.5	0	0.035	0.02
C31	2.16	1	0	100	0.015	0.02
C32	0.890	1	0	100	0.015	0.02

6.4 Results

The results from the 1D hydrological model are shown below. It demonstrates the median water level in the dam arises from the 1% AEP 45-minute storm duration. There was also minimal difference between several durations due to the outlet configuration. The 20, 25, and 45-minute storm events were passed to the 2D hydraulic model for further analysis. The 60-minute ensemble was also run in the developed scenario to determine the maximum water level. These ensembles were chosen in order to capture the maximum median storm for a variety of different sized catchments.

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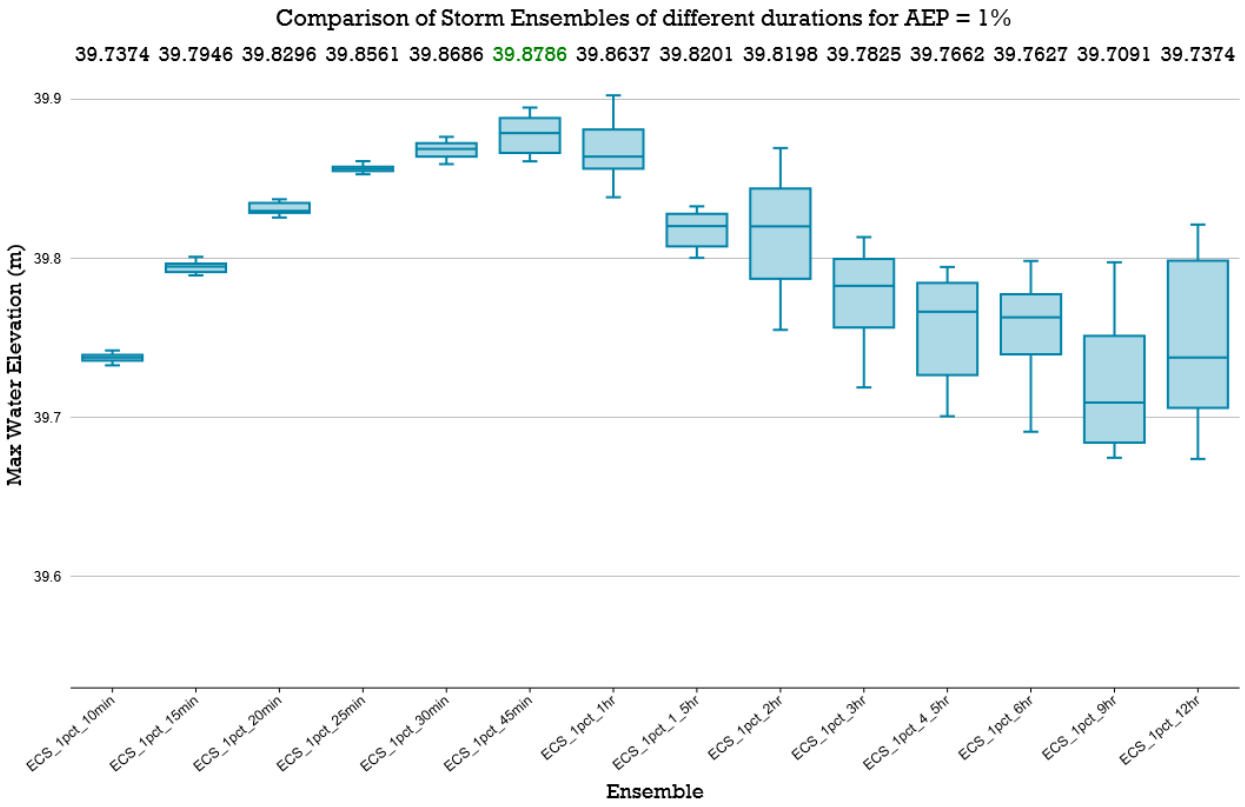

Figure 4 - Median dam level from 1D model

The median 1% AEP outflow from the dam was approximately 10m³/s which is in the same order of magnitude as the previous Jacobs / SKM reporting.

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7 Hydraulic Model

A two-dimensional hydraulic model was constructed using the XP-STORM software. This program uses the TUFLOW Classic finite difference hydrodynamic engine.

Separate models were used for the existing and post developed cases and parameters such as grid size, roughness, topography, tailwater, inflow, and 1D network are discussed below.

7.1 Grid Size and Timestep

A grid size of 2m x 2m was adopted to represent the flow within the road network whilst balancing run time. A timestep of 0.5 seconds was implemented and the model run for 90 minutes to capture the peaks within the dam.

7.2 Roughness

Manning's roughness used for the assessment was the same for both existing and developed cases and is summarised in Table 4 below.

Table 4 - Manning's roughness

Surface	Roughness
Trees with sparse under canopy	n = 0.05
Road reserve	n = 0.02
Channel	n = 0.07
Concrete spillway	n = 0.012
Park	n = 0.035
Waterbody	n = 0.03
Dense riparian vegetation	n = 0.08
Residential blocks	n = 0.30

A spatial distribution for both the pre and post developed scenarios are presented in Appendix A – Figures A3 and A4 respectively.

7.3 Topography

The topography for the existing case model consists of a combined surface of LiDAR, detailed survey and design drawings as discussed above in Section 5. Adjustments to this surface to reflect site observations and design drawings include:

- The dam crest to the south of the spillway has been raised to a level of 40.15m AHD to match the Water Solutions design drawings;
- A constant dam invert of 39.0m AHD has been adopted over the observed standing water extent. This will not have any impact in the results due to the specification of an initial water level; and
- The sag point to the west of The Northern Road has been lowered upstream of Stage 1D to represent an 800mm difference between the road surface and the inlet pit level as observed on-site.

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The developed surfaces were provided by J.Wyndham Prince and were added to the existing case model to construct the developed case topography. These surfaces include the proposed residential sub-division to the west of the “Secret Garden” dam as well as the retirement village to the east.

Model topography for both the existing and developed case scenarios is presented in Appendix A, Figures A5 and A6 respectively.

7.4 Tailwater and Initial Water Levels

Two tailwater interface lines have been adopted across Lakeside Parade and downstream of the Jubilee Road spill crest. Locations are presented in Appendix A, Figures A4 and A5. A normal flow depth has been adopted at the downstream end of the Jubilee Road culverts. Fixed water levels are outlined below in Table 5.

Table 5 - Tailwater levels

Location	Level (m AHD)
Lakeside Parade	36
Downstream Jubilee Road	33

7.5 Inflow Points

Hydrographs from the RAFTS catchments have been applied to the grid at the locations shown in Appendix A, Figures A4 and A5. Assumptions include:

- The catchment C22 hydrograph has been applied upstream of The Northern Road adjacent to Stage 1D due to significant inlet infrastructure. This tests whether flow from this location will spill across the subject site;
- The catchment C4 hydrograph has been applied downstream of The Northern Road and upstream of the dam. This assumes The Northern Road conveys all local and upstream runoff to the low point. This is considered an appropriate assumption given there is a high point at approximately the intersection with Jordan Springs Boulevard;
- Catchment C5 discharges to an observed low point within the constructed bund. Previously the WRM report had this catchment discharging to the dam; and
- Catchments within the urban area discharge upstream of the nearest inlet pit to represent the flow within the gutter prior to capture.

7.6 1D Network

The 1D pit and pipe network was estimated based off work as executed drawings for Stages 1A – 1G and site observations. Inlet rating curves were based on 1.8m lintel with 900 x 450mm grate for all on grade pits and 2.4m lintel with 900 x 450mm for sag pits. Grated inlet pits within the sag adjacent to The Northern Road were entered based on their measured dimensions.

Blockage of 20 percent was applied to all on grade inlet pits and 50 percent for sag pits. This assumption was considered conservative in determining whether spill would occur in the vicinity of the subject site. A sediment blockage of 25 percent was applied to the culverts under Jubilee Drive. This is representative of a High Debris Potential and Low Sedimentation Potential at the structure.

The purpose of the study was not to undertake a detailed analysis of the street network in the existing section of Jordan Springs, rather estimate the magnitude of spill, if any, from Jordan Springs Boulevard into the subject site and adjacent land.

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Location of 1D elements and culvert sizes for both the existing and developed case models are presented in Appendix A, Figures A5 and A6 respectively.

7.7 Results

A range of flood characteristics are presented in Appendix A – Figures B1-B4 and C1-C8. These include depth, elevation, velocity, velocity depth product, hazard and hydraulic category. Flood hazard has been determined in accordance with ARR 2016 guidelines reproduced in Figure 5 below. Hydraulic category estimation has been adapted from Newcastle Council guidelines outlined in Table 6 below.

Table 6 - Hydraulic Classification

	50% and 1%AEP	PMF
Floodway	vd > 0.3 m²/s	vd > 1.0 m²/s
Flood Storage	d > 0.5 m	d > 1.0 m
Flood Fringe	d < 0.5 m	d < 1.0 m

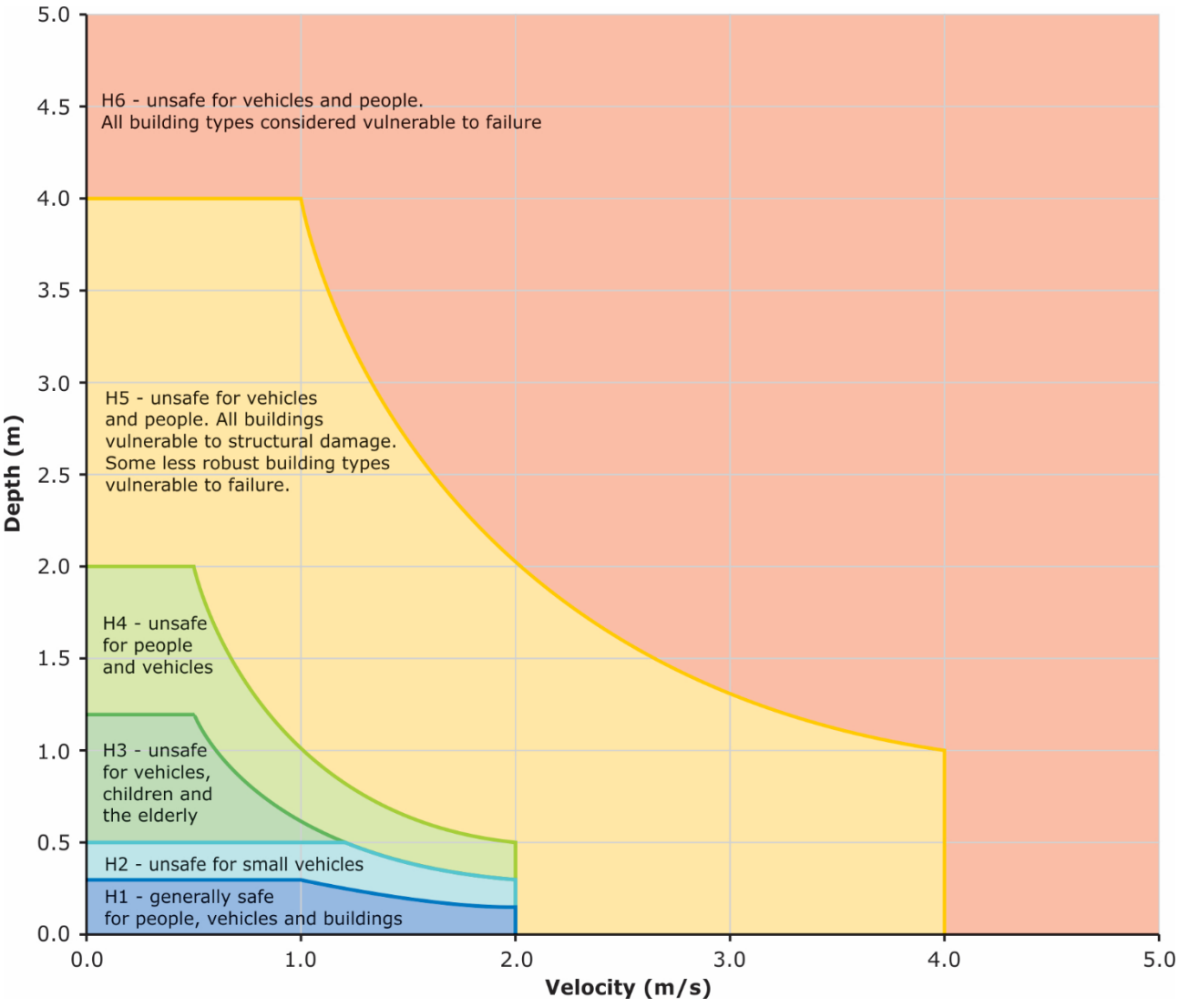

Figure 5 - ARR 2016 Hazard Categories

The results for the "Secret Garden" Dam top water level are shown below in Table 7 and Table 8.

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Table 7 - Dam water levels 50% and 1%AEP adjacent to site

	Median (m AHD)	Max (m AHD)	Min (m AHD)
1% AEP Existing	39.89	39.90	39.83
50% AEP Developed	39.66	39.67	39.65
1% AEP Developed	39.89	39.91	39.84

Table 8 - Dam water levels 50% and 1%AEP south dam

	Median (m AHD)	Max (m AHD)	Min (m AHD)
1% AEP Existing	39.90	39.92	39.85
50% AEP Developed	39.67	39.67	39.65
1% AEP Developed	39.91	39.93	39.85

Comparison of flood behaviour is presented in Appendix A – Figures D1 and D2.

Increases in flood depth are observed in the western portion of the development due to re-direction of flows around the subject site. This is localised in nature and largely due to the way the inflow has been applied to the grid.

Minor increases between 10-50mm are observed within Jordan Springs Boulevard due to the reconstruction of the kerb and footpath preventing water spilling through Lot 3991. This limited to the section between the current temporary carpark and the intersection with Lakeside Parade.

Within the channel downstream and in the dam, changes in level and velocity are negligible.

Peak flows from the upstream catchments are summarised in Table 9.

Table 9 - Site diversion flow

Catchment upstream of Site	Area (ha)	1%AEP Median Flow (m^3/s)	1%AEP Maximum Flow (m^3/s)
C11	1.71	0.64	0.72
C12	1.18	0.45	0.52
C13	0.62	0.25	0.31
C11 + C12	2.89	1.09	1.23

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8 Discussion

8.1 Comparison with Previous Studies

It is noted that the water levels for the dam in this study are higher than those previously determined. It is most likely this is due to the raising of the dam crest since the previous report were written.

The SKM / Jacobs channel study used an inflow of 13.2m³/s in the 1%AEP event. The median is approximately 14m³/s which is in the same order. Furthermore, the peak flow out of the storage node in the WRM report in the PMF is 70.4m³/s compared to the 64.3m³/s reported in this study.

This lends further weight to the cause of the level discrepancy being due to the revised outlet configuration.

8.2 Diversion of Upstream Flows

It is noted J Wyndham Prince have included a swale in their design to cater for flow diversion from the catchment upstream of the residential subdivision. No flow is expected to spill from Jordan Springs Boulevard into the retirement village site.

8.3 Impact of Development on Flood Behaviour

Some minor impacts in flood level are observed within the model upstream of the residential subdivision, along Jordan Springs Drive and with a temporary basin adjacent to the channel. Impacts downstream within the dam and channel are considered negligible.

It is considered the impacts due to the development are minimal and within the limits specified by Penrith City Council.

8.4 Flood Free Access

Council requires flood free access to new development. The introduction of the proposed twin 750mm RCP culvert crossing adjacent to the north-eastern corner of the residential precinct shows flood free access is available up and including the 1% AEP design storm event.

8.5 Minimum Road, Lot and Floor Levels

The minimum and preferred minimum road, lot and floor levels adjacent to the dam are summarised in Table 10 overleaf.

Consideration should also be given to providing freeboard to the 1%AEP levels within the gully to the south of the subdivision. Levels are shown in Appendix A – Figure C5.

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Table 10 - Minimum levels

	Minimum Level (m AHD)	Preferred Minimum Level (m AHD)
Road	39.95	40.45
Lot	39.95	40.45
Finished Floor Level	40.45	40.45

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9 Conclusion

An analysis of flood behaviour adjacent to the proposed residential subdivision at Jordan Springs has been undertaken. From review it was concluded that:

- The 1% AEP level in the dam is approximately 39.89m AHD;
- The roads, lots and finished floor levels will be able to be accommodated above these levels. Consideration should also be given the gully to the south of the development when determining minimum levels;
- The development causes minor localised redistribution of flow in the median 1% AEP event. The impacts within the dam and in the channel downstream have negligible changes; and
- The intent of Penrith City Council Pre-DA minutes and DCP can be satisfied in the design of the subdivision.

We commend our finding to Council for their review.

Should you have any queries, please feel free to contact the undersigned on (02) 4943 1777.

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APPENDIX A

Figures

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APPENDIX B

Pre- DA Minutes

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APPENDIX C

Available Information

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