

# 600 WOODSTOCK AVENUE, GLENDENNING

## CIVIL ENGINEERING PACKAGE DEVELOPMENT APPLICATION



LOCALITY PLAN

SOURCE : NEARMAP.COM.AU (©2021)

### CIVIL DRAWING SCHEDULE

DWG No.	DRAWING TITLE
DAC01.01	COVER SHEET, DRAWING SCHEDULE & LOCALITY PLAN
DAC01.11	SPECIFICATION NOTES - SHEET 01
DAC01.12	SPECIFICATION NOTES - SHEET 02
DAC01.21	GENERAL ARRANGEMENT PLAN
DAC02.01	CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN
DAC02.11	SEDIMENT AND SOIL EROSION CONTROL DETAILS
DAC03.11	POST-CDC CUT AND FILL PLAN
DAC04.01	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 01
DAC04.02	SITEWORKS AND STORMWATER MANAGEMENT PLAN - SHEET 02
DAC05.11	STORMWATER LONGITUDINAL SECTIONS - SHEET 01
DAC05.12	STORMWATER LONGITUDINAL SECTIONS - SHEET 02
DAC05.13	STORMWATER LONGITUDINAL SECTIONS - SHEET 03
DAC05.14	STORMWATER LONGITUDINAL SECTIONS - SHEET 04
DAC05.31	STORMWATER DETAILS - SHEET 01
DAC05.32	STORMWATER DETAILS - SHEET 02
DAC05.33	STORMWATER DETAILS - SHEET 03
DAC05.41	STORMWATER CATCHMENT PLAN
DAC16.01	DETAILS - SHEET 01
DAC16.02	DETAILS - SHEET 02

DESIGNED: A. CARVALHAES  
DRAWN: E. EAGER  
JOB MANAGER: -  
VERIFIER: S. FRYER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
01	ISSUED FOR INFORMATION	EE		AC	17.12.21
02	ISSUED FOR SSDA	MM		AC	19.01.22
03	ISSUED FOR CLIENT REVIEW	MM		AC	02.02.22
04	ISSUED FOR CLIENT REVIEW	VC		AC	29.03.22
05	ISSUED FOR INFORMATION	EE		AC	16.05.22
06	ISSUED FOR INFORMATION	EE		AC	14.06.22

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ARCHITECT

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SCALE 1:5000@A1

Sydney

Level 11 345 George Street, Sydney NSW 2000  
Ph (02) 9241 4188 Fax (02) 9241 4324  
Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT

600 WOODSTOCK AVENUE,  
GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

COVER SHEET, DRAWING  
SCHEDULE & LOCALITY PLAN

JOB NUMBER

211274

DRAWING NUMBER

DAC01.01

REVISION

06

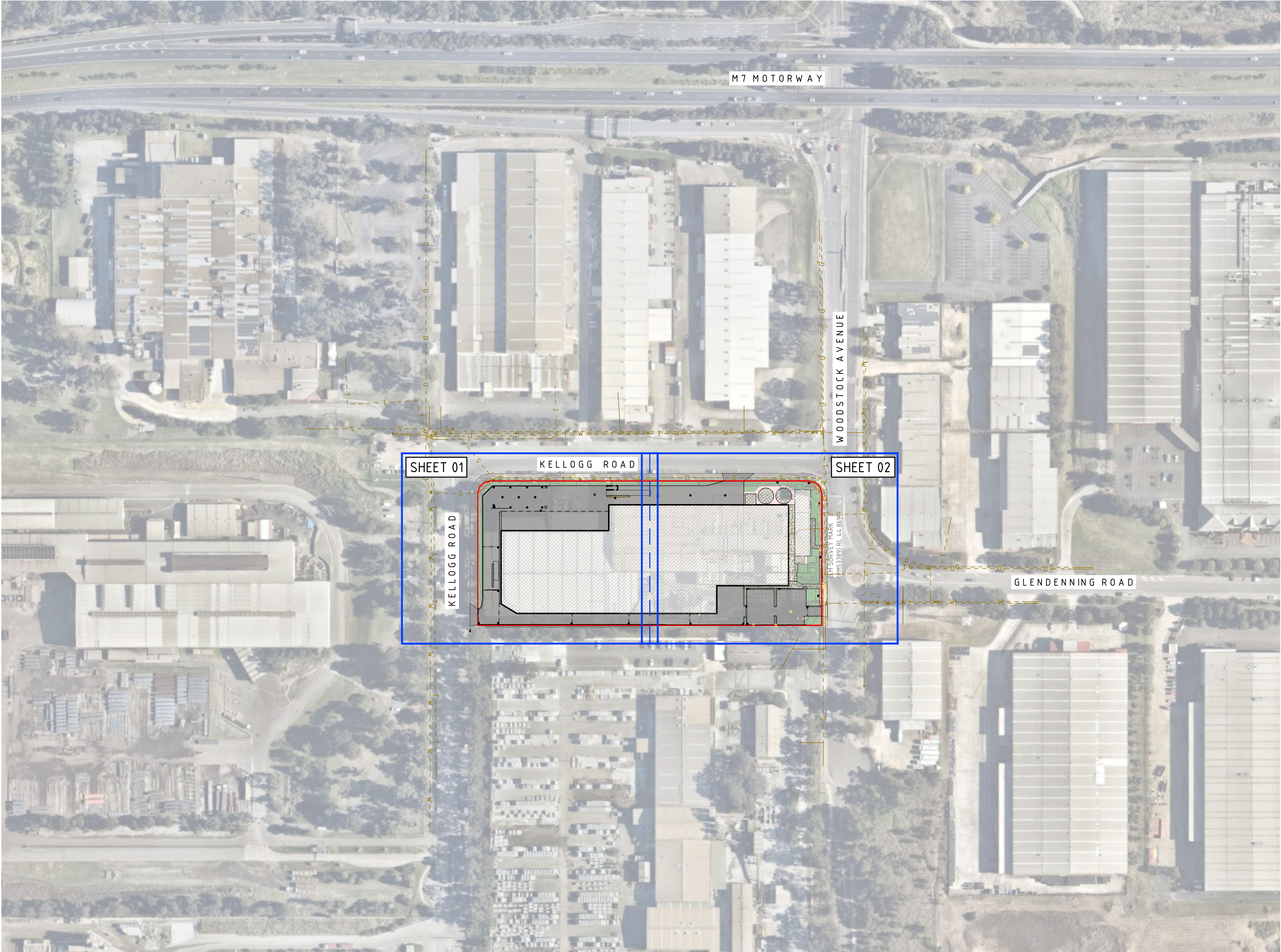
DRAWING SHEET SIZE = A1

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DRAWN: E. EAGER  
DESIGNED: A. CARVALHAES  
JOB MANAGER: -  
VERIFIER: S. FRYER



LEGEND

EXISTING BOUNDARY LINE

SITE BOUNDARY LINE

PROPOSED BOUNDARY LINE

EXISTING ELECTRICITY

EXISTING TELSTRA

EXISTING GAS

EXISTING SEWER

SHEET EXTENTS

GENERAL NOTES:

1. SURVEY SUPPLIED BY:

11. NAME: BOXALL SURVEYORS

12. DATE: 16.07.2021

13. REVISION: A

2. ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA OR DIAL BEFORE YOU DIG SEARCHES. THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY. NOTE SERVICE AUTHORITY REQUIREMENTS FOR LOCATING OF SERVICES PRIOR TO COMMENCEMENT OF WORKS.

3. NORTHROP TAKE NO RESPONSIBILITY FOR THE ACCURACY AND/OR USE OF THIS SURVEY AND ITS CONTENTS

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01	ISSUED FOR INFORMATION	EE		AC	17.12.21	<div>Charter Hall</div> <div>DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED</div>
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SCALE 1:1250 @ A1

0 10 20 30 40 50 60m

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Sydney

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Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT

600 WOODSTOCK AVENUE, GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

GENERAL ARRANGEMENT PLAN

JOB NUMBER

211274

DRAWING NUMBER

DAC01.21

REVISION

05

DRAWING SHEET SIZE = A1

NOT FOR CONSTRUCTION

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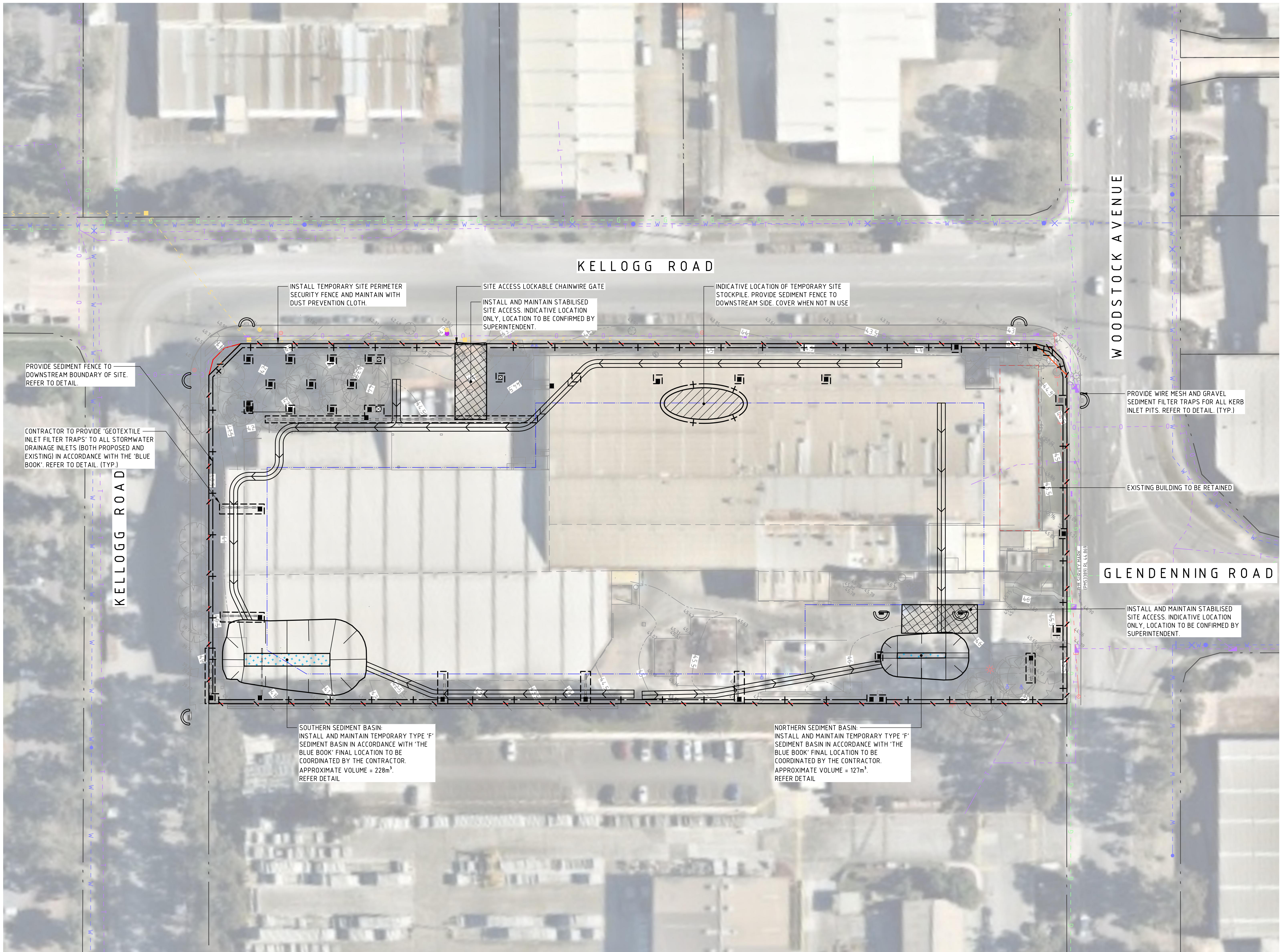


VERIFIER: S. FRYER

JOB MANAGER: -

DESIGNED: A. CARVALHAES

DRAWN: E. EAGER



LEGEND

- EXISTING BOUNDARY LINE
- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- PROPOSED BUILDING FOOTPRINT
- EXISTING BUILDING TO BE RETAINED
- EXISTING CONTOURS
- SEDIMENT FENCE
- SECURITY FENCE
- SECURITY GATE
- EXISTING ELECTRICITY
- EXISTING GAS
- EXISTING TELSTRA
- EXISTING OPTUS
- EXISTING WATER
- EXISTING SEWER
- WIRE MESH AND GRAVEL SEDIMENT FILTER
- GEOTEXTILE INLET FILTER TRAP
- DRAINAGE SWALE
- STABILISED SITE ACCESS
- STOCKPILE
- SEDIMENT BASIN

GENERAL NOTES:

- REFER SPECIFICATIONS NOTES FOR SEDIMENT AND SOIL EROSION CONTROL GENERAL REQUIREMENTS.
- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
- ALL SEDIMENT AND SOIL EROSION CONTROL MEASURES TO BE INSTALLED IN ACCORDANCE WITH THE 'BLUE BOOK'. CONTRACTOR TO ENSURE THESE MEASURES ARE IN PLACE AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION WORKS.
- CONTRACTOR TO PROVIDE 'WIRE MESH AND GRAVEL SEDIMENT FILTER' TO ALL PAVED / ROAD AREAS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.
- CONTRACTOR TO PROVIDE 'GEOTEXTILE INLET FILTER TRAPS' TO ALL STORMWATER DRAINAGE INLETS (BOTH PROPOSED AND EXISTING) IN ACCORDANCE WITH THE 'BLUE BOOK'.

NORTHERN SEDIMENT BASIN CALCULATIONS

PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	0.69
SOIL TEXTURE GROUP	F
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	80
x-DAY, y-PERCENTILE RAINFALL EVENT	24.6
Cv	0.5
SETTLING ZONE VOLUME (m³)	85.2
SEDIMENT STORAGE VOLUME (m³)	42.6
TOTAL BASIN VOLUME (m³)	127.803

SOUTHERN SEDIMENT BASIN CALCULATIONS

PARAMETER	ADOPTED VALUE
TOTAL DISTURBED AREA (ha)	1.24
SOIL TEXTURE GROUP	F
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	80
x-DAY, y-PERCENTILE RAINFALL EVENT	24.6
Cv	0.5
SETTLING ZONE VOLUME (m³)	152.1
SEDIMENT STORAGE VOLUME (m³)	76.1
TOTAL BASIN VOLUME (m³)	228.208

FOR CONSTRUCTION

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03	ISSUED FOR CLIENT REVIEW	MM		AC	02.02.22
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05	ISSUED FOR INFORMATION	MM		AC	04.05.22
06	ISSUED FOR CONSTRUCTION	EE	SRF	AC	09.05.22
07	ISSUED FOR CONSTRUCTION	EE	SRF	AC	16.05.22
08	ISSUED FOR INFORMATION	EE		AC	14.06.22

CLIENT

**Charter Hall**

ARCHITECT

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Email sydney@northrop.com.au ABN 81 094 433 100

PROJECT

**600 WOODSTOCK AVENUE, GLENDENNING**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**CONCEPT SEDIMENT AND SOIL EROSION CONTROL PLAN**

JOB NUMBER

**211274**

DRAWING NUMBER

**DAC02.01**

REVISION

**08**

DRAWING SHEET SIZE = A1

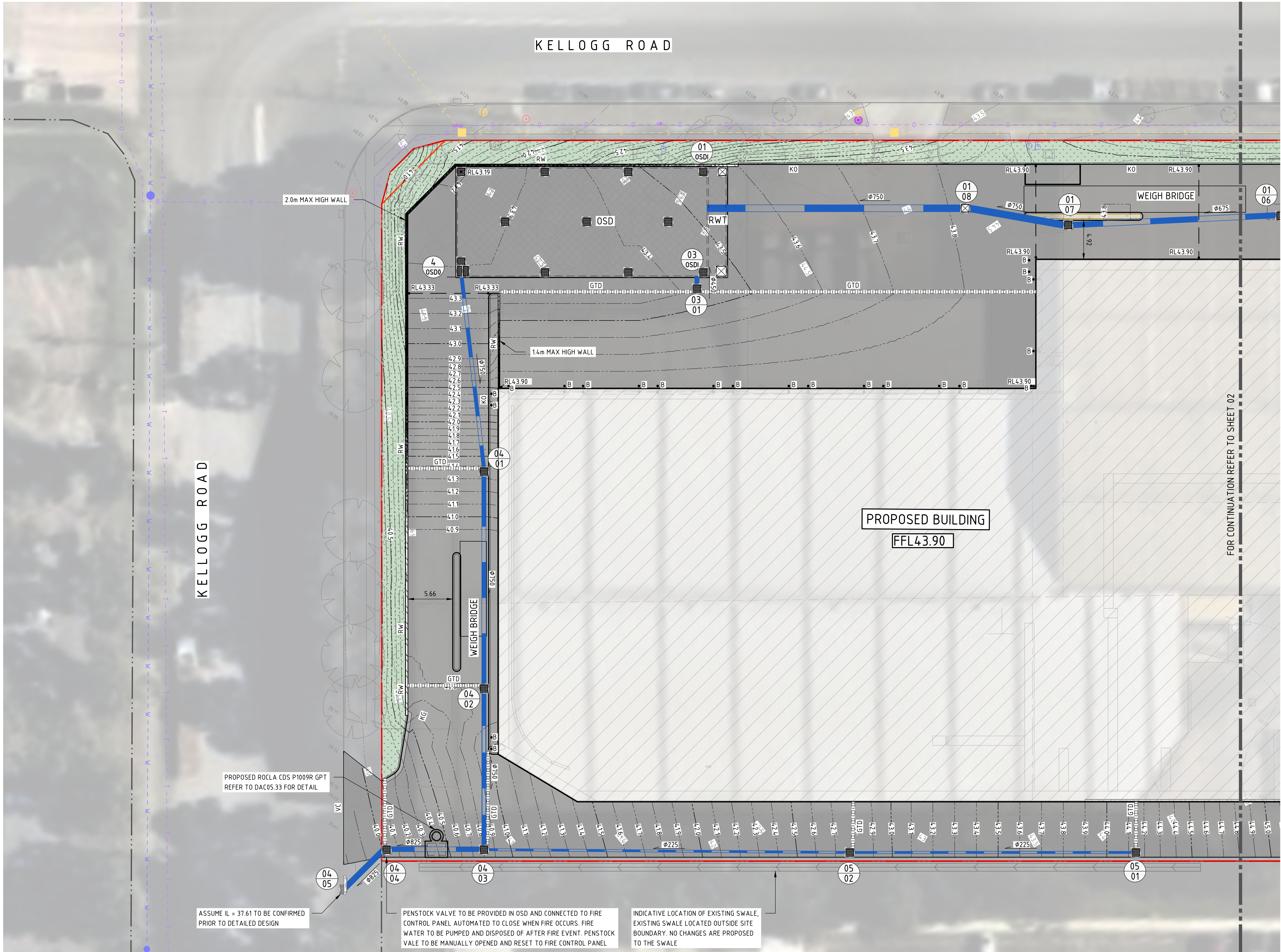


VERIFIER: S. FRYER

JOB MANAGER: -

DESIGNED: A. CARVALHAES

DRAWN: E. EAGER



LEGEND

EXISTING BOUNDARY LINE

SITE BOUNDARY LINE

PROPOSED BOUNDARY LINE

PROPOSED KERB

KO  
KG  
VC

KERB ONLY  
KERB AND GUTTER

KR

VEHICULAR CROSSING

WS

KERB RAMP

WS

WHEEL STOP

FFLXX.XX

PROPOSED FINISHED FLOOR LEVEL

GRADE CREST

E

EXISTING ELECTRICITY

G

EXISTING GAS

T

EXISTING TELSTRA

O

EXISTING OPTUS

W

EXISTING WATER

S

EXISTING SEWER

XXXX

CONTOURS

XXXX

EXISTING CONTOURS

EXISTING SWALE

1  
A

STORMWATER PIT TAG  
STRUCTURE No / LINE ID

Ø150

STORMWATER PIPE

GTD

GRADED TRENCH DRAIN

EXISTING DRAINAGE STRUCTURE

NEW DRAINAGE STRUCTURE

OSD

ON-SITE DETENTION TANK

B

BOLLARD

RETAINING WALL - TYPE 1

TRAFFICABLE PAVEMENT

FOOTPATH

STRUCTURAL SLAB

LANDSCAPING - MASS PLANTING  
(REFER LANDSCAPE ARCHITECTS  
DRAWINGS FOR DETAILS)

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.

2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.

3. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

4. SUBSOIL DRAINAGE TO RETAINING WALLS, KERBS AND SWALE DRAINS NOT SHOWN FOR CLARITY - REFER RELEVANT DETAILS.

5. REFER 'STORMWATER PIT SCHEDULE' OR LONGSECTIONS FOR PIT INFORMATION.

6. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.

7. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.

8. CONTRACTOR TO ALLOW TO ADJUST AND LIAISE WITH RELEVANT SERVICE AUTHORITIES IN RELATION TO EXISTING SERVICE ADJUSTMENT AND MODIFICATIONS.

9. WHEEL STOPS TO BE INSTALLED TO ALL CAR SPACES AS SHOWN AND INSTALLED IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND MANUFACTURERS SPECIFICATIONS. IF WHEEL STOPS ARE NOT SHOWN, ALLOW FOR WHEEL STOPS WHERE CAR SPACES ARE FRONTING A WALL.

10. REFER 'RETAINING WALL ELEVATIONS' FOR RETAINING WALL INFORMATION.

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0 2 4 6 8 10 12m

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PROJECT

600 WOODSTOCK AVENUE,  
GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

SITEWORKS AND STORMWATER  
MANAGEMENT PLAN - SHEET 01

JOB NUMBER

211274

DRAWING NUMBER

DAC04.01

REVISION

08

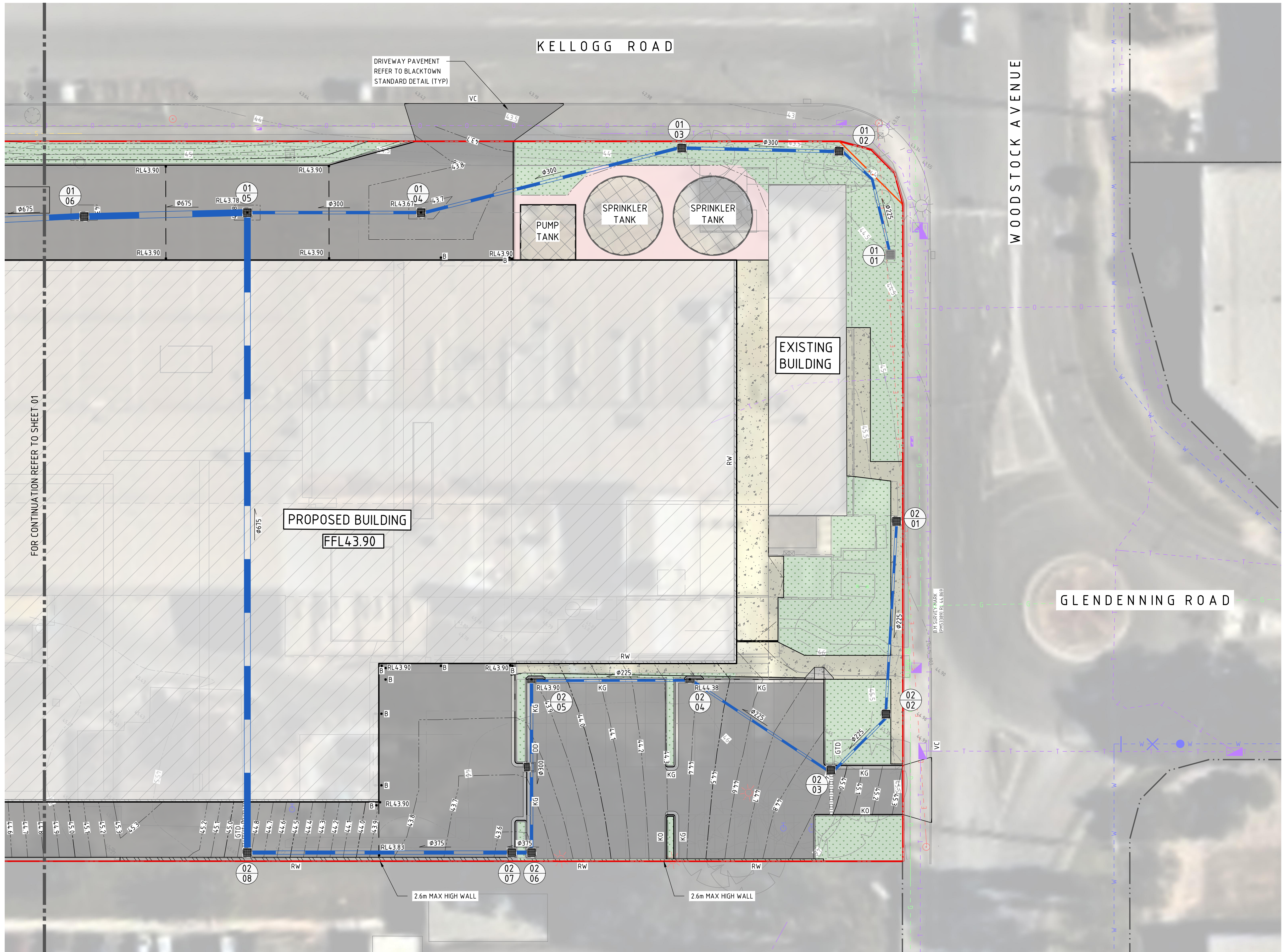
DRAWING SHEET SIZE = A1

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DRAWN: E. EAGER  
DESIGNED: A. CARVALHAES  
JOB MANAGER: -  
VERIFIER: S. FRYER

FOR CONTINUATION REFER TO SHEET 01



LEGEND

EXISTING BOUNDARY LINE

SITE BOUNDARY LINE

PROPOSED BOUNDARY LINE

PROPOSED KERB

KO  
KG  
KERB ONLY  
KERB AND GUTTER

VC  
VEHICULAR CROSSING

KR  
KERB RAMP

WS  
WHEEL STOP

FFLXX.XX  
PROPOSED FINISHED FLOOR LEVEL

GRADE CREST

E  
EXISTING ELECTRICITY

G  
EXISTING GAS

T  
EXISTING TELSTRA

O  
EXISTING OPTUS

W  
EXISTING WATER

S  
EXISTING SEWER

CONTOURS

EXISTING CONTOURS

EXISTING SWALE

1  
A  
STORMWATER PIT TAG  
STRUCTURE No / LINE ID

Ø150  
STORMWATER PIPE

GTD  
GRADED TRENCH DRAIN

EXISTING DRAINAGE STRUCTURE

NEW DRAINAGE STRUCTURE

OSD  
ON-SITE DETENTION TANK

B  
BOLLARD

RETAINING WALL - TYPE 1

TRAFFICABLE PAVEMENT

FOOTPATH

STRUCTURAL SLAB

LANDSCAPING - MASS PLANTING  
(REFER LANDSCAPE ARCHITECTS  
DRAWINGS FOR DETAILS)

GENERAL NOTES:

1. REFER SPECIFICATIONS NOTES FOR STORMWATER AND SITEWORKS GENERAL REQUIREMENTS.

2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.

3. CAD FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

4. SUBSOIL DRAINAGE TO RETAINING WALLS, KERBS AND SWALE DRAINS NOT SHOWN FOR CLARITY - REFER RELEVANT DETAILS.

5. REFER 'STORMWATER PIT SCHEDULE' OR LONGSECTIONS FOR PIT INFORMATION.

6. REFER HYDRAULIC ENGINEERS / ARCHITECTS DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZING.

7. PROVIDE DRAINAGE CONNECTIONS TO KERB IN ACCORDANCE WITH COUNCIL STANDARD DETAILS AND SPECIFICATION.

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PROJECT

600 WOODSTOCK AVENUE,  
GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE  
  
SITEWORKS AND STORMWATER  
MANAGEMENT PLAN - SHEET 02

JOB NUMBER

211274

DRAWING NUMBER

DAC04.02

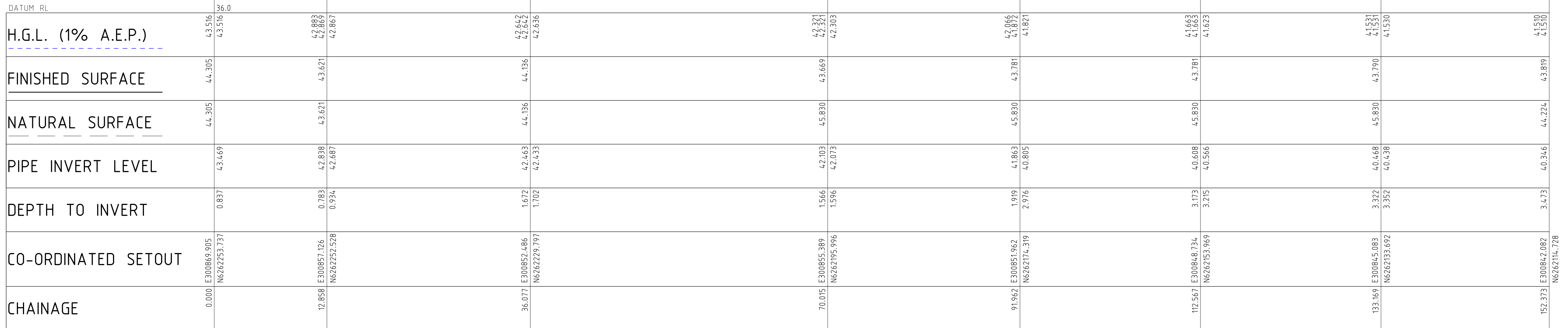
REVISION


08

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01	ISSUED FOR INFORMATION	EE		AC	17.12.21	<div>Charter Hall</div>	<div>RESOURCE RECOVERY DESIGN (AUST) PTY LTD.</div>	<div> <b>NORTHROP</b> Sydney Level 11 345 George Street, Sydney NSW 2000 Ph (02) 9241 4188 Fax (02) 9241 4324 Email sydney@northrop.com.au ABN 81 094 433 100</div>	600 WOODSTOCK AVENUE, GLENDENNING	CIVIL ENGINEERING PACKAGE	211274		
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DRAWING SHEET SIZE = A1													



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SCALE 1:50 @ A1

0 2 4 6 8 10 12m

0.0 0.5 1.0 1.5 2.0 2.5m

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Sydney

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PROJECT

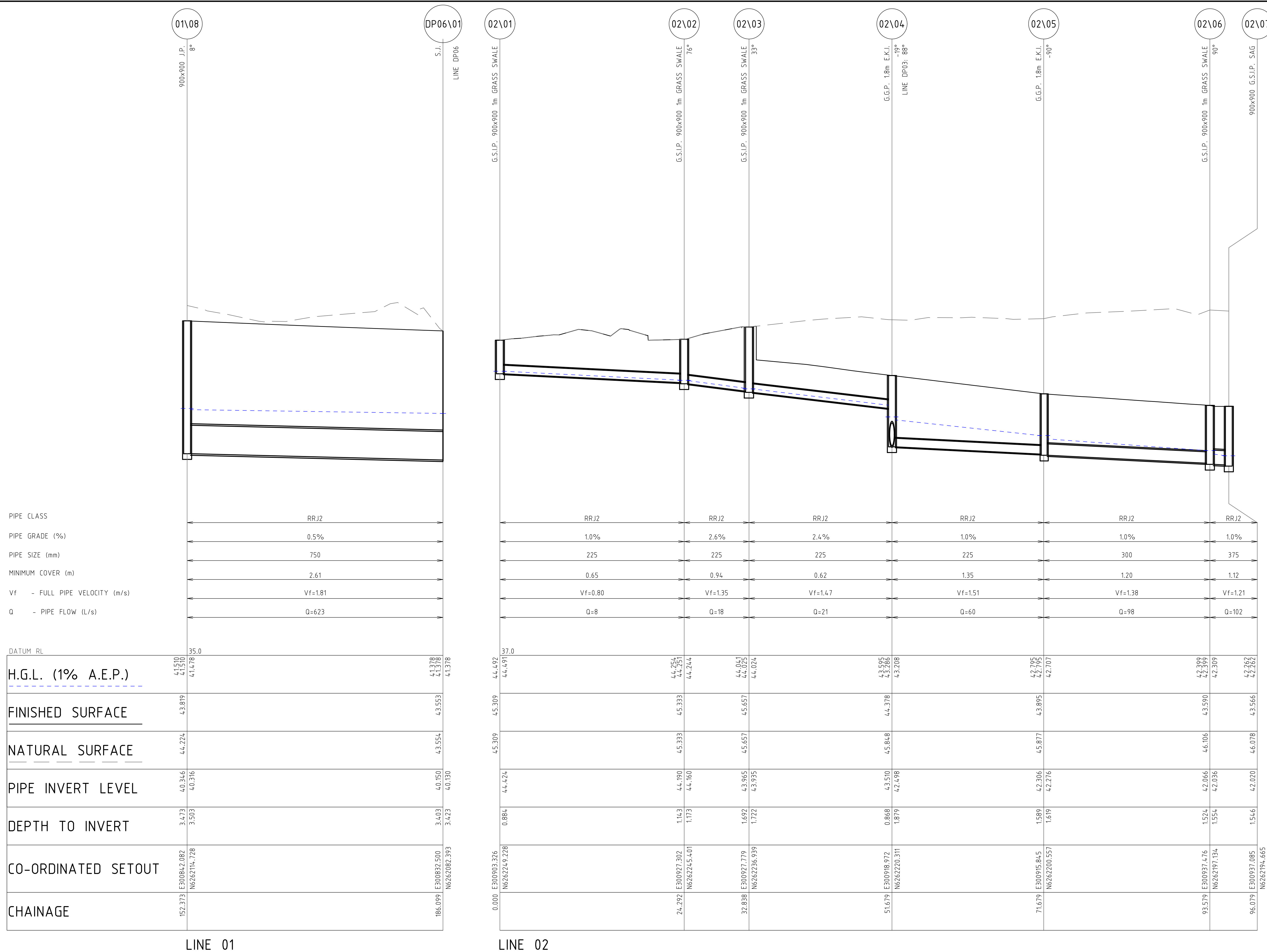
**600 WOODSTOCK AVENUE,  
GLEN DENNING**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER LONGITUDINAL  
SECTIONS - SHEET 02**

JOB NUMBER	
<b>211274</b>	
DRAWING NUMBER	REVISION
<b>DAC05.12</b>	<b>05</b>
DRAWING SHEET SIZE = A1	



**NOT FOR CONSTRUCTION**



VERIFIER: S. FRYER

JOB MANAGER: -

DESIGNED: A. CARVALHAES

DRAWN: E. EAGER

PIPE CLASS  
PIPE GRADE (%)  
PIPE SIZE (mm)  
MINIMUM COVER (m)  
Vf - FULL PIPE VELOCITY (m/s)  
Q - PIPE FLOW (L/s)

DATUM RL		36.0
H.G.L. (1% A.E.P.)	42.262 42.262	42.231
FINISHED SURFACE	43.566	44.830
NATURAL SURFACE	46.078	45.694
PIPE INVERT LEVEL	42.020 41.990	41.665 41.635
DEPTH TO INVERT	1.546 1.576	3.165 3.195
CO-ORDINATED SETOUT	96.079 E300931.085 N6262194.665	129.481 E300931.864 N6262161.673
CHAINAGE	96.079	129.481

LINE 02

RRJ2  
1.0%  
375  
1.17  
Vf=1.35  
Q=118

RRJ2  
1.0%  
675  
1.60  
Vf=1.80  
Q=423

	42.262 42.262	42.231	41.872 41.872	41.821
	43.566	44.830	43.781	43.781
	46.078	45.694	45.830	45.805
	42.020 41.990	41.665 41.635	40.835 40.805	40.805
	1.546 1.576	3.165 3.195	2.946 2.976	2.976
	96.079 E300931.085 N6262194.665	129.481 E300931.864 N6262161.673	210.371 E300851.962 N6262174.319	210.371

RRJ2  
1.0%  
450  
2.78  
Vf=1.93  
Q=-239

	41.409 41.401	41.378 41.378	41.321
	43.427	43.439	43.439
	42.96	42.529	41.378
	40.160	40.150 40.130	40.130
	3.267	3.289 3.309	3.309
	0.000 E300846.801 N6262079.674	1.000 E300845.418 N6262079.893	24.658 E300855.408 N6262049.495

LINE 03

RRJ2  
1.0%  
750  
1.01  
Vf=2.06  
Q=911

	41.450 41.330	41.028 41.028	41.028
	43.313	41.357	41.357
	41.992	41.706	41.706
	39.800 39.820	39.578	39.578
	3.493	1.779	1.779
	0.000 E300840.775 N6262050.558	24.658 E300855.408 N6262049.495	24.658

LINE 04

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02	ISSUED FOR SDA	MM		AC	19.01.22
03	ISSUED FOR CLIENT REVIEW	EE		AC	02.02.22
04	ISSUED FOR INFORMATION	EE		AC	18.03.22
05	ISSUED FOR INFORMATION	EE		AC	14.06.22

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PROJECT

600 WOODSTOCK AVENUE,  
GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE

STORMWATER LONGITUDINAL  
SECTIONS - SHEET 03

JOB NUMBER

211274

DRAWING NUMBER

DAC05.13

REVISION

05

DRAWING SHEET SIZE = A1

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VERIFIER: S. FRYER

JOB MANAGER: -

DESIGNED: A. CARVALHAES

DRAWN: E. EAGER

PIPE CLASS  
RRJ2  
PIPE GRADE (%)  
1.0%  
PIPE SIZE (mm)  
750  
MINIMUM COVER (m)  
0.54  
Vf - FULL PIPE VELOCITY (m/s)  
2.11  
Q - PIPE FLOW (L/s)  
933

DATUM RL	33.0
H.G.L. (1% A.E.P.)	41.028 41.028 40.992
FINISHED SURFACE	41.357
NATURAL SURFACE	41.706
PIPE INVERT LEVEL	39.578 39.548
DEPTH TO INVERT	1.779 1.809
CO-ORDINATED SETOUT	52.063 E300865.408 N6262049.495
CHAINAGE	24.658

LINE 04

RRJ2  
1.0%  
750  
0.69  
Vf=2.15  
Q=949

DATUM RL	33.0
H.G.L. (1% A.E.P.)	40.682 40.682 40.674
FINISHED SURFACE	40.815
NATURAL SURFACE	41.650
PIPE INVERT LEVEL	39.283 39.253
DEPTH TO INVERT	1.532 1.562
CO-ORDINATED SETOUT	52.063 E300892.775 N6262045.211
CHAINAGE	52.063

04\02

RRJ2  
1.6%  
825  
0.34  
Vf=1.86  
Q=996

DATUM RL	33.0
H.G.L. (1% A.E.P.)	40.072 40.072 39.920
FINISHED SURFACE	40.021
NATURAL SURFACE	40.055
PIPE INVERT LEVEL	38.670 38.650
DEPTH TO INVERT	1.351 1.371
CO-ORDINATED SETOUT	85.175 E300910.998 N6262029.826
CHAINAGE	85.175

04\03

RRJ2  
1.3%  
825  
0.34  
Vf=1.55  
Q=830

DATUM RL	33.0
H.G.L. (1% A.E.P.)	39.820 39.820 39.820
FINISHED SURFACE	39.670
NATURAL SURFACE	39.670
PIPE INVERT LEVEL	38.570 38.570
DEPTH TO INVERT	1.100 1.000
CO-ORDINATED SETOUT	92.332 E300914.760 N6262023.738
CHAINAGE	92.332

04\04

RRJ2  
1.3%  
825  
0.34  
Vf=1.55  
Q=830

DATUM RL	33.0
H.G.L. (1% A.E.P.)	39.820 39.820 39.820
FINISHED SURFACE	39.670
NATURAL SURFACE	39.670
PIPE INVERT LEVEL	38.570 38.570
DEPTH TO INVERT	1.100 1.000
CO-ORDINATED SETOUT	92.332 E300914.760 N6262023.738
CHAINAGE	92.332

04\05


RRJ2  
3.8%  
225  
0.60  
Vf=1.51  
Q=13

DATUM RL	34.0
H.G.L. (1% A.E.P.)	43.329 43.329 44.144
FINISHED SURFACE	44.144
NATURAL SURFACE	44.145
PIPE INVERT LEVEL	43.268 43.268
DEPTH TO INVERT	0.877 0.877
CO-ORDINATED SETOUT	36.133 E300920.141 N6262087.597
CHAINAGE	36.133

LINE 05

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CLIENT	ARCHITECT
	
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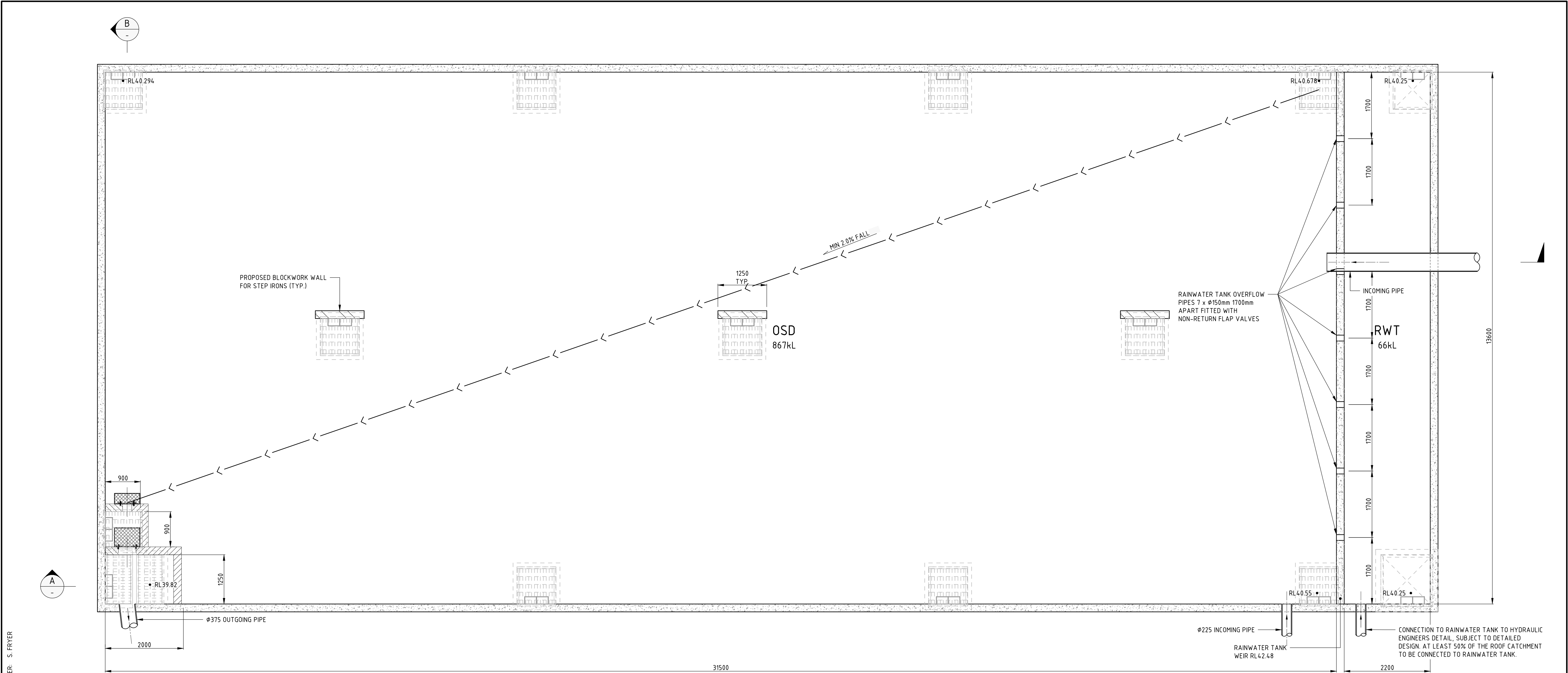
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600 WOODSTOCK AVENUE, GLENDENNING

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STORMWATER LONGITUDINAL SECTIONS - SHEET 04

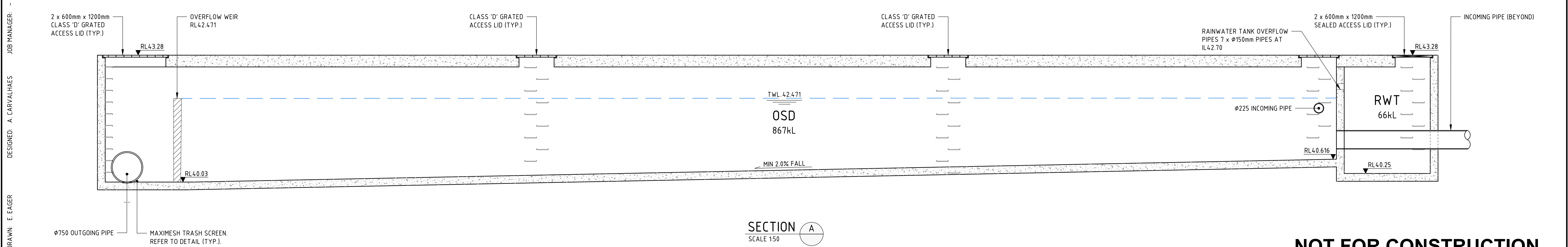
JOB NUMBER
211274
DRAWING NUMBER
DAC05.14
REVISION
05
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OSD BASE PLAN  
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SECTION A  
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PROJECT

**600 WOODSTOCK AVENUE, GLENDENNING**

DRAWING TITLE

**CIVIL ENGINEERING PACKAGE**

**STORMWATER DETAILS - SHEET 01**

JOB NUMBER

**211274**

DRAWING NUMBER

**DAC05.31**

REVISION

**04**

DRAWING SHEET SIZE = A1



DRAWN: E. EAGER

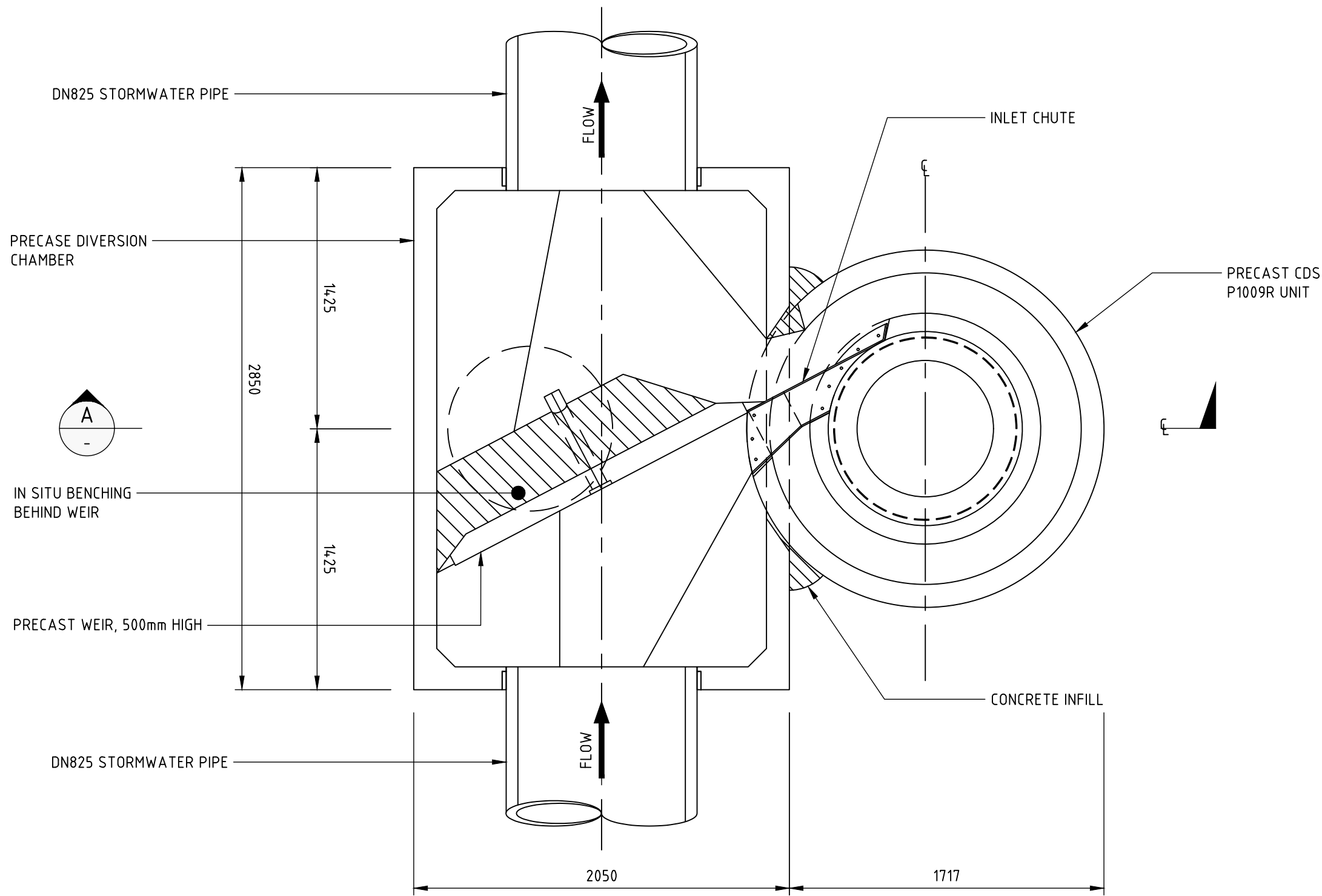


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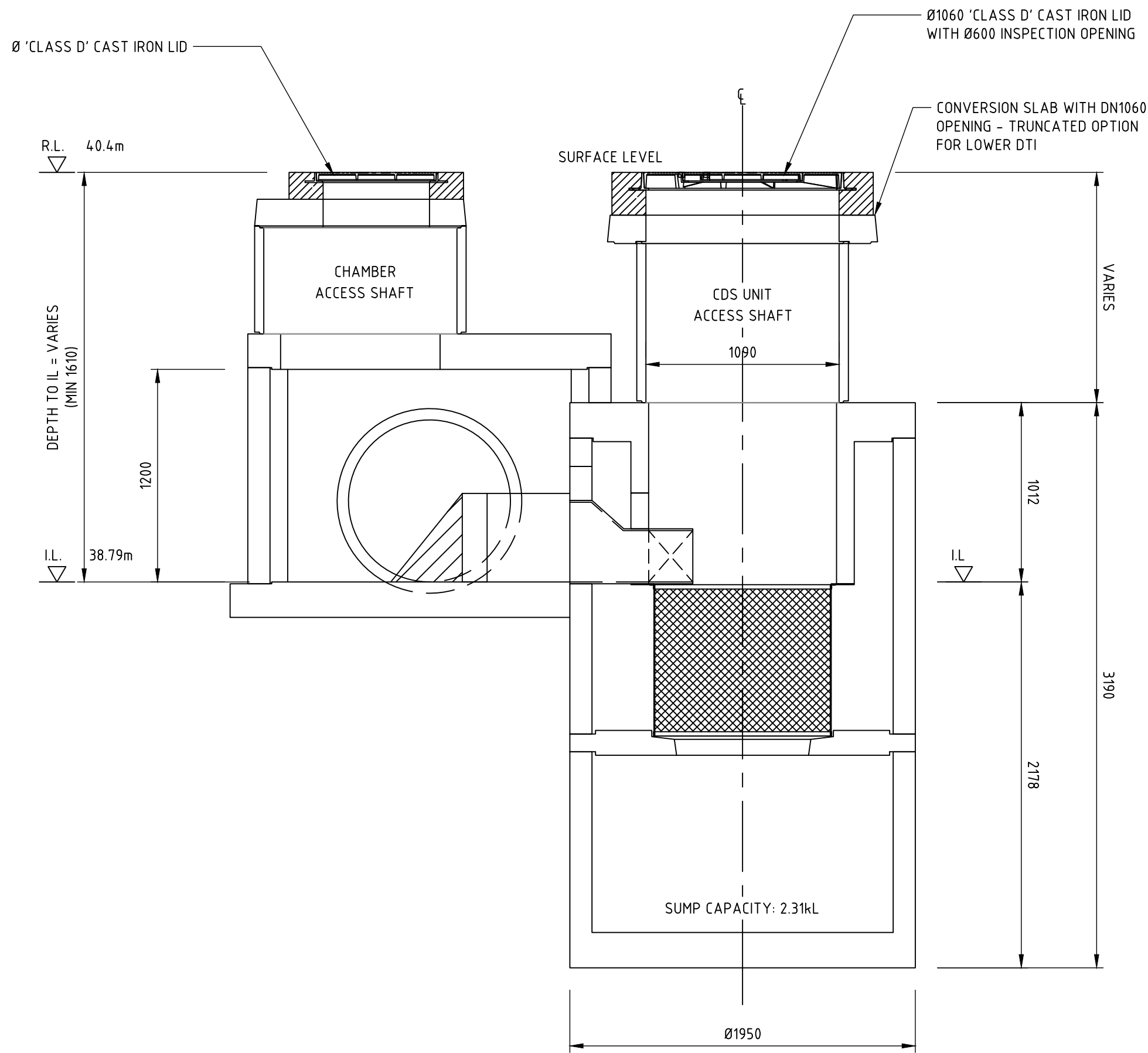
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											DAC05.32	04
											DRAWING SHEET SIZE = A1	



DESIGNED: A. CARVALHAES  
DRAWN: E. EAGER  
JOB MANAGER: -  
VERIFIER: S. FRYER



ROCLA CS P1009R GPT 1800x1200H CHAMBER  
SCALE 1:25




SECTION A  
SCALE 1:25

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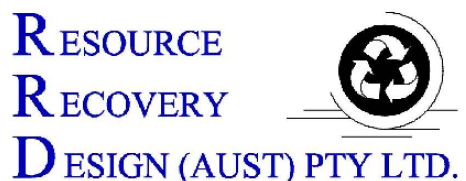
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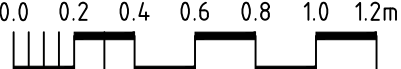
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PROJECT

600 WOODSTOCK AVENUE,  
GLENDENNING

DRAWING TITLE

CIVIL ENGINEERING PACKAGE  
  
STORMWATER DETAILS - SHEET  
03

JOB NUMBER

211274

DRAWING NUMBER

DAC05.33

REVISION

01

DRAWING SHEET SIZE = A1







14 June 2022

Ref: SY211274-00-CV-CT2-1

Tim Greenway  
Project Strategy Pty Ltd  
PO Box 271  
Sutherland NSW 1499

Dear Tim,

**Re: 600 Woodstock Av Glendening – Civil Engineering SSDA Comments**

This letter references the queries raised in a letter dated 12 of April 2022 from Blacktown City Council. This is in response to queries raised with respect to the proposed stormwater system for the site of the proposed development - SSD-29999239.

## 2. Drainage

a. The applicant is to submit a letter of offer to enter into a Voluntary Planning Agreement to Catherine.Harris@blacktown.nsw.gov.au. This must be done prior to the determination of the Development Application.

*(Northrop response) The applicant has submitted a letter of offer to enter into a VPA on the 3<sup>d</sup> of June 2022.*

b. Alternatively, should a Voluntary Planning Agreement not be entered into then amendments to the water quality measures shall be provided on-site as per Part J of Councils DCP 2015.

*(Northrop response) The applicant has submitted a letter of offer to enter into a VPA on the 3<sup>rd</sup> of June 2022.*

c. If on-lot treatment is the preferred option, a Model for Urban Stormwater Improvement Conceptualisation catchment plan showing which areas drain to the proposed water quality system and areas bypassing is required to be submitted.

(Northrop response) Not applicable, the applicant has submitted a letter of offer to enter into a VPA on the 3<sup>rd</sup> of June 2022.

d. Due to the cut and/or fill exceeding 1.5 m, a desktop Groundwater Assessment Report is required for the site in accordance with section 4 of Council's Water Sensitive Urban Design developer handbook. Where there is the potential for interaction with groundwater, a Groundwater Management Plan must be prepared by a Geotechnical Engineer registered with the National Engineering Register.

*(Northrop response) A Groundwater Management Plan is being prepared by WSP, and will be submitted to Council.*

e. Provide an on-site detention catchment plan showing the areas draining to the detention tank and clearly show areas of bypass. Note that a 15% maximum site catchment bypass is permitted for the On Site Detention tank.



f. Investigation is required for the swale located to the south east of the development. Ascertain if there is any flow coming into this property from the adjoining property given the current obstructions on the adjoining property. Provide details of the potential impacts to the proposed works and provide appropriate freeboard.

*(Northrop response) There is an existing kerb along the boundary which obstructs the flows towards the subject site, the kerb and levels will be generally maintained along the boundary, maintaining existing conditions.*



g. Drawings DAC04.01 (03) and DAC04.02 (02):

- Two options have been provided for the proposed roof drainage and connection to the rainwater tank. Nominate one of the two options for the rainwater tank and size the rainwater tank accordingly. Provide details on the plans and amend the Model for Urban Stormwater Improvement Conceptualisation subsequently.



*(Northrop response) The option that drains half of the roof to the rainwater tank has been nominated. Please refer to drawing DAC05.31 for updated rainwater tank size.*

- The levels in existing street Pit 04/05 are to be confirmed and incorporated into the design.

*(Northrop response) Noted, the invert levels of the existing street pit 04/05 have been measured on site, and will be surveyed prior to detailed design.*

- The Gross Pollutant Trap labelled CDS 1009 is undersized and the flows in Section 2.4.2.2 “Gross Pollutant Trap” of the civil engineering report are significantly low. Review the flows and calculations and refer to Council’s Engineering Guide for Development 2005 for the rainfall intensities for 1 Year Average Recurrence Interval event.

*(Northrop response) The sizing of the GPT has been discussed with Blacktown's Council Design Engineer, and the following calculation was undertaken to size the GPT:*

*The GPT treatable flow will be the maximum 50% AEP flow from the OSD + the 6 month flow from the bypass areas.*

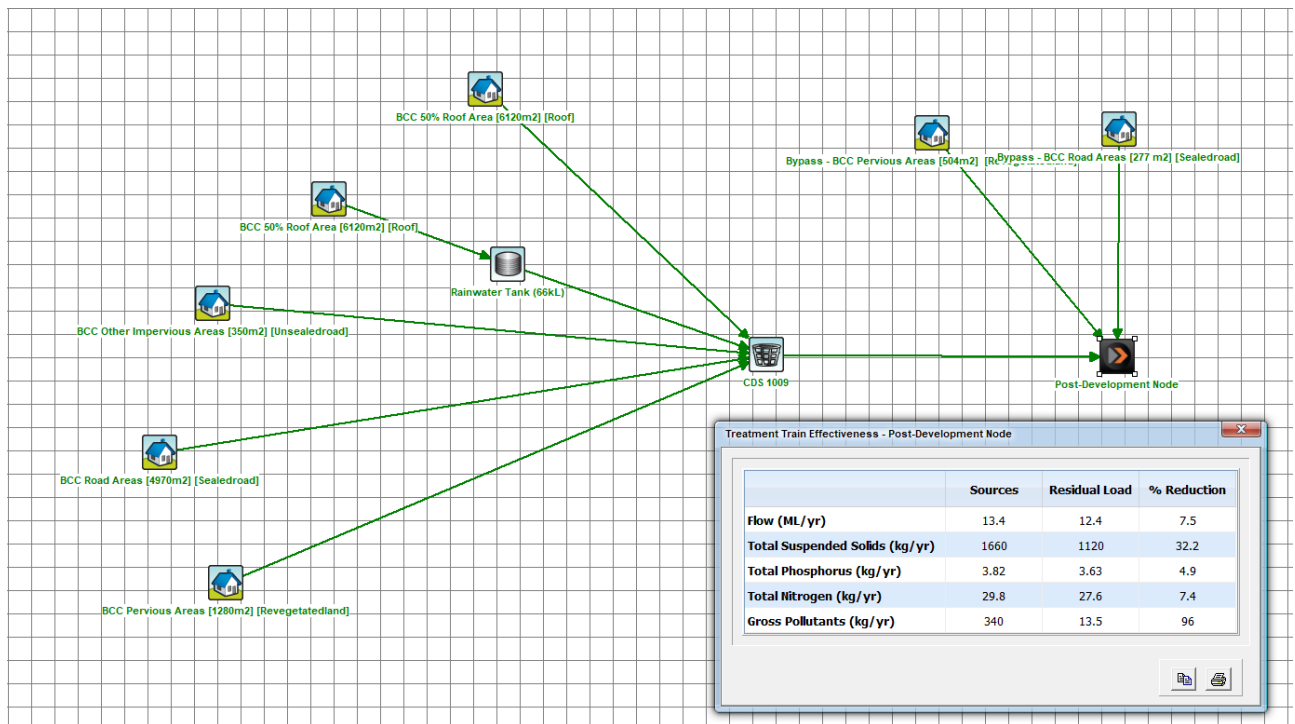
- Maximum 50% AEP OSD Discharge: 63L/s (extracted from the OSD spreadsheet)
- OSD bypass area flows:  
 Bypass area = 2246 m<sup>2</sup>  
 We have calculated the flows using the rational method, adopting the rainfall intensity frequency duration of 77 mm/hr (5 min duration, for the 1 year storm) based on BCC's Engineering guide for development – 2005.  
 Using the rational method,  $Q_{1\text{ year}} = c \times I \times A = 0.9 \times 0.077 \times 2246 / 36000 = 0.043236 \text{ m}^3/\text{s}$   
 $Q_{6\text{ month}} = Q_{1\text{ year}} \times 0.75 = 0.043236 \times 0.75 = 0.032427 \text{ m}^3/\text{s}$

$$GPT \text{ flows} = 50\% \text{ AEP OSD discharge} + \text{bypass flow} = 63 + 32.4 = 95.4 \text{ L/s}$$

*Based on the CDS sizing table, the GPT unit CDS 1009 would be appropriate for flows between 100-110 L/s.*

According to the MUSIC model, the proposed treatment train achieves a gross pollutants removal of 96%, please refer to image below and MUSIC model attached.





- Provide details of the Gross Pollutant Trap including sections and levels.

*(Northrop response) Please refer to drawing DAC05.33 for details of the Gross Pollutant Trap.*

- Pit 04/03 is to be a splitter with a diversion weir to divert the flows. Provide Hydraulic Grade Line details and calculations for the proposed Gross Pollutant Trap and splitter pit system to ensure there is sufficient hydraulic head and no obstruction in flows.

(Northrop response) A diversion chamber is provided with the Gross Pollutant Trap, please refer to drawing DAC05.33 for details. The weir level to be set at the top water level for the 1 EY, storm event, subject to detailed design.

- The 375 mm diameter outlet pipe from On Site Detention tank is significantly undersized. The outlet pipe must be sized to 1% Annual Exceedance Probability 5-minute storm event. Preliminary calculations suggest the outlet pipe to be minimum 675 mm diameter. Review and amend the pipe sizes (i.e. Increase pipe sizes) from the OSD tank to the existing street pipe discharge.

*(Northrop response) Please refer to drawing DAC05.13 and DAC05.14 for updated pipe sizes.*

- The 1% Annual Exceedance Probability flows from the site are to be directed to the On Site Detention. Demonstrate how the surface flows in excess of the pipe capacity are directed to the On Site Detention system.

*(Northrop response) The piped system upstream of the On Site Detention has been designed to cater for the 1% AEP flows to ensure the 1% AEP flows are directed to the OSD.*

- The lids for the On Site Detention tank are to be grated. Remove the sealed lids. Reflect the pit/grate locations correctly and match with drawing DAC05.31 (02).

*(Northrop response) Noted, drawings DAC04.01 and DAC05.31 have been updated.*



- Show how the roof water gets to the rainwater tank. Provide a separate system for roof water and surface drainage. Pits between the roof lines (i.e. charged pipes) are to be sealed.

*(Northrop response) Noted, this will be provided in the hydraulic engineer's drawings, during detailed design.*

- Charge line cleanout pits are to be provided at the low point of all charge line systems for the rainwater tanks to facilitate cleaning of the system.

(Northrop response) Noted, this will be provided in the hydraulic engineer's drawings, during detailed design.

h. Drawings DAC05.31 (02) and DAC05.32 (02):

- The lids for the On Site Detention tank are to be grated trafficable lids.

*(Northrop response) Noted, please refer to updated drawings DAC05.31 and DAC05.32.*

- Rename 100 year Average Recurrence Interval to 1% Annual Exceedance Probability on all notes and plans.

(Northrop response) Noted, please refer to updated drawing DAC05.32.

- Rename 1.5 year Average Recurrence Interval to 50% Annual Exceedance Probability on all notes and plans.

(Northrop response) Noted, please refer to updated drawing DAC05.32.

- Provide 2 x 600 x 1200 mm grates over the 1% Annual Exceedance Probability orifice control pit and overflow pit.

(Northrop response) Noted, please refer to updated drawing DAC05.31.

- Provide a 900 mm x 900 mm grate over the 50% Annual Exceedance Probability orifice.

*(Northrop response) Noted, please refer to updated drawings DAC05.31 and DAC05.32.*

- The starting / lowest level in the base of the On Site Detention tank is to be the centreline of the 50% AEP orifice (1.5 year orifice) grading up at 2% from there.

(Northrop response) Noted, please refer to updated drawing DAC05.32.

- Provide separate orifice details for the 50% Annual Exceedance Probability orifice and 1% Annual Exceedance Probability orifice.

*(Northrop response) Noted, subject to detail design.*

- Provide a minimum 2% slope in the On Site Detention storage. For larger tanks this can be in the form of a 2% cross-slope to a central “V” drain with 2% longitudinal slope along the “V” drain. Reassess tank dimensions to achieve the minimum storage volumes.

(Northrop response) Noted, please refer to updated drawing DAC05.32.

- The orifice within the Discharge Control Pit is to be protected by a suitable screen. Provide Maximesh Rh3030 for orifice diameters 150 mm or less with a minimum area of 50 times the



orifice area and Weldlok F40/203 for orifices 150 mm diameter or more with a minimum area of 20 times the orifice area.

*(Northrop response) Noted, please refer to updated drawing DAC05.32.*

- Remove the rainwater tank weir and extend the wall to the soffit of the tank. Provide series of overflow pipes (i.e. 4 x 150 mm diameter) with non-return flaps.

(Northrop response) Noted, please refer to updated drawing DAC05.31.

- The outlet pipe from the On Site Detention tank must be sized to 1% Annual Exceedance Probability 5-minute storm event. Increase the pipe size accordingly.

(Northrop response) Noted, please refer to updated drawings DAC05.13 and DAC05.14 for updated pipe sizes.

- The sealed lid to the rainwater tank pump must have a minimum internal opening of 2 x 600 mm x 1200 mm to facilitate maintenance access to the pumps

(Northrop response) Noted, please refer to updated drawing DAC05.31.

i. Drawing DAC05.41 (02):

- The 1% Annual Exceedance Probability flows from the site are to be directed to the On Site Detention tank. Demonstrate how the 1% Annual Exceedance Probability flows will be directed to the On Site Detention tank. There are areas to the east and south east (flows in excess of pit and pipes) which are bypassing the On Site Detention. Clearly show the areas of bypass.

*(Northrop response) Noted, please refer to updated stormwater long sections on drawings DAC05.11-14, drawing DAC05.41 shows the area bypassing the On Site Detention tank.*

j. Submit On Site Detention Deemed to Comply Tool spreadsheet electronically to Council for review.

(Northrop response) Noted.

k. Submit all models including the Model for Urban Stormwater Improvement Conceptualisation to Council electronically.

(Northrop response) Noted.

I. All pits deeper than 1.2 m must provide step irons at 300 centres.

(Northrop response) Noted, please refer to step iron detail in drawing DAC05.32.

m. The internal pipe network is to be designed in accordance with the Council's Engineering Guide for Development 2005 to carry the 5% Annual Exceedance Probability (20 year Average Recurrence Interval) storm flows

(Northrop response) Noted, please refer to updated stormwater long sections on drawings DAC05.11-14.





n. Review the pit size as 600 \* 600 mm pits are limited to 600 mm maximum depth and 600 \* 900 mm pits are limited to 900 mm depth. Pits greater than 900 mm depth are all to be minimum 900 \* 900 mm. All pits within the proposed development must comply with these requirements.

(Northrop response) Noted, the minimum pit size is 900x900.

We trust you find the above satisfactory. Feel free to discuss any aspect with me.

Yours faithfully,

Karvalhas

**Aline Carvalhaes**  
Civil Engineer  
BE(Civil)