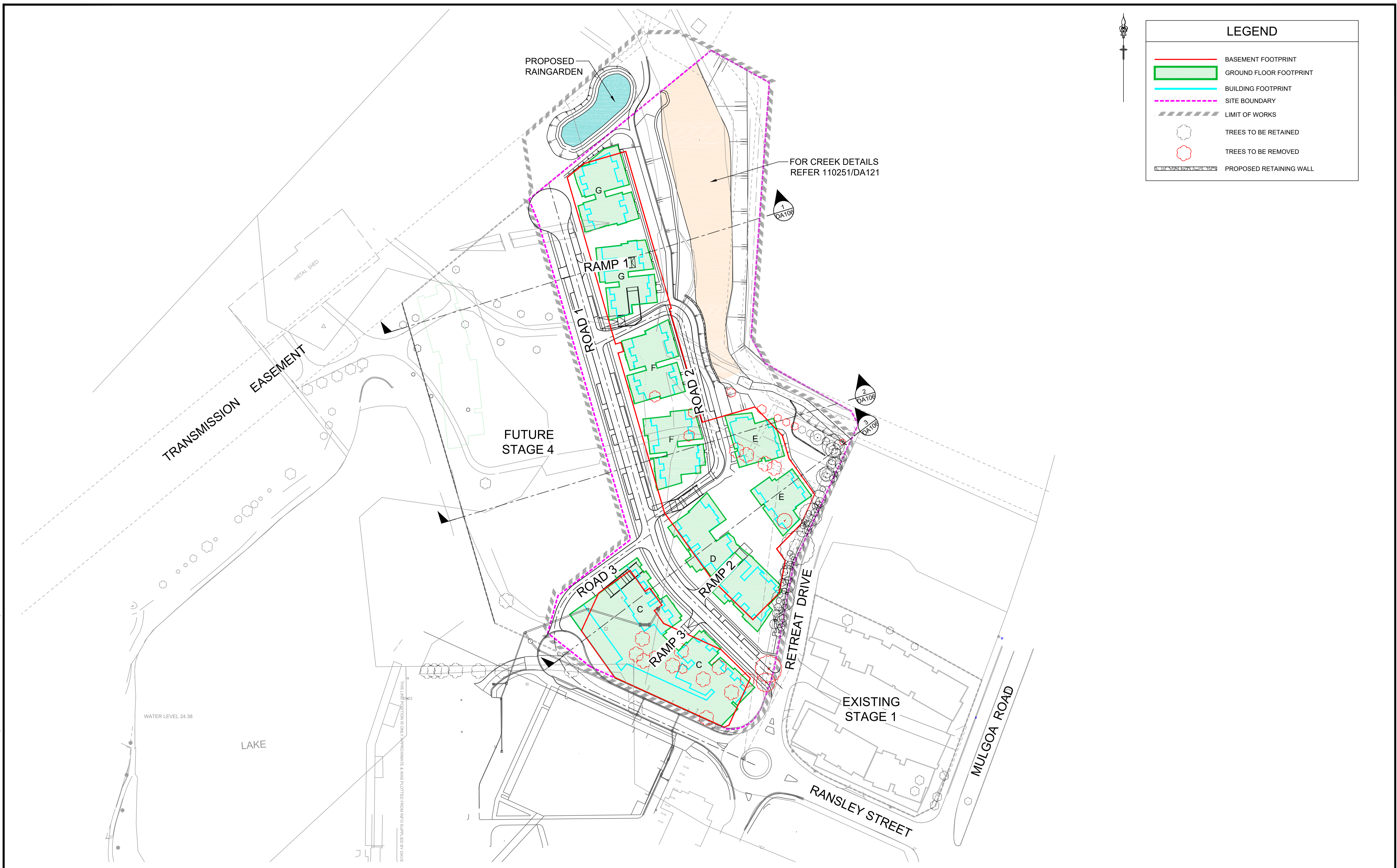



Plotted: 12 June, 2019 1:02:59 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stages 2A, 2B And 3\CD\DA\110251DA101.dwg



AMENDMENT	DES	DRN	CKD	APR	DATE
D	CC	NAF	DH	MS	12/06/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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 AZIMUTH:  
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 ORIGIN:  
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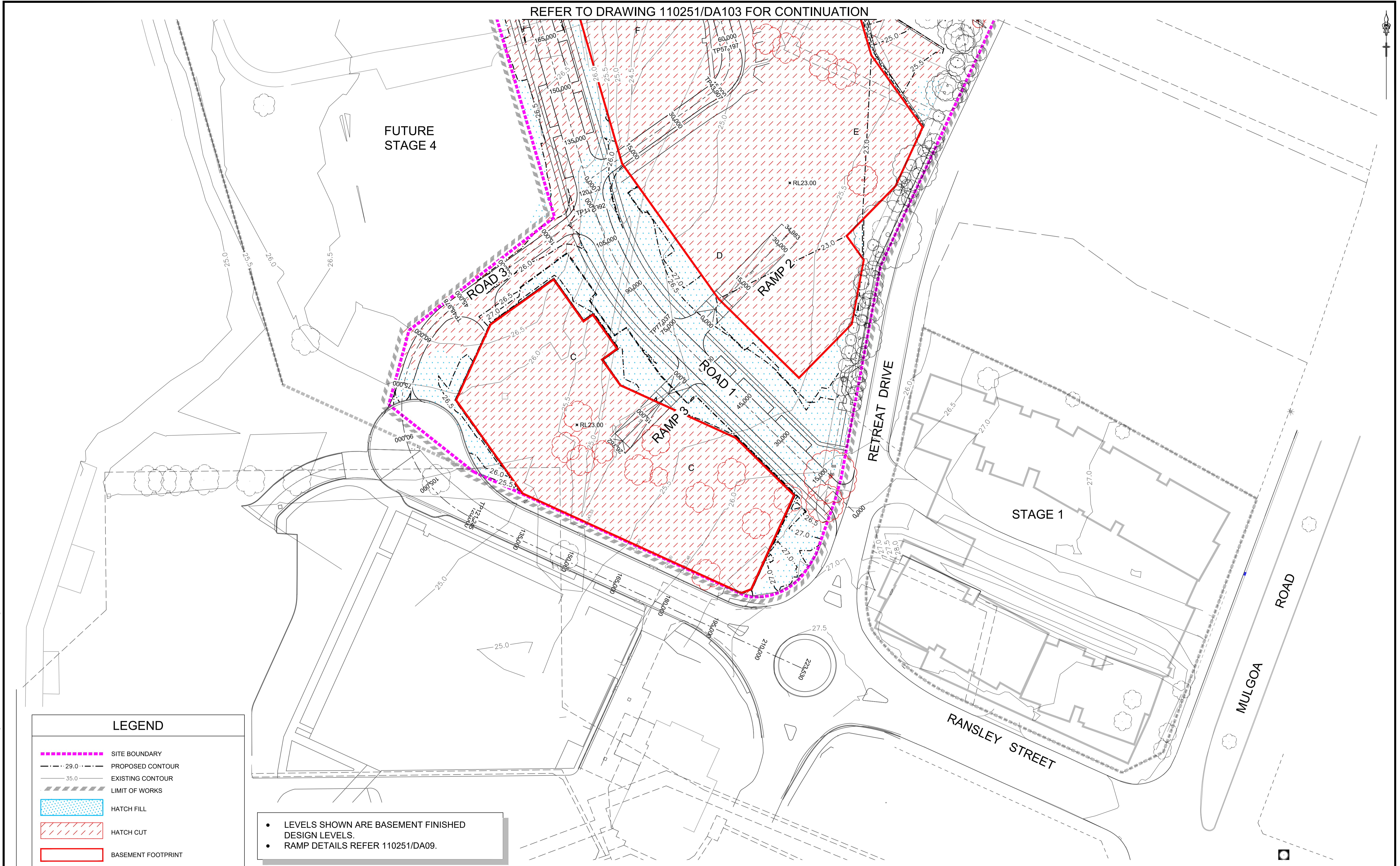
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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 LAYOUT & TREE MANAGEMENT PLAN

PLAN No: 110251/DA101 D  
 FILE No: 110251DA101  
 SHEET SIZE: A1 ORIGINAL

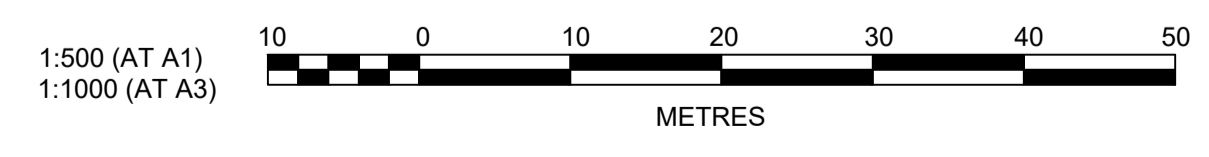


REFER TO DRAWING 110251/DA103 FOR CONTINUATION



- LEVELS SHOWN ARE BASEMENT FINISHED DESIGN LEVELS.
- RAMP DETAILS REFER 110251/DA09.

LEGEND	
	SITE BOUNDARY
	PROPOSED CONTOUR 29.0
	EXISTING CONTOUR 35.0
	LIMIT OF WORKS
	HATCH FILL
	HATCH CUT
	BASEMENT FOOTPRINT
	PROPOSED RETAINING WALL



Plotted: 12 June, 2019 1:03:21 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\ICDD\DA110251\DA102.dwg

AMENDMENT	DES	DRN	CKD	APR	DATE
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D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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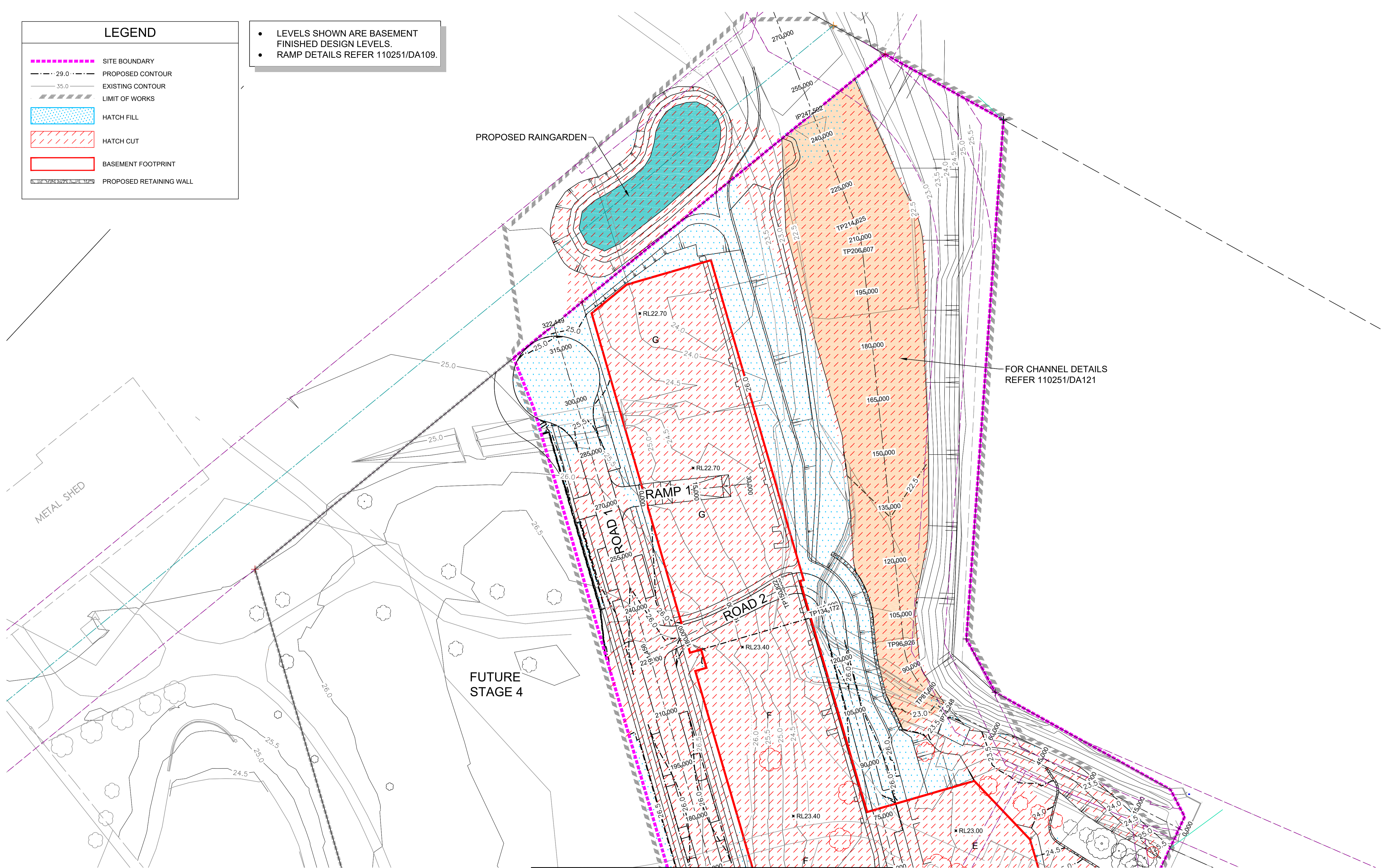
**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 BASEMENT DETAIL & CUT/FILL PLAN  
 SHEET 1

PLAN No: 110251/DA102 E  
 FILE No: 110251DA102  
 SHEET SIZE: A1 ORIGINAL



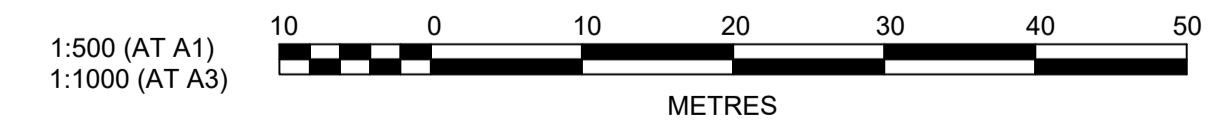
LEGEND	
	SITE BOUNDARY
	PROPOSED CONTOUR
	EXISTING CONTOUR
	LIMIT OF WORKS
	HATCH FILL
	HATCH CUT
	BASEMENT FOOTPRINT
	PROPOSED RETAINING WALL

- LEVELS SHOWN ARE BASEMENT FINISHED DESIGN LEVELS.
- RAMP DETAILS REFER 110251/DA109.



Plotted: 12 June, 2019 1:03:49 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA103.dwg

REFER TO DRAWING 110251/DA102 FOR CONTINUATION



AMENDMENT	DES	DRN	CKD	APR	DATE
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D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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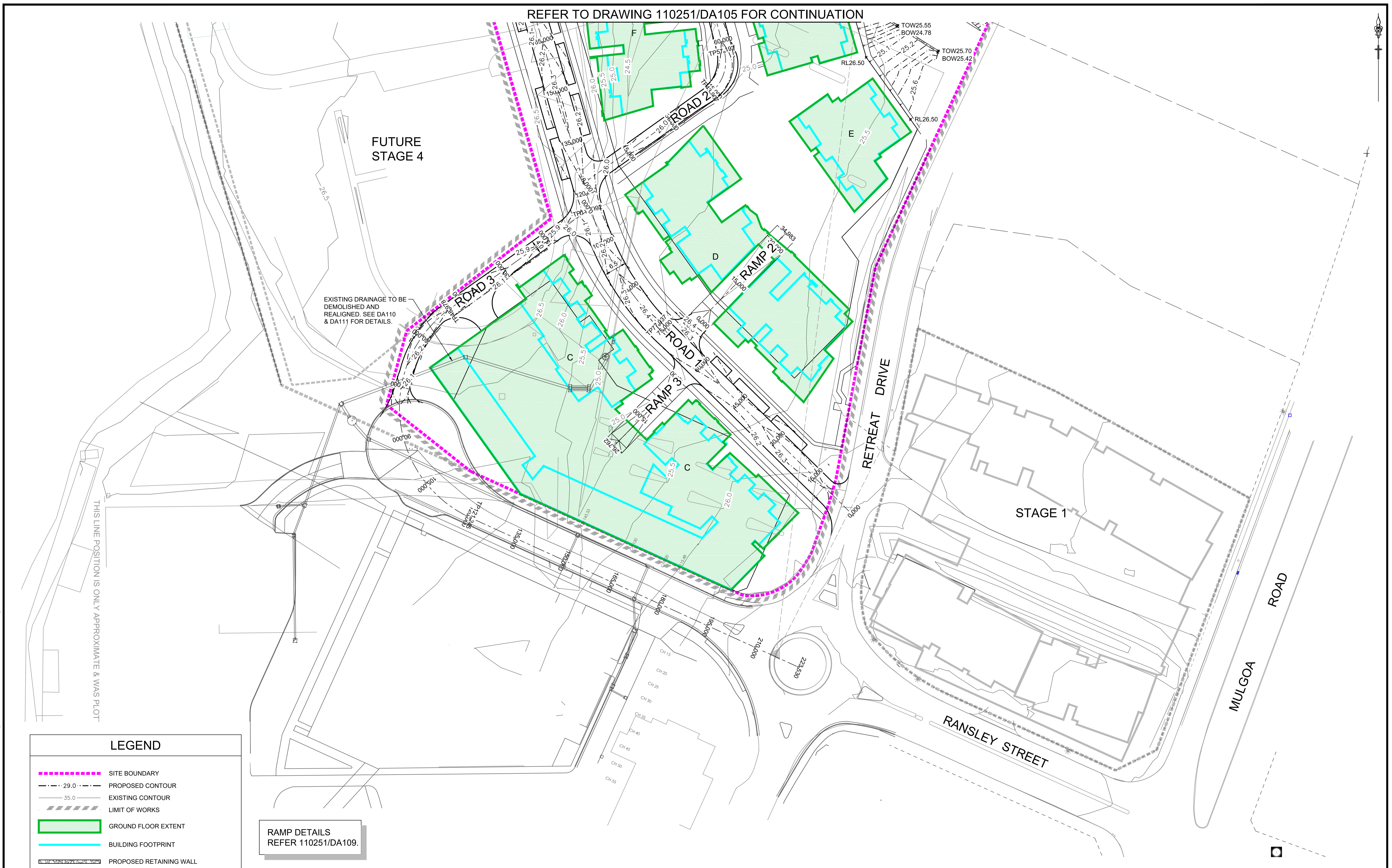
**ISSUED FOR DA APPROVAL**  
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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 BASEMENT DETAIL & CUT/FILL PLAN  
 SHEET 2

PLAN No: **110251/DA103** E  
 FILE No: 110251DA103  
 SHEET SIZE: A1 ORIGINAL



REFER TO DRAWING 110251/DA105 FOR CONTINUATION

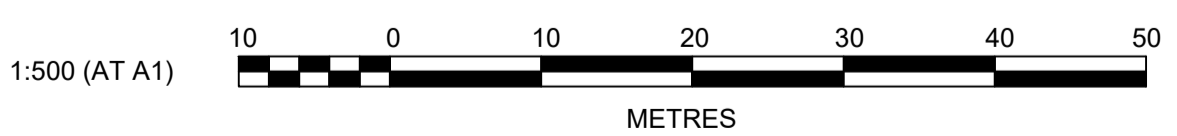


THIS LINE POSITION IS ONLY APPROXIMATE & WAS PLOTT

EXISTING DRAINAGE TO BE DEMOLISHED AND REALIGNED. SEE DA110 & DA111 FOR DETAILS.

RAMP DETAILS REFER 110251/DA109.

LEGEND	
	SITE BOUNDARY
	PROPOSED CONTOUR
	EXISTING CONTOUR
	LIMIT OF WORKS
	GROUND FLOOR EXTENT
	BUILDING FOOTPRINT
	PROPOSED RETAINING WALL



AMENDMENT	DES	DRN	CKD	APR	DATE
E	CC	NAF	DH	MS	12/06/19
D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 GROUND LEVEL DETAIL PLAN  
 SHEET 1

PLAN No: 110251/DA104 **E**  
 FILE No: 110251DA104  
 SHEET SIZE: A1 ORIGINAL

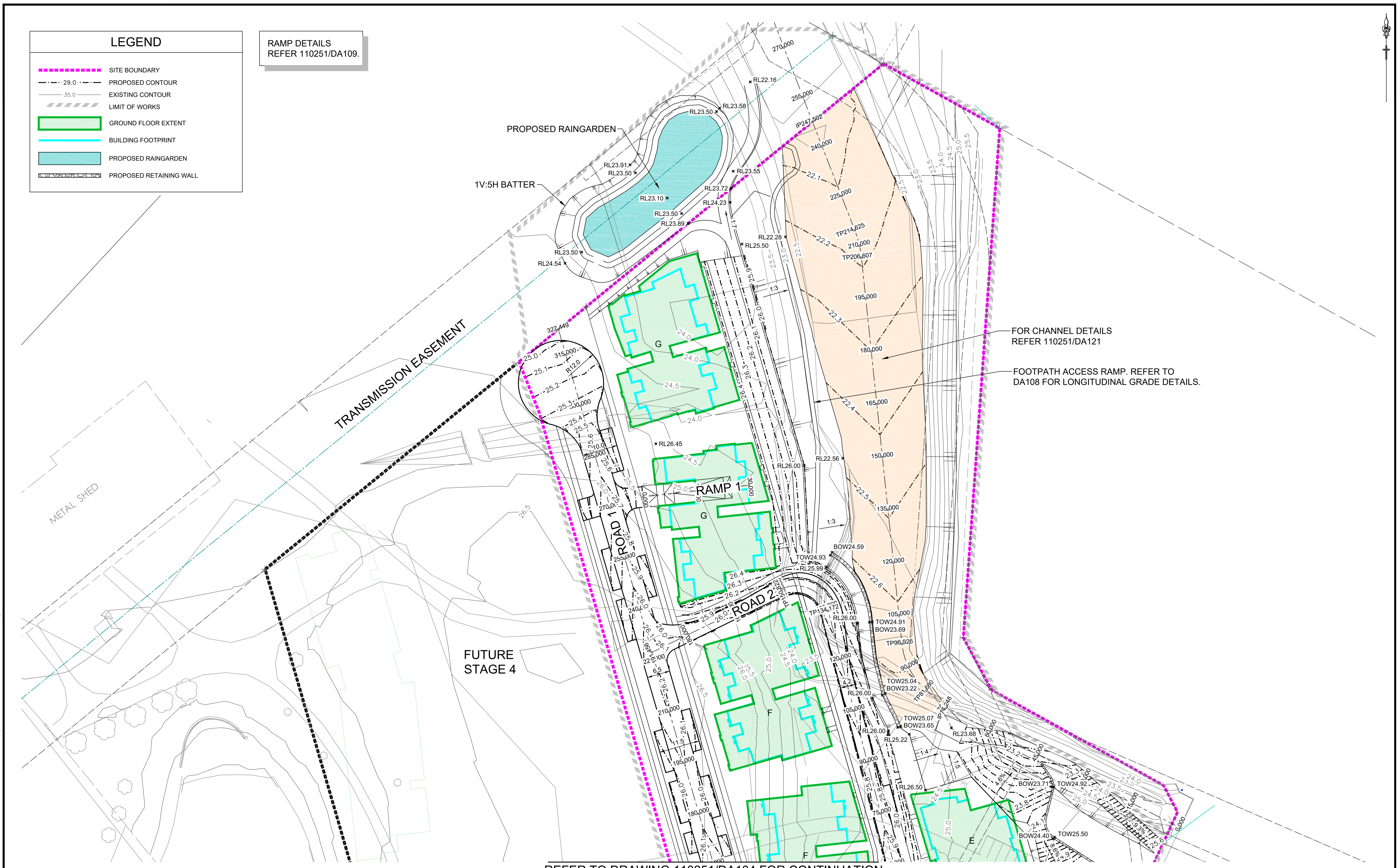
Plotted: 12 June, 2019 1:04:11 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA104.dwg



**LEGEND**

- SITE BOUNDARY
- - - - - 29.0 PROPOSED CONTOUR
- - - - - 35.0 EXISTING CONTOUR
- / / / / / LIMIT OF WORKS
- ▭ GROUND FLOOR EXTENT
- ▭ BUILDING FOOTPRINT
- ▭ PROPOSED RAINGARDEN
- ▭ PROPOSED RETAINING WALL

RAMP DETAILS  
REFER 110251/DA109.



FOR CHANNEL DETAILS  
REFER 110251/DA121

FOOTPATH ACCESS RAMP. REFER TO  
DA108 FOR LONGITUDINAL GRADE DETAILS.

REFER TO DRAWING 110251/DA104 FOR CONTINUATION



Plotted: 12 June, 2019 7:23:47 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA105.dwg

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D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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DATUM:  
ORIGIN:



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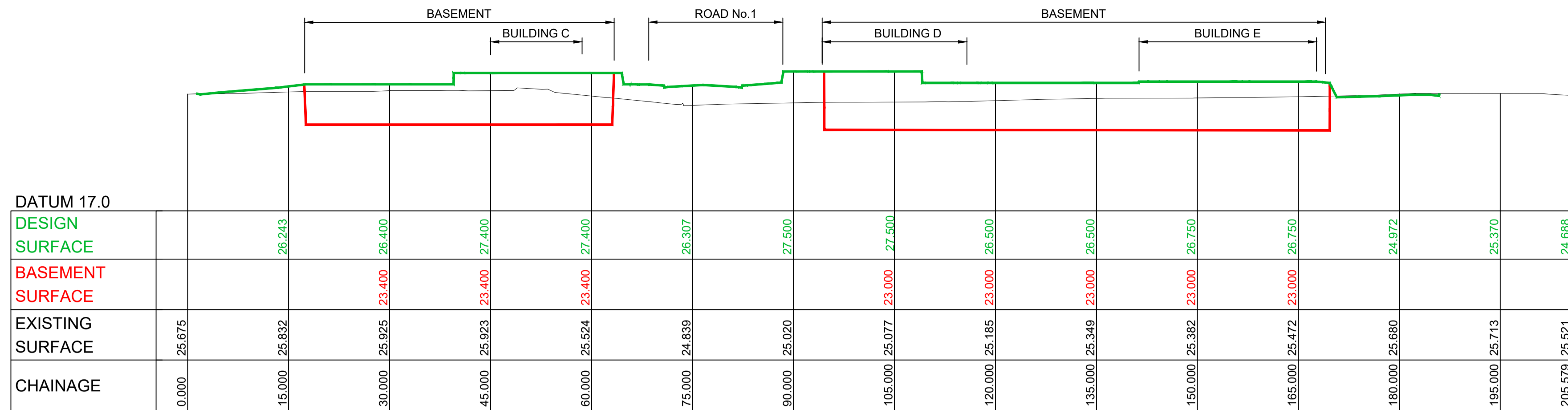
**ISSUED FOR DA APPROVAL**  
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PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
GROUND LEVEL DETAIL PLAN  
SHEET 2

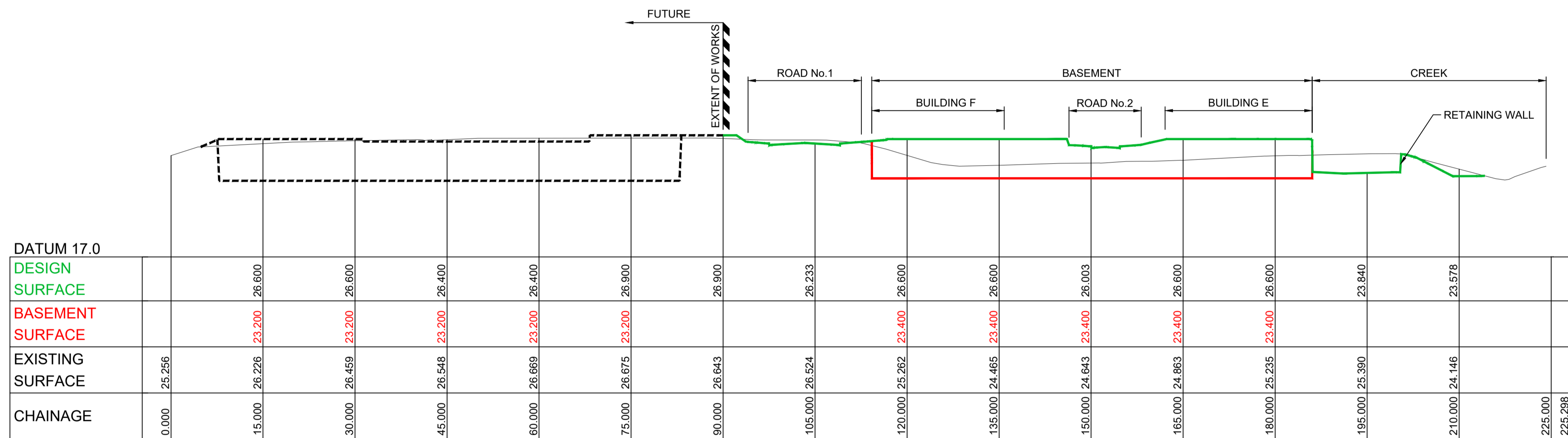
PLAN No:	110251/DA105	<b>E</b>
FILE No:	110251DA105	
SHEET SIZE:	A1 ORIGINAL	



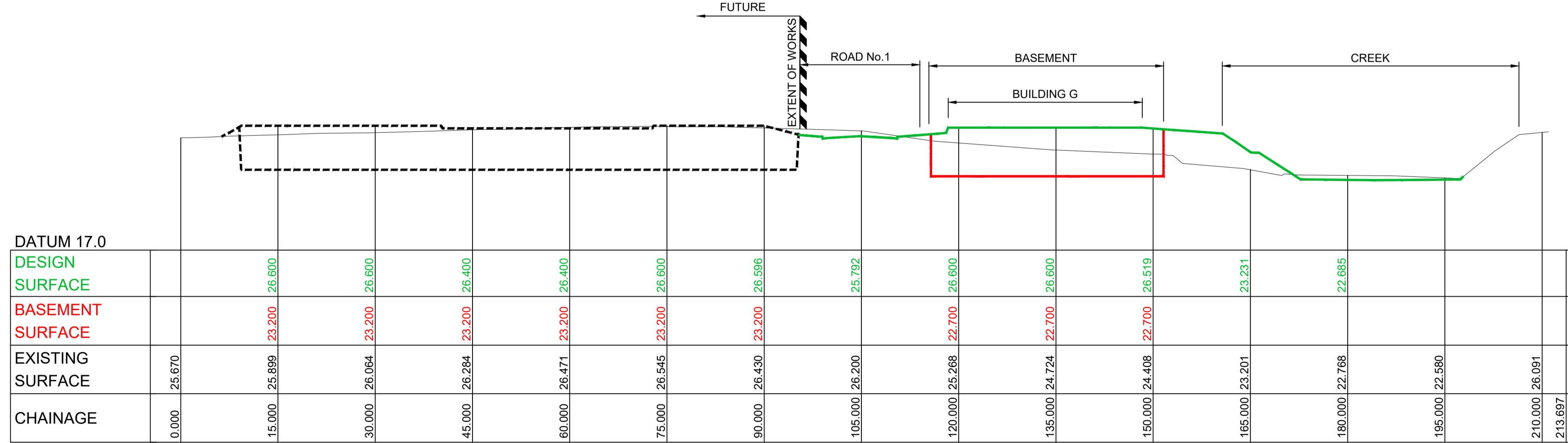
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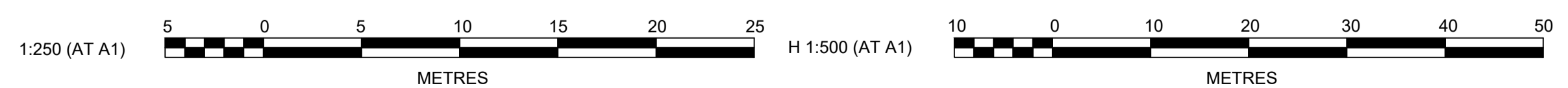
**LONGITUDINAL SITE SECTION 3**  
SCALE H 1:500  
V 1:250



**LONGITUDINAL SITE SECTION 2**  
SCALE H 1:500  
V 1:250



**LONGITUDINAL SITE SECTION 1**  
SCALE H 1:500  
V 1:250



E	ARCHITECTURAL LAYOUT AMENDED	CC	CC	DH	MS	12/06/19
D	RETAINING WALL EXTENDED	VG	VG	MS	RO	15/03/19
C	ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B	ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A	ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18
	AMENDMENT	DES	DRN	CKD	APR	DATE

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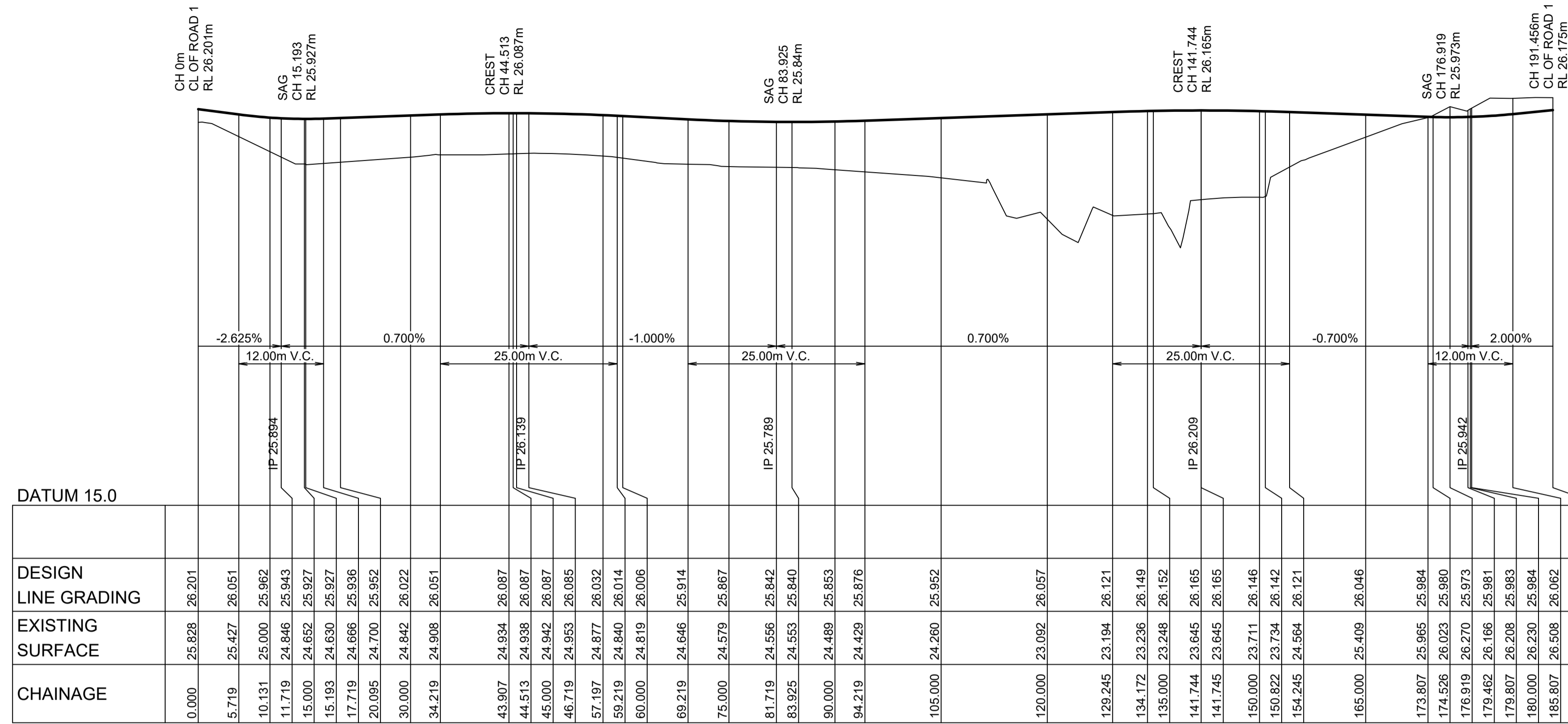
PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
SITE LONGITUDINAL SECTIONS

PLAN No: 110251/DA106 **E**  
FILE No: 110251DA106  
SHEET SIZE: A1 ORIGINAL

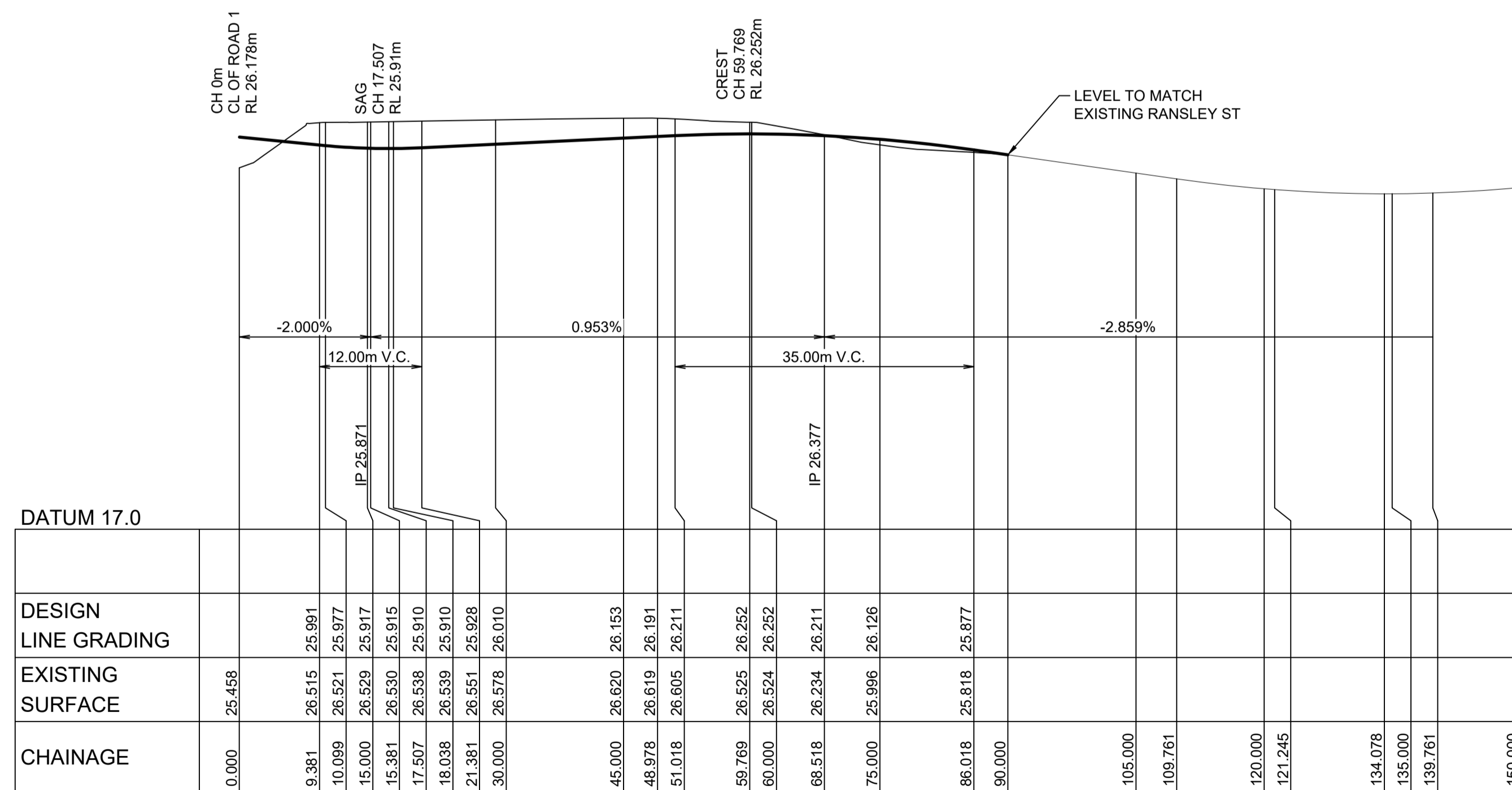




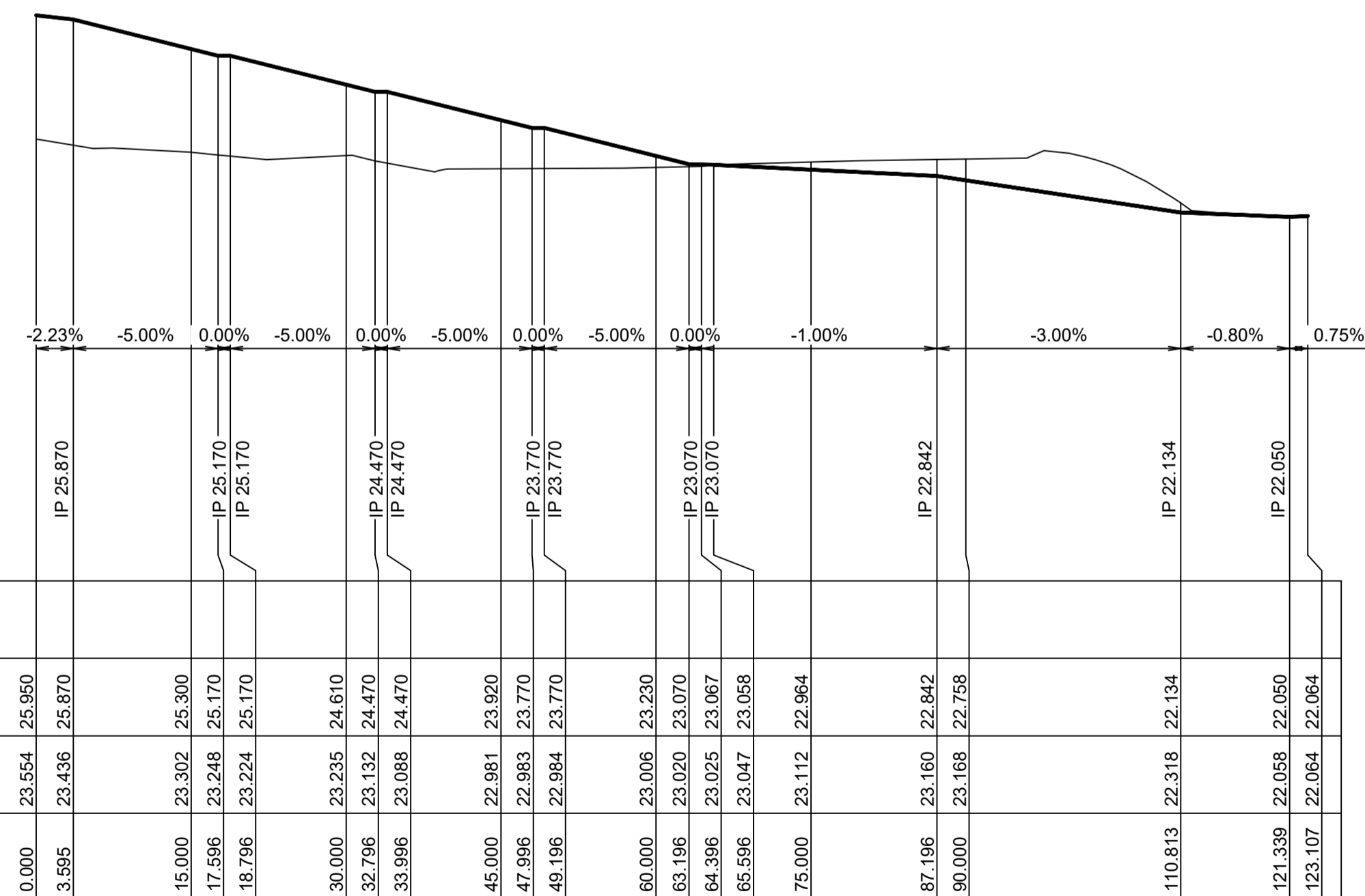
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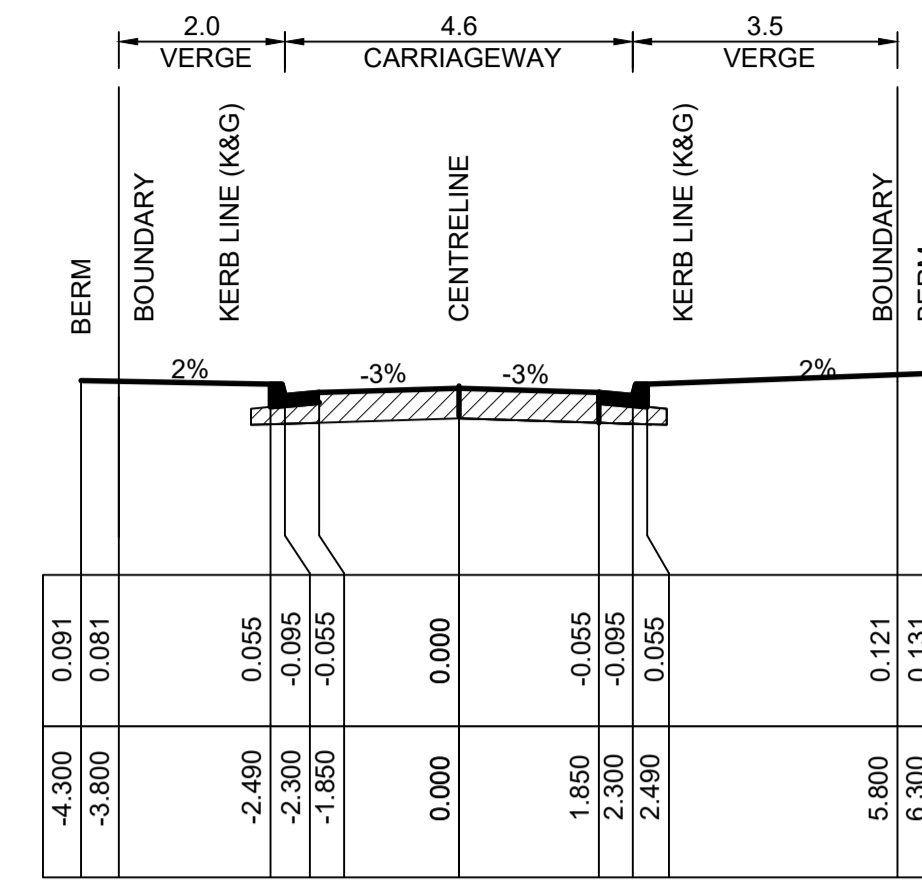
LONGITUDINAL SECTION ROAD 2  
HORIZONTAL SCALE 1:500  
VERTICAL SCALE 1:100



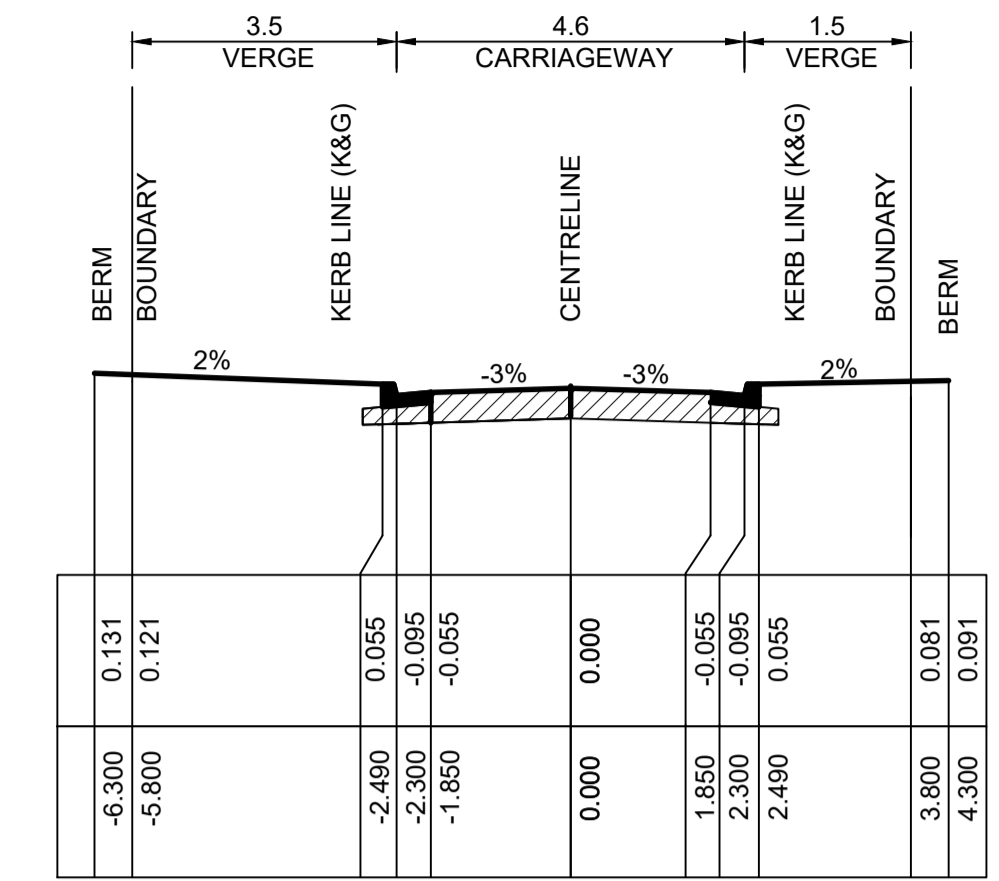
LONGITUDINAL SECTION ROAD 3  
HORIZONTAL SCALE 1:500  
VERTICAL SCALE 1:100



LONGITUDINAL SECTION ACCESS FOOTPATH RAMP  
HORIZONTAL SCALE 1:500  
VERTICAL SCALE 1:100



TYPICAL CROSS ROAD 2  
1:100 NATURAL



TYPICAL CROSS ROAD 3  
1:100 NATURAL

ROAD No.2- SAWTOOTH GRADING DUE TO PROPOSED SITE LEVELS AND EXISTING RETREAT DRIVE LEVELS. FLOWS TO POND 200mm PRIOR TO SPILLING OVER CREST.



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DATUM:

ORIGIN:

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PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
FOOTPATH RAMP & ROAD LONGITUDINAL & TYPICAL SECTIONS  
SHEET 2

PLAN No:  
**110251/DA108**

FILE No: 110251DA108

SHEET SIZE: A1 ORIGINAL

AMENDMENT	DES	DRN	CKD	APR	DATE
D FOOTPATH ACCESS RAMP ADDED	CC	CC	DH	MS	12/06/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

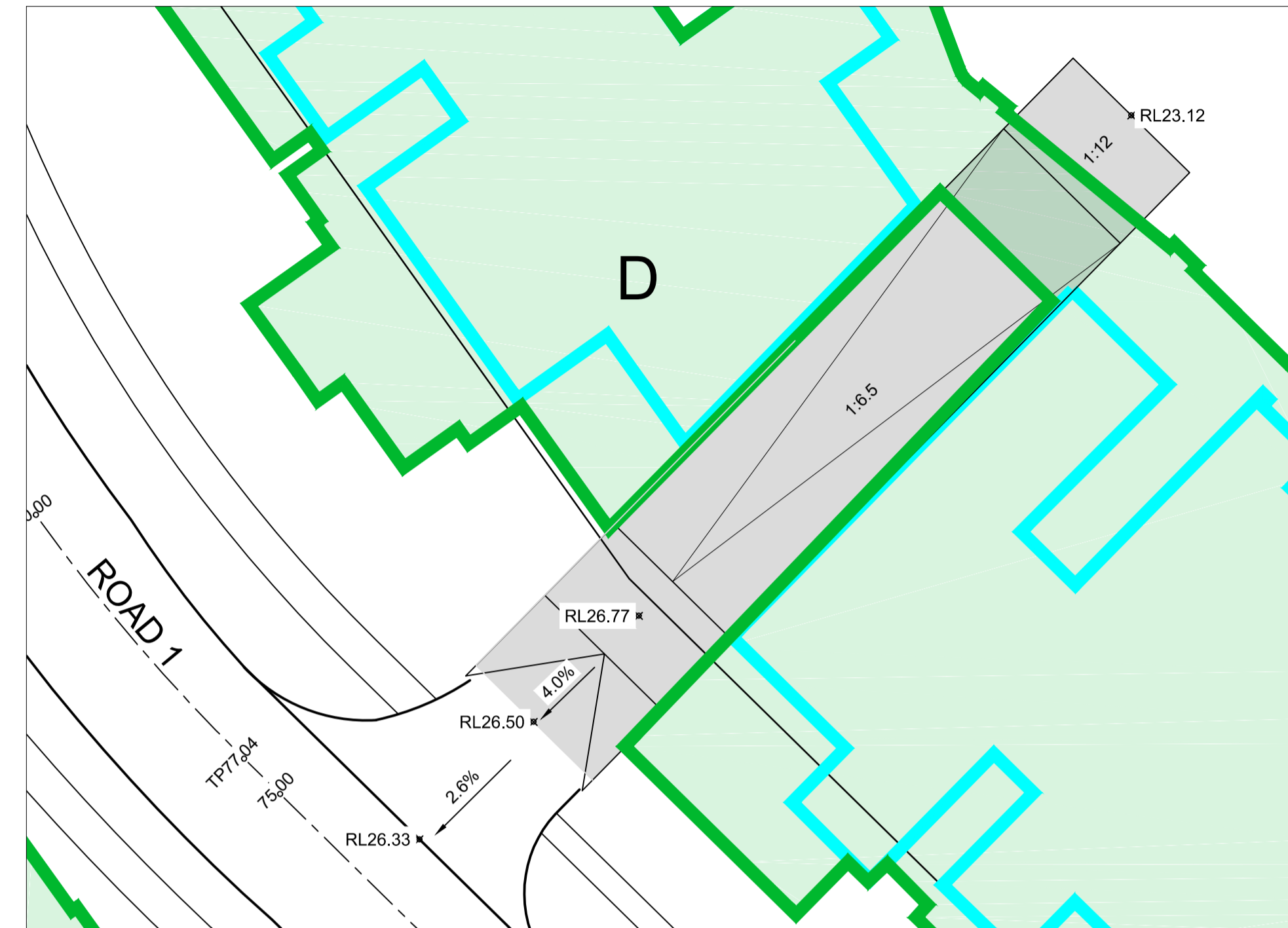
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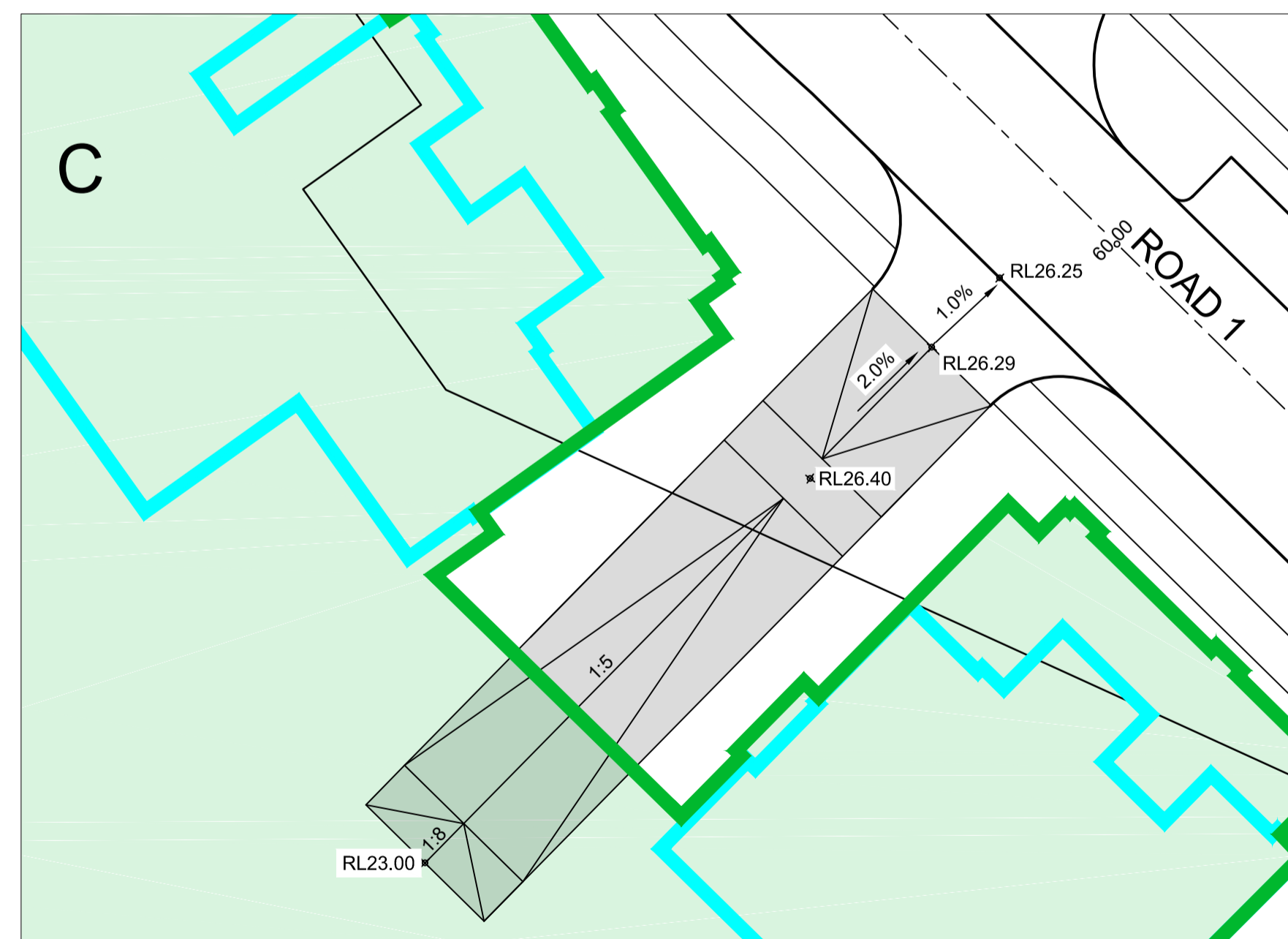




RAMP 1 PLAN  
SCALE 1:200



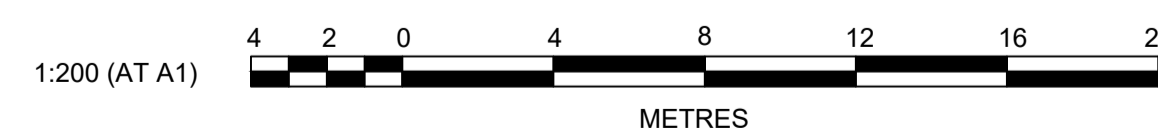
RAMP 2 PLAN  
SCALE 1:200



RAMP 3 PLAN  
SCALE 1:200

RAMP GRADIENTS SUBJECT TO  
FINAL LEVELS FROM ARCHITECT  
& TRAFFIC ENGINEER APPROVAL.

NOTE:  
RAMPS TO BE DESIGNED TO STOP 100yr  
OVERLAND FLOW ENTERING BASEMENTS.  
100yr LEVEL OF RL25.9 + 0.3m MIN  
FREEBOARD USED.



Plotted: 12 June, 2019 1:05:33 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\ICD\DA\110251DA109.dwg

AMENDMENT	DES	DRN	CKD	APR	DATE
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C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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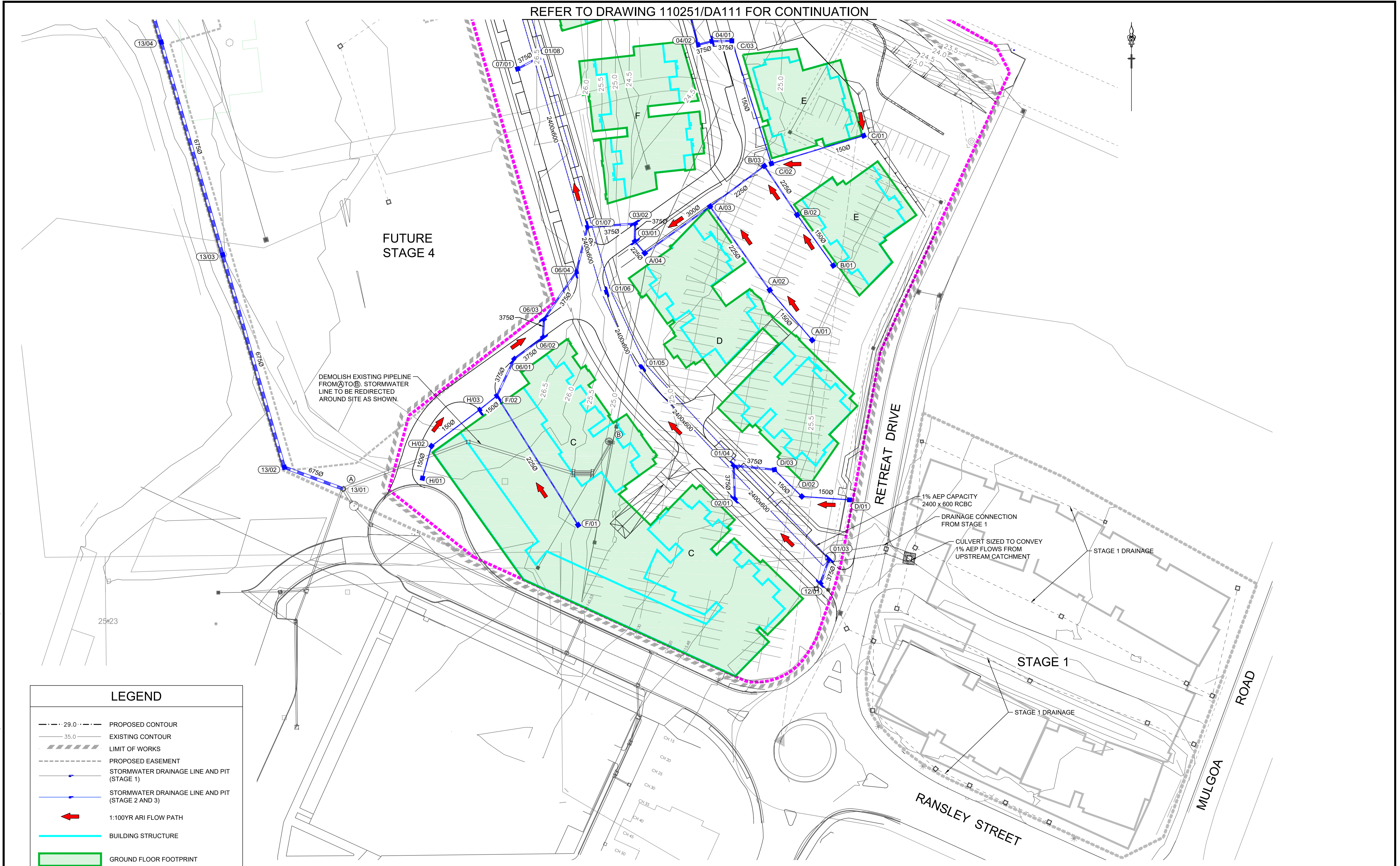
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PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
RAMP DETAILS 1, 2 & 3

PLAN No: 110251/DA109 **D**  
FILE No: 110251DA109  
SHEET SIZE: A1 ORIGINAL



REFER TO DRAWING 110251/DA111 FOR CONTINUATION



**LEGEND**

- 29.0 PROPOSED CONTOUR
- 35.0 EXISTING CONTOUR
- LIMIT OF WORKS
- PROPOSED EASEMENT
- STORMWATER DRAINAGE LINE AND PIT (STAGE 1)
- STORMWATER DRAINAGE LINE AND PIT (STAGE 2 AND 3)
- ← 1:100YR ARI FLOW PATH
- BUILDING STRUCTURE
- GROUND FLOOR FOOTPRINT
- SITE BOUNDARY
- PROPOSED RETAINING WALL



Plotted: 12 June, 2019 1:59:07 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stages 2A, 2B And 3\CD\DA\110251DA110.dwg

AMENDMENT	DES	DRN	CKD	APR	DATE
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D RETAINING WALL EXTENDED	VG	VG	MS	RO	15/03/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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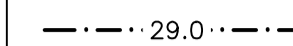
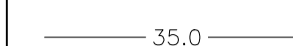


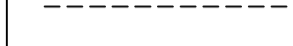






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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 DRAINAGE STRATEGY PLAN  
 SHEET 1

PLAN No: **110251/DA110** E  
 FILE No: 110251DA110  
 SHEET SIZE: A1 ORIGINAL

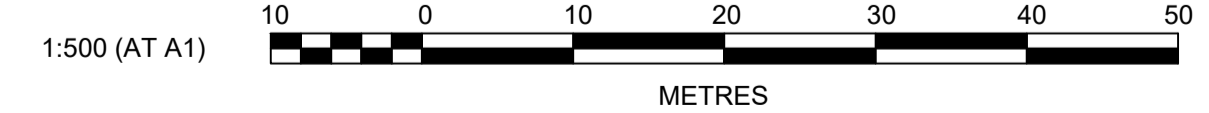


**LEGEND**

-  29.0 PROPOSED CONTOUR
-  35.0 EXISTING CONTOUR
-  LIMIT OF WORKS
-  PROPOSED EASEMENT
-  STORMWATER DRAINAGE LINE AND PIT (STAGE 1)
-  STORMWATER DRAINAGE LINE AND PIT (STAGE 2 AND 3)
-  1:100YR ARI FLOW PATH
-  BUILDING STRUCTURE
-  GROUND FLOOR FOOTPRINT
-  SITE BOUNDARY
-  PROPOSED RETAINING WALL



REFER TO DRAWING 110251/DA110 FOR CONTINUATION



Plotfile: 12 June, 2019 1:59:30 PM, File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A And 3\ICD\DA110251DA111.dwg

AMENDMENT	DES	DRN	CKD	APR	DATE
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D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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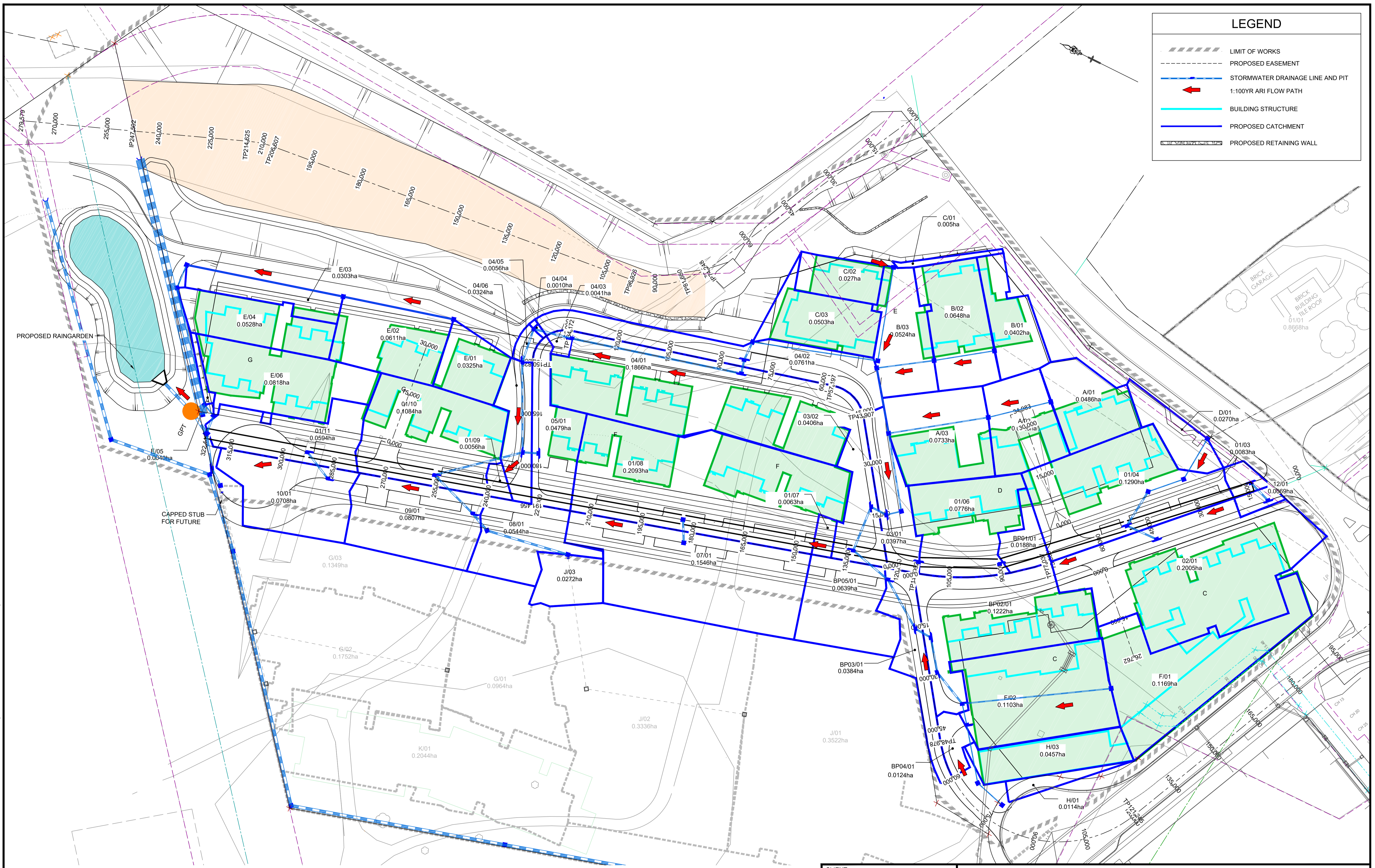
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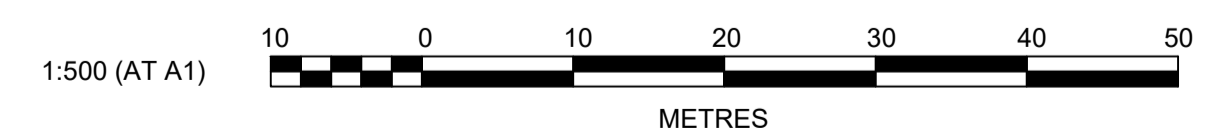
**PANTHERS NORTH PRECINCT**  
 RANSLEY STREET, PENRITH  
 DRAINAGE STRATEGY PLAN  
 SHEET 2

PLAN No: 110251/DA111 **E**  
 FILE No: 110251DA111  
 SHEET SIZE: A1 ORIGINAL





LEGEND	
	LIMIT OF WORKS
	PROPOSED EASEMENT
	STORMWATER DRAINAGE LINE AND PIT
	1:100YR ARI FLOW PATH
	BUILDING STRUCTURE
	PROPOSED CATCHMENT
	PROPOSED RETAINING WALL



Plotted: 12 June, 2019 2:08:41 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA112.dwg

AMENDMENT	DES	DRN	CKD	APR	DATE
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D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 CATCHMENT PLAN

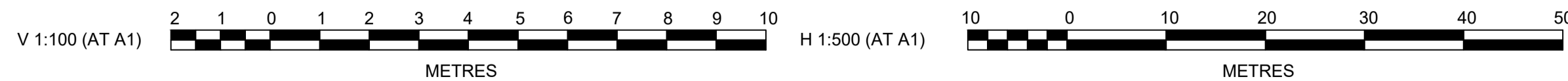
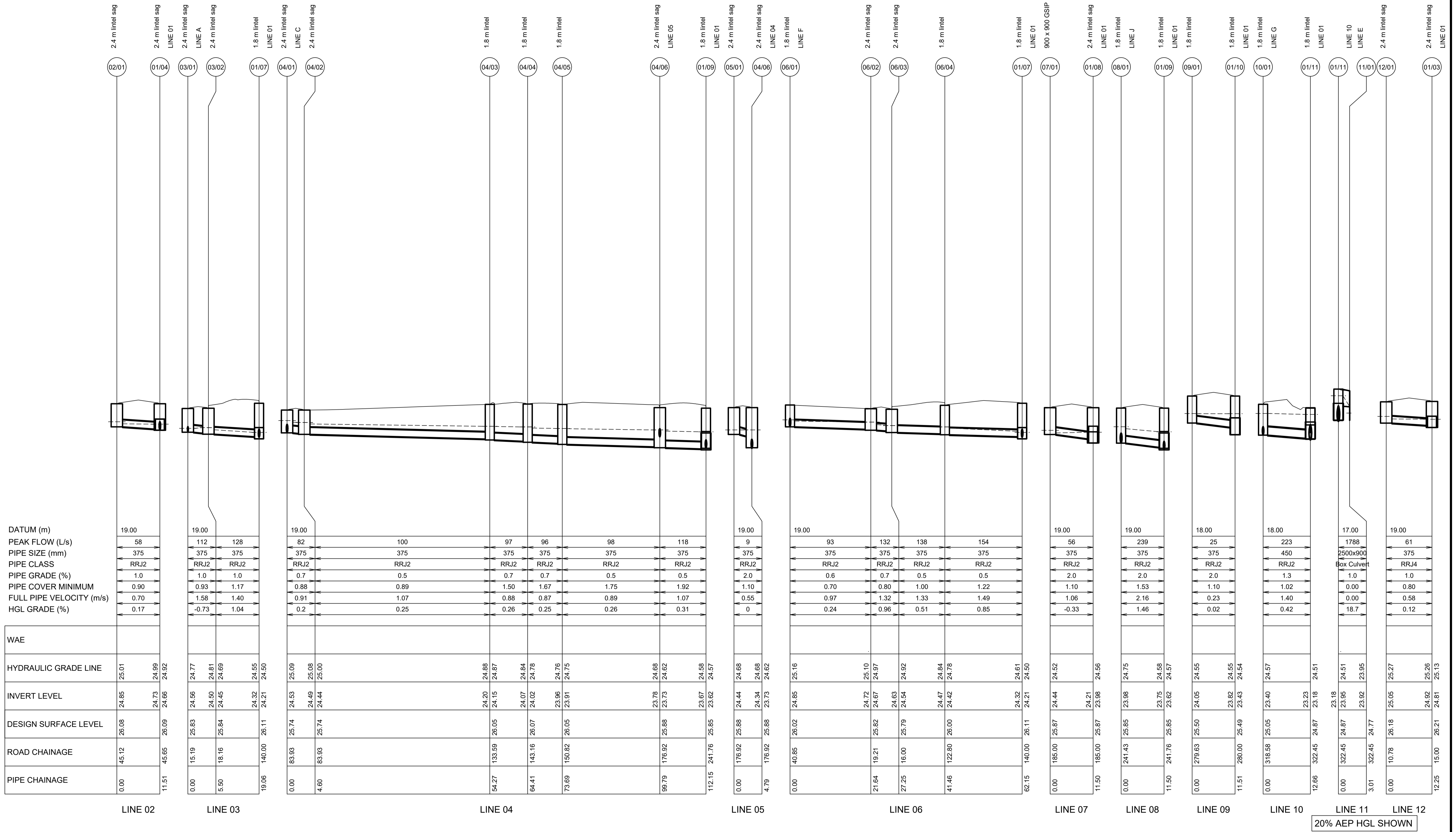
PLAN No: 110251/DA112 E  
 FILE No: 110251DA112  
 SHEET SIZE: A1 ORIGINAL







Plotfile: 12 June, 2019 2:00:21 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA114.dwg



AMENDMENT	DES	DRN	CKD	APR	DATE
D ARCHITECTURAL LAYOUT AMENDED	CC	CC	DH	MS	12/06/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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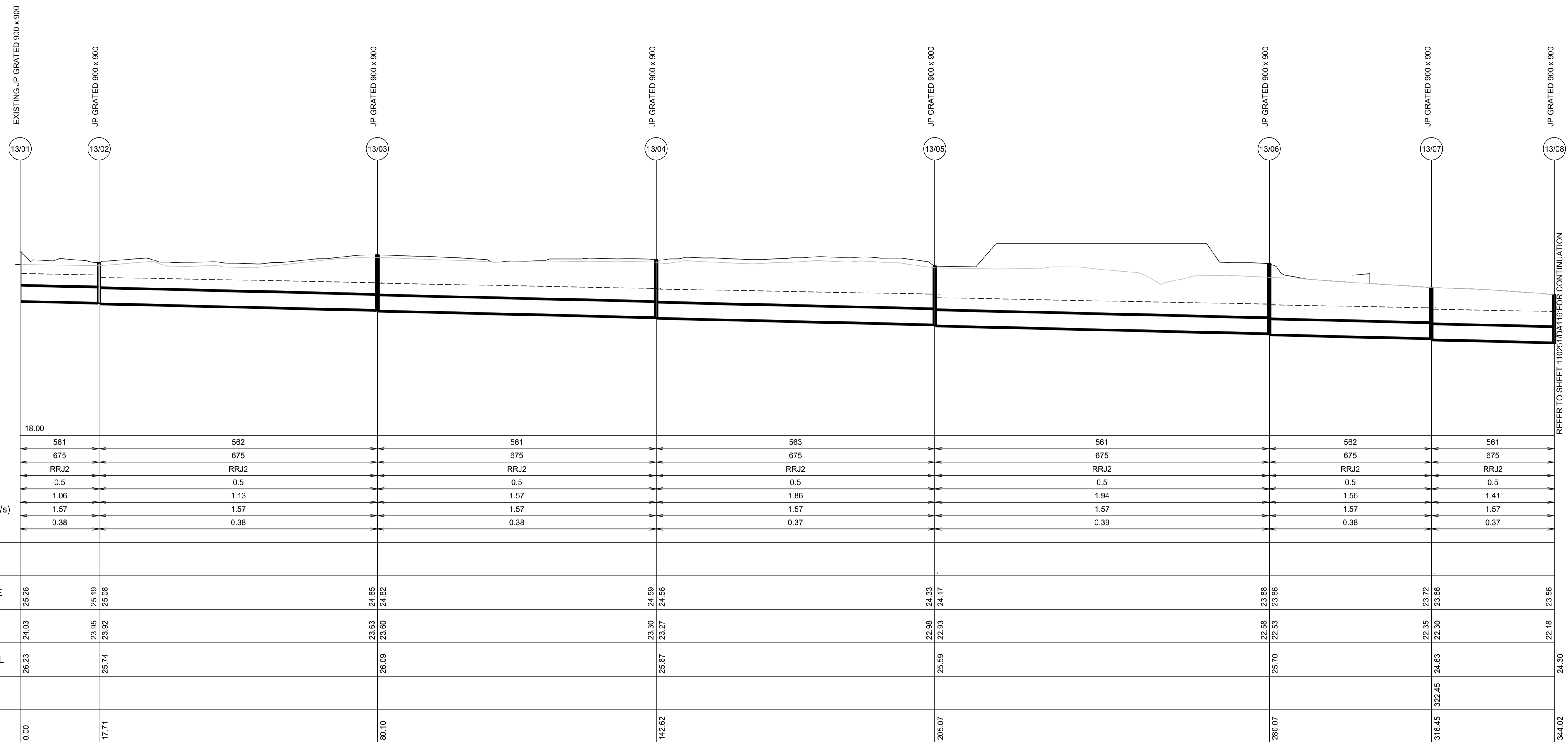
**ISSUED FOR DA APPROVAL  
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**PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
DRAINAGE LONG SECTION (20% AEP)  
SHEET 2**

PLAN No: **110251/DA114** D  
 FILE No: 110251DA114  
 SHEET SIZE: A1 ORIGINAL

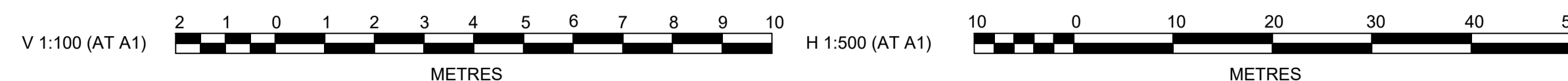


Plotted: 12 June, 2019 2:00:34 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA115.dwg



LINE 13

20% AEP HGL SHOWN



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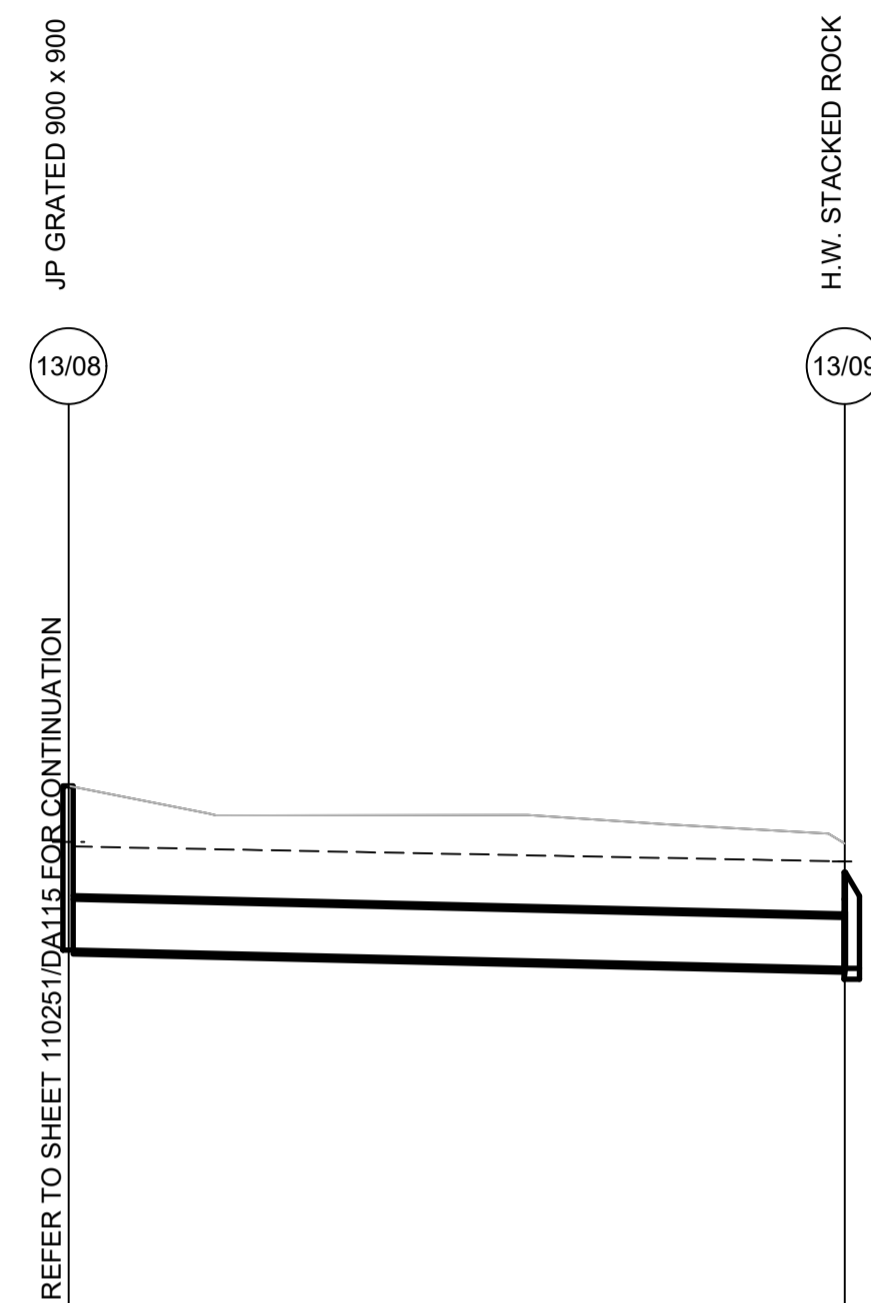
PANTHERS NORTH PRECINCT  
 RANSLEY STREET, PENRITH  
 DRAINAGE LONG SECTION (20% AEP)  
 SHEET 3

PLAN No: 110251/DA115 **B**  
 FILE No: 110251DA115  
 SHEET SIZE: A1 ORIGINAL

AMENDMENT	DES	DRN	CKD	APR	DATE
B ISSUED FOR DA APPROVAL	CC	CC	AM	MS	12/03/19
A DRAINAGE LINE ADDED	CC	CC	AM	MS	08/03/19



Plotted: 12 June, 2019 2:00:51 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA116.dwg

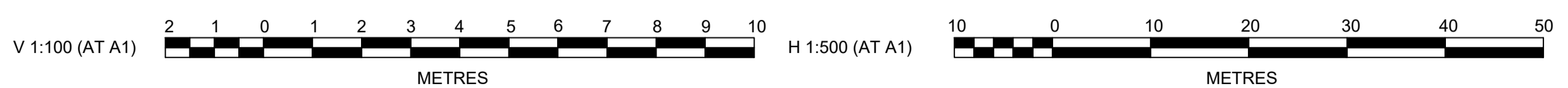


DATUM (m)	17.00
PEAK FLOW (L/s)	562
PIPE SIZE (mm)	675
PIPE CLASS	RRJ2
PIPE GRADE (%)	0.5
PIPE COVER MINIMUM	0.94
FULL PIPE VELOCITY (m/s)	1.57
HGL GRADE (%)	0.39

WAE		
HYDRAULIC GRADE LINE	23.56 23.50	23.30
INVERT LEVEL	22.18 22.13	21.88
DESIGN SURFACE LEVEL	24.30	22.63
ROAD CHAINAGE		
PIPE CHAINAGE	344.02	395.35

LINE 13

20% AEP HGL SHOWN



B	ISSUED FOR DA APPROVAL	CC	CC	AM	MS 12/03/19
A	DRAINAGE LINE ADDED	CC	CC	AM	MS 08/03/19
	AMENDMENT	DES	DRN	CKD	APR DATE

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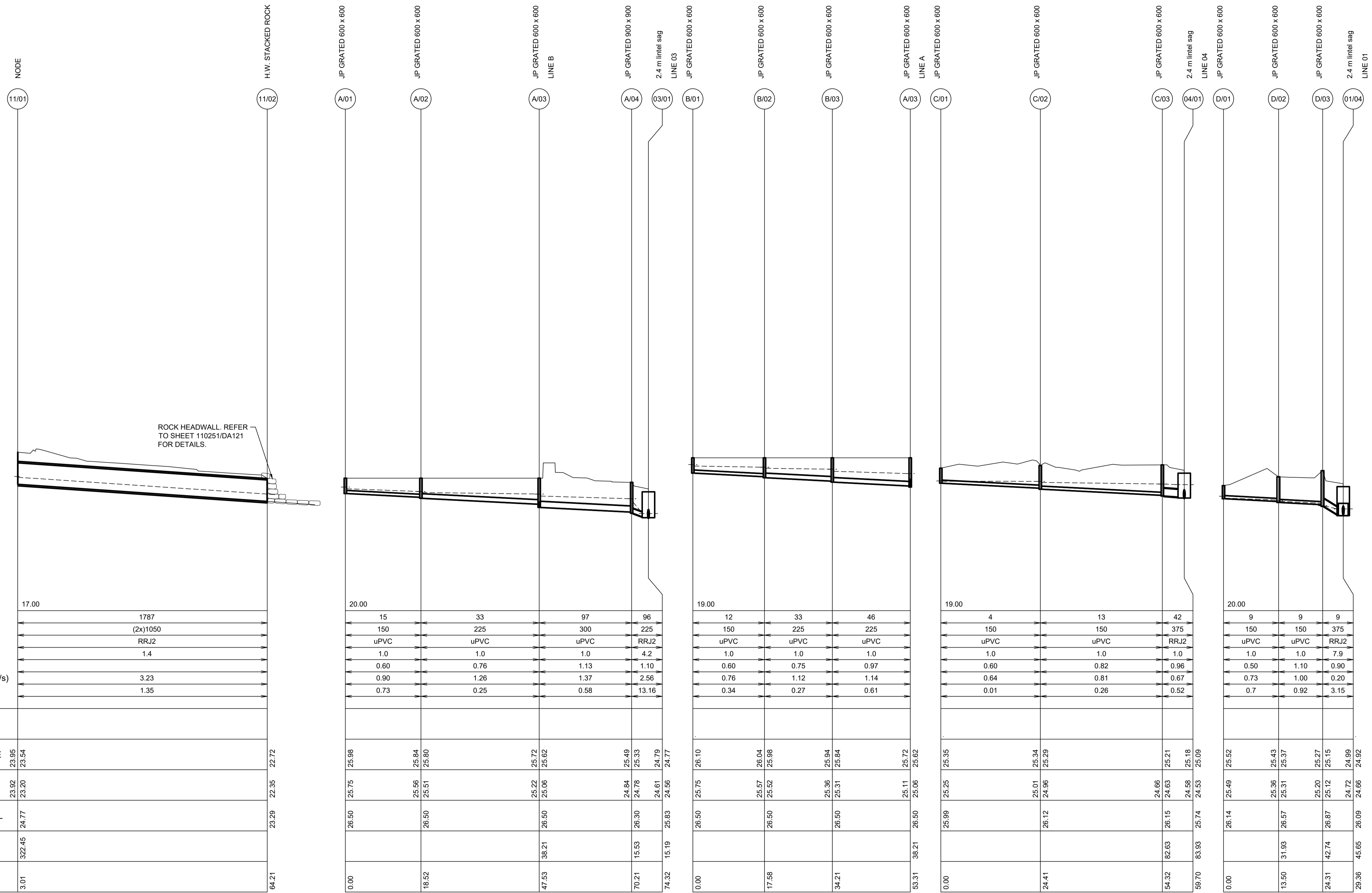
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PANTHERS NORTH PRECINCT  
 RANSLEY STREET, PENRITH  
 DRAINAGE LONG SECTION (20% AEP)  
 SHEET 4

PLAN No: 110251/DA116 **B**  
 FILE No: 110251DA116  
 SHEET SIZE: A1 ORIGINAL



Plotfile: 12 June, 2019 2:01:05 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stages 2A, 2B And 3\CD\DA\110251DA117.dwg



DATUM (m)	17.00
PEAK FLOW (L/s)	1787
PIPE SIZE (mm)	(2x)1050
PIPE CLASS	RRJ2
PIPE GRADE (%)	1.4
PIPE COVER MINIMUM	0.60
FULL PIPE VELOCITY (m/s)	3.23
HGL GRADE (%)	1.35

WAE	
HYDRAULIC GRADE LINE	23.95 23.54
INVERT LEVEL	23.92 23.20
DESIGN SURFACE LEVEL	24.77
ROAD CHAINAGE	322.45
PIPE CHAINAGE	3.01

DATUM (m)	20.00
PEAK FLOW (L/s)	15 33 97 96
PIPE SIZE (mm)	150 225 300 225
PIPE CLASS	uPVC uPVC uPVC RRJ2
PIPE GRADE (%)	1.0 1.0 1.0 4.2
PIPE COVER MINIMUM	0.60 0.76 1.13 1.10
FULL PIPE VELOCITY (m/s)	0.90 1.26 1.37 2.56
HGL GRADE (%)	0.73 0.25 0.58 13.16

HYDRAULIC GRADE LINE	25.98 25.84 25.80
INVERT LEVEL	25.75 25.56 25.51
DESIGN SURFACE LEVEL	26.50 26.50
ROAD CHAINAGE	47.53 36.21 26.50
PIPE CHAINAGE	0.00 18.52

DATUM (m)	19.00
PEAK FLOW (L/s)	12 33 46
PIPE SIZE (mm)	150 225 225
PIPE CLASS	uPVC uPVC uPVC
PIPE GRADE (%)	1.0 1.0 1.0
PIPE COVER MINIMUM	0.60 0.75 0.97
FULL PIPE VELOCITY (m/s)	0.76 1.12 1.14
HGL GRADE (%)	0.34 0.27 0.61

HYDRAULIC GRADE LINE	26.10 26.04 25.98
INVERT LEVEL	25.75 25.57 25.52
DESIGN SURFACE LEVEL	26.50 26.50
ROAD CHAINAGE	53.31 38.21 26.50
PIPE CHAINAGE	0.00 17.56

DATUM (m)	19.00
PEAK FLOW (L/s)	4 13 42
PIPE SIZE (mm)	150 150 375
PIPE CLASS	uPVC uPVC RRJ2
PIPE GRADE (%)	1.0 1.0 1.0
PIPE COVER MINIMUM	0.60 0.82 0.96
FULL PIPE VELOCITY (m/s)	0.64 0.81 0.67
HGL GRADE (%)	0.01 0.26 0.52

HYDRAULIC GRADE LINE	25.35 25.34 25.29
INVERT LEVEL	25.25 25.01 24.96
DESIGN SURFACE LEVEL	26.12 26.12
ROAD CHAINAGE	54.32 82.63 24.66
PIPE CHAINAGE	0.00 24.41

DATUM (m)	20.00
PEAK FLOW (L/s)	9 9 9
PIPE SIZE (mm)	150 150 375
PIPE CLASS	uPVC uPVC RRJ2
PIPE GRADE (%)	1.0 1.0 7.9
PIPE COVER MINIMUM	0.50 1.10 0.90
FULL PIPE VELOCITY (m/s)	0.73 1.00 0.20
HGL GRADE (%)	0.7 0.92 3.15

HYDRAULIC GRADE LINE	25.52 25.43 25.37
INVERT LEVEL	25.49 25.36 25.31
DESIGN SURFACE LEVEL	26.14 26.57 26.57
ROAD CHAINAGE	13.50 31.93 26.87
PIPE CHAINAGE	0.00 13.50

LINE 11

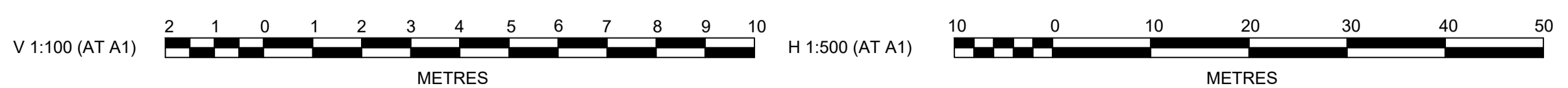
LINE A

LINE B

LINE C

LINE D

20% AEP HGL SHOWN




AMENDMENT	DES	DRN	CKD	APR	DATE
D ARCHITECTURAL LAYOUT AMENDED	CC	NAF	DH	MS	12/06/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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CLIENT:  
  
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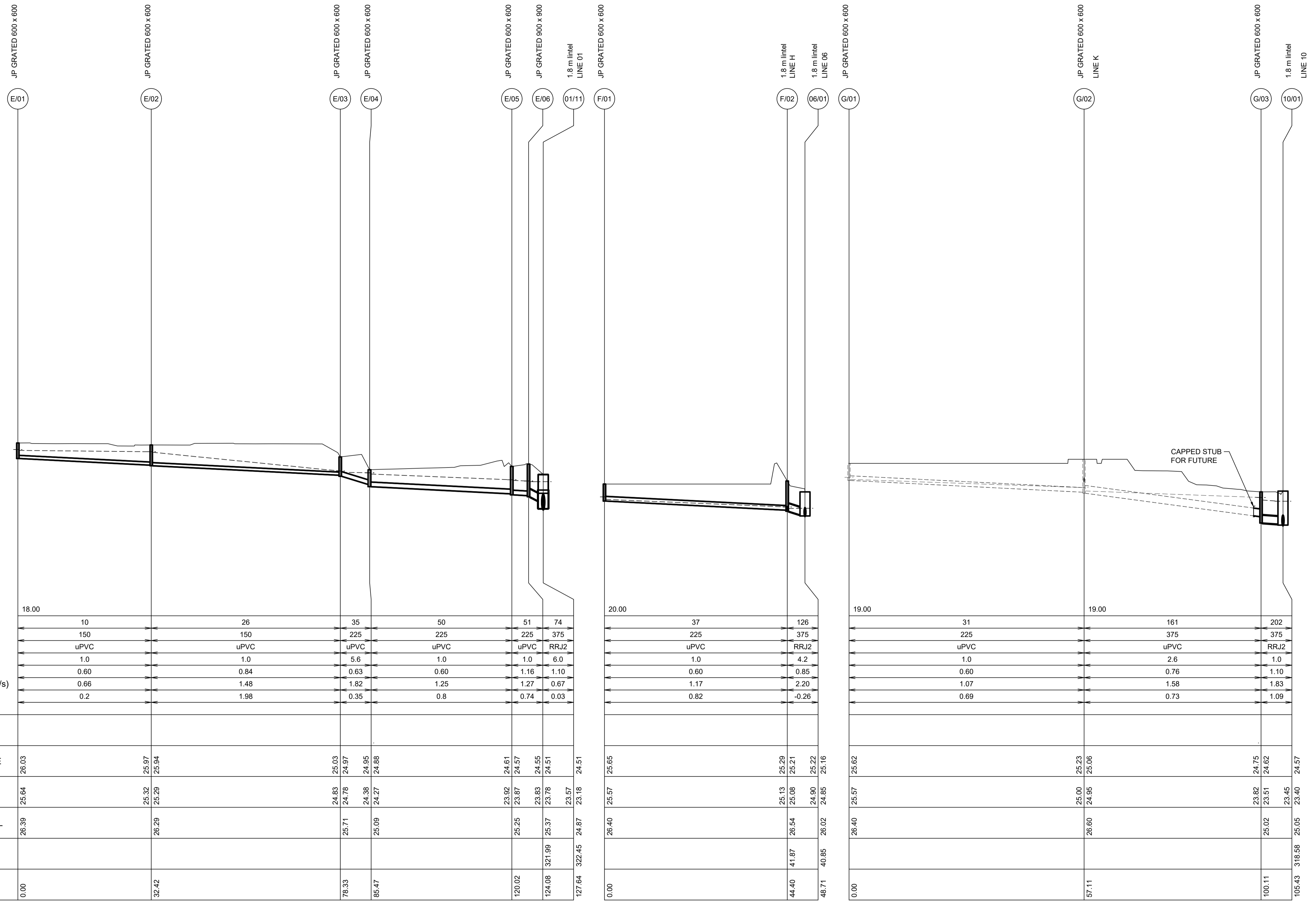
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PANTHERS NORTH PRECINCT  
 RANSLEY STREET, PENRITH  
 DRAINAGE LONG SECTION (20% AEP)  
 SHEET 5

PLAN No: 110251/DA117 **D**  
 FILE No: 110251DA117  
 SHEET SIZE: A1 ORIGINAL



Plotted: 12 June, 2019 2:01:26 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A And 3\CD\DA\110251DA118.dwg



DATUM (m)	18.00
PEAK FLOW (L/s)	10
PIPE SIZE (mm)	150
PIPE CLASS	uPVC
PIPE GRADE (%)	1.0
PIPE COVER MINIMUM	0.60
FULL PIPE VELOCITY (m/s)	0.66
HGL GRADE (%)	0.2

WAE	
HYDRAULIC GRADE LINE	26.03
INVERT LEVEL	25.64
DESIGN SURFACE LEVEL	26.39
ROAD CHAINAGE	
PIPE CHAINAGE	0.00

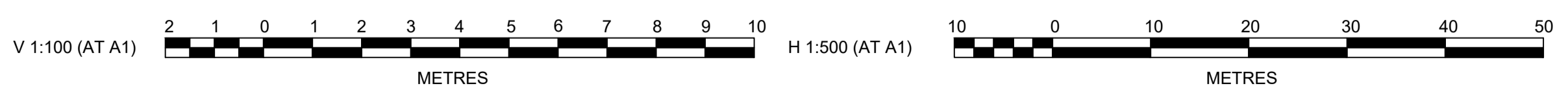
DATUM (m)	20.00
PEAK FLOW (L/s)	37
PIPE SIZE (mm)	225
PIPE CLASS	uPVC
PIPE GRADE (%)	1.0
PIPE COVER MINIMUM	0.60
FULL PIPE VELOCITY (m/s)	1.17
HGL GRADE (%)	0.82

HYDRAULIC GRADE LINE	25.65
INVERT LEVEL	25.57
DESIGN SURFACE LEVEL	26.40
ROAD CHAINAGE	
PIPE CHAINAGE	0.00

DATUM (m)	19.00
PEAK FLOW (L/s)	31
PIPE SIZE (mm)	225
PIPE CLASS	uPVC
PIPE GRADE (%)	1.0
PIPE COVER MINIMUM	0.60
FULL PIPE VELOCITY (m/s)	1.07
HGL GRADE (%)	0.69

HYDRAULIC GRADE LINE	25.62
INVERT LEVEL	25.57
DESIGN SURFACE LEVEL	26.40
ROAD CHAINAGE	
PIPE CHAINAGE	0.00

20% AEP HGL SHOWN



AMENDMENT	DES	DRN	CKD	APR	DATE
C					12/03/19
B					08/03/19
A					25/05/18

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**PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
DRAINAGE LONG SECTION (20% AEP)  
SHEET 6**

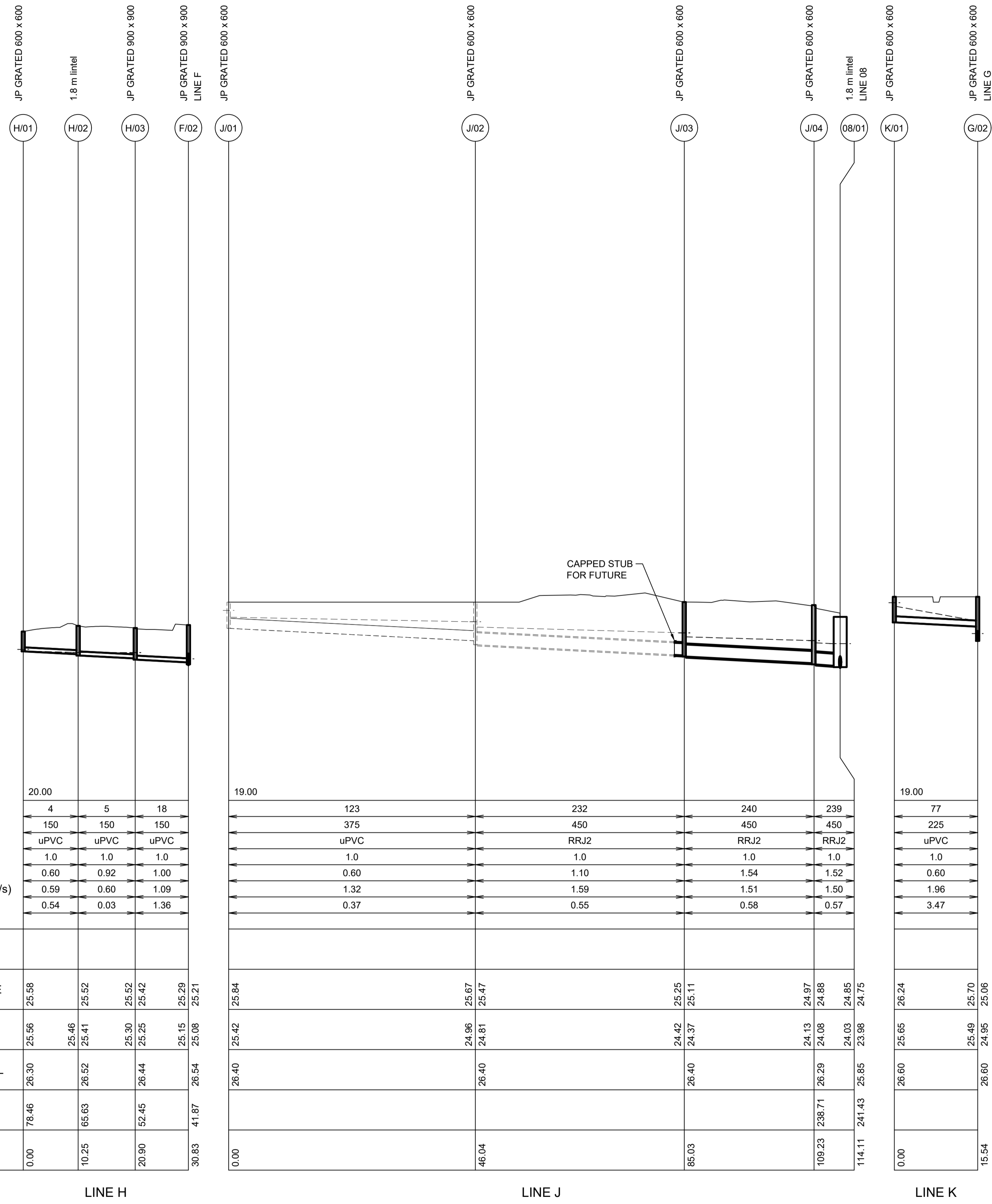
PLAN No: **110251/DA118** C

FILE No: 110251DA118

SHEET SIZE: A1 ORIGINAL



Plotfile: 12 June, 2019 2:01:40 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA119.dwg



DATUM (m)	20.00		
PEAK FLOW (L/s)	4	5	18
PIPE SIZE (mm)	150	150	150
PIPE CLASS	uPVC	uPVC	uPVC
PIPE GRADE (%)	1.0	1.0	1.0
PIPE COVER MINIMUM	0.60	0.92	1.00
FULL PIPE VELOCITY (m/s)	0.59	0.60	1.09
HGL GRADE (%)	0.54	0.03	1.36

WAE			
HYDRAULIC GRADE LINE	25.58	25.52	25.42
INVERT LEVEL	25.56	25.46	25.30
DESIGN SURFACE LEVEL	26.30	26.62	26.44
ROAD CHAINAGE	78.46	65.63	52.45
PIPE CHAINAGE	0.00	10.25	20.90

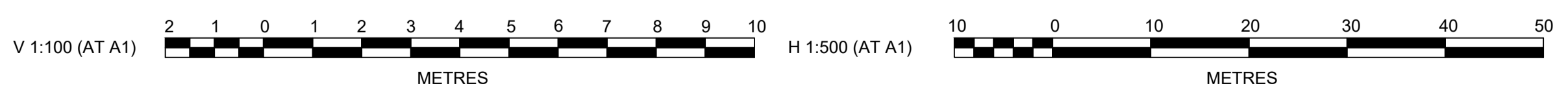
DATUM (m)	19.00				
PEAK FLOW (L/s)		123	232	240	239
PIPE SIZE (mm)		375	450	450	450
PIPE CLASS		uPVC	RRJ2	RRJ2	RRJ2
PIPE GRADE (%)		1.0	1.0	1.0	1.0
PIPE COVER MINIMUM		0.60	1.10	1.54	1.52
FULL PIPE VELOCITY (m/s)		1.32	1.59	1.51	1.50
HGL GRADE (%)		0.37	0.55	0.58	0.57

WAE					
HYDRAULIC GRADE LINE	25.84	25.67	25.42	25.25	24.97
INVERT LEVEL	25.42	24.96	24.37	24.13	24.08
DESIGN SURFACE LEVEL	26.40	26.40	26.40	26.29	26.29
ROAD CHAINAGE				238.71	
PIPE CHAINAGE	0.00	46.04	85.03	109.23	114.11

DATUM (m)	19.00	
PEAK FLOW (L/s)	77	
PIPE SIZE (mm)	225	
PIPE CLASS	uPVC	
PIPE GRADE (%)	1.0	
PIPE COVER MINIMUM	0.60	
FULL PIPE VELOCITY (m/s)	1.96	
HGL GRADE (%)	3.47	

WAE	
HYDRAULIC GRADE LINE	26.24
INVERT LEVEL	25.65
DESIGN SURFACE LEVEL	26.60
ROAD CHAINAGE	
PIPE CHAINAGE	0.00

20% AEP HGL SHOWN



C	ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B	ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A	ISSUED FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18
	AMENDMENT	DES	DRN	CKD	APR	DATE

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PANTHERS NORTH PRECINCT  
RANSLEY STREET, PENRITH  
DRAINAGE LONG SECTION (20% AEP)

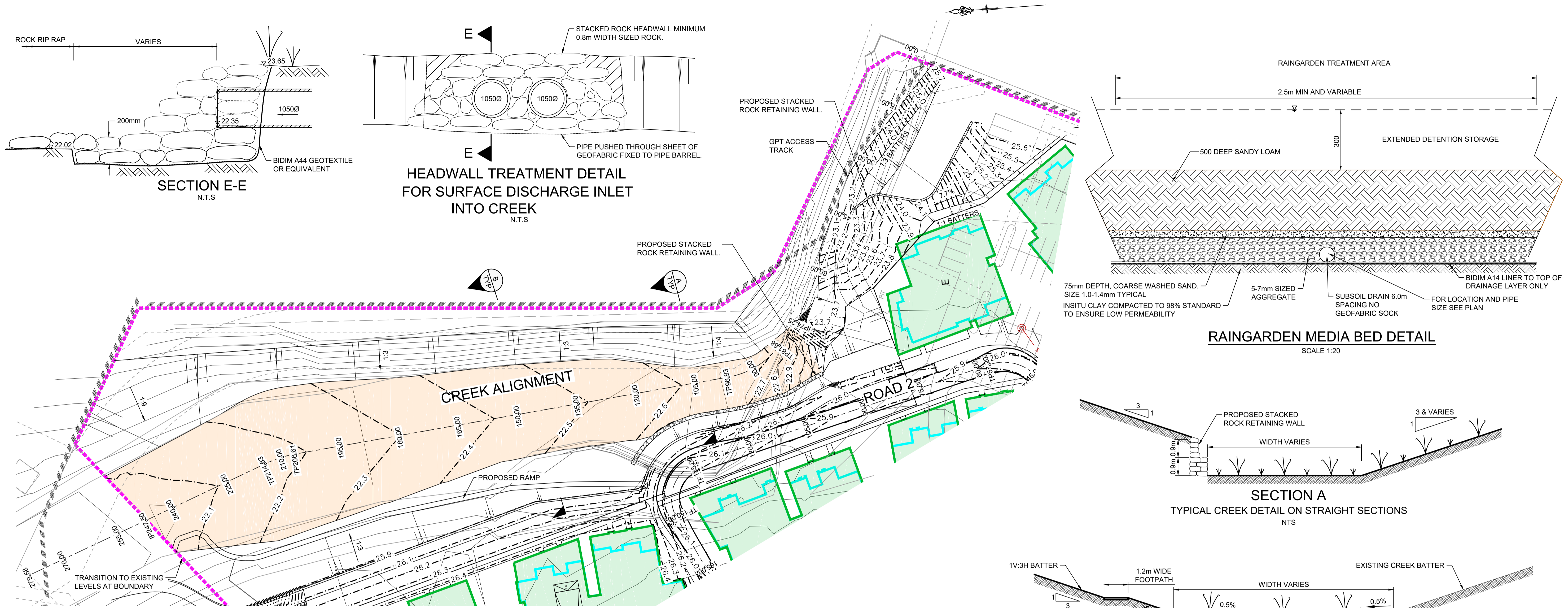
PLAN No: 110251/DA119 **C**  
FILE No: 110251DA119  
SHEET SIZE: A1 ORIGINAL







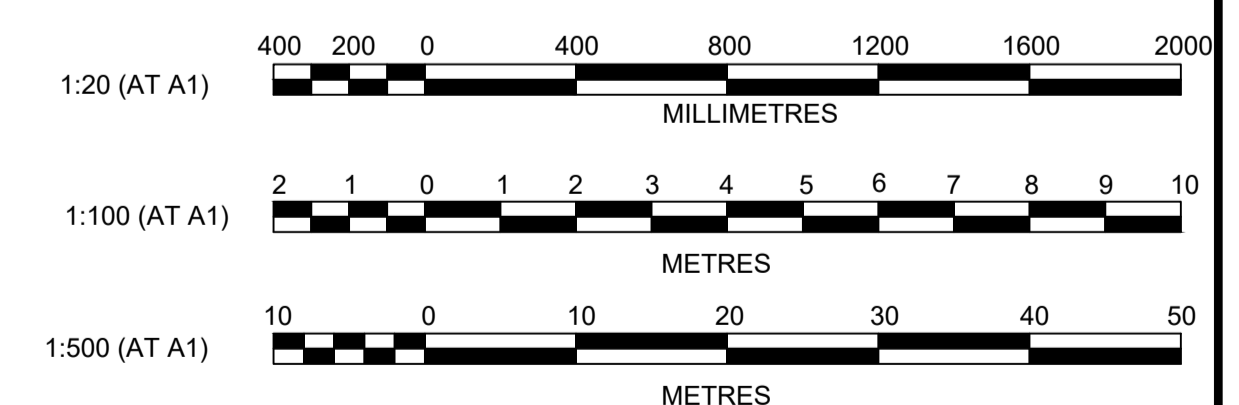
Plotted: 12 June, 2019 2:02:14 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\ICD\DA\110251DA121.dwg



CHAINAGE	0.000	6.430	12.440	18.038	30.000	42.030	47.090	58.200	65.390	70.390	74.248	81.680	90.000	96.926	105.000	120.000	135.000	150.000	165.000	180.000	195.000	206.607	214.625	225.000	240.000	247.489	255.000	270.000	279.579
DESIGN LINE GRADING		23.646	23.747	23.908	23.755	23.541	23.479	23.240	22.905	22.784	22.746	22.714	22.679	22.650	22.616	22.553	22.490	22.427	22.364	22.301	22.237	22.189	22.155	22.111	22.048	22.016	21.973	21.885	21.916
EXISTING SURFACE		23.646	23.747	23.908	23.755	23.541	23.479	23.240	22.905	22.784	22.746	22.714	22.679	22.650	22.616	22.553	22.490	22.427	22.364	22.301	22.237	22.189	22.155	22.111	22.048	22.016	21.973	21.885	21.916

**LONGITUDINAL SECTION CREEK ALIGNMENT**  
 HORIZONTAL SCALE 1:500  
 VERTICAL SCALE 1:100

NOTE:  
 REFER TO LANDSCAPE ARCHITECTS PLANS BY OCULUS FOR FURTHER LANDSCAPING DETAILS WITHIN CREEK AND RAINGARDEN



AMENDMENT	DES	DRN	CKD	APR	DATE
E	CC	NAF	DH	MS	12/06/19
D	VG	VG	MS	RO	15/03/19
C	DG/CC	CC	AM	MS	12/03/19
B	DG/CC	CC	AM	MS	08/03/19
A	DG	NAF	AM	MS	25/05/18

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 PANTHERS NORTH PRECINCT  
 RANSLEY STREET, PENRITH  
 CHANNEL WORKS  
 PLAN No: 110251/DA121 **E**  
 FILE No: 110251DA121  
 SHEET SIZE: A1 ORIGINAL



Plotted: 12 June, 2019 2:02:31 PM. File Name: J:\110251 - Panthers North Precinct\05 - Stage 2A 2B And 3\CD\DA\110251DA122.dwg

### MEDIA MATERIAL IN BIO FILTRATION

DEFINITIONS - AS1726-1993

SEDIMENT	SIZE(mm)	
BOULDERS	>200	
COBBLES	63-200	
GRAVELS	COURSE	20-63
	MEDIUM	6-20
	FINE	2.36-6
SANDS	COURSE	0.6-2.36
	MEDIUM	0.2-0.6
	FINE	0.075-0.2
SILTS	COURSE	0.02-0.075
	MEDIUM	0.006-0.02
	FINE	0.002-0.006
CLAYS	COLLOIDAL	<0.002

EC dS/m		
TOLERANCE	RATING	dS/m
Sensitive	Very Low	<0.95
Moderately Sensitive	Low	0.95-1.9
Moderately Tolerant	Medium	1.9-4.5
Tolerant	High	4.5-7.7
Very Tolerant	Very High	7.7-12.2
Too Saline	Extreme	>12.2

Preferred Mix Percentage of Mix	
Fine Gravel	<3%
Course Sand	7-10%
Medium Sand	40-60%
Fine Sand	10-30%
Very Fine Sand	5-30%
Clay and Silt	<3%
Organic Matter	<5%

IN REFERENCE TO ABOVE MIX TABLE, THE FOLLOWING PERFORMANCE PARAMETERS SHALL BE APPLIED:

- HYDRAULIC CONDUCTIVITY  $\geq 100\text{mm/hr}$ 
  - DETERMINED BY THE McINTYRE AND JAKOBSEN TEST METHOD (1993) AND CARRIED OUT BY AN INDEPENDENT NATA REGISTERED SOIL LABORATORY &/OR THE PREDICTED AND ACTUAL VALUES USING USGA OR ASTM F1815-06 STANDARD TESTING PROCEDURES
- ELECTRICAL CONDUCTIVITY  $<1.2\text{dS/m}$
- PHOSPHORUS CONCENTRATION  $<20\text{mg/kg}$  FOR P SENSITIVE PLANTS (FOR VERY P SENSITIVE PLANTS USED:  $P<5\text{mg/kg}$ )
- NITROGEN DRAWDOWN  $>0.5$
- CIRCUMNEUTRAL pH
- SANDY LOAM TO LOAMY SAND TEXTURE
- GYPSUM APPLIED AT  $2\text{kg/cu.m}$
- BULK DENSITY TO BE BETWEEN  $1.1\text{ g/cum}$  &  $1.8\text{ g/cum}$
- FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 25mm DIAMETER
- FREE OF BRUSH OR SEED FROM WEEDS

BENEDICT SAND & GRAVEL BIO-RETENTION FILTER MEDIA M165 GENERALLY COMPLIES WITH THIS SPECIFICATION AND IS CONSIDERED "FIT FOR PURPOSE" AS A SUITABLE FILTER MEDIA FOR USE WITHIN A BIO-FILTRATION STORMWATER TREATMENT PRACTICE.

IMMEDIATELY PRIOR TO DELIVERY TO THE SITE THE MEDIA SHALL BE SUBJECTED TO A PARTICLE SIZE DISTRIBUTION TEST IN ACCORDANCE WITH AS1141 - SAMPLING AND TESTING AGGREGATES, TO CONFIRM COMPLIANCE WITH THE ABOVE PERCENTAGES OF SAND, SILT, CLAY AND ORGANIC MATTER. IF COMPLIANCE IS NOT ACHIEVED THEN THE MEDIA SHALL BE SUBJECTED TO A FURTHER HYDRAULIC CONDUCTIVITY TEST AS DESCRIBED EARLIER. DELIVERY SHALL NOT PROCEED UNTIL THE SUPERINTENDENT IS SATISFIED THAT THE MEDIA ACHIEVES THE DESIRED HYDRAULIC CONDUCTIVITY STANDARD.

PLACEMENT:  
THE MEDIA SHALL BE PLACED IN 300mm LIFTS AND LOOSELY COMPACTED.

### 1. Site Data Sheet

Site Name: Penrith Panthers  
 Site Location: Panthers  
 Precinct: North Precinct Stgaes 2 and 3  
 Description of Site: Bulk Earthworks

Site area	Site			Remarks
Total catchment area (ha)	1	2	3	
Disturbed catchment area (ha)	5.3			
	4.4			

Soil analysis					
% sand (fraction 0.02 to 2.00 mm)	33				Soil texture should be assessed through mechanical dispersion only. Dispersing agents (e.g. Calgon) should not be used
% silt (fraction 0.002 to 0.02 mm)	33				
% clay (fraction finer than 0.002 mm)	33				
Dispersion percentage	10.0				E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	4.95				See Section 6.3.3(e)
Soil Texture Group	F				See Section 6.3.3(c), (d) and (e)

Rainfall data					
Design rainfall depth (days)	5				See Sections 6.3.4 (d) and (e)
Design rainfall depth (percentile)	75				See Sections 6.3.4 (f) and (g)
x-day, y-percentile rainfall event	19				See Section 6.3.4 (h)
Rainfall intensity: 2-year, 6-hour storm	10.1				See IFD chart for the site

RUSLE Factors					
Rainfall erosivity (R-factor)	2250				Automatic calculation from above data
Soil erodibility (K-factor)	0.041				
Slope length (m)	80				
Slope gradient (%)	1				RUSLE data can be obtained from Appendixes A, B and C
Length/gradients (LS-factor)	1.11				
Erosion control practices (P-factor)	13				
Ground cover (C-factor)	1				

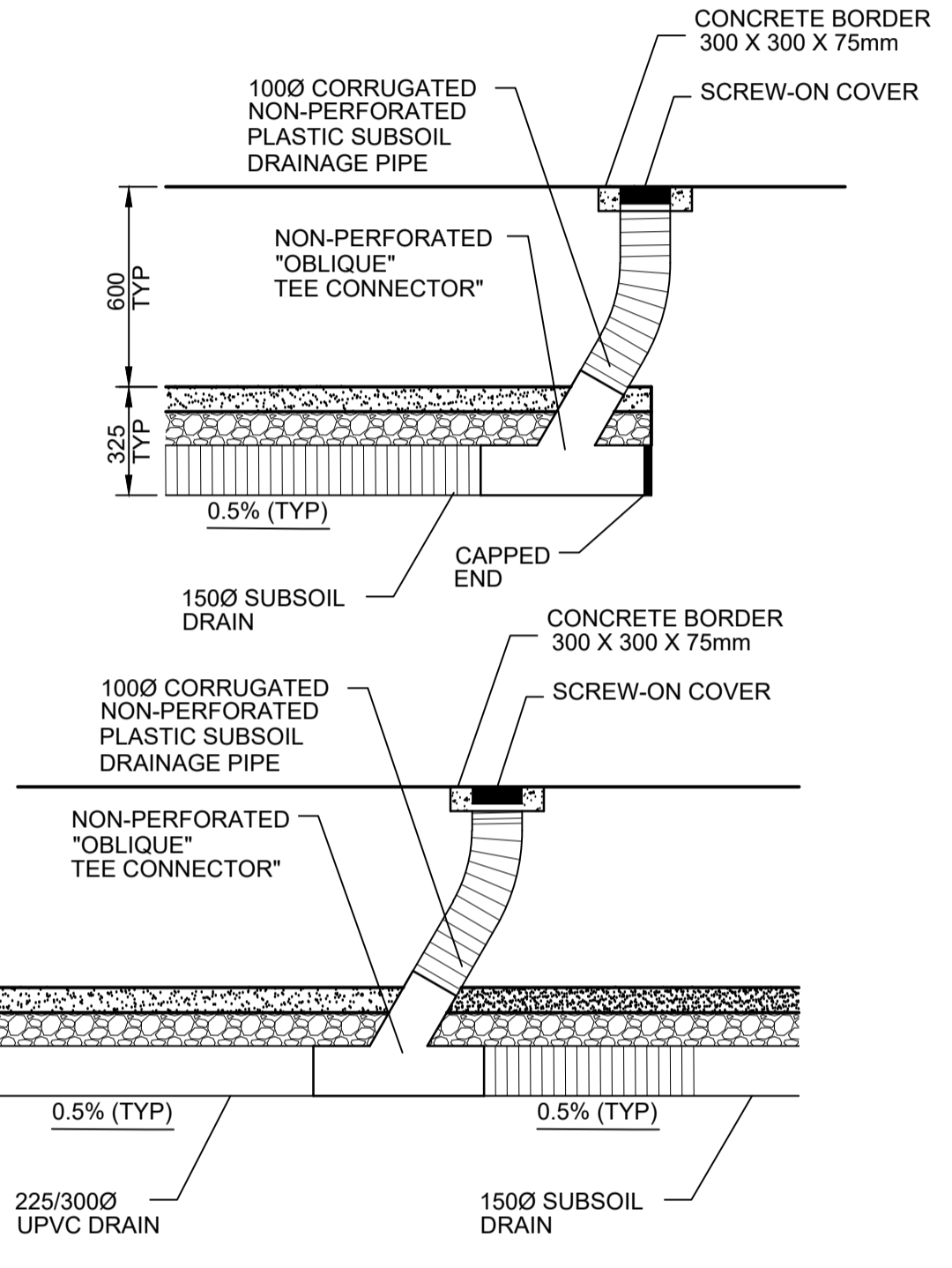
Calculations					
Soil loss (t/ha/yr)	133				
Soil Loss Class	1				See Section 4.4.2(b)
Soil loss (m <sup>3</sup> /ha/yr)	102				
Sediment basin storage volume, m <sup>3</sup>	77				See Sections 6.3.4(i) and 6.3.5 (e)

### Total Basin Volume

Site	C <sub>r</sub>	R <sub>e-day, yr/site</sub>	Total catchment area (ha)	Settling zone volume (m <sup>3</sup> )	Sediment storage volume (m <sup>3</sup> )	Total basin volume (m <sup>3</sup> )
1	0.50	19	5.3	503.5	77	580.5
2	0.50					
3	0.50					
	0.50					
	0.50					
	0.50					

**NOTE - TREATMENT OF SOILS**

- COMPACT EXISTING CLAY SUB-GRADE AND WALLS TO 98% STANDARD TO ENSURE LOW PERMEABILITY.
- ANY UNSUITABLE (POROUS) MATERIAL ENCOUNTERED DURING RAINGARDEN EXCAVATIONS SHALL BE OVER EXCAVATED MIN 300mm AND BACKFILLED WITH SELECTED CLAY AND COMPACTED TO 98% STANDARD COMPACTION.



### RODDING EYE/SUBSOIL DETAIL

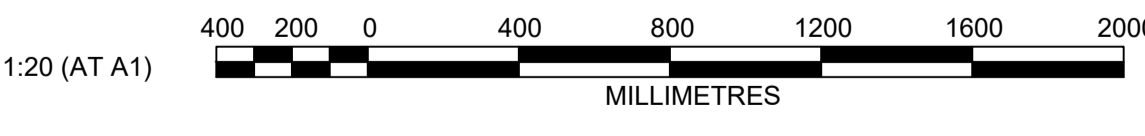
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**DEVELOPMENT STAGES OF RAINGARDEN & DETENTION BASIN**

STAGE 1: DURING ROAD CONSTRUCTION, THE RAINGARDEN AND DETENTION BASIN TO BE FORMED IN EARTHWORKS AND USED AS TEMPORARY SEDIMENTATION BASIN. MEDIA BED AND SUBSOIL DRAINAGE NOT INSTALLED AT THIS STAGE.

\*STAGE 2: POST-ROAD CONSTRUCTION, WHERE DELAYS ARE ANTICIPATED BETWEEN RESIDENTIAL CONSTRUCTION AND FINAL COMMISSIONING OF RAINGARDEN/DETENTION BASIN, AN INTERIM STRATEGY IS REQUIRED. THE EXISTING SEDIMENTATION BASIN BASE AND BATTERS SHOULD BE TURFED AND DEWATERING RISER INSTALLED. THE DETENTION FUNCTION OF BASIN WILL BE OPERATIONAL.

\*\*STAGE 3: WHEN ALL UPSTREAM HOUSE BUILDING ACTIVITIES HAVE BEEN SUBSTANTIALLY COMPLETED (APPROX. 80%) THE RAINGARDEN TO BE FULLY COMMISSIONED, (TURF & SILT REMOVED AND FINAL PLANTINGS INSTALLED)



C	ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B	ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A	ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18
	AMENDMENT	DES	DRN	CKD	APR	DATE

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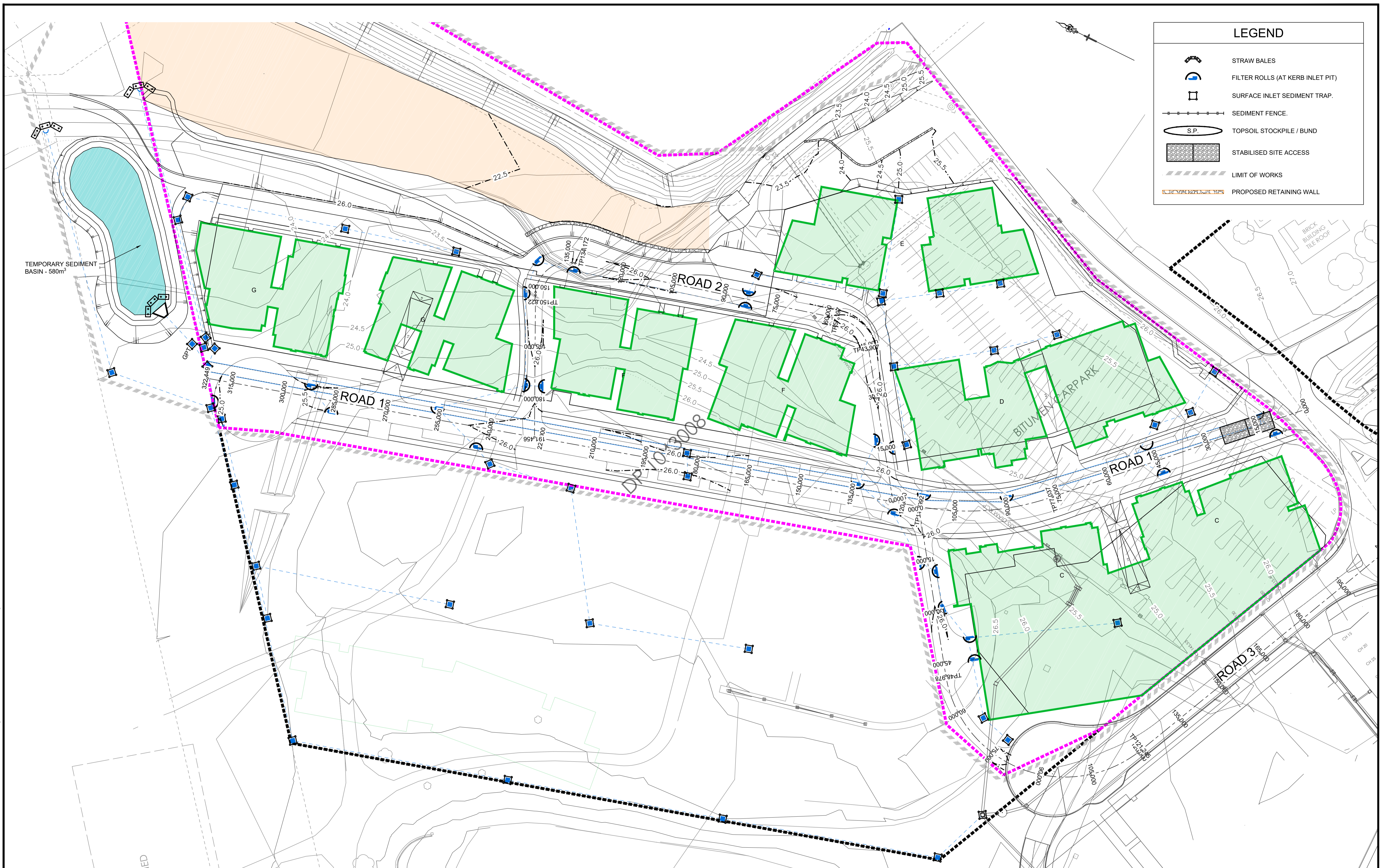
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**PANTHERS NORTH PRECINCT**  
RANSLEY STREET, PENRITH  
SOIL & WATER MANAGEMENT NOTES

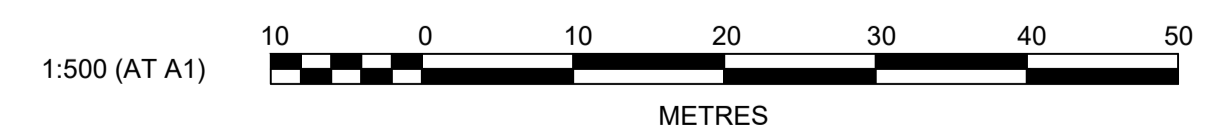
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LEGEND	
	STRAW BALES
	FILTER ROLLS (AT KERB INLET PIT)
	SURFACE INLET SEDIMENT TRAP.
	SEDIMENT FENCE.
	TOPSOIL STOCKPILE / BUND
	STABILISED SITE ACCESS
	LIMIT OF WORKS
	PROPOSED RETAINING WALL



AMENDMENT	DES	DRN	CKD	APR	DATE
E ARCHITECTURAL LAYOUT AMENDED	CC	NAF	DH	MS	12/06/19
D RETAINING WALL EXTENDED	VG	VG	MS	RO	15/03/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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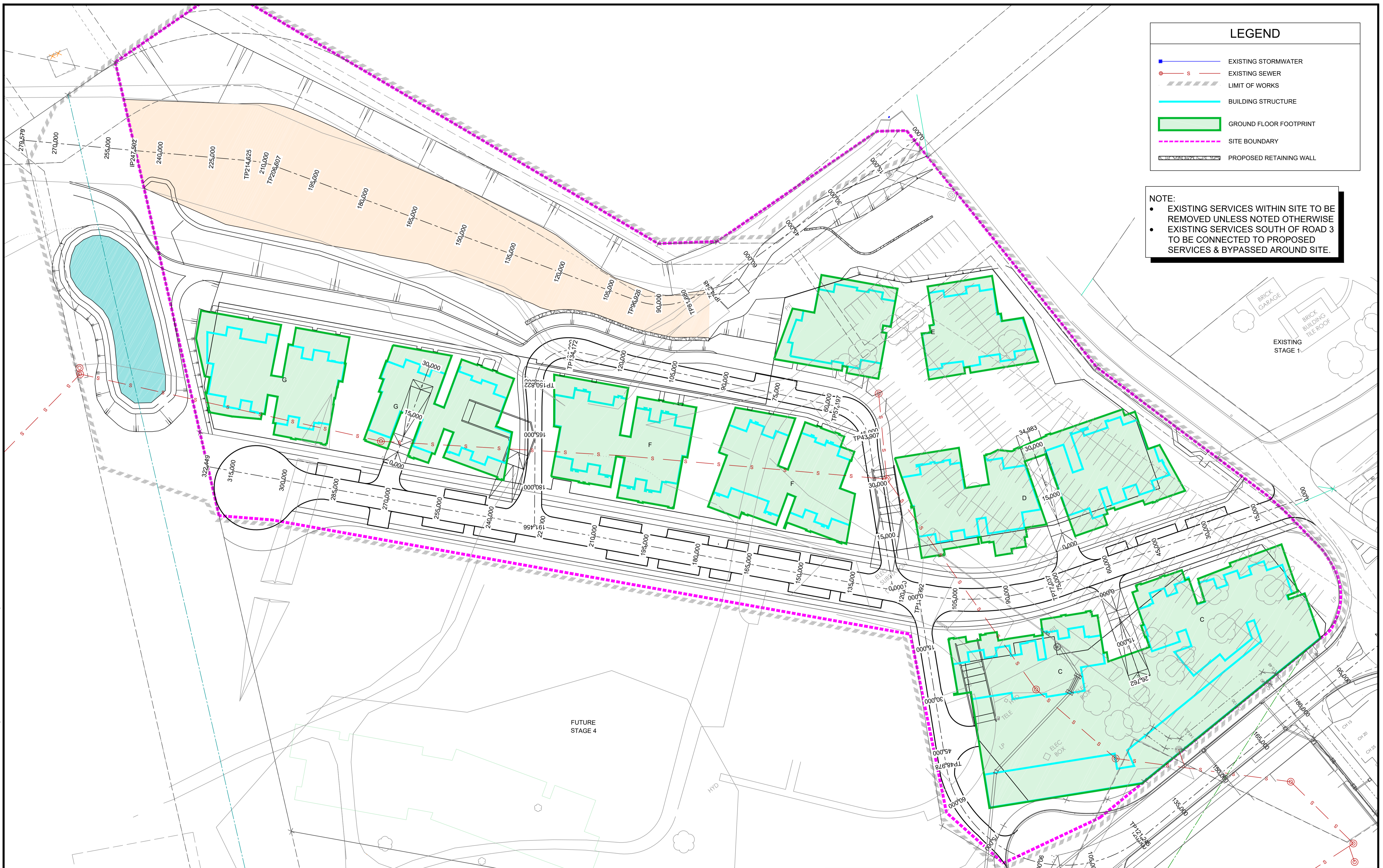
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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 SOIL & WATER MANAGEMENT PLAN

PLAN No: 110251/DA123 **E**  
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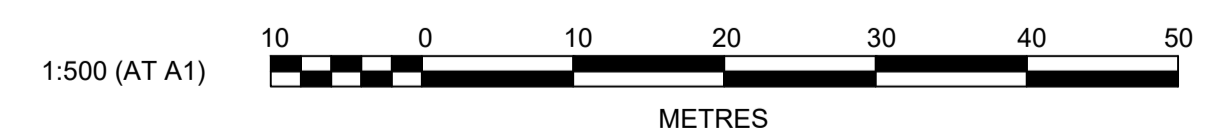


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LEGEND	
	EXISTING STORMWATER
	EXISTING SEWER
	LIMIT OF WORKS
	BUILDING STRUCTURE
	GROUND FLOOR FOOTPRINT
	SITE BOUNDARY
	PROPOSED RETAINING WALL

**NOTE:**  
 • EXISTING SERVICES WITHIN SITE TO BE REMOVED UNLESS NOTED OTHERWISE  
 • EXISTING SERVICES SOUTH OF ROAD 3 TO BE CONNECTED TO PROPOSED SERVICES & BYPASSED AROUND SITE.



AMENDMENT	DES	DRN	CKD	APR	DATE
E ARCHITECTURAL LAYOUT AMENDED	CC	NAF	DH	MS	12/06/19
D RETAINING WALL EXTENDED	VG	VG	MS	RO	15/03/19
C ISSUED FOR DA APPROVAL	DG/CC	CC	AM	MS	12/03/19
B ROAD WIDTH AMENDED	DG/CC	CC	AM	MS	08/03/19
A ISSUE FOR DA APPROVAL	DG	NAF	AM	MS	25/05/18

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**PANTHERS NORTH PRECINCT**  
**RANSLEY STREET, PENRITH**  
 EXISTING SERVICES PLAN

PLAN No: **110251/DA124** E  
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