Memo – Delmore Overland Flow Paths

To:	Vineway Ltd
From:	Derek Kong
Cc:	James Kitchen,
Date:	28/06/2025

Subject: – Delmore Stage 1 and 2, Upper Orewa

1. BACKGROUND & PURPOSE

This memo accompanies the Fast-Track approval application for the proposed road corridor works. It summarises the detailed Overland Flow Path ("**OLFP**") engineering analysis undertaken to confirm that all flood hazards are safely managed within the road reserve and that the design fully complies with:

- Auckland Transport's TDM Road Drainage Guide (v1.2, Table 3)
- Auckland Council's Healthy Waters Stormwater Code of Practice (SWCoP)

This detailed analysis is found on the following drawings –

Overland flowpath Plans – 3725-1-4600 to 4607, 3725-2AB-4600 to 4605 and 3725-2CDE-4600 to 4605

Outlet sizing typical plan and dimensions – 3725-1-4650, 372-2AB-4650 & 372-2CDE-4650

2. RAINFALL & HYDROLOGICAL MODELING

Design Storm: 100-year ARI + 3.8 °C climate change allowance (32.7% increase).

TP108 Depth: 309.2 mm total for the 100-yr event.

Method: Rational method, 10 time of concentration

Losses: Manning's n = 0.015 (road corridor overland flow).

Bypass Assumption: All flows considered as surface bypass; no pipe capacity has been allowed for.

3. DRAWING REFERENCES

Stage 1: Sheets 3725-1-4600 to 3725-1-4607, & 3725-1-4606

Stage 2: Sheets 3725-2AB-4600 to 3725-2AB-4605, 3725-2CDE-4600 to 3725-2CDE-4605, & 3725-2AB-4606, 3725-2CDE-4606

4. RESULTS SUMMARY

Location	Peak D×V (m/s^2)	TDM Category (Table 3, Refer Figure 1 below)	Compliance Status	Notes
Stage 1	≤ 0.4	"Obvious Danger"	Complies	**All pram crossings are within this category.**
Stage 1	≤ 0.6	"No Obvious Danger"	Complies	No pram crossings adjacent to OLFP's where DxV is above this threshold.
Stage 2	≤ 0.4	"Obvious Danger"	Complies	Entire foot path network below pedestrian hazard limit.
Stage 2	≤ 0.6	"No Obvious Danger"	Complies	No pram crossings adjacent to OLFP's where DxV is above this threhold

TABLE 3 MAJOR EVENT - ROADWAY FLOW LIMITATIONS

Situation	Requirement
Where floor levels of adjacent buildings are above road level	Total flow contained within road reserve. Freeboard from peak flow level to habitable floors in accord with Building Code and unitary plan.
Where floor levels of adjacent buildings are less than 350mm above the top of the kerb, and the fall on the footpath towards the kerb is..	**Greater than 100mm:** Water depth must be limited to 50mm above top of kerb. **Less than 100mm:** Water depth must be limited to top of kerb in conjunction with a footpath profile that prevents flow from the roadway entering onto the adjacent property. In these cases, compliance with Building Code and unitary plan may require separate approvals.
Where no kerb is provided	Above depths must be measured from the channel lip level plus 100mm.
Pedestrian safety[1]	**No obvious danger:** $d_s \times V_{ave} \leq 0.6 m^2/s$. **Obvious danger:** $d_s \times V_{ave} \leq 0.4 m^2/s$.
Vehicle safety	Maximum height of energy line300mm above roadway surface for areas subject to transverse flow. The exception is specific floodway design and additional vehicle warning and protection, where $d_{dg} \times V_{ave} \leq 0.3 m^2/s$. On-street parking is not to be permitted where overland flow exceeds $0.3 m^2/s$.

1 Obvious danger is interpreted as areas where pedestrians are directed to, or most likely to cross water paths, e.g. marked crossings and corners of intersections.

d_s = flow depth in the channel adjacent to the kerb, i.e. at the invert (m).

V_{ave} = average velocity of the flow (m/s).

Source: Adapted from DNRW (2007a)

Figure 1 - Table 3 from Auckland Transports Road Drainage chapter, Transport Design Manual

Containment: All OLFPs remain within the top-of-kerb extent under the 1 % AEP storm.

Pedestrian Safety: All depths × velocities are below 0.4 m^2/s at pram crossing locations. (Table 3 threshold for "low hazard").

Vehicle Safety: Where D×V is between 0.4 and 0.6 m^2/s, depths remain ≤ 0.25 m and are classified as "No Obvious Danger." No pram crossings are located within these zones, so pedestrians are not directed to these areas to direct them away from the danger.

Erosion Protection: Discharge points to adjacent streams are detailed with rip-rap aprons and grade-control weirs to prevent scour, down to the stream edge. They will follow the natural contour as far as practical.

Drawing 3275-1-4650 and 3725-2-4650 have typical OLFP channel dimensions and rip rap sizes. Note this is preliminary and final design will be confirmed during Engineering Plan Approval stage. This is consistent with the standard approach taken in respect of this matter.

5. COMPLIANCE WITH AT TDM & SWCoP

Depth × Velocity Criteria: All pedestrian and vehicle 'hazard zones' are classified as such where they meet or exceed the TDM thresholds (0.4 m^2/s and 0.6 m^2/s). The 'hazard zones' within the development are located away from pram crossings, vehicle parking areas or dwellings.

Freeboard & Flow Widths: Overland flow easements and all dwelling freeboard allowances exceed SWCoP minimums (≥ 300 mm freeboard above 1 % AEP level; ≥ 1 m flow path width).

Stormwater Conveyance: Surface bypass design aligns with SWCoP Section 6.5.3, ensuring swale slopes ≤ 1 : 20 and grass-lined channels are provided where required.

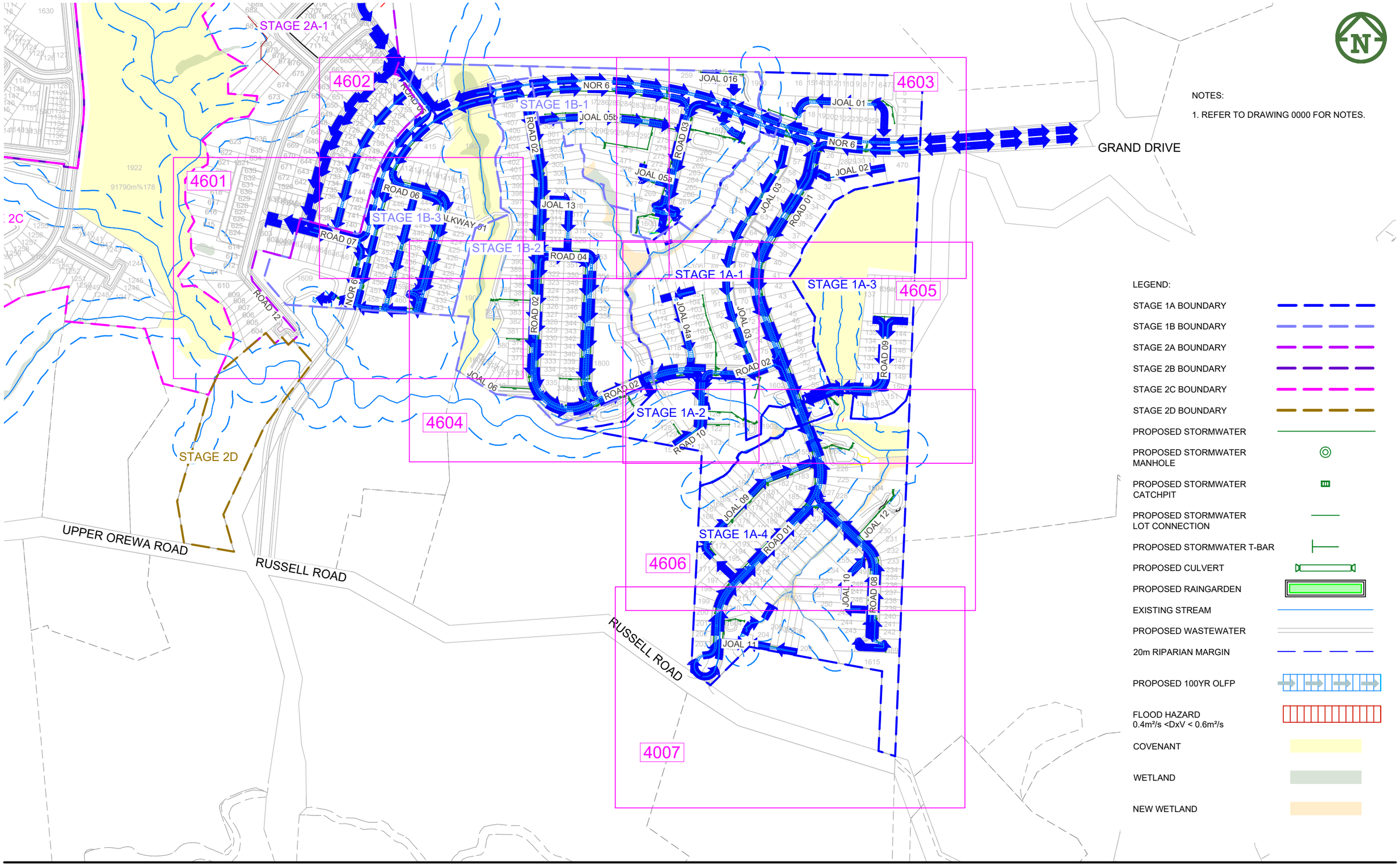
Maintenance Access: All flow paths include vehicle access points and inspection chambers per SWCoP Guidelines.

6. CONCLUSIONS

The OLFP design contains all floodwater within the road corridor or directs minor, controlled spillovers to protected discharge points. The relatively small catchments, and moderate steepness of the roads limits the extents of the OLFP's to ensure that they do not pose a hazard risk to people, infrastructure or property

The design satisfies all requirements of Auckland Transport's TDM Road Drainage Guide and Healthy Waters' SWCoP. As such, all flood hazards will be safely managed within the road reserve in accordance with all relevant standards. OLFPs and flooding are therefore not considered to have an adverse impact.

Appendix A – Drawings



NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.

LEGEND:

- STAGE 1A BOUNDARY
- STAGE 1B BOUNDARY
- STAGE 2A BOUNDARY
- STAGE 2B BOUNDARY
- STAGE 2C BOUNDARY
- STAGE 2D BOUNDARY
- PROPOSED STORMWATER
- PROPOSED STORMWATER MANHOLE
- PROPOSED STORMWATER CATCHPIT
- PROPOSED STORMWATER LOT CONNECTION
- PROPOSED STORMWATER T-BAR
- PROPOSED CULVERT
- PROPOSED RAINGARDEN
- EXISTING STREAM
- PROPOSED WASTEWATER
- 20m RIPARIAN MARGIN
- PROPOSED 100YR OLFP
- FLOOD HAZARD 0.4m²/s <DxV < 0.6m²/s
- COVENANT
- WETLAND
- NEW WETLAND

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
D	FOR RESOURCE CONSENT	ZW	JK		2/07/2025
C	FOR RESOURCE CONSENT	NC	PO	JK	5/02/2025
B	FOR RESOURCE CONSENT	NC	PO	JK	31/01/2025
A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE STAGE 1 53A, 53B & 55 RUSSELL RD OREWA

TITLE: STORMWATER 1% AEP OLFP PLAN OVERALL

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:4000 @A3

DO NOT SCALE

DRAWING NO: 3725-1-4600

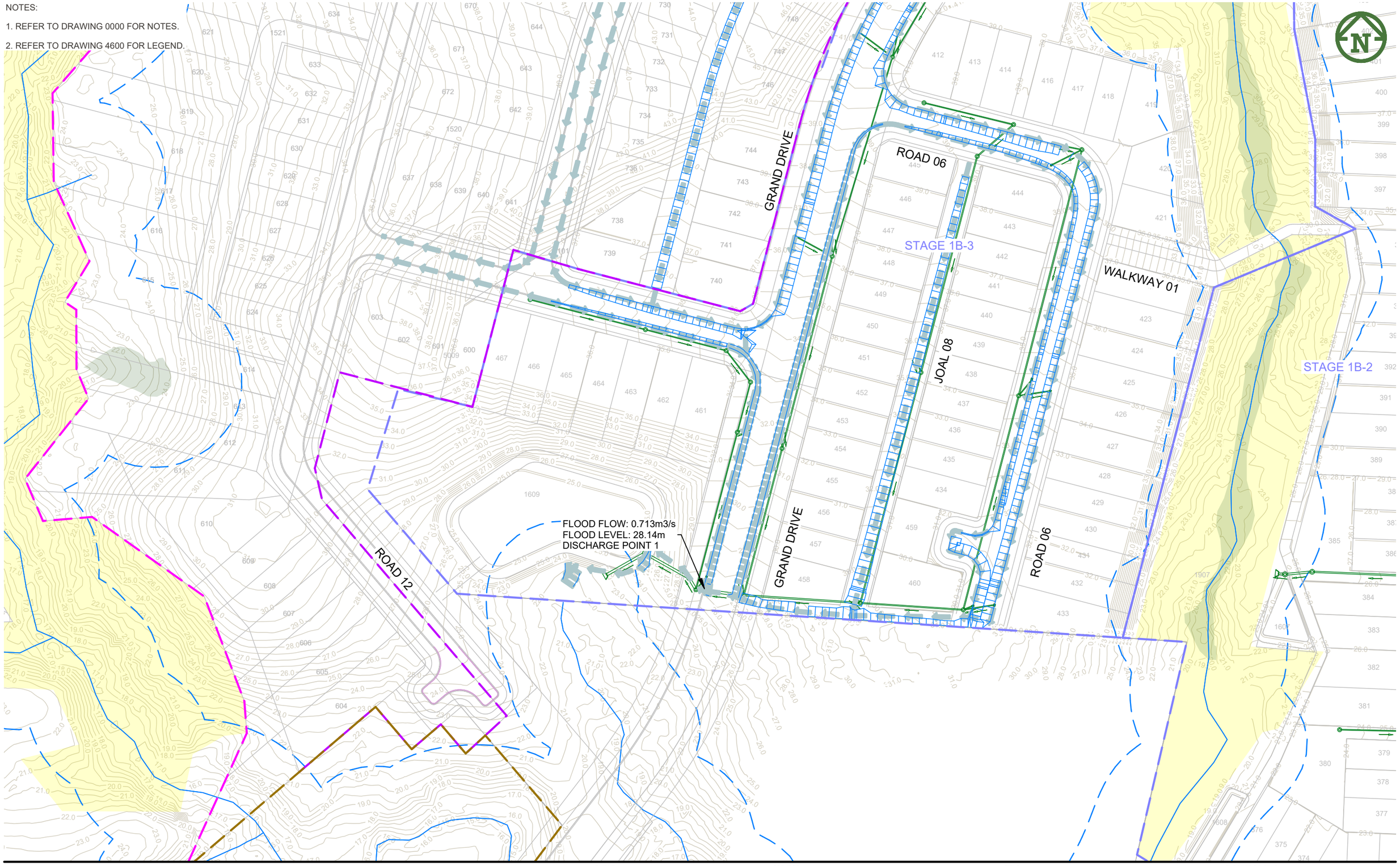
REV: D

c:\12ds\data\MCKFS01\3725 Delmore - 53A, 53B & 55 Russell Road, Orewa. Delmore_4684\06. Engineering Design\6.4. 12d\Stage 1 Plotting.12dmodel Stage 1 Plotting

NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.

2. REFER TO DRAWING 4600 FOR LEGEND.



REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

TITLE: STORMWATER
1% AEP OLFP PLAN
SHEET 1 OF 7

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:1000 @ A3
DO NOT SCALE

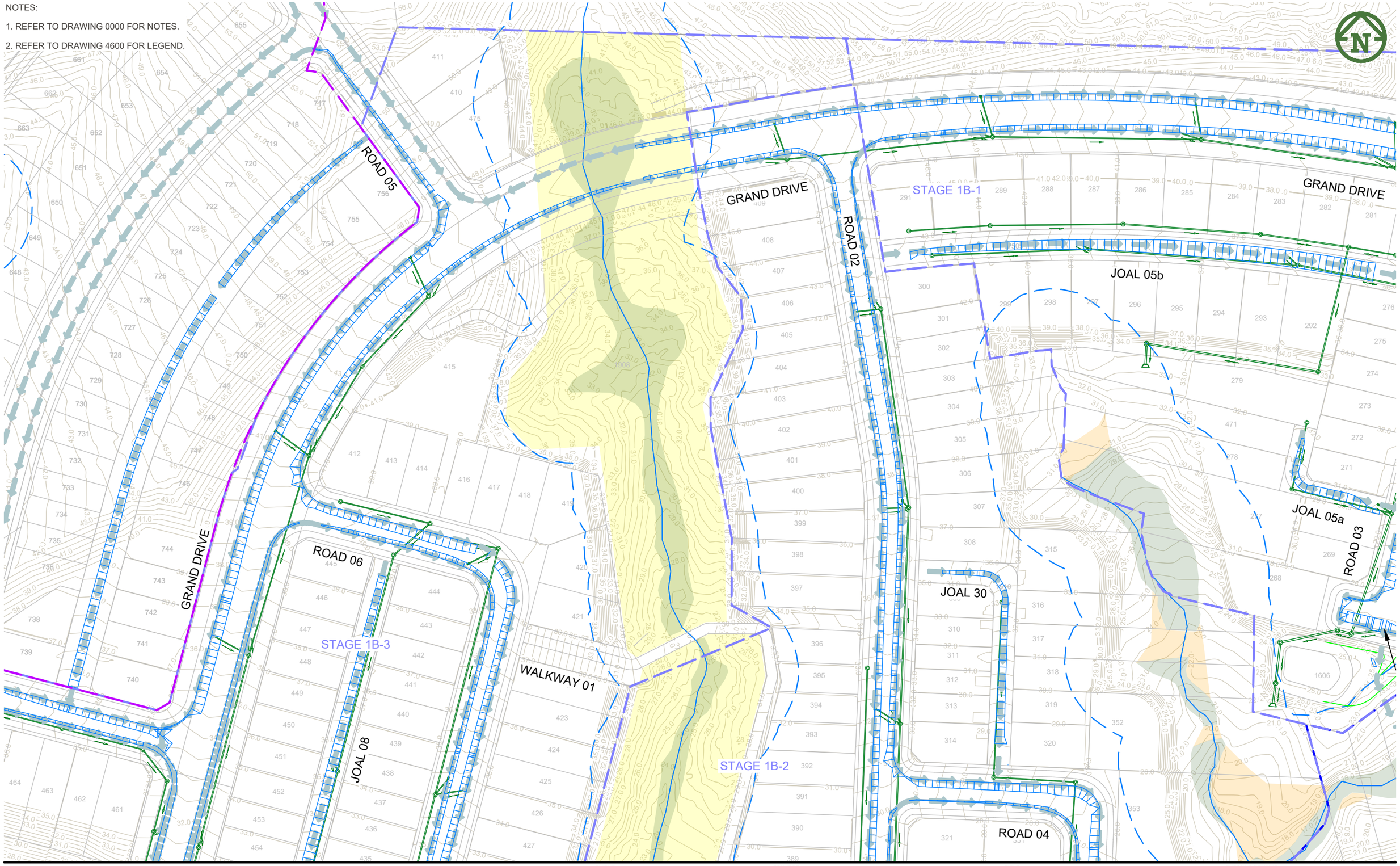
DRAWING NO: 3725-1-4601

REV: D

NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.

2. REFER TO DRAWING 4600 FOR LEGEND.



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A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT:
VINEWAY LIMITED

PROJECT:
DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

TITLE:
STORMWATER
1% AEP OLFP PLAN
SHEET 2 OF 7

PURPOSE OF ISSUE:
RESOURCE CONSENT

SCALE:
1:1000 @ A3
DO NOT SCALE

DRAWING NO: 3725-1-4602

REV: D

NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 4600 FOR LEGEND.

JOAL 34

GRAND DRIVE

FLOOD FLOW: 0.713m3/s
FLOOD LEVEL: 38.63m
DISCHARGE POINT 2

JOAL 01

GRAND DRIVE

ROAD 03

JOAL 05a

ROAD 03

FLOOD FLOW: 1.123m3/s
FLOOD LEVEL: 27.48m
DISCHARGE POINT 3

JOAL 02

JOAL 03

ROAD 01

JOAL 03a

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT:
VINEWAY LIMITED

PROJECT:
DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

TITLE:
STORMWATER
1% AEP OLFP PLAN
SHEET 3 OF 7

PURPOSE OF ISSUE:
RESOURCE CONSENT

SCALE:
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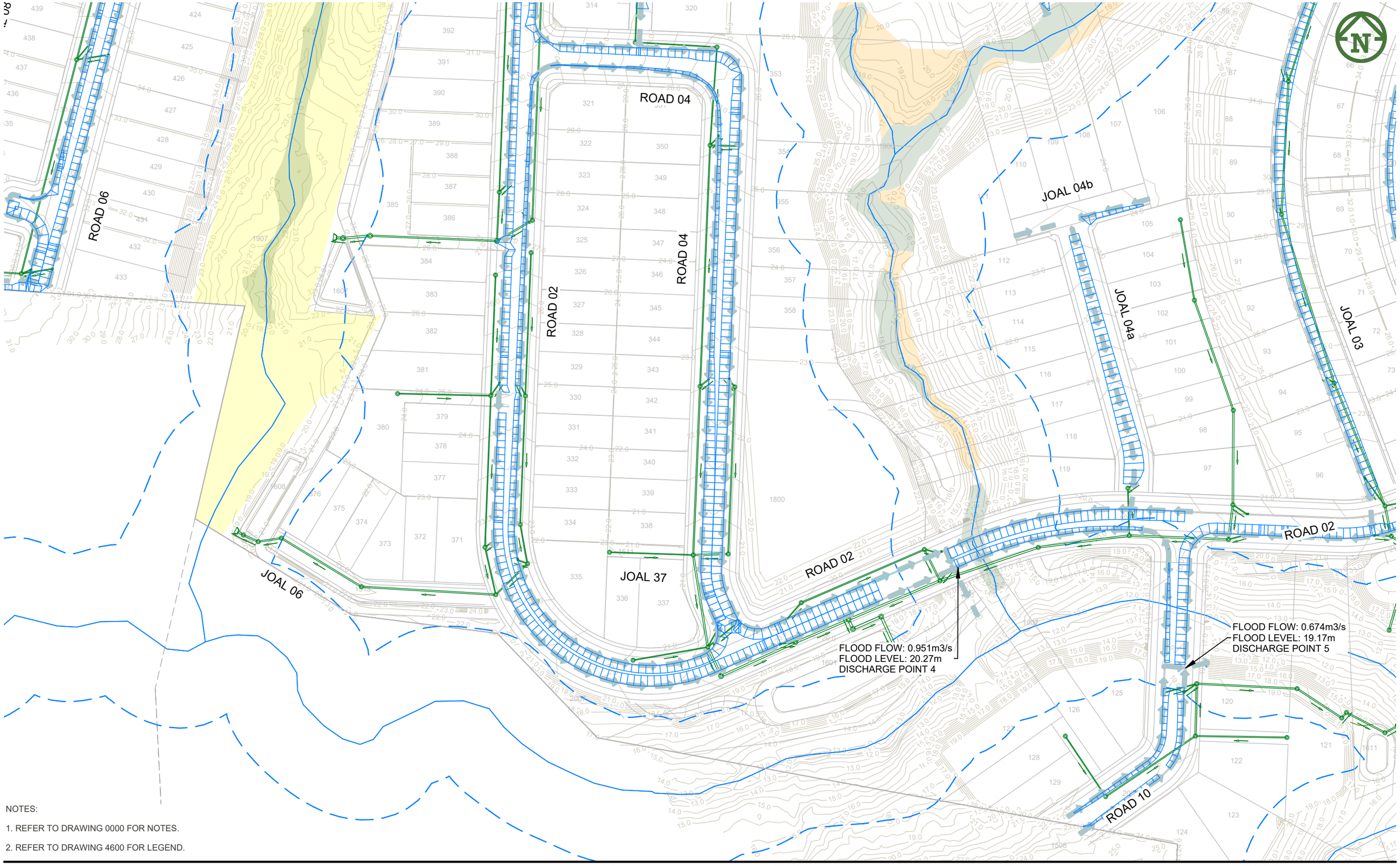
DO NOT SCALE

DRAWING NO: 3725-1-4603

REV: D



NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 4600 FOR LEGEND.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT:
VINEWAY LIMITED

PROJECT:
DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

TITLE:
STORMWATER
1% AEP OLFP PLAN
SHEET 4 OF 7

PURPOSE OF ISSUE:
RESOURCE CONSENT

SCALE:
1:1000 @ A3
DO NOT SCALE

DRAWING NO: 3725-1-4604
REV: D

NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 4600 FOR LEGEND.

STAGE 1A-1

STAGE 1A-2

STAGE 1A-3

JOAL 04b

JOAL 04a

JOAL 03

JOAL 40

JOAL 40a

ROAD 01

ROAD 02

ROAD 10

FLOOD FLOW: 0.951m3/s
FLOOD LEVEL: 20.27m
DISCHARGE POINT 4

FLOOD FLOW: 0.674m3/s
FLOOD LEVEL: 19.17m
DISCHARGE POINT 5

FLOOD FLOW: 0.412m3/s
FLOOD LEVEL: 20.13m
DISCHARGE POINT 6

FLOOD FLOW: 1.984m3/s
FLOOD LEVEL: 19.41m
DISCHARGE POINT 7

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
D	FOR RESOURCE CONSENT	ZW	JK		2/07/2025
C	FOR RESOURCE CONSENT	NC	PO	JK	5/02/2025
B	FOR RESOURCE CONSENT	NC	PO	JK	31/01/2025
A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

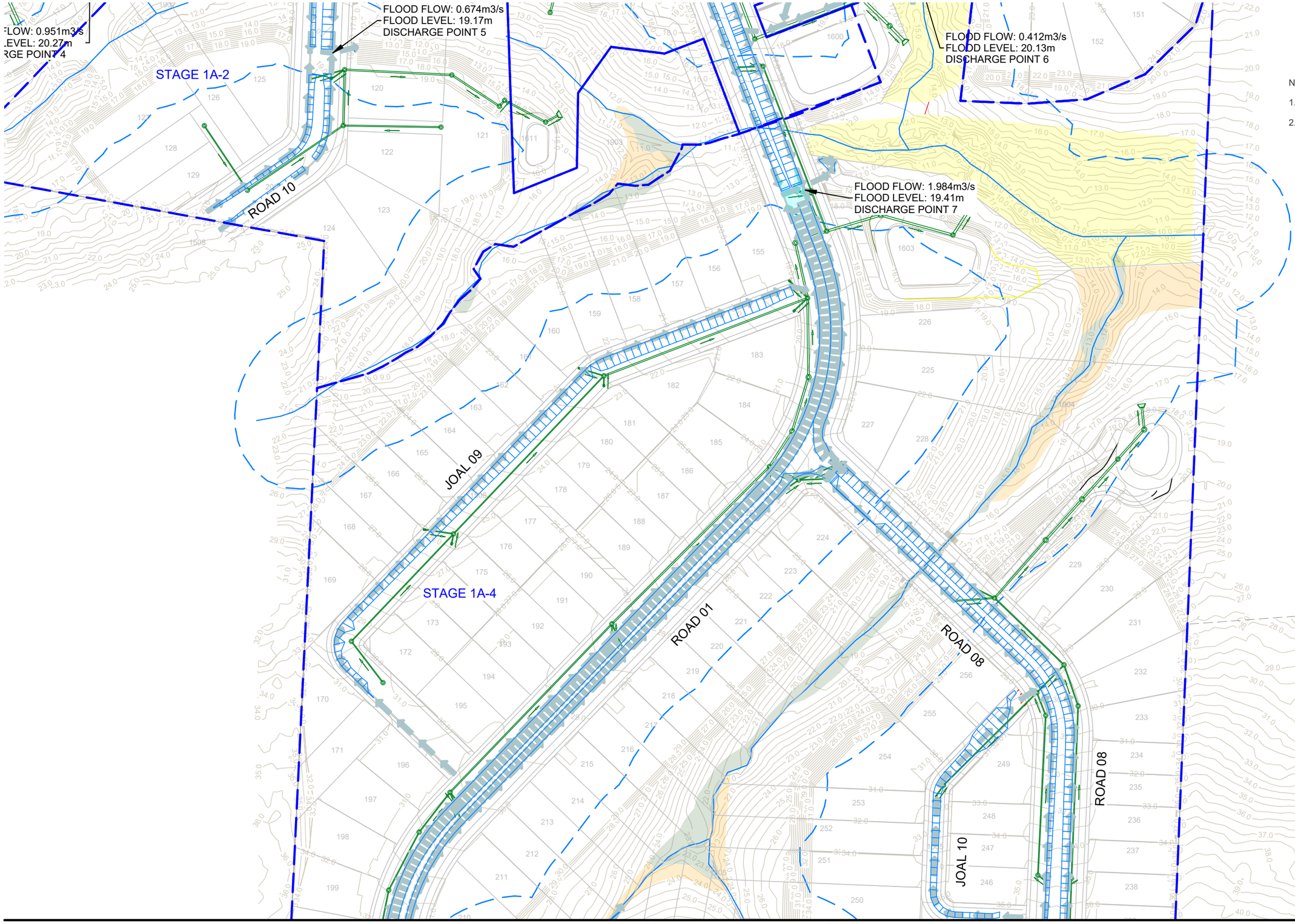
TITLE: STORMWATER
1% AEP OLFP PLAN
SHEET 5 OF 7

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:1000 @ A3
DO NOT SCALE

DRAWING NO: 3725-1-4605

REV: D



NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 4600 FOR LEGEND.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

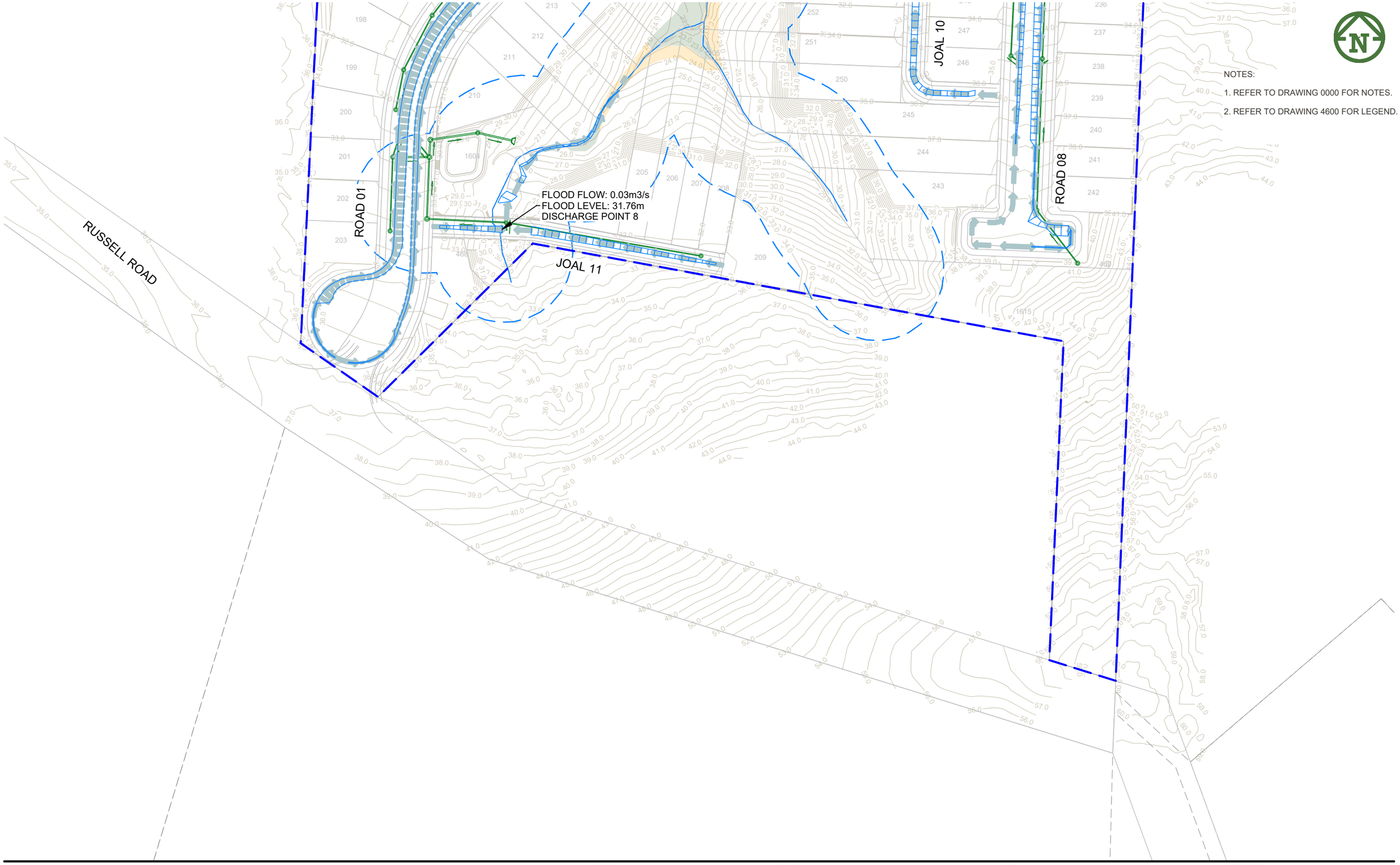
TITLE: STORMWATER
1% AEP OLFP PLAN
SHEET 6 OF 7

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:1000 @ A3
DO NOT SCALE

DRAWING NO: 3725-1-4606

REV: D



NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.
2. REFER TO DRAWING 4600 FOR LEGEND.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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C	FOR RESOURCE CONSENT	NC	PO	JK	5/02/2025
B	FOR RESOURCE CONSENT	NC	PO	JK	31/01/2025
A	FIRST ISSUE				20/12/2024

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE
STAGE 1
53A, 53B & 55 RUSSELL RD
OREWA

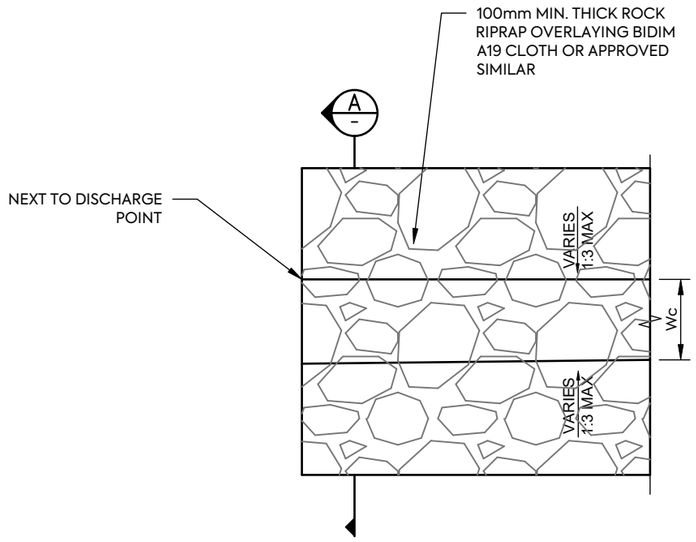
TITLE: STORMWATER
1% AEP OLFP PLAN
SHEET 7 OF 7

PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:1000 @ A3
DO NOT SCALE

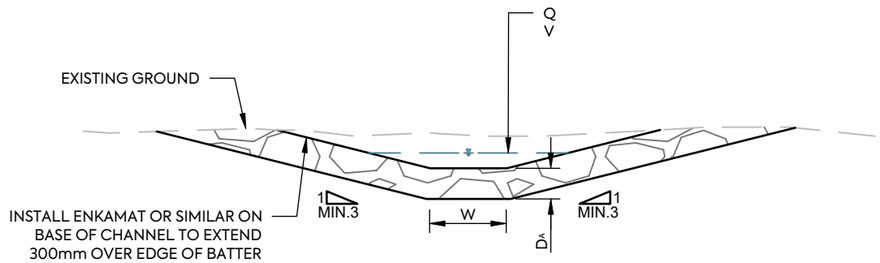
DRAWING NO: 3725-1-4607

REV: D



TYPICAL DISCHARGE CHANNEL DETAIL - PLAN

SCALE: 1:40 @ A3



SECTION A

SCALE: 1:40 @ A3

DISCHARGE POINT DIMENSIONS

DISCHARGE	FLOOD FLOW (m3/s)	FLOOD VELOCITY (m/s)	CHANNEL BED WIDTH Wb	GRADE (SLOPE) '%'	CHANNEL SIDE SLOPE	RIPRAP DIAMETER 'd^s' (m)	RIPRAP THICKNESS 'D^A' (m)
DISCHARGE POINT 1	0.713	2.99	0.4	12	1 IN 3	0.20	0.40
DISCHARGE POINT 2	1.013	4.784	0.5	34	1 IN 3	0.43	0.86
DISCHARGE POINT 3	1.123	4.256	0.5	23	1 IN 3	0.36	0.72
DISCHARGE POINT 4	0.951	OVER TOP AT CULVERT 5					
DISCHARGE POINT 5	0.674	OVER TOP AT CULVERT 4					
DISCHARGE POINT 6	0.412	OVER TOP AT CULVERT 2					
DISCHARGE POINT 7	1.984	OVER TOP AT CULVERT 3					
DISCHARGE POINT 8	0.03	OVER TOP AT CULVERT 12					

Refer to Engineering Calculations (TR2013/018)

MCKENZIE & CO.

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
A	FOR CONSENT	ZW	JK	JK	29/06/25

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE STAGE 1 53A, 53B & 55 RUSSELL ROAD OREWA

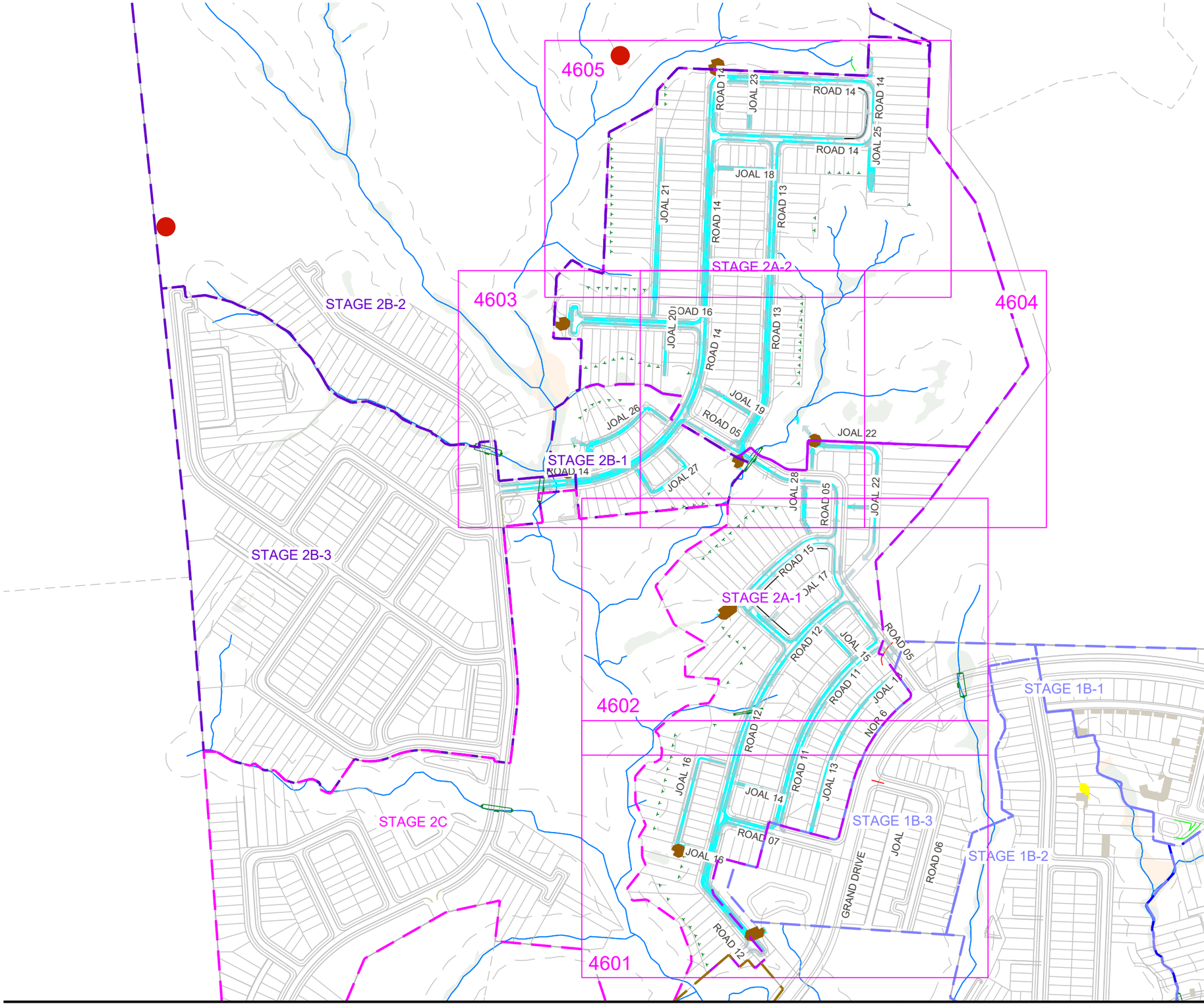
TITLE: STORMWATER DISCHARGE CHANNEL DETAIL PLAN

PURPOSE OF ISSUE: FOR RESOURCE CONSENT

SCALE: AS SHOWN DO NOT SCALE

DRAWING NO: 3725-1-4608 REV: A

C:\12DS\DATA\MCKFS01\3725-1 DELMORE STAGE 1_5231\06000. ENGINEERING DESIGN\6500. DRAWINGS\4600-OLFP DISCHARGE CHANNEL STAGE 1.DWG



NOTES:

1. REFER TO DRAWING 0000 FOR NOTES.

LEGEND:

- STAGE 1A BOUNDARY
- STAGE 1B BOUNDARY
- STAGE 2A BOUNDARY
- STAGE 2B BOUNDARY
- STAGE 2C BOUNDARY
- STAGE 2D BOUNDARY
- PROPOSED STORMWATER
- PROPOSED STORMWATER MANHOLE
- PROPOSED STORMWATER CATCHPIT
- PROPOSED STORMWATER LOT CONNECTION
- PROPOSED STORMWATER T-BAR
- PROPOSED CULVERT
- PROPOSED RAINGARDEN
- EXISTING STREAM
- PROPOSED WASTEWATER
- 20m RIPARIAN MARGIN
- PROPOSED 100YR OLFP
- PROPOSED 100YR OLFP 0.4m²/s <DxV < 0.6m²/s
- COVENANT
- WETLAND
- NEW WETLAND
- ARCHAEOLOGICAL SITE

REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
F	FOR CONSENT	ZW	JK		1/07/2025
E	FOR CONSENT	ZW	JK		11/02/2025
D	FOR CONSENT	ZW	JK		4/02/2025
C	FOR CONSENT	ZW	JK		31/01/2025
B	UPDATED CONTOURS	TDW	JK		16/01/2025
A	FIRST ISSUE				

MCKENZIE & CO.

CLIENT: VINEWAY LIMITED

PROJECT: DELMORE
STAGE 2A1, 2A2, 2B1, & 2D
53A, 53B & 55 RUSSELL RD
OREWA

TITLE: STORMWATER
100 YR OLFP PLAN
OVERALL

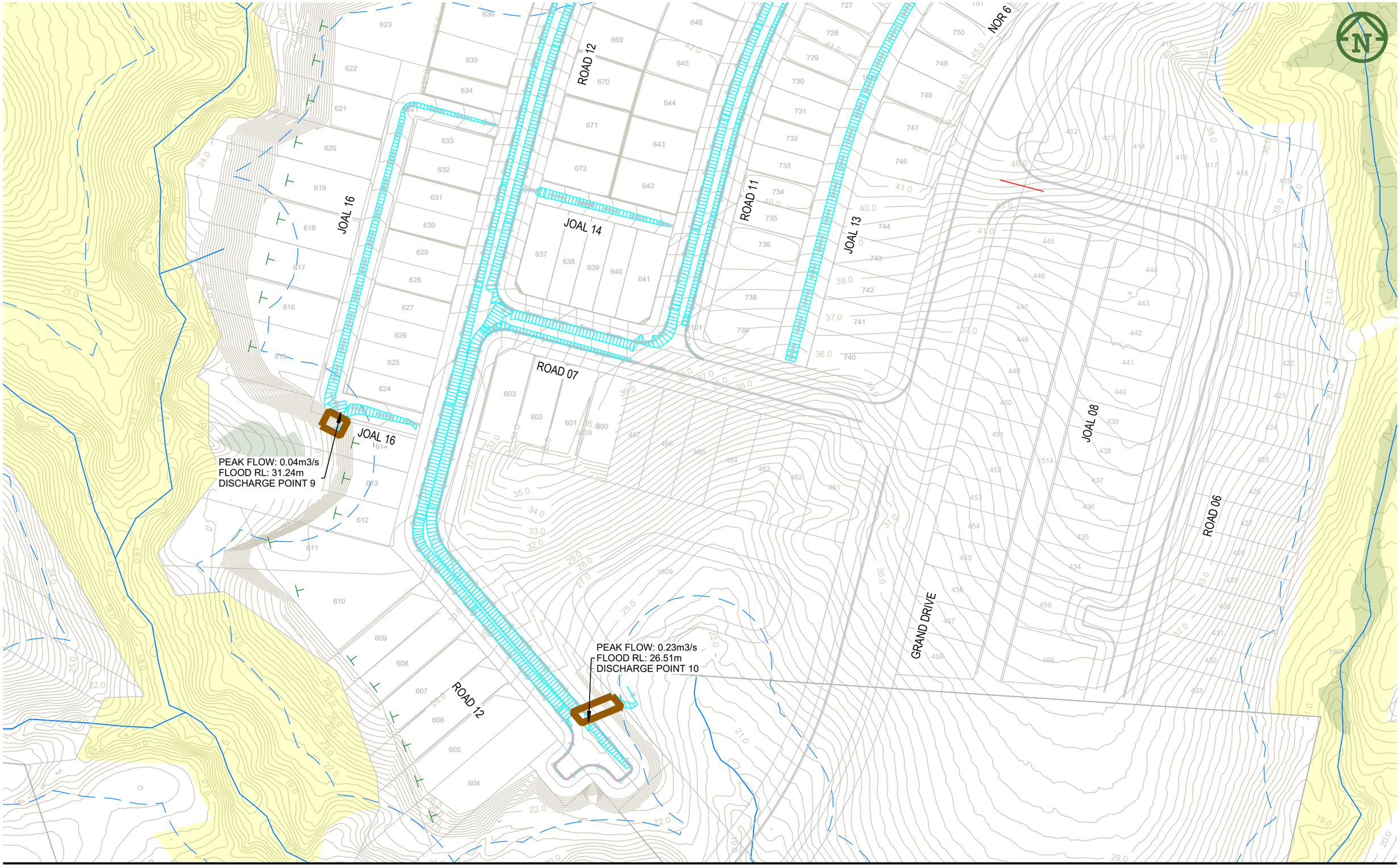
PURPOSE OF ISSUE: RESOURCE CONSENT

SCALE: 1:4000 @A3
DO NOT SCALE

DRAWING NO: 3725-2AB-4600

REV: F

c:\12dS\data\MCKFS01\3725-2 Delmore Stage 2_5201\06000. Engineering Design\6400. 12d\Stage 2AB Plotting.12dmodel Stage 2AB Plotting



REV	DESCRIPTION	DRN BY	CHK BY	APP BY	DATE
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E	FOR CONSENT	ZW	JK		11/02/2025
D	FOR CONSENT	ZW	JK		4/02/2025
C	FOR CONSENT	ZW	JK		31/01/2025
B	UPDATED CONTOURS	TDW	JK		16/01/2025
A	FIRST ISSUE				

MCKENZIE & CO.

CLIENT:
VINEWAY LIMITED

PROJECT:
DELMORE
STAGE 2A1, 2A2, 2B1, & 2D
53A, 53B & 55 RUSSELL RD
OREWA

TITLE:
STORMWATER
100 YR OLFP PLAN
SHEET 1 OF 5

PURPOSE OF ISSUE:
RESOURCE CONSENT

SCALE:
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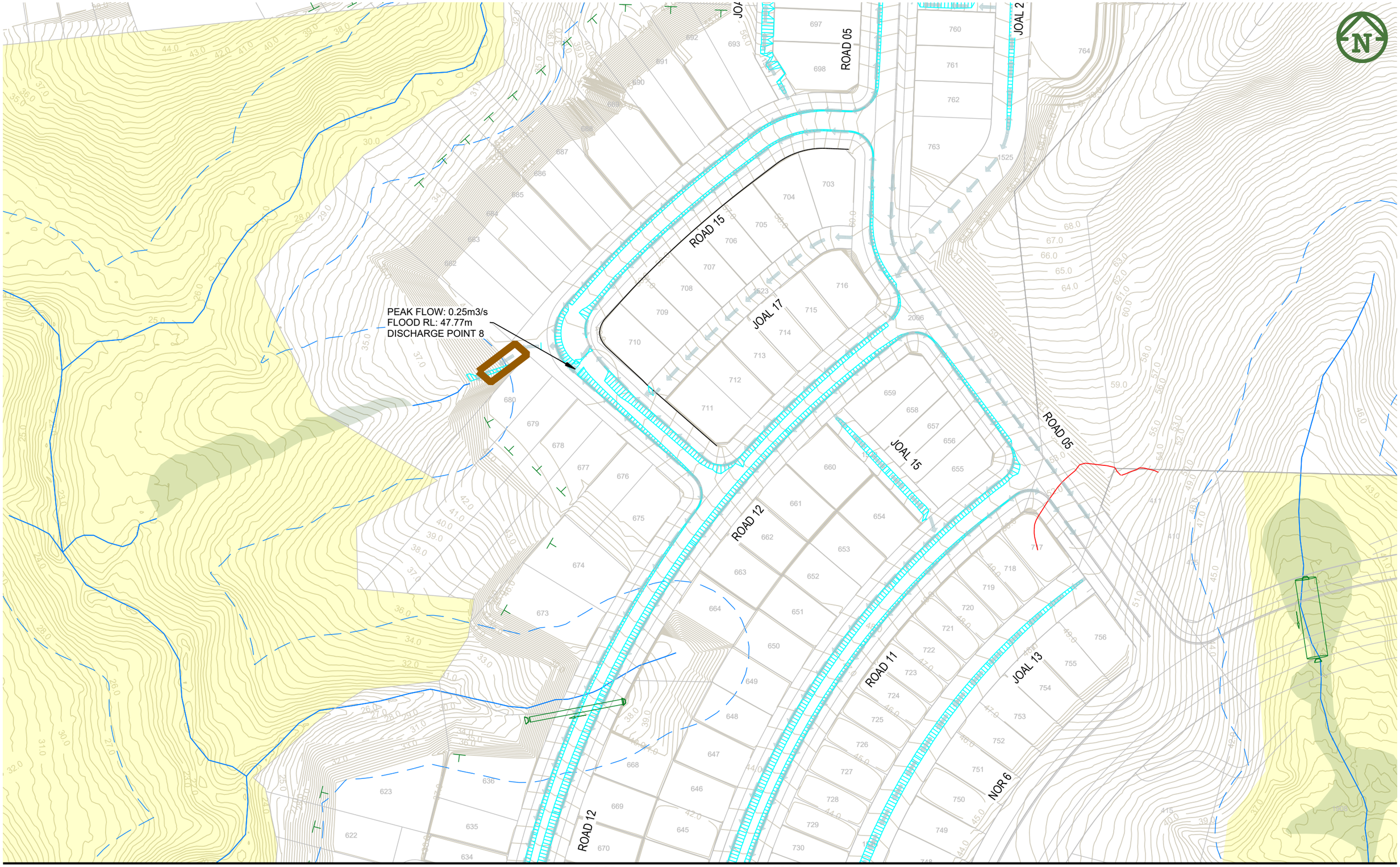
DO NOT SCALE

DRAWING NO: 3725-2AB-4601
REV: F



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B	UPDATED CONTOURS	TDW	JK		16/01/2025
A	FIRST ISSUE				

MCKENZIE & CO.

CLIENT:
VINEWAY LIMITED

PROJECT:
DELMORE
STAGE 2A1, 2A2, 2B1, & 2D
53A, 53B & 55 RUSSELL RD
OREWA

TITLE:
STORMWATER
100 YR OLFP PLAN
SHEET 2 OF 5

PURPOSE OF ISSUE:
RESOURCE CONSENT

SCALE:
1:1000 @ A3
DO NOT SCALE

DRAWING NO: 3725-2AB-4602

REV: F

c:\12dS\data\MCKFS01\3725-2 Delmore Stage 2_5201\06000. Engineering Design\6400. 12d\Stage 2AB Plotting.12dmodel Stage 2AB Plotting