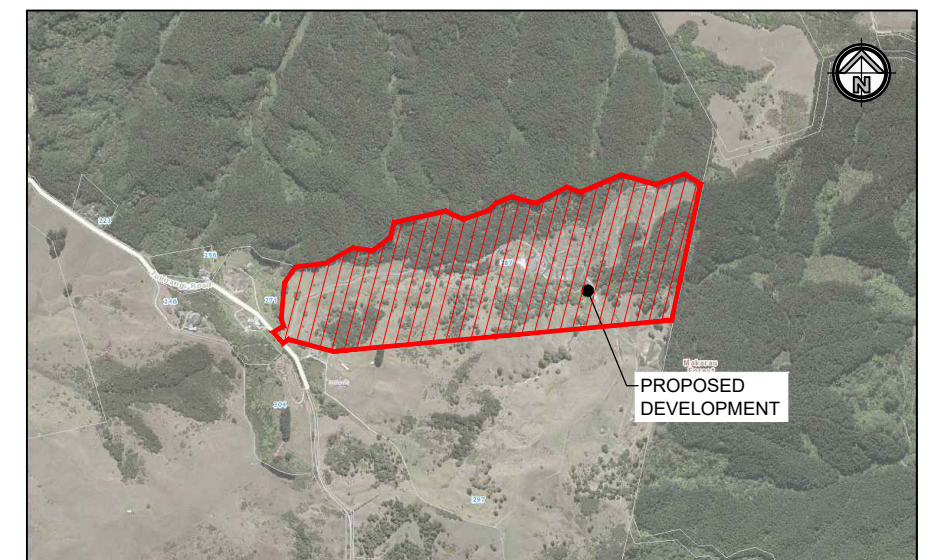


287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

CLIENT: AUCKLAND SHOOTING CLUB INCORPORATED
PROJECT No. 230400

ENGINEERING PLANS FOR
RESOURCE CONSENT
REVISION C

SEPTEMBER 2023



LOCALITY PLAN
N.T.S

**287 TUHIRANGI ROAD,
MAKARAU, AUCKLAND**

CLIENT: AUCKLAND SHOOTING CLUB INCORPORATED
PROJECT No. 230400

TABLE OF CONTENTS - RESOURCE CONSENT

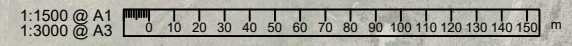
DRAWING NUMBER		REVISION DATE		
		19 05 23	10 08 23	25 09 23
SITE MODIFICATIONS				
230400-RC-050	SITE OVERALL LAYOUT PLAN - PROPOSED ACTIVITIES BOUNDARY	/	A	/
230400-RC-051	SITE LAYOUT PLAN - PROPOSED ACTIVITIES BOUNDARY	/	A	/
230400-RC-100	SITE OVERALL LAYOUT PLAN	A	B	C
230400-RC-101	SITE LAYOUT PLAN - SHEET 1 OF 3	A	/	/
230400-RC-102	SITE LAYOUT PLAN - SHEET 2 OF 3	A	/	B
230400-RC-103	SITE LAYOUT PLAN - SHEET 3 OF 3	A	B	C
230400-RC-110	SITE OVERALL LAYOUT PLAN - EXISTING WETLAND	A	/	/
230400-RC-111	SITE LAYOUT PLAN - EXISTING WETLAND - SHEET 1 OF 3	A	/	/
230400-RC-112	SITE LAYOUT PLAN - EXISTING WETLAND - SHEET 2 OF 3	A	/	/
230400-RC-113	SITE LAYOUT PLAN - EXISTING WETLAND - SHEET 3 OF 3	A	/	/
230400-RC-120	SITE OVERALL LAYOUT PLAN - EXISTING STREAM	A	/	/
230400-RC-121	SITE LAYOUT PLAN - EXISTING STREAM - SHEET 1 OF 3	A	/	/
230400-RC-122	SITE LAYOUT PLAN - EXISTING STREAM - SHEET 2 OF 3	A	/	/
230400-RC-123	SITE LAYOUT PLAN - EXISTING STREAM - SHEET 3 OF 3	A	/	/
230400-RC-200	OVERALL EARTHWORKS PLAN	A	B	/
230400-RC-201	EARTHWORKS PLAN - SHOOTING BAY	A	/	/
230400-RC-210	TYPICAL CROSS SECTION - SHEET 1 OF 3	A	/	/
230400-RC-211	TYPICAL CROSS SECTION - SHEET 2 OF 3	A	/	/
230400-RC-212	TYPICAL CROSS SECTION - SHEET 3 OF 3	A	/	/
230400-RC-215	EARTHWORKS PLAN - 10m STREAM RIPARIAN MARGIN	/	A	/
230400-RC-220	TRACKING PLAN	A	B	/
230400-RC-300	EROSION AND SEDIMENT CONTROL PLAN	A	/	/
230400-RC-310	EROSION AND SEDIMENT STANDARD DETAILS	A	/	/
230400-RC-400	DRAINAGE LAYOUT PLAN	A	B	/
230400-RC-410	10 YEAR STORMWATER CATCHMENY PLAN	A	/	/
230400-RC-411	10 YEAR SWALE ASSESSMENT	A	/	/
230400-RC-412	STORMWATER OUTFALL DETAILS	/	A	/
230400-RC-500	CULVERT 1 DESIGN WITH FISH PASSAGE	/	/	A
230400-RC-501	CULVERT 4 DESIGN WITH FISH PASSAGE	/	/	A



SHEET 051

LEGEND:

— PROPOSED ACTIVITY BOUNDARY



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	10/08/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

terra
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INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
AUCKLAND**

DRAWING TITLE
**SITE OVERALL LAYOUT PLAN
- PROPOSED ACTIVITY BOUNDARY**

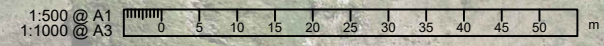
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PROJECT NUMBER	SCALE
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DWG NUMBER	REVISION
RC- 050	A

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LEGEND:

— PROPOSED ACTIVITY BOUNDARY



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	10/08/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

terra
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PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

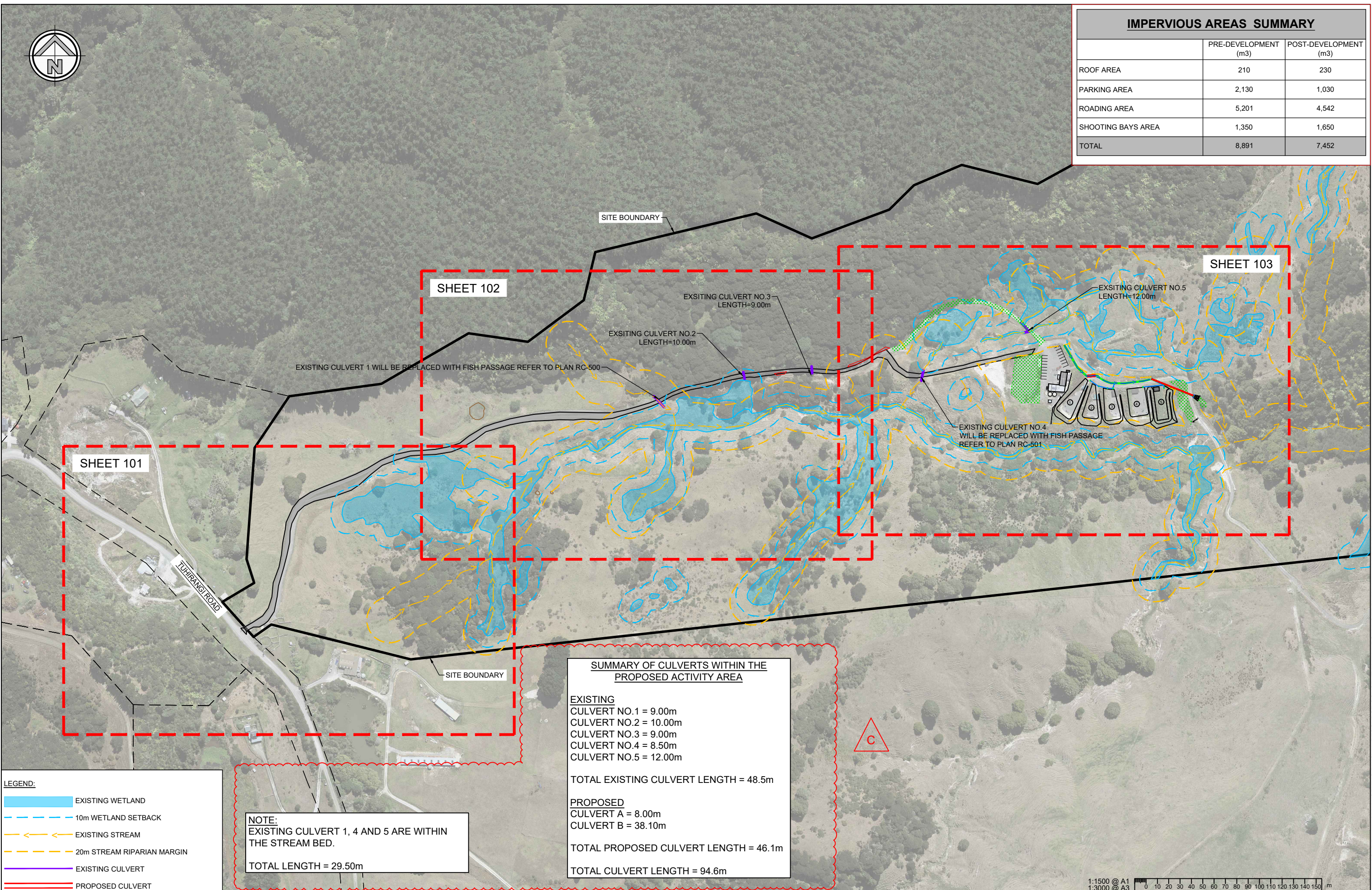
DRAWING TITLE
**SITE LAYOUT PLAN
 - PROPOSED ACTIVITY BOUNDARY**

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FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE A1:1:500
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DWG NUMBER	REVISION
RC- 051	A

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IMPERVIOUS AREAS SUMMARY		
	PRE-DEVELOPMENT (m3)	POST-DEVELOPMENT (m3)
ROOF AREA	210	230
PARKING AREA	2,130	1,030
ROADING AREA	5,201	4,542
SHOOTING BAYS AREA	1,350	1,650
TOTAL	8,891	7,452

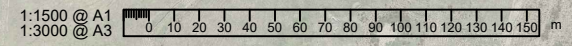


LEGEND:

- EXISTING WETLAND
- 10m WETLAND SETBACK
- EXISTING STREAM
- 20m STREAM RIPARIAN MARGIN
- EXISTING CULVERT
- PROPOSED CULVERT

NOTE:
 EXISTING CULVERT 1, 4 AND 5 ARE WITHIN THE STREAM BED.
 TOTAL LENGTH = 29.50m

SUMMARY OF CULVERTS WITHIN THE PROPOSED ACTIVITY AREA	
EXISTING	
CULVERT NO.1 = 9.00m	
CULVERT NO.2 = 10.00m	
CULVERT NO.3 = 9.00m	
CULVERT NO.4 = 8.50m	
CULVERT NO.5 = 12.00m	
TOTAL EXISTING CULVERT LENGTH = 48.5m	
PROPOSED	
CULVERT A = 8.00m	
CULVERT B = 38.10m	
TOTAL PROPOSED CULVERT LENGTH = 46.1m	
TOTAL CULVERT LENGTH = 94.6m	



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	SURVEYED	TERRA 01/03/23	<p>terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS</p>
B	10/08/23	FOR S92 RESPONSE	GC	GCAI	DESIGNED		
C	25/09/23	FOR S92 RESPONSE	GT	GZ	DRAWN		
					TRACED		
					CHECKED		

CLIENT
AUCKLAND SHOOTING CLUB INCORPORATED

PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
SITE OVERALL LAYOUT PLAN

STAGE
FOR RESOURCE CONSENT

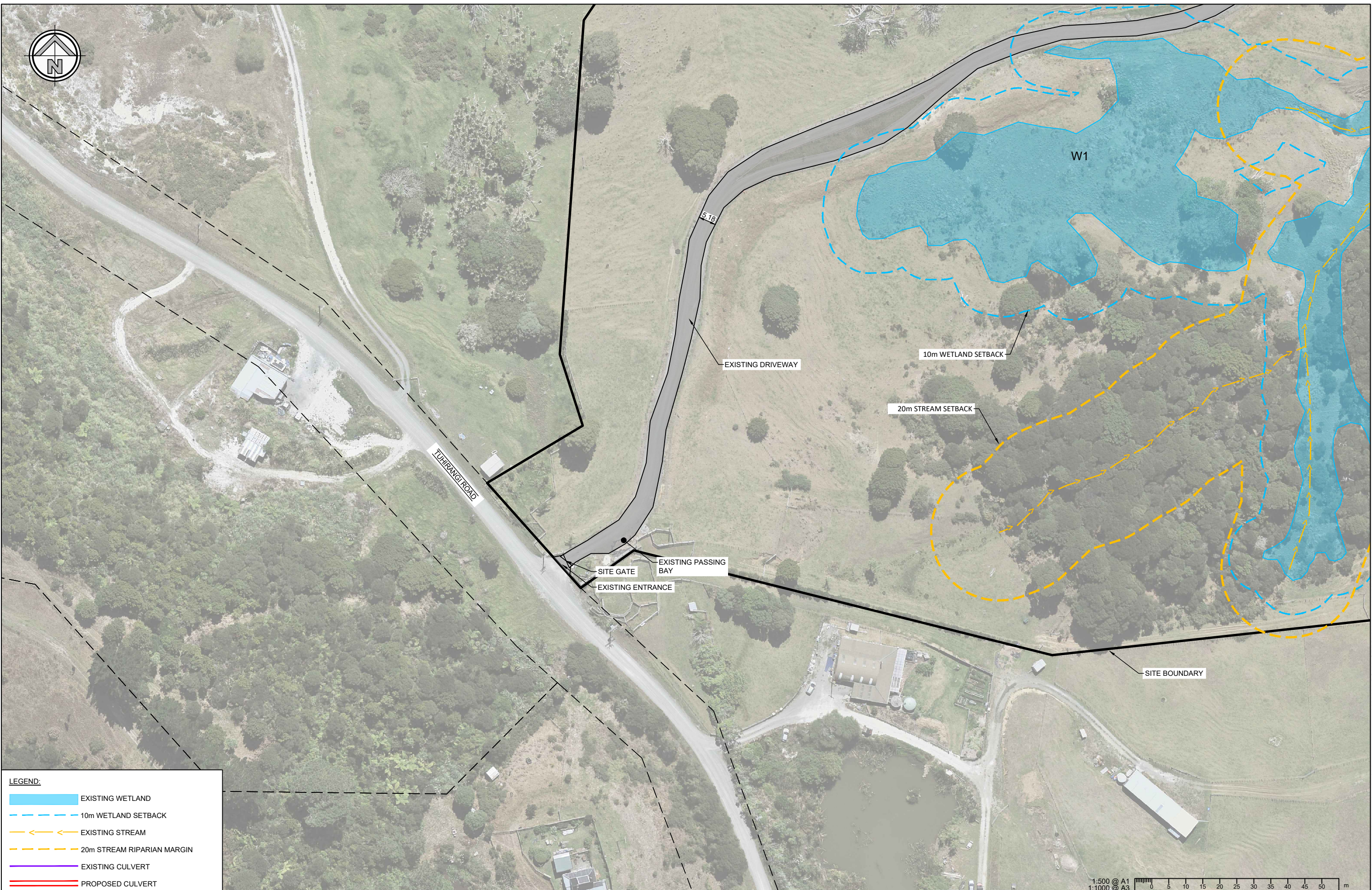
PROJECT NUMBER
230400

DWG NUMBER
RC-100

SCALE
 A1:1:1500
 A3:1:3000

REVISION
C

Z:\Tuhirangi Road (287)\Engineering\CAD\Drawing\02 - WORKING DWG\04 - RESOURCE CONSENT\230400-RC100-SITE PLAN.dwg, 100_9/29/2023 4:13 pm



LEGEND:

	EXISTING WETLAND
	10m WETLAND SETBACK
	EXISTING STREAM
	20m STREAM RIPARIAN MARGIN
	EXISTING CULVERT
	PROPOSED CULVERT

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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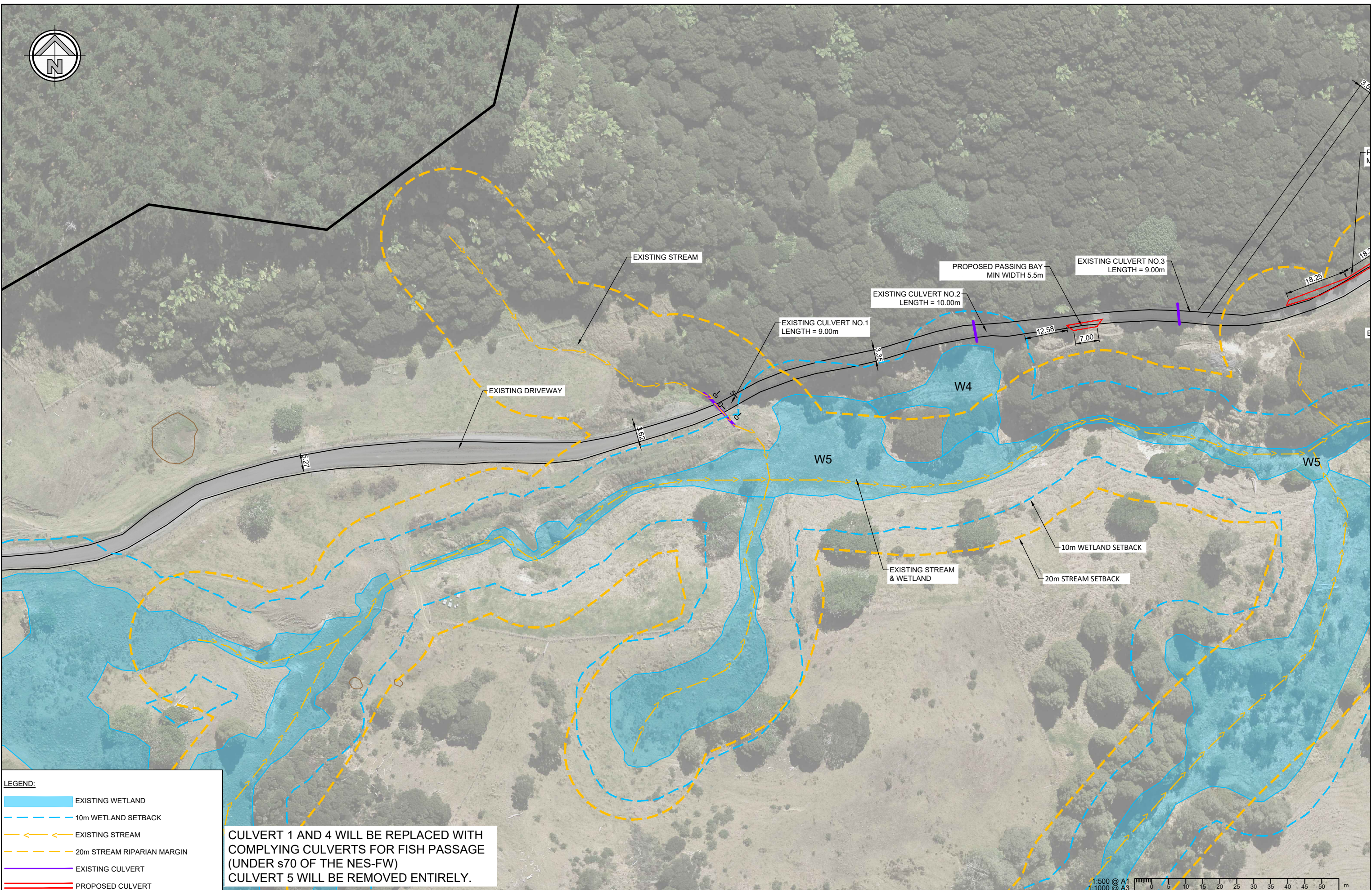
CLIENT
**AUCKLAND SHOOTING CLUB
 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN
 SHEET 1 OF 3**

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE A1:1:500
230400	A3:1:1000
DWG NUMBER	REVISION
RC- 101	A

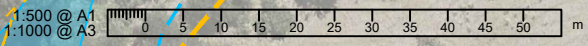
z:\tuhirangi road (287)\engineering\lead drawing\02_working\dwg\04_resource consent\230400-RC100-SITE PLAN.dwg, 101, 8/14/2023 5:32 pm



LEGEND:

- EXISTING WETLAND
- 10m WETLAND SETBACK
- EXISTING STREAM
- 20m STREAM RIPARIAN MARGIN
- EXISTING CULVERT
- PROPOSED CULVERT

CULVERT 1 AND 4 WILL BE REPLACED WITH COMPLYING CULVERTS FOR FISH PASSAGE (UNDER s70 OF THE NES-FW)
CULVERT 5 WILL BE REMOVED ENTIRELY.



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	SURVEYED	TERRA 01/03/23	<p>terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS</p>
B	25/09/23	FOR RESOURCE CONSENT	GT	GZ	DESIGNED		
					DRAWN		
					TRACED		
					CHECKED		

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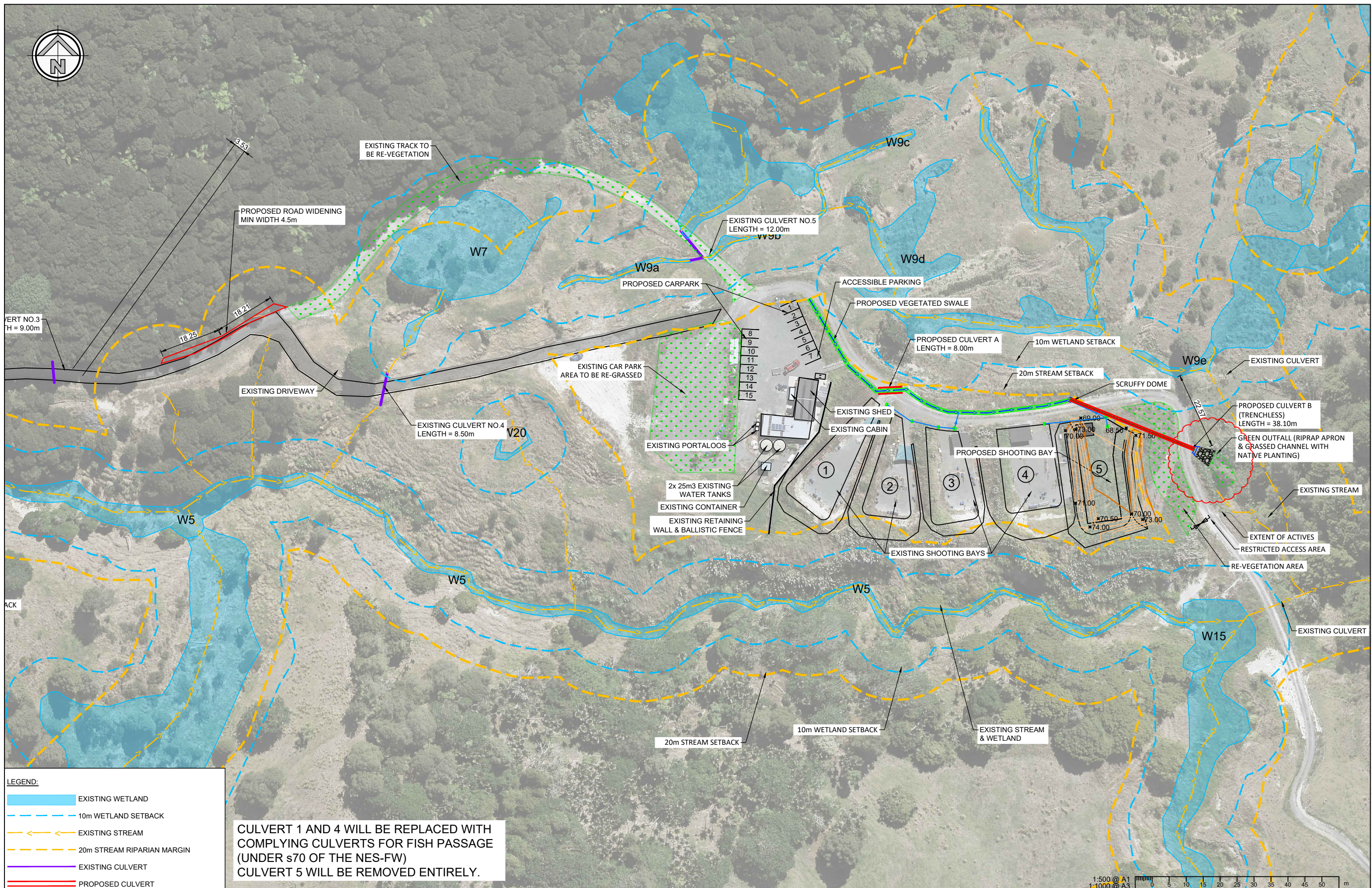
CLIENT
AUCKLAND SHOOTING CLUB INCORPORATED

PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
SITE LAYOUT PLAN SHEET 2 OF 3

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
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DWG NUMBER	REVISION
RC-102	B

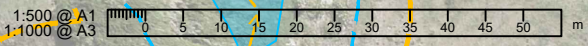
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LEGEND:

- EXISTING WETLAND
- 10m WETLAND SETBACK
- EXISTING STREAM
- 20m STREAM RIPARIAN MARGIN
- EXISTING CULVERT
- PROPOSED CULVERT

**CULVERT 1 AND 4 WILL BE REPLACED WITH COMPLYING CULVERTS FOR FISH PASSAGE (UNDER s70 OF THE NES-FW)
CULVERT 5 WILL BE REMOVED ENTIRELY.**



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	SURVEYED	TERRA 01/03/23	 PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS
B	10/08/23	FOR S92 RESPONSE	GC	GCAI	DESIGNED		
C	25/09/23	FOR S92 RESPONSE	GT	GZ	DRAWN		
					TRACED		
					CHECKED		

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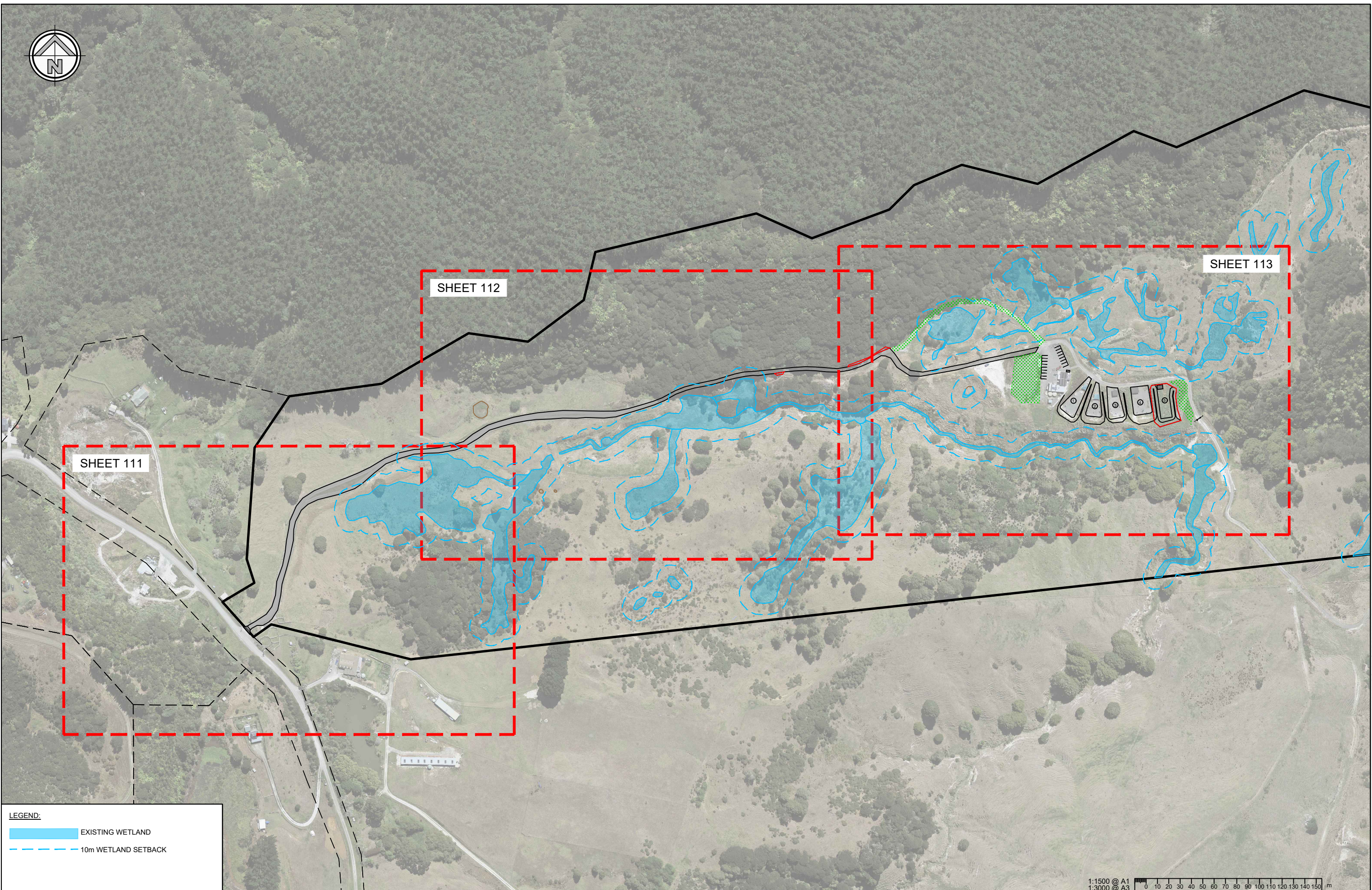
CLIENT
 AUCKLAND SHOOTING CLUB
 INCORPORATED

PROJECT / LOCATION
 287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND

DRAWING TITLE
 SITE LAYOUT PLAN
 SHEET 3 OF 3

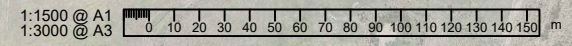
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FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
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DWG NUMBER	REVISION
RC-103	C

Z:\Tuhirangi Road (287)\Engineering\CAD\Drawing\02 - WORKING DWG\04 - RESOURCE CONSENT\230400-RC100-SITE PLAN.dwg, 103_9/29/2023 4:16 pm



LEGEND:

	EXISTING WETLAND
	10m WETLAND SETBACK



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE OVERALL LAYOUT PLAN
 - EXISTING WETLAND**

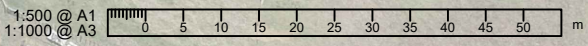
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DWG NUMBER RC-110	REVISION A

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LEGEND:

	EXISTING WETLAND
	10m WETLAND SETBACK



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING WETLAND
 SHEET 1 OF 3**

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
230400	A1:1:500 A3:1:1000
DWG NUMBER	REVISION
RC-111	A

z:\tuhirangi road (287)\engineering\lead drawing\02_working\dwg\04_resource consent\230400-RC1-00-SITE PLAN-WETLAND.dwg, 11.1, 8/14/2023 5:53 pm



PROPOSED ROAD WIDENING
MIN WIDTH 4.5m

PROPOSED PASSING BAY
MIN WIDTH 5.5m

W4

W5

W5

LEGEND:

EXISTING WETLAND

10m WETLAND SETBACK



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING WETLAND
SHEET 2 OF 3**

STAGE
FOR RESOURCE CONSENT

PROJECT NUMBER 230400	SCALE A1:1:500 A3:1:1000
DWG NUMBER RC-112	REVISION A

z:\tuhirangi road (287)\engineering\lead drawing\02 - working dwg\04 - resource consent\230400-RC1-00-SITE PLAN-WETLAND.dwg, 112_8/14/2023 6:53 pm



PROPOSED ROAD WIDENING
MIN WIDTH 4.5m



LEGEND:

	EXISTING WETLAND
	10m WETLAND SETBACK



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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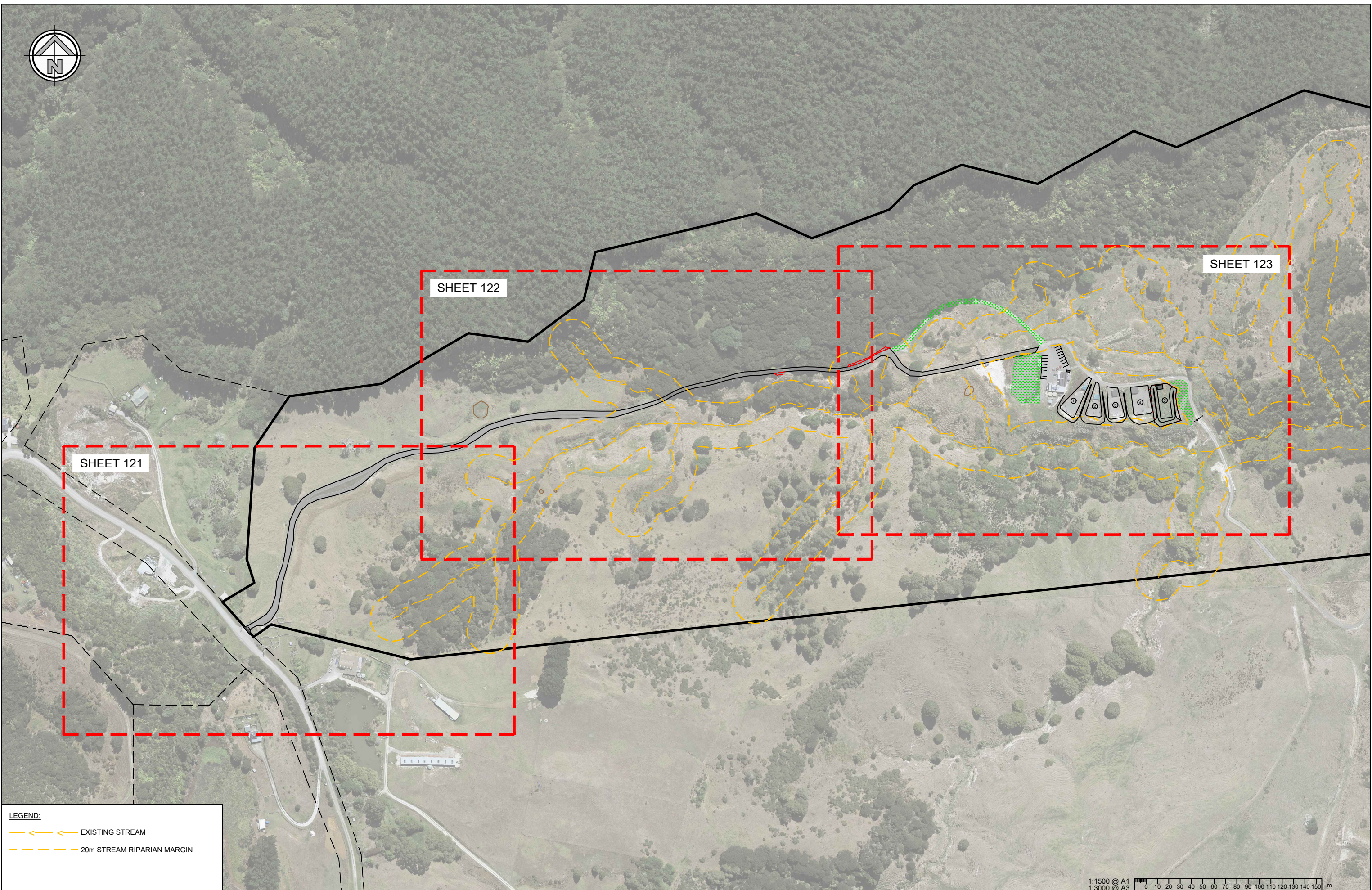
CLIENT
**AUCKLAND SHOOTING CLUB
INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING WETLAND
SHEET 3 OF 3**

STAGE FOR RESOURCE CONSENT	
PROJECT NUMBER 230400	SCALE A1 1:500 A3 1:1000
DWG NUMBER RC- 113	REVISION A

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LEGEND:

	EXISTING STREAM
	20m STREAM RIPARIAN MARGIN

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

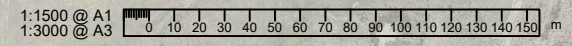
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CLIENT
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 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE OVERALL LAYOUT PLAN
 - EXISTING STREAM**

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
230400	A1:1:1500 A3:1:3000
DWG NUMBER	REVISION
RC- 120	A

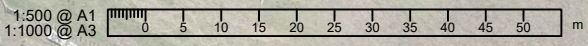


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LEGEND:

	EXISTING STREAM
	20m STREAM RIPARIAN MARGIN



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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**AUCKLAND SHOOTING CLUB
 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING STREAM
 SHEET 1 OF 3**

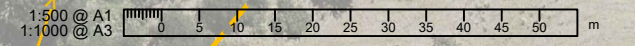
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PROJECT NUMBER	SCALE
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DWG NUMBER	REVISION
RC- 121	A

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LEGEND:

	EXISTING STREAM
	20m STREAM RIPARIAN MARGIN



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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 INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING STREAM
 SHEET 2 OF 3**

STAGE FOR RESOURCE CONSENT	
PROJECT NUMBER 230400	SCALE A1:1:500 A3:1:1000
DWG NUMBER RC-122	REVISION A

z:\tuhirangi road (287)\engineering\lead drawing\02 - working dwg\04 - resource consent\230400-RC120-SITE PLAN-STREAM.dwg, 122_8/14/2023 5:33 pm



PROPOSED ROAD WIDENING
MIN WIDTH 4.5m



LEGEND:

	EXISTING STREAM
	20m STREAM RIPARIAN MARGIN

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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INCORPORATED**

PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
AUCKLAND**

DRAWING TITLE
**SITE LAYOUT PLAN - EXISTING STREAM
SHEET 3 OF 3**

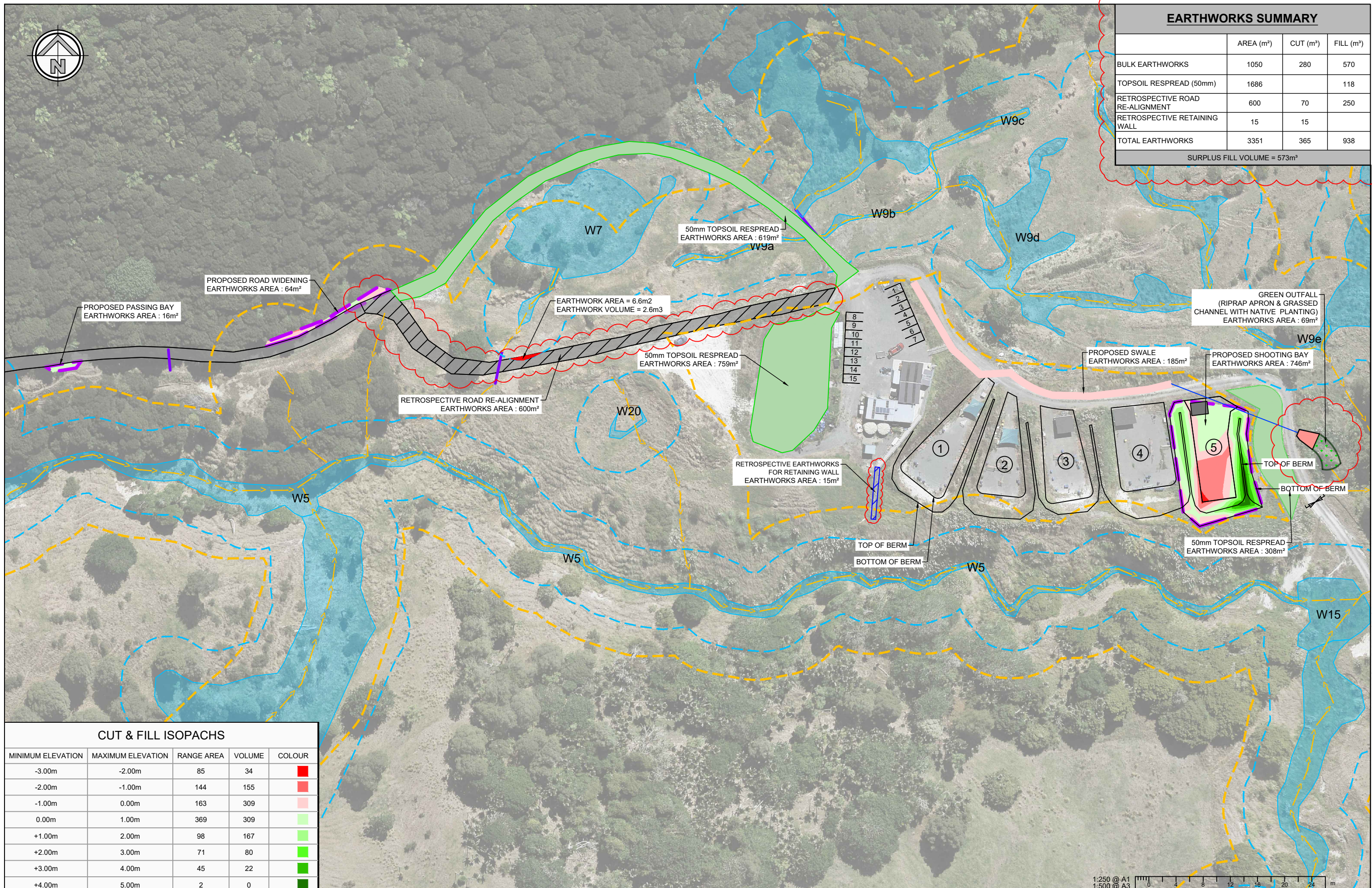
STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE A1:1:500
230400	A3:1:1000
DWG NUMBER	REVISION
RC- 123	A

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EARTHWORKS SUMMARY

	AREA (m ²)	CUT (m ³)	FILL (m ³)
BULK EARTHWORKS	1050	280	570
TOPSOIL RESPREAD (50mm)	1686		118
RETROSPECTIVE ROAD RE-ALIGNMENT	600	70	250
RETROSPECTIVE RETAINING WALL	15	15	
TOTAL EARTHWORKS	3351	365	938
SURPLUS FILL VOLUME = 573m ³			



CUT & FILL ISOPACHS

MINIMUM ELEVATION	MAXIMUM ELEVATION	RANGE AREA	VOLUME	COLOUR
-3.00m	-2.00m	85	34	Red
-2.00m	-1.00m	144	155	Light Red
-1.00m	0.00m	163	309	Pink
0.00m	1.00m	369	309	Light Green
+1.00m	2.00m	98	167	Light Green
+2.00m	3.00m	71	80	Green
+3.00m	4.00m	45	22	Dark Green
+4.00m	5.00m	2	0	Dark Green

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	SURVEYED	TERRA 01/03/23	<p>terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS</p>
B	10/08/23	FOR S92 RESPONSE	GC	GCAI	DESIGNED		
					DRAWN		
					TRACED		
					CHECKED		

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PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
OVERALL EARTHWORKS PLAN

STAGE
FOR RESOURCE CONSENT

PROJECT NUMBER
230400

DWG NUMBER
RC- 200

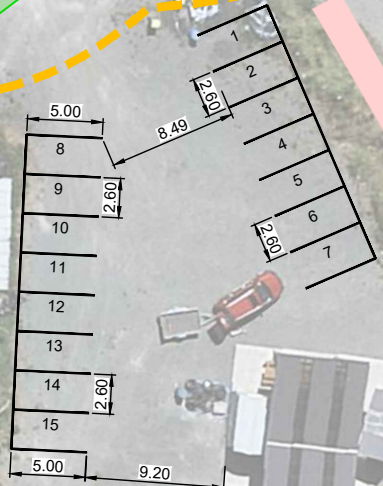
SCALE
A1:1:500
A3:1:1000

REVISION
B

z:\tuhirangi road (287)\engineering\lead drawing\02_resource consent\230400-RC200-EARTHWORKS PLAN.dwg, 200: 8/14/2023 5:34 pm



50mm TOPSOIL RESPREAD
EARTHWORKS AREA : 619m²



PROPOSED SWALE
EARTHWORKS AREA : 185m²

PROPOSED SHOOTING BAY
EARTHWORKS AREA : 746m²

GREEN OUTFALL
(RIPRAP APRON & GRASSED
CHANNEL WITH NATIVE PLANTING)
EARTHWORKS AREA : 69m²

50mm TOPSOIL RESPREAD
EARTHWORKS AREA : 759m²

RETROSPECTIVE EARTHWORKS FOR RETAINING WALL
EARTHWORKS AREA : 15m²

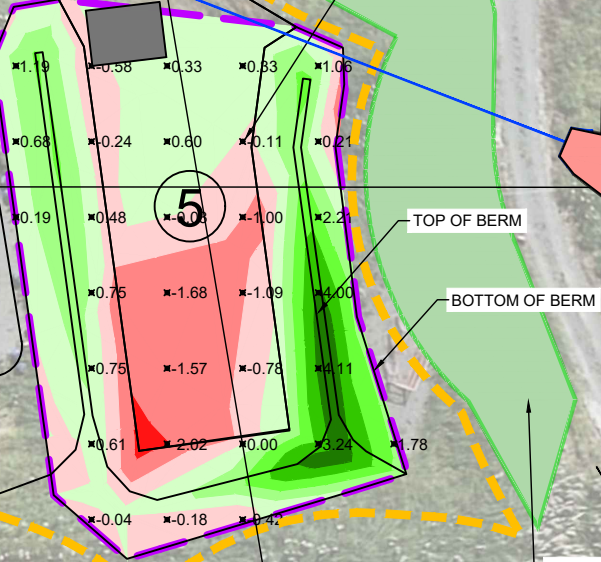
BOTTOM OF BERM

TOP OF BERM

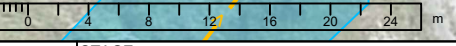
TOP OF BERM

BOTTOM OF BERM

50mm TOPSOIL RESPREAD
EARTHWORKS AREA : 308m²



1:250 @ A1
1:500 @ A3



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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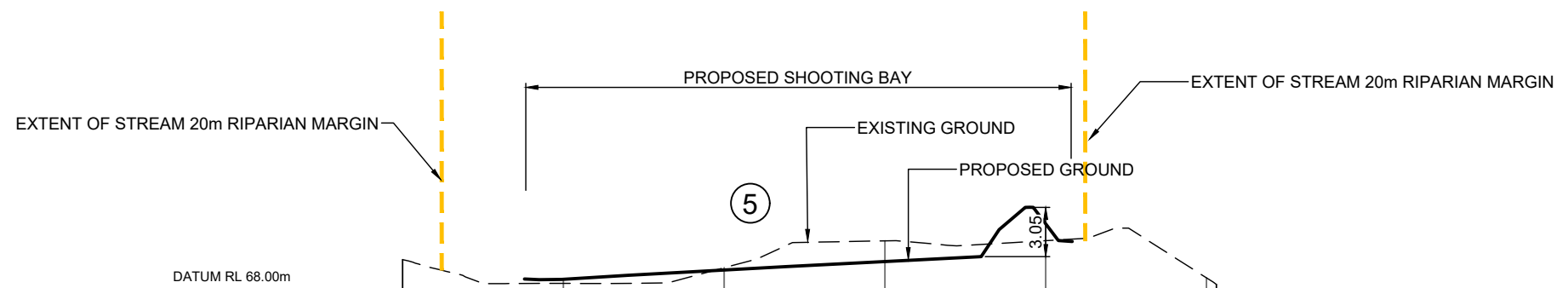
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PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
AUCKLAND**

DRAWING TITLE
**EARTHWORKS PLAN
- SHOOTING BAY**

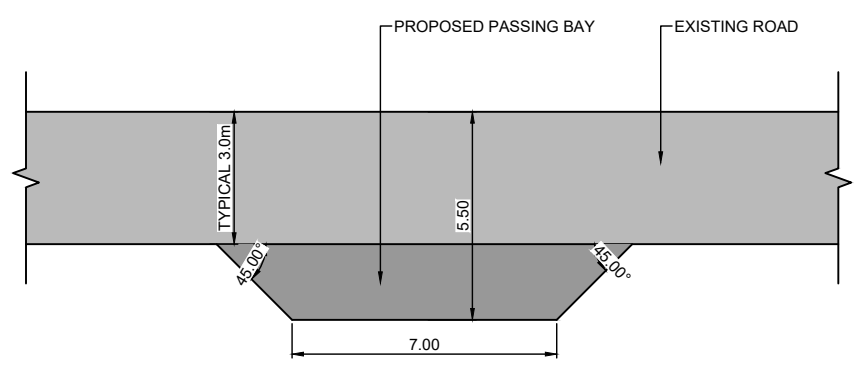
STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
230400	A1:1:250 A3:1:500
DWG NUMBER	REVISION
RC- 201	A

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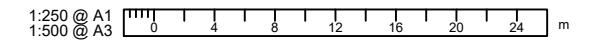


DATUM RL 68.00m	
PROPOSED LEVEL	69.97 68.50 69.47 71.14 71.15 68.84 68.43
EXISTING LEVEL	69.97 68.50 69.47 71.14 71.15 68.84 68.43
CUT (-) / FILL (+)	0.00 0.00 0.00 0.00 0.00 0.00 0.00
CHAINAGE	0.00 10.00 20.00 30.00 40.00 50.00 50.61

SECTION B-B LONGSECTION
 CH: 0.00m TO CH: 50.61m
 1:500H 1:500V @ A1 (DOUBLE FOR A3)



TYPICAL PASSING BAY DETAILS
 1:100 @A1
 1:200 @A3



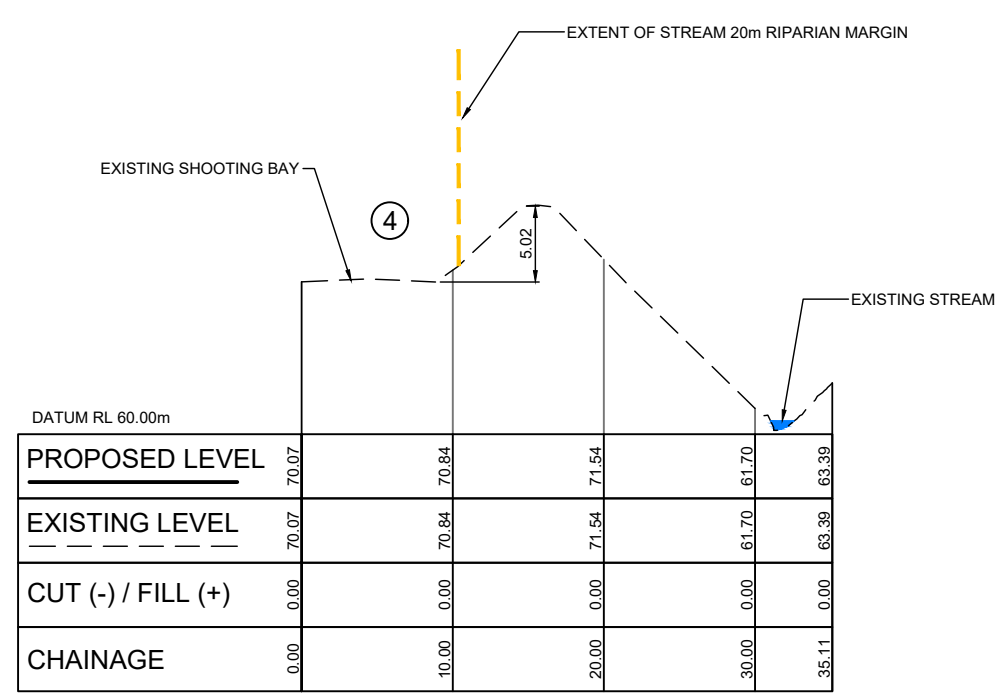
ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	 PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS

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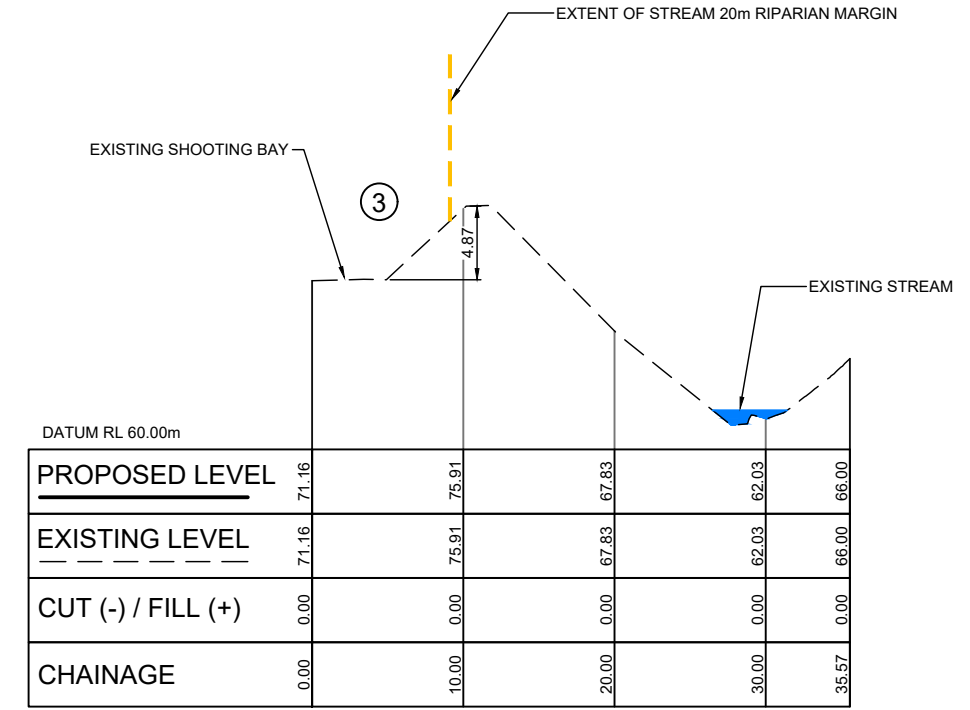
PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
**TYPICAL CROSS SECTION
 SHEET 2 OF 3**

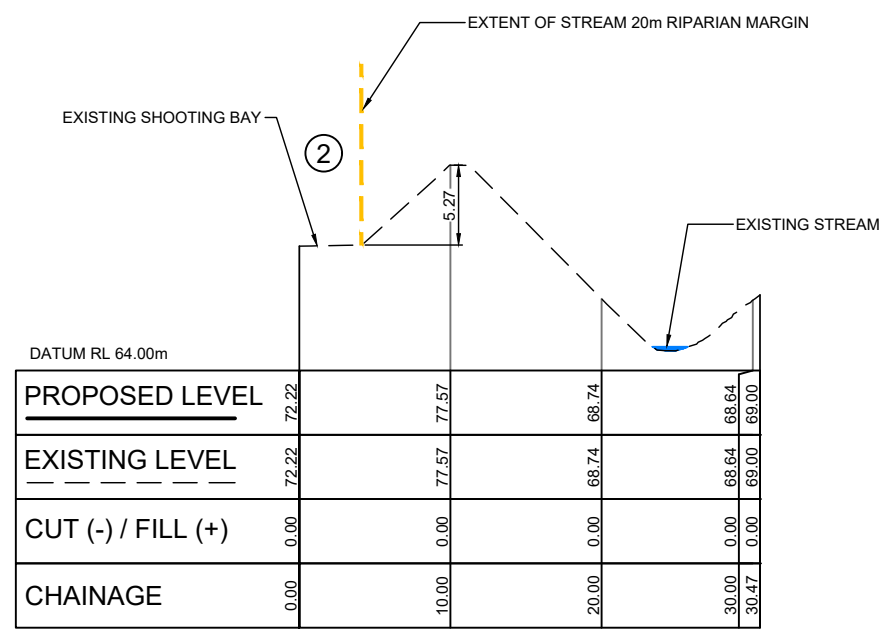
STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
230400	A1:1:250 A3:1:500
DWG NUMBER	REVISION
RC- 211	A



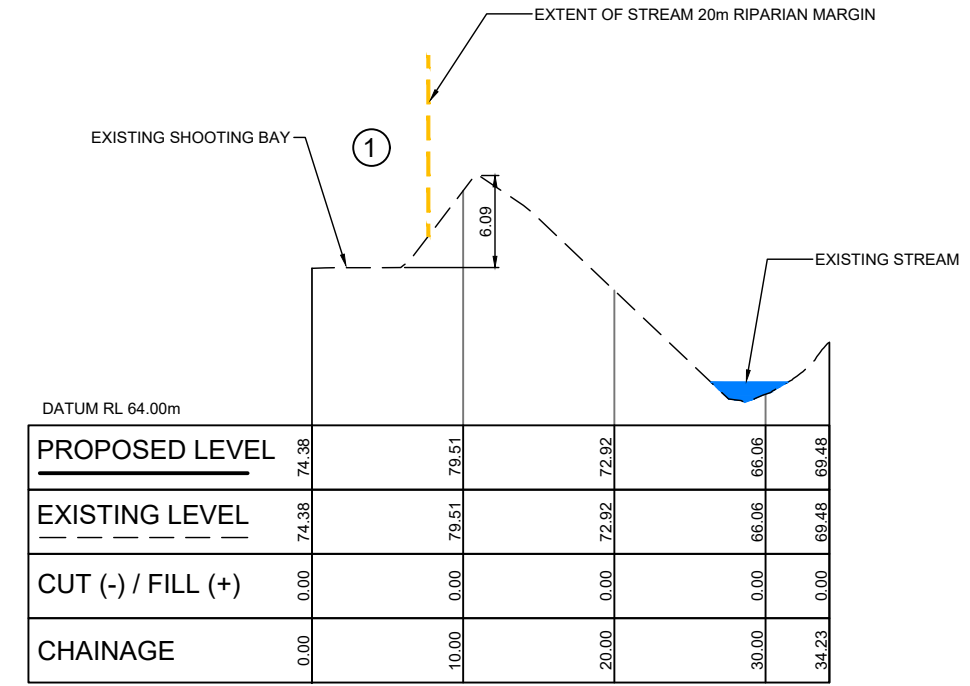
SECTION C-C LONGSECTION
CH: 0.00m TO CH: 35.11m
1:500H 1:500V @ A1 (DOUBLE FOR A3)



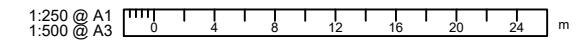
SECTION D-D LONGSECTION
CH: 0.00m TO CH: 35.57m
1:500H 1:500V @ A1 (DOUBLE FOR A3)



SECTION E-E LONGSECTION
CH: 0.00m TO CH: 30.47m
1:500H 1:500V @ A1 (DOUBLE FOR A3)



SECTION F-F LONGSECTION
CH: 0.00m TO CH: 34.23m
1:500H 1:500V @ A1 (DOUBLE FOR A3)



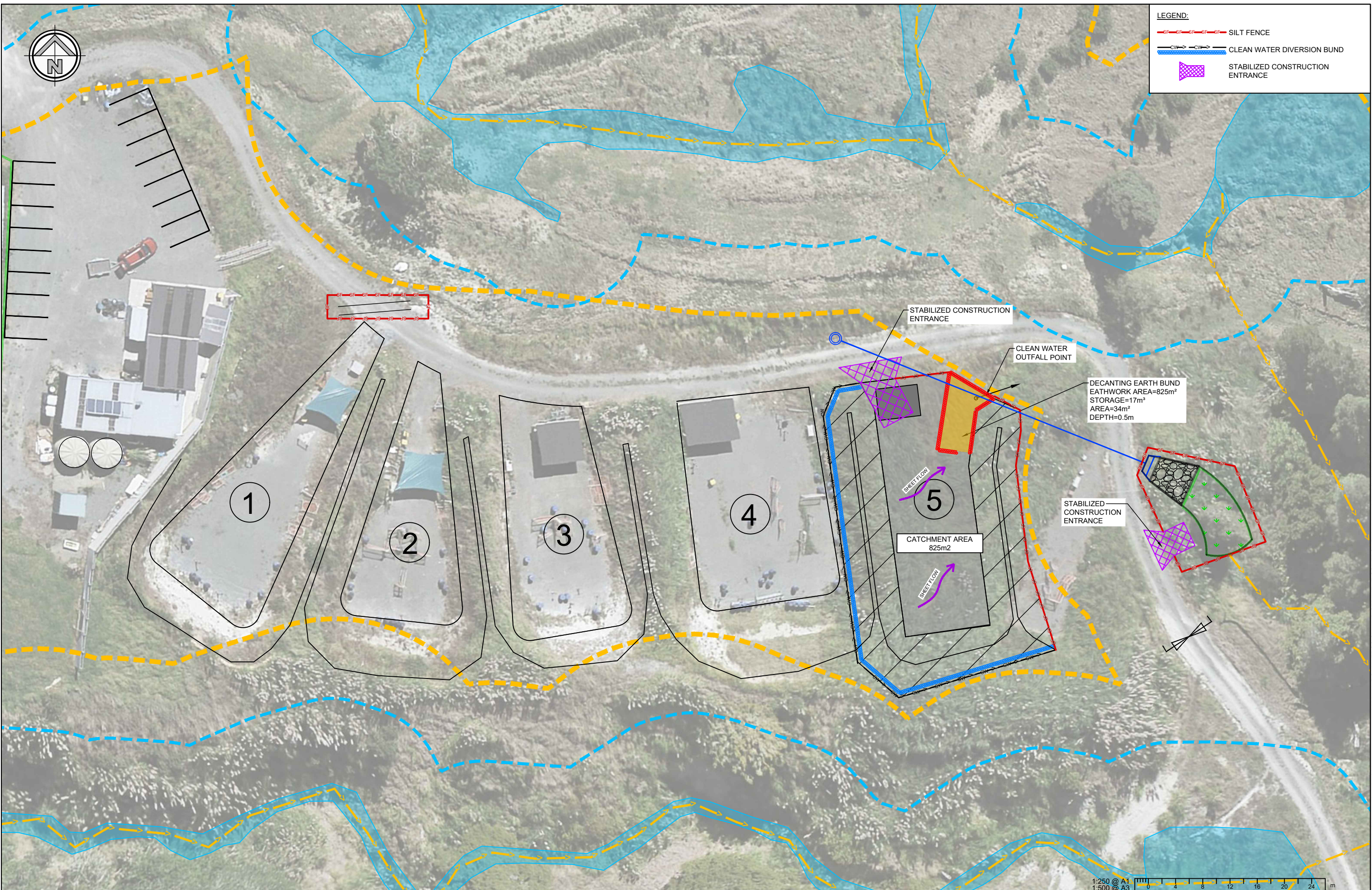
ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	 PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS

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PROJECT / LOCATION	287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE	TYPICAL CROSS SECTION SHEET 3 OF 3
---------------	---------------------------------------

STAGE	FOR RESOURCE CONSENT
PROJECT NUMBER	230400
DWG NUMBER	RC- 212
SCALE	A1:1:250 A3:1:500
REVISION	A

z:\tuhirangi road (287)\engineering\lead drawing\02_working\dwg\04_resource consent\230400-RC200-EARTHWORKS PLAN.dwg, 212, 8/14/2023 5:34 pm



LEGEND:

	SILT FENCE
	CLEAN WATER DIVERSION BUND
	STABILIZED CONSTRUCTION ENTRANCE

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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PROJECT / LOCATION
**287 TUHIRANGI ROAD, MAKARAU,
 AUCKLAND**

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

STAGE FOR RESOURCE CONSENT	
PROJECT NUMBER 230400	SCALE A1:1:250 A3:1:500
DWG NUMBER RC- 300	REVISION A

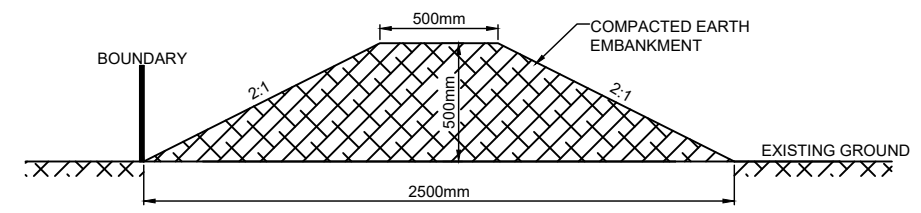
z:\tuhirangi road (287)\engineering\lead drawing\02_resource consent\230400-RC300-EROSION AND SEDIMENT CONTROL PLAN.dwg, 300, 8/14/2023 5:34 pm

POST SPACING CAN BE INCREASED FROM 2 METRES TO 4 METRES TO SUPPORT BY A 16mm DIAMETER HIGH TENSILE WIRE ALONG THE TOP WITH CLIPS EVERY 200mm.

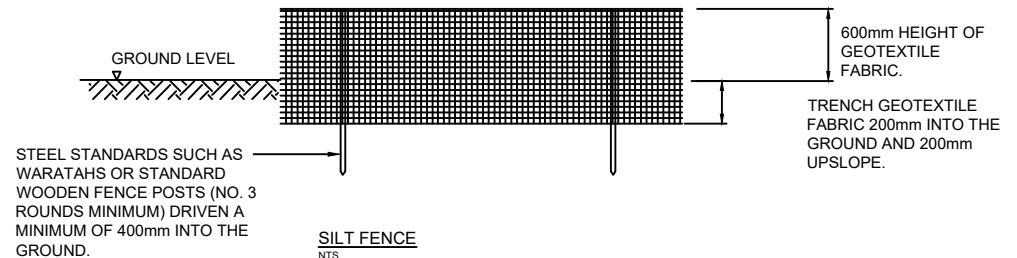
SELF TAPPING WOOD SCREWS

WRAP BOTH ENDS OF THE FABRIC AROUND ONE STAKE AND CLAMP THE OTHER STAKE TO IT USING SELF TAPPING SCREWS AT 150mm SPACINGS.

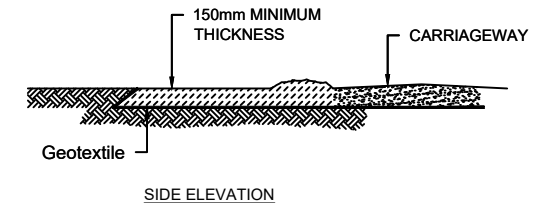
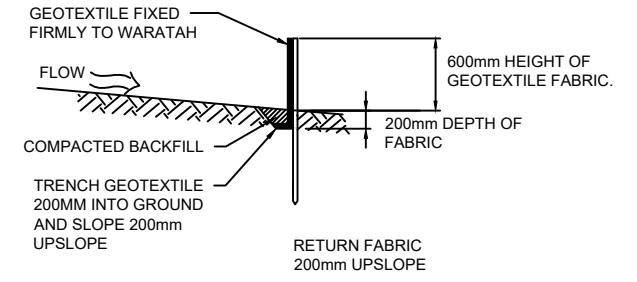
STANDARD DETAIL FOR FABRIC JOIN



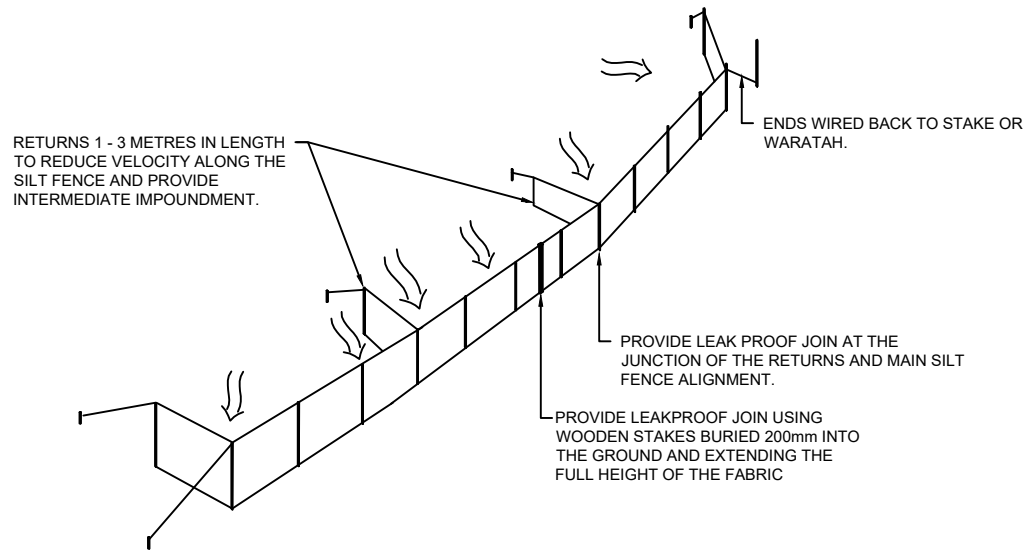
EARTH BUND CROSS SECTION
NTS



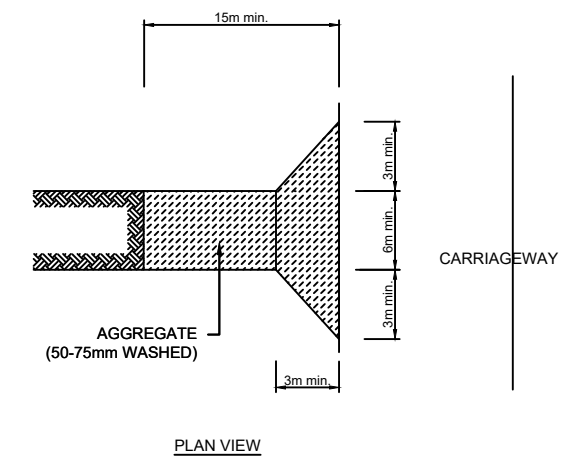
SILT FENCE
NTS



SIDE ELEVATION

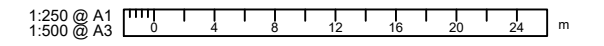


SILT FENCE WITH RETURNS AND SUPPORTS WIRE



PLAN VIEW

STABILISED CONSTRUCTION ENTRANCE
N.T.S.



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	<p>terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS</p>

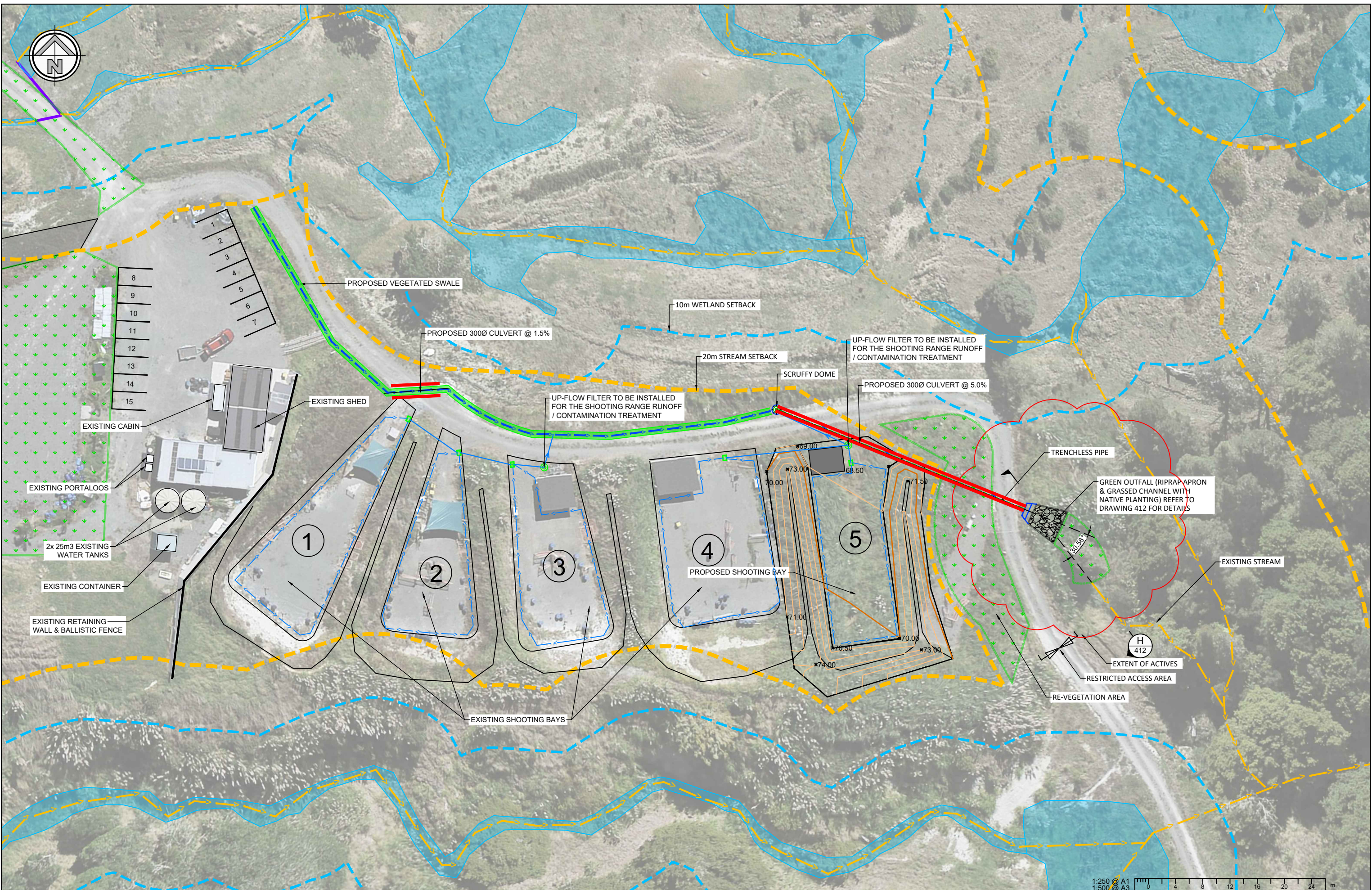
CLIENT
AUCKLAND SHOOTING CLUB INCORPORATED

PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
EROSION AND SEDIMENT CONTROL STANDARD DETAILS

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE
230400	A1 1:250 A3 1:500
DWG NUMBER	REVISION
RC- 310	A

z:\tuhirangi road (287)\engineering\lead drawing\02_resource consent\230400-RC300-EROSION AND SEDIMENT CONTROL PLAN.dwg, 310, 8/14/2023 5:34 pm



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	SURVEYED	TERRA 01/03/23	terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS
B	10/08/23	FOR S92 RESPONSE	GC	GCAI	DESIGNED		
					DRAWN		
					TRACED		
					CHECKED		

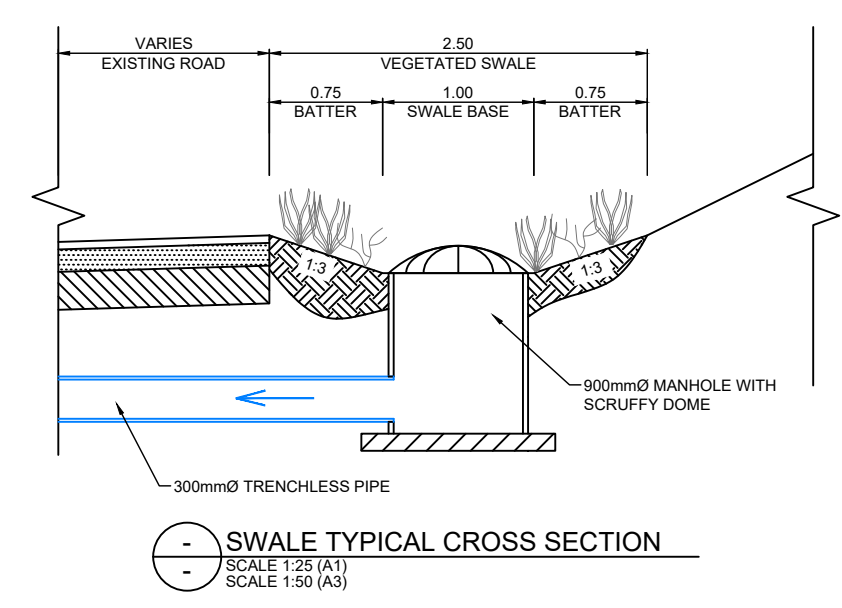
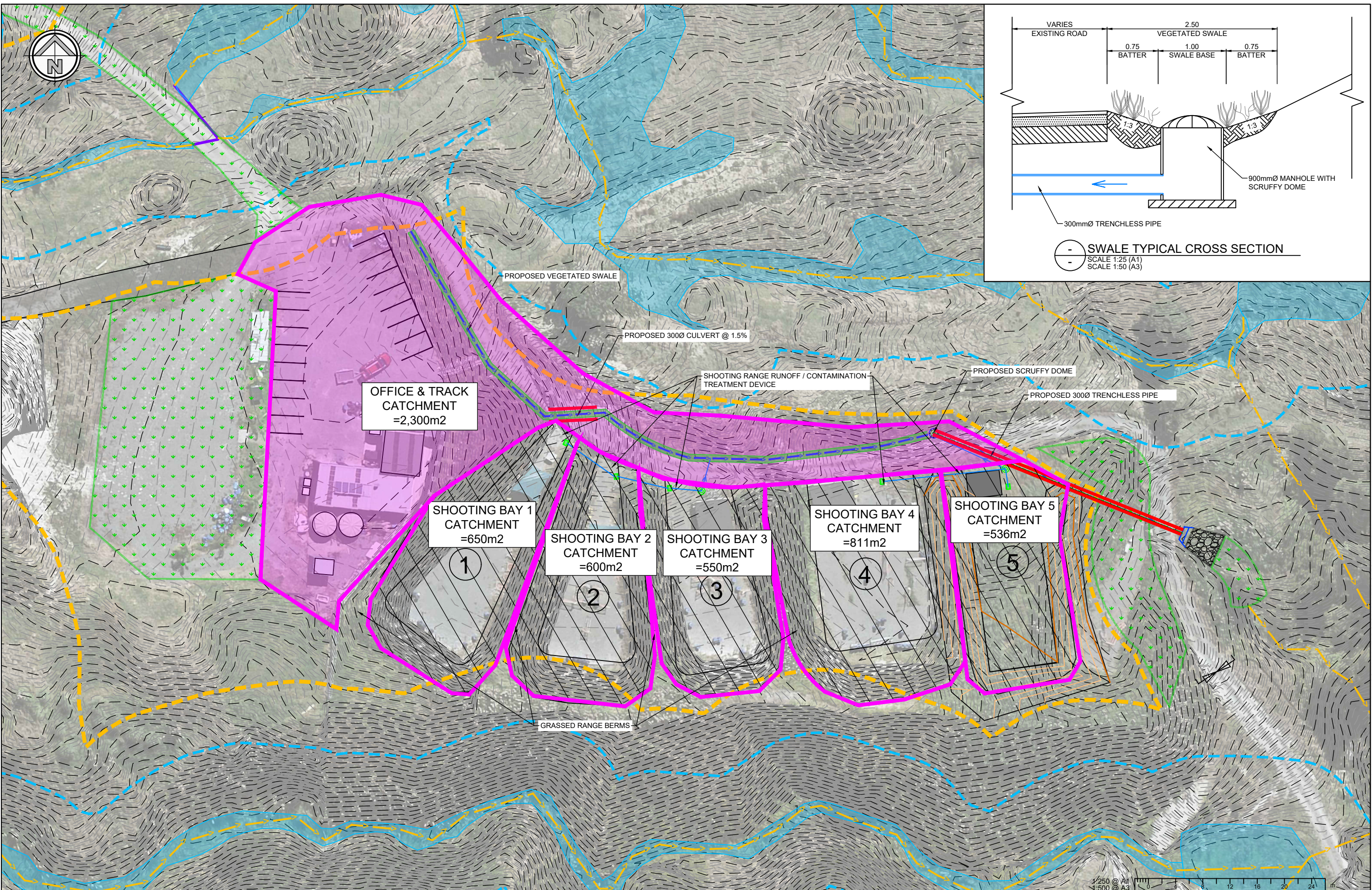
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 PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
DRAINAGE LAYOUT PLAN

STAGE		FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE	A1:1:250	A3:1:500
230400			
DWG NUMBER	REVISION		
RC- 400			B

z:\tuhirangi road (287)\engineering\lead drawing\02_working\dwg\04_resource consent\230400-RC400-DRAINAGE PLAN.dwg_400_8/14/2023 6:35 pm



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	

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 PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
10 YEAR STORMWATER CATCHMENT PLAN

STAGE	
FOR RESOURCE CONSENT	
PROJECT NUMBER	SCALE A1:1:250
230400	A3:1:500
DWG NUMBER	REVISION
RC- 410	A

z:\tuhirangi road (287)\engineering\lead drawing\02_resource consent\230400-RC410-10 YEAR STORMWATER CATCHMENT PLAN.dwg, 410, 8/14/2023 5:35 pm

JOB: 287 Tuhirangi Road, Makarau, Auckland		
SUBJECT: 10 Year Swale Capacity Assessment		
BY: G.CAI	DATE: 2/05/23	JOB NO: 230400

SWALE DESIGN CALCULATIONS

Auckland Council
GD01; C6.0

CATCHMENT AREA

Impermeable Area	3461	m ²
Permeable Area	500	m ²
Total Catchment Area A_c	3961	m²

RUNOFF FLOW

Rational Method

Water Quality Rainfall Intensity	i	10.0	mm/hr
Impermeable Coefficient	C_{imp}	0.95	
Permeable Coefficient	C_{perm}	0.50	
Total Water Quality Flow Q	0.010	m³/s	

SWALE DESIGN

Auckland Council GD01

Water Quality Flow Depth	d	0.062	m
Planting Type		Vegetated	
Channel Slope	s	5.00%	
Base width	b	1.000	m
Side Slope	Z 1:	3	
Mannings 'n'	n	0.250	
Cross-sectional area	A	0.073	m ²
Hydraulic radius	R	0.059	m
Width at Water Level	w	1.37	m
WQV Design Flow Check Q_d	0.010	m³/s $\geq Q$	OK
Velocity V	0.135	m/s	
$V < 0.8m/s$		OK	

$$0.6m < b < 2m$$

$$A = bd + Zd^2$$

$$T = b + 2dZ$$

$$Eq 34$$

$$V = Q/A$$

10 YEAR STORM RUNOFF

10yr Rainfall Intensity	101.0	mm/hr
Total 10 Year Flow Q_{10}	0.099	m³/s

10 YEAR SWALE FLOW

10 Year Flow Depth	d_{10}	0.209	m
Mannings 'n'	n	0.250	
Cross-sectional area	A	0.341	m ²
Hydraulic radius	R	0.186	m
Width at Water Level	w_{10}	2.26	m
Design Flow Check Q_d	0.099	m³/s $\geq Q_{10}$	OK
Velocity V	0.291	m/s	
$V < 1.5m/s$		OK	

Eq 34
 $V = Q/A$

CHECK DAM DESIGN

Check Dams Used	No	Check Dams Not Required
Swale Longitudinal Grade	5.00%	
Check Dam Height	0.10	m
Check Dam Spacing	N/A	m
Check Dam Volume	-	m ³
Residence Time at WQF	0.0	min

Eq 38
Eq 36

CHECK 10 YEAR FLOW OVER CHECK DAMS

Depth of Flow Over Check Dam	0.110	m
Depth of Water at Check Dam	N/A	m

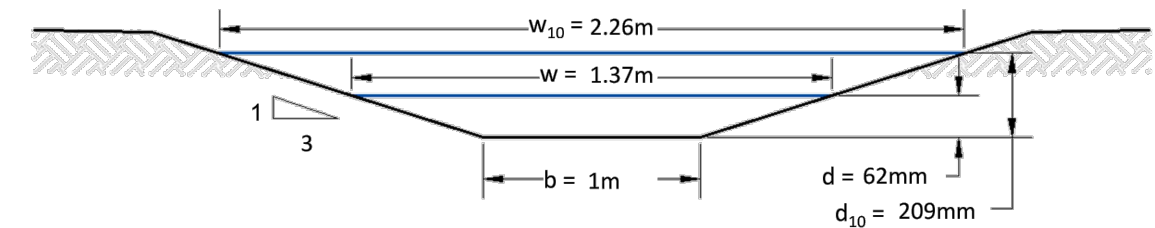
Eq 41

CHECK RESIDENCE TIME

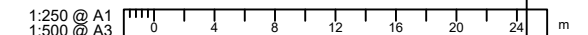
Minimum travel time	t	9	min
Minimum swale length L	72.8	m	

Minimum 9mins
Eq 35 & 36

SWALE DIMENSIONS:



Planting = Vegetated
Longitudinal Slope = 5 %
Check Dams = N/A
Length Required = 72.8 m



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	terra consultants

CLIENT	AUCKLAND SHOOTING CLUB INCORPORATED	DRAWING TITLE	10 YEAR SWALE TREATMENT ASSESSMENT	STAGE	FOR RESOURCE CONSENT
PROJECT / LOCATION	287 TUHIRANGI ROAD, MAKARAU, AUCKLAND	PROJECT NUMBER	230400	SCALE	A1:1:250 A3:1:500
		DWG NUMBER	RC- 411	REVISION	A

z:\tuhirangi road (287)\engineering\lead drawing\02_working\dwg\04_resource consent\230400-RC410-10 YEAR STORMWATER CATCHMENT PLAN.dwg_411_8/14/2023 5:35 pm

JOB: 287 Tuhirangi Road, Makarau, Auckland		
SUBJECT: Outfall Calculation		
BY: G.CAI	DATE: 10/08/23	JOB NO: 230400

RIP-RAP OUTLET DESIGN

PIPE FLOW RATE

Storm Scenario	10%	AEP
Pipe Flow Rate	q	99 l/s

DESIGN CAPACITY

$$V_d = \frac{1}{n} R^{2/3} S^{1/2}$$

Manning's Formula

Pipe Material	Concrete	
Pipe Size	D _o	300 mm
Pipe Slope	S	5.00%
Number of Barrels	1	
Manning's n	n	0.012
Pipe Design Flow	Q _d	234.2 l/s OK

PARTIAL PIPE FLOW

Flow Depth	y	136 mm
Relative Depth	y/D	0.45
Angle	θ	2.96 rad
Flow Area	A	0.03 m ²
Wetted Perimeter	P	0.44 m
Partial Pipe Flow Velocity	V	3.2 m/s OK

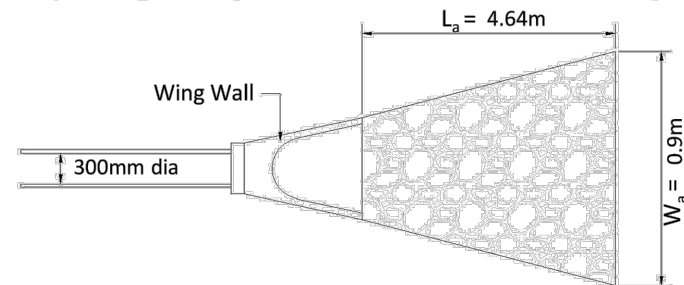
CHECK CRITICAL FLOW

Froude Number	F _o	2.7 (Supercritical)
Scour Protection	RIP-RAP/BAFFLE BLOCKS	

$$F_o = v / (g \times d_p)^{0.5}$$

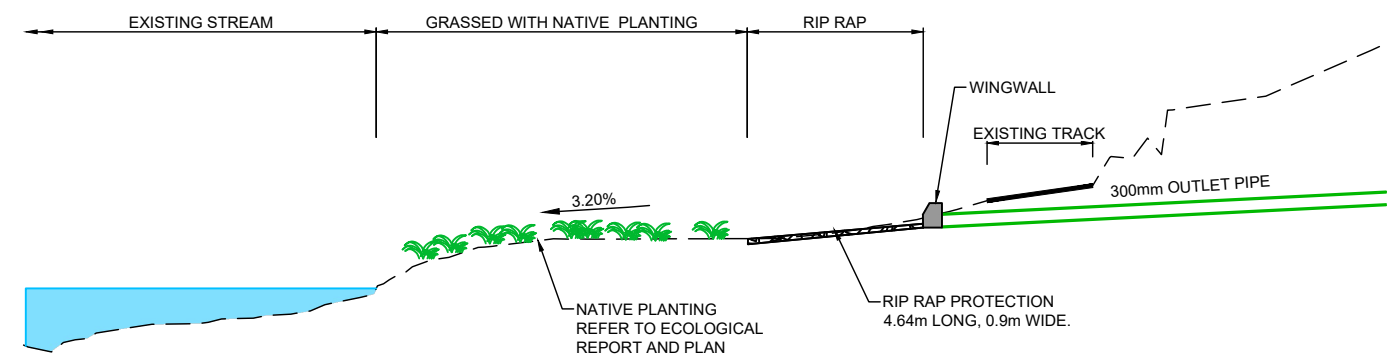
RIP-RAP APRON DESIGN

Median Rip-Rap Diameter	d ₅₀	206 mm	$d_{50} = 0.25 \times D_o \times F_o$
Minimum Apron Width	W _a	0.90 m	$W_a \geq 3 \times D_o$
Minimum Apron Length	L _a	4.64 m	$L_a = D_o (8 + 17 \times \log F_o)$



Sheet: Rip-Rap Pipe Outlet
File: SW-AKCL-TP2013-018 Outfall Design.xlsm

of 1
2023 2:21 pm



H 400 STORMWATER OUTFALL DETAILS
1:100H, 1:100V @A1
1:200H, 1:200V @A3

1:100 @ A1
1:200 @ A3

ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	03/05/23	FOR RESOURCE CONSENT	GC	GCAI	TERRA	01/03/23	
					DESIGNED		
					DRAWN		
					TRACED		
					CHECKED		

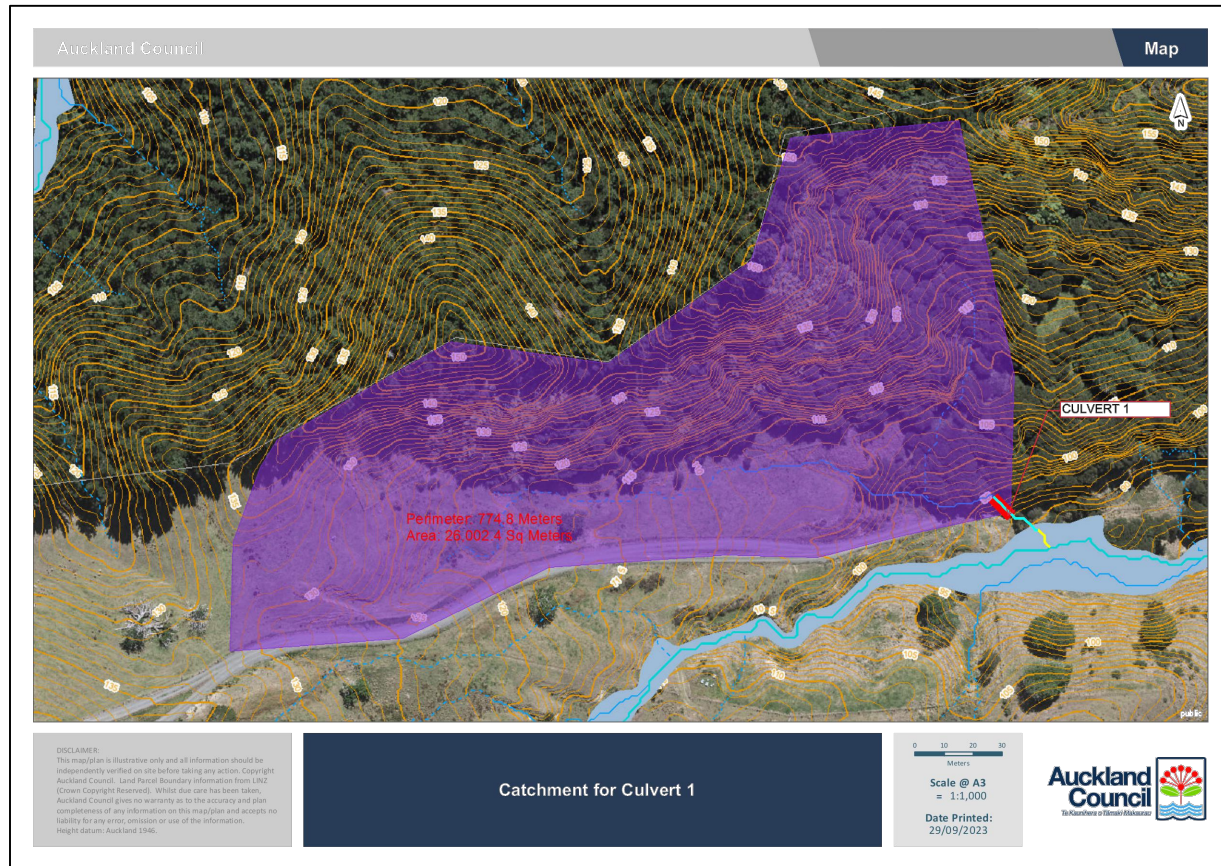
terra
CONSULTANTS
PO BOX 12858, Penrose, New Zealand
Auckland: (09) 357 3557
Northland: (09) 431 4444
Christchurch: (03) 379 5055
Email: terra@terragroup.co.nz | Web: www.terragroup.co.nz
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CLIENT
AUCKLAND SHOOTING CLUB INCORPORATED
PROJECT / LOCATION
287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE
10 YEAR SWALE TREATMENT ASSESSMENT

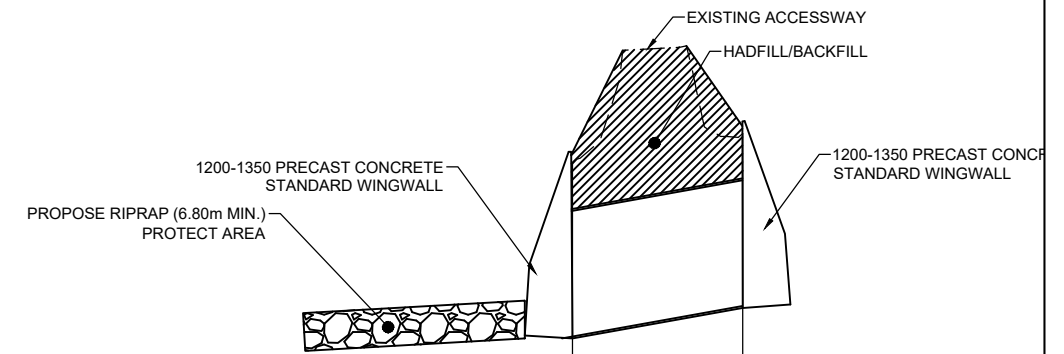
STAGE FOR RESOURCE CONSENT	
PROJECT NUMBER 230400	SCALE A1 1:100 A3 1:200
DWG NUMBER RC- 412	REVISION A

NOTE:
CULVERT DESIGN COMPLIES TO THE FISH PASSAGE, REFER TP131 FOR MORE DETAILS.



DESIGN FLOW - RATIONAL METHOD:

		Q = k.C.i.A	
Metric Conversion	k	2.78E-04	
Catchment Coefficient	C	0.4	
Rainfall Intensity	i	159	mm/hr
Catchment Area	A	26,002	m ²
Catchment Flow Q		459.4	l/s



DATUM RL 92.00m	
LID LEVEL	
DEPTH TO STRUCTURE SUMP	
INVERT LEVEL AT INSIDE EDGE	93.98
DISTANCE	9.00m
GRADIENT	3.55%
PIPE SIZE AND MATERIAL	PROPOSED 1350mm Ø CONCRETE 9.00m LONG CULVERT
FLOW DETAIL	MAXIMUM FLOW 460L/S (1% AEP)

CULVERT 1 LONG SECTION - LONGSECTION 1:200H 1:40V @ A1 (DOUBLE FOR A3)



JOB:	287 TUHIRANGI ROAD
SUBJECT:	RIP-RAP OUTLET DESIGN-CULVERT 1
BY:	
DATE:	28/09/23
JOB NO:	230400

RIP-RAP OUTLET DESIGN

TP 2013/018:
Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices

PIPE FLOW RATE

Storm Scenario	1%	AEP
Pipe Flow Rate q	459.4	l/s

DESIGN CAPACITY

$$V_d = \frac{1}{n} R^{2/3} S^{1/2}$$

Manning's Formula

Pipe Material	Concrete
Pipe Size D _o	450 mm
Pipe Slope S	3.55%
Number of Barrels	1
Manning's n	0.012
Pipe Design Flow Q _d	581.9 l/s

PARTIAL PIPE FLOW

Flow Depth y	302	mm
Relative Depth y/D	0.67	
Angle θ	3.84	rad
Flow Area A	0.11	m ²
Wetted Perimeter P	0.86	m
Partial Pipe Flow Velocity V	4.1	m/s

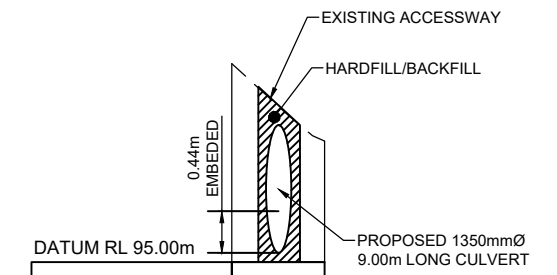
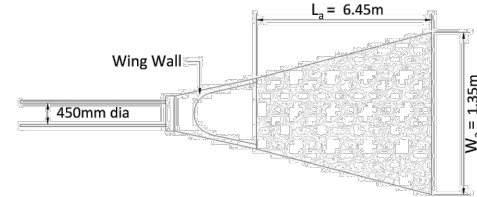
CHECK CRITICAL FLOW

Froude Number F _o	2.4	(Supercritical)
Scour Protection	RIP-RAP/BAFFLE BLOCKS	

$$F_o = v / (g \times d_o)^{0.5}$$

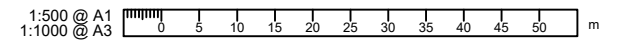
RIP-RAP APRON DESIGN

Median Rip-Rap Diameter d ₅₀	265	mm	$d_{50} = 0.25 \times D_o \times F_o$
Minimum Apron Width W _a	1.35	m	$W_a \geq 3 \times D_o$
Minimum Apron Length L _a	6.45	m	$L_a = D_o (8 + 17 \times \log F_o)$



DATUM RL 95.00m	
LID LEVEL	
DEPTH TO STRUCTURE SUMP	
INVERT LEVEL AT INSIDE EDGE	
DISTANCE	
GRADIENT	
PIPE SIZE AND MATERIAL	PROPOSED 1350mmØ 9.00m LONG CULVERT
FLOW DETAIL	MAXIMUM FLOW 460L/S (1% AEP)

CULVERT 1 CROSS SECTION - LONGSECTION 1:200H 1:40V @ A1 (DOUBLE FOR A3)



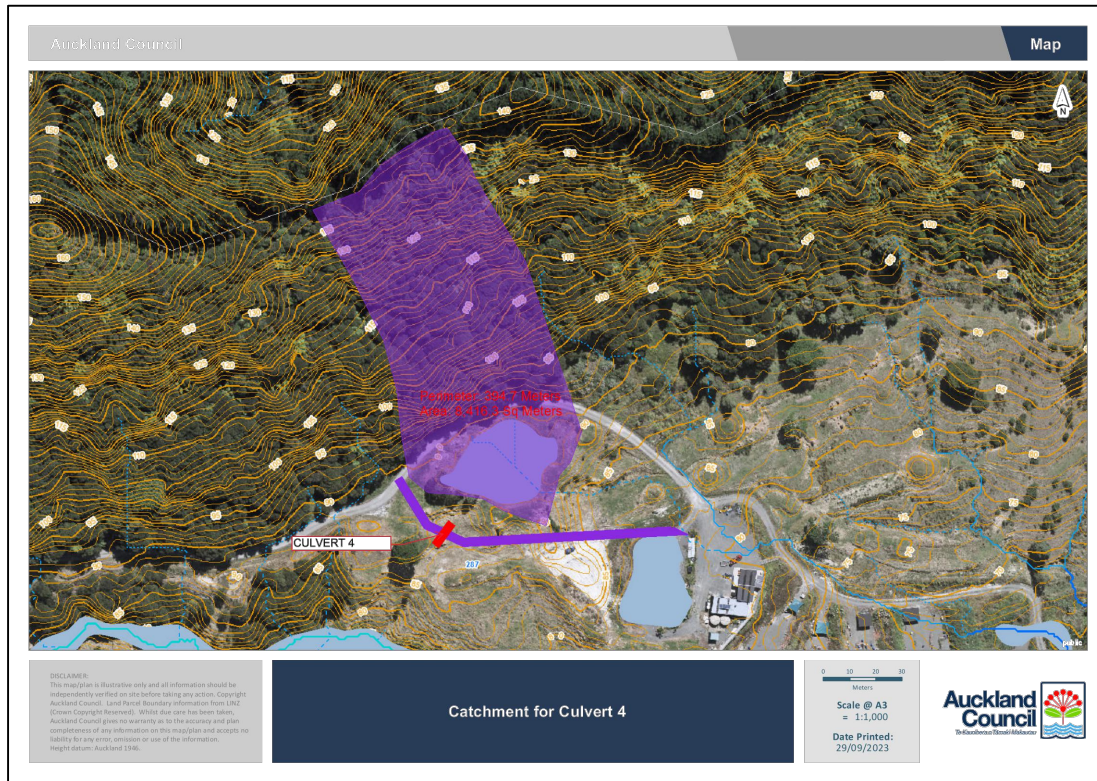
ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	29/09/23	FOR S92 RESPONSE	GT	GZ	TERRA	01/03/23	<p>terra CONSULTANTS PO BOX 12858, Penrose, New Zealand Auckland: (09) 357 3557 Northland: (09) 431 4444 Christchurch: (03) 379 5055 Email: terra@terragroup.co.nz Web: www.terragroup.co.nz DRAWINGS ARE COPYRIGHT AND PROPERTY OF TERRA CONSULTANTS</p>

CLIENT	AUCKLAND SHOOTING CLUB INCORPORATED
PROJECT / LOCATION	287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE	CULVERT 1 DESIGN WITH FISH PASSAGE
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STAGE	FOR RESOURCE CONSENT
PROJECT NUMBER	230400
DWG NUMBER	RC- 500
SCALE	A1:1:200 A3:1:400
REVISION	A

Z:\Tuhirangi Road (287)\Engineering\CAD Drawing\02 - WORKING DWG\04 - RESOURCE CONSENT\230400-RC100-SITE PLAN.dwg, 500, 9/29/2023 2:42 pm



terra consultants

JOB: 287 TUHIRANGI ROAD
SUBJECT: RIP-RAP OUTLET DESIGN-CULVERT 4
BY: GZ DATE: 28/09/23 JOB NO: 230400

RIP-RAP OUTLET DESIGN

TP 2013/018:
Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices

PIPE FLOW RATE

Storm Scenario	1% AEP
Pipe Flow Rate q	148.7 l/s

DESIGN CAPACITY

$$V_d = \frac{1}{n} R^{2/3} S^{1/2}$$

Manning's Formula

Pipe Material	PE
Pipe Size D _o	300 mm
Pipe Slope S	6.24%
Number of Barrels	1
Manning's n	0.011
Pipe Design Flow Q _d	285.5 l/s OK

PARTIAL PIPE FLOW

Flow Depth y	154 mm
Relative Depth y/D	0.51
Angle θ	3.19 rad
Flow Area A	0.04 m ²
Wetted Perimeter P	0.48 m
Partial Pipe Flow Velocity V	4.1 m/s OK

CHECK CRITICAL FLOW

Froude Number F _o	3.3 (Supercritical)
Scour Protection	SPECIFIC DESIGN REQUIRED

$$F_o = v / (g \times d_p)^{0.5}$$

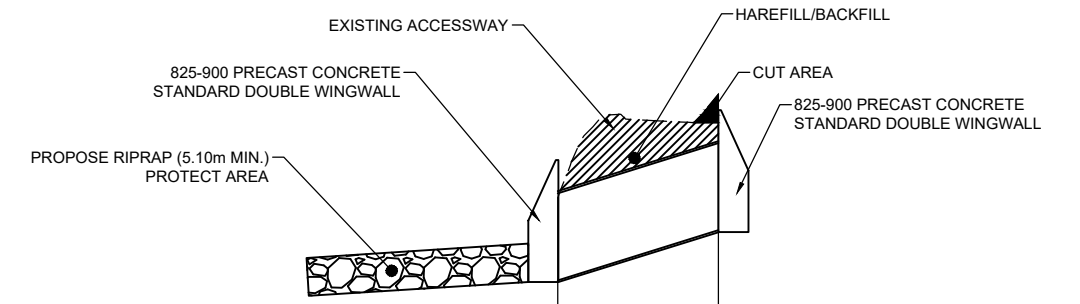
RIP-RAP APRON DESIGN

Median Rip-Rap Diameter d ₅₀	249 mm	$d_{50} = 0.25 \times D_o \times F_o$
Minimum Apron Width W _a	0.90 m	$W_a \geq 3 \times D_o$
Minimum Apron Length L _a	5.06 m	$L_a = D_o (8 + 17 \times \log F_o)$

Wing Wall
300mm dia
L_a = 5.06m
W_a = 0.9m

Page 1 of 1
29/09/2023 3:21 pm

Sheet: Rip-Rap Pipe Outlet
File: Copy of SW-AKCL-TP2013-018 Outfall Design-CULVERT 4



DATUM RL 83.00m

LID LEVEL	
DEPTH TO STRUCTURE SUMP	
INVERT LEVEL AT INSIDE EDGE	84.25 84.78
DISTANCE	8.50m
GRADIENT	6.24%
PIPE SIZE AND MATERIAL	PROPOSED 900mm Ø CONCRETE 8.50m LONG CULVERT
FLOW DETAIL	MAXIMUM FLOW 149L/S (1% AEP)

CULVERT 4 LONG SECTION - LONGSECTION
1:200H 1:40V @ A1 (DOUBLE FOR A3)

terra consultants

JOB: 287 TUHIRANGI ROAD
SUBJECT: FLOW CALCULATION FOR CULVERT 4
BY: GZ DATE: 28/09/23 JOB NO: 230400

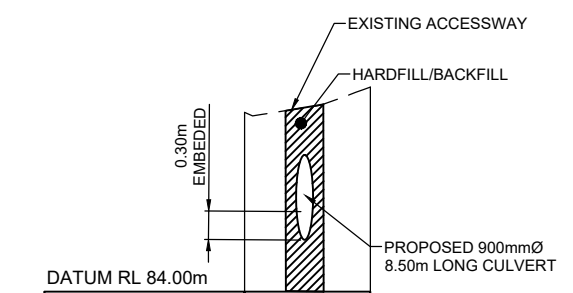
OVERLAND FLOW PATH DESIGN - EVEN SIDED CHANNEL

DESIGN FLOW - RATIONAL METHOD:

$$Q = k.C.i.A$$

Metric Conversion	k	2.78E-04
Catchment Coefficient	C	0.4
Rainfall Intensity	i	159 mm/hr
Catchment Area	A	8,416 m ²

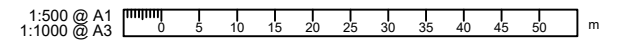
Catchment Flow	Q	148.7 l/s
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DATUM RL 84.00m

LID LEVEL	
DEPTH TO STRUCTURE SUMP	
INVERT LEVEL AT INSIDE EDGE	
DISTANCE	
GRADIENT	
PIPE SIZE AND MATERIAL	PROPOSED 900mmØ 8.50m LONG CULVERT
FLOW DETAIL	MAXIMUM FLOW 149L/S (1% AEP)

CULVERT 4 CROSS SECTION - LONGSECTION
1:200H 1:40V @ A1 (DOUBLE FOR A3)



ISSUE	DATE	REVISION	CHKD	DRWN	NAME	DATE	CONSULTANT
A	29/09/23	FOR S92 RESPONSE	GT	GZ	TERRA	01/03/23	terra consultants

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CLIENT: AUCKLAND SHOOTING CLUB INCORPORATED

PROJECT / LOCATION: 287 TUHIRANGI ROAD, MAKARAU, AUCKLAND

DRAWING TITLE: CULVERT 4 DESIGN WITH FISH PASSAGE

STAGE: FOR RESOURCE CONSENT

PROJECT NUMBER	230400	SCALE	A1:1:200 A3:1:400
DWG NUMBER	RC- 501	REVISION	A

Z:\Tuhirangi Road (287)\Engineering\CAD Drawing\02 - WORKING DWG\04 - RESOURCE CONSENT\230400-RC100-SITE PLAN.dwg, 501, 9/29/2023 3:30 pm