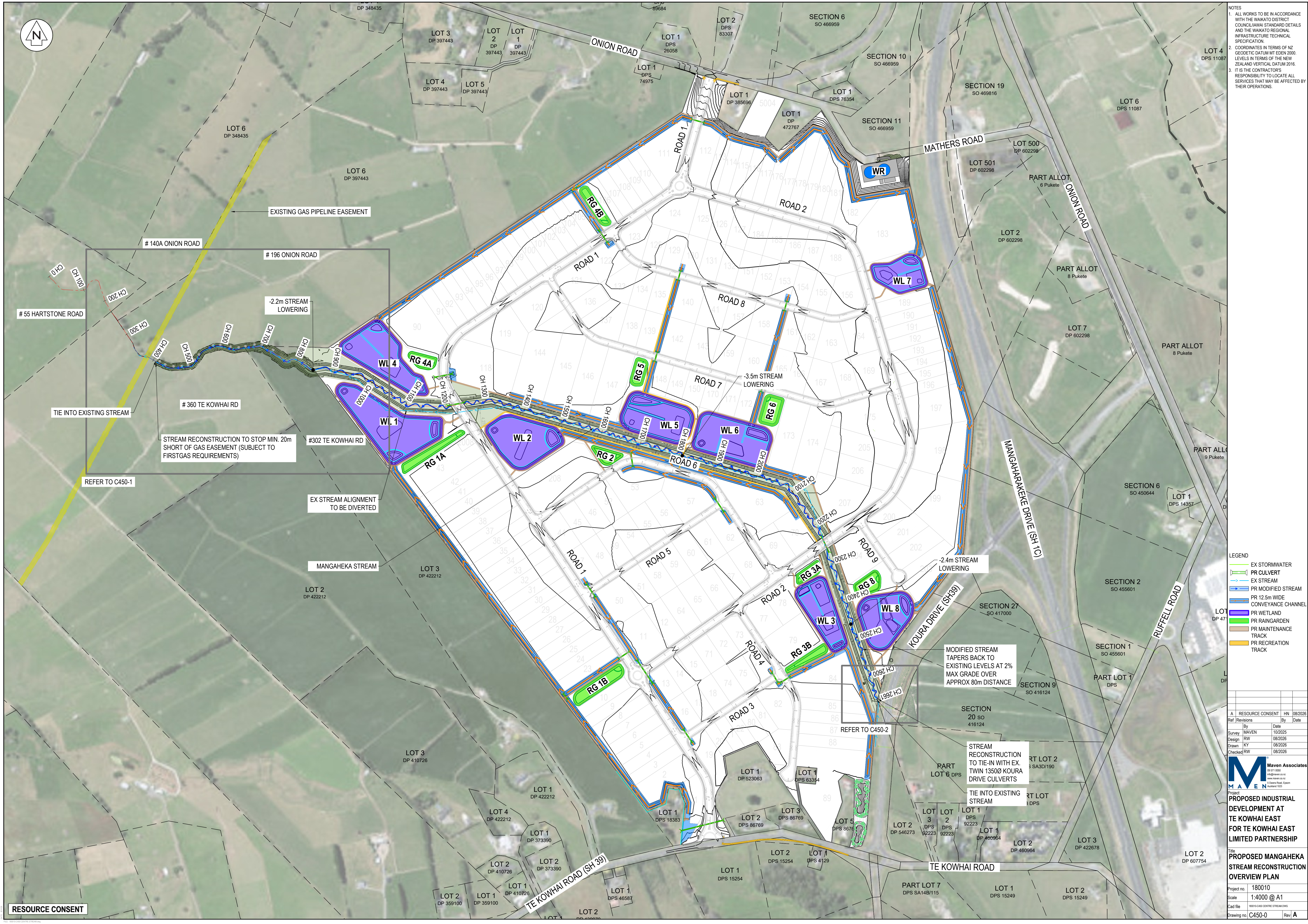
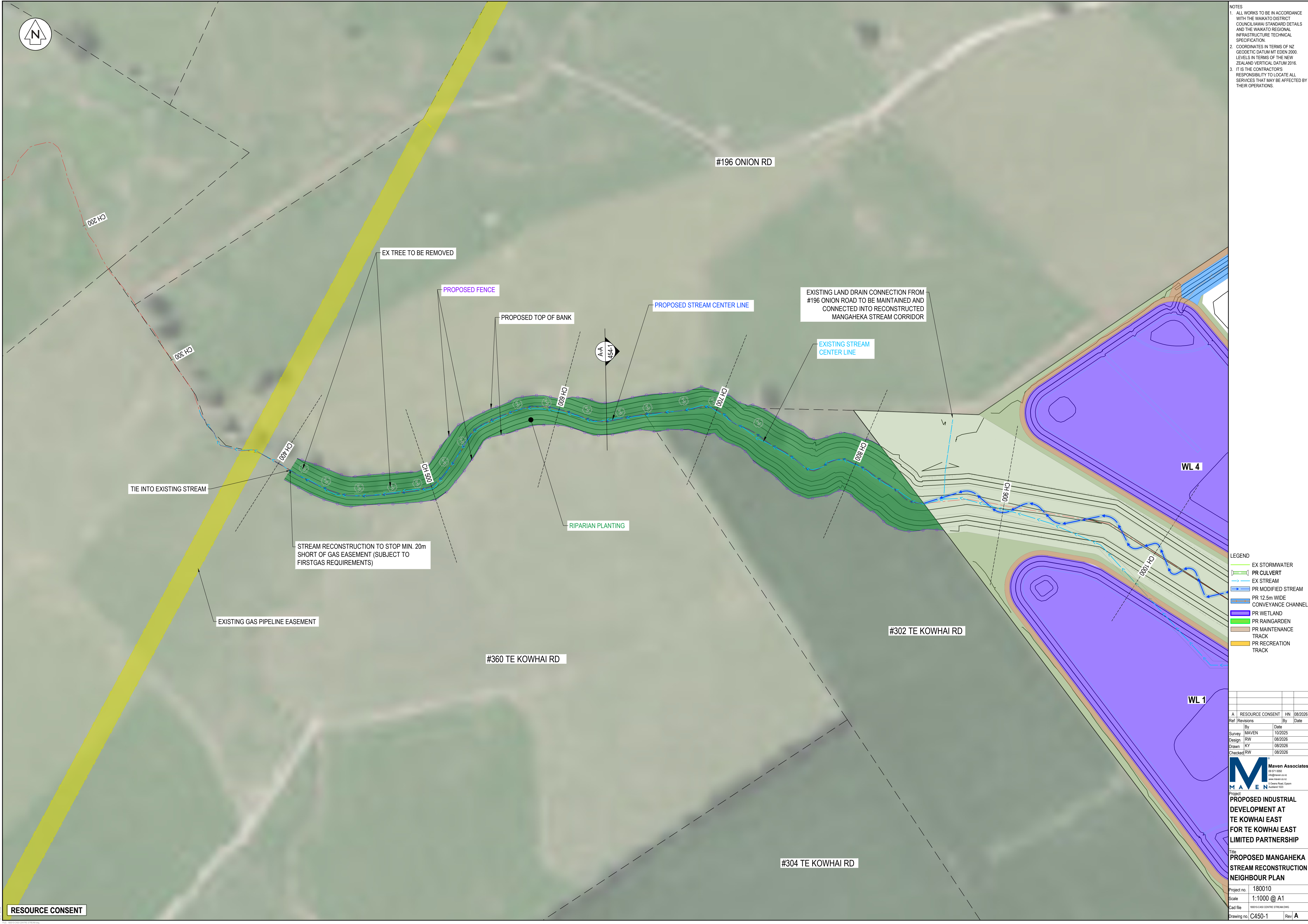




LEGEND

-  EX STORMWATER
-  PR CULVERT
-  EX STREAM
-  PR MODIFIED STREAM
-  PR 12.5m WIDE CONVEYANCE CHANNEL
-  PR WETLAND
-  PR RAINGARDEN
-  PR MAINTENANCE TRACK
-  PR RECREATION TRACK

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	Project PROPOSED INDUSTRIAL DEVELOPMENT AT FOR TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP	
	Title PROPOSED MANGAHEKA STREAM RECONSTRUCTION OVERVIEW PLAN	
	Project no.	180010
	Scale	1:4000 @ A1
	Cad file	180010-C&B-CDTLINE STREAM.DWG
Drawing no.	C450-0 Rev. A	



RESOURCE CONSENT



LOT 84

12.5m CONVEYANCE CHANNEL

3m MAINTENANCE TRACK

LOT 85

LOT 86

RESOURCE CONSENT

MODIFIED STREAM TAPERS
BACK TO EXISTING LEVELS
AT 3% MAX GRADE OVER
APPROX 80m DISTANCE

WETLAND 8 RESERVE

PROPOSED 3m WIDE MAINTENANCE
CHANNEL ALONG RECONSTRUCTED
STREAM CORRIDOR

EX. SH39 TABLE DRAIN

NORTHERN CORNER OF MANGAHEKA STREAM TIE-IN WITH
SH39 TABLE DRAIN TO BE SHAPED TO PROMOTE MORE
NATURAL CONFLUENCE. TO BE DETAILED AT EPA STAGE IN
COORDINATION WITH ECOLOGIST & LANDSCAPE ARCHITECT

EX. SCOUR POOL TO REMAIN
AND AVOID DISTURBANCE
DURING CONSTRUCTION

EX. TWIN 1350Ø
KOURA DRIVE
CULVERTS

EX. SH39 TABLE DRAIN

EX. HOOKER DRAIN

KOURA DRIVE (SH39)

- NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH THE WAIKATO DISTRICT COUNCIL/AIAI STANDARD DETAILS AND THE WAIKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
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- LEGEND
- EX STORMWATER
 - PR CULVERT
 - EX STREAM
 - PR MODIFIED STREAM
 - PR 12.5m WIDE CONVEYANCE CHANNEL
 - PR WETLAND
 - PR RAINGARDEN
 - PR MAINTENANCE TRACK
 - PR RECREATION TRACK

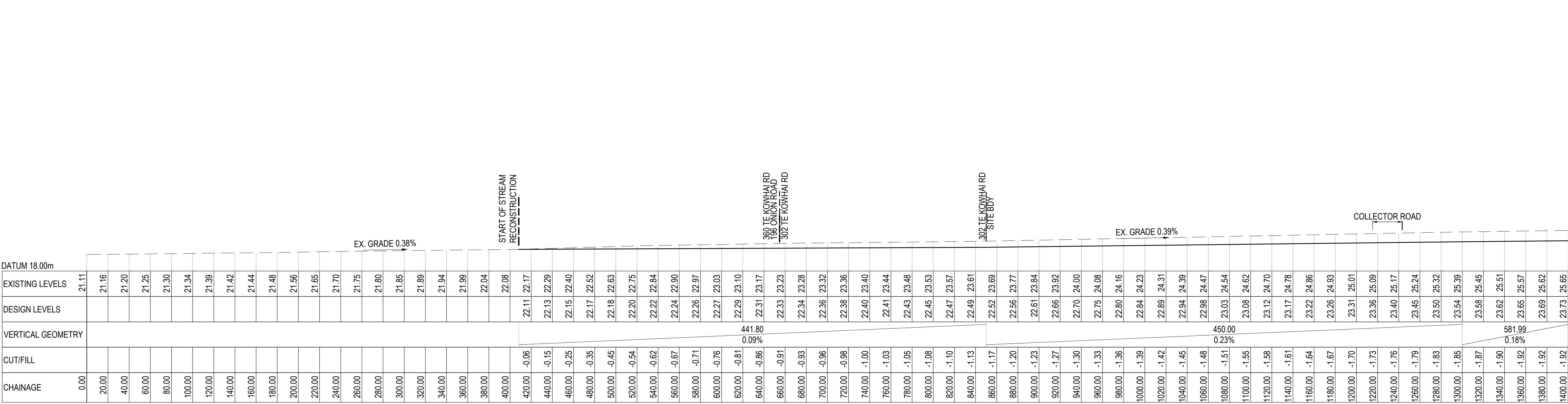
Ref	Revisions	By	Date
A	RESOURCE CONSENT	HN	08/2026

Survey	MAVEN	10/2025
Design	RW	08/2026
Drawn	RY	08/2026
Checked	RW	08/2026

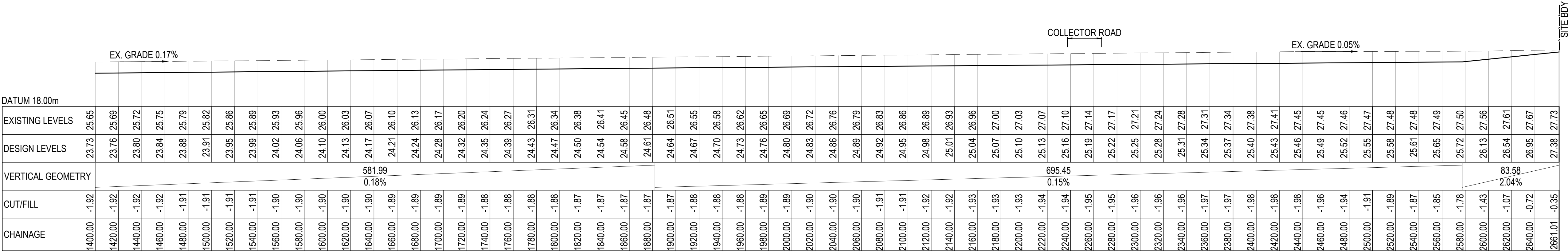
M **A** **E** **N**
Project
PROPOSED INDUSTRIAL
DEVELOPMENT AT
TE KOWHAI EAST
FOR TE KOWHAI EAST
LIMITED PARTNERSHIP

Title
PROPOSED MANGAHEKA
UPSTREAM TIE-IN
DETAIL PLAN

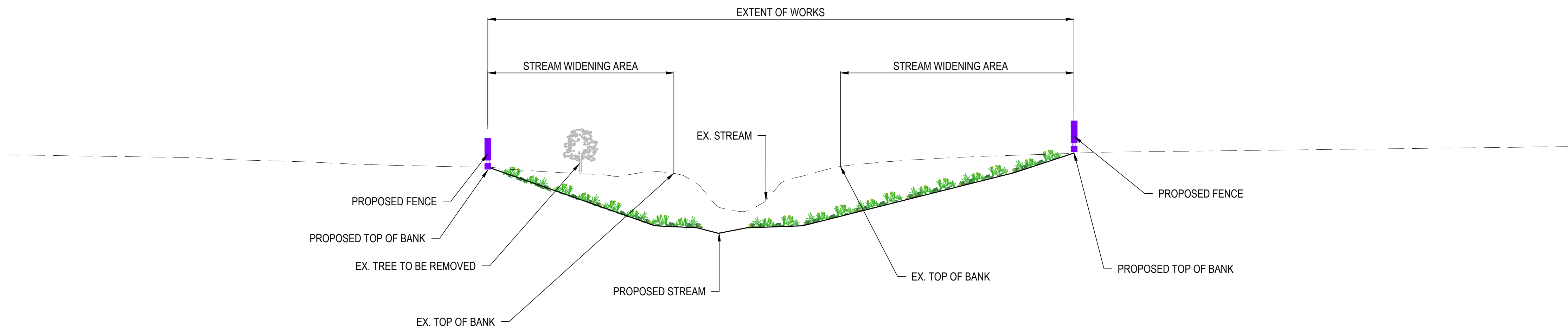
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Scale	1:250 @ A1
Cad file	180010-C450-CENTRE STREAM.DWG
Drawing no.	C450-2
Rev	A



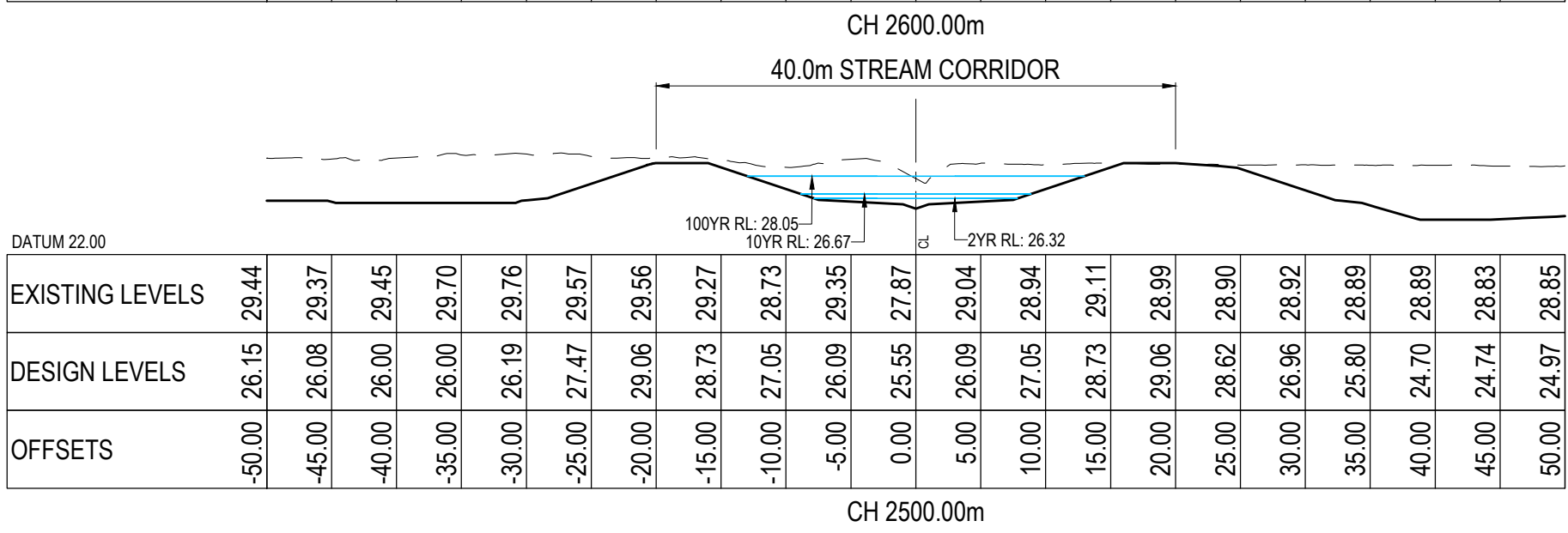
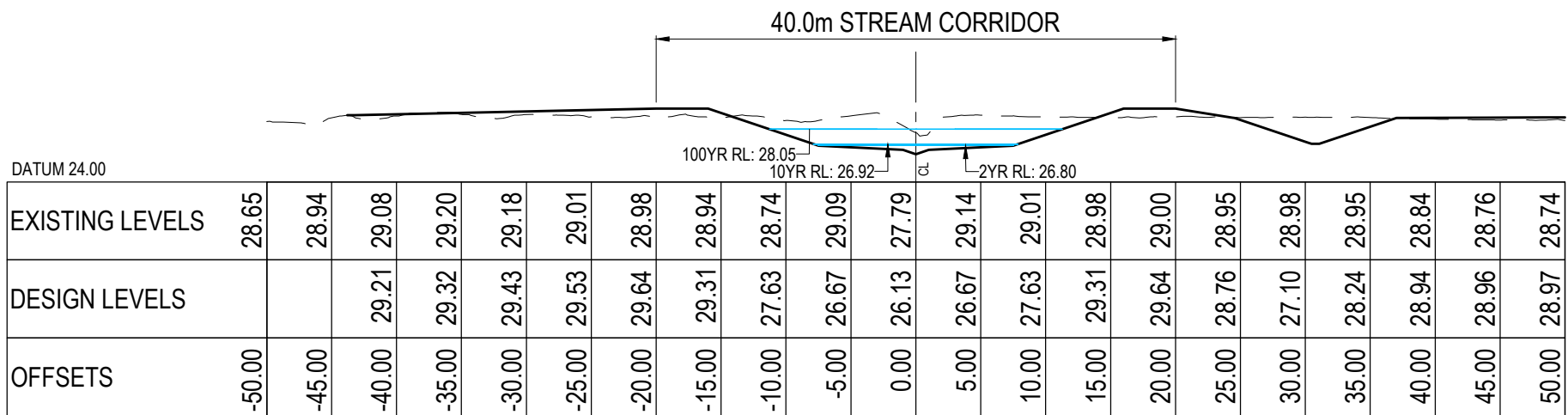
MANGAHEKA STREAM
SCALE: HORI 1:500 VERT 1:100



MANGAHEKA STREAM
SCALE: HORI 1:500 VERT 1:100



TYPICAL MANGAHEKA STREAM RECONSTRUCTION AT NEIGHBOUR SECTION A-A
SCALE 1:250 @ A3



RESOURCE CONSENT

LEGEND
--- EX GROUND LEVEL
--- PR GROUND LEVEL
--- PR FLOOD LEVEL

A	RESOURCE CONSENT	HN	08/2026
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	By	Date	
Survey	MAVEN	10/2025	
Design	RW	08/2026	
Drawn	KY	08/2026	
Checked	RW	08/2026	

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Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
PROPOSED MANGAHEKA STREAM RECONSTRUCTION CROSS SECTIONS

Project no. 180010
Scale 1:500 @ A1
Cad file 180010-CROSS CENTRE STREAM.DWG
Drawing no. C454-3 Rev. A

- NOTES
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A	RESOURCE CONSENT	SP	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	KY		08/2026
Drawn	KY		08/2026
Checked	RW		08/2026

M

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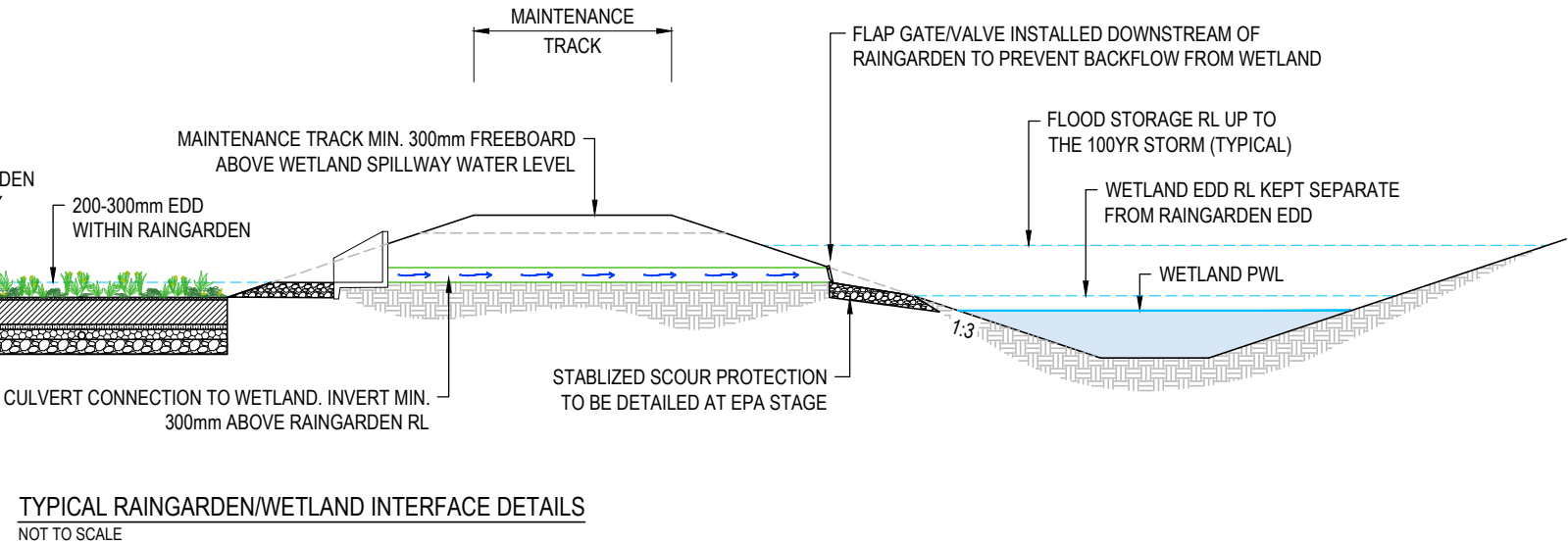
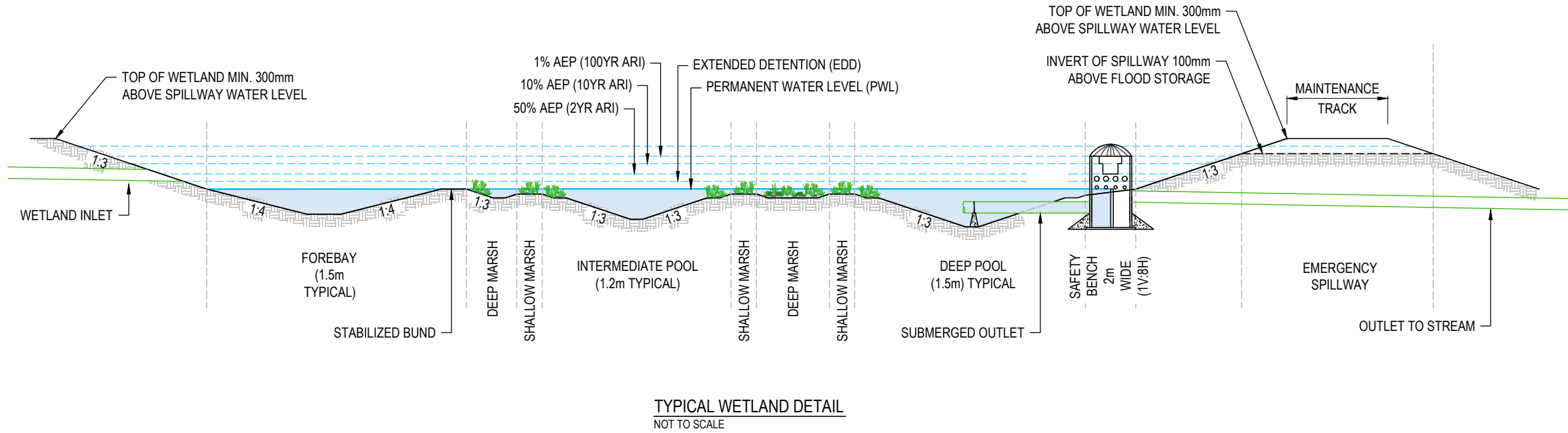
Project

PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

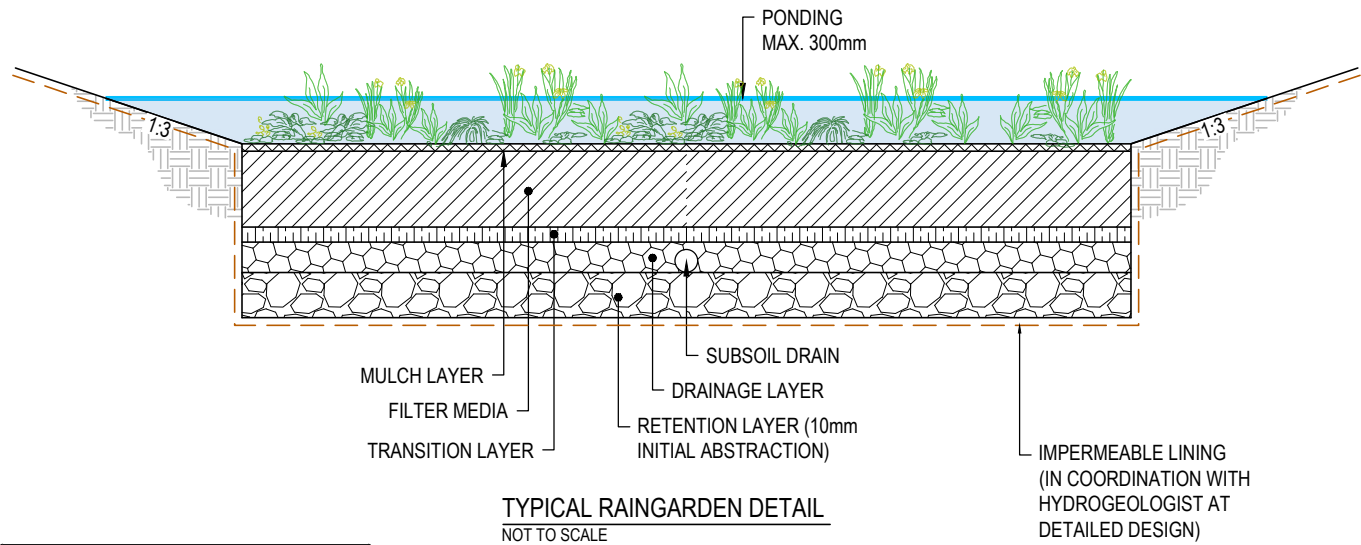
Title

PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-1
Rev	A

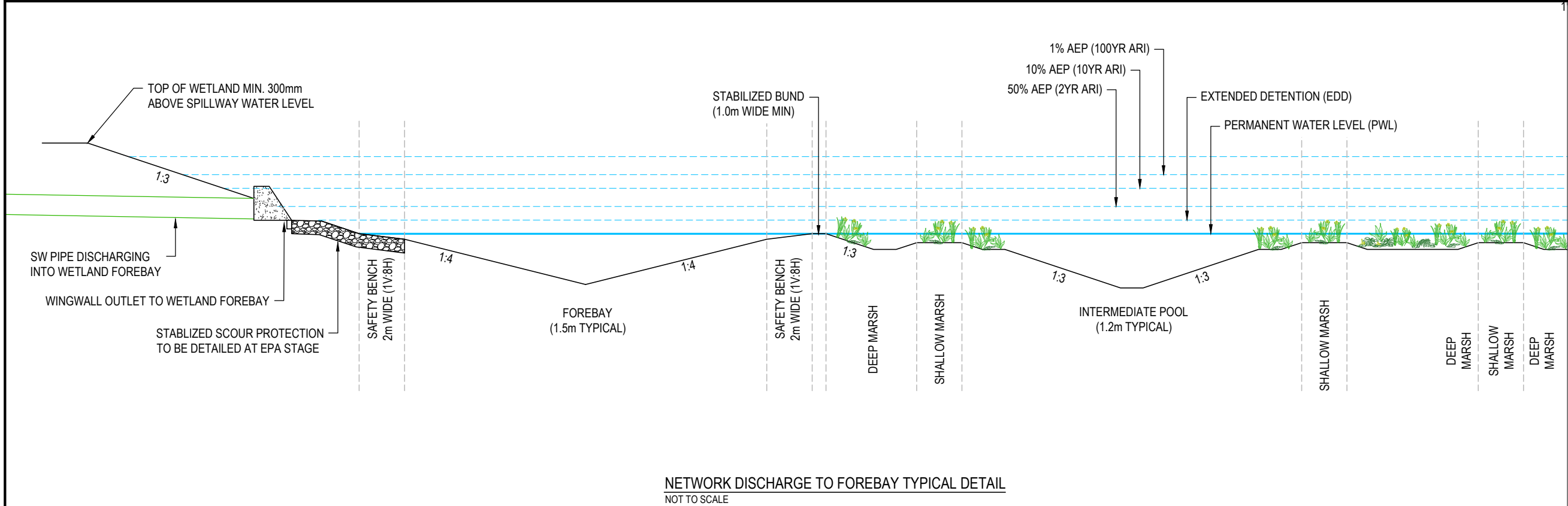


- NOTES:
1. THE PLANTING MEDIA MIX IS TO MEET THE REQUIREMENTS OF RITS & TR20/07
 2. THE TRANSITION LAYER IS TO COMPRISE OF COARSE SAND OR CLEAN, WELL-GRADED GRAVEL (2-7mm DIAMETER) WITH MINIMAL FINES.
 3. THE DRAINAGE LAYER IS TO COMPRISE CLEAN, WASHED PEA GRAVEL (~10mm DIAMETER) WITH LITTLE/NO FINES AND A MINIMUM INFILTRATION RATE OF 4,000 mm/hr. WHERE FALLS ARE ACHIEVABLE, THE DRAINAGE LAYER MUST BE GRADED AT A MINIMUM OF 0.5% TOWARD THE OUTLET AND PROVIDE AT LEAST 50mm OF COVER ABOVE THE DRAINAGE PIPE.
 4. PLANTING AND LANDSCAPING OF RAINGARDENS WITHIN LANDSCAPE DRAWINGS AND SPECIFICATION.



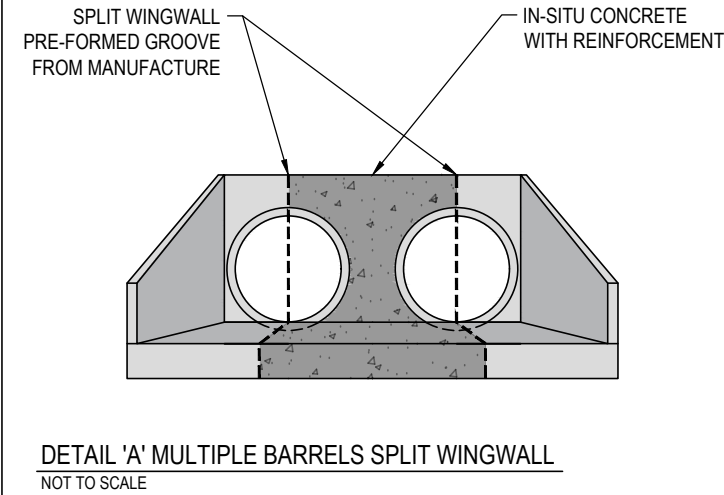
RESOURCE CONSENT

RAINGARDEN COMPOSITION DETAILS										
LOCATION	RG1A	RG1B	RG2	RG3A	RG3B	RG4A	RG4B	RG5	RG6	RG8
PONDING DEPTH	0.30m									
MULCH LAYER	0.05m									
FILTER MEDIA	0.50m									
TRANSITION LAYER	0.10m									
DRAINAGE LAYER	0.20m									
RETENTION LAYER	0.30m	0.40m	0.40m	0.30m	0.40m	0.30m	0.50m	0.30m	0.40m	0.30m

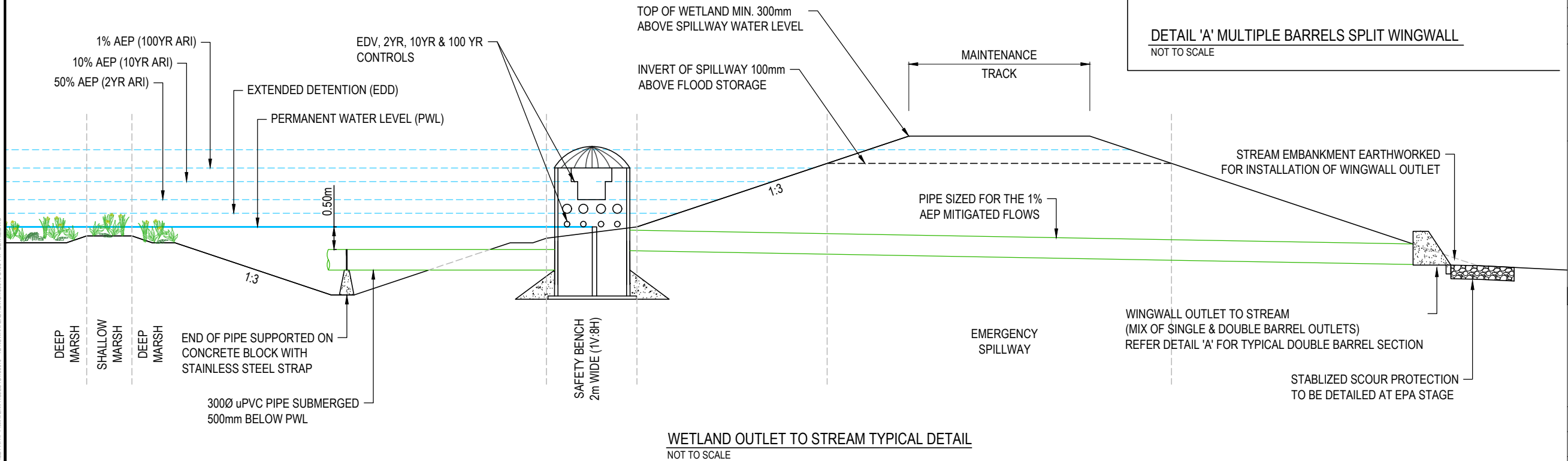


NETWORK DISCHARGE TO FOREBAY TYPICAL DETAIL
NOT TO SCALE

WETLAND OUTLET CONTROL									
		WETLAND 1	WETLAND 2	WETLAND 3	WETLAND 4	WETLAND 5	WETLAND 6	WETLAND 7	WETLAND 8
EDD (ORIFICE)	ORIFICE TYPE	5 x 160mm	4 x 140mm	4x 120mm	5 x 140mm	4 x 130mm	4 x 150mm	4 x 100mm	4 x 120mm
	IL(m)	23.60	24.60	26.30	23.65	25.15	25.50	28.20	26.45
2YR (ORIFICE)	ORIFICE TYPE	5 x 180mm	5 x 150mm	5 x 180mm	5 x 180mm	4 x 150mm	5 x 180mm	5 x 130mm	5 x 100mm
	IL(m)	23.95	24.90	26.70	24.00	25.60	25.90	28.50	26.80
10YR (SPILLWAY)	LENGTH (m)	0.8	0.5	1.0	0.8	0.5	0.8	0.5	0.5
	IL(m)	24.85	25.55	27.40	24.90	26.55	26.60	28.90	27.60
100YR (SPILLWAY)	LENGTH (m)	1.5	0.2	0.5	2.0	0.5	1.5	1.0	NO WEIR
	IL(m)	25.10	25.85	27.65	25.15	26.75	27.00	29.20	
EMERGENCY SPILLWAY	LENGTH (m)	30	15	15	35	15	25	15	15
	IL(m)	25.70	26.65	28.20	26.00	27.30	27.45	29.60	28.35



DETAIL 'A' MULTIPLE BARRELS SPLIT WINGWALL
NOT TO SCALE



WETLAND OUTLET TO STREAM TYPICAL DETAIL
NOT TO SCALE

- NOTES
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A	RESOURCE CONSENT	KY	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	KY		08/2026
Drawn	KY		08/2026
Checked	RW		08/2026

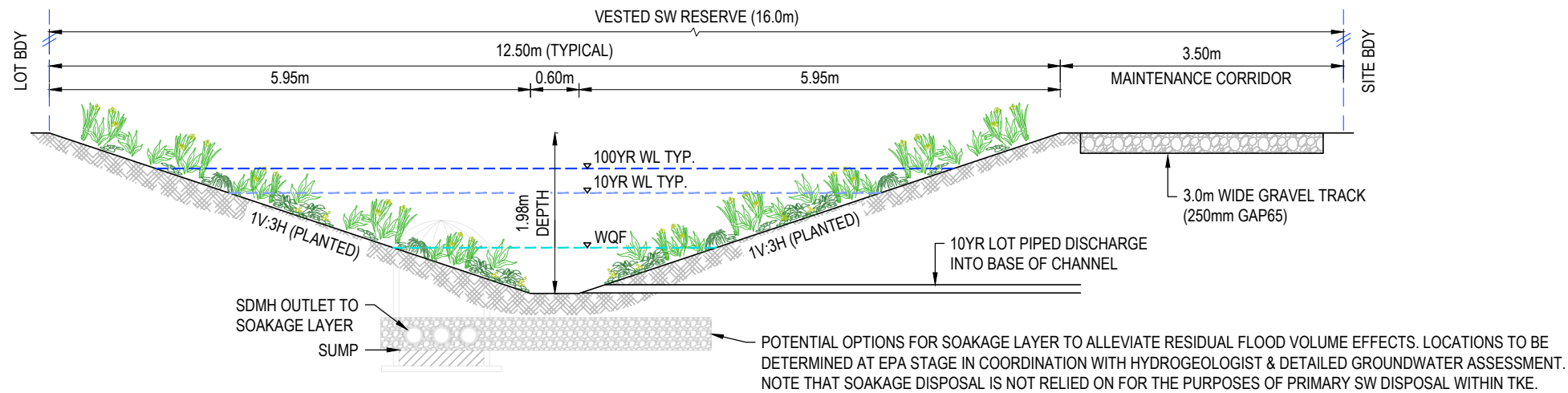
M **Maven Associates**
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Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

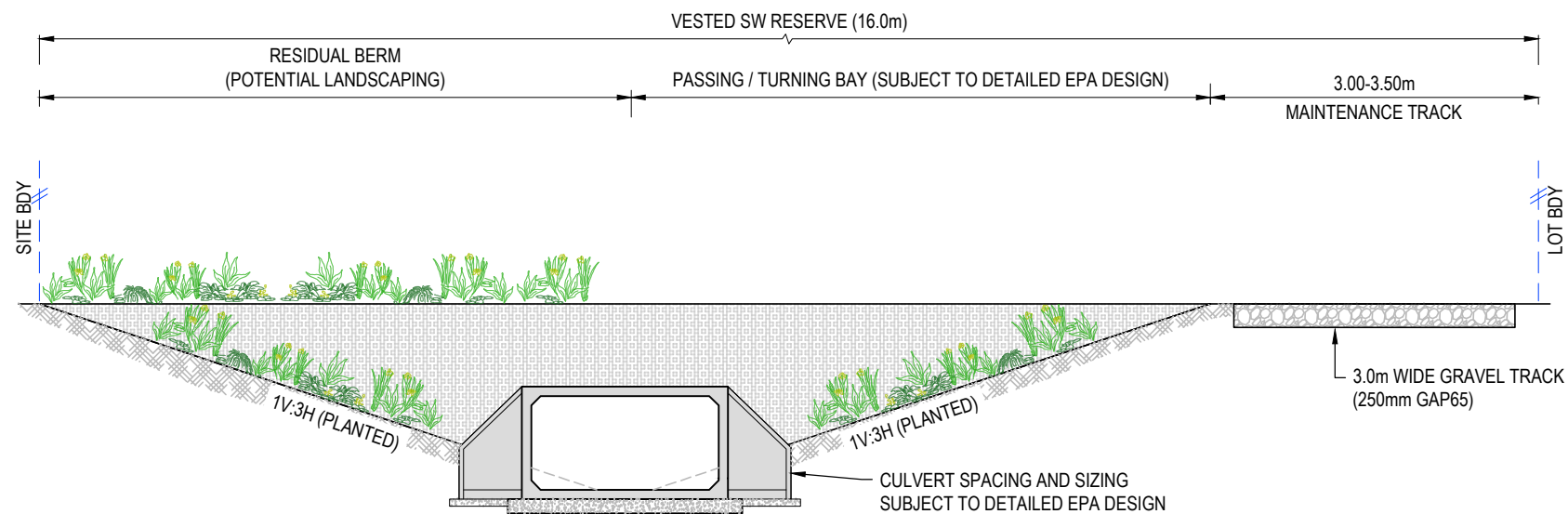
Title
PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-2
Rev	A

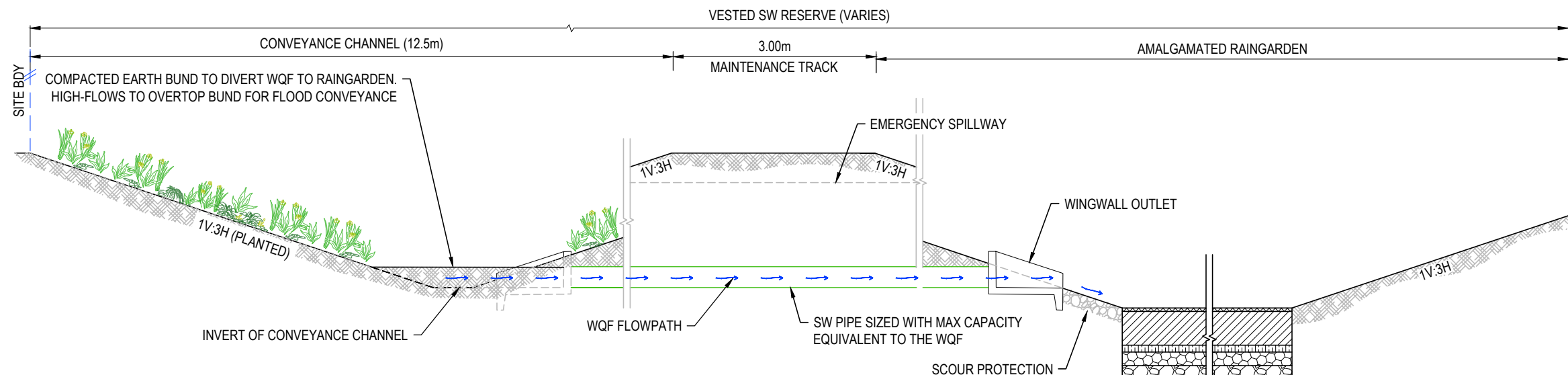
RESOURCE CONSENT



TYPICAL CONVEYANCE CHANNEL CROSS-SECTION
SCALE 1:75 @ A3



TYPICAL CONVEYANCE CHANNEL CROSS-SECTION
WITH PASSING / TURNING BAY
SCALE 1:75 @ A3



TYPICAL CONVEYANCE CHANNEL CROSS-SECTION
WITH LOW-FLOW DIVERSION BUND
SCALE 1:75 @ A3

- NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH THE WAIKATO DISTRICT COUNCIL/IAWAI STANDARD DETAILS AND THE WAIKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
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		By	Date
Survey	MAVEN		10/2025
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Drawn	KY		08/2026
Checked	RW		08/2026

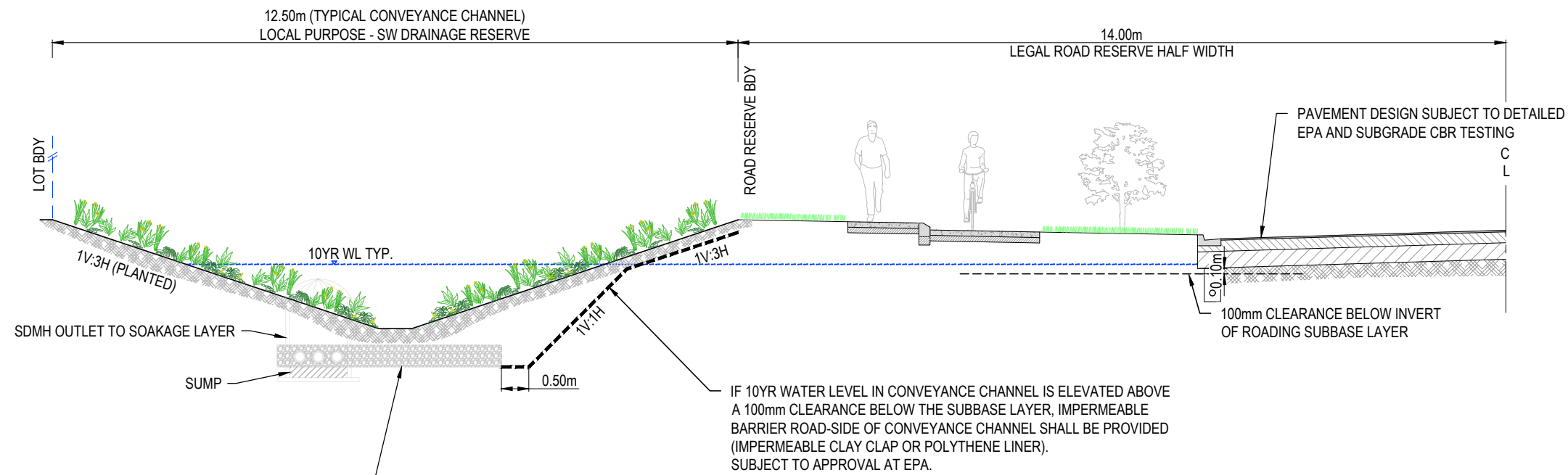


Project
**PROPOSED INDUSTRIAL
DEVELOPMENT AT
TE KOWHAI EAST
FOR TE KOWHAI EAST
LIMITED PARTNERSHIP**

Title
**PROPOSED STORMWATER
MANAGEMENT DEVICES
TYPICAL DETAILS**

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-3
Rev	A

RESOURCE CONSENT



POTENTIAL OPTIONS FOR SOAKAGE LAYER TO ALLEVIATE RESIDUAL FLOOD VOLUME EFFECTS. LOCATIONS TO BE DETERMINED AT EPA STAGE IN COORDINATION WITH HYDROGEOLOGIST & DETAILED GROUNDWATER ASSESSMENT.

CONVEYANCE CHANNEL IMPERMEABLE LINING (ROADING SUBGRADE PROTECTION)
SCALE 1:100 @ A3

- NOTES
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A	RESOURCE CONSENT	AF	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	AF		08/2026
Drawn	AF		08/2026
Checked	KY		08/2026

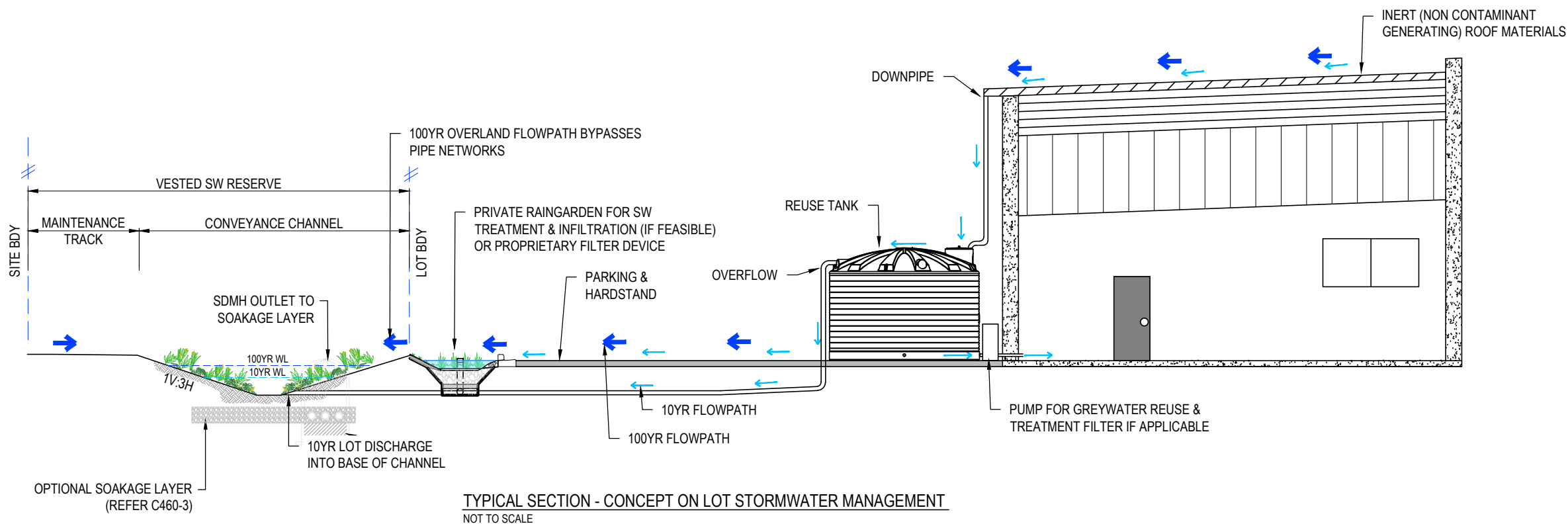
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5 Owens Road, Epsom
Auckland 1023

Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-4
Rev	A

RESOURCE CONSENT



- NOTES
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Survey	MAVEN		10/2025
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Checked	RW		08/2026

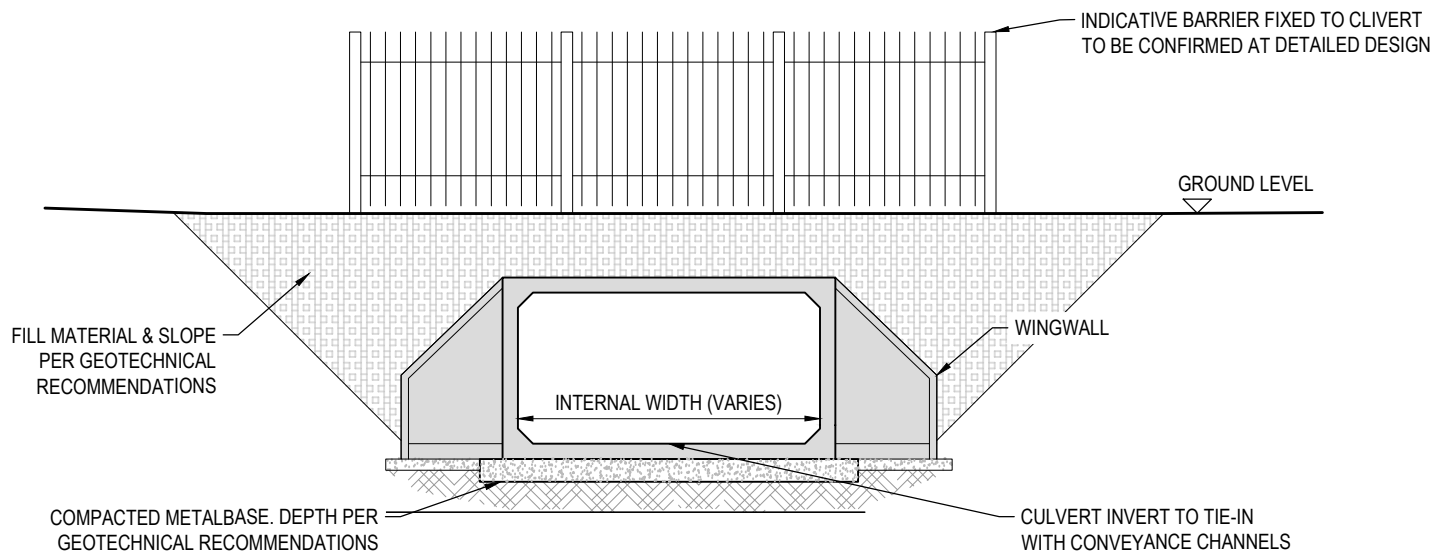
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PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

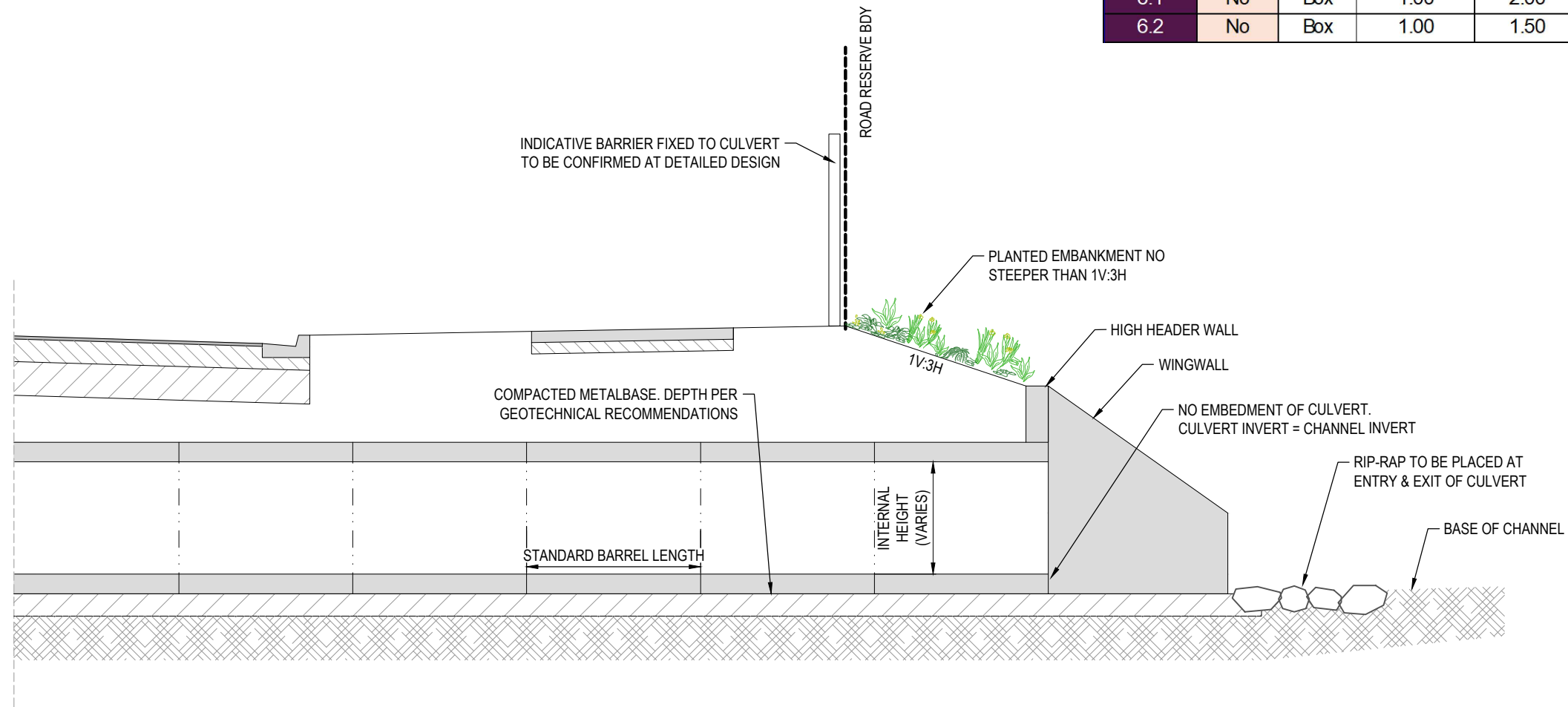
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Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-5
Rev	A

RESOURCE CONSENT



TYPICAL BOX CULVERT CROSS-SECTION
(WITHOUT FISH PASSAGE)
SCALE: 1:50 @ A3

Culvert	Fish Passage	Type	Internal Height (m)	Internal Width (m)
M.1	Yes	Box	1.50	3.00
M.2	Yes	Box	1.50	2.00
O.1	Yes	Box	1.00	1.50
1.1	No	Box	1.00	2.00
1.2	No	Box	1.00	2.00
1.3	No	Box	1.00	1.50
1.4	No	Box	1.00	1.50
1.5	No	Box	1.00	1.50
2.1	No	Box	1.00	1.50
2.2	No	Box	1.00	1.50
3.1	No	Box	1.00	1.50
3.2	No	Box	1.00	1.50
4.1	No	Box	1.00	1.50
4.2	No	Box	1.00	1.50
4.3	No	Box	1.00	1.50
4.4	No	Box	1.00	1.50
5.1	No	Box	1.00	1.50
5.2	No	Box	1.00	1.50
6.1	No	Box	1.00	2.00
6.2	No	Box	1.00	1.50



TYPICAL BOX CULVERT LONG-SECTION
(WITHOUT FISH PASSAGE)
SCALE 1:50 @ A3

- NOTES
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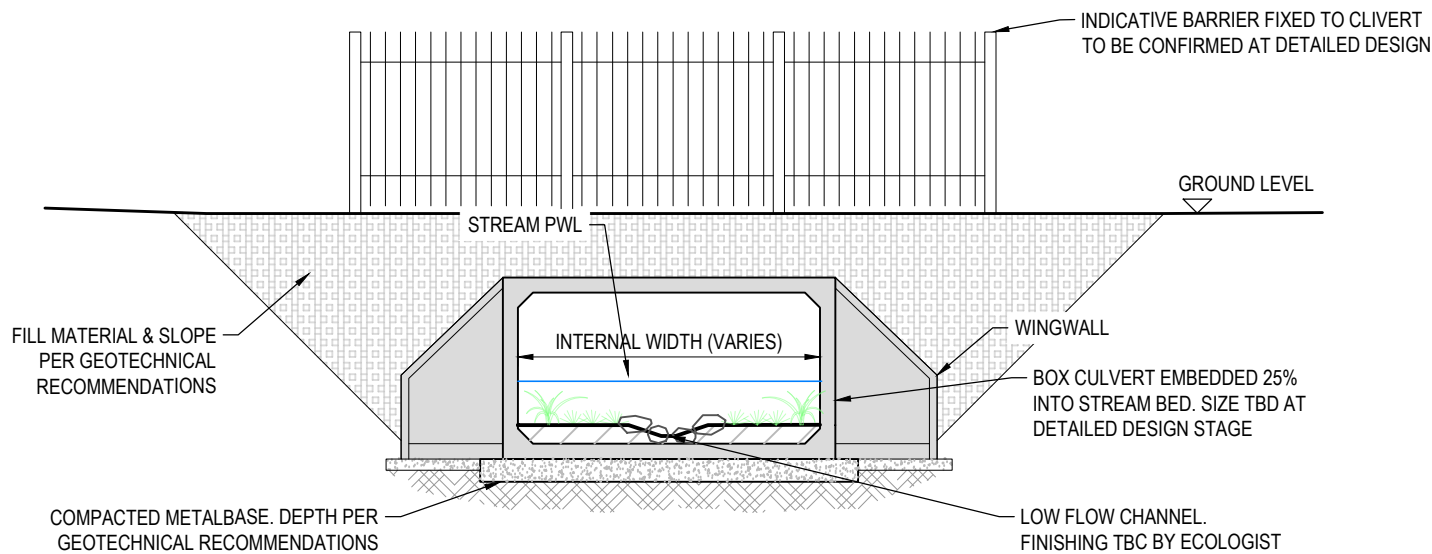
A	RESOURCE CONSENT	KY	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	KY		08/2026
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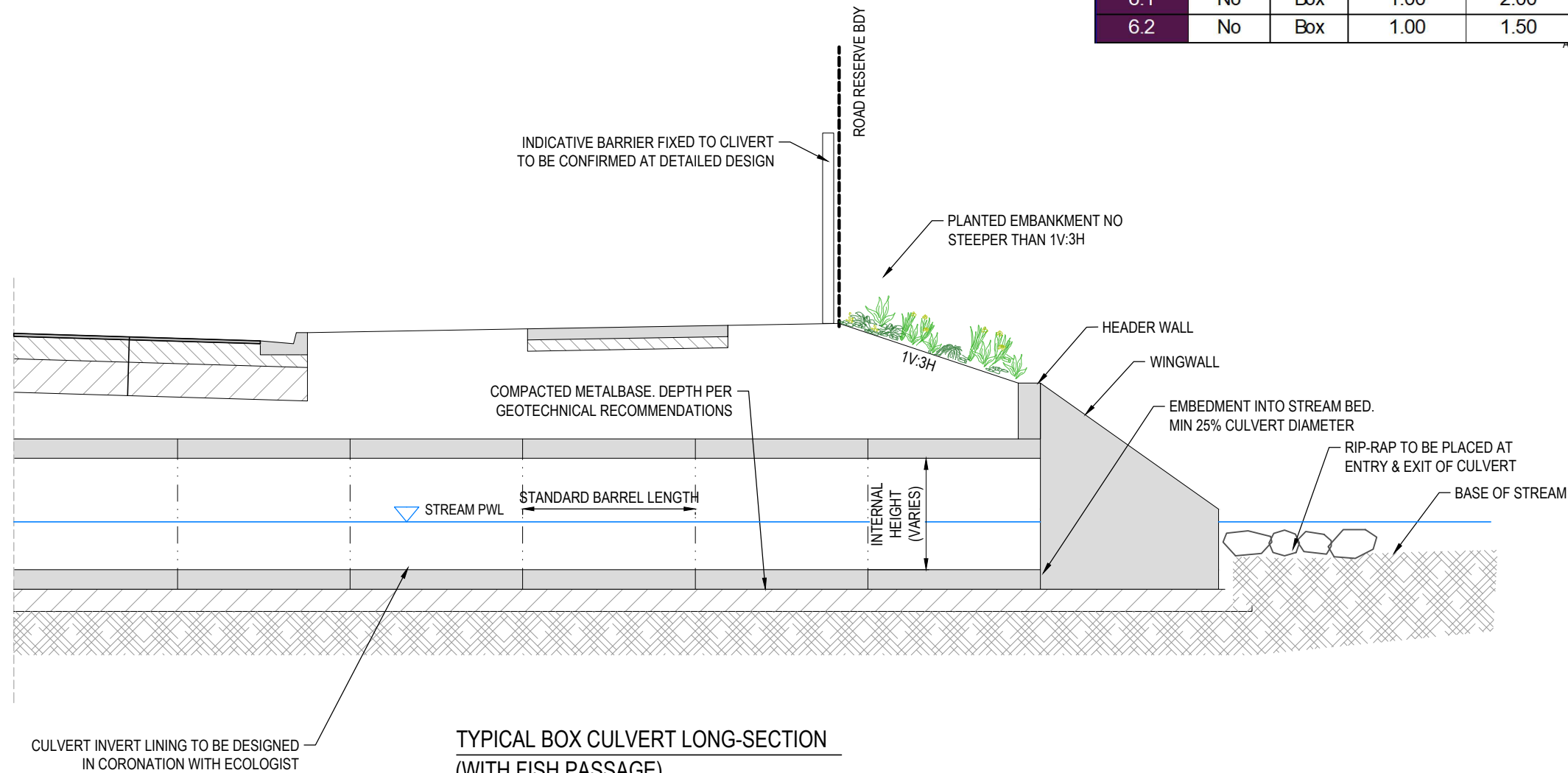
Title
PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-7
Rev	A



TYPICAL BOX CULVERT CROSS-SECTION
(WITH FISH PASSAGE)
SCALE: 1:50 @ A3

Culvert	Fish Passage	Type	Internal Height (m)	Internal Width (m)
M.1	Yes	Box	1.50	3.00
M.2	Yes	Box	1.50	2.00
O.1	Yes	Box	1.00	1.50
1.1	No	Box	1.00	2.00
1.2	No	Box	1.00	2.00
1.3	No	Box	1.00	1.50
1.4	No	Box	1.00	1.50
1.5	No	Box	1.00	1.50
2.1	No	Box	1.00	1.50
2.2	No	Box	1.00	1.50
3.1	No	Box	1.00	1.50
3.2	No	Box	1.00	1.50
4.1	No	Box	1.00	1.50
4.2	No	Box	1.00	1.50
4.3	No	Box	1.00	1.50
4.4	No	Box	1.00	1.50
5.1	No	Box	1.00	1.50
5.2	No	Box	1.00	1.50
6.1	No	Box	1.00	2.00
6.2	No	Box	1.00	1.50



TYPICAL BOX CULVERT LONG-SECTION
(WITH FISH PASSAGE)
SCALE 1:50 @ A3

- NOTES
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	RESOURCE CONSENT	KY	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	KY		08/2026
Drawn	KY		08/2026
Checked	RW		08/2026

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Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

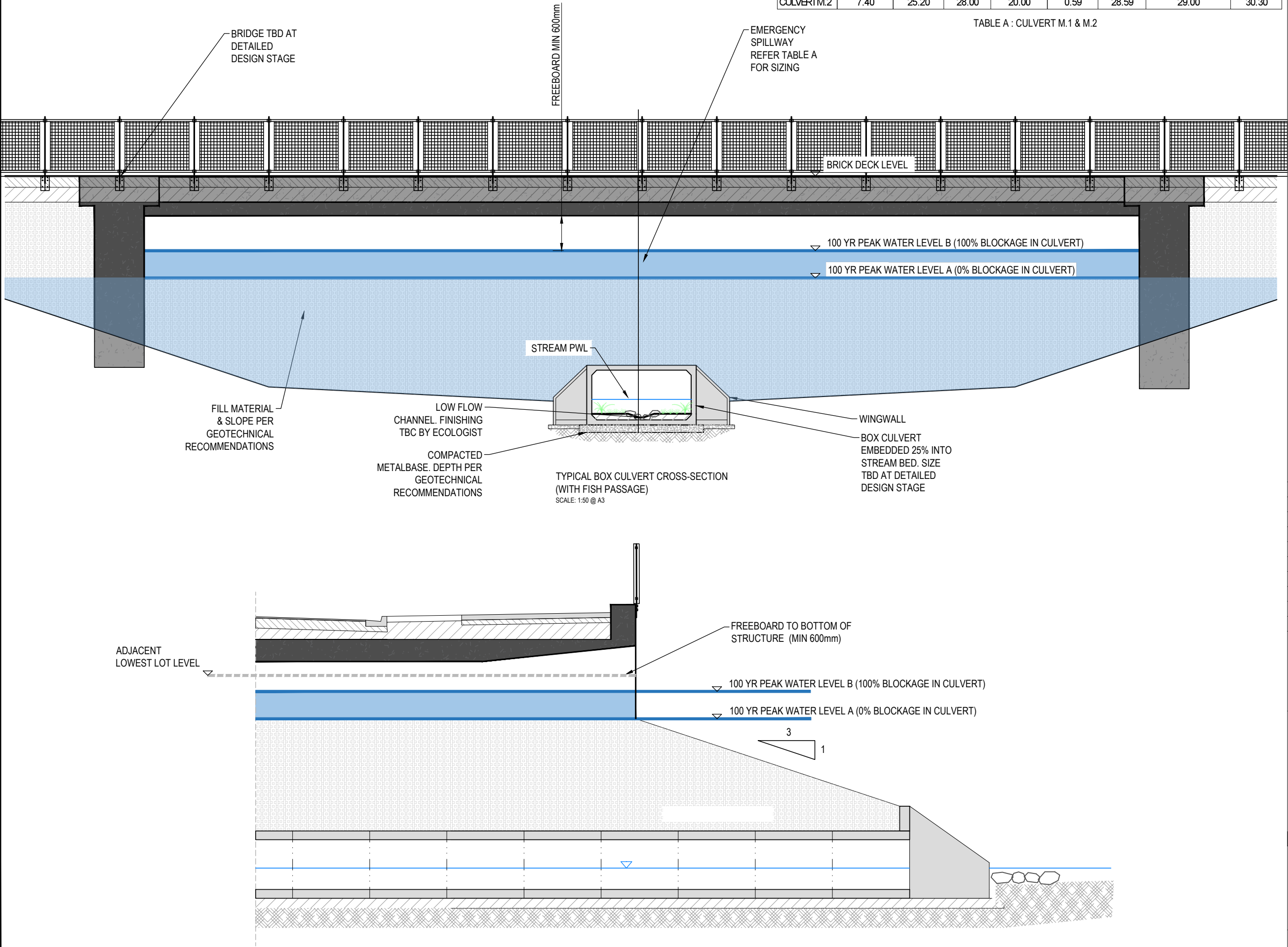
Title
PROPOSED STORMWATER MANAGEMENT DEVICES TYPICAL DETAILS

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-8
Rev	A

	PEAK FLOW RATE (m³/s)	STREAM RL (m)	100 YR PWLA (m)	SPILLWAY LENGTH (m)	SPILLWAY DEPTH (m)	100 YR PWL B (m)	ADJACENT LOWEST LOT LEVEL (m)	GROUND LEVEL (m)
CULVERT M.1	8.40	23.30	26.45	20.00	0.54	26.99	27.20	28.40
CULVERT M.2	7.40	25.20	28.00	20.00	0.59	28.59	29.00	30.30

TABLE A : CULVERT M.1 & M.2

- NOTES
- ALL WORKS TO BE IN ACCORDANCE WITH THE WAIKATO DISTRICT COUNCIL/IAWAI STANDARD DETAILS AND THE WAIKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
 - COORDINATES IN TERMS OF NZ GEODETIC DATUM MT EDEN 2000. LEVELS IN TERMS OF THE NEW ZEALAND VERTICAL DATUM 2016.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.



CULVERT M.1 & M.2 LONG-SECTION
WITH EMERGENCY SPILLWAY
SCALE 1:75 @ A3

RESOURCE CONSENT

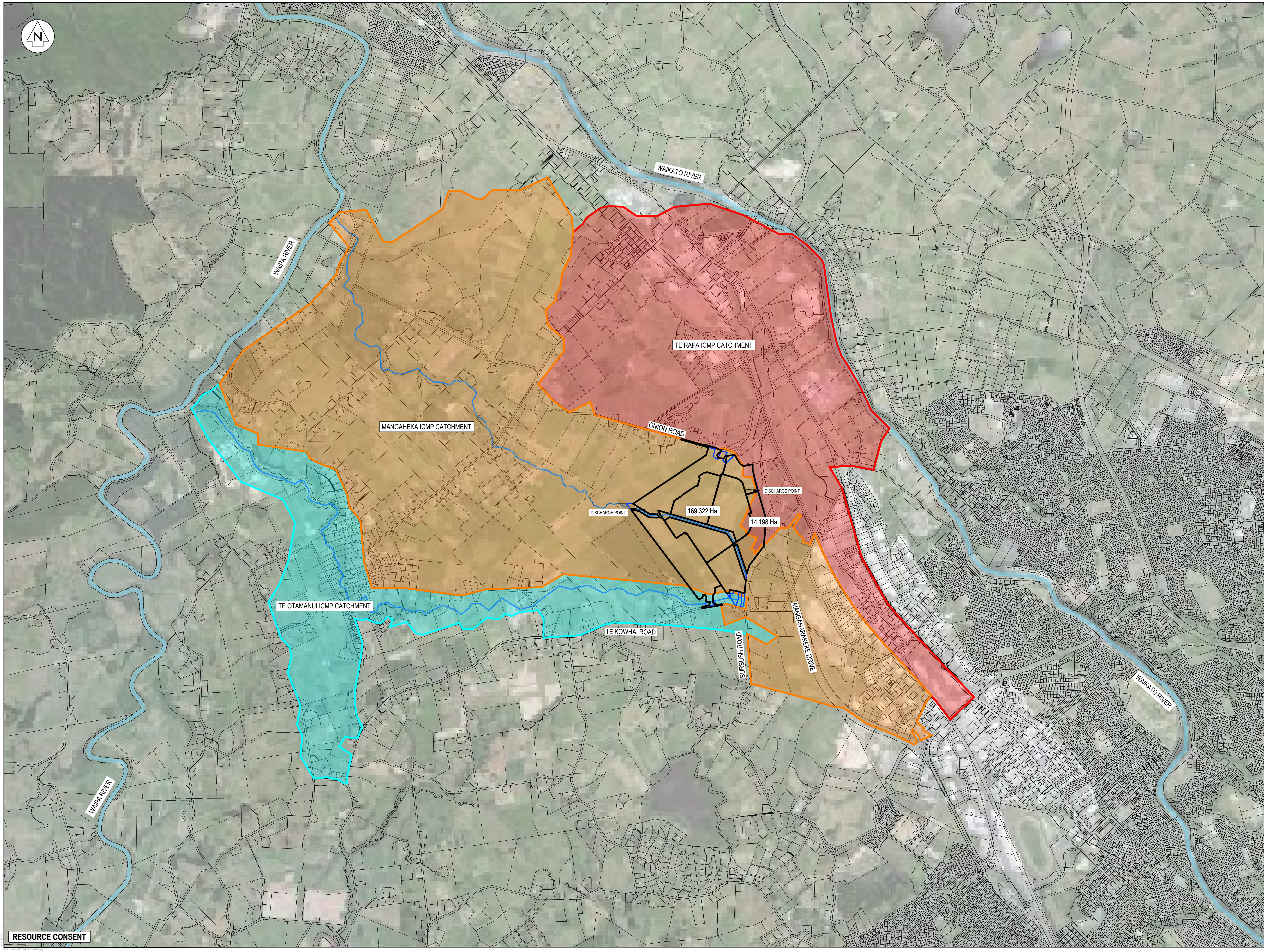
A	RESOURCE CONSENT	AZ	08/2026
Rev	Description	By	Date
		By	Date
Survey	MAVEN		10/2025
Design	KY		08/2026
Drawn	KY		08/2026
Checked	RW		08/2026

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Project
**PROPOSED INDUSTRIAL
DEVELOPMENT AT
TE KOWHAI EAST
FOR TE KOWHAI EAST
LIMITED PARTNERSHIP**

Title
**PROPOSED STORMWATER
MANAGEMENT DEVICES
TYPICAL DETAILS**

Project no.	180010
Scale	AS SHOWN @ A3
Cad file	180010-C460 TYP DETAIL.DWG
Drawing no.	C460-9
Rev	A



- NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH THE WAIKATO DISTRICT COUNCIL/JAWAI STANDARD DETAILS AND THE WAIKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
 2. COORDINATES IN TERMS OF NZ GEODETIC DATUM MT EDEN 2000. LEVELS IN TERMS OF THE NEW ZEALAND VERTICAL DATUM 2016.
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- LEGEND
- EX BDY
 - SITE BDY
 - STREAM
 - TE RAPA ICMP CATCHMENT
 - MANGAHEKA ICMP CATCHMENT
 - TE OTAMANUI ICMP CATCHMENT

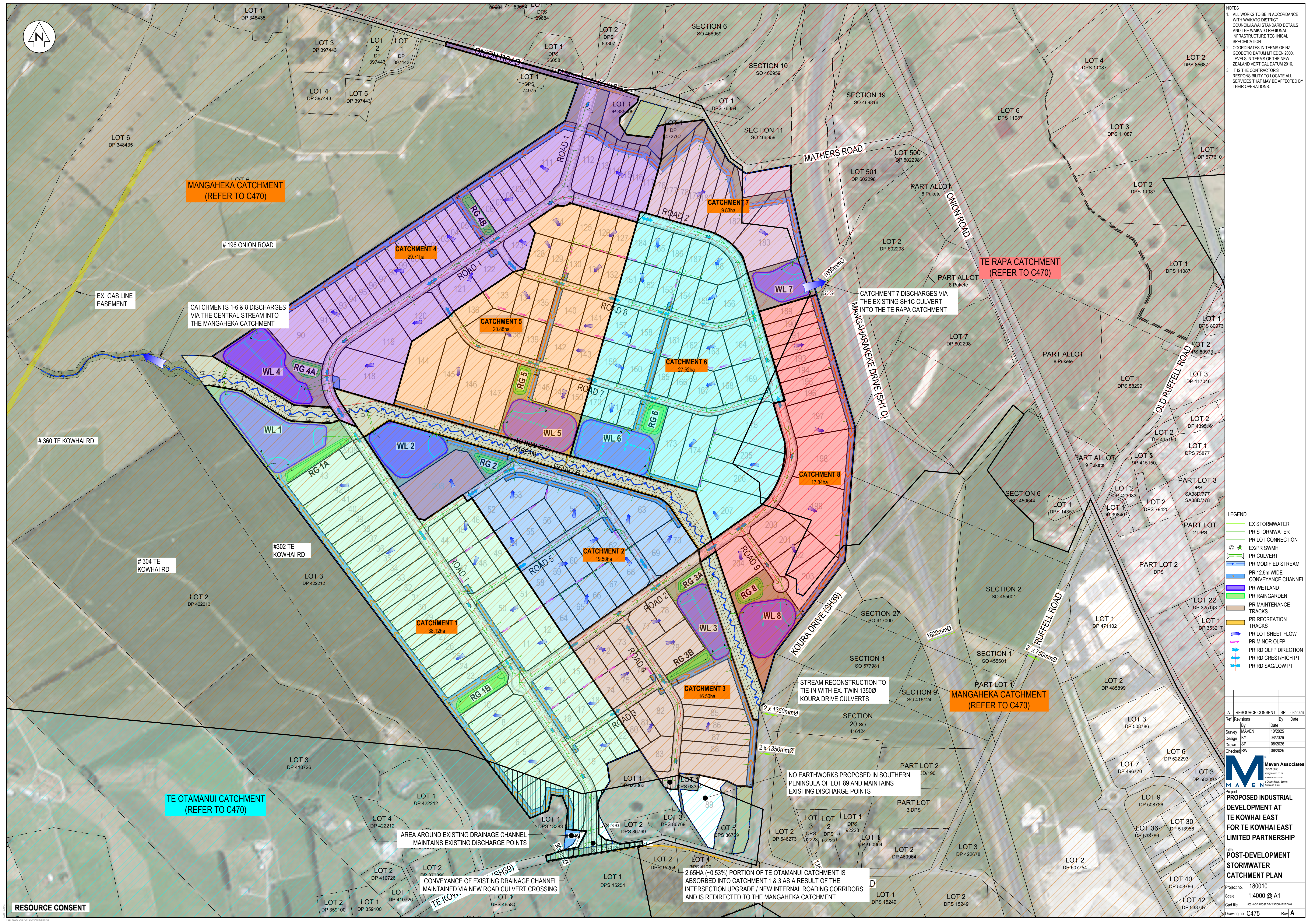
Ref	Revisions	By	Date
A	RESOURCE CONSENT	SP	08/2026



Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
ICMP CATCHMENTS BOUNDARIES OVERVIEW PLAN

Project no. 180010
Scale 1:20000 @ A1
Cad file 180010-ICMP CATCHMENTS.DWG
Drawing no. C470 Rev A



- NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH WAIKATO DISTRICT COUNCIL/JAWAI STANDARD DETAILS AND THE WAIKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
 2. COORDINATES IN TERMS OF NZ GEODETIC DATUM MT EDEN 2000. LEVELS IN TERMS OF THE NEW ZEALAND VERTICAL DATUM 2016.
 3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.

- LEGEND
- EX STORMWATER
 - PR STORMWATER
 - PR LOT CONNECTION
 - EX PR SWMH
 - PR CULVERT
 - PR MODIFIED STREAM
 - PR 12.5m WIDE CONVEYANCE CHANNEL
 - PR WETLAND
 - PR RAINGARDEN
 - PR MAINTENANCE TRACKS
 - PR RECREATION TRACKS
 - PR LOT SHEET FLOW
 - PR MINOR OLPF
 - PR RD OLPF DIRECTION
 - PR RD CREST/HIGH PT
 - PR RD SAG/LOW PT

Ref	Revisions	By	Date
A	RESOURCE CONSENT	SP	08/2026

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Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
POST-DEVELOPMENT STORMWATER CATCHMENT PLAN

Project no. 180010
Scale 1:4000 @ A1
Cad file 180010-CATCH POST DEV CATCHMENT DWG
Drawing no. C475 Rev A

RESOURCE CONSENT



NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH THE WAKATO DISTRICT COUNCIL/MAVENS STANDARD DETAILS AND THE WAKATO REGIONAL INFRASTRUCTURE TECHNICAL SPECIFICATION.
2. COORDINATES IN TERMS OF NZ GEODETIC DATUM MT EDEN 2000. LEVELS IN TERMS OF THE NEW ZEALAND VERTICAL DATUM 2016.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL SERVICES THAT MAY BE AFFECTED BY THEIR OPERATIONS.
4. ALL CATCHMENT AREAS SHOWN ON THIS PLAN ARE IN SQUARE METRES (m²).

LEGEND

- 100% IMPERVIOUS
- 90% IMPERVIOUS
- 35% IMPERVIOUS

Ref	Revisions	By	Date
A	RESOURCE CONSENT	AF	08/2026
Survey	MAVEN		10/2025
Design	AF		08/2026
Drawn	AF		08/2026
Checked	KY		08/2026



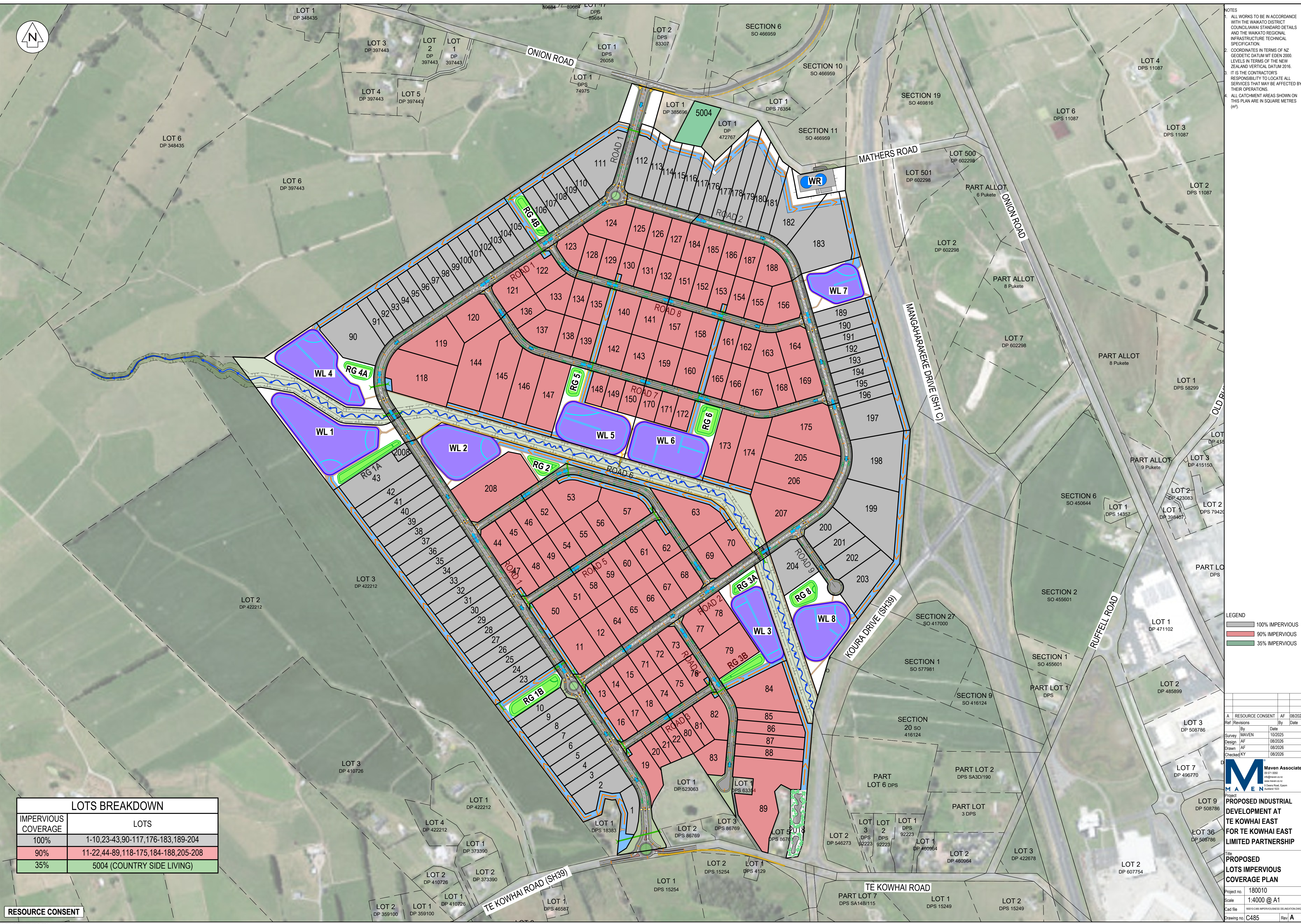
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Project
PROPOSED INDUSTRIAL DEVELOPMENT AT TE KOWHAI EAST FOR TE KOWHAI EAST LIMITED PARTNERSHIP

Title
PROPOSED LOTS IMPERVIOUS COVERAGE PLAN

Project no. 180010
Scale 1:4000 @ A1
Cad file 180010-C485-IMPERVIOUS-DELIN-01.DWG
Drawing no. C485 Rev. A

LOTS BREAKDOWN	
IMPERVIOUS COVERAGE	LOTS
100%	1-10,23-43,90-117,176-183,189-204
90%	11-22,44-89,118-175,184-188,205-208
35%	5004 (COUNTRY SIDE LIVING)



RESOURCE CONSENT