

LEGEND

	EXISTING PROPERTY BOUNDARY		PROPOSED DESIGNATION BOUNDARY
	EXISTING STREAM		REALIGNED STREAM (INDICATIVE DESIGN)
	CLEAN OPEN CHANNEL		CLEAN LINED CHANNEL
	ROAD RUNOFF CHANNEL		VEGETATED SWALE
	CULVERT WITH ID IF SHOWN		STORMWATER PIPE
	POND INLET/OUTLET		SWALE TO SWALE CULVERT WITH ID
	HEADWALL WITH RIP RAP		SCRUFFY DOME
	MANHOLE		CATCH PIT
	CATCH PIT		MANHOLE CATCH PIT
	SCOUR PROTECTION		SPOIL SITE OPTION (INDICATIVE EXTENT)
	SPOIL SITE OPTION (INDICATIVE EXTENT)		MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
	CUT AREA		FILL AREA
	POSSIBLE PROPERTY ACCESS ROUTE		

SITE 15
SOUTH OF WAIKAWA STREAM

SCALE 1:2000 (A3)

REV	REVISIONS	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	10.10.22

PROF REGISTRATION:

Client:

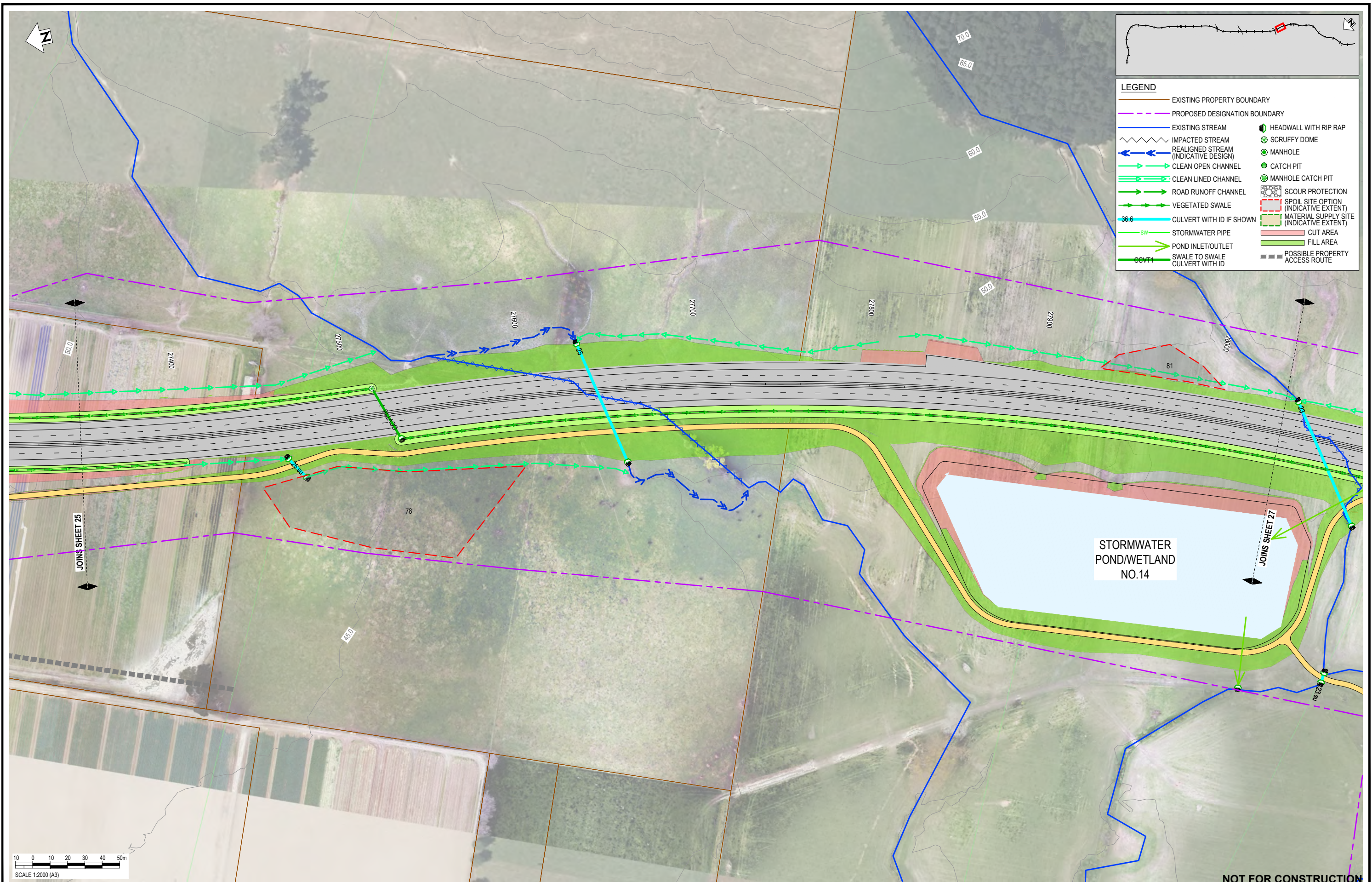
WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 25

NOT FOR CONSTRUCTION

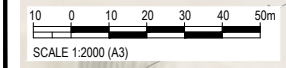
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Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1024
Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING PROPERTY BOUNDARY
- - -	PROPOSED DESIGNATION BOUNDARY	—	EXISTING STREAM
—	EXISTING STREAM	—	IMPACTED STREAM
—	REALIGNED STREAM (INDICATIVE DESIGN)	—	ROAD RUNOFF CHANNEL
—	CLEAN OPEN CHANNEL	—	VEGETATED SWALE
—	CLEAN LINED CHANNEL	—	CULVERT WITH ID IF SHOWN
—	STORMWATER PIPE	—	POND INLET/OUTLET
—	SWALE TO SWALE	—	CULVERT WITH ID
—	HEADWALL WITH RIP RAP	—	SCOUR PROTECTION
—	SCRUFFY DOME	—	SPOIL SITE OPTION (INDICATIVE EXTENT)
—	MANHOLE	—	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
—	CATCH PIT	—	CUT AREA
—	MANHOLE CATCH PIT	—	FILL AREA
—	POSSIBLE PROPERTY ACCESS ROUTE		



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REV	DESCRIPTION	DRN	CHK	APP	DATE
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A	ISSUED FOR DBC	SS	AC	JP	18.06.21

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	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall	

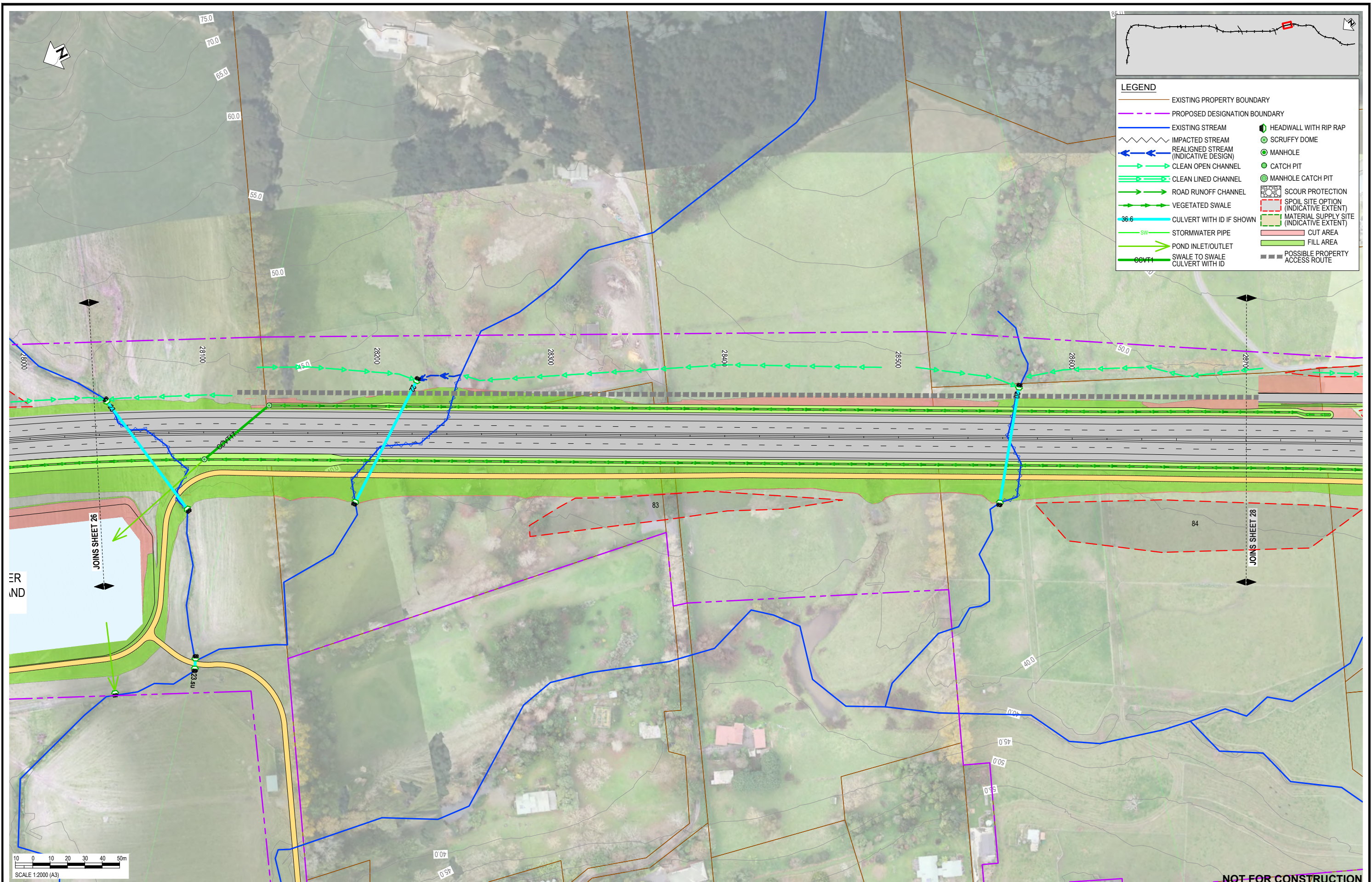
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WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 26

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1025
Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⊕	IMPACTED STREAM	⊕	SCRUFFY DOME
⊕	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	CLEAN OPEN CHANNEL	⊕	MANHOLE
⊕	CLEAN LINED CHANNEL	⊕	ROAD RUNOFF CHANNEL	⊕	CATCH PIT
⊕	VEGETATED SWALE	⊕	VEGETATED SWALE	⊕	MANHOLE CATCH PIT
36.6	CULVERT WITH ID IF SHOWN	⊕	STORMWATER PIPE	⊕	SCOUR PROTECTION
SW	STORMWATER PIPE	⊕	POND INLET/OUTLET	⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)
COVT1	SWALE TO SWALE CULVERT WITH ID	⊕	POSSIBLE PROPERTY ACCESS ROUTE	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
		⊕		⊕	CUT AREA
		⊕		⊕	FILL AREA

SCALE 1:2000 (A3)

REV	DESCRIPTION	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	10.10.22
D	ISSUED FOR RMA CONSENT	19.08.22
C	ISSUED FOR CONSENT - DRAFT	20.04.22
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A	ISSUED FOR DBC	18.06.21

DRN	CHK	APP	DATE

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED	DATE
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall	18.06.21

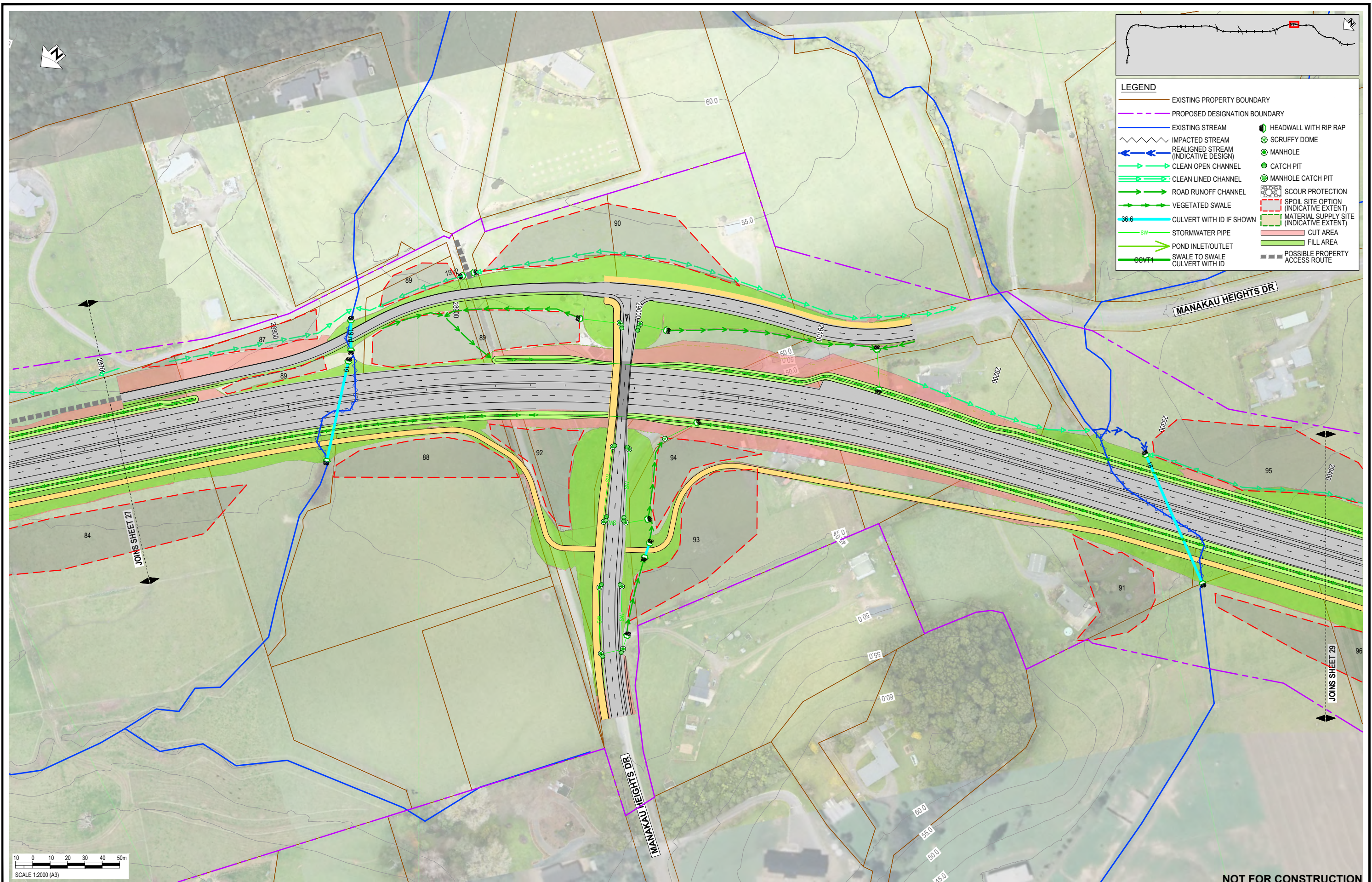
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WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 27

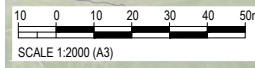
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Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	⬮	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⊗	SCRUFFY DOME
—	EXISTING STREAM	⊙	MANHOLE
~	IMPACTED STREAM (INDICATIVE DESIGN)	⊚	CATCH PIT
→	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	MANHOLE CATCH PIT
→	CLEAN OPEN CHANNEL	⊖	SCOUR PROTECTION
→	CLEAN LINED CHANNEL	⊗	SPOIL SITE OPTION (INDICATIVE EXTENT)
→	ROAD RUNOFF CHANNEL	⊘	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
→	VEGETATED SWALE	⊙	CUT AREA
→	CULVERT WITH ID IF SHOWN	⊚	FILL AREA
—	STORMWATER PIPE	⊖	POSSIBLE PROPERTY ACCESS ROUTE
→	POND INLET/OUTLET		
→	SWALE TO SWALE		
→	CULVERT WITH ID		



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REV	DESCRIPTION	DRN	CHK	APP	DATE
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B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

STATUS	NAME	DATE
SURVEYED		
DESIGNED	Nolan Naidoo	18.06.21
DRAWN	Gavin Smit	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	10.10.22
PROF REGISTRATION:		

Client:




WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 28

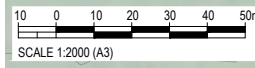
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Drawing No.	310203848-01-300-C1027
Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⊕	IMPACTED STREAM	⊕	SCRUFFY DOME
—	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	CLEAN OPEN CHANNEL	⊕	MANHOLE
—	CLEAN LINED CHANNEL	⊕	ROAD RUNOFF CHANNEL	⊕	CATCH PIT
—	VEGETATED SWALE	⊕	CULVERT WITH ID IF SHOWN	⊕	MANHOLE CATCH PIT
—	STORMWATER PIPE	⊕	POND INLET/OUTLET	⊕	SCOUR PROTECTION
—	SWALE TO SWALE	⊕	CULVERT WITH ID	⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)
—	CULVERT WITH ID	⊕	SW	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
⊕	HEADWALL WITH RIP RAP	⊕	POND INLET/OUTLET	⊕	CUT AREA
⊕	SCRUFFY DOME	⊕	CULVERT WITH ID	⊕	FILL AREA
⊕	MANHOLE	⊕	SW	⊕	POSSIBLE PROPERTY ACCESS ROUTE
⊕	CATCH PIT	⊕	POND INLET/OUTLET		
⊕	MANHOLE CATCH PIT	⊕	CULVERT WITH ID		
⊕	SCOUR PROTECTION				
⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)				
⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)				
⊕	CUT AREA				
⊕	FILL AREA				
⊕	POSSIBLE PROPERTY ACCESS ROUTE				



NOT FOR CONSTRUCTION

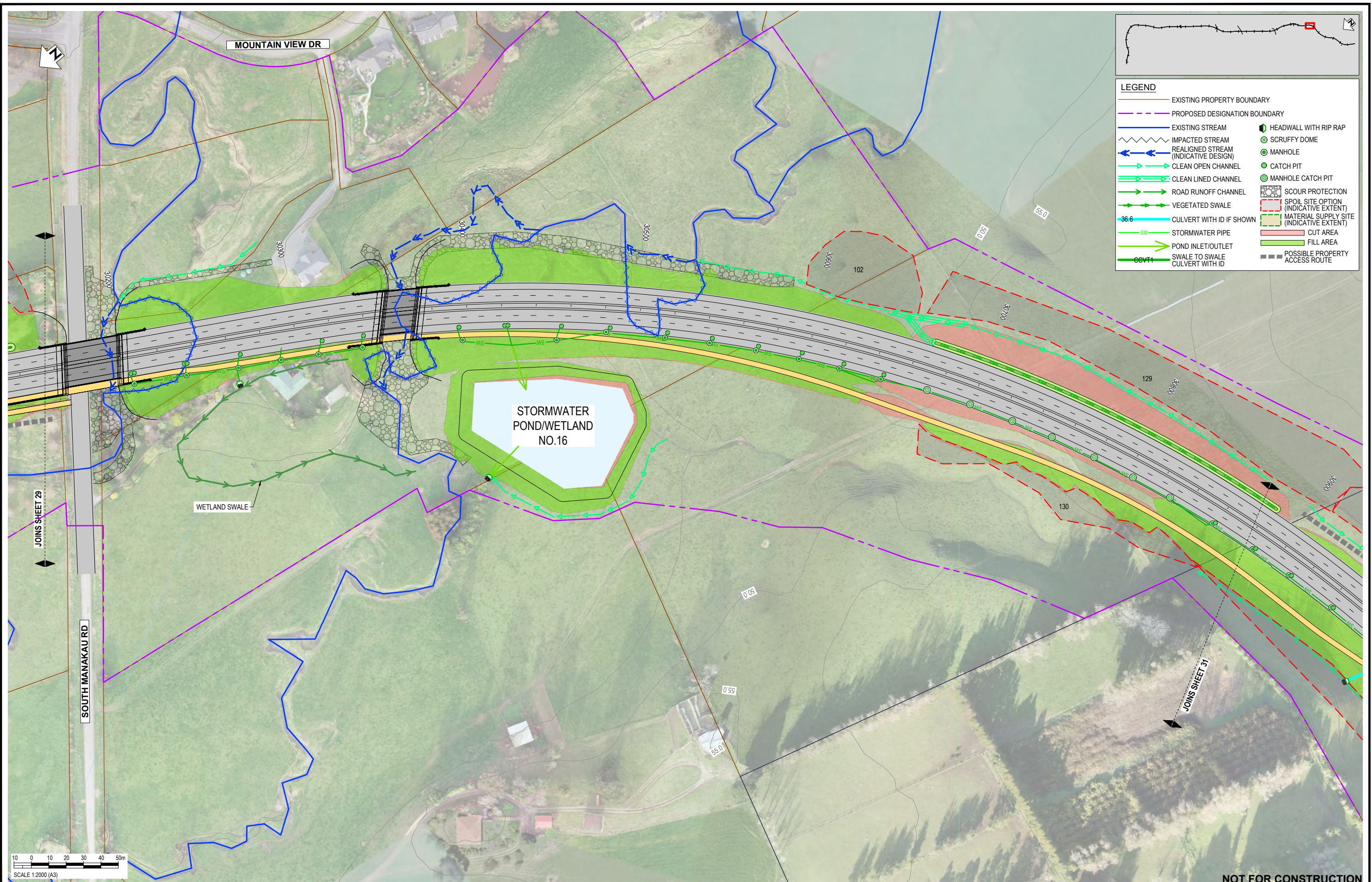
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D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

STATUS	NAME	DATE
SURVEYED		
DESIGNED	Nolan Naidoo	18.06.21
DRAWN	Gavin Smit	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	10.10.22
PROF REGISTRATION:		



Client:
WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 DRAINAGE LAYOUT PLAN - INDICATIVE
 SHEET 29

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1028
Rev.	E



LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⬇	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⬇	IMPACTED STREAM	⊕	SCRUFFY DOME
⬇	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	MANHOLE	⊕	CATCH PIT
⬇	CLEAN OPEN CHANNEL	⊕	MANHOLE CATCH PIT	⊕	SCOUR PROTECTION
⬇	CLEAN LINED CHANNEL	⊕	SPoil SITE OPTION (INDICATIVE EXTENT)	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
⬇	ROAD RUNOFF CHANNEL	⊕	CUT AREA	⊕	FILL AREA
⬇	VEGETATED SWALE	⊕	POSSIBLE PROPERTY ACCESS ROUTE		
⬇	CULVERT WITH ID IF SHOWN				
⬇	STORMWATER PIPE				
⬇	POND INLET/OUTLET				
⬇	SWALE TO SWALE				
⬇	CULVERT WITH ID				

REV	DESCRIPTION	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

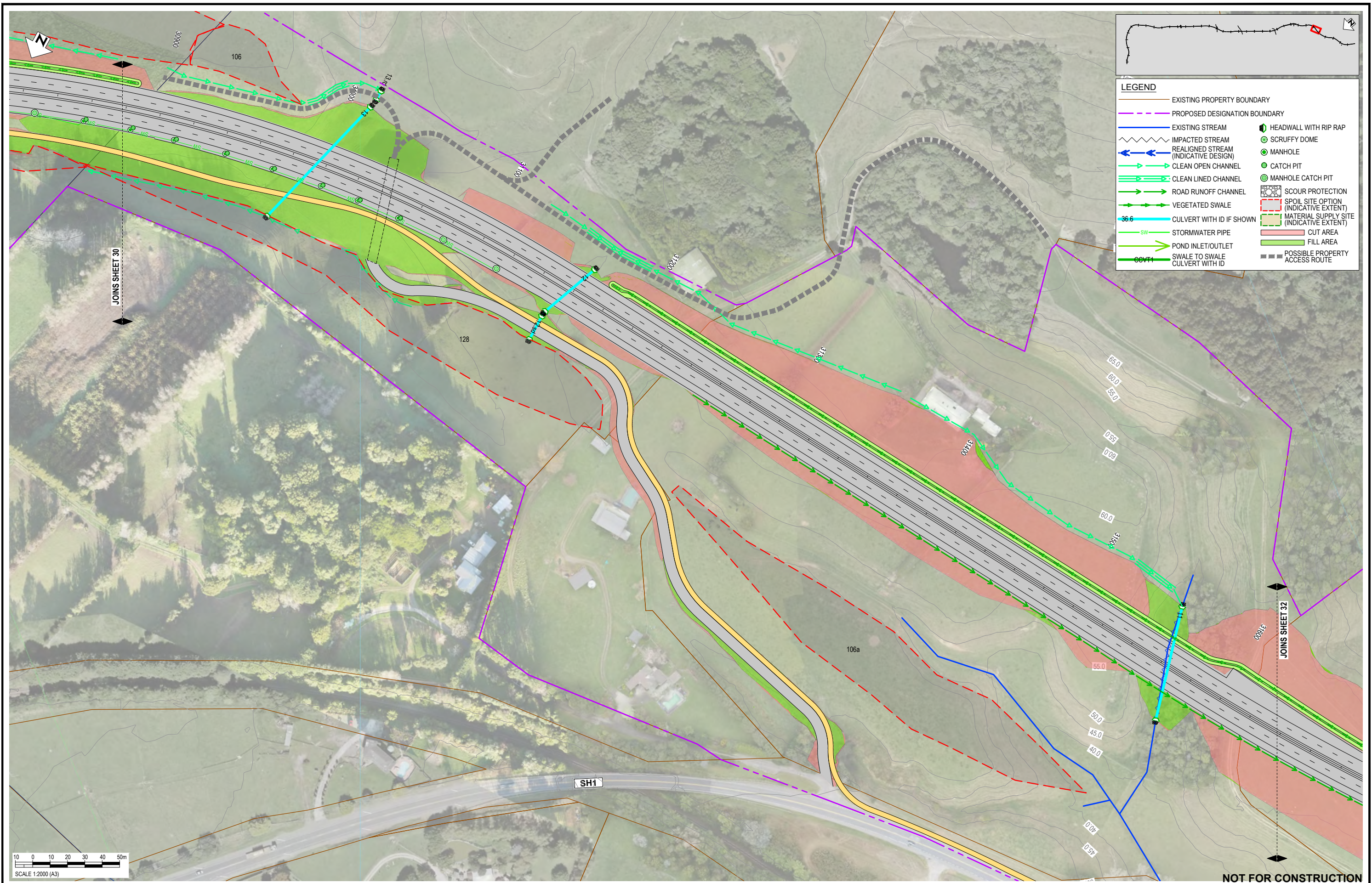
STATUS	NAME	DATE
SURVEYED		
DESIGNED	Nolan Naidoo	18.06.21
DRAWN	Gavin Smit	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	10.10.22

Client:




WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 DRAINAGE LAYOUT PLAN - INDICATIVE
 SHEET 30

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1029
Rev.	E



LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	~	IMPACTED STREAM	⊗	SCRUFFY DOME
—	REALIGNED STREAM (INDICATIVE DESIGN)	→	CLEAN OPEN CHANNEL	⊙	MANHOLE
→	CLEAN LINED CHANNEL	→	ROAD RUNOFF CHANNEL	⊕	CATCH PIT
→	VEGETATED SWALE	→	CULVERT WITH ID IF SHOWN	⊕	MANHOLE CATCH PIT
→	STORMWATER PIPE	→	POND INLET/OUTLET	⊕	SCOUR PROTECTION
→	SWALE TO SWALE	→	CULVERT WITH ID	⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)
→	CULVERT WITH ID	→	SW	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
→	SW	→	POND INLET/OUTLET	⊕	CUT AREA
→	CULVERT WITH ID	→	SWALE TO SWALE	⊕	FILL AREA
→	CULVERT WITH ID	→	CULVERT WITH ID	⊕	POSSIBLE PROPERTY ACCESS ROUTE

REV	DESCRIPTION	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

STATUS	NAME	DATE
SURVEYED		
DESIGNED	Nolan Naidoo	18.06.21
DRAWN	Gavin Smit	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	10.10.22
PROF REGISTRATION:		

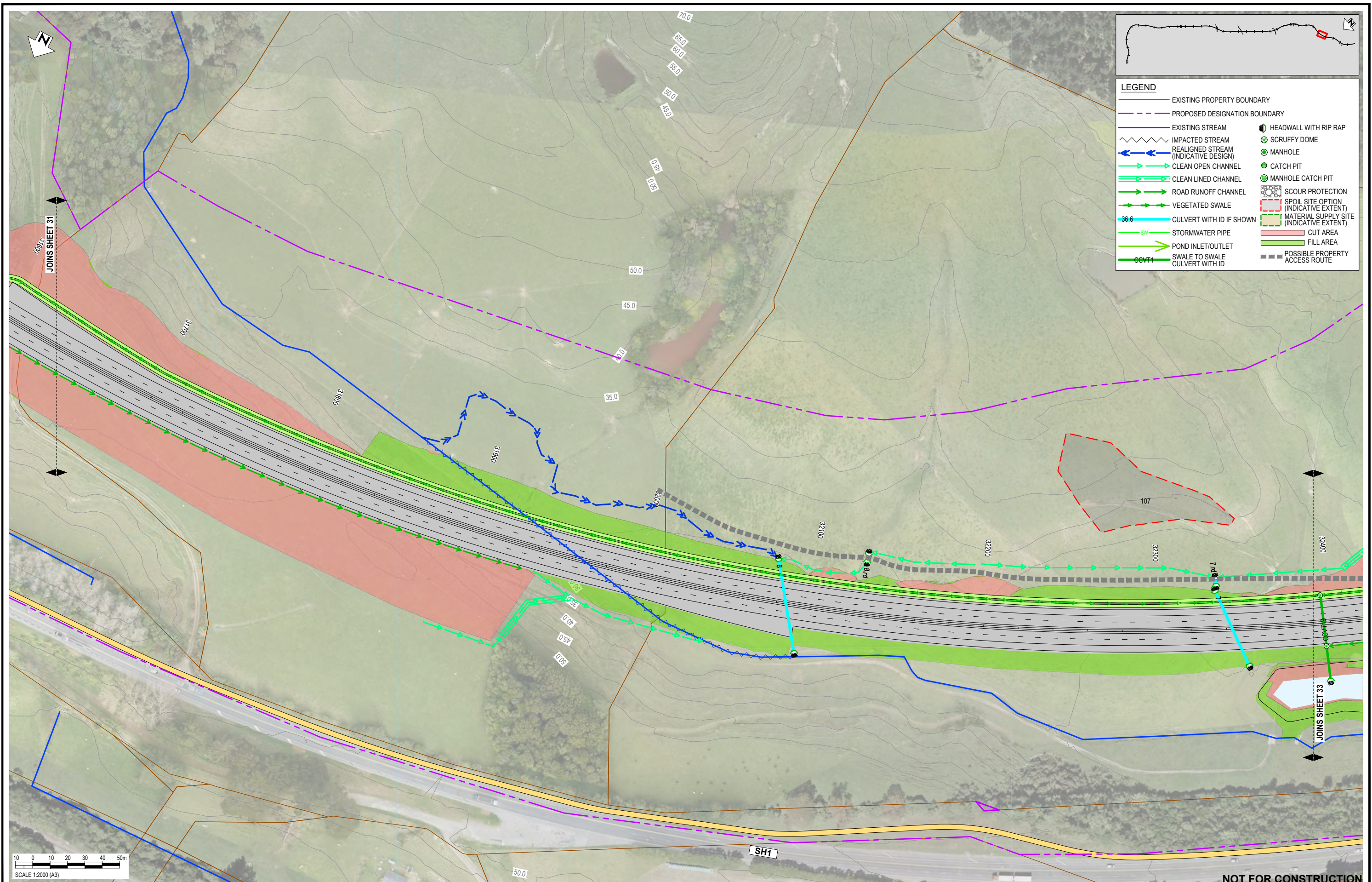
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WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 DRAINAGE LAYOUT PLAN - INDICATIVE
 SHEET 31

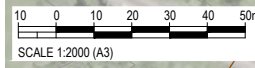
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 Drawing No.
 310203848-01-300-C1030
 Rev: **E**

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⊕	IMPACTED STREAM	⊕	SCRUFFY DOME
⊕	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	CLEAN OPEN CHANNEL	⊕	MANHOLE
⊕	CLEAN LINED CHANNEL	⊕	ROAD RUNOFF CHANNEL	⊕	CATCH PIT
⊕	VEGETATED SWALE	⊕	CULVERT WITH ID IF SHOWN	⊕	MANHOLE CATCH PIT
⊕	STORMWATER PIPE	⊕	POND INLET/OUTLET	⊕	SCOUR PROTECTION
⊕	SWALE TO SWALE	⊕	CUT AREA	⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)
⊕	CULVERT WITH ID	⊕	FILL AREA	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
		⊕	POSSIBLE PROPERTY ACCESS ROUTE		



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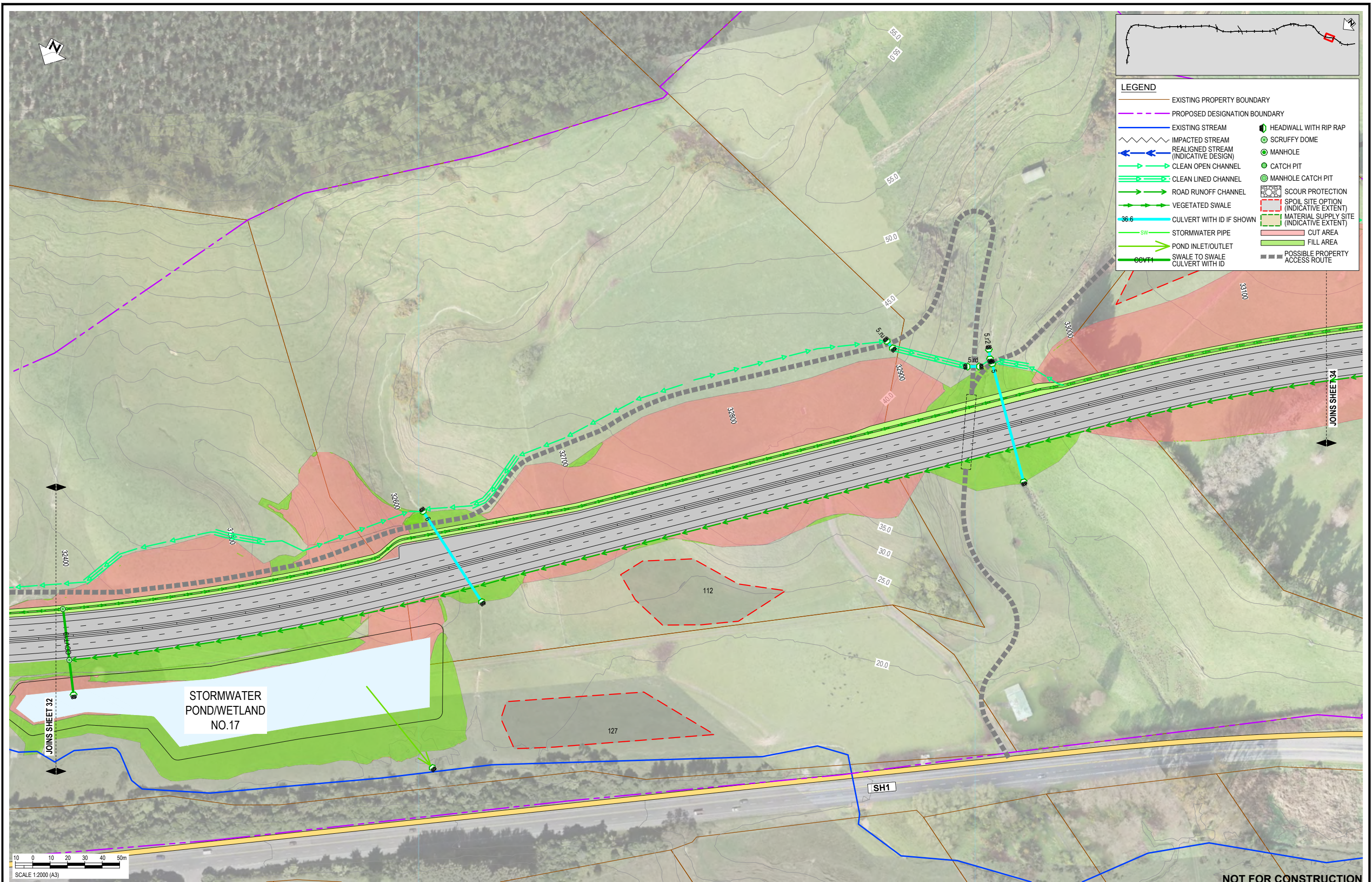
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E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
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A	ISSUED FOR DBC	SS	AC	JP	18.06.21

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall



Client: WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 DRAINAGE LAYOUT PLAN - INDICATIVE
 SHEET 32

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1031
Rev.	E



LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	~	IMPACTED STREAM	⊗	SCRUFFY DOME
→	REALIGNED STREAM (INDICATIVE DESIGN)	→	CLEAN OPEN CHANNEL	⊙	MANHOLE
→	CLEAN LINED CHANNEL	→	ROAD RUNOFF CHANNEL	⊙	CATCH PIT
→	VEGETATED SWALE	→	CULVERT WITH ID IF SHOWN	⊙	MANHOLE CATCH PIT
→	STORMWATER PIPE	→	POND INLET/OUTLET	⊙	SCOUR PROTECTION
→	SWALE TO SWALE	→	CULVERT WITH ID	⊙	SPOIL SITE OPTION (INDICATIVE EXTENT)
				⊙	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
				⊙	CUT AREA
				⊙	FILL AREA
				⊙	POSSIBLE PROPERTY ACCESS ROUTE

REV	REVISIONS	DRN	CHK	APP	DATE
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C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall

Client:

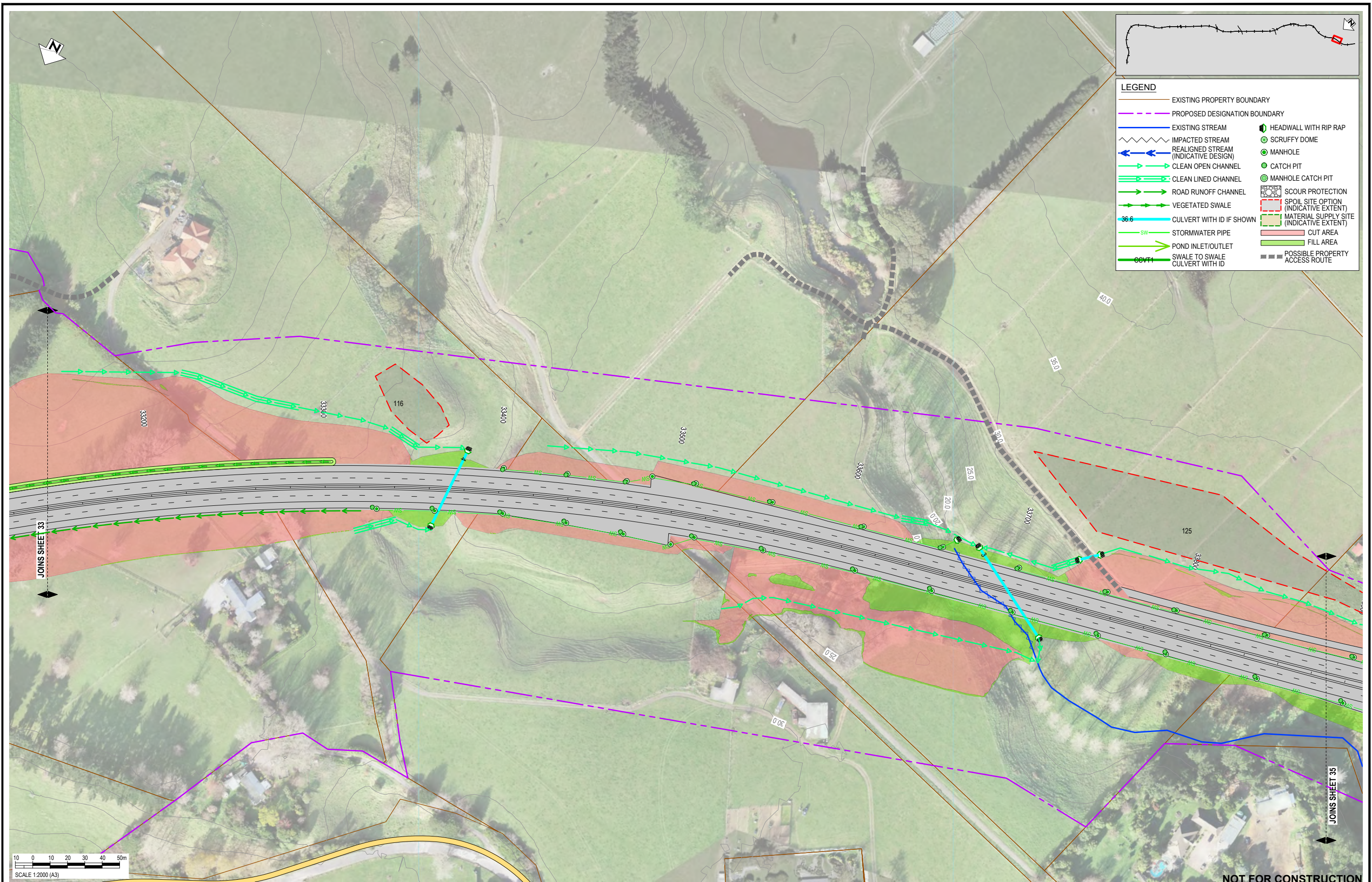



WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
 SHEET 33

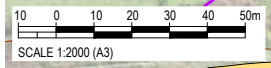
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Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⬇	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⋯	IMPACTED STREAM	⊕	SCRUFFY DOME
⬅	REALIGNED STREAM (INDICATIVE DESIGN)	➡	CLEAN OPEN CHANNEL	⊙	MANHOLE
➡	CLEAN LINED CHANNEL	➡	ROAD RUNOFF CHANNEL	⊙	CATCH PIT
➡	VEGETATED SWALE	➡	CULVERT WITH ID IF SHOWN	⊙	MANHOLE CATCH PIT
36.6	STORMWATER PIPE	➡	SWALE TO SWALE	⊙	SCOUR PROTECTION
⬇	POND INLET/OUTLET	➡	CULVERT WITH ID	⊙	SPOIL SITE OPTION (INDICATIVE EXTENT)
⬇	SWALE TO SWALE	➡	STORMWATER PIPE	⊙	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
⬇	CULVERT WITH ID	➡	POND INLET/OUTLET	⊙	CUT AREA
		➡	SWALE TO SWALE	⊙	FILL AREA
		➡	CULVERT WITH ID	⊙	POSSIBLE PROPERTY ACCESS ROUTE



NOT FOR CONSTRUCTION

REV	DESCRIPTION	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	10.10.22

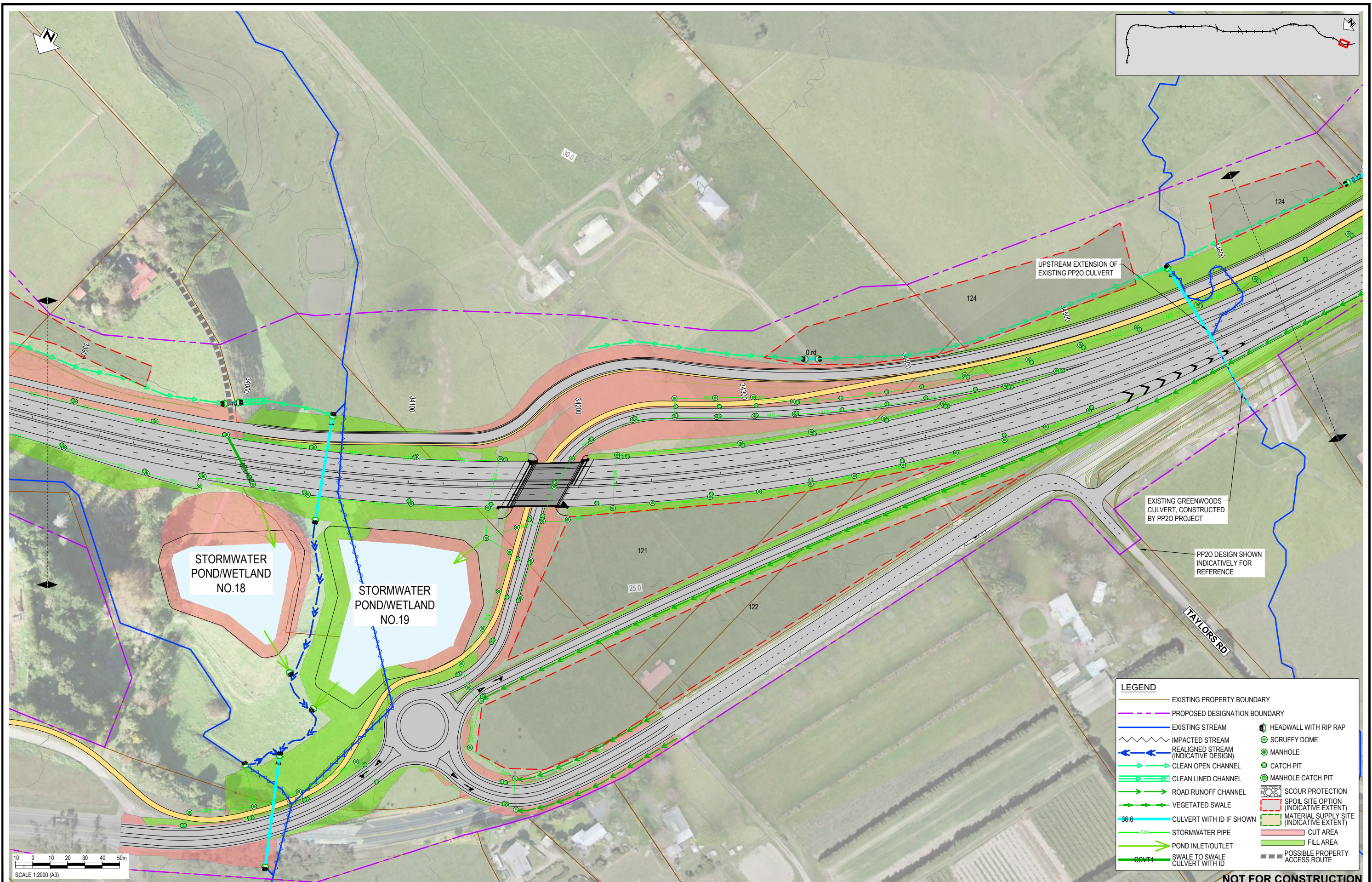
Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 34

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1033
Rev.	E

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LEGEND

—	EXISTING PROPERTY BOUNDARY	—	PROPOSED DESIGNATION BOUNDARY
—	EXISTING STREAM	—	HEADWALL WITH RIP RAP
—	IMPACTED STREAM	—	SCRUFFY DOME
—	REALIGNED STREAM (INDICATIVE DESIGN)	—	MANHOLE
—	CLEAN OPEN CHANNEL	—	CATCH PIT
—	CLEAN LINED CHANNEL	—	MANHOLE CATCH PIT
—	ROAD RUNOFF CHANNEL	—	SCOUR PROTECTION
—	VEGETATED SWALE	—	SPOIL SITE OPTION (INDICATIVE EXTENT)
—	CULVERT WITH ID IF SHOWN	—	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
—	STORMWATER PIPE	—	CUT AREA
—	POND INLET/OUTLET	—	FILL AREA
—	SWALE TO SWALE CULVERT WITH ID	—	POSSIBLE PROPERTY ACCESS ROUTE

NOT FOR CONSTRUCTION

REV	DESCRIPTION	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	10.10.22

Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 35

Status Stamp

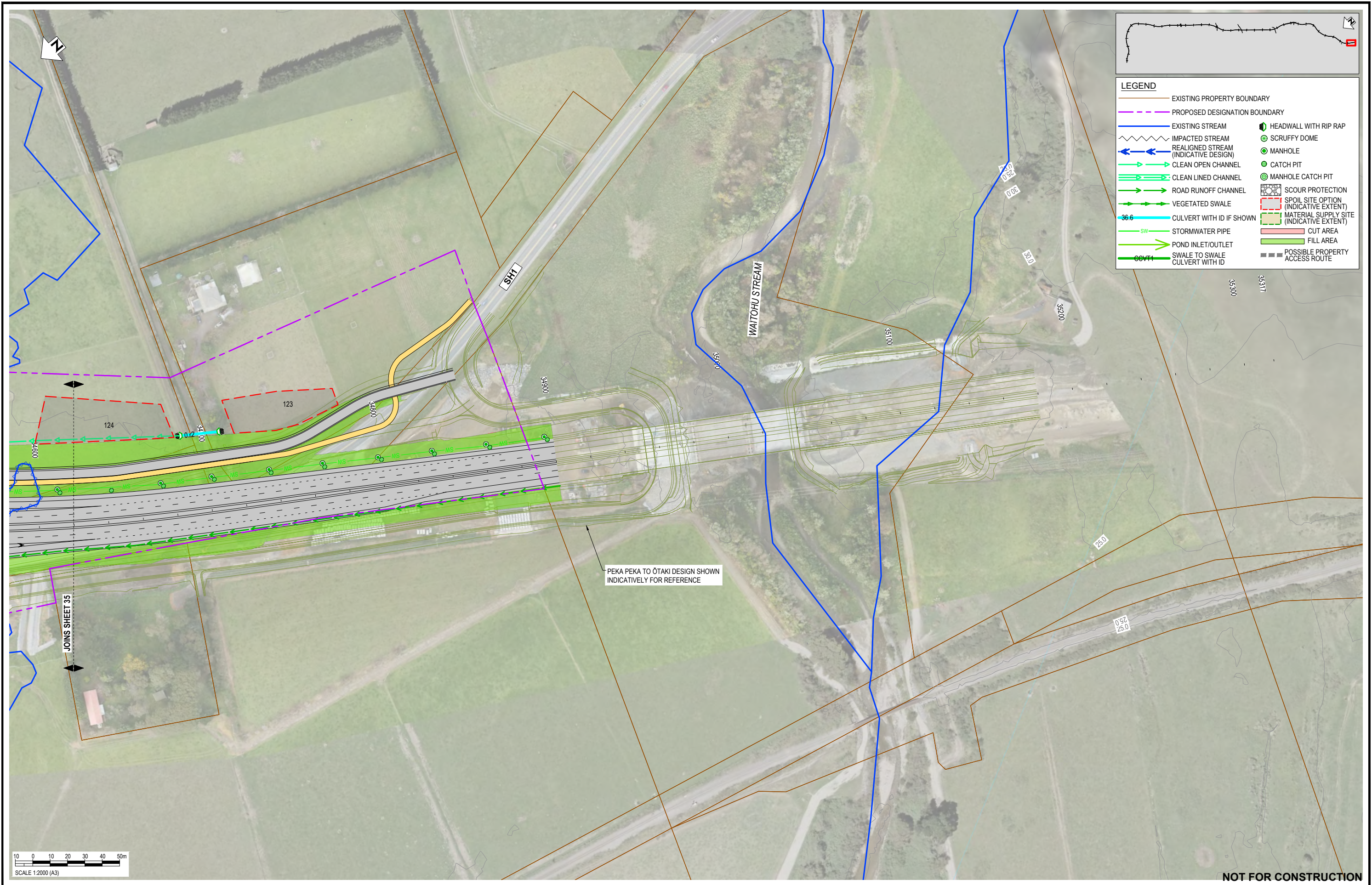
FOR CONSENT

Date Stamp: **10.10.22**

Scale: 1 : 2000 (A3)

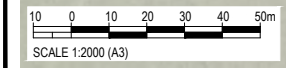
Drawing No: **310203848-01-300-C1034**

Rev: **E**



LEGEND

—	EXISTING PROPERTY BOUNDARY	—	EXISTING STREAM	⊕	HEADWALL WITH RIP RAP
- - -	PROPOSED DESIGNATION BOUNDARY	⊕	IMPACTED STREAM	⊕	SCRUFFY DOME
—	REALIGNED STREAM (INDICATIVE DESIGN)	⊕	CLEAN OPEN CHANNEL	⊕	MANHOLE
—	CLEAN LINED CHANNEL	⊕	ROAD RUNOFF CHANNEL	⊕	CATCH PIT
—	VEGETATED SWALE	⊕	CULVERT WITH ID IF SHOWN	⊕	MANHOLE CATCH PIT
—	STORMWATER PIPE	⊕	SWALE TO SWALE	⊕	SCOUR PROTECTION
—	POND INLET/OUTLET	⊕	CULVERT WITH ID	⊕	SPOIL SITE OPTION (INDICATIVE EXTENT)
—	SWALE TO SWALE	⊕	CUT AREA	⊕	MATERIAL SUPPLY SITE (INDICATIVE EXTENT)
—	CULVERT WITH ID	⊕	FILL AREA	⊕	POSSIBLE PROPERTY ACCESS ROUTE



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REV	REVISIONS	DRN	CHK	APP	DATE
E	VARIOUS UPDATES - ISSUED FOR RMA CONSENT	MH	JP	JP	10.10.22
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

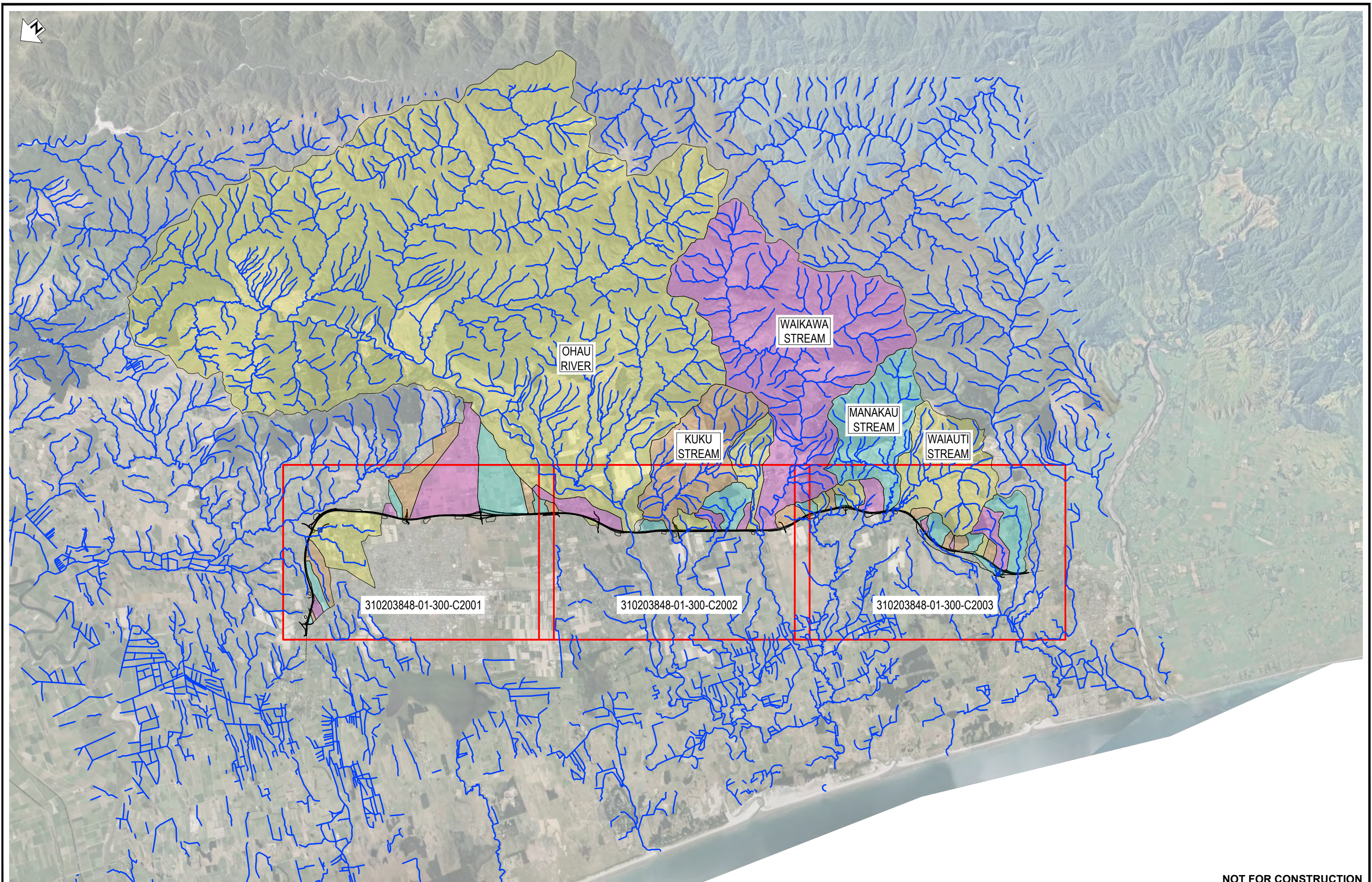
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	Nolan Naidoo	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	10.10.222

Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT
DRAINAGE LAYOUT PLAN - INDICATIVE
SHEET 36

Status Stamp	FOR CONSENT
Date Stamp	10.10.22
Scale	1 : 2000 (A3)
Drawing No.	310203848-01-300-C1035
Rev.	E

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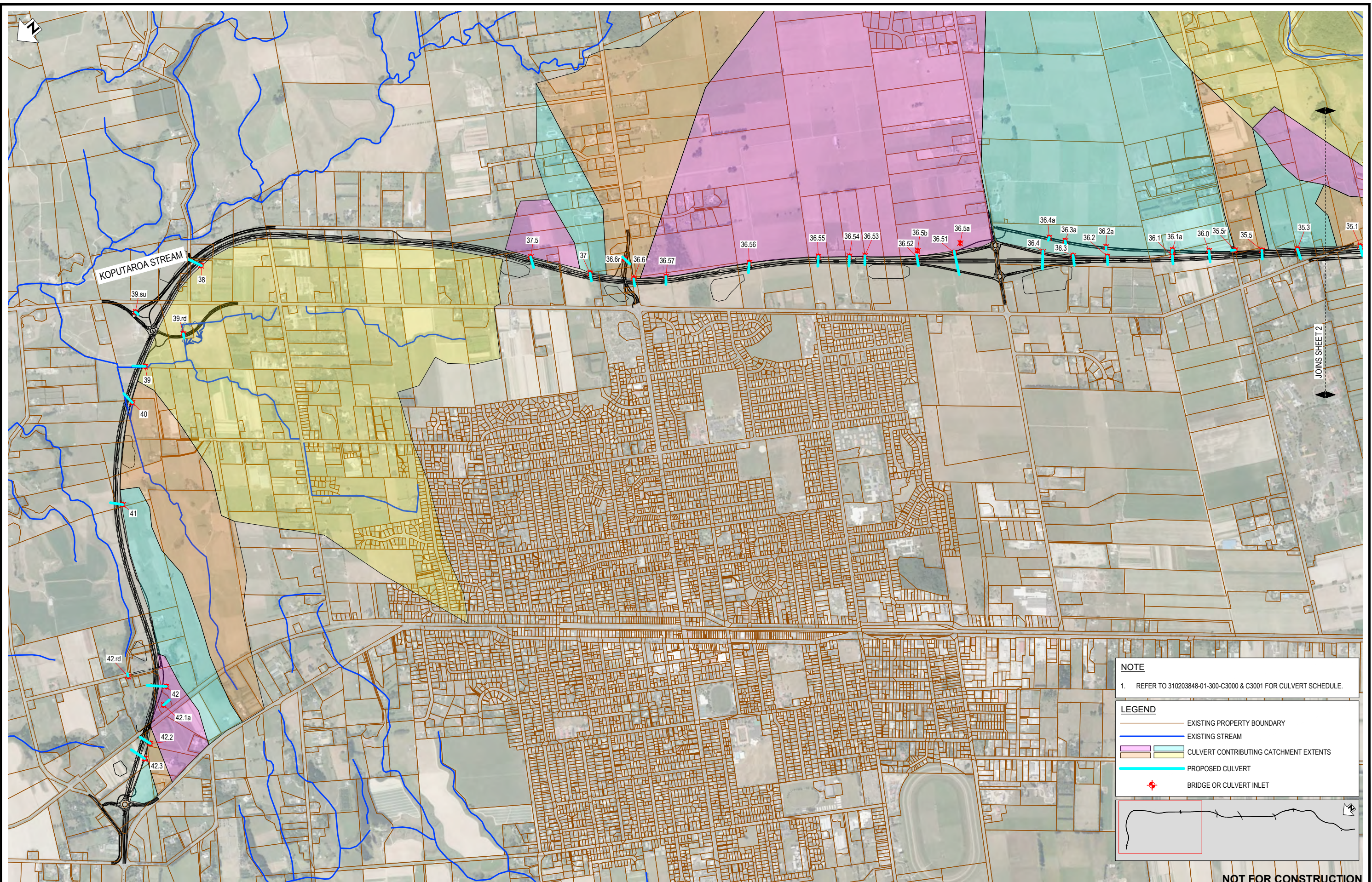
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D	SS	AC	JP	19.08.22				
C	SS	AC	JP	20.04.22				
B	SS	AC	JP	09.12.21				
A	SS	NK	JP	18.06.21				

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED	PROF REGISTRATION
-	Andrew Craig	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall	
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	19.08.22	



Client: WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 OVERALL CATCHMENT PLAN

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	1 : 100000 (A3)
Drawing No.	310203848-01-300-C2000
Rev.	D



NOTE

1. REFER TO 310203848-01-300-C3000 & C3001 FOR CULVERT SCHEDULE.

LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING STREAM
- CULVERT CONTRIBUTING CATCHMENT EXTENTS
- PROPOSED CULVERT
- BRIDGE OR CULVERT INLET

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REV	ISSUED FOR RMA CONSENT	ISSUED FOR CONSENT - DRAFT	ISSUED FOR CONSENT - DRAFT	ISSUED FOR DBC	DRN	CHK	APP	DATE	REVISIONS
D	SS	AC	JP	19.08.22					
C	SS	AC	JP	20.04.22					
B	SS	AC	JP	09.12.21					
A	SS	NK	JP	18.06.21					

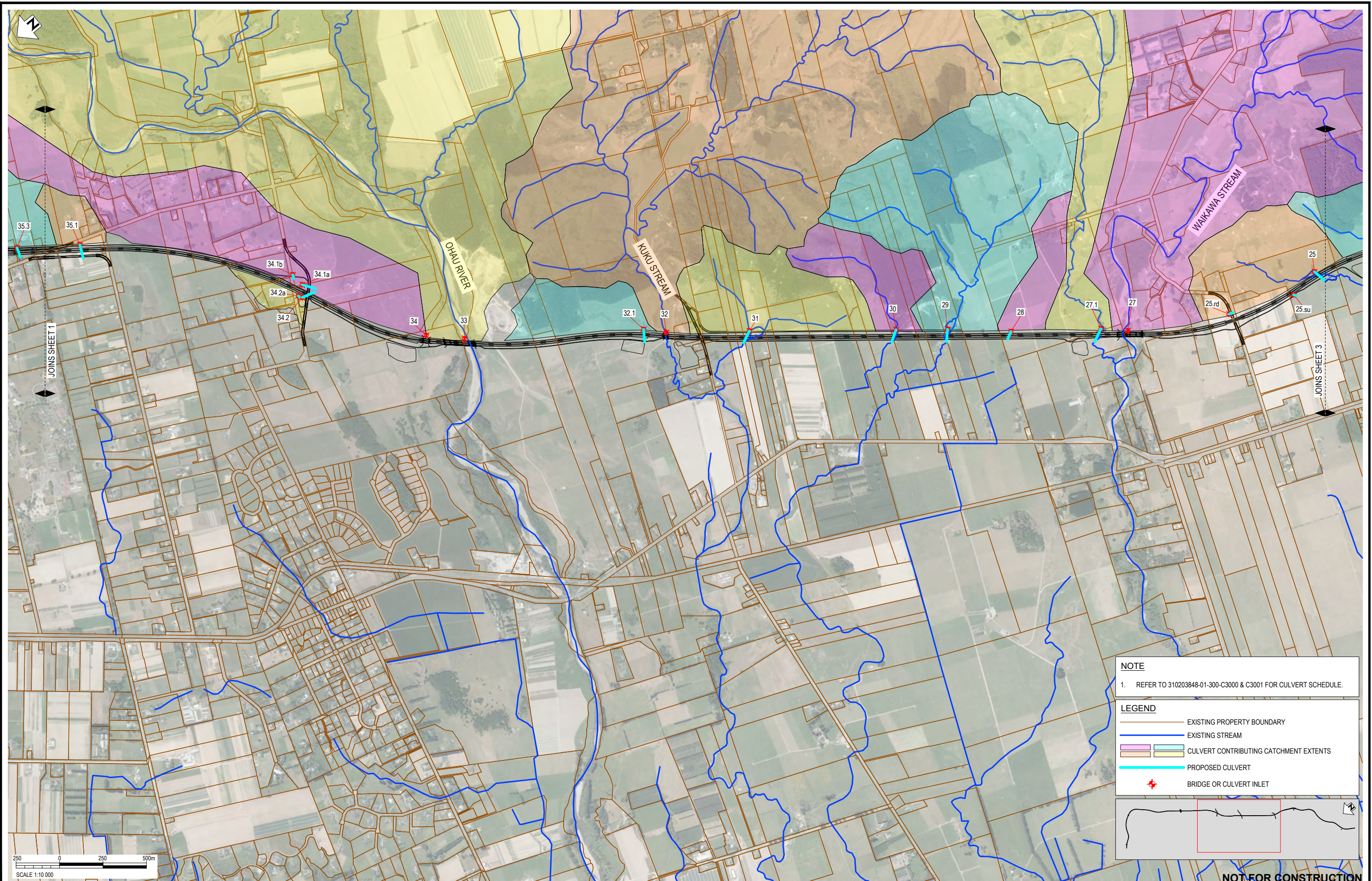
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED	PROF REGISTRATION
	Andrew Craig	Gavin Smit	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall	
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	19.08.22	

Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

CATCHMENT PLAN
SHEET 1

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	1 : 20000 (A3)
Drawing No.	310203848-01-300-C2001
Rev.	D



NOTE

- REFER TO 310203848-01-300-C3000 & C3001 FOR CULVERT SCHEDULE.

LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING STREAM
- CULVERT CONTRIBUTING CATCHMENT EXTENTS
- PROPOSED CULVERT
- ⊕ BRIDGE OR CULVERT INLET

NOT FOR CONSTRUCTION

REV	ISSUED FOR	DRN	CHK	APP	DATE	PROF REGISTRATION:
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22	
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22	
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21	
A	ISSUED FOR DBC	SS	NK	JP	18.06.21	

SURVEYED	-	-
DESIGNED	Andrew Craig	18.06.21
DRAWN	Gavin Smit	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	19.08.22

Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

CATCHMENT PLAN
SHEET 2

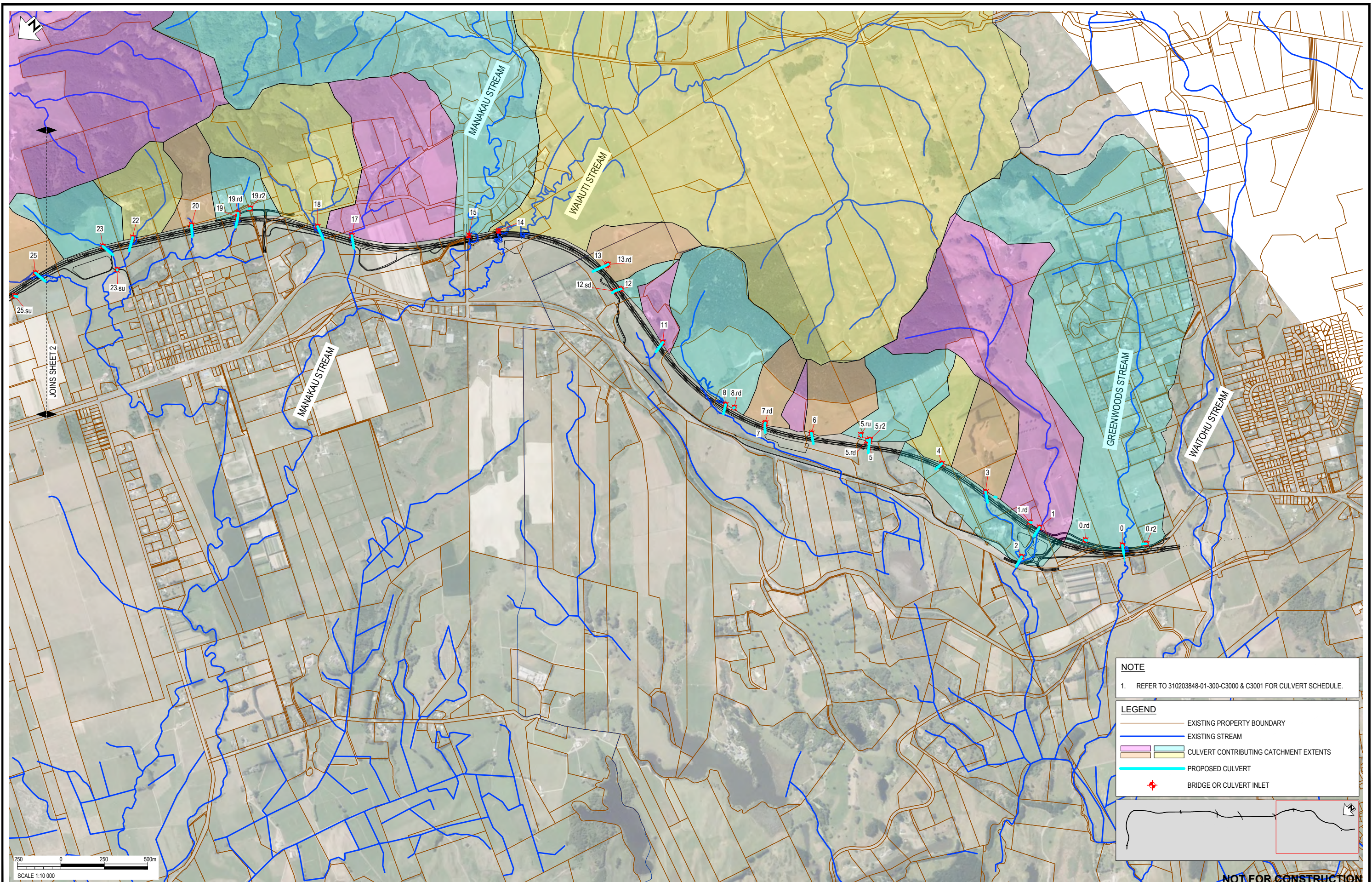
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Date Stamp: **19.08.22**

Scale: 1 : 20000 (A3)

Drawing No: **310203848-01-300-C2002**

Rev: **D**



NOTE

- REFER TO 310203848-01-300-C3000 & C3001 FOR CULVERT SCHEDULE.

LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING STREAM
- CULVERT CONTRIBUTING CATCHMENT EXTENTS
- PROPOSED CULVERT
- BRIDGE OR CULVERT INLET

NOT FOR CONSTRUCTION

REV	ISSUED FOR	CHK	APP	DATE	PROF REGISTRATION
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	NK	JP	18.06.21

DESIGNED	DATE
Andrew Craig	18.06.21
Gavin Smit	18.06.21
Steve Sutton	18.06.21
Nick Keenan	14.04.22
Andrew Craig	15.04.22
Jamie Povall	19.08.22

Client:

WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

CATCHMENT PLAN
SHEET 3

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	1 : 20000 (A3)
Drawing No.	310203848-01-300-C2003
Rev.	D

Summary of Proposed Watercourse Crossings - Concept Design																	
O2NL Flowpath ID	O2NL Chainage (m)	Name	Flowpath definition	Fish passage required	Shape	Total flow width (m)	Total height (m) incl embed	Embed height (m)	Total area open (m2)	Barrels	Culvert Length approx (m)	Culvert slope	Flowpath slope existing	Culvert Inlet/Outlet Type	Inlet apron length (m) included in total length	Outlet apron length (m) included in total length	Upstream debris arrester / screen (*tbc detail design)
		Bridges					See structures drawings 310203848-400										
34	22430	Ohau flood relief	Overland flow path	No	Bridge		31m in 35m top span			1				90 degree wingwall (rounded backfill)			no
33	22658	Ohau River	River	Yes	Bridge		175m less piers & spill-thru abutments			5	4 x 2 inline piers			rounded spill-through abutments			no
32	23808	Kuku Stream	Stream	Yes	Bridge		17m in 21m top span			1				90 degree wingwall (rounded backfill)			no
27	26440	Waikawa Stream	Stream	Yes	Bridge		140m less piers & spill-thru abutments			4	3 x 2 inline piers			rounded spill-through abutments			no
15	30190	Manakau Stream	Stream	Yes	Bridge		13m river plus road in 32m top span			1				90 degree wingwall (rounded backfill)			no
14	30350	Waiauti Stream	Stream	Yes	Bridge		20m in 24m top span			1				90 degree wingwall (rounded backfill)			no
		Culverts (stream)															
40	12690	New Culvert 40.	Stream	Yes	Rectangular	4.00	1.50	0.38	4.50	1	71	0.5%	0.5%	Flared wingwalls, 30 to 75 degrees.	3	5	no*
39	12880	New Culvert 39.	Stream	Yes	Rectangular	8.00	1.50	0.38	9.00	2	72	0.7%	0.7%	Flared wingwalls, 30 to 75 degrees.	3	5	no* (deflector wedge)
31	24280	New Culvert 31.	Stream	Yes	Rectangular	4.00	1.50	0.38	4.50	1	75	0.5%	0.6%	Flared wingwalls, 30 to 75 degrees.	3	4	no*
30	25125	New Culvert 30.	Stream	Yes	Rectangular	2.00	1.00	0.25	1.50	1	76	1.7%	1.6%	Flared wingwalls, 30 to 75 degrees.	2	3	no*
29	25430	New Culvert 29.	Stream	Yes	Rectangular	8.00	1.50	0.38	9.00	2	72	1.4%	1.3%	Flared wingwalls, 30 to 75 degrees.	3	4	no* (deflector wedge)
27	26300	New Culvert 27.1	Stream	Yes	Rectangular	10.00	2.00	0.50	15.00	3	83	1.0%	1.0%	Flared wingwalls, 30 to 75 degrees.	4	5	no* (deflector wedge)
25	27645	New Culvert 25.	Stream	Yes	Rectangular	2.50	1.50	0.38	2.81	1	75	1.7%	1.7%	Flared wingwalls, 30 to 75 degrees.	3	4	no*
23.su	28100 offline	New Culvert 23.su	Stream	Yes	Rectangular	3.00	1.00	0.25	2.25	1	4	2.0%	2.0%	Flared wingwalls, 30 to 75 degrees.	2	4	no*
23	28060	New Culvert 23.	Stream	Yes	Rectangular	1.50	1.00	0.25	1.13	1	78	3.7%	3.9%	Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
22	28205	New Culvert 22.	Stream	Yes	Rectangular	1.50	1.00	0.25	1.13	1	79	2.7%	2.5%	Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
20	28565	New Culvert 20.	Stream	Yes	Circular	0.90	0.90	0.23	0.52	1	68	4.3%	4.0%	Square Edge Headwall.	2	3	Screen inlet
19.rd	28840 offline	New Culvert 19.rd	Stream	Yes	Rectangular	1.50	1.00	0.25	1.13	1	18	2.8%	2.8%	Flared wingwalls, 30 to 75 degrees.	2	4	no*
19	28830	New Culvert 19.	Stream	Yes	Rectangular	1.50	1.00	0.25	1.13	1	59	2.9%	2.8%	Flared wingwalls, 30 to 75 degrees.	2	3	no*
18	29315	New Culvert 18.	Stream	Yes	Rectangular	4.00	1.50	0.38	4.50	1	81	2.1%	2.0%	Flared wingwalls, 30 to 75 degrees.	3	4	no*
17	29515	New Culvert 17.	Stream	Yes	Rectangular	3.00	1.50	0.38	3.38	1	75	1.2%	1.1%	Flared wingwalls, 30 to 75 degrees.	3	4	no*
11	31565	New Culvert 11.	Stream	Yes	Circular	0.90	0.90	0.23	0.52	1	68	3.0%	2.9%	Square Edge Headwall.	2	3	no*
8	32085	New Culvert 8.	Stream	Yes	Rectangular	3.00	1.50	0.38	3.38	1	55	1.1%	1.5%	Flared wingwalls, 30 to 75 degrees.	2	5	no*
3	33700	New Culvert 3.	Stream	Yes	Rectangular	1.50	1.00	0.25	1.13	1	63	2.1%	1.9%	Flared wingwalls, 30 to 75 degrees.	2	3	no*
2	34050 offline	New Culvert 2.	Stream	Yes	Rectangular	2.50	1.50	0.38	2.81	1	65	0.9%	1.0%	Flared wingwalls, 30 to 75 degrees.	3	5	no*
1	34050	New Culvert 1.	Stream	Yes	Rectangular	3.00	1.50	0.38	3.38	1	61	1.3%	1.4%	Flared wingwalls, 30 to 75 degrees.	3	5	no*
0	34575	Extend PP20 culvert	Stream	Yes	Arch	3.72	1.98	0.45	5.80	1	49	1.3%	1.2%	Mitered to Slope	4	n/a (existing)	no*
		Culverts (overland flow path, highway)															
42.30	10585	New Culvert 42.3	Overland flow path	No	Circular	0.60	0.60	0.00	0.28	1	93			Scruffy dome inlet, Square Edge Headwall outlet	2	2	Scruffy inlet
42.20	10680	New Culvert 42.2	Overland flow path	No	Circular	0.60	0.60	0.00	0.28	1	69			Scruffy dome inlet, Manhole bend chamber at KR culvert.	2	2	Scruffy inlet
42	10995	New Culvert 42.	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	111			Square Edge Headwall.	2	3	no*
41	12075	New Culvert 41.	Overland flow path	Yes	Rectangular	2.50	1.00	0.25	1.88	1	72			Flared wingwalls, 30 to 75 degrees.	2	3	no*
38	13580	New Culvert 38.	Overland flow path	No	Circular	0.45	0.45	0.00	0.16	1	78			Scruffy dome inlet; bubble up outlet	1	2	Scruffy inlet
37.50	15560	New Culvert 37.5	Overland flow path	No	Circular	0.90	0.90	0.00	0.64	1	65			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
37.00	15910	New Culvert 37.	Overland flow path	No	Circular	0.75	0.75	0.00	0.88	2	47			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36.60	16160	New Culvert 36.6	Overland flow path	No	Rectangular	6.00	1.00	0.00	6.00	2	42			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.57	16320	New Culvert 36.57	Overland flow path	No	Rectangular	3.00	1.00	0.00	3.00	1	45			Screen chamber inlet; bubble up outlet	2	3	Screen inlet
36.56	16820	New Culvert 36.56	Overland flow path	No	Rectangular	3.00	1.00	0.00	3.00	2	57			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.55	17210	New Culvert 36.55	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	57			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36.54	17400	New Culvert 36.54	Overland flow path	No	Circular	0.90	0.90	0.00	1.27	2	58			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36.53	17490	New Culvert 36.53	Overland flow path	No	Circular	0.75	0.75	0.00	0.88	2	51			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36.52	17800	New Culvert 36.52	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	48			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.51	18020	New Culvert 36.51	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	127			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.40	18520	New Culvert 36.4	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	96			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.30	18690	New Culvert 36.3	Overland flow path	No	Circular	0.75	0.75	0.00	0.88	2	54			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36.20	18890	New Culvert 36.2	Overland flow path	No	Rectangular	3.00	1.00	0.00	3.00	2	48			Screen chamber inlet; bubble up outlet	2	4	Screen inlet
36.10	19260	New Culvert 36.1	Overland flow path	No	Circular	0.90	0.90	0.00	1.27	2	47			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
36	19480	New Culvert 36.	Overland flow path	No	Circular	0.90	0.90	0.00	1.27	2	66			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
35.5	19780	New Culvert 35.5	Overland flow path	No	Circular	0.90	0.90	0.00	0.64	1	51			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
35.3	19990	New Culvert 35.3	Overland flow path	No	Circular	0.60	0.60	0.00	0.28	1	58			Scruffy dome inlet; bubble up outlet	2	2	Scruffy inlet
35.1	20350	New Culvert 35.1	Overland flow path	No	Circular	0.45	0.45	0.00	0.16	1	80			Scruffy dome inlet; bubble up outlet	1	2	Scruffy inlet
34.2	21700	New Culvert 34.2	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	78			Flared wingwalls, 30 to 75 degrees.	2	3	no*
32.1	23690	New Culvert 32.1	Overland flow path	No	Rectangular	3.50	1.00	0.00	3.50	1	72			Flared wingwalls, 30 to 75 degrees.	2	3	no*
28	25790	New Culvert 28.	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	50			Scruffy dome inlet; bubble up outlet	2	3	Scruffy inlet
13	30995	New Culvert 13.	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	87			Flared wingwalls, 30 to 75 degrees.	2	3	no*
12	31160	New Culvert 12.	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	39			Scruffy dome inlet; Square Edge Headwall outlet	2	3	Scruffy inlet
7	32345	New Culvert 7.	Overland flow path	Yes	Rectangular	1.50	1.00	0.25	1.13	1	48			Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
6	32625	New Culvert 6.	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	62			Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
5	32950	New Culvert 5.	Overland flow path	Yes	Rectangular	2.00	1.00	0.25	1.50	1	71			Flared wingwalls, 30 to 75 degrees.	2	3	no*
4	33375	New Culvert 4.	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	49			Flared wingwalls, 30 to 75 degrees.	2	3	no*

CONTINUES ON SHEET 2

GENERAL NOTE
DESIGN SHOWN IS A CONCEPT FOR PURPOSES OF ASSESSING ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT. ALL INFORMATION SHOWN IS SUBJECT TO FURTHER DESIGN AND THE DETAILS MAY CHANGE WITHIN THE PARAMETERS OF ANY RMA APPROVALS. AREAS AND MEASUREMENTS SUBJECT TO SURVEY.

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D ISSUED FOR RMA CONSENT C ISSUED FOR CONSENT - DRAFT B ISSUED FOR CONSENT - DRAFT A ISSUED FOR DBC REV REVISIONS	SS	AC	JP	19.08.22	SURVEYED	-	-
	SS	AC	JP	20.04.22	DESIGNED	Andrew Craig	18.06.21
	SS	AC	JP	09.12.21	DRAWN	Gavin Smit	18.06.21
	SS	NK	JP	18.06.21	CAD REVIEW	Steve Sutton	18.06.21
	DRN	CHK	APP	DATE	DESIGN CHECK	Nick Keenan	14.04.22
					DESIGN REVIEW	Andrew Craig	15.04.22
					APPROVED	Jamie Povall	19.08.22
					PROF REGISTRATION:		

Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

CATCHMENT CULVERT, SWALE AND POND/WETLAND SCHEDULE
SHEET 1

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	NTS
Drawing No.	310203848-01-300-C3000
Rev.	D

Summary of Proposed Watercourse Crossings - Concept Design																	
O2NL Flowpath ID	O2NL Chainage (m)	Name	Flowpath definition	Fish passage required	Shape	Total flow width (m)	Total height (m) incl embed	Embed height (m)	Total area open (m2)	Barrels	Culvert Length approx (m)	Culvert slope	Flowpath slope existing	Culvert Inlet/Outlet Type	Inlet apron length (m) included in total length	Outlet apron length (m) included in total length	Upstream debris arrester / screen (*tbc detail design)
Culverts (overland flow path, offline)																	
42.rd	11050 offline	New Culvert 42.rd	Overland flow path	Yes	Circular	0.45	0.45	0.00	0.13	1	16			Square Edge Headwall.	1	2	no*
42.1a	10900 offline	New Culvert 42.1a	Overland flow path	No	Circular	0.45	0.45	0.00	0.16	1	45			Square Edge Headwall.	1	2	no*
39.su	13150 offline	New Culvert 39.su	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	22			Square Edge Headwall.	1	2	no*
39.rd	13200 offline	New Culvert 39.rd	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	27			Flared wingwalls, 30 to 75 degrees.	2	3	no*
36.6r	16100 offline	New Culvert 36.6r	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	34			Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
36.4a	18550 offline	New Culvert 36.4a	Overland flow path	No	Rectangular	2.00	1.00	0.00	2.00	1	18			Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
36.3a	18650 offline	New Culvert 36.3a	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	18			Square Edge Headwall.	2	3	Screen inlet
36.2a	18900 offline	New Culvert 36.2a	Overland flow path	No	Rectangular	3.00	1.00	0.00	3.00	1	19			Flared wingwalls, 30 to 75 degrees.	2	3	Screen inlet
36.1a	19250 offline	New Culvert 36.1a	Overland flow path	No	Circular	0.90	0.90	0.00	0.64	1	17			Square Edge Headwall.	2	3	Screen inlet
35.5r	19600 offline	New Culvert 35.5r	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	22			Square Edge Headwall.	1	2	no*
34.2a	21650 offline	New Culvert 34.2a	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	9			Flared wingwalls, 30 to 75 degrees.	2	3	no*
34.1b	21600 offline	New Culvert 34.1b	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	22			Flared wingwalls, 30 to 75 degrees.	2	3	no*
34.1a	21650 offline	New Culvert 34.1a	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	1	82			Flared wingwalls, 30 to 75 degrees.	2	3	no*
25.su	27450 offline	New Culvert 25.su	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	15			Square Edge Headwall.	1	2	no*
25.rd	27100 offline	New Culvert 25.rd	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	26			Square Edge Headwall.	1	2	no*
19.r2	28900 offline	New Culvert 19.r2	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	7			Square Edge Headwall.	1	2	no*
13.rd	31010 offline	New Culvert 13.rd	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	6			Square Edge Headwall.	2	3	no*
12.sd	31150 offline	New Culvert 12.sd	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	17			Square Edge Headwall.	1	2	no*
8.rd	32130 offline	New Culvert 8.rd	Overland flow path	No	Circular	0.45	0.45	0.00	0.16	1	6			Square Edge Headwall.	1	2	no*
7.rd	32330 offline	New Culvert 7.rd	Overland flow path	No	Circular	0.75	0.75	0.00	0.44	1	6			Square Edge Headwall.	2	3	no*
5.ru	32900 offline	New Culvert 5.ru	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	6			Square Edge Headwall.	1	2	no*
5.rd	32940 offline	New Culvert 5.rd	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	7			Square Edge Headwall.	1	2	no*
5.r2	32950 offline	New Culvert 5.r2	Overland flow path	No	Rectangular	1.50	1.00	0.00	1.50	2	6			Flared wingwalls, 30 to 75 degrees.	2	3	no*
1.rd	34000 offline	New Culvert 1.rd	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	9			Square Edge Headwall.	1	2	no*
0.rd	34350 offline	New Culvert 0.rd	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	7			Square Edge Headwall.	1	2	no*
0.r2	34700 offline	New Culvert 0.r2	Overland flow path	No	Circular	0.38	0.38	0.00	0.11	1	24			Square Edge Headwall.	1	2	no*

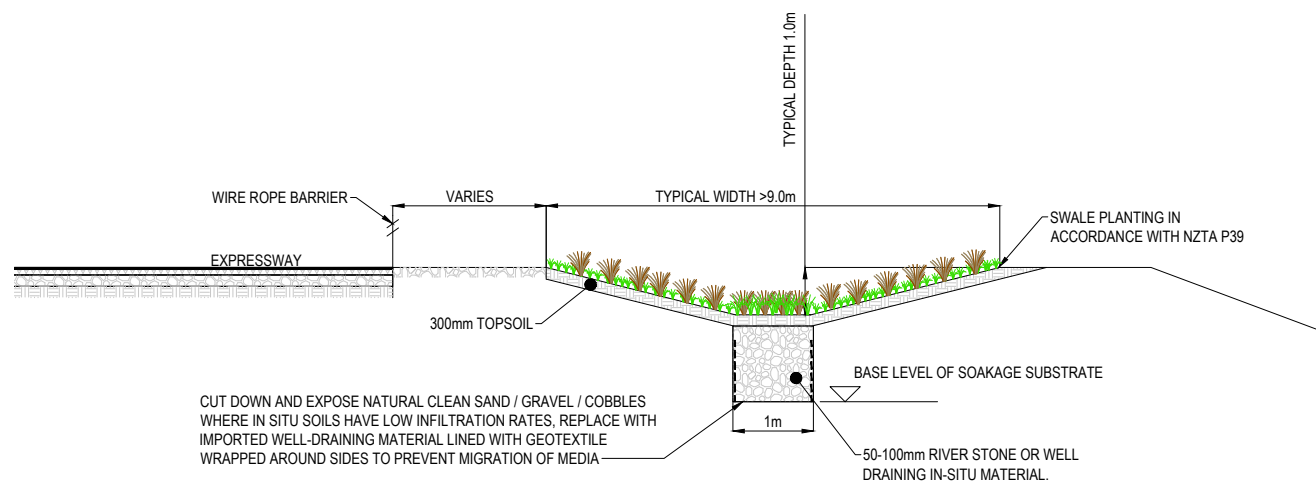
Forebay, Wetland and Pond Facilities												Soakage Facilities		
Pond Facility ID	Road Chainage (m)	Project Footprint Catchment (ha)	Design volume (m3)			Design					Discharge into Stream Name	Ground Soakage Dimensions (LxWxH = Volume) (m) and (m3)	Ground Soakage Area (m2)	
			Forebay (m3)	Wetland (m3)	Attenuation Basin (m3)	"Forebay (ave. 1.5m depth)" Area (m2)	"Wetland (ave. 0.5m depth)" Area (m2)	"Attenuation Basin (max 1.5m depth)" Area (m2)		Depth (m)				Outlet Throttle DN (mm)
1	10,500	3.08	300	500	2,300	300	1,100	2,300	1.0	50	3,700	Koputaroa		
2	11,200	3.30	300	500	2,300	350	1,200	2,600	1.1	50	4,150	Koputaroa		
3	12,350	9.00	700	1,300	3,000	600	2,300	5,000	1.4	100	7,900	Koputaroa		
4	13,300	13.72	1,200	2,900	5,500	800	6,300	8,400	1.1	100	15,500	Koputaroa		
5	15,500	5.16	400	900	2,700	400	2,100	3,200	1.4	70	5,700		60x60x1.5 = 5,400	3,600
6	16,100	3.83	300	600	2,400	250	1,200	2,700	1.1	50	4,150	100% ground soakage facility within Lake Horowhenua catchment	60x60x1.5 = 5,400	3,600
7	16,700	6.68	500	1,100	3,200	500	2,500	4,300	1.2	70	7,300		75x75x1.5 = 8,100	5,625
8	17,600	5.05	400	900	2,700	400	2,100	3,200	1.4	70	5,700		80x80x1.5 = 9,600	6,400
9	18,700	28.83	2,600	5,700	8,900	2,000	12,100	14,000	1.2	135	28,100		105x105x1.5 = 11,100	16,650
10	22,300	11.05	900	1,800	5,000	750	3,400	5,300	1.5	90	9,450	Ohau River		
11	23,600	6.73	500	1,100	3,200	500	2,500	4,300	1.2	70	7,300	Kuku Stream		
12	23,900	10.80	800	1,700	4,800	750	3,200	4,900	1.5	102	8,850	Kuku Stream		
13	26,150	3.16	300	500	2,400	250	1,200	2,600	1.2	48	4,050	Waikawa Stream		
14	28,200	10.26	750	1,600	4,200	750	3,200	4,800	1.5	100	8,750	Manakau Stream		
15	29,600	5.50	400	900	2,700	400	2,100	3,300	1.4	70	5,800	Manakau Stream		
16	30,400	2.76	300	500	2,400	250	1,200	2,500	0.9	50	3,950	Waitohu Stream		
17	32,300	10.22	750	1,500	4,200	700	3,200	4,800	1.5	95	8,700	Waitohu Stream		
18	34,000	3.08	300	500	2,300	300	1,200	2,300	1.4	45	3,800	Waitohu Stream		
19	34,100	2.96	300	500	2,400	350	1,350	2,600	0.9	50	4,300	Waitohu Stream		

Swale-to-Swale Cross Culverts				
Culvert ID	Chainage	Type	Size (DN)	Length (m)
CCVT1	10500	RCRRJ	450	58
CCVT2	11600	RCRRJ	375	35
CCVT3	13400	RCRRJ	1050	80
CCVT4	14150	RCRRJ	675	35
CCVT5	15500	RCRRJ	450	35
CCVT6	16050	RCRRJ	450	35
CCVT7	16775	RCRRJ	525	35
CCVT8	17725	RCRRJ	525	35
CCVT9	18625	RCRRJ	375	30
CCVT10	18650	RCRRJ	375	40
CCVT11	18675	RCRRJ	525	45
CCVT12	22275	RCRRJ	675	55
CCVT13	23600	RCRRJ	675	35
CCVT14	23875	RCRRJ	675	110
CCVT15	26150	RCRRJ	525	80
CCVT16	27525	RCRRJ	675	40
CCVT17	28125	RCRRJ	450	75
CCVT18	29600	RCRRJ	675	60
CCVT19	32400	RCRRJ	675	60
CCVT20	34000	RCRRJ	675	70

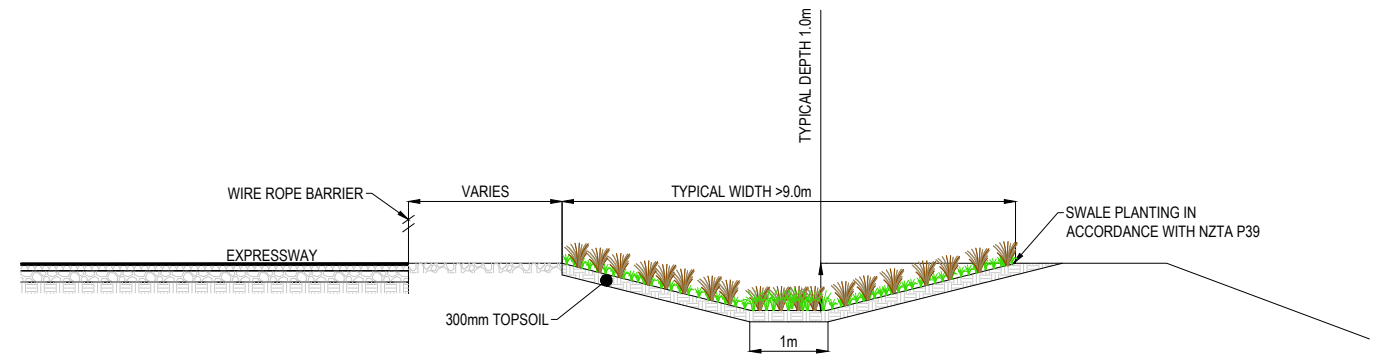
GENERAL NOTE
 DESIGN SHOWN IS A CONCEPT FOR PURPOSES OF ASSESSING ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT. ALL INFORMATION SHOWN IS SUBJECT TO FURTHER DESIGN AND THE DETAILS MAY CHANGE WITHIN THE PARAMETERS OF ANY RMA APPROVALS. AREAS AND MEASUREMENTS SUBJECT TO SURVEY.

NOT FOR CONSTRUCTION

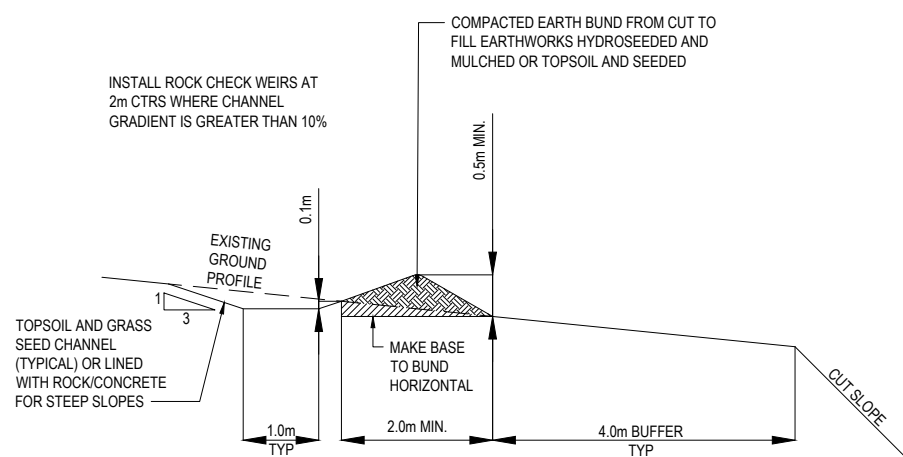
A REV	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22	SURVEYED DESIGNED Andrew Craig 18.06.21 DRAWN Steve Sutton 18.06.21 CAD REVIEW Steve Sutton 18.06.21 DESIGN CHECK Nick Keenan 14.04.22 DESIGN REVIEW Andrew Craig 15.04.22 APPROVED Jamie Povall 19.08.22 PROF REGISTRATION:	 	Client: WAKA KOTAHI OTAKI TO NORTH OF LEVIN PROJECT CATCHMENT CULVERT, SWALE AND POND/WETLAND SCHEDULE SHEET 2	Status Stamp FOR CONSENT Date Stamp 19.08.22 Scale: NTS Drawing No. 310203848-01-300-C3001	Rev. A
		REVISIONS	DRN	CHK	APP					



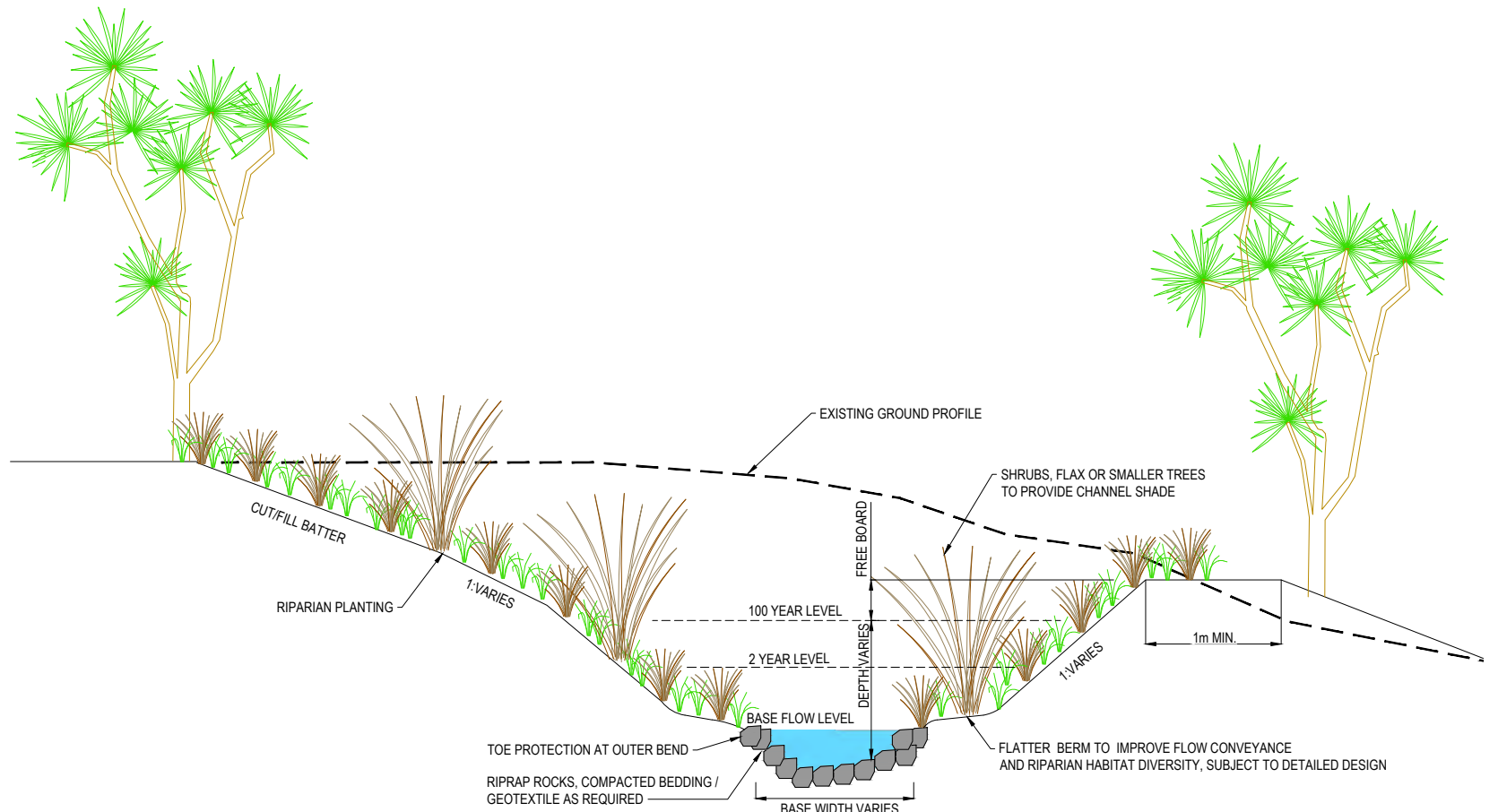
TYPICAL VEGETATED SWALE DETAIL WITH INFILTRATION
SCALE 1 : 200



TYPICAL VEGETATED SWALE DETAIL
SCALE 1 : 200



TYPICAL CLEANWATER DIVERSION CHANNEL AND EARTH BUND
SCALE 1 : 100



OPEN CHANNEL / STREAM DIVERSION TYPICAL CROSS SECTION FOR EXTENSION/DIVERSION OF NATURAL STREAMS
SCALE 1 : 50

NOT FOR CONSTRUCTION

REV	ISSUED FOR	SS	AC	JP	DATE	DRN	CHK	APP	DATE
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22				
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22				
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21				
A	ISSUED FOR DBC	SS	AC	JP	18.06.21				

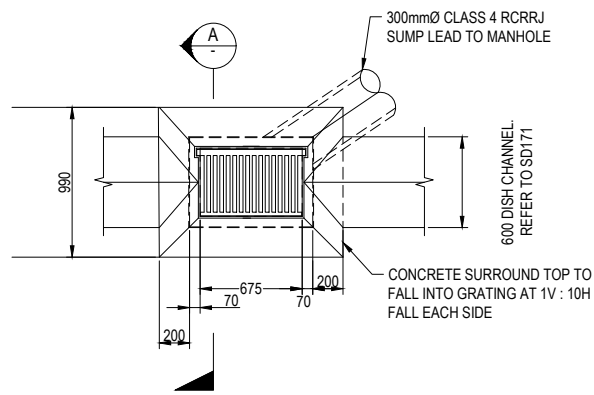
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Reid Hermansen	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall



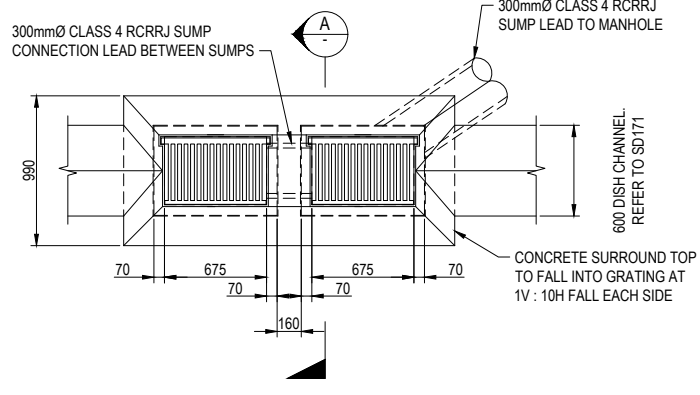
Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
SWALES AND OPEN CHANNELS

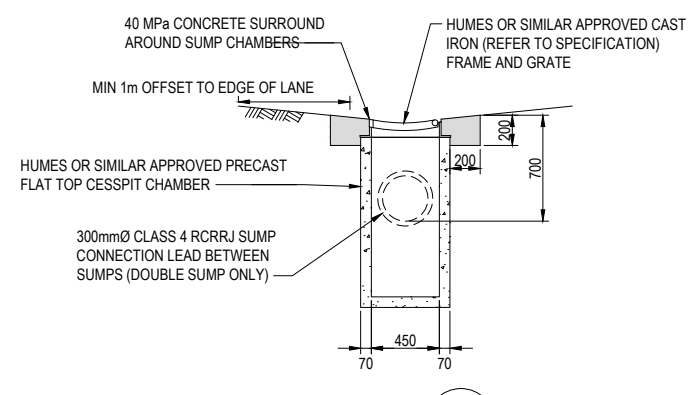
Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	AS SHOWN (A3)
Drawing No.	310203848-01-300-C9100
Rev.	D



SINGLE
SCALE 1 : 25



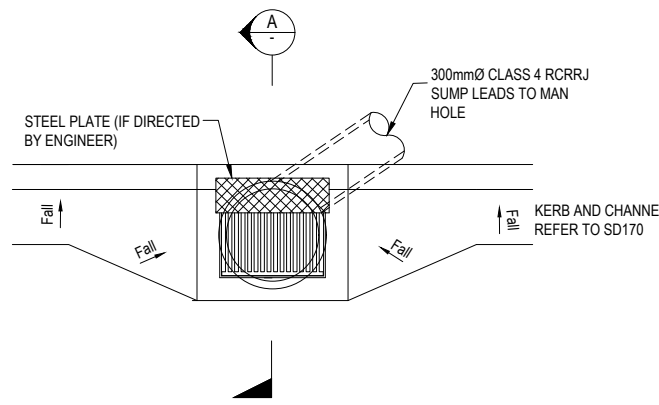
DOUBLE
SCALE 1 : 25



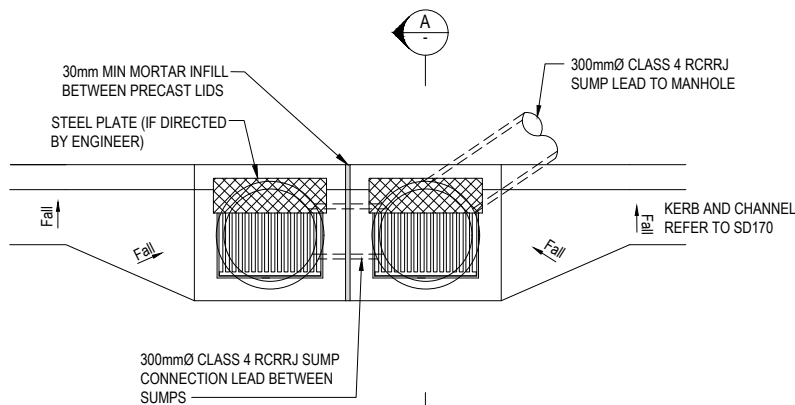
SECTION A
SCALE 1 : 25

TYPICAL YARD SUMP
SCALE 1 : 25

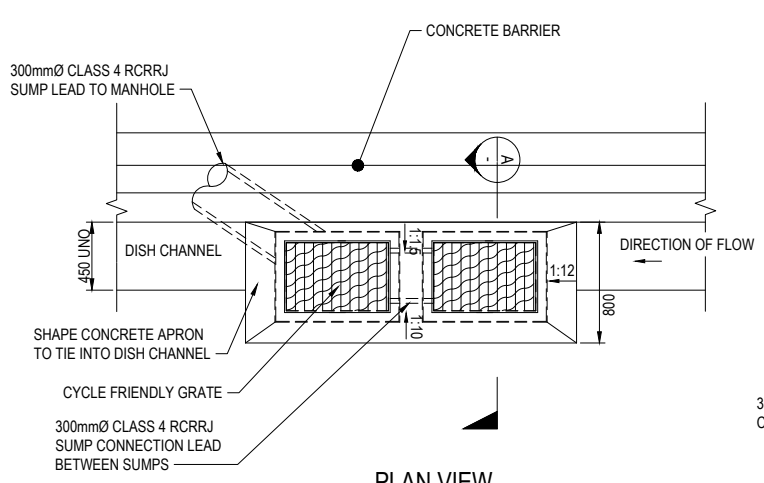
NOTES
1. SUMPS AS PER LOCAL AUTHORITY STANDARDS



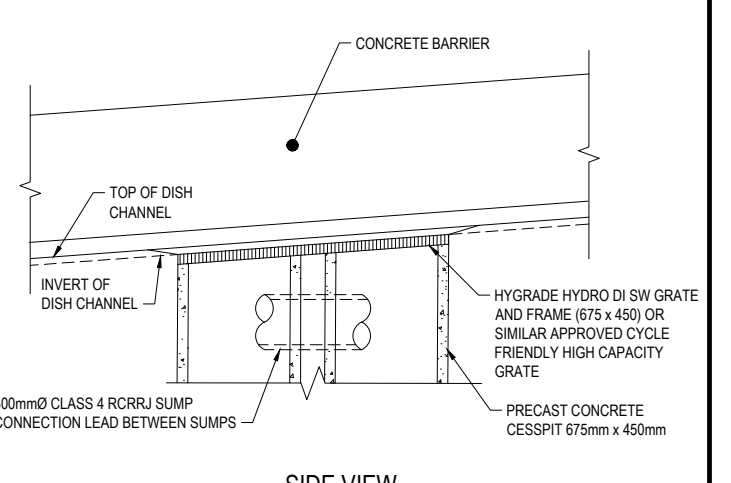
TYPICAL SINGLE BACK ENTRY SUMP
SCALE 1 : 25



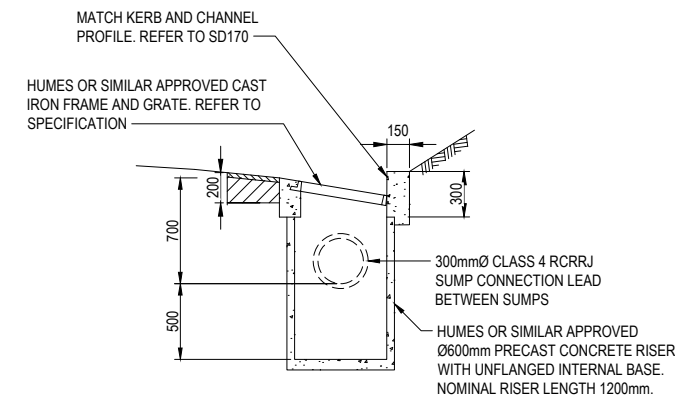
TYPICAL DOUBLE BACK ENTRY SUMP
SCALE 1 : 25



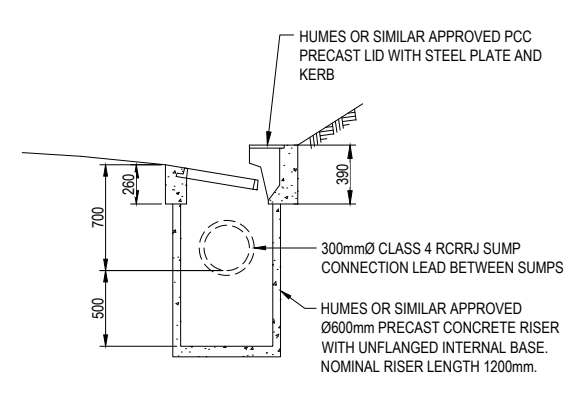
PLAN VIEW
SCALE 1 : 25



SIDE VIEW
SCALE 1 : 25

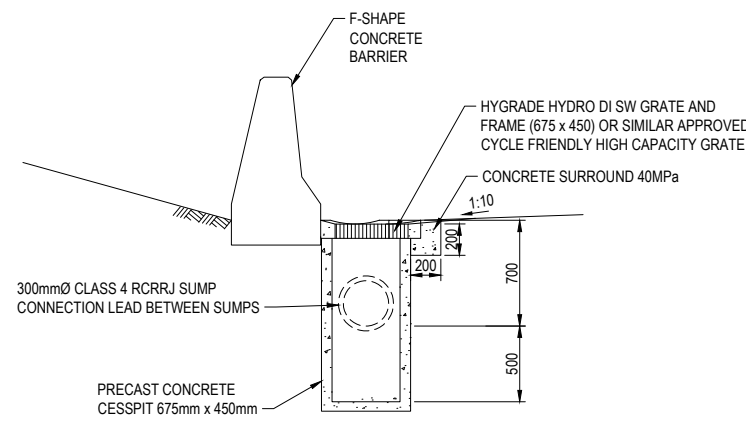


SECTION WITHOUT BACK ENTRY
SECTION A
SCALE 1 : 25



SECTION WITH BACK ENTRY
SECTION A
SCALE 1 : 25

TYPICAL ENTRY SUMPS



SECTION A
SCALE 1 : 25

YARD SUMP ADJACENT TO CONCRETE BARRIER
SCALE 1 : 25

NOT FOR CONSTRUCTION

REV	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
A	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21

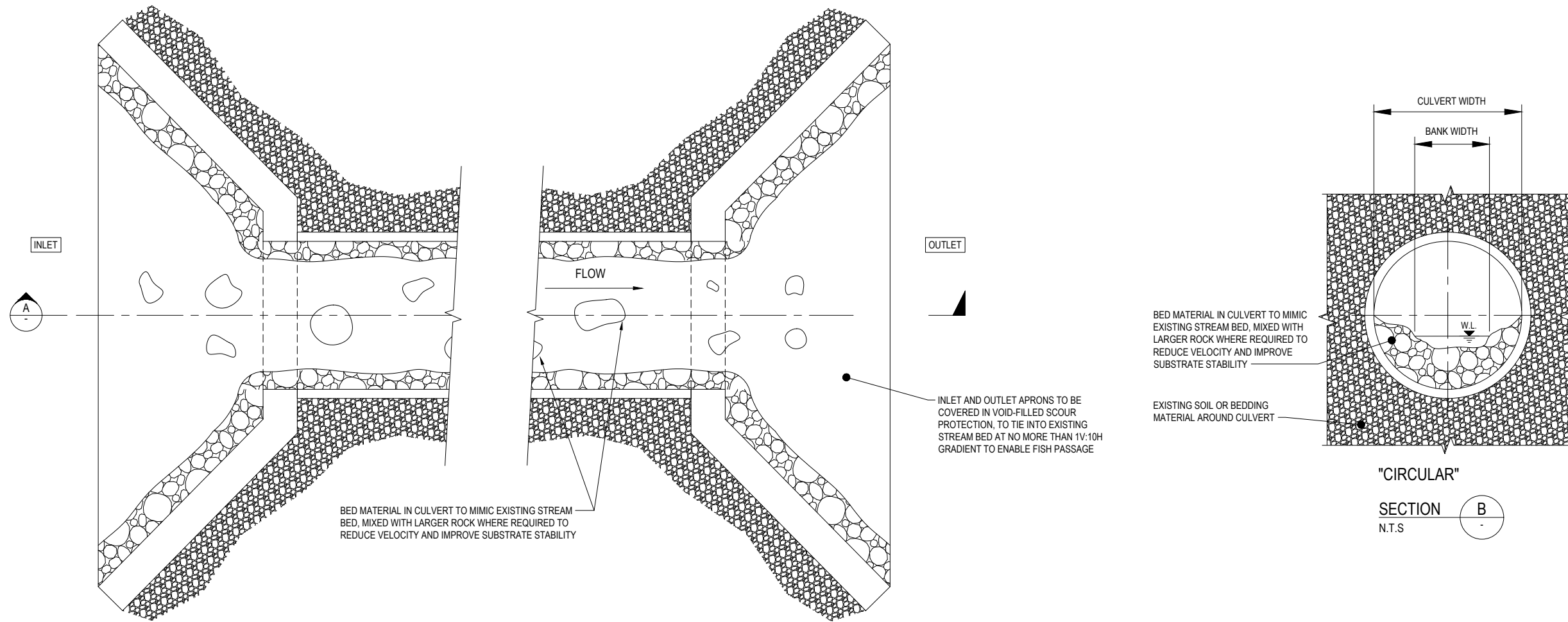
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Georgia Mkiandia	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.11.21	18.11.21	09.12.21	14.04.22	15.04.22	19.08.22



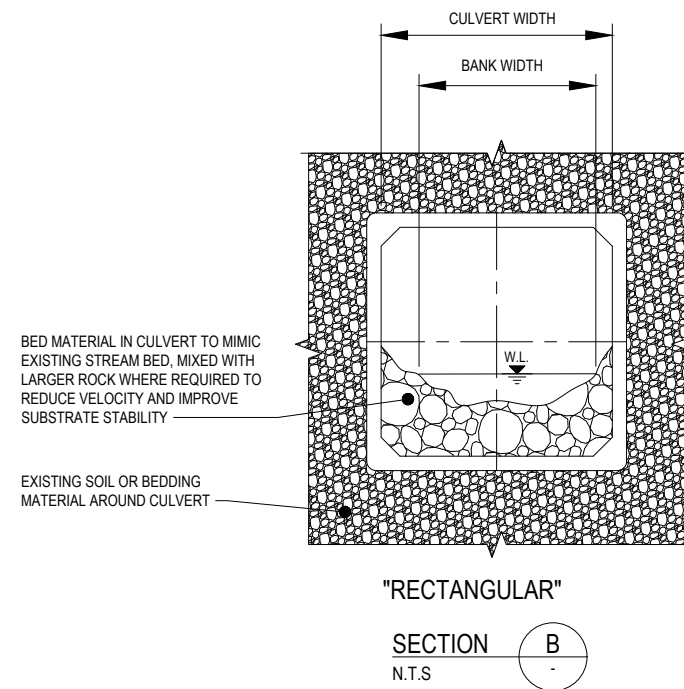
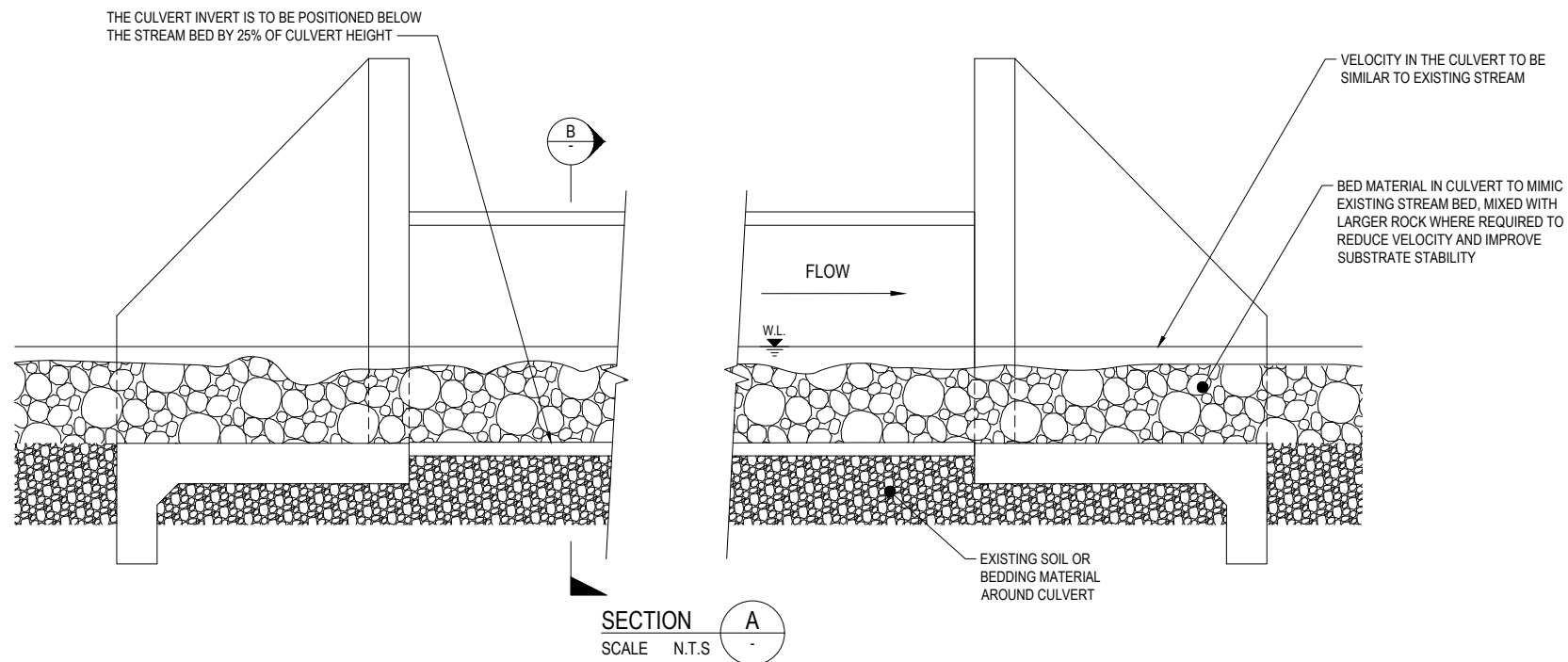
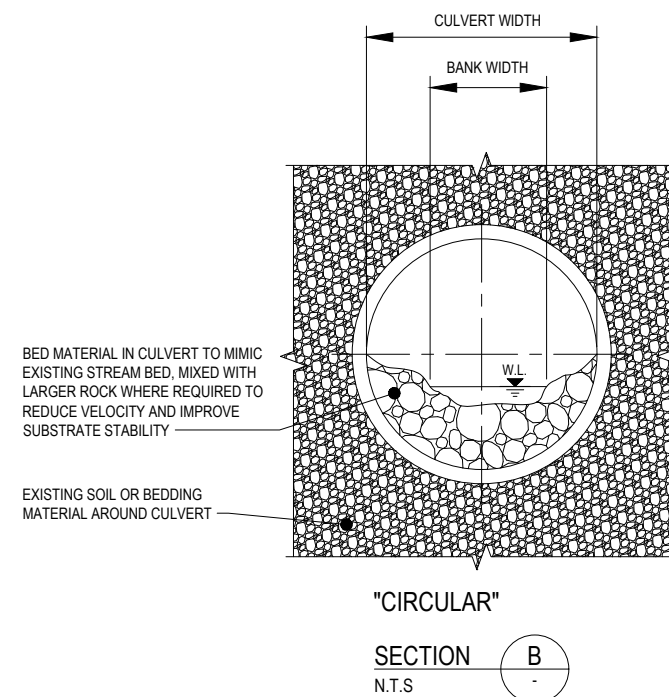
WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
SUMP DETAILS

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	AS SHOWN (A3)
Drawing No.	310203848-01-300-C9230
Rev.	C



CULVERT FISH PASSAGE TYPICAL DETAILS - PLAN
N.T.S



NOT FOR CONSTRUCTION

REV	DESCRIPTION	DRN	CHK	APP	DATE
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

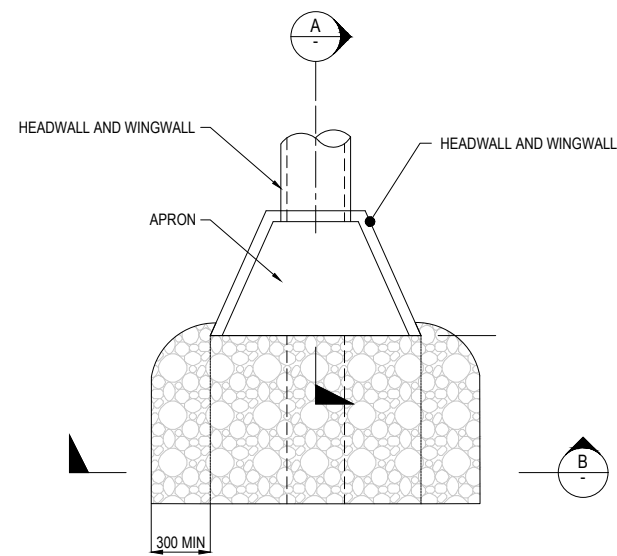
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Reid Hermansen	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall



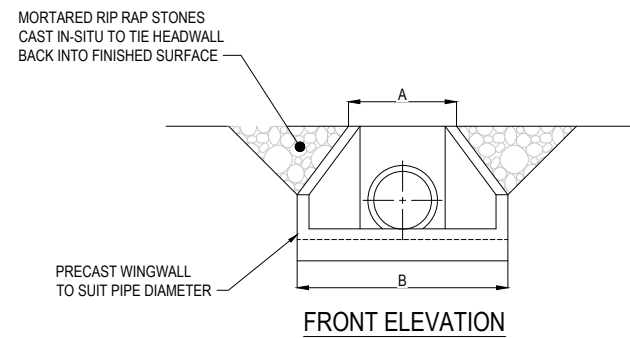
Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
CULVERTS FISH PASSAGE

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	AS SHOWN (A3)
Drawing No.	310203848-01-300-C9300
Rev.	D

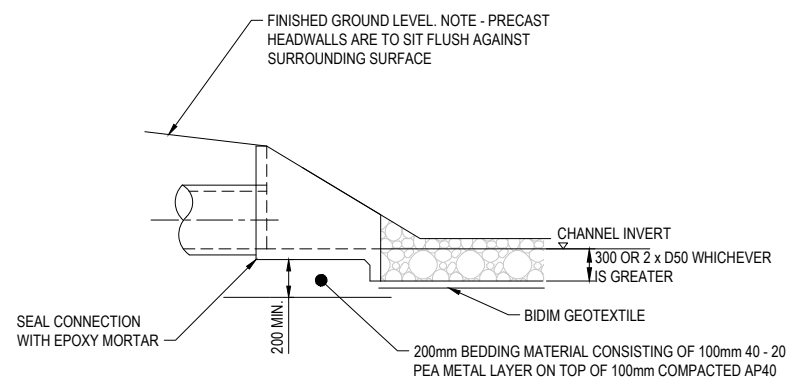


PLAN

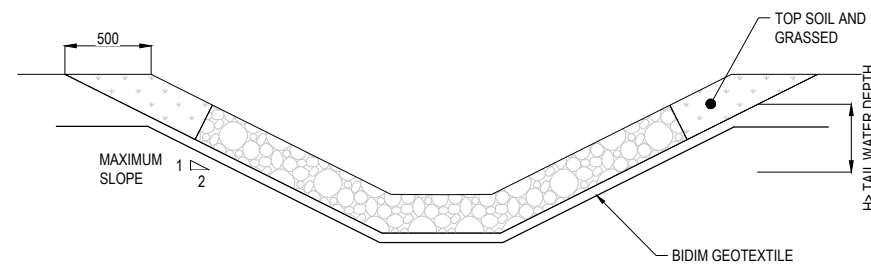


FRONT ELEVATION

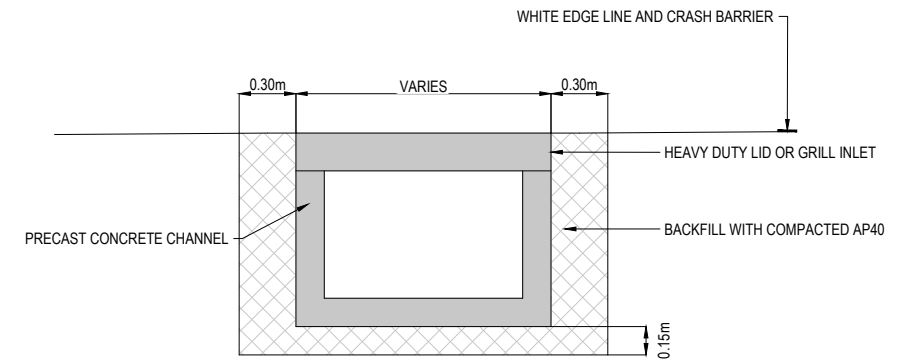
TYPICAL INLET/OUTLET WINGWALL STRUCTURE WITH RIPRAP DETAIL



SECTION A

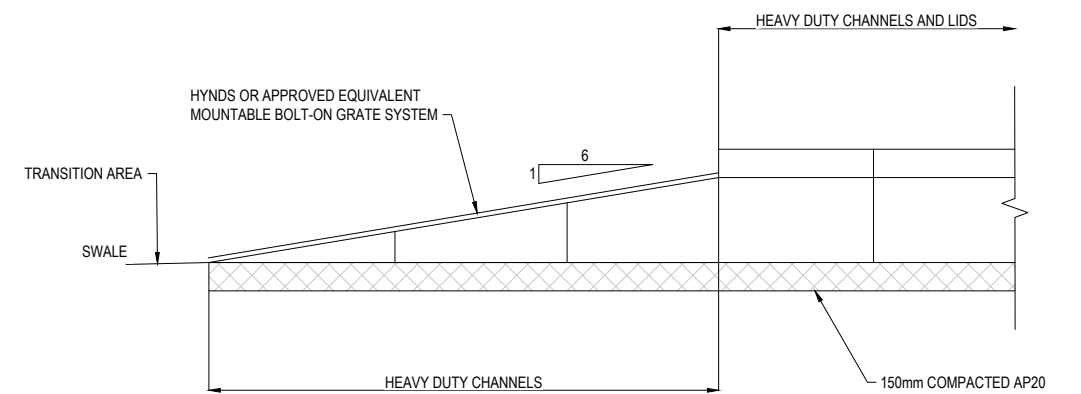


SECTION B



CONCRETE BOX DRAIN (CONVEYANCE CHANNEL)

SCALE 1 : 40



TYPICAL BOX DRAIN TRANSITION DETAIL

SCALE 1 : 40

NOT FOR CONSTRUCTION

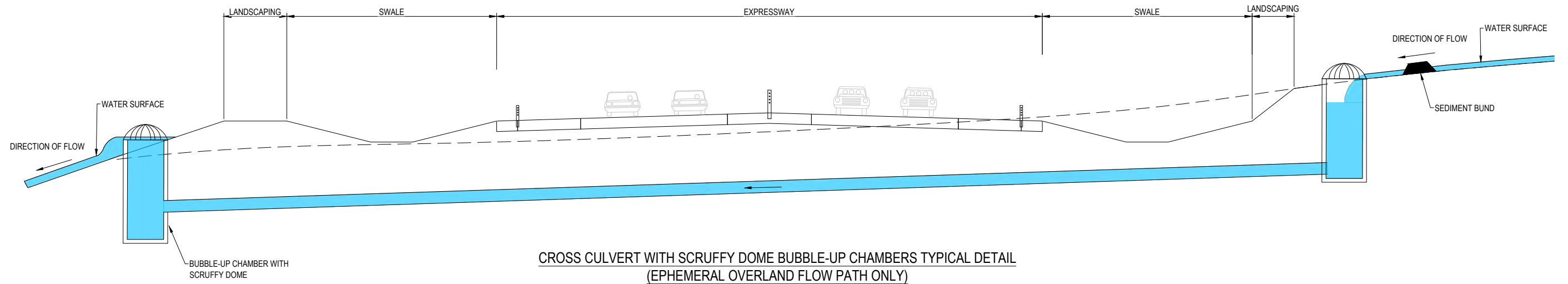
REV	REVISIONS	DRN	CHK	APP	DATE
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

STATUS	NAME	DATE
SURVEYED	-	-
DESIGNED	Nolan Naidoo	18.06.21
DRAWN	Reid Hermansen	18.06.21
CAD REVIEW	Steve Sutton	18.06.21
DESIGN CHECK	Nick Keenan	14.04.22
DESIGN REVIEW	Andrew Craig	15.04.22
APPROVED	Jamie Povall	19.08.22



Client:
WAKA KOTAHI
 OTAKI TO NORTH OF LEVIN PROJECT
 TYPICAL DETAILS
 ENERGY DISSIPATION

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	AS SHOWN (A3)
Drawing No.	310203848-01-300-C9310
Rev.	D



CROSS CULVERT WITH SCRUFFY DOME BUBBLE-UP CHAMBERS TYPICAL DETAIL
(EPHEMERAL OVERLAND FLOW PATH ONLY)

NOT FOR CONSTRUCTION

REV	REVISIONS	DRN	CHK	APP	DATE
D	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22
C	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21
A	ISSUED FOR DBC	SS	AC	JP	18.06.21

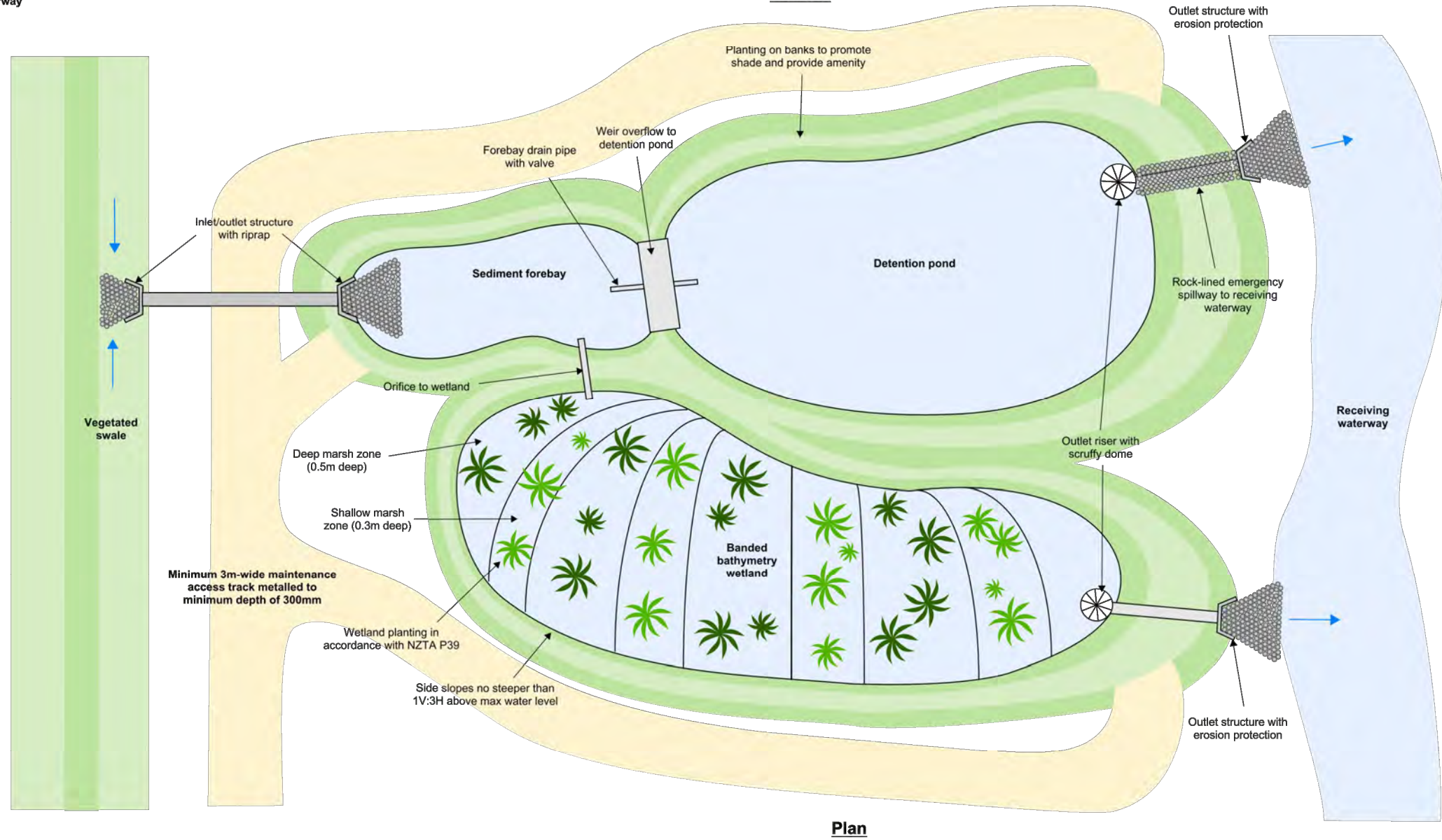
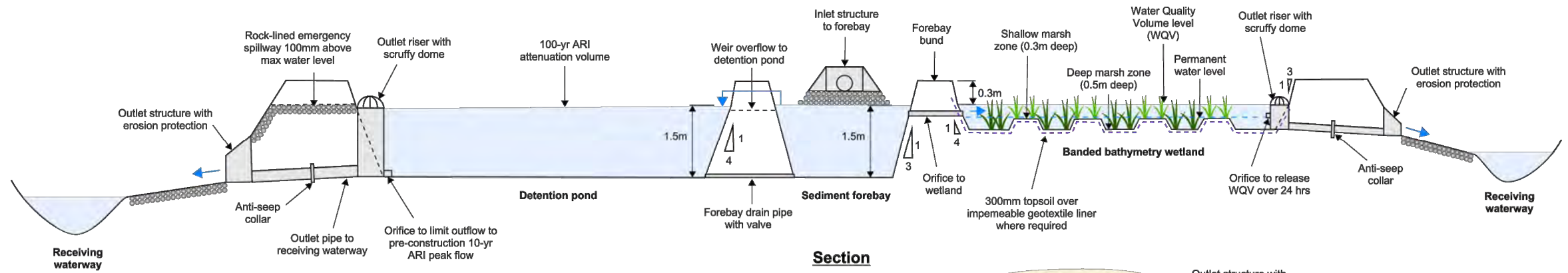
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
	Nolan Naidoo	Reid Hermansen	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	19.08.22



Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
CULVERT WITH BUBBLE-UP

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	1 : 200 (A3)
Drawing No.	310203848-01-300-C9400
Rev.	D



Typical forebay-wetland-pond arrangement to receiving waterway arrangement

(NOT TO SCALE)

NOT FOR CONSTRUCTION

REV	ISSUED FOR	DATE	DRN	CHK	APP
D	ISSUED FOR RMA CONSENT	19.08.22	SS	AC	JP
C	ISSUED FOR CONSENT - DRAFT	20.04.22	SS	AC	JP
B	ISSUED FOR CONSENT - DRAFT	09.12.21	SS	AC	JP
A	ISSUED FOR DBC	18.06.21	SS	AC	JP

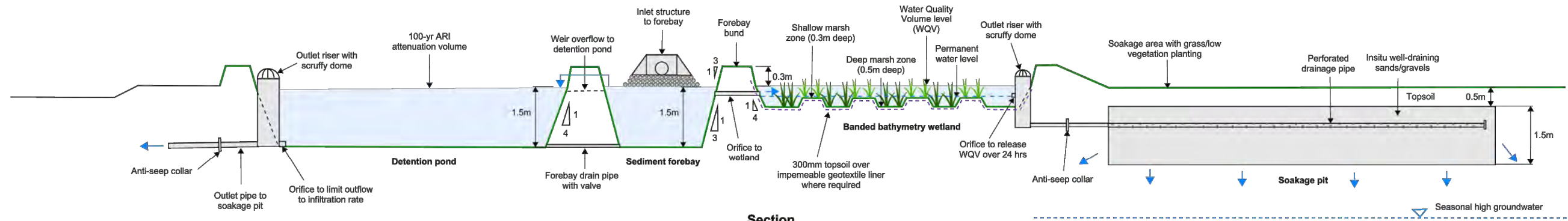
SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED
-	Nolan Naidoo	Reid Hermansen	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall
-	18.06.21	18.06.21	18.06.21	14.04.22	15.04.22	19.08.22



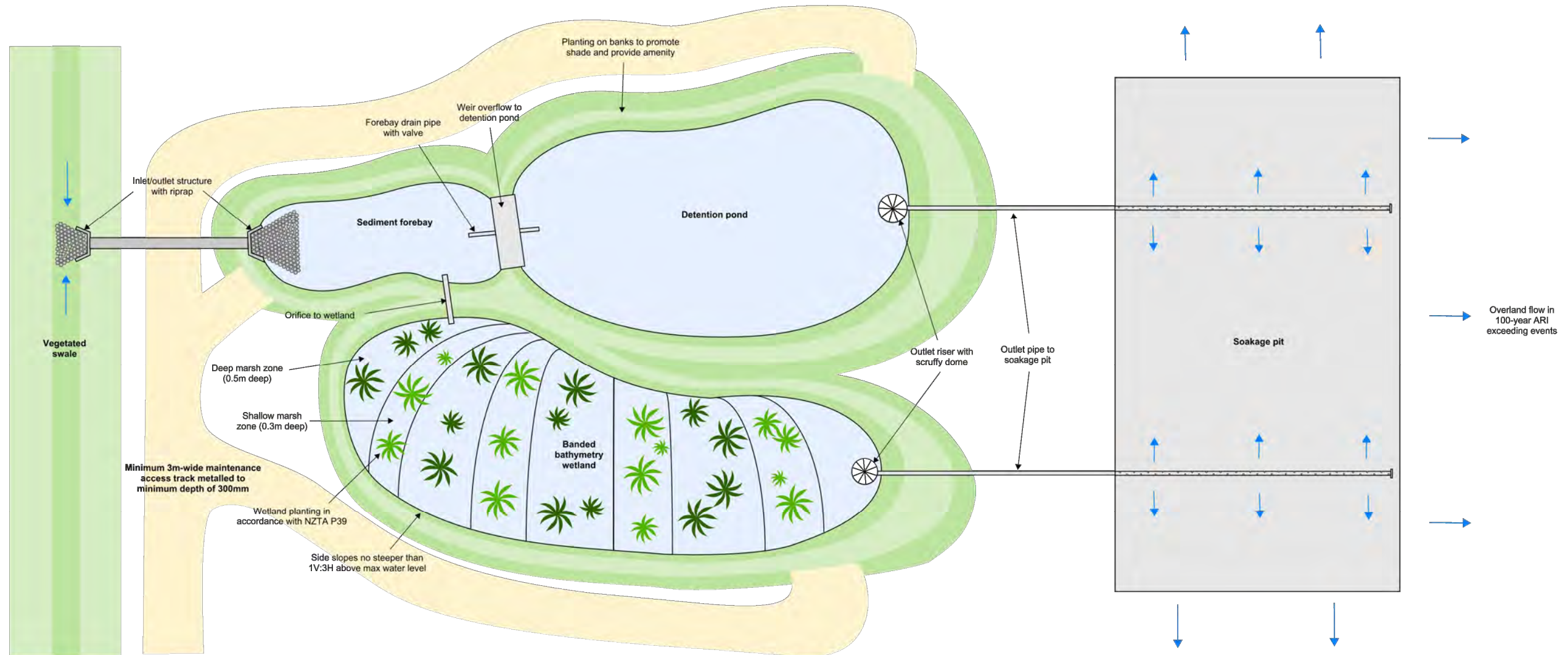
Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
POND/WETLAND TO WATERWAY ARRANGEMENT

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	NTS
Drawing No.	310203848-01-300-C9600
Rev.	D



Section



Plan

Typical forebay-wetland-pond to soakage arrangement

(NOT TO SCALE)

NOT FOR CONSTRUCTION

REV	ISSUED FOR RMA CONSENT	SS	AC	JP	DATE	REVISIONS
C	ISSUED FOR RMA CONSENT	SS	AC	JP	19.08.22	
B	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	20.04.22	
A	ISSUED FOR CONSENT - DRAFT	SS	AC	JP	09.12.21	

SURVEYED	DESIGNED	DRAWN	CAD REVIEW	DESIGN CHECK	DESIGN REVIEW	APPROVED	PROF REGISTRATION
-	Nolan Naidoo	Georgia Mkandia	Steve Sutton	Nick Keenan	Andrew Craig	Jamie Povall	
					15.04.22	19.08.22	



Client: WAKA KOTAHI
OTAKI TO NORTH OF LEVIN PROJECT

TYPICAL DETAILS
POND/WETLAND TO SOAKAGE ARRANGEMENT

Status Stamp	FOR CONSENT
Date Stamp	19.08.22
Scale	NTS
Drawing No.	310203848-01-300-C9601
Rev.	C