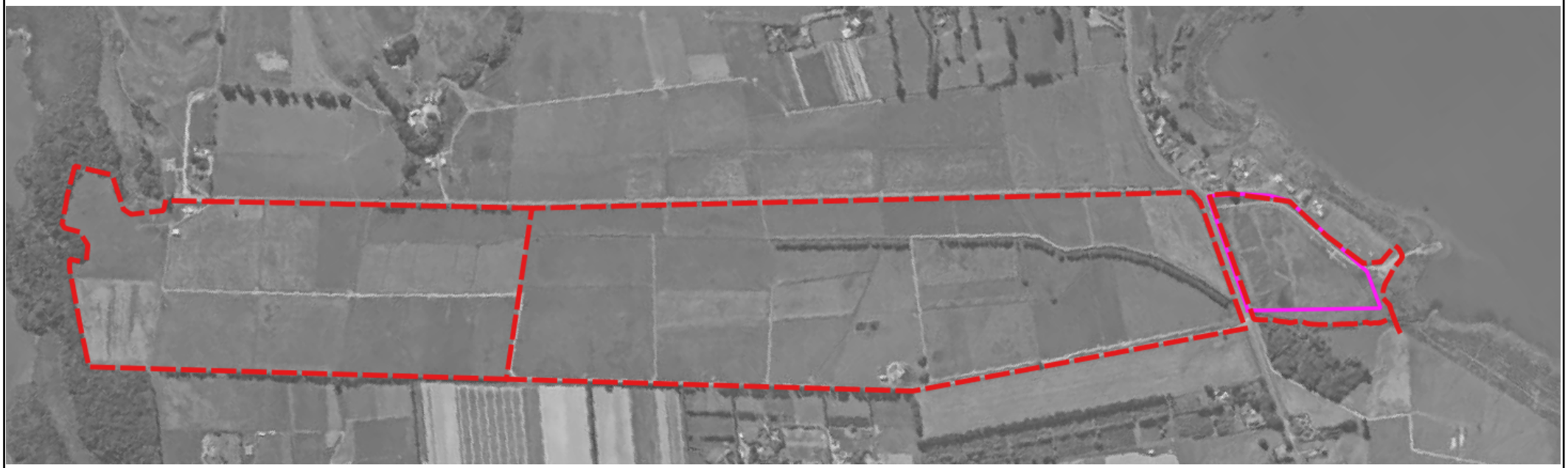
ARAWHATA WETLAND DESIGN DRAWINGS

19 JULY 2023



DRAWING SCHEDULE	
SHEET NUMBER	DESCRIPTION
1	COVER SHEET AND DRAWING SCHEDULE
2	EXISTING SITE PLAN AND NATURAL WETLAND AREAS
3	CONSTRUCTION PHASE 1 PLAN
4	CONSTRUCTION PHASE 2 PLAN
5	WETLAND OUTLET ROCK WEIR PLAN
6	WETLAND OUTLET ROCK WEIR DETAILS
7	KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL PLAN
8	KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL DETAILS
9	KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL CROSS-OVER SECTION
10	STREAM CHANNEL/WETLAND BUND CHANNEL CROSS-SECTIONS
11	ROAD DRAIN DIVERSION DETAIL - PLAN 1
12	ROAD DRAIN DIVERSION DETAIL - PLAN 2 (ZOOMED)
13	SEDIMENT BASIN PLAN
14	SEDIMENT BASIN DETAILS
15	SACRIFICIAL WETLAND CROSS-SECTION
16	CONTOUR BUND CROSS-SECTION
17	BIOREACTOR PLAN
18	BIOREACTOR DETAILS
19	NATURAL VS CONSTRUCTED WETLANDS AND MAINTENANCE PLAN

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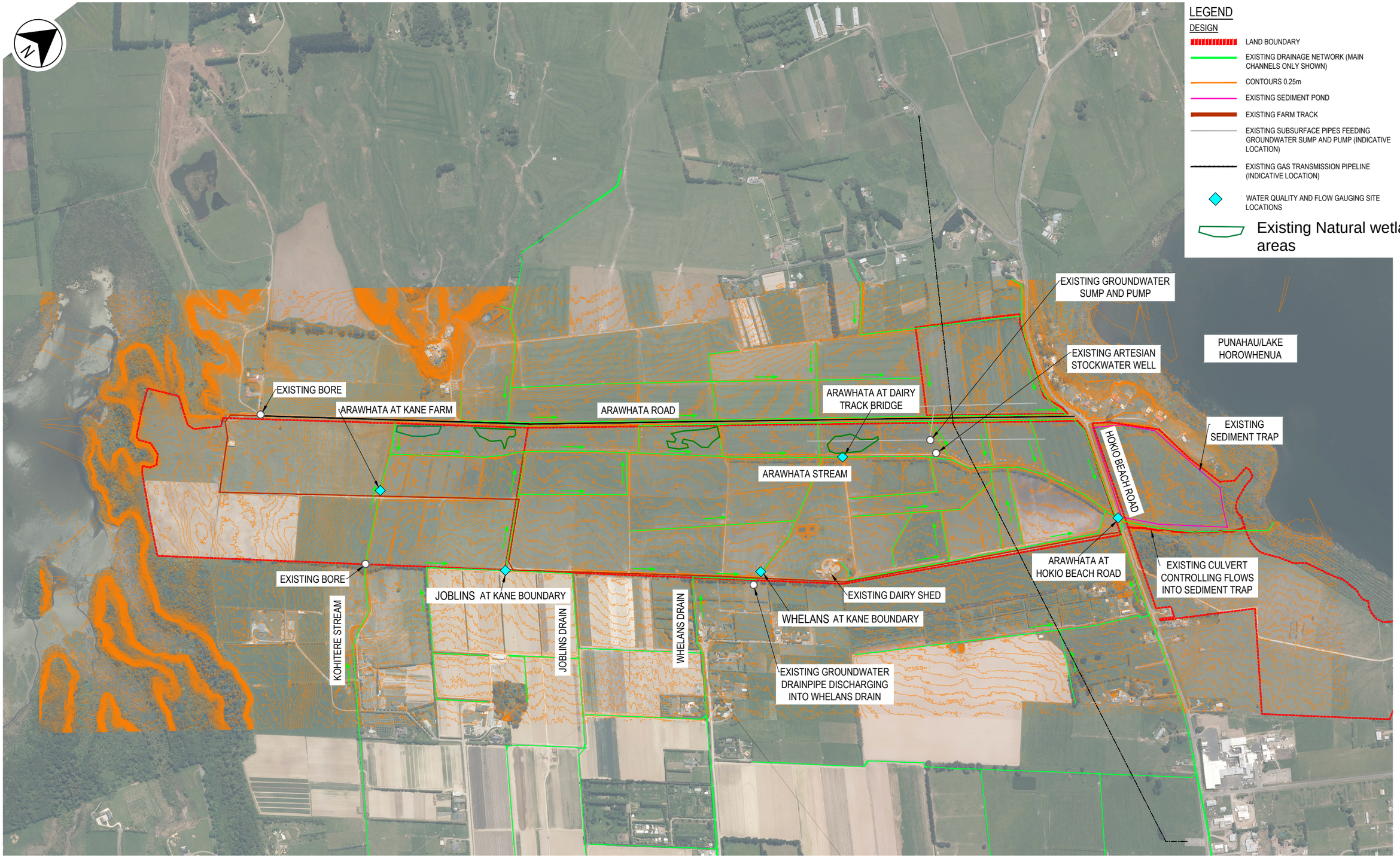

LEGEND

DESIGN

- LAND BOUNDARY
- EXISTING DRAINAGE NETWORK (MAIN CHANNELS ONLY SHOWN)
- CONTOURS 0.25m
- EXISTING SEDIMENT POND
- EXISTING FARM TRACK
- EXISTING SUBSURFACE PIPES FEEDING GROUNDWATER SUMP AND PUMP (INDICATIVE LOCATION)
- EXISTING GAS TRANSMISSION PIPELINE (INDICATIVE LOCATION)
- WATER QUALITY AND FLOW GAUGING SITE LOCATIONS
- Existing Natural wetland areas

DRAFT

PLAN - ARAWHATA WETLAND
SCALE 1:4000

0 50 100 150 200 250m
SCALE 1:5000 (A3)

FOR INFORMATION ONLY

REV	DATE	DRAWN	REV'D	APP'D	REVISION	DRAWING NUMBER	REFERENCE DRAWING TITLE
0	13/03/23	CZ	MM	KS	ISSUE FOR INFORMATION	IA273100-000	EXISTING PLAN

horizons regional council

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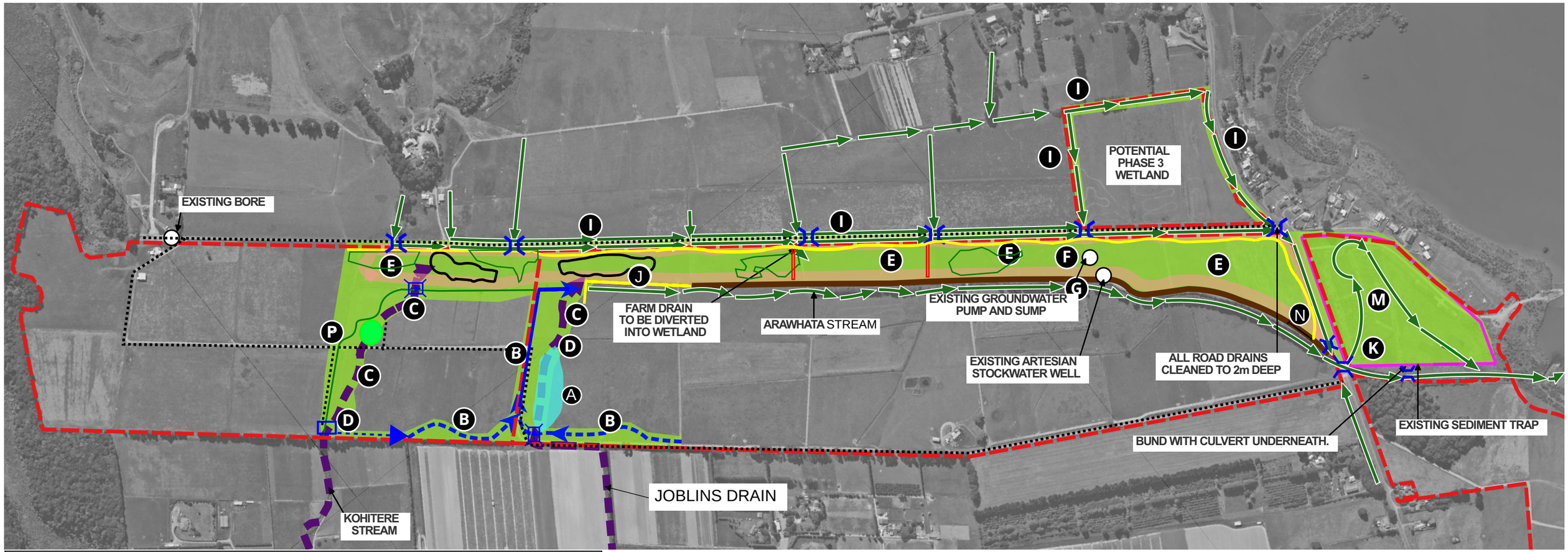
CLIENT: HORIZONS REGIONAL COUNCIL			
PROJECT: ARAWHATA WETLAND PROJECT			
DRAWN: CZ	DRAWING CHECK	REVIEWED / DATE	APPROVED / DATE
DESIGNED	DESIGN REVIEW		

TITLE: HOKIO BEACH ROAD TO LAKE PAPAITONGA EXISTING PLAN

SCALE	DRAWING No	REV
AS SHOWN	IA273100-000	0



Legend

- Land Boundary
- Deeper cut wetland areas
- Proposed outlet weir location
- Proposed Bund
- Existing bund to be increased in height
- Component Label - Phase 1
- Existing/new channel farm drains
- Subsurface perforated drain pipe laid in invert of existing/new drains then drain backfilled with wood chips, bark (Bioreactor)
- Bioreactor treated flow discharge pipe (solid pipe)
- Channel taking flow from drains in vegetable growing area to feed into wetland
- Approximate edge of wetland wetted area
- Sediment Basin

Construction Phases

- Phase 1

- Wetland internal bund (~0.5m high)
- Sacrificial Wetland
- Existing natural wetland areas
- New culvert, arrow indicating flow direction
- Existing culvert to be retained
- Kohitere low flow channel
- Kohitere low flow channel diversion structure
- Wetland maintenance access tracks (existing and proposed)

Phase 1 Components

- Sediment Basin alongside existing Joblins Drain/site boundary (A – see plan for location)
- Installation of perforated pipe in existing Joblins Drain channel (within the site boundary) and drains as well as new drains along the property boundary either side of Joblins Drain, backfilled with woodchips/bark/hay for groundwater treatment (Blue dashed arrows). (B)
- Construction of new channels at flatter grade than ground slope such that water can be discharged onto surface of wetlands from Kohitere stream and Joblins Drain. (purple arrows) (C)
- Surface water overflow from sediment trap directed into new channels (purple) under gravity. (D)
- Partial planting through wetland areas. (E)
- Retention of existing groundwater pump + southern well for irrigation (F)(G)
- Plants for phase 1 need to be purchased.
- Cleaning out/deepening farm drains and roadside drains such that groundwater is intercepted. Invert to still be sloped and discharged to either Arawhata Stream or the Phase 1 wetlands. (I)
- Extension of stopbanks along Arawhata Stream west side. (J)
- Sediment trap to be retained as is (M)
- Lower section of wetland perimeter bund for discharging treated flow (outlet weir) (N)
- Kohitere low flow channel/fish passage channel (partial existing location, partial new) (P)

DRAFT

N

NZGD2000
Scale: 1:8500

0 200 400 m

Arawhata Wetland
Diagram 1: Construction Phase 1

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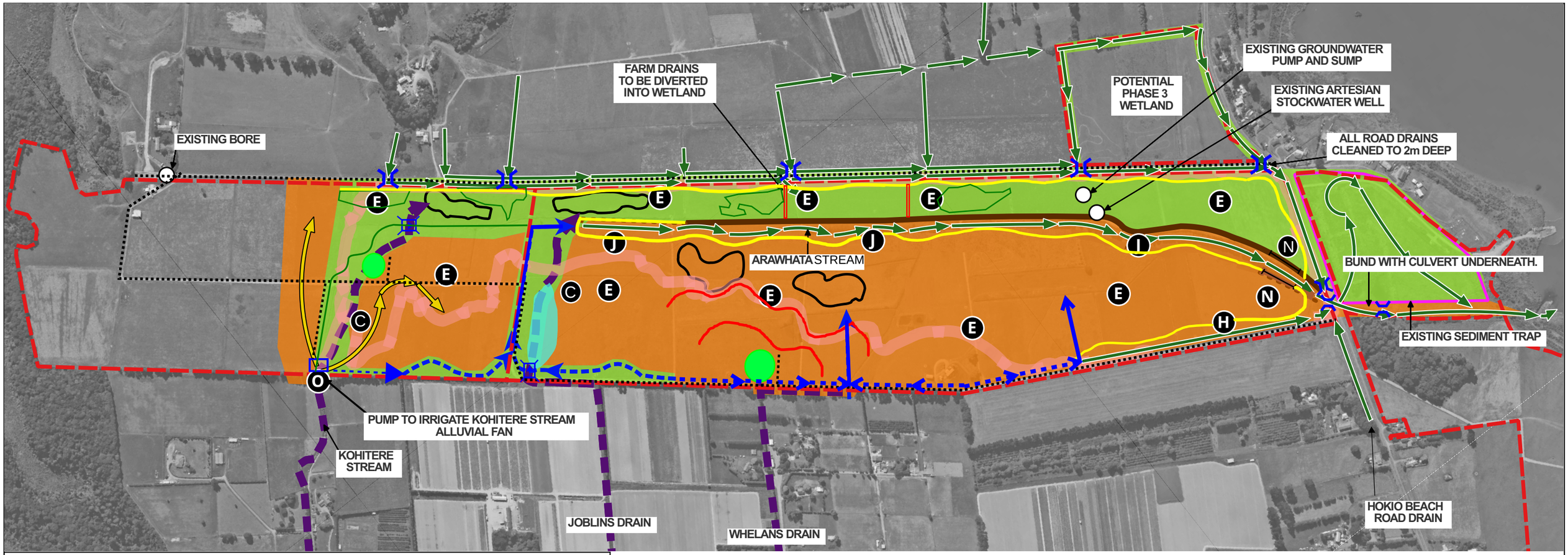

Legend

- Land Boundary
- Deeper cut wetland areas
- Proposed outlet weir location
- Proposed Perimeter Bund
- Existing Bund - Height to be increased
- Proposed outlet weir location
- Component Label - Phase 2
- Surface irrigation perforated pipe to irrigation Kohitere stream alluvial fan
- Existing/new channel farm drains
- Subsurface perforated drain pipe laid in invert of existing/new drains then drain backfilled with wood chips, bark (Bioreactor)
- Bioreactor treated flow discharge pipe (solid pipe)
- Channel taking flow from drains in vegetable growing area to feed into wetland
- Approximate edge of permanent wetland wetted area (other than in extended dry periods)
- Sediment Basin

Construction Phases

- Phase 1
- Phase 2
- Kohitere low flow channel
- Wetland maintenance access tracks (Existing and proposed)

N

NZGD2000
Scale: 1:8500

0 200 400 m

Phase 2 Components

- Construction of new channels at flatter grade than ground slope such that water can be discharged onto surface of wetlands from Whelans Drains. (C)
- More planting in Phase 1 and Phase 2 areas (E)
- New bund on east side of existing Arawhata Stream to contain Phase 2 wetland. (J)
- A lower section of bund/stopbank will be built at the downstream end alongside Hokio Beach Road to discharge treated wetland flow into the main Arawhata drain. (N)
- New groundwater collection drains along Hokio Beach road and wetland site boundary. (H)
- Installation of small new pump to irrigate sediment pond water into Kohitere Stream alluvial fan in areas where it cannot flow under gravity. (O)

Stream Naturalisation/Wetland Naturalisation Principals

- Existing bund to be used as foundation for higher bund in same location
- Bund toe to be at least 1m from the stream invert
- Avoidance of straight lines (other than existing bund)
- Planting (species TBC) to be used on wider floodplain above normal water depth

DRAFT

Arawhata Wetland
Diagram 1: Construction Phase 2

Jacobs

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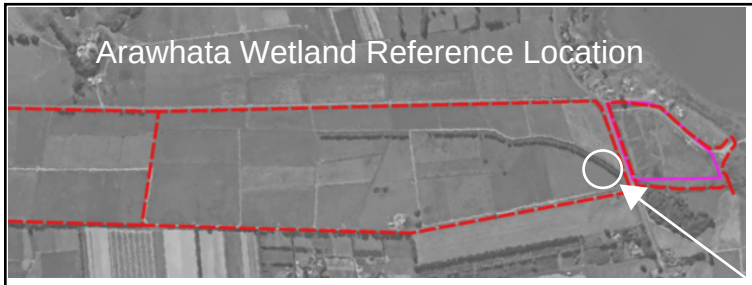

A

Wetland

Rip Rap Rock Apron, Weir, and Slope Armour

10 m

Flow

Wetland Perimeter Bund

Wetland Perimeter Bund

Flow

Arawhata Stream bank slope

B

See sheet 6

B

A

See sheet 6

Arawhata Stream Invert

SHEET NUMBER: 5

DRAWING TITLE: WETLAND OUTLET ROCK WEIR PLAN

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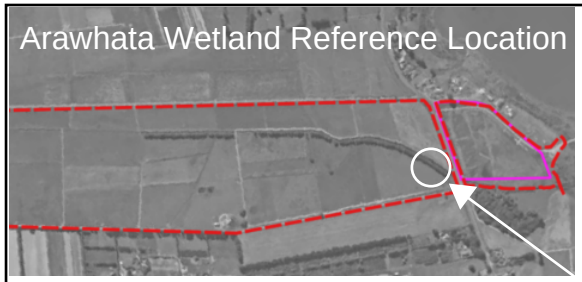
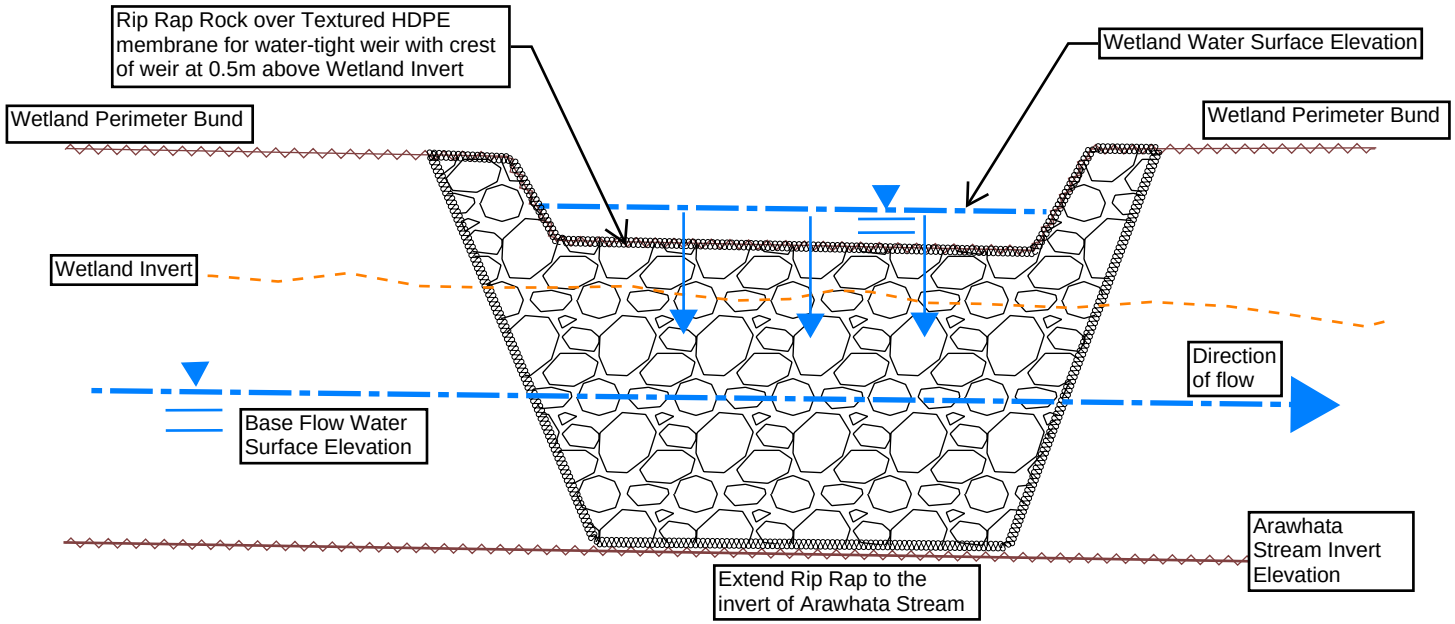
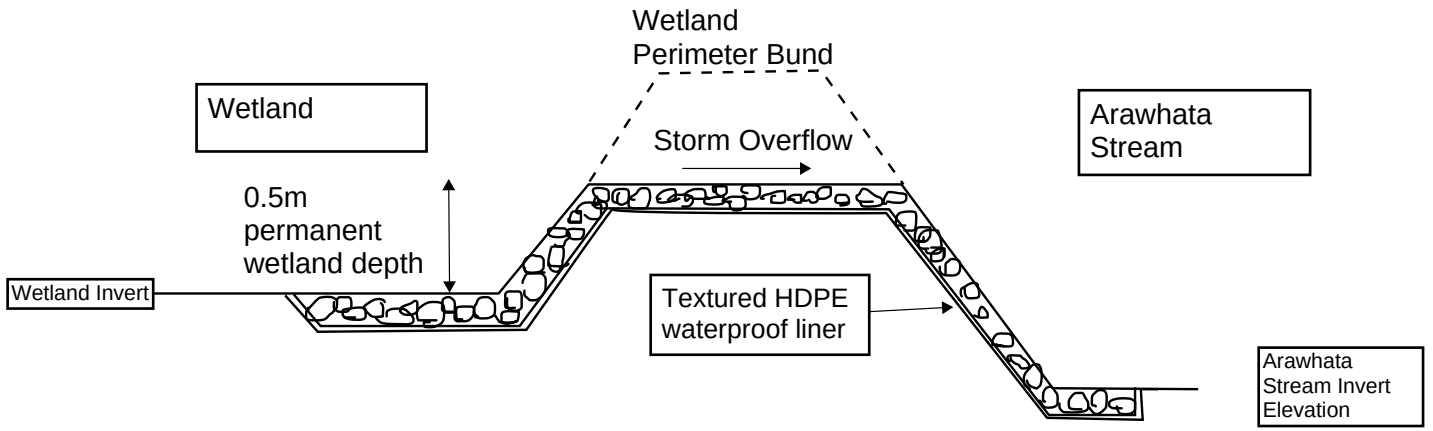




ELEVATION B



SECTION A

SHEET NUMBER: 6

DRAWING TITLE: WETLAND OUTLET ROCK WEIR DETAILS

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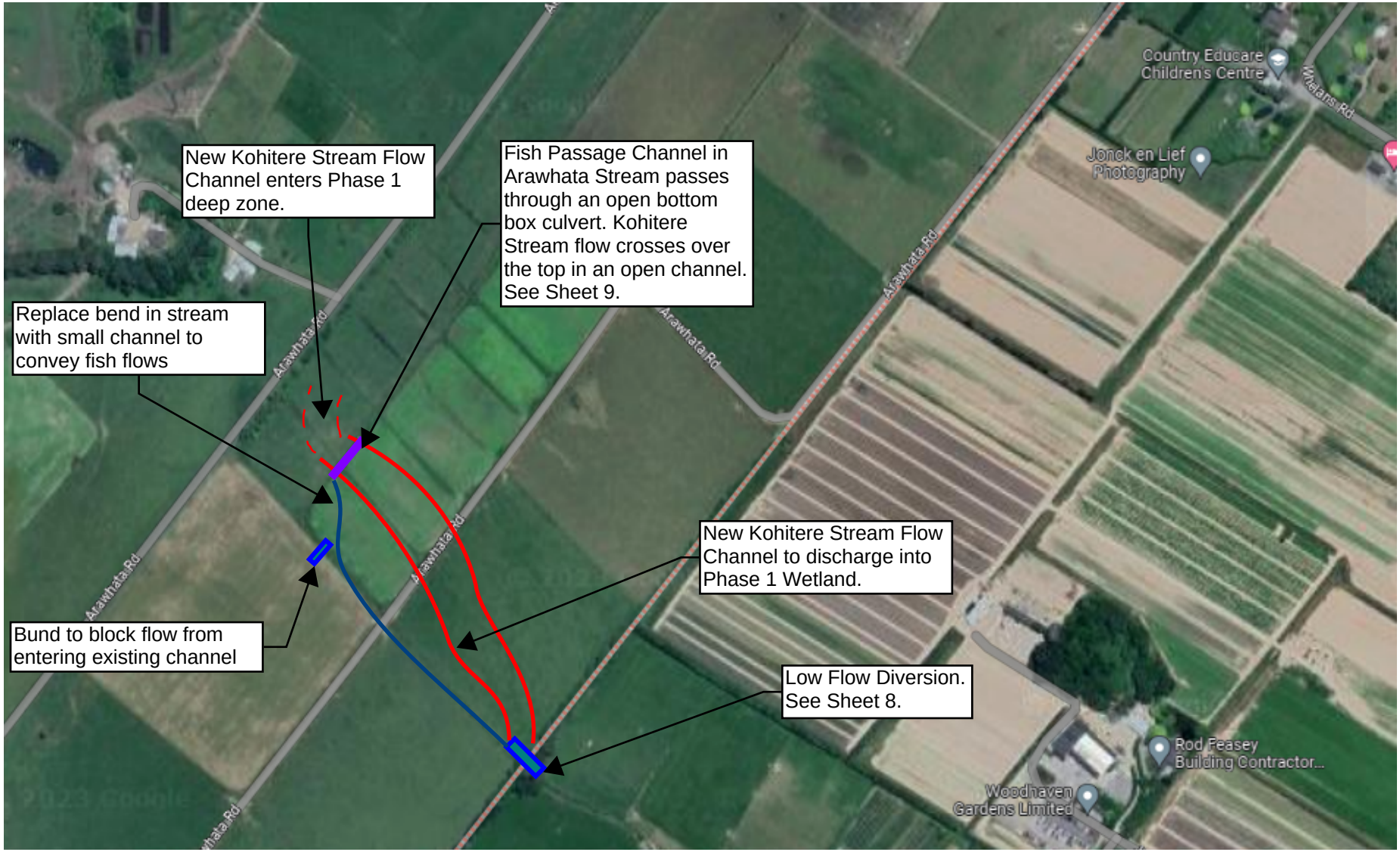

SHEET NUMBER: 7

DRAWING TITLE: KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL PLAN

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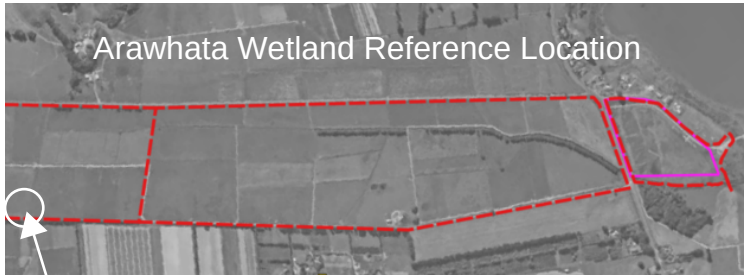
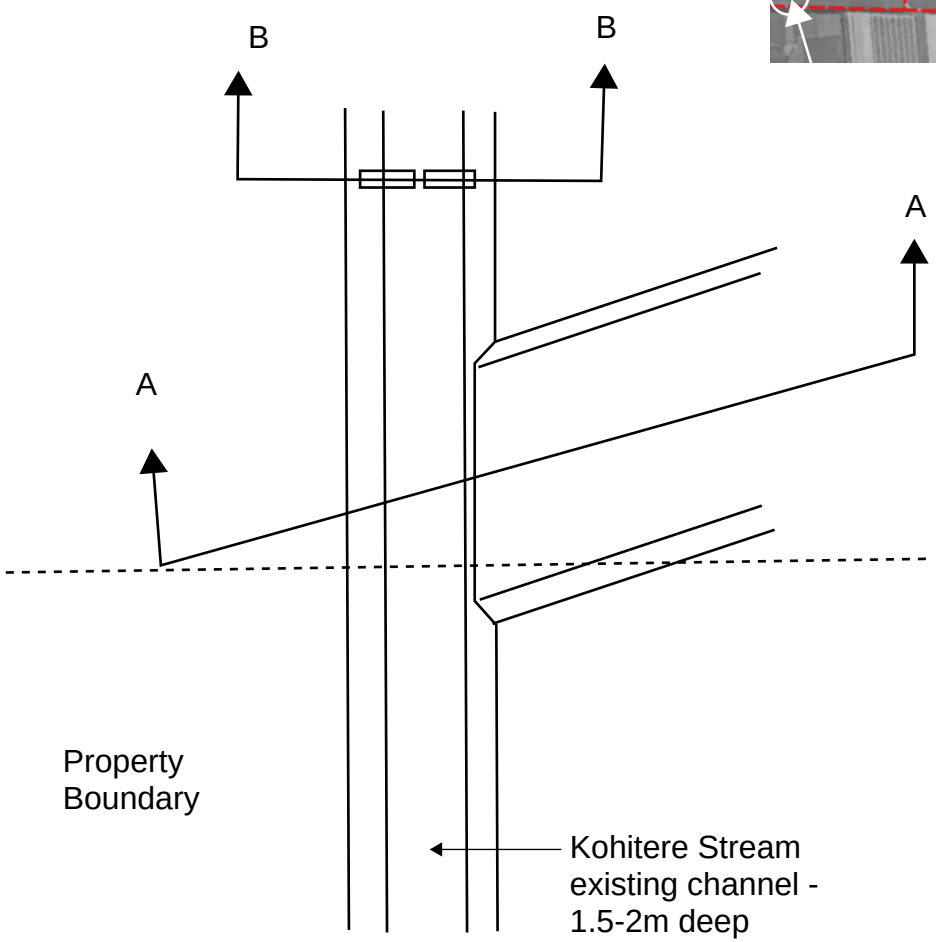


NOTES

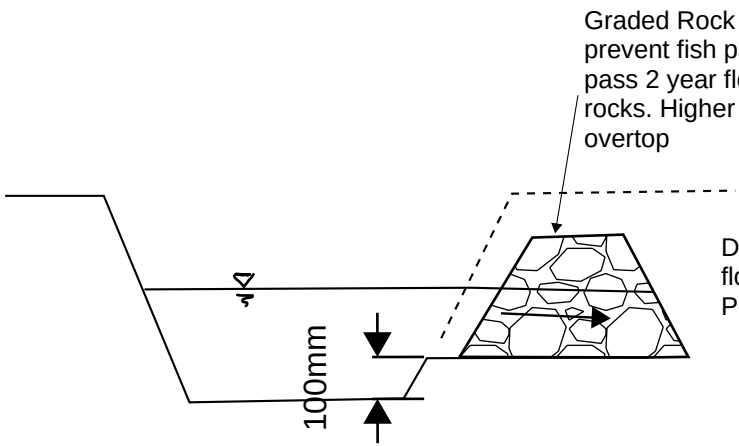
New Channel to convey Kohitere Stream Flows to Phase one Wetland.

1.5 to 2m deep at upstream endthis end to match Existing Arawhata Channel invert

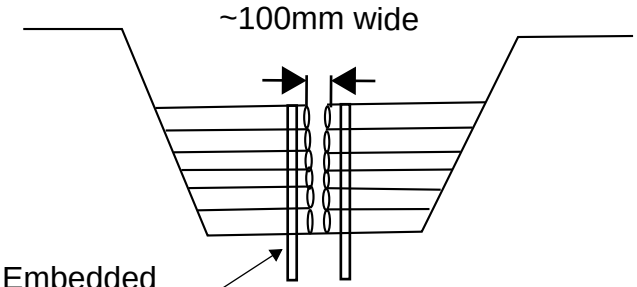
Increasing width and decreasing depth to allow full conveyance of up to 2 yr storm into Phase 1 Wetland



Plan View



Section A - A



Section B - B

Log Jam: Long crested weir top with vertical slot weir for fish bypass Construct with logs as walls and weir as a gap in the logs to pass low flows

Alternative to logs would be rocks- to be discussed at hui.

Access required for maintenance

SHEET NUMBER: 8

DRAWING TITLE: KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL DETAILS

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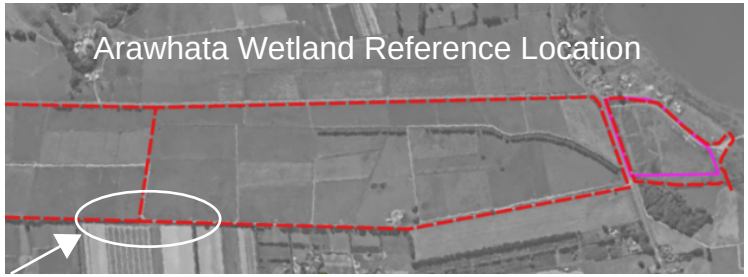

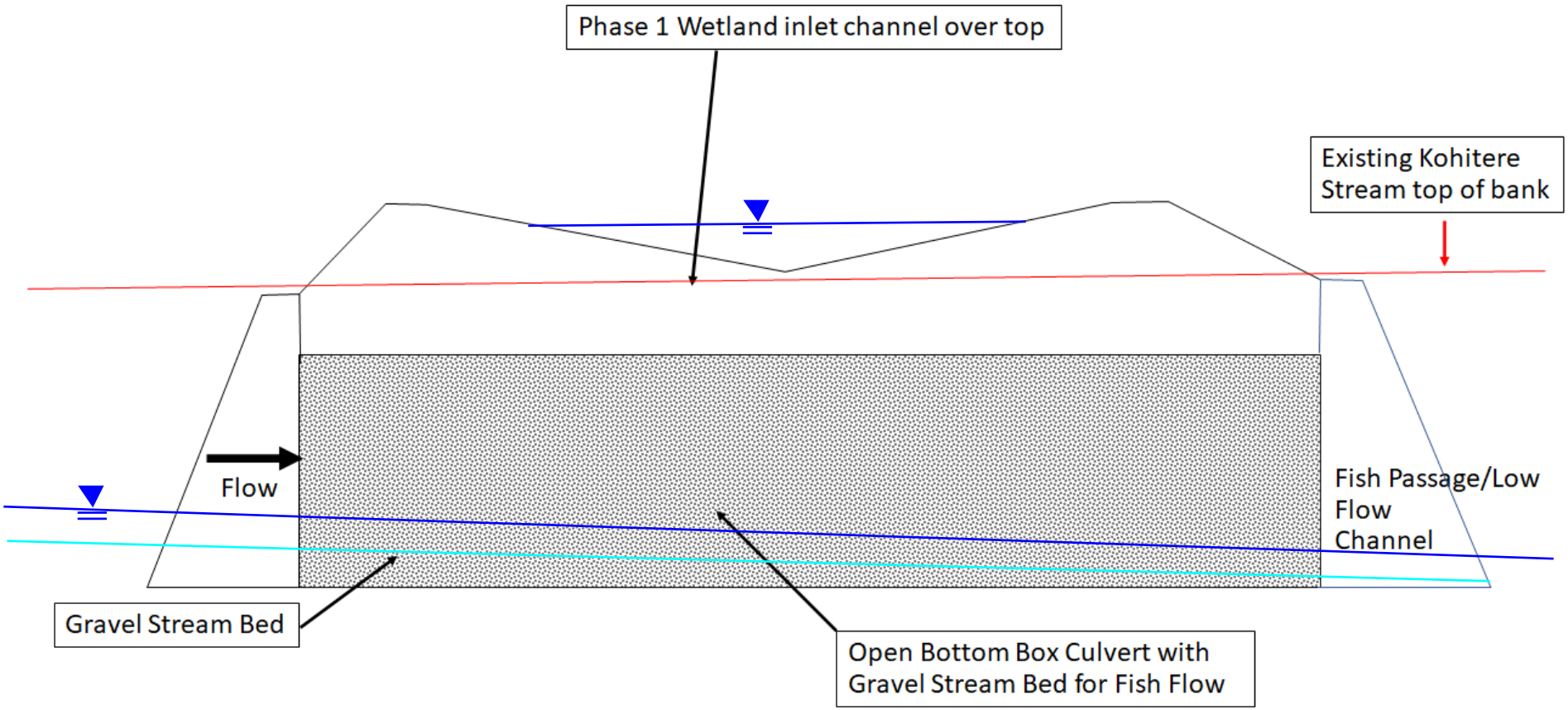

SHEET NUMBER: 9

DRAWING TITLE: KOHITERE STREAM LOW FLOW CHANNEL/PHASE 1 INLET CHANNEL CROSS-OVER SECTION

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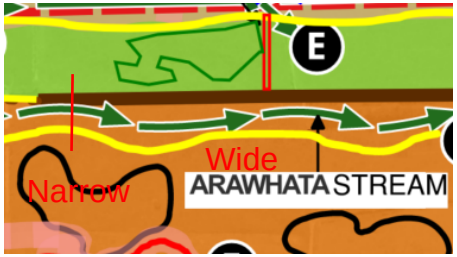
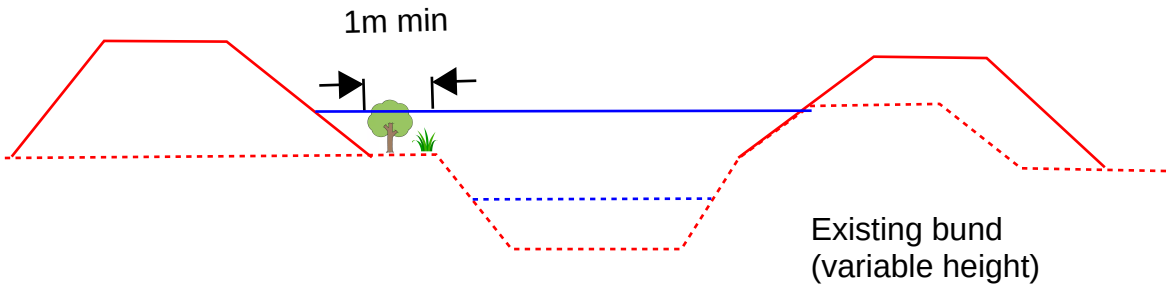
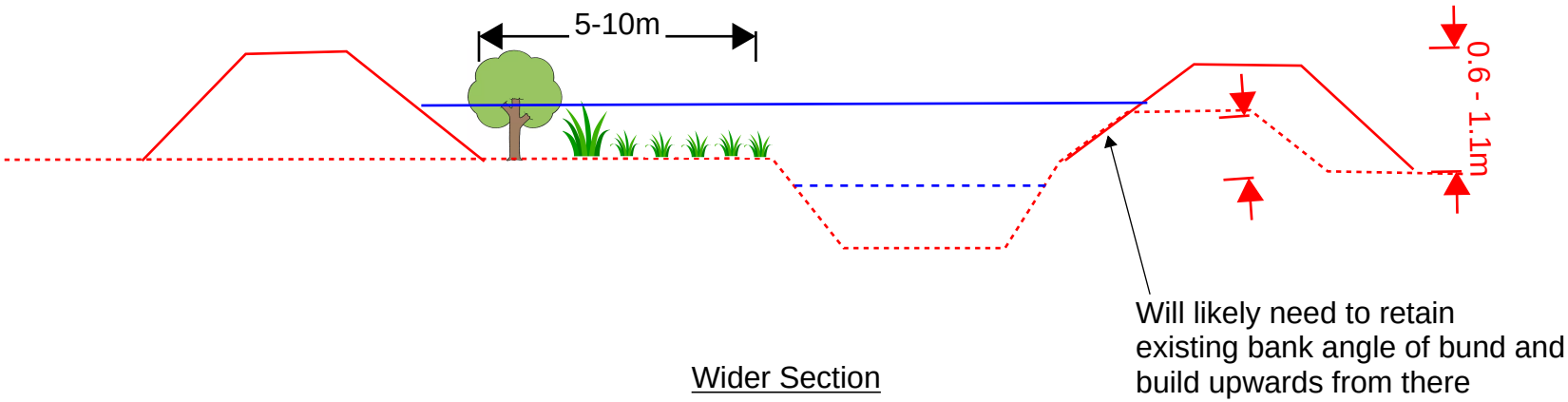


LEGEND

- EXISTING GROUND
- PROPOSED GROUND
- NORMAL FLOW DEPTH - PRIMARILY GROUNDWATER INFLOW DRIVEN
- APPROX. FLOW DEPTH IN LARGER STORMS - TO SHOW HOW FLOW WILL SPREAD OVER AREA BETWEEN BUND
- PLANTING - VARIABLE SPECIES



Narrow section



Wider Section

SHEET NUMBER: 10

DRAWING TITLE: ARAWHATA STREAM CHANNEL/WETLAND BUND CHANNEL TYPICAL CROSS SECTIONS

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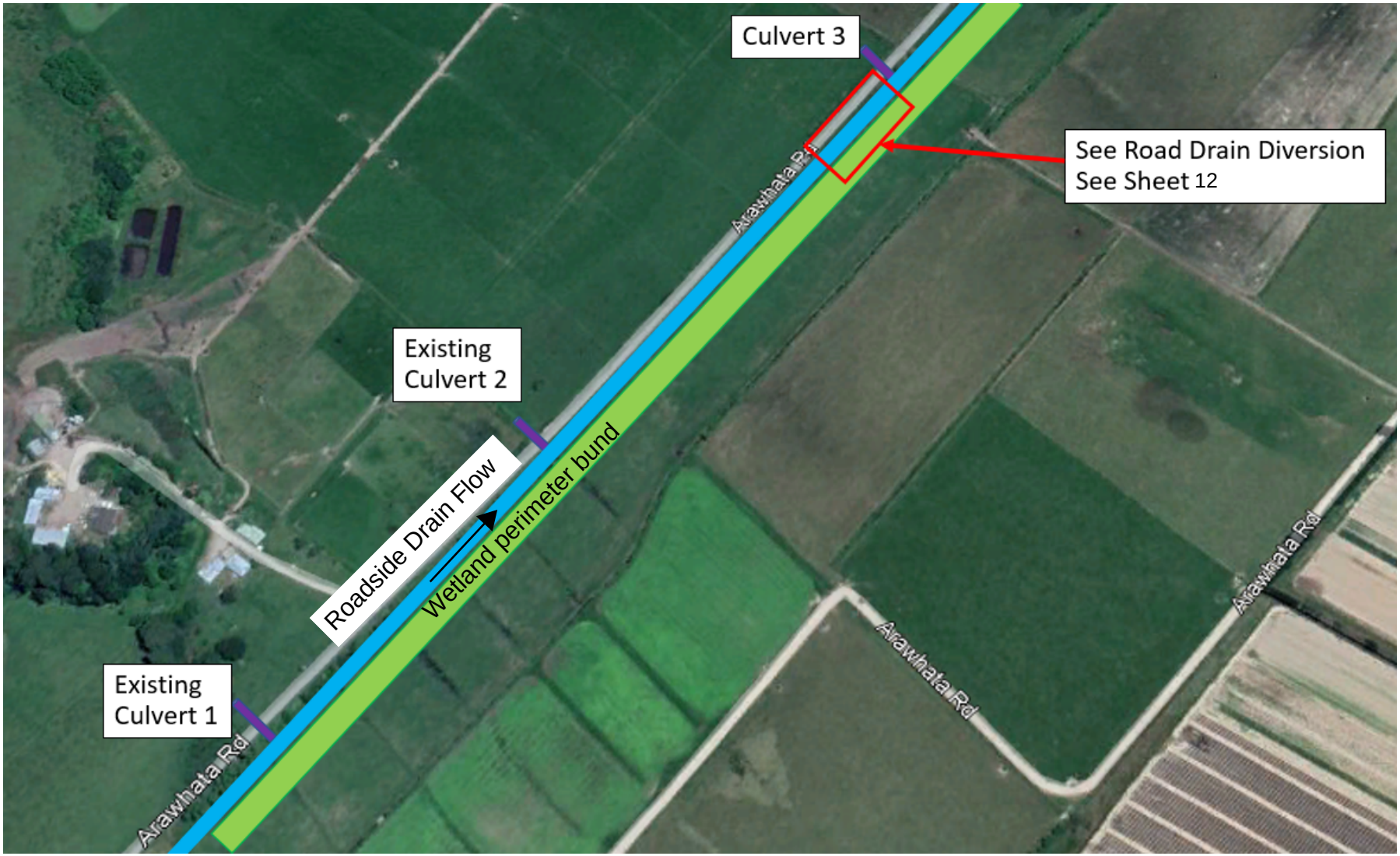

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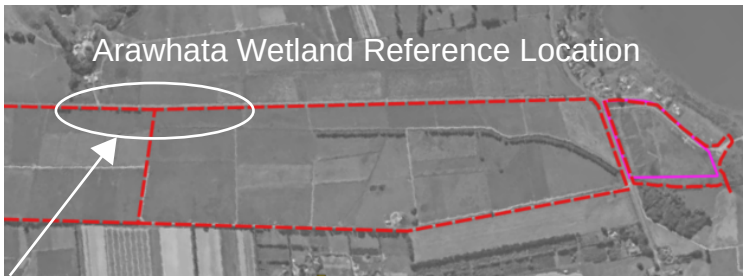
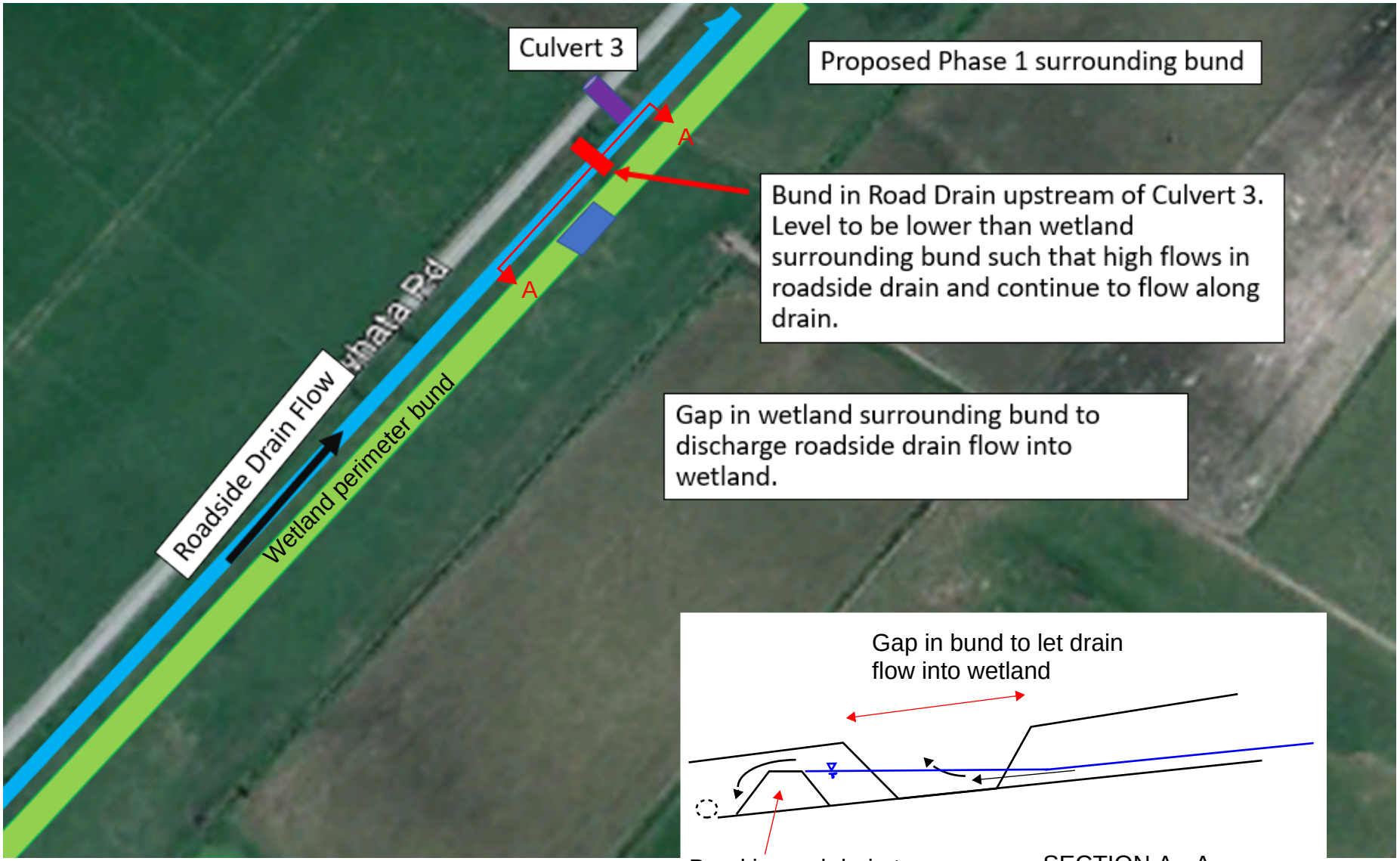
SHEET NUMBER: 11

DRAWING TITLE: ROAD DRAIN DIVERSION DETAIL - PLAN 1





SHEET NUMBER: 12

DRAWING TITLE: ROAD DRAIN DIVERSION DETAIL - PLAN 2 (ZOOMED)

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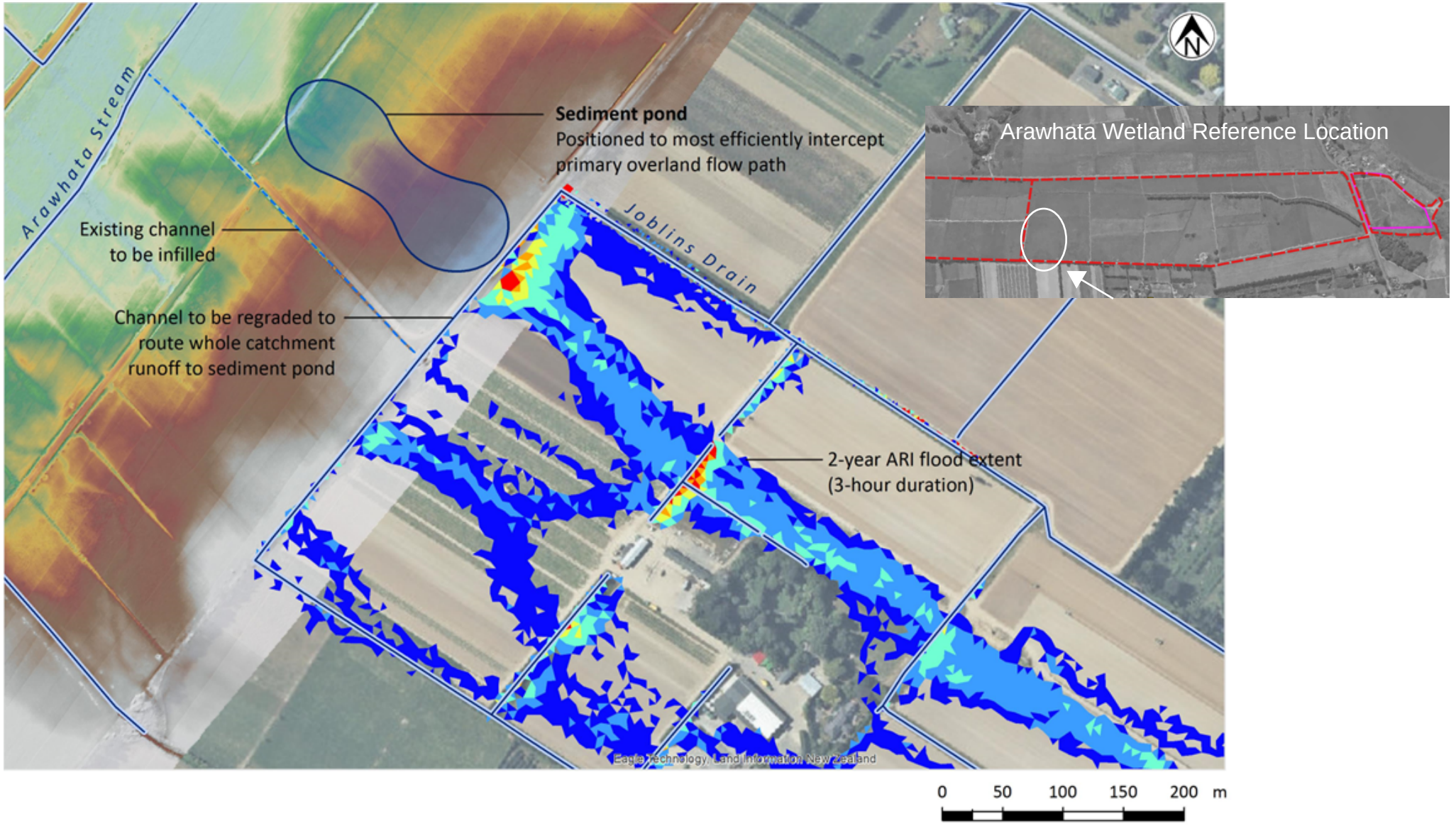

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SHEET NUMBER: 13

DRAWING TITLE: JOBLINS SEDIMENT BASIN PLAN

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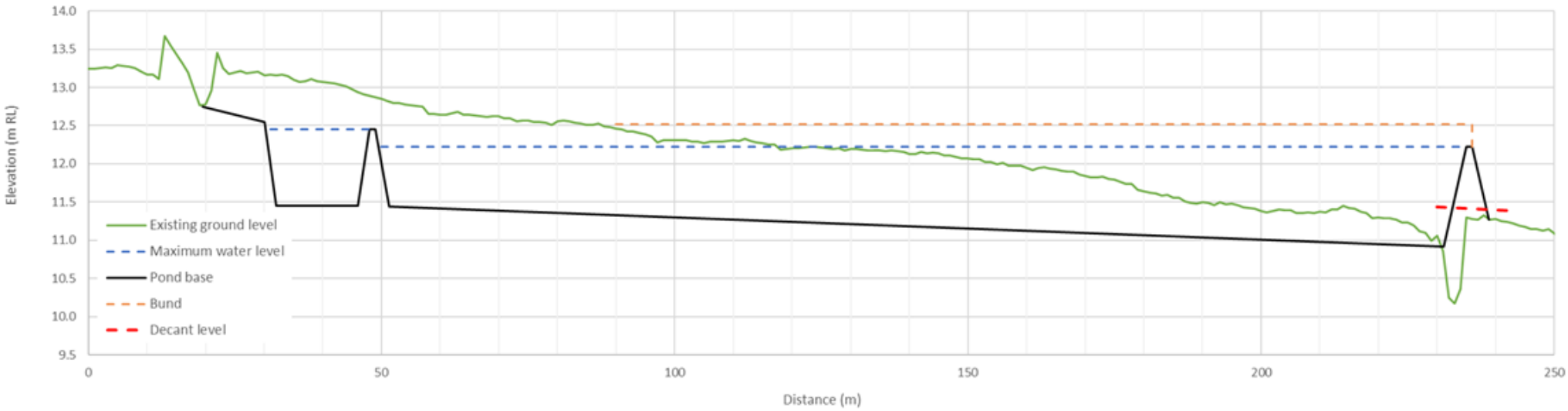
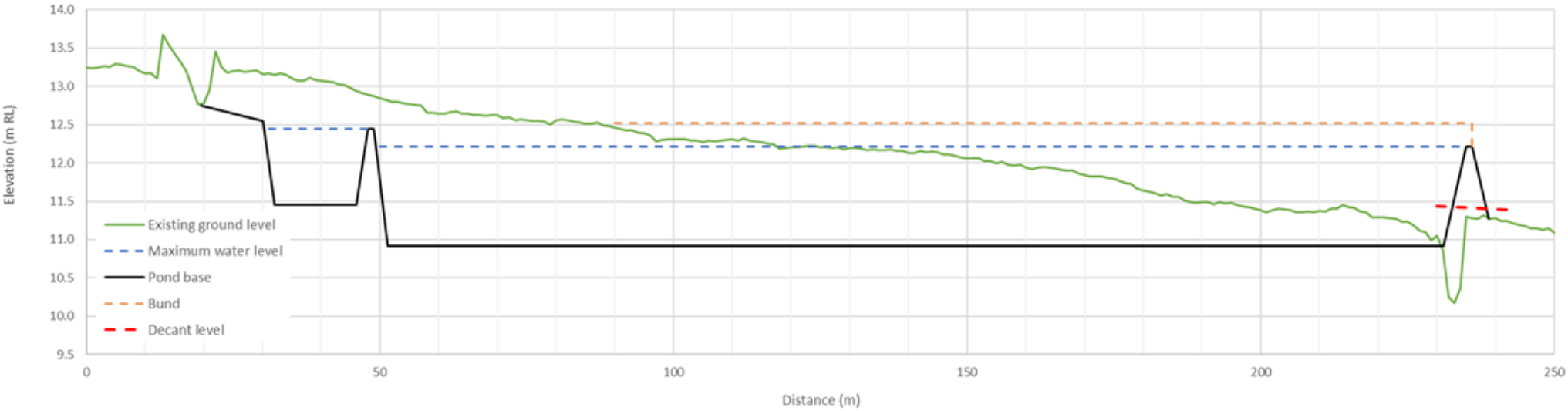


Lower cut option



Higher cut option

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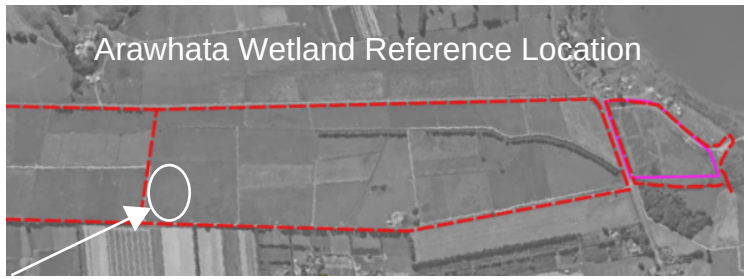
SHEET NUMBER: 14

DRAWING TITLE: SEDIMENT BASIN DETAILS



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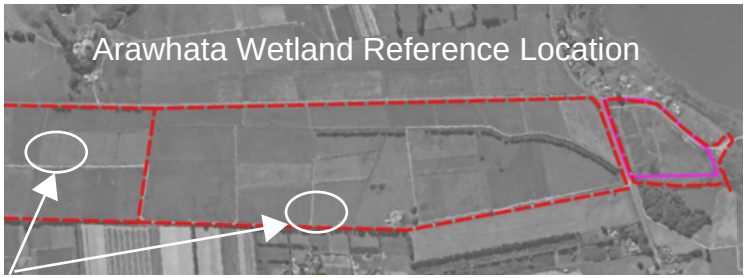
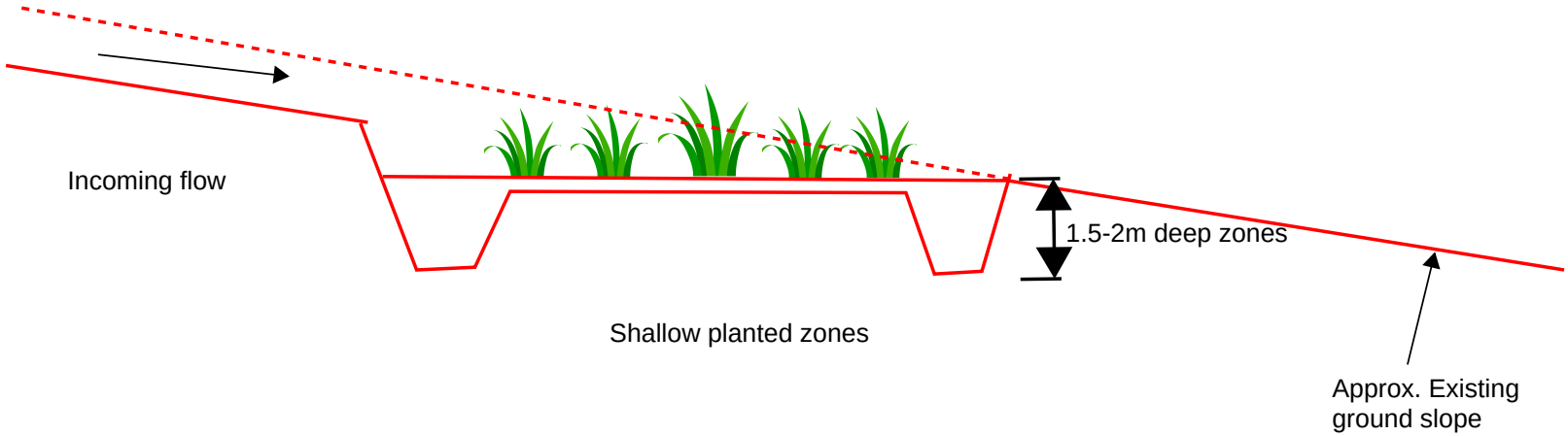


LEGEND

EXISTING GROUND

PROPOSED GROUND

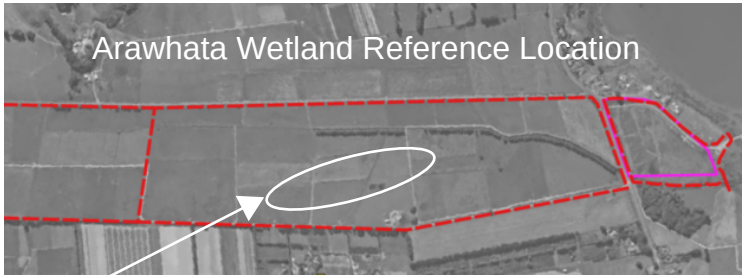
PLANTING - SPECIES TO BE CONFIRMED



SHEET NUMBER: 15

DRAWING TITLE: SACRIFICIAL WETLANDS CROSS-SECTION (KOHITERE AND JOBLINS)

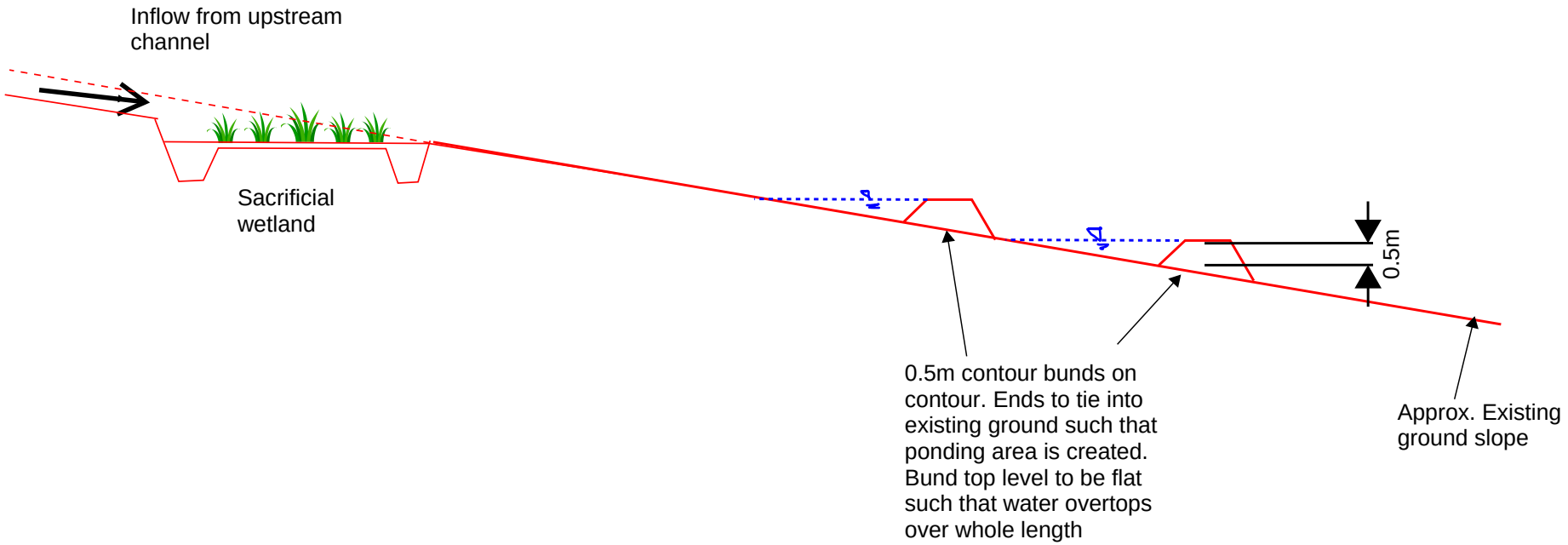
DRAFT



LEGEND

EXISTING GROUND

PROPOSED GROUND



SHEET NUMBER: 16

DRAWING TITLE: WHELANS CONTOUR BUND CROSS-SECTION

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LEGEND

Perforated Pipe

Solid Pipe

See Sheet 18 for details

SHEET NUMBER: 17

DRAWING TITLE: BIOREACTOR PLAN

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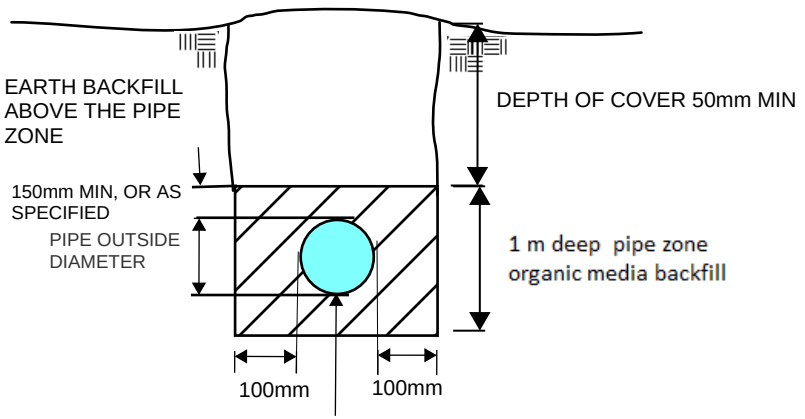
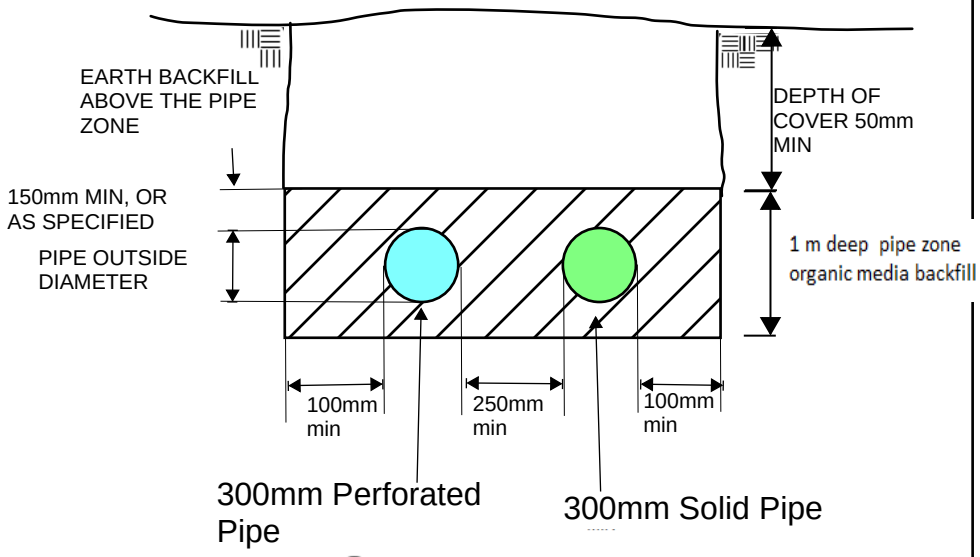
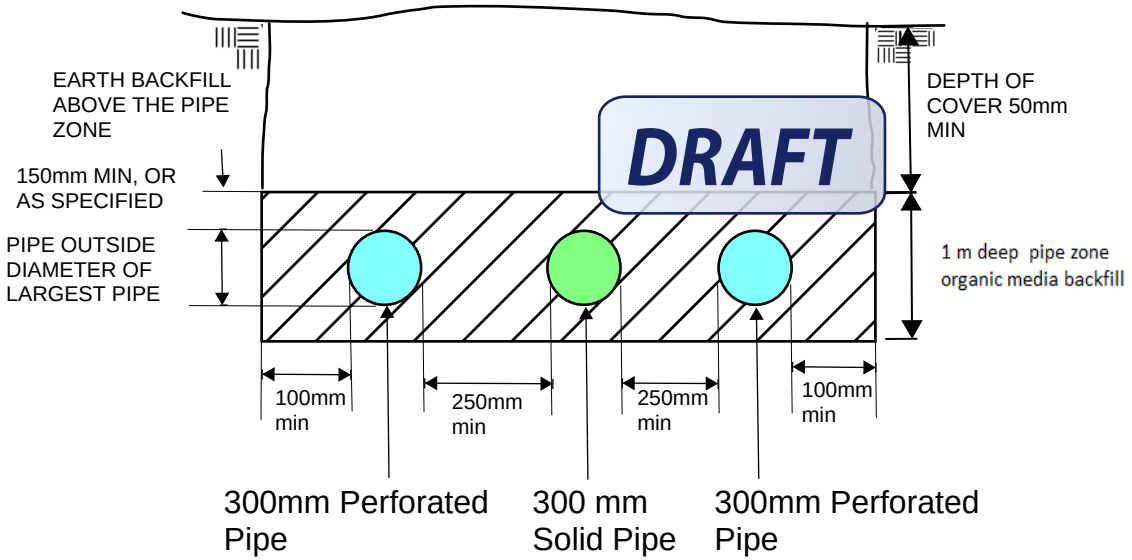


1 TYPICAL 1 PIPE TRENCH
NTS



2 TYPICAL 2 PIPE TRENCH
NTS

NB: Detail not currently needed



3 TYPICAL 3 PIPE TRENCH
NTS

DRAFT

SHEET NUMBER: 18

DRAWING TITLE: BIOREACTOR DETAILS