



Stream Works Methodology Plan

Drury Centre - Stage 2

Kiwi Property Holding No. 2 Limited
14/03/2025

For Fast Track Consent Application

Document Control

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1. Executive Summary

This report outlines the engineering methodology for stream works that will be undertaken within the Stage 2 Earthworks of the Drury Centre Development. Stream works will involve stream daylighting, realignment and restoration post-earthworks.

This report details the methodology for erosion and sediment controls and best practices to protect streams from the surrounding earthworks required for the development.

This report details the suite of devices that may be utilised on this site including the limitations of the devices and additional measures that can be implemented to improve the performance of the devices.

The controls to be implemented for stream works are proposed contour drains, diversion drains, drop out pits, clean water diversions, silt fences, and filter strips.

2. Statement of Qualifications and Experience

Colin Dryland

I am a Principal Engineer and the General Manager of Engineering at Wood and Partners Consultants Limited ("Woods"). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since 2012.

I hold a National Diploma of Architectural Technology (Unitec Institute of Technology, 2002), a New Zealand Diploma of Civil Engineering (Unitec Institute of Technology, 2011), and an Applied Diploma of Civil Engineering (Infratrains 2014). I am a Chartered Professional Engineer (CPEng) and a member of Engineering New Zealand (CMEngNZ), Engineering New Zealand Transportation Group, New Zealand Society of Construction Law and Water New Zealand. In addition, I am also a qualified Independent Hearings Commissioner and am appointed to the Palmerston North City Council Commissioner Pool until November 2026.

I have 23 years of experience in all aspects of land development engineering design, construction and contract management.

I have been the principal designer, report author and lead engineer for a wide range and scale of land development projects, including but not limited to: earthworks and erosion and sediment control; civil infrastructure servicing; stormwater modelling and green infrastructure; on-site stormwater and wastewater disposal; roading, transport, pavement engineering and geometric design; streamworks and culverting; and all aspects of land development Resource Consenting and Engineering Plan Approval design and compliance.

I confirm that, in my capacity as approver of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Glenn Wright

I am a Senior Associate Engineer within the Engineering Team at Wood and Partners Consultants Limited ("Woods"). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since 2021.

I hold a Bachelor of Engineering degree from the University of Auckland, which I completed in 2006. I am a Chartered Professional Engineer (CPEng) and a member of Engineering New Zealand (CMEngNZ).

I have over 19 years of experience in earthworks, roading, stormwater, wastewater and water design, for land development and infrastructure projects.

I have been the principal author and lead engineer for a wide range of Infrastructure and Earthworks Methodology reports to support land development projects.

I confirm that, in my capacity as the author of this report, I have read and abide by the Environment Court of New Zealand's Practice Note 2023, in particular section 9 on the Code of Conduct for Expert Witnesses.

Sine Foulger

I am an Associate Engineer within the Engineering Team at Wood and Partners Consultants Limited ("Woods"). Woods is a multi-disciplinary consultancy specialising in planning, urban design, engineering, water infrastructure, and surveying. I have been employed at Woods since 2022.

I hold a Bachelor of Engineering (Honours) degree in Civil Engineering (University of Auckland, 2012), a Master of Engineering Studies (Honours) in Transportation (University of Auckland, 2013) and a Bachelor of Science (University of Auckland, 2007). I am a Chartered Professional Engineer (CPEng), an International Professional Engineer (IntPE(NZ)), a member of Engineering New Zealand (CMEngNZ), the Temporary Works Forum NZ and UDINZ.

I have 13 years' experience of working in residential land development in Auckland. My technical experience involves design of all civil engineering aspects related to residential subdivisions, including but not limited to roading geometry, earthworks, stormwater and wastewater design. My experience involves preparation of land development packages for small to large scale residential subdivisions, from preliminary concept to design phase, through to consenting and construction.

I confirm that, in my capacity as a reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

3. Introduction

This report details the methods to be adopted as part of the stream works operation to minimise the potential for erosion and the methods for sediment control to be adopted to maximise the removal of sediment prior to discharge into the receiving environment. It also details the suite of devices that may be utilised on this site.

The proposed work involves the removal of a culvert and daylighting of a stream, the realignment of a section of stream, and stream restoration.

This methodology proposes a range of erosion & sediment control measures that have been designed to meet the existing standards (Guidance for Erosion & Sediment Control GD05, August 2023). These measures have been used successfully in previous stages of the Drury Centre development, ensuring a best practice outcome for erosion and sediment control.

The range of measures allows for a combination of most applicable solutions to meet the differing requirements of parts of the development area.

This report should be read in conjunction with the drawings in Appendix A at the back of this report and the other documents submitted as part of this consent. It is anticipated that this report will be updated and submitted for approval prior to commencing works.

4. Erosion & Sediment Control Methodology

For the erosion and sediment control methodology, refer to the Woods Sediment Control Management Plan for Drury Centre – Stage 2.¹ In addition, the following drawings highlight the erosion and sediment control locations & details related to stream works, and are included in Appendix A:

- P24-447-01-1852-EW
- P24-447-01-1852-EW
- P24-447-01-1856-EW

¹ Sediment Control Management Plan prepared for Kiwi Property Holding No. 2 Limited by Woods 13/03/2025 Rev V5

4.1. Last Line of Defence

The 'last line of defence' approach has been formulated as a backup to the proposed controls.

While the primary erosion and sediment control measures will minimise the discharge of the sediment to the receiving environment, an extra line of defence is proposed:

- For works areas that are within 50m of existing streams and waterways: a Super Silt Fence will be erected between the works and the stream. The Super Silt Fences will provide backup protection in the unlikely event that the primary erosion and sediment control devices and measures fail. Alternatively, oversized and well compacted bunds will be constructed.

4.2. Monitoring

The aim of monitoring is to ensure the proposed erosion and sediment control measures are installed correctly and function effectively throughout the duration of the works. The monitoring programme will provide certainty to all parties that appropriate measures are being undertaken to ensure compliance with conditions of consent and that potential problems or improvements are identified promptly.

Monitoring shall consist of:

- Weekly site walkovers involving all stakeholders to inspect and determine the effectiveness of the erosion & sediment control devices installed on site.
- Weekly pre-inspection walkovers by Woods personnel, as well as pre and post significant rainfall events.

By implementing a rigorous monitoring programme, the following benefits will result:

- Improved response times for rectifying any failures in erosion and sediment control devices with a focused response.
- Weather responsive monitoring/storm preparedness.
- Compliance with resource consent conditions.
- The minimisation of potential for adverse effects in the receiving environment.

4.3. Additional Measures

The following actions are proposed as a form of contingency to ensure erosion and sediment control standards are always achieved on site:

- Team meetings are to be held prior to all predicated significant rain events. The purpose of these meetings is to review the status of controls (confirm all chemical sheds stocked with chemical, all controls in place) and agree additional controls determined as being beneficial (Drop out pits, additional bunds). Each of the team organisations has a dedicated resource available for these meetings.
- Allowance will be made for additional storage in devices so that if other devices fail or are not working correctly, catchments can be temporarily diverted to these controls until the necessary repairs/remedial works are made.

5. Earthworks Methodology

For the earthworks methodology, refer to the Woods Sediment Control Management Plan for Drury Centre – Stage 2.¹

5.1. Overview

The earthworks will include the daylighting of approximately 80m of stream, the realignment of approximately 96m of permanent stream and the permanent reclamation of 66m of stream. Enabling works will be undertaken before the commencement of the bulk earthworks.

5.2. Pre-Construction Meeting

Prior to commencing earthworks, all relevant consents will be obtained and conditions satisfied.

A pre-construction meeting onsite with AC representatives will be held prior to installing any erosion and sediment controls

5.3. Stream Works Methodology

The preliminary staging plan for stream works during the earthworks seasons is as follows:

5.3.1. Step 1 - Stream daylighting

- Strip topsoil over daylighting area leaving the topsoil at each end to keep them stabilised.
- Start the cut along the new alignment of the stream, leaving each end to create a bund and to keep the stream flowing along its current alignment.
- Finish the cut, while leaving the bunds in place, and stabilise the stream alignment.
- Remove the downstream bund, during a period of forecasted fine weather, and complete the works at the connection to Fitzgerald stream. Stabilise the area before moving to the next step.
- Remove the upstream bund, during a period of forecasted fine weather, and complete the works at the connection to Stream A. Stabilise the connection point as quickly as possible.
- Once the stream realignment is complete and stabilised, the existing culvert will be removed.
- The culvert will be removed from the upstream end. As soon as practicable after the removal of the first culvert, the contractor will place and compact the fill adjacent to stream A. Once complete the connection point will be stabilised and stream A will be operational along the proposed alignment.
- The contractor will continue to remove the remaining culverts to the boundary of the site. Outside of the site, the contractor will grout fill the remaining section of pipe, to the downstream manhole.

5.3.2. Step 2 - Stream A realignment and Removal of stream A wetland

- The realignment of Stream A can be undertaken before or after the daylighting of the bottom section of the stream.
- Before starting the works, a bund will be placed downstream of the works area to isolate the earthworks area.
- A culvert will be installed to divert the clean water from the upstream/eastern catchment around the earthworks area. The water will be discharged to Stream A (downstream of the bund).
- Fish salvage and relocation from the extent of the earthworks will be undertaken before earthworks commence and in accordance with the Ecological Management Plan prepared by Tonkin and Taylor Ltd, dated February 2025.
- Pump out the water from the proposed re-alignment area of stream (shown as pink boundary in the Plan "P24-447-01-1855-EW").

- Topsoil bunds will be placed around the site to divert the upper catchment around the works area, discharging the clean water downstream of the construction area and directing the water to the sediment retention ponds.
- Once the controls are in place, the works associated with the realignment will be undertaken, topsoil stripping, removing unsuitable material, cut and filling to form the finished levels.
- At the completion of the works the works area will be stabilised.
- Final checks to be undertaken to make sure that there will be no dirty water discharging from the works area.
- The downstream bund will then be removed, and the area stabilised as quickly as possible.

5.3.3. Step 3 - Removal of Controls

- Once areas have been mulched or suitable grass strike has been obtained, seek approval from AC Monitoring Officer for removal of controls if required.
- Install SSF or DEB for removal of SRPs if required
- Remove structures within SRP
- Undertake cut to fill operation within SRP area under a Geotechnical Engineer's observation.
- Prepare for and topsoil area, then stabilise.
- Remove the Culvert taking Overland Flow from neighbours as shown on Plan P24-447-01-1856-EW

5.4. Earthworks Cut to Fill Operation

Refer to the Woods Sediment Control Management Plan for Drury Centre – Stage 2.¹

5.5. Ecological Areas

Tonkin & Taylor are the appointed ecologists onsite and will be monitoring the ecological impacts and works in and around stream and wetland areas. Orange safety mesh demarcation will be installed prior to the pre-construction meeting and will remain in place until works are required within these areas. This fence is to be maintained throughout the stream works operation, if removed for works to be undertaken, it will be reinstated as soon as practicable once the works are complete. The earthworks have been designed to maintain the existing flow patterns and to keep water flowing towards the inland wetlands and streams.

6. Risk Management

6.1. Identifying Risk

It is considered that the key elements of risk for earthworks sediment yield are:

1. Works within, and adjacent to, streams and tributaries due to the reduced contingency of grass filter strips.
2. Pumping of sediment-laden water from impoundment areas as this is not a rain-active operation.

6.2. Recommendations for Reducing Risk

To mitigate this risk, the following recommendations will be adopted:

- Works staged so that minimal open areas are open adjacent to the stream while reclaiming and realigning the stream.

-
- That super silt fences are installed parallel to the streams and wetland as a last line of defence.
 - Sediment retention ponds are designed based on 3% of the catchment to provide extra storage capacity over the GD05 requirements.
 - All dirty water is pumped into or upstream of a SRP and the decants to be raised during times where pumping is required. The clarity of the water will be monitored and approved before the decants are to be lowered.

These areas will be monitored weekly and if there is a likelihood of inclement weather additional measures will be discussed on-site and implemented.

7. Conclusion

In conclusion, the erosion and sediment control methodology outlined in this report provides a comprehensive approach to safeguarding streams during the earthworks phase of the Drury Centre Stage 2 earthworks.

By implementing a suite of erosion and sediment control devices and measures, with the goal to minimise the potential for sedimentation and erosion that could impact waterways.

This report highlights a three-step erosion and sediment control methodology, proposed to ensure that any potential effects resulting from land and stream disturbance activities are appropriately avoided, remedied and / or mitigated.

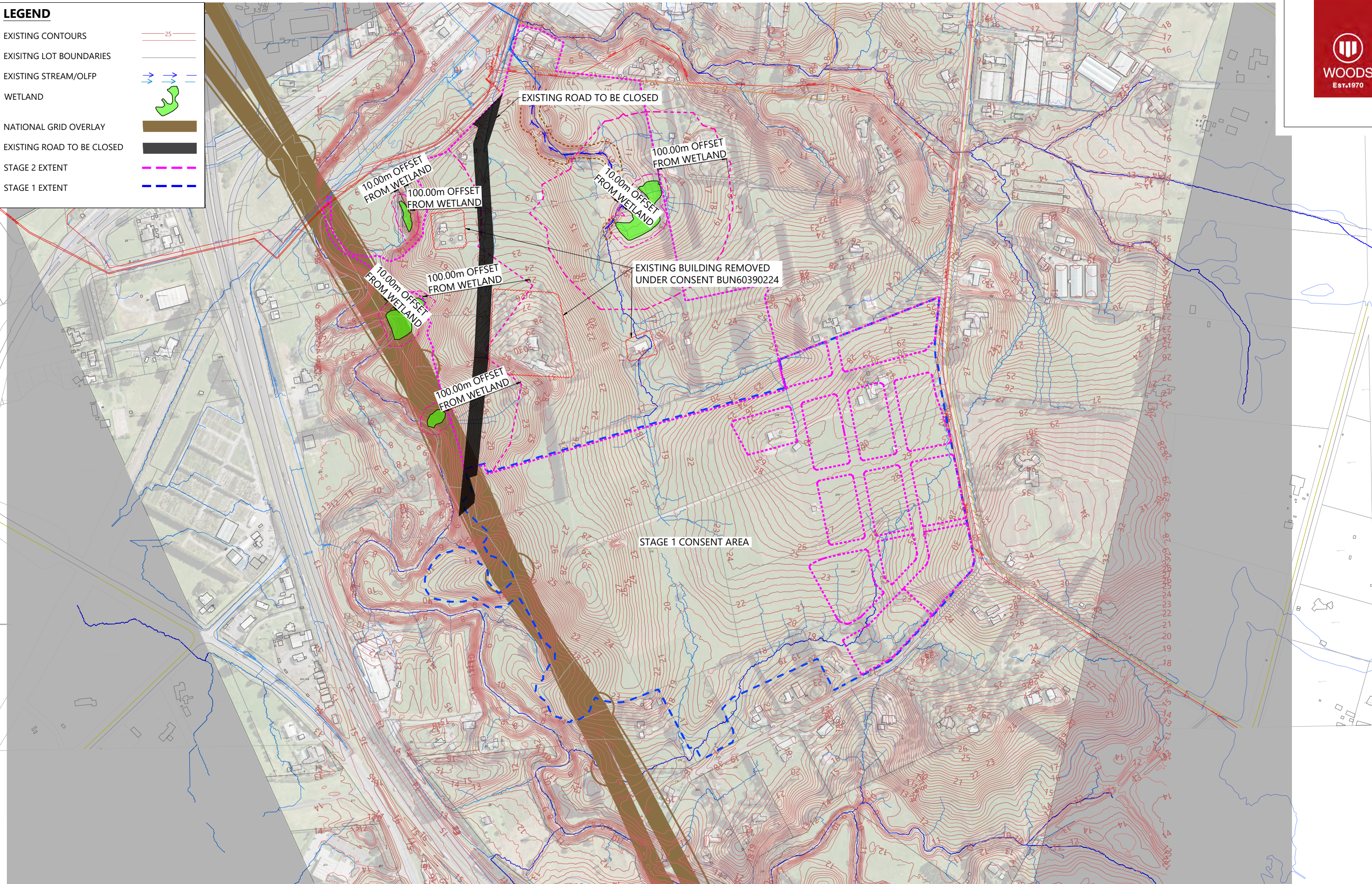
Additionally, this report highlights the importance of supplementary measures and ongoing maintenance to enhance the performance of the devices and ensure long-term environmental protection. A monitoring programme will be implemented to ensure the effective ongoing operation of erosion and sediment control methods and to identify any adverse effects on the receiving environment and any necessary amendments that may be required.

Appendix A – Drury Centre Stage 2 Earthworks Erosion & Sediment Control Drawings

- P24-447-01-0010-GE – Site Features Plan
- P24-447-01-1150-EW, P24-447-01-1151-EW – Stream Works Plans
- P24-447-01-1160-EW, P24-447-01-1161-EW – Stream Works Cross Sections
- P24-447-01-1200-EW – Stage 2 Cut Fill Plan
- P24-447-01-1850-EW to P23-315-02-1856-EW – E&S Control Plans
- P24-447-01-1857-EW to P24-447-01-1861-EW – Sediment & Erosion Control Typical Details

LEGEND

- EXISTING CONTOURS
- EXISTING LOT BOUNDARIES
- EXISTING STREAM/OLFP
- WETLAND
- NATIONAL GRID OVERLAY
- EXISTING ROAD TO BE CLOSED
- STAGE 2 EXTENT
- STAGE 1 EXTENT



REVISION DETAILS					INT	DATE	SURVEYED	XXX
1	FOR 50% DESIGN	NS	22/11/24	DESIGNED	XXX			
2	FOR 90% DESIGN	NC	29/11/24	DRAWN	NS			
3	FOR 99% SUBMISSION	MF-E	10/02/25	CHECKED	GW			
4	FOR FAST TRACK CONSENT	EW	21/02/2025	APPROVED	CD			



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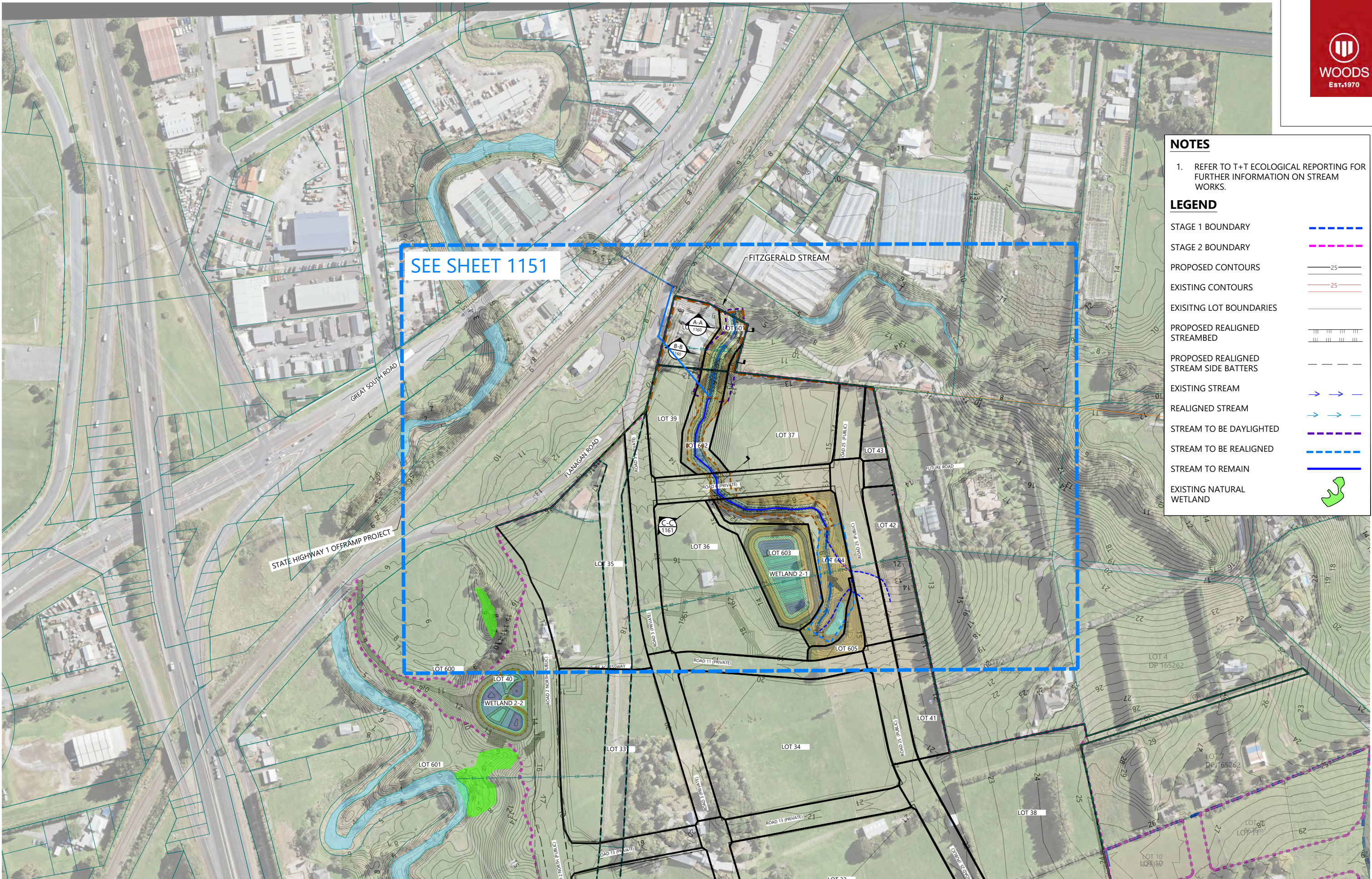
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DRURY CENTRE-STAGE 2
SITE FEATURES PLAN



STATUS	FOR FAST TRACK CONSENT	REV
SCALE	1:5000 @ A3	4
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-0010-GE	



NOTES

1. REFER TO T+T ECOLOGICAL REPORTING FOR FURTHER INFORMATION ON STREAM WORKS.

LEGEND

STAGE 1 BOUNDARY

STAGE 2 BOUNDARY

PROPOSED CONTOURS

EXISTING CONTOURS

EXISTING LOT BOUNDARIES

PROPOSED REALIGNED STREAMBED

PROPOSED REALIGNED STREAM SIDE BATTERS

EXISTING STREAM

REALIGNED STREAM

STREAM TO BE DAYLIGHTED

STREAM TO BE REALIGNED

STREAM TO REMAIN

EXISTING NATURAL WETLAND

REVISION DETAILS					INT	DATE	SURVEYED	
1	ISSUED FOR 50% DESIGN				EW	22/11/24	DESIGNED	EW
2	ISSUED FOR 90% DESIGN				NC	29/11/24	DRAWN	EW
3	ISSUED FOR 99% SUBMISSION				MF-E	10/02/25	CHECKED	GW
4	ISSUED FOR FAST TRACK CONSENT				EW	21/02/25	APPROVED	CD



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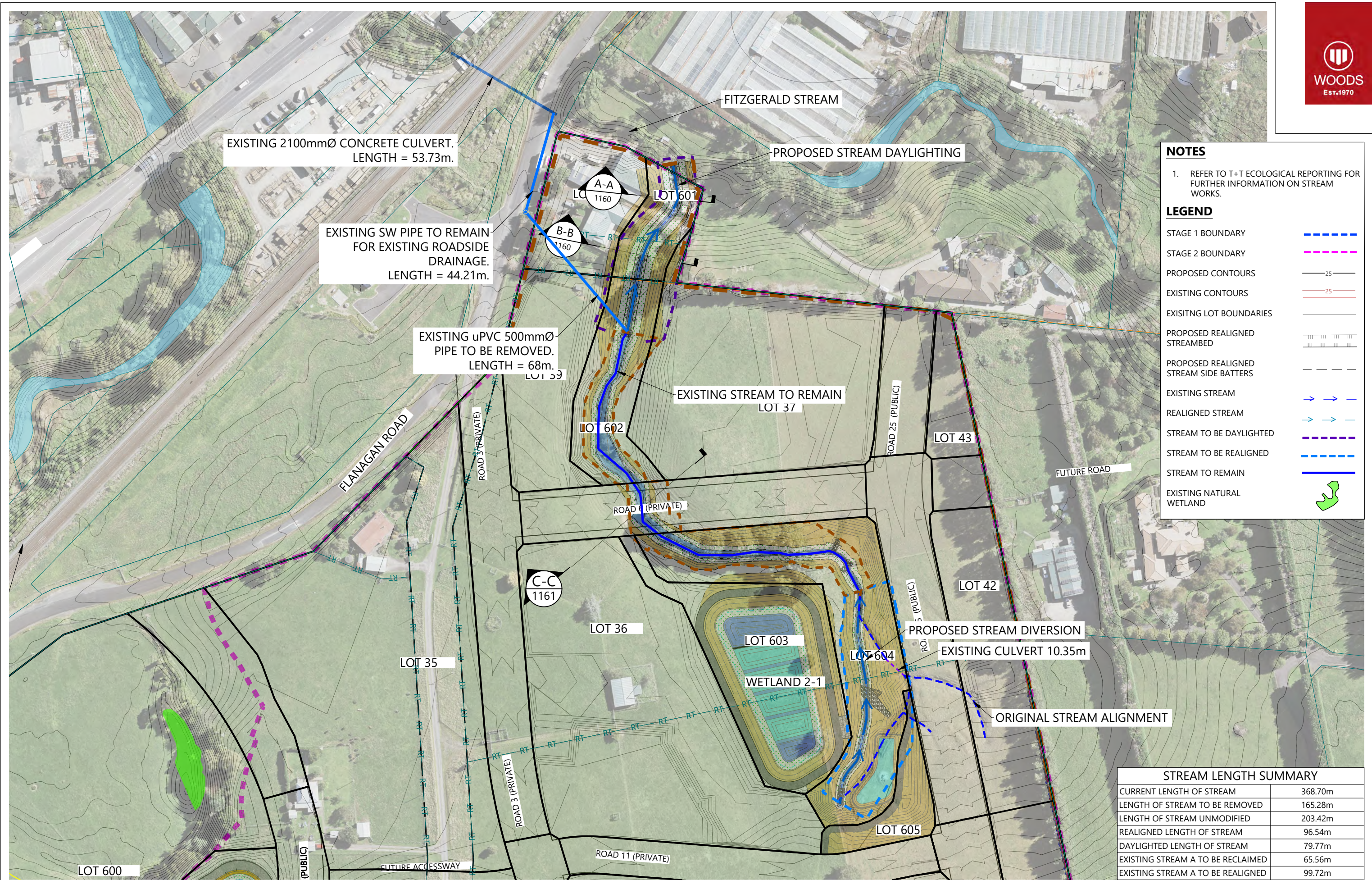


DRURY CENTRE-STAGE 2

STREAM WORKS
OVERALL LAYOUT PLAN



STATUS	FOR FAST TRACK CONSENT	REV
SCALE	1:3000 @ A3	4
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1150-DR	



NOTES

- REFER TO T+T ECOLOGICAL REPORTING FOR FURTHER INFORMATION ON STREAM WORKS.

LEGEND

STAGE 1 BOUNDARY	---
STAGE 2 BOUNDARY	---
PROPOSED CONTOURS	25
EXISTING CONTOURS	25
EXISTING LOT BOUNDARIES	---
PROPOSED REALIGNED STREAMBED	---
PROPOSED REALIGNED STREAM SIDE BATTERS	---
EXISTING STREAM	---
REALIGNED STREAM	---
STREAM TO BE DAYLIGHTED	---
STREAM TO BE REALIGNED	---
STREAM TO REMAIN	---
EXISTING NATURAL WETLAND	---

STREAM LENGTH SUMMARY

CURRENT LENGTH OF STREAM	368.70m
LENGTH OF STREAM TO BE REMOVED	165.28m
LENGTH OF STREAM UNMODIFIED	203.42m
REALIGNED LENGTH OF STREAM	96.54m
DAYLIGHTED LENGTH OF STREAM	79.77m
EXISTING STREAM A TO BE RECLAIMED	65.56m
EXISTING STREAM A TO BE REALIGNED	99.72m

REVISION DETAILS	INT	DATE	SURVEYED	
3 STREAM LENGTHS ADDED TO PLAN	SF	22/01/24	DESIGNED	EW
4 ADDITIONAL STREAM LENGTHS ADDED TO PLAN	SF	22/01/24	DRAWN	EW
5 ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	CHECKED	GW
6 ISSUED FOR FAST TRACK CONSENT	EW	21/02/25	APPROVED	CD



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DRURY CENTRE-STAGE 2

STREAM WORKS
LAYOUT PLAN



STATUS	FOR FAST TRACK CONSENT	REV
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COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1151-DR	

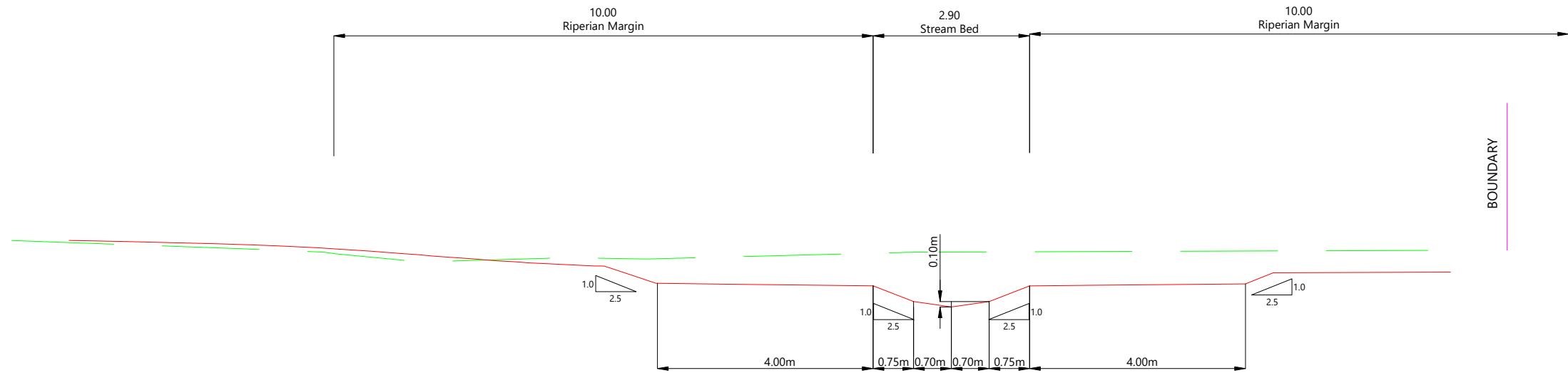


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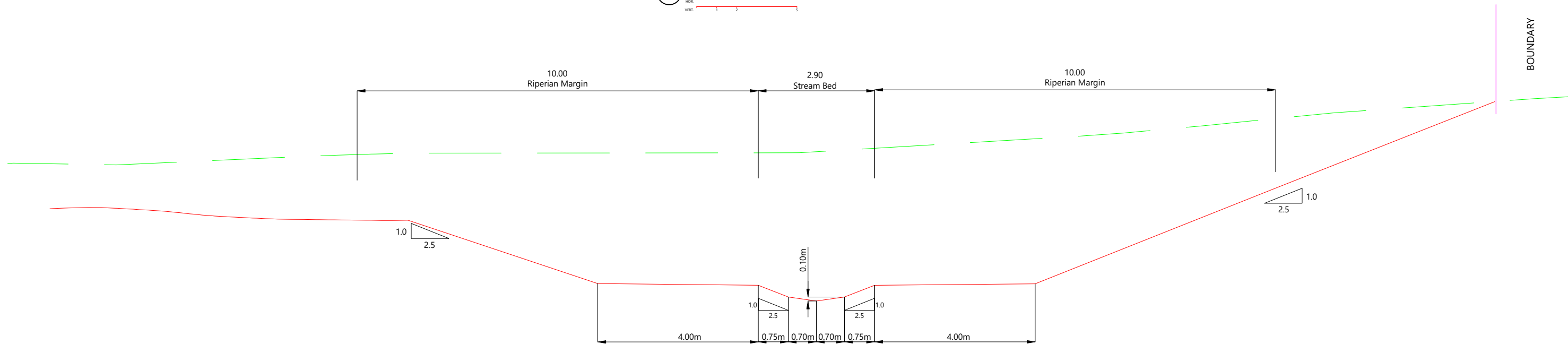
EXISTING GROUND LEVEL

PROPOSED SURFACE LEVEL

KIWI PROPERTY BOUNDARY



A-A
5500
STREAM REALIGNED CROSS SECTION



B-B
5501
STREAM REALIGNED CROSS SECTION

REVISION DETAILS						<div>BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229</div> <div>WOODS.CO.NZ</div>		DRURY CENTRE-STAGE 2				<div>STATUS<div>FOR FAST TRACK CONSENT</div>REV<div>4</div></div> <div>SCALE<div>1:100 @ A3</div></div> <div>COUNCIL<div>AUCKLAND COUNCIL</div></div> <div>DWG NO<div>P24-447-01-1160-DR</div></div>
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2	ISSUED FOR 90% DESIGN	NC	29/11/24	DRAWN				EW				
3	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	CHECKED				GW				
4	ISSUED FOR FAST TRACK CONSENT	EW	21/02/25	APPROVED				CD				
						STREAM WORKS CROSS SECTION A-A & B-B						

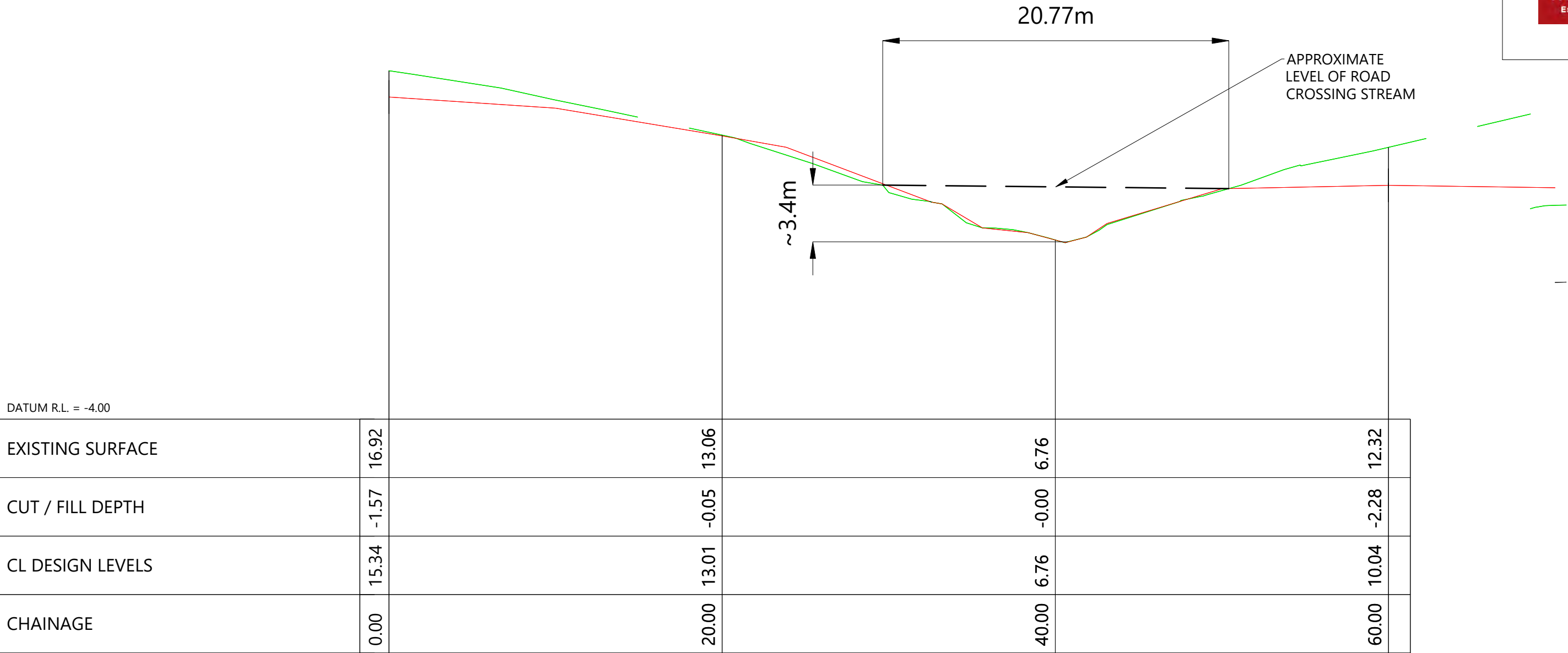


LEGEND

EXISTING GROUND LEVEL

PROPOSED SURFACE LEVEL

KIWI PROPERTY BOUNDARY



C-C
5500

STREAM EXISTING CROSS SECTION

HOR. 5 10 25
VERT.

REVISION DETAILS					INT	DATE	SURVEYED		<div>DRURY CENTRE-STAGE 2</div> <div>STREAM WORKS</div> <div>CROSS SECTION C-C</div>			STATUS	FOR FAST TRACK CONSENT	REV
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4	ISSUED FOR FAST TRACK CONSENT				EW	21/02/25	APPROVED	CD						



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LEGEND

PROPOSED CUT

PROPOSED FILL

CUT CONTOUR

FILL CONTOUR

ZERO CONTOUR

110kV TRANSMISSION POWERLINES

220kV TRANSMISSION POWERLINES

EXISTING STREAM

REALIGNED STREAM

WETLAND 10m SETBACK

WETLAND 100m SETBACK

EARTHWORK EXTENT

STREAM TO BE REALIGNED

STREAM TO DAYLIGHTED

STAGE 2 BOUNDARY

NZTA DESIGNATION BOUNDARY

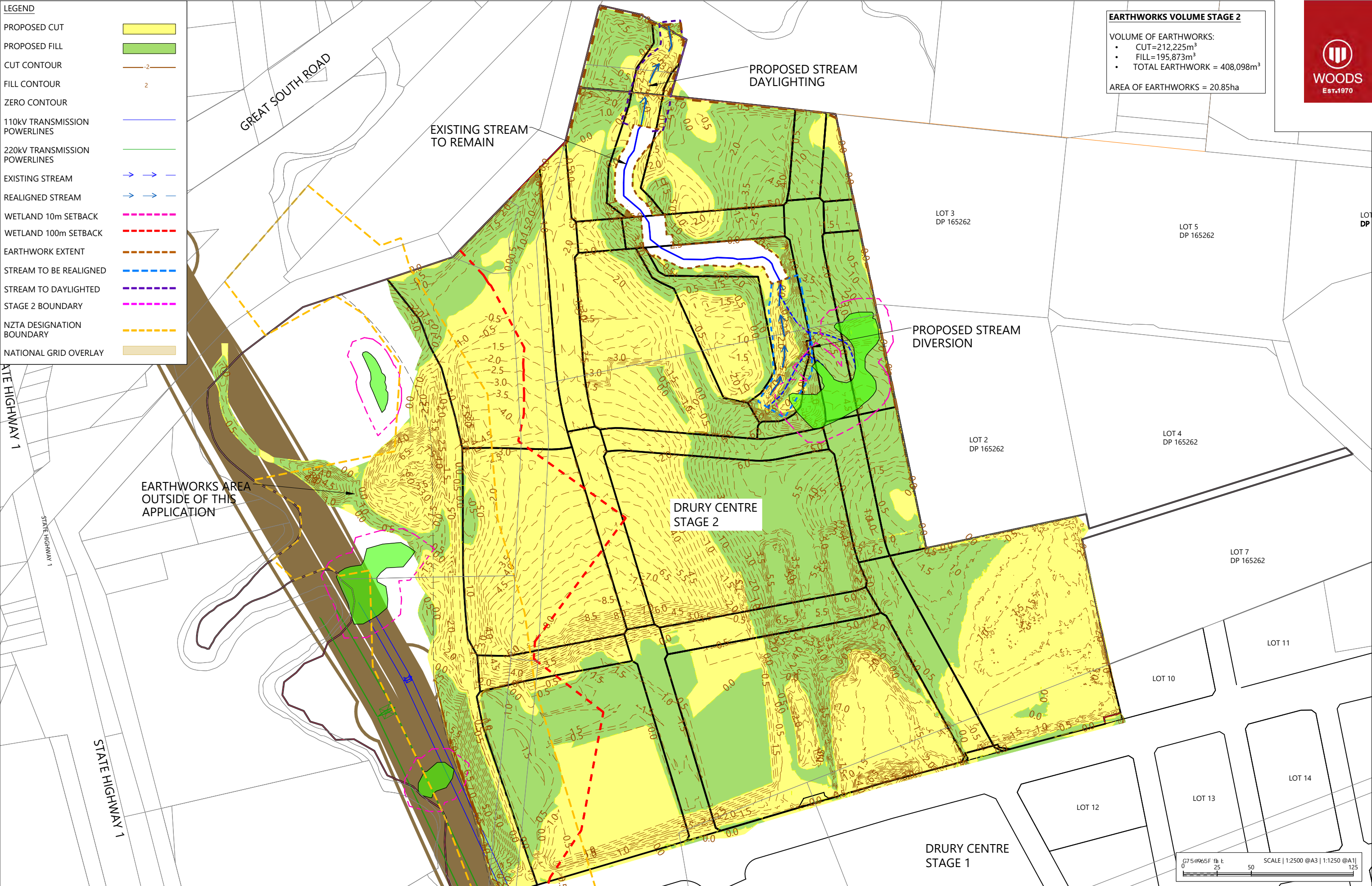
NATIONAL GRID OVERLAY

EARTHWORKS VOLUME STAGE 2

VOLUME OF EARTHWORKS:

- CUT=212,225m³
- FILL=195,873m³
- TOTAL EARTHWORK = 408,098m³

AREA OF EARTHWORKS = 20.85ha



REVISION DETAILS		INT	DATE	SURVEYED	
1	ISSUED FOR DISCUSSION	EW	19/11/2024	DESIGNED	JK
2	FOR 90% DESIGN	NC	29/11/24	DRAWN	JK
3	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	CHECKED	GW
4	ISSUED FOR FAST TRACK CONSENT	EW	21/02/25	APPROVED	GW



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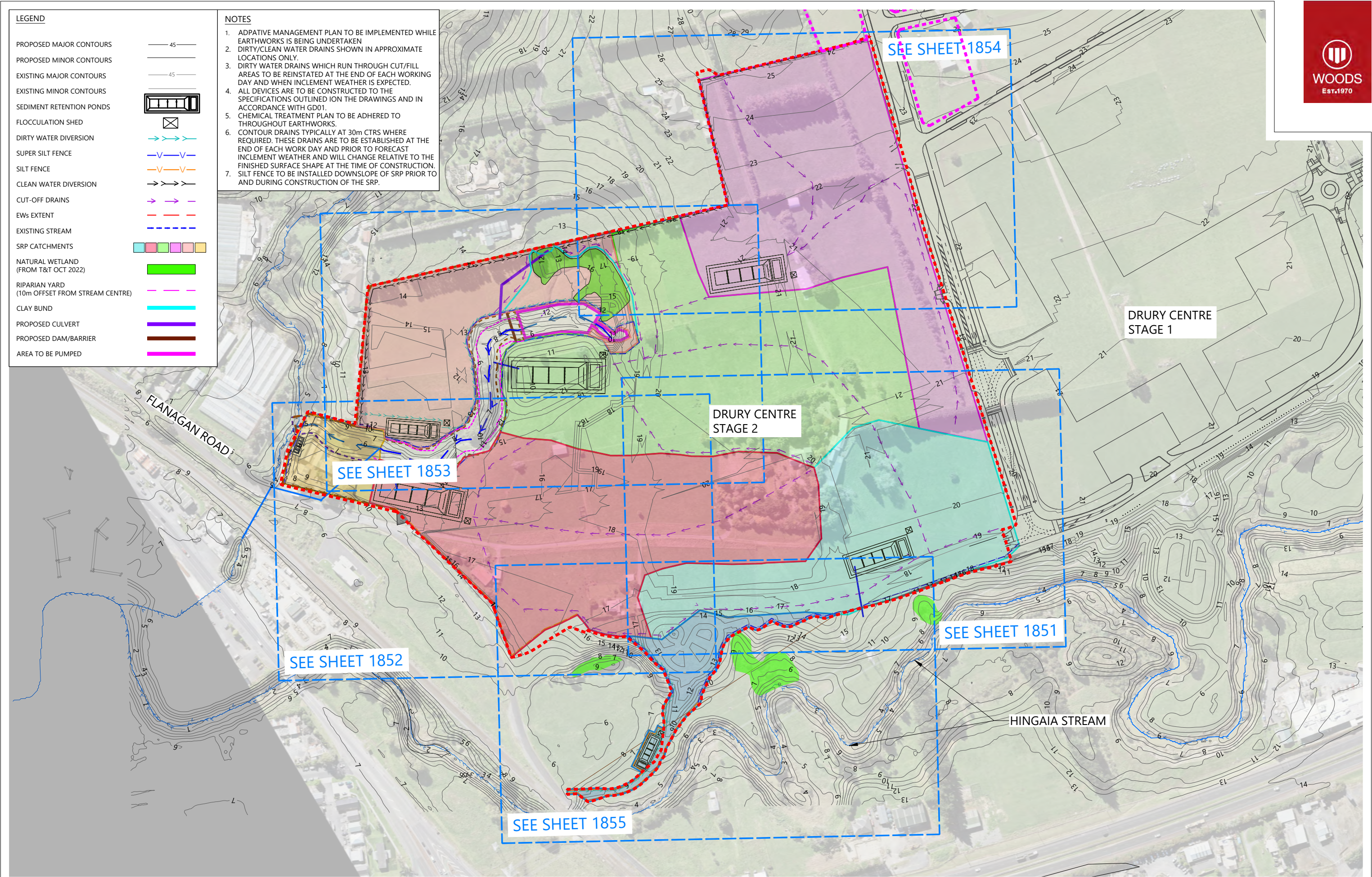



DRURY CENTRE-STAGE 2

STAGE 2 CUT FILL PLAN



STATUS	FOR FAST TRACK CONSENT	REV
SCALE	1:2500 @ A3	4
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1200-EW	



REVISION DETAILS			INT	DATE	SURVEYED	BJ	
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					APPROVED	GW	

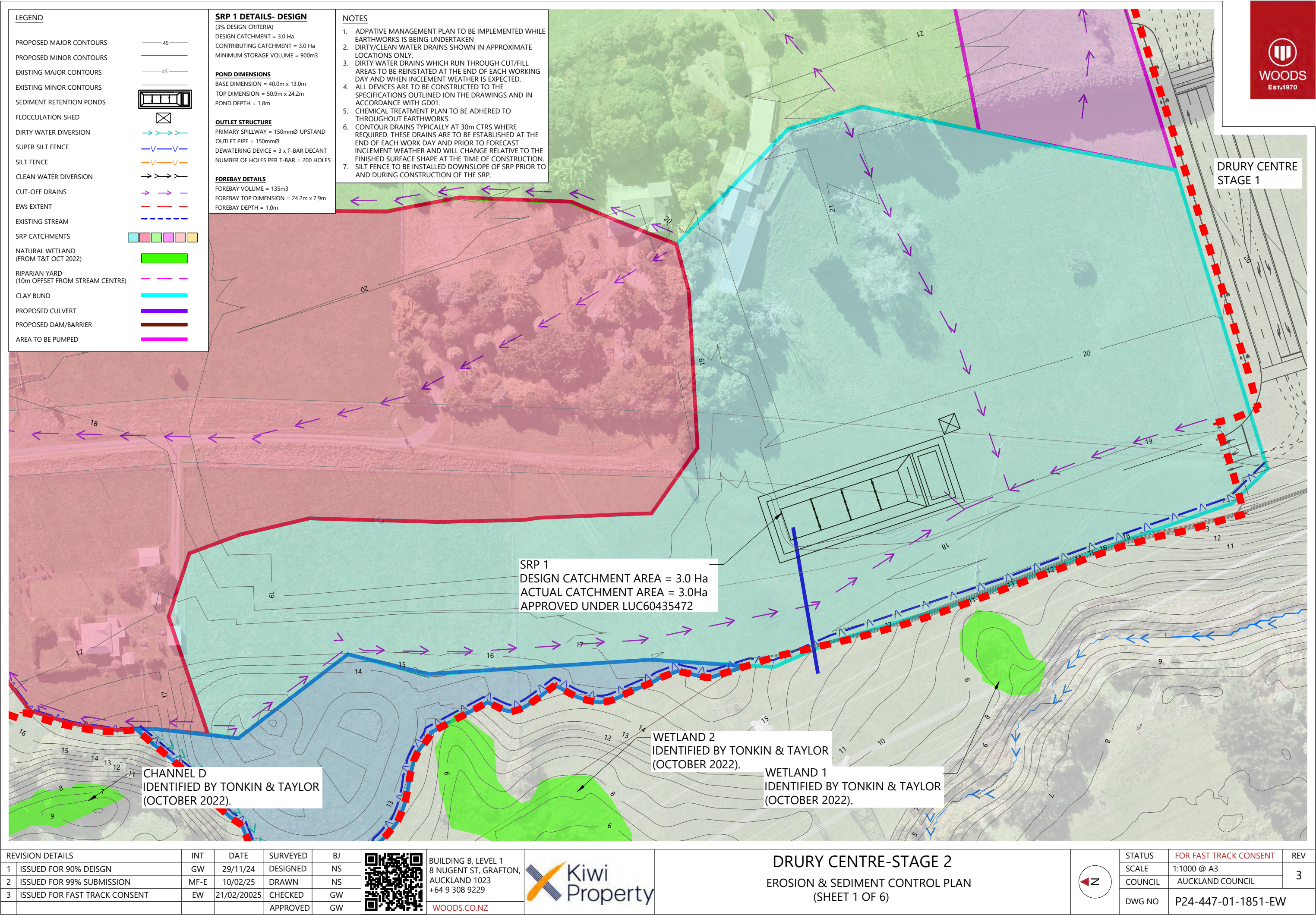
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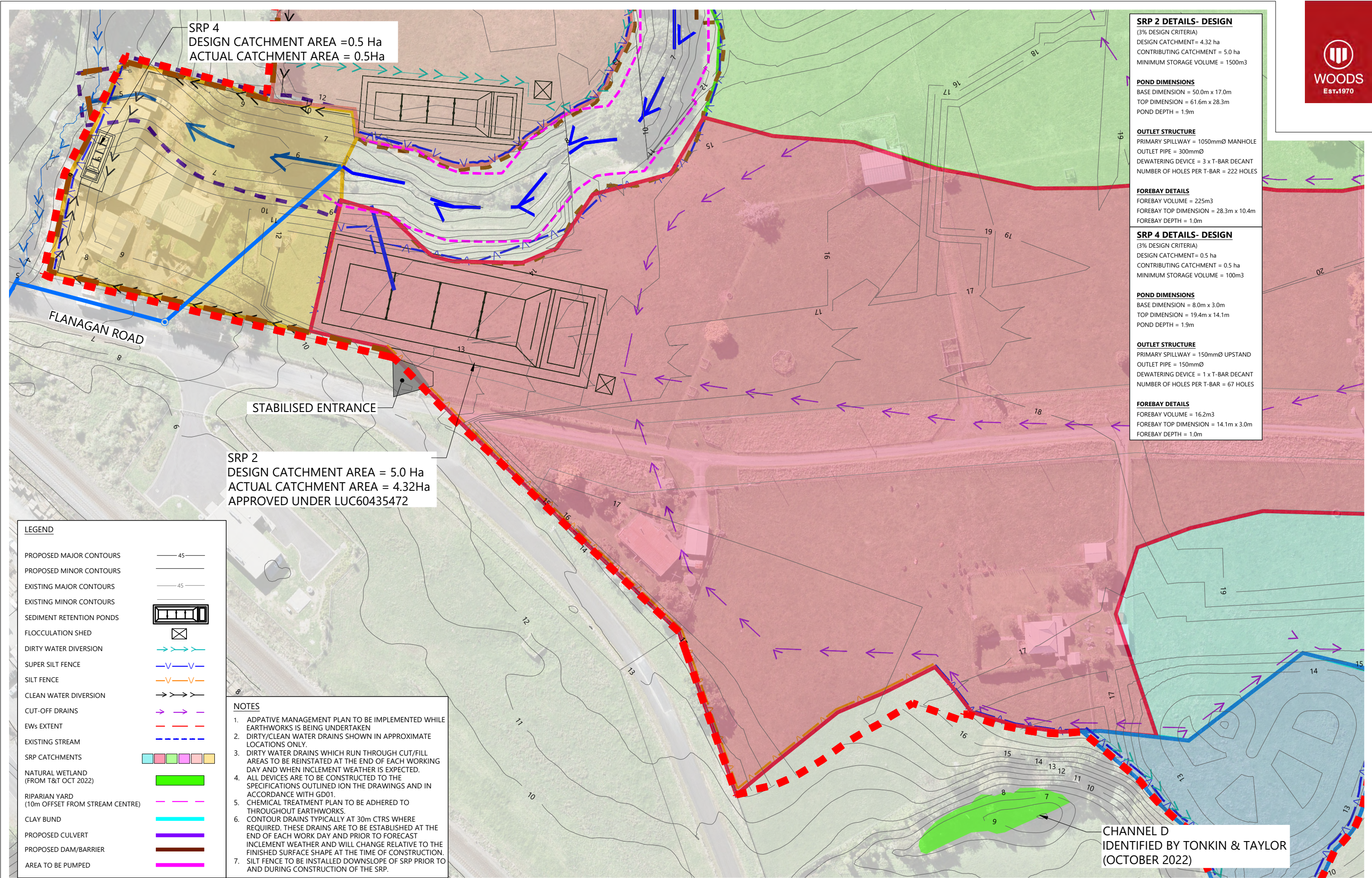


DRURY CENTRE-STAGE 2
OVERALL EROSION & SEDIMENT CONTROL PLAN

	STATUS	FOR FAST TRACK CONSENT	REV
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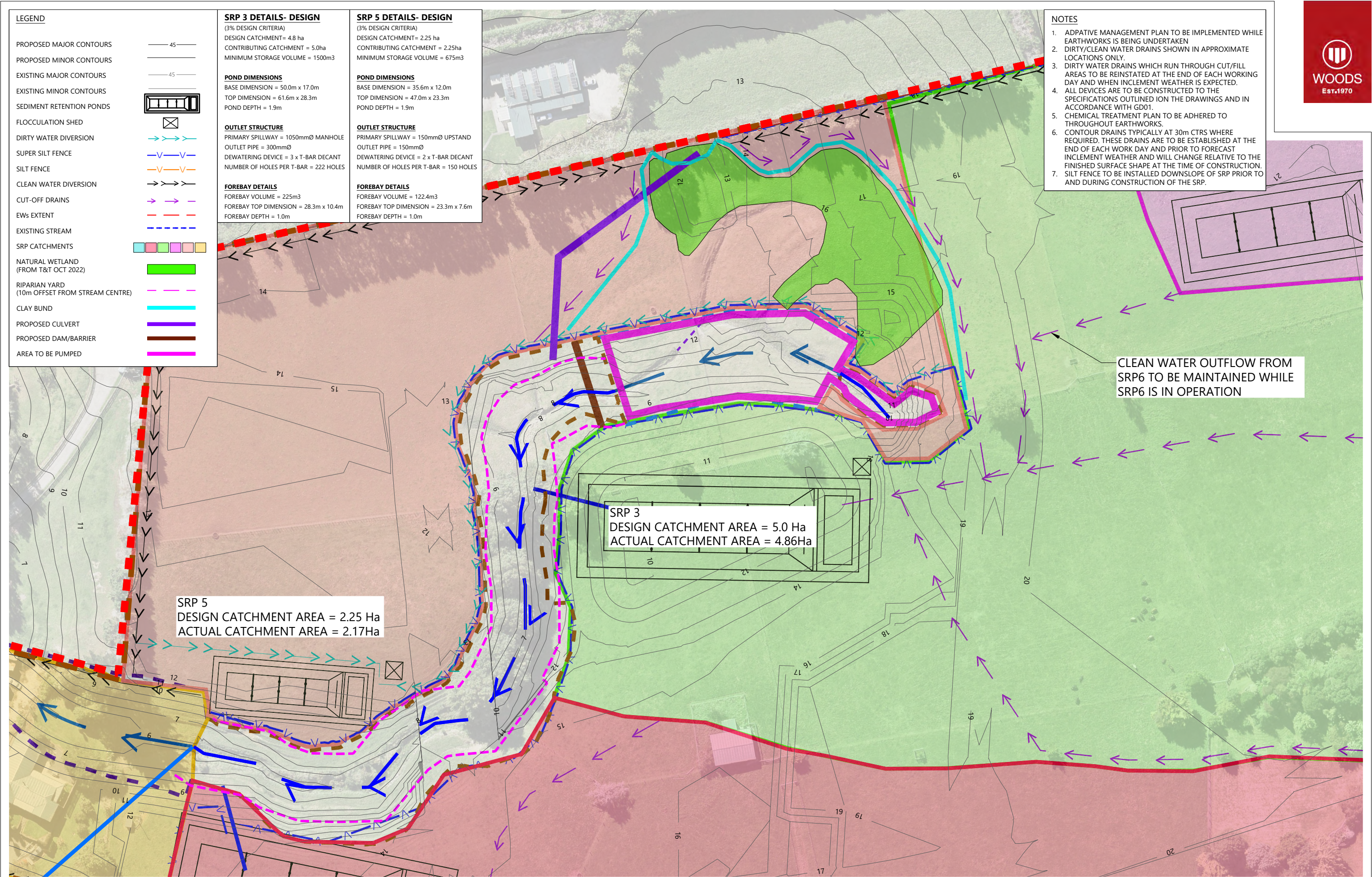
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		EW	21/02/20025	CHECKED
				APPROVED

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DRURY CENTRE-STAGE 2
EROSION & SEDIMENT CONTROL PLAN
(SHEET 2 OF 6)

STATUS		FOR FAST TRACK CONSENT	REV
SCALE	1:1000 @ A3		3
COUNCIL	AUCKLAND COUNCIL		
DWG NO	P24-447-01-1852-EW		



REVISION DETAILS				
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2	ISSUED FOR 99% SUBMISSION	GW	29/11/24	DESIGNED
3	ISSUED FOR FAST TRACK CONSENT	MF-E	10/02/25	DRAWN
		EW	21/02/20025	CHECKED
				APPROVED

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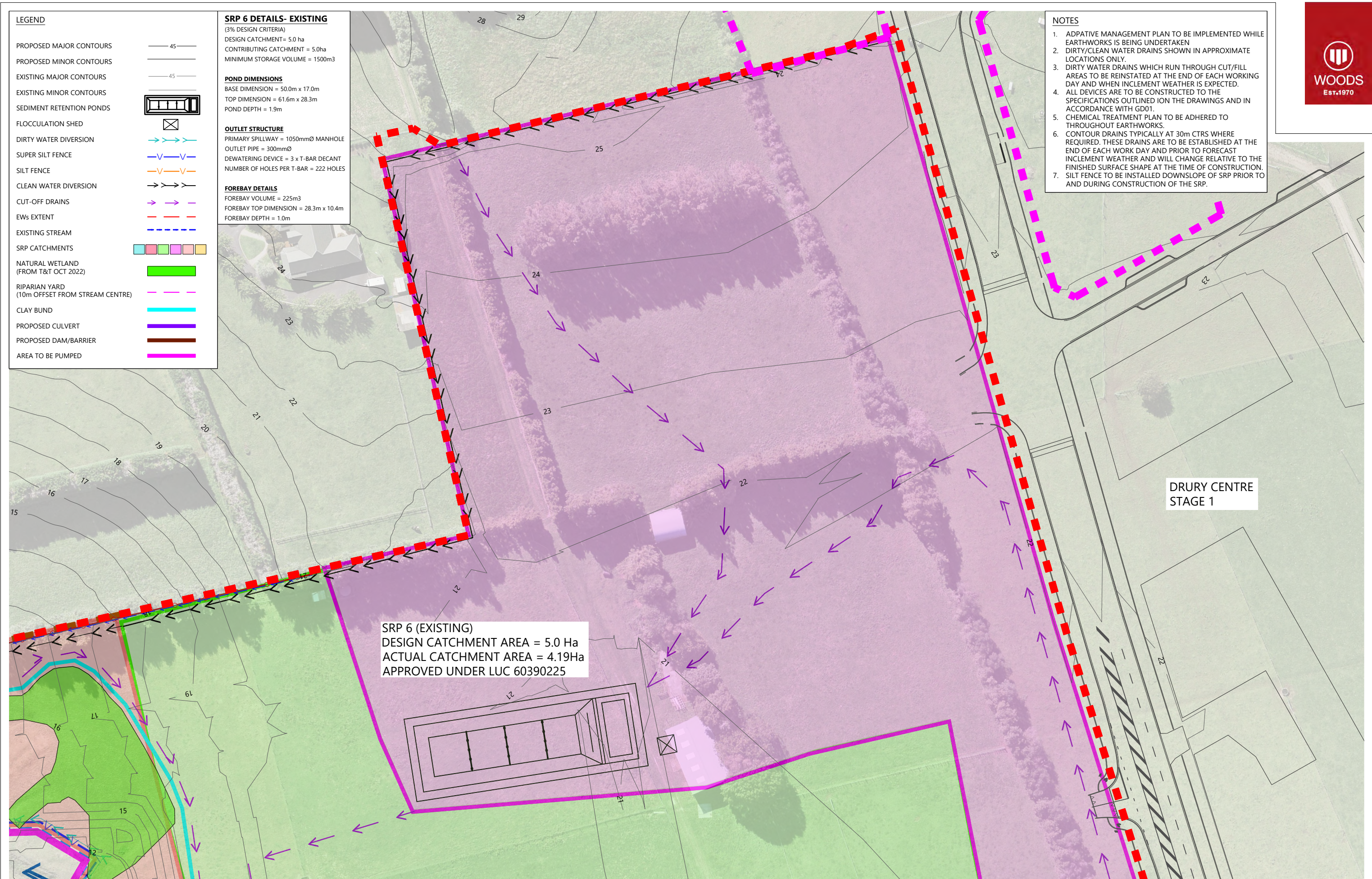
DRURY CENTRE-STAGE 2
EROSION & SEDIMENT CONTROL PLAN
(SHEET 3 OF 6)

	STATUS	FOR FAST TRACK CONSENT	REV
	SCALE	1:1000 @ A3	3
	COUNCIL	AUCKLAND COUNCIL	
	DWG NO	P24-447-01-1853-EW	



Plot Date: 9:56:07 am, 21 February 2025, ELLAWA

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REVISION DETAILS		INT	DATE	SURVEYED	BJ
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2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN	NS
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED	GW
				APPROVED	GW



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DRURY CENTRE-STAGE 2
EROSION & SEDIMENT CONTROL PLAN
(SHEET 4 OF 6)



STATUS	FOR FAST TRACK CONSENT	REV
SCALE	1:1000 @ A3	3
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1854-EW	

LEGEND

PROPOSED MAJOR CONTOURS

PROPOSED MINOR CONTOURS

EXISTING MAJOR CONTOURS

EXISTING MINOR CONTOURS

SEDIMENT RETENTION PONDS

FLOCCULATION SHED

DIRTY WATER DIVERSION

SUPER SILT FENCE

SILT FENCE

CLEAN WATER DIVERSION

CUT-OFF DRAINS

EWs EXTENT

EXISTING STREAM

SRP CATCHMENTS

NATURAL WETLAND
(FROM T&T OCT 2022)

RIPARIAN YARD
(10m OFFSET FROM STREAM CENTRE)

CLAY BUND

PROPOSED CULVERT

PROPOSED DAM/BARRIER

AREA TO BE PUMPED

— 45 —

— 45 —

NOTES

1. ADPATIVE MANAGEMENT PLAN TO BE IMPLEMENTED WHILE EARTHWORKS IS BEING UNDERTAKEN

2. DIRTY/CLEAN WATER DRAINS SHOWN IN APPROXIMATE LOCATIONS ONLY.

3. DIRTY WATER DRAINS WHICH RUN THROUGH CUT/FILL AREAS TO BE REINSTATED AT THE END OF EACH WORKING DAY AND WHEN INCLEMENT WEATHER IS EXPECTED.

4. ALL DEVICES ARE TO BE CONSTRUCTED TO THE SPECIFICATIONS OUTLINED ION THE DRAWINGS AND IN ACCORDANCE WITH GDD1.

5. CHEMICAL TREATMENT PLAN TO BE ADHERED TO THROUGHOUT EARTHWORKS.

6. CONTOUR DRAINS TYPICALLY AT 30m CTRS WHERE REQUIRED. THESE DRAINS ARE TO BE ESTABLISHED AT THE END OF EACH WORK DAY AND PRIOR TO FORECAST INCLEMENT WEATHER AND WILL CHANGE RELATIVE TO THE FINISHED SURFACE SHAPE AT THE TIME OF CONSTRUCTION.

7. SILT FENCE TO BE INSTALLED DOWNSLOPE OF SRP PRIOR TO AND DURING CONSTRUCTION OF THE SRP.

SRP 7
DESIGN CATCHMENT AREA = 1.0 Ha
ACTUAL CATCHMENT AREA = 0.65Ha

SRP 7 DETAILS- EXISTING
(3% DESIGN CRITERIA)
DESIGN CATCHMENT= 0.65 ha
CONTRIBUTING CATCHMENT = 1.0ha
MINIMUM STORAGE VOLUME = 300m3

POND DIMENSIONS
BASE DIMENSION = 24.0m x 8.0m
TOP DIMENSION = 33.6m x 17.6m
POND DEPTH = 1.6m

OUTLET STRUCTURE
PRIMARY SPILLWAY = 150mmØ UPSTAND
OUTLET PIPE = 150mmØ
DEWATERING DEVICE = 1 x T-BAR DECANT
NUMBER OF HOLES PER T-BAR = 133 HOLES

FOREBAY DETAILS
FOREBAY VOLUME = 45m3
FOREBAY TOP DIMENSION = 17.6m x 4.6m
FOREBAY DEPTH = 1.0m

REVISION DETAILS					INT	DATE	SURVEYED	BJ
1	ISSUED FOR 90% DESIGN				NS	06/12/24	DESIGNED	NS
2	ISSUED FOR 99% SUBMISSION				MF-E	10/02/25	DRAWN	NS
3	ISSUED FOR FAST TRACK CONSENT				EW	21/02/20025	CHECKED	GW
							APPROVED	GW

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DRURY CENTRE-STAGE 2
EROSION & SEDIMENT CONTROL PLAN
(SHEET 5 OF 6)

	STATUS	FOR FAST TRACK CONSENT	REV
	SCALE	1:1000 @ A3	3
	COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1855-EW		

Plot Date: 9:56:08 am,21 February 2025, ELLAWA

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LEGEND

PROPOSED MAJOR CONTOURS

PROPOSED MINOR CONTOURS

EXISTING MAJOR CONTOURS

EXISTING MINOR CONTOURS

SEDIMENT RETENTION PONDS

FLOCCULATION SHED

DIRTY WATER DIVERSION

SUPER SILT FENCE

SILT FENCE

CLEAN WATER DIVERSION

CUT-OFF DRAINS

EWs EXTENT

EXISTING STREAM

SRP CATCHMENTS

NATURAL WETLAND
(FROM T&T OCT 2022)

RIPARIAN YARD
(10m OFFSET FROM STREAM CENTRE)

CLAY BUND

PROPOSED CULVERT

PROPOSED DAM/BARRIER

AREA TO BE PUMPED

45

45

- NOTES
1. ADPATIVE MANAGEMENT PLAN TO BE IMPLEMENTED WHILE EARTHWORKS IS BEING UNDERTAKEN

2. DIRTY/CLEAN WATER DRAINS SHOWN IN APPROXIMATE LOCATIONS ONLY.

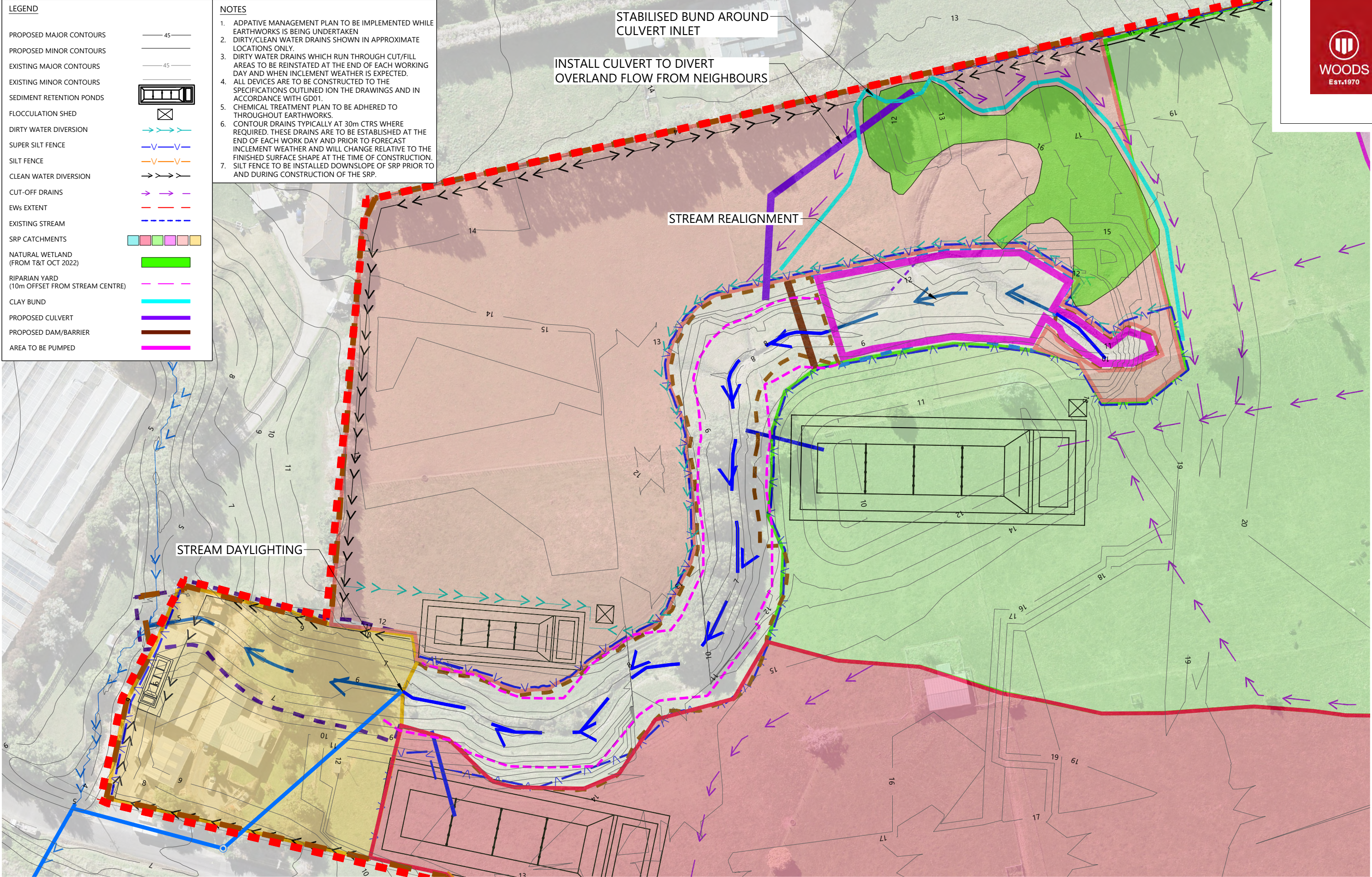
3. DIRTY WATER DRAINS WHICH RUN THROUGH CUT/FILL AREAS TO BE REINSTATED AT THE END OF EACH WORKING DAY AND WHEN INCLEMENT WEATHER IS EXPECTED.

4. ALL DEVICES ARE TO BE CONSTRUCTED TO THE SPECIFICATIONS OUTLINED ION THE DRAWINGS AND IN ACCORDANCE WITH GD01.

5. CHEMICAL TREATMENT PLAN TO BE ADHERED TO THROUGHOUT EARTHWORKS.

6. CONTOUR DRAINS TYPICALLY AT 30m CTRS WHERE REQUIRED. THESE DRAINS ARE TO BE ESTABLISHED AT THE END OF EACH WORK DAY AND PRIOR TO FORECAST INCLEMENT WEATHER AND WILL CHANGE RELATIVE TO THE FINISHED SURFACE SHAPE AT THE TIME OF CONSTRUCTION.

7. SILT FENCE TO BE INSTALLED DOWNSLOPE OF SRP PRIOR TO AND DURING CONSTRUCTION OF THE SRP.



REVISION DETAILS					INT	DATE	SURVEYED	BJ
1	ISSUED FOR 90% DESIGN				GW	29/11/24	DESIGNED	NS
2	ISSUED FOR 99% SUBMISSION				MF-E	10/02/25	DRAWN	NS
3	ISSUED FOR FAST TRACK CONSENT				EW	21/02/20025	CHECKED	GW
							APPROVED	GW



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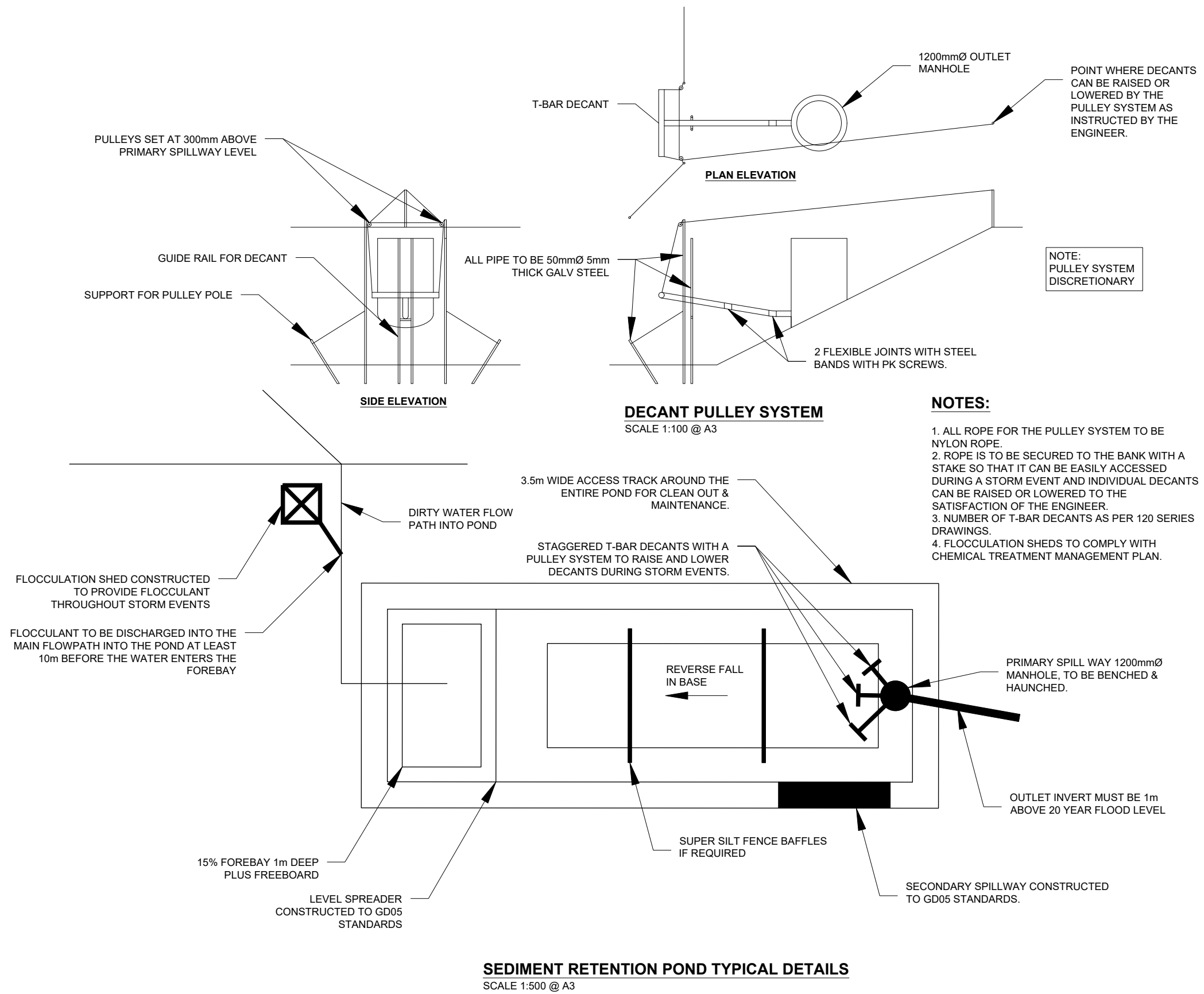
DRURY CENTRE-STAGE 2


EROSION & SEDIMENT CONTROL PLAN FOR REALIGNING STREAM

(SHEET 6 OF 6)



STATUS	FOR FAST TRACK CONSENT	REV
SCALE	1:1000 @ A3	3
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1856-EW	



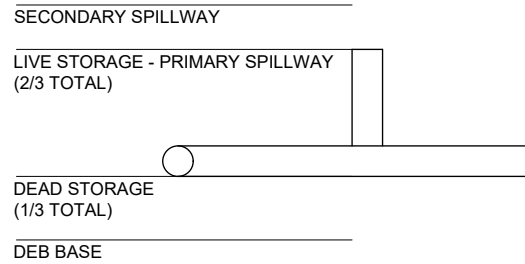
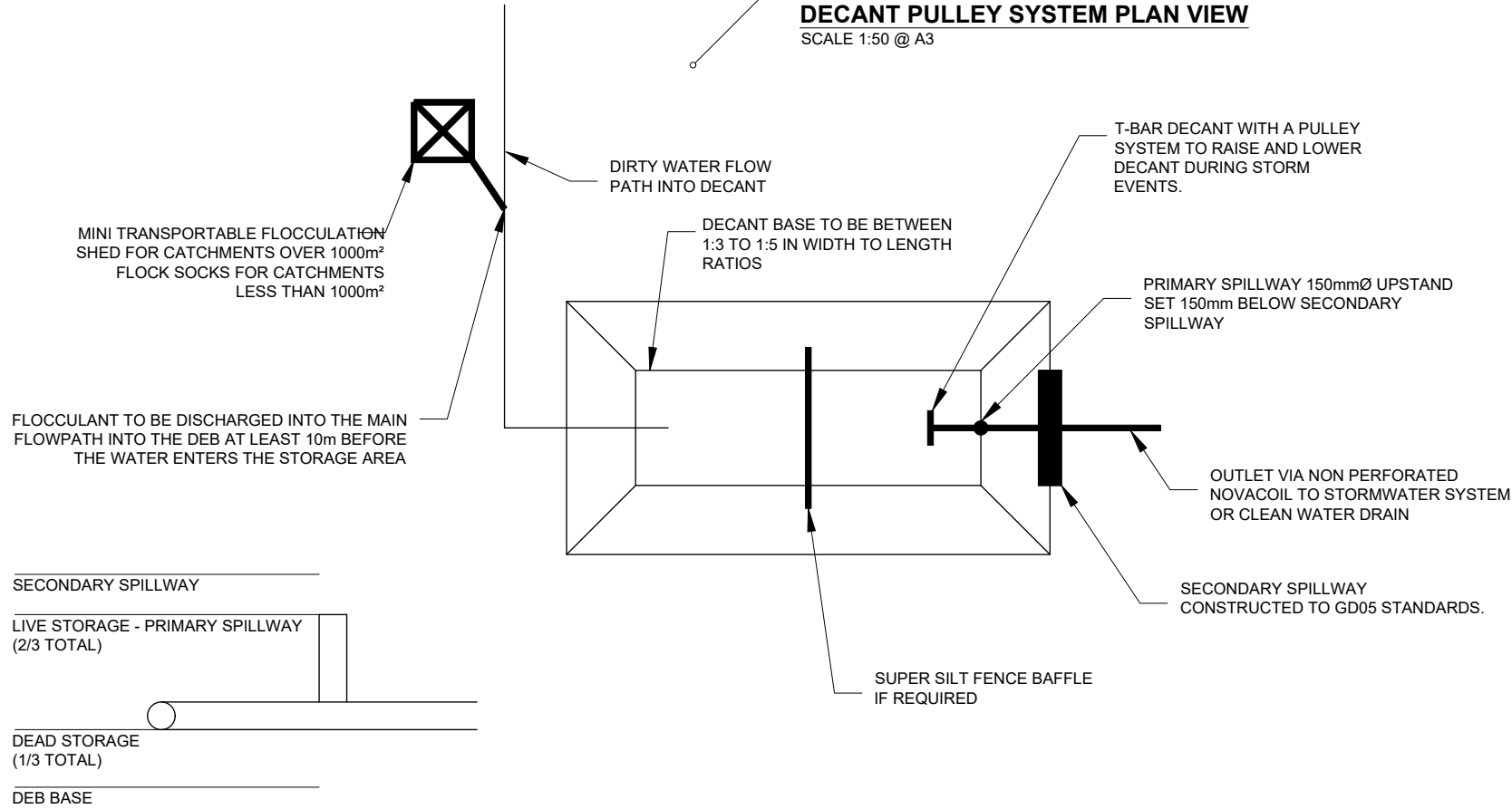
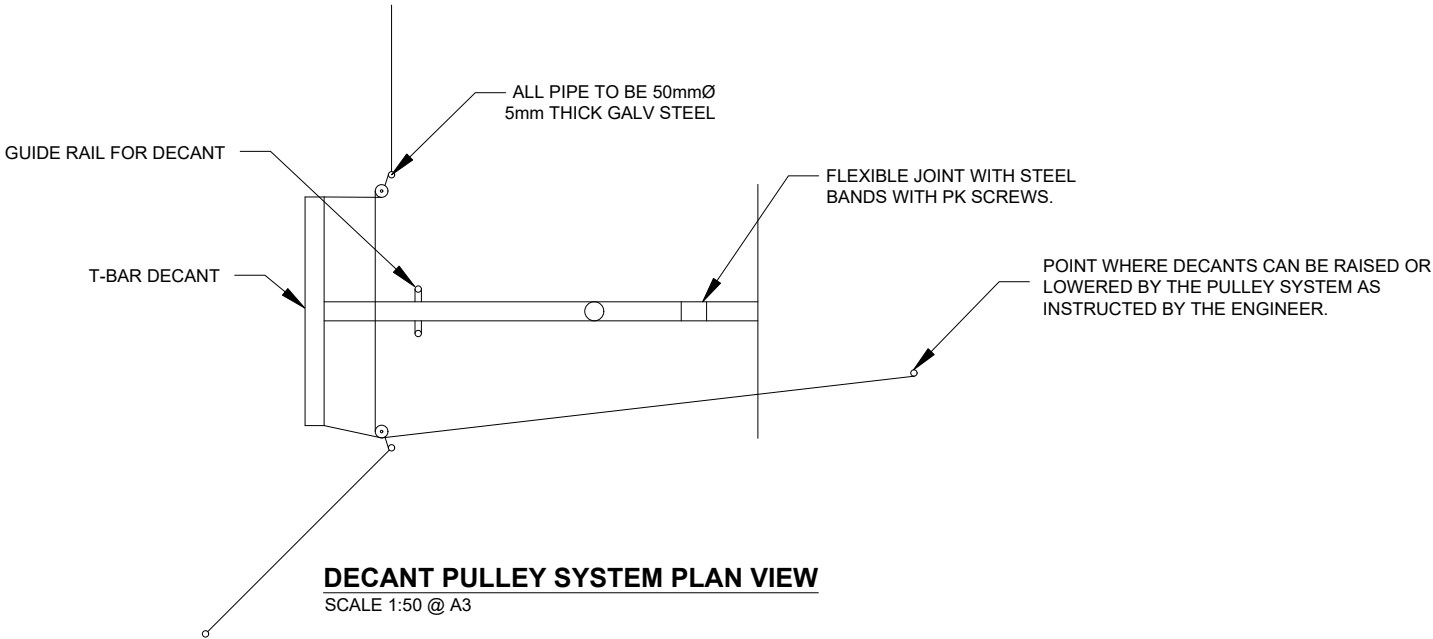
REVISION DETAILS					
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2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN	
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED	
				APPROVED	GW

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DRURY CENTRE-STAGE 2
STAGE 2 BULK EARTHWORKS
EROSION & SEDIMENT CONTROL TYPICAL DETAILS

STATUS	FOR FAST TRACK CONSENT	REV
SCALE	NOT TO SCALE	3
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1857-EW	



REVISION DETAILS		INT	DATE	SURVEYED		
1	ISSUED FOR 90% DESIGN	GW	29/11/24	DESIGNED	NS	
2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN	NS	
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED	GW	
				APPROVED	GW	

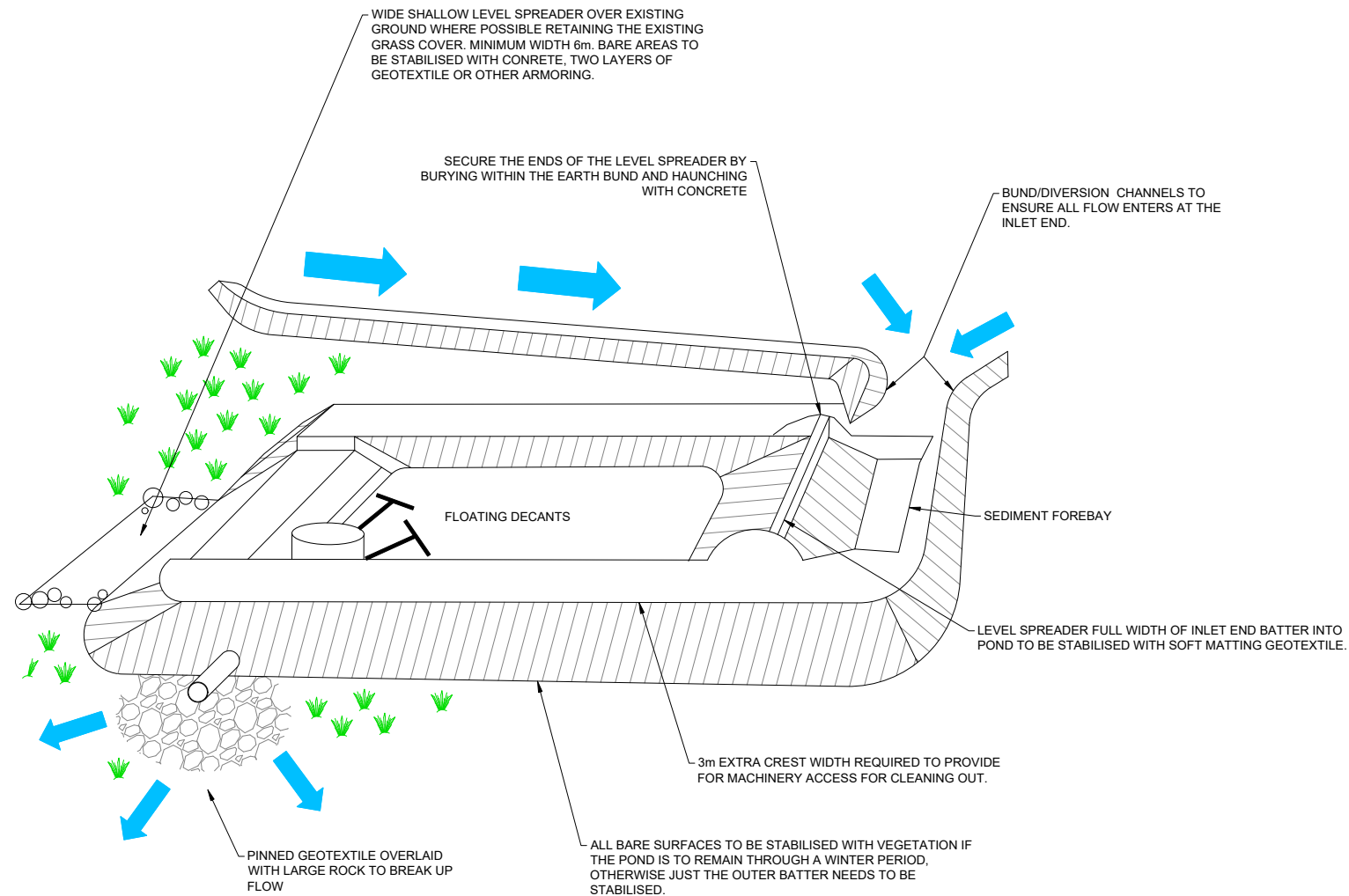


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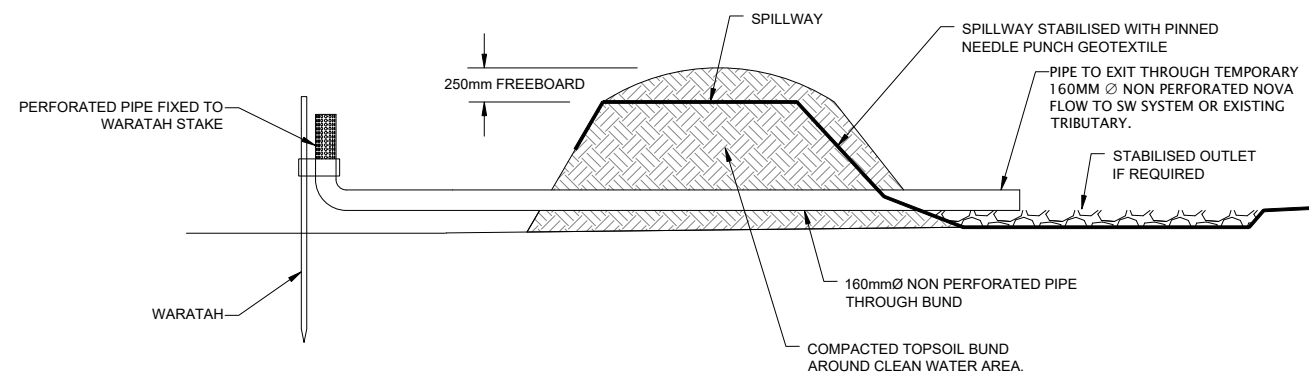


DRURY CENTRE-STAGE 2
STAGE 2 BULK EARTHWORKS
EROSION & SEDIMENT CONTROL TYPICAL DETAILS

STATUS	FOR FAST TRACK CONSENT	REV
SCALE	NOT TO SCALE	3
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1858-EW	

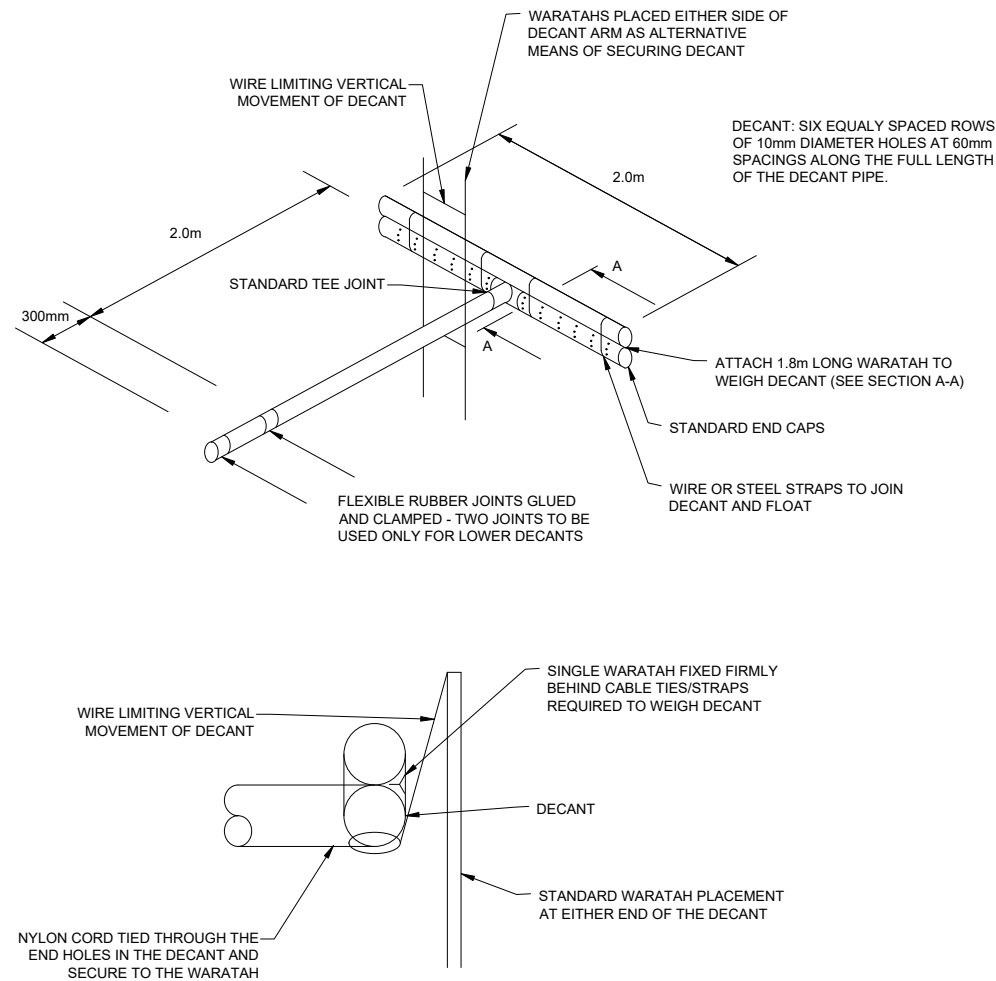


SEDIMENT RETENTION POND SCHEMATIC

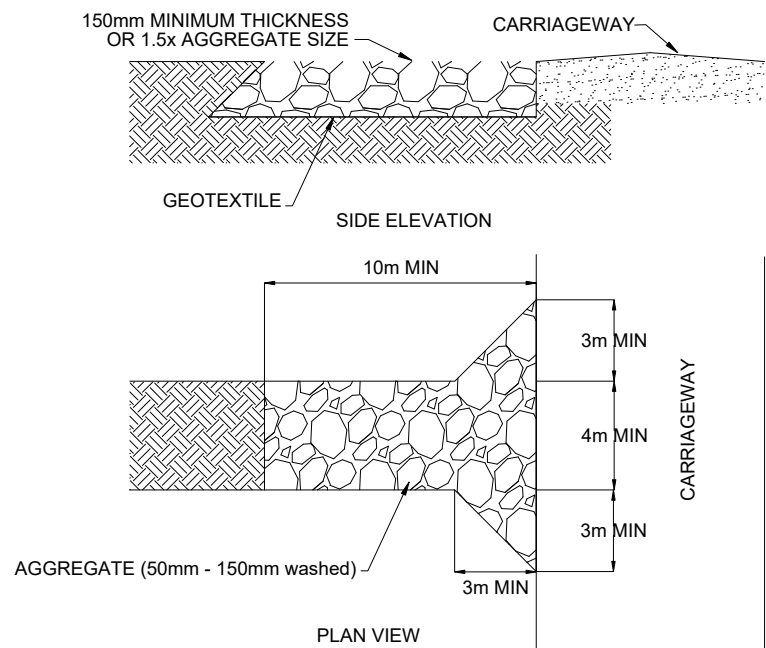


CLEAN WATER DECANT DETAIL

NOTES:
REFER TO ESCP FOR DECANT DESIGN & NUMBER OF HOLES.



T-BAR DECANT DETAIL



STABILISED CONSTRUCTION ENTRANCE DETAIL

REVISION DETAILS					INT	DATE	SURVEYED	
1	ISSUED FOR 90% DESIGN	GW	29/11/24	DESIGNED	NS			
2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN	NS			
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED	GW			
				APPROVED	GW			

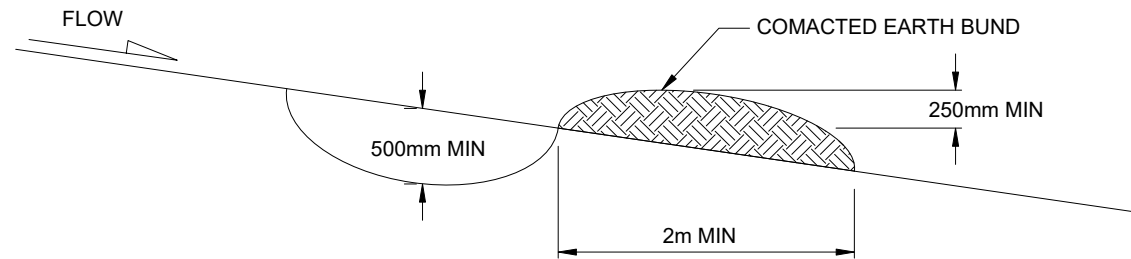


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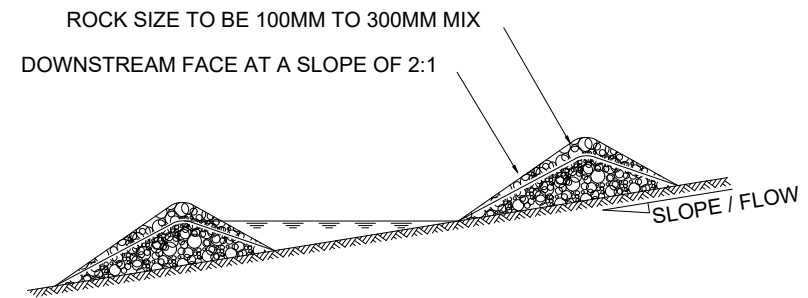
DRURY CENTRE-STAGE 2
STAGE 2 BULK EARTHWORKS
EROSION & SEDIMENT CONTROL TYPICAL DETAILS

STATUS	FOR FAST TRACK CONSENT	REV
SCALE	NOT TO SCALE	3
COUNCIL	AUCKLAND COUNCIL	
DWG NO	P24-447-01-1859-EW	



CONTOUR DRAIN DETAIL

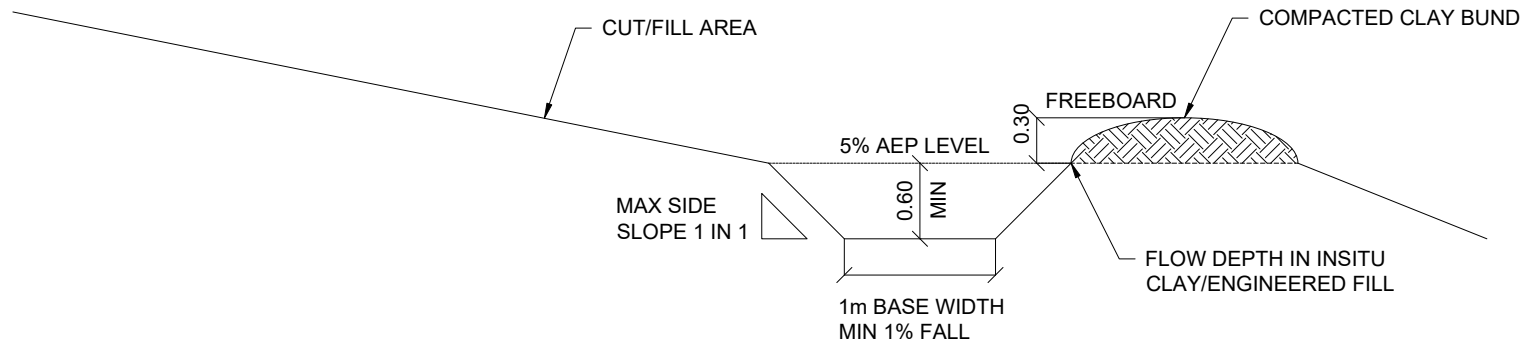
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ELEVATION



CROSS SECTION



PRIMARY DIRTY WATER DIVERSION DRAIN DETAIL

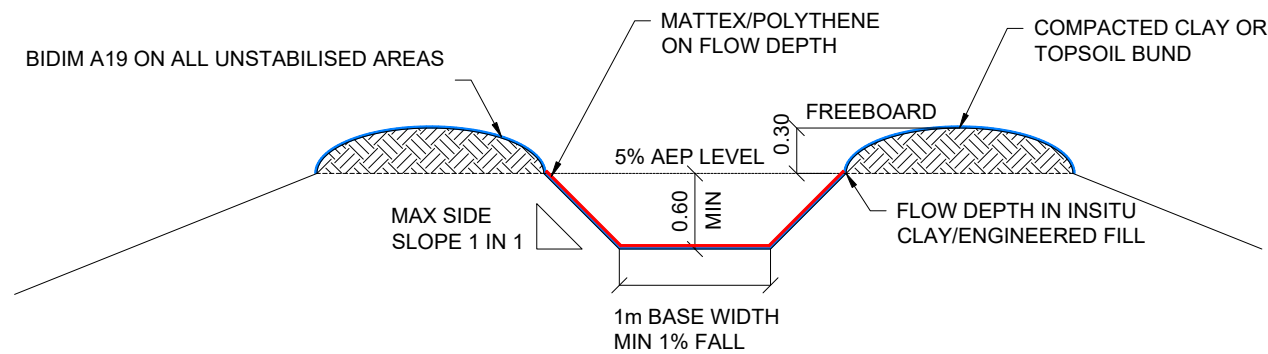
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STANDARD ROCK CHECK DAM DESIGN

SLOPE	SPACING (M) BETWEEN DAMS (450MM CENTRE HEIGHT)	SPACING (M) BETWEEN DAMS (600MM CENTRE HEIGHT)
2% OR LESS	24	30
2% TO 4%	12	15
4% TO 7%	8	11
7% TO 10%	5	6
OVER 10%	USE STABILISED CHANNEL	USE STABILISED CHANNEL

ROCK CHECK DAM DETAIL

Not to Scale



PRIMARY CLEAN WATER DIVERSION DRAIN DETAIL

Scale: 1:50 @ A3

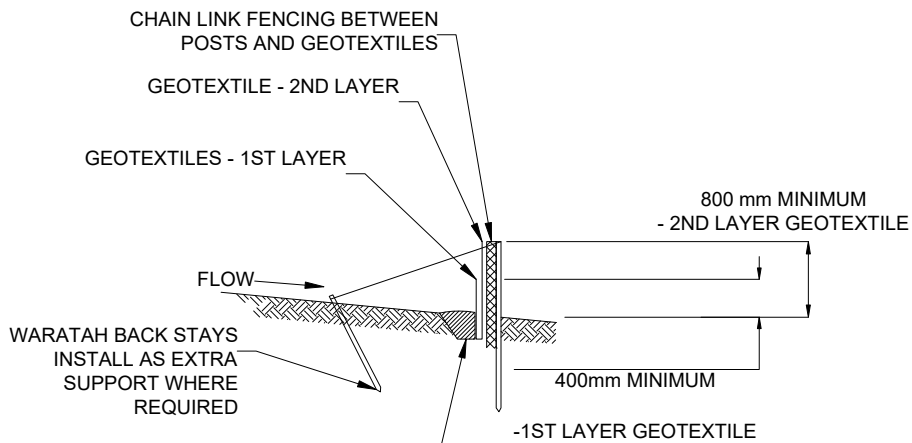
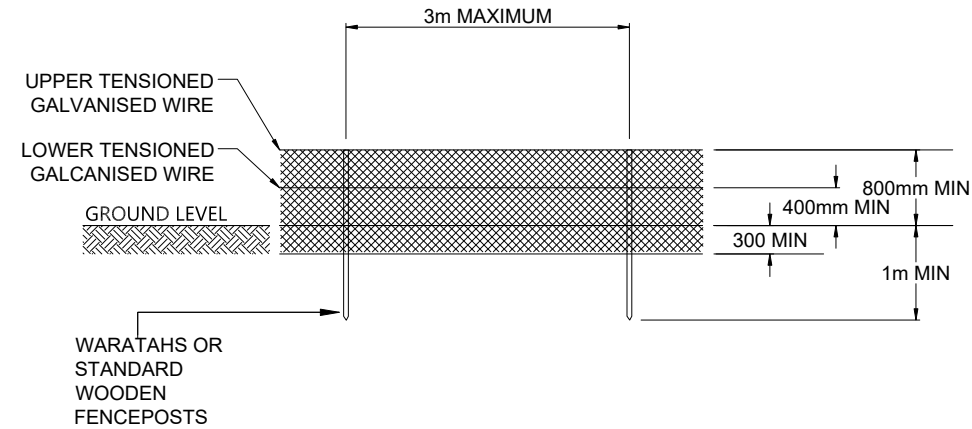
PRIMARY DRAINS NOTES:

1. DRAINS DESIGNED FOR MAXIMUM 6 Ha CATCHMENTS WITH MINIMUM 1% GRADES. WHERE CATCHMENTS ARE LARGER OR GRADES ARE LESS, THEN FURTHER DESIGN IS REQUIRED BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. LINING OF CLEAN WATER DRAINS IS TO BE BIDIM A19 ON ALL EXPOSED CLAY AREAS AND MATTEX GT15 ON TOP OF BIDIM WITHIN FLOW CHANNEL. POLYTHENE MAY BE REQUIRED UPON INSTRUCTION BY GEOTECHNICAL ENGINEER IN SPECIFIC AREAS.
3. ROCK CHECK DAMS IN CLEAN WATER AND DROP OUT PITS FOR DIRTY WATER DRAINS ARE REQUIRED FOR GRADES STEEPER THAN 5%. LOCATIONS TO BE DETERMINED ON SITE BY ENGINEER PRIOR TO INSTALLATION.

REVISION DETAILS						BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229 WOODS.CO.NZ		DRURY CENTRE-STAGE 2 STAGE 2 BULK EARTHWORKS EROSION & SEDIMENT CONTROL TYPICAL DETAILS				
1	ISSUED FOR 90% DESIGN	GW	29/11/24	DESIGNED						STATUS	FOR FAST TRACK CONSENT	REV
2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN						SCALE	NOT TO SCALE	3
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED						COUNCIL	AUCKLAND COUNCIL	
				APPROVED						DWG NO	P24-447-01-1860-EW	

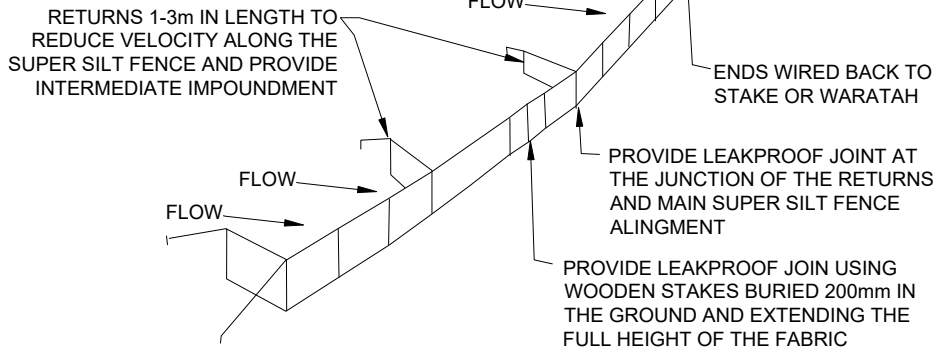
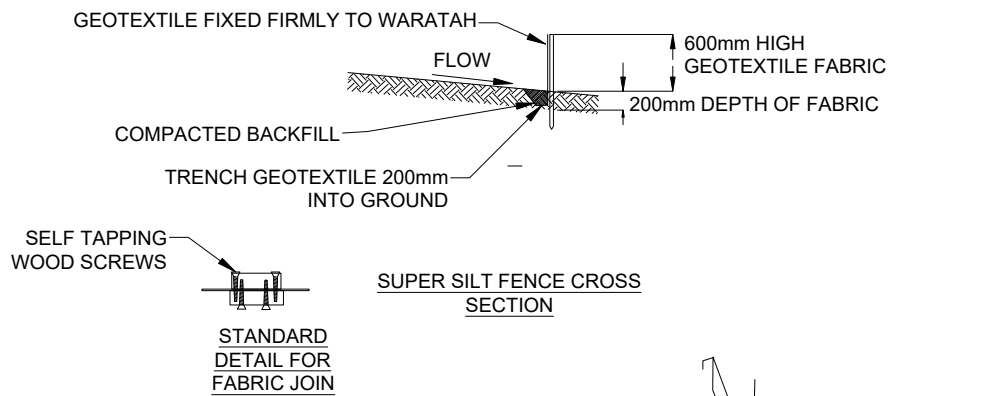
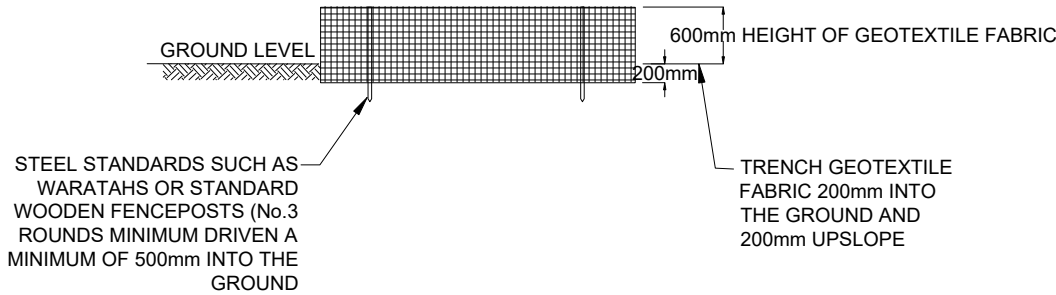
NOTES:
1. POST SPACING CAN BE INCREASED FROM 2m TO 4m IF SUPPORTED BY A 2.5mm DIAMETER HIGH TENSILE WIRE ALONG THE TOP WITH CLIPS EVERY 200mm
2. WRAP BOTH ENDS OF THE FABRIC AROUND ON STAKE AND CLAMP THE OTHER STAKE TO IT USING SELF TAPPING WOOD SCREWS AT 150mm SPACINGS

SUPER SILT FENCE RETURNS DETAILS	
SLOPE DRAIN (%)	SPACING RETURN (m)
00-10	60
10-20	50
20-33	40
33-50	30
>50	20



TYPICAL CATCHMENT DETAILS		
SLOPE (%)	SLOPE LENGTH (m)	SUPER SILT FENCE (m)
00-10	UNLIMITED	UNLIMITED
10-20	60	450
20-33	30	300
33-50	30	150
>50	15	75

SUPER SUPER SILT FENCE DETAIL



SUPER SILT FENCE WITH RETURNS DETAIL

REVISION DETAILS						<div>BUILDING B, LEVEL 1 8 NUGENT ST, GRAFTON, AUCKLAND 1023 +64 9 308 9229</div> <div>WOODS.CO.NZ</div>		DRURY CENTRE-STAGE 2			<div>STATUS<div>FOR FAST TRACK CONSENT</div></div> <div>SCALE<div>NOT TO SCALE</div></div> <div>COUNCIL<div>AUCKLAND COUNCIL</div></div> <div>DWG NO<div>P24-447-01-1861-EW</div></div>	REV <div>3</div>	
1	ISSUED FOR 90% DESIGN	GW	29/11/24	DESIGNED				NS	STAGE 2 BULK EARTHWORKS				
2	ISSUED FOR 99% SUBMISSION	MF-E	10/02/25	DRAWN				NS	EROSION & SEDIMENT CONTROL TYPICAL DETAILS				
3	ISSUED FOR FAST TRACK CONSENT	EW	21/02/20025	CHECKED				GW					
				APPROVED				GW					