



# Hastings District Council Whakatu Arterial Project Erosion and Sediment Control Plan

June 2014



# Table of contents

1.	Introduction.....	1
1.1	Purpose of this report.....	1
1.2	The Whakatu Arterial Project.....	1
1.3	Objectives of the erosion and sediment control plan.....	1
1.4	Assumptions .....	2
2.	Erosion and sediment control – design considerations .....	3
2.1	General principles of sediment and erosion control measures .....	3
2.2	Erosion control measures .....	3
2.3	Sediment control measures .....	5
3.	Construction activities and sequencing.....	7
3.1	Construction .....	7
4.	Environmental performance standards .....	7
5.	Monitoring and Responsibilities .....	8
5.1	Monitoring .....	8
5.2	Responsibilities .....	8
6.	Basis of Report.....	9

# Figure index

Figure 1 Typical arrangement for stream entry.....	4
Figure 2 Typical layout for detention pond .....	6

# Appendices

Appendix A - (Erosion and Sediment Control Plans)



# 1. Introduction

## 1.1 Purpose of this report

The purpose of this report is to describe the management approach for erosion and sediment control during the construction phase of the Whakatu Arterial Link (WAL) between State Highway 2 (SH2) north and Pakowhai Road, Hastings.

This Erosion and Sediment Control Plan should be read in-conjunction with the Stormwater Management Plan (GHD 2014g) which describes the management approach for stormwater following the completion of construction activities.

## 1.2 The Whakatu Arterial Project

The WAL will provide an efficient heavy vehicle route for the movement of freight between the Whakatu industrial area and the Port of Napier. The new road will run between SH2 North and Pakowhai Road and will provide a direct linkage to the Whakatu industrial area at Whakatu Road.

The WAL is a new two lane carriageway of approximately 3.5 kms in length with an average construction footprint width of approximately 36m and a maximum width of 80 metres. It generally follows the Karamu Stream for much of its length. The land traversed is predominately flat horticultural, agricultural and industrial land.

The construction activities planned for the site include;

- Topsoil stripping and construction of a raised roadway embankment, including stockpiling for bulk materials and storage of petroleum products for operation of construction plant;
- Metalling and sealing of the carriageway ;
- Construction of miscellaneous concrete features including kerb and channel at intersections and at roundabouts and a railway level crossing;
- Construction of a temporary “dirty water” and permanent clean water roadway drainage system, including swales, pipes, detention ponds and outlet structures;
- Construction of a 72m long prefabricated bridge spanning the Karamu Stream;
- Minor penetrations of the existing stop banks with stormwater drainage pipes;

## 1.3 Objectives of the erosion and sediment control plan

The objectives of this plan are to:

- Provide for the efficient conveyance of runoff from the WAL during construction activities, to ensure health and safety of road users and to protect surrounding properties;
- Avoid or minimise any potential effects on water quality and aquatic ecosystems from site drainage from the WAL during construction and associated earth disturbance activities;
- Protect and enhance the natural character and amenity values of the Karamu Stream; and

- Minimise any potential adverse effects from flooding and erosion of land and/or water courses from site drainage from the WAL during construction and associated earth disturbance activities.

## 1.4 Assumptions

This Erosion and Sediment Control Plan has been developed from contours derived from a specific site topography survey and from Hawke's Bay Regional Council LIDAR data. Other sources of data used are NIWA's High Intensity Rainfall Design System ("HIRDS") and Landcare Research S-map geological data. The general stormwater management approach follows the guidance given in Hawke's Bay Regional Council's Waterway Design Guidelines – Stormwater Management. The other document that informs this report is the Hawke's Bay Waterway Guideline – Erosion and Sediment Control.

## 2. Erosion and sediment control – design considerations

### 2.1 General principles of sediment and erosion control measures

All sediment and erosion control measures will be implemented and maintained in accordance with the Technical Guidelines AM08/13 for waterways entitled “Erosion and Sediment control Guidelines for the Hawke’s Bay Region”

The general philosophy of the approach is in accordance with the following principles:

- Earth disturbance is minimised as much as possible;
- The extent of construction works are clearly marked using fences, signs and flags;
- The amount of exposed soil which could be affected by rainfall is minimised by staging construction activities;
- Exposed soil is stabilised as soon as possible by using a range of soil coverage techniques appropriate to the situation, such as grass sowing and straw mulching;
- The creation of steep sloping exposed faces on the project is minimised as much as possible. Where these cannot be avoided, steep slopes are protected by directing runoff away from the slopes;
- Waterways are protected by careful identification of all site drainage patterns and construction of adequate sediment control measures;
- Perimeter controls are employed to isolate clean water runoff from sediment laden water;
- Detention devices are employed to capture sediment laden water and are designed to allow sediment to settle within the structures prior to discharging the water. Additionally, in large storm events detention devices are designed to provide for some level of settlement;
- Construction personnel are educated as to the planned erosion and sediment control practices adopted for this project, including the various monitoring activities required;
- The Erosion and Sediment Control Plan is able to evolve (with appropriate oversight) as construction activities progress over the lifetime of the project; and
- Regular inspections are carried out and control devices appropriately maintained to ensure ongoing system performance.

### 2.2 Erosion control measures

Active erosion control measures are employed in three key areas, as detailed below.

#### 2.2.1 Swales

Two sets of swales will be installed as detailed on Plan 51-31468-C351 Rev C to 51-31468-C355 Rev C.

One set of swales will convey dirty (construction affected) water to the sediment ponds and the other set will convey normal clean surface runoff into the new formalised stormwater outlets to the Karamu Steam or to existing roadside drains.

Both sets of swales will be constructed at the beginning of the construction program so that the surface of the swales can heal prior to major construction and earthmoving activities. In most locations the dirty water swales will become the final swales for the completed works. The clean water swales will be deconstructed at the end of the construction.

The dirty water swales are to be cut below the existing surface and will be grassed and bare areas treated with a semi-permanent surface to reduce erosion along their length.

The clean water swales are in the form of a bund installed above the existing grassed surface to divert clean water over existing grassed surfaces, reducing the likelihood of surface erosion and isolating clean water from construction areas.

### 2.2.2 Waterway entries

The interfaces between the new drainage system and the Karamu Stream and the existing roadside drain channels present potential erosion issues.

The Karamu Stream discharges will take the form of velocity controlled outlet structures where the exit velocity is designed as per the recommendations proposed in the Hydraulic Design of Energy Dissipators for Culverts and Channels, HEC 14, July 2006. The objective of this design is to reduce the entry velocity to the stream thereby reducing the potential for scour at the interface point. These arrangements are part of the stormwater management system for the site (as described in GHD2014g), but will be required for the construction phase as well. Figure 1 shows a typical layout for a structure.

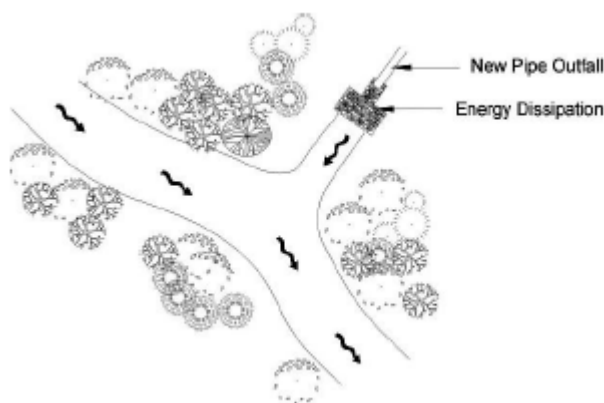


Figure 1 Typical arrangement for stream entry

The erosion control devices for the exit to existing road side drains will be in the form of decanting earth bunds. These will be installed at the physical end of the works and will only be used for discharging non construction effected drainage water. The location details of these structures are shown in the plans contained within Appendix A.

### 2.2.3 Bridge construction

As presented in the Whakatu Arterial Link Project Description (GHD 2014a), the WAL requires the construction of a new bridge to cross the Karamu Stream.

During bridge construction, a bund will be installed on both sides of the stream where the bridge crosses. All construction work for the approaches and the bridge piles will be up-gradient from this bund and all construction runoff from these areas will be conducted to the settlement ponds.

The bridge has been designed so that no pillars are required within the wet stream bed. This low impact design coupled with the approach outlined above will prevent sediment laden water from entering the Karamu Stream during construction.



#### 2.2.4 Karamu Stream widening

As presented in the Whakatu Arterial Link Project Description (GHD 2014a), the Hawke's Bay Regional Council has planned stream widening works in the vicinity of the proposed bridge crossing for flood control purposes.

This widening will be completed as part of the construction of the WAL, to minimise overall disturbance of the Karamu Stream and to provide for the use of removed material for construction fill.

The widening will take place downstream from the bridge on the true right bank. Runoff will be controlled by the installation of a bund between the cut area and the Karamu Stream, conveying all surface water runoff from this area to pond B.

### 2.3 Sediment control measures

Key sediment control measures consist of sediment retention ponds, decanting earth bunds and rock dams. These are described below.

#### 2.3.1 Sediment retention ponds

The main sediment retaining structures are a series of eight retention ponds. All of these structures will be designed to comply with the Hawke's Bay Waterway Guideline – Erosion and Sediment Control.

Six of the ponds will discharge surplus drainage water into the new drainage system and the final two will discharge into the existing road side drains on Pilcher Road.

The key features of the ponds are:

- Sediment forebays which are large enough to be mechanically cleaned. Forebays will be periodically cleaned as required following maintenance inspections;
- Level spreader inlets which will reduce entry velocity to the main detention area;
- Floating decants; and
- Wide shallow spillways for large stormwater events, followed by scruffy dome inlets which return water to the formal piped drainage system.

Figure 2 shows the characteristics of the sediment detention ponds.

Following the completion of construction works the sediment detention ponds will no longer be required as part of the stormwater management system. The land occupied by the ponds will be reinstated to a pre-construction state and disposed or retained in accordance with project requirements and any agreement with landowners.

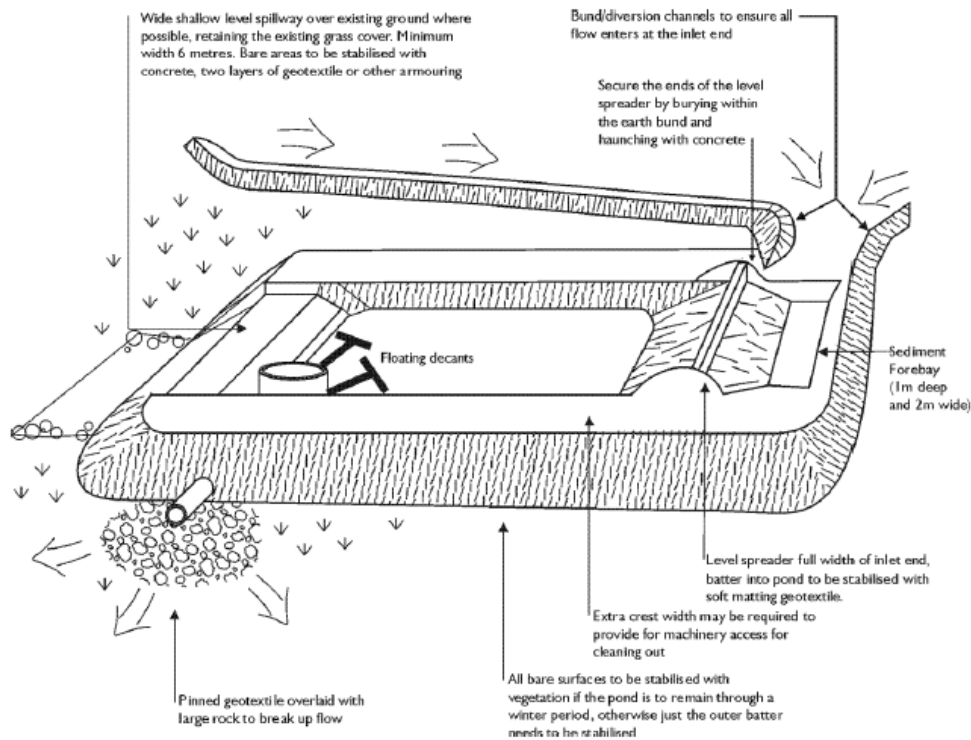


Figure 2 Typical layout for sediment detention ponds

### 2.3.2 Earth bunds

Twelve earth decanting bunds will be installed within the dirty water swale network to slow the velocity of water and reduce erosion within the swales.

The bunds incorporate a dead and live water feature that allows sediment to accumulate in the dead storage area. Accumulated sediment is then removed mechanically if/when required.

All surplus drainage water is then decanted past the bund into a small pipe and through into existing roadside drains.

### 2.3.3 Rock dams

35 rock dams will also be installed within the swale network. These are small, temporary structures used to slow the velocity of concentrated water flows which reduces erosion. The rock dams also serve to trap and reduce sediment loads in the drainage water during construction.

## 3. Construction activities and sequencing

### 3.1 Construction

Construction activities are summarised in Section 1.2 above and more fully explained in the Whakatu Arterial Link Project Description (GHD 2014a).

Construction is expected to commence in mid 2015, continuing for 18 to 24 months.

The sequencing of the construction will be in discrete sections between intersections. Only one work front will be worked on at any particular time.

Construction will generally follow the below sequence:

- Construction of the complete drainage system, including the swales, ponds, pipework and outlet structures, both for the dirty and clean water prior to any earth stripping activities;
- Construction of plant standing and refuelling areas;
- Stripping of the topsoil and removal of any unsuitable sub-base material;
- Development of bulk material storage areas;
- Placement of sub-base material;
- Construction of kerb and channel and any concrete works;
- Construction of basecourse layers;
- Sealing of the carriageway, permanent grassing/ landscaping and construction of fencing and property access points; and
- Deconstruction of temporary drainage features.

The bridge will likely be constructed in the winter of 2015 due to this activity being easier to undertake in a wet period of the year than the more weather dependent earth moving activities.

## 4. Environmental performance standards

The following environmental performance standards shall be complied with when undertaking the proposed soil disturbance and construction activities.

These have been developed with guidance from the Technical Guidelines AM08/13 for waterways and entitled "Erosion and Sediment control Guidelines for the Hawke's Bay Region".

Environmental Performance Standards to be achieved during construction activities:

- Erosion and sediment control measures as outlined in the Whakatu Arterial Erosion and Sediment Control Plan shall be installed and maintained throughout all soil disturbance activities;
- The concentration of suspended solids in any discharge from the site shall not exceed 100 grams per cubic metre of water;
- The concentration of suspended solids in the Karamu Stream shall not increase by more than 10% as a result of any discharges from site construction activities. The point

at which compliance with the standard is measured will not be more than 60m downstream from the point of discharge;

- All exposed areas of soil shall be stabilised against erosion by vegetation cover or other methods as soon as practical following completion of the construction activities; and
- All clean surface water runoff from non-construction affected ground will be diverted away from the construction site and will enter the drainage system downstream of any sediment control devices.

## 5. Monitoring and Responsibilities

### 5.1 Monitoring

During the construction period, the sediment and erosion control system will require on-going monitoring to ensure that objectives and performance standards are being met. The following monitoring regime shall be implemented and maintained throughout the duration of all construction activities:

- A rain gauge will be installed on site and daily rainfall will be recorded;
- Stormwater ponds will be inspected weekly and immediately after each rainfall event large enough to create surface runoff;
- Visible hydrocarbons will be removed using an absorbent boom and disposed of to an approved off-site facility;
- Swales will also be inspected weekly and immediately after each rainfall event large enough to create surface runoff. Any section where scour has occurred will be repaired;
- If sediment build up in retention ponds exceeds 20% of capacity, material will be removed and disposed of to an appropriate disposal facility;
- Each sediment retention pond will be sampled for the following, once more than 1m of sediment material has accumulated in the pond; and
  - Suspended solids
  - Total dissolved solids
  - pH
  - Chloride
  - Total hydrocarbons
  - Surfactants
- Regular weekly visual inspections of the complete length of the Karamu Stream will be conducted over the complete construction period to look for environmental issues.

### 5.2 Responsibilities

It is expected that the owners' representative will monitor the condition of the site including the sediment and erosion measures, this will form one of the duties of the "Engineer to the Contract" and his site representative, the "Engineers Representative". This will also include a review of the contractor's records as to the effectiveness of the measures and any remedial works required to maintain the measures in good working order. Particular care will be required during changing

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.

over of the dirty water temporary system to a final drainage system, including decommissioning of the ponds.

The contractor is to maintain a record of all control structures, including the date of commissioning/decommissioning and a program of routine inspections. Any observed deficiencies in the plan, the program of inspections and any noncompliance will be reported formally to the contractor by the Engineers Representative. Frequency of inspections are shown in Section 5.1.

## 6. Basis of Report

This report: has been prepared by GHD for Hastings District Council and may only be used and relied on by Hastings District Council for the purpose agreed between GHD and the Hastings District Council as set out in Section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Hastings District Council (and GHD's wider team of sub-consultants) arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

# Appendices

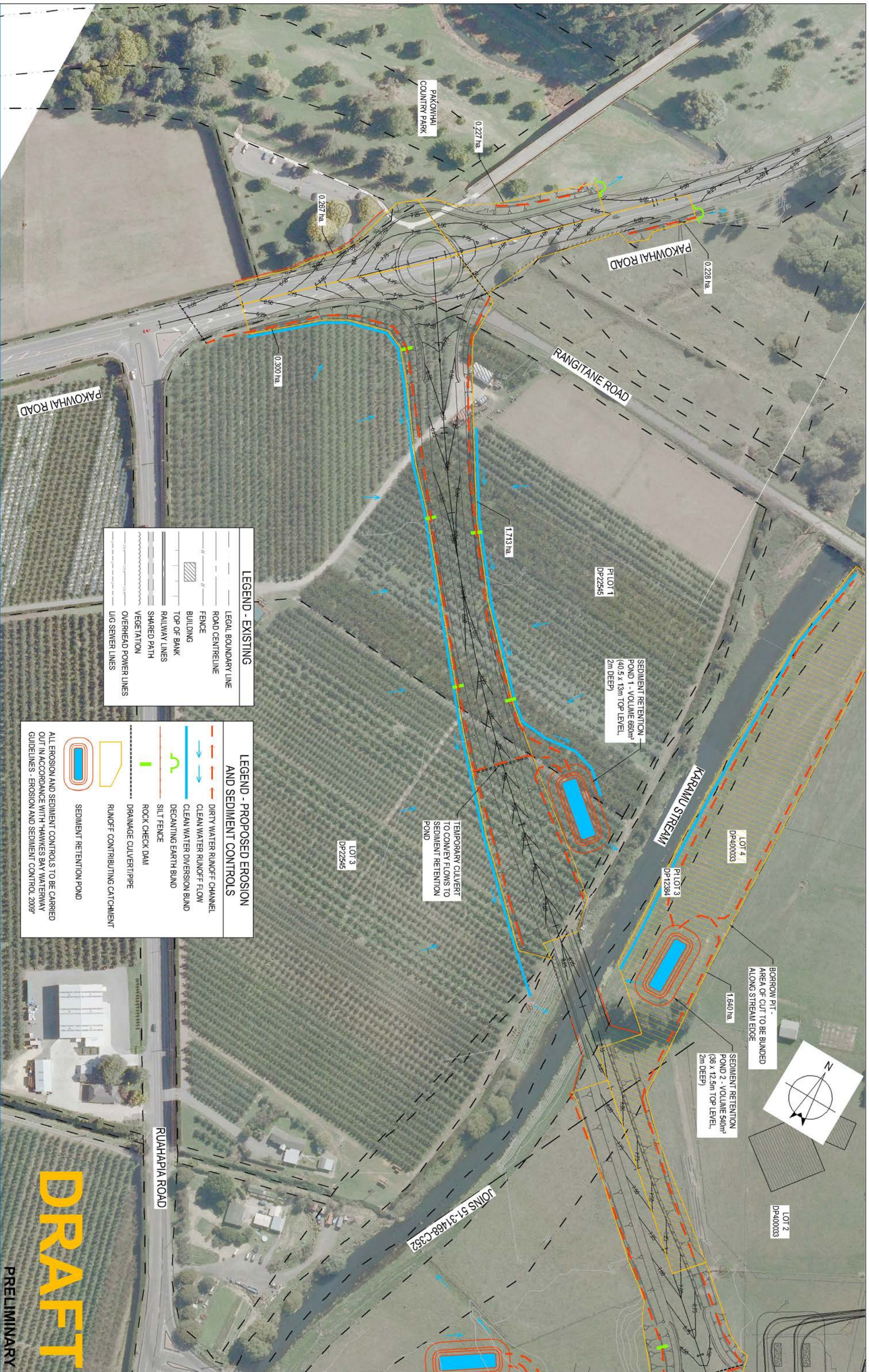
# Appendix A - (Erosion and Sediment Control Plans)

Drawings 51-31468-C351 C352 to Rev B

51-31468-C353 C354 Rev C

51-31468-C355 Rev B





**LEGEND - EXISTING**

	LEGAL BOUNDARY LINE
	ROAD CENTRELINE
	FENCE
	BUILDING
	TOP OF BANK
	RAILWAY LINES
	SHARED PATH
	VEGETATION
	OVERHEAD POWER LINES
	UG SEWER LINES

**LEGEND - PROPOSED EROSION AND SEDIMENT CONTROLS**

	DIRTY WATER RUNOFF CHANNEL
	CLEAN WATER RUNOFF FLOW
	CLEAN WATER DIVERSION BUND
	DECANTING EARTH BUND
	SILT FENCE
	ROCK CHECK DAM
	DRAINAGE CULVERT/PIPE
	RUNOFF CONTRIBUTING CATCHMENT
	SEDIMENT RETENTION POND

ALL EROSION AND SEDIMENT CONTROLS TO BE CARRIED OUT IN ACCORDANCE WITH "HAWKES BAY WATERWAY GUIDELINES - EROSION AND SEDIMENT CONTROL 2009"



**GHD**  
 136 Omana Street East  
 Hastings 4155, New Zealand  
 T 04 6 870 9105 F 04 6 874 5281  
 W www.ghd.com

No.	Revision	Note	Drawn	ISO Manager	Project Director	Date
A	PRELIMINARY		KA			
B	DESIGN UPDATE		NM			

Print Date: 18 May 2014 12:40 pm. Project: Ruahapia Road. Client: HASTINGS DISTRICT COUNCIL. Project: WHAKATU ARTERIAL PROJECT. SHEET 1. Drawing No: 51-31468-C351. Rev: B

**DRAFT**  
 PRELIMINARY

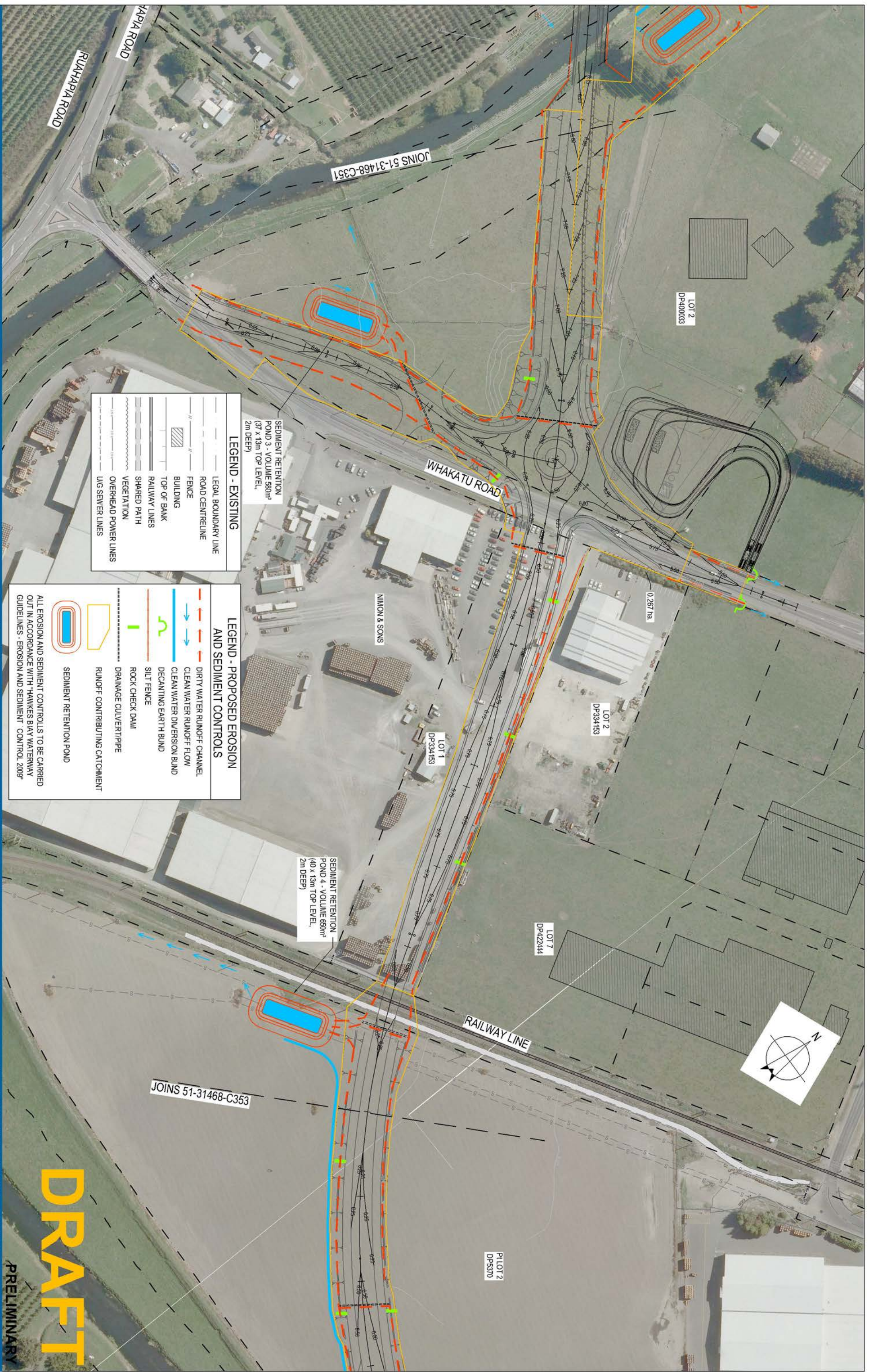
**DO NOT SCALE**

GHD Limited  
 Conditions of Use:  
 This document may only be used by GHD's client and any other person who has been specifically authorised in writing by GHD. It is not to be used for any other purpose.

Drawn	K. ASTWOOD	Designer	K. ASTWOOD
Drafting	S. CARRNEY	Design	S. CARRNEY
Checked		Checked	
Approved (Project Director)		Approved (Project Director)	
Date		Date	
Scale	1:1000	Scale	

Client: HASTINGS DISTRICT COUNCIL  
 Project: WHAKATU ARTERIAL PROJECT  
 SHEET 1  
 Drawing No: 51-31468-C351  
 Rev: B





**LEGEND - EXISTING**

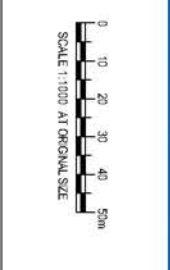
- LEGAL BOUNDARY LINE
- ROAD CENTRELINE
- FENCE
- BUILDING
- TOP OF BANK
- RAILWAY LINES
- SHARED PATH
- VEGETATION
- OVERHEAD POWER LINES
- U/G SEWER LINES

**LEGEND - PROPOSED EROSION AND SEDIMENT CONTROLS**

- DIRTY WATER RUNOFF CHANNEL
- CLEAN WATER RUNOFF FLOW
- CLEAN WATER DIVERSION BUND
- DECANTING EARTH BUND
- SILT FENCE
- ROCK CHECK DAM
- DRAINAGE CULVERT/PIPE
- RUNOFF CONTRIBUTING CATCHMENT
- SEDIMENT RETENTION POND

ALL EROSION AND SEDIMENT CONTROLS TO BE CARRIED OUT IN ACCORDANCE WITH 'HAWKES BAY WATERWAY GUIDELINES - EROSION AND SEDIMENT CONTROL 2009'

No.	Revision	Note	Drawn	Checked	Date
A	PRELIMINARY		KA		
B	DESIGN UPDATE		NM		



**GHD**  
 136 Queen Street East  
 Hastings 4155, New Zealand  
 T 04 6 870 9105 F 04 6 874 5281  
 W www.ghd.com

**DO NOT SCALE**  
 GHD Limited  
 Conditions of Use:  
 This document may only be used by  
 GHD's client (and any other person who  
 has been given written authority to use  
 and must not be used by any other  
 person or for any other purpose.

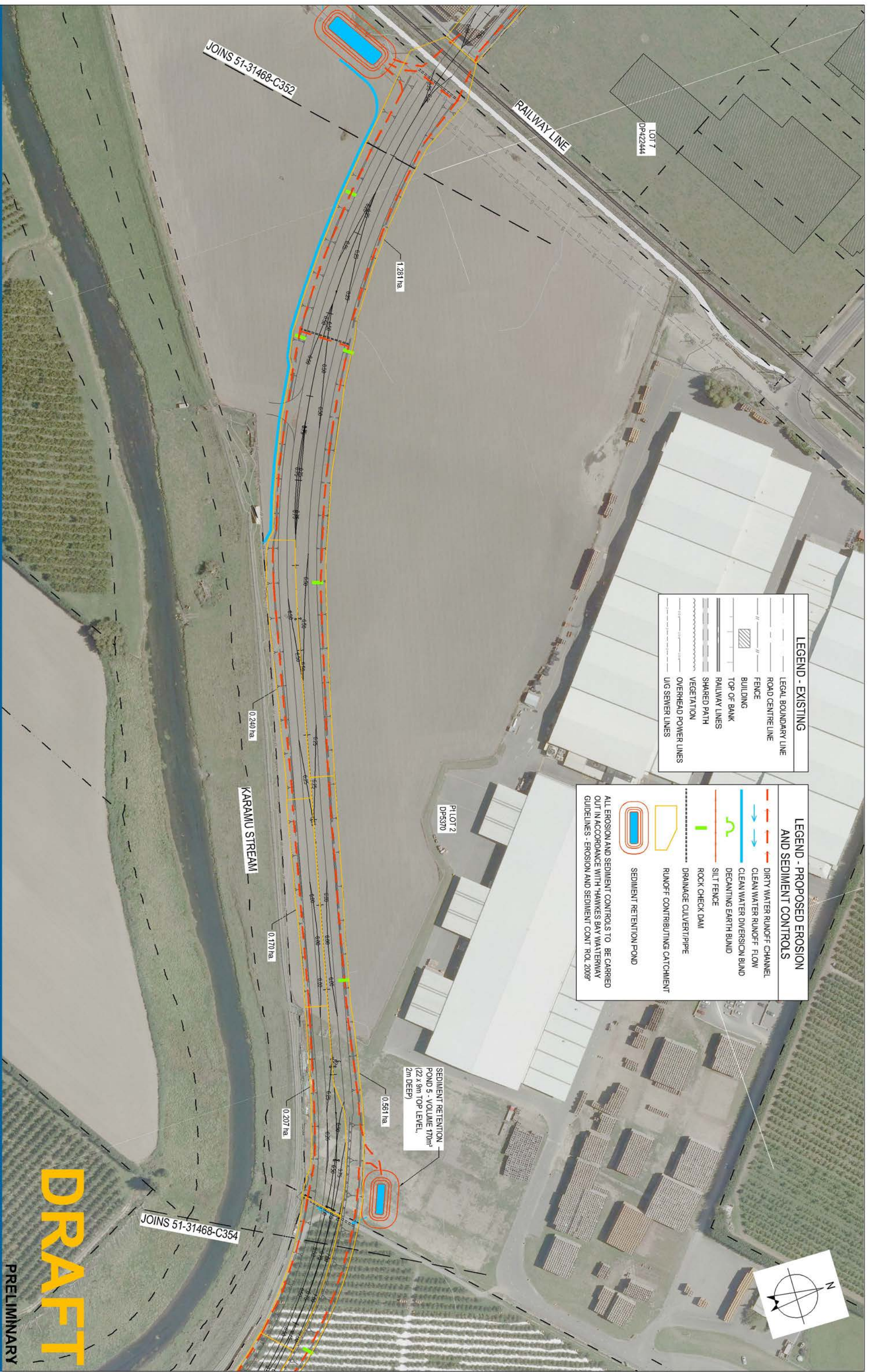
Drawn	K. ASTWOOD	Designer	K. ASTWOOD
Drafting	S. CARNEY	Design	S. CARNEY
Checked		Checked	
Approved	(Project Director)		
Date			
Scale	1:1000		

Client: **HASTINGS DISTRICT COUNCIL**  
 Project: **WHAKATU ARTERIAL PROJECT**  
 Type: **EROSION AND SEDIMENT CONTROL PLAN**  
 Drawing No.: **51-31468-C352**  
 Rev: **B**

**DRAFT**

**PRELIMINARY**





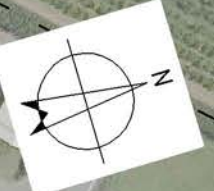
**LEGEND - EXISTING**

	LEGAL BOUNDARY LINE
	ROAD CENTRE LINE
	FENCE
	BUILDING
	TOP OF BANK
	RAILWAY LINES
	SHARED PATH
	VEGETATION
	OVERHEAD POWER LINES
	U/G SEWER LINES

**LEGEND - PROPOSED EROSION AND SEDIMENT CONTROLS**

	DIRTY WATER RUNOFF CHANNEL
	CLEAN WATER RUNOFF FLOW
	CLEAN WATER DIVERSION BUND
	DECANTING EARTH BUND
	SILT FENCE
	ROCK CHECK DAM
	DRAINAGE CULVERT/PIPE
	RUNOFF CONTRIBUTING CATCHMENT
	SEDIMENT RETENTION POND

ALL EROSION AND SEDIMENT CONTROLS TO BE CARRIED OUT IN ACCORDANCE WITH "HAWKES BAY WATERWAY GUIDELINES - EROSION AND SEDIMENT CONT. VOL 2009"



No.	Revision	Note	Drawn	Checked	Date
A	PRELIMINARY		KA		
B	DESIGN UPDATE		NM		
C	REMOVAL OF DECANTING EARTH BUNDS		LSW		

Scale 1:1000 AT ORIGINAL SIZE



GHD  
136 Queen Street East  
Hastings 4155, New Zealand  
T 06 8 870 9105 F 06 8 873 5281  
W www.ghd.com

**DO NOT SCALE**

Drawn	K. ASTWOOD	Designer	K. ASTWOOD
Drafting	S. CARRNEY	Design	S. CARRNEY
Checked		Checked	
Approved	(Project Director)	Approved	
Date		Date	
Scale	1:1000	Scale	

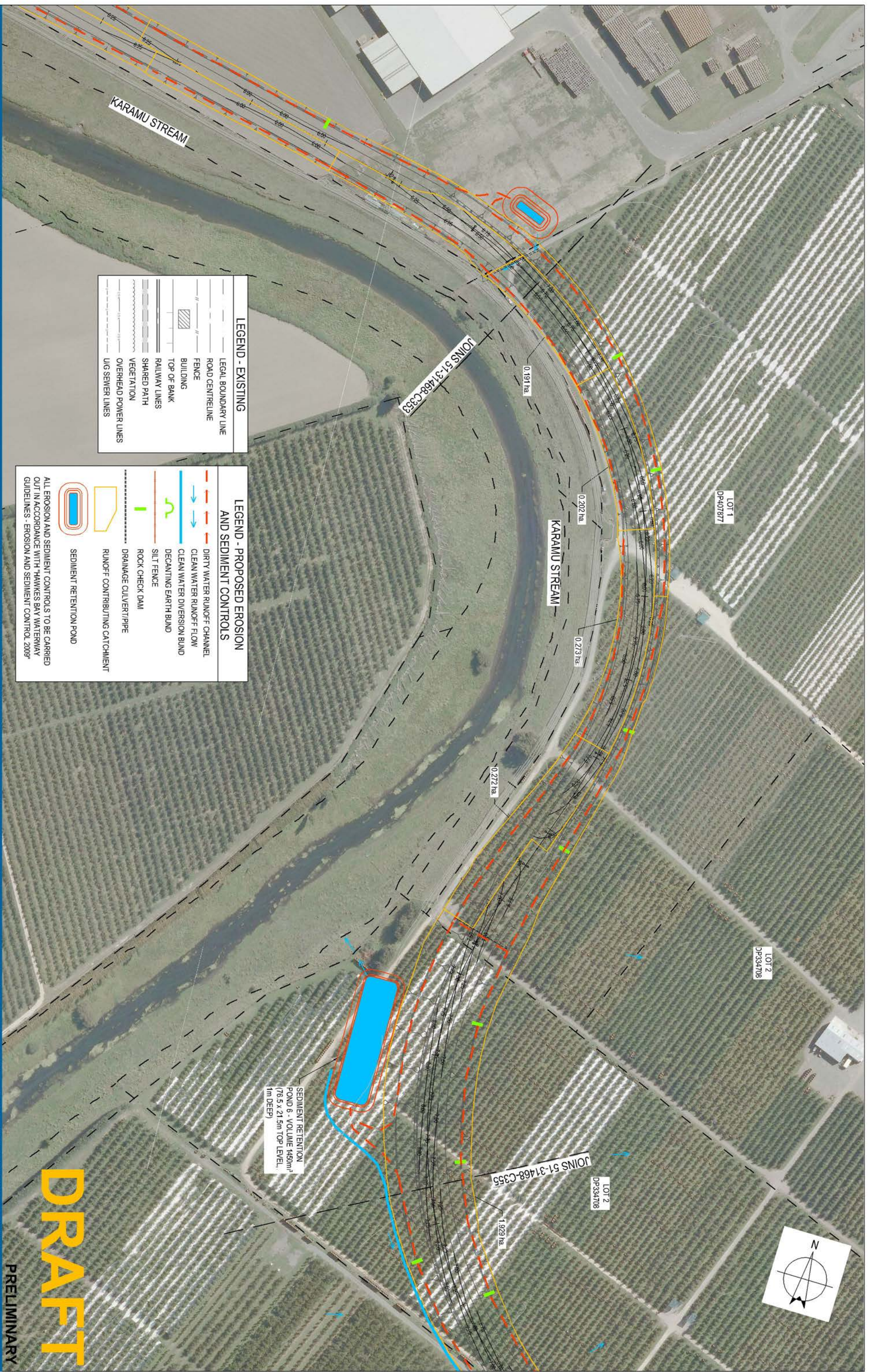
Client: HASTINGS DISTRICT COUNCIL  
Project: WHAKATU ARTERIAL PROJECT  
Type: EROSION AND SEDIMENT CONTROL PLAN  
Sheet: SHEET 3

Rev: C

**DRAFT**

PRELIMINARY





**LEGEND - EXISTING**

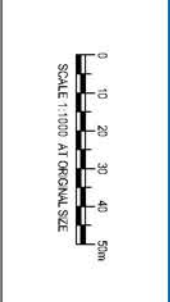
	LEGAL BOUNDARY LINE
	ROAD CENTRELINE
	FENCE
	BUILDING
	TOP OF BANK
	RAILWAY LINES
	SHARED PATH
	VEGETATION
	OVERHEAD POWER LINES
	UG SEWER LINES

**LEGEND - PROPOSED EROSION AND SEDIMENT CONTROLS**

	DIRTY WATER RUNOFF CHANNEL
	CLEAN WATER RUNOFF FLOW
	CLEAN WATER DIVERSION BUND
	DECANTING EARTH BUND
	SILT FENCE
	ROCK CHECK DAM
	DRAINAGE CULVERT/PIPE
	RUNOFF CONTRIBUTING CATCHMENT
	SEDIMENT RETENTION POND

ALL EROSION AND SEDIMENT CONTROLS TO BE CARRIED OUT IN ACCORDANCE WITH "HAWKES BAY WATERWAY GUIDELINES - EROSION AND SEDIMENT CONTROL 2009"

No.	Revision	Note	Drawn	Checked	Permit	Date
A	PRELIMINARY		KA			
B	DESIGN UPDATE		NM			
C	REMOVAL OF DECANTING EARTH BUNDS		LSW			



**GHD**  
 136 Queen Street East  
 Hastings 4155, New Zealand  
 T 04 8 870 9105 F 04 8 873 5281  
 W www.ghd.com

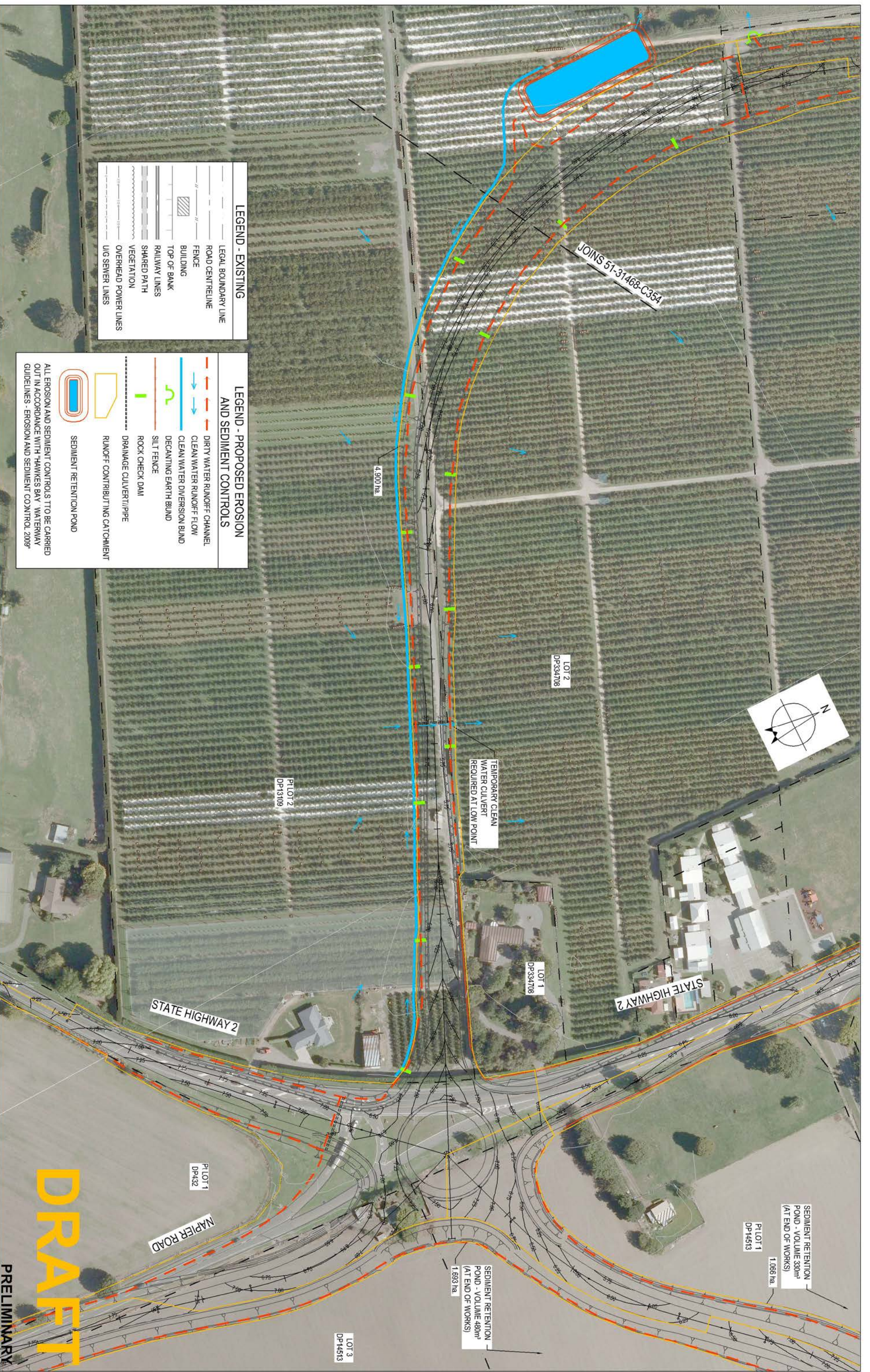
**DO NOT SCALE**  
 GHD Limited  
 Conditions of Use:  
 This document may only be used by GHD's client (and any other person who has the written consent of GHD) and must not be used for any other purpose.

Drawn	K. ASTWOOD	Designer	K. ASTWOOD
Drafting	S. CARNEY	Design	S. CARNEY
Checked		Check	
Approved (Project Director)			
Date			
Scale	1:1000		

Client: **HASTINGS DISTRICT COUNCIL**  
 Project: **WHAKATU ARTERIAL PROJECT**  
 Type: **EROSION AND SEDIMENT CONTROL PLAN**  
 Drawing No.: **51-31468-C354**  
 Rev: **C**

**DRAFT**  
 PRELIMINARY





**LEGEND - EXISTING**

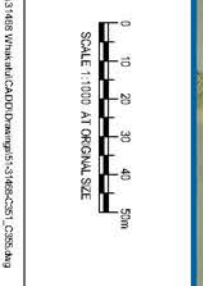
---	LEGAL BOUNDARY LINE
---	ROAD CENTRELINE
---	FENCE
---	BUILDING
---	TOP OF BANK
---	RAILWAY LINES
---	SHARED PATH
---	VEGETATION
---	OVERHEAD POWER LINES
---	UG SEWER LINES

**LEGEND - PROPOSED EROSION AND SEDIMENT CONTROLS**

---	DIRTY WATER RUNOFF CHANNEL
---	CLEAN WATER RUNOFF FLOW
---	CLEAN WATER DIVERSION BUND
---	DECANTING EARTH BUND
---	SILT FENCE
---	ROCK CHECK DAM
---	DRAINAGE CULVERT/PIPE
---	RUNOFF CONTRIBUTING CATCHMENT
---	SEDIMENT RETENTION POND

ALL EROSION AND SEDIMENT CONTROLS TO BE CARRIED OUT IN ACCORDANCE WITH 'HAWKES BAY WATERWAY GUIDELINES - EROSION AND SEDIMENT CONTROL 2009'

No.	Revision	Note	Drawn	Checked	Date
A	PRELIMINARY		KA		
B	DESIGN UPDATE		NM		



**GHD**  
136 Queen Street East  
Hastings 4155, New Zealand  
T 04 6 870 9105 F 04 6 874 5281  
W www.ghd.com

**DO NOT SCALE**  
GHD Limited  
Conditions of Use  
This document may only be used by GHD's client (and any other person who has been given written permission) and must not be used for any other purpose.

Drawn	K. ASTWOOD	Designer	K. ASTWOOD
Drafting	S. CARNEY	Design	S. CARNEY
Checked		Checked	
Approved (Project Director)			
Date			
Scale	1:1000		

Client: **HASTINGS DISTRICT COUNCIL**  
Project: **WHAKATU ARTERIAL PROJECT**  
Type: **EROSION AND SEDIMENT CONTROL PLAN**  
Drawing No.: **51-31468-C355**  
Rev: **B**

**DRAFT**

**PRELIMINARY**





GHD

134 Queen Street East  
Hastings 4156  
T: 64 6 870 9105 F: E:

© GHD Limited 2014

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

N:\NZ\Palmerston North\Projects\51\31468\Tech\Stormwater\Whakatu arterial erosion and sediment control plan.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	Peter Free	Tony Harrison		Tony Harrison		28/10/13
1	Peter Free	Tony Harrison		Tony Harrison		12/11/13
2	Peter Free	Tony Harrison		Tony Harrison		2/06/14

[www.ghd.com](http://www.ghd.com)



This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft document.