

**Stage 1 RL67.5**

Stage 1 RL67.5 will involve gradual cutting into the bank to progressively bench down to final RL's. Initially a bund will be installed around the perimeter of the Stage 1 area.

Soakage rates of the material beneath the topsoil has been confirmed to be 153 mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

The HIRDS 24-hour rainfall depth for the area is 155mm. The soakage rates exceed this rainfall depth.

Therefore, by installing a bund around the extent of the area will contain the runoff from up to the 100-year rainfall event.

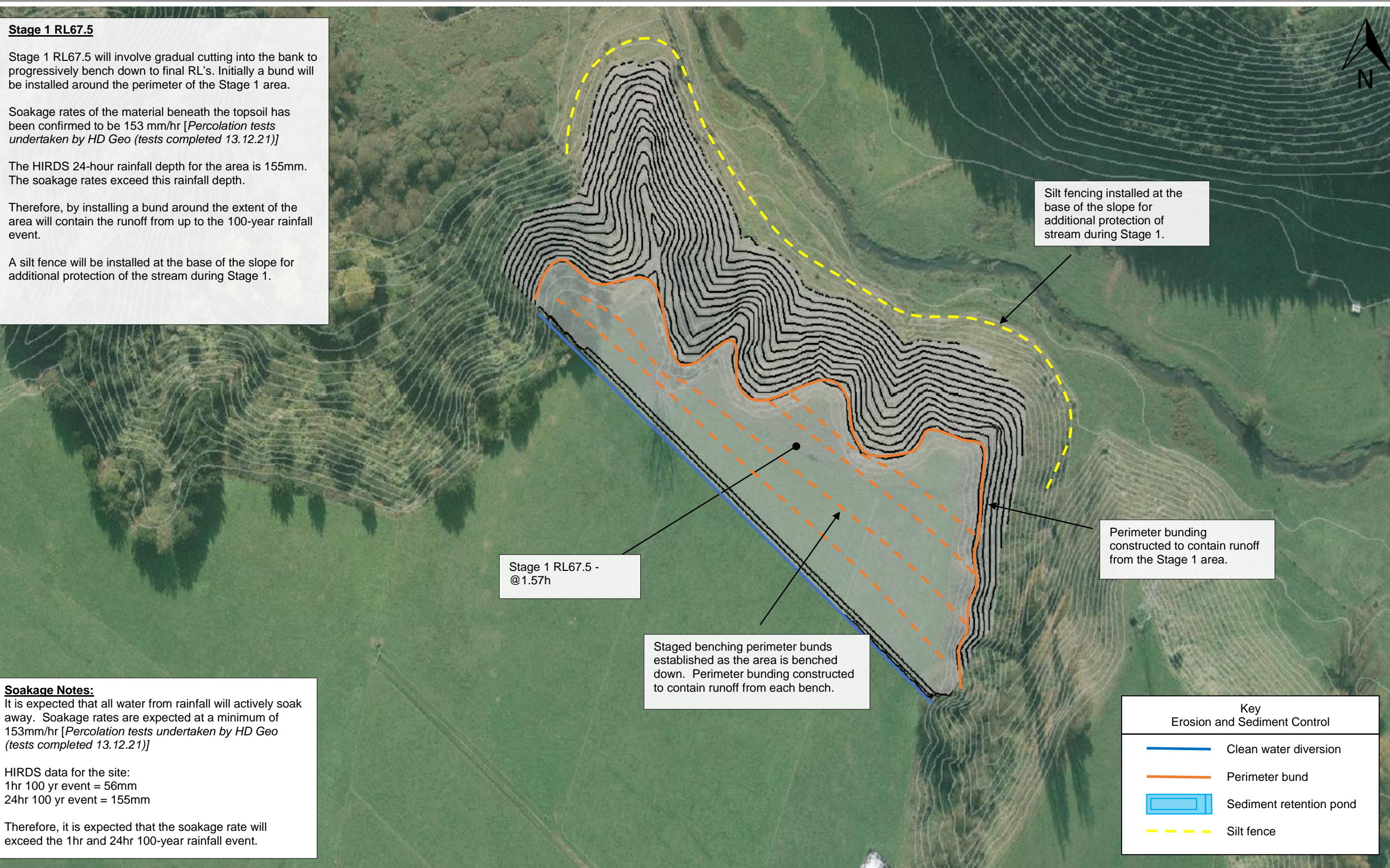
A silt fence will be installed at the base of the slope for additional protection of the stream during Stage 1.

**Soakage Notes:**

It is expected that all water from rainfall will actively soak away. Soakage rates are expected at a minimum of 153mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

HIRDS data for the site:  
1hr 100 yr event = 56mm  
24hr 100 yr event = 155mm

Therefore, it is expected that the soakage rate will exceed the 1hr and 24hr 100-year rainfall event.



Stage 1 RL67.5 - @1.57h

Silt fencing installed at the base of the slope for additional protection of stream during Stage 1.

Perimeter bunding constructed to contain runoff from the Stage 1 area.

Staged benching perimeter bunds established as the area is benched down. Perimeter bunding constructed to contain runoff from each bench.

Key Erosion and Sediment Control	
	Clean water diversion
	Perimeter bund
	Sediment retention pond
	Silt fence

**NOTES**

- All erosion and sediment controls will be installed and maintained in accordance with the Waikato Regional Council's Technical Report No. 2009/02 'Erosion and Sediment Control Guideline for Soil Disturbing Activities, January 2009' (TR09/02).
- Earthworks are to be programmed to ensure rapid stabilisation in accordance with TR09/02.
- All erosion and sediment control measures will be inspected on a daily basis by the site foreman.
- Site monitoring will be undertaken before and immediately after rain as well as during heavy rainfall events. Any required maintenance or improvements to control measures will be undertaken immediately.

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Project	RS SANDS
Title	Erosion & Sediment Control Plan Stage 1 RL67.5
Drawing No.	ESCP-001-A
Sheet No.	2

**Stage 1 RL52.5**

Stage 1 RL52.5 will involve the progressive benching down to final RL's.

As the contractor benches down each bench will be sloped back in towards the bank. Bunding will be constructed at either end of the benches so that no runoff could flow offsite.

Soakage rates of the material beneath the topsoil has been confirmed to be 153 mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

The HIRDS 24 hour rainfall depth for the area is 155mm. The soakage rates exceed this rainfall depth.

Therefore, by installing a bund around the extent of the area will contain the runoff from up to the 100-year rainfall event.

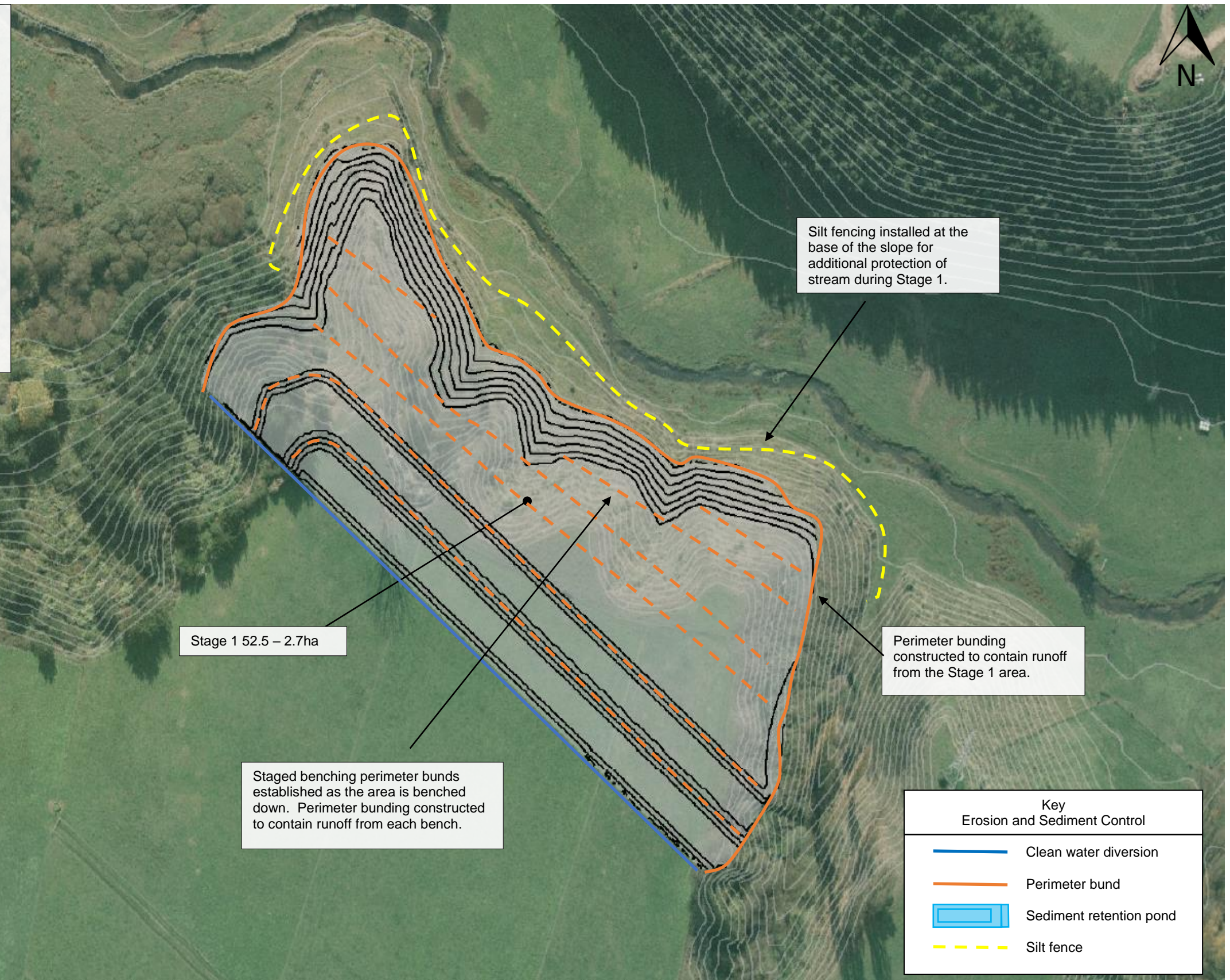
A silt fence will be installed at the base of the slope for additional protection of the stream during Stage 1.

**Soakage Notes:**

It is expected that all water from rainfall will actively soak away. Soakage rates are expected at a minimum of 153mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

HIRDS data for the site:  
1hr 100 yr event = 56mm  
24hr 100 yr event = 155mm

Therefore, it is expected that the soakage rate will exceed the 1hr and 24hr 100-year rainfall event.



Stage 1 52.5 – 2.7ha

Silt fencing installed at the base of the slope for additional protection of stream during Stage 1.

Perimeter bunding constructed to contain runoff from the Stage 1 area.

Staged benching perimeter bunds established as the area is benched down. Perimeter bunding constructed to contain runoff from each bench.

Key	
Erosion and Sediment Control	
	Clean water diversion
	Perimeter bund
	Sediment retention pond
	Silt fence

- NOTES**
- All erosion and sediment controls will be installed and maintained in accordance with the Waikato Regional Council's Technical Report No. 2009/02 'Erosion and Sediment Control Guideline for Soil Disturbing Activities, January 2009' (TR09/02).
  - Earthworks are to be programmed to ensure rapid stabilisation in accordance with TR09/02.
  - All erosion and sediment control measures will be inspected on a daily basis by the site foreman.
  - Site monitoring will be undertaken before and immediately after rain as well as during heavy rainfall events. Any required maintenance or improvements to control measures will be undertaken immediately.

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Project	RS SANDS
Title	Erosion & Sediment Control Plan Stage 1 RL52.5
Drawing No.	ESCP-001-1B
Sheet No.	3

**Stage 1 RL45**

Stage 1 RL45 will involve the construction of SRP-2

As the contractor benches down each bench will be sloped back in towards the bank. Bunding will be constructed at either end of the benches so that no runoff could flow offsite.

Once RL40 is reached SRP-2 will be constructed.

Soakage rates of the material beneath the topsoil has been confirmed to be 153 mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

The HIRDS 24-hour rainfall depth for the area is 155mm. The soakage rates exceed this rainfall depth.

Therefore, by installing a bund around the extent of the area will contain the runoff from up to the 100-year rainfall event.

A silt fence will be installed at the base of the slope for additional protection of the stream during Stage 1

**Sediment Retention Pond 2**  
 Catchment area: 5ha  
 Total volume: 1,000m<sup>3</sup>  
 Dead storage: 300m<sup>3</sup>  
 Live storage: 700m<sup>3</sup>

Refer to specific SRP-2 design details.

Silt fencing installed at the base of the slope for additional protection of stream during Stage 1.

Stage 1 RL45 – 2.7ha





Perimeter bunding constructed to contain runoff from the Stage 1 area.

**Soakage Notes:**  
 It is expected that all water from rainfall will actively soak away. Soakage rates are expected at a minimum of 153mm/hr [Percolation tests undertaken by HD Geo (tests completed 13.12.21)]

HIRDS data for the site:  
 1hr 100 yr event = 56mm  
 24hr 100 yr event = 155mm

Therefore, it is expected that the soakage rate will exceed the 1hr and 24hr 100-year rainfall event.

Key  
Erosion and Sediment Control

-  Clean water diversion
-  Perimeter bund
-  Sediment retention pond
-  Silt fence

- NOTES**
- All erosion and sediment controls will be installed and maintained in accordance with the Waikato Regional Council's Technical Report No. 2009/02 'Erosion and Sediment Control Guideline for Soil Disturbing Activities, January 2009' (TR09/02).
  - Earthworks are to be programmed to ensure rapid stabilisation in accordance with TR09/02.
  - All erosion and sediment control measures will be inspected on a daily basis by the site foreman.
  - Site monitoring will be undertaken before and immediately after rain as well as during heavy rainfall events. Any required maintenance or improvements to control measures will be undertaken immediately.

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Project	RS SANDS		
Title	Erosion & Sediment Control Plan Stage 1 RL45		
Drawn	Checked	Drawing No.	Sheet No.
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**Stage 2**

SRP-2 will remain in place for Stage 2.

Stage 2 will largely be an extension to the Stage 1 footprint, progressively excavated to the south towards Newcombe Road.




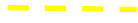
The total Stage 2 footprint will be 3.4ha.

Stage 1 will be progressively reinstated as Stage 2 expands.

**Sediment Retention Pond 2**  
 Catchment area: 5ha  
 Total volume: 1,000m<sup>3</sup>  
 Dead storage: 300m<sup>3</sup>  
 Live storage: 700m<sup>3</sup>

Refer to specific SRP-2 design details.

**Stage 2 = 3.4ha**

Key Erosion and Sediment Control	
	Clean water diversion
	Perimeter bund
	Sediment retention pond
	Silt fence

- NOTES**
- All erosion and sediment controls will be installed and maintained in accordance with the Waikato Regional Council's Technical Report No. 2009/02 'Erosion and Sediment Control Guideline for Soil Disturbing Activities, January 2009' (TR09/02).
  - Earthworks are to be programmed to ensure rapid stabilisation in accordance with TR09/02.
  - All erosion and sediment control measures will be inspected on a daily basis by the site foreman.
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Project	RS SANDS
Title	Erosion & Sediment Control Plan Stage 2
Drawing No.	ESCP-002-01
Sheet No.	5

**Processing Area and Site Establishment**

To enable construction of the processing area SRP-1 will be constructed within the future water processing pond location. SRP-1 has been designed with a maximum contributing catchment area of 5ha and a length to width ratio of 5:1 to fit in the processing pond footprint. The contributing catchment area is approximately 4.8ha.

Topsoil will then be stripped from the area and stockpiled around the perimeter of the processing area to form the screening bunds and perimeter bunds as shown. As construction of the perimeter bunding is undertaken it will be progressively stabilised with grass seed and hay mulch.

The processing area will then be cut down an average of 2m.

The access road into site will be stripped and shaped before being stabilised with aggregate.

Once the earthworks are complete the entire processing area will be sheeted with aggregate.

**Sediment Retention Pond 1**

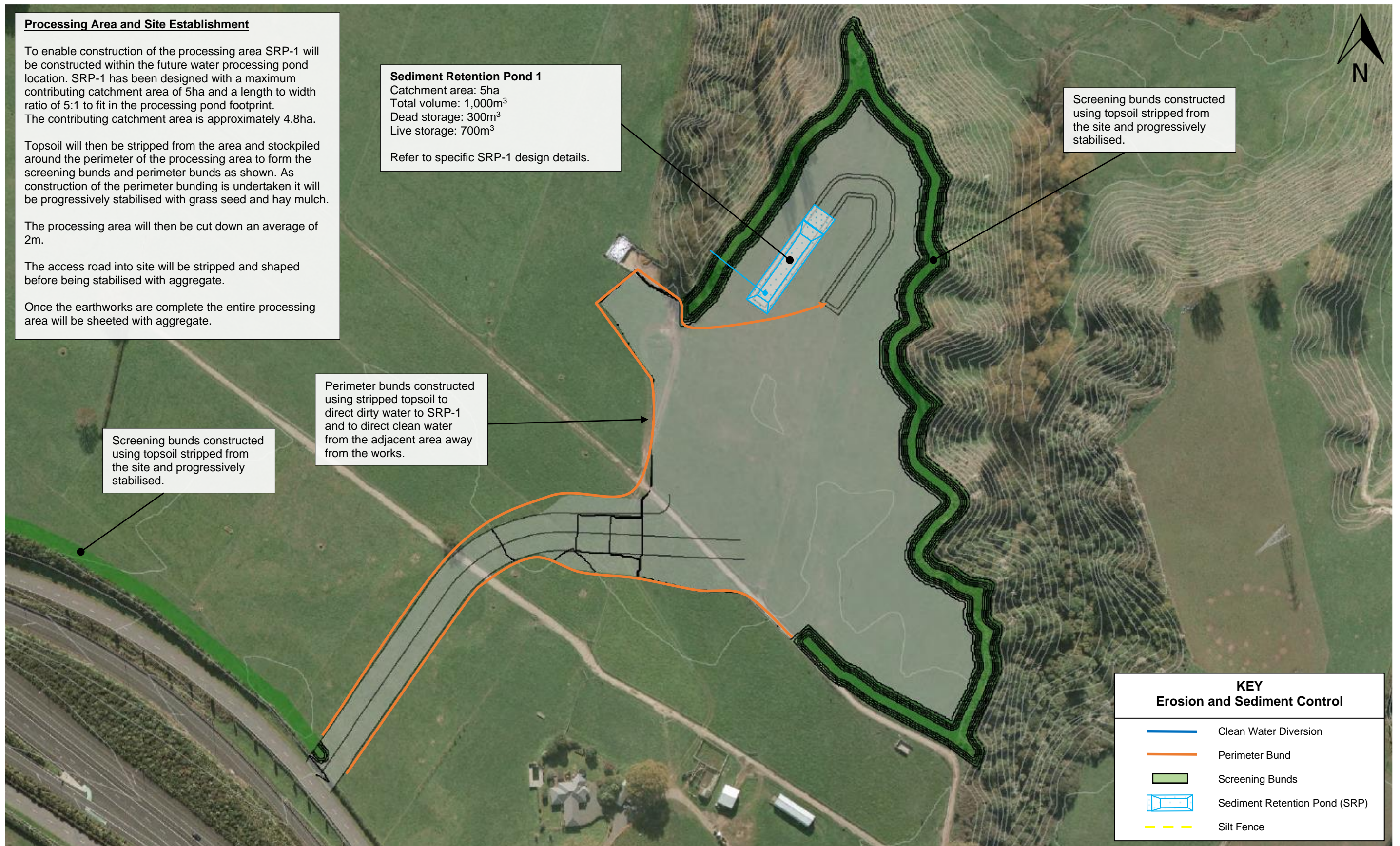
Catchment area: 5ha  
 Total volume: 1,000m<sup>3</sup>  
 Dead storage: 300m<sup>3</sup>  
 Live storage: 700m<sup>3</sup>

Refer to specific SRP-1 design details.

Screening bunds constructed using topsoil stripped from the site and progressively stabilised.

Perimeter bunds constructed using stripped topsoil to direct dirty water to SRP-1 and to direct clean water from the adjacent area away from the works.

Screening bunds constructed using topsoil stripped from the site and progressively stabilised.



KEY	
Erosion and Sediment Control	
	Clean Water Diversion
	Perimeter Bund
	Screening Bunds
	Sediment Retention Pond (SRP)
	Silt Fence

- NOTES**
- All erosion and sediment controls will be installed and maintained in accordance with the Waikato Regional Council's Technical Report No. 2009/02 'Erosion and Sediment Control Guideline for Soil Disturbing Activities, January 2009' (TR09/02).
  - Earthworks are to be programmed to ensure rapid stabilisation in accordance with TR09/02.
  - All erosion and sediment control measures will be inspected on a daily basis by the site foreman.
  - Site monitoring will be undertaken before and immediately after rain as well as during heavy rainfall events. Any required maintenance or improvements to control measures will be undertaken immediately.

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**Fulton Hogan**

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Title	Erosion & Sediment Control Plan Processing Area and Site Establishment
Drawing No.	ESCP-PA-01
Sheet No.	1