

Technical Notes – ESC

- The Project has 5 distinct areas:
 - The Lower Playing Field and Link Access Track leading to Area 2.
 - The Upper Playing Filed and access tracks leading to Area 3.
 - Reservoir Excavation Site.
 - Dorking Road Access
 - Waitangi Stream culvert extension

Technical Notes – Area 1

- SRP1 (non-conforming device due to buried utilities and limited space)
- Capacity of SRP1 is 430m³ (plus 20m³ forebay)
- Treatment area for SRP1 is 5200m² and includes the link access track between the fields.
- Further detail on Pages 2, 5-7 of this Appendix.

Technical Notes – Area 2

- SRP2 (non-conforming device due to buried utilities and limited space)
- Capacity of SRP2 is 587m³ (plus 30m³ forebay).
- Treatment area for SRP2 is 9163.5532m² and includes the access tracks to Area 3.
- Further detail on Pages 3-5 of this Appendix.

Technical Notes – Area 3

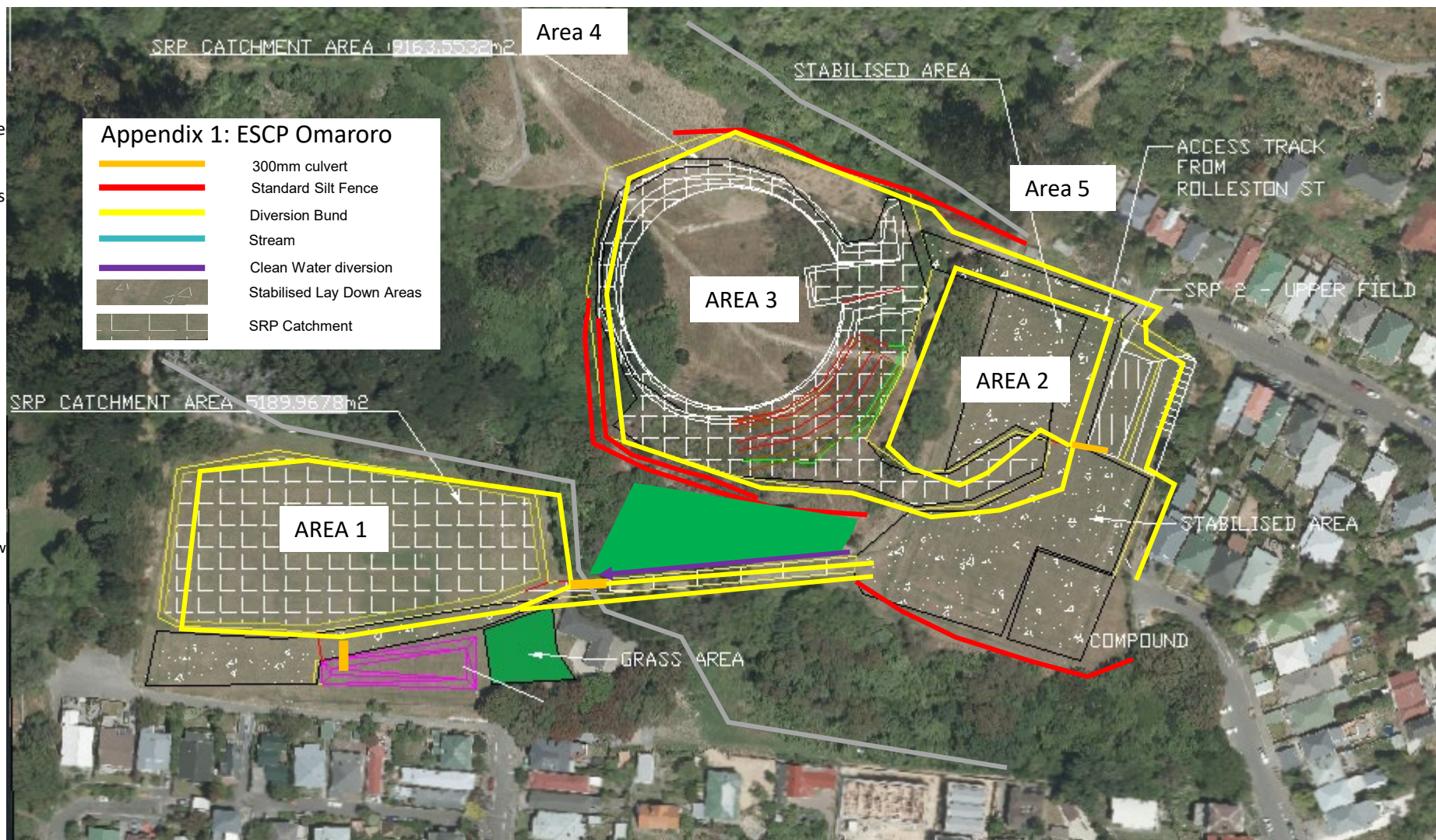
- Bunding of perimeter.
- Interior will rapidly lower as the site is excavated.
- Treatment area for SRP2 is 5000m² and will be manually dewatered to SRP2.
- During backfilling activities silt fencing to be installed initially to allow for fill to come and bunding diversions to be put in place towards SRP2
- Further detail on Pages 3 of this Appendix.

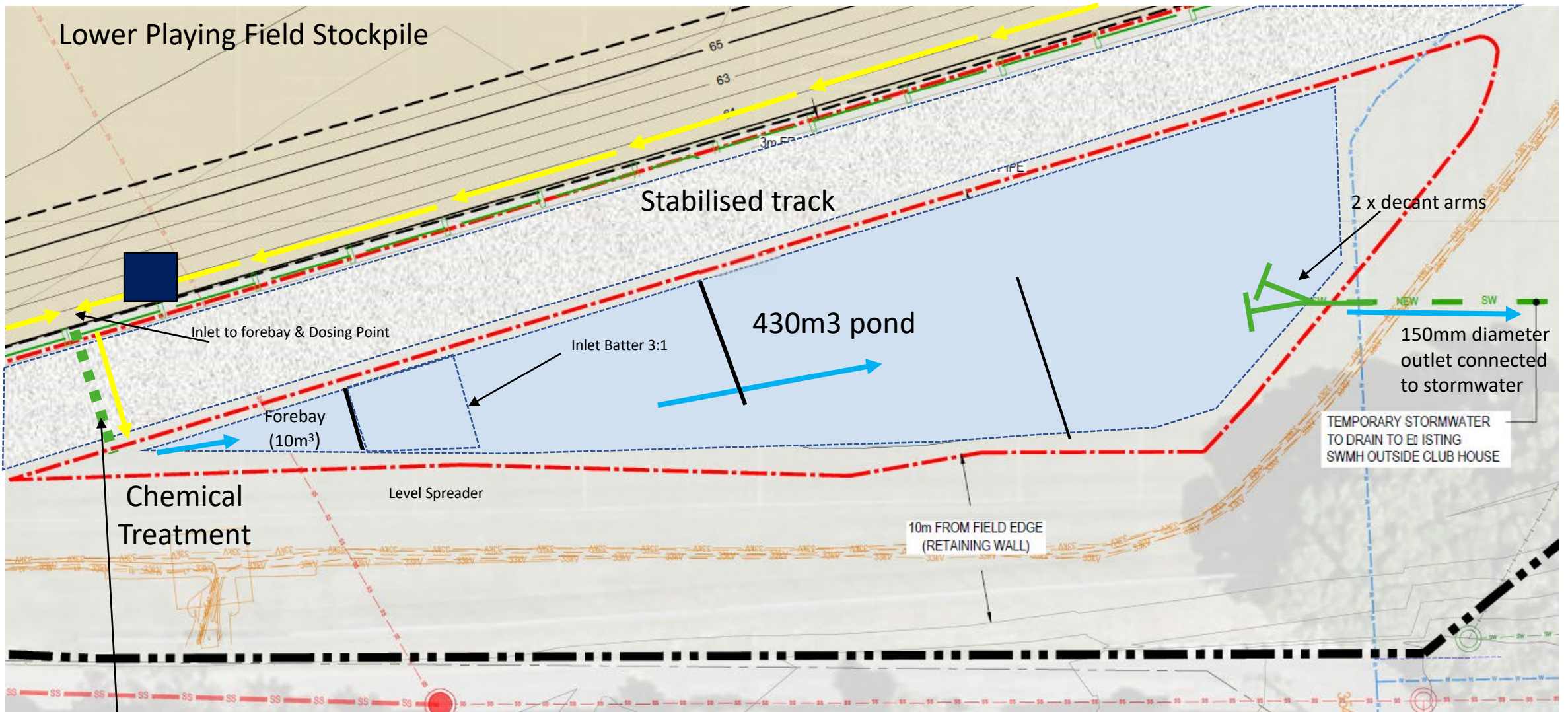
Technical Notes – Area 4

- Widening of access track from Dorking road
- Silt fence below works
- Progressively stabilise
- Clean water catchment controls above works

Technical Notes – Area 5

- 3m Culvert extension in Waitangi stream
- Staging of works as per 12.3.3





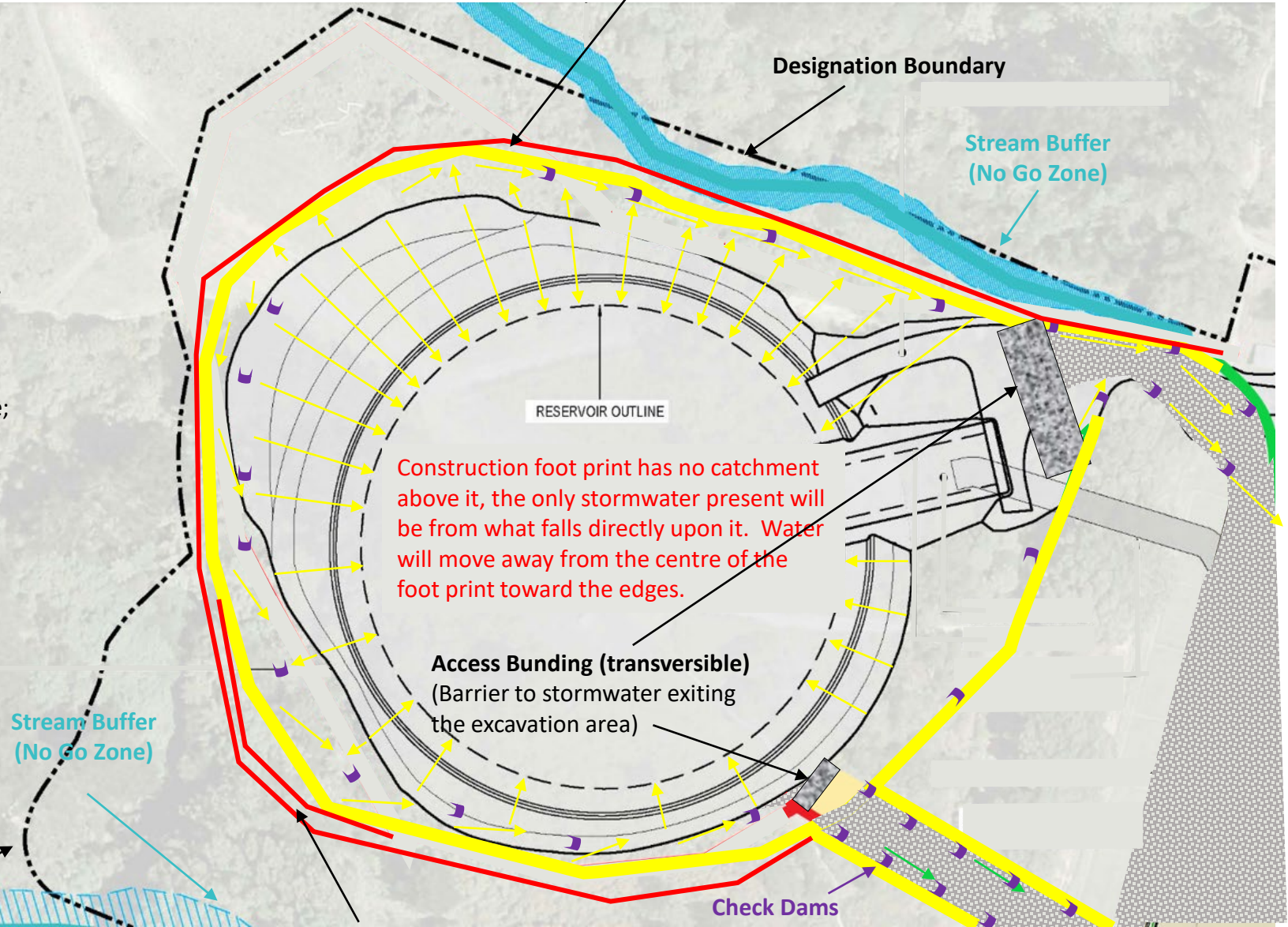
300mm diameter culvert under track
(Refer Appendix 4 for supporting Calculations)

Technical Notes – Lower Playing Fields:

- The track surface will be covered with rock (GAP65 or Rota Millings) to render the surface stabilised.
- The track will be constructed using a cut and cover approach (leaving a stabilised surface at the conclusion of each day)
- The stabilised entranceway will also be constructed with the approach of cut and cover.
- The bunding will be at least 550mm in height and be stabilised in stages as completed.
- Any points that may scour due to water flow will be armoured using geotextile fabrics.
- Additional baffles will be installed and covered with Cirtex Enviroforce as per the GWRC guideline for ESC.

Sequence of ESC associated with initial access track installation

- Within a window of dry weather strip the vegetation on the footprint of the initial access track.
- The track will follow the contour around the hill at the minimum grade.
- The track surface will be slightly inclined toward the inside of the hill
- The track will be stabilised at the conclusion of each day with aggregate;
- Runoff from the track will be controlled with bunds on either side of the track directing the water to SRP2 on the Upper Playing Field.
- Velocity check dams will be installed on the track to slow stormwater as it travels to SRP2 on the Upper Playing Field
- This track will allow access to the top of the site.
- Perimeter bund will be installed and stabilised with geotextile fabric.
- Velocity check dams will be installed on the bund.



Silt fencing - where required to construct fill and establish bund to SRP2

Designation Boundary

Stream Buffer (No Go Zone)

RESERVOIR OUTLINE

Construction foot print has no catchment above it, the only stormwater present will be from what falls directly upon it. Water will move away from the centre of the foot print toward the edges.

Access Bunding (transversible)
(Barrier to stormwater exiting the excavation area)

Stream Buffer (No Go Zone)

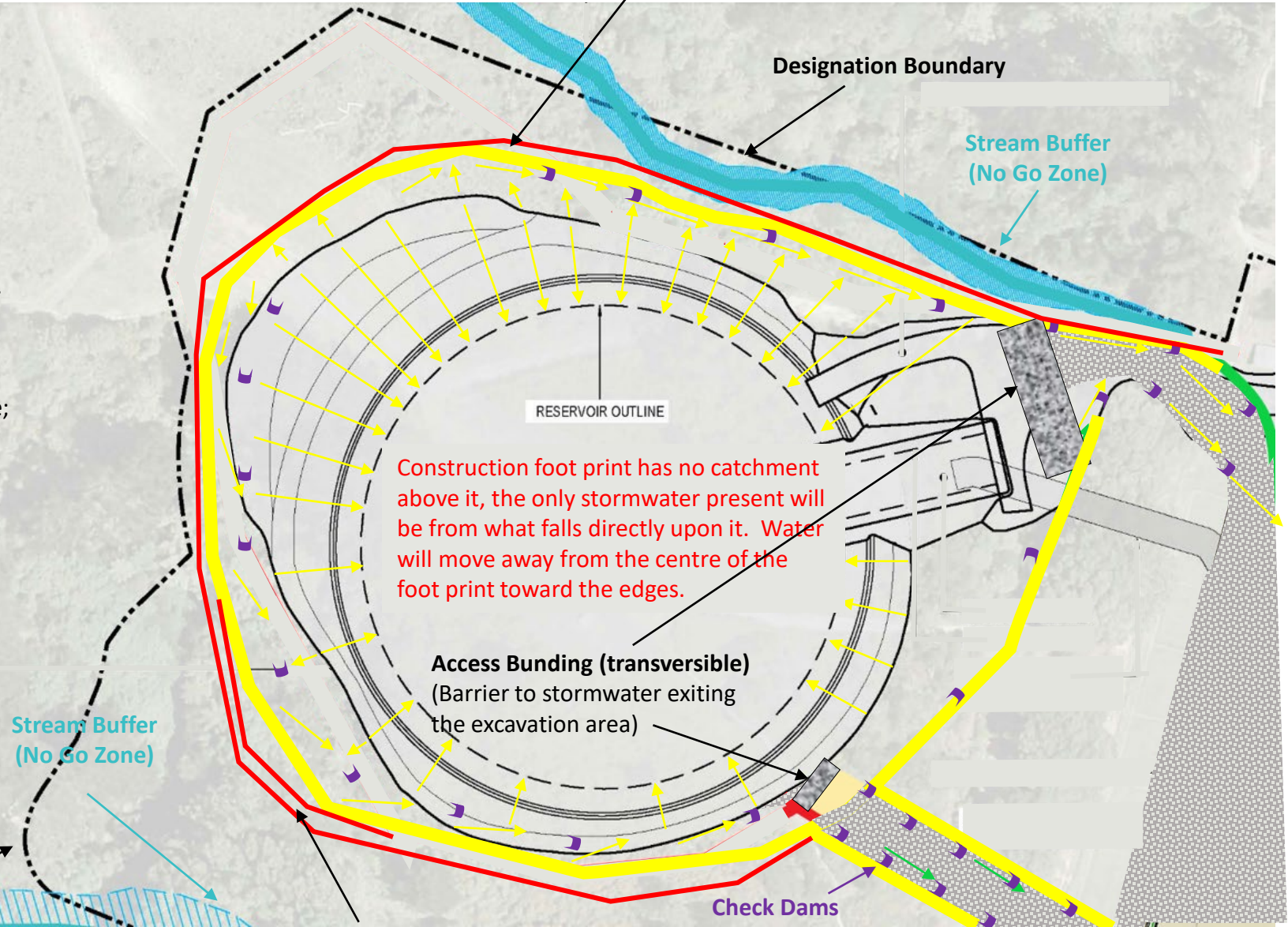
Designation Boundary

Check Dams

Gully works – double silt fencing installed at base. Area to opened in minimal sections

Sequence of ESC associated with initial access track installation

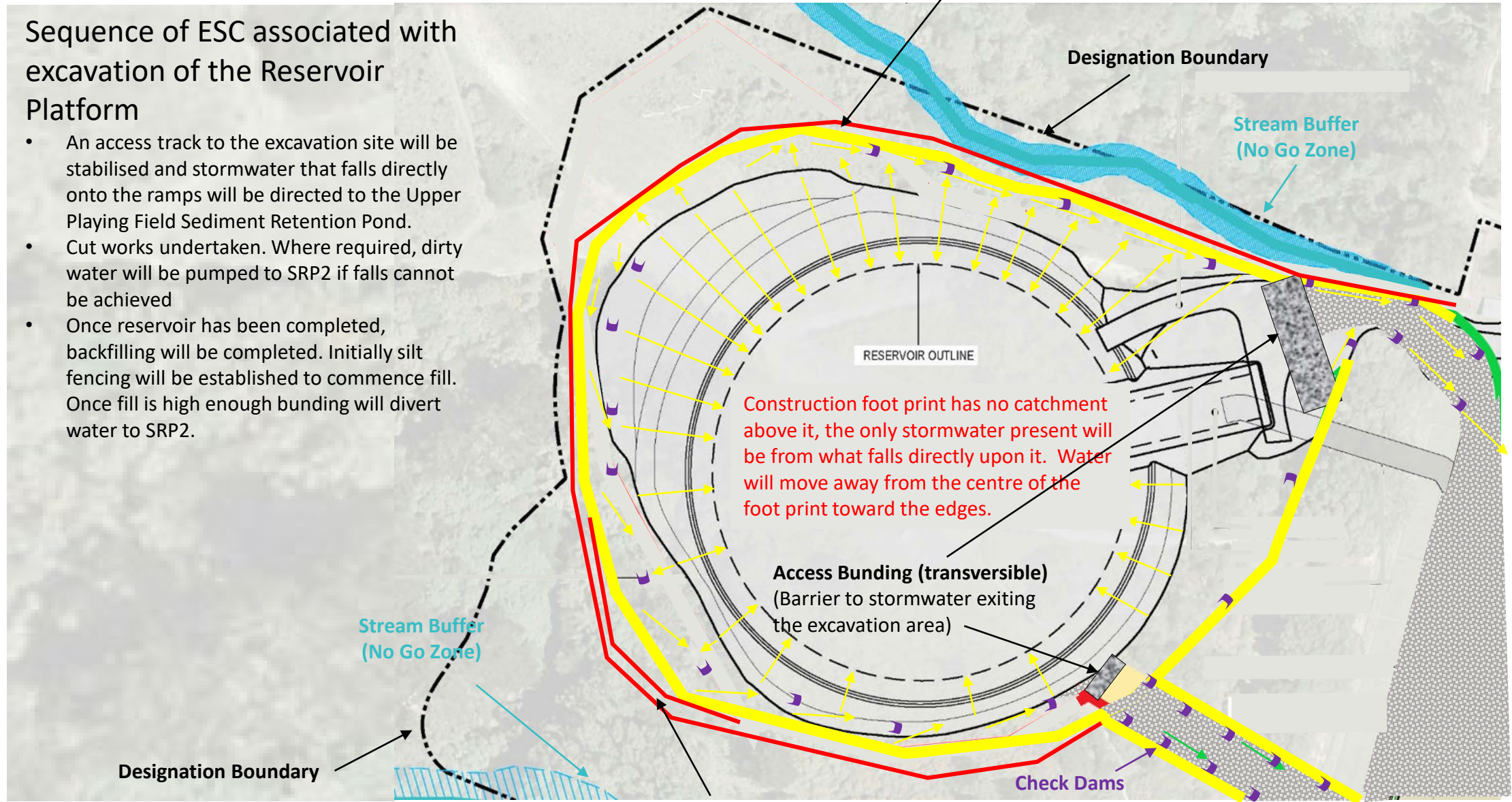
- Within a window of dry weather strip the vegetation on the footprint of the initial access track.
- The track will follow the contour around the hill at the minimum grade.
- The track surface will be slightly inclined toward the inside of the hill
- The track will be stabilised at the conclusion of each day with aggregate;
- Runoff from the track will be controlled with bunds on either side of the track directing the water to SRP2 on the Upper Playing Field.
- Velocity check dams will be installed on the track to slow stormwater as it travels to SRP2 on the Upper Playing Field
- This track will allow access to the top of the site.
- Perimeter bund will be installed and stabilised with geotextile fabric.
- Velocity check dams will be installed on the bund.



Gully works – double silt fencing installed at base. Area to opened in minimal sections

Sequence of ESC associated with excavation of the Reservoir Platform

- An access track to the excavation site will be stabilised and stormwater that falls directly onto the ramps will be directed to the Upper Playing Field Sediment Retention Pond.
- Cut works undertaken. Where required, dirty water will be pumped to SRP2 if falls cannot be achieved
- Once reservoir has been completed, backfilling will be completed. Initially silt fencing will be established to commence fill. Once fill is high enough bunding will divert water to SRP2.

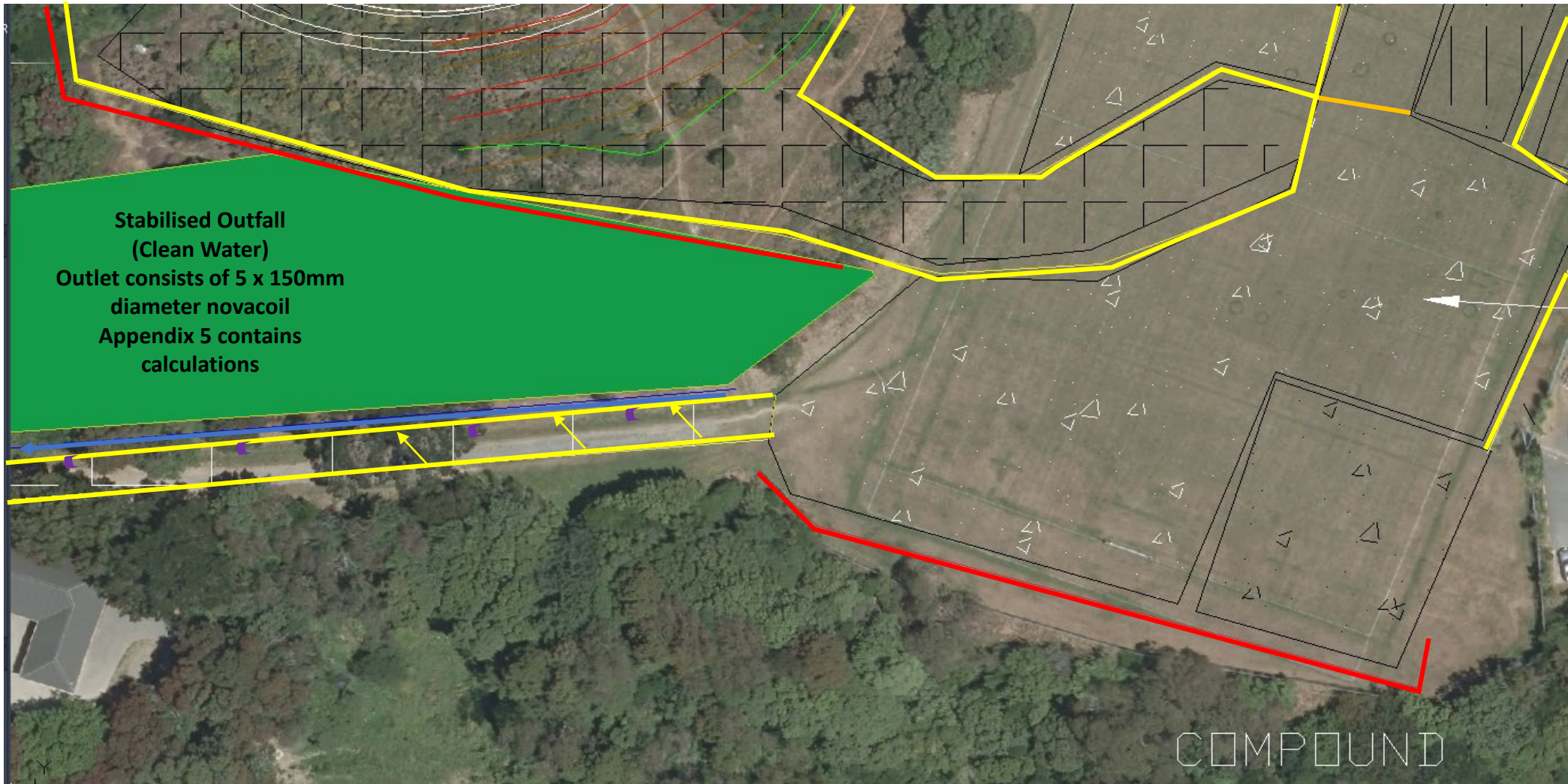


Gully works – double silt fencing installed at base.
Area to opened in minimal sections

Technical Notes – Upper Playing Fields:

- The track surface will be covered with rock (GAP65 or Rota Millings) to render the surface stabilised.
- The track will be constructed using a cut and cover approach (leaving a stabilised surface at the conclusion of each day)
- The stabilised entranceway will also be constructed with the approach of cut and cover.
- The bunding will be at least 550mm in height and be stabilised in stages as completed.
- Any points that may scour due to water flow will be armoured using geotextile fabrics.
- The pond will be constructed at a length ratio of 2.1:1 due to existing and future services to be constructed (non-compliant device). Additional baffles will be installed and covered with Cirtex Enviroforce as per the GWRC guideline for ESC. This will lengthen the flow path from the inlet to the decant.
- The 9200m² treatment area is comprised of 3 parts however when the stock pile material has been completed it will be stabilised and be treated as a clean water area, thus reducing the treatment area to approximately 5000m², the areas include:
 1. 3200m² stockpile area
 2. 1000m² access track areas
 3. 5000m² reservoir excavation





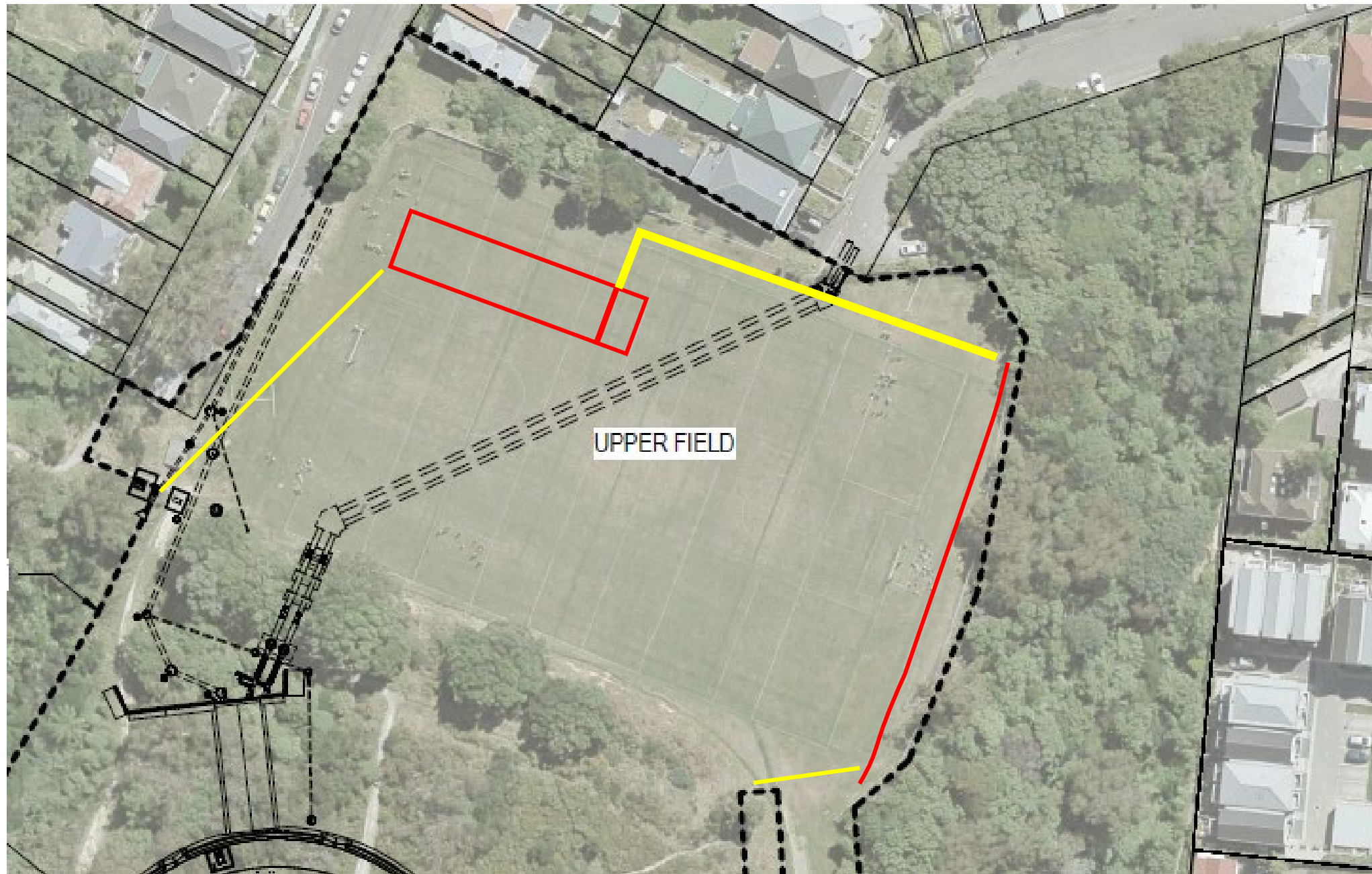
Technical Notes – Access Track between the Upper and Lower Playing Fields:

- The track surface will be covered rock (GAP65 or rota millings) to render the surface stabilised.
- A compacted earth bund of at least 550mm in height will be created on both sides of the track and then covered with geotextile to stabilise the bunds surface.
- The track surface will fall toward the hill side of the track which will manage stormwater to one side of the track.
- Velocity check dams will be positioned on the hill side of the track to slow the stormwater as it moves down the track.



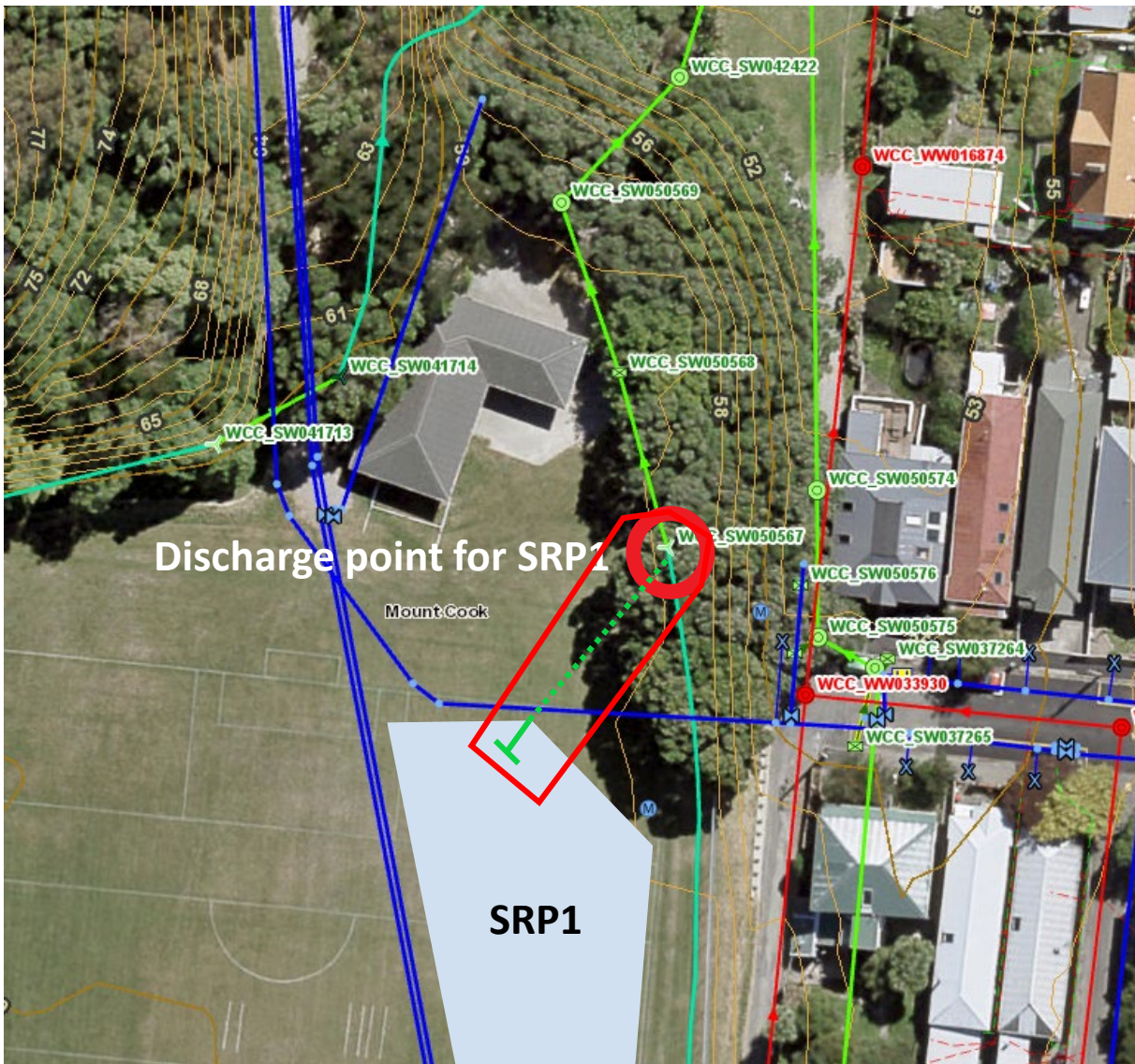
Technical Notes – Clean Water Diversion outfall:

- Stormwater from the track surface will be directed through a 300mm diameter culvert across the area of the stream to enter into the stockpile bunding that delivers stormwater to SRP1.
- The upper part of the track will be shaped to direct off to the silt fences associated with the Upper Playing Field.
- To introduce clean stormwater into the stream at the bottom of the track without causing scour to the stream bed or stream bank a coffer dam will be constructed adjacent the stream and water will be dropped into the stream using novacoil pipes.
- To avoid the existing stream culvert an overland pipe culvert (300mm diameter), similar to that shown in the photo will be used to transfer the dirty water to the proposed bund surrounding the stock pile.



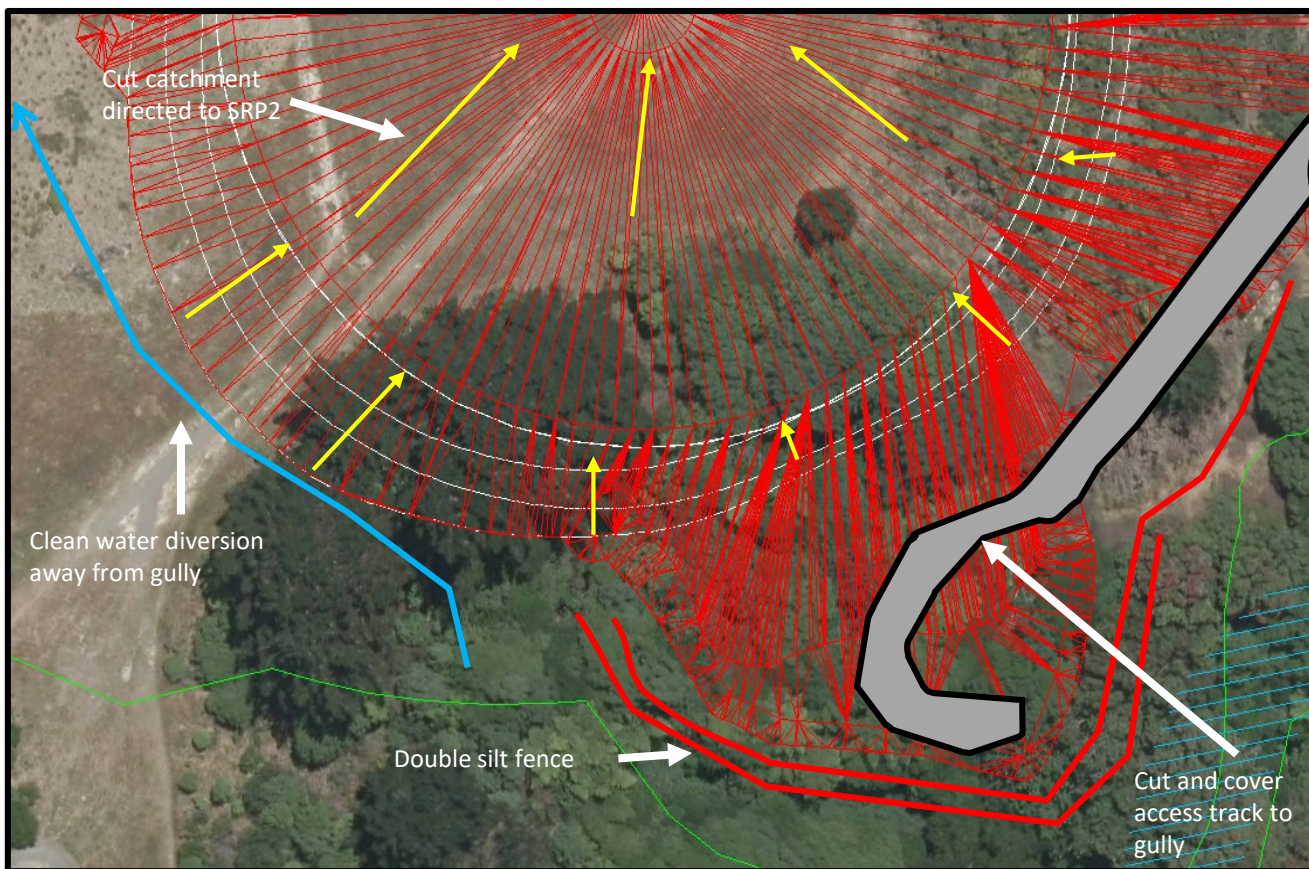
Technical Notes – Watermain Installation:

- The Watermain needs to be installed after the sediment retention pond has been installed
- Open area will be drained to the SRP while the excavation is opened.
- The pipe will be limited to 24m long and will be progressive stabilised back to hardstand

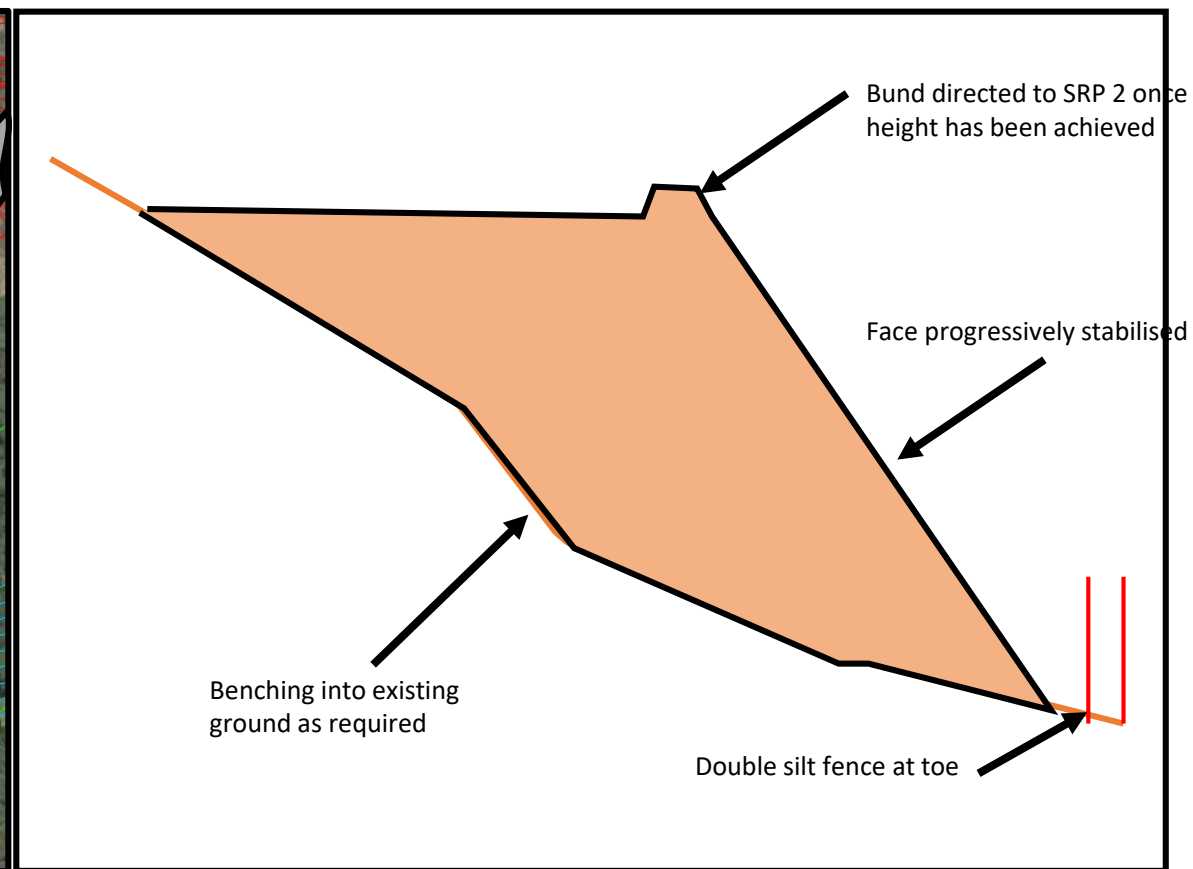


Technical Notes – Discharge Points associated with SRPs:

- Primary outlet pipes will be directly connected to the stormwater network and buried.
- Emergency spillway will be overland within a confined flow path to the same stormwater network only it will enter via a connection through the manhole (diameter 500mm).
- SRP1 it discharges into the piped section of the Papawai Stream approximately 100m away and SRP2 discharges into the piped section of the Waitangi Stream that discharges into the harbour after several kilometres. The pipes at 375mm diameter concrete at the point of entry.



PLAN

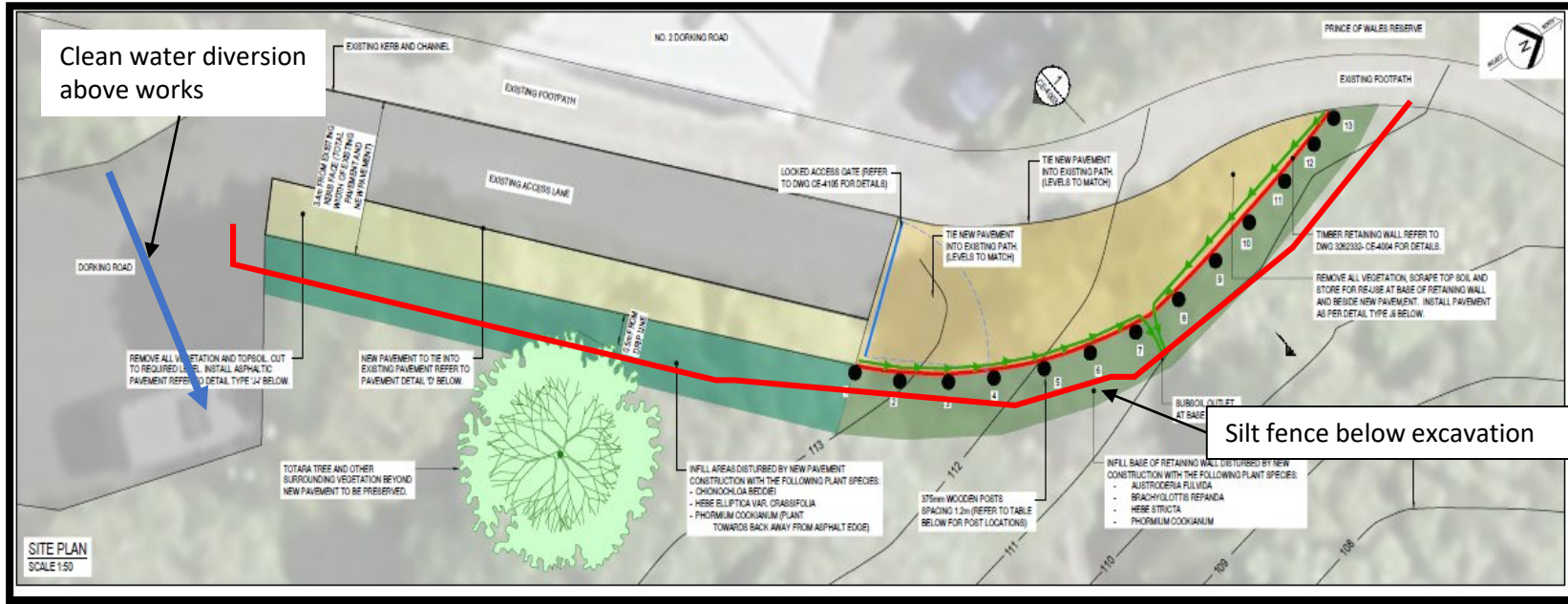


CROSS SECTION THROUGH GULLY

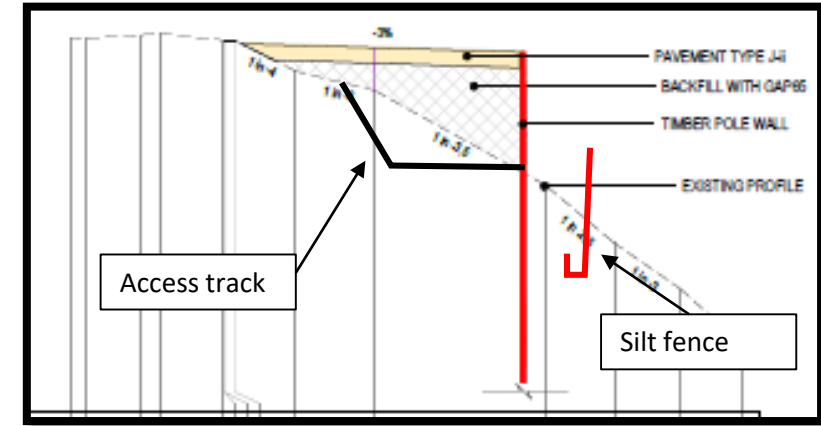
Technical Notes – Gully Works

- Double silt fence at bottom of gully
- Clean water diversion above cut and gully directing water away
- Cut and cover access track into gully
- Foundation detail and benching
- Minimal area opened up at a time
- Area progressively stabilised as works proceed
- Once height has been achieved, sediment laden water will be directed to SRP2 by bund

DORKING ROAD



PLAN



Cross Section

Technical Notes – Dorking Road

- Access to site from Dorking Road
- Silt fence below excavation
- Direct clean water catchment away from works
- Excavate track alongside pole location
- Minimise open area where possible
- Install fence post
- Deliver and place backfill and stabilise access area

Technical Notes – Waitangi Stream culvert extension (as per 12.3.3)

- Approval from GWRC
- Completed during a dry weather window
- All materials procured in advance
- Notification sent to GWRC of commencement of works 48 hours in advance
- Fish rescue completed by Freshwater ecologist in accordance with “Fish Rescue Protocol for Minor Streamworks”
- Install temp earth dam and armour
- Remove vegetation with oversight by Ecologist
- Remove existing inlet and extend pipe 3m
- Stabilise area
- Remove temporary diversion and complete planting

