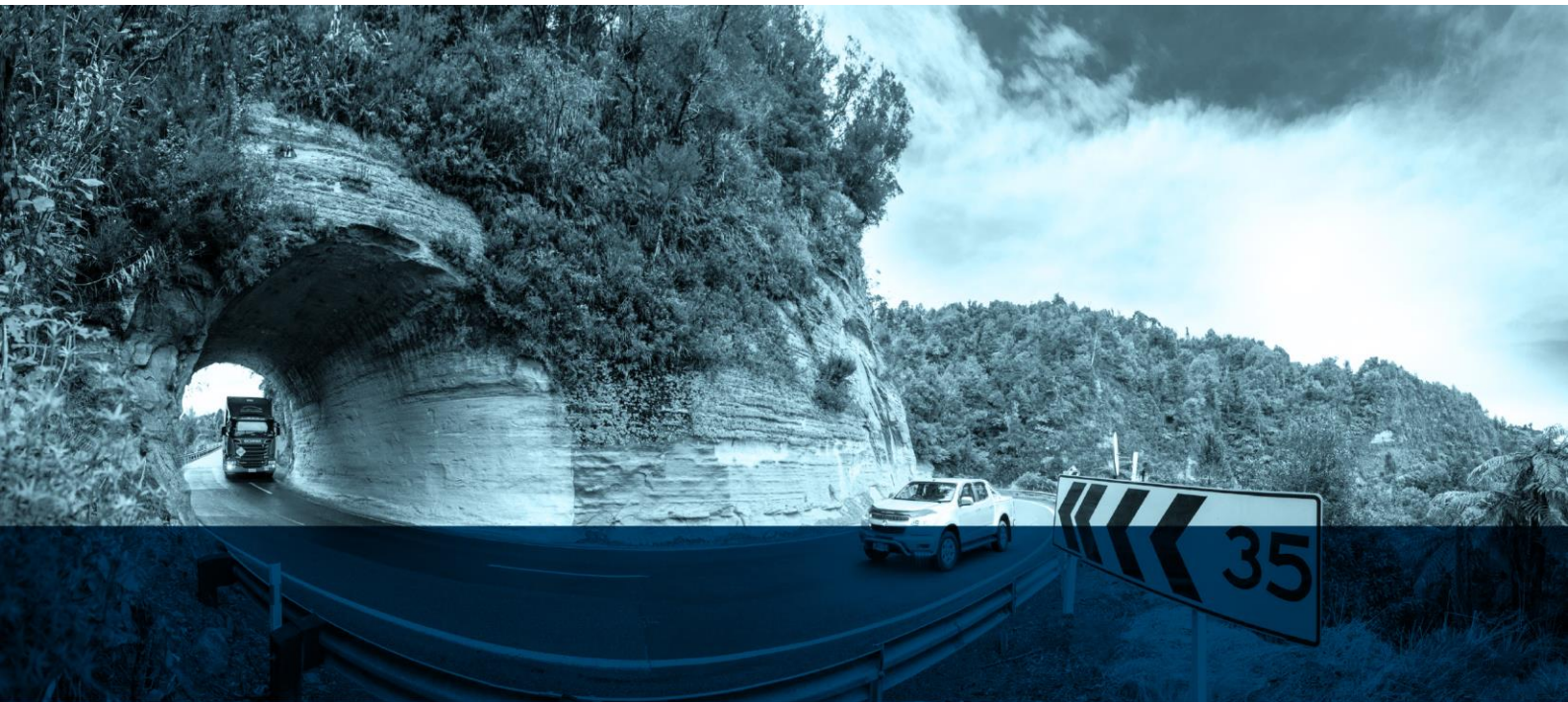


Specific Construction Water Management

Temporary Access Crossing at CH 570

Reference: North Z2 at CH 570. ACCESS: TEMPORARY CROSSING _RPT 1120

MMA-DES-ESC-E1-RPT-1120



Revision schedule		
Rev. Number	Date	Description
0.	25 May 2018	For Council
1.	17 July 2018	Updated for Council hearing

Disclaimer

This report has been prepared by the Mt Messenger Alliance for the benefit of the NZ Transport Agency. No liability is accepted by the Alliance Partners or any employee of or sub-consultant to the Alliance Partners companies with respect to its use by any other person. This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Contents

1	SCWMP Overview	1
1.1	Purpose	1
1.2	Scope	1
1.3	Description	1
1.4	Site Conditions	2
1.5	Monitoring	3
2	Construction Method and Erosion and Sediment Control Measures	3
2.1	Overview	3
2.2	Specific control measures	4
2.3	Stabilisation	5
2.4	Works within 20 Year ARI Flood Plain	6
2.5	Risk Analysis and Contingency Measures	7
2.6	Works in a Watercourse	8
	2.6.1 Stream diversion capacity (channel or pipe)	8
	2.6.2 Design Details	8
	Appendix A: Drawings and calculations	11

1 SCWMP Overview

1.1 Purpose

This Specific Construction Water Management Plan (SCWMP) has been prepared in accordance with the guidance in the Construction Water Management Plan (CWMP) to meet resource consent conditions and the SCWMP template appended to the CWMP.

This SCWMP is considered a **field document**, and is developed in consultation with suitably qualified staff (e.g. construction supervisors and engineers) to guide construction works (refer Section 2).

This SCWMP may be updated over time based on feedback from Taranaki Regional Council (TRC) compliance staff and/or in response to lessons learned as works proceed and/or as part of the CWMP review process.

1.2 Scope

This SCWMP covers the activity of establishing a temporary access road crossing at approximately CH 570. The location of this activity is shown on Drawing MMA-DES-ESC-E1-DRG-1121 (attached in Appendix A).

This SCWMP addresses the Establishment works of earthworks to:

- Extend the access road within the 10 m stream buffer zone; and
- Install temporary culverts and associated structures.

These works, and associated construction details are shown on Drawings MMA-DES-ESC-E1-DRG-1122 to 1124 (attached in Appendix A).

The crossing details, including the contingency overflow path will be reviewed prior to the access road being extended across the full width of the floodplain (to complete fill works on the eastern side of the stream). As part of this, a permanent spillway or overflow path will be designed to convey flood overflows (i.e. that exceeding the culvert capacity) up to the 20 year event. This will be confirmed in a separate SCWMP prepared for this stage of work.

1.3 Description

The works are located within the Tongaporutu Catchment.

The potential maximum open earthwork area associated with this SCWMP is 0.17 ha.

All activities within this SCWMP will be progressively stabilised, and it is unlikely that this whole area will be open at once.

Table 1.1 – Activity and duration

Works type	✓	Description	Duration	Area (ha)	Earthworks volume (m ³)
Establishment works	✓	Earthworks to construct the access road over Managapepeke Stream.	Up to 1 week (timed for a suitable weather window).	0.12 (1200 m ²)	Approx. 1500
Stream works	✓	Online stream diversion and instream earthworks to install temporary culverts.	Up to 1 week (timed for a suitable weather window).	0.05 (500 m ²)	Approx. 400
Main earthworks	×	NA			

1.4 Site Conditions

The site conditions of the temporary access crossing at CH 570 comprises:

- The existing stream channel;
- Vegetated flood plain with underlying material eroded from the surrounding hillsides which have been re-deposited as soft, compressible soils (predominately silt).

Soil material for constructing the access track will be sourced from the nearest cut area within the project alignment or be imported from off-site. Soil sourced from within the project alignment comprises soft siltstone and sandstone rock of the Mount Messenger Formation.

The existing stream channel where the temporary culverts will be installed is likely to comprise soft material which contains organic material. This material is considered unsuitable for access track earthworks. This material will be excavated and removed to a disposal area outside the extent of this SCWMP (e.g. Disposal Area 3 or 4).

It is not expected earthworks will encounter soil conditions, such as acid based soils, that would compromise the effectiveness of the erosion and sediment control measures or methodology proposed.

A flocculated treatment pond is not required for the works because this comprises a small footprint of works of short duration, and are progressively stabilised.

If any unexpected geological conditions are encountered, discussions will be held with the TRC monitoring officer to determine appropriate contingency measures.

1.5 Monitoring

This SCWMP will be monitored in accordance with the Monitoring Programme as per resource consent conditions and the CWMP.

An important focus of site monitoring will be to ensure that when large or high intensity rainfall events are forecasted, appropriate monitoring and or maintenance is implemented in response. This monitoring will include a ‘feedback loop’ to ensure that all personnel are aware of any changing requirements and or any improvements to management practices.

This feed-back loop will include procedures for adapting erosion and sediment controls in response to the monitoring outcomes.

2 Construction Method and Erosion and Sediment Control Measures

2.1 Overview

This SCWMP has been prepared and reviewed by the following suitably qualified persons:

SCWMP prepared by:		Sharon Parackal E&SC Engineer
Construction method(s) reviewed by:		Stu Haynes Construction Manager
SCWMP reviewed by:		Ed Breese Environmental Manager
Approved for Release:		Hugh Milliken Alliance Manager

All erosion and sediment control measures have been designed by a suitability qualified staff who meet the following requirements:

Plan Preparation Requirements (as per SCWMP template)	✓
Is familiar with the requirements of the Transport Agency Guidelines, conditions of consent (under draft), the CWMP and any supporting plans (e.g. Chemical Treatment Plans).	✓
Is familiar with expected site conditions and proposed construction methodologies relevant to this SCWMP.	✓
Is familiar with topographical lay of the surrounding land relevant to this SCWMP.	✓
Has completed a site visit relevant to this SCWMP.	✓

2.2 Specific control measures

Table 2.1 summarises the sequence of works and the specific application of erosion and sediment control measures from the CWMP. Refer to Appendix A for further details: Drawings MMA-ESC-E1-DRG-1122 to 1124; Design calculations for DEB-TRACK1; and the temporary culverts.

Table 2.1 – Work sequence and erosion and sediment control (ESC) measures

Work Sequence	ESC measure	Comments
1. Set out toe of road batter and install silt fence on both sides of the stream.	No plant or vehicle tracking. Silt fences to be installed by hand.	
2. Push out temporary access to the edge of the 10m buffer zone on the east side of the stream. Set out and construct DEB-TRACK 1 (500 m ² catchment).	Silt fence on downslope side of works area and stream (Detail 1).	Install silt fence as per Detail 1. Install DEB as per Detail 2. Stabilise outside batter face of DEB with pinned geotextile. DEB discharging to a stabilised outlet.
3. Install sandbag dam upstream and downstream of works area. Install diversion pump and discharge line and pump stream around works area.	Coffer dam constructed from non-erodible material (e.g. pinned sandbags or stacked concrete blocks). Float attached to the pump inlet to prevent extraction of bed sediments. Pump outlet with a diffuser setting, discharging to stabilise ground (e.g. grass or geotextile lined area).	Install temporary cofferdam. Carry out fish relocation in accordance with the Fish Relocation Protocols in the ELMP. Pump to be fitted with an appropriate inlet screen with mesh size of 3 mm or less and inlet velocity of less than 0.12 m ³ /s.
4. Muck out stream channel and excavate to 400 mm below pipe invert level. Excavate stream banks to form new inlet and outlet channels.	Stream pumped around works area. Dirty water pumped to DEB-TRACK 1.	Construction supervisor to monitor excavation and dewatering pumping is carried out in a suitable weather window.
5. Install culverts and backfill. Construct inlet and outlet headwall structures.	Stream pumped around works area. Dirty water pumped to DEB-TRACK 1.	Install culverts and headwalls and stabilise the inlet and outlet channels as shown on Drawing MMA-DES-ESC-E1-DRG-1123.

Work Sequence	ESC measure	Comments
		Remove all loose soil, debris and plant once channel is stabilised.
6. Complete earthworks to form the road, safety bunds and stabilised spillway.	Silt fence on downslope side of works area. Stream pumped around works area. DEB-Track 1 (Detail 2).	Continue stream pumping for all earthworks within 10 m of the stream. Earthworks directed to DEB-Track 1. Road outside batter face stabilised with pinned geotextile.
7. Once earthworks are complete and stabilised, remove sandbag dams and cease pumping. Note: DEB will be maintained for treating runoff from the road surface.	DEB-Track 1 (Detail 2).	Remove downstream dam and then upstream dam before ceasing to pump.

2.3 Stabilisation

The CWMP sets out the definition of **Stabilised Area** and **Actively Worked**. Areas not subject to works for more than a 14-day period will be identified and stabilised as works proceed (referred as “Stabilisation Trigger”).

As per SCWMP template	
Stabilisation Trigger:	14 days not Actively Worked
Is the Stabilisation Trigger likely to occur	Yes or <input checked="" type="radio"/> No Guidance note: circle one
Stabilisation techniques	Access road & DEB: Pinned geotextile on the outside batter face. Note: The road running surface will be not be stabilised. This surface will be managed by routine trimming of loose soil, and stormwater runoff being directed to a dedicated DEB.
	Stream excavation sides: Plastic and geotextile lining with sandbags stacked vertically and tied back to the existing ground.
	Culvert inlet & outlet headwall: Sandbags stacked vertically with grid reinforcement between each layer.

As per SCWMP template	
Stabilisation Trigger:	14 days not Actively Worked
	Culvert inlet & outlet channels: Sandbags (or similar approved) on the channel side with plastic and geotextile lining of the channel base over the extents shown on Drawing MMA-DES-ESC-E1-DRG-1123.
Frequency of check on Activity Worked area	Weekly checks by the Construction Supervisor. Records of these checks will be maintained by the ESC Supervisor.

2.4 Works within 20 Year ARI Flood Plain

The Temporary access crossing will be installed and operated within flood plain of the Mangapepeke Stream.

The location of this crossing is considered the only viable option for this SCWMP.

Rainfall equating to about 150 mm of rain in a 24 hour period is considered a 20 year ARI event. Flood depths for the 20 year ARI event roughly at the DEB-Track 1 location have been predicted as follows:

- RL 12.1m, or about 200 mm above existing ground: predevelopment where the existing floodplain width is fully available;
- RL 12.3m, or about 400 mm above existing ground: post-development where the floodplain constrained to about 25 m wide.

Based on the predicted flood depths for the 20 year ARI event, this crossing is not considered likely to be inundated by flood flows (refer Long section – Crossing on Drawing MMA-DES-ESC-E1-DRG-1122). Instead, flood flows will naturally discharge at the lowest point within the floodplain (i.e. existing ground level).

The temporary culverts are designed for a 2 year ARI event. Rainfall equating to about 90 mm of rain in a 24 hour period is considered a 2 year ARI event. Prior to forecasted rainfall exceeding the 2 year ARI event (i.e greater than 90 mm, or equivalent 2 year ARI event), a temporary overflow pathway will be where shown on Drawing MMA-DES-ESC-E1-DRG-1122. This will typically comprise:

- Forming a temporary 0.5 m high non-erodible bund (e.g. sandbags) between the works area and floodplain; and
- Stabilising any disturbed ground in the floodplain with pinned geotextile for about a 25m length. This shall include the removal of plant and material that may be present in the floodplain.

Note: As Establishment works are completed on the eastern side of the stream, if this crossing is considered likely to impede flood flows it will be reassessed for inclusion of a stabilised spillway to safely convey flood flows. Prior to this being required, a SCWMP will be prepared.

2.5 Risk Analysis and Contingency Measures

The potential risk of increased sediment discharges from activities of this SCWMP is assessed in Table 2.2, along with specific measures (both structural and/or non –structural) to address this risk.

Table 2.2 – Risk assessment

Risk activity	Specific measures	Residual risk after controls
Untreated sediment laden discharges to stream.	A suitable weather forecast required to start works.	Low
	Establish an online stream diversion (pumping) to remove flowing water from the works area.	
	Silt fences between working area and stream, installed prior to any earthworks commencing.	
	Earthworks staging shall allow for time to stabilise undertaken works prior to forecasted poor weather.	
Flooding of partially completed works in the flood plain	A suitable weather forecast to complete works is required prior to starting stream works .	Low
	Earthwork staging to prioritise completing and stabilising works within the stream channel.	
	Refer Section 2.6 for establishing a temporary overflow path.	
Flooding of completed crossing	Refer Section 2.6.	Low while the flood plain remains unimpeded on the eastern side. Note: Risk to be monitored and reassessed as Establishment works are completed on the eastern side of the flood plain.

In accordance with the CWMP, this SCWMP includes a risk assessment process to assess works in the winter period (1 May to 30 September inclusive).

As per SCWMP template	
Date prepared	13 July 2018
Is Winter Works required	Yes or No
Next review date	1 April 2019

2.6 Works in a Watercourse

2.6.1 Stream diversion capacity (channel or pipe)

This SCWMP includes temporary stream diversions for the temporary access road.

These temporary stream diversions are designed to allow flows through the diversion for events up to the 2 year ARI event (2 x DN2400 diameter culverts).

For rain events that exceed the capacity of the formal temporary diversion, flow will be directed over stabilised surface (“overflow path”), which will be established on a rain forecast reactive basis. This overflow path will be the existing flood plain as described in Section 2.4, at the location shown on Drawing MMA-DES-ESC-E1-DRG-1122.

Design details are summarised below.

2.6.2 Design Details

Item	Diversion ID: TEMP CROSSING @ CH570	
Construction method	On-line as described in the CWMP	
Contributing catchment area above work site	3.61 km ² (361 ha)	
Stream type and name	Permanent Stream – Mangapepeke Stream	
Design rainfall event	Frequency: 50 % AEP	Qculverts = 14.3 m ³ /s
Overflow path	Temporary stabilised overflow path created prior to event exceeding 90 mm in 24 hr (or equivalent 2 year ARI event).	
Duration of works within watercourse	Time of Year: January Duration: 1 Week	
Fish Passage requirements	Culvert invert embedded into stream channel with substrate placed in the pipe invert. Maximum culvert grade of 1%	

Item	Diversion ID: TEMP CROSSING @ CH570
Estimated baseflow at time of works	Low (< 1m ³ /min)
Diversion and dewatering for construction	
Minimum coffer dam height	1 m
Diversion pump size capacity (pumping clean water around works area, back into the stream)	Up to 2 m ³ /min (6inch submersible pump)
Dewatering pump size capacity (pumping dirty water to DEB)	Up to 3 l/s (50 mm submersible pump)
Overflow contingency	Additional 6inch pump on hand (increase pumping capacity to 4m ³ /min)
Diversion design (refer Appendix A for design calculations)	
Drawing reference	Drawing MMA-DES-ESC-E1-DRG-1123.
Diversion pipe diameter	2 x DN2400 mm
Diversion pipe length	Approx. 11 m

Appendices

Appendix A: Drawings and calculations

11

Appendix A: Drawings and calculations
