

TCC Resilience Projects

Project Briefs



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Prepared By

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1. Manhole Resilience (Project 3)

1.1. Problem Description

There is uncertainty surrounding the expected performance of manholes of various types and forms (e.g. concrete, fiberglass, plastic, pre-cast) in liquefaction / lateral spread events as well as in different soil-types and groundwater rise.

TCC have approximately 17,000 wastewater and 13,000 stormwater manholes and better understanding manhole performance will help ensure renewals and new assets are best suited to the local conditions.

1.2. Scope of Works

Desktop review of product and design literature to better assess and define the various available construction materials and methodologies and their performance in various ground conditions and seismic events.

Identify potential research and development opportunities to further progress improvements in this field.

1.3. Deliverables

Engineering assessment report covering the following;

1. Construction materials;
2. Construction methodologies;
3. Research and development opportunities;
4. Whole-of -life costs;
5. Summary of key findings including risks available options for the various local conditions (materials/methodology/ground conditions/seismic/groundwater rise).

1.4. Relevant Documentation

- Not applicable

1.5. Internal Notes

Study done by Opus at Te Tumu looking at pump stations and rising mains – TCC contact is Kate Dawkings

1.6. Procurement

- Client Nominated Price – suggest in the \$10-\$15,000 range depending on budget constraints.
- Potential to combine with the Roads in High Water Tables (project 15).

2. Roads in high water tables (Project 15)

2.1. Problem Description

There is uncertainty around how different road construction techniques and materials will perform in areas where ground saturation is likely on a regular basis.

By understanding the effect of a high-water table on various construction techniques and materials will help ensure renewals and new assets are best suited to the local conditions.

2.2. Scope of Works

Site inspection and desktop review of the specific locations/areas of interest as noted below;

1. Welcome Bay Road from James Cook Drive to Waitaha Road
2. Eversham and Gloucester Roads

Desktop review of product and design literature to better assess and define the various construction materials and methodologies and any research and development opportunities to further progress improvements in this field.

2.3. Deliverables

Engineering assessment report covering the following;

1. Construction materials;
2. Construction methodologies;
3. Research and development opportunities;
4. Whole-of-life costs;
5. Summary of key findings including risks and available options for the various local conditions (materials / methodology / ground conditions / seismic / groundwater rise).

2.4. Relevant Documentation

- Not applicable

2.5. Internal Notes

JB to confirm FAR subsidy for this project.

2.6. Procurement

- Client Nominated Price.
- Potential to combine with Manhole Resilience (project 3).

3. Mauao Reservoir and pipes (Project 10)

3.1. Problem Description

The Mauao reservoir is the oldest water reservoir in Tauranga and it is nearing the end of its durability design life. There is the potential risk of slips/seismic events causing damage to the reservoir and associated pipework which TCC wish to understand further to enable a decision to be made on the future of the existing reservoir.

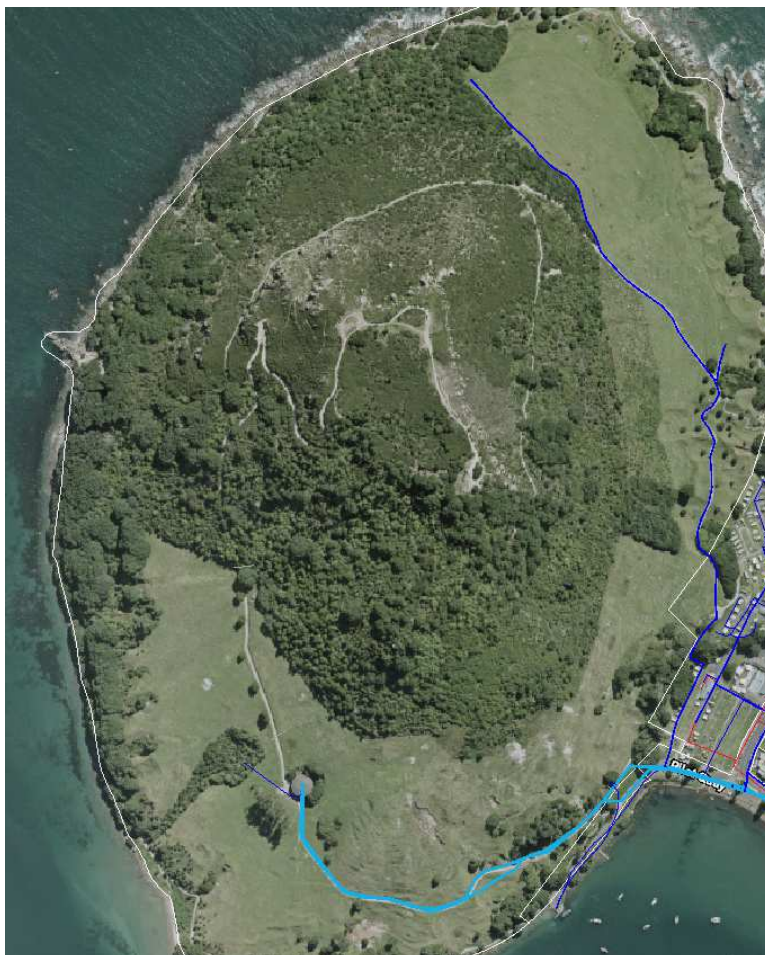


Figure 1 Mauao Water Reservoir and associated pipework

3.2. Scope of Works

Stage 1 – Proposal

Supplier to submit a proposal including the following;

1. Geotechnical investigation to enable assessment of ground conditions surrounding the existing reservoir and pipework;
2. Reporting to include;
 - a. Geotechnical interpretive report;
 - b. Risk assessment of slips/seismic events damaging the reservoir and associated pipework;

HOLD POINT – TCC to engage with the Mauao Board and community to agree geotechnical investigation can commence. This may require some input from the geotechnical consultant to attend meetings etc.

Stage 2 – Geotechnical Works

Complete geotechnical investigation and reporting.

Stage 3 – Feasibility Report

Complete a feasibility study to assess the options and constraints associated with strengthening the existing reservoir or a full replacement in the same or different location.

3.3. Deliverables

Stage 1 – Proposal

Consultant Proposal

Stage 2 – Geotechnical Works

Geotechnical investigation and reporting as per scope of works.

Stage 3 - Feasibility

Feasibility report – scope to be determined based on geotechnical works.

3.4. Relevant Documentation

- 2018-08-27 - Mount Maunganui - proposed update for Replacement Recommendation
- Mount Maunganui Reservoir - Engineering Inspection Report - Final (A304948)
- Mt Maunganui Reservoir - Draft - 20180615 - NZ1-14930310-Reservoir Condition Assessment Inspection Report - Mt Maunganui Reservoir (A8843221)

3.5. Internal Notes

Feasibility report will be a separate piece of work to procure.

3.6. Procurement

- BECA have carried out various assessments of the reservoir to date.
- Direct Appointment – BECA.

4. Oropi Road Water Pump Station (Project 7)

4.1. Problem Description

The Oropi Road water pump station (BM247) is located in a Flood Hazard Area and has several different pipework routes running into and out as shown on the figure below.

The pipework and pump station are at risk of inundation (and failure) in an extreme weather event and the seismic performance is also unknown.

One of the high-risk areas is a 600mm watermain crossing Waimapu stream (as indicated with the highlighted yellow circle in the figure below) which has previously suffered a number of faults. If a fault occurred under the stream a repair would be slow and difficult. Likewise, in a flood or seismic event any break of the many pipes into and out of the pump station would be problematic.

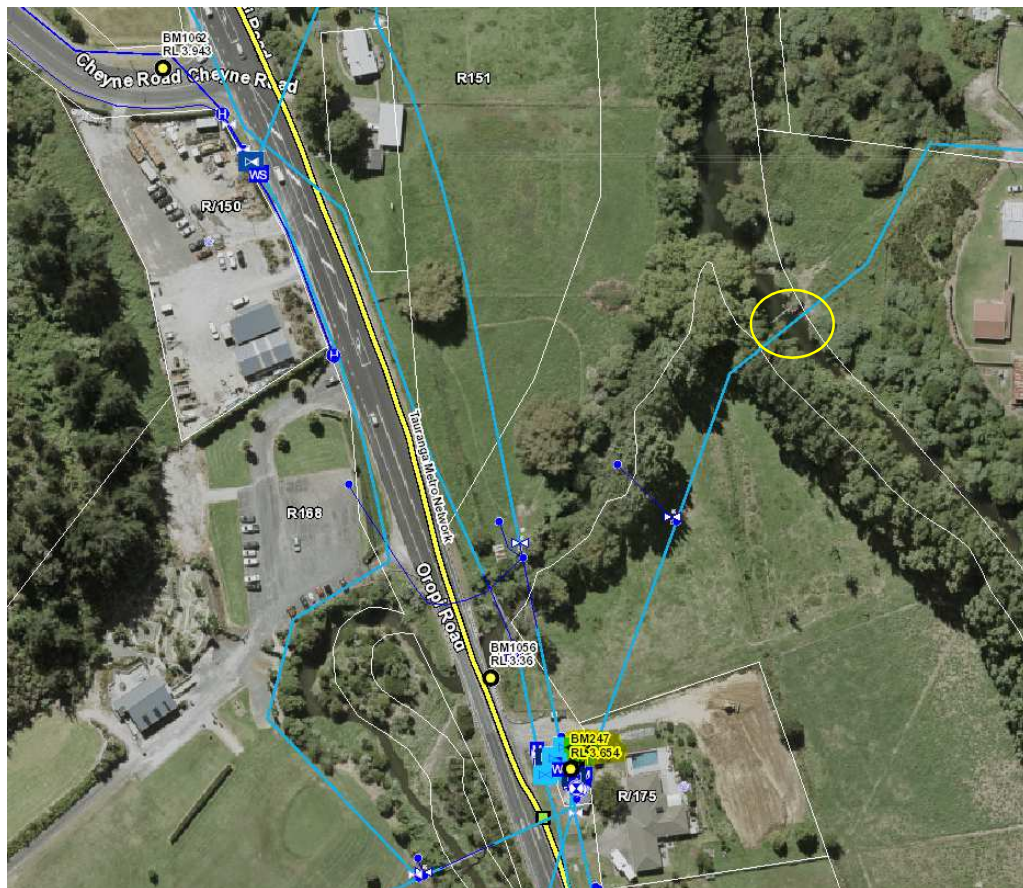


Figure 2 Oropi Road Pump Station and associated pipework

4.2. Scope of Works

1. Desktop review of known natural hazards, geotechnical information, and archaeological features;
2. Carry out an on-site condition survey of the pump station and associated pipework;
3. Prepare a mitigation plan for this site including consideration of;

- Failure and repair of the pump station and associated pipework;
- Proactive renewal options
- Proactive bypass options

4.3. Deliverables

Assessment report covering the following;

1. Natural hazards risk assessment
2. Geotechnical considerations (including further geotechnical investigation if applicable)
3. Archaeological considerations;
4. Risk mitigation plan covering the following;
 - a. Failure and repair options
 - b. Renewals options
 - c. Bypass options

4.4. Relevant Documentation

- Oropi Road Water Pump Station - CDS Report (October 1999)

4.5. Internal Notes

The scope of works to Civil Design Services (from Lower Hutt) required that the pump station motors and switchgear should be located to avoid the known flood risk.

4.6. Procurement

Direct Appointment or Closed Contest (3 suppliers)

5. Cambridge and Moffat Roads (Project 19)

5.1. Problem Description

Cambridge and Moffat Roads are likely to be a key arterial link if Takitimu Drive is affected by a significant natural event. Therefore, it is important for TCC to understand the performance of Cambridge and Moffat Roads and associated TCC-owned utilities in such a scenario.

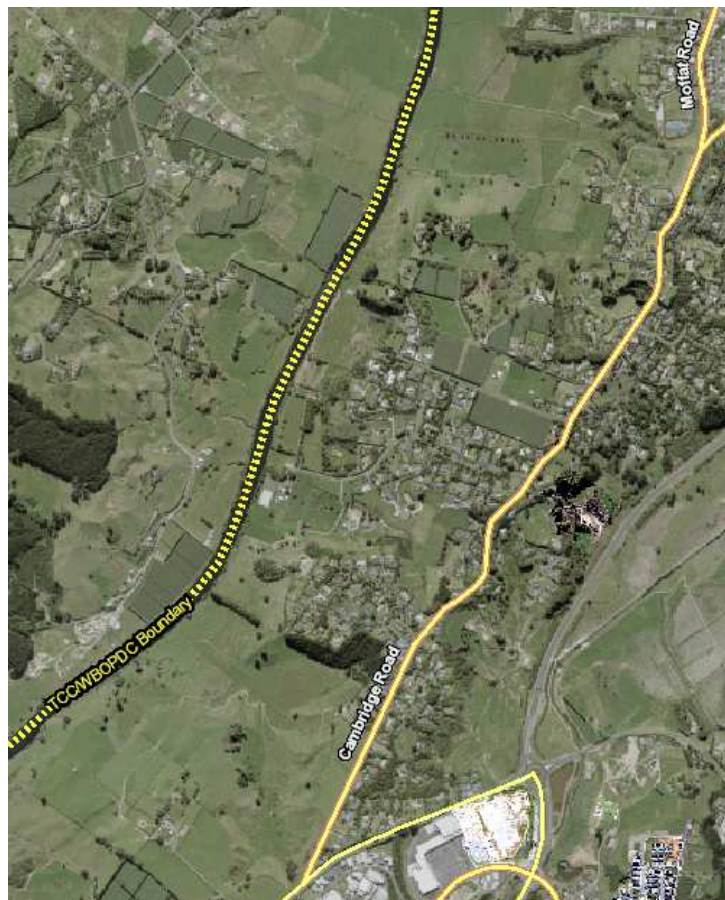


Figure 3 Cambridge Road from SH29 to Moffat Road intersection

TCC have identified the key risk areas as;

- South of Moffat Road/Cambridge Road intersection to SH29
- West of house numbers 500+ on Cambridge Road

Areas of interest where work has been carried out previously include the following;

- 185 Cambridge Road – Timber Retaining Wall (refer to Opus' Producer Statement)
- 258 Cambridge Road – TCC are currently dealing with a slip that has occurred away from the road towards the back of Ferland Spa
- 461 Cambridge Road – Subdivision carried out in 2000 which involved some geotechnical work.
- 491 Cambridge Road – Timber Retaining Wall (refer to Opus' Detailed Design Report) has been built – awaiting Code of Compliance as of October 2018
- 1 Rosewood Lane – Geotechnical assessment carried out in 2008.

5.2. Scope of Works

Stage 1

1. Desktop review of current geotechnical information, slip history, and archaeological features;
2. Assess the local hazards and the nature of the environment;
3. Provide summary of properties with stormwater soakage versus reticulated mains;
4. Assess the importance of the assets (link to state highway, 3 waters utilities);
5. Assess the risk exposure including the compounding risk on other parts of the network;
6. Identify options to protect the network (roading and utilities infrastructure).

Stage 2

Further geotechnical investigation and reporting

5.3. Deliverables

1. Engineering assessment report including the Stage 1 scope of works
2. Geotechnical investigation and reporting proposal

5.4. Relevant Documentation

185 CAMBRIDGE ROAD-PS4 (dated 17/03/2015)
TL10037 - Detailed Design Report - Timber Retaining Wall - 491 Cambridge Road - Tauranga City Council (dated 27/10/2017)

5.5. Internal Notes

Isolated work done by TCC in the past (Richard Joyes – TCC Transport Project Manager)

- Close to Rosewood Lane
- Adjacent to 491 Cambridge Road (retaining wall)

Deliverable timeframes to be confirmed with TCC.

TCC to confirm what additional information is available from previous works and Building Consents.

5.6. Procurement

- Direct Appointment or Closed Contest (3 suppliers)
- Potential to be combined with Oropi Road (project 20) as this will have significant geotechnical input.

6. Oropi Road north of SH 29A and Chadwick Road (Project 20)

6.1. Problem Description

TCC's stormwater, water, and wastewater assets lie beneath Oropi road. Should a major event (e.g. seismic, weather) induce a significant slip this would have a substantial effect on the operation of the network.

Slips have occurred along Oropi Road in recent history and TCC's standard response has been to remove the slip material and hydroseed the bank. The exception is that in 2017 a 12m long reinforced earth wall was constructed outside 24 Oropi Road and the entrances to 26, 28 and 30 Oropi Road (refer to Opus' Completion Report attached).

There is uncertainty of the risk of further slips with the limited availability of geotechnical information and the impact they may have on TCC-owned assets.

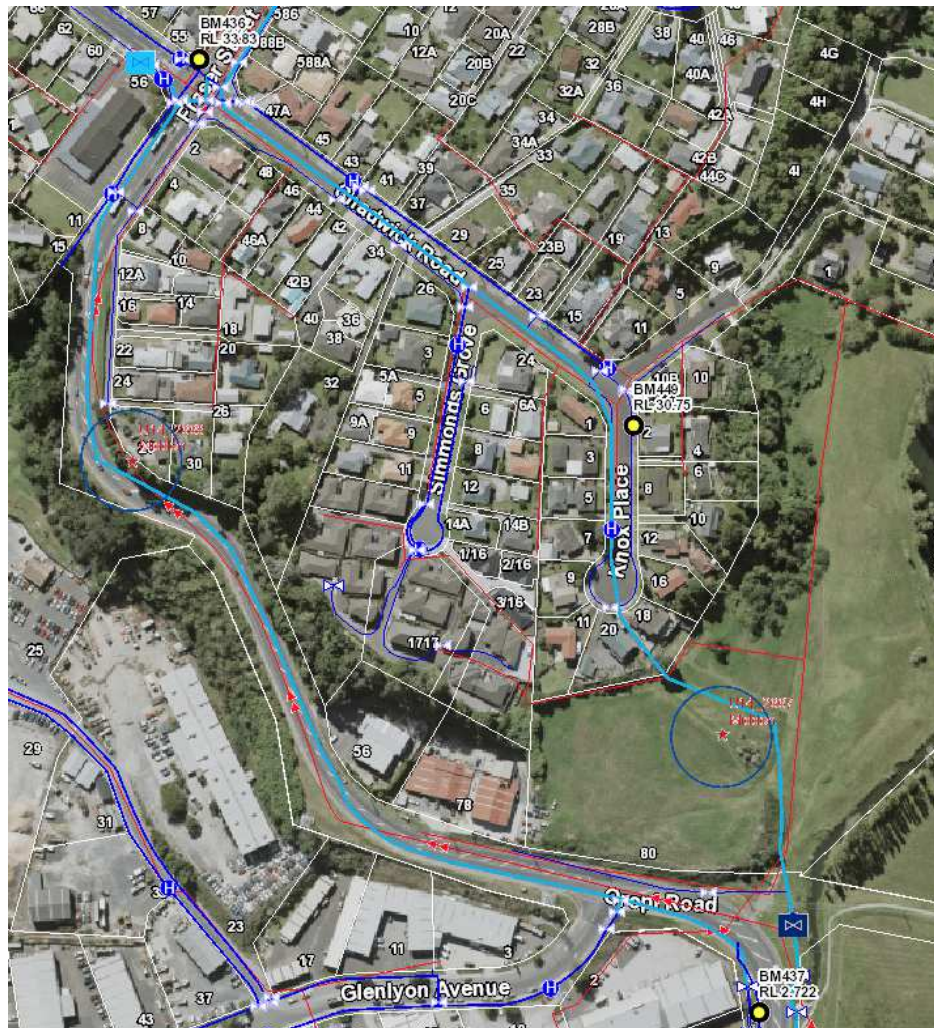


Figure 4 Oropi Road

6.2. Scope of Works

Stage 1

1. Desktop review of current geotechnical information, relic slips, and archaeological features;
2. Geotechnical investigation works required to assess the areas of interest (to be agreed with TCC);
3. Geotechnical interpretive report;
4. Assessment of the natural hazards (i.e. slips, liquefaction, flooding, etc) and the nature of the environment;
5. Assessment of the importance of TCC-owned assets (i.e. roading link to state highway, 3 waters infrastructure);
6. Assessment of the risk exposure including the compounding risk on other parts of the network;

Stage 2 (provisional item)

1. Identify options to protect the networks (e.g. shutoff valves at either end of the WW rising main, diversions, etc);
2. Carry out a cost-benefit analysis associated with repairing slips after the fact vs proactive engineering prevention.

6.3. Deliverables

1. Geotechnical interpretive report;
2. Engineering assessment report covering the following
 - a. Archaeological considerations;
 - b. Natural hazard summary;
 - c. Risk assessment of TCC-owned assets

6.4. Relevant Documentation

- Oropi Road Reinforced Earth Wall Report (31 July 2017)
- Oropi Road Slip Stabilization_ Geotech Report (22 November 2016)
- Response letter to TCC_ES (24 November 2016)

6.5. Internal Notes

Deliverable timeframes to be confirmed with TCC.

6.6. Procurement Notes

- Direct Appointment or Closed Contest
- Potential to be combined with Cambridge/Moffat Roads (project 19) as this will have significant geotechnical input.