

# STAFF REPORT

**TO:** Chairman & Members, Engineering Services Committee

**FROM:** Rivers Asset Engineer

**DATE:** 22 September 2005

**SUBJECT:** Riwaka River Stopbanks – Upgrade Options Study

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## PURPOSE

To present findings of upgrade option study.

A powerpoint presentation will be given at the Engineering Services Committee meeting on 29 September 2005.

## BACKGROUND

MWH NZ Ltd were engaged by Tasman District Council to revise the Riwaka and Brooklyn Stopbanks Review – Stage 3 which was completed by MWH NZ Ltd in September 2004. This review is limited to the Riwaka River only and the purpose is to develop different improvement options for the Riwaka River and to improve the cost estimate of the previous report.

## COMMENT

MWH NZ Ltd have provided three different improvement options in this report, as detailed below:

In each option, where the existing ground level is as high or higher than the level of protection required by that option, there is an allowance for reworking the existing stopbank to provide the profile as set out in Appendix F. This profile provided the basis for the cost calculations.

**Option 1:** 2% AEP (50 year) protection plus 500 mm freeboard throughout river system. Complete rebuild with a 500mm clay blanket on inside of the stopbank.

**Option 2:** 5% AEP (20 year) protection plus 500 mm freeboard to downstream of the State Highway Bridge. A designated spillway or overflow 400m in length on the left bank has been allowed to give protection to the State Highway along with a complete rebuild with 500mm clay blanket on the inside of the bank.

**Option 3:** 5% AEP (20 year) protection (bankfull). Rework of existing banks (no freeboard) to give approximate existing level of protection at bankfull. If a freeboard allowance is taken into account the protection will effectively be a 20% AEP (5 year) protection with 500mm freeboard.

This option also has provision for a 400m long designated overflow spilling downstream of the State Highway Bridge on the left bank. This spillway is necessary to prevent flooding of the State Highway as a result of a backwater curve effect caused by the stopbanks downstream.

This option provides for a rework of existing materials with no clay blanket, thereby introducing some residual geotechnical risk depending on existing quality of stopbank materials.

The cost estimates are based on twenty cross-sections of the Riwaka River from chainage 3500 to 8390 that were surveyed in 1998. An area was calculated at each section for cut to waste, imported fill, reworking existing material, imported clay and topsoiling. These were averaged between each section and multiplied by the length between the sections. A general estimated rate was applied to each of these volumes. Allowance was made for preliminaries, contingency and engineering/administration. No allowance has been made for land compensation and legalisation of easements.

The final cost estimates for the three options are set out below:

Option 1 (2% AEP + 500mm)	\$3,670,000
Option 2 (5% AEP + 500mm)	\$3,310,000
Option 3 (5% AEP)	\$1,500,000

## **CONCLUSIONS**

The present stopbanks on the Riwaka River only provide a level of protection equivalent to 10% AEP (10 year flood).

There are 3 improvement options that have been considered ranging from 2% AEP (50 year) protection down to 5% AEP (20 year) protection with no allowance for freeboard. In considering these options the Council needs to be aware of the level of service associated with each option.

The Building Act is the only piece of legislation currently that sets a standard of protection in relation to habitable dwellings. This protection standard is the 2% AEP standard.

The Council does not have a formal level of service to be applied to proposals of this nature.

## **RECOMMENDATIONS**

- 1. That the Council refer the options to the community at risk to determine the level of service they are prepared to accept and pay for. This may involve principles outlined in the draft NZ Flood Mitigation Protocol and may require Council to adopt appropriate risk management standards.**
  
- 2. That the Council consider additional policies that may better complement the wider management of the Riwaka floodplains and the development that is currently occurring on it as set out below:**
  - Developing flood hazard maps to control development and mitigate residual risk.**
  - Public education to improve flood risk awareness.**
  - Establish early flood warning systems.**

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