



AUDIT OF RIVER MANAGEMENT ASSET MAINTENANCE STANDARDS

- Audit of:** River Schemes managed by the Flood Protection Department, Landcare Division of the Greater Wellington Regional Council
- Audit by:** Michael Hewison, Mike Longworth and Maia Kawana of the Operations Department Wairarapa Division, Greater Wellington Regional Council
- Locations:** Wainuiomata River and Porirua Stream
- Guides:** Jeff Evans, Mike Jensen & Jacky Cox of the Flood Protection Department, Landcare Division, Wellington Regional Council
- Date:** 19 July 2005

1.0 Introduction

Annual Peer reviews are undertaken of river assets in the Wellington and Wairarapa areas. The peer reviews provide an audit of maintenance standards and procedures.

To do this audit, sites from the Western Region asset registers are chosen by the guides and inspected by the reviewers. Maintenance responsibility for these assets lies with the Flood Protection Department.

This year's inspection of the Western Region assets concentrated on the Wainuiomata River and Porirua stream.

2.0 Wainuiomata River

The Flood Protection Department manages a section of the Wainuiomata River under an agreement with Hutt City Council. The section managed under this agreement is largely within the urban area. Edge protection works in the urban reach have primarily been through willow planting to maintain the preferred alignment with more substantial works in strategic locations. The floods of 2004 and early this year caused significant damage to these works.

The maintenance budget is typically around \$18,000 per year, but the flood damage has and will significantly exceed this. Over the next three to five years a further \$10,000 per year will be needed for willow planting. There is no design alignment currently available for this river, which makes the design of protection works difficult. For the purpose of this audit the following 2 sites were inspected.

2.1 Poole Crescent Rockline

Down stream of Richard Prouse Park the Wainuiomata River takes a sharp right hand bend where there are a set of four rail and timber pole groynes providing protection to the out side of the bend. In the February 2004 floods a section of the bank between the two inner groynes was severely eroded. A repair was effected by restoring the bank edge and lining the bank edge with two hundred tonnes of rock rip rap between these two groynes. Down stream of the groyne set, large boulders off the river bed have been collected and used as a rip rap armouring layer on the left bank.



Figure 1 Poole Cres Rockline Looking upstream



Figure 2 Poole Cres Rockline Looking downstream

The rock rip rap has provided a good long term solution to protecting this sharp right hand bend. The older rail and timber pole groynes could have some of the rail irons cut down so as not to extend excessively above the top horizontal. The reviewers concur with protective works adopted for this site. The combination of new protection works and existing

protection works provides sheltered areas where future willow plantings could be established.

2.3 Faulkes Property - Down Stream Alignment

The right hand bend down stream of the Faulkes property has suffered significant erosion of the left bank with earlier willow pole planting being out flanked and the river now being over wide. The proposed works being considered are a series of short debris fences on the outside of the bend and removing the beach and high inside corner on the inside of the bend. Many of the willow trees protecting the banks were washed out in the 2004 floods.



Figure 3 Looking Downstream - out flanked poles and over wide bed

The reviewers would agree with the proposed method of reinstating this bend. The design of this work would definitely benefit from having a design channel alignment available on this river. It is understood that the budget for repair work on this bend is in the order of \$10,000 which is unlikely to be sufficient.

3.0 Porirua Stream

The Porirua stream extends from Porirua Harbour, through the central business district, up the Tawa valley into the Glenside area where both the Stebbings and Seton Nossier retention dams are sited to control the rate of flow down the Porirua stream. The Regional Council manages the Porirua Stream under an agreement with the Porirua and Wellington City Councils.

3.1 Central Business District Reach

The gradient of the Porirua Stream flattens as it approaches the Porirua Harbour, encouraging the deposition of gravel and therefore raising streambed level. The increase in streambed levels reduces the flood carrying capacity of the system and blocks the local drainage outlets.

Over the last two years 8,000 cubic metres of gravel has had to be removed to restore the channel capacity to the original design streambed level at the time of scheme construction, and restore local drainage efficiency. This is the first time since the scheme was constructed and the design bed level established in 1993 that gravel has been extracted.

The extraction operation is made more difficult due to very limited manoeuvring room for trucks both off the road and in the stream bed. To aid future extraction operations, a heavy duty concrete ramp was built down into the stream bed. The concrete ramp and cleanout cost in the order of \$60,000.

The CBD is protected by a concrete flood wall rather than a stopbank due to the limited area between the road and the stream. The wall has been designed to provide protection from a 100 year return period flood. The wall and stream bank have been beautified by incorporating seats and gardens.



Figure 4 Cleaned out stream looking downstream



Figure 5 Flood wall incorporating seats and gardens

The reviewers were of the opinion that the channel capacity had been effectively restored in what were obviously difficult operating conditions. The flood wall and the general area appeared in good condition and were being well maintained.

3.2 Wall Place

The stream at the end of Wall Place has mown grass banks and has a rock lining in sections. There was a small amount of frittering of the toe of the bank edge which was not seen as significant, particularly as the stream bed is fairly stable.



Figure 6 Looking down stream

The reviewers noted the well maintained stream banks in this reach. The grass cover was uniform and mown. The toe of the stream banks were frittering which will need to be monitored to ensure it does not develop to the point of causing problems.

3.3 Debris Arrestor

In the Glenside area there is a debris arrestor that was constructed in 1977 following the 1976 flood event. The arrestor is constructed of rail irons at an angle to the stream and in large floods can be overtopped. The arrestor is cleaned once a month or when needed following freshets.



Figure 7 Debris arrestor looking upstream

The arrestor was in good condition and free of debris. A repair had been effected at the downstream end where it abutted to the left bank. It was also noted that the stream banks in the area had been planted with native plants by a local stream care group which will enhance the stream environment in time.

3.4 Stebbings Detention Dam

The Stebbings detention dam is sited in the upper reaches of the Porirua Stream. The dam is 20m high and the culvert pipe under the dam is 100m long and 1.6m in diameter. Because of the scale of the dam it is audited by the Dam Watch group. The dam structure is maintained by the Flood Protection Department.



Figure 8 Down stream face of Stebbings dam

Seton Nossier Dam Intake Structure

The Seton Nossier detention dam is a motorway embankment as well as the dam wall. The Regional Council maintains the intake structures and the armco culvert pipe to the requirements of Transit. The intake structures consist of a concrete grid screen primary intake and a secondary higher level concrete intake structure with concrete hood to prevent debris blockage.

The reviewers note that a comprehensive monitoring and maintenance programme is in place for both dams and on site observation reinforced this. At Stebbing Dam there was an even sward of grass over the dam face which was well maintained with no significant unevenness in surface profile. The mowing of the grass was even considering the steepness of the dam walls. The intake structure at Seton Nossier was clear of debris and appeared to be well maintained.

4.0 Summary

Nine sites on Wainuiomata River and Porirua Stream schemes in the Wellington area were selected for this year's audit of the assets managed by the Flood Protection Department of the Land Care Division. These inspections were considered to provide a reasonably representative overview of river asset maintenance standards for the Wellington Area Rivers.

The reviewers are of the view that adequate resources are being applied to maintain the scheme assets to an appropriate standard. The Wainuiomata River has suffered serious damage to the willow plantings which will require adequate funding to reinstate.

The few areas that we recommend the scheme managers give attention to are:

- Developing the design channel alignment for the Wainuiomata River.
- Continue to monitor the toe of the Porirua Stream at Wall Place to ensure the minor bank toe erosion does not increase in scale.

Report prepared in August 2005 by:

Mike Longworth
Engineer

Michael Hewison
Engineer

Maia Kawana
Supervisor