

File No Y/1/0



## **AUDIT OF RIVER MANAGEMENT ASSET MAINTENANCE STANDARDS**

- Audit of:** River Schemes managed by the Flood Protection Group of Landcare Division, Wellington Regional Council
- Audit by:** Ranjan Cyril, Widana Gamage & Murray McKenzie of the Operations Department of Wairarapa Division, Wellington Regional Council
- Locations:** Waiwhetu & Porirua Streams, and Hutt & Wainiomata Rivers
- Guides:** Steve Murphy, Jeff Evans and Mike Jensen of the Flood Protection Group, Landcare Division, Wellington Regional Council
- Date:** 26 July 2002

### **1.0 Introduction**

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

To do this audit, inspections of randomly selected sites from the Flood Protection Group's asset register were carried out. Maintenance responsibility for these assets lies with the Flood Protection Group, with funds coming from the Wellington Regional Council, and the Hutt, Wellington, and Porirua City Councils.

This year's inspection of the Wellington river assets concentrated on the Waiwhetu & Porirua Streams, and the Hutt & Wainiomata Rivers.

### **2.0 Waiwhetu Stream**

The reach of the Waiwhetu Stream maintained by the Flood Protection Group runs down the eastern side of the lower Hutt Valley from Naenae to the mouth of the Hutt River. The length of this reach is 6km, which is generally urban in nature with some

industry in the lower section. The primary maintenance issue is exotic weed control. The capacity of the present channel is limited to a 20-year event, so control of weed growth is essential if maximum channel capacity is to be maintained.

Several methods of weed control have been tried out, such as manual & machine cleaning, suppression of weed growth by shading, and using chemicals. The most effective method is with the use of chemicals, however there is some community opposition to this, and chemicals are currently used only if manual clearing methods fail. The present herbicide spray consent runs out in February 2003, and the staff is in the process of applying for a renewal.

An annual stream maintenance run is carried out in May – June each year, as well as the regular ongoing clearing of blockages throughout the year. Supervisory staff also spend time attending frequent meetings of the Stream Working Group.

The budget for this work is \$38,357, which is fully funded by the Wellington Regional Council.

At the time of inspection, the stream was reasonably clear of weeds following the recent spray, and a good flow was observed except over a short reach. The reviewers felt that the stream was being maintained satisfactorily under difficult constraints and with a limited budget.

### **3.0 Wainuiomata River – Wood Street Stopbank**

Approximately 4km of river channel within the urban area of Wainuiomata is maintained by the Flood Protection Group at an annual cost of \$16,050. This work is carried out under the terms of a Watercourse Agreement with the Hutt City Council. Two lengths of stopbank also form part of the scheme, and run on the left bank from below the Coast Road bridge to the high ground of Wood Hatton School, and in Leonard Wood Park protecting Orewa Grove.

A Flood hazard assessment has been completed for the whole river, which now enables Flood Protection staff to advise property owners of flood risks to their property

A section of the stopbank goes through private property, which has a 2 metre high fence across the stopbank. A garage is also sited in the floodway. This is not ideal as it poses a restriction to flood flows. It is expected that large event would flatten the fences but the resultant turbulence may damage the stopbank. It is an important spot to monitor in any large event. If the opportunity arises the situation should be remedied.

An access agreement is in place for the Council to enter the stopbank for inspection and maintenance purposes.

The stopbank was in excellent overall condition. No vehicular access is allowed on to the stopbank. The stopbank is used extensively by recreational walkers, and since the area is important for recreational use, pedestrian access cannot be restricted. Some minor grass damage could be seen on top of the stopbank. Since the stopbank has sufficient freeboard this is not a major concern. However the grass cover would benefit from regular application of fertiliser.

The adjoining river channel was in good condition and free of debris. The willows on the riverbank need close monitoring and selective removal to avoid encroachment into the channel.

#### **4.0 Hutt River Mouth Sand Extraction**

Extraction of sand from the Hutt River mouth is a very important operation to keep the opening to Wellington Harbour free. Any blockages would have serious implications on flood levels within the Hutt River.

The Flood Protection Group has a long term Resource Consent for the extraction of 50,000 m<sup>3</sup> of sand annually. The extraction is carried out by Winstone Aggregates Ltd under a long-term contract. The extraction of sand and deposition of waste material are carried out within designated areas. These areas are inspected jointly with the contractor twice yearly, and monitored by annual aerial photography and 5 yearly surveys.

Because this is an industrial area, there is no pedestrian access along the beach, which is a concern to some people. The reviewers feel that the sand extraction process is a very important part of the management of Hutt River, and non-availability of pedestrian access through this area is a comparatively minor inconvenience

At the time of inspection the buoys marking the extraction and disposal areas were in place, and the barge and other plant seemed to be in good order. The approach area to the extraction plant was tidy, and the area was generally attractive with grass cover and shrubs.

#### **5.0 Porirua Stream**

Porirua Stream from Stebbings Flood Detention Dam to Porirua Harbour is maintained at an annual cost of \$64,100 by the Wellington Regional Council under the terms of a Watercourse Agreement with Wellington and Porirua City Councils.

##### **5.1 Porirua Debris Arrestor**

This debris arrestor was built in 1977, and is a driven rail iron structure designed to capture flood debris and prevent it from moving downstream to cause channel and bridge waterway blockage. The debris arrestor is checked on receipt of heavy rainfall warnings, and then cleared of debris after flood events.

The structure is also thoroughly inspected after major flood events. The structure was recently checked and approved by an independent structural engineer.

In spite of these very appropriate precautions, the downstream section of the structure failed during the October 2000 floods. It has now been rebuilt with additional concrete footings and scour protection.

At the time of inspection the arrestor was in good condition and was being cleared of debris,

## **5.2 Porirua City Centre Flood Protection Scheme**

This flood protection and channel enhancement project was completed in 1995, and consists of a stopbank on the right bank and floodwall with reinforced berm on the left bank, both protecting the commercial area of Porirua. The scheme is inspected jointly with Porirua City Council staff every six months to check the overall condition of the stream and the banks. The annual maintenance budget for the PCC length of the stream is \$32,000 including the CBD reach.

At the time of inspection the stopbanks, floodgates and the bank protection works were in good condition. However gravel build up in the channel was a major concern, as the water level was almost up to the walkway area. Our guides informed us that there was a proposal to remove the excess gravel last year, but did not succeed due to funding problems with Porirua City Council. Resource Consent is being applied to remove the gravel this year.

The reviewers agree that the gravel should be removed before long, to maintain the flood capacity of the channel, and to prevent frequent spill-over into walkway areas.

## **6.0 Owen Street Groynes in Hutt River**

A 150 m section of the riverbank and berm suffered severe erosion in the October 1998 floods, which had threatened the adjacent residential area. Several large concrete block groynes were immediately built to provide temporary protection while a permanent solution was sought.

Final repair works consisted of berm filling and restoration, planting with rooted willow stock, and construction of three 950 tonne rock groynes.

At the time of inspection there were no signs of rock displacement or slumping, and the planting between the groynes had established well.

Overall the repair works looked well constructed and maintained, and the berm was well consolidated with good grass cover.

## 7.0 Summary

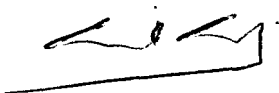
Six sites on the Waiwhetu & Porirua Streams, and the Hutt & Wainiomata Rivers, were randomly selected and inspected over a one day period. These inspections were considered to provide a representative overview of river asset maintenance standards.

The reviewers are pleased to note that adequate resources are being applied to maintain the scheme assets to an appropriate standard.

The two areas that we recommend the Scheme Managers give particular attention to are:

- Monitoring and selective removal of willows on the Wainuiomata River to avoid encroachment into the channel.
- Removal of gravel from the section of Porirua Stream within the central business area.

Report prepared in July 2002 by:



Ranjan Cyril  
BSc.Eng.(Civil), MICE  
Chartered Engineer



Widana Gamage  
BSc.Eng.(Civil), MICE  
Chartered Engineer