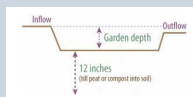


Catchment Wide Options

N1 SOURCE CONTROL

Produce a Source Control Manual for New Development/Infill that provides a toolbox of source control solutions for property owners to consider.



Stormwater filtration technology

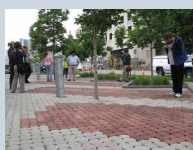
N2 SOURCE CONTROL ✓

Encourage landowners to reduce run-off from their land by education (advice) and financial incentives (e.g. grants), open spaces, council owned public land by 2015 all private property by 2020.

N3 SOURCE CONTROL - PLANNING

Encourage people to direct discharge of stormwater to the street from all properties within the Waiwhetu catchment.

Lower parks to act as floodwater storage areas.



Permeable surface

N4 PLANNING CONTROLS

For the Waiwhetu catchment, introduce planning building measures to control run-off from all new developments, subdivisions, alterations and infill housing so as not to increase run-off from the site. Controls on development in areas affected by floods up to the 100 year flood level.

N7 HAZARD MAPS ✓

Ensure that development is compatible with flood risk by publishing a range of hazard maps. Make the information part of the PIMS and LIMS system.

N8 HAZARD MAPS

Set minimum floor levels for new habitable buildings at 100 year return period flood extent level (to bottom of floor joists or concrete slab).

N9 POLICY

Purchase private property within the stream corridor when the opportunity arises.

N10 POLICY

Remove property encroachments in the stream corridor.

C2 CHANNEL MANAGEMENT

Promote amenity enhancements (e.g. seating along banks, network of paths, riparian planting) by reach, to encourage recreational use and ownership by local community.

C9 EDUCATION

Implement an education programme that promotes good behaviour by adjacent landowners to prevent illegal dumping, littering, grass clippings, using enforcement options if necessary.

C10 DEBRIS AND SEDIMENT PROTECTION

Construct, upgrade or replace debris control structures in eastern hill sub-catchments at stormwater inlets and stormwater drain outlets to intercept and filter out suspended sediments from stormwater in eastern hill sub-catchments HCC to Maintain appropriately.

C11 BANK EDGE PROTECTION ✓

Remove existing failed bank edges and replace with planting as required. Maintain channel of the stream within the channel alignment.

C12 ONGOING MAINTENANCE AND MANAGEMENT OF THE STREAM

Option 1: Status Quo

Option 2a: Enhancement - budget of \$80,000 (e.g. employ river ranger to manage the stream)

Option 2b: Enhancement - budget of \$150,000

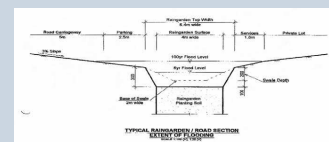
Option 2c: Enhancement - budget of \$500,000

S1 SOURCE CONTROL

Install rain gardens and swales along roads as a required part of all road maintenance, re-profiling and upgrading projects, where practical.



Swale



Rain garden design

R1 EMERGENCY MANAGEMENT

- Provide earlier flood warnings to owners of properties in 'high priority areas'
- Establish additional flow recorder and rain gauge for flood warning purposes
- Phone link to Telemetry System Levels

R2 EMERGENCY MANAGEMENT

Evacuate high risk areas before inundation. Forecast triggers to be established for extreme events.

R3 EMERGENCY MANAGEMENT

Raise awareness of the HCC Emergency Management Office Readynet system and encourage registration by local groups (in particular, residents in the 'High Priority Areas'), to receive earlier warnings etc.

R4 INSURANCE

Encourage owners of properties in flood prone areas within the Waiwhetu catchment to insure their house and contents.

R5 CLIMATE CHANGE

Allow for the possible effects of climate change by:

- Designing with flexibility in mind so that higher defences can be retrofitted to proposed structural measures
- Ensure a full range of non structural measures is implemented if required

R6 EDUCATION

Inform the local community of the Waiwhetu catchment about the risks of flooding and what to do (e.g. local school programmes to reinforce preparedness in the home).

R7 EDUCATION

Disseminate information in the 'Flood Warning and Evacuation Report' to named businesses in the report at risk from flooding, to allow a re-evaluation of their own emergency procedures.

R8 EDUCATION

Raise awareness of flood proofing measures to target owners/occupiers of residential and commercial properties 'high priority areas' and encourage implementation of these measures by a set date.

R9 EDUCATION

Target property owners/occupiers in 'low priority' flood hazard areas to raise awareness of flooding issues and the importance of flood proofing measures.

R10 WELFARE AND RECOVERY

HCC and GWRC recovery co-ordinating team (e.g. photos, welfare, surveys to collect flood information).

? POLLUTION CONTROL ?

? SEWER DISCHARGES ?