
3.1 Design Objectives

WCC and RDC are focused on implementing stormwater management solutions that mitigate against the adverse effects of development described in section 2.1.

The most critical factors associated with development will vary from site to site. Key design objectives applied in this document are described below:

- Objective.1 **To prevent increased erosion and change to the hydrologic regime of downstream watercourses.** Development has the potential to cause a change in the pattern of stormwater discharges to streams. In particular, an increase in impervious surface areas within a catchment can result in stormwater being transmitted faster to streams. As a result there are more occurrences in a year of short, high flow events associated with regular rainfall conditions (i.e. less than a 1 in 1 year event) than would have occurred pre-development. This change in stream response to rainfall can result in significant channel erosion and downcutting, which in turn adversely affects stream habitat.
- Objective.2 **To prevent downstream flooding.** Without controls in place, the effect of providing increased impervious surface within a catchment is to reduce the volume of runoff that infiltrates naturally back into the ground, and cause runoff to discharge faster. As a result the peak flows and discharge volumes associated with storm events increases and can cause serious flooding problems downstream. Several streams in Waitakere City and Rodney District already flood regularly and will potentially impact more properties if there is any increase in discharge rates and volumes from upstream catchments.
- Objective.3 **To minimise the potential for increased discharge of contaminants associated with stormwater runoff from a site following development, to streams and coastal receiving environments.** Stormwater runoff generated on impervious areas, particularly roads, tends to pick up contaminants. These contaminants have the potential to degrade streams and sensitive coastal receiving environments.

The first two objectives can be achieved through mitigating against change in the peak flow, volume and time of concentration of stormwater runoff from an area during a rainfall event after residential development has occurred. The critical rainfall event differs if the key design objective is stream channel protection or downstream flooding. Design approaches are tailored to address key objectives (refer 4.1.1).

The third objective is achieved through incorporating stormwater treatment and source control of contaminants as outlined in section 4.1.2.

3.2 Auckland Regional Council Technical Publications

The ARC has developed a series of technical publications that promote a low impact design approach to the management of stormwater and provide guidance on how to treat stormwater. Of particular relevance are the:

- Low Impact Design Manual for the Auckland Region (Technical Publication 124)
- Stormwater Treatment Devices: Design Guideline Manual (Technical Publication No 10) - (<http://www.arc.govt.nz/arc/environment/water/>).
- Guidelines for stormwater runoff modeling in the Auckland Region, (Technical Publication 108)

For sub-divisions reference should be made to these documents as they include information on devices not covered in this document. This applies in particular to devices more suited to servicing larger catchments such as wetlands, detention ponds and sand filters.

Erosion and sediment control during construction is also a key facet in protecting downstream receiving environments. Both RDC and WCC support the methods outlined by the ARC in the following publication:

- Erosion and sediment control – Guidelines for Land Disturbing Activities in the Auckland Region (Technical Publication 90)

For design of wastewater treatment and disposal systems reference should be made to:

- On-site Wastewater Systems: Design and Management Manual (Technical Publication 58)

3.3 Limitations

- a) It is intended that this Code be used as a guide to appropriate on-site management of stormwater. Effective stormwater management depends on correct application of systems to site constraints such as slope, bush cover, soil conditions and proposed site layout. Proper site assessment needs to be undertaken in conjunction with the use of this Code to develop appropriate on-site stormwater management techniques; and
- b) This document is to be used as a guide to appropriate on-site management of stormwater for lots greater than or equal to 4000 m². However, Council reserves the right in any particular case to impose more restrictive requirements than those required under this document where Council considers it necessary to ensure appropriate stormwater management, including without limitation that Council may limit the methods of stormwater mitigation that are considered appropriate on a site by site or catchment basis; and
- c) As the ARC is the regulator of stormwater in the Auckland Region, this Code may not in all instances meet their requirements. If for any reason the ARC do not accept the use of devices within this

document to mitigate the effects of a development then a separate resource consent may be required from the ARC; and

- d) Developers are advised to use the services of a consulting engineer to assist in the development of appropriate on-site stormwater management options.