



# ASHBOURNE RETIREMENT VILLAGE DEVELOPMENT

Stormwater Operation & Maintenance Plan



## PROJECT INFORMATION

CLIENT	Unity Developments Limited
PROJECT	289001

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# 1. Introduction

## 1.1. Background

Maven Matamata Ltd have been engaged by Unity Development Ltd to undertake Infrastructure Design in support of Ashbourne Retirement Village Development at 247 Station Road, Matamata.

## 1.2. Purpose of this report

The purpose of this Operation and Maintenance Plan report is to provide guidance on the correct ongoing operation of the stormwater quality management devices within the Ashbourne Retirement Village development. The information provided herein outlines the methodology associated with the stormwater infrastructure onsite. This report is to be read in conjunction with the engineering drawings around stormwater management within the site held between Waikato Regional Council (WRC) and Matamata-Piako District Council (MPDC).

It is the responsibility of the nominated maintenance contractor for Unity Development Ltd to carry out maintenance of the stormwater system devices. The maintenance is to be undertaken generally in accordance with the recommendations outlined in this document, WRC Stormwater Guidelines and MPDC's Stormwater Guidelines.

## 1.3. Stormwater Assets

All Stormwater assets are in private ownership, and include:

- Stormwater lot connections, catchpits and pipe networks to convey flows up to a 10-year ARI cc event to each raingarden and/or wetland.
- Centralised Raingardens providing quality for four sub-catchments. These devices are at-source rain gardens providing water quality and extended detention.
- Artificial wetlands providing stormwater quality for the remainder of the Retirement village development. In addition, the wetlands provide flood storage and attenuation to release flows at less than 80% pre-development flows.
- Stormwater Swales for conveyance to each wetland

## 1.4. Contact Information

A summary of the contact information relating to the ownership, maintenance manager, and designer for the stormwater system is included below.

Asset ID:		Resource Consent Number:	
Location:	247 Station Road, Matamata	Development Name / Legal Description:	
<b>Asset Owner Details:</b>			
Name:	Unity Developments Limited	Postal Address: 110 Carlton Gore Road Newmarket	
Telephone Number:	Refer to Online Contact Form	Auckland 1023	
Email:	<a href="mailto:info@unitydevelopments.co.nz">info@unitydevelopments.co.nz</a>	Physical Address: 110 Carlton Gore Road Newmarket Auckland 1023	
<b>Maintenance Manager Emergency Contact Details</b>			
Name:	TBC	Address:	
Telephone Number: (Daytime)			
Telephone Number: (After Hours)			
Email:			

<b>Designer Details:</b>		
Name:	Maven Matamata Limited	Maven Matamata 8 Tainui Street Matamata 3400
Telephone Number:	07 880 9429	
Email:	matamatainfo@maven.co.nz	

## 2. Stormwater System Description

### 2.1. Site Description

The Ashbourne Retirement Village area is a circa 20 ha block of land within the Matamata-Piako District. The current site access is through 247A Station Road in Matamata. The site adjoins with the new Highgrove Development to the north-east, and the remainder of the site is surrounded by agricultural land.

There is an existing stormwater swale that follows the northern and eastern boundary. The Waitoa River which runs south to north is approximately 0.5km to the west of the subject site.

The site has an existing farmhouse located at 247A/247B Station Road. Most of the site is low-lying flat farmland, that is interspersed with artificial farm drains.

### 2.2. Design Standards

Stormwater systems have been designed in accordance with Regional Infrastructure Technical Specifications (RITS) and other relevant standards including the MPDC Development Manual 2010 and caters for the primary pipe system up to the 10-year event as well as the secondary system and overland flow paths to manage excess runoff that cater for events exceeding the capacity of the primary stormwater system for events exceeding the 10-year event.

### 2.3. Stormwater Management Plan (SMP)

The overarching stormwater strategy has been derived from the Maven Waikato Limited SMP which sets out the high-level, best practice approach to stormwater management within the Ashbourne Retirement Village development site. The SMP outlines the overarching stormwater management principles which will form the basis of stormwater design to support future development on the proposed sites.

Furthermore, the stormwater management strategy establishes a robust long term stormwater solution, which integrates desired urban form outcomes, with the mitigation of flooding (flood plains and OLFPs) and consideration of best-practice design outcomes as detailed within relevant Waikato guidance documents.

The key components of the Ashbourne stormwater management strategy are as follows:

- Stormwater conveyance for 10yr cc ARI rainfall event
- Overland flow paths for 100yr cc ARI rainfall event to be accommodated within the site and conveyed to wetlands.
- Treatment of runoff prior to discharge into receiving environment in accordance with TP10 / GD01 / Waikato Stormwater Management Guidelines (WRC Technical Report 2018/01).

For further details please refer to the SMP prepared by Maven Waikato Limited dated November 2025.

### 2.4. Capacity and Quality

#### Stormwater Strategy for Lot Areas

Roof runoff is managed using inert roofing materials, while driveway runoff is directed through a catch pit with a sump for pre-treatment before disposal into the proposed stormwater network via lot connections. The artificial wetlands and raingardens will provide treatment of runoff from the lot areas. The artificial wetlands are designed to attenuate the 10-year and 100-year ARI storm event including climate change for the lot areas.

### **Stormwater Strategy for Road Carriageway**

The road carriageway runoffs will be collected via catchpits. The artificial wetlands and raingardens will provide treatment of runoff from the road carriageways. The artificial wetlands are designed to attenuate the 10-year and 100-year ARI storm event including climate change for the road carriageway.

### **Stormwater Strategy for Stormwater Raingardens 1, 2 and 3**

Stormwater raingardens 1, 2 and 3 will provide treatment of the water quality volume for their corresponding catchments. Extended detention up to 300mm depth is provided in accordance with RITS. Larger flows up to the 10-year ARI storm event will be discharged via a scruffy dome. Flood storage and attenuation will be provided for by wetland 1.

### **Stormwater Strategy for Artificial Wetlands 1 and 2**

Artificial wetlands 1 and 2 forms a critical part of the overall stormwater mitigation system. Wetlands will be incorporated into the stormwater system to treat the water quality volume, provide extended detention (1.2xWQV) for their corresponding catchments as well as manage peak flows up to a 100-year return period storm event (including climate change) for the proposed retirement village. These wetlands are designed to temporarily store runoff during storm events and release it at a controlled rate, thereby reducing downstream flooding risk and protecting receiving environments. Wetland 1 discharges to an existing culvert which crosses Station Road and heads north via an existing channel eventually reaching Waitoa river. Wetland 2 discharges to the proposed greenway before discharging into the Waitoa River.

Key design considerations include:

- Sizing based on achieving water quality volume within the permanent storage zone, the extended detention and attenuation of the 10 and 100-year storm events releasing at 80% of pre-development.
- Extended detention up to max 350mm depth and release over 24-hours.
- Flow splitter device upstream of each wetland to direct <2-year event through the wetland, >2-year event is directed to a highflow bypass channel to prevent scour of treatment elements and re-mobilisation of accumulated sediments.
- Highflow bypass channel outlet includes an outlet control. Flows back up and engage flood storage within the wetland.
- Permanent storage pool bathymetry per RITS to be detailed during EPA.
- Maintenance access ramp and platform adjacent the forebay will be detailed during EPA.
- Freeboard and spillway design to safely pass extreme events.

## **3. Stormwater System Devices**

### **3.1. Raingardens**

Four Centralised raingardens are proposed to provide stormwater treatment for 4 localised sub-catchments. They have been designed to treat stormwater run-off from hardstand areas such as roads, footpaths, car parks etc. by filtering it through vegetation and then soaking vertically through an organic loam soil mix before draining into the piped stormwater network.

#### ***Vegetation***

Vegetation enhances raingarden performance for stormwater treatment and therefore requires close attention.

Maintenance includes fertilising plants, removing noxious plants or weeds, re-establishing plants that die and maintaining mulch cover.

Regular inspections by the responsible entity must be done to ensure that the desired vegetation remains and is not overtaken by invasive undesirable plants.

In some situations, the replacement of the planted vegetation by a volunteer species may be beneficial, but only if the invasive species provides equal or increased water quality benefits and is accepted by the owners of the site.

#### *Plants*

Use native plants as per the approved landscaping plans to replace plants if this is required.

#### *Sediment*

Sediments accumulate in raingardens. Removal should occur when surface ponding lasts significantly longer than the one day drain time, which indicates surface clogging. When sediments are to be removed, it is essential to restore the vegetation and soil conditions to the originally constructed condition.

Sediment removal will necessitate disturbance of the vegetation, so steps will have to be taken to re-establish the vegetation upon completion of sediment removal.

Erosion control in the contributing drainage area also will be necessary to prevent scour and excessive sedimentation in the rain garden until there is once again a dense stand of vegetation.

Sediment may also impede effective performance of a rain garden by clogging the soil surface and preventing design storms from being treated. If stormwater backs up into the upstream drainage area, overflow may occur and bypass the treatment area.

#### *Debris*

Similar to other types of practices, debris removal is an ongoing maintenance function at all rain garden systems.

Debris, if not removed, can block inlets or outlets, and can be unsightly if located in a visible location.

#### *Soil*

Only use approved raingarden soil (usually a sandy loam compost) which is readily available at some horticultural centres.

#### *Drainage Testing*

If water is not observed freely draining from the rain garden outlet it may be blocked. Back wash through the outlet and/or maintenance access port until the rain garden is freely draining. If this does not help then the soil may be blocked and need to be removed, pipes inspected/cleared.

#### *Avoid*

- The use of sprays to kill weeds or algae as this will contaminate the downstream waterways.
- Do not compact the rain garden soil mix.
- Do not add clay or silt in the rain garden soil mix as this will restrict infiltration.

#### **Raingarden Inspection requirements**

- Debris cleanout
  - Removal of debris
  - No dumping of wastes into raingarden
  - Litter has been removed
- Vegetation
  - Plant height not less than design water depth

- Fertilised per specifications
- No evidence of erosion
- Is planting composition still according to approved plans
- No placement of inappropriate plants
- Dewatering and sedimentation
  - Raingarden deters between storms
  - No evidence of standing water
  - No evidence of surface clogging
  - Sediments should not be > than 20% raingarden design depth
- Outlets / Overflow Spillway
  - No evidence of erosion
  - No evidence of any blockages
- Integrity of Biofilter
  - Raingarden has not been blocked or filled inappropriately
  - Mulch layer still in place
  - Noxious plants or weeds removed

#### Raingarden Maintenance procedures

Timing	Component	Action
Following storms	Grass filter strip, kerbing, and paved area	Remove rubbish, leaves, and other debris from the grass filter strip and surrounding drainage area
	Ponding area	Clear inflow points of sediments, rubbish, and leaves Check for erosion or gouging and repair Test drainage of ponding area
	Mulch	Mulch may need to be redistributed or added around inflow points.
3 monthly	Grass filter strip, kerbing, and paved area	Mow no shorter than 50mm. Re-sow grass as necessary. Remove rubbish, leaves, and other debris. Remove excess mulch/soil if required.
	Ponding area	Clear inflow points of built-up sediment, rubbish, and leaves. Check for erosion or gouging.
	Mulch layer	Remove rubbish, leaves, and other debris. After storm events, mulch may need to be redistributed or added around inflow points.
	Plants	Water establishing plants monthly during extended dry periods. Check plant health and replace dead plants. Use native species to suit garden conditions. Remove weeds – do not use herbicides, pesticides, and fertilisers.
Annually	Ponding area	Clear inflow points of sediment, rubbish, and leaves. Check for erosion or gouging and repair. Check all water has drained 24 hours after heavy rain.

	Raingarden soil mix	Check soil level is below surrounding hard surface level and overflow grate.
	Mulch layer	Check surface of mulch for build-up of sediment, remove and replace.
	Underdrain system	Use inspection well to check underdrain is working properly.

### Raingarden Troubleshooting

Symptom	Possible problems	Solutions
Stormwater runoff is bypassing the raingarden	Local earthworks increasing sediment load to raingarden, blocking raingarden outlets, or raising surface level of the raingarden	Check surface of the raingarden is below the surrounding areas. Remove any sediments and debris from inflow areas and from the surface of the raingarden. Protect raingarden from future construction sediments.
	Rubbish and other debris blocking the inflow points to the raingarden	Regularly remove rubbish leaves, and any other debris from inflow points.
Raingarden is ponding for longer than 24 hours	Incorrect blend of soil mix	Replace soil mix with the correct raingarden soil mix.
Stormwater and/or mulch flowing off the raingarden	The soil within the garden compacted during construction or other activities	Loosen the top 500mm of soil by tiling or forking.
	Raingarden filled with too much mulch or soil	Remove excess mulch or soil so that surface of ponding area is approximately 200-300mm below the surrounding hard surfaces and overflow
Sulphur smell coming from the raingarden	Plants and soils lacking oxygen.	Inspect raingarden after rain event to check garden drains within 12 to 24hours.
Erosion and gouging occurring within the raingarden	Kerbs and other hard structures channelling stormwater flow.	Create openings in the kerb to increase number and width of run off points or replace kerbing with a different design.

### 3.2. Wetland

The Ashbourne Retirement Village development includes the construction of two (2) stormwater wetlands. All stormwater runoff within the RV will be treated by the wetlands with the exception of the 4 sub-catchments serviced by centralised raingardens. However, the wetlands will provide flood attenuation for all RV catchments. Pipe networks will convey flows up to the 10-year ARI cc event and discharge to the wetland flow splitter. The flow splitter directs flows less than the 2-year ARI cc event to the wetland for treatment, flows greater than the 2-year AR will bypass the wetland via high flow bypass swales. A flood attenuation device is proposed within the highflow bypass before discharging from site to control the peak 10 and 100-year ARI cc events to 80% of pre-development flows.

#### Inspection requirements

- Embankment & Emergency Spillway

- Level of spillway
- Vegetation and ground cover
- Freeboard
- No evidence of embankment erosion
- Removal of debris on emergency spillway
- Riser & Service Spillway
  - No low flow orifice obstructed
  - No excessive sediment accumulation inside the riser
  - Function of outfall channels
  - Slope protection
  - No rip-rap failures
- Wetland
  - No undesirable vegetation growth
  - Removal of floating debris
  - No visible pollution
  - No evidence of edge erosion
- Sediment Forebays
  - Sediment is not accumulated more than 50%
  - Provision of access of maintenance

#### Maintenance procedures

Timing	Component	Action
Following storms / Monthly	Inlet	Inspect and remove rubbish and debris from inlets.
	Trash racks and debris screens	Inspect and clear all litter, including leaves, rubbish, branches, and any other materials.
	Sediment forebay	Check the forebay for accumulated sediment. Test sediments for contaminants prior to dredging and dispose of sediment to landfill or similar, suitable for contaminant levels.

	Risers, control structures, grates, outlet pipes, skimmers, weirs, and orifices	<p>Inspect control structures, weirs, orifices, outfall pipes for leaks and blockages.</p> <p>Clear and remove all blockages to avoid local flooding.</p> <p>Inspect outflow pipes for leaky joints or soil piping erosion.</p> <p>Check if anti-seep collars need repair or replacement.</p> <p>Check outfall and water discharge areas for erosion and restore and stabilise erosion.</p>
	Emergency overflow or spillway	<p>Check emergency overflow path remains clear of debris and blockages and remove any blockages.</p> <p>Check flow paths for erosion and repair as necessary.</p>
	Erosion and bank stability	Inspect banks for settlement, erosion, scouring, cracking, sloughing, seepage and rilling.
	Water body	Remove rubbish and other floating debris from wetland pond.
	Wildlife	Remove dead animals to prevent disease spread.
	Soil	Inspect for loss of soil on wetland banks from erosion.
Annually	Valves and pumps	<p>Check pumps and valves.</p> <p>Check moving parts for corrosion and lubricate.</p>
2+ years	Wetland liners	Inspect liner for leaks and fix as per manufacturers or design specifications.
	Sediment forebay	<p>Check the forebay for accumulated sediment.</p> <p>Test sediment for contaminants prior to dredging and dispose of sediment to landfill or similar suitable for contaminant levels.</p>

### Troubleshooting

Symptom	Possible problems	Solutions
Wetland water levels remain high	The outlet riser openings may be too narrow to allow fast draining after a storm	Unless water levels remain high for more than two days or flooding is a threat, action may not be necessary,

	Outlets structures are clogged	Check outlet structures and openings for blockage by debris or sediment, and clean as necessary.
Wetland is dry	Invasive plants	Remove plants by hand. (no herbicide)
	A maintenance valve is open	Check drain valves and shut if open
	Water leaking from cracks in outlet structure	Inspect for cracks and repair as necessary. Inspect for leaky joints at outlet pipes and repair.
	Wetland in area of changing groundwater levels	Pond will remain dry as long as groundwater levels are low. Design for pond should have taken this into account, so this may be normal for this wetland.
Stormwater discharging from the wetland looks dirty, muddy, or dark	High concentration of sediments washing into wetland, especially silts and clays, due to erosion or construction in the catchment area	Check catchment for erosion areas, including construction works. Check erosion controls are in place.
	Forebay full of sediment	Forebay usually needs more frequent clearing of sediment than wetland pond.
	Local works disturbing soils, with rain washing these into wetland	Check erosion and sediment controls in place on local construction sites.
Pond banks are eroding	Water flowing down pond banks is eroding soils	Minor erosion can be repaired by replacing soil and stabilising with planting or other methods.
	Stormwater outlet pipes direct flow at banks	Cause of erosion from direct discharge may be required, for example, by extending pipes down into pond. Extensive erosion due to continuing discharge may require erosion protection.
Water is leaking from the wetland and through the banks along pipes	Leak collars around pipes have failed or have not been fitted correctly.	Qualified contractors should make immediate repairs. It usually requires pond to be drained, banks excavated, leak collars repaired, and pond banks.

### 3.3. Permanent Swales

Permanent swales have been constructed to capture surface water from rainfall events exceeding 10 year and discharge it to stormwater wetland 1 and 2 highflow bypasses.

The swales shall be inspected in line with the Waikato Stormwater Management Guideline 2020. This will include manual/mechanical prevention of undesired overgrowth from taking over the area (mowing/weeding) and manual debris and sediment removal from the outlets discharging into the permanent swales.

#### Permanent Swale Inspection requirements

- Debris cleanout
  - Removal of debris
  - No dumping of wastes into swales
  - Litter has been removed
- Vegetation
  - Plant height not less than design water depth
  - Fertilised per specifications
  - No evidence of erosion
  - Grass height not greater than 250mm
  - No placement of inappropriate plants
- Dewatering
  - Swales dewater between storms
  - No evidence of standing water

#### Permanent Swale Maintenance procedures

Timing	Component	Action
Following storms	Inflow points	Check for scouring, channelling, and erosion and repair as necessary.
	Side slopes	Check for scouring, channelling, and erosion and repair by adding soil and replanting as necessary.
	Channel base	Check for scouring, channelling, and erosion and repair by adding soil and replanting as necessary.
	Plants and soil	Check stormwater is filtering through soil following stormwater runoff. Remove weeds.
Monthly	Outlet	Check for scouring or erosion, and repair to suit.
	Inflow points	Remove rubbish and debris.
	Channel base	If grassed, mow channel no shorter than 150mm Re-seed bare patches of grass.
	Plants and soil	Replant gaps and water new plants in dry conditions until established.
Two yearly	Outlet	Remove rubbish and debris from outlet grate or catchpit.
	Channel base	Check for boggy patches and ponding water. Check soil is not compacted and aerate surface or tip up dips to repair.
	Grass, plants, and soil	Remove weeds, rubbish, and debris. Re-plant gaps and re-seed bare patches, and water if required to establish. Aerate soil to prevent natural compaction.

		Check Stormwater is filtering through soil.
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#### Permanent Swale Troubleshooting

Symptom	Possible problems	Solutions
Water not draining	Soil compacted	Aerate soil with rotating aerator or core.
	Soil clogged with fine sediments	Remove top layer of soil and replace, turning soil.
	Underdrain, if present, may be blocked	Re-build underdrain.
Water flowing straight to outlet	Soil not free draining	Aerate soil, replace top layer of soil, replace soil with free draining mix.
	Swale slope is too steep	If slope is over 5%, construct check dams to slow flows.
	Plants or grass is not dense enough	Leave grass longer, and re-seed to increase density.
Scouring / Channels appearing	Inflow is concentrated at inlets	Remove blockages including rubbish, debris, and sediment build up.

## 4. Reporting and Scheduling

Any monitoring and maintenance which is carried out shall be documented with details of the inspection, results and maintenance requirements.

Stormwater management inspection documentation shall be made available to MPDC if requested, and kept onsite at all times. A checklist is provided as Appendix B.

## Appendix A – Auckland Council’s Wetlands Operation and Maintenance Guide

## Appendix B –Maintenance Event and Frequency Checklist

## Appendix C – Troubleshooting Guide