

MATERIAL SPECIFICATIONS

1. PLANTING MEDIA (SOIL MIX)

Raingarden media shall be sourced from an HCC approved supplier and meet the following specifications:

- Minimum depth 500mm
- Saturated hydraulic conductivity: 150 to 300mm/hr
- Plant available water: 100mm
- Organic matter: 10% - 30% by volume.
- Ph range: 6.5-7.5+
- Electrical conductivity: <2.5 ds/m
- Total nitrogen: < 1,000 mg/kg
- Total phosphorus: leachate testing required if > 100 mg/kg
- Total copper: ≤ 80 mg/kg
- Total zinc: ≤ 200 mg/kg
- Media sources: from a clean source (no waste products)

Place rain garden soil mix in 300-400mm layers and wet to aid natural compaction. Use light weight lawn roller or lightly compact with manual soil tamper. Do not compact the soil using a digger bucket or other mechanical methods.

2. MULCH

- 50mm Non-floating mulch layer.
- 75% Organic mulch with 25% compost mix.

3. TRANSITION LAYER

- Clean, washed, well graded coarse sand with minimal fines, 100mm thick.
- Sand grading shall comply with NZS 3116:2002 Table 4 Sand Category I
- The sand material shall contain no deleterious materials such as clay or organic material

4. DRAINAGE LAYER

- Washed drainage metal, 2mm to 5mm, 200mm min. thickness, void ratio 0.3

5. UNDER-DRAIN

- Under drain shall be slotted rigid pipe (uPVC or similar to AS2439.1), minimum grade 0.5%. Cut 2mm wide slots at maximum 50mm centres.
- Minimum diameter 100mm for up to 10m² rain garden, 1x150mm dia. or 2x100mm dia. for 10-20m² rain garden area. Specific design of the underdrain is required for rain gardens larger than 20m²
- One drain per 3.0m width of rain garden.
- Pipe SHALL NOT be installed with a filter sock surrounding pipe.
- Underdrain shall connect with solid walled uPVC riser (to enable inspection)

6. FILTER CLOTH/GEOTEXTILE

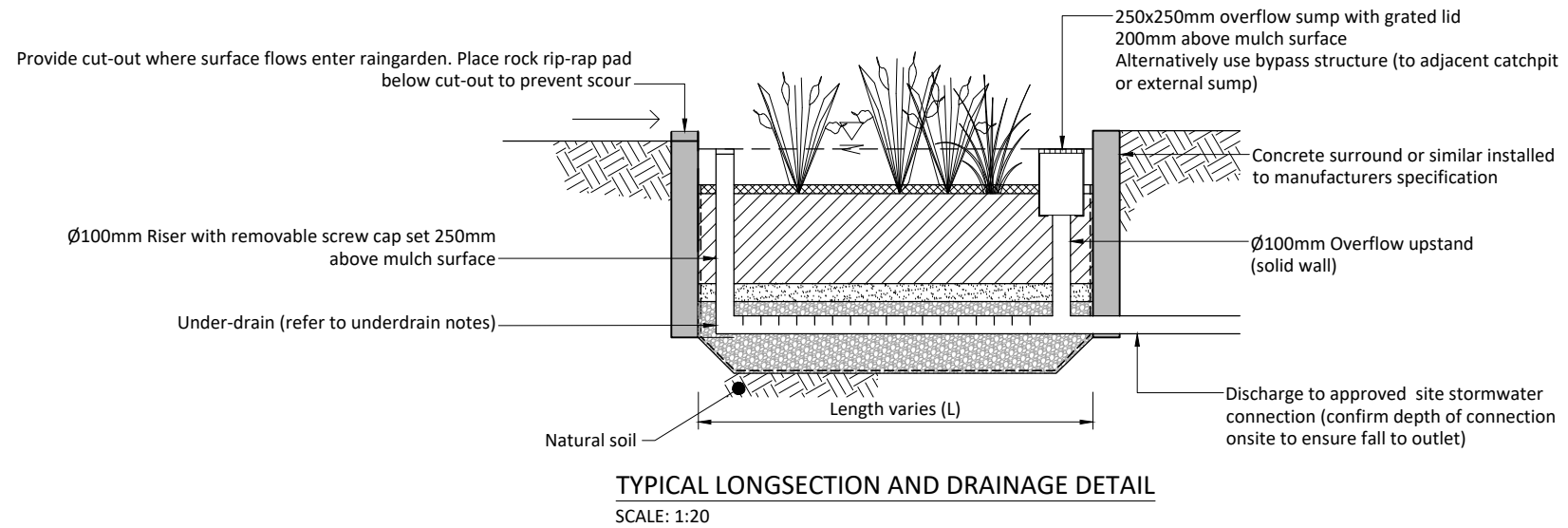
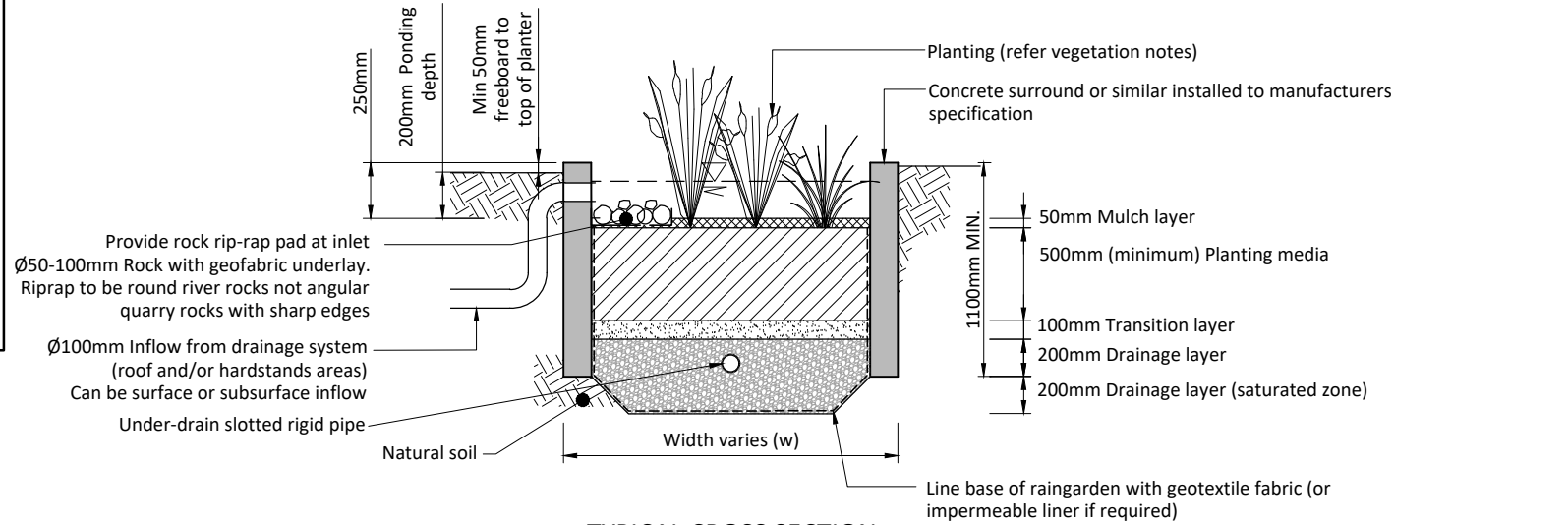
- Geotextile cloth to be non-woven, Filtration Class 1-4, Strength Class 1.
- Geotextile fabric SHALL NOT be placed between any filter layers.
- Geotextile to be placed below drainage layer when constructed in clay soils and shall extend up the side walls.

7. IMPERMEABLE LINER

- Impermeable liners may be used where the raingarden is connected with stormwater harvesting scheme or site conditions require lining.
- Lining to respond to site specific requirements (e.g. unstable ground or steep slopes) and must consider adjacent services, adjacent trees, slope stability, buildings (including footings) and road substrates.

CONSTRUCTION NOTE

THE RAINGARDEN SHALL BE PROTECTED (WITH GEOTEXTILE FABRIC OVER THE SURFACE OR SEDIMENT BARRIER AT THE INLET) DURING THE BUILDING PHASE TO ENSURE NO DIRTY SITE RUNOFF ENTERS THE RAINGARDEN. IF POSSIBLE, DO NOT CONSTRUCT THE RAIN GARDEN UNTIL SURROUNDING AREAS HAVE BEEN STABILISED AND EROSION IS NO LONGER A CONCERN. INCOMING FLOWS SHALL BE DIVERTED UNTIL THE RAINGARDEN IS FULLY PLANTED AND MULCHED.



GENERAL NOTES:

- Works to be under taken in accordance with Waikato LASS Regional Infrastructure Technical Specification and NZBC E1 (surface water).
- On lot bioretention devices shall not be shared between private properties
- Bulk and location requirements:
 - Devices should be located so that stormwater runoff from ground surfaces (driveways, patios, paths etc) can flow to the device under gravity without the need for 'bubble up' inlets.
 - Setback min. 0.5m from all site boundaries, and minimum 0.2m from road boundaries (to avoid fence footings).
 - Minimum setbacks from foundations as per below
 - For standard shallow foundations to NZS3604:2011, a minimum separation of 2m or 1.5x the depth of the system (whichever is the greater)
 - For standard raft foundations (Firth RibRaft or similar), a minimum separation of 1.5m or 1x the depth of the system (whichever is the greater)
 - Any foundations outside of the above should have specific assessment
 - Sites with soils classed as 'expansive' may need a bigger separation - specific design should be undertaken
 - Located so they can be easily accessed and maintained on long term basis.
 - Must not be located below winter high water table or within the 1 in 10 year floodplain. Where possible outside the 1 in 50 year floodplain.
 - Raingardens should not be located beside retaining walls. For walls less than 2.0m high, the clearance must not be less than a horizontal distance that is equal to the retaining wall height plus 1.5m, unless a site-specific design (including PS1 Certification) is carried out. The site-specific design must take into account geotechnical considerations, and ensure stormwater entering the raingarden will not enter the cut-off drain for the retaining wall. For walls higher than 2.0m, a site specific design must always be carried out.
 - Raingardens must not be located within 2.0m of public sanitary sewers or 1.0m of private sewers.
 - Raingardens must not be positioned on slopes that have the potential to be unstable (generally no steeper than 1V:5H) without site specific design.
- Secondary flow paths shall be provided for events that exceed the design capacity of the bioretention device.
- Encroachment inside the parameters outlined above will require a site-specific design (including PS1 certification) to be carried out.
- Health and Safety associated with the rain garden is the owners responsibility.

VEGETATION NOTES

- Plant selection in accordance with RITS - refer table 1.
- Plants should be able to tolerate periods of inundation and longer dry periods, be perennial, have deep fibrous roots. need to be suited to free draining soil. natives preferred.
- Successful plant establishment in bioretention systems is considered when the plants are robust and self-sustaining, and meet the following criteria:
 - Vegetation must cover at least 90% of the bioretention surface with mulch covering the remainder (<10% mulch visible from above)
 - Average groundcover plant height >500mm
 - Plants must be healthy and free from disease, no weeds or litter to be present
- Plant will require supplementary watering immediately after planting and for first 4 weeks minimum.

TABLE 1: APPROVED PLANT SPECIES

Botanical Name	Common Names	Type	Recommended Min grade (PB size)	Plant Density
Apodasmia similis	Oioi/Jointed Rush	Medium Rush	3	6 plants/m ²
Carex Appressa	Southern Cutty Grass/Tussock Sedge	Sedge	3	
Ficinia Nodosa	Wiwi/Knobby Club Rush	Small grass	3	
Carex Edgariae	Edgar's Sedge	Sedge	3	
Juncus Pallidas	Great Soft Rush/Giant Rush	Sedge	3	



SURVEY	Date	Checked	Date
DESIGN	HV	08/22	
DRAWN	HV	08/22	
PROJECT VERIFICATION			
AMENDMENTS			

PROJECT MANAGER	Andrea Phillips
ASSET MANAGER	Private
APPROVED FOR ISSUE	
PREPARED FOR	PRIVATE OWNERSHIP

SCALE	1:40 @ A3
PATH	
ORIGIN OF LEVELS	N/A
Plan No.	HCC-04.1