

# Tamaki Raingarden: plants and mulches



The site unmasked prior to raingarden construction, revealing infrastructure to be avoided: two stormwater grates, a manhole cover (sewage) and outlet to the stormwater system.



Excavation complete and subsoil in place. Rock underlies the site, limiting excavation depth. We decided to avoid the infrastructure and only fully excavate the irrigated area to 1.1m depth. Iron oxides give the subsoil its nut-brown colour. The black plastic lining can be seen protecting the building foundations and at the front of the raingarden. The blue pipe will be connected to the horizontal black pipe which discharges to the Auckland University stormwater system.

## Plant selection

Each plant species has specific ecological and/or cultural values while being adapted to well-drained, deep soil filling the Tamaki raingarden. The two primary plants are *Muehlenbeckia astonii* and *Hebe speciosa*. Their extensive and deep root systems and high leaf production maximise uptake of contaminants such as heavy metals which can be removed in annual clipping to reduce metal accumulation in the raingarden. The much-tangled branches of *Muehlenbeckia* are refuges for invertebrates. The *Hebe speciosa* includes four rare and distinct genotypes propagated by Tristan Armstrong to showcase their use in landscaping. The two larger-leaved, taller genotypes are from Northland, and two smaller-leaved genotypes from the South Island. All four may have been cultivated by Maori. The groundcovers *Scleranthus biformis* and *Muehlenbeckia axillaris* form the centre of the koru, the 'wetland' receiving the 'water'.



The flume that measures flow from the base of the raingarden. Topsoil spread.



Long-lived feature plants and small trees are placed to frame the feature boulders and are outside the area irrigated with stormwater, so they will not be disturbed when the raingarden needs to be renovated. These feature plants are expensive and relatively slow growing. *Xeronema callistemon* or Poor Knights' lily, with its spectacular red flower spikes, grows luxuriantly on scoria retaining walls at the former Landcare Research and DSIR Mount Albert campus and features in the atrium at Tamaki.

## Mulch selection

Two mulches made from greenwaste are used. The standard fine mulch is a mix of shredded and composted greenwaste locally produced in Auckland by Living Earth and is an effective weed suppressant for 18 months to 2 years when applied at 50 to 100 mm depth for 18 months to 2 years. The coarse mulch is only available from Living Earth by special request as it contains moderate amounts of plastics and other in-organic materials which are greenwaste contaminants, however, the coarse mulch is more effective at dispersing the energy of irrigated stormwater, will be longer-lived, and probably of greater value as insect habitat.



Mulch spread, entrance boulders replaced and 'Koru' plants established, with white irrigation pipe just visible.



Layout of pipe aims to irrigate most of the available surface area; in 12 months it will be hidden by plants.

## Soil selection

The topsoil used is a Dalton's product created largely from radiata pine bark (a byproduct of the timber industry) and an Allophanic subsoil, which has a very high capacity to remove metal contaminants and is quarried near Cambridge. The soil is guaranteed weed free, and was chosen to contrast with natural topsoils planned for a second raingarden in North Shore City to be constructed in late 2005.



Hebe flower



Muehlenbeckia

Ideal subsoils were very difficult to source from soil suppliers in Auckland. Holcim's Bombay Quarry combined a Pumiceous Tuff, used for creating stable building platforms and surfacing farm races, with the overlying subsoil which is effectively a waste product of quarrying. Pumice provides free drainage while the addition of subsoil should have increased water retention and capacity to retain contaminants. The subsoil had a fairly friable structure and is anticipated to be high in iron oxides given its similarity to the Granular soils typical of the Pukekohe and Bombay area.