



The Venny green roof

Location:

JJ Holland Park, 85 Kensington Road, Kensington

Melway Reference:

2T G6

Completion Date:

September 2010

The Venny green roof a joint venture between the City of Melbourne, Melbourne University and Melbourne Water, provides an opportunity to increase Melbourne's local knowledge of green roof design, installation and maintenance.

With differing micro climatic conditions and substrates, the roof is divided into four distinct roof zones. There are three different engineered substrates (growing media) which, along with the experimental planting zone, form the major part of an Australian Research Council (ARC) Linkage Grant project.

Flat Green Roofs

There are three flat-roofed sections of green roof to the east, west and south of the pitched roof measuring 14.6m², 63m² and 30.5m² respectively.

For all three lower roofs, a proprietary green roof drainage and water retention cell was installed over a waterproofing membrane followed by a geo-textile filter layer and substrate. The substrate depths ranges from 85mm on the perimeter to 150mm above the drain area, and up to 200mm in the raised circles.

Both the western and southern roofs use a mineral-based substrate based on a recycled waste product from coal-fired power stations; a bottom ash known as 'Envir-O-Agg (Bayswater Sand and Eraring Filter). The mix consists of two different grades of the Envir-O-Agg and a proportion of medium horticultural grade coir.

The eastern roof uses an organic substrate, based upon a medium grade composted pine bark and medium horticultural grade coir.

To reduce wind erosion during establishment, a woven coconut fibre matting was stretched over all four roofs.

Pitched Roof

The 103m² pitched roof, located above the main activity area, houses 44m² of photovoltaic cells and solar hot water panels. It faces due north and is the most exposed of the four roofs.

An EPDM (ethylene propylene diene monomer) liner, below a proprietary slow wicking irrigation mat, was installed directly over the corrugated sheet metal roof with a 100mm deep substrate layer, based on 100% coir with a saturated weight between 50kg-60kg/m installed above.



Plant selection criteria

The difference in substrate depth is a significant factor to consider in plant selection for extensive green roofs. For locations where the substrate is close to 85mm in depth, the selected plants have a very high of water deficit tolerance.

Therefore the shallow substrate profile has permitted only low-growing evergreen perennials to be used. Plants chosen grow to approximately 150mm and where possible have a spreading habit. Some more upright plants for accent were used in the raised circles, where increased depths allow for their growth habit.

High impact aesthetic value was achieved through using colour from both foliage and flowering materials in both plant selection and planting design.

Plant habits that provide good ground coverage (from foliage and form characteristics) were recommended to reduce weed invasion and increase vegetation density on the roof. To assist in rapid plant establishment plants were selected that have moderate to high growth rates.

Plants chosen were known to be less subject to pests and diseases or abiotic stress factors and where possible have the capacity for in-situ regeneration (mainly through vegetative reproduction), recovery from injury or stress (basal re-sprouts, node rooting) and longevity.

Team

Client: The Venny; City of Melbourne

Architect: City of Melbourne

Project Manager: City of Melbourne

Horticulture: University of Melbourne; School of Land and Environment

Structural Engineer: Lambert & Rehbeint

Specialist Green Roof Contractor: Junglefy

Funding Partners: City of Melbourne; Melbourne Water

Species selection

The main planting areas were planted at a density of approximately 20 plants per meter square, approximately 3000 plants in total across the four roofs.

On top of this there is also a 9m² “experimental planting zone” consisting of twenty (0.5*0.5m) test plots on Roof A, which is planted with different species including *Sedum pachyphyllum*, *Carpobrotus modestus*, *Disphyma crassifolium*, *Sedum clavatum* and *Sedum rubrotinctum* and will be monitored actively over the next few years.

Plants used in the main shallow substrate areas are:

- *Sedum xrubrotinctum*
- *Sedum reflexum*
- *Oscularia deltoides*
- *Sedum mexicanum*
- *Sedum pachyphyllum*
- *Sedeveria 'Pats pink'*
- *Carpobrotus modestus*

Plants used in the raised circles are:

- *Aloe 'Aries'*
- *Aloe 'Southern cross'*
- *Kalanchoe tomentosa*
- *Crassula falcata*
- *Senecio mandraliscae*
- *Cotyledon orbiculata*
- *Aloe 'Always red'*
- *Aloe 'Topaz'*
- *Aloe mitriformis*