

Green Wall and Green Roof Fact Sheet

Q: What are green roofs and walls?

A: Green roofs and walls are a living skin of plants and growing medium located as an extension of a building's roof or walls. For a green roof this will involve a high quality water proofing system, a drainage system, filter cloth, lightweight growing medium and plants. Each component may be installed separately or be installed in pre-prepared modules. Green walls involve a system of modules containing the lightweight growing media, and plants with irrigation to each module. These are then hung from the host wall via a bracketing system or framework.

Q: How many green roofs and walls are there and where are they located?

A: There are three green roofs for the Adelaide Zoo development. Two smaller green roofs are located within the new panda exhibit development and are approximately 24 and 25 sq m respectively. The final green roof is the largest at approximately 456 sq m and is located on level one of the new entrance building.

There are two green walls for the development. Both are associated with the new entrance building. The first green wall is externally located adjacent to the entrance precinct and is approximately 91 sq m. The second green wall is approximately 111 sq m and is internally located wrapping around the stairway leading up to the level one conference centre.

Q: Why were green roofs and walls chosen for the Adelaide Zoo development?

A: The green roof for the entrance building was originally chosen as a response to the proximity of Botanic Park. Imagine the ground plane being lifted to create a green roof in which people pass under to enter the zoo. Green roofs and walls also help demonstrate that the zoo, as a place, is a significant Horticultural park as well as a Zoological organisation. Green roofs were seen as an opportunity to showcase native plants, to create habitat and generate biodiversity. Green roofs have many other benefits such as absorbing rainwater and thus mitigating stormwater runoff, providing insulation to help keep building cool in summer, improving air quality, and reducing ambient temperature to help combat the 'heat island effect' of cities.

Green roofs also help to improve air quality and decrease ambient temperature. The plant room for the control of irrigation and fertilisation of the green roof and wall has been located by louvers in the green wall. The plants in the green wall will cool the ambient temperature thus cooling the air entering the plant room which will help reduce energy consumption. The external green wall has the added role, in the forecourt, of linking the ground plane to the green roof.

Q: How was the planting plan for the green roof resolved/designed?

A: When considering the planting plan of a green roof the soil profile must also be considered. The load bearing capacity of the roof was taken into account when first designing the soil profile of the roof. The load bearing columns and beams were utilized with the soil profile mounded over these locations to create areas of deeper soil. This undulation in the soil profile serves three purposes:

1. Increase biodiversity: when the soil is mounded small changes in microclimate are created through differences in sun and shade and soil moisture. This will likely affect the biodiversity of the roof particularly within the soil itself as well as potentially on the surface of the soil with smaller invertebrates as well as potentially small lizards and birds.
2. Screening: the mounds have been located to help screen penetrations in the roof, such as the cafe exhaust.
3. Trees: the increase in the soil profile afforded by the mounds allowed us to plant trees in these locations. The greater volume of soil will allow for the growth and anchorage of the trees root system to the roof.

The soil profile of the roof varies from 350mm to 700mm.

Q: What kinds of plants have been used on the green roofs?

A: Plants chosen for the largest roof are native, hardy, drought tolerant and low maintenance. Plants placed at the drainage end of the roof are tolerant of periodic inundation in the event the soil profile becomes waterlogged in this zone due to a blockage in the drainage system or during a heavy rain event.

Species chosen include:

<i>Dianella caerulea</i> 'Cassa Blue' (native)	"Dianella Cassa Blue"
<i>Dianella revoluta</i> 'Revelation' (native)	"Dianella Revelation"
<i>Eucalyptus porosa</i> (endemic)	"Mallee Box"
<i>Isolepis nodosa</i> (endemic)	"Knobby Club Rush"
<i>Juncus pallidus</i> (native)	"Pale Rush"
<i>Lomandra longifolia</i> 'Nyalla' (native)	"Lomandra Nyalla"
<i>Lomandra longifolia</i> 'Tanika' (native)	"Lomandra Tanika"

Trees chosen for the roof are a locally native small mallee species, *Eucalyptus porosa*, which are anchored to the roof with a specialised roof anchoring system. Trees have been planted in groups of three to mimic the habit of these mallee trees in nature.

Plants chosen for the green roofs in the panda exhibit reflect the plantings chosen within the exhibits themselves and include a dwarf bamboo and a dwarf Photinia species.

Q: What kinds of plants were used on the green walls?

A: The design intent behind the species selection was to use as many native species as possible to showcase the use of native species in a green wall or green roof situation.

The external green wall plant palette reflects a more dryland plant selection in line with the landscape of the forecourt located adjacent to the wall. Hardy native plants have been used including *Enchylaena tomentosa* or "Ruby Saltbush" which is native to the Adelaide plains. The patterning of the plants in the wall alludes to the proximity of first creek.

Species chosen for the external wall include:

<i>Dianella caerulea</i> 'Little Jess' (native)	"Dianella Little Jess"
<i>Dianella tasmanica</i> 'Tas Red' (native)	"Dianella Tas Red"
<i>Enchylaena tomentosa</i> (endemic)	"Ruby Saltbush"
<i>Lomandra confertifolia</i> ssp. <i>rubiginosa</i> 'Seascape' (native)	"Lomandra Seascape"

The plant palette for the internal green wall is more lush in comparison to the external green wall. The intent was to use as many native plants as possible but due to availability from the nursery & suitability for the internal location this was not possible for the whole plant palette.

Species chosen for the internal wall include:

<i>Adiantum</i> sp. (native)	"Spleenwort"
<i>Asplenium oblongifolium</i>	"Shining Spleenwort"
<i>Blechnum nudum</i> (native)	"Fishbone Waterfern"
<i>Crytomium</i> sp.	"Holly Fern"
<i>Davallia pyxidata</i> (native)	"Hare's-Foot Fern"
<i>Dichondra repens</i> 'Emerald Falls' (native)	"Kidney Weed"
<i>Doodia aspera</i> (native)	"Prickly Rasp Fern"
<i>Liriope</i> 'Evergreen Giant'	"Lilyturf"
<i>Peperomia</i> sp.	"Ripple Plant"
<i>Polypodium</i> 'Blue Star'	"Rock Polypody"

<i>Pteris albo-liniata</i>	"Brake Fern"
<i>Pteris umbrosa (native)</i>	"Jungle Brake"
<i>Selaginella</i> sp.	"Spikemoss"
<i>Soleirolia soleirolii</i>	"Baby Tears"
<i>Streptocarpus caulescens</i>	"Nodding Violet"
<i>Tradescantia</i> 'Spiderwort'	"Spiderwort"
<i>Viola hederacea (native)</i>	"Native Violet"

The plants were grown-on in their individual mixed species modules by the supplier, Fytogreen, at their nursery in Victoria. There was a long growing-on time for the plants to create 100% plant coverage at the time of installation. The modules were transported from Victoria and installed on site along with the irrigation system, which includes the ability to fertilise the plants when irrigating.

When installed the modules are hung on the wall from a bracket system, according to the plan, to generate patterns created through the use of different plant species.

Q: What are the maintenance requirements of the large green roof?

A: A continuous fall arrest system is installed which allows for regular safe access to perform duties such as maintenance on the roof. The roof is not publicly accessible though can be viewed from a paved deck which extends out from the conference centre on Level 1. This viewing platform has its own balustrade, meaning there is no need for a balustrade to the edge of the roof allowing the plants and trees being easily viewed from Frome road and the adjacent entrance precinct.

Q: What are the maintenance requirements of green walls?

A: Maintenance will be carried out regularly on the green walls as they have a higher maintenance requirement than the green roofs. Maintenance will include checking the health of the plants, trimming the plants, irrigation system checks as well as the control of any pests and diseases.