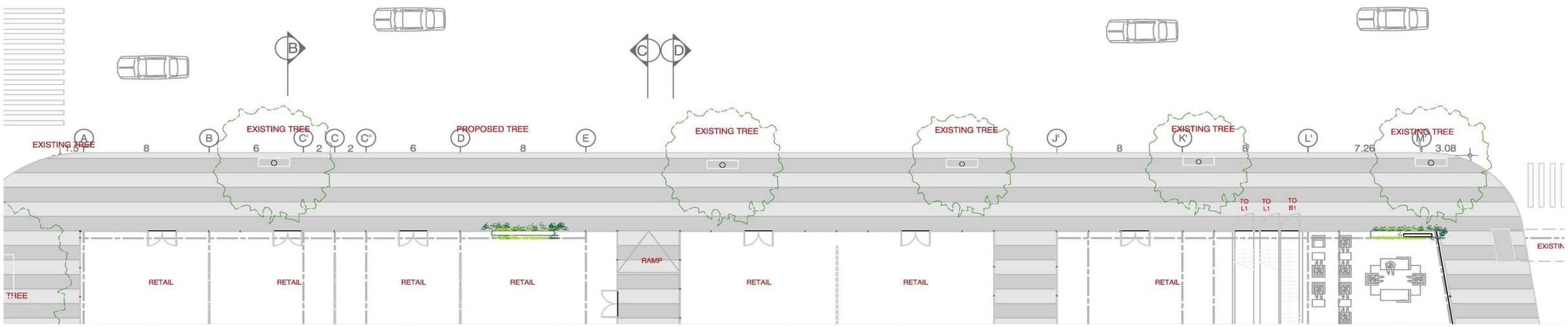
APPENDIX

Broadway street trees
Existing Gate - Block 2
Maintenance report
Technical report

Broadway street trees

The 5 existing trees (Ficus sp.) in front of the Block 2 are preserved.




LEVEL 3
30.05m AHD
LEVEL
25.4m AHD
LEVEL
21.05m AHD
16.70m AHD
ELEVATION

MAINTENANCE REPORT

The whole environmental project was developed to allow for easy and inexpensive maintenance whilst respecting the building's performances.

1/ IMPLEMENTED MEANS

1.1 Sealings
The sealings are envisaged antiroot self protected or protected by screeds. The protection are covered with drainage layers and a filter layer preventing the pollution of these drainage layers and the rain pipes. The rain pipes are accessible from underneath the slabs.

1.2 Soils
a) "Classical" gardens of traditional structure
The selected earthy mixtures are slightly reduced so as to preserve at the susbstrates a considerable water retention capacity, a good capacity of ionic exchanges and have an excellent buffer effect.

b) Gardens balconies and terraces with modular planter
This solution integrates the whole of the constraints of drainage, of water retention in an autonomous envelope. The supports with their strong capacity of ionic exchanges will be very autonomous.

c) Light high terraces
There the systems are lighter. We maintain a thickness of substrate ≥ 10 cm so as to temporize the climatic variations. The substrates are able to resist some delays of watering therefore the selected plantations will be very xerophilous.

1.3 Watering
A drip-irrigation system that is entirely programmed and linked to a weather station. Therefore, the water quantities of watering will be reduced to a minimum (the sources of water can be managed by calculating the values of daily evapotranspiration and by adjusting automatically the operation durations).

The sections of the primary and secondary drains are calibrated so as to be able to adjust themselves to the extreme climatic variations. A system of automatic control of the short circuits and various breakdowns of watering make it possible "to jump" the short circuit stations and to pursue remaining watering. Detection is provided with visual or sound alarms.
In addition, a maximum availability of the network is assured by the density of the lines of drippers, the networks segmentation by cut valves.
Recycled black water is used. In the event of breakdowns on this network, the network of watering is connected to the drinking water network.

1.4 Nutrition
The nutritive solution is automated thanks to a direct mode of injection in the liquid of watering. One or two yearly samples on the various culture systems will allow, after analysis, to adjust the nutritive contributions.

1.5 Vegetation
Three types of vegetation are envisaged and distributed according to the microclimatic conditions. Schematically one will have:
- Levels 0 to 15: mesophilous vegetation (characterize the average conditions in the gradient dryness/moisture)
- Levels 16 to 24: mesoxerophilous vegetation (characterize the average conditions of dryness)
- Levels 25 to 35: xerophilous vegetation (species adapting or not fearing dry mediums, in particular in summer period)

In addition there is a choice of resistant plants, heliophilous plants or part shade, prospering in fairly acid soils to neutral, resulting from soils generally mesotrophic (*), light and indifferently fresh to dry, will ensure a good durability.
(*) (mesotrophic: grounds fairly rich in nutritive elements, fairly acid, allowing an average biological activity).

2/ MAINTENANCE CRITERIA

All elements are designed to supervise and minimize the maintenance:

2.1 Automatic watering
Supervised by a centralized data-processing management which allows the detection of any anomaly instantaneously.
Two annual visits are to be envisaged (1 large general and 1 small).

2.2 Automated nutrition
One control analysis per year on the various substrates. In first year 2 analysis are planned for the regulation of the nutritional needs.

2.3 Health protection
The selected plants are not very sensitive to parasitic attacks. This choice is permanent. However, a continuous monitoring will avoid the possible invasions (observation by survey every month).

2.4 Management of the vegetation
The soils are planted with a perennial ground-cover stratum.

a) Classical gardens
The plantation of the ground-cover stratum will cover in less than two years the whole of the grounds.
1st year: cleaning/hoeing: 6 times per year
2nd year and beyond: cleaning/ hoeing: 3 times per year

b) Light gardens
The choice of a pre-plantation in nursery of the system module/grating allows the achievement of a complete cover within 6 months in preparation for the conditions of the building.
1st year: cleaning: 4 times per year
2nd year: cleaning: 2 times per year

c) The high stratum (trees, shrubs, climbing)
The dead or collapsing plants are replaced one by one on site (maximum assumption 10% of mortality during the first year of guarantee).

SEASON	VEGETATION WORKS	GENERAL
SUMMER	A : hoeing B : small possible replacements Small annual visit of complete watering	Data-processing follow-up of watering and the nutrients contribution. Observation with the binocular of the plant, possible plant health treatment. Uninterrupted… weekly report with the manager
AUTOMN	Vegetation analysis. Counting Setting in nursery of the replacements to be envisaged. Cleaning foliages Visit drainage courses, rain pipes, stubs of visit… A : hoeing B : small possible replacements	
WINTER	Annual prune A : hoeing B : small possible replacements Large annual visit of complete watering	
SPRING	Vegetation analysis Annual prunes after flowering (plants with spring flowering)	

A: Classical gardens
B: Light gardens

TECHNICAL REPORT

1 – OBJECTIVES

- Cover the building in perennial vegetation using horizontal and vertical, linear and massed effects.
- Avoid the “planter box” effect at slab edges and balconies by integrating the planters into the slab thickness.
- Facilitate building and garden space management.
- Allow fast and easy installation.
- Use simple plant management techniques. Seek solutions that do not require sophisticated knowledge and that are risk-tolerant.
- Keep water consumption to a minimum.
- Keep installation and maintenance costs down.

2 – TERMINOLOGY

- **Envelope box** : An architectural element that allows:
. Integration of the landscape elements into the architecture
. Integration of the main water supply and drainage network
. Reception of the agricultural modules (small containers, trays, structures…) carrying the plants.

- **Agricultural modules**: repetitive, easy to handle unitary elements (weight < than 30 kg) that receive the plants and contain all the various functions necessary to their nutrition and development (plant medium, drip tube, drainage layer, plant supports…). The agricultural modules can be of several types depending on location and type of plant.

3 – AGRONOMIC REQUIREMENTS

3.1 – Water needs

As a general rule, water consumption must be minimized.
Evapotranspiration varies widely as a function of:
- The type of plant
- Positioning of the plant on the facade thus within a specific microclimate (for example northern exposure, Venturi effects, and façade reflections all increase the evapotranspiration considerably).

Water needs can vary by a factor of three according to the type of plant, the exposure and the technique used. This is an essential design parameter and requires great precision in the calculation of water supplies.

With this in mind we have drawn up a card questionnaire (see appendix 1) by level and by facade. The questionnaire will need to be completed for each condition in order to accurately calculate the required supply.
Water will be distributed to the plants by a micro-irrigation system (see appendix 2).

3.2 – Nutrition

Plant nutrition is a familiar problem in horticulture. An automatic nutrient station mixer is proposed (see appendix 3).

3.3 – The plants

It is essential to choose frugal, resistant plants that are perfectly adapted to the climatic conditions of Sydney and the specific microclimatic conditions of the project. The success of the operation depends in large part on proper plant selection. The intervention of a good botanist is required.

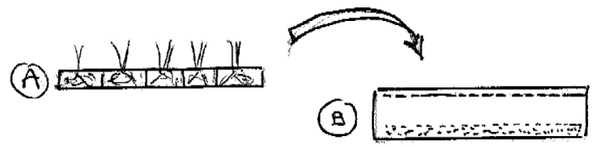
3.4 – Cultivation of the plants

Rather than planting in “window boxes” preinstalled on the building, we strongly recommend pre-cultivation of agricultural modules in the nursery. This will allow plants at least 6 months of development (1 to 2 years for shrubs) before being installed on the building. The plants will thus be well-rooted.
The plants should be prepared in the nursery under similar microclimatic conditions (orientation, water supply…) to those they will encounter on the building.
Several cultivation methods are possible:

a) Planting with seedbed or cuttings at nursery
solution 1 – short lead time (2 to 6 months)
Plants are precultivated in a plastic grating (A). At installation time, grating (A) is placed on top of a perforated plastic tray (B) filled with plant medium and then the ensemble is dropped into the envelope box on the building.

Advantage: rooting is perfect within the grating
Disadvantage: rooting at precultivation stage is limited to the grate depth

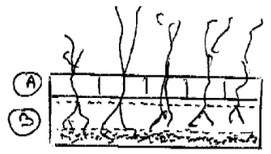
Suitable for seedbeds and plants that accept short duration cuttings.



solution 2 – long lead time (> 6 months)
Plants are precultivated in (A+B, grating+tray), at the nursery. At installation time the ensemble is dropped into the envelope box on the building.

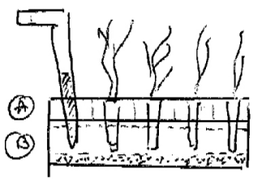
Advantage: deep rooting and vegetal coverage are perfect at precultivation stage
Disadvantage: longer lead time

This solution is suitable for any kind of plant and cultivation method.



b) planting separately cultivated plants (multiple nurseries)
solution 3
Plants are planted in (A+B, grating+tray) with dibble using forest standard pots (long and straight).

Advantage: plants can be arranged and grouped at the last moment
Disadvantage: plant rooting must happen on the building. Planting is difficult, labor-intensive, and therefore more costly.



Solution 2 is the best solution.
Solutions 1 and 2 are less expensive than 3.