STATEMENT OF SIGNIFICANCE

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"...the Parklands demonstrate the growing appreciation in Victorian times of the need for public open space for recreation, education and enjoyment."

The Centennial Parklands, comprising Moore Park, Centennial Park and Queens Park are of outstanding heritage significance. They have historical, aesthetic, social and technical/research values all levels from national to local. They represent a rare example of their type of designed cultural landscape and that the same time have many features representative of urban parklands developed in the late 19th and early 20th centuries.

From their origins in the Second Sydney Common, the Parklands demonstrate the growing appreciation in Victorian times of the need for public open space for recreation, education and enjoyment. The dedication of Centennial Park in 1888 was important in marking a significant milestone in the development of the Australian colonies – the centenary of European settlement in New South Wales. Centennial Park is also representative of a trend in the western world in the second half of the nineteenth century towards the establishment of large landscaped urban parks where people of all classes could get away from the cramped conditions of the city.

The Centennial Parklands are important for their associations with several institutions and individuals influential in the horticultural development of Sydney and New South Wales. Of particular note are the links with Charles Moore, Director of Sydney's Botanic Gardens and his successor in that role, J H Maiden. Not to be forgotten are the Park supervisors, James Jones and William Forsyth whose contributions to the development of the Parklands have been less widely recognised. Collectively, these men had an enormous influence on amenity horticulture, particularly the tree species that have become characteristic of many of our urban parks and streets.

The Centennial Parklands have enormous aesthetic value, not only because of their contribution to the greening of Sydney's eastern suburbs but also because they demonstrate an evolution of landscape styles including the English landscape tradition, the picturesque, the gardenesque and the post World War II native plant movement. The Grand Drive in Centennial Park is a rare example of a great tree-lined avenue laid out in the gardenesque style. The use of indigenous tree species such as *Ficus macrophylla*, *Ficus rubiginosa* and several araucarias is significant as an indicator of experimentation with native plants and a growing appreciation of their horticultural potential. Maiden's introduction of *Phoenix canariensis* as an avenue planting in Moore Park and Centennial Park led to the widespread use of this species in parks and streets throughout New South Wales, imparting a tropical look to many precincts and towns.

The tree plantings in the Parklands have varying degrees of significance. Of outstanding value are those trees planted in the formative years of the Parklands' development, from the 1890s to the1920s. Many of these are now excellent mature specimen trees or are important components of the Parklands' avenues and spaces

The considerable social significance of the Centennial Parklands to past and present generations may be measured by the very high levels of visitation to and recreational use of the area. The esteem in which the Parklands is held by the contemporary community may be gauged by their listing on most major heritage registers and by the level of concern expressed when any threats to the Parklands arise.

Centennial Parklands have enormous technical and research potential since they reflect in their plantings and landscape more than 130 years of experimentation with native and exotic plant species for amenity horticulture. The archival record of the Parklands in areas such as arboriculture, landscape design, plant pathology, outdoor recreation and heritage conservation is a valuable research tool for present and future park managers throughout Australia.

The heritage significance of the Centennial Parklands is being maintained and enhanced through a program of innovative park management practices and the continuing use of the Parklands as a place for the commemoration and celebration of important events in Sydney and New South Wales

SOIL ASSESSMENTS

"Centennial Park presents difficult conditions for tree establishment and growth."

3.1 APPROACH

Soil sampling was carried out within Centennial Park in conjunction with Roy Lawrie – NSW Department of Agriculture

Soil sampling was undertaken with a truck mounted hydraulic soil auger. The sampling approach included:

- A total of 30 samples collected at 21 separate sites.
- Sample depths ranging from 0.5 metres (in areas of rock) to approximately 2.0 metres

AIMS

Samples were collected and visually assessed in selected locations with the following aims:

(i) To test some of the long held beliefs as to why some trees are in poor condition or are unable to be established.

(ii) To compare the soil conditions of trees in poor conditions to adjacent trees where these demonstrate good vigor.

(iii) To locate some of the reported below ground constraints to tree growth (e.g. shallow rock, waterlogged conditions, old excavated planting trenches).

3.2 MAIN ISSUES

Generally the results of field soil surveys confirmed the long held views that Centennial Park presents difficult conditions for tree establishment and growth.

However, in most of the locations sampled, it was demonstrated that some of the long held beliefs as to why trees have difficulty in growing were not so much due to the original difficult site conditions but due to successive decades of inappropriate (or possibly ill-informed) tree management practices. It is apparent that, in all but a few locations, the worst growing conditions are man made and not a problem of the original site.

The main issues arising out of the soil sampling include:

- A significant limiting factor to tree root development was the successive layers of fill placed over tree root zones – this is particularly the case for the trees along Grand Drive where car parking occurs.
- In most locations around Grand Drive, the top 500 to 600mm of the profiles were found to have few or no tree roots. In other words, the zone normally considered to support the bulk of the root mass of a tree (growing under normal conditions) was, in the areas sampled, unfavorable to tree root development.
- Generally, soil compaction may not be as physically limiting a factor to the penetration of roots as previously thought (although in some locations it appears that it is one of several factors). However, layering of dissimilar materials does tend to restrict root growth through the creation dry zones or providing limited nutrient buffer capacity.
- Some of the areas previously thought to limit tree growth because of shallow rock were in fact found to have deep sands. (Although the Ceremonial Triangle was found to have very shallow underlying sandstone).
- Some of the areas thought to limit tree growth because of underlying saturated soils were not found to exhibit excessive soil moisture and there was no evidence of prolonged waterlogging. In some profiles with apparently saturated sandy B horizons, the most active root growth was found – particularly fig roots.
- At this stage, it appears that the most limiting factor to the growth of figs is water stress. This appears to be exacerbated in some locations by shallow soils (particularly if the original A has been graded off), poor fill material or where there is competition from grass and where there is no apparent access to the underlying shallow water table or moist sand over "coffee rock".

- Original construction techniques, in particular cut and filling from road construction, appears to be an important factor in limiting the growth of trees in several locations (e.g. Grand Drive between Loch Ave. and Robinson Drive). The original poor planting technique and successive layers of poor fill material also appear to have exacerbated the longer term poor tree performance.
- Where trees have access to original soils profiles (i.e. A horizon through to C horizon), even where these have been filled over, tree performance is generally good. Tree viability has been further improved where roots also have access to the underlying water table (even at depths of between 1.5 to 2 metres, and possibly deeper).
- In some locations, these more ideal site conditions are present but some trees are in poor condition. At this stage (without further testing) it may be that the genetic vigor of individual trees is diminished compared to that of adjacent specimens and / or there may be some specific limiting conditions confined to the area immediately around those affected trees.
- The effects of long term car parking within the root zones of trees is considered to have been a significant factor, both directly and indirectly, on the health and viability of the affected trees. This issue also has implications for the future management of both existing and future replacement plantings.

Soil sampling was also directed to the areas of newly planted *Washingtonia filifera* palms. The current opinion as to why these palms are affected by *Fusarium oxysporum* strains is that there is too much organic matter in the soil into which they have been planted and that this acts to stress the young palms.

Sampling revealed the following:

- While sampling indicated that there is more organic matter in narrow bands along the line of the original *Phoenix sp.* plantings, there was no apparent indication that there was an excess of organic matter or that this may have been sufficient to stress the young palms. More resent soil chemical analysis has confirmed this.
- Soil conditions do not appear to be a limiting factor to the growth of tree species if this option is adopted instead of re-establishing a palm species.

3.3 SUMMARY & COMMENT

The critical factors previously thought to limit tree growth on this site were climatic and edaphic (i.e. geography / climate / soil / geology). Although these must still be considered as important , they are possibly less so now given that the mature tree population has created some favorable microclimate effects. Instead, it seems that man made limitations have also played an important part in determining tree performance.

The most important conclusion therefore is that, with current understanding of what is required for tree establishment and growth, it is feasible to amend some of those previous man made constraints, although techniques will require further investigation and may be controversial, while others may require significant allocation of funds.

3.4 OPTIONS

The soil sampling results indicate that there are a number of possible options for managing the existing tree population and specifically trees associated with roadways. The results also provide some indication of appropriate practices that should be adopted and maintained for future tree plantings.

Management of trees adjacent to roadways may involve several techniques, including:

(i) Block removals (of trees in a state of decline for which improved conditions would provide no benefit) and replacement into improved conditions.

(ii) Relocation of existing car parking bays and / or rationalisation of available parking spaces away from existing and future plantings.

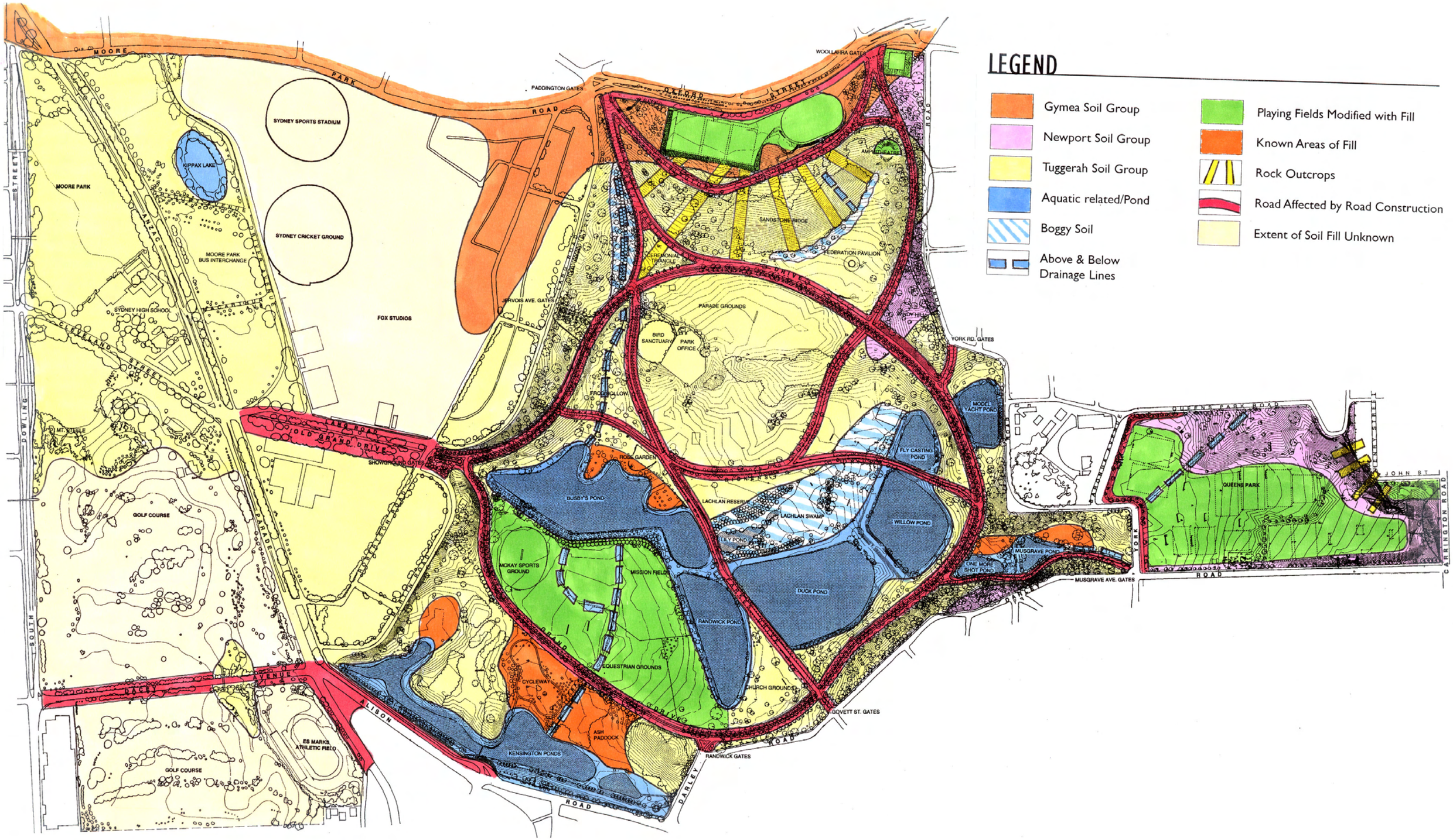
(iii) Adoption of practices to improve existing soil conditions so as to extend the viability of trees currently exhibiting reasonable health (e.g. hydraulic excavation of unfavorable materials and installation of improved soil mix; vertical mulching).

(iv) New plantings into areas currently considered to be unfavorable to tree establishment but being mindful that trees may not have been planted in some of these areas for design rather than environmental reasons. For example, avenue plantings adjacent to the Cafe precinct on Grand Drive were probably not planted in order to maintain the vista from the Ceremonial Triangle across the Parade Ground.

(v) Change species, planting locations and / or species mix, historically planted in some locations, to species more suitable to localised site constraints.

(vi) Undertake further soil investigations to identify other locations / factors limiting to tree growth.

- New tree plantings should incorporate techniques that aim at replicating natural soil profiles and conditions. Improved organic mater levels and mulching around the base of these trees should extend as far out from the tree as possible.
- Where appropriate to the landscape character, trees should be planted in groups to establish favourable microclimatic conditions or nursery planting could be considered to provide protection during the critical establishment period.



LEGEND

- Gymea Soil Group
- Newport Soil Group
- Tuggerah Soil Group
- Aquatic related/Pond
- Boggy Soil
- Above & Below Drainage Lines
- Playing Fields Modified with Fill
- Known Areas of Fill
- Rock Outcrops
- Road Affected by Road Construction
- Extent of Soil Fill Unknown

context
Landscape Design

in association with:
- Catherine Evans, Landscape Architect
- Tempe Macgowan, Landscape Architect
- David Beaver, Landscape Architect
- MUSEcape Pty Ltd
- Garry Clubley, Arborist

SOIL ANALYSIS

Drawing No: V 2.2

0 250 500m

Scale: 1:10,000 @A3 approx