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2 FIGTREE DRIVE, SYDNEY OLYMPIC PARK

ARBORICULTURAL IMPACT ASSESSMENT

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date	*revision*	*prepared*	*checked*
09/06/15	Issued Development Application	AM	AS
10/08/15	Issued Development Application	AM	AS

Executive Summary

This report was commissioned by Mirvac Projects Pty Ltd to accompany the Multilevel Residential Development Application at 2 Figtree Drive, Sydney Olympic Park. The aim of this report is to provide an **assessment of the impacts** of the proposed development on one hundred and twenty six trees. It also contains a **Plan of Management** for the transplanting of a mature Moreton Bay Fig, Tree 1.

This report collates and presents information collected by Andrew Morrison on the 22/5/15 and by Andrew Morrison and Luke Smart on the 4/6/15. The data collected is located at **7. Tree Survey Table** (page 23) also see **8. Tree Survey Table Notes** (page 32) for notes relating to tree survey table.

Generally the site's vegetation was observed to have a majority native tree canopy, with a native shrub midstorey and a native groundcover layer. The existing surveyed trees are shown at **9. Tree Location Plan** (page 36).

The proposed development will involve the construction of a multistorey residential development with associated driveways, basement carparking, gardens, turf, paths, paving and retaining walls. This will involve the demolition of existing structures and regrading site levels through excavation, cutting and filling of soil on site. The extent of site works is also illustrated at **9. Tree Location Plan** (page 36).

- 7 trees will be unaffected by the development (Tree No.'s 37, 38, 39, 40, 41, 42 & 43).

- 5 trees are located adjacent to the proposed development and the proposed construction will provide a major encroachment (greater than 10% of the TPZ area) within the TPZ (Tree No.'s 1, 2, 3, 114 & 115).

- 114 trees are located within the building footprint (Tree No.'s 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126).

The matrix below gives a brief overview summary of tree significance and level of encroachment from the proposed development of numbered trees. (L-M) indicates the tree is of low to medium significance.

	ENCROACHMENT WITHIN TPZ Numbering of trees as shown on Tree Location Plan				
TREE LANDSCAPE SIGNIFICANCE		**No Impact**	**Minor Encroachment**	**Major Encroachment**	**Within Development Footprint**
	High	-	-	1 & 3	-
	Medium	37	-	2 (M-H),	8, 11, 14, 19, 23,100 105, 106, 107, 108, 109, 117, 118, 119 120, 126
	Low	38(L-M), 39(L-M), 40(L-M), 41(L-M),42(L-M), 43(L-M)	-	114 & 115(L-M)	4, 5(L-M), 6 (L-M), 7(L-M), 9(L-M), 10(L-M), 12, 13(L-M), 15, 16, 17(L-M), 18(L-M), 21, 20(L-M), 22(L-M), 24, 25, 26, 27, 28, 29(L-M), 30 (L-M), 31, 32, 33, 34, 35, 36, 44(L-M), 45, 46, 47, 48, 49(L-M), 50, 51, 52, 53, 54, 55, 56, 57, 58, 59(L-M), 60(L-M),61(L-M), 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79(L-M), 80, 81, 82, 83, 84, 85(L-M), 86, 87, 88, 89, 90, 91, 92(L-M), 93(L-M), 94(L-M), 95(L-M), 96, 97, 98, 99(L-M), 101(L-M), 102 (L-M), 103 (L-M), 104, 110, 111, 112, 113, 116, 121, 122(L-M), 123(L-M), 124(L-M), 125(L-M)
	Total Number of trees	**7**	**0**	**5**	**114**

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained. This report specifically recommends:

- The removal of Tree No.'s 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126, if the development is approved as there is an unavoidable major encroachment into the tree protection zone.
  - Tree No.'s 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126 are located on the adjacent property. Permission will be required from the owner of 4 Figtree to remove trees from their land.
  - Tree 118 will have a major but sustainable encroachment by construction of the first stage of the proposed road but will require removal for the second stage of the road (within 4 Figtree Drive).
- The removal of Tree No.'s 114 & 115 as there is unavoidable major encroachment into the tree protection zone.
- The replacement planting of 30 locally native or deciduous canopy trees shall be installed in 25L pot size to offset the loss of trees on site.
- The replacement planting of 7 locally native or deciduous canopy trees shall be installed in 25L pot size to offset the loss of trees within the road reserve of Figtree Drive.
- The replacement planting of 14 locally native or deciduous small trees shall be installed in 25L pot size to offset the loss of trees within the road reserve of the proposed new street.
- The retention of Tree No.'s 37, 38, 39, 40, 41, 42 & 43. The construction will not impact these trees.
- The retention of Tree No.'s 2 & 3. The construction will provide a major encroachment into the tree protection zone. This is sustainable by the trees provided the following tree sensitive construction methods are used
  - All excavation works are to avoid the SRZ and exposed lateral (buttress) roots.
  - Excavation for isolated piers within the TPZ of retained trees is to be carried out by hand to detect and avoid underground woody structural roots. If woody structural roots greater than 40mm diameter are found, they must be retained and protected until it is determined if they should either remain or be pruned. The project arborist (AQF Level 5) should be contacted to assess if roots should remain and construction modified – or - the root(s) pruned under their supervision.
  - Excavation for construction entry and public footpath should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.
  - Excavation for the proposed retaining wall to the south of Tree 3 should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.
  - It is anticipated that crown lifting will be required to achieve a minimum 2m pedestrian clearance above elevated walkways under the crown and to achieve a visually attractive canopy. The amount of branch removal required should be carefully considered before pruning. This is especially the case for Tree 2 due to the present health status of the tree. No more than 10% of the crown should be removed during the construction period without advice from the project arborist.

- The retention of Tree No. 1. This tree will be transplanted on site. Whilst the root plate will temporarily be pruned for that process, optimal conditions for root, regrowth and establishment must be provided and the tree protected from adjacent construction activities. Several construction activities are proposed:
  - Installation of stormwater piping and treatment works.
  - Rerouting of sewer pipe.
  - Construction of a public elevated walkway.
  - Construction of a retaining wall to the south of this tree.
  - Construction of stairs to the south and north of this tree.
  - The sewer and stormwater elements should be installed as early as practicable in the construction process to allow healthy root establishment in back filled trenches.
  - Associated compaction and soil inversion caused during construction is to be made good immediately at the conclusion of works according to soil amelioration guidelines as recommended by the soil consultant.
  - As much of the area of the TPZ as prescribed by AS4970 is to be fenced off as an exclusion zone to prevent activities which may cause damage to the tree and to allow optimum conditions for root 'break out' (re-establishment). We anticipate fencing will be required to be moved to allow the above activities. It should be replaced immediately at the conclusion of each activity (including soil remediation) to enclose as much of the TPZ as is practical, in consultation with the project arborist.
  - The duration of the tree fencing has been extended to beyond the construction phase in order to exclude all activities during the re-establishment of the tree. An indicative exclusion zone is shown on the tree Location Plan which should be fenced off.
  - This tree will require regular monitoring during the establishment period for health and implementation of sound arboricultural practices to maintain and promote its vigour. This will involve maintenance and adjustment of the irrigation system specified in 6.0 of the Tree Transplanting Plan of Management to accommodate the needs of the tree.
- It is anticipated minor pruning of the crown may be required for Tree 1 for installation of trench shoring structures, if the open trenching option is chosen for the sewer re-routing. Pruning of branches should comply with Australian Standard No *4373 -2007 - Pruning of Amenity Trees*. Branch reduction should be made to internal lateral branches or stems which are at least 1/3rd of the diameter of the branch being cut – or – removed at the branch collar, consistent with AS *4373 -2007; Sections 6.4 a) & b) and 7.3.*
- It is anticipated that construction activities will not be able to be excluded from the entire TPZ of Trees 1, 2 & 3. Tree Protection Fencing (PTF) shall be located to enclose as much of the TPZ as possible. Where approved excavation and construction encroaches into the TPZ, the TPF layout shall be determined with advice from the project arborist.
- It is anticipated that due to construction activities, the tree protection fence will not be able to be installed around the entire TPZ of Trees 37, 38, 39, 40, 41, 42 & 43. It should be installed to protect as much as practically possible of the TPZ.
- Pruning of branches should comply with Australian Standard No *4373 -2007 - Pruning of Amenity Trees*. Branch reduction should be made to internal lateral branches or stems which are at least 1/3rd of the diameter of the branch being cut – or – removed at the branch collar, consistent with AS *4373 -2007; Sections 6.4 a) & b) and 7.3.* Deadwooding should be carried out concurrently.

- Hand excavation is required for all works located within the TPZ of all retained trees. These works shall be supervised by the project arborist.
- A minimum AQF Level 5 Project Arborist shall be engaged to certify the tree protection works in accordance with the hold points provided at **6.3. Hold Points** (page22).
- For additional tree protection notes see **10. General Tree Protection Notes** (page 41).

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1. Introduction

This report was commissioned by Mirvac Projects Pty Ltd to accompany the Multilevel Residential Development Application at 2 Figtree Drive, Sydney Olympic Park. The aim of this report is to provide an **assessment of the impacts** of the proposed development on one hundred and twenty six trees. It also contains a **Plan of Management** for the transplanting of a mature Moreton Bay Fig, Tree 1.

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2. Methodology

2.1. Limitations

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However Andrew Morrison - Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others. Unless stated otherwise:

- Information contained in this report covers only the tree/s examined and reflects the health and structure of the tree at the time of inspection. The documented, observations, results, recommendations and conclusions given may vary after the site visit due to environmental conditions. Liability will not be accepted for damage to person or property as a result of natural processes, unforeseeable actions or occurrences.
- Observations recorded for trees located within adjacent properties have been made without entering that property. As a result measurements for these trees are estimated. Similarly these trees were not subject to a complete visual inspection and defects or abnormalities may be present but not recorded.
- The inspection was limited to visual examination from the base of the subject tree without dissection, excavation, probing or coring (unless specifically noted otherwise).
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.

2.2. Site Inspection

A visual inspection of the tree/s was performed from ground level, data collected includes:

- Genus, Species, Common Name;
- Height, Width, DBH (Diameter at Breast Height), DRB (Diameter above Root Buttress);
- Age and Health;
- Amenity and Ecological Value;
- Crown Form and Condition;
- Visible Defects or Evidence of Wounding.

2.3. Measurement

- Tree locations are supplied on the client supplied survey plan or triangulated using a measuring tape.
- Diameter at breast height (DBH) and Diameter above Root Buttress (DRB) are measured using a diameter tape.
- Height is measured using a clinometer.
- Canopy width is estimated using a measured stride paced out on site.
- Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) radii are measured (in accordance with AS 4970-2009) from the centre of the trunk.
- Development impact/setback is measured from the nearest face of the trunk to the face of the structure in Auto CAD using the perpendicular distance function. Generally this is measured without detailed foundation design.

2.4. Recording Data

Data collected is collated in the tree survey table located at **7. Tree Survey Table** (page 23). The tree survey table contains abbreviations for terms describing the trees characteristics; explanatory notes pertaining to these are located at **8. Tree Survey Table Notes** (page 32).

The physical data for tree locations, crown width and DRB is schematically described in **9. Tree Location Plan** (page 36).

2.5. Reference Documents

The report was written in coordination with:

- Architectural Site Plan, Basement plans, Ground Floor Plans prepared by BVN Architecture, Rev F, dated 07/08/15.
- Survey Plan prepared by Linker Surveying Pty Ltd, Issue 3, dated 02/07/15.
- Landscape Masterplan prepared by 360 Degrees, Issue B, dated 07/08/15.
- Stormwater Siteworks Plan prepared by B G & E, Issue B, dated 04/08/15.
- Auburn Sewerage Deviation Plan prepared by RMA Infrastructure – Open Trench option, Case No. 147110WW, Rev B, dated 03/08/15.
- Auburn Sewerage Deviation Plan prepared by RMA Infrastructure – Underbore option, Case No. 147110WW, prepared by RMA Infrastructure, Rev B, dated 03/08/15.
- Site Establishment Plan SOP_010 prepared by Mirvac, (undated) suppled on 07/08/15.
- The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).

2.6. SOPA Masterplan 2030

This document requires Tree No. 1 to be relocated elsewhere on the project site to accommodate the new street and Tree No.'s 2 and 3 to be sustainably retained on site.

2.7. Determining a tree's significance

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. When determining a tree's significance within the landscape context, the following questions are asked with respect to each tree. Significance may be expressed in increments of High, Medium or Low. For a High rating the majority (≥4) of the answers will be yes; for a Medium rating half (=3) of the answers will be yes; and for the Low rating the minority of answers will be yes (≤2).

1. Is the tree a locally native remnant; an endangered species; a part of an endangered ecological community; or does the tree provide critical habitat for an endangered species?

2. Is the tree of botanical interest; listed as a heritage item under the Federal State or Local Regulations?

3. Is the tree visually prominent in the locality?

4. Is the tree well structured?

5. Is the tree in good health and does it display signs of good vigour?

6. Is the tree typically formed for the species?

7. Is the tree located in a position that will accommodate future growth?

3. Observations

3.1. Site Description

The site is a single commercial block located at 2 Figtree Drive, Sydney Olympic Park. It currently contains a multistorey building containing office and warehouse space, driveway, parking areas, paths and gardens. The site has a general easterly aspect.

3.2. Soil Landscape Map

The soils in this area are mapped as developed terrain originally from the Blacktown soil landscape group [3]. They are generally shallow to moderately deep <100 cm Red and Brown Podzolic Soils on crests, upper slopes and well-drained areas; deep 150-300 cm Yellow Podzolic Soils and Soloths on lower slopes and in areas of poor drainage.

Generally the landscape is characterised by gently undulating rises on Wianamatta Group shales and Hawkesbury shale. There is local relief to 30 m, and slope gradients usually less than 5%. Additionally there are broad rounded crests and ridges with gently inclined slopes [3].

These soils are generally limited by moderately reactive highly plastic subsoil, low soil fertility, and poor soil drainage. The critical soil characteristics of this soil type for trees growing on this site include poor drainage. [3]

3.3. Native Vegetation Map

This area is mapped as Sydney Turpentine Ironbark Forest prior to 1788 by Benson and Howell. The Sydney Turpentine Ironbark Forest (STIF) endangered ecological community[13, 14] is dominated by *Syncarpia glomulifera* with *E. paniculata* and *E. eugeniodes* occurring less frequently. In areas of higher rainfall (1050 – 1080 mm per annum), *E. saligna* is dominant. *Eucalyptus punctata* occurs occasionally in areas where the shale soils are relatively shallow. [13, 14]

A stratum of small trees is usually present and is composed of a mixture of species including *Syncarpia glomulifera, Pittosporum undulatum, Trema aspera* and *Acacia parramattensis subsp parramattensis*. The shrub stratum is usually sparse, and contains predominantly mesic species such as *Pittosporum revolutum, Breynia oblongifolia, Maytenus sylvestris, Polyscias sambucifolia, Notelaea longifolia* and *Ozothamnus diosmifolius*[13, 14].

The ground stratum consists of a dense mixture of herb and grass species dominated by *Oplismenus aemulus, Pseuderanthemum variabile* and *Echinopogon ovatus*. Other frequently recorded species include *Entolasia marginata, Pratia purpurascens, Dianella longifolia, Arthropdium milleflorum* and *Rubus parvifolia*[13, 14].

There appears to be no representative species from this community on or adjacent to the site.

3.4. Summary of site inspection data

Generally the site's vegetation was observed to have a majority native tree canopy, with a native shrub midstorey and a native groundcover layer. The existing surveyed trees are shown at **9. Tree Location Plan** (page 36).

3.5. Summary of Proposed Development

The proposed development will involve the construction of a multistorey residential development with associated driveways, basement carparking, gardens, turf, paths, paving and retaining walls. This will involve the demolition of existing structures and regrading site levels through excavation, cutting and filling of soil on site. The extent of site works is also illustrated at **9. Tree Location Plan** (page 36).

3.6. Summary of tree impacts

- 7 trees will be unaffected by the development (Tree No.'s 37, 38, 39, 40, 41, 42 & 43).

- 5 trees are located adjacent to the proposed development and the proposed construction will provide a major encroachment (greater than 10% of the TPZ area) within the TPZ (Tree No.'s 1, 2, 3, 114 & 115).

- 114 trees are located within the building footprint (Tree No.'s 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126).

3.7. Tree significance and encroachment matrix

The matrix below gives a brief overview summary of tree significance and level of encroachment from the proposed development of numbered trees. (L-M) indicates the tree is of low to medium significance.

	ENCROACHMENT WITHIN TPZ Numbering of trees as shown on Tree Location Plan				
TREE LANDSCAPE SIGNIFICANCE		**No Impact**	**Minor Encroachment**	**Major Encroachment**	**Within Development Footprint**
	High	-	-	1 & 3	-
	Medium	37	-	2 (M-H),	8, 11, 14, 19, 23,100 105, 106, 107, 108, 109, 117, 118, 119 120, 126
	Low	38(L-M), 39(L-M), 40(L-M), 41(L-M),42(L-M), 43(L-M)	-	114 & 115(L-M)	4, 5(L-M), 6 (L-M), 7(L-M), 9(L-M), 10(L-M), 12, 13(L-M), 15, 16, 17(L-M), 18(L-M), 21, 20(L-M), 22(L-M), 24, 25, 26, 27, 28, 29(L-M), 30 (L-M), 31, 32, 33, 34, 35, 36, 44(L-M), 45, 46, 47, 48, 49(L-M), 50, 51, 52, 53, 54, 55, 56, 57, 58, 59(L-M), 60(L-M),61(L-M), 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79(L-M), 80, 81, 82, 83, 84, 85(L-M), 86, 87, 88, 89, 90, 91, 92(L-M), 93(L-M), 94(L-M), 95(L-M), 96, 97, 98, 99(L-M), 101(L-M), 102 (L-M), 103 (L-M), 104, 110, 111, 112, 113, 116, 121, 122(L-M), 123(L-M), 124(L-M), 125(L-M)
	Total Number of trees	**7**	**0**	**5**	**114**

4. Discussion

4.1. Trees with a Major TPZ Encroachment

The proposed construction encroaches within the TPZ by more than 10%.

- **Tree 1** is located on the boundary between 2 Figtree Drive and 4 Figtree Drive within the footprint of the proposed new road. It is a high significance tree and will be transplanted from the existing location as it is located within the footprint of a new road to be constructed within the TPZ according to the SOPA Masterplan 2030. It will be transferred to another location on the southern boundary of the property under a separate DA (see Tree Location Plan).

  Specifications for the preparation, moving and after care of this tree appear in the Plan of Management for the transplanting of the tree contained within this report. See **12 Tree Transplanting Plan of Management** (page 45). The comments below are confined to construction impacts on the tree.

  It is anticipated the tree will have a root plate of 10m x 10m, which may vary according to the contractor engaged for transplanting. The roots will be severed at existing location. Destination location is proposed to be 10.26m from anticipated scaffolding (2m wide) used in construction of proposed building.

  It is anticipated there will be regrading of contours to achieve a grade of the surrounding backfill soil which is the same as the soil surface at the top of the transplanted root plate at the line of interface. Consideration be given to FFLs of new street.

  Several encroachments have been identified from constructed elements which are proposed to be located within root re-establishment area (breakout zone). However as the encroachments are located within areas not currently containing tree roots rather it is areas where root growth is likely to occur. Due to the reduction in size of connected root mass, the TPZ encroachment formulas do not apply.

  The greater volume (and therefore area) of uncompacted soil that is provided for the tree around the root plate, the greater the likelihood of favourable outcomes for re-establishment, growth and sustainable contribution by the tree to this site. This should be borne in mind with regard to the following elements in the supplied plans.

  There are several constructed elements in the vicinity of the tree which are considered to **deflect** future root growth. None encroach within the transplanted root plate. The proposed road lies outside the TPZ. The proposed buildings including basement are located to the periphery of the TPZ to the north and east and a retaining wall is located to the south east near the periphery of the TPZ. There are two sets of stairs and associated retaining walls.

  There are several constructed elements in the vicinity of the tree which are considered to **allow** future root growth between isolated footings and pipework. None encroach within the transplanted root plate. The proposed elevated walkway and pipework for the stormwater treatment tank are constructed elements which provide this encroachment.

The route of the diverted sewer line is indicated to run along the western and southern boundaries within the periphery of the TPZ and under part of the crown. The route is indicated at **9. Tree Location Plan** (page 36). Two methods are being considered for installation; open trenching 1.5m wide with shoring and underboring. If the open trenching method is used, we understand a clearance of up to 4.5m is required to accommodate the installation of underboring. We anticipate minimal (sustainable) pruning will be required. Machinery is to be placed to require no unnecessary pruning of the crown, as per the Tree Transplanting Plan of Management (see **12 Tree Transplanting Plan of Management** (page 45). If this method is used, the project arborist should provide advice regarding pruning in liaison with the contractor.

These elements should be installed as early as possible in the construction process to allow healthy root establishment in back filled trenches. Associated compaction and soil inversion caused during construction is to be made good at the conclusion of works according to soil amelioration guidelines as recommended by the soil consultant.

The crown: the methodology for transplanting the tree is to leave as much of the crown intact as possible. Some branches may require removal to facilitate access of the machinery used during transplanting. If the crown is left intact (as shown in the Tree Location Plan) we anticipate it will be around 0.8m from the scaffold (assuming 2m width) required for construction of the proposed building and will need little or no pruning to give clearance for construction of the building or the building itself.

In general, **compaction** caused from the machinery used in the vicinity of the tree (for transplanting, civil and stormwater works) should be rectified according to soil amelioration guidelines as recommended by the soil consultant immediately the respective works are concluded.

Tree Protection: As much of the area of the TPZ as prescribed by AS4970 is to be fenced off as an exclusion zone to prevent activities which may cause damage to the tree and to allow optimum conditions for root 'break out' (re-establishment). We anticipate fencing will be required to be moved to allow the above activities. It should be replaced immediately at the conclusion of each activity (including soil remediation) to enclose as much of the TPZ as is practical, in consultation with the project arborist.

Ongoing tree Management: The Establishment Maintenance program in Section 6.0 of the Tree Transplanting Plan of Management outlines such elements as the installation of an irrigation system, hormone treatments and other ameliorants. This tree will require regular monitoring during the establishment period for health and implementation of sound arboricultural practices to maintain and promote its vigour. This will involve maintenance and adjustment of the irrigation system to accommodate the needs of the tree.

- **Tree 2** is located 7.4m from proposed construction entry and 9.22m from proposed public footpath providing 6.1% encroachment (likely to be excavation or cut). It is also located 5.23m from the proposed serpentine elevated walkway providing 12.6% spot TPZ encroachment from the associated isolated concrete piers. This tree is of medium to high significance and should be retained and protected, as required by the SOPA Masterplan 2030. It is considered to be in fair to average health and encroachments from construction should be minimised. This is considered to be a moderate

impact and sustainable by the tree, provided the measures below are undertaken.

Crown Lifting will be required to achieve a minimum 2m pedestrian clearance above elevated walkways under the crown and to achieve a visually attractive canopy. Branches are important locations for food storage and the amount of branch removal required should be carefully considered before pruning due to the present health status of the tree. The removal of a maximum of 10% of this tree's crown is considered sustainable. No more than this should be removed during the construction period without advice from the project arborist.

Tree sensitive construction measures must be implemented if works are to proceed within the TPZ as prescribed by the Australian Standard AS4970-2009 *Protection of trees on development sites*. Specifically,

- All excavation works are to avoid the SRZ and exposed lateral (buttress) roots.

- Excavation for isolated piers within the TPZ of retained trees is to be carried out by hand to allow the detection and avoidance of underground woody structural roots. If woody structural roots greater than 40mm diameter are found, they must be retained and protected until it is determined by the project arborist if they should either remain or be pruned. The project arborist (AQF Level 5) should be contacted to assess if roots should remain and construction modified – or - the root(s) pruned under their supervision.

- Excavation for construction entry and public footpath should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.

An area equivalent to the *encroachment* is required to be provided (additional to and contiguous with the remaining TPZ) to offset against the encroachment. This additional area is to be protected during construction.

In view of its below-average health and high landscape significance, **attention should be given to improving the health of this tree** under the supervision of a Level 5 arborist. Further investigation and the application of products such as soil ameliorants, mulch and the installation of irrigation should be implemented. Testing of soil samples taken from throughout the TPZ should be carried out to inform the management of the tree.

- **Tree 3** is located 6.58m from excavation associated with proposed retaining wall providing 18.9% encroachment within the TPZ. It is also located 3.91m from the proposed serpentine elevated walkway providing 7.5% spot encroachment within the TPZ. This tree is of high significance and should be retained and protected, as required by the SOPA Masterplan 2030. The encroachment is considered to be in the low to moderate impact range and sustainable by the tree.

  Crown Lifting will be required to achieve a minimum 2m pedestrian clearance above elevated walkways under the crown and to achieve a visually attractive canopy. Branches are important locations for food storage and the amount of branch removal required should be carefully considered

before pruning. No more than 10% of the crown should be removed during the construction period without advice from the project arborist.

Tree sensitive construction measures must be implemented if works are to proceed within the TPZ as prescribed by the Australian Standard AS4970-2009 *Protection of trees on development sites*. Specifically,

- All excavation works are to avoid the SRZ and exposed lateral (buttress) roots.

- Excavation for isolated piers within the TPZ of retained trees is to be carried out by hand to detect and avoid underground woody structural roots. If woody structural roots greater than 40mm diameter are found, they must be retained and protected until it is determined if they should either remain or be pruned. The project arborist (AQF Level 5) should be contacted to assess if roots should remain and construction modified – or - the root(s) pruned under their supervision.

- Excavation for the proposed retaining wall should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.

An area equivalent to the *encroachment* is required to be provided (additional to and contiguous with the remaining TPZ) to offset against the encroachment. This additional area is to be protected during construction.

- Tree 114 is located within 4 Figtree Drive, 0.92m from the 1.5m wide open trench option for sewer re-route layout providing 23.6% encroachment within the TPZ and encroachment within the SRZ. We understand the location of the trench is indicative and may be adjusted in location or not used. Instead, an option of underboring may be used to install the sewer which would not impact this tree. This tree is of low significance but is located on a neighbouring property. The open trench is considered to provide a high impact which is unsustainable by the tree.

  Consideration should be given to approaching the owner of the tree for permission to apply for its removal if the open trench is to proceed as described.

- Tree 115 is located within 4 Figtree Drive, 1.96m from 1.5m open trench option for sewer re-route layout providing 14.7% encroachment within the TPZ. We understand the location of the trench is indicative and may be adjusted in location or not used. Instead, an option of underboring may be used to install the sewer which would not impact this tree. This tree is of low-medium significance but is located on a neighbouring property. The open trench is considered to provide a low to moderate impact which is sustainable by the tree.

  Tree sensitive construction measures must be implemented if works are to proceed within the TPZ as prescribed by the Australian Standard AS4970-2009 Protection of trees on development sites. Specifically the final cut of roots should result in a clean cut, using appropriate tools. Severing roots by earthmoving equipment is unacceptable as this results in tearing damage to roots, putting the tree at greater risk of root decay and/or structural instability.

An area equivalent to the encroachment is required to be provided (additional to and contiguous with the remaining TPZ) to offset against the encroachment. This additional area is to be protected during construction.

4.2. Trees within the development footprint

Trees Within the Proposed new road

- Trees 117, 119, 120 & 126 are located within the adjacent property, 4 Figtree Drive within the new street required in the SOPA Masterplan 2030 and adjacent to excavation for construction of the first half of the carriageway within 2 Figtree Drive. These trees are considered to be of **medium** significance and are suitable for retention. However, extensive redesign of the road would be required to retain these trees. It they cannot be retained if the development is approved in its current form.

- Trees 116 & 118 are located within the adjacent property, 4 Figtree Drive within the new street required in the SOPA Masterplan 2030. They are located 0.73m and 3.23m from the excavation for the first half of the carriageway within 2 Figtree Drive which will provide a 34.1% and 11.9% encroachment respectively within the TPZ.

  Tree 116 is considered to be of low significance but is located on a neighbouring property. The first stage of road construction is considered to provide a high impact which is unsustainable by the tree.

  Consideration should be given to approaching the owner of the tree for permission to apply for its removal as it cannot be retained if the development is approved in its current form.

  Tree118 is considered to be of **medium** significance. The construction of the first stage/half of the road will provide a low to moderate impact on the tree. It may be retained temporarily during the proposed works, but will require removal when the second half of the street is constructed.

  Consideration should be given to approaching the owner of the tree for permission to apply for its removal as it cannot be retained when the full road is constructed as per the SOPA Masterplan.

- Trees 121, 122, 123, 124 & 125 are located within 4 Figtree Drive within the new street required in the SOPA Masterplan 2030 and adjacent to excavation for construction of the first half of the carriageway within 2 Figtree Drive. These trees are considered to be of **low** or low-medium significance and are suitable for retention. However, extensive redesign of the road would be required to retain these trees. It they cannot be retained if the development is approved in its current form.

- Trees, 5(L-M), 6 (L-M), 24, 65, 66, 67, 68, 69, 70, 71 & 72 are within new street required in the SOPA Masterplan 2030. These trees are considered to be of **low** significance and should not be considered a constraint on the development.

Trees Within the Proposed Basement

- Trees 105 & 106, are located within the proposed basement. These trees are considered to be of **medium** significance and are suitable for retention.

However, extensive redesign of the proposed basement would be required to retain these trees. They cannot be retained if the development is approved in its current form.

- Trees 4, 45, 46, 47, 48, 49(L-M), 50, 51, 52, 53, 54, 55, 56, 57, 58, 59(L-M), 60(L-M),61(L-M), 62, 63, 64, 77(within entrance ramp), 78, 79(L-M), 80, 81, 82, 83, 84, 85(L-M) & 86, are located within the proposed basement. These trees are considered to be of **low** and low-medium significance and should not be considered a constraint on the development.

Trees Within the Proposed modified levels and landscape elements – Figtree Drive frontage

The Site Establishment Plan indicates most of the area along the boundary within both the property and the road reserve will be required for construction activities such as staging and delivery zones, concrete pumping and Site Accommodation – see **9. Tree Location Plan** (page 36). This temporary use alone would require the removal of all trees.

The extent of permanent level changes (mainly fill) indicated in the landscape sections will also require the removal of these trees.

- Trees 8, 11, 14, 19 & 23 are located within modified levels, constructed stairs, retaining walls, mounded earth, and electric substations shown on landscape plans within Figtree Drive frontage. These trees are considered to be of **medium** significance and are suitable for retention. However, extensive redesign of the proposed basement would be required to retain these trees. They cannot be retained if the development is approved in its current form.

- Trees 7, 9(L-M), 10(L-M), 12, 13(L-M), 15, 16, 17(L-M), 18(L-M), 20(L-M), 21 & 22(L-M) are located within modified levels, constructed stairs, retaining walls, mounded earth, and electric substations shown on landscape plans within Figtree Drive frontage. These trees are considered to be of **low** significance and should not be a constraint on the development.

- Trees 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 & 36 are located within areas of modified levels and construction zones within Figtree Drive road reserve shown on site establishment plan and landscape plans. These trees are considered to be of **low** significance and should not be a constraint on the development.

Trees Within the Proposed modified levels - battering of soil against basement wall – southern boundary

- Trees 100, 107, 108, 109 are located within re contoured, mounded (fill) areas shown on landscape plans along southern boundary. These trees are considered to be **medium** significance and are suitable for retention. However, extensive redesign of the proposed basement would be required to retain these trees. They cannot be retained if the development is approved in its current form.

- Trees 95(L-M), 96, 97, 98, 99(L-M), 101(L-M), 102(L-M), 103(L-M), 104, 110, 111, 112 & 113 are located within re contoured, mounded (fill) areas shown on landscape plans along southern boundary. These trees are considered to be **low** significance and should not be a constraint on the development.

Tree Within the Proposed modified levels - battering of soil against wall – Australia Avenue frontage

- Tree 44 (L-M) is located within modified levels shown on landscape plans along Australia Avenue, showing fill of up to 700mm. This is an unsustainable impact and the tree cannot be retained. This tree is considered to be of low significance and should not be a constraint on the development.

Trees Within the area required for Fig transplanting – final destination

- Trees 73, 74, 75, 76, 87, 88, 89, 90, 91, 92(L-M), 93(L-M) & 94(L-M)(Group of 3) are located within the area required for excavation, transplanting using heavy machinery and establishment of Tree 1. They cannot be retained sustainably if the tree transplanting is approved. These trees are considered to be of **low** significance and should not be a constraint on the development.

4.3. Other Tree Comments

- Trees 37, 38(L-M), 39(L-M), 40(L-M), 41(L-M), 42(L-M), 43(L-M) are located in positions that will allow their retention without impact from the proposed development, provided construction activities are prohibited within TPZs of these trees.

5. Recommendations

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained. This report specifically recommends:

- The removal of Tree No.'s 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126, if the development is approved as there is an unavoidable major encroachment into the tree protection zone.
  - Tree No.'s 116, 117, 118, 119, 120, 121, 122, 123, 124, 125 & 126 are located on the adjacent property. Permission will be required from the owner of 4 Figtree to remove trees from their land.
  - Tree 118 will have a major but sustainable encroachment by construction of the first stage of the proposed road but will require removal for the second stage of the road (within 4 Figtree Drive).
- The removal of Tree No.'s 114 & 115 as there is unavoidable major encroachment into the tree protection zone.
- The replacement planting of 30 locally native or deciduous canopy trees shall be installed in 25L pot size to offset the loss of trees on site.
- The replacement planting of 7 locally native or deciduous canopy trees shall be installed in 25L pot size to offset the loss of trees within the road reserve of Figtree Drive.

- The replacement planting of 14 locally native or deciduous small trees shall be installed in 25L pot size to offset the loss of trees within the road reserve of the proposed new street.
- The retention of Tree No.'s 37, 38, 39, 40, 41, 42 & 43. The construction will not impact these trees.
- The retention of Tree No.'s 2 & 3. The construction will provide a major encroachment into the tree protection zone. This is sustainable by the trees provided the following tree sensitive construction methods are used
  - All excavation works are to avoid the SRZ and exposed lateral (buttress) roots.
  - Excavation for isolated piers within the TPZ of retained trees is to be carried out by hand to detect and avoid underground woody structural roots. If woody structural roots greater than 40mm diameter are found, they must be retained and protected until it is determined if they should either remain or be pruned. The project arborist (AQF Level 5) should be contacted to assess if roots should remain and construction modified – or - the root(s) pruned under their supervision.
  - Excavation for construction entry and public footpath should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.
  - Excavation for the proposed retaining wall to the south of Tree 3 should be carried out by first excavating a narrow trench to the depth required, by hand along the closest line of cut to tree. This will allow the location of woody structural roots greater than 40mm which can then be pruned cleanly by an AQF Level 3 Arborist or Horticulturist.
  - It is anticipated that crown lifting will be required to achieve a minimum 2m pedestrian clearance above elevated walkways under the crown and to achieve a visually attractive canopy. The amount of branch removal required should be carefully considered before pruning. This is especially the case for Tree 2 due to the present health status of the tree. No more than 10% of the crown should be removed during the construction period without advice from the project arborist.
- The retention of Tree No. 1. This tree will be transplanted on site. Whilst the root plate will temporarily be pruned for that process, optimal conditions for root, regrowth and establishment must be provided and the tree protected from adjacent construction activities. Several construction activities are proposed:
  - Installation of stormwater piping and treatment works.
  - Rerouting of sewer pipe.
  - Construction of a public elevated walkway.
  - Construction of a retaining wall to the south of this tree.
  - Construction of stairs to the south and north of this tree.
  - The sewer and stormwater elements should be installed as early as practicable in the construction process to allow healthy root establishment in back filled trenches.
  - Associated compaction and soil inversion caused during construction is to be made good immediately at the conclusion of works according to soil amelioration guidelines as recommended by the soil consultant.
  - As much of the area of the TPZ as prescribed by AS4970 is to be fenced off as an exclusion zone to prevent activities which may cause damage to the tree and to allow optimum conditions for root 'break out' (re-establishment). We anticipate fencing will be required to be moved to allow the above activities. It should be replaced immediately at the

conclusion of each activity (including soil remediation) to enclose as much of the TPZ as is practical, in consultation with the project arborist.

- The duration of the tree fencing has been extended to beyond the construction phase in order to exclude all activities during the re-establishment of the tree. An indicative exclusion zone is shown on the tree Location Plan which should be fenced off.
- This tree will require regular monitoring during the establishment period for health and implementation of sound arboricultural practices to maintain and promote its vigour. This will involve maintenance and adjustment of the irrigation system specified in 6.0 of the Tree Transplanting Plan of Management to accommodate the needs of the tree.

- It is anticipated minor pruning of the crown may be required for Tree 1 for installation of trench shoring structures, if the open trenching option is chosen for the sewer re-routing. Pruning of branches should comply with Australian Standard No *4373 -2007 - Pruning of Amenity Trees*. Branch reduction should be made to internal lateral branches or stems which are at least 1/3rd of the diameter of the branch being cut – or – removed at the branch collar, consistent with AS *4373 -2007; Sections 6.4 a) & b) and 7.3.*
- It is anticipated that construction activities will not be able to be excluded from the entire TPZ of Trees 1, 2 & 3. Tree Protection Fencing (PTF) shall be located to enclose as much of the TPZ as possible. Where approved excavation and construction encroaches into the TPZ, the TPF layout shall be determined with advice from the project arborist.
- It is anticipated that due to construction activities, the tree protection fence will not be able to be installed around the entire TPZ of Trees 37, 38, 39, 40, 41, 42 & 43. It should be installed to protect as much as practically possible of the TPZ.
- Pruning of branches should comply with Australian Standard No *4373 -2007 - Pruning of Amenity Trees*. Branch reduction should be made to internal lateral branches or stems which are at least 1/3rd of the diameter of the branch being cut – or – removed at the branch collar, consistent with AS *4373 -2007; Sections 6.4 a) & b) and 7.3.* Deadwooding should be carried out concurrently.
- Hand excavation is required for all works located within the TPZ of all retained trees. These works shall be supervised by the project arborist.
- A minimum AQF Level 5 Project Arborist shall be engaged to certify the tree protection works in accordance with the hold points provided at **6.3. Hold Points** (page22).
- For additional tree protection notes see **10. General Tree Protection Notes** (page 41).

6. Tree Management

6.1. Tree Management Objectives

The general tree management objectives include:

- Appointment of a Project Arborist who has a minimum Level 5 AQF Arboriculture qualification and experience in managing trees on construction sites.
- Installation of additional root, trunk and branch protection as required to protect retained trees where minor encroachments within the TPZ are anticipated.
- The installation of a Tree Protection Fence to enclose and protect the TPZ.

- Monitoring, inspection and certification of tree protection as per the below hold points.

6.2. Management Objective Priorities

The prioritisation of the above objectives is integral for the successful management of site trees:

1. Protection of the TPZ of retained trees;
2. Protection of the trunk and branches of retained trees;
3. Reduction of stress related to construction impacts;
4. The ongoing viability of retained trees after practical completion.

6.3. Hold Points, Inspection and Certification

To ensure this plan is implemented hold points (**HP**) have been specified in the schedule of works (below). Once each stage is reached the work will be inspected and certified by the Project Arborist and the next stage may commence.

Alterations to this schedule may be required due to necessity however this shall be through consultation with the Project Arborist only.

6.4. Schedule of Works and Responsibilities

Hold Point	Task	Responsibility	Certification	Timing of Inspection
1	Complete foundation design so to avoid woody roots greater than 40mm	Principal Contractor	Project Arborist	Prior to construction certificate application
2	Indicate clearly (with spray paint on trunks) trees approved for removal only	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
3	Install TPF and additional root, trunk and/or branch protection	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
4	Supervise all excavation works proposed within the TPZ	Principal Contractor	Project Arborist	As required prior to the works proceeding adjacent to tree
5	Re-install TPF and additional root, trunk and/or branch protection	Principal Contractor	Project Arborist	Prior to demolition and site establishment.
6	Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Monthly during construction period
7	Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Following the removal of tree protection measures from HP 1
8	Final Inspection of trees by Project Arborist	Principal Contractor	Project Arborist	Prior to issue of occupation certificate.

7. Tree Survey Table

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
1	*Ficus*	*macrophylla*	Moreton Bay Fig	15	24	1200	1200	1200	3573	14400	M	G	AV	H	H	M	D, S	(roots severed at existing location). Destination location is proposed to be 10.26m from anticipated scaffolding (2m wide) used in construction of proposed building . No encroachment within transplanted rootplate. TPZ encroachment formulas do not apply. Several encroachments from constructed elements within root re-establishment area (breakout zone).	-
2	*Ficus*	*rubiginosa*	Port Jackson Fig	11	16	860	860	890	3151	10320	M	F-AV	AV	M-H	M-H	M	CD, S	Located 7.4m from proposed construction entry and 9.22m from proposed public footpath providing 6.1% encroachment. Located 5.23m from serpentine elevated walkway providing 12.6% spot encroachment within the TPZ.	S canopy extends to corner of existing fence. Deadwood 5-10% of canopy, to 200mm diameter, mostly 100mm diameter. Crown somewhat sparse
3	*Ficus*	*macrophylla*	Moreton Bay Fig	14	24	2050	2050	2050	4474	15000	M	G	AV	H	H	M	D, S	Located 6.58m from excavation associated with proposed retaining wall providing 18.9% encroachment within the TPZ and 3.91m from serpentine elevated walkway providing 7.5% spot encroachment within the TPZ.	Numerous low laterals, 250-300mm diameter, removed. Hollow to SW, 600mm high opening, 600mm from front to back, 350mm wide. Extent unknown. New adventitious root. Canopy spread N 12m, S 10m, E 13m, W extends to existing building
4	*Ficus*	*benjamina exotica*	Weeping Fig	8	12	310	310	300	1996	3720	SM	G	P	L	L	L	D, S	Within development footprint (basement)	3 x lowest first order branches failed, tear at trunk with extensive wounding, 1/3 circumference of trunk damaged
5	*Corymbia*	*maculata*	Spotted Gum	15	5	250	250	330	2077	3000	SM	AV	AV	L-M	L-M	M	CD, U	Within development footprint (proposed road)	
6	*Corymbia*	*maculata*	Spotted Gum	17	5	270	270	360	2155	3240	SM	AV	AV	L-M	L-M	M	CD, U	Within proposed public path associated with new road	
7	*Corymbia*	*maculata*	Spotted Gum	17	5	260	260	300	1996	3120	SM	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
8	*Corymbia*	*maculata*	Spotted Gum	18	6	360	360	420	2299	4320	SM	AV	AV	M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
9	*Corymbia*	*maculata*	Spotted Gum	18	6	290	290	340	2104	3480	SM	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
10	*Corymbia*	*maculata*	Spotted Gum	17	5	310	310	370	2180	3720	SM	F-AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
11	*Corymbia*	*maculata*	Spotted Gum	18	12	530	530	600	2670	6360	M	AV	AV	M	L-M	M	CD, B	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
12	*Corymbia*	*maculata*	Spotted Gum	15	5	300	300	340	2104	3600	SM	P	F	L	L	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
13	*Corymbia*	*maculata*	Spotted Gum	16	6	310	310	360	2155	3720	SM	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
14	*Corymbia*	*maculata*	Spotted Gum	17	7	340	340	380	2204	4080	SM	AV	AV	M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
15	*Corymbia*	*maculata*	Spotted Gum	17	6	280	280	320	2051	3360	SM	F	F	L	L	M	CD, U, CS	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Deadwood to 70mm diameter
16	*Corymbia*	*maculata*	Spotted Gum	17	7	210	210	275	1924	2520	SM	AV	F-AV	L	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
17	*Corymbia*	*maculata*	Spotted Gum	18	8	310	310	360	2155	3720	SM	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
18	*Corymbia*	*maculata*	Spotted Gum	20	7	340	340	390	2228	4080	SM	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
19	*Corymbia*	*maculata*	Spotted Gum	20	10	410	410	500	2474	4920	M	AV-G	AV-G	M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
20	*Corymbia*	*maculata*	Spotted Gum	20	7	315	315	360	2155	3780	SM	AV-G	AV-G	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
21	*Corymbia*	*maculata*	Spotted Gum	18	6	230	230	280	1939	2760	SM	AV	AV	L	L-M	M	CD, U, CS	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
22	*Corymbia*	*maculata*	Spotted Gum	19	8	325	325	410	2276	3900	SM	AV	F-AV	L-M	L-M	M	CD, U, CS	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Crown shy and crown skew at 6m, corrects then forks at 11m
23	*Corymbia*	*maculata*	Spotted Gum	22	12	540	540	610	2689	6480	M	AV-G	G	M	M	M	CD, B	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Basal wound to N, exposed heartwood. Occluding pruning cuts at 3-4m
24	*Corymbia*	*maculata*	Spotted Gum	9	2	120	120	150	1492	1440	J	F	F	L	L	M	D, U	Within development footprint (proposed road)	
25	*Corymbia*	*maculata*	Spotted Gum	8	3	100	100	130	1405	1200	J	AV	AV	L	L	M	D, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
26	*Corymbia*	*maculata*	Spotted Gum	6	2	70	70	90	1204	840	J	AV	AV	L	L	M	D, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
27	*Eucalyptus*	*microcorys*	Tallowood	12	7	320	320	390	2228	3840	SM	AV	F-AV	L	L	M	D, B	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Codominant leaders at 6m with inclusion

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
28	*Eucalyptus*	*sp.*	Gumtree	6	4	210	210	280	1939	2520	SM	P	P	L	L	M	CD, L	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Lean to NE. 50% deadwood
29	*Eucalyptus*	*botryoides*	Southern Mahogany	12	10	390	390	390	2228	4680	SM	AV	AV	L-M	L-M	M	CD, S	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
30	*Corymbia*	*maculata*	Spotted Gum	14	3	180	180	190	1647	2160	J	AV	AV	L-M	L-M	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Codominant leaders at 6m
31	*Corymbia*	*maculata*	Spotted Gum	12	3	170	170	200	1683	2040	J	AV	AV	L	L	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Codominant leaders at 3m
32	*Corymbia*	*maculata*	Spotted Gum	10	2	130	130	150	1492	1560	J	F-AV	AV	L	L	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
33	*Corymbia*	*maculata*	Spotted Gum	9	2	130	130	150	1492	1560	J	P	P	L	L	M	CD, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Trunk corkscrew from 2-7m. Sparse canopy
34	*Corymbia*	*maculata*	Spotted Gum	13	3	200	200	230	1785	2400	SM	F-AV	AV	L	L	M	D, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Codominant leaders at 3m with inclusion
35	*Corymbia*	*maculata*	Spotted Gum	10	3	120	120	150	1492	1440	J	AV	AV	L	L	M	D, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	Codominant leaders at 3m with inclusion
36	*Corymbia*	*maculata*	Spotted Gum	8	2	90	90	110	1310	1080	J	AV	AV	L	L	M	D, U	Trees within the proposed modified levels and landscape elements – Figtree Drive frontage	
37	*Eucalyptus*	*microcorys*	Tallowood	17	7	350	350	410	2276	4200	SM	AV-G	AV	M	M	M	CD, B	No Impact	Crownlifted
38	*Eucalyptus*	*microcorys*	Tallowood	16	5	310	310	340	2104	3720	SM	AV	F	L-M	L-M	M	CD, L	No Impact	Crownlifted. Lean to E over roadway. Canopy somewhat sparse. Live crown ration <50%
39	*Eucalyptus*	*microcorys*	Tallowood	17	6	310	310	370	2180	3720	SM	AV	F	L-M	L-M	M	CD, B	No Impact	Fist order branch removed at 5m. Asymmetrical canopy. Epicormic growth from pruned first order branch
40	*Eucalyptus*	*microcorys*	Tallowood	17	7	390	390	460	2388	4680	M	AV	F	L-M	L-M	M	CD, L	No Impact	Crownlifted. Lean to E over roadway. Canopy somewhat sparse. Live crown ration <50%
41	*Eucalyptus*	*microcorys*	Tallowood	11	6	320	320	330	2077	3840	SM	F-AV	F	L-M	L-M	M	CD	No Impact	Trunk skew to N frm 4-6m, corrects. Live crown ratio <50%
42	*Eucalyptus*	*microcorys*	Tallowood	15	6	360	360	410	2276	4320	M	F	F	L-M	L-M	M	CD, L	No Impact	Lean to NE over roadway. Live crown ratio <50%
43	*Eucalyptus*	*microcorys*	Tallowood	17	8	400	400	500	2474	4800	M	AV-G	F-AV	L-M	L-M	M	CD, B	No Impact	
44	*Ficus*	*macrocarapa var. hillii*	Hills Weeping Fig	10	10	330	330	350	2129	3960	SM	G	AV	L-M	L-M	M	D, S	Within the proposed modified levels - battering of soil against \wall – Australia Ave frontage	
45	*Syzigium*	*smithii*	Lilly Pilly	8	4	220	220	260	1879	2640	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	Epicormic growth at 1-2m

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
46	*Syzigium*	*smithii*	Lilly Pilly	8	4	200	200	250	1849	2400	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	Epicormic growth at 1-2m
47	*Syzigium*	*smithii*	Lilly Pilly	8	4	280	280	320	2051	3360	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	
48	*Corymbia*	*maculata*	Spotted Gum	15	6	280	280	340	2104	3360	SM	AV	AV	L	L	M	CD, U	Within development footprint (basement)	
49	*Corymbia*	*maculata*	Spotted Gum	18	8	490	490	600	2670	5880	M	G	AV	L-M	L	M	CD, B	Within development footprint (basement)	
50	*Syzigium*	*smithii*	Lilly Pilly	8	4	240	240	280	1939	2880	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	
51	*Syzigium*	*smithii*	Lilly Pilly	7	3	170	170	200	1683	2040	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	Included leaders at 1.5m
52	*Syzigium*	*smithii*	Lilly Pilly	8	4	240	240	260	1879	2880	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	Included leaders at 1m
53	*Eucalyptus*	*robusta*	Swamp Mahogany	8	6	280	280	360	2155	3360	SM	F	F	L	L	M	CD, S	Within development footprint (basement)	
54	*Eucalyptus*	*robusta*	Swamp Mahogany	8	4	200	200	250	1849	2400	SM	F	F	L	L	M	CD, S, SU	Within development footprint (basement)	Suppressed by Trees 53 and 55
55	*Corymbia*	*maculata*	Spotted Gum	10	3	200	200	230	1785	2400	SM	F	F	L	L	M	CD, U	Within development footprint (basement)	
56	*Eucalyptus*	*robusta*	Swamp Mahogany	9	6	280	280	360	2155	3360	SM	G	AV	L	L	M	CD, B	Within development footprint (basement)	
57	*Corymbia*	*maculata*	Spotted Gum	8	4	170	170	200	1683	2040	J	F	P-F	L	L	M	CD, U	Within development footprint (basement)	Loss of main leader at 5m. First order branches serving as main leaders. Deadwood to 60mm diameter
58	*Eucalyptus*	*robusta*	Swamp Mahogany	8	6	240	240	320	2051	2880	SM	F-AV	F	L	L	M	CD, S	Within development footprint (basement)	Hangers at 4-7m
59	*Eucalyptus*	*robusta*	Swamp Mahogany	9	7	360	360	440	2344	4320	SM	G	AV	L-M	L-M	M	CD, S	Within development footprint (basement)	Winding trunk
60	*Eucalyptus*	*robusta*	Swamp Mahogany	11	8	380	380	440	2344	4560	M	G	AV	L-M	L-M	M	CD, S	Within development footprint (basement)	
61	*Eucalyptus*	*robusta*	Swamp Mahogany	10	11	400	400	520	2515	4800	M	G	AV	L-M	L-M	M	CD, S	Within development footprint (basement)	
62	*Syzigium*	*smithii*	Lilly Pilly	7	3	190	190	200	1683	2280	SM	G	G	L	L	M	CD, B	Within development footprint (basement)	Codominant leaders at 800mm with inclusion
63	*Syzigium*	*smithii*	Lilly Pilly	7	3	180	180	190	1647	2160	SM	G	G	L	L	M	CD, B	Within development footprint (basement)	Codominant leaders at 700mm. Exposed heartwood at 800mm
64	*Syzigium*	*smithii*	Lilly Pilly	7	3	180	180	190	1647	2160	SM	G	G	L	L	M	CD, B	Within development footprint (basement)	
65	*Syzigium*	*smithii*	Lilly Pilly	7	3	200	200	220	1752	2400	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	
66	*Syzigium*	*smithii*	Lilly Pilly	5	2	160	160	160	1533	1920	SM	AV	AV	L	L	M	CD,B, MS	Within development footprint (proposed road)	Multiple stems from base
67	*Syzigium*	*smithii*	Lilly Pilly	7	3	160	160	180	1611	1920	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	
68	*Syzigium*	*smithii*	Lilly Pilly	6	4	160	160	190	1647	1920	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	
69	*Syzigium*	*smithii*	Lilly Pilly	6	3	150	150	170	1572	1800	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	Codominant leaders at 800mm with inclusion
70	*Syzigium*	*smithii*	Lilly Pilly	7	4	170	170	190	1647	2040	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	Codominant leaders at 800mm

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
71	*Syzigium*	*smithii*	Lilly Pilly	7	3	160	160	180	1611	1920	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	
72	*Syzigium*	*smithii*	Lilly Pilly	7	4	220	220	260	1879	2640	SM	AV	AV	L	L	M	CD,B	Within development footprint (proposed road)	Codominant leaders at 1m with inclusion
73	*Syzigium*	*smithii*	Lilly Pilly	7	5	240	240	270	1910	2880	SM	AV	AV	L	L	M	CD,B	Within development footprint (area required for transplanting Tree 1)	Codominant leaders at 1m with inclusion
74	*Acacia*	*decurrens*	Sydney Wattle	7	5	250	250	320	2051	3000	SM	F	P	L	L	M	CD, L	Within development footprint (area required for transplanting Tree 1)	Heavy borer damage from 1-2m. Dead first order branch due to borer damage at 1.5m. Leaning on existing chainmesh fence
75	*Syzigium*	*smithii*	Lilly Pilly	6	4	150	150	230	1785	1800	SM	AV	AV	L	L	M	CD, B	Within development footprint (area required for transplanting Tree 1)	
76	*Syzigium*	*smithii*	Lilly Pilly	6	2	110	110	160	1533	1320	J	AV	F	L	L	M	CD, U	Within development footprint (area required for transplanting Tree 1)	
77	*Syzigium*	*smithii*	Lilly Pilly	7	3	200	200	250	1849	2400	SM	AV	AV	L	L	M	CD, B	Within development footprint (driveway)	Codominant leaders at 800mm with inclusion
78	*Syzigium*	*smithii*	Lilly Pilly	6	3	170	170	200	1683	2040	SM	AV	AV	L	L	M	CD, B	Within development footprint (basement)	Codominant leaders at 800mm
79	*Eucalyptus*	*robusta*	Swamp Mahogany	11	7	360	360	430	2322	4320	SM	F-AV	AV	L-M	L	M	CD, S	Within development footprint (basement)	
80	*Eucalyptus*	*robusta*	Swamp Mahogany	9	6	300	300	350	2129	3600	SM	AV	F-AV	L	L	M	CD, S	Within development footprint (basement)	
81	*Eucalyptus*	*robusta*	Swamp Mahogany	8	6	300	300	340	2104	3600	SM	A	F-AV	L	L	M	CD, S	Within development footprint (basement)	Deadwood <20mm diameter
82	*Eucalyptus*	*robusta*	Swamp Mahogany	8	4	190	190	210	1718	2280	SM	F	F	L	L	M	CD, S	Within development footprint (basement)	Deadwood 40mm diameter
83	*Eucalyptus*	*robusta*	Swamp Mahogany	9	8	390	390	410	2276	4680	SM	AV	P-F	L	L	M	CD, S	Within development footprint (basement)	Multiple snapouts in crown
84	*Eucalyptus*	*robusta*	Swamp Mahogany	8	2	180	180	190	1647	2160	SM	P-F	P-F	L	L	M	CD, U	Within development footprint (basement)	
85	*Eucalyptus*	*robusta*	Swamp Mahogany	11	9	390	390	430	2322	4680	SM	AV	F-AV	L-M	L	M	CD, S	Within development footprint (basement)	
86	*Eucalyptus*	*robusta*	Swamp Mahogany	9	4	250	250	290	1968	3000	SM	F	P	L	L	M	CD, S	Within development footprint (basement)	Kino flow at 1.2m
87	*Casuarina*	*glauca*	Swamp Oak	12	3	150	150	200	1683	1800	SM	AV	AV	L	L	M	CD, U	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base.
88	*Casuarina*	*glauca*	Swamp Oak	14	5	350	350	350	2129	4200	SM	AV	AV	L	L	M	CD, U	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base. Codominant leaders at 800mm
89	*Corymbia*	*maculata*	Spotted Gum	7	3	130	130	150	1492	1560	J	AV	AV	L	L	M	CD, U	Within development footprint (area required for transplanting Tree 1)	
90	*Casuarina*	*glauca*	Swamp Oak	15	8	400	400	400	2252	4800	SM	AV	AV	L	L	M	CD, U	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base. Codominant leaders at 800mm
91	*Casuarina*	*glauca*	Swamp Oak	11	3	200	200	250	1849	2400	SM	AV	F	L	L	M	CD, L	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base.

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
92	*Corymbia*	*maculata*	Spotted Gum	11	5	230	230	270	1910	2760	SM	G	G	L-M	L-M	M	CD, U	Within development footprint (area required for transplanting Tree 1)	
93	*Casuarina*	*glauca*	Swamp Oak	15	8	350	350	380	2204	4200	M	AV	AV	L-M	L-M	M	CD, U	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base.
94	*Casuarina*	*glauca*	Swamp Oak	13	6	300	300	360	2155	3600	SM	AV	AV	L-M	L-M	M	CD, U	Within development footprint (area required for transplanting Tree 1)	Crownlifted. Suckering at base.
94a							0		0	0								Within development footprint (area required for transplanting Tree 1)	
94b							0		0	0								Within development footprint (area required for transplanting Tree 1)	
94c							0		0	0								Within development footprint (area required for transplanting Tree 1)	
95	*Casuarina*	*glauca*	Swamp Oak	17	7	350	350	450	2366	4200	SM	AV	AV	L-M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base.
96	*Casuarina*	*glauca*	Swamp Oak	15	8	420	420	490	2453	5040	M	F	AV	L	L	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base. Sparse canopy. Codominant leaders at 7m with inclusion
97	*Casuarina*	*glauca*	Swamp Oak	15	6	350	350	370	2180	4200	SM	P-F	P-F	L	L	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base. Leaf distortion. Exposed heartwood with occluding rams horns
98	*Casuarina*	*glauca*	Swamp Oak	16	5	300	300	330	2077	3600	SM	F-AV	F	L	L	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base.
99	*Casuarina*	*glauca*	Swamp Oak	16	6	300	300	340	2104	3600	SM	AV	AV	L-M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base.
100	*Casuarina*	*glauca*	Swamp Oak	16	6	370	370	400	2252	4440	SM	AV	AV	M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base.
101	*Casuarina*	*glauca*	Swamp Oak	15	7	350	350	360	2155	4200	SM	AV	AV	L-M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base. Codominant leaders at 1m
102	*Casuarina*	*glauca*	Swamp Oak	13	7	290	290	310	2024	3480	SM	AV	AV	L-M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base. Multiple rib inclusions

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
103	*Casuarina*	*glauca*	Swamp Oak	12	7	350	350	370	2180	4200	SM	AV	AV	L-M	L-M	M	CD, U	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Crownlifted. Suckering at base.
104	*Eucalyptus*	*paniculata*	Grey Ironbark	8	3	150	150	160	1533	1800	J	AV	F	L	L	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Multiple snapped leaders
105	*Corymbia*	*maculata*	Spotted Gum	19	8	400	400	460	2388	4800	M	AV	G	M	M	M	CD, B	Within development footprint (basement)	
106	*Corymbia*	*maculata*	Spotted Gum	21	8	460	460	535	2545	5520	M	G	G	M	M	M	CD, B	Within development footprint (basement)	
107	*Corymbia*	*maculata*	Spotted Gum	20	8	425	425	470	2410	5100	M	G	G	M	M	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	
108	*Corymbia*	*maculata*	Spotted Gum	20	8	435	435	490	2453	5220	M	AV	AV	M	M	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	
109	*Casuarina*	*cunninhamiana*	River Oak	18	9	600	600	600	2670	7200	M	G	AV	M	M	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Codominant leaders at 400mm
110	*Casuarina*	*cunninhamiana*	River Oak	16	5	330	330	330	2077	3960	SM	AV	AV	L	L	M	CD, B	Within the proposed modified levels - battering of soil against basement wall – southern boundary	Twin stems with inclusion
111	*Casuarina*	*cunninhamiana*	River Oak	14	3	150	150	170	1572	1800	SM	AV	AV	L	L	M	CD, B, SU	Within the proposed modified levels - battering of soil against basement wall – southern boundary	
112	*Casuarina*	*cunninhamiana*	River Oak	14	3	180	180	190	1647	2160	SM	AV	AV	L	L	M	CD, B, SU	Within the proposed modified levels - battering of soil against basement wall – southern boundary	
113	*Casuarina*	*cunninhamiana*	River Oak	12	2	160	160	170	1572	1920	SM	AV	AV	L	L	M	CD, B, SU	Within the proposed modified levels - battering of soil against basement wall – southern boundary	
114	*Eucalyptus*	*sp.*	Gumtree	10	7	200	200	220	1752	2400	SM	AV	AV	L	L	M	CD, S	Located within 4 Figtree Drive, 0.92m from 1.5m open trench option for sewer re-route layout providing 23.6% encroachment within the TPZ and encroachment within the SRZ	Located in neighbouring property.
115	*Eucalyptus*	*saligna*	Sydney Blue Gum	17	8	300	300	330	2077	3600	SM	F-AV	AV	L-M	L-M	M	CD, U	Located within 4 Figtree Drive, 1.96m from 1.5m open trench option for sewer re-route layout providing 14.7% encroachment within the TPZ	Located in neighbouring property.

No impact | Minor encroachment | Major encroachment | Within development footprint

NO#	Genus	Species	Common Name	Height	Spread	Trunk Dia	DBH	DRB	SRZ	TPZ	Age	Health	Crown	Signifi-cance	Am	Eco	Form	Development Setback and Encroachment	Comments
116	*Syncarpia*	*glomulifera*	Turpentine	8	5	230	230	250	1849	2760	SM	AV	AV	L	L	M	CD, U	Within development footprint (proposed road). 0.73m from first stage of road, providing a major (34.1%) encroachmetn within TPZ.	Located in neighbouring property.
117	*Eucalyptus*	*paniculata*	Grey Ironbark	17	7	300	300	340	2104	3600	SM	G	AV	M	M	M	CD, U	Within development footprint (proposed road)	Located in neighbouring property.
118	*Corymbia*	*citriodora*	Lemon-scented Gum	25	12	450	450	550	2575	5400	M	AV	AV	M	M	M	CD, B	Within development footprint (proposed road). 3.21m from first stage of road, providing a major (11.9%) encroachmetn within TPZ.	Located in neighbouring property. Codominant leaders at 10m with inclusions
119	*Corymbia*	*citriodora*	Lemon-scented Gum	18	8	300	300	350	2129	3600	SM	AV	AV	M	M	M	CD, B	Within development footprint (proposed road)	Located in neighbouring property.
120	*Corymbia*	*citriodora*	Lemon-scented Gum	19	12	350	350	400	2252	4200	M	AV	AV	M	M	M	CD, B	Within development footprint (proposed road)	Located in neighbouring property.
121	*Eucalyptus*	*sp.*	Gumtree	10	4	160	160	210	1718	1920	J	F	F	L	L	M	CD, B	Within development footprint (proposed road)	Located in neighbouring property. 2 x laterals from base
122	*Corymbia*	*citriodora*	Lemon-scented Gum	14	11	350	350	390	2228	4200	SM	AV	AV	L-M	L-M	M	CD, S	Within development footprint (proposed road)	Located in neighbouring property.
123	*Corymbia*	*citriodora*	Lemon-scented Gum	16	6	280	280	310	2024	3360	SM	AV	F-AV	L-M	L-M	M	CD, U	Within development footprint (proposed road)	Located in neighbouring property.
124	*Corymbia*	*citriodora*	Lemon-scented Gum	17	7	280	280	310	2024	3360	SM	F-AV	F	L-M	L-M	M	CD, U	Within development footprint (proposed road)	Located in neighbouring property.
125	*Ficus*	*rubiginosa*	Port Jackson Fig	8	I6, E7, S8, W	400	400	480	2431	4800	SM	AV	AV	L-M	L-M	M	CD, S	Within development footprint (proposed road)	Located in neighbouring property. Located on fenceline
126	*Corymbia*	*citriodora*	Lemon-scented Gum	14	18	450	450	500	2474	5400	M	AV	AV	M	M	M	CD, S	Within development footprint (proposed road)	Located in neighbouring property.

8. Tree Survey Table Notes

8.1. Genus, Species and Common Name

The botanical and common name of each tree is identified and recorded. Occasionally the exact species name is unknown; *sp.* is recorded to indicate this.

8.2. Height, Spread, Trunk Dia, DBH and DRB

- The tree's height and spread is recorded in metres.
- The tree **DBH** is recorded in millimetres. DBH is an abbreviation of Diameter (of the trunk) measured at Breast Height (or 1.2m from the base of the trunk). If more than one trunk is present the DBH is calculated in accordance with AS4970-2009 Protection of Trees on Development Sites.
- If the tree has multiple trunks multiple trunks each trunk DBH (**Trunk Dia**) will be recorded individually.
- The tree **DRB** is recorded in millimetres. DRB is an abbreviation of Diameter (of the trunk) measured above the Root Buttress. It is required to calculate the SRZ in accordance with AS4970-2009 Protection of Trees on Development Sites when there is major encroachment within the TPZ, ie. greater than 10% is encroached upon or if there is an encroachment within the SRZ.

8.3. Age

The age class of each tree is estimated as either:

- **J** – Juvenile, a young sapling, easily replaced from nursery stock.
- **SM** - Semi Mature, a tree that has not grown to mature size.
- **M** - Mature, a tree that has reached mature size and will slowly increase in size over time.
- **OM** - Over Mature, a tree that has been mature for a long period and is beginning to display signs of decline, e.g. large dead branches.
- **S** - Senescent, an over mature tree that is now in decline.

8.4. Health and Vigour

The trees health and vigour is recorded as a measurement of:

- **G** - Good the tree does not appear stressed with no excessive dieback, insect infestation, decay, dead wood or epicormic shoots.
- **Avg** - Average Health the tree appears stressed and have some crown dieback, and/or a few epicormic shoots, and/or some dead wood in the crown and some new growth at branch tips. These trees may benefit from remediation of the growing environment to reduce stress and return it to good health.
- **F** - Fair the tree may have areas of crown dieback, and/or epicormic shoots, and/or areas of decay, and/or reduced new growth at branch tips. These trees have been stressed for a short period of time, remediation of the growing environment may improve the trees health.
- **P** - Poor the tree may have large areas of crown dieback, and/or many epicormic shoots, and/or reduced new growth at branch tips. These trees have been stressed for a long time, remediation of the growing environment would not return the tree to good health.

- **D** – Dead the tree is dead

8.5. Crown Condition

The crown condition of each tree is assessed and recorded as either:

- **G** - Good Condition: the tree appears to have no visible indication of inherent structural defects.
- **Avg** - Average Condition: the tree has minor structural defects which may be corrected with remedial works or pruning, allowing the tree to return to Good Condition.
- **F** - Fair Condition: the tree has visible structural defects such as (but not limited to) dead branches, and/or an unbalanced crown, and/or leaning trunk and/or areas of decay. These trees do not demonstrate the typical form of their species, or have been damaged or have begun to deteriorate. Remedial works or pruning may return the tree to Average Condition.
- **P** - Poor Condition: the tree has significant structural defects such as (but not limited to) very large dead branches, and/or extremely unbalanced crown, and/or subsiding trunk and/or large areas of decay. These trees do not demonstrate the typical form of their species, or have been severely damaged or have deteriorated significantly. Remedial pruning would not return the tree to Fair Condition.

8.6. Significance

Measured as High, Medium or Low, see **2.7. Determining a tree's significance** (page 10).

8.7. Amenity Value

Amenity value is a subjective measurement based on the tree's contribution to the landscape, it may be based on the tree's visual form, however it also includes non visual attributes such as provision of shade for a seat, screening of poor views or for privacy, or if it has historical significance. The amenity value is recorded as:

- **H** - High, the trees form is an excellent example of its species and it makes a great specimen and/or it has other attributes such screening, or is historical significance. These trees are visually prominent and valuable to the community or public domain.
- **M** - Medium, the tree may have an altered form and/or it has attributes that provides amenity to local residents only.
- **L** – Low, the tree is not a good specimen and it does not provide substantial benefit to local residents or the community.

8.8. Ecological Value

Ecological value is a measurement of the trees contribution to the environment. It is determined by the trees area of origin, its potential to provide habitat to native fauna and its potential to become an environmental pest. The ecological value is recorded as:

- **H** - High, the tree is locally native or remnant and/or it has habitat value for native fauna.
- **M** - Medium the tree is native but not locally native.

- **L** - Low, the tree is not native and/or it may be a listed nuisance or weed species.
- **Ha** – Habitat, is the tree valued by fauna for food (ie. foliage fruit or sap) or shelter (ie. nesting, roosting, dray or hollow).

8.9. Form

The form, structure or shape of each tree is assessed and recorded as either one or a combination of several of the below terms; (**U**) Upright, (**B**) Broad, (**C**) Conical, (**Sh**) Shrub, (**CS**) Crown Shy (also referenced is the adjacent dominant tree canopy ie. **T4**), (**V**) Vase, (**D**) Dome, (**P**) Palm, (**S**) Spreading, (**L**) Leaning or (**BM**) Basal Multi Trunked.

Crown form may also be assessed in accordance with the relationship with the neighbouring tree and recorded as either: **S** - Suppressed, the crown is located beneath another larger crown and is leaning away (Crown Shy); **CD** - Codominant, the crown is adjacent to another crown of similar size, their crown areas may appear joined; **D** - Dominant, the crown is above other lower crowns; **E** - Emergent, the crown emerges from a lower canopy formed by other dominant or codominant crowns.

8.10. Defects

The presence of one or a combination of several defects is recorded (**W**) Wound, (**D**) Decay, (**F**) Fungus, (**B**) Bulge, (**FB**) Fibre Buckling, (**C**) Cracks, (**S**) Split, (**H**) Hollow, (**DB**) Die Back, (**E**) Epicormic shoots, (**DW**) Dead Wood, (**I**) Inclusion, (**CA**) Cavities, (**PF**) Previous Failure, (**R**) Root Damage, (**P**) Pruning wound, (**PD**) Pests and diseases, (**ST**) Storm Damage.

8.11. SRZ (Structural Root Zone)

The SRZ is a radial area extending outwards from the centre of the trunk. This area contains the majority of the structural woody roots. This area is responsible primarily for stability. Root damage or root loss within this zone greatly increases the opportunity for decay fungi to ingress into the heartwood, causing internal decay in addition to destabilising the tree's structural integrity. The SRZ is calculated as follows (This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites):

$$\textbf{SRZ (Radius)} = (D \times 50)^{0.42} \times 0.64$$

8.12. TPZ (Tree Protection Zone)

The TPZ is a circular area with a radius measured by multiplying the DBH by twelve (12), or a circular area the size of the tree's drip line whichever is greater. This area contains the majority of the essential structural and feeder roots responsible for stability, gaseous exchange and water and nutrient uptake. Excavation, back filling, compaction or other disturbance should not occur in this area.

The TPZ is used to identify the minimum area required for the safe retention of a given tree. This calculation is derived from the Australian Standard 4970 – 2009 Protection of Trees on Development Sites. An incursion to 10% within the TPZ is potentially acceptable if no other option is available. A major encroachment (in excess of 10%) is required to be clearly justified by the project Arborist and compensated for elsewhere. Justification methodology may vary depending on site or the individual tree's health, vigour and ability to withstand disturbance and may require root investigation.

8.13. Development Setback / Impact

The successful retention of trees on construction sites is dependent on the adequate allocation and management of the space above, below and around trees to be retained.

The trunk and canopy of trees to be retained must be protected to ensure the trunk and branches are not damaged during construction. The removal of bark and / or branches allows the potential ingress of micro organisms which may cause decay. Similarly the removal of bark restricts the tree's ability to distribute water, mineral ions and glucose.

It is essential to prevent the disturbance of the soil beneath the drip line of each tree, because this is the area where oxygen, water and mineral ions are absorbed by tree roots. Oxygen, water and mineral ions are essential for healthy plant growth. If soil becomes compacted, the ability of roots to function correctly is greatly reduced. Similarly the removal or damage of roots will reduce the ability of roots to function correctly. Woody roots provide stability for the tree and they also transport nutrients to the leaves.

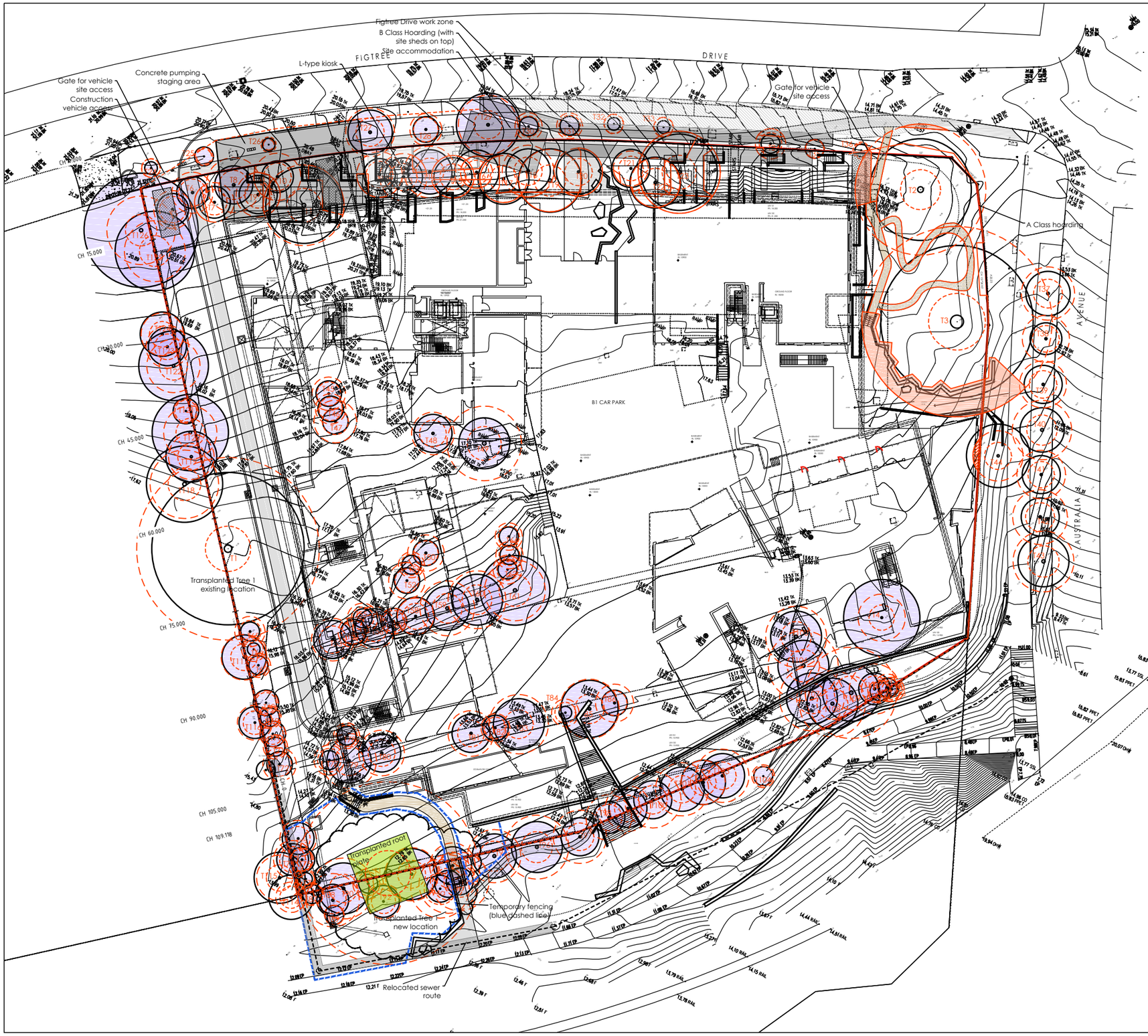
The potential implications of removing or damaging roots are threefold:

1. The risk of whole tree failure is increased, as tree roots anchor and stabilise the tree. Woody roots are developed to assist in the support of the tree in prevailing wind, with these roots removed wind throw may occur, which would result in the mass failure of the tree.
2. The ability of the tree to absorb and transfer the essential nutrients, oxygen and water from the soil to the leaves is greatly affected. This will place the tree under stress and reduce the tree's ability to photosynthesise, and in turn cause the tree to use up stored energy reserves. These energy reserves are used to fight infection and insect attack, for new growth, maintenance of existing tissues and also for healing wounds. Once energy reserves become depleted a tree is much more susceptible to drought, disease and pest attack.
3. Open wounds are sites by which decay-causing pathogens can enter the tree. The severance or damage of woody roots creates sites where pathogens may gain ingress. Whilst the effect of decay may not be immediately apparent, the long term health and structure of the tree will be compromised.

8.14. Comments

Comments generally relate to the suitability for retention. The comments allow for a brief notation of other factors relevant to the assessment of the tree.

9. Tree Location Plan



LEGEND

+101.45	Existing levels
+ RL 101.55	Proposed levels
+ TOW 101.55	Proposed Top Of Wall levels
	Boundary
	Fence
	To be removed / demolished
	Existing tree
	Tree Protection Zone
	Structural Root Zone
	Encroachment into Tree Protection Zone
	Assessed tree within development footprint

Note: 1m construction setback from basement line has not been indicated on this plan

REVISION	DESCRIPTION	DRAWN	CHECK	DATE
A	SUBMITTED TO CLIENT FOR COMMENT	AM	AS	25-05-15
B	PRELIMINARY ADVICE	LS	AM	10-06-15
C	PRELIMINARY ADVICE - CONSULTANTS	LS	AM	07-07-15
D	PRELIMINARY ADVICE - CONSULTANTS	LS	AM	15-07-15
E	DEVELOPMENT APPLICATION	CG	AM	07-08-15

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ADDRESS
2 FIGTREE DRIVE, SYDNEY OLYMPIC PARK

CLIENT
MIRVAC

PROJECT
NEW RESIDENTIAL DEVELOPMENT

DRAWING
TREE LOCATION PLAN

SCALE	ISSUE	SHEET
NTS @ A3	DA	T - 01

DRAWN	CHECK	DATE	REVISION
CG	AM	07-08-15	E

LEGEND

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+ TOW 101.55	Proposed Top Of Wall levels
—·—	Boundary
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Existing tree

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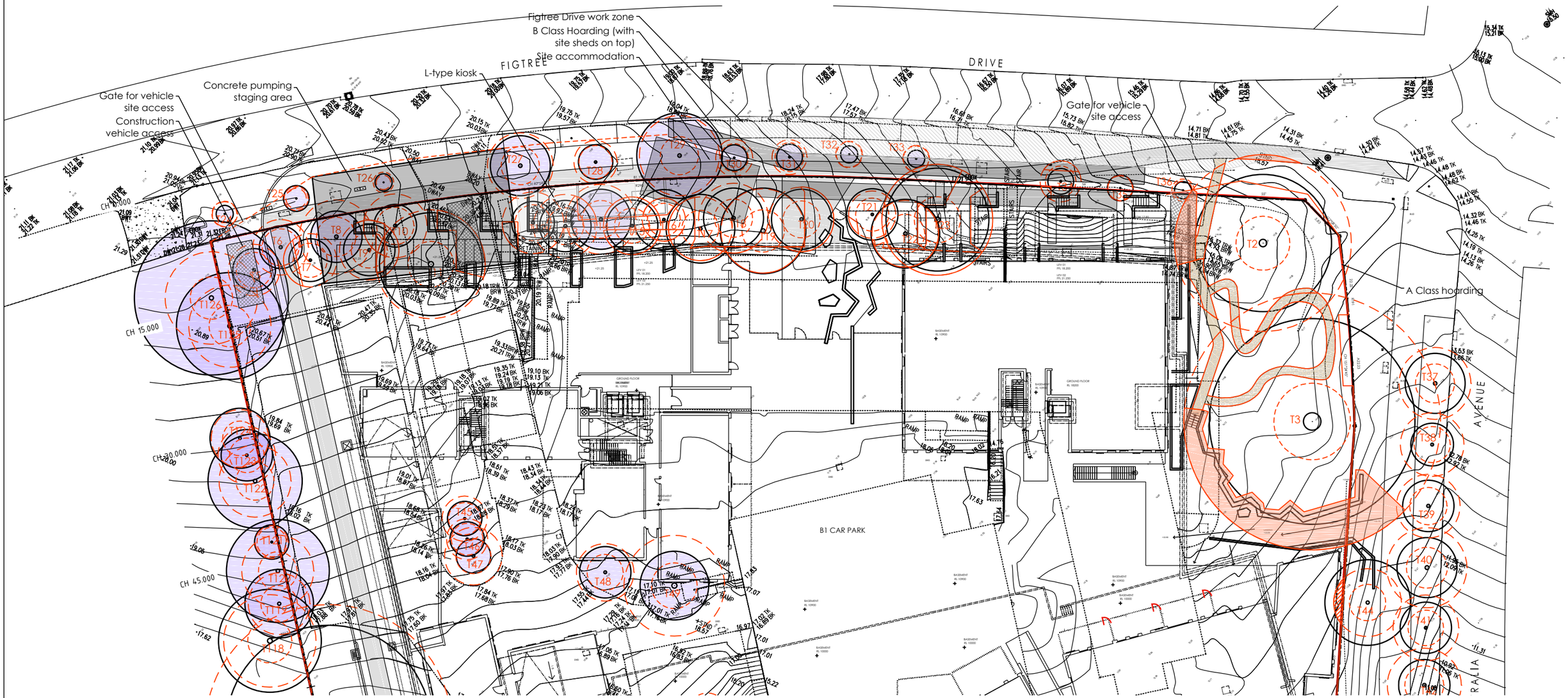
Encroachment into Tree Protection Zone

Assessed tree within development footprint



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5. Drawing remains the property of arboreport
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7. All work to be performed by a suitably qualified tradesperson
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MIRVAC

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NEW RESIDENTIAL DEVELOPMENT

DRAWING
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SCALE	ISSUE	SHEET
NTS @ A3	DA	T - 02

DRAWN	CHECK	DATE	REVISION
CG	AM	07-08-15	E

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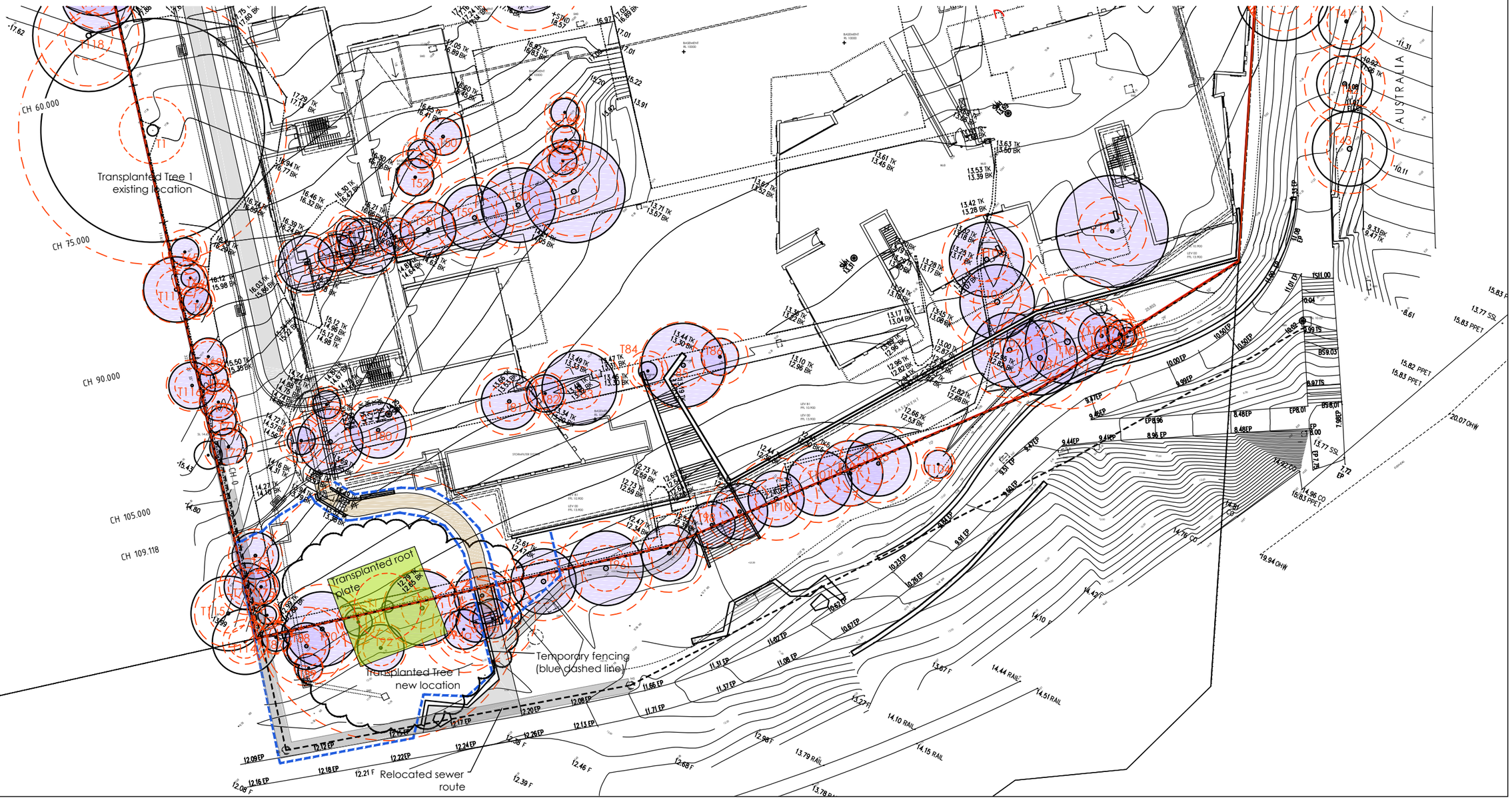

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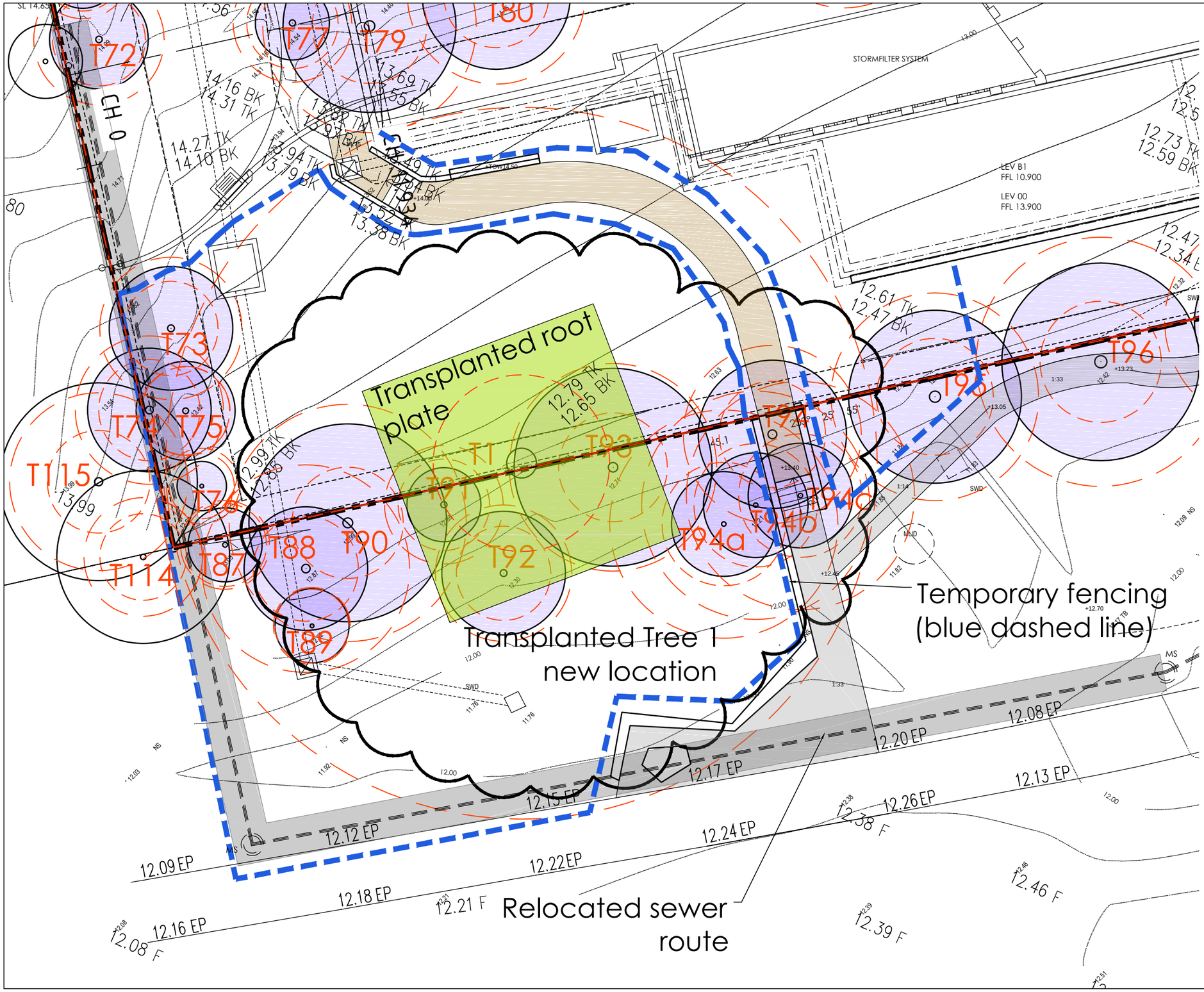
DRAWING
TREE LOCATION PLAN

SCALE	ISSUE	SHEET
NTS @ A3	DA	T - 03

DRAWN	CHECK	DATE	REVISION
CG	AM	07-08-15	E



LEGEND

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CLIENT: **MIRVAC**

PROJECT: NEW RESIDENTIAL DEVELOPMENT

DRAWING: TREE LOCATION PLAN

SCALE	ISSUE	SHEET
NTS @ A3	DA	T - 02

DRAWN	CHECK	DATE	REVISION
CG	AM	07-08-15	E

10. General Tree Protection Notes

10.1. Structural Root Zone (SRZ)

The SRZ is a radial area extending outwards from the centre of the trunk calculated as follows:

$$\textbf{SRZ (Radius)} = (D \times 50)^{0.42} \times 0.64$$

10.2. Tree Protection Zone (TPZ)

The TPZ is a radial area extending outwards from the centre of the trunk equal to the DBH x 12. This area shall be protected by a TPF (*see below*). For all trees to be retained a TPZ is to be created and maintained.

The TPZ function is primarily to protect the root zone by restricting access however the canopy of the tree shall also be protected from damage or injury. The Project Arborist shall approve the extent of the TPZ.

The TPZ shall be mulched to a depth of 75mm with an approved organic mulch. Supplementary watering shall be provided in dry periods to reduce water or construction stress, particularly to those trees which may have incurred root disturbance.

In the TPZ the following activities shall be excluded:

- Excavation, compaction or disturbance of the existing soil.
- The movement or storage of materials, waste or fill.
- Movement or storage of plant, machinery, equipment or vehicles.
- Any activity likely to damage the trunk, crown or root system.
- Scaffolding.

10.3. Tree Protection Fencing (TPF)

Prior to site establishment, tree protection fencing shall be installed to establish the TPZ for trees to be retained. Tree protection fencing shall be maintained entire for the duration of the construction program.

Tree protection fencing shall be:

- To enclose as much of the TPZ as can reasonably be enclosed, allowing for pedestrian access and 1m offset around construction footprint and scaffolding.
- Cyclone chain link wire fence or similar, with lockable access gates.
- Certified and Inspected by the Project Arborist
- Installed prior to the commencement of the works.
- Prominently signposted with 300mm x 450mm boards stating "**NO ACCESS TO THIS AREA - TREE PROTECTION ZONE CONTACT PROJECT ARBORIST 0407 006 852**".

10.4. Trunk and Root Zone Protection

Other measures may be required in addition to tree protection fencing. These specific protection measures will be installed as directed by the Project Arborist to protect the canopy, trunk or branches from the risk of damage.

The Project Arborist shall be consulted if there is risk of damage to a retained tree. The Project Arborist may require:

- A 75mm layer of approved mulch to be installed to the TPZ.
- A temporary drip irrigation system to be installed to the TPZ.
- Additional root protection to be installed.
- Additional trunk and branch protection to be installed.

10.5. Tree Damage

In the event of damage to a tree or the TPZ of a tree to be retained the Project Arborist shall be engaged to inspect and provide advice on remedial action. This should be implemented as soon as practicable and certified by the Project Arborist.

10.6. Excavation within the TPZ

Excavation within the TPZ shall be avoided. All care shall be undertaken to preserve tree root systems. Excavation within the canopy drip line or TPZ shall subject to the approval and supervision of the Project Arborist. Excavation shall be executed by hand to avoid damage to roots.

If excavation within the TPZ is required other than that anticipated in this report the Project Arborist shall be notified. A root mapping exercise may be required and should be certified by the Project Arborist. Root mapping shall be undertaken by either ground penetrating radar (GPR), air spade, water laser or by hand excavation. The purpose shall be to locate woody structural roots greater than 50mm in diameter.

Where roots 50mm dia. or greater are encountered, alternative construction method shall be considered to ensure roots are not severed. Adequate allowance must also be made for future radial root growth. In paved areas, consideration should be given to raising the proposed pavement level and using a porous fill material in preference to excavation.

If there is no avoiding placing services through the TPZ excavate outside the TPZ and underbore below the root ball of the tree as directed by the Arborist.

10.7. Fill

All fill material to be placed within the TPZ should be approved by Arborist and equal to 5-7mm Round River Pea Gravel to provide aeration and percolation to the root zone. Otherwise no fill should be placed within the TPZ of trees to be retained.

10.8. Pavements

Proposed paved areas within the TPZ should be placed on or above grade to minimise excavation, and avoid root severance and/or damage. Pavements should be permeable or avoided otherwise.

10.9. Pruning

All pruning work required (including root pruning) should be in accordance with Australian Standard No *4373 -2007 - Pruning of Amenity Trees*.

If required, roots should be severed with clean sharp implement flush with the face of the excavation and maintained in a moist condition. Root pruning shall be performed under the supervision of the Project Arborist.

10.10. Tree Removal

Tree removal work shall be carried out by an experienced tree surgeon in accordance with the NSW Work Cover Code of Practice for the Amenity Tree Industry (1998).

Care shall be taken to avoid damage to trees during the felling operation. Stumps shall be grubbed-out using a mechanical stump grinder to a minimum depth of 300mm without damage to other retained root systems.

10.11. Post Construction Maintenance

In the event of any tree deteriorating in health after the construction period, the Project Arborist shall be engaged to provide advice on any remedial action. Remedial action shall be implemented as soon as practicable and certified by the Project Arborist.

Tree protection fencing with additional trunk and root protection shall be removed following completion of construction. The mulch layer in the TPZ shall be retained and replenished where required to maintain a 75mm thickness.

11. References

1. **AS 4970 - 2009 Protection of Trees on Development Sites**; Standards Australia.

2. **AS 4373 - 2007 Pruning of Amenity Trees**; Standards Australia.

3. Chapman, G.A, Murphy, C.L.; **Soil Landscapes of the Sydney 1:100 000 Sheet**; Soil Conservation Service of NSW, Sydney; 2004.

4. Barrell, J.; **Tree AZ; http://www.barrelltreecare.co.uk/treeaz** ; 2005.

5. Fairley, A., Moore, P.; **Native Plants of the Sydney District an Identification Guide**; New Holland; Sydney; 2002.

6. Fakes, J.; **Arboriculture and Tree Care and Maintenance Notes**; TAFE NSW; 2004.

7. Harris, R.W., Clark, J.R; & Matheny, N.P; **Arboriculture; Integrated Management of Landscape Trees, Shrubs & Vines 3rd Edition**; Prentice Hall, New Jersey; 1999.

8. Institute of Australian Consulting Arboriculturists (IACA); **IACA Significance of a Tree, Assessment Rating System (STARS)**; 2010.

9. Institute of Australian Consulting Arboriculturists (IACA); **Sustainable Retention Index Value (SRIV)**; Version 4; 2010.

10. Lonsdale, D.; **Principles of Tree Hazard Assessment and Management**; The Stationery Office; London; 2005.

11. Matheny, N.P. & Clark, J.R.; **Trees & Development: A Technical Guide to Preservation of Trees During Land Development**; International Society of Arboriculture, Savoy, Illinois 1998.

12. Mattheck, Dr. Claus R., Breloer, Helge; **The Body Language of Trees - A Handbook for Failure Analysis 6th Edition**; The Stationery Office; London. England; 1994.

13. Benson, D., & Howell, J.; **Natural Vegetation of the Sydney Area -1:100,000 Map**; Royal Botanic Gardens Sydney; 1994.

14. Benson, D., & Howell, J.; **Natural Vegetation of the Sydney Area – Detailed Descriptions;** Cunninghamia Volume 3 (4), Royal Botanic Gardens Sydney, 1994.

15. Robinson, L.; **Field Guide to the Native Plants of Sydney**; Kangaroo Press; Sydney; 1994.

16. Shigo, A. L.; **Modern Arboriculture Touch Trees**; Shigo and Trees Associates; New Hampshire; 2003.

17. Wrigley, J. W., Fagg, M. A.; **Australian Native Plants Cultivation, Use in Landscaping and Propagation**; Kangaroo Press; Sydney; 2003.

12. Tree Transplanting Plan of Management

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ACN 052 941 741 **ABN 86 052 941 741**
Telephone: (02) 9979 6431
PO Box 1028
MONA VALE NSW 1660 **Email: info@treetransplanters.com.au**

TREE TRANSPLANTING

PLAN OF MANAGEMENT

Ficus macrophylla
(Moreton Bay Fig)

July, 2015

Proposed Development
2 Figtree Drive, Sydney Olympic Park
Ref Nº: TTA/SOP-AM080715

Prepared For:

Mirvac Projects Pty Ltd
C/-
Arboreport
P.O Box 8136
Baulkham Hills, NSW 2153

Limiting Conditions

The information provided in this Plan of Management covers the subject tree only and is provided in relation to the observations made at the time of the inspection.

No responsibility can be accepted regarding the safety of persons or property resulting from injury or damage in respect to the subject tree; or the continuing health of the tree, now or in the future.

This report is provided as a whole document. No separate items, from within this document may be used or referred to in relation to the subject tree or other related trees unless the original document and author is referred to in its entirety.

Yours sincerely
TREE TRANSPLANTERS AUSTRALIA PTY LTD

D. DOOLEY (*Assoc Dip Horticulture / Dip Arboriculture*)

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1.0 Overview

1.1 This Transplanting Management Plan has been prepared at the request of Mr Andrew Morrison of Arboreport on behalf of their client, Mirvac Projects Pty Ltd. It is provided in relation to a mature Fig Tree identified as T1which is required to be relocated as a part of the SOPA Master Plan 2030. This Tree Transplanting Plan of Management shall form a part of the arboricultural assessments provided by Arboreport (Transplanting Preliminary Notes Letter dated 22 May, 2015) that detail the existing health and condition of the tree and the size and description of the tree as well as any other pertinent information pertaining to the tree and site. As such, these documents must be viewed in conjunction with this Transplanting Management Plan.

1.2 The following points were provided as preliminary comments to this submission

1.2.1 One half of the tree exists within the boundaries of the neighbouring Fujitsu site and therefore the preparation works shall need to be undertaken on one half of the root plate from their side of the fence.

1.2.2 The access road in the Fujitsu property may not be significantly impacted upon as a result of the transplant works, however, this will depend on the transplanting contractor and his chosen methodology.

1.2.3 There is more than one method of relocating the tree but most likely the most suitable is to jack and slide the tree.

1.2.4 It would appear the most suitable access point to undertake mass excavation for the process of underpinning the tree with flooring beams would be on the south east side of the tree which is on the lower side of the tree at an angle which may minimise the disturbance to the neighbouring roadway.

1.2.5 Significant access will be required at the new location of the tree at the time of relocation. One half of the root plate will be required to be located within the Linear Park property. A significant encroachment into this area and most likely in close proximity to the existing rail line shall be necessary to effectively perform the relocation procedure utilizing very heavy earth moving machinery.

1.2.6 Underground services may be impacted upon as a result of the relocation process.

Figure 1

1.3 The work under this Transplanting Management Plan describes the transplantation and relocation on site of a mature *Ficus macrophylla* (Moreton Bay Fig) located within the subject site (2 Figtree drive, Sydney Olympic Park) as part of a proposed redevelopment of the location as a part of the SOPA Master Plan 2030. The work includes the preparation, excavation, horizontal drilling, installation & construction of lifting structure, support structure, lifting, relocation, re-planting and establishment maintenance of the nominated tree. The works shall be performed in accordance with all plans and specifications provided. A relocation plan is attached as Attachment B.

2.0 Project Management

2.1 The Project Arborist

2.1.1 The project Arborist shall be responsible to oversee the works, provide approval at each of the following Progress Points and certify compliance with this Transplanting Management Plan.

2.1.2 A minimum of 48 hours notice must be provided to the Project Arborist prior to the following Progress Points:

- Following initial root plate and canopy pruning and
- After mass excavation & prior to drilling
- After drilling & installation of steel flooring beams
- Following preparation of new location and drainage.
- During the relocation from original location to new location
- After completion of backfilling

2.2 The Transplanting Contractor

2.2.1 Must have extensive experience in the transplantation of mature trees (minimum 10 years experience).

2.2.1 Provide record of experience with tender.

2.2.2 Provide details of public liability and other relevant insurances with tender.

2.2.3 Must visit the site prior to tendering to personally inspect all aspects of the proposed procedure.

2.2.4 Must provide acknowledgement of this Transplanting Management Plan and provide details of any alternative methodology if significant variations to the plan are proposed to be implemented.

3.0 Programming

3.1.1 It is recommended to prepare the proposed root plate and carry out preliminary preparation works on the tree at least 26 weeks prior to lifting and relocation. If this is not possible, due to construction programs, it is imperative that a suitable contractor is engaged and the preliminary pre-transplant works be initiated as soon as possible.

3.1.2 Pre-transplant maintenance must be performed on a 2 weekly basis for the period between initiating the preliminary preparation works and the lifting and relocation of the tree.

3.1.3 The lifting and relocation procedure should be performed prior to the commencement of the proposed demolition works to ensure the relocation of the tree is given priority in possession and use of the site.

3.1.4 Agreement must be sought between the Transplanting Contractor and the client (or their builder) as to whether the relocation process shall be undertaken in conjunction with the Civil Earthworks Contract to make use of similar machinery or to perform the works as an individual contract. The transplanting

contractor may be required to prepare a programme for the transplanting process to ensure the client (or their builder) and its subcontractors remain informed of periods at which work on the tree shall need to be co-ordinated with other works on site, if the Civil Works contract is to be undertaken concurrently.

3.1.5 It is important that the re-establishment maintenance period is performed for as long as possible (minimum 104 weeks) post transplant. Any necessary processes available to aid in the successful re-establishment of the tree must be maintained for this period in accordance with Section 6.0 Establishment Maintenance Program.

4.0 Pre-transplant Preparation

4.1 Pre-transplantation Considerations

4.1.1 Identify any obstructions to transplanting works, for example:

- Services and obstructions. Underground and overhead. Existing or proposed.
- Rock or other impervious layers within the vicinity of the root zone of the tree to be transplanted as well as the proposed new location of the tree
- Other plant material on site that is to remain which could be affected by the transplanting process.
- Adjacent structures and public areas which may be affected by the transplanting works. The subject tree is situated in the middle of the western boundary of the property and as such, all the applicable services and infrastructure of the neighbouring property must be considered.
- Proposed landscape design at the new location may have an impact on the re-establishment of the tree.

4.1.2 Determine size of the root plate to be dug. The proposed root plate, once dug is recommended to be approximately ten (10) metres in diameter with a minimum considered to be eight (8) metres x eight (8) metres square. The depth of the root plate shall be determined by evaluating the depth at which root density markedly decreases. From the exploratory excavation performed on site, a minimum depth of 800mm from the existing soil surface level is suggested, however, further exploratory excavations by the transplanting contractor are recommended to confirm the proposed depth.

4.1.3 Determine the weight of the tree once dug in order to evaluate the engineering required to lift and relocate.

4.1.4 Plan the required transplanting procedure including methods, programming and relocation route required.

4.1.5 Plan to carry out transplanting procedure in autumn/winter (most suitable period for nominated species). If this is not possible, allow to carry out pre-transplant preparation as early as possible to ensure the benefit of a significant pre-transplant maintenance period is utilized (minimum 6 months is recommended).

4.1.6 Inform all associated personnel of the archaeological significance of the area and the potential likelihood of unearthing heritage artefacts. Highlight their obligations and requirements in relation to working with archaeological personnel and the importance of potential discoveries. Archaeological and Heritage Assessment Reports shall be available to the transplanting contractor.

4.1.7 A meeting on site is arranged between the client, any relevant subordinates, demolition contractor (if concurrent contract), earthworks contractor (if concurrent contract) and the transplanting contractor to highlight any important details and identify any site restraints such as existing services and other features to be preserved.

4.1.8 Site safety shall be maintained in accordance with:

- Work Health & Safety Act 2011
- Australian Standards & Guides
    - NOHSC 1016: National Standard for Construction Work
    - NOHSC 1010: National Standard for Plant
    - Work cover NSW: Guide to Preventing Slips, Trips & Falls
    - AS/NZS 4994 Temporary Edge Protection
    - AS/ANZ 1269: Occupational Noise Management
    - AS/ANZ 2294 Earth Moving Machinery
- NSW Workcover Code of Practices
    - Moving Plant on Construction Sites
    - Manual Handling
    - Noise Management & Protection of Hearing at Work
    - Excavation Work 2000
    - Control of Workplace Hazardous Substances
    - The Amenity Tree Industry (1998)

4.2 Preliminary Preparation of Tree

4.2.1 The orientation to north shall be marked on the base of the trunk using indelible marking paint so the tree can be reinstated in the same orientation as it currently exists. This shall reduce the likelihood of exposure of bark tissue, which would not be accustomed to sun light radiation, resulting in sun scald on the trunk and major limbs and eventual degradation of the tree.

4.2.2 The proposed root plate of the tree is marked out on the ground using high visibility marker paint.

4.2.3 The existing boundary fence bisecting the tree shall be removed to facilitate access to the tree's root zone. This must be undertaken as carefully as possible to avoid damage to the tree's roots beneath it and any steel posts should be cut off at ground level rather than extracting them, thus avoiding disturbance to the root plate of the Fig tree.

Figure 2

4.2.4 Any vegetation under the canopy of the tree is to be removed. Any plant material that is considered to be within the perimeter of the proposed root plate of the Fig must be severed at its base, leaving its root zone intact and thus avoiding disturbance to the root plate of the Fig tree.

4.2.5 Top soil and sub-soil samples must be taken from within the tree's existing root plate for diagnostic analysis, to provide information to aid in improving the tree's vigour and detailing the most suitable backfill material. The results and any recommendations must be adopted as a component of the transplanting process.

4.2.6 Exploratory excavations should be performed outside the perimeter of the proposed root plate to confirm the proposed root plate depth to be prepared.

4.2.7 Heavy watering and application of soil wetting agent, seaweed extract soil supplement, and root growth stimulant is applied to the root zone of the tree. The canopy of the tree is treated with an anti-transpirant to reduce transpiration.

4.2.8 The root zone of the tree is cut out vertically on two opposite sides of the proposed root plate, using a tree saw or high pressure water blaster at a pre-determined distance from the trunk of the tree. All woody roots at the extremity of the root plate shall be severed at the face of the excavation by hand using clean, sharp pruning implements. The severed sides of the root zone is covered with a geo-textile fabric and back filled with site soil.

4.2.9 A battery operated automatic irrigation system is installed upon the tree to provide constant moisture throughout the root zone until the date of relocation.

4.2.10 A 75mm layer of decomposed leaf mulch is installed over the root zone. The mulch is placed so that it is not in contact with the trunk or buttress of the tree.

4.2.11 The tree is left to settle from the impacts of the root cutting and maintained in accordance with the Pre-relocation Maintenance Program (as detailed in Section 6.0) until such time it is prepared for relocation (approx 6 months later).

4.3 Pruning

4.3.1 All dead wood including the large lower limb (see Figure 3) on the eastern side of the tree should be removed.

4.3.2 All live branches of the subject tree shall remain intact except the lowest first order limb growing to the north east which needs to be removed to facilitate machinery access for the relocation procedure. No pruning of live branches shall be performed without the prior approval of the site arborist. When removing damaged limbs and dead wood or where approval is granted to remove lower branches to facilitate excavation of the root plate, all pruning work shall be undertaken under the supervision of a qualified arborist and in accordance with Australian Standard No 4373-2007-Pruning of Amenity Trees and the NSW Workcover Code of Practice for the Amenity Tree Industry (1998).

Figure 3

4.4 Trunk and Limb Protection

4.4.1 The transplanting process will inevitably result in a significant loss of leaf throughout the canopy thus exposing more bark tissue than usual. This event can lead to sun scald of the tree's limbs. Minimise the likelihood of sun scald to the trunk and major limbs of the tree by wrapping with a protective material for the duration of the re-establishment period. Alternatively a light shade cloth material may be affixed to cover the canopy of the tree.

4.5 Preparation of Relocation Site

4.5.1 Prior to the commencement of any excavation, the location of any underground services in the vicinity of the works shall be verified by the client (or their builder) and their alignment marked on the ground surface with high visibility marker paint.

4.5.2 The transplanting contractor is to liaise with the project manager and earthworks contractor with respect to the designated new location and the proposed bulk earthworks required for the relocation route. This relocation route must be suitably constructed to enable the effective manoeuvring of the tree from its current location to its new location by hauling on a skid system with large earthmoving equipment.

4.5.3 Confirmation must be obtained by exploratory excavation that there is sufficient depth at the new location for the predetermined depth of the root zone of the tree (as well as any steel flooring beams that may remain).

4.5.4 The new location for the tree is prepared in liaison with the earthworks contractor under the direction of the transplanting contractor. The new location of the tree must be prepared to a level that is set to receive the base of the tree's root plate including the steel flooring beams. The new location must be prepared in a manner that allows the tree to be manoeuvred to the final location by the earthmoving machinery utilised to skid the tree. Once the root plate is backfilled, the top of the root plate shall match the proposed finished levels of the landscape.

4.6 Drainage

4.6.1 A thorough inspection and draining tests must be performed at the proposed new location to ensure the proposed location is free draining at depth.

4.6.2 If the drainage requires improvement, the installation of a drainage system must be installed. A detail of a recommended Tree Planting and Drainage System is provided in the attached specifications (see Attachment A subsection 2). Alternatively, mounding of the root plate whereby the top of the root plate is proud of the finished levels of the surrounding landscape is an acceptable practice that assists in the drainage of the new location and promotes a quicker re-establishment; however, this would need to be approved by SOPA.

5.0 Transplanting

5.1 Excavation of Root Plate

5.1.1 Prior to the commencement of any excavation work, the proposed root plate of the tree shall be marked out on the ground, using high visibility marking paint.

5.1.2 The root zone of the tree shall be irrigated to bring the soil moisture level to field capacity and allowed to drain.

5.1.3 Bulk excavation adjacent the severed side of the root zone is carried out with the use of the excavation machinery, to permit access to the base of the root zone for boring and lifting equipment.

5.1.4 The exposed root plate is to be covered in protective material (such as carpet underlay) and kept moist during the excavation and transplanting process.

5.2 Drilling

5.2.1 A steel levelling platform is constructed adjacent one severed side of the root plate to house the directional drilling equipment.

5.2.2 The horizontal boring equipment is utilised to drill a series of level holes below the base of the root plate from one side of the root plate to the other effectively severing the root plate from its existing location.

5.2.3 Steel flooring beams are installed beneath the severed root plate, effectively constructing a structural steel platform to permit the root plate to be contained and lifted without damage to the root plate, trunk or crown. Installing the flooring beams or pipes beneath the root plate by ramming methods using hydraulic or pneumatic pressure is not acceptable.

5.2.4 The trunk and main limbs of the tree are protected and secured to the steel lifting platform to provide stability whilst in transit to its new location.

5.3 Soils

5.3.1 It is recommended to utilise any existing sub-soil and top soil that the tree is currently growing in and remediate as per the soil analysis results for use at the new location. Therefore both the sub-soil and top-soil surrounding the tree's current location should be separated and set aside for retention and amelioration.

5.3.2 The backfill medium for the subsoil is prepared by ameliorating the subsoil from the original position (as per soil analysis test results) and stockpiling adjacent the new location.

5.3.3 The topsoil backfill may need to be prepared by mixing a recommended transplanting soil mix blend with ameliorated topsoil from the original position (as per soil analysis test results).

5.3.4 The recommended transplanting soil mix must comply with the Australian Standard (AS 4419) and shall consist of a blend such as:

MATERIALS	QUANTITY
SANDY LOAM	30%
COARSE RIVER SAND	30%
COMPOSTED GREEN WASTE	20%
GRADED ASH	10%
PEAT MOSS	10%

5.4 Lifting & Relocation

5.4.1 The two intact sides of the root plate are severed using the same method for the original two sides and the hydraulic lifting jacks are installed at each corner of the lifting platform. Absorbent material such as carpet underlay, heavy grade geofabric or several layers of hessian shall be wrapped around and affixed to the severed root plate to minimise soil disturbance and maximise moisture retention during the lifting and relocation procedure.

5.4.2 The hydraulic pump is used to drive each of the lifting jacks, effectively raising the root zone of the tree by the lifting platform to a height suitable to permit entry of the relocation sled.

5.4.3 The tree is lowered onto the lifting sled by means of the hydraulic jacks and affixed to the lifting platform in readiness for towing to the new location.

5.4.4 Two adequate size track excavators are positioned to pull the towing sled with suitable rigging equipment and two sufficient size track bulldozers are positioned to push the relocation sled at the pre-constructed pushing point of the sled. The type, size and number of machines required are to be determined by the transplanting contractor.

5.4.5 The tree is manoeuvred by skidding to its new location approximately 80 metres away.

5.4.6 At this new location the sled is unhitched from the relocation equipment and the root zone is raised by the lifting jacks once again to a suitable height to permit the towing sled to be removed.

5.4.7 The tree is lowered to the ground at a pre-determined level to satisfy the proposed finished levels.

5.4.8 The tree shall be placed in the identical orientation to its original position with the trunk in the same vertical alignment as its original location.

5.5 Backfilling & completion

5.5.1 The steel lifting platform is dismantled and flooring beams are removed, leaving several beneath the root plate that are affixed to the bracing system to provide support for the tree during its re-establishment period.

5.5.2 The base of the tree's root zone is backfilled with the prepared mix of subsoil. The remainder of the root zone is backfilled with a mix of original growing media and imported soil mix up to the finished design grade. The backfill material shall be installed to ensure there are no voids.

5.5.3 A watering basin is formed around the root zone using the top soil to facilitate ease of watering and prevent run off.

5.5.4 Heavy watering and application of soil wetting agent, and root growth stimulant is carried out upon the root zone of the relocated tree.

5.5.5 The soil surface beneath the canopy of the tree is covered with a 75mm thick layer of composed leaf mulch.

5.5.6 The irrigation system, originally installed over the root plate of the tree can be extended to cover the backfill soil and breakout zone (soil area that the tree roots shall grow into). The irrigation tubing should be placed beneath the mulch to prevent ultraviolet deterioration.

5.5.7 A Tree Protection Zone is formed outside the perimeter of the canopy with the use of heavy duty fencing. The protection fencing can be constructed in various acceptable forms, provided it is sturdy enough to exist in its designated format for the duration of the construction program. It must consist of durable panels no less than 1800mm high which may be supported by a stable base or posts driven into the ground, (as detailed in Section 7.0 Specifications, Attachment A subsection 4.0).

5.5.8 An exclusion zone preventing public entry must be maintained for a period of three years or until such time the tree is assessed as sufficiently re-established in its new location.

6.0 Pre-transplant Maintenance Program (Minimum 26 Week Period) and Establishment Maintenance Program (Minimum 104 Week Period)

6.1 Pruning of any damaged or unhealthy foliage, (including dead wooding) in accordance with the Australian Standard No 4373-2007 (Pruning of Amenity Trees).

6.2 Application of anti-transpirant to the canopy of the tree to reduce transpiration and stress.

6.3 Application of fungicide treatment to the root zone of the tree to prevent any fungal activity (if deemed necessary).

6.4 Application of soil wetting agent to the root zone of the tree to aid the water holding capacity of the soil and aid in the retention of the other transplanting treatments.

6.5 Application of rooting hormone to stimulate the initiation of new root growth.

6.6 Monitoring of watering procedure to maintain satisfactory moisture content throughout the root zone of the tree. The irrigation regime should ensure the root zone never be allowed to dry out and should remain moist but not wet. The tree shall require regular supplementary watering for the 104 week Establishment Maintenance Program and therefore arrangements will need to be made to link up to SOPA Linear Park irrigation system at the end of the construction program.

6.7 Topping up organic mulch over the soil within the drip area of the tree to aid in the retention of moisture and a constant temperature throughout the root zone, as well as promoting a mycorrhizae association. The mulch is placed so that it is not in contact with the trunk or buttress of the tree

6.8 Application of slow release organic fertilizer, once the tree has recovered from the initial shock of the transplant operation.

6.9 Monitoring of the tree and carrying out the correct horticultural practices to alleviate any cultural problems or pest and disease attack. The tree shall be inspected by a qualified arborist with experience in transplanting on a quarterly basis, at which time a report on the tree's progress and any remedial action necessary, shall be provided.

7.0 Attachments

TREE TRANSPLANTERS AUSTRALIA PTY LIMITED
ACN 052 941 741 **ABN 86 052 941 741**
Telephone: (02) 9979 6431
PO Box 1028
MONA VALE NSW 1660 **Email: info@treetransplanters.com.au**

TREE TRANSPLANTING

SPECIFICATIONS:

- **Treatments & Applications**
- **Planting & Drainage**
- **Irrigation**
- **Tree Protection Fencing**

Ficus macrophylla
(Moreton Bay Fig)

Proposed Development
2 Figtree Drive, Sydney Olympic Park
Ref Nº: TTA/SOP-AM090615
June, 2015

TREE TRANSPLANTING & ARBORICULTURAL SERVICES

1.0 Treatments & Applications

1.1 Soil Wetting Agent. Soil wetting agents are essentially the same as detergents. They reduce the surface tension of the water and allow it to wet the waxy surface of the soil particles allowing water to move into the soil through the pores. Soil wetting agents belong to a class of chemicals called surfactants.

1.1.1 WA 100®. To be mixed with water at a rate of 1:1000 and applied in solution to the root zone at a dosage of 500 litres.

1.2 Liquid Organic Fertilizer. Liquid organic fertilisers are "high energy fertilisers" provided in a form which can be readily mixed with water for application to the soil or direct to the plant. Much more soil comes in contact with the fertiliser molecules than can happen with solid fertiliser. These molecules are attracted to the soil colloids (humus and clay) and held in a highly energetic readily available form.

1.2.1 Liquid Blood & Bone®. To be mixed with water at a rate of 1:200 and applied in solution to the root zone at a dosage of 500 litres.

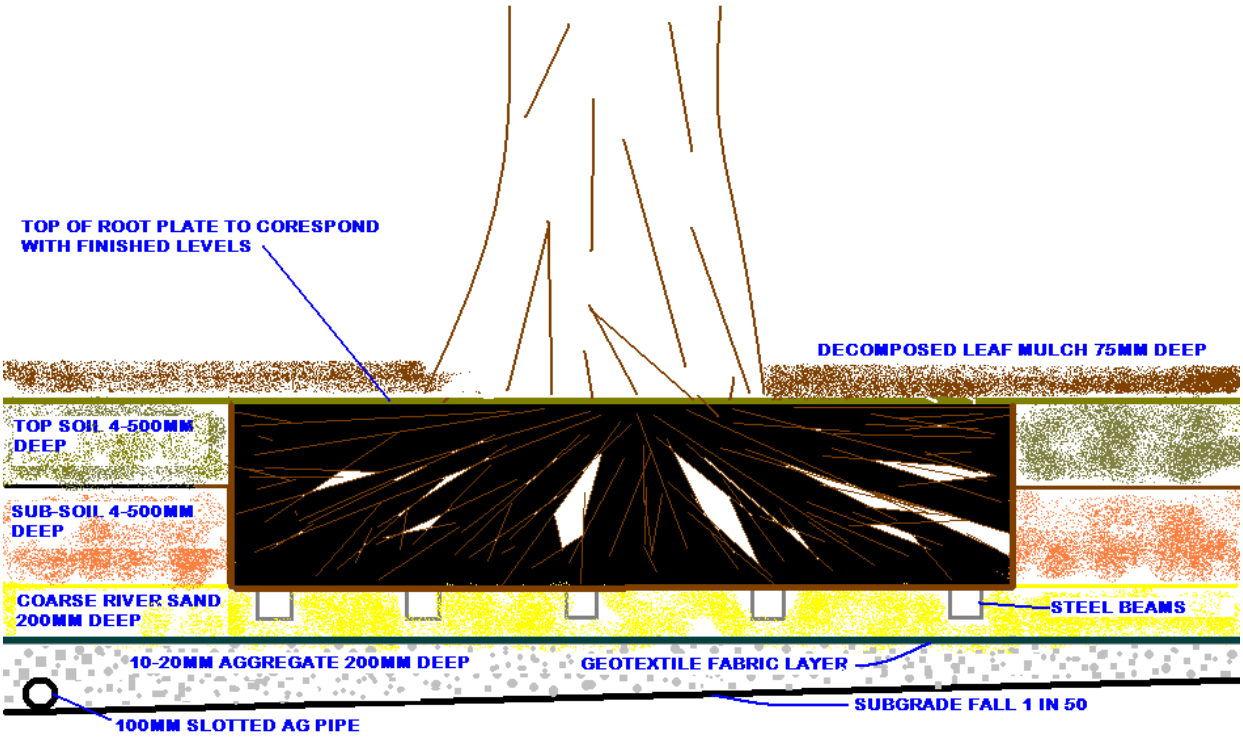
1.3 Root Growth Stimulant. Plant hormone (auxins) that regulates stem and root growth in plants. Auxins influence many aspects of plant growth and development, including cell enlargement, inhibition of development of axillary buds, tropisms, and the initiation of roots. Auxin affects cell division mainly at the tip, because it is here that cell division in a stem or root mainly occurs. Just behind the tip the cells grow in size under the influence of auxins, causing the stem or root to grow longer.

1.3.1 Auxinone®. To be mixed with water at a rate of 1:1000 and applied in solution to the root zone at a dosage of 500 litres.

1.4 Anti-transpirant. Anti-transpirants are compounds applied to the leaves of plants to reduce transpiration by reducing the stomatal opening and increasing the leaf resistance to water vapour diffusion without effecting carbon dioxide uptake.

1.4.1 Envy®. To be mixed with water at a rate of 1:20 and applied in solution to the foliage of the tree up to the point of runoff.

2.0 Tree Planting & Drainage Detail



TREE PLANTING & DRAINAGE DETAIL

NOTE: The width of planting position must be a minimum of 1.5 times the size of the prepared root plate.

3.0 Irrigation

3.1 A temporary irrigation system, consisting of polyethylene tubing and micro-sprays as well as drip line, shall be installed within the root plate with a DC controlled automatic timing device installed. The polyethylene tubing and drip line should be installed above the root plate in a ring beneath the mulch if possible to prevent ultraviolet deterioration. The number of micro-sprayers and amount of drip line to be installed shall be sufficient to provide full coverage of the transplanted root plate to ensure the root zone is moistened to just below field capacity upon each watering program.

3.1.1 The system will consist of:

- Anti-backflow prevention device to be connected to the water source.

- In line disc filter

- Pressure Reducer

- DC Controller: Galcon®

- Polyethylene tubing: 19mm diameter

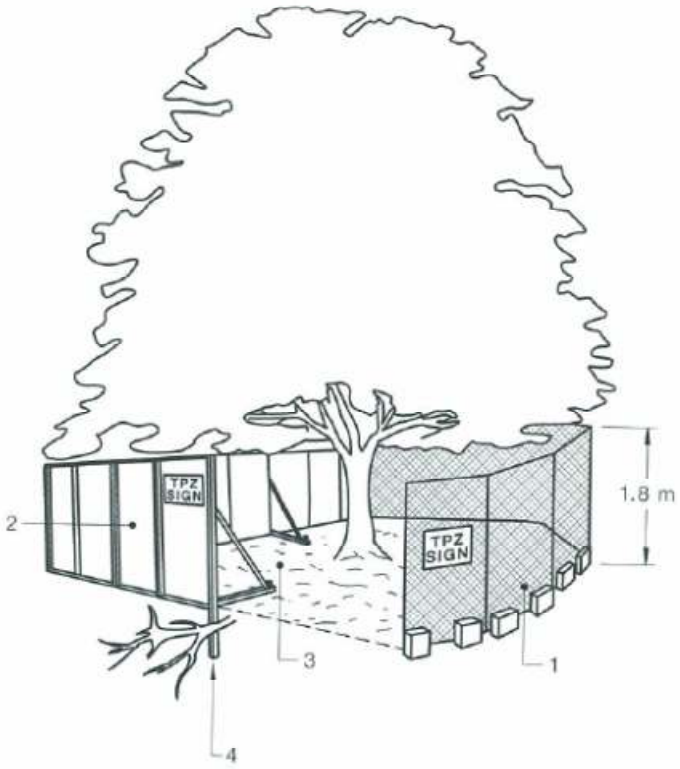
- Drip line: Techline® 13mm pressure compensating

- Stop valves to direct the flow from the micro-sprays to the drip line and visa versa.

- Micro-sprays: Dan Modular Series Sprayers®

- Pipe fittings as required

4.0 Tree Protection Fencing Detail



LEGEND:

1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

SOURCE: Australian Standards AS4970-2009 Protection of Trees on Development Sites

Attachment B – Tree Relocation Plan