

4 October 2016

## Introduction

1. This report forms an addendum to arboricultural assessment report prepared by Tree Logic for Japara Health Care, as part of the aged care development at 35 - 39 Regent Street, Mount Waverley (Ref No. 7216)
2. The report assesses the impacts to trees in response to the proposed design to construct a multi-level aged care facility.
3. Several arboricultural reports have been issued to Japara Health Care in regards to the subject site. These reports provided an initial assessment of the trees and provided preliminary information for designers and architects. Several other reports related to non-destructive root investigations were carried out to further inform design intent. These reports all prepared by Tree Logic Pty. Ltd. include;
  - Arboricultural Assessment Report for 35 – 39 Regent Street, Mount Waverley, Prepared by David Phillips, Ref No. 7216, Vers 1, Dated 07/07/2016.
  - Root investigation report – Yellow Box (Tree 4), Prepared by David Phillips, Dated 27/06/2016.
  - Root investigation report – Lemon-scented Gum (Tree 38), Prepared by David Phillips, Dated 29/06/2016.
  - Root investigation report – Brush Box (Tree 27), Prepared by David Phillips, Dated 27/06/2016.
  - Root investigation report – Conifer Group & Hakea (Tree 33 & Tree Group 4), Prepared by David Phillips, Dated 27/06/2016.
4. During the initial site inspection on 11/02/2016, tree 4 displayed Fair health exhibiting typical foliage colour, size and even distribution. The canopy density was open, but not sparse or reduced in density that would indicate a health problem. No major deadwood or pathogens were noted at this time either. A subsequent site visit in June, 2016 noted minor signs of crown dieback, particularly within the lower north-east section of the canopy. A following site visit in September 2016 noted significantly more dieback and thinning of the canopy suggesting a health problem was evident.
  - 4.1. The changes in tree health appear to be symptomatic of age related decline as it has occurred in such a short period and at a time of the year where environmental conditions generally have lesser impact on tree condition. The dry soil conditions that were observed during the non-destructive root investigation and competition for essential resources from the adjacent Pine trees is likely to hasten the tree's decline. The tree is unlikely to respond to practical arboricultural treatment and the continued decline of the tree would be expected in the short-term. Subsequently the tree has been downgraded from High to Low arboricultural value.
  - 4.2. With the tree's continued decline, the loss of the tree to the streetscape is expected. As such, the proposed development should maintain the area for a replacement planting of the same species that can adapt to the changed site conditions.

## Impact Assessment

5. The latest documents and plans received to inform this design review include the following;
  - 5.1. Town Planning Drawing Set, Prepared by Spowers Pty Ltd, Job No. 2015017, Dwg Nos. TP00 – TP31, Rev B, Dated 15/08/2016.
6. The drawings detail the construction of a multi-level aged care facility on the site. A ground floor is set below the existing soil grade that includes the accommodation, utility services, staff facilities and car parking. The first floor consists of accommodation and at ground car parking and further accommodation is provided on the second floor.
  - 6.1. The ground floor level is to be located below the existing soil grade requiring excavation within the site and the construction of retaining walls, particularly along the northern property boundary. A at grade permeable car park is proposed with entry via a new crossover to the north-east and a second crossover is to be constructed to the south-east of the site.
7. Under the proposed design, trees 3, 4, 27, 31, 32, 33, tree group 4, 35, 37, 38, 42 – 49 are nominated for retention. The loss of tree 4 is expected irrespective of development and retention of the tree would not be viable.
8. A review of the proposed design was undertaken and the impacts to the retained trees are as follows,
  - The TPZs of trees 31, 32, 35, 38, and 48 are to be encroached by less than 10 % or less and it is expected that the condition of the trees would be maintained.
  - The TPZs of trees 3, 27 and 42 are to be encroached by greater than 10 %.
  - No impact is expected to trees 37, 43, 44, 45, 47 and 49.
  - The condition of tree 33 and tree group 4 is expected to be maintained.
9. The proposed new crossover to the north-east of the subject site encroaches into the TPZ of trees 3 and 35 by approximately 10 %. Both trees are expected to tolerate this amount of encroachment. The extent of the permeable car park further encroaches into the 3.2 m TPZ of tree 3. It is understood that soil fill to the depth of 100 mm is to be placed within the TPZ to attain the desired level of the car park.
  - An evenly sized aggregate with no fines is to be utilised for the base course of the car park within the TPZ. This is to allow for the continued movement of water and oxygen to the existing soil below after the profile is compacted. The subgrade must not be compacted.
  - All pavers located within the TPZ must utilise the footprint of the existing fence or not incorporated into the proposed design.
  - The gas meter enclosure must utilise the depth and width of the existing masonry fence footing. All associated pipes must utilise the footprint of the footing. Where pipelines are located outside of the footing and within the TPZ of trees 3 and 38, they must be bored at a minimum of 600 mm below grade and bore entry/exit pits are to be located outside the TPZs of retained trees.
10. Tree 27 is a semi mature Brush Box (*Lophostemon confertus*) located in the adjacent northern property. The adjacent retaining wall encroaches into its TPZ by 15 %. The alignment of the retaining wall is in line with the recommendation based upon the non-destructive root investigation and the condition of the tree is expected to be retained.

11. Tree 42 is a Late Black Wattle (*Acacia mearnsii*) located within the adjacent Valley Reserve. The extent of the ground floor excavation encroaches the TPZ by 11%. The tree was over-mature in age, in poor condition and expected to have a short useful life expectancy within the landscape. The tree should not constrain the proposed design as the decline of the tree is expected in the short term.
12. Tree 33 and tree group 4 were located within the adjacent northern property. The alignment of the retaining wall is in line with the recommendation based upon the results of the non-destructive root investigation. The condition of these trees is expected to be maintained under the current design proposal.
13. Tree pruning would be required for tree 48 to gain sufficient clearance from the development. Excessive pruning must be avoided that they may have a detrimental impact upon tree health and limited to that part of the canopy that is within the footprint of the proposed works.
  - 13.1. All pruning works are to be undertaken prior to the commencement of construction activity and by a fully qualified arborist in accordance with AS4373 2007 Pruning of amenity trees.
14. The project arborist must be on site where construction activity occurs within the TPZ of all retained trees.
15. The remaining trees have not been considered for retention within the proposed design.
16. Tree 50, a Snow in Summer (*Melaleuca linariifolia*) is located within the road reserve of 39 Regent Street. The tree would be unsustainable under the proposed design, as it is located within the footprint of the proposed south-eastern crossover. The tree is established in the landscape and expected to develop further in size, however the species are generally small to medium sized trees at maturity and their loss would be offset by several replacement plantings within the road reserve. The replacement trees should be advanced specimens of species that develop into medium to large sized trees.

## **Tree Protection**

17. During all phases of the redevelopment retained trees must be afforded appropriate tree protection measures including, tree protection fencing. Protection fencing is important to isolate trees and protect the growing environment during construction activity. TPZ fencing must be established around all retained trees, including street trees and where TPZs extend into the subject site prior to any works occurring on site including demolition, bulk earthworks, excavation for footings or installation of underground services or any construction related activity. This is to prevent damage to roots, buttress, trunk or limbs and to prevent soil compaction. See Figure 1 for example of TPZ fencing.
  - 17.1. TPZ fencing is also to be erected around the TPZ of tree 38 that extend into the road reserve.
  - 17.2. The area within the TPZ should be mulched to 100mm depth with matured wood chip mulch with a particle size of 25mm for 75% of the volume.



Figure 1. Example of tree protection fencing and signage for a street tree. This type of fencing is suitable for trees to be retained within the subject site.

18. At times during construction, the TPZ of retained trees may be temporarily encroached. Where the TPZ is to be encroached a ground protection system (GPS) may be required to minimise soil disturbance and compaction. The GPS should consist of placing geo-textile fabric over the TPZ with 100mm of crushed rock or a mixed particle mulch covering the fabric with tree protection matting or rumble boards placed on top. See Appendix 1 for installation of a GPS.
19. To successfully retain all suitable trees, tree protection measures must be adopted including the following:
  - Demolition of the existing masonry fence, including the footing and driveway within the TPZs of trees 3 and 38 must be undertaken using hand held pneumatic tools only. The debris is to be removed from the site by hand.
  - Site access must be determined prior to the commencement of construction works and designed to avoid the TPZ of retained trees. Demolition of the existing driveways should not occur where they are utilised for site access. If access is required after demolition, a GPS must be installed.
  - Soil fill that is placed within the TPZs of retained trees to replace existing infrastructure or hard surfaces, it must be coarser in texture than the existing soil below to allow for the continued movement of water and oxygen.
  - All conditions of the tree protection guidelines attached as Appendix 5 of the arboricultural assessment report must be adopted and applied for the duration of the site redevelopment including demolition, bulk earthworks, excavation or installation of underground services, landscaping or any construction related activity. This is to prevent damage to roots, buttress, trunk or limbs and to prevent soil compaction that may have an adverse impact on retained trees.
  - All underground services, including power, telecommunication, gas, water, drainage must be designed to avoid the TPZ of any retained tree. Where it is unavoidable to place services within the TPZ, they must be bored at a minimum of 600 mm below the existing soil grade to the top of the bore head. Bore entry and exit pits must be located outside the TPZ of retained trees.

- Supplementary watering should be provided to all trees during and after the construction process. Proper watering is the most important maintenance task in terms of successfully retaining the designated trees.
- No fuel, oil dumps or chemicals shall be allowed in or stored on the TPZ and the servicing and re-fuelling of equipment and vehicles should be carried out away from the root zones.
- No storage of material, equipment or temporary building should take place over the root zone of any tree.

20. This impact assessment must be read in conjunction with the previous arboricultural reports prepared by Tree Logic.

### **Conclusion.**

21. A review of the proposed designs was undertaken to assess the impacts to retained trees.
22. The health of tree 4 has declined since the initial tree assessment and the loss of the tree is expected in the short-term. To offset the loss of the tree, the area should be maintained within the design and replaced with advanced specimens of the same species.
23. Under the proposed design, trees 3, 27, 31, 32, 33, tree group 4, 35, 37, 38, 42 – 49 are nominated for retention. Seven (7) of these trees are expected to be impacted by varying degrees, however the ongoing condition of the trees is expected to be maintained. The exception is trees 4 and 42 that are showing symptoms of decline and the loss of the trees would be expected regardless of the proposed redevelopment.
24. Recommendations include;
- All pavers located within the TPZ of tree 3 must utilise the footprint of the existing fence or not incorporated into the proposed design.
  - An evenly sized aggregate with no fines is to be utilised for the base course of the car park within the TPZs of tree 3. This is to allow for the continued movement of water and oxygen to the soil below after the profile is compacted. The subgrade must not be compacted.
  - The gas meter enclosure must utilise the depth and width of the existing fence footing. All associated pipes must utilise the footprint of the footing. Where pipelines are located outside of the footing and within the TPZ of trees 3 and 38, they must be bored at a minimum of 600 mm below grade and bore entry/exit pits are to be located outside the TPZs of retained trees.
  - The area of the TPZ of tree 38 that extends into the road reserve must be protected during all phases of the redevelopment.
  - The project arborist must be on site where construction activity occurs within the TPZ of retained trees.
25. Tree management recommendations are provided for tree 48, which can be seen in the Tree Assessment Table attached as Appendix 1 of the arboricultural assessment report. The removal of excessive foliage must be avoided that may have a detrimental impact upon tree health.
26. All pruning works are to be undertaken prior to the commencement of construction activity and by a fully qualified arborist in accordance with AS4373 2007 Pruning of amenity trees.
27. To successfully retain suitable trees, tree protection measures as set out in Appendix 5 of the arboricultural assessment report must be implemented prior to commencing any construction related activity including;

demolition, bulk earthworks and must be maintained for the duration of the construction process including landscaping.

- TPZ fencing must be established around all retained trees, including street trees and where TPZs extend into the subject site prior to any works occurring on site.
- Fencing is also to be erected around the TPZ of tree 38 that extend into the road reserve.
- A ground protection system (GPS) in accordance with AS4970 is to be installed where the TPZs of retained trees is to be temporarily encroached. See Appendix 1 for installation and dismantling a GPS.
- Demolition of the existing masonry fence, including footing and driveway within the TPZs of trees 3 and 38 must be undertaken using hand held pneumatic tools only and the debris is to be removed by hand from the site.
- Site access is to be determined prior to the commencement of construction activity and avoid the TPZ of retained trees. Demolition of the existing driveways should not occur where they are utilised for site access. If access is required after demolition, a GPS must be installed.
- Soil fill that is placed within the TPZs of retained trees to replace existing infrastructure or hard surfaces must be coarser in texture than the existing soil to allow for the continued movement of water and oxygen to the soil below.
- All underground services, including power, telecommunication, gas, water, drainage must be designed to avoid the TPZ of any retained tree. Where it is unavoidable to place services within the TPZ, they must be bored at a minimum of 600 mm below the existing soil grade to the top of the bore head. Bore entry and exit pits must be located outside the TPZ of retained trees.
- Supplementary watering should be provided to all trees during and after the construction process. Proper watering is the most important maintenance task in terms of successfully retaining the designated trees. The TPZ of retained trees is to be mulched to a thickness of 100 mm.

28. This impact assessment must be read in conjunction with the previous arboricultural reports prepared by Tree Logic.

No part of this report shall be reproduced unless in full.

I am available to answer any questions arising from this review of design.

A handwritten signature in black ink that reads 'D. Phillips'.

Signed

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## Appendix 1: Ground Protection System (GPS).

The TPZ areas can be temporarily encroached if the area is protected. Measures may include a permeable membrane, such as a geotextile, to cover the TPZ area beneath a 100 mm layer of crushed rock below rumble boards or tree protection matting, such as Economat™ (See Diagram 1). This will allow temporary access.

Process for installation and removal of ground protection system (GPS).

- No need to remove organic matter layer. Close mow of all grass within area. If excavation is required to attain levels, no more than 100 mm in depth is to be removed.
- The entire area is to be covered with a geotextile fabric that will extend beyond the area by a distance to account for any crimping when a surface material is laid on top. Geotextile to be firmly anchored into the soil. The geo-fabric shall comprise Bidim U34 filter fabric or equivalent. Installed by hand.
- When installing the GPS, work from the existing hard surfaces towards the extremities, using a mini tracked excavator to transport the rock material. Excavator is to always work on installed GPS.
- When dismantling, work from the extremities back towards the existing hard surfaces. Using a mini tracked excavator. Excavator to always work on remaining GPS.
- Geotextile comes up last (by hand).
- Reinstall grass.

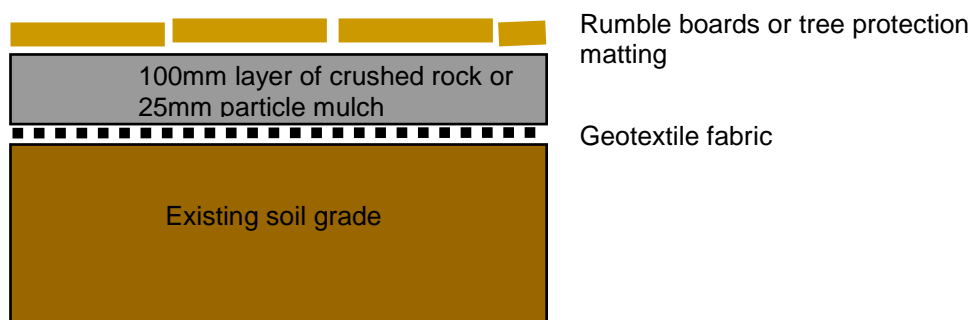


Diagram 1: Indicative ground protection system - adapted from AS4970 Clause 4.5.3 Ground protection



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## **RE: Arboricultural Consultancy**

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