# PEERS BROWN MILLER LTD

Arboricultural & Environmental Consultants

# ASSESSMENT OF PROPOSED WORKS AFFECTING COPPER BEECH TREE AT 134 MAIN ST, GREYTOWN

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	cc: Victoria Knobloch - Woolworths NZ
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# 1.0 Introduction and Background

Peers Brown Miller (PBM) has been asked to review information associated with the proposal to carry out works in the vicinity of, and on, a mature Copper beech tree which stands within 134 Main Street in Greytown. This property is currently a residential site occupied by a single house and with front and back yards. Woolworths NZ owns the property and plans to convert it to a corridor for delivery trucks and other vehicles – with ingress only from Main St through to the main supermarket carpark area on West St.

The Copper beech tree stands in the southern corner of the property – to the left, as viewed from Main St. The brief provided to PBM was to scrutinise the supplied information and offer further arboricultural commentary and advice on the effects of this proposal on the tree.

The following documentation was provided and has been studied. References are made, in this report, to some aspects of these documents.

- Site Plan (from Proposed Supermarket Resource Consent Package) dated 27 May 2022
- Arboricultural Impact Assessment, by Treecology Tree Consultancy (Treecology report)
- letter from All Seasons Tree Services, dated 2-6-22 (All Seasons report)

# 2.0 Methodology of Assessment

I have visited the site twice – on 19/08/22 and 16/08/22. I was able to enter the site fully and access the base of the tree from all sides. The inspection of the tree itself was a VTA (Visual Tree Inspection) from ground level.

With regard to the ground/soil conditions, I used a steel spear extensively to probe the ground in many locations in order to gain an understanding of the soil type, the presence and distribution of root material, and footing depths of the driveway and wall. The soil type is loose friable alluvial loam – quite moist after regular rainfall over the winter. Accordingly, I was able to insert the spear to considerable depths in all locations where probing was undertaken.

No other ground invasive technique or method was employed.

## 3.0 General Discussion

There are four discrete elements of the design, in terms of works on the ground in the vicinity of the tree. Each of those elements is discussed individually in Section 4.0 - along with some comments about the pruning of the tree.

Before I commence on the discussions, I'd like to endorse the quality and content of the Treecology report. It is thorough, and demonstrates a comprehensive analysis of the tree and its environment, and of the potential impacts of various activities proposed to be undertaken in its root zone. The report carries through to the provision of recommended tree protection and appropriate works methodologies during the site preparation and construction phases. Those are valid suggestions that can be the basis of a more specifically targeted tree protection regime that will need to be put together at a later stage of the proceedings when design work has been finalised.

For the purposes of this report, however, my commentary is restricted to just that of an assessment/critique of what is designed thus far – along with the provision of some alternative suggestions that can contribute to further design considerations.

At this point, I need to register my main difference of opinion with one aspect of the Treecology report. In that report the TPZ (Tree Protection Zone) of the tree has been correctly calculated as a radius of 15m – shown diagrammatically as Figure 1 in the report. Mr Partridge has modified the tree's root zone to become an 'actual tree rooting area', as demonstrated in Figure 2. I agree with his rationale for the modification, but I believe that the existing driveway within the site, and the ground to the east of that, can be further deducted from the 'rooting area'. Probing at the edge of the driveway did not encounter any woody roots, the driveway footprint presents an inhospitable environment for root growth, there is no heaving of the driveway surface, and the ground on the other side of the driveway is heavily occupied by the root masses of the copious volume of trees and shrubs in that area.

In light of those reasons, I consider that the critical root mass of the beech tree is concentrated in the ground to the west of the driveway – a generous

area of ground for the tree's root system to function within nonetheless. Accordingly, it is for this reason that any disturbances, coverages or other impacts that are proposed for this area of open ground, are carefully considered in terms of the potentially adverse effects that may be visited upon the tree's health and longevity. As Mr Partridge has stated, and I agree – based on my own experience and observations, European beech is particularly sensitive to root disturbance.

### 4.0 Assessments

#### 4.1 New Driveway

The current site plan shows that the new driveway is 9m in width at the footpath. It is offset 2m from the northeast boundary, so there is a distance of 11m to the edge of the driveway closest to the tree. As measured on site this width extends 650mm into the open ground between the tree and the existing driveway (see Fig. 1 below).



Figure 1 – red line indicates edge of proposed new driveway

It is clear that the existing driveway curves northwards away from the tree (see Fig. 2 below). However, the proposed new driveway commences a curve towards the southwest boundary after running in a straight line immediately past the base of the tree. It appears that this situation cannot be avoided, due to the proposal to create a loading area and a separated roadway as shown on the site plan.



Figure 2 – showing front yard and existing driveway as viewed from the footpath. Note the area of lawn compacted by the occupant's use of the area for car parking and manoeuvring

I probed to depths of 400mm along the alignment indicated in Fig. 1 above and did not strike any woody root from the beech tree. Despite that, I would expect there to be root mass from the tree beyond the red line and I would be uncomfortable in supporting any driveway design that involved impermeable surfacing at that proximity to the tree. Indeed, it would be preferable if even a permeable surfacing were not that close to the tree.

Where the straight line past the tree finishes (at 5m past centre of its base), the plan shows that there is an offshoot from the driveway in towards the southwest boundary – leading to three carpark spaces. This necessitates extra coverage of ground beyond the actual driveway strip itself. The issue of the carparks is discussed in the next subsection.

Following are suggested amendments to the design that have the objective of increasing the open ground area over the tree's root zone and minimising the impacts of new surfacing – permeable or impermeable.

- (a) Reduction of width of driveway entrance off the street at least by 650mm maintain that clearance from the tree for as long as possible.
- (b) Eliminate the carparks altogether
- (c) Construct driveway with the Geoweb system proposed by Treecology until 10m past centre of tree – from there it can convert to standard concrete. This system should be endorsed by engineers. It is noted that it is not available in New Zealand, but the product website shows that it is distributed in all main Australian cities

- (d) Investigate whether the range of Firth permeable eco-pavers (Porouspavers, Enviro-pavers, Flow-pavers) would meet engineering standards for the proposed usage (information accompanies this report)
- (e) Investigate whether permeable concrete would meet engineering standards (accompanying information)
- (f) Investigate whether a permeable asphalt solution is available (accompanying information)

#### 4.2 Carparks



Figure 2 – measuring wheel at 5m from centre of base of tree – closest edge of carparks to tree

It has been suggested in (b) above that the carparks could be eliminated. This would allow a significant area of the tree's root zone to remain unaltered – with an opportunity for enhancement of the ground to take place.

However, if it is deemed to be absolutely vital that those carpark spaces must be provided, it is strongly recommended that a raised timber car deck should be constructed – preferably on screw piles. An on-ground paving system – even of a permeable product, should be avoided. Two examples of timber car decking are provided over the page.



Figure 3 – example of timber decking over tree root zone – conventional piling



Figure 4 – setting out for car decking on screw piles



Figure 5 – the tree around which the screw pile supported decking was built – for a childcare centre carpark area

#### 4.3 Pedestrian Path



Figure 6 – showing strip where pathway is proposed. Note utility plates and plinth

It is proposed to form a pedestrian path of 2m in width alongside the southwest boundary out to the public footpath. I probed the ground between the base of the tree and the boundary and found that the ground is very light – it having been a garden bed in the past. I did strike one woody root at 200mm depth. There is also hard material buried in that strip, and there is a coppicing plum tree stump (see Fig. 6) that will need to be ground out carefully (not extracted by machine) However, I do consider that there is an ability to scrape off a layer of this loose friable soil to create a bed for the following suggested path construction options (concrete being unacceptable where passing by the tree).

- (a) A wooden boardwalk to 10m past the tree. Consideration would need to be given to the interface with the footpath, as, despite the ability to lower the ground level, the need for some degree of ground clearance and the emplacement of bearers and the timber planking may result in a higher level at the interface with the footpath – thereby requiring a step or ramping – an issue for wheelchairs, elderly, etc. Worth investigating though.
- (b) Hoggin. See Figs. 7 & 8 below for examples. Also specifications and information accompany this report
- (c) A gravel-type solution
- (d) Any of the range of Firth pavers mentioned in 4.1(d)



Figure 7 – Hoggin - Victoria Park, Auckland



Figure 8 – Hoggin - Rocket Park, Auckland

#### 4.4 Stone Wall

It is proposed to remove the existing masonry wall at the street boundary and replace it with a new stone wall. The new wall is shown wrapping around to be at the edge of the new driveway for 3m.

The removal of the existing wall may provide a strip in which the new wall can be installed. To gain an idea of the depth of the footing of the existing wall, I probed in an attempt to ascertain its base. There is a concrete mowing strip at the base of the wall and I was able to probe laterally under that (Fig. 9 over page). The wall is actually not footed that deep into the ground and it is rather narrow. Therefore, it is likely that the new wall, if it were to be designed to have a strip-footed base, would require a deeper and wider excavation than the trench that would be made available after the removal of the existing wall. This would not be desirable, given the close proximity to the base of the tree and the likelihood of roots being bunched at the base of the wall, as is typical in such situations.

In light of the above commentary, there are two options to consider;

(a) Do not finalise the design of the base of the new wall until the old wall is removed (carefully). The exposed trench can then be inspected with a view to whether there can be some excavations to provide a suitable trench for a strip-footed base without causing excessive root damage.

- (b) Build the new wall on ground beams supported by piles. Pile locations would need to be selected carefully so as to avoid severance of any significant roots.
- (c) Do not build a wall, as such. Rather, consider a fencing option.



Figure 9 – showing base of existing wall and probe under its base

#### 4.5 Pruning of Tree

There will need to be pruning of the eastern side of the tree's canopy to provide clearance for vehicles entering the proposed new driveway. In short, I can see no issue with this, as the pruning would be in the nature of a canopy lift only – involving the removal of some low branches - some of which have already been stubbed. Such pruning would not compromise the form of the tree or alter its visual profile significantly.

In the All Seasons report, there is a suggestion that a particular stem of the tree may have an unsound connection at it base – and that the height of the stem should be reduced to mitigate against the risk of failure of the stem. I have studied the structure of the tree closely and cannot agree with that opinion. Beech trees typically have tightly packed stem bases and, in my long career as an arborist, I have never observed a stem failure in a beech tree. The overall crown shape of this tree is very compact and there is no weight leverage off any individual stem. However, to allay any concerns that may be aroused by the statement in the report, a short Cobra strop can be discreetly inserted to brace the stem securely.

# 5.0 Conclusion

To conclude, I would like to note an observation and offer a suggestion. Both are not, strictly speaking, pertinent to the brief given, but do warrant consideration.

The observation pertains to the open water course that flows down through the site adjacent to the northeast boundary – then curves away to enter a channel under the footpath. There is a distance of 2.35m between the eastern boundary point and the centre of this stream (see Fig. 10 over page) – which means that it is covered by the proposed new driveway. Furthermore, the pylon sign is shown as being erected lengthwise along the edge of the 2m offset from the northeast boundary – with a low stone wall at the street boundary. This will take place right over the stream. On the site plan there is no mention of this water course and how it is to be treated. Local residents told me that these water course throughout Greytown perform an important function in terms of drainage and irrigation.



Figure 10 – red circle indicates centre of stream



Fig 11 – water course entering pipe under footpath

My suggestion involves the well-grown and tidy Lancewood tree that stands adjacent to the southwest boundary. Although it is acknowledged that this tree stands directly in the alignment of the proposed pathway, I would like to suggest that some consideration should be given to the retention of this tree. It is unusual to see such a large specimen of this native species in an urban environment and it would be regrettable if it were to be removed - if that can practicably be avoided.



Figure 12 - the Lancewood

Please feel free to contact me if any further arboricultural input is required.

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