PEERS BROWN MILLER LTD
ARBORICULTURAL & ENVIRONMENTAL CONSULTANTS

Arboricultural Assessment

Site Scope:	Queen Street Diversion Works – Part 3
Prepared for:	Watercare Ltd
Cc:	WSP
Purpose of Report:	Arboricultural Assessment of the proposed Wastewater Diversion Works

Report Compiled by:	Matthew Paul	Signed: 
Date of Report:	15/06/23	

Peers Brown Miller Ltd
P. O. Box 10166 Dominion Road, Auckland 1446
Ph 09 631 7610

Contents

1.0 Introduction

1.1 Overview

Watercare Services Limited (WSL) is proposing to upgrade the wastewater network for the upper catchment (southern) of Auckland City Centre. The project has been split into multiple parts for the purpose of design, consenting, and construction.

This report provides an assessment of the Part 3 portion of the project which travels along Queen Street from north to south. The project area is linear along Queen Street, between Victoria Street and Mayoral Drive. During construction, the area subject to project works will extend onto sections of Victoria Street, Wellesley Street, and the surface carpark at 329 Queen Street and 38 Greys Avenue.

Figure 2 shows the geographic area for the project, however, construction activity at surface level will be focused on the Queen Street intersections of Mayoral Drive, Wellesley Street, and Victoria Street.

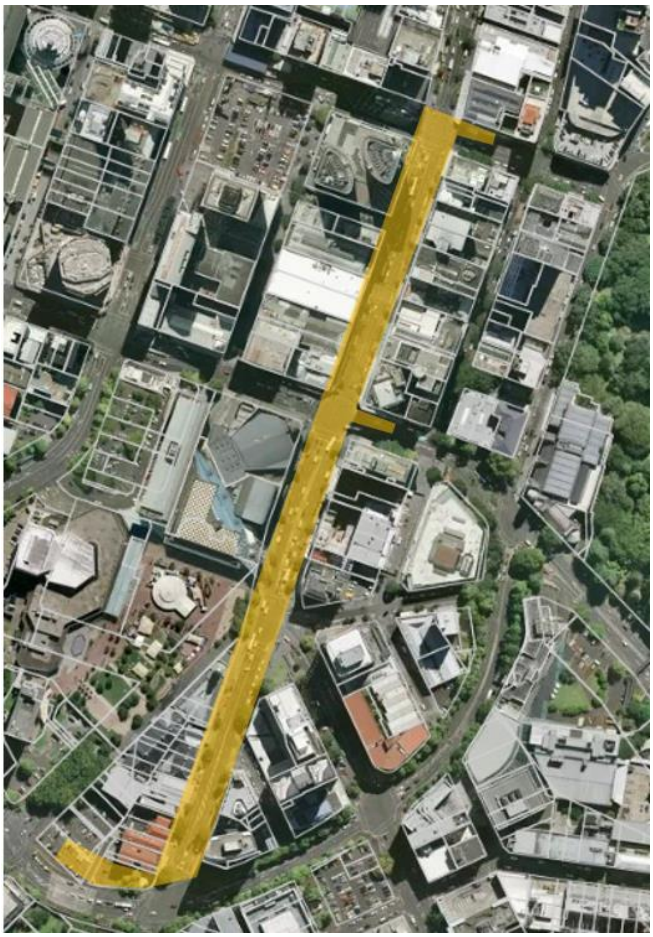

Figure 1 Project area

To support the resource consent application for Part 3 works, an arboricultural assessment is required to determine the actual and potential effects that may be generated by the project.

Based on the nature of the project, it is likely that most, if not all effects will relate to construction activity.

2.0 Design Overview

2.1 Part 3 pipeline alignment & Shaft Locations

The Project works will see the construction of a new wastewater pipeline under Queen Street, running between Mayoral Drive and Victoria Street. Connections to the existing wastewater network will be provided at Mayoral Drive, Wellesley Street, and Victoria Street.

To provide for the new pipe, three temporary shafts will be provided along Queen Street (located at Mayoral Drive, Wellesley Street and Victoria Street). Once the shafts are constructed, tunneling works will commence from Mayoral Drive, heading north along Queen Street towards Victoria Street. The Micro-Tunnel Boring Machine (mTBM) will be extracted at Victoria Street. Once tunnelling works are completed, the three shafts will be backfilled and converted to manholes.

2.2 Shaft locations

As outlined above, three temporary shafts are required to install the new pipeline.
Table 1 below provides basic information on each shaft below.

2.2.1 Queen Street/ Mayoral Drive Shaft

This shaft will be located on Queen Street, outside 323 Queen Street, and once constructed will have a depth of around 13.72m. This shaft will be used as a launch shaft for the tunnelling works. The shaft will be of post and panel construction and as such will require continuous dewatering to be undertaken whilst the shaft is in use. Once tunneling works are completed, the shaft will be backfilled and will be used as a manhole.

The works compound will include a laydown area of 60m x 12m. A mature Sweet Gum (Liquidambar styraciflua) street tree (identified as Tree 1) stands at the northern end of this compound and is growing in the public footpath area adjacent to the road. It is anticipated that some pruning of this tree would be required to enable machinery operation, with the operation of this machinery also anticipated with the tree's protected root zone.

Figure 2 below shows the position of the shaft (marked red) and the surrounding construction support area.

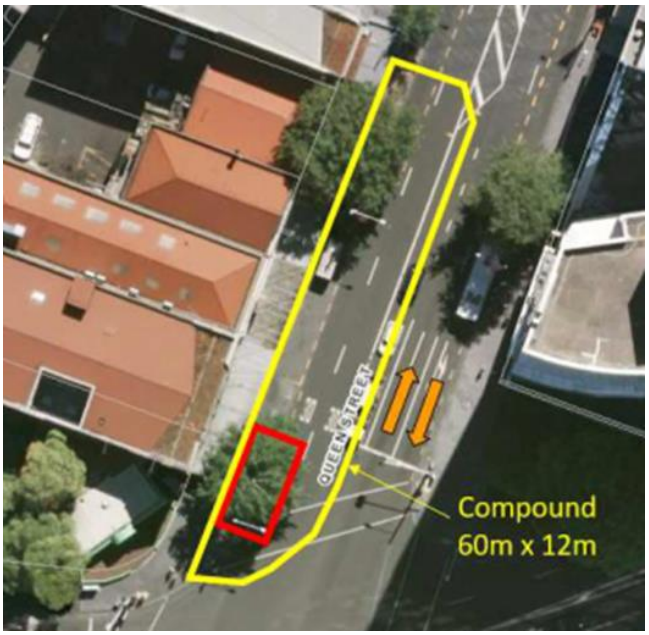

Figure 2 Mayoral Drive Shaft position and construction support area. Proposed shaft shown by the red square. The street tree in shaft footprint has since been removed and a kerb buildout constructed.

2.2.2 Queen Street/Wellesley Street Shaft

This shaft will be located on Wellesley Street, adjacent to 290 Queen Street, and will have a total depth of around 7.24m. This shaft will be used for service connections as well as support for the tunnelling works. This shaft will be sealed when constructed and as such ongoing dewatering will not be required.
Once tunnelling works are completed, the shaft will be backfilled and will be used as a manhole.

No street trees are affected by this shaft or the associated construction area.

Figure 4 shows the position of the shaft (marked red) and the surrounding construction support area on Wellesley Street.

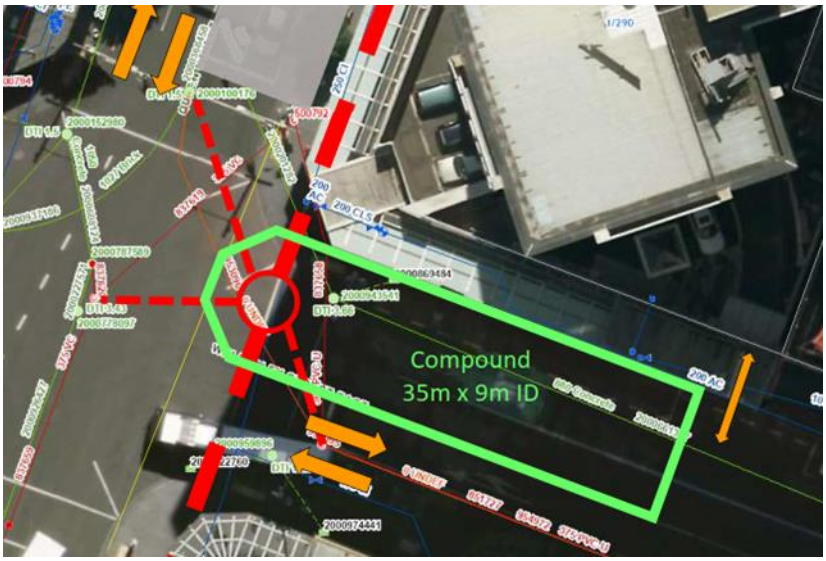

Figure 3 Wellesley Street Shaft position and construction support area

2.2.3 Queen Street/Victoria Street Shaft

This shaft will be located on Victoria Street, adjacent to 210 Queen Street, and will have a total depth of around 6.35m. This shaft will be used to provide a connection to the Orakei Main Sewer as well as for the recovery of the mTBM. The shaft will be of post and panel construction and as such will require continued dewatering whilst the shaft is in use.
Once tunnelling works are completed, the shaft will be backfilled and will be used as a manhole.

No street trees will be affected by this shaft or the associated construction area.

Figure 4 shows the position of the shaft (marked red) and the surrounding construction support area on Victoria Street.

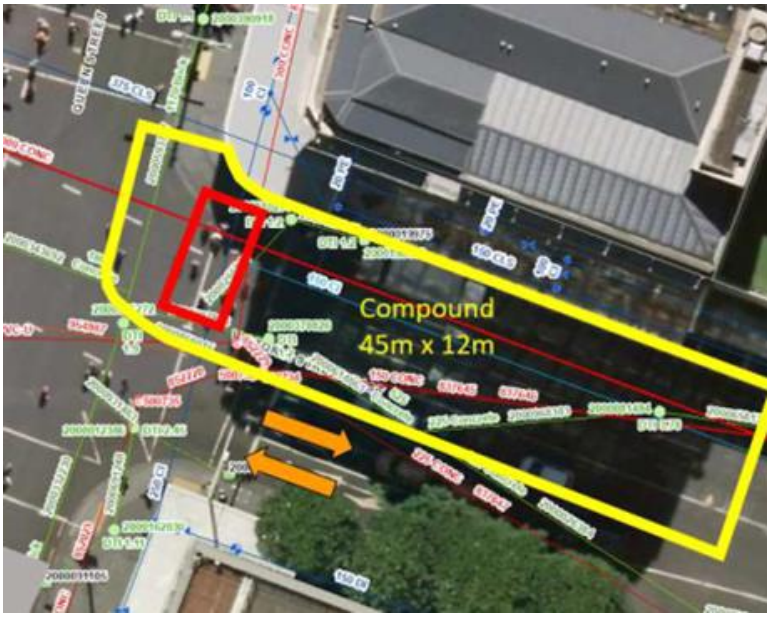

Figure 4 Victoria Street Shaft position and construction support area

2.3 Tunnelling Works

Tunnelling works will commence from the shaft at Mayoral Drive to the shaft at Victoria Street using a mTBM.

To support tunnelling works, a Construction Support Area (CSA) will be established on part of the public car park at 38 Greys Avenue and 329 Queen Street that will contain ancillary equipment and functions for tunnelling. Figure 5 shows the proposed layout for the Greys Avenue CSA and how it relates to the construction shaft on Queen Street.

Figure 5 shows the proposed layout for the Greys Avenue CSA and how it relates to the construction shaft on Queen Street.

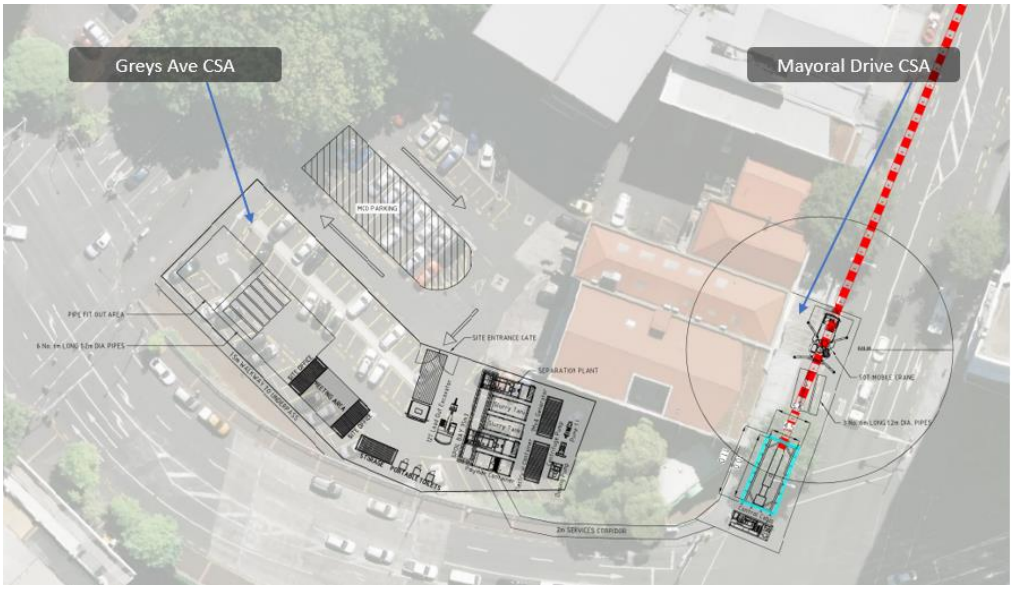

Figure 5 Greys Avenue CSA during tunnelling works

3.0 Statutory Framework – Tree Protection

<u>Auckland Unitary Plan – Operative in Part</u>

For this application, the rules in the Auckland Unitary Plan are considered.

The trees and vegetation impacted as part of this project stand within the road reserve. The specific rules applicable to this application are the following;

E26. Network utilities and electricity generation – Trees in roads and open space zones

Tree Pruning

The following are the relevant AUP (OP) rules for the pruning of a street tree:

- Rule E26.4.3.1. (A83): Tree trimming or alteration in road and public open spaces that comply with Standard E26.4.5.1 – a **Permitted Activity**

The works within the protected root zone

The following are the relevant AUP (OP) rules for the proposed works within the protected root zone:

- Rule E26.4.3.1. (A87): Works within the protected root zone in road and public open spaces that comply with Standard E26.4.5.2 – a **Permitted Activity**

In summary, the following activities can be undertaken as **Permitted Activities:**

Works within the Protected Root Zone

- Trimming of a protected tree (Tree 1) to enable the delivery of materials and operation of machinery and equipment – complying with Standard E26.4.5.2 – a Permitted Activity

- Works within the protected root zone of a protected tree **(Tree 1)** within Queen Street carriageway as part of the trenchless installation of the new wastewater pipeline (associated compound works) – complying with Standard E26.4.5.2 – a Permitted Activity

4.0 Plan References

The following plans are relevant to the content of this report;

WSP – QUEEN STREET WASTEWATER DIVERSION – PART 3 –- DRAFT Issue – Project No: W-SL001.03– 21/04/23

5.0 Arboricultural Assessment

5.1 Overview

For the most part, the construction works will be largely clear of both private and public trees growing within the project area.

The only location where the works may effect protected trees is adjacent to the proposed Mayoral Drive/Queen Street shaft compound.

A single Council-owned Sweet Gum tree is growing to the north of the proposed shaft excavation point and compound area.

Figure 6 – Tree 1 to the north of the proposed shaft and compound area

Based on the compound plan provided by WSP, the proposed compound will follow the footprint of the existing kerbline and adjacent buildout section.

5.1.1 Pruning Works

Currently, the canopy of the Sweet Gum tree does not extend beyond the buildout. However, as the timeline for project construction and delivery is currently unknown, some pruning may be required in the future to provide adequate clearance for delivery of materials and machinery/equipment operation at the time of construction.

In considering the current canopy extent, any pruning will be minor, with branches no larger than 60mm in diameter to be pruned at the time of construction. The proposed pruning would be well within the permitted standard thresholds outlined in Standard E26.4.5.1, with no more than 10% of the canopy to be pruned and branches no larger than 60mm to be removed.

All pruning works are to be undertaken by a suitably qualified arborist under the direction of a works arborist. The works arborist is to determine any required pruning at the time of the initial pre-construction meeting.

5.1.2 Works within the Protected Root Zone

The proposed stormwater pipeline will travel beneath the tree as a significant depth, being greater than 0.8m and installed via trenchless methods. There is no potholing anticipated within the protected root zone of the Sweet Gum tree.

No direct construction works are anticipated near the subject tree, with the only works likely to be material delivery and machinery operation and delivery.
As such, these activities would comply with Standard E25.4.5.2 and would be assessed as a Permitted Activity.

As no direct excavations or disturbance is anticipated near this tree, it is recommended that the tree be fenced off and excluded from the works area by way of protective fencing at the edge of the buildout kerb line.

As an added precaution, it is recommended that all works are undertaken in accordance with the recommendations provided in Section 6.0 of this report in case of changes to the methodology or the works compound during the physical works period.

6.0 Tree Protection Methodology

This section outlines a set of appropriate works methods and tree protection measures that should be adopted and put in place to ensure that adverse effects on the protected trees being retained within the project area are minimised and/or avoided.

(a) Prior to any works commencing in the vicinity of any of the protected trees (either on the site or on the road), a prestart meeting should be held to discuss all issues pertaining to the protection of the retained trees and to gain a common understanding of the relevant conditions of consent in that regard. Present at the meeting should be;

- The consent holder
- The site foreman or project manager
- The worksite supervisory arborist
- Council Compliance Officer
- Any other relevant personnel

Excavation and New Construction Works

(b) The extent and technical specifications of all new elements to be constructed within the root zones of protected trees are to be provided to and approved by the works arborist prior to construction, in order to confirm that these works are in line with accepted arboricultural practice. It is considered that all detailed design elements are to be designed in such a way as to minimise potential disturbance in and around the root zones of those trees to be retained and worked around as part of the project.

(c) No heavy machinery or equipment or materials should be stored or deposited within the root zone area of any tree within the site. If any materials do need to be deposited within the dripline of any tree a sheet of plastic or a tarpaulin should be laid down first.

(d) When machinery is to be used beneath the root zone of any retained tree, track movement must be kept to a minimum - with materials preferably installed progressively from the previously metaled/hard surface. Any movement on open ground must be undertaken on track mats or plywood where ground is not to be excavated.

(e) Protective fencing should be installed wherever practicable at the dripline edge of trees being retained in the vicinity of any physical works or excavations. This fencing shall remain in place for the duration of the project in order to best protect the subject trees. The fencing is to be rent-o-style 1.8 metre steel mesh sections. The location of this fencing is to be confirmed and approved prior to any works being undertaken with the vicinity of the tree.

(f) Temporary relocation of the fencing can be undertaken at the point when specific works are to be carried out within the driplines of the subject trees - with the fencing to be re-erected following that specific activity.

Pruning Works

(g) Any required pruning works are to be undertaken by a suitably qualified arborist under the direct supervision of the works arborist. The extent of pruning is to be assessed and discussed at the pre-start meeting to determine the exact requirements. All pruning works are to be undertaken in accordance with permitted standards in accordance with best practice.

Compliance

(g) Compliance with all conditions of consent relating to tree protection would be monitored by the appointed works arborist - with the detail of each visit and communication being

logged. The completed log would be provided to the consent holder at the completion of the project to serve as a compliance report.

7.0 Asset Owner Approval

A formal Tree Owner Approval (TOA) is required from the Auckland Council Urban Forest Specialist team.

Formal approval will be applied for and gained prior to construction.

8.0 Conclusion

This report has been prepared to accompany the resource consent applications to install a new wastewater trunk pipeline within the road reserve of Queen Street between the intersections of Mayoral Drive and Victoria Street. It provides the information that will assist Council to assess the activities that affect protected trees - under the relevant tree protection rules.

Any pruning required, together with the works proposed within the Protected Root Zone of the protected tree implicated as part of this project, are permitted activities, subject to arboricultural supervision. Provided that the tree protection recommendations outlined in Section 6.0 of this report are adopted as contract specifications of the project, there would be no adverse effects.

Please feel free to contact the undersigned if any further information is required.

Matthew Paul
Consultant Arborist
Peers Brown Miller Ltd

APPENDIX A

Tree Details

Specific details pertaining to each scheduled tree and some more significant trees implicated in the proposal are outlined in the following section:

Description Key

- **Tree No**

Refers to the number assigned to each tree

- **Tree Species – Common Name**

The generally accepted common, or Maori, name of the tree is given.

- **Tree Species – Botanical Name**

The genus and species, and cultivar or variety where known, is given. Where the species is unknown the tree is identified as; (Genus) sp.

- **Protective Status**

This refers to the protective status of the tree as defined by the AUP-OIP (where relevant).

Y = Refers to trees protected as part of the Auckland Unitary Plan rules

N= No Protection.

Protected trees are indicated by red text to clearly separate these trees from the non-protected trees. AUP (Auckland Unitary Plan) relates to their specific protection status.

- **Height (in metres)/ Girth (in metres)**

- **Condition**

This category addresses the physiological condition of the tree as a whole, described as;

Good – Full healthy canopy but possibly including some suppressed or damaged branches

Fair – Slightly reduced leaf cover, minor dead wood or isolated major dead wood

Poor – Overall sparse leafing and/or extensive dieback. Irreversible decline

- **Comments**

Addresses the general location of the trees and/or any specific comments about the tree

ID #	Common Name *Botanical name*	Location	Protected status (Y / N)	Height m	Girth m	Condition (P,F,G)	Comments
1	Sweet Gum *Liquidambar styraciflua*	Queen Street (adjacent to 319 Queen Street)	Y	14.0	1500+	Good	**Retain** – Works within the root zone as part of the proposed trenchless installation works compound and machinery operation.

Appendix B
Tree Location Image

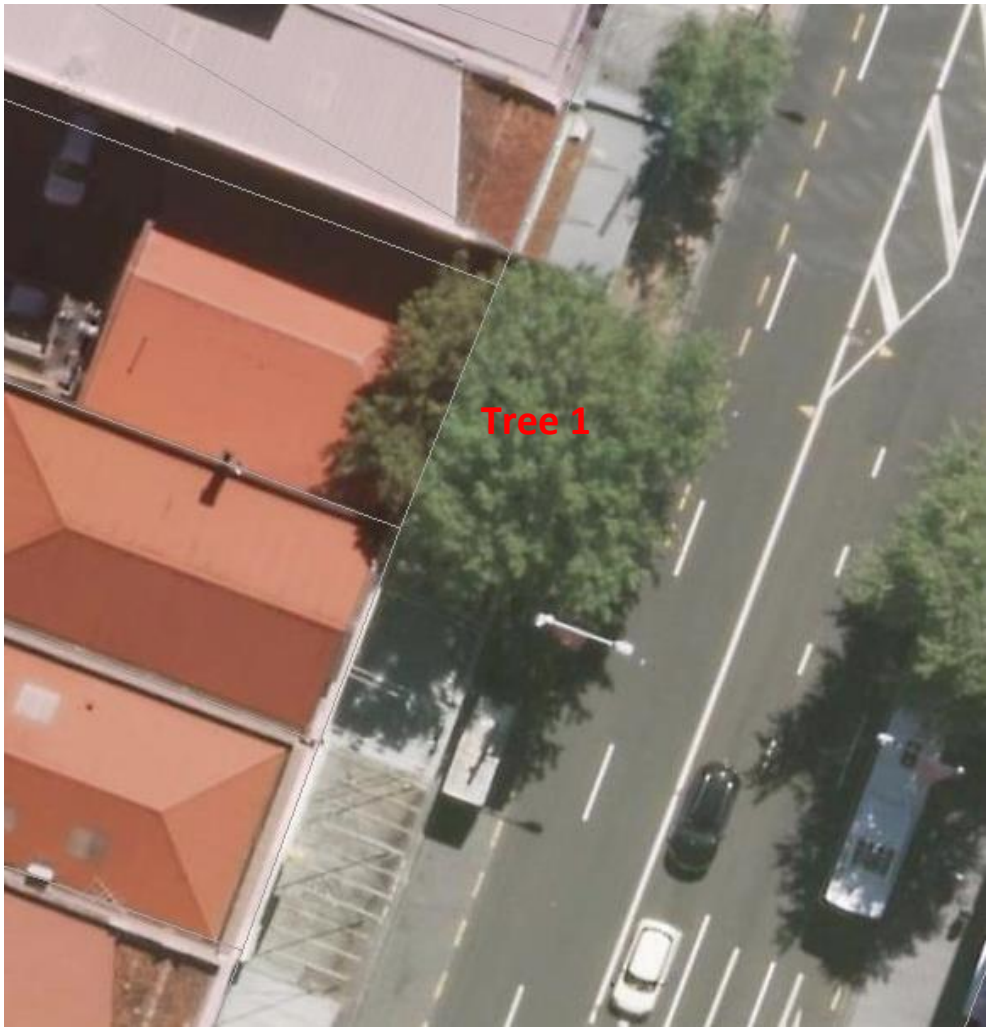

Figure 1 – Aerial snip showing Tree 1 as currently growing on Queen Street.