Watercare Services Limited

QUEEN STREET WASTEWATER DIVERSION PROGRAMME: MAYORAL DRIVE ALIGNMENT PROJECT

ARBORICULTURAL ASSESSMENT

26 JUNE 2025

PUBLIC

QUEEN STREET WASTEWATER DIVERSION PROGRAMME: MAYORAL DRIVE ALIGNMENT

ARBORICULTURAL ASSESSMENT

WATERCARE SERVICES LIMITED

REV	DATE	DETAILS
A	09.06.25	DRAFT
B	16.06.25	DRAFT; Updated to include permitted activity table

	NAME	DATE	SIGNATURE
Prepared by:	Matthew Paul	19.06.25	

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ABBREVIATIONS

AEE	Assessment of Environmental Effects
Auckland Council	The 'Council'
AUP	Auckland Unitary Plan (Operative in Part)
PRZ	Protected Root Zone
TPZ	Tree Protection Zone
The Project	The new wastewater pipeline between Part 3 – Part 4 Connector Tunnel within 329 Queen Street and P1MH1 within Vincent Street
Watercare	Watercare Services Limited
WSP	WSP New Zealand Limited

EXECUTIVE SUMMARY

This report assesses the arboricultural effects associated with the proposed Mayoral Drive Alignment works (the Project). The proposed activities have been assessed against the relevant Auckland Unitary Plan (AUP) standards, with the findings summarised below:

Notable trees within Mayoral Drive –

- Excavation works within the protected root zone (PRZ) of five Notable Tulip trees (Trees 1-5) and the potential storage of materials or machinery operation within the PRZ - Restricted Discretionary Activity

Protected Street Trees –

- The pruning of two Queensland Box trees (Tree 6 & 7) and a London Plane tree (Tree 8) in accordance with Standard E26.5.4.1 – Permitted Activity.
- Works within the PRZ of two Queensland Box street trees (Trees 6 & 7) and a London Plane (Tree 8) in accordance with Standard E26.4.5.2 – Permitted Activity.

Overall, the effects of the proposed works on the Notable Tulip trees are expected to be less than minor, as they can be adequately managed through the implementation of the Tree Protection Measures outlined in Section 5 of this report.

1 INTRODUCTION

Watercare is proposing to upgrade the existing wastewater network of the upper (southern) catchment of Auckland City Centre. The current network has insufficient capacity to meet future needs based on increased development in the area. The wider programme of works has been split into separate parts for the purpose of design, consenting and construction; the consenting and construction packages of the Queen Street programme are shown in Figure 1-1.

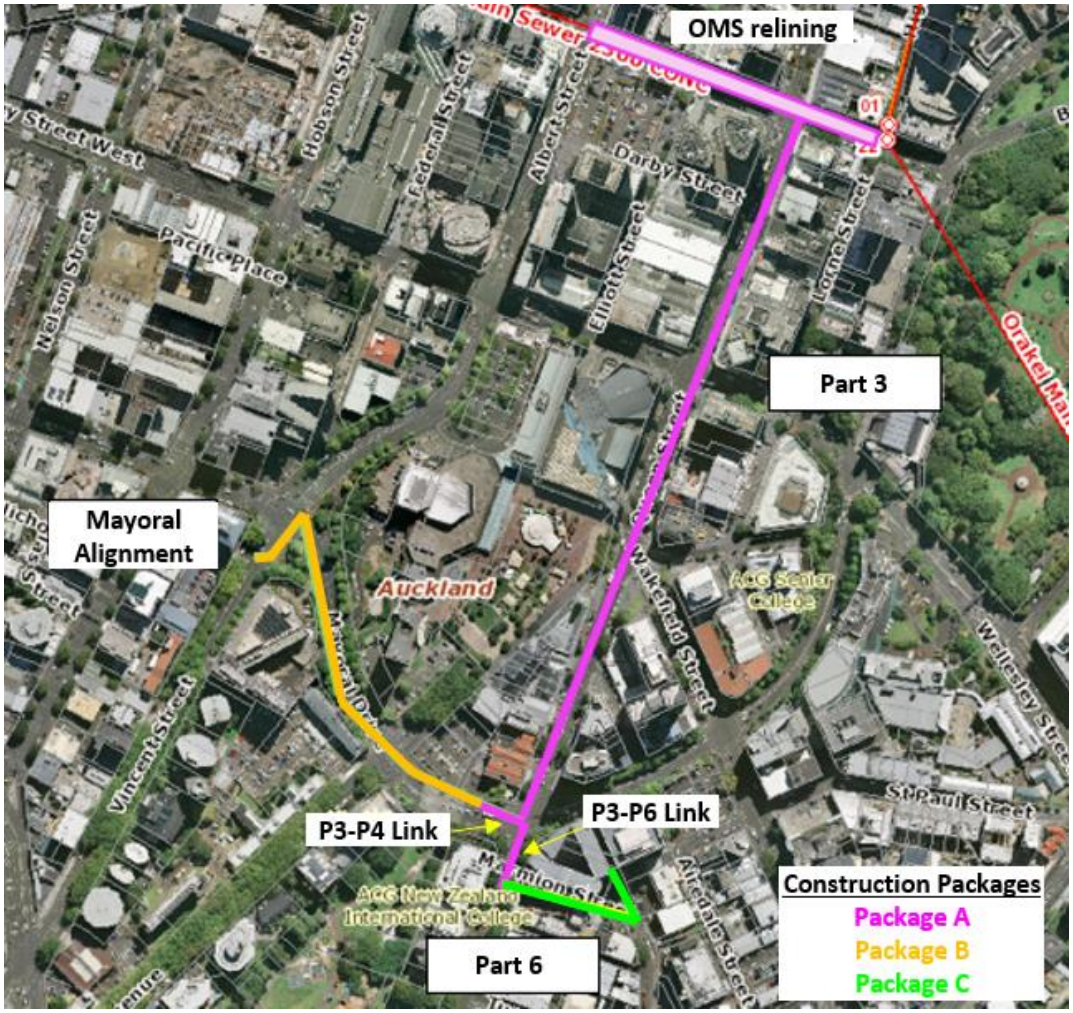

Figure 1-1: Queen Street Wastewater Diversion Programme

The Mayoral Drive alignment involves a new wastewater pipe within or adjacent to the road reserve of Mayoral Drive. The works proposed under this consent ('the Project') include a 375mm – 700mm diameter wastewater pipeline between the P4MH3 shaft within 329 Queen Street and the P1MH1 shaft within Vincent Street, along with connections to 'engineered overflow points' ('EOPs') and manholes.

1.1 PURPOSE OF THIS REPORT

The purpose of this report is to provide an assessment of the effects of the proposed Mayoral Drive Alignment Project (the Project) on protected street trees, Notable trees and other arboricultural-related matters.

2 DESCRIPTION OF EXISTING ENVIRONMENT

The project is located within Auckland City Centre, on a section of Mayoral Drive between Queen Street and Vincent Street/Cook Street, along with a short extension within Vincent Street (see Figure 2-1 for approximate project area). In addition, the project works will also occur within a surface carpark at 34-38 Greys Avenue and 329 Queen Street. The CSA site will contain both a section of the proposed wastewater pipeline and the CSA for the Queen Street programme[1].

Figure 2-1: Mayoral Drive Alignment project area in orange

2.1 AFFECTED STREET TREES

The new subterranean pipeline will be installed at depths ranging from 4.10 m to 12.97 m below ground. In order to install the proposed pipeline, a series of shafts are required, with new manholes to be installed in six (6) locations along the new route following the pipe installation works.

Four of the six shaft locations will be installed adjacent to trees growing within the road carriageway. Specifically, shafts P4MH1B/1A and P5MH2 will be installed within the road carriageway of Mayoral Drive, near some Notable Tulip trees (*Liriodendron tulipifera*). Shaft P5MH1/P1MH3 will be located close to two Queensland Box trees ((*Lophostemon confertus)*, while shaft P1MH2 on Vincent Street will be adjacent to a London Plane tree (*Platanus x acerifolia).*

Further discussion of the anticipated effects on street and Notable trees is discussed in Section 4 of this report. The preceding section details the construction activities in more detail.

[1] The CSA at 34-38 Greys Avenue and 329 Queen Street has been established under the 'Part 3' consent and retained for the Mayoral Drive alignment construction works.

3 NATURE OF WORK (ACTIVITIES) SUBJECT TO ASSESSMENT

The following is a summary of the construction activities to which the resource consent relates. For more details on the nature of the works proposed, refer to the Construction Methodology (**Appendix C**). The Construction Methodology has been based on a likely scenario and has been developed to provide a baseline assessment.

This Project relates to the construction of a new wastewater sewer line within/adjacent to the road corridor of Mayoral Drive, including connections to the existing wastewater network.

The Project will be constructed using a combination of trenchless pilot bore and open-cut trenching excavation, with shafts utilised along the alignment to launch and receive the pilot boring machine. An overview of the proposed construction activities is shown below as Figure 3-1.

To ensure flexibility in the consenting process, a consenting envelope approach has been adopted for all shaft dimensions and the construction compounds. The dimensions specified within the consent allow for changes through the detailed design phase.

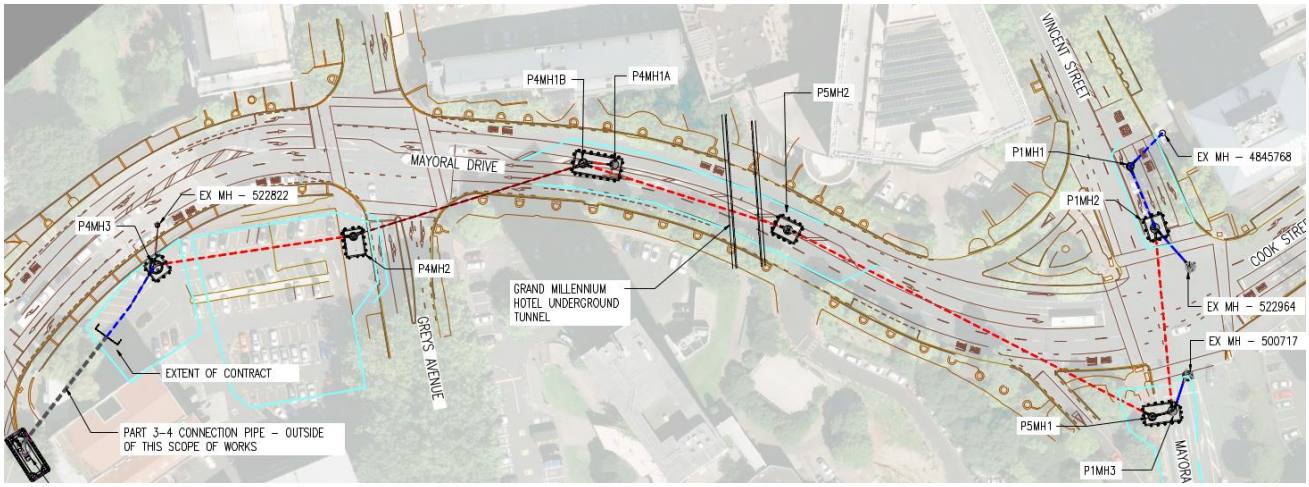

Figure 3-1: Overview of main indicative construction works (red lines are trenchless pipelines, blue are trenched pipelines)

Table 3-1 provides a high-level overview of the different construction activities and stages, which are provided in greater detail within the Construction Methodology.

Table 3-1: Overview of the different construction activities and stages

Network Utility Relocations	The existing network utilities within and around the proposed shafts will need to be relocated. The exact utilities to be diverted are yet to be confirmed, but will likely include potable water, electricity, wastewater, stormwater and communications. Open-cut progressive trenching will be utilised to relocate any utilities that are required to be relocated. New utilities will be constructed around the proposed shaft locations, and the existing utilities will be removed during shaft construction. Dewatering of the trenches may be required.

Temporary Construction Shafts	Most manhole locations on this alignment will be used as launch/reception pits for the trenchless construction method (axis/pilot bore). Six construction shafts are proposed along the Mayoral Drive alignment. The trenchless method requires shafts with maximum internal dimensions of **5.5 m x 12 m** and a maximum depth of **9 m**. The shafts are expected to be constructed using a 'post and panel' type methodology although, other construction methods may also be used such as sheet piling and/or secant bored piles. Refer to Section 3.1 of the Construction Methodology (**Appendix C)** for the steps to construct the temporary shafts.
Trenchless Tunnelling Works	It is proposed to construct the tunnelled sections between manholes P4MH3 (within Greys Avenue Carpark) and P1MH2 (within Vincent Street, opposite the intersection with Mayoral Drive) of the wastewater pipeline using a trenchless pilot-guided boring methodology. Refer to Section 3.2 of the Construction Methodology (**Appendix C**) for more detail of the trenchless tunnelling methodology.
Open Cut Construction Works	Open-cut construction is proposed for two short sections of the proposed pipeline between the shafts for P4MH3 and the P3-P4 Connector Tunnel within 329 Queen Street, and between P1MH1 and the shaft within Vincent Street. Open-cut construction is also proposed for network tie-ins and connections to existing EOPs. Refer to Section 4 of the Construction Methodology (**Appendix C**) for more detail of the trenchless tunnelling methodology.
Construction Support Areas	To support the proposed construction activities, a primary CSA will be used within the public carpark at 38 Greys Avenue and 329 Queen Street. This CSA is already set up as part of the approved Part 3 Alignment and will also be utilised for the Part 3 – Part 4 Connector Tunnel consents. The CSA may be reconfigured to respond to the works proposed for the Project. The CSA contains site offices and welfare facilities, along with some limited site laydown and materials storage areas. The indicative site layout for the Greys Avenue CSA is shown below in Figure 3-2 which reflects the set up for Part 3 construction. Three secondary construction compounds (compounds) will be established within the road corridor of Mayoral Drive and Vincent Street to allow for the construction of shafts and to undertake tunnelling works. In addition, the Greys Avenue CSA will be extended into the footpath at Greys Avenue to accommodate the construction of P4MH2. These compounds are expected to be in place for 6 to 8 months. Temporary concrete or steel barriers with hoardings will be constructed around the perimeter of each, with access gates one or both ends. The indicative compound boundaries around the possible shaft envelopes adjacent to protected trees are shown below as Figure 3-4 and Figure 3-5.

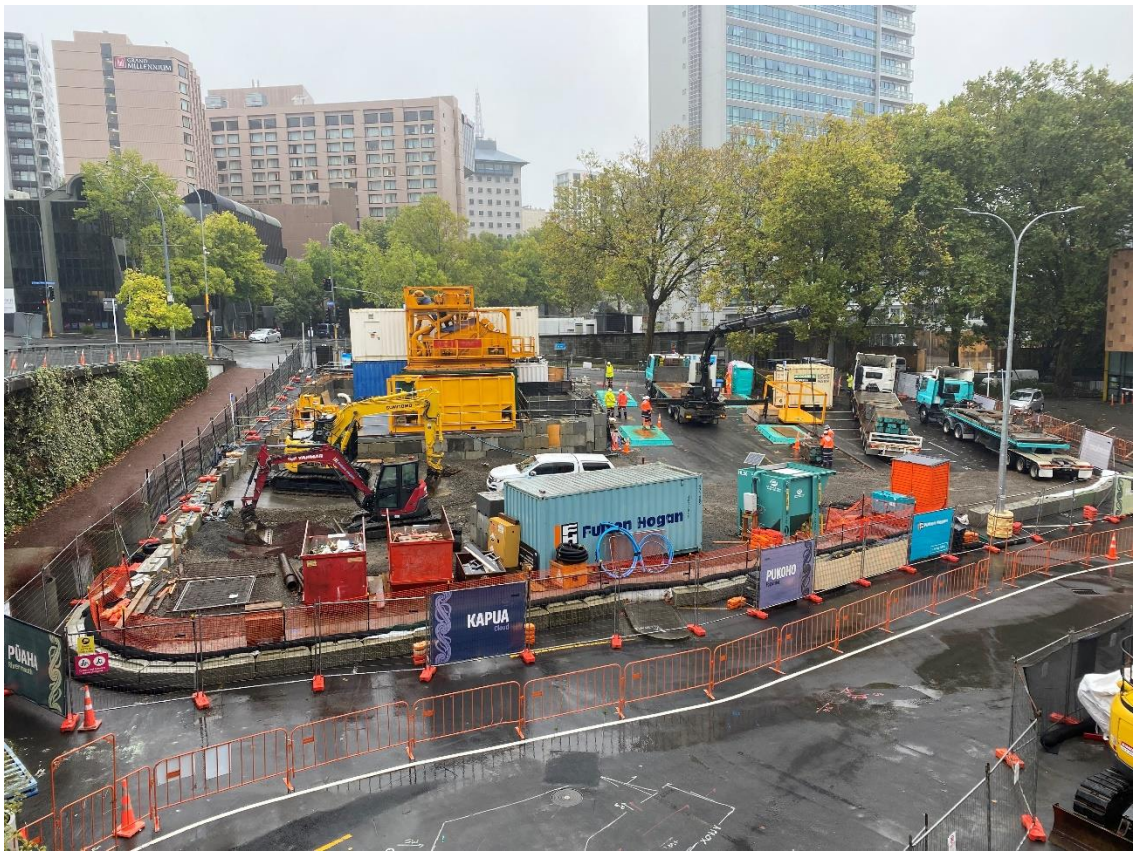

Figure 3-2: Indicative Greys Ave CSA layout (looking north-west towards Greys Ave)

Providing a detailed figure of the indicative compounds surrounding P4MH3 and P4MH2 within the Greys Ave Carpark is deemed unnecessary due to the absence of trees in the vicinity of the shafts. All other indicative compounds (light blue) are provided below, however.

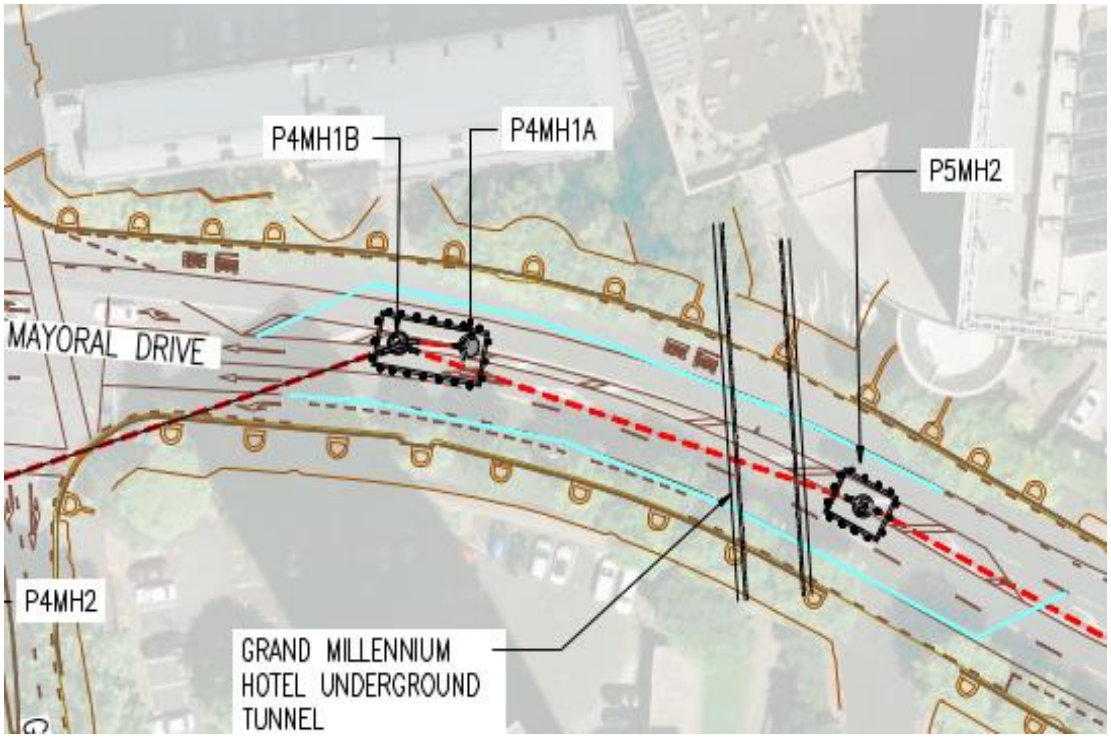

Figure 3-3: Indicative compound on Mayoral Drive outside 299 Queen Street, G05/1 Greys Ave

Figure 3-4: Indicative compound at Cook St/Mayoral Drive intersection

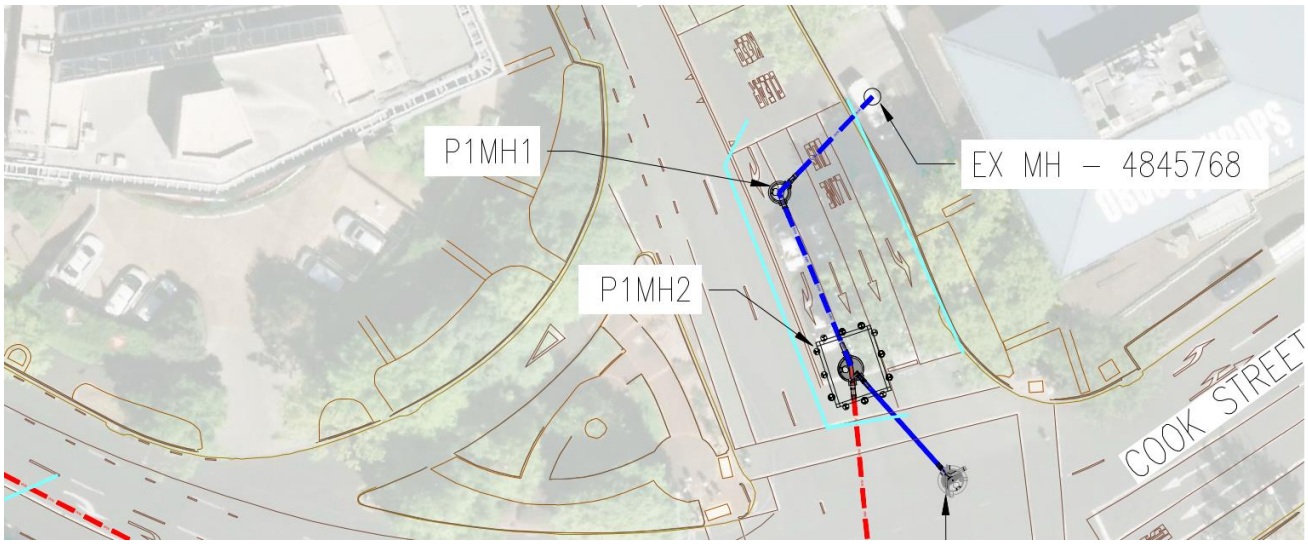

Figure 3-5: The indicative compound at Cook St/Mayoral Drive/Vincent St intersection

4 ARBORICULTURAL ASSESSMENT

As mentioned in Section 2.1, tunnel works are to be undertaken within the Mayoral Drive and the Vincent Street carriageway adjacent to both protected street trees and Notable trees.

The proposed works will be undertaken either within or at the edge of the Protected Root Zone (PRZ) of both street and Notable trees overhanging the proposed subterranean pipe route. The most significant works affecting trees will be directly adjacent to the proposed tunnel boring entry/exit shafts, plant installation and associated site works compounds.

Four of the six shaft locations will be installed adjacent to trees growing within the road carriageway, with the affected trees including five (5) Notable Tulip trees (Trees 1 – 5), two (2) Queensland Box (Trees 6 & 7) and a London Plane tree (Tree 8) (refer **Appendix B** for affected trees along alignment).

The effects on the subject trees as part of the tunnelling and shaft excavation works are anticipated to be less than minor.

Further discussion of the specific anticipated effects on trees at each location is discussed in Section 4.1 below.

4.1 DESCRIPTION OF ACTIVITIES AND ASSESSMENT OF EFFECTS

4.1.1 EFFECTS ON TREES 1-5 WITHIN MAYORAL DRIVE

4.1.1.1 EXCAVATION

The proposed P4MH1A/ P4MH1B shaft and Shaft P5MH2 will be constructed in the central median/right-hand turn lane within the road carriageway of Mayoral Drive. Excavation works within the carriageway are also anticipated within the technical Tree Protection Zone (TPZ) (As per AS 4970 Standards utilised by Auckland Council Community Facilities) and the PRZ of Notable Tulip trees (as per the AUP defined root zone) (Trees 1-5)(refer **Appendix B**). As such, consent is sought for the excavation/disturbance within the PRZ of Notable trees.

4.1.1.2 PRUNING

It is anticipated that some plant operations will occur within the TPZ/PRZ of the Notable trees, with the potential for the operation of a crane and/or hiab. In some instances, the use of the adjacent footpath for machinery or material storage may be required. Considering the existing clearances of the Notable trees due to regular pruning for double-decker bus clearance over the carriageway, it is not anticipated that additional pruning will be required for such activities.

All works, including the storage of materials, plant operation, or temporary works, are to be discussed and undertaken under the supervision of the works arborist.

Figure 4-1: Red line adjacent to cones showing approximate TBM shaft adjacent to Trees 1 -3

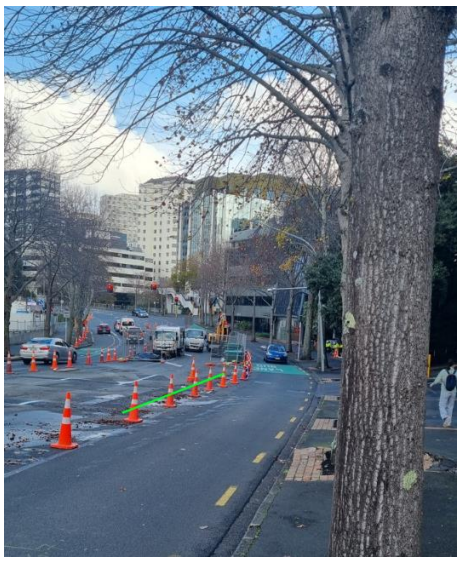

Figure 4-2: Green line adjacent to cones showing approximate TBM shaft adjacent to Trees 4 & 5

4.1.2 EFFECTS ON TREE 6 AND AREA OF PUBLIC VEGETATION

4.1.2.1 EXCAVATION

As part of the proposed shaft installation at P5MH1 & P1MH3, excavation will be required adjacent to two (2) Queensland box trees. These trees are growing on a road island on the northeast side of the Cook Street/Mayoral Drive intersection.

The proposed shaft will be constructed to the northwest of Tree 6, with the edge of the shaft at the outer periphery of the PRZ of Tree 6. While physical works are anticipated to be at the outer edge of its PRZ, they will occur within the TPZ of Tree 6. As such, arboricultural supervision will be required.

Any roots encountered at the edge of the proposed shaft cut footprint are to be cleanly cut back to the excavated edge by a works arborist, with all works to be supervised/overseen by the works arborist for the duration of the project. Protective fencing will be required, in accordance with those recommendations provided in Section 5 of this report.

This activity above will comply with Standard E25.4.5.2 and is assessed as a Permitted Activity.

4.1.2.1 PRUNING

In order to operate machinery safely within the site compound, some minor pruning of the outer canopy of Tree 6 may be required for flexibility during the project. The level of pruning anticipated would comply with permitted standards, with the pruning of less than 20% of the canopy and of branches no larger than 80mm proposed. (See Figure 4.9 below for an indicative mark-up.)

4.1.2.2 REMOVAL OF PUBLIC VEGETATION

A small area of public vegetation will require removal immediately to the west of Trees 6 & 7, as part of the shaft works. This vegetation is identified as a small row of *Carex sp.* grasses, Jasmine (*Trachelospermum jasminoides)* and *Phormium cookianum* growing between the road and footpath. Reinstatement of these shrubs, on a like-for-like basis, is to be undertaken following the

reinstatement of the above-ground area, post shaft construction. All reinstatement works are to be undertaken to the satisfaction of the relevant Auckland Council Community Facilities representative.

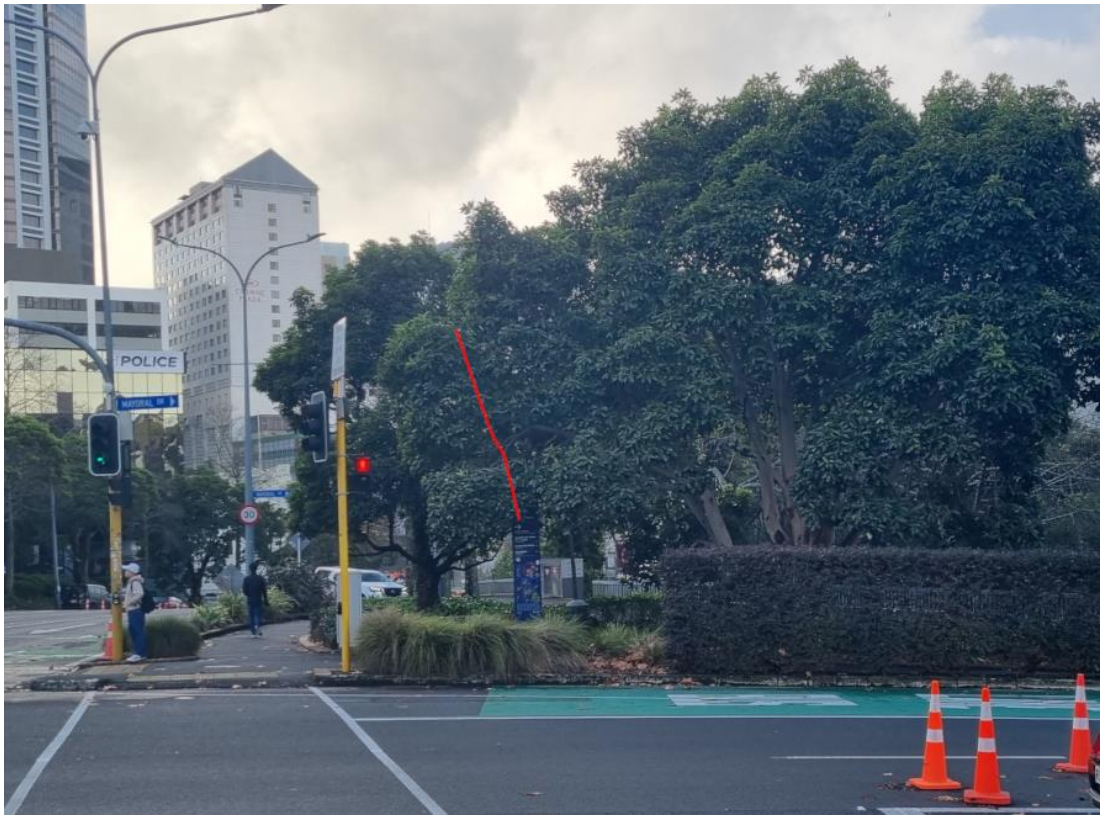

Figure 4-3: Proposed clearance pruning of Tree 6 for shaft construction clearance (red line)

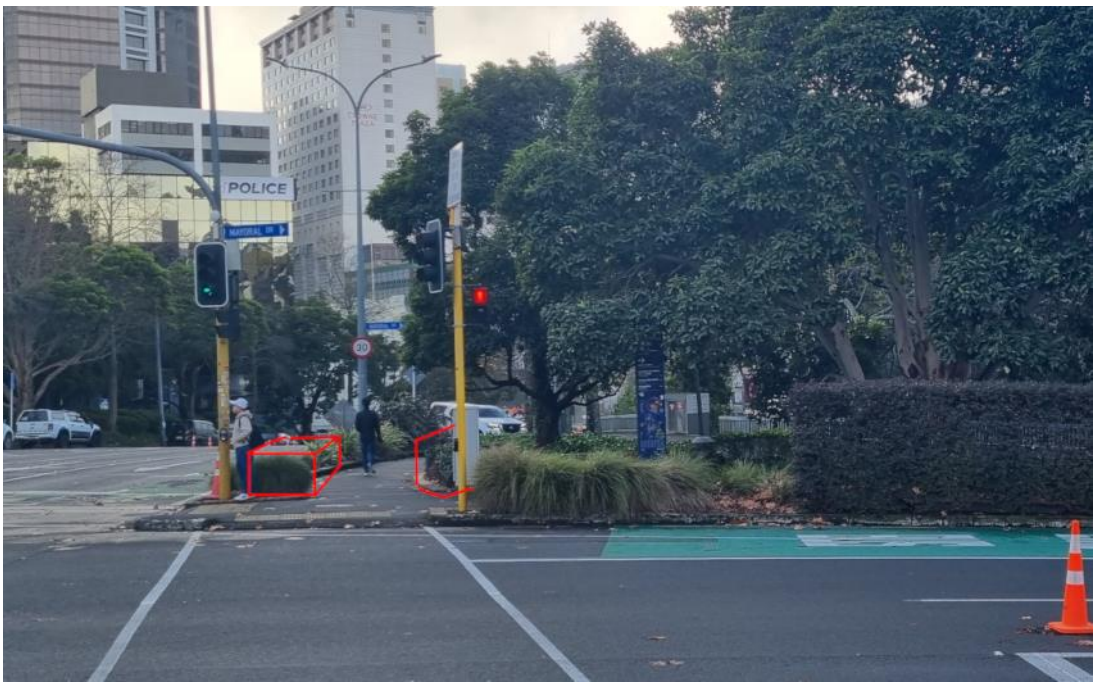

Figure 4-4: Areas of public vegetation proposed for removal and replacement (red outlines)

Figure 4-5: Alternate view showing inner public vegetation proposed for removal and replacement post project

4.1.3 EFFECTS ON TREE 7 WITHIN MAYORAL/COOK INTERSECTION

4.1.3.1 PRUNING

As part of the proposed shaft installation at P5MH1 & P1MH3, pruning of a portion of the canopy on the southwest corner of Tree 7 (Queensland Box) is proposed. This will enable better clearance for the sheet pile rig and ensure unintended damage does not occur. Any pruning required will not require the removal of any branch greater than 100 mm or the pruning of more than 20% of the live growth. Therefore, the activity will comply with Standard E25.4.5.1 and is assessed as a Permitted Activity. The estimated pruning extent is shown in the image below.

Figure 4-6: Plan Snip showing approximate extent of pruning of Tree 7

4.1.3.2 EXCAVATION

Calculations have been made to determine the percentage of root zone disturbance for Tree 7. Based on onsite measurements and calculations, the extent of root zone disturbance within the TPZ is 6.6%, with the PRZ disturbance calculated at 0.4%, as reflected in Figures 4-4 & 4-5 below. As such, the activity will comply with Standard E25.4.5.2 and is assessed as a Permitted Activity.

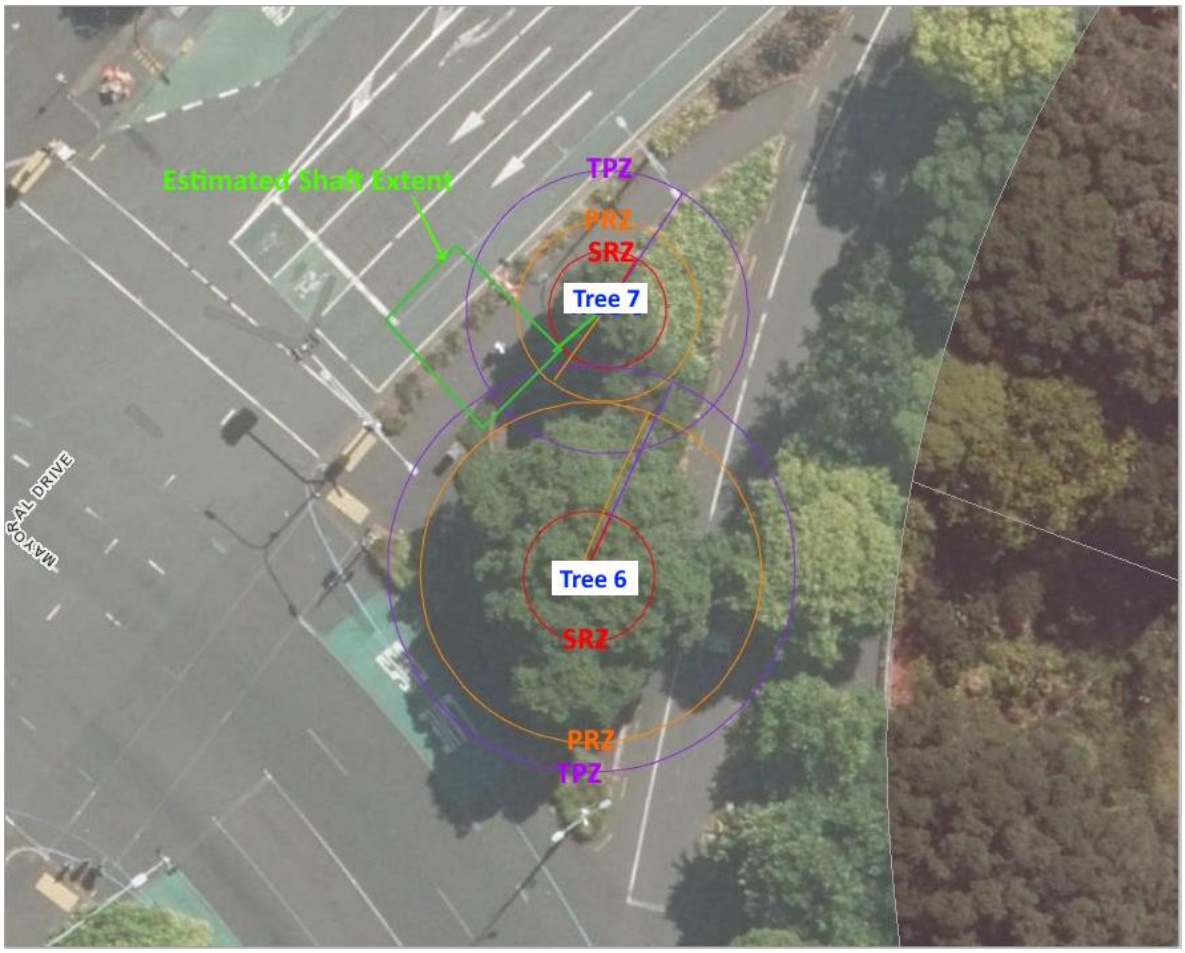

Figure 4-7: Plan snip showing TPZ/SRZ & PRZ measurements for Trees 6 & 7 in relation to the proposed shaft

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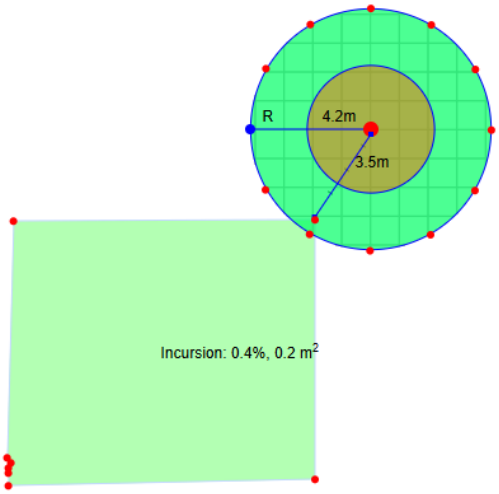

Figure 4-8: PRZ disturbance calculation for Tree 7

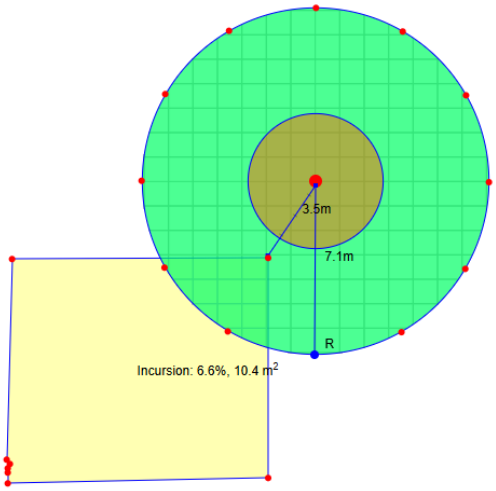

Figure 4-9: TPZ disturbance calculation for Tree 7

Figure 4-10: Image showing approximate shaft location indicating the edge of shaft adjacent to Tree 7

4.1.4 EFFECTS ON TREE 8 WITHIN VINCENT STREET

4.1.4.1 EXCAVATION

Two manhole connections will be made to the south and northern edges of a large London Plane street tree (Tree 8) growing near the corner of Vincent Street and Cook Street.

The new P1MH2 shaft will be constructed outside of the tree's PRZ. Previously undertaken investigation works (as part of the Project's site investigations) to the south of the tree have determined the presence of minor roots less than 20mm in diameter at this location.

Figure 4-11: Previous investigation works to the south of Tree 8 showing minor roots in proposed footpath manhole connection location

In consideration of the ground conditions, trunk location and overhanging canopy, the works would affect less than 20% of the tree's root zone. As such, this excavation activity complies with Standard E25.4.5.2 and is assessed as a Permitted Activity.

While the works are largely beyond the tree's PRZ, it is still recommended that protective fencing be installed between the proposed trench and the subject tree, where practical, when undertaking the section within the pedestrian area to ensure no materials or machinery are stored near the tree's base.

4.1.4.2 PRUNING

Currently, the canopy of Tree 8 does not extend significantly over the carriageway, in part due to the requirement to maintain clearance for double-decker buses and the City Rail Link (CRL) works. However, as the timeline for the start of project construction is still being finalised, some pruning may be required in the future to provide adequate clearance for the 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 100mm in diameter to be pruned at the time of construction. The proposed pruning would be within the permitted standard thresholds outlined in Standard E26.4.5.1, with no more than 20% of the canopy to be pruned and branches no larger than 100mm 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.

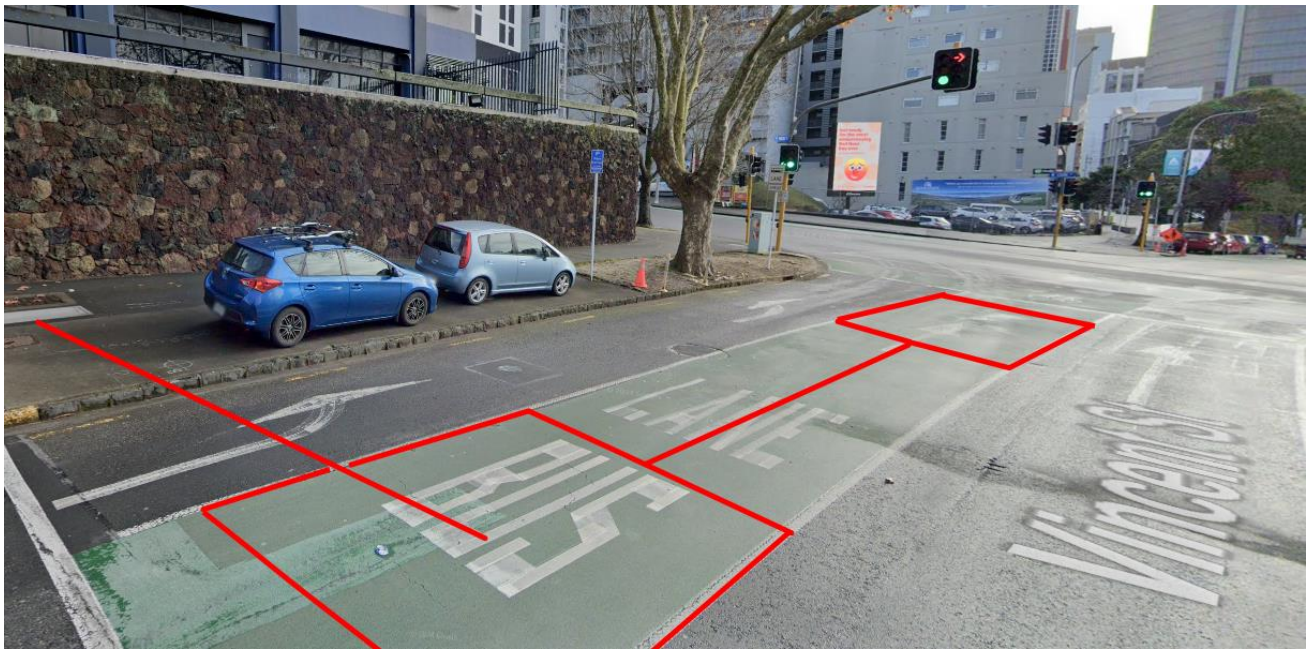

Figure 4-12 Estimated shaft locations adjacent to Tree 8

4.2 AUP RULE ASSESSMENT – TREE PROTECTION

Based on Section 4.1 above, the following assessment of the proposed works against the relevant tree protection rules within the AUP is summarised below.

PERMITTED STANDARD	ASSESSMENT
E26.4.5.1 Trees in roads and open space zones - tree trimming or alteration (non-notable)	
(1) Tree trimming or alteration of trees in streets and open space zones must comply with the following standards: *(a) the maximum diameter of any branch removed must be no greater than 100mm;* *(b) no more than 20 per cent of live growth of the tree must be removed which can be increased to 30 per cent under the direct supervision of a suitably qualified arborist;* *(c) the natural shape, form and branch habit of the tree must be retained for trees in public open space;* *(d) the natural shape, form and branch habit of the tree must be retained for trees in streets where practicable; and* *(e) All works must be carried out in accordance with best arboricultural practice.*	Can comply The pruning of three street trees (Tree 6-8) to enable the installation of shaft edge sheet piles and the delivery of materials and operation of machinery and equipment is a permitted activity as branches no larger than 100mm in diameter would need to be pruned, and less than 20% of the canopy would be pruned or altered, ensuring the trees retain a largely natural shape despite their already modified form. All pruning works are to be undertaken by a suitably qualified arborist under the direction of a works arborist. The works arborist is to confirm any required pruning at the time of the initial pre-construction meeting (as canopy growth may have changed from tw

	time of writing this report to the start of construction).
E26.4.5.2. Trees in roads and open space zones - works within the protected root zone (non-notable)	
(2) For roots less than 80mm: *(a) excavation undertaken by hand digging or air spade or hydro vac or machine excavator within the protected root zone with direction and/or supervision of a qualified arborist: (i) works must not disturb more than 20% of the protected root zone;* *(ii) works involving root pruning must not be on roots greater than 80mm in diameter at severance;* *(iii) any machine excavator must operate on top of paved surfaces and/or ground protection measures and must be fitted with a straight blade bucket;*	Can comply Excavation and associated compound works within the PRZ of the three protected street trees (Trees 6-8) can comply. All cut excavations will be supervised, with a works arborist to be engaged for the duration of the physical works phase. As identified within Section 4.1, the excavation to develop the shafts will not disturb more than 20% of the PRZs of Trees 6-8). The works will not involve pruning of roots greater than 80mm in diameter at severance. When excavating the shafts near Trees 6-8, the excavator will be fitted with a straight blade bucket and will sit on a paved surface.
E26.4.5.3. Notable trees - tree trimming or alteration	
(1) Tree trimming or alteration of notable trees must meet the following standards: *(a) the maximum branch diameter must not exceed 50mm at severance;* *(b) must not result in the removal of more than 10 per cent of live growth of the tree in any one calendar year;* *(c) the trimming must retain the natural shape, form and branch habit of the tree.* *(d) the works must meet best arboricultural practice*	No pruning of Notable trees is proposed.
E26.4.5.4. Notable trees - works within the protected root zone to enable trenchless methods at a depth greater than 1m below ground level	

(1) Excavation must be undertaken by hand-digging, air spade, hydro vac or drilling machine, within the protected root zone at a depth of 1m or greater. *(2) The surface area of a single excavation must not exceed 1m².* *(3) Works involving root pruning must not be on roots greater than 35mm in diameter at severance.* *(4) Works must not disturb more than 10 per cent of the protected root zone.* *(5) Any machines must operate on top of paved surfaces and/or ground protection measures.* *(6) Any machines used must be fitted with a straight blade bucket.* *(7) All works must be undertaken under the direction of a qualified arborist.*	Cannot comply Non-trenchless methods are required within the PRZ of five (5) Notable Tulip trees (Trees 1 - 5) as part of the construction of two shafts (P4MH1A/1B & P5MH2). Additionally, the storage of materials or machinery operation may be required within the PRZ and TPZ of Trees 1-5. Works within the PRZ of Trees 1-5 are a Restricted Discretionary Activity

In summary, resource consent is required under the AUP pursuant to Rule E26.4.3.1. (A88): Works within the protected root zone not otherwise provided for as a Restricted Discretionary Activity.

4.3 ASSESSMENT CRITERIA

The following table provides an assessment of the proposed works within the Protected Root Zone of five Notable Tulip trees against the criteria in E26.4.7.2 (1) relating to trees in roads and open space or Notable trees.

Table 4-1 Restricted Discretionary Activity Assessment Criteria – Notable Tree Overlay:

E26.4.7.2(2) ASSESSMENT CRITERIA		DISCUSSION
(a)	*the extent to which effects on the values of the tree or trees including any effects on the natural shape, form and branch habit and the root network can be minimized*	The trees are proposed for retention and protection as part of the works. Where construction works are undertaken near retained trees, it is recommended that all works be undertaken in accordance with the recommended tree protection measures provided in Section 5 of this report.
(b)	*the extent to which any impact on the immediate or long term health and stability of the tree or trees is able to be minimized or avoided*	No adverse effects are anticipated. All trees will be retained and worked around. All works near the subject trees are to be supervised and/or monitored by the appointed works arborist.

(c)	*the risk of actual damage to people and property from the tree or trees including the extent to which adverse effects on the health and safety of people have been addressed*	The subject trees are considered to be adequately distanced from the works to ensure their ongoing health and safety, provided the tree protected methodologies in this report are adhered to. In the case of potential overhead clearance issues, these must be monitored by the works arborist.
(d)	*the degree to which any proposed mitigation adequately responds to the effects on the tree or trees*	No trees are to be removed.
(e)	*the degree to which the proposal is consistent with best practice guidelines for tree management*	Any works within the PRZ of trees to be retained will be undertaken in accordance with best arboricultural practice as outlined in Section 5 below.
(f)	*whether there is the need for the direction and supervision of a suitably qualified arborist while the works are being carried out*	Where works are to be undertaken within the PRZ of any trees to be retained, protected or otherwise, it is recommended that the works be supervised by a suitably qualified arborist.
(g)	*the functional and operational requirements and benefits derived from infrastructure*	The proposed works will enable the installation of the proposed wastewater tunnel and associated enabling works.

5 TREE PROTECTION MEASURES

This section outlines a set of appropriate work 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, a prestart meeting shall be held to discuss all issues pertaining to the protection of the retained. Present at the meeting should be;

- The site foreman or project manager
- The worksite supervisory arborist
- 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. 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 outside of the compound, unless discussed with the works arborist prior to installation. 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 the ground is not to be excavated.

(e) Protective fencing should be installed wherever practicable at the protected root zone (dripline) edge of trees being retained in the vicinity of any physical works or excavations. Where practical, the pedestrian facility adjacent to the shaft shall be fenced off and a delineation provided. 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 in the vicinity of the tree.

Pruning Works

(f) Any required pruning works are to be undertaken by a suitably qualified arborist (Auckland Council Approved) 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, if any. All pruning works are to be undertaken in accordance with permitted standards in accordance with best practice.

6 TREE OWNER ASSET APPROVAL

As part of the proposed works, a formal tree a formal Tree Owner Approval (TOA) is required from the Auckland Council Urban Forest Specialist team for works impacting protected trees growing on Road Reserve within the project area.

Formal approval will be applied for and gained prior to construction

7 CONCLUSION AND RECOMMENDATIONS

This report has been prepared to accompany the resource consent application for the installation of the Mayoral Drive Alignment section of the wastewater pipeline within the road carriageway of Mayoral Drive, spanning from Queen Street to Mayoral Drive/Cook Street, including a short extension within Vincent Street. It provides an assessment of the effects of the proposed works on both the protected street trees and the notable trees within the project area.

While resource consent is required for excavation and storage of materials within the PRZ of the Notable Tulip Trees along Mayoral Drive, the effects on these trees are considered less than minor, provided the works are carried out with arboricultural supervision and the measures provided in Section 5 of this report are followed

The assessment found that any pruning required, as well as excavations within the PRZ of the protected street Trees 6-8, can be undertaken as permitted activities as per standards E26.4.5.1 and E26.4.5.2, subject to arboricultural supervision and the implementation of the measures provided in Section 5 of this report.

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

Matthew Paul

Managing Director/ 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 Māori, 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/Buttress m	Condition (P,F,G)	Comments
1	Tulip tree *Liriodendron tulipifera*	Road Reserve adjacent to 100 Mayoral Drive	Y (Notable)	10.0	1.1m 1.17m	Good	Retain – Main compound works outside PRZ within carriageway (ensure protection during works). Possibility of machinery operation and/or storage or materials within PRZ for the duration of works (flexibility requested). All works within the PRZ to be undertaken under the supervision of a works arborist.
2	Tulip tree *Liriodendron tulipifera*	Road Reserve adjacent to 100 Mayoral Drive	Y (Notable)	14.0	1.0m 1.35m	Good	Retain – Main compound works outside PRZ within carriageway (ensure protection during works). Possibility of machinery operation and/or storage or materials within PRZ for the duration of works (flexibility requested) All works within the PRZ to be undertaken under the supervision of a works arborist.

ID #	Common Name *Botanical name*	Location	Protected status (Y / N)	Height m	Girth/Buttress m	Condition (P,F,G)	Comments
3	Tulip tree *Liriodendron tulipifera*	Road Reserve adjacent to 100 Mayoral Drive	Y (Notable)	10.0	1.8m 2.25m	Good	Retain – Main compound works outside PRZ within carriageway (ensure protection during works). Possibility of machinery operation and/or storage or materials within PRZ for the duration of works (flexibility requested) All works within the PRZ to be undertaken under the supervision of a works arborist.
4	Tulip tree *Liriodendron tulipifera*	Road Reserve adjacent to 100 Mayoral Drive	Y (Notable)	14.0	1.65m 2.1m	Good	Retain – Main compound works outside PRZ within carriageway (ensure protection during works). Possibility of machinery operation and/or storage or materials within PRZ for the duration of works (flexibility requested) All works within the PRZ to be undertaken under the supervision of a works arborist.
5	Tulip tree *Liriodendron tulipifera*	Road Reserve adjacent to	Y (Notable)	14.0	1.85m 2.15m	Good	Retain – Main compound works outside PRZ within carriageway (ensure protection during works). Possibility of

ID #	Common Name *Botanical name*	Location	Protected status (Y / N)	Height m	Girth/Buttress m	Condition (P,F,G)	Comments
		100 Mayoral Drive					machinery operation and/or storage or materials within PRZ for the duration of works (flexibility requested) All works within the PRZ to be undertaken under the supervision of a works arborist.
6	Queensland Box *Lophostemon confertus*	Road Reserve Island to the northeast of Vincent St/Mayoral Drive intersection	Y	12.0	1.6m 2.28m (10.56m TPZ) 2.75m (3.14m SRZ)	Good	Retain – edge of proposed shaft works. All works adjacent to this tree to be supervised by works arborist, in accordance with tree protection measures. Pruning works as required to clear shaft construction area.
7	Queensland Box *Lophostemon confertus*	Road Reserve Island to the northeast of Vincent St/Mayoral Drive intersection	Y	14.0	1.85m (7.07m TPZ) 2.4m (SRZ 2.95m) PRZ 4.2m	Good	Retain – pipeline to be tunnelled beneath this tree. At 4.0m + invert. Edge of shaft to southwest of tree. Pruning works also proposed. Tree Protection measures as required during construction.

ID #	Common Name *Botanical name*	Location	Protected status (Y / N)	Height m	Girth/Buttress m	Condition (P,F,G)	Comments
8	London Plane *Platanus x acerifolia*	Road Reserve adjacent to 67-101 Vincent Street	Y	18.0	5.0+	Good	**Retain** – Works within PRZ as part of manhole installation, trenching and shaft works. Pruning possible for overhead clearance. Supervision required.

APPENDIX B – AFFECTED TREES ALONG ALIGNMENT

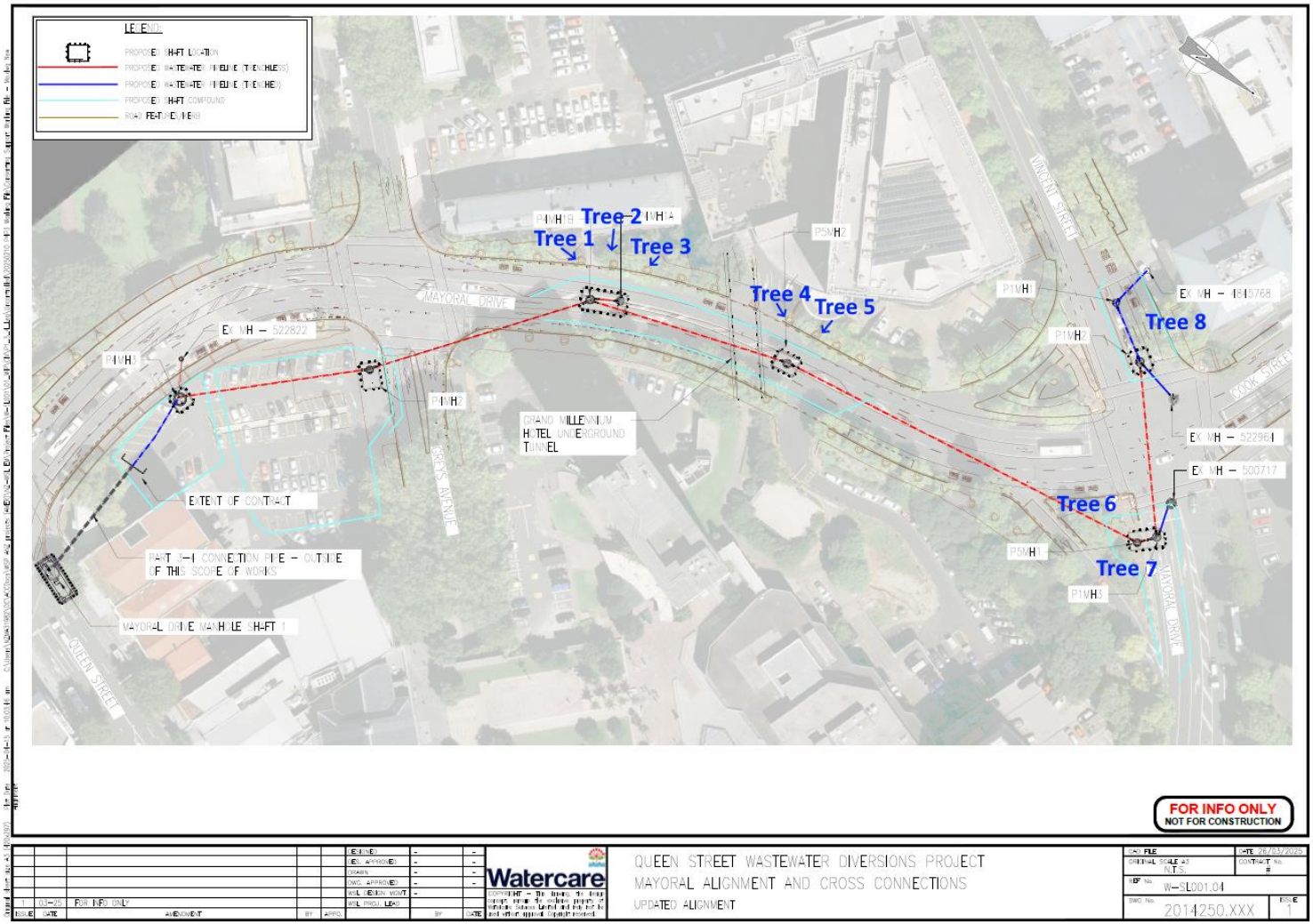

Figure B – 1 – Project layout plan showing affected tree locations