

Assessment of Arboricultural Effects

Tawariki Street, Grey Lynn Drop Shaft Site



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1. EXECUTIVE SUMMARY

- 1.1 GreensceneNZ Limited has been commissioned by Watercare Services Limited (Watercare) to prepare this arboricultural report relating to the construction of a proposed wastewater interceptor from Western Springs Park, Western Springs to Tawariki Street, Grey Lynn (Grey Lynn Tunnel).
- 1.2 Works associated with the Grey Lynn Tunnel also involve the construction, operation and maintenance of two shafts and associated structures at the eastern end of Tawariki Street, Grey Lynn. The majority of the above ground construction works will take place at 44, 46 and 48 Tawariki Street (Tawariki Street Shaft Site), as well as works also taking place within the adjacent road reserve at the eastern end of Tawariki Street and within a small area of St Paul's College land (bordering the end of Tawariki Street).
- 1.3 To facilitate the construction of the two shafts and associated structures at the eastern end of Tawariki Street, there is a requirement to remove 18 single trees/groups of trees growing either within or immediately adjacent to the property boundaries of No.44, 46 and 48 Tawariki Street and St Pauls College. None of these trees are protected by relevant rules in the Auckland Unitary Plan Operative in Part (AUP(OP)) and consent is not required for their removal.
- 1.4 There are also trees growing in close proximity to the proposed works that are to be retained. These trees are not protected by the relevant rules under the Auckland Unitary Plan Operative in Part (AUP (OP)) and no consent is required to work in proximity to the trees. Nevertheless, this report recommends best-practical tree protection methodology be implemented in order to ensure that there are no long-term health and safety issues relating to the identified trees once the proposed works have been completed.

Recommendations

- 1.5 In relation to the Grey Lynn Tunnel, the following specific best-practical tree protection recommendations are made:
 - (a) All arboricultural works associated with the Tawariki Street Drop Shaft Site shall be carried out in accordance with the Arboricultural Assessment report by GreensceneNZ Limited dated 9th November 2018 submitted with the application.
 - (b) Prior to works proceeding, Landowner Consent/approval shall be obtained from the legal tree owners if an assessment prior to works commencing identifies that the works may impact a tree/group of trees.
 - (c) The consent holder shall employ a suitably experienced arborist (appointed arborist) to monitor, direct and supervise all works that may affect all trees that have been identified in the Arboricultural Assessment report as being 'retained'.
 - (d) Prior to works commencing, a pre-commencement meeting between the consent holder, the project manager/site supervisor and the consent holder's appointed arborist shall be held on site. This meeting shall discuss the proposed works, how they are to be undertaken, all relevant conditions of consent as they relate to trees, tree protection methodologies, as well as protective fencing installation and maintenance requirements.

- (e) The consent holder shall ensure that all contractors, sub-contractors and work site supervisory staff who are carrying out works covered by this consent are advised of all relevant conditions of consent as they relate to trees.
- (f) A copy of the Tree Protection Methodology as outlined in the Arboricultural Assessment report shall be available at all times on the work site.

2. INTRODUCTION

- 2.1 Watercare is the water and wastewater service provider for Auckland. Watercare is proposing to construct the Grey Lynn Tunnel, a wastewater interceptor from Tawariki Street, Grey Lynn to Western Springs Reserve. The Grey Lynn Tunnel will connect to the Central Interceptor at Western Springs.
- 2.2 This report and assessment is submitted to accompany an application for resource consents and a Notice of Requirement (NoR) by Watercare for the construction, operation and maintenance of the Grey Lynn Tunnel.

Project Overview

2.3 The Grey Lynn Tunnel involves the elements as shown in the drawings and outlined in the reports which form part of the application.

Grey Lynn Tunnel

(a) The Grey Lynn Tunnel involves the construction, operation and maintenance of a 1.6km gravity tunnel from Western Springs to Tawariki Street, Grey Lynn with a 4.5m internal diameter, at an approximate depth of between 20 to 60m below ground surface, depending on local topography. The tunnel will be constructed northwards from Western Springs using a Tunnel Boring Machine (TBM). The Grey Lynn Tunnel will connect to the Central Interceptor at Western Springs via the Western Springs shaft site.

Tawariki Street Shaft Site

(a) The Grey Lynn Tunnel also involves the construction, operation and maintenance of two shafts and associated structures at the Tawariki Street Shaft Site.

The Tawariki Street Shaft Site will be located at 44-48 Tawariki Street, where the majority of the construction works will take place. Construction works will also take place within the road reserve at the eastern end of Tawariki Street and a small area of school land (St Paul's College) bordering the end of Tawariki Street (approximately 150m2).

The Tawariki Street Shaft Site will involve the following components:

Main Shaft

- A 25m deep shaft, with an internal diameter of approximately 10.8m, to drop flow from the existing sewers into the Grey Lynn Tunnel;
- Diversion of the Tawariki Local Sewer to a chamber to the north of the shaft. This chamber will be approximately 12m long, 5m wide and 5m deep below ground, and will connect to the shaft via a trenched sewer;

- Diversion of the Orakei Main Sewer to a chamber to the south of the shaft. This chamber will be approximately 10m long, 5m wide and 11m deep below ground;
- (iv) Construction of a stub pipe on the western edge of the shaft to enable future connections (that are not part of this proposal) from the Combined Sewer Overflows (CSO) network;
- (v) Construction of a grit trap within the property at 48 Tawariki Street to replace the existing grit trap located within the Tawariki Street road reserve. The replacement grit trap will be approximately 16m long, 5m wide and 13m deep below ground;
- (vi) Permanent retaining of the bank at the end of Tawariki Street to enable the construction of the chamber for the Orakei Main Sewer. The area of the bank requiring retaining will be approximately 44m long, 3m wide and 2m high; and
- (vii) An above ground plant and ventilation building that is approximately 14m long, 6m wide and 4m high. An air vent in a form of a stack will be incorporated into the plant and ventilation building and discharge air vertically via a roof vent. The vent stack will be designed with a flange to allow future extension of up to 8m in total height and approximately 1m in diameter in the unexpected event of odour issues.

Tawariki Connection Sewer Shaft – Secondary Shaft A secondary shaft will be constructed at the Tawariki Street Shaft Site to enable the connection of future sewers (that are not part of this proposal) from the CSO network. This will involve the following components:

- (i) A 25m deep drop shaft with an internal diameter of approximately 10.2m; and
- (ii) A sewer pipe constructed by pipe-jacking to connect the secondary shaft to the main shaft.
- 2.4 The Grey Lynn Tunnel represents a key component for the upgrading and reorganisation of Auckland's metropolitan wastewater network, as it will:
 - (a) increase the capacity of the metropolitan wastewater network, thereby supporting the intensification of the Auckland urban area;
 - (b) assist in reducing the frequency of storm-related overflow events from the combined wastewater / storm water network;
 - (c) improve network reliability and enable future upgrades and improvements to the network.

General Comment

- 2.5 This report has been compiled with reference to Plan No.2012917.100 prepared by Jacobs AECOM on behalf of Watercare and provided to *GreensceneNZ Limited* for the purpose of undertaking an arboricultural assessment of the proposed works. The general location of the works is outlined in Section 2 Figure 1 of this report. The proposed site works layout is outlined in Section 2 Figure 2 of this report.
- 2.6 This report provides information relating to the arboricultural 'characteristics' of the surrounding area and identifies trees located within the Tawariki Street Shaft Site and within the western aspect of St Pauls College, Grey Lynn that may be affected by the proposed works associated with the Grey Lynn Tunnel. This report provides details relating to:
 - Information relating to all trees that may be impacted by the proposed works;
 - Reference to the relevant statutory rules;
 - Recommendations that aim to minimise the impact the proposed works may have on trees that have been identified to be retained growing adjacent to the proposed works (this being the hedgerow growing within the College grounds whose canopies overhang the rear yards of the residential sites. The hedgerow is recommended for retention, if possible, due to visual screening purposes)
 - Street trees that may require canopy lifting over the carriageway. Note that Council Parks Department are to undertake this work as standard tree maintenance practices
- 2.7 The purpose of this report is to provide an assessment of the potential impact that the installation of the tunnel drop shafts and associated infrastructure may have on privately owned trees located within the vicinity of the proposed works at the Tawariki Street Shaft Site.
- 2.8 In order to facilitate the above works, it has been assessed that there is a requirement to either remove or work within the root zone of 18 single/groups of trees that are growing either within or immediately adjacent to the work site. None of the trees proposed to be removed or that are to be retained and have works undertaken within their root zones are protected under the relevant AUP rules.
- 2.9 As identified above, there are a number of non-protected trees growing within close proximity to the proposed works site that may be affected by the construction aspect of the proposed works but whose removal is not required in order to facilitate the works. Appropriate consideration should be given to these trees to ensure that no long-term arboricultural health and safety issues arise as a result of the proposed works.
- 2.10 Details pertaining to the potentially affected trees and their growing locations are provided within the tree details tables contained in the appendices of this report.
- 2.11 The proposed site works layout is outlined in Figure 1 below.



Figure 1: Aerial view of the proposed site works layout

3. TREE ASSESSMENTS

- 3.1 Works associated with the Tawariki Street Shaft Site will necessitate excavations for the construction of two drop shafts, three underground wastewater control chambers, an above ground plant room (to house power supplies, controls for penstocks and an air vent), a below ground grit chamber and an associated wastewater piping network.
- 3.2 The proposed works are located within the root zone of a number of trees growing within and immediately adjacent to Nos.44, 46, and 48 Tawariki Street, Grey Lynn and within the grounds of St Paul's College, Grey Lynn.
- 3.3 There are 18 single specimens/groups of trees that are growing either within or immediately adjacent to the Tawariki Street Shaft Site that have been identified as needing to be removed, or retained and have works undertaken within their root zones, in order for the proposed works to be undertaken. For a visual indication of the growing locations of the subject trees, please refer to the appendices of this report.
- 3.4 None of the identified trees/groups of trees are protected under the relevant AUP(OP) rules and therefore they can be removed or have works undertaken within their root zones as a permitted activity.
- 3.5 The relevant specifications in relation to the identified trees are contained within the tree details tables in the appendices of this report.
- 3.6 As the physical boundary lines of properties were not marked out on site during the assessment, in some cases accurately determining tree ownership of specimens growing along the perceived site boundary lines was difficult. This issue relates to the acmena hedge line growing at the rear of Nos.44, 46 and 48 Tawariki Street (these being the only specimens as part of the '18 trees/groups of trees' that are to be retained and have works undertaken within their root zones). Once surveying of the work site has occurred, then

conformation as to whether the hedgerow can be successfully retained or not will be confirmed.

- 3.7 If the hedgerow requires removal, then, as the hedgerow is not protected under the AUP(OP) rules, Watercare will work with the tree owner to manage the effective resolution of this issue. If the hedgerow is to be retained, appropriate tree protection methodologies should be employed to ensure their long-term viability is not compromised.
- 3.8 Protection measures to support the effective retention of the hedgerow are outlined in Section 3 Tree Protection Methodology of this report.
- 3.9 In addition, to gain access to the Tawariki Street Shaft Site, associated heavy haulage vehicles will have to use Tawariki Street, Moira Road and Mokau Street. Whilst there are no vehicular/tree conflicts on Tawariki Street and Moira Road, on Mokau Street there are three pohutukawa street trees located in the berm that have low hanging branches. Canopy lifting will be required to provide unimpeded access to high sided vehicles. As this is considered to be a 'tree maintenance' issue, the Auckland Council Parks Department will be responsible for attending to this matter. Given that Council will be undertaking the required tree pruning works within the context of their global tree management consent, no further comment in respect to this issue is provided in this report.

AUP(OP) PROVISIONS

3.10 The trees identified as being potentially impacted by the proposed works (by either removal or works within their root zone) are not protected under the relevant rules of the AUP(OP) The proposed works have therefore been assessed as a permitted activity (i.e. resource consent is not required)

Arboricultural Planning Assessment: Nos.44, 46, and 48 Tawariki Street, Grey Lynn

Zoning:	Residential – Mixed Housing Suburban Zone
Designation:	Nil (as they relate to trees)
Rules:	The proposed tree removals are a Permitted Activity
	There are no rules protecting any vegetation located within the properties
	of Nos.44, 46 and 48 Tawariki Street

Arboricultural Planning Assessment: St Pauls College (183 Richmond Road), Grey Lynn

Zoning:	Special Purpose –School Zone
Designation:	Nil (as they relate to trees)
Rules:	The proposed tree removals and works within the root zone are a Permitted Activity
	There are no rules protecting any vegetation growing with the St Pauls College grounds that may be affected by the proposed works

Tree Protection Methodology

3.11 Trees that do not require removal, but have the potential to be affected by the proposed works at the Tawariki Street Shaft Site and are worthy of retention, shall be protected from damage for the duration of the works. This is to be achieved by compliance with the following best-practical specific tree protection methodologies:

General

- 1.1 A suitably experienced arborist is to be employed by Watercare (appointed arborist) to monitor, supervise and direct all works within the root zone of trees that are to be retained (retained trees) for the duration of the proposed works.
- 1.2 The appointed arborist shall implement the Site Specific Tree Protection Methodology outlined below, and provide feedback and guidance to the contractors in respect to construction methodologies and machinery requirements in relation to all works within the root zone of the retained trees.
- 1.3 Prior to works commencing, a meeting shall be arranged by Watercare so that the Site Specific Tree Protection Methodology and conditions of consent are explained by the appointed arborist to all contractors, sub-contractors and work site supervisory staff that are carrying out any works within the root zones of the retained trees. All aspects of the works that may affect the canopy and/or root zone of the retained trees shall be discussed and methodologies agreed with the appointed arborist.
- 1.4 The following Site Specific Tree Protection Methodology shall be available at all times on the work site.

Site Specific Tree Protection Methodology: Root Zone

- 1.5 'Root Zone' (RZ) is defined as the "circular area of ground around the trunk of a protected tree, the radius of which is the greatest distance between the trunk and the outer edge of the canopy. For columnar crown species, the protected root zone is half the height of the tree." There are no protected trees located within the work zone at the Tawariki Street Shaft Site, however retained trees shall be protected so as to ensure that their long-term health, safety and/or longevity is not compromised.
- 1.6 Prior to any works commencing on site, the appointed arborist shall determine the placement of suitable protective fencing (i.e. 1.8 metre high pole/wire mesh fencing material with ground anchor spikes or accepted alternative) at the extent, where practicable, of the RZ of the retained trees. The protective fencing shall remain in place for the duration of the works. The appointed arborist shall monitor the condition of the protective fencing for the duration of the works.
- 1.7 Additional protection measures may be necessary where placement of the protective fencing is impractical and/or the RZ extends past site perimeter fencing. This may include appropriate ground protection measures. Provision should also be made, where practicable, to protect the trunk and low branches of the retained trees from mechanical damage, including stem and branch wraps.
- 1.8 Within the RZ of the retained trees, the following provisions shall apply:
 - a) No site huts, temporary structures, machinery, fuel, materials, spoil or equipment should be stored or temporarily placed unless they can be kept wholly within the bounds of an existing load bearing surface.
 - b) No adjustments to the tree protection fencing should occur without prior consultation and agreement from the appointed arborist.
 - c) Only those works specified in consent conditions and shown on the approved plans should be carried out and only under the direct supervision of the appointed arborist to enable the continued health and long-term viability of the retained trees.
- 1.9 All excavations within the RZ of retained trees shall be carried out under the direct supervision of the appointed arborist.
- 1.10 Root remediation associated with the works within the RZ of retained trees shall be undertaken in the following manner:
 - a) All roots over 50mm in diameter should be retained where possible. Where root retention is unfeasible, approval for the removal of such roots must be obtained from the appointed arborist prior to their removal being undertaken;

- b) All root pruning is to be undertaken either by the appointed arborist or under the direction of the appointed arborist in accordance with correct arboricultural practices.
- c) Records of all root pruning, including size of roots removed and photographs, must be maintained by the appointed arborist and supplied to Auckland Council's Resource Consents Monitoring Team Leader upon request.
- 1.11 Excavations within the RZ of retained trees shall be lined with a suitable plastic medium prior to any concrete pour. The plastic is to remain in place as a permanent root barrier.
- 1.12 No washing of equipment or machinery shall be undertaken within the permeable RZ of retained trees. Special attention shall be paid to concrete products and petrol/diesel operated machinery so as to not contaminate the soil within the RZ of retained trees.

Site Specific Tree Protection Methodology: Tree Trimming / Removal

- 1.13 All pruning of retained trees must be undertaken either by the appointed arborist or under the direction of the appointed arborist in accordance with correct arboricultural practices.
- 1.14 All tree removals must ensure that adjacent vegetation/trees that are to be retained are not damaged during the tree removal process.

4. SUMMARY AND CONCLUSIONS

- 4.1 The proposed construction works requires the removal and/or works within the root zone of 18 trees/groups of trees growing within and immediately adjacent to the Tawariki Street Shaft Site and within the grounds of St Paul's College, Grey Lynn. These trees are not identified as protected within the AUP(OP).
- 4.2 There are trees adjacent to the Tawariki Street Shaft Site, which will potentially have works occurring within their root zones. These trees are not protected under the relevant AUP(OP) rules. Watercare will work with the tree owner in relation to the desired outcome for successful retention or effective mitigation.

APPENDIX A – TREE DETAILS

Tree No.	Species	Health & Form	Height (m)	Girth (mm)	C/S PRZ (m)	Comments & Proposed works
1	acmena (Syzygium smithii)	Fair	2.5	200	1.9	Fair specimen. Growing in front yard of site. Private tree. Remove
2	ficus (ficus benjamina)	Poor	5	350	2.6	Listed as a pest plant. Poor specimen. Growing in front yard of site. Private tree. Remove
3	woolly nighteshade (Solanum mauritianum)	Fair	3	200	2.2	Listed as a National Plant Pest. Fair specimen. Growing in rear yard of site. Private tree. Remove

Table 1: Tree Details - No.44 Tawariki Street, Grey Lynn



Figure 1: Tree Location Plan - No.44 Tawariki Street

Tree No.	Species	Health & Form	Height (m)	Girth (mm)	C/S PRZ(m)	Comments & Proposed works
1	lemon (Citrus limon)	Fair	2	200	1.4	Fair specimen. Growing in front yard of site. Private tree. Remove
2	lemon (Citrus limon)	Fair	3	200	1.8	Fair specimen. Growing in rear yard of site. Private tree. Remove
3	ponga x 3 (<i>Cyathea</i> <i>dealbata)</i>	Fair	2 – 3.5	200	3	Fair specimen. Growing in rear yard of site. Private tree. Remove

Table 2: Tree Detail - No.46 Tawariki Street, Grey Lynn



Figure 2: Tree Location Plan - No.46 Tawariki Street

Tree No.	Species	Health & Form	Height (m)	Girth (mm)	C/S PRZ(m)	Comments & Proposed works
1	magnolia (magnolia denudate)	Fair	2	200	2.5	Fair specimen. Growing in front yard of site. Private tree. Remove
2	Italian cypress (Cupressus sempervirens)	Fair	6	300	1.5	Fair specimen. Growing near southeastern corner of dwelling. Private tree. Remove
3	olive (olea europaea)	Fair	3.5	400	3.5	Fair specimen. Growing on western side of dwelling. Private tree. Remove
4	pohutukawa (<i>metrosideros</i> <i>excelsa)</i>	Fair	3.5	200	2.7	Fair specimen. Growing in rear yard of site. Private tree. Remove
5	wisteria (wisteria disambiguation)	Fair	3	200	6	Fair specimen. Growing near northwestern corner of dwelling. Private tree. Remove

Table 3: Tree Detail - No.48 Tawariki Street, Grey Lynn



Figure 3: Tree Location Plan - No.48 Tawariki Street

Tree No.	Species	Health & Form	Height (m)	Girth (mm)	C/S PRZ(m)	Comments & Proposed works
1	olive (olea europaea)	Fair	3.5	400	3.5	Fair specimen. Growing adjacent to public walkway within College grounds. Private tree. Remove
2	phoenix palm (Phoenix canariensis)	Fair	3.5	1300	3.5	Fair specimen. Growing on bank within College grounds. Private palm. Remove.
3	poplar x 5 (Populous alba)	Fair	11- 13.5	400	14 (as a group)	Fair specimens. Growing on bank within College grounds. Private trees. Remove.
4	wattle x 7 +(<i>Acacia spp</i>)	Fair	7 - 13	200 - 400	4 - 12	Listed as a Pest Plant Surveillance – Whole Region. Fair specimens. Growing on bank within College grounds. Private trees. Remove.
5	wattle x 5 +(<i>Acacia spp</i>)	Fair	7 - 13	200 - 400	4 - 12	Listed as a Pest Plant Surveillance – Whole Region. Fair specimens. Growing on bank within College grounds. Private trees. Remove.
6	wattle x 4 (<i>Acacia spp</i>)	Fair	7 - 13	200 - 400	4 - 12	Listed as a Pest Plant Surveillance – Whole Region. Fair specimens. Growing on bank within College grounds. Private trees. Remove.
7	acmena (Syzygium smithii) hedge row	Fair	6	350	3.5	Fair specimens. Formed as a hedgerow. Growing within College grounds. Overhanging rear yard of residential sites. Retain and protect

Table 4:	Tree Detail -	St Pauls	College.	Grev L	.vnn
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Figure 4: Tree Location Plan - St Pauls College

APPENDIX B - PHOTOS



Photo 1: Depicts a row of acmena trees behind No.46 Tawariki Street



Photo 2: Depicts weed species located within the College grounds



Photo 3: Depicts poplar trees to the left, a phoenix palm in the centre and a redwood tree (not impacted by the works) to the right



Photo 4: Depicts a ficus tree



Photo 5: Depicts ponga trees



Photo 6: Depicts a row of acmena trees