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ARBORICULTURAL & ENVIRONMENTAL CONSULTANTS

Tree Management Plan

Project: Newmarket Level Crossing – Cowie Street,
Parnell

Prepared For: Opus International Consultants

By: Matthew Paul

Date: 4/09/17

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1.0 Scope of Tree Management Plan

The following tree management plan provides detail on the mitigation measures proposed to address adverse effects on specimen and valued trees potentially affected by construction of the Newmarket Level Crossing Project.

This project includes the construction of a new roadway and bridge to connect Cowie Street and Laxon Terrace, Newmarket. The existing exit and entry connecting Sarawia Street and Laxon Terrace will be removed following the construction of the new connection.

Construction works affecting (or potentially) affecting trees within the works footprint are identified on a plan and the appropriate management methods (in conjunction with relevant tree protection measures) detailed.

The appropriate management methodologies relating to the various tree management issues are outlined in Stages (1 – 5)

2.0 Identification of affected trees to be removed or retained and protected

With regards to the construction of the new roadway, bridge and associated infrastructure, all vegetation not specifically identified for removal (as per the schedule in section 3 below), is considered vegetation of value and will be retained and protected. It is acknowledged that in a densely vegetated area such as within and adjacent to Newmarket Park, works may be required to occur within the dripline or rootzone area of valued vegetation to be retained and protected.

Typically these works include tracking of machinery and excavations, earthworks and construction works in order to enable the construction of the new infrastructure.

In accordance with the details of the tree schedule and tree management plan - Sections 3, 4 of this report, these works will be accurately identified and appropriate mitigation measures addressed prior to commencement of site works.

Specific tree protection measures appropriate to the scale of works on site are detailed in Section 5 of this report.

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3.0 Plan Reference, Construction Measures & Tree Schedule

Affected trees are identified/ numbered on a suite of plans prepared by Opus International Consultants

- Auckland Transport New Market Level Crossing Cowie Street – Laxon Terrace Timber Boardwalk Plan and Longsection.
- Auckland Transport New Market Level Crossing Cowie Street – Timber Board Walkpile Setout Plan
- Auckland Transport New Market Level Crossing Cowie Street – General Arrangement Plan
- Auckland Transport New Market Level Crossing – Prelim Design Plan – Bulk Earthworks
- Auckland Transport New Market Level Crossing – Cross Section – Cowie Street and Boardwalk Poplar Tree Retained

3.1 Works to be undertaken on Cowie Street affecting Trees

3.1.1 Works to be undertaken within 9 Cowie Street.

. The main activities to be undertaken that would affect trees are outlined below:

- Removal of private trees along with works within the root zone of trees to be retained that are growing within 9 Cowie Street
- Construction of new Roadway
- Construction of new boardwalk around retained Poplar tree
- Introduction of hard surfaces to facilitate pedestrian integration

3.1.2 Landscaping Works

Replacement planting is proposed within 9 Cowie Street as part of the overall project. Additional planting within 9 Cowie Street, adjacent to the new roadway and bridge is proposed. This would include the specimen trees to be planted as per the Landscape Plan provided by Opus International Consultants dated August 2017.

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3.2 Construction Methodologies for Activities within 9 Cowie Street

3.2.1 Tree Removal Works

- All tree removal works are to be undertaken in consultation with the client's works arborist
- All trees must be approved and clearly marked prior to works commencing
- All works are to be undertaken by a suitably qualified works arborist approved by the works arborist

3.2.1 Construction of Roadway

The following apply to the construction of the roadway adjacent to and within 9 Cowie Street:

- A pre-commencement meeting is to be held on site prior to both enabling works and construction works
- No storage of machinery is to be undertaken within the dripline of protected trees without prior works arborist approval
- The existing hard surface is to be retained until it is no longer practical to do so. All physical works are to be undertaken in accordance with the Earthworks plan provided by Opus International Consultants dated XXXX. This plan indicates no requirement for excavation within the root zone of the Poplar tree to be retained. If any variation is required, this variation must be discussed and approved by the works arborist prior to implementation.
- Protective fencing is to be erected as soon as practical. This fencing is to consist of Rent-o-style steel mesh fence panels at a minimum of 1.8 metres in height. Protective fencing is to be secured in place to prevent movement and relocation by contractors. Any movement of protective fencing during construction is to be approved by the works arborist.
- All kerb line works are to be undertaken in accordance with the General Arrangement Plan (L052-L057, 01/09/2017) prepared by Opus International Consultants.

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- There is to be no fill placed within 0.5 metres of the base of the Poplar tree. A timber retaining wall, consisting of timber piles at no less than 1.0 metre centre, is to be installed as near to the new roadway as possible.
- All surfaces are to be constructed 'on or above the existing grade'.
- Following the removal of the existing hard concrete, no excavation is to be undertaken below the existing base course level.
- A geo-textile layer is to be installed on the existing ground at which point metal fill can be placed above to achieve the required levels.
- All washings derived from concrete are to be managed with a sucker truck. No concrete works are to be washed into areas that are either surrounded by protective fencing or are classified as open ground within the root zone of those trees to be retained.

3.2.2 Construction of New Boardwalk

The following applies to the new boardwalk within 9 Cowie Street:

- The exact proposed alignment of the new boardwalk is to be surveyed and sited in advance of the proposed works date. The exact alignment and the extent of the proposed activities proposed in relation to the construction of the new boardwalk are to be discussed and approved prior to implementation.
- All pile locations are to be probed or pot-holed prior to construction. If roots in excess of 40mm in diameter are encountered, these are to be retained and worked around where practical. Roots in excess of this diameter are to be retained unless the works arborist confirms their severance would not adversely impact the tree.
- Where practical, all pile locations in close proximity to the Poplar tree are to be hydro-excavated. Hand-digging may also be suitable in some circumstances provided approval is sought from the works arborist. All pile locations are to be inspected with works supervised by the works arborist.
- All reinstatement works are to replicate the existing environment as best as possible. No filling around the base of the Poplar tree, beyond that of the

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existing environment, is to be undertaken. Any additional works are to be approved by the works arborist.

3.2.3 Landscape Works

The following applies to landscape works within and adjacent to 9 Cowie Street:

- All approved landscape works, are to be implemented as per the detail of the Landscape Plan provided by Opus International Consultants (September 2017).
- All works are to be implemented in accordance with best practice. The locations of all replanting and hard landscape surfaces are to be approved prior to implementation. When works are to be undertaken within the root zone or in the vicinity of trees to be retained, the works must be overseen by the works arborist. Where applicable, excavations would require arboricultural supervision in these instances.
- Any tree removal and replanting works proposed as part of the consultation with CSRA , within Road Reserve, will require written Council Parks approval and would be subject to an additional Resource Consent process. These works are outside of that which was originally proposed as part of the original resource consent.

3.2.4 Schedule of Affected Trees – Cowie Street

Trees to be removed highlighted in red.

Trees to be retained are highlighted in green.

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Tree No	Botanical Name	Common Name	Age Class	Designation Y/ N	Condition	Comments	Activity Proposed	Protection/ Mitigation Measures
1	<i>Populus deltoides</i>	Cottonwood Poplar	Mature	Y	Good	Canopy overhangs works area	Works within the dripline. Construction of boardwalk, new road and bridge abutment	<ul style="list-style-type: none"> Protective fencing Arboricultural supervision of works Retain and protect all roots >40mm diameter
2	<i>Vitex lucens</i>	Puriri	Mature	N	Good	Stands adjacent to main works area within 9 Cowie Street	No physical works Staging and works area storage	<ul style="list-style-type: none"> Protective fencing Storage areas approved and always on hard surface
3	<i>Alectryon excelsus</i>	Titoki	Semi - Mature	Y	Good	Standing adjacent to existing carpark within 9 Cowie Street	Works within the rootzone to store materials	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
4	<i>Alectryon excelsus</i>	Titoki	Semi - Mature	Y	Good	Standing adjacent to existing carpark within 9 Cowie Street	Works within the rootzone to store materials	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
5	<i>Alectryon excelsus</i>	Titoki	Semi - Mature	Y	Good	Standing adjacent to existing carpark	Works within the rootzone to store	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by

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Tree No	Botanical Name	Common Name	Age Class	Designation Y/ N	Condition	Comments	Activity Proposed	Protection/ Mitigation Measures
						within 9 Cowie Street	materials	qualified contractor
6	<i>Alectryon excelsus</i>	Titoki	Semi - Mature	Y	Good	Standing adjacent to existing carpark within 9 Cowie Street	Removal to facilitate new roadway	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
7	<i>Alectryon excelsus</i>	Titoki	Semi - Mature	Y	Good	Standing adjacent to existing carpark within 9 Cowie Street	Removal to facilitate new roadway	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
8	<i>Podocarpus totara</i>	Totara	Semi - Mature	Y	Good	Stands within the planted area at the entrance to 9 Cowie Street	Removal to facilitate roadway	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
9	<i>Corynocarpus laevigatus</i> (grouping of 17 small trees)	Karaka	Young	Y	Good	Stands near Totara	Remove to facilitate boardwalk and associated construction	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor
10	<i>Magnolia grandiflora</i>	Bull Bay	Semi-mature	Y	Good	Near Totara in front of berm	Works within the dripline to facilitate new boardwalk and roadway	<ul style="list-style-type: none"> Protective fencing Arboricultural supervision of works Retain and protect all roots >40mm diameter
11	<i>Quercus</i>	Pin Oak	Mature	Y	Good	Growing within 6	Works within	<ul style="list-style-type: none"> Protective fencing

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Tree No	Botanical Name	Common Name	Age Class	Designation Y/ N	Condition	Comments	Activity Proposed	Protection/ Mitigation Measures
	<i>palustris</i>					Cowie Street.	the dripline to facilitate new boardwalk and associated works	<ul style="list-style-type: none"> Arboricultural supervision of works Retain and protect all roots >40mm diameter
12	<i>Platanus x acerifolia</i>	London Plane	Mature	Y	Good	Growing within 6 Cowie Street.	Works within the dripline to facilitate new boardwalk and associated works	<ul style="list-style-type: none"> Protective fencing Arboricultural supervision of works Retain and protect all roots >40mm diameter
13	<i>Corynocarpus laevigatus</i>	Karaka	Semi-mature	Y	Good	Stands near Totara	Remove to facilitate boardwalk and associated construction	<ul style="list-style-type: none"> Pre-commencement meeting Works undertaken by qualified contractor

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3.3 Trees affected by works that are growing within and adjacent to Newmarket Park

In order to construct the new roadway, a number of trees are to be removed in order to facilitate the works. These trees are those outlined as part of the approved Resource Consent and are outlined in Item 3.3.4 of this section.

3.3.1 Construction of Road way

- A pre-commencement meeting is to be held on site prior to both enabling works and construction works
- No storage of machinery is to be undertaken within the dripline of protected trees without prior works arborist approval
- All storage areas adjacent to Newmarket Park are to be marked and approved by the appointed works arborist prior to commencement. Any storage areas are to be adequately fenced in order to protect vegetation proposed for retention as part of the project.
- Protective fencing is to be erected as soon as practical. This fencing is to consist of Rent-o-style steel mesh fence panels at a minimum of 1.8 metres in height. Protective fencing is to be secured in place to prevent movement and relocation by contractors. Following its installation, any movement of protective fencing during construction is to be approved by the works arborist.
- All kerb line works are to be undertaken in accordance with the General Arrangement Plan (L052 – L057) prepared by Opus International Consultants.
- All washings derived from concrete are to be managed with a sucker truck. No concrete works are to be washed into areas that are either surrounded by protective fencing or are classified as open ground within the root zone of those trees to be retained.

3.3.2 Tree Removal Works

- All tree removals proposed within, and adjacent to, the new roadway are to be clearly marked and approved by the works arborist at a meeting to be held prior to tree removal. At this meeting shall be:

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- A client's representative
- The works arborist
- The contractor (physical works)
- The contractor (tree removal)

3.3.3 Construction of new pathway connection

As part of the roadway network connecting with Laxon Terrace, a new connection and associated pathways will be required within Newmarket Park. It is important that works within the park are kept to minimum in order to lessen the potential for any adverse impacts.

- All trees to be retained are to be fenced appropriately with no material storage to be undertaken outside of existing hard surface.
- Where practical, all hard surfaces including the existing pathways are to remain in place for the duration of the works. Hard surface should only be removed at which point renewal or construction works are to be undertaken.
- It is possible reduction pruning or lifting of trees to be retained (especially in the case of the retained Pin Oak trees to the south of the existing pathway). All pruning works are to be undertaken by a suitably qualified arborist under the supervision of the works arborist.
- All washings derived from concrete are to be managed with a sucker truck. No concrete works are to be washed into areas that are either surrounded by protective fencing or are classified as open ground within the root zone of those trees to be retained.

3.3.4 Landscaping Works

Replacement planting is proposed within Newmarket Park and along Laxon Terrace as part of the overall project. All new specimen trees and additional plantings are to be planted as per the Landscape Plan provided by Opus International Consultants (September 2017).

3.3.5 Schedule of Affected Trees – Newmarket Park/Laxon Terrace

Trees to be removed highlighted in red. Trees to be retained are highlighted in green.

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Tree No	Botanical Name	Common Name	Age Class	Designation Y/ N	Condition	Comments	Activity Proposed	Protection/ Mitigation Measures
15	<i>Acacia melanoxylon</i>	Tasmanian Blackwood	Mature	Y	Typical	Growing on railway land	Remove - Construction of new bridge abutment and roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
16	<i>Myoporum laetum</i> x4	Ngaio	Mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new bridge abutment and roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
17	<i>Metrosideros excelsa</i>	Pohutukawa	Semi - Mature	Y	Good	Stands adjacent to new roadway (Laxon Terrace)	Works within the rootzone to construct roadway	<ul style="list-style-type: none"> • Protective fencing • Arboricultural supervision of works • Retain and protect all roots >40mm diameter
18	<i>Leptospermum scoparium</i>	Manuka	Semi-mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new bridge abutment and roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
19	<i>Leptospermum scoparium</i>	Manuka	Semi-mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new bridge abutment	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor

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Tree No	Botanical Name	Common Name	Age Class	Designation Y/ N	Condition	Comments	Activity Proposed	Protection/ Mitigation Measures
							and roadway	
20	<i>Coprosma repens</i> x2	Taupata	Semi - Mature	Y	Good	Stand within footprint of roadway	Remove - Removal to facilitate new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
21	<i>Coprosma repens</i> x2	Taupata	Semi - Mature	Y	Good	Stand within footprint of roadway	Remove to facilitate new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
22	<i>Myoporum laetum</i>	Ngaio	Mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
23	<i>Metrosideros excelsa</i>	Pohutukawa	Semi - Mature	Y	Good	Stands adjacent to new roadway (Laxon Terrace)	Works within the rootzone to construct roadway	<ul style="list-style-type: none"> • Protective fencing • Arboricultural supervision of works • Retain and protect all roots >40mm diameter
24	<i>Metrosideros excelsa</i>	Pohutukawa	Semi - Mature	Y	Good	Stands adjacent to new roadway (Laxon Terrace)	Works within the rootzone to construct roadway	<ul style="list-style-type: none"> • Protective fencing • Arboricultural supervision of works • Retain and protect all roots >40mm diameter
25	<i>Coprosma repens</i> x2		Semi - Mature	Y	Good	Stand within footprint of roadway	Remove - facilitate new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor

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26	<i>Coprosma repens</i> x2	Taupata	Semi - Mature	Y	Good	Stand within footprint of roadway	Remove -to facilitate new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
27	<i>Coprosma repens</i> x2	Taupata	Semi - Mature	Y	Good	Stand within footprint of roadway	Remove - facilitate new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
28-37	<i>Myoporum laetum</i> x9	Ngaio	Mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
38	<i>Pseudopanax lessonii</i>	Hopara	Semi-mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
39	<i>Cordyline australis</i>	Cabbage Tree	Semi-Mature	Y	Good	Stands within footprint of roadway	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
40	<i>Metrosideros excelsa</i>	Pohutukawa	Semi - Mature	Y	Good	Edge of railway land within roadway footprint	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
41	<i>Metrosideros excelsa</i>	Pohutukawa	Semi - Mature	Y	Good	Edge of railway land within roadway footprint	Remove - Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor

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42	<i>Cordyline australis</i>	Cabbage Tree	Semi-Mature	Y	Good	Edge of roadway/ pathway cut	Remove- Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
43	<i>Quercus palustris</i>	Pin Oak	Semi-Mature	Y	Good	Edge of roadway/ pathway cut	Remove Construction of new roadway	<ul style="list-style-type: none"> • Pre-commencement meeting • Works undertaken by qualified contractor
44	<i>Quercus palustris</i> x2	Pin Oak	Semi-Mature	Y	Good	Edge of roadway/ pathway cut	Works within the rootzone to construct roadway	<ul style="list-style-type: none"> • Protective fencing • Arboricultural supervision of works • Retain and protect all roots >40mm diameter

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4.0 Tree Management Table	
Tree Management Issue	Tree Management Method
<p>The following aspects of the Newmarket Level Crossing Project (Tree removal within Newmarket Park) have been identified as tree management issues:</p> <ol style="list-style-type: none"> 1. Initial identification of trees to be removed necessary to facilitate construction works 2. Pre-commencement identification of trees to be removed 3. Identification/ set-out of route with respect to areas of adjacent vegetation to be retained and protected; appropriate tree protection measures to be implemented (as per Sections 3, 5) 4. Confirm appropriate tree protection and construction measures for retained vegetation (as per Sections 3, 5) 5. Confirm extent of required pruning 6. Identification of appropriate access routes with respect to retained vegetation 7. Mitigation post-works (e.g. pruning, replanting etc) <p>These aspects shall be managed with the tree management and protection measures outlined on this plan.</p>	<ol style="list-style-type: none"> 1. Prepare affected tree location plan 2. Pre-works commencement meeting. Liaison between site supervisor and works arborist. 'Dazzle' trees to be clear felled. 3. Site supervisor and works arborist to confirm route and vegetation to be retained and protected; implement tree protection measures (Sections 3, 5) 4. Liaison between site supervisor and works arborist. Outcome to be recorded. 5. Liaison between site supervisor/ works arborist and contracting arborists 6. Liaison between site supervisor/ works arborist and contractors. Route to be taped or fenced as appropriate. 7. Works arborist to monitor and sign off
Stages of Tree Management Plan	Stage 1
1. Appointment of site supervisor	

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<p>and works arborist.</p> <ol style="list-style-type: none"> 2. Set up communication methodology between site supervisor and works arborist 3. Agree on issues relating to removal of trees; works within the dripline of retained trees; pruning of trees; clarify any arising issues 4. Agree on timing/ staging of works 5. Monitoring and supervision of works – document all stages (1 – 5) 	<p>Site Supervisor Contact Details Name: TBC Phone No.:</p> <p>Works Arborist Contact Details Name: Matthew Paul, Peers Brown Miller Ltd Phone No.: 021 399 298</p>
<p>Stages 2 – 4 to be addressed at pre-works commencement meeting.</p>	<p>Stages 2 – 4</p> <ul style="list-style-type: none"> • Pre-commencement meeting to discuss tree removal, tree protection measures and staging of works. • Confirmation of extent of tree removal works and location of WSP in relation to retained trees (i.e. any site specific or unforeseen issues such as terrain, engineering/ design issues, additional access zones etc that need to be addressed)
<p>Stage 5; all works to be monitored by works arborist and any issues to be recorded and communicated to site supervisor</p>	<p>Stage 5</p> <ul style="list-style-type: none"> • Implementation of physical works and tree protection measures i.e. tree removal, marking out WSP routes; erection of protective fencing, earthworks within dripline of retained trees etc
<p>All relevant details relating to stages 1 – 5 are logged in a site monitoring and supervision log sheet</p>	<p>Stages 1 – 5</p> <ul style="list-style-type: none"> • Compliance with agreed tree and site management measures shall be monitored on an ongoing basis by the works arborist and logged in accordance with the log sheet as detailed in Section 5 of this TMP

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5.0 General Tree Protection Measures

1. The works arborist shall monitor, direct and supervise all tree removal, site investigation works and works within the dripline of all retained vegetation on site i.e. all vegetation not specifically identified for removal in Section 3.2 of this report and the following plan;
 - General Arrangement Plan (L052-L057, 01/09/2017), Boardwalk Design (L056-L057, 01/09/2017)
2. Prior to works commencing, a meeting shall be arranged so that the trees to be removed are clearly identified and appropriate tree protection measures are explained by the works arborist to all contractors, sub-contractors and work site supervisory staff who are carrying out any works associated with the project.
3. All proposed works, including but not limited to, tree removal, extraction, tracking of machinery, location of temporary storage areas, location of excavations shall be identified to as great a degree of accuracy as possible prior to the commencement of site works. A process for communication between works arborist and contractors shall be discussed and a method for the implementation of the tree management plan identified. Copies of the tree management plan shall be circulated between affected parties.
4. Clearance of vegetation shall be undertaken in such a way as to avoid damage to peripheral vegetation. Areas of vegetation to be retained shall be clearly identified and demarcated prior to the commencement of felling and extraction operations in consultation between the works arborist and tree removal contractors.
5. Removal of vegetation shall be confined to that identified in Section 3.3 & 3.4 (highlighted in red) and numbered as per the following plan;
 - Newmarket Level Crossing Tree Identification Plan
 - Newmarket Level Crossing Tree Removal Plan
6. Temporary access and storage areas are to be identified and delineated prior to the commencement of site works (at the pre-start meeting). All machinery and materials will be confined to agreed areas and the demarcated work areas.
7. Compliance with the recommended tree protection measures shall be monitored by the works arborist and logged in accordance with the appended log sheet (section 6 of this report). The log sheet shall be provided to Council officers at agreed intervals or where required, upon request

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Newmarket Level Crossing Proposed Tree Removal Plan



Auckland Council
The Government of Auckland

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Newmarket Level Crossing Tree Identification Plan



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