

Tree Management Plan for Network Utility Works in the Road Corridor

Management Approach for works on and near trees in road corridors undertaken by Auckland's Network Utility Operators

NOTE: This DRAFT Document has not been adopted by any member of the Auckland Utility Operators Group (AUOG)
This Draft Document is provided without prejudice and is a Working Draft between Auckland Council and the AUOG.



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PREFACE

Preface

The Auckland Council and Auckland's Network Utility Operators ('NUOs) recognise the importance of the amenity and ecological values of the trees located in the road corridors of the Auckland region, and the need to manage works on or near these trees so that these values are appropriately maintained and managed.

Road corridors are vital for the city to function, for safe and efficient passage of people and goods and for the delivery of network utility services. It is therefore essential for the NUOs to undertake works on or near trees in the road corridor in an efficient manner to ensure the continued delivery of critical infrastructure to the Auckland region.

The Council and the Network Utility Operators have developed a management approach for works on or near trees in the road corridor undertaken by Network Utility Operators to maintain repair and upgrade existing network infrastructure and install new infrastructure to support growth and development in Auckland.

This management approach is only for works on or near trees in or overhanging the road corridor undertaken by Network Utility Operators only, and excludes works on any scheduled or notable trees identified in the Unitary Plan.

The Council and the Network Utility Operators recognise different methods and legislative mechanisms available for managing works on or near street trees undertaken by Network Utility Operators.

The management approach adopted by Council and the Network Utility Operators for managing works on or near trees located in the road corridor, where the works are undertaken by Network Utility Operators is based on the Corridor Access Request Process undertaken in accordance with the National Code of Practice for Utility Operators Access to Transport Corridors under the Utilities Access Act 2010.

This management approach recognises the role of Auckland Transport (a Council Controlled Organisation of Auckland Council) as the asset owner of both the road corridor and the trees in the road corridor.

The Council and the Network Utility Operators for Auckland consider that this management approach is the most appropriate method for managing works on or near trees in road corridors, where the works are undertaken by Network Utility Operators to ensure the delivery of critical infrastructure to the Auckland region.

NOTE:

The Corridor Access Requests Process is outlined in Appendix Six of this Document at present.

These provisions will be incorporated into a companion document on the Corridor Access Request Process that is currently being prepared by Auckland Transport in consultation with Auckland Council and the NUO.

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TREE MANAGEMENT PLAN

1.0 Overview of Tree Management Plan

Tree works carried out in accordance with the **Corridor Access Request Process** must be undertaken in accordance with a Tree Management Plan.

This Tree Management Plan sets out the requirements for works undertaken on or near trees located in road corridors by **Network Utility Operators** under the **Corridor Access Request Process**. It is recognised that in the future, a Network Utility Operator may choose to develop a different Tree Management Plan to reflect specific operational requirements.

The Tree Management Plan classifies works occurring on or near **Trees** in the **Road Corridor** into three tiers based on the potential effects on the trees.

The management approach in each tier is differentiated by:

- (i) the level of direction or supervision required by a **Works Arborist** and / or
- (ii) the need for approval by the **Asset Owner** (being Auckland Transport).

Specifically, the management approach for Tiers 1, 2 and 3 is as follows:

Tier 1

Tree works can be undertaken without the supervision of a **Works Arborist**. No **Tree Works Plan** is required to be submitted for **Tier 1** works.

Tier 2

Tree works shall be carried out under the direction of a **Works Arborist**. No **Tree Works Plan** is required to be submitted for **Tier 2** works.

Tier 3

Tree works require the approval of the **Asset Owner** by way of a **Tree Works Plan** submitted as part of the **Corridor Access Request Process (CAR)**. Works shall be carried out under the direction of a **Works Arborist**.

Table 1 (Management Approach by Tiers for Tree Works in the Road Corridor undertaken by Network Utility Operators) sets out this tiered approach to managing works in the protected root zone of trees in the **Road Corridor**.

The level of direction or supervision required by a **Works Arborist** refers to the monitoring, direction and/or supervision of the tree works that is appropriate to ensure works undertaken in the **Protected Root Zone** of a **Tree** is carried out in accordance with **Best Management Practices** and in a manner that ensures the health, safety or longevity of the **Tree** is maintained or managed.



2.0 Definition of Terms

The following definition of terms shall apply to this document and documentation prepared under this Tree Management Plan.

Terms that are in bold and italics throughout this document are defined in this Definition of Terms.

<i>Airspade</i>	A tool that uses compressed air at high velocity to remove soil.
<i>Arboricultural Management Practices</i>	Arboricultural Management Practises as outlined in Section 2.4, Arboricultural Management Practices in this document.
<i>Asset Owner</i>	Auckland Transport, being the owner of the trees within the <i>Road Corridor</i> or it's appointed representative.
<i>AUOG</i>	The Auckland Utilities Operators Group.
<i>Best Practice Guidelines</i>	Documents produced by <i>NZ Arboricultural Association</i> that set out currently accepted arboricultural practices for Amenity Tree Pruning, Tree Protection Fencing on Development Sites and Safety Requirements for New Zealand Arboricultural Operations as reproduced in Appendices 3, 4 and 5 of this document.
<i>Cambium Protection</i>	Measures to protect the cambium of branches, stems, trunks and roots of trees from damage. This is includes wrapping of materials suitable to avoid contact and abrasion of bark and underlying tissues.
<i>Corridor Access Request Process (CAR)</i>	The Corridor Access Request (CAR) Process as described in The National Code of Practice for Utility Operators Access to Transport Corridors. (Utilities Access Act, 2010).
<i>CAR Arborist</i>	An arborist appointed by the <i>Corridor Manager</i> to advise and support the corridor manager in managing the health of trees in the <i>Road Corridor</i> and undertaking the functions of the <i>Asset Owner</i> in respect of this Tree Management Plan.
<i>Corridor Manager</i>	Auckland Transport as the Council Controlled Organisation responsible for management of the <i>Road Corridor</i> under the Utilities Access Act 2010.
<i>Council</i>	The relevant staff, contractors, consultants and representatives nominated by Auckland Council.
<i>Excavation</i>	Any ground disturbance that includes trenching or creation of a pit

that involves use of **Airspade, Hydrovac, Machine Excavation, Hand-Digging**, but excluding removal of any **Paved Surface**.

Ground Cover The depth of material above an underground pipe or cable duct as measured between the uppermost level of the utility service and the ground level above it.

Ground Protection Measures Any suitable materials used to avoid damage to roots and soil compaction, including but not limited to: mulch, swamp mats, track mats, aggregate and geotextile fabrics and a combination of these materials.

Hand Digging Any **Excavation** carried out using non mechanical means, such as spade, pick, shovel and other **Hand Tools**.

Hand Tools Any non-motorised tool that is used manually.

Hand-Held Secateurs A pruning tool with short handles and bypass blades suitable for use with one hand for pruning small diameter branchlets.

Hydro-Jet Cutting The method of **Root Cutting** that involves inserting a high-pressure water jet system into existing pipes for the purpose of clearing tree roots from within existing piped infrastructure.

Hydrovac A system that uses a combined water jet and sucker pump to remove soil. Effective means of excavating within the **Protected Root Zone** of **Trees** with minimal damage to **Tree** roots.

Induction A meeting held prior to the commencement of any works on a particular site or project during which the **Network Utility Operator** and **Works Arborist** confirm and agree the methodology of the works and the tree protection measures that are required.

Line of Works The alignment of the proposed network utility that is being installed, including any associated trench, access path and structures such as haunching and thrust blocks.

Machine Trimming Use of a machine mounted flail or circular cutting implement, or similar, to control areas of continuous vegetation within the road corridor. Machine trimming is predominantly undertaken in rural areas.

Network Utility Operator(s) ('NUOs') Network Utility Operator(s) responsible for the supply of electricity, telecommunications, gas water supply, wastewater, stormwater and roading in Auckland. Includes the management, supervisory staff, contractors and subcontractors of Network Utility Operators.

NZ Arboricultural Association

The New Zealand Arboricultural Association.

Open Cut Trenching

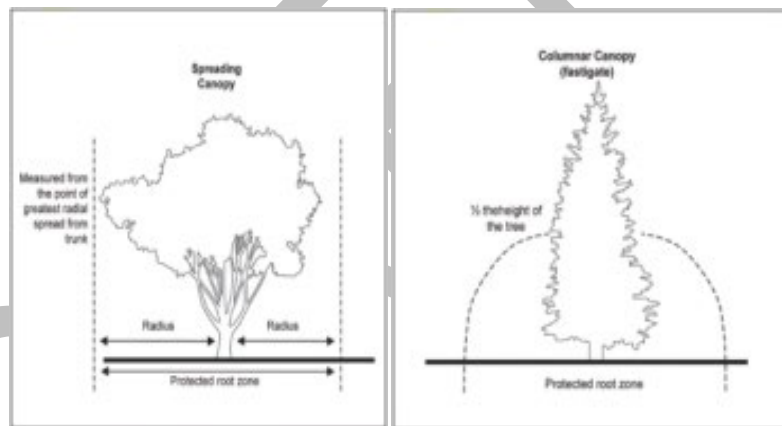
Excavation of a lineal hole for the purposes of installing a network utility.

Paved Surface

Ground covering structure made from concrete or asphalt which includes any of the following; footpath, vehicle crossing, carriageway.

Protected Root Zone

The circular area of ground around the trunk of a **Tree**, the radius of which is the greatest distance between the trunk and the outer edge of the canopy. For columnar crown species (excurrent or fastigate species), the **Protected Root Zone** is half the height of the tree.



Protective Fencing

Measures that are placed to provide a physical barrier between work zones and the **Protected Root Zone of Trees**.

Pruning

Any cutting of the above ground parts of **Trees** carried out to arboricultural standards (refer to **Best Practice Guideline**) that is appropriate for the situation in which the **Tree** is growing.

Pruning Tool

Any implement that is used for **Pruning** and **Root Pruning**, such as hand-saw, loppers, **Hand-Held Secateurs**, chainsaw or hydraulic pruning tool. Excludes any machine mounted machine trimming implement.

List of Removable Vegetation

The List of Removable Vegetation set out in Appendix 2: List of Removable Vegetation of this document.

Retrospective Tree Works Plan

A **Tree Works Plan** that is approved after the works have commenced on site.

Road Corridor

The entire area of the legal road reserve as defined by the Local

	Government Act spanning between property boundaries, including the road reserve berms and the carriageway but excluding unformed (paper) roads.
Root Cutting	Severance of tree roots using remote mechanical means, such as through Machine Excavation and Hydro-Jet Cutting operations.
Root Pruning	Severance of tree roots in accordance with correct arboricultural practices.
Root Protection Measures	Any materials emplaced to avoid damage, contamination and desiccation to roots that have been exposed by Excavation , including but not limited to: sphagnum moss, hessian, soil, polythene.
Tiers	All works occurring on or near trees in the road corridor are classified into Tiers in this Tree Management Plan. The Tiers differentiate tree works by the level of direction required by a Works Arborist and / or the need for approval by the Asset Owner being Auckland Transport. The Tiers are set out in Table 1 (Management Approach by Tiers for Tree Works in the Road Corridor undertaken by Network Utility Operators) in this document.
Trained Person/ Personnel	Those contractors and staff of Network Utility Operators and Works Arborists that have attended and passed the requirements of the relevant Training programme.
Training	A programme of learning that is delivered by the Network Utility Operator or its representatives to allow Network Utility Operator personnel to become competent to work on network utilities within the Protected Root Zone of Trees under this Tree Management Plan .
Tree / Trees	Means any woody perennial plant growing in or overhanging the Road Corridor .
Tree Works Plan	A standardised report that is completed by a Works Arborist to obtain approval for Tier 3 works.
Trenchless Technology Operation	The physical works involved with installing network utility ducts, pipes and cables by means that do not involve Open Cut Trenching . This includes but is not limited to directional drilling, pipe-jacking, tunnelling, thrusting and insertion into existing ducts
Works Arborist	An approved independent arborist that has been engaged by the Network Utility Operator .

TABLE 1

Management Approach by Tiers for Tree Works in the Road Corridor undertaken by Network Utility Operators

Tree Works	Tier 1	Tier 2	Tier 3
	Tree works undertaken without direction of a Works Arborist	Tree works undertaken under the direction of a Works Arborist	Tree works requiring approval of the Asset Owner and undertaken under the direction of a Works Arborist
All Tree Works	Works undertaken in accordance with Arboricultural Management Practices	Works undertaken in accordance with Arboricultural Management Practices	Works undertaken in accordance with Arboricultural Management Practices and Works undertaken in accordance with an approved Tree Works Plan .
Tree Pruning	Works undertaken by Hand Secateurs and Works undertaken in accordance with relevant statutory requirements (e.g. the Electricity (Hazards from Trees) Regulations 2003).	Works involving Pruning that create a wound no greater than 100mm in diameter and Works involving removal of no more than 20% of a Tree's live canopy and The natural shape, form and branch habit of the Tree is retained where practicable and All pruning undertaken by the Works Arborist	Works involving Pruning that create wounds 100mm or greater in diameter and/or Works involving removal of more than 20% of a Tree's live canopy and The natural shape, form and branch habit of the Tree is retained where practicable and All pruning undertaken by the Works Arborist .

Tree Works	Tier 1	Tier 2	Tier 3
	Tree works undertaken without direction of a Works Arborist	Tree works undertaken under the direction of a Works Arborist	Tree works requiring approval of the Asset Owner and undertaken under the direction of a Works Arborist
Machine Trimming	Use of Machine Trimming methods to carry out trimming to maintain the road corridor where this activity has already been established and has been carried out within the previous 3 years.	Use of Machine Trimming methods to carry out trimming to maintain the road corridor where this activity has already been established but has not been carried out within the previous 3 years	Use of Machine Trimming methods to carry out trimming to maintain the road corridor where this activity has not been established in the past.
Excavation undertaken by hand digging within the Protected Root Zone	Surface area of single Excavation shall be equal to or less than 1 metre x 1 metre and Works involve Root Pruning less than 35mm in diameter	Works will disturb less than 20% of the Protected Root Zone and/or Works involve Root Pruning between 35mm and 100mm in diameter	Works will disturb greater than 20% of the Protected Root Zone and/or Works involve Root Pruning greater than 100mm in diameter
Excavation undertaken by Air Spade / Hydro Vac within the Protected Root Zone	Not Applicable	Works will disturb less than 20% of the Protected Root Zone and/or Works involve Root Cutting less than 100mm in diameter	Works will disturb greater than 20% of the Protected Root Zone and/or Works involve Root Cutting over 100mm or greater in diameter
Excavation undertaken by trenchless methods within the Protected Root Zone	Works undertaken at a depth greater than or equal to 800mm below ground level	Not Applicable	Works undertaken at a depth less than 800 mm below ground level

Tree Works	Tier 1	Tier 2	Tier 3
	Tree works undertaken without direction of a Works Arborist	Tree works undertaken under the direction of a Works Arborist	Tree works requiring approval of the Asset Owner and undertaken under the direction of a Works Arborist
<p>Excavation undertaken by digger within the Protected Root Zone</p>	<p>Works involving the removal of structures or Paved Surfaces provided that the removal of the surface is carried out without damage to any visible surface roots and the work is undertaken in a way that avoids damage to tree roots.</p> <p>and</p> <p>All machinery shall operate from on top of Paved Surfaces and/or Ground Protection Measures.</p>	<p>Works will disturb less than 20% of the Protected Root Zone and/or</p> <p>Works involving Root Cutting less than 100mm in diameter and</p> <p>Excavation undertaken by a digger fitted with a straight blade bucket</p> <p>and</p> <p>All machinery shall operate from on top of an existing Paved Surface and/or Ground Protection Measures.</p>	<p>Excavation undertaken by a digger fitted with a bucket other than straight blade</p> <p>and/or</p> <p>Works will disturb greater than 20% of the Protected Root Zone</p> <p>and/or</p> <p>Works involve Root Cutting over 100mm in diameter</p> <p>and / or</p> <p>Unable to operate from an existing Paved Surface and/or Ground Protection Measures.</p>
<p>Asset Maintenance inside existing infrastructure within the Protected Root Zone</p>	<p>Works undertaken inside existing infrastructure that involve Root Cutting.</p>	<p>Not Applicable</p>	<p>Not Applicable</p>

Tree Works	Tier 1	Tier 2	Tier 3
	Tree works undertaken without direction of a Works Arborist	Tree works undertaken under the direction of a Works Arborist	Tree works requiring approval of the Asset Owner and undertaken under the direction of a Works Arborist
All Other Construction Activities within the Protected Root Zone	Works do not exceed Tier 1 parameters of all other Activities	Works do not exceed Tier 2 parameters of all other Activities	Works do not exceed Tier 3 parameters of all other Activities
Tree Removal		<p>Tree Species in the List of Removable Vegetation (contained in Appendix 2) where the height of the Tree is less than 4 metres and the girth of the Tree is less than 400mm (where the girth is measured 400mm above ground level)</p> <p>and</p> <p>Tree Removal shall be approved by the Corridor Manager prior to any tree removal being undertaken</p> <p>and</p> <p>Notification of adjacent residents has been completed.</p>	<p>The height of the Tree is less than 4 metres in height and the girth of the Tree is less than 400mm (where the girth is measured 400mm above ground level)</p> <p>or</p> <p>Tree species identified on the species identified on the List of Removable Vegetation (contained in Appendix 2), and the Tree is 4 metres or greater in height and the girth of the Tree is 400mm or greater (where the girth is measured 400mm above ground level)</p> <p>and</p> <p>Notification of adjacent residents has been completed.</p>

3.0 Arboricultural Management Practices

Text in ***bold italics*** are defined in the Definitions of Terms found in this document.

General Tree Management Practices

The following practices shall apply to all works undertaken by ***Network Utility Operators*** within the ***Protected Root Zone*** of ***Trees*** located in the road corridor.

- 1) All ***Network Utility Operators*** shall ensure that all personnel that undertake works within the ***Protected Root Zone*** of ***Trees*** are trained in accordance with the training requirements set out in Section 2.5 of this document.
- 2) A ***Works Arborist*** is to be engaged by the ***Network Utility Operator*** to review, direct and supervise as appropriate all tree works under this Tree Management Plan that require input by a ***Works Arborist***.
- 3) The level of arboricultural supervision by the ***Works Arborist*** shall be appropriate for the specific works that are being undertaken within the ***Protected Root Zone*** of the ***Tree***.
- 4) The ***Network Utility Operator*** (including any subcontractor) shall undertake all works according to the requirements of the relevant ***Tier*** for Tree works, as set out in **Table 1: Management Approach by Tiers for Tree Works in the Road Corridor**.
- 5) Works that meet the requirements of ***Tier 1*** of **Table 1: Management Approach by Tiers for Tree Works in the Road Corridor** may be carried out without a ***Works Arborist*** being present, provided that the works conform to the relevant provisions of ***Tier 1*** of **Table 1**.
- 6) Works that meet the requirements of ***Tier 2*** of **Table 1: Management Approach by Tiers for Tree Works in the Road Corridor** shall be carried out under the direction or supervision of a ***Works Arborist***.
- 7) Works that meet the requirements of ***Tier 3*** of **Table 1** (entitled the Management Approach by Tiers for Tree Works in the ***Road Corridor***) shall be carried out under the direction or supervision of a ***Works Arborist***. The ***Network Utility Operator*** shall also prepare a ***Tree Works Plan*** for the approval of the ***Asset Owner*** in accordance with **Appendix 1: Site Works Plan and Protocols**.
- 8) Prior to any ***Tier 2*** and ***Tier 3*** works (excluding reactive works) commencing within the ***Protected Root Zone*** of ***Trees*** within the road corridor, a site induction meeting is to be convened by the ***Network Utility Operator***. At the induction, the ***Network Utility Operator*** project manager and crew and/or contractor representatives shall have the ***Works Arborist*** explain in detail the

tree protection matters that are relevant to the specific sites and work methodologies to all **Trained Personnel** who will be implementing the works.

- 9) The **Network Utility Operator** shall ensure that all **Trained Personnel** carrying out any works within the **Protected Root Zone** of any **Tree** are informed of any additional conditions of an approved **Tree Works Plan** and act in accordance with the conditions. This shall be agreed and documented on site.
- 10) For **Tier 3** works, a copy of the **Tree Works Plan** shall be available at all times on each work site.
- 11) A copy of the **Tree Management Plan** shall be available to all personnel on site at all times.

General Works Around Trees Practices

- 12) The maintenance, renewal and/or upgrading of all **Network Utility Operator** assets within the **Protected Root Zone** of **Trees** within the **Road Corridor** shall be undertaken in a manner that seeks to avoid damage to live **Tree** roots.
- 13) When undertaking **Excavation** works within the **Protected Root Zone** of **Trees**, the **Network Utility Operator** shall seek to ensure that no damage occurs to the above ground portion of any **Tree**.
- 14) All work locations shall be hand excavated/probed using a **Hand Tools** prior to **Excavation** to check for the presence of roots.
- 15) Prior to works commencing on individual applicable work sites for **Tier 2** and **Tier 3** works, the **Works Arborist** shall, in consultation with the **Network Utility Operator** and the **CARs Arborist** where specified, mark out site specific areas where arboricultural supervision, monitoring and/or direction is required.
- 16) For **Tier 2** and **Tier 3** works, where determined appropriate by the **Works Arborist** and **CARs Arborist**, **Protective Fencing** shall be erected and positioned between the works and all permeable areas within the **Protected Root Zone** of **Trees** within the **Road Corridor** so as to restrict access to/storage on such areas.
- 17) **Root Pruning** associated with any **Excavation** within the **Protected Root Zone** of any **Tree** is to be undertaken in the following manner:
 - a) All retained roots shall be protected from damage and drying out by covering with **Root Protection Measures**.
 - b) Retained roots shall be kept damp and protected until the excavated area can be backfilled.
 - c) **Root Pruning** should only occur once the full extent of the roots within the excavation has been revealed.

- d) Root retention and removal is to be carried out in accordance with the relevant level of supervision and approval that is detailed in **Table 1: Management Approach by Tiers for Tree Works in the Road Corridor**.
 - e) For **Tier 2** works, tree roots shall only be removed where the **Works Arborist** is satisfied that the health and safety of the **Tree/s** will not be affected to a more than minor degree.
 - f) For Tier 3 works, in the manner approved by the **Tree Works Plan**.
 - g) All authorised root removal required shall be cleanly cut back to the edge of the excavated area with a sharp **Pruning Tool**.
 - h) All cut root faces 35 mm or greater in diameter shall be protected from drying out by covering with **Root Protection Measures** and kept damp until the excavated area can be backfilled.
- 18) All decisions on the pruning of roots that measure between 35mm and 100 mm diameter shall be made by the **Works Arborist** based on the following factors:
- a) the species of tree and its relative tolerance to the proposed activity,
 - b) the age, overall health and the tree's ability to respond to change,
 - c) the total extent of the proposed disturbance and root loss,
 - d) any previous damage and disturbance that has occurred around the **Tree**,
 - e) methods that can be utilised to minimise harm to the **Tree**, and
 - f) ability to mitigate root loss.

If **Root Pruning** is required to carry out the works but this could cause life threatening damage to the tree, the **Network Utility Operator** will review removal of the tree with the **Asset Owner**.

Reinstatement

- 19) When backfilling an excavated area within any soft landscape area, a 50mm layer of sand or topsoil (or approved equivalent/amount) shall surround all retained roots and root cut faces where applicable/possible.
- 20) The layer of sand or topsoil (or approved equivalent) around retained tree roots is to be compacted by non-mechanical hand tamping methods only.
- 21) When backfilling an excavated area within any hard surface, where the layer of sand or soil may cause future slumping of a structure, the **Works Arborist** will nominate an appropriate capping over the top of the retained root with a layer of sand and/or geotextile material (to minimise contact with the retained root).

- 22) Unless permitted by the **Works Arborist**, only hand-operated plate compactors shall be used for compaction of materials when operating within the **Protected Root Zone of Trees**.
- 23) Backfilling of any **Excavation** and grass berm reinstatement may be carried out without **Works Arborist** attendance, provided that the provisions in Clause 56 below are adhered to.

Tree Pruning

- 24) All **Pruning** of above ground parts of a **Tree** shall be carried out according to the **best practice guideline** for Amenity Tree Pruning produced by the **NZ Arboricultural Association** contained in **Appendix 4**.
- 25) **Network Utility Operators** may carry out the following pruning without a **Works Arborist** being present:
 - a) Minor trimming of branches using **Hand-Held Secateurs**.
 - b) Rural road corridor maintenance using a tractor or digger-mounted machine trimmer (refer **Mechanical Trimming** section below).
- 26) **Tier 2 Pruning** works that involve removal of up to 20% of the living canopy of a tree, or that involve cutting of limbs (other than with hand-held secateurs) up to 100mm in diameter are required to be carried out by a **Works Arborist**.
- 27) **Pruning works** that involve removal of more than 20% of the living canopy of a tree, or that involve cutting of limbs greater than 100mm in diameter are required to be carried out under the direction of a **CAR Arborist**, unless approval for a **Works Arborist** to carry out the **Pruning Works** has been authorised in a **Tree Works Plan** approved by the **Asset Owner**.

Mechanical Trimming

- 28) **Mechanical Trimming** involving the use of a flail mower/circular blade cutting implement (or similar) may be used to carry out maintenance of trees within the road corridor where the trees generally form a continuous canopy, where this method has been used in the past, or has been approved by the **CAR Arborist**. This predominantly relates to rural areas.

Excavation By Hand Digging

- 29) The preferred method of **Excavation** within the **Protected Root Zone of Trees** is to be by way of **Hand Digging** using **Hand Tools**. Excavation by **Airspade** or **Hydrovac** may be preferred over this method where these alternative methods are practicable for the specific work site.

- 30) **Hand digging** shall be carried out with care to allow **Tree** roots to be identified before they are damaged and to allow for the removal of soil to expose the **Tree** roots so as to allow for root protection measures.
- 31) **Hand digging** will generally sever all non-woody and small diameter (<5mm) roots. Larger roots when detected should be carefully excavated around using a short/careful digging action and/or a short handled hand trowel or other **Hand Tools** to expose the root without excessive contact with the root.
- 32) The **Excavation** should be carried out in such a manner as to ensure that the bark and cambium of the root is retained intact as much as possible.
- 33) The retained roots should be protected by **Root Protection Measures** as soon as they are exposed.
- 34) Roots should not be levered against during digging, unless **Root Protection Measures** are adequate to prevent damage to the bark and cambium.

Excavation by Airspade / Hydrovac

- 35) **Airspade** and/or **Hydrovac** technology shall be used where practicable in order to undertake **excavation** within the **Protected Root Zone** of the **Trees** so as to identify **Tree** roots that are required to be preserved.
- 36) **Airspade** and **Hydrovac Excavation** within the dripline of trees shall be undertaken under **Works Arborist** direction.
- 37) The operator of the **Airspade** and **Hydrovac** shall undertake the **Excavation** with care to avoid contact of machinery with the roots, trunk and branches of the **Tree**. All operators shall be trained to carry out **Airspade** and **Hydrovac Excavation** works in a way that minimises damage to trees and their roots.
- 38) Any person undertaking either **Airspade** or **Hydrovac Excavation** must be competent and trained in the proper use of the equipment around tree roots. The **Works Arborist** shall fully brief the operator of any specific issues or conditions that need to be adhered to during use of the equipment.
- 39) All vehicles and machinery (e.g. compressor) associated with **Airspade** and **Hydrovac** excavation shall be excluded from the **Protected Root Zone** of the **Tree** (unless in compliance with Clause 56).

Piloting

- 40) The **Network Utility Operator** shall undertake pilot trenches to confirm the location of existing underground structures within the works area. The pilot trenches will be outside of the **Protected Root Zone** of **Trees**, except where approved by the **Works Arborist** and in accordance with the relevant protocols in **Table 1**.

Excavation by Trenchless Methods

- 41) When undertaking any underground **Trenchless Technology Operations**, the **Line Of Works** shall, where possible, maintain a **Gound Cover** depth of at least 800mm below ground level when within the **Protected Root Zone** of **Trees**.
- 42) The network utility asset installation shall be designed to ensure that as far as possible all excavations associated with **Trenchless Technology Operations** are located outside the **Protected Root Zone** of all **Trees**. This includes pilot trenches, pressure relief and entry and exit pits.
- 43) **Excavations** within the **Protected Root Zone** of **Trees** associated with **Trenchless Technology Operations** that have received approval to be installed will proceed in accordance with the methodologies outlined in this document, under the supervision and direction of the **Works Arborist**, where applicable to **Tier 2** and **Tier 3**. Any root retention/removal works shall be undertaken in accordance with the methods outlined in this document.
- 44) If, during the works it becomes apparent that open cut trenching or an alternative works methodology is required within the **Protected Root Zone** of **Trees** because of ground and/or site conditions or design requirements, the **Works Arborist** is to assess the works against **Table 1** and submit details of these works (via an amendment to the approved **Tree Work Plan**) to the **Corridor Manager** for approval as required by Table 1.
- 45) If equipment associated with the trenchless technology operation becomes stuck underground whilst works are progressing within the **Protected Root Zone** of trees, all attempts at retrieval by way of **Excavation** shall be carried out under the direction and supervision of the **Works Arborist**. If retrieval of the equipment is not possible without compromising the health and/or safety of the tree, the equipment shall be abandoned or approval shall be sought from the **CAR Arborist**.
- 46) All vehicles and machinery associated with the **Trenchless Technology Operation** shall be excluded from the **Protected Root Zone** of the **Tree** unless undertaken in compliance with Clause 56.

Mechanical Excavation

- 47) All excavation machinery is to operate from outside the **Protected Root Zone** of **Trees** unless the machinery used for excavation can operate from and remain fully on top of existing paved surfaces or appropriate **Ground Protection Measures** specified by the **Works Arborist** or an approved **Tree Works Plan**.

- 48) When undertaking **Excavation** works within the **Protected Root Zone** of **Trees** within the road corridor the **Machine Excavator** shall be fitted with a straight blade bucket, unless use of an alternative attachment is agreed by the **Works Arborist**.
- 49) The machine excavator shall be operated with care to avoid contact with the branches, limbs and trunks of **Trees**. Branches that overhang the works area that may come into contact with the **Machine Excavator** should be protected with **Cambium Protection**, tied back or pruned, as deemed appropriate by the **Works Arborist** and pursuant to the relevant tier of the **Table 1** prior to the works occurring.
- 50) The machine operator shall only undertake **Machine Excavation** works within the **Protected Root Zone** of **Trees** in the **Road Corridor** under the appropriate supervision and direction of the **Works Arborist**, except where the machine is being used to remove existing **Paved Surface** or to back-fill an **Excavation**.
- 51) All machine excavators shall be appropriate for the task and suitable for use with consideration of the constraint of space from trees that may affect movement and operation of the machine.

Asset Maintenance within Existing Infrastructure

- 52) Roots that have encroached into pipes, chambers, manholes, meter boxes and other similar network utility infrastructure may be cut to ensure the effective functioning of the infrastructure.
- 53) The **Network Utility Operator** shall consult with a **Works Arborist** to ensure the activity is carried out in accordance with **Root Pruning** and **Root Cutting** methods appropriate for the situation.
- 54) All works are to be carried out from the appropriate inlet, outlet or chamber. If any additional **Excavation** is required then these works must be carried out in accordance with the relevant sections of this plan
- 55) Use of a **Hydro-Jet Cutter** does not require a **Works Arborist** to be in attendance, provided that all associated plant is operated from outside of the **Protected Root Zone** of **Trees** or on a **Paved Surface** and in accordance with Clause 56.

General Construction Activities

- 56) With respect to the position, operation, delivery and/or storage of vehicles, machinery, equipment, spoil and/or materials, the following restrictions will apply:
 - a) No vehicles, machinery, equipment, spoil and/or materials shall be positioned, operated, delivered, stored, wheeled or driven within the

Protected Root Zone of Trees unless it can be kept within the bounds of an existing **Paved Surface** or **Ground Protection Measures** and does not conflict with any above ground portion of trees.

- b) If, due to site conditions, activities detailed in 'a' above are required to occur within the **Protected Root Zone** of a **Tree**, the **Works Arborist** is to specify **Ground Protection Measures** that shall be implemented out before commencement of such works.
 - c) No machinery, equipment, spoil and/or construction materials are to be placed or temporarily stored against the trunk or branches of any **Tree**.
- 57) The installation of emulsion, bitumen, Rugasol and all other similar manufactured products which can cause harm to trees shall be undertaken in a manner that ensures that no direct spray or spray drift comes in contact with any portion of any tree. The **Works Arborist** is to advise on how works using such products are to be undertaken when in close proximity to any **Tree**.
- 58) Any washing off of products referenced in the above condition shall be undertaken in a manner that ensures that no water or resulting slurry or waste comes in contact with any **Protected Root Zone** or any part of any **Tree**. All such activities shall be undertaken in accordance with relevant material safety data sheets and an approved environmental management plan.

Tree Removal

- 59) The **Works Arborist** shall determine the species and confirm the size of the **Tree** and advise whether a site works plan is required, or whether the species can be removed under **Tier 2**, pursuant to the **List of Removable Vegetation**, contained in **Appendix 2**.
- 60) The **Asset Owner** may specify replacement tree planting to mitigate the removal of a tree. Tree planting is to be carried out to the satisfaction of the **Asset Owner**.
- 61) All removal of **trees** shall be carried out according to the **Best Practice Guideline** for Arboricultural Operations produced by the **NZ Arboricultural Association**, contained in **Appendix 3**.
- 62) All tree removal shall be carried out by **Council's** arboricultural contractors, unless approval for an alternative contractor to carry out tree removal has been received from the **Asset Owner**.
- 63) The **Asset Owner** may require the **Network Utility Operator** to carry out consultation and liaison with the local community and/or relevant stakeholders if deemed appropriate with regards to the proposed works.

4.0 Requirements for Training, Monitoring and Reporting

Training

All **Network Utility Operators** shall ensure that all personnel involved in works in the **Protected Root Zone of Trees** are trained in the practices set out in this **Tree Management Plan**.

This training of personnel should generally be undertaken as follows:

- A **training** programme shall be initiated by **Network Utility Operators** and undertaken on an annual basis for all staff, contractors, sub-contractors and supervisory staff involved in implementing works within the **Protected Root Zone of Trees** within the **Road Corridor**.
- The content of the **training** programme is to be developed by the **Works Arborist** and **Network Utility Operator**.
- All personnel undertaking works within the **Protected Root Zone of Trees** within the **Road Corridor** shall be required to have gained competency under the relevant **training** programme from the **Network Utility Operator**.

Monitoring and Reporting

The **Network Utility Operator** shall provide to **Council** a summary of all works undertaken within the **Protected Root Zone** of all **Trees** within the **Road Corridor**.

The **Works Arborist** shall advise the **Asset Owner**, immediately if any damage resulting from the works is likely to result in any significant adverse effect to any part of a tree, either immediately or long term or which has reduced, or will reduce the visual amenity value of the **Tree**.

If, during the works it becomes apparent that an alternative works methodology is required within the **Protected Root Zone of Trees** because of ground and/or site conditions or design requirements, the **Works Arborist** shall assess the works against **Table 1** and submit details of these works through the Amendment Register detailed in **Appendix 1: Tree Works Plan Protocol** to the **Asset Owner** for approval as necessary.

A reporting programme is to be developed by the **Works Arborist** and **Network Utility Operator** to the satisfaction of the **Asset Owner**.

APPENDIX ONE

Tree Works Plan Protocol



TREE WORKS PLAN PROTOCOL

The following protocol shall be followed for **Tier 3** works.

Text in **bold italics** are defined in Section 2.0, Definitions of Terms of this document.

- 1) For works that are determined to be **Tier 3**:
 - (a) The **Network Utility Operator** shall, with the assistance of the **Works Arborist**, prepare a **Tree Works Plan (TWP)**, for the **Trees** affected by the proposed works..
 - (b) The **TWP** shall detail the manner in which arboriculturally suitable construction methodologies will be effectively applied to the works in order to ensure that any adverse effects of the works on any **Tree** is minimised.
 - (c) The **TWP** must include:
 - (i) an assessment of the current condition and growing location of the affected **Trees** growing within the **Road Corridor**;
 - (ii) digital photographs of the trunks and canopies of the **Trees**; and
 - (iii) a description of how the proposed construction methodology for network utilities works will be applied in relation to the works and their effect on the **Tree(s)**.
- 2) The **TWP** must be submitted for approval to the relevant **Asset Owner**.

*Note: That it is anticipated that a suitable outcome will be negotiated to modify the works and construction methodology to a level that is acceptable to all parties so that sign off of a **TWP** can be achieved.*
- 3) When approving a **TWP**, the following conditions apply:
 - (a) The **Asset Owner** may conduct walkovers or site inspections to assess the information outlined in the **TWP**.
 - (b) The **Asset Owner** must be satisfied that the **TWP** effectively describes the trees and the construction methodology and demonstrate that adverse effects on any protected tree detailed in the **TWP** will be minimised.
 - (c) The **Asset Owner** shall, within 5 working days of receiving the **TWP**, respond in writing to the **Network Utility Operator** (or appointed representative) with either:
 - (i) Approval of the **TWP**; or
 - (ii) Notification of the requirement to modify the submitted **TWP** and/or to provide further information to enable the works to be undertaken in a manner that ensures the effects on the identified **Trees** are minimised. The **Network Utility Operator** shall modify

the original **TWP** and resubmit to the **Asset Owner** for processing in accordance with this process.

- (d) If written approval or notification is not provided to the **Network Utility Operator** within 5 working days of receipt of the **TWP**, the **TWP** shall be deemed to be approved.
- 4) As works are proceeding, it may become apparent that changes to the approved **TWP** and/or construction methodologies within the dripline of trees is required. Where this is the case, the **Works Arborist** is to complete the 'Amendment Register' and, where appropriate, supply a digital photograph of individual sites where change of the previously approved **TWP** and/or construction methodology is required. The Arborist is to specify the assessed level of effect that the proposed changes may have on the canopy, root plate or the health, safety and longevity of the **Tree/s**.
- 5) The **TWP** Amendment Register shall be 'processed' in the same manner as the **TWP**, with the response from the **Asset Owner** occurring within 5 working days from the date of receiving the **TWP** Amendment Register.
- 6) If written approval is not provided to the **Network Utility Operator** within 5 working days of receipt of the Amendment Register, the **TWP** Amendment Register shall be deemed to be approved.
- 7) The **Network Utility Operator** must ensure that all contractors, sub-contractors and work site supervisory staff carry out any works in accordance with the approved **TWP** and act in accordance with any agreed construction methodology.
- 8) A copy of signed **TWPs** and any **TWP** Amendment Register as applicable, shall be available at all times on each work site.

EXAMPLE of TREE WORKS PLAN

TO BE DEVELOPED

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EXAMPLE of AMENDMENT REGISTER

TO BE DEVELOPED

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APPENDIX TWO

List of Removable Vegetation



List of Removable Vegetation

The following trees and vegetation may be removed under **Tier 1** (if under 4m in height and 400mm in girth measured at 400mm above the ground) or **Tier 3** (over 4m in height and 400mm in girth measured at 400mm above the ground, with an approved **Tree Works Plan**).

Removable Vegetation	
The removal of any Tree or part of a Tree that is dead or that is suffering from an untreatable disease which has caused a significant decline in its health. (Evidence shall be produced if required)	
Note: Where any element of uncertainty exists as to the likely fate of the tree, the benefit of doubt will be given to the tree survival by not removing it until such time as its irreversible decline or infection is obvious. Before removing any affected tree, consultation with the Asset Owner is to occur.	
The removal of any Tree (regardless of its state of health) which has been positively identified as suffering from any notable dangerously infectious disease such as Dutch elm disease or any tree in accordance with a forest disease eradication or control programme within an infected area declared pursuant to the Forests Act 1949 and the Forest Disease Control Regulations 1967.	
Any tree that is structurally unsound	
Any Tree identified within the Auckland Regional Plant Pest Management Strategy or listed as a National Surveillance Plant Pest under the Biosecurity Act 1993 or any subsequent amendments, excluding Research Organisms and scheduled heritage trees.	
Bamboo	<i>Phyllostachys, Bambusa and Pseudosasa</i> species
Silver wattle	<i>Acacia dealbata</i>
Sydney golden wattle	<i>Acacia longifolia</i>
Black wattle	<i>Acacia mearnsii</i>
Loquat	<i>Eriobotrya japonica</i>
Downy hakea	<i>Hakea globosa</i>
Willow-leaved hakea	<i>Hakea salicifolia</i>
Prickly hakea	<i>Hakea sericea</i>
Queensland Poplar	<i>Homalanthus populifolius</i>
Brush Wattle	<i>Paraserianthes lophantha</i>
Phoenix Palm	<i>Phoenix canariensis</i>
Radiata pine, Monterey pine	<i>Pinus radiata</i>
White poplar	<i>Populus alba</i>
Chinese poplar	<i>Populus yunnanensis</i>
Grey willow	<i>Salix cinerea</i>
Crack willow	<i>Salix fragilis</i>
Red Monkey Apple	<i>Syzygium australe</i>
Tamarix	<i>Tamarix tetrandra</i>
Chinese Windmill Palm	<i>Trachycarpus fortunei</i>

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APPENDIX THREE

Best Practice Guidelines: Safety Requirements for New Zealand Arboricultural Operations, 2013

**Produced by New Zealand Arboricultural Association
Edition Number 4**



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APPENDIX FOUR

Best Practice Guidelines: Amenity Tree Pruning

**Produced by New Zealand Arboricultural Association
Edition Number 3**



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APPENDIX FIVE

Best Practice Guidelines: A Guideline for Tree Protection Fencing on Development Sites

**Produced by New Zealand Arboricultural Association
Edition Number 3**



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APPENDIX SIX

Overview of Corridor Access Request Process and Management Approach for Tree Works in the Road Corridor by NUOs



Summary of Management Approach using the Corridor Access Request Process to Managing Works on or near Trees in the Road Corridor undertaken by Network Utility Operators in the Auckland Region

Prior to undertaking any works in a road corridor, a **Corridor Access Request ('CAR')** must be lodged by a **Network Utility Operator** with the **Corridor Manager** in accordance with the 'National Code of Practice' for Utility Operators Access to Transport Corridors under the Utilities Access Act 2010.

The National Code of Practice provides for tree management in the road corridor to be managed through the **Corridor Access Request ('CAR')**.¹ Under the Code, **Network Utility Operators** are required to have a best practice management plan for working within the dripline of trees, to carry out such works in accordance with that plan, and provide the management plan to the **Corridor Manager** on request.

Auckland Transport is the **Corridor Manager** in Auckland responsible for **Road Corridors** under the Utilities Access Act 2010. Auckland Transport is also responsible for the management of **Trees** in the **Road Corridor**.

The **CARs** process provides a streamlined, efficient mechanism for managing works on or near trees in the **Road Corridor** recognising the need for **Network Utility Operators** to operate, maintain, repair and install network utilities to ensure the continued delivery of critical infrastructure to the Auckland region.

The Tree Management Plan outlines a single approach for tree management in **Road Corridor** to be used by all **Network Utility Operators** in the Auckland region. It sets out the requirements and specifications for all works on or near trees located in road corridors undertaken by the **Network Utility Operators**

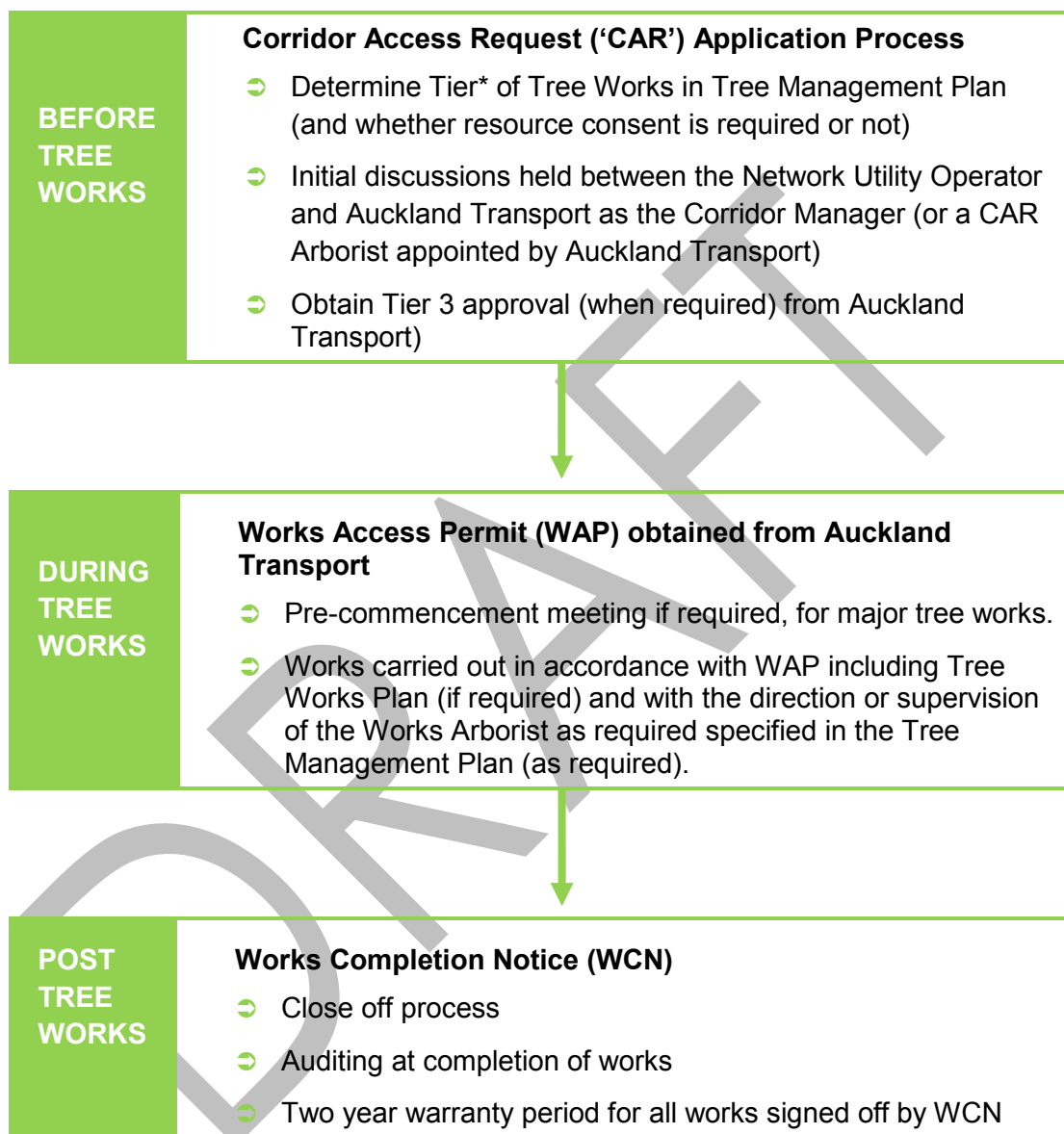
All works on or near trees in the road corridor by **Network Utility Operators** shall be carried out in accordance with a **Corridor Access Request Process**, and shall comply with the requirements and specifications in the Tree Management Plan.

¹

Refer Section 5.1.5, Working in the Vicinity of Trees, National Code of Practice for Utility Operators 'Access to Transport Corridors (November 2011) and the Utilities Access Act 2010.

Figure 1:

OVERVIEW OF THE PROCESS



Note: * The Tree Management Plan provides three tiers of works on or in the vicinity of street trees. Each tier details requirements and specifications for different types of tree works including the level of independent arborist supervision. Tier 3 requires that the tree works are approved by an Auckland Transport authorised arborist in advance of the works.

Figure 2:

Approach to Management of Works near and around Trees in the Road Corridor by Network Utility Operators

