



Talbot Mackenzie & Associates

Consulting Arborists

1344 Thurlow Road, Victoria

Construction Impact Assessment & Tree Preservation Plan

Prepared For: Elisabeth Westlake
1344 Thurlow Road
Victoria, BC V8S 1L6

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ISA Certified # PN-0428A
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Jobsite Property: 1344 Thurlow Road, Victoria, BC

Date of Site Visits: November 28, 2019, July 16, 2021

Site Conditions: No ongoing construction activity.

Summary: There are two bylaw protected fruit trees on the property, one of which will require removal to accommodate the proposed construction activity. There is one bylaw protected fruit tree on the neighbour's property that although the majority of the critical root zone can likely be preserved, it will require significant pruning to accommodate the proposed new house at the front of the property. The tree has been pruned drastically in the past, resulting in most of the canopy extending onto the subject property, we do not believe that any limbs larger than 10 cm diameter will require pruning to accommodate the construction activity. It should be possible to minimize any potential impacts on the remaining trees on the property, the trees on the neighbouring property and municipal boulevard by following the recommendations within this report. As part of the proposal existing trees are going to be transplanted and new trees and shrubs are to be planted as shown in the attached landscape plan.

Scope of Assignment:

- Inventory the existing bylaw protected trees and any trees on municipal or neighbouring properties that could potentially be impacted by construction or that are within three metres of the property line
- Review the proposal to demolish the existing house, subdivide the property, construct two new residences and upgrade and install new services.
- Comment on how construction activity may impact existing trees
- Prepare a tree retention and construction damage mitigation plan for those trees deemed suitable to retain given the proposed impacts

Methodology:

- We visually examined the trees on the property and prepared an inventory in the attached Tree Resource Spreadsheet.
- Each by-law protected tree was identified using a numeric metal tag attached to its lower trunk. Municipal trees and neighbours' trees were not tagged.
- Information such as tree species, DBH (1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory.
- The conclusions reached were based on the information provided within the plans provided by Knot in a Box Design Inc.

- A Tree Management Plan was created using the Landscape Plan provided.

Limitations:

- No exploratory excavations have been conducted and thus the conclusions reached are based solely on critical root zone calculations and our best judgement using our experience and expertise. The location, size and density of roots are often difficult to predict without exploratory excavations and therefore the impacts to the trees may be more or less severe than we anticipate.

Summary of Tree Resource: There are two bylaw protected fruit trees on the property, one of which 759 will require removal to accommodate the proposed construction activity. It should be possible to minimize any potential impacts to the remaining trees on the property, trees on the neighbouring property and municipal boulevard by following the recommendations within this report. As part of the proposal two non bylaw protected trees are going to be transplanted and new trees are to be planted along with the additional landscape plantings shown in the attached landscape plan.

Trees to be Removed

The following bylaw protected trees will require removal due to construction related impacts: Pear tree 759.

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees or neighbours trees should be completed under supervision by the project arborist. This includes (but is not limited to) the following activities within CRZs:
 - Excavation for the house on the proposed front lot, which will be close to existing trees on the neighbouring property Nt1 – Nt3. Efforts should be made to minimize any over excavation in this area.
 - Installation of temporary driveway if required within the critical root zone of tree 758.
 - Any proposed excavation for services or driveway preparation within the critical root zone of apple tree 758.
 - Any proposed excavation within the critical root zone of bylaw protected horse chestnut Nt6
- **Pruning Roots:** Any severed roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. Backfilling the excavated area around the roots should be done as soon as possible to keep the roots moist and

aid in root regeneration. Exposed roots should be kept moist until the area is backfilled, especially if excavation occurs during a period of drought. This can be accomplished in a number of ways, including wrapping the roots in burlap or installing a root curtain of wire mesh lined with burlap, and keeping the area moist throughout the construction process.

- **Barrier Fencing:** The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zones.

The barrier fencing must be a minimum of 4 feet in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with plywood, or flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

- **Minimizing Soil Compaction:** In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:

- Installing a layer of hog fuel or coarse wood chips at least 20 cm in depth and maintaining it in good condition until construction is complete.
- Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top.
- Placing two layers of 19mm plywood.
- Placing steel plates.

- **Mulching:** Mulching can be an important proactive step in maintaining the health of trees and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. No mulch should be touching the trunk of the tree. See “methods to avoid soil compaction” if the area is to have heavy traffic.

- **New Services:** The services shown on the plans provided are located where we anticipate there will likely be some root pruning necessary on apple tree 758. We recommend that the project arborist be onsite to prune any roots that are in direct conflict with the service installation and preserve any roots that are possible to retain. The services for the front lot are shown in the front yard where no bylaw protected trees are located.

- **Landscaping and Irrigation Systems:** The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we

recommend the irrigation technician consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on tree health and can lead to root and trunk decay.

- **Arborist Role:** It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:
 - Locating the barrier fencing
 - Reviewing the report with the project foreman or site supervisor
 - Locating work zones, where required
 - Supervising any excavation within the critical root zones of trees to be retained
 - Reviewing and advising of any pruning requirements for machine clearances

- **Review and Site Meeting:** Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any site clearing, tree removal, demolition, or other construction activity occurs and to confirm the locations of the tree protection barrier fencing.

Please do not hesitate to call us at (250) 479-8733 should you have any further questions.

Thank you,



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TRAQ – Qualified

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Encl. 1-page tree resource spreadsheet, 1-page Tree Management Plan, 1-page barrier fencing specifications, 2-page tree resource spreadsheet methodology and definitions

Disclosure Statement

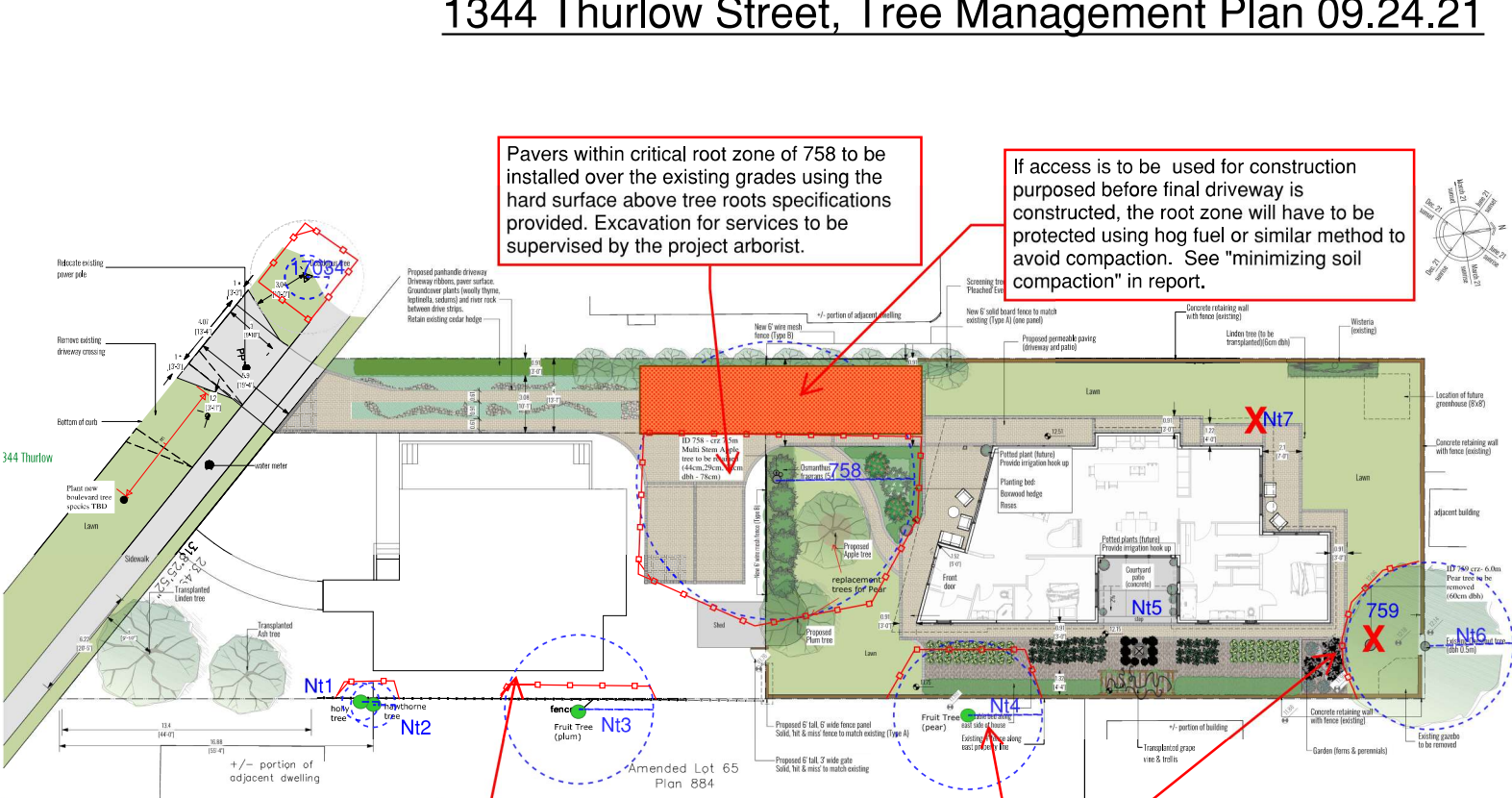
The tree inventory attached to the Tree Preservation Plan can be characterized as a limited visual assessment from the ground and should not be interpreted as a “risk assessment” of the trees included.

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve their health and structure or to mitigate associated risks.

Trees are living organisms, whose health and structure change, and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. It is not possible for an Arborist to identify every flaw or condition that could result in failure or can he/she guarantee that the tree will remain healthy and free of risk.

Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

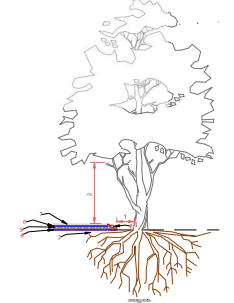
1344 Thurlow Street, Tree Management Plan 09.24.21



Legend

- Tree to be retained
CRZ radius (m) with tag #
- Proposed barrier fencing
- Tree to be removed
- Temporary access for construction using hog fuel or similar.

HARD SURFACE ABOVE TREE ROOTS DETAIL



HARD SURFACE ABOVE TREE ROOTS NOTES

1. Minimum CRZ radius shall be 1.5m for trees to be retained and 0.5m for trees to be removed.
2. Retain any concrete structures in the immediate vicinity of the tree to be retained. Retain any concrete structures in the immediate vicinity of the tree to be removed.
3. Retain any concrete structures in the immediate vicinity of the tree to be retained. Retain any concrete structures in the immediate vicinity of the tree to be removed.
4. Retain any concrete structures in the immediate vicinity of the tree to be retained. Retain any concrete structures in the immediate vicinity of the tree to be removed.
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7. Retain any concrete structures in the immediate vicinity of the tree to be retained. Retain any concrete structures in the immediate vicinity of the tree to be removed.
8. Retain any concrete structures in the immediate vicinity of the tree to be retained. Retain any concrete structures in the immediate vicinity of the tree to be removed.

Arborist to supervise excavation within critical root zone of tree N13. any roots encountered to be pruned to sound tissue to encourage new root growth. Clearance pruning to be limited to limbs under 10 cm in diameter.

Arborist to supervise any excavation within critical root zones of trees to be retained.

TREE PROTECTION NOTES

Tree protection barrier: The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zone. The barrier fencing to be erected must be a minimum of 1200mm in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

Arborist supervision: All excavation occurring within the critical root zones of protected trees must be completed under the supervision of the project arborist. Any severed or severely damaged roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound.

Demolition: The demolition of the existing houses, driveways, and any services that must be removed or abandoned must take the critical root zone of the trees to be retained into account. If any excavation or machine access is required within the critical root zones of trees to be retained, it must be completed under the supervision of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.

Methods to avoid soil compaction: In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:

- Installing a layer of hog fuel or coarse wood chips at least 20cm in depth and maintaining it in good condition until construction is complete.
- Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15cm over top.
- Placing two layers of 19mm plywood.
- Placing steel plates.

Mulching: Mulching can be an important proactive step in maintaining the health of trees and mitigating construction related impacts and overall stress. Mulch should be made from a natural material such as wood chips or bark pieces and be 5-8cm deep. No mulch should be touching the trunk of the tree. See "methods to avoid soil compaction" if the area is to have heavy traffic.

Pruning: We recommend that any pruning of bylaw-protected trees be performed to ANSI A300 standards and Best Management Practices.

Paved surfaces above tree roots: Where paved areas cannot avoid encroachment within critical root zones of trees to be retained, construction techniques, such as floating permeable paving, may be required. The "paved surfaces above tree roots" detail above offers a compromise to full depth excavation (which could impact the health or structural stability of the tree). The objective is to avoid root loss and to instead raise the paved surface above the existing grade (the amount depending on how close roots are to the surface and the depth of the paving material and base layers). Final grading plans should take this potential change into account. This may also result in soils which are high in organic content being left intact below the paved area. To allow water to drain into the root systems below, we also recommend that the surface be made of a permeable material (instead of conventional asphalt or concrete) such as permeable asphalt, paving stones, or other porous paving materials and designs such as those utilized by Grasspave, Gravelpave, Grasscrete and open-grid systems.

Blasting and rock removal: Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibrations and overall impact to the surrounding environment. Only explosives of low phototoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.

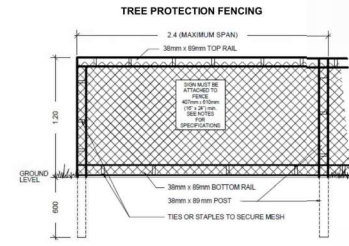
Scaffolding: This assessment has not included impacts from potential scaffolding including canopy clearance pruning requirements. If scaffolding is necessary and this will require clearance pruning of retained trees, the project arborist should be consulted. Depending on the extent of pruning required, the project arborist may recommend that alternatives to full scaffolding be considered such as hydraulic lifts, ladders or

platforms. Methods to avoid soil compaction may also be recommended (see "Minimizing Soil Compaction" section).

Landscaping and irrigation systems: The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technical consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on the tree health and can lead to root and trunk decay.

Arborist's role: It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:

- Locating the barrier fencing.
- Reviewing the report with the project foreman or site supervisor.
- Locating work zones and machine access corridors where required.
- Supervising excavation for any areas within the critical root zones of trees to be retained including any proposed retaining wall footings and review any proposed fill areas near trees to be retained.



**Tree Resource Spreadsheet
1344 Thurlow Road**

Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (diameter in metres)	CRZ (radius in metres)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Retention Status
n.t.1	Holly	<i>Ilex aquifolium</i>	9.0	3.0	1.0	Good	Good	Fair	Located on neighbouring property	Retain
n.t.2	English Hawthorn	<i>Crataegus laevigata</i>	12.0	3.0	1.2	Good	Fair	Fair	Located on neighbouring property	Retain
n.t.3	Plum	<i>Prunus species</i>	15, 25, 15	3.0	4.0	Good	Fair	Poor	Located on neighbouring property, heavily topped	Retain
n.t.4	Pear	<i>Pyrus species</i>	25, 15, 15	5.0	4.0	Moderate	Fair	Fair	Located on neighbouring property	Retain
n.t.5	Mullberry	<i>Morus species</i>	15.0	4.0	2.0	Moderate	Fair	Fair	heavy lean, owner will try and transplant	to be transplanted
759	Pear	<i>Pyrus species</i>	42, 30	6.0	6.0	Moderate	Fair	fair	Ganoderma on trunk, 1 large stem previously removed.	X
n.t.6	Horse chestnut	<i>Aesculus hippocastanum</i>	45.0	8.0	4.5	Good	Good	Fair	Co-dominant tree, located mostly on neighbours property, but possibly shared.	Retain
n.t.7	Apple	<i>Malus species</i>	29.5	4.0	3.0	Good	Poor	Poor	Previously topped, very poor health and structure.	X
758	Apple	<i>Malus species</i>	43, 28, 25	9.0	7.5	Good	Fair	fair	Mature tree, high crown	Retain
17034	Persian Ironwood	<i>Parrotia persia</i>	8.0	2.0	1.0	Moderate	Good	fair	Boulevard tree no impacts anticipated.	Retain

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Tree Resource Spreadsheet Methodology and Definitions

Tag: Tree identification number on a metal tag attached to tree with nail or wire, generally at eye level. Trees on municipal or neighboring properties are not tagged.

NT: No tag due to inaccessibility or ownership by municipality or neighbour.

DBH: Diameter at breast height – diameter of trunk, measured in centimetres at 1.4m above ground level. For trees on a slope, it is taken at the average point between the high and low side of the slope.

* Measured over ivy

~ Approximate due to inaccessibility or on neighbouring property

Crown Spread: Indicates the diameter of the crown spread measured in metres to the dripline of the longest limbs.

Relative Tolerance Rating: Relative tolerance of the tree species to construction related impacts such as root pruning, crown pruning, soil compaction, hydrology changes, grade changes, and other soil disturbance. This rating does not take into account individual tree characteristics, such as health and vigour. Three ratings are assigned based on our knowledge and experience with the tree species: Poor (P), Moderate (M) or Good (G).

Critical Root Zone: A calculated radial measurement in metres from the trunk of the tree. It is the optimal size of tree protection zone and is calculated by multiplying the DBH of the tree by 10, 12 or 15 depending on the tree's Relative Tolerance Rating. This methodology is based on the methodology used by Nelda Matheny and James R. Clark in their book "Trees and Development: A Technical Guide to Preservation of Trees During Land Development."

- 15 x DBH = Poor Tolerance of Construction
- 12 x DBH = Moderate
- 10 x DBH = Good

To calculate the critical root zone, the DBH of multiple stems is considered the sum of 100% of the diameter of the largest stem and 60% of the diameter of the next two largest stems. It should be noted that these measures are solely mathematical calculations that do not consider factors such as restricted root growth, limited soil volumes, age, crown spread, health, or structure (such as a lean).

Health Condition:

- Poor - significant signs of visible stress and/or decline that threaten the long-term survival of the specimen
- Fair - signs of stress
- Good - no visible signs of significant stress and/or only minor aesthetic issues

Structural Condition:

- Poor - Structural defects that have been in place for a long period of time to the point that mitigation measures are limited
- Fair - Structural concerns that are possible to mitigate through pruning
- Good - No visible or only minor structural flaws that require no to very little pruning

Retention Status:

- X - Not possible to retain given proposed construction plans
- Retain - It is possible to retain this tree in the long-term given the proposed plans and information available. This is assuming our **recommended mitigation measures are followed**
- Retain * - See report for more information regarding potential impacts
- TBD (To Be Determined) - The impacts on the tree could be significant. However, in the absence of exploratory excavations and in an effort to retain as many trees as possible, we recommend that the final determination be made by the supervising project arborist at the time of excavation. The tree might be possible to retain depending on the location of roots and the resulting impacts, but concerned parties should be aware that the tree may require removal.
- NS - Not suitable to retain due to health or structural concerns