



Talbot Mackenzie & Associates
Consulting Arborists



820 Dunsmuir Rd, Esquimalt

Construction Impact Assessment & Tree Preservation Plan

Prepared For: Kimberley Colpman
Large and Co.
607 Vancouver St
Victoria, BC.
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Jobsite Property: 820 Dunsmuir Rd, Esquimalt, BC

Date of Site Visits: October 25, 2019

Site Conditions: No ongoing construction activity.

Summary: The proposed development will require the removal of 9 bylaw protected trees, 1 non bylaw protected tree and a hedge (NT1). It should be noted that trees #332-335 and #340-341 are ornamental species (#334 is not bylaw protected), Western Red Cedars #338 and 339 have been heavily pruned for clearance from the overhead utility lines, and both Douglas-firs #336 and 337 are in fair/poor structural condition.

Building B and the patio area outside unit 4 may require excavation and blasting into the critical root zones of municipal Garry Oak NT2. Efforts must be made to minimize excavation outside the building and patio footprints towards this tree. The project arborist should be on site to supervise all excavation/blasting within the CRZs of this tree. We anticipate NT2 can be retained if our recommended mitigation measures are followed.

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 deconstruct the existing house and construct 7 townhouses
- 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 architectural site plan prepared by Victoria Design Group (August 11, 2021).

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.
- The extent of impacts to some trees will largely depend on the cut-slope prescribed by the geotechnical engineer during excavation for the foundations. Therefore, the proximity of excavation to trees (without shoring) can only be estimated and may be closer or farther from trees than we estimate.
- Where trees were not surveyed on the plans provided, we have added their approximate locations. The accuracy of our estimated locations has not been verified by a professional surveyor.

Summary of Tree Resource: 13 trees and hedges were included in our inventory, 10 of which are on the subject property. There are 9 protected trees on the subject property, 1 on the Wollaston St municipal boulevard, 1 on a neighbouring property (#815 Wollaston St), and 1 is a laurel hedge possibly on municipal property or under shared ownership.

Trees to be Removed:

- All 10 trees on the subject property (**#332-341**) will have to be removed, as they are within or immediately adjacent to the proposed building or patio footprints. It should be noted that trees #332-335 and #340-341 are ornamental species (#334 is not bylaw protected), Western Red Cedars #338 and 339 have been heavily pruned for clearance from the overhead utility lines, and that both Douglas-firs #336 and 337 are in fair/poor structural condition.
- **Laurel hedge NT1:** The vast majority of this hedge will likely have to be removed to install the proposed new sidewalk. This hedge is likely on municipal property or under shared ownership.
- **Potential Impacts on Trees to be Retained and Mitigation Measures**
- **Garry Oak NT2 (76cm DBH):** This tree is growing on the Wollaston St municipal frontage. The architectural site plan indicates the patio for Building Bis approximately 7m from the tree. If blasting is required within the critical root zone, the recommendations in the “Blasting” section below must be followed.

We recommend that an effort be made to minimize the extent of excavation outside the patio area and onto the municipal boulevard. The project arborist must supervise any excavation within the CRZ of this tree (7.5m). We do not anticipate its health or structural stability will be significantly impacted if our recommendations are followed. Barrier fencing should be erected in the locations shown on the attached tree management plan (T1).

- **Deodara Cedar NT3 (~40cm DBH):** This tree is growing on the west neighbour's property (#815 Wollaston St). It was not professionally surveyed and we only roughly estimated its location on the attached tree management plan (T1). Exposed bedrock separates the base of this tree from the subject property. We could not determine whether roots from this tree are growing down the face of the exposed bedrock on the subject property due to the understory plants surrounding this tree.

We recommend the project arborist supervise any excavation or blasting required within the CRZ of this tree (5.0 meters) and barrier fencing be erected in the locations shown on the attached tree management plan (T1).

- **Service Connections:** At this time we have not reviewed a current civil concept plan. Once a civil concept plan is prepared, it is recommended that the project arborist review the plan and update this report accordingly.
- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. This includes (but is not limited to) the following activities:
 - Any excavation or blasting within the CRZs of trees NT2 and NT3.
- **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.
-
- **Deconstruction of the existing house:** Based on discussions with the applicant, it is our understanding that the existing house will be deconstructed. If the demolition permit precedes the tree removal permit, the project arborist must be onsite to supervise excavation to remove foundations that are located within critical root zones.
 - **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.
 - **Blasting:** 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 vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity 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 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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Attachments. 1 page tree management plan (T1), 1-page tree resource spreadsheet, 2-page tree resource spreadsheet methodology and definitions

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Disclosure Statement

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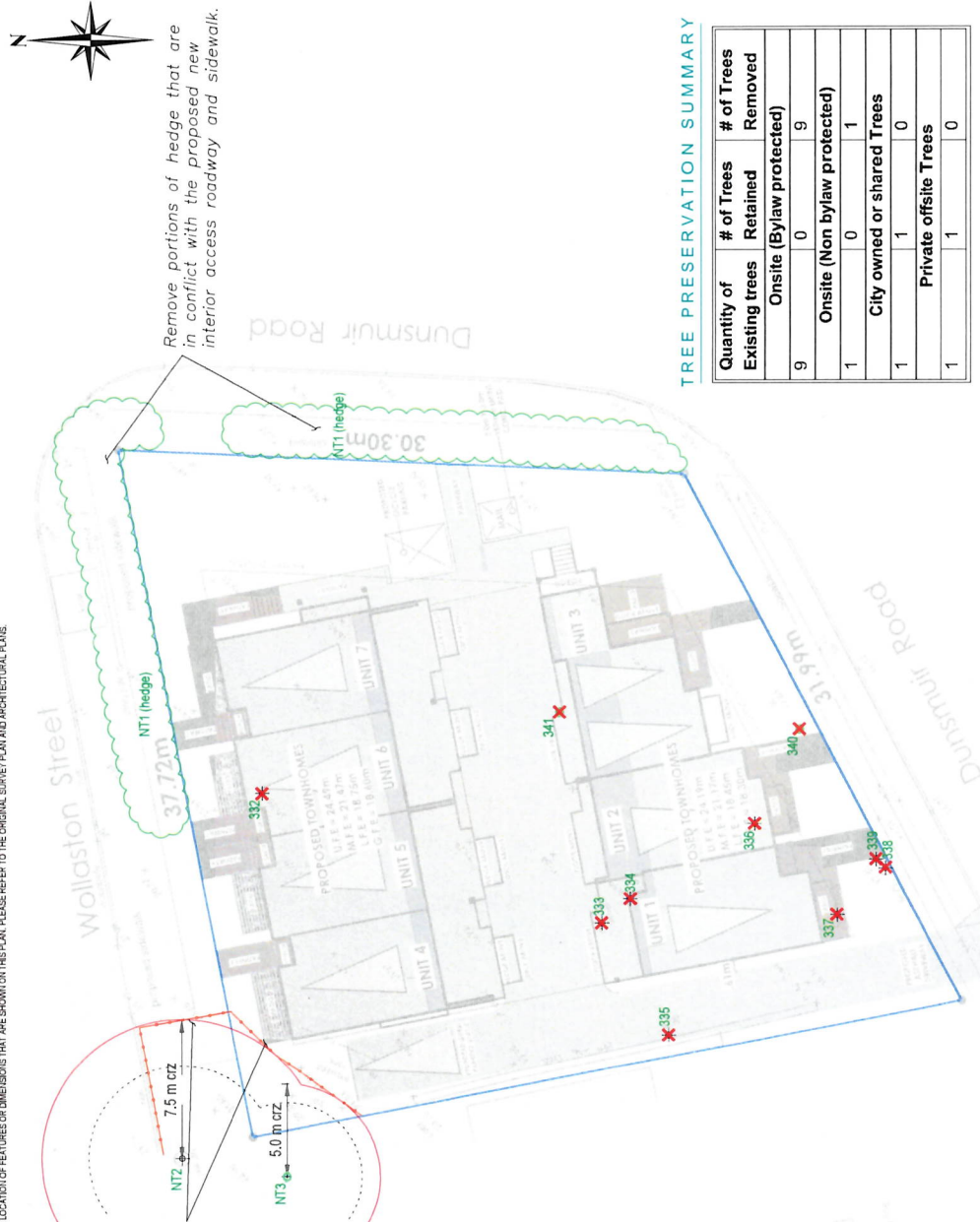
Arborists are professionals who examine trees and use their training, knowledge, and experience to recommend techniques and procedures that will improve a tree's health and structure or to mitigate associated risks. Trees are living organisms whose health and structure change and are influenced by age, 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. The arborist's review is limited to a visual examination of tree health and structural condition, without excavation, probing, resistance drilling, increment coring, or aerial examination. There are inherent limitations to this type of investigation, including, without limitation, that some tree conditions will inadvertently go undetected. The arborist's review followed the standard of care expected of arborists undertaking similar work in British Columbia under similar conditions. No warranties, either express or implied, are made as to the services provided and included in this report.

The findings and opinions expressed in this report are based on the conditions that were observed on the noted date of the field review only. The Client recognizes that passage of time, natural occurrences, and direct or indirect human intervention at or near the trees may substantially alter discovered conditions and that Talbot Mackenzie & Associates cannot report on, or accurately predict, events that may change the condition of trees after the described investigation was completed.

It is not possible for an Arborist to identify every flaw or condition that could result in failure nor can he/she guarantee that the tree will remain healthy and free of risk. The only way to eliminate tree risk entirely is to remove the entire tree. All trees retained should be monitored on a regular basis. 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.

Immediately following land clearing, grade changes or severe weather events, all trees retained should be reviewed for any evidence of soil heaving, cracking, lifting or other indicators of root plate instability. If new information is discovered in the future during such events or other activities, Talbot Mackenzie & Associates should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein.

Remove portions of hedge that are in conflict with the proposed new interior access roadway and sidewalk.



The diagram shows a tree with several concentric and overlapping zones and boundaries:

- Existing tree with tag or ID #**: Indicated by a small tag on the tree trunk.
- Dipline radius (m)**: A dashed circle centered on the tree trunk.
- Tree protection fencing**: A solid red square boundary around the tree.
- Critical root zone radius (m)**: A solid red circle centered on the tree trunk.
- Tree to be removed (proposed)**: Indicated by a red 'X' symbol.
- Non-bylaw undersize tree**: Indicated by a blue circle with a diagonal slash.
- Unsurveyed tree (approx. loc'n)**: Indicated by a green circle with a cross.
- Site boundary**: A solid blue line.

TREE PROTECTION FENCING DETAIL



Tree Management Plan - T11
820 Dunsmuir Road
Essex, BC

DATE: August 24, 2021
 PREPARED FOR: Large and Co.
 SCALE: 1"=50' @ 11" X 17"
 DRAWN BY: NT
 REVISION: 1

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820 Dunsmuir Rd
Tree Resource Spreadsheet

Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Bylaw Protected	Retention Status
332	Cherry	<i>Prunus spp.</i>	25, 23, 10, 9	8	5.5	Moderate	Good	Fair	Narrow codominant union	Y	X
333	Purple Leaf Plum	<i>Prunus cerasifera</i>	23, 22, 11, 8	8	5.0	Moderate	Fair	Fair	Some dieback, decay in stems	Y	X
334	Cherry	<i>Prunus spp.</i>	20	6	2.5	Moderate	Good	Fair		N	X
335	Mountain Ash	<i>Sorbus aucuparia</i>	25, 21	8	5.5	Poor	Fair	Fair	Narrow oominant union, growing next to retaining wall	Y	X
336	Douglas-fir	<i>Pseudotsuga menziesii</i>	57*	6	8.5	Poor	Fair	Fair/poor	Leaning, codominant union near apex	Y	X
337	Douglas-fir	<i>Pseudotsuga menziesii</i>	89, 61	8	12.0	Poor	Good	Fair/poor	Possibly two trees, larger stem has multiple leaders, likely topped near apex, ivy on trunk	Y	X
338	Western Red Cedar	<i>Thuja plicata</i>	54, 39, 34	8	10.0	Poor	Good	Fair	Pruned for hydro lines	Y	X
339	Western Red Cedar	<i>Thuja plicata</i>	39	8	6.0	Poor	Good	Fair	Pruned for hydro lines	Y	X
340	Hazel	<i>Corylus spp.</i>	16, 16, 16, 15, 14	8	4.0	Moderate	Fair	Fair		Y	X
341	Fig	<i>Ficus spp.</i>	24, 12, 9	8	4.5	Moderate	Fair	Fair		Y	X
NT1	Common Laurel hedge	<i>Prunus laurocerasus</i>	Multistem	5	2.5	Good	Good	Good	Most stems likely shared or on municipal property, stems up to ~25cm DBH	N	X (portions)
NT2	Garry Oak	<i>Quercus garryana</i>	76	10	7.5	Good	Fair	Fair	Municipal, codominant stems, small deadwood	Y	Retain*
NT3	Deodara Cedar	<i>Cedrus deodara</i>	~40	8	5.0	Moderate	Good	Good	Neighbour's tree, next to rock outcrop	Y	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