



Talbot Mackenzie & Associates

Consulting Arborists

2558 Quadra St, Victoria

Construction Impact Assessment & Tree Preservation Plan

Prepared For: Greater Victoria Housing Society
2326 Government Street
Victoria, BC
V8T 5G5

Prepared By: Talbot, Mackenzie & Associates
Noah Borges
ISA Certified # PN-8409A
TRAQ – Qualified

Date of Issuance: October 3, 2019

Box 48153 RPO - Uptown Victoria, BC V8Z 7H6
Ph: (250) 479-8733
Fax: (250) 479-7050
Email: tmtreehelp@gmail.com



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Jobsite Property: 2558 Quadra St, Victoria, BC

Date of Site Visits: September 12, 2019

Site Conditions: No ongoing construction activity.

Summary: Two bylaw protected Western Red Cedar trees (#494 and 495) are in the proposed parkade footprint and will require removal. During the demolition phase, these trees must be protected by erecting barrier fencing as indicated on the attached site plan. If the existing paved walkway to the front entrance of the building is removed before the trees are, caution must be exercised to not damage any roots that may be growing directly underneath and the barrier fencing should be extended to isolate this area.

There are four young maple trees (#496-499) that appear to be growing on municipal property west of the parking area. Based on discussions with the applicant, it is our understanding that they intend to remove these trees as well.

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 building and construct a new multi-story building with an underground parkade
- 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 attached site and building plans from dHKarchitects (dated May 2019) and landscape plan from Murdoch de Greeff Inc. (dated October 2, 2019).

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.
- 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. Only the trees shown on the attached site survey were professionally surveyed.

Summary of Tree Resource: 6 trees were included in the inventory, including two bylaw protected Western Red Cedar trees growing on the subject property. There are four recently planted maple trees located west of the parking area which appear to be on municipal property.

Trees to be Removed:

- **Western Red Cedars #494 and 495** are located within the footprint of the parkade.
- **Maples #496-499:** Based on discussions with the applicant, it is our understanding that these four trees will be removed. #498 is within the footprint of the driveway and #497 is in the waste sorting area (see attached landscape plan).

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Demolition of the Existing Building:** It is our understanding that the two Western Red Cedar trees (#494 and 495) must be protected during the demolition phase. The demolition of the existing building and any services that must be removed or abandoned, must take the critical root zone of these trees into account. If any excavation or machine access is required within the CRZs of these trees, it must be completed under the supervision and direction of the project arborist. Barrier fencing must be constructed in the areas indicated on the attached site plan to prevent soil compaction within their CRZs. If the existing paved walkway to the front entrance of the building is removed before the trees are, caution must be exercised to not damage any roots that may be growing directly underneath. The barrier fencing should be extended to isolate this area following the removal of the pathway. If the barrier fencing must be temporarily removed or modified, the project arborist must be notified.
- **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.
- **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.

Talbot Mackenzie & Associates

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

Thank you,



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Encl. 1-page tree resource spreadsheet, 10-page site and building plans, 2-page landscape plans, 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.

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
494	Western Red Cedar	<i>Thuja plicata</i>	103 (measured at 1.1m above ground)	10	15.5	Poor	Good	Fair	Pruned for utility line clearance, codominant leaders	Y	X
495	Western Red Cedar	<i>Thuja plicata</i>	85	10	13.0	Poor	Good	Fair	Codominant leaders, asymmetric crown due to competition with 494	Y	X
496	Maple	<i>Acer spp.</i>	8	2	1.0	Moderate	Good	Fair	Likely a municipal tree, likely red or freeman maple	N	X
497	Maple	<i>Acer spp.</i>	7	2	1.0	Moderate	Good	Fair	Likely a municipal tree	N	X
498	Maple	<i>Acer spp.</i>	8	3	1.0	Moderate	Good	Fair	Likely a municipal tree	N	X
499	Maple	<i>Acer spp.</i>	7	3	1.0	Moderate	Good	Fair	Likely a municipal tree	N	X

BC LAND SURVEYORS SITE PLAN OF:

Civic: 2558 Quadra Street

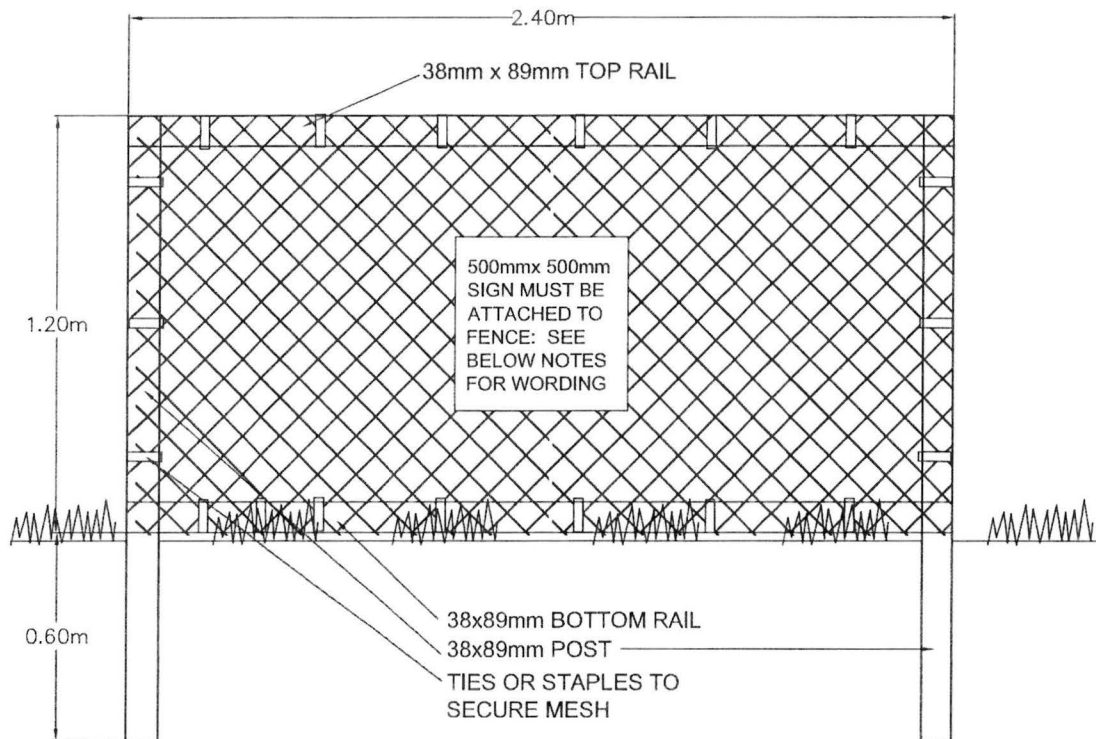
Legal: Lot A, Section 4,

Victoria District, Plan 11029

Plan Identifier: 100-121-209 in the City of Victoria

SCALE 1:300

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TREE PROTECTION FENCING

1. FENCE WILL BE CONSTRUCTED USING 38 mm X 89mm WOOD FRAME: TOP, BOTTOM AND POSTS * USE ORANGE SNOW-FENCING MESH AND SECURE THE WOOD FRAME WITH "ZIP" TIES OR GALVANIZED STAPLES.
 2. ATTACH A 500mm X 500mm SIGN WITH THE FOLLOWING WORDING: WARNING- TREE PROTECTION AREA. THIS SIGN MUST BE AFFIXED ON EVERY FENCE OR AT LEAST EVERY 10 LINEAR METERS.
- * IN ROCKY AREAS, METAL POSTS (T-BAR OR REBAR) DRILLED INTO ROCK WILL BE ACCEPTED



Talbot Mackenzie & Associates

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Box 48153 RPO - Uptown Victoria, BC V8Z 7H6

Ph: (250) 479-8733

Fax: (250) 479-7050

Email: tmtreehelp@gmail.com

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