



Talbot Mackenzie & Associates

Consulting Arborists

1811 Oak Bay Avenue, Victoria

Tree Risk Assessment

91.0 cm DBH *Acer macrophyllum*

Tag #99

PREPARED FOR:

Norm Eden
2350 Sunriver Way
Sooke, BC V9Z 0Y4
Canada

PREPARED BY:

Talbot, Mackenzie & Associates

Graham Mackenzie – Consulting Arborist
ISA Certified # PN-0428
TRAQ – Qualified

DATE OF ISSUANCE: April 15, 2019

Box 48153 RPO - Uptown Victoria, BC V8Z 7H6

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Talbot Mackenzie & Associates

Consulting Arborists

Jobsite Property: 1811 Oak Bay Avenue, Victoria

Date of Site Visit(s): April 10, 2019

Site Conditions: Residential backyard. No construction activity or signs of disturbance.

During our April 10, 2019 site visit, at the owner's request, we visually examined the health and structure of a 91 cm DBH Big Leaf Maple tree (*Acer macrophyllum*) with tag number 99 located in the Southwest corner of the property at 1811 Oak Bay Avenue. We had previously inventoried the tree as part of a development proposal and had noted fruiting bodies of the fungal decay pathogen *Kretzschmaria deusta*. *K. deusta* is a disease pathogen that breaks down both cellulose and lignin in the wood tissues, causing a white rot that attacks the trunks, root collar and structural roots in many deciduous tree species. The disease can be difficult to diagnose visually or through sampling as there is often no evidence of a decline in tree health, and internal cavities may not form within the trunk tissues as the strength of the wood degrades. Infected trees may fail as a result of the infection and deterioration of the structural roots, without any evidence of decline in the tree canopy.

Resistograph readings taken at the base of the tree and at an angle into the root collar encountered significant drops on resistance, particularly in readings taken from the Southeast and Northeast sides of the tree. There is an open cavity with decayed tissue on the East side at the base of the tree that is difficult to access due to the existing garage, but the wood tissue that was able to be removed is deteriorated and consistent with the fungal infection.

This decay pathogen is known to cause whole tree failure due to the deterioration of the root system, or trunk shearing as a result of weakened brittle wood tissues. The tree is located where considerable property damage could occur should the tree fail, and it is our understanding that there will be demolition activity on the site to remove the existing buildings for the proposed new use of the property. Given the risk associated with the tree and the demolition activity that is going to occur, we recommend the tree be removed at the time of demolition to eliminate the risk associated with it.



Picture 1: Location of tree on property.



Picture 2: Kretzschmaria deusta fruiting body found during inventory.



Picture 3: Newly formed fruiting body found in follow up examination.

Please do not hesitate to call us at 250-479-8733 should you have any questions.
Thank you,

A handwritten signature in black ink, appearing to be 'T. Mackenzie'.

Talbot Mackenzie & Associates
ISA Certified & Consulting Arborists

Disclosure Statement

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve the health and structure of individual trees or group of trees, 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 nor 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.



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Consulting Arborists

1811 Oak Bay Avenue, Victoria

Construction Impact Assessment & Tree Preservation Plan

PREPARED FOR: Norm Eden
2350 Sunriver Way
Sooke, BC V9Z 0Y4
Canada

PREPARED BY: Talbot, Mackenzie & Associates

Graham Mackenzie
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TRAQ – Qualified

DATE OF ISSUANCE: March 13, 2019

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Talbot Mackenzie & Associates

Consulting Arborists

Jobsite Property: 1811 Oak Bay Avenue, Victoria
Date of Site Visit: March 5 & 12, 2019
Site Conditions: Residential multi unit building. No construction activity present at the time of our site visit.

Summary: Two bylaw protected trees, Big leaf maple #99 and Dogwood #98, will require removal due to construction related impacts, both of which are either in poor health or structural condition. Additionally, non-bylaw protected Western Red cedar #100 and Lawson Cypress #97 will require removal. Based on the survey provided, both Big leaf maple #99 and Western Red cedar #100 have at least partial shared ownership with the neighbouring property to the west and we recommend that the neighbours be consulted prior to the removal of the trees. There is one municipal cherry tree located on the boulevard and two ginkgo trees on the neighbouring property to the west that have a good opportunity to be retained provided their critical root zones can be protected during construction. The neighbour's trees root zones are restricted by an existing retaining wall and we do not anticipate they will be impacted providing the existing retaining wall remains in place. Any proposed offsite work or sidewalk improvements must take the critical root zone of the municipal cherry tree into account.

Scope of Assignment:

- To inventory the existing bylaw protected trees and any trees on 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.
- 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 by-law protected trees with their identification numbers were labelled on the attached Site Plan. The conclusions reached were based on the information provided within the attached plans from Low Hammond Rowe Architect Ltd.

Limitations: No exploratory excavations have been requested 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: 7 trees were included in the inventory, including two bylaw protected trees on the subject property.

Trees to be Removed: Two bylaw protected trees, Big leaf maple #99 and Dogwood #98 will require removal due to construction related impacts both of which are either in poor health or structural condition due to existing health concerns. Additionally, non-bylaw protected Western Red cedar #100 and Lawson Cypress #97 will require removal. Based on the survey provided, both Big leaf maple #99 and Western Red cedar #100 have at least partial shared ownership with the neighbouring property to the West and we recommend that the neighbours be consulted prior to the trees removal.

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Trees to be Retained:** There is one municipal cherry tree located on the boulevard and two ginkgo trees on the neighbouring property to the west that have a good opportunity to be retained provided their critical root zones can be protected during construction. The neighbours trees root zones are restricted by an existing retaining wall and we do not anticipate they will be impacted providing the existing retaining wall remains in place. Any proposed offsite work or sidewalk improvements must take the critical root zone of the municipal cherry tree into account.
- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. Any severed roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. In particular, the following activities should be completed under the direction of the project arborist:
 - Any excavation near neighbours' trees to be retained.
 - Any excavation for offsite work within the critical root zone of municipal Cherry tree N.t.1.
- **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.
- **Demolition of the Existing Building:** The demolition of the existing house 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 and direction of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.
- **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.
- **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.



Dogwood #98- showing dead area of cambium.



Big Leaf Maple #100 – showing fruiting body of *Kretzschmaria deusta* found at base.

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

Thank you,

Graham Mackenzie
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Encl. 1-page tree resource spreadsheet, 1-page tree resource spreadsheet methodology and definitions, 1-page site plan with trees, 15-page building plans, 1-page barrier fencing specifications

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Disclosure Statement

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Tree Resource Spreadsheet
1811 Oak Bay Avenue

Tree ID	Common Name	Latin Name	DBH (cm) ~ approximate	Crown Spread (m)	CRZ (m)	Relative Tolerance	Health	Structure	Remarks and Recommendations	Protected by bylaw	Retention Status
97	Lawson cypress	<i>Chamaecyparis lawsoniana</i>	50.0	5.0	6.0	Poor/Moderate	Good	Fair	Previously topped. Within underground parking footprint	No	X
98	Dogwood	<i>Cornus nuttallii</i>	15.0	5.0	3.0	Poor	Poor	Poor	~50% of cambium on lower trunk dead. Within underground parking footprint.	Yes	X
99	Big Leaf Maple	<i>Acer macrophyllum</i>	91.0	9.0	9.0	Moderate	Fair	Fair/Poor	Decay evident on East side of lower trunk. <i>Kretzschmaria deusta</i> fruiting bodies found on lower trunk. Survey shows partial ownership with neighbour.	Yes	X
100	Western Red Cedar	<i>Thuja plicata</i>	47.0	7.0	4.5	Moderate	Good	Fair	Lower foliage sheared. Within underground parking footprint. Survey shows partial ownership with neighbour.	No	X
N.t. 1	Cherry tree	<i>Prunus serrulata</i>	22.0	3.0	2.5	Moderate	Good	Good	Boulevard planting.	Yes	Retain
N.t.2	Ginkgo	<i>Ginkgo biloba</i>	13.0	4.0	2.0	Good	Good	Good	Located on neighbouring property, Do not anticipate any significant impacts providing existing retaining wall remains in place.	No	Retain
N.t.3	Ginkgo	<i>Ginkgo biloba</i>	13.0	3.5	2.0	Good	Good	Good	Located on neighbouring property, Do not anticipate any significant impacts providing existing retaining wall remains in place.	No	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:

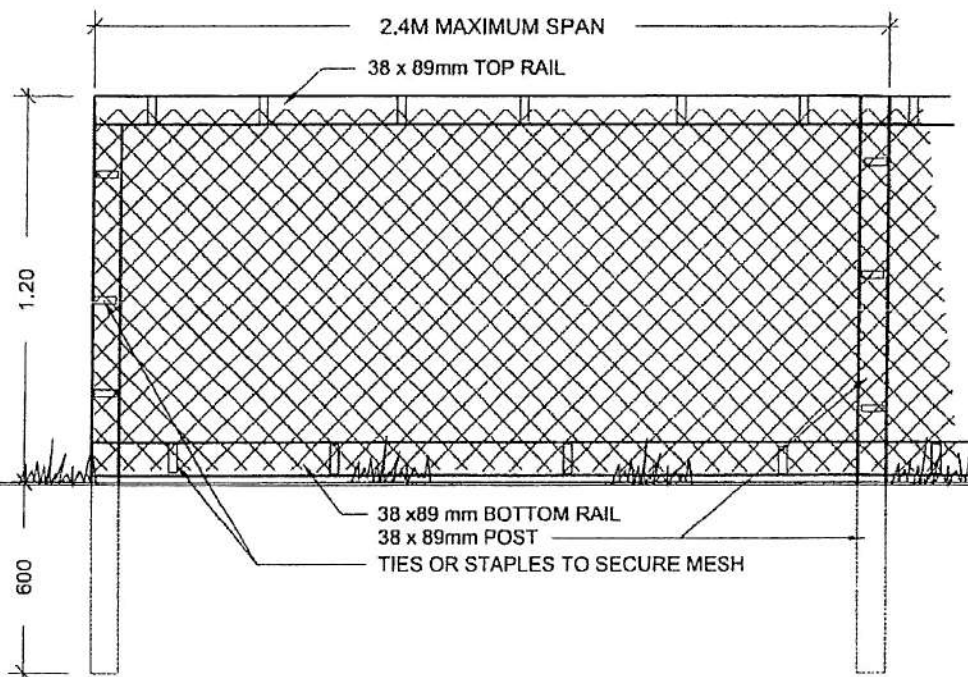
- Poor - significant signs of visible stress and/or decline that threaten the long-term survival of the specimen
- Fair - signs of stress
- Good - no visible signs of significant stress and/or only minor aesthetic issues

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



TREE PROTECTION FENCING
 FENCE WILL BE CONSTRUCTED USING
 38 X 89 mm (2"X4") WOOD FRAME:
 TOP, BOTTOM AND POSTS. *
 USE ORANGE SNOW-FENCING MESH AND
 SECURE TO THE WOOD FRAME WITH
 "ZIP" TIES OR GALVANIZED STAPLES

* IN ROCKY AREAS, METAL POSTS (T-BAR
 OR REBAR) DRILLED INTO ROCK WILL BE
 ACCEPTED

DETAIL NAME:

TREE PROTECTION FENCING

DATE: Oct 30/07
 DRAWN: DM
 APP'D: RR
 SCALE: N.T.S.

E105
 DRAWING