



GYE + ASSOCIATES

Consultants in Urban Forestry and Arboriculture

**Summary Arborist Report
2920 Prior Street,
Victoria, BC**

Date of Report: December 17, 2019

Dates of Field Work: October 31, 2018 & November 21, 2019

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EXECUTIVE SUMMARY

Rezoning for a two-lot subdivision with one new house are proposed. Three significant trees are potentially impacted by the proposed development: one on-site bylaw-protected Douglas-fir and two mature boulevard ash trees. The architectural, civil and landscape designs for the project have been optimized to protect the subject trees. Provided best practices are followed, the safe, useful life expectancy of these trees should not be affected. No tree removals are proposed for this project.

BACKGROUND

A two-lot subdivision and rezoning is proposed for the current lot at 2920 Prior Street. R1B zoning is proposed for the southern-most lot (retaining the existing home) and R1-S2 is proposed for the northern-most lot (restricted small lot with 2-storey proposed building).

One private bylaw-protected tree, two boulevard trees and several small off-site fruit or flowering trees are considered in the site plan design for this property.



Figure-1 Context photo indicating location of subject lot

ASSIGNMENT

Prepare a Tree Preservation Plan (TPP) and written summary in accordance with the City's published Terms of Reference. The TPP shall address all phases of the development requiring tree protection, including site preparation, on-site servicing, construction, landscaping and post-construction care.

METHODOLOGY

A visual assessment was completed of a single bylaw-protected tree located in the front yard in relation to a conceptual site plan. A trench was hand dug 4.1m west of the tree close to the front wall of a proposed new home in order to investigate the depth of the root horizon and the number and size of tree roots at this location that might be impacted. The trench was



2.5m long and 60cm deep. Two fir roots were found: one 5.5 cm diameter crossed the trench, while 5 cm root was revealed at the east side of the trench and appeared to be a sinker root. The roots were below the A horizon and within clay.

On November 21, 2019, additional trees growing on the site, boulevard trees and trees growing off-site with root systems encroaching into the subject lot were located, measured and assessed for health and structural integrity. Site conditions associated with these trees were also assessed, including topography, existing buildings, retaining walls, sidewalks and other site elements.

The species, age and condition of the trees, along with their associated site conditions, were considered in estimating their Protected Root Zones (PRZs). Multipliers of 12x, 15x and 18x the stem diameter (DBH) were applied to determine the radial offsets for PRZs, depending on these factors.¹

Legal topographic survey, architectural and civil site plan drawings were reviewed to develop the tree plan drawing to scale in CAD and analyse potential conflicts between trees and built elements, including site grading. Conflicts identified by this process were brought to the attention of the owner and the house designer for discussion and the site plan was modified to alleviate the conflicts as much as possible.

OBSERVATIONS

The existing site is a residential property with one accessory building located on the west side of Prior Street. The lot slopes gently from north to south and from east to west. A mature Douglas-fir is located in the front of the property beside the existing driveway and municipal boulevard, both of which are approximately 60cm higher in grade than the base of the tree and retained by a dry-stacked wall (in the case of the driveway) and a concrete retaining wall (in the case of the boulevard). The fir is 65 cm DBH and exhibits an 80% live crown ratio, stable height-to-girth ratio and a typical excurrent form with strong apical dominance. The crown of the tree shows good vitality through its foliage colour, density and twig growth. No fungal fruiting bodies are visible and there are no other indications of structural defect in the tree, which has a single leader.

Two mature ash trees are located on the municipal boulevard (*Fraxinus* sp. cultivars), both of which appear to be in good health and condition. A large off-site Garry oak tree is located in the front yard of the adjacent lot to the north of the subject property. It is estimated that its root system extends partially over the shared property boundary. Several fruit and flowering trees are located off-site with root systems that extend into the property, as indicated on the attached tree plan drawing. (See the Tree Table below for details of the tree inventory.)

¹ Nelda Methany and Clark, James R., Trees and Development – A Technical Guide to Preservation of Trees During Land Development (International Society of Arboriculture, Publishers, Champaign Illinois, USA) 1988.



Figure-2 Mature Douglas-fir and two boulevard ash trees

TREE TABLE								
G&A Tree ID	Common Name	DBH (cm)	PRZr (m)	Crown Radius (m)	Health	Structural Condition	Tree Status	Recommendations
001	Douglas-fir	65	8	6	Good	Good	Bylaw protected	Retain and Protect
002	Ash sp.	30	3.6	3	Good	Good	Public tree	Retain and Protect
003	Ash sp.	55	6.6	5	Good	Good	Public tree	Retain and Protect
004	Fruiting apple	40	5	4	Good	Good	Off-site tree	Retain and Protect
005	Fruiting cherry	30	3.6	4	Good	Good	Off-site tree	Retain and Protect
006	English hawthorn	25	3	4	Fair	Fair	Off-site tree	Retain and Protect
007	Garry oak	70, 70	13.4	10	Good	Good	Off-site tree	Retain and Protect

Site plan:

The site plan indicates a sub-division of the present residential lot into two smaller lots. A new house is proposed for the upper lot. The siting of the new house has in part been determined in consultation with the neighbour to the north, who has sight lines that he wishes to retain and would be obscured were the house to be sited further toward the rear of the lot. Building setbacks for the new zoning of the upper lot are another constraint. The proposed house encroaches by 2.75m into the west portion of the *protected root zone* (PRZ) of the fir tree (Tree 001 on the tree plan), which has an estimated root radius of 8m; however, the root investigation described above indicates that the house could be placed where proposed without compromising the health or stability of the fir, provided best management practices are followed during the excavation for the house foundation.



Figure-3 Douglas-fir 001 and retaining walls



Figure-4 Exploratory trench

The proposed driveway for the upper lot encroaches into the PRZ of both the fir tree (TR-001) and boulevard tree BT-002. In order to mitigate potential impacts to the root systems of these two trees, the following design changes have been made:

- The original driveway width has been narrowed;
- The finished elevation and the cross-section design of the driveway have been modified to allow the excavated bed for the driveway to remain above the ceiling of the tree root horizon. (See the cross-section detail provided on the tree plan).

Similar measures will be taken for the driveway servicing the lower lot in order to mitigate potential root impacts to the second boulevard ash tree (BT-003).

The underground services and utilities for the two lots are also anticipated to impact the three subject trees. The placement of this infrastructure has been optimized as much as possible, given the other design constraints.

DISCUSSION

Understanding construction damage

To understand the significance of construction impact to trees it is necessary to be able to picture the area of a tree's root system. The average tree:

- has a horizontal root spread that is greater than the branch spread,
- has most (>60%) of it's roots outside of the drip line,
- has most (>95%) roots in the top metre of soil
- has most fine, or smallest diameter roots in the top 40cm (16 inches) of soil.



The woody roots of a tree function physiologically to *convey* water and nutrients gathered by the fine *non-woody* roots back to and up the tree. It is the fine non-woody roots that do all the biological “heavy lifting” to support the tree.

The soils in which tree roots grow are highly structured. This structure allows for the free passage of air and respiratory gases, as well as water. Growing soils are alive with a diverse and abundant biology. It is biological activity that gives rise to the soil structure that is so critical to its ecological function and the health of the trees. Consequently, these living soils are very vulnerable to compaction and other forms of disturbance associated with the building and development process.

Site Plan Impacts

The proposed site plan will not result in any meaningful impact to **off-site trees** on the three adjacent properties to the south, west and north of the site, provided best tree protection practices are implemented and followed.

Impacts **are** anticipated to the mature Douglas-fir in the front of the site, as well as the two boulevard ash trees; however, as a result of modifications made to the original conceptual site plan and special measures indicated on the attached tree plan drawing, the safe, useful life expectancy of the three trees in question should not be affected. In particular, trenching for the underground services and utilities will need to be done carefully under the direct supervision of the arborist. Air-spade and hydro-excavation methods shall be employed as necessary. Larger woody conveyance roots transiting the trenches shall be retained where possible.

Blasting impacts associated with the site preparation for the new house also a significant risk to the root system of the fir tree. Best practices noted on the tree plan shall be followed in order to minimize this risk.

TREE MANAGEMENT MEASURES

Role of the Arborist

In addition to assisting with the planning and design phase of the project, the arborist plays a key role in assisting, supervising and monitoring work during the site preparation, construction and landscape phases that must be carried out within or immediately adjacent to the PRZ of protected trees. The following is a summary of the key interventions required by the arborist (G&A) that are identified in this report.

A mandatory site meeting is required with the owner, general contractor or builder prior to work commencing within the PRZ. The purpose of the meeting is to systematically review the Tree Protection Plan together and to answer any queries. The following items will be reviewed:

- Areas of greatest sensitivity for the protected tree resource;
- Layout and specifications for tree protection fencing and soil armouring (if needed);
- Procedures to be followed for underground service trenching, excavation of the house foundation, and any associated site grading;



- Procedures for rock removal or blasting near protected tree areas, including a pre-bid meeting with rock removal contractors tendering work;
- Procedures for protecting excavated cut faces with exposed roots from dessication and soil erosion;
- Procedures for supplemental irrigation or mulching, if required;
- Coordination of tree pruning with a certified arboricultural technician;
- Review when the arborist shall be on site to supervise work adjacent to the protected tree areas;
- Limiting access to other trades and materials within the protected tree areas;
- Review of proposed landscape plan drawings, if solicited, prior to tendering;
- Pre-landscape meeting with the landscape contractor and general contractor to review work procedures within sensitive tree areas, standards for the selection and planting of new tree stock and after-planting care;
- Periodic site inspections are required of the project arborist by the City of Victoria during the construction and landscaping phase as a condition of the tree permit;
- Prepare a letter to the City of Victoria confirming successful completion of project, including the effective resolution of any deficiencies.

CERTIFICATION

This report and the opinions expressed within it have been prepared in good faith and to accepted arboricultural standards within the scope afforded by its terms of reference and the resources made available to the consultant.

Respectfully submitted,

Jeremy Gye – Senior Consultant
Gye and Associates, Urban Forestry Consultants Ltd.

Consulting Arborist (Diploma, American Society of Consulting Arborists, 1997)

ISA Certified Arborist (Certification No. PN-0144A)

ISA Municipal Specialist (Certification No. PN-0144AM)

ISA Tree Risk Assessment Qualified

Certified Master Woodland Manager (Small Woodlands Program of BC)

APPENDICES

- Tree Management Plan drawing

