

CONTENTS

- 1. INTRODUCTION 1**
- 2. TREE INVENTORY METHODOLOGY 1**
- 3. EXECUTIVE SUMMARY 1-2**
- 4. TREE INVENTORY DEFINITIONS 2-3**
- 5. SITE INFORMATION & PROJECT UNDERSTANDING 5**
- 6. FIELD OBSERVATIONS 5**
- 7. CONSTRUCTION IMPACT ASSESSMENT 6**
 - 7.1. Retention and Removal of Municipal Trees.....6
 - 7.2. retention and removal of private offsite trees6
 - 7.3. retention and removal of onsite trees6
- 8. IMPACT MITIGATION 6-9**
- 9. DISCLOSURE STATEMENT..... 9-10**
- 10. IN CLOSING..... 10**
- 11. REFERENCES 11**

TABLES

- Table 1. Tree Inventory4

APPENDICES

- Appendix A Tree Management Plan -----12-13
- Appendix B Site Photographs----- 14-16
- Appendix C Specifications for Paving over roots-----17
- Appendix D City of Victoria Replacement Tree Species: Medium-----18
- Appendix E Exploratory excavation within CRZ of Nt1-----19-20
- Appendix F Tree Preservation Summary-----21

1. INTRODUCTION

Talmack Urban Forestry Ltd was asked to complete a tree inventory, construction impact assessment and management plan for the trees at the following proposed project:

Site:	27 South Turner St
Municipality	City of Victoria
Client Name:	Bryan and Keira Higgins
Dates of Site Visit:	May 14 th 2021, June 4, 2021, November 14, 2022, November 24, 2022
Site Conditions:	1 urban lot.
Weather During Site Visit:	Sunny/Clear (2021 dates) and Overcast (2022 dates)

The purpose of this report is to address the deficiencies outlined in the Application Review Summary prepared by the City of Victoria in response to the original Arborist report submission (September 2021) in accordance with Tree Protection Bylaw No. 21-035. This report has been prepared based on review of the site design package prepared by Ryan Hoyt Designs (November 17, 2022).

2. TREE INVENTORY METHODOLOGY

Prior to our site visit, we were provided with surveyed tree locations. Trees not included in the survey were added to the Tree Protection Plan. For the purpose of this report: the size, health, and structural condition of trees was documented. For ease of identification in the field, numerated metal tags were attached to the lower trunks of onsite trees. Trees located on municipal frontage are referred to in this report by their ID numbers acquired from VicMap.

3. EXECUTIVE SUMMARY

There are 14 on-site trees, 4 of which are bylaw protected size (Nt2, 255, 265, 266). All on-site trees are necessary for removal to accommodate the proposed: new house (255, 256); front walkway (253, 254); rain garden (251, 252); driveway (257, 263, 264); and garage (265, 266, Nt2).

The municipal Cherry tree (Site ID#: 24122) may be possible for retention provided the project arborist supervises any excavation for the sidewalk widening and old services being capped within the tree's critical root zone (CRZ). Tree protection fencing is to be installed according to Appendix A.

The retention of the private off-site elm tree (Nt1) is conditional on the proposed driveway being designed and built so it requires minimal excavation within 4m of the Southeast corner of the subject property, where Nt1 is located. Within the 4m setback from the corner, driveway paving should follow the specifications

outlined in Appendix C, not exceeding the depths at which structural roots were found in the exploratory excavation (Appendix E). A profile diagram of the arborist-proposed modified floated driveway is provided in section 8 of this report. The project arborist should be consulted for review once a definitive plan has been derived for a minimum excavation driveway that satisfies the depth and compaction mitigation parameters outlined in this report. The project arborist is to supervise any excavation for the driveway within the CRZ of Nt1.

The subject site has a tree minimum of 3, outlined in the City of Victoria Tree Protection Bylaw No. 21-035. 2 medium size replacement trees have been proposed in the landscape plan, the remaining 2 replacements required to supplement the removal of the 4 on site protected trees will need to be supplied as cash-in-lieu to the City of Victoria Tree Fund. Species for the 2 proposed replacement trees should be selected from the list in Appendix D.

4. TREE INVENTORY 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

Dripline: Indicates the radius 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."

- 14 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

Suitability ratings are described as follows:

Rating: Suitable.

- A tree with no visible or minor health or structural defects, is tolerant to changes to the growing environment and is a possible candidate for retention provided that the critical root zone can be adequately protected.

Rating: Conditional.

- A tree with good health but is a species with a poor tolerance to changes to its growing environment or has a structural defect(s) that would require that certain measures be implemented, in order to consider it suitable for retention (ie. retain with other codominant tree(s), structural pruning, mulching, supplementary watering, etc.)

Rating: Unsuitable.

- A tree with poor health, a major structural defect (that cannot be mitigated using ANSI A300 standards), or a species with a poor tolerance to construction impacts, and unlikely to survive long term (in the context of the proposed land use changes).

Retention Status:

- Remove - 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

Table 1. Tree Inventory

Tag/ID #	Surveyed ? (Yes/No)	Location (On, Off, Shared, City)	Bylaw protected ? (Yes/No)	Name		DBH (cm)	Critical root zone radius (m)	Dripline radius (m)	Condition		Observations/Comment	Relative tolerance	Tree retention/location comments	Retention status
				Common	Botanical				Health	Structural				
24122	Yes	City	Yes	Flowering cherry	<i>Prunus yedoensis</i>	41	4.7	4	Good	Fair	Multiple stem scars on north and east sides of tree near base, historical pruning wounds with associated decay	Moderate	CRZ overlap with existing services to be capped and sidewalk to be widened. May be possible for retention provided arborist supervise excavation within CRZ and tree protection fencing be installed according to Appendix A	Retain
251	No	On	No	Japanese maple	<i>Acer japonica</i>	17	1.6	1.5	Fair-Good	Fair-Good	Multiple stems, historical pruning wounds and associated decay,	Good	Located in proposed rain garden, not suitable for retention	Remove
252	No	On	No	Paper birch	<i>Betula papyrifera</i>	27	3.1	1	Fair	Fair	Historical pruning wounds with associated decay	Moderate	Located in proposed rain garden, not suitable for retention	Remove
253	No	On	No	Paper birch	<i>Betula papyrifera</i>	14	1.6	1	Fair	Fair	Historical pruning wounds with associated decay	Moderate	Significant CRZ overlap with proposed paved walkway, not suitable for retention	Remove
254	No	On	No	Pyramidal cedar	<i>Thuja occidentalis</i>	23	2.2	1 each	Fair	Fair	Multiple stems, surface rooted,	Good	CRZ overlap with proposed house, not suitable for retention	Remove
255	No	On	Yes	Cherry plum	<i>Prunus cerasifera</i>	62	7.1	2.5	Fair	Fair-Poor	Canopy touching existing gutter line, historical pruning wounds with associated decay, deadwood, multiples stems	Moderate	Significant CRZ overlap with proposed building footprint, not suitable for retention	Remove
256	No	On	No	Cherry plum	<i>Prunus cerasifera</i>	18	2.0	2.5	Poor	Poor	historical pruning wounds with associated decay, deadwood, multiples stems,	Moderate	Significant CRZ overlap with proposed building footprint, not suitable for retention	Remove
257	No	On	No	Apple	<i>Malus domestica</i>	10	1.2	1	Fair	Poor	Heavy lean towards northwest, vegetation limiting visibility of root flare, historical pruning wounds with associated decay	Moderate	Located within proposed driveway, not suitable for retention	Remove
263	No	on	No	Apple	<i>Malus domestica</i>	29	3.4	2	Fair	Fair-Poor	Vegetation limiting visibility of root flare, historical pruning wounds with associated decay	Moderate	Located within proposed driveway, not suitable for retention	Remove
264	No	On	No	Cherry plum	<i>Prunus cerasifera</i>	24	2.8	3.5	Fair	Fair-Poor	Asymmetrical canopy, leader extending over eastern fence line, suckering at based, historical pruning wounds with associated decay	Moderate	Significant CRZ overlap with proposed garage footprint, located within proposed driveway, not suitable for retention.	Remove
265	Yes	On	Yes	small leaf Linden	<i>Tilia cordata</i>	49	4.7	7	Fair-Good	Fair	Heavy suckering at base, vegetation limiting visibility of root flare, historical pruning wounds with associated decay, clothesline wheel embedded in limb on south side of tree	Good	Located in proposed garage footprint, not suitable for retention.	Remove
266	Yes	On	Yes	European hawthorn	<i>Carpinus betulus</i>	47	5.4	6.5	Fair-Good	Fair	Engulfing existing fence, historical pruning wounds with associated decay, lvey growing up base, asymmetrical crown, suppressed on south side from neighbour tree, canopy extending over Northern fence line	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
267	No	On	No	Common hazel	<i>Corylus avellana</i>	22	2.5	1.5	Fair	Fair-Poor	Previously topped, historical pruning wounds with associated decay, vegetation limiting visibility of root flare	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
268	No	On	No	Common hazel	<i>Corylus avellana</i>	23	2.6	2.5	Fair	Fair	Previously topped, historical pruning wounds with associated decay, vegetation limiting visibility of root flare	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
Nt1	No	Off	Yes	American Elm	<i>Ulmus american</i>	82	7.8	7.5	Fair	Fair	Limited visibility of trunk due to lack of access to neighbouring property, multiple stems from union at approximately 1m height, canopy extending into subject Lot by approximately 4m from Southeast corner	Good	CRZ overlap with proposed driveway, Driveway grades altered based on exploratory excavation carried out by Talmack (Appendix E). Retention status is conditional on specifications for proposed driveway within CRZ, to be reviewed by project arborist. Outline for arborist-suggested driveway proposed in section 8 of this report.	*Retain
Nt2	No	On	Yes	Plum	<i>Prunus sp.</i>	18,15,12	3.2	3	Fair-Poor	Fair-Poor	Limited visibility of trunk tissue due to ivy, growing on subject side of existing fence, canopy lean to East.	Good	CRZ overlap with proposed garage, not suitable for retention.	Remove

*CRZ calculated above and drawn as follows on Tree Management Plan: $CRZ + 0.5 * d.b.h.$ (drawn from the center of the stem)

5. SITE INFORMATION & PROJECT UNDERSTANDING

The subject site consists of one urban lot (27 South Turner St.), in Victoria, B.C., which has an existing single-family residence situated in the middle of the lot. There is a retaining wall in the back yard and an upward slope towards the eastern property line. It is our understanding that the proposal is to demolish the existing residence and rebuild a new one on a slightly altered footprint with a new permeable driveway leading to the proposed detached garage to the rear.

6. FIELD OBSERVATIONS

The onsite tree resource consists of 2 Birch trees (tag#: 252, 253), 1 Japanese maple (tag#: 251) along the South Turner frontage. There are 6 trees (tag# 254, 255, 256, 266, 267, 268) located along the Northern margin of the property. 3 trees (tag#: 265, 264, Nt2) located centrally along the rear (Eastern) fence line. 2 Additional on-site trees (tag# 257, 263) are located in the back yard along the Southern property line. 4 of these 14 on-site trees are protected under the City of Victoria's tree protection Bylaw No. 21-035. There is an off-site private tree (#Nt1) beyond the Southeastern corner of the property. There is also 1 municipal tree along the South Turner St. boulevard in front of the subject site (Site ID# 24122).



figure 1: Site context air photo: The boundary of the subject site is outlined in Yellow, municipal trees are indicated with green dots..

7. CONSTRUCTION IMPACT ASSESSMENT

7.1. RETENTION AND REMOVAL OF MUNICIPAL TREES

The following municipal tree (indicated by ID #) is located where it may be possible for retention provided the tree protection methods outlined in this report are followed. The project arborist must be onsite to supervise any excavation require for the proposed house footprint, sidewalk widening, and capping of existing services within its critical root zone (shown in *Appendix A*):

Retain and protect 1 municipal tree

- 24122

7.2. RETENTION AND REMOVAL OF PRIVATE OFFSITE TREES

The following off-site private tree is located where it has CRZ overlap with the proposed driveway. It may be possible for retention provided a driveway build with minimal excavation can be achieved within the CRZ of this tree, while limiting compaction on soil in the root zone. An arborist-suggested altered driveway is outlined in Section 8 of this report, based on the results of the exploratory excavation performed on November 24, 2022 (*Appendix E*). Further consultation with a geotechnical engineer may be required to assess this suggested modified driveway specification. Any alternative minimal-excavation driveways derived for this project must be reviewed by the project arborist to determine its impacts on the retention suitability of Nt1.

Retain and protect 1 off-site private tree.

- Nt1

7.3. RETENTION AND REMOVAL OF ONSITE TREES

There are 14 on site trees located on the subject site, 4 are protected size (255, 256, 266, Nt1). All on site trees are necessary for removal to accommodate the proposed development.

Remove 4 bylaw protected onsite trees

- 255, 265, 266, Nt2

Remove 10 non-bylaw protected trees

- 251, 252, 253, 254, 256, 257, 263, 264, 267, 268

8. IMPACT MITIGATION

Tree Protection Barrier: The areas surrounding the trees to be retained should be isolated from the construction activity by erecting protective barrier fencing (see *Appendix A* for municipal barrier specifications). Where possible, fencing should be erected at the perimeter of the critical root zone. The barrier fencing to be erected 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 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 should be completed under supervision by 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. In particular, the following activities should be completed under the direction of the project arborist:

- Excavation for sidewalk widening within the CRZ of tree #24122
- Excavation for servicing work within CRZ of tree #24122
- Excavation and installation of driveway surface within CRZ of Nt1

Tree protection details for modified driveway in CRZ of Off-site protected tree Nt1:

Architectural plans provided have been updated since those issued for the Arborist report by Talmack (formerly Talbot Mackenzie and Associates) in June 2022. The updated plans provide finished grade information that requires some driveway modifications in order to retain off site tree Nt1.

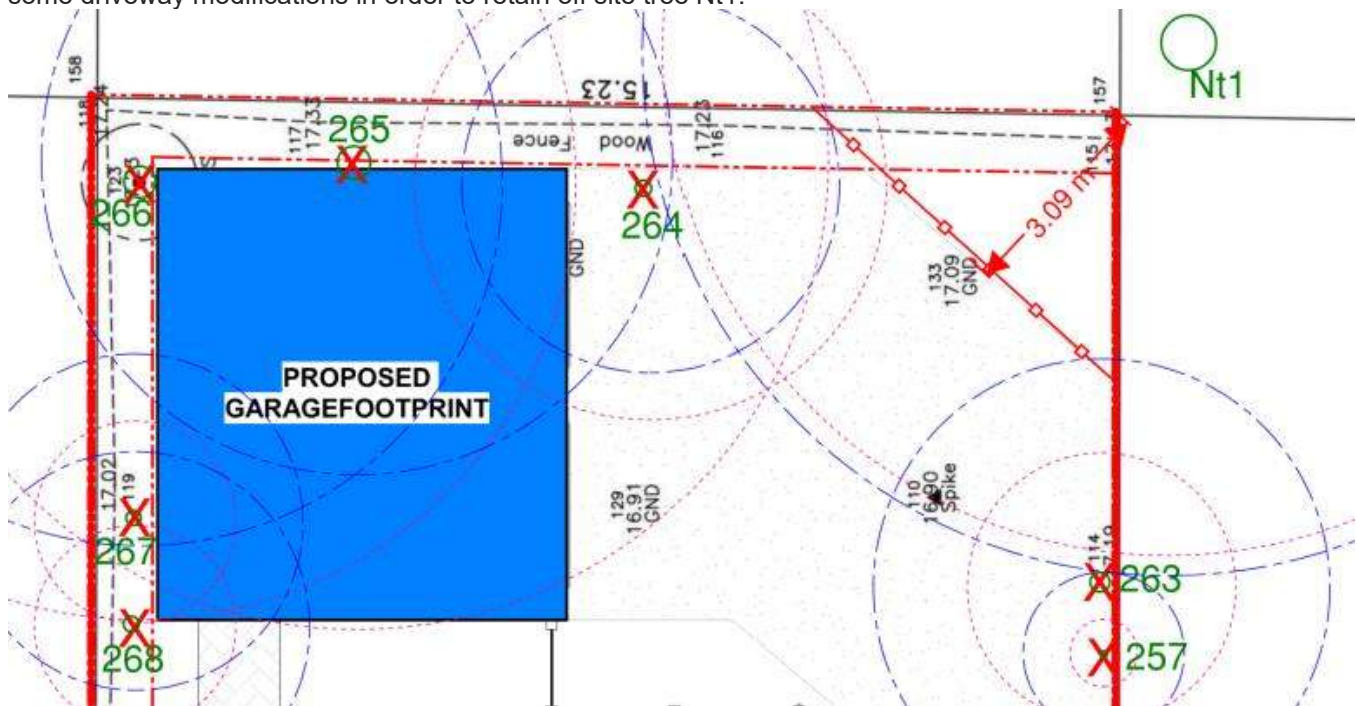


Figure 1: TMP derived from plans provided by Hoyt Designs in April 2022. Shows original proposed driveway with an approximately 3m setback from the Southeast property corner where Nt1 is located.

The intention on the latest set of plans provided by Hoyt Designs (Nov 17, 2022) is to extend the driveway to the Southeast corner of the property where Nt1 is located. The grade of the slab for the proposed garage has been raised to an elevation 17.00m at both the Southeast and Southwest corners of the proposed garage to limit the slope of the driveway while allowing for a section of the driveway to be floated over roots of Nt1. The intention of our driveway proposal is to start floating the driveway within 4m of the Southeast property corner, where roots were encountered during the exploratory excavation (Appendix E). The natural grade within 4m of the property corner increases from 17.09m to 17.4m, at the corner. The finished grades of the driveway within the CRZ of Nt1 is subject to slight variation, however Talmack has provided a sketch below that roughly outlines a profile of the proposed floated driveway within the CRZ of Nt1.

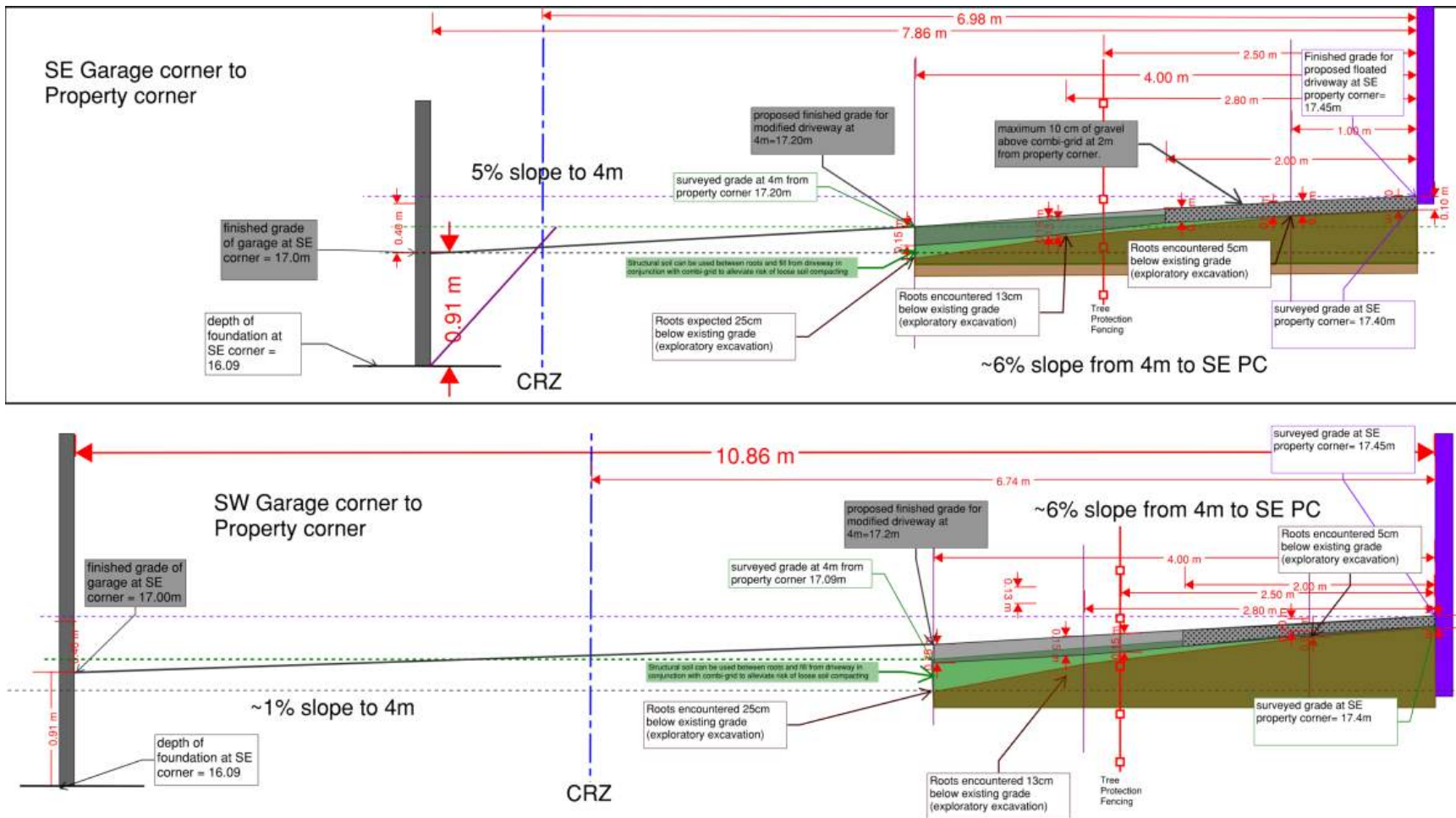


Figure 2: Profile drawing of arborist-suggested proposed floated driveway within CRZ of Nt1. This diagram is informed by the surveyed existing grade values and the results of the exploratory excavation within 4m, 2.7m and 1m of the Southeast corner of the subject property.

4m was established as a reasonable limit of approach from the offsite tree to limit excavation required for proposed driveway within the CRZ of Nt1. As outlined in figure 2, at 4m from the Southeast property corner the driveway will be altered to the 15cm thickness floated driveway spec provided in Appendix C., to mitigate impacts to roots encountered. The proposal is to follow this floated driveway spec along the existing grade until roughly 2.5m from the SE property corner, where the fill layer will start to taper off in order to match the 5-10cm of gravel above combi-grid within 2m of the property corner. Figure 2 shows 10cm for the gravel depth, pending geotechnical engineer consultation. Ideally the gravel layer can be closer to 5m to not exceed a 5% slope on the driveway.

This method ensures no excavation occurs below the depths at which structural roots were encountered during the exploratory excavation. Any alternative minimal-excavation driveway proposals should be reviewed by the project arborist prior to a definitive retention status being determined for Nt1. Any excavation or fill installation relating to the driveway, within the CRZ of Nt1, shall be supervised by the project arborist.

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 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.

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.

9. DISCLOSURE STATEMENT

This arboricultural field review report was prepared by Talmack Urban Forestry Consultants Ltd. for the exclusive use of the Client and may not be reproduced, used, or relied upon, in whole or in part, by a party other than the Client without the prior written consent of Talmack Urban Forestry Consultants Ltd. Any unauthorized use of this report, or any part hereof, by a third party, or any reliance on or decisions to be made based on it, are at the sole

risk of such third parties. Talmack Urban Forestry Consultants Ltd. accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions based on this report, in whole or in part.

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 Talmack Urban Forestry Consultants Ltd. 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 additional information is discovered in the future during such events or other activities, Talmack Urban Forestry Consultants Ltd. 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.

10. IN CLOSING

We trust that this report meets your needs. Should there be any questions regarding the information within this report, please do not hesitate to contact the undersigned.

Yours truly,

Talbot Mackenzie & Associates

Prepared by:



Shannon Murray, BSc
ISA Certified Arborist PN – 9024A
Tree Risk Assessment Qualification
Email: Shannon@Talmack.ca

11. REFERENCES

The City of Victoria Tree Preservation Bylaw No. 21-035

VicMap online GIS software

APPENDIX A - TREE MANAGEMENT PLAN

Tag/ID #	Surveyed ? (Yes/No)	Location (On, Off, Shared, City)	Bylaw protected ? (Yes/No)	Name		DBH (cm)	Critical root zone radius (m)	Dripline radius (m)	Condition		Observations/Comment	Relative tolerance	Tree retention/location comments	Retention status
				Common	Botanical				Health	Structural				
24122	Yes	City	Yes	Flowering cherry	<i>Prunus yedoensis</i>	41	4.7	4	Good	Fair	Multiple stem scars on north and east sides of tree near base, historical pruning wounds with associated decay	Moderate	CRZ overlap with existing services to be capped and sidewalk to be widened. May be possible for retention provided arborist supervise excavation within CRZ and tree protection fencing be installed according to Appendix A	Retain
251	No	On	No	Japanese maple	<i>Acer japonica</i>	17	1.6	1.5	Fair-Good	Fair-Good	Multiple stems, historical pruning wounds and associated decay.	Good	Located in proposed rain garden, not suitable for retention	Remove
252	No	On	No	Paper birch	<i>Betula papyrifera</i>	27	3.1	1	Fair	Fair	Historical pruning wounds with associated decay	Moderate	Located in proposed rain garden, not suitable for retention	Remove
253	No	On	No	Paper birch	<i>Betula papyrifera</i>	14	1.6	1	Fair	Fair	Historical pruning wounds with associated decay	Moderate	Significant CRZ overlap with proposed paved walkway, not suitable for retention	Remove
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255	No	On	Yes	Cherry plum	<i>Prunus cerasifera</i>	62	7.1	2.5	Fair	Fair-Poor	Canopy touching existing gutter line, historical pruning wounds with associated decay, deadwood, multiples stems	Moderate	Significant CRZ overlap with proposed building footprint, not suitable for retention	Remove
256	No	On	No	Cherry plum	<i>Prunus cerasifera</i>	18	2.0	2.5	Poor	Poor	historical pruning wounds with associated decay, deadwood, multiples stems,	Moderate	Significant CRZ overlap with proposed building footprint, not suitable for retention	Remove
257	No	On	No	Apple	<i>Malus domestica</i>	10	1.2	1	Fair	Poor	Heavy lean towards northwest, vegetation limiting visibility of root flare, historical pruning wounds with associated decay	Moderate	Located within proposed driveway, not suitable for retention	Remove
263	No	on	No	Apple	<i>Malus domestica</i>	29	3.4	2	Fair	Fair-Poor	Vegetation limiting visibility of root flare, historical pruning wounds with associated decay	Moderate	Located within proposed driveway, not suitable for retention	Remove
264	No	On	No	Cherry plum	<i>Prunus cerasifera</i>	24	2.8	3.5	Fair	Fair-Poor	Asymmetrical canopy, leader extending over eastern fence line, suckering at based, historical pruning wounds with associated decay	Moderate	Significant CRZ overlap with proposed garage footprint, located within proposed driveway, not suitable for retention.	Remove
265	Yes	On	Yes	small leaf Linden	<i>Tilia cordata</i>	49	4.7	7	Fair-Good	Fair	Heavy suckering at base, vegetation limiting visibility of root flare, historical pruning wounds with associated decay, clothesline wheel embedded in limb on south side of tree	Good	Located in proposed garage footprint, not suitable for retention.	Remove
266	Yes	On	Yes	European hawthorn	<i>Carpinus betulus</i>	47	5.4	6.5	Fair-Good	Fair	Engulfing existing fence, historical pruning wounds with associated decay, lvey growing up base, asymmetrical crown, suppressed on south side from neighbour tree, canopy extending over Northern fence line	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
267	No	On	No	Common hazel	<i>Corylus avellana</i>	22	2.5	1.5	Fair	Fair-Poor	Previously topped, historical pruning wounds with associated decay, vegetation limiting visibility of root flare	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
268	No	On	No	Common hazel	<i>Corylus avellana</i>	23	2.6	2.5	Fair	Fair	Previously topped, historical pruning wounds with associated decay, vegetation limiting visibility of root flare	Moderate	Significant CRZ overlap with proposed garage footprint, not suitable for retention.	Remove
Nt1	No	Off	Yes	American Elm	<i>Ulmus american</i>	82	7.8	7.5	Fair	Fair	Limited visibility of trunk due to lack of access to neighbouring property, multiple stems from union at approximately 1m height, canopy extending into subject Lot by approximately 4m from Southeast corner	Good	CRZ overlap with proposed driveway, Driveway grades altered based on exploratory excavation carried out by Talmack (Appendix E). Retention status is conditional on specifications for proposed driveway within CRZ, to be reviewed by project arborist. Outline for arborist-suggested driveway proposed in section 8 of this report.	*Retain
Nt2	No	On	Yes	Plum	<i>Prunus sp.</i>	18,15,12	3.2	3	Fair-Poor	Fair-Poor	Limited visibility of trunk tissue due to ivy, growing on subject side of existing fence, canopy lean to East.	Good	CRZ overlap with proposed garage, not suitable for retention.	Remove

TREE PROTECTION NOTES Tree Management Plan: 27 SouthTurner St.

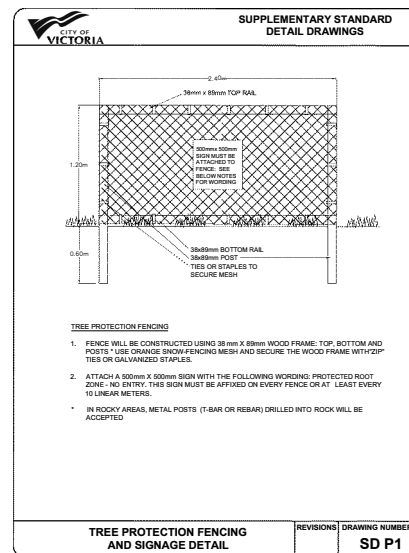
Tree protection barrier: The areas, surrounding the trees to be retained, should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the critical root zone. The barrier fencing to be erected must be a minimum 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.

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:

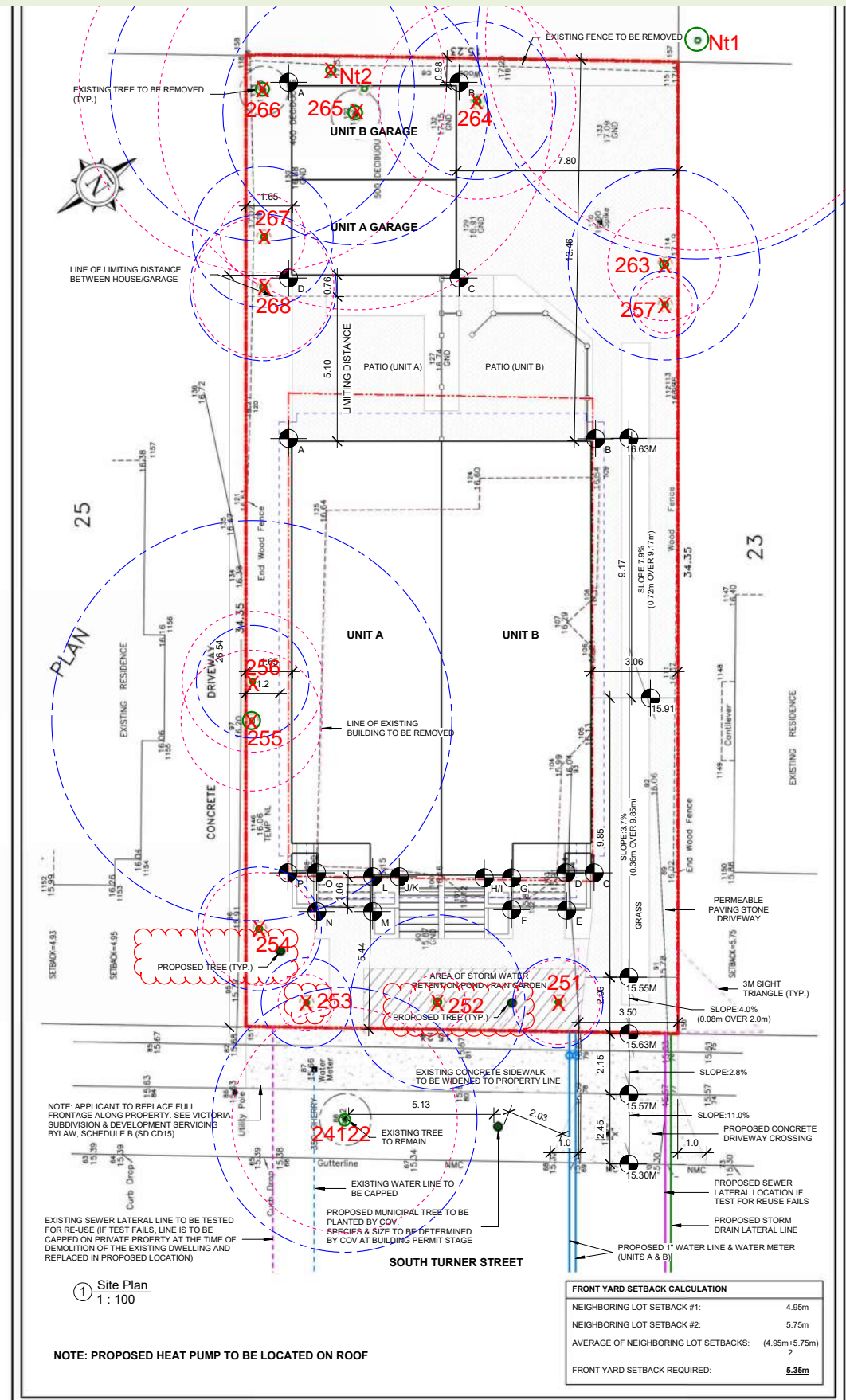
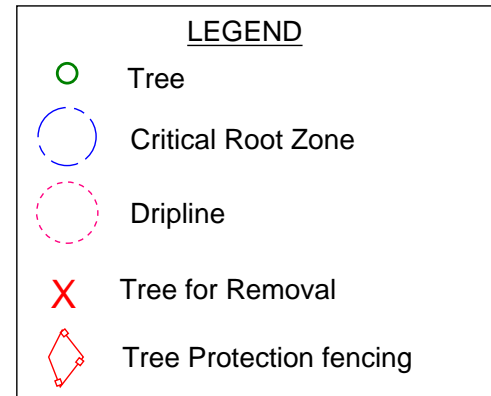
- Installing a layer of hog fuel or coarse wood chips at least 20cm in depth and maintaining it in good condition until construction is complete.
- Placing medium weight geotextile cloth over the area to be used and installing a layer of crushed rock to a depth of 15cm over top.
- Placing two layers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

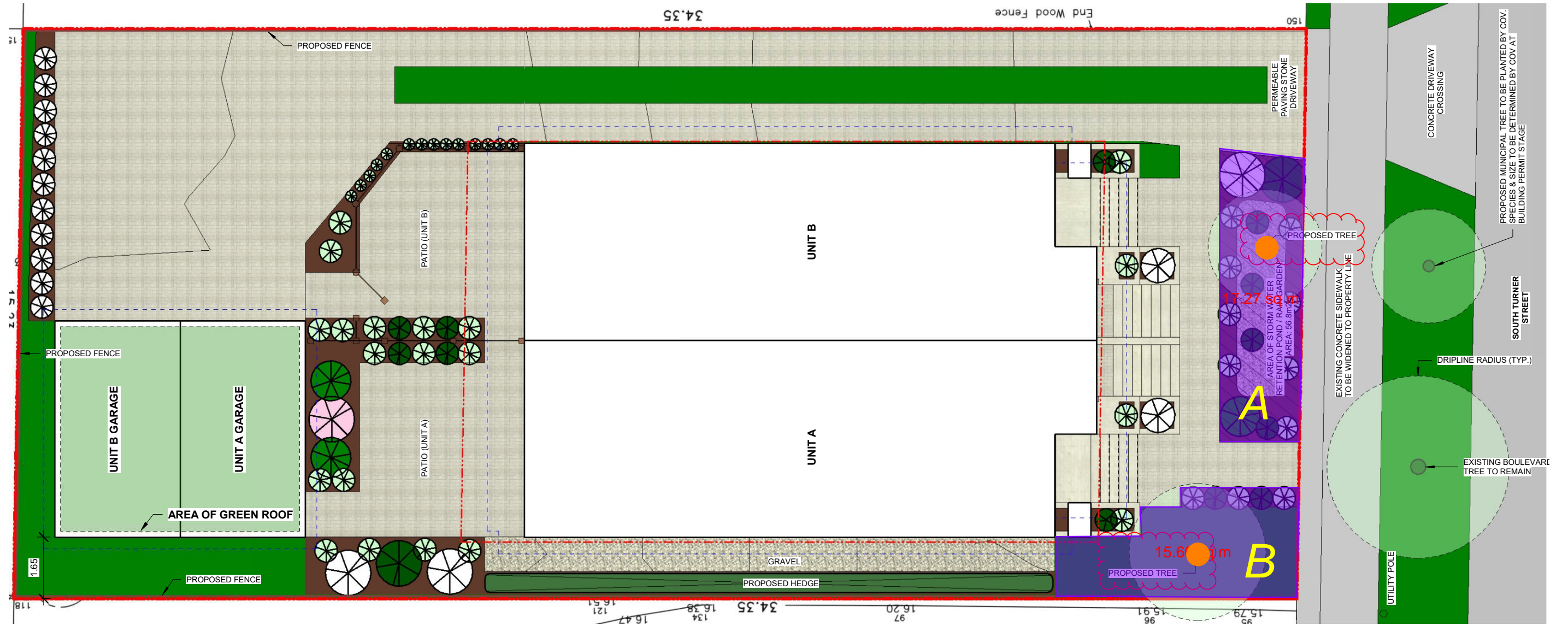


Pruning: We recommend that any pruning of bylaw-protected trees be performed to ANSI A300 standards and Best Management Practices.

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 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.



Tree Replacement Planting Plan: 27 South Turner St.



SUGGESTED REPLACEMENT SPECIES:

- = MEDIUM TREE:
Red maple (*Acer rubrum*), Tupelo (*Nyssa sylvatica*), Yellow bird magnolia (*Magnolia accuminata*)

Planting Area ID	Area (m ²)	Soil Volume multiplier	Estimated Soil Volume (m ³)	Replacement Trees Proposed		Soil Volume Required		Total
				# Small	# Medium	Small	Medium	
A	17.27	1m	17.27 m ³	0	1	6 m ³	15 m ³	15 m ³
B	15.66	1m	15.66 m ³	0	1	6 m ³	15 m ³	15 m ³

APPENDIX B- PHOTOGRAPHS



Photograph 1-Cherry plums (tag#: 255, 256) and Pyramidal cedar (tag#: 254) (rear) along Northern fence line captured while facing South Turner Street



Photograph 2 – Paper birches (tag#: 252, 253)– along South Turner St frontage showing proximity to existing building

Construction Impact Assessment and Tree Management Plan for
27 South Turner St.
Prepared for Bryan and Keira Higgins



Photograph 3 – Off-site Elm (#Nt1) located beyond Southeast corner of property.



Photograph 4 Linden (tag #265) in back yard along Eastern fence line

Construction Impact Assessment and Tree Management Plan for
27 South Turner St.

Prepared for Bryan and Keira Higgins

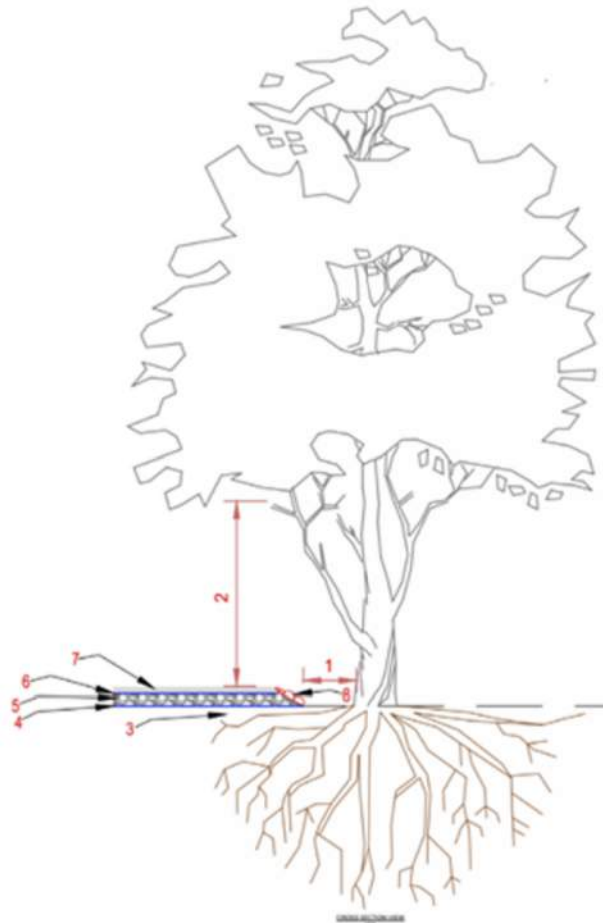


Photograph 5- Municipal tree (tag # 24122)- along South Turner frontage



Photograph 6- Protected plum tree Nt2 located along rear fence.

Hard Surface Above Tree Roots Details

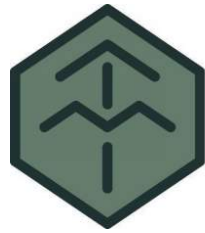


1. Maintain as large a setback as possible between fill encroachment and the root cellar of the tree as possible.
2. Review any canopy clearance pruning requirements to accommodate vehicle or pedestrian clearances (pruning to be performed to ANSI A300 standards)
3. Excavate the new footprint of the driveway or sidewalk under the supervision of the project arborist. Excavation will be limited to the removal of the existing sod layers. Excavation around root structures must be performed by hand, airspace, or hydroexcavation.
4. Install a two-dimensional (such as combi-grid30/30) or three-dimensional geogrid reinforcement.
5. Install a 150mm depth layer of clear crushed gravel (no fines) using 20mm and/or 75mm diameter material or approved equivalent. *Note: depth may be less than 150mm in some situations (dependent on grading constraints)
6. Install medium weight geotextile fabric (such as Nillex 4535 or similar) over the clear gravel layer to prevent fine particles of sand infiltrating this layer.
7. The bedding or base layer and new driveway or sidewalk surface can be installed directly on top of the felted filter fabric.
8. Fill slopes – where possible, install loose-stacked boulders to reduce footprint of fill slopes that encroach within the critical root zone. Fill slope materials must be permeable to air and water. Do not pile fill material directly against tree trunk.

APPENDIX D- CITY OF VICTORIA REPLACEMENT TREE SPECIES

Part 1 – Replacement species acceptable for 1:1 replacement

Abies	balsamea		Balsam fir	Conifer	Medium
Abies	fraseri		Fraser fir	Conifer	Medium
Abies	concolor		White fir	Conifer	Medium
Acer	miyabei	Rugged Ridge	Rugged Ridge maple	Deciduous	Medium
Acer	rubrum	Armstrong	Armstrong maple	Deciduous	Medium
Acer	rubrum		Red maple	Deciduous	Medium
Acer	saccharum	Legacy	Legacy sugar maple	Deciduous	Medium
Acer	truncatum	Crimson Sunset	Pacific Sunset maple	Deciduous	Medium
Aesculus	indica		Indian horse chestnut	Deciduous	Medium
Aesculus	X carnea	Briotii	Red horse chestnut	Deciduous	Medium
Arbutus	menziesii		Arbutus	Broadleaf evergreen	Medium
Betula	nigra	Dura Heat	Dura Heat birch	Deciduous	Medium
Carpinus	betulus	Fastigiata	Pyramidal hornbeam	Deciduous	Medium
Castanea	mollissima		Chinese chestnut	Deciduous	Medium
Catalpa	speciosa		Northern catalpa	Deciduous	Medium
Celtis	occidentalis		Common hackberry	Deciduous	Medium
Cercidiphyllum	japonicum		Japanese katsura tree	Deciduous	Medium
Cladrastis	kentukea		American yellowwood	Deciduous	Medium
Cladrastis	kentukea	Perkins Pink	Perkins Pink American yellowwood	Deciduous	Medium
Cornus	nuttallii		Pacific dogwood	Deciduous	Medium
Corylus	colurna		Turkish filbert	Deciduous	Medium
Fagus	sylvatica	Riversii	Riversii beech	Deciduous	Medium
Fraxinus	americana	Autumn Applause	Autumn Applause ash	Deciduous	Medium
Gleditsia	triacanthos		Honey locust	Deciduous	Medium
Gleditsia	triacanthos	Shademaster	Shademaster locust	Deciduous	Medium
Magnolia	accuminata	Yellow Bird	Yellow Bird magnolia	Deciduous	Medium
Magnolia	kobus		Kobus magnolia	Deciduous	Medium
Malus	fusca		Pacific crabapple	Deciduous	Medium
Nyssa	sylvatica		Tupelo	Deciduous	Medium
Ostrya	virginiana		Ironwood	Deciduous	Medium
Pinus	densiflora		Japanese red pine	Conifer	Medium
Pinus	thunbergii		Japanese black pine	Conifer	Medium
Pinus	contorta	Contorta	Shore pine	Conifer	Medium
Populus	tremuloides		Quaking aspen	Deciduous	Medium
Quercus	frainetto		Hungarian oak	Deciduous	Medium
Quercus	robur	Fastigiata	Pyramidal English oak	Deciduous	Medium
Robinia	pseudoacacia	Frisia	Golden Black Locust	Deciduous	Medium
Salix	lasiandra		Pacific willow	Deciduous	Medium
Ulmus	americana	Brandon	Brandon elm	Deciduous	Medium
Ulmus	parvifolia		Lacebark elm	Deciduous	Medium
Zelkova	serrata	Green Vase	Green Vase zelkova	Deciduous	Medium
Zelkova	serrata		Japanese zelkova	Deciduous	Medium



TALMACK
URBAN FORESTRY
— Consultants Limited —

Exploratory Excavation within CRZ of Off-site Elm tree Nt1

Date: November 24, 2022

Purpose:

The purpose of the exploratory excavation performed by Talmack on November 24, 2022 was to evaluate the presence and depth of structural roots from offsite tree Nt1 where its critical root zone overlaps with the proposed driveway. Using this information, the project arborist will work with the design team to devise a modified permeable driveway, minimizing impact to structural roots encountered.

Methods:

Shovels and hand-digging were used to perform limited exploratory excavation at various distances from the southeast corner of the subject property. A measuring tape and shovel handle were used to measure the approximate depth of the exposed root compared to natural grade (end of trench). 3 trenches of varying depths under 40cm were dug at 4m, 2.7m, and 1m of the Southeast corner of subject.

Results:



Photograph 1:
4cm root encountered at 4m from Southeast property corner (top of root approximately 25cm below existing grade)



Photograph 2:
7cm root encountered at 2.8m from Southeast property corner (top of root approximately 13cm below existing grade).



Photograph 3:
10cm root encountered at 1m from Southeast property corner (approximately 5cm below surveyed grade).



Photograph 4:
Old tree stump uncovered in Southeast corner of subject property beside Nt1.


We trust that this appendix accurately depicts details regarding roots exposed from tree Nt1 within the footprint of the proposed driveway. Should there be any questions regarding the information herein, please contact the undersigned.

Talmack Urban Forestry Consultants Ltd.

Prepared by:

Shannon Murray BSc
ISA Certified Arborist PN – 9024A
Tree Risk Assessment Qualification
Email: Shannon@talmack.ca

APPENDIX F – TREE PRESERVATION SUMMARY

Tree Preservation Summary			
City of Victoria Project No: Unknown			
Address: 27 South Turner St.			
Arborist: Shannon Murray			
Certifications/Qualifications: ISA Certified Arborist (PN9024A), Tree Risk Assessment Qualified			
	Count	Multiplier	Total
ONSITE Minimum replacement tree requirement			
A. Protected Trees Removed	4	X 1	A. 4
B. Replacement Trees Proposed per Schedule "E", Part 1	2	X 1	B. 2
C. Replacement Trees Proposed per Schedule "E", Part 2	1	X	C. 0
D. Replacement Trees Proposed per Schedule "E", Part 3	0	X 1	D. 0
E. Total replacement trees proposed (B+C+D) Round down to nearest whole number			E. 0
F. Onsite replacement tree deficit (A-E) Record 0 if negative number			F. 2
ONSITE Minimum trees per lot requirement (onsite trees)			
G. Tree minimum on lot*			G. 3
H. Protected trees retained (other than specimen trees)	0	X 1	H. 0
I. Specimen trees retained	0	X 3	I. 0
J. Trees per lot deficit (G - (B+C+H+I) Record 0 if negative number			J. 1
OFFSITE Minimum replacement tree requirement (offsite trees)			
K. Protected trees Removed	0	X 1	K. 0
L. Replacement trees proposed per Schedule "E", Part 1 or Part 3	0	X 1	L. 0
M. Replacement trees proposed from Schedule "E", Part 2	0	X 0.5	M. 0
N. Total replacement trees proposed (L+ M) Round down to nearest whole number			N. 0
O. Offsite replacement tree deficit (K - N) Record 0 if negative number			O. 0
Cash-in-lieu requirement			
P. Onsite trees proposed for cash-in-lieu Enter F. or J., whichever is the greater number			P. 2
Q. Offsite trees proposed for cash-in-lieu Enter 0.			Q. 0
R. Cash-in-lieu proposed ((P+Q) X \$2,000)			R. \$4,000
Summary prepared and submitted by: 			
Date: December 7th, 2022			