

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

# 480 & 492 Esquimalt Road—Victoria, BC

# Construction Impact Assessment &

# Tree Management Plan

- Prepared For: Aryze Developments Inc. c/o Vinit Jain 1839 Fairfield Road Victoria, BC V8S 1G9
- Prepared By: Talbot, Mackenzie & Associates Robert McRae ISA Certified # PN-7125A TRAQ – Qualified

Brayden Borle ISA Certified #PR-5508A

Date of Issuance: May 27, 2022

# Revision Log:

		Author
	2021-04-08	RM
ct comments and updated plans	2021-09-15	RM
ct comments and updated plans	2022-01-12	RM
ct comments and updated plans	2022-05-27	RM & BB
180 & 107 Ecquimalt Pood	Victoria PC	
(	ct comments and updated plans ct comments and updated plans ct comments and updated plans 480 & 492 Esquimalt Road;	ct comments and updated plans2021-09-15ct comments and updated plans2022-01-12

Date of Site Visit(s):March 30, 2021Site Conditions:Commercial lot sloping north to south with no ongoing<br/>construction activity.

# SUMMARY

- The proposal includes construction of a six-storey residential complex, with underground parking, landscaping, bike parking, and underground services.
- There are no trees on the subject property. However, seven (7) trees located on the neighbouring property at 404 Dundas Street were included in the inventory, of which five (5) are bylaw protected. An additional three (3) trees were inventoried along the Esquimalt Road municipal boulevard fronting the subject property.
- Three offsite, bylaw protected trees (OS#3-OS#5) and one off-site, non-bylaw protected tree (OS#6), located on 404 Dundas Street, have been recommended for removal due to the proposed construction. Three (3) replacement trees have been proposed. The planting locations and species have not yet been finalized and are to be determined via consultation with the property owner.

## 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 construct a six-storey residential complex with underground parking, landscaping, bike parking, and underground servicing.
- 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 of the tree resources (Appendix A).

- No trees exist on the subject property; therefore, no identification tags were used. Neighbours' trees were labeled "OS#," and municipal trees labeled "M#" on the site plan. No tags were attached to offsite or municipal trees.
- 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 site survey (J.E. Anderson & Associates, August 19, 2021), architectural plans (Dialog Design, #2003557, January 10, 2022), preliminary site servicing plan (J.E. Anderson & Associates, 32911, May 26, 2022), and landscape plan (Biophilia, May 25, 2022).

# LIMITATIONS

- No exploratory excavations have been conducted and thus the conclusions reached are based solely on critical root zone calculations, observations of site conditions, and our best judgement using our experience and expertise. The location, size and density of roots are often difficult to predict without exploratory excavations and therefore the impacts to the trees may be more or less severe than we anticipate.
- The extent of impacts to some trees will largely depend on the cut-slope prescribed by the geotechnical engineer during excavation for the foundations. Therefore, the proximity of excavation to trees (without shoring) can only be estimated and may be closer or farther from trees than we estimate.
- Finalized site servicing plans were not available at time of report writing. As such, the impacts from site service installation may change and impact municipal or offsite trees. As required, impacts can be reassessed once new information emerges.

	Α	В	С	D		
Tree Status	Total # of	# Of Trees	# Of NEW or	# Of EXISTING	NET CHANGE (A-	
	Protected	to be	REPLACEMENT	non-protected		
	Trees	REMOVE	Trees to be	Trees Counted		
		D	Planted*	as Replacements	B+C+D)	
Onsite Trees	0	0	12	0	+12	
Private Offsite Trees	5	3	3	0	0	
Municipal Trees	3	0	1	N/A	+ 1	
Total	8	3	16	0	+13	

# TREE IMPACT & PRESERVATION SUMMARY

Based on bylaw criteria, eleven (11) trees are required to fulfil the tree minimum on the subject lot  $(2,197m^2)$ . The landscape plan shows conceptual locations of the twelve (12) on-site replacement trees (identified in planting areas: A – G, I, & J), which exceeds the tree minimum (see Tree Preservation Summary). One (1) municipal tree is proposed to be planted along Russell Street. Three (3) replacement trees have been proposed to be planted at 404 Dundas Street. The planting locations and species have yet been finalized and are to be determined via consultation with the property owner. Refer to landscape plan for specifications and soil volume calculations.

Tree Preservation St         City of Victoria Project No: Unknown         Address: 480 Esquimalt Road         Arborist: Brayden Borle       Certifications/Qualifications: ISA Certified Arborist (PR-5508A)         Con         ONSITE Minimum replacement         A. Protected Trees Removed       0         B. Replacement Trees Proposed per       0         Schedule "E", Part 1       0         C. Replacement Trees Proposed per       0         Schedule "E", Part 2       0         Replacement Trees Proposed per       0         Schedule "E", Part 3       12         Schedule "E", Part 3       12         Schedule "E", Part 3       12         ONSITE Minimum trees per lot requered 0 if negative for n	nt Multiplier tree requirement X 1 X 1 X 0.5 X 0.5 X 1 nearest whole number ve number	A. B. C. D. E. F. G. H.	otal 0 0 0 12 12 0 11 0 11 0							
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number										
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Summary prepared and submitted by: Date: May 25, 2022										

# TREES TO BE REMOVED

• Excavation for the underground levels of the new building is proposed along the northern property line (shared with 404 Dundas St.). This excavation is within the CRZs of Three (3) Norway Maples (*Acer platanoides*) OS#3-5 (44, 30, and 34cm DBHs, respectively) and One (1) Pyramidal Cedar (*Thuja occidentialis*) OS#6 (11/9/9/cm DBH):

These trees are located approximately 0.5m from the property line. Excavation for level P2 (8.75m finished grade) is proposed as much as 9m below existing grades where the above trees grow (between 17-17.68m). Excavation in this location at the proposed depth is likely to destabilize these trees. Therefore, we recommend the removal of OS#3-6, of which OS#3-5 are bylaw protected (Appendix A).

# POTENTIAL IMPACTS TO TREES AND MITIGATION MEASURES

## **BUILDING FOOTPRINT**

- P1/P2 foundation excavations are proposed within the CRZ of **Norway Maple OS#7 (36cm DBH)**. The project arborist should be contacted if over-excavation is required beyond the north property line (shared with 404 Dundas St.)—in this event we may recommend alternative construction techniques (i.e., shoring) to minimize disturbance within the CRZ.
- To mitigate impacts to **Norway Maple OS#2 (21cm DBH)**, we recommend the stump of OS#3 be left in place or ground to just below grade, as the roots of these two trees may be grafted together. OS#2 is not bylaw protected.

# DRIVEWAY/SERVICING

• Three (3) Red Maples (*Acer rubrum*) M#1-3, municipal ID#s 29668, 29669 & 29670 (20cm, 19cm, and 18cm DBHs, respectively): We recommend the project arborist be onsite to supervise any excavations within the CRZs, including sidewalk upgrades and water service installation (as required). Protective barrier fencing should be erected and maintained to the edges of the CRZs to the east and west, and to the sidewalk/curb edges north and south to prevent machinery access and material storage in these areas (Appendix B & C).

# MITIGATION MEASURES (FOR REFERENCE)

## **ARBORIST SUPERVISION**

- All excavation occurring within the critical root zones of protected trees should be completed under the direction or supervision of the project arborist. This includes (but not limited to) the following activities within CRZs:
  - Any excavations within the CRZs of M#1-3.
  - Excavations for P1/P2 within the CRZs of OS#7.

# **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. Ideally, the area surrounding exposed roots should be watered; this is particularly important if excavation occurs, or the roots are exposed 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 watering the area periodically 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 (Appendix B & C). 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 or a combination of the following methods (depending on the size of machinery and the frequency of use):

- Placing a layer of geogrid (such as Combigrid 30/30) over the area to be used and installing a layer of crushed rock to a depth of 15 cm over top or a layer of hog fuel or coarse wood chips at least 30 cm in depth and maintaining it in good condition until construction is complete.
- 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 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.

# PAVED SURFACES ABOVE TREE ROOTS

• If the new paved surfaces within the CRZs of retained trees require excavation down to bearing soil and significant roots are encountered in this area, this could impact the health or stability of the retained trees. If tree retention is desired, the following recommendations should be followed.

The objective of "no-dig" construction techniques is to avoid root loss and to instead raise the paved surface and/or its base material above the root systems of trees. This may result in the finished grade of the paved surface being raised above existing grade (the amount depending on how close roots are to the surface and the depth of the paving material and base layers). Final grading plans should take this potential change into account (e.g. the resulting slope, grades of surrounding patios, etc.). Contractors should be informed that soils which are high in organic content will likely be left intact below the paved area.

Within the CRZs, the project arborist should supervise any excavation associated with constructing these hard surfaces, including the removal of the existing paving or turf. If significant roots are encountered, excavation should be stopped.

Depending on the amount of the critical root zone covered by the paved surface, the condition of the sub-grade and the number of roots observed, it may be recommended that the paved surface be made permeable and that a geogrid material (such as CombiGrid 30/30 or similar) be used. The function of the geogrid is to reduce compaction and to disperse weight over soils high in organics and roots. The base material for the paving should be placed above this geogrid and should be clear washed gravels (3/4" clear) in order to inhibit future root growth and potential damage to paving as well as to ensure a well-draining aeration layer. An

additional layer of filter cloth or geotextile fabric may be recommended to separate coarse and fine layers (if a finer material is required directly underneath the paving).

To allow water to drain into the root systems below, the project arborist may 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. If the paved surface is a driveway, it may be possible to construct a "ribbon driveway" with an unpaved area between the two strips of paving.

Ultimately, a geotechnical engineer may be consulted and in consultation with the project arborist, may specify their own materials and methods that are specific to the site's grading, soil conditions and requirements, while also avoiding root loss, reducing compaction to the sub-grade and ensuring the most long-term aeration and permeability.

# 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 (not dyed) and be 5-8cm deep. No mulch should be touching the trunk of the tree. See "methods to avoid soil compaction" if the area is to have heavy traffic.

# BLASTING

• Care must be taken to ensure that the area of blasting does not extend beyond the necessary footprints and into the critical root zones of surrounding trees. The use of small low-concussion charges and multiple small charges designed to pre-shear the rock face will reduce fracturing, ground vibration, and overall impact on the surrounding environment. Only explosives of low phytotoxicity and techniques that minimize tree damage should be used. Provisions must be made to ensure that blasted rock and debris are stored away from the critical root zones of trees.

# SCAFFOLDING

• This assessment has not included impacts from potential scaffolding including canopy clearance pruning requirements. If scaffolding is necessary and this will require clearance pruning of retained trees, the project arborist should be consulted. Depending on the extent of pruning required, the project arborist may recommend that alternatives to full scaffolding be considered such as hydraulic lifts, ladders, or platforms. Methods to avoid soil compaction may also be recommended (see "Minimizing Soil Compaction" section).

# LANDSCAPING AND IRRIGATION SYSTEMS

• The planting of new trees and shrubs should not damage the roots of retained trees. The installation of any in-ground irrigation system must consider the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technician consult with the project arborist about the most suitable locations for the irrigation lines and how best to mitigate the impacts on the trees to be retained. This may require the project arborist supervise the excavations associated with installing the irrigation system. Excessive frequent irrigation and irrigation which wets the trunks of trees can have a detrimental impact on tree health and can lead to root and trunk decay.

## ARBORIST ROLE

- It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:
  - Locating the barrier fencing
  - Reviewing the report with the project foreman or site supervisor
  - Locating work zones, where required
  - Supervising any excavation within the critical root zones of trees to be retained
  - Reviewing and advising of any pruning requirements for machine clearances

## **REVIEW AND SITE MEETING**

• Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any site clearing, tree removal, demolition, or other construction activity occurs and to confirm the locations of the tree protection barrier fencing.

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

Thank you,

BAL

Brayden Borle ISA Certified Arborist: PR-5508A brayden@talmack.ca

Talmack Urban Forestry Consultants Ltd. ISA Certified Consulting Arborists tmtreehelp@gmail.com

Robbie McRae ISA Certified Arborist: PN-7125A TRAQ Qualified robbie@talmack.ca

#### **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.

Appendix A: 1-page Tree Resource Spreadsheet

Appendix B: 1-Page Tree Removal and Preservation Plan

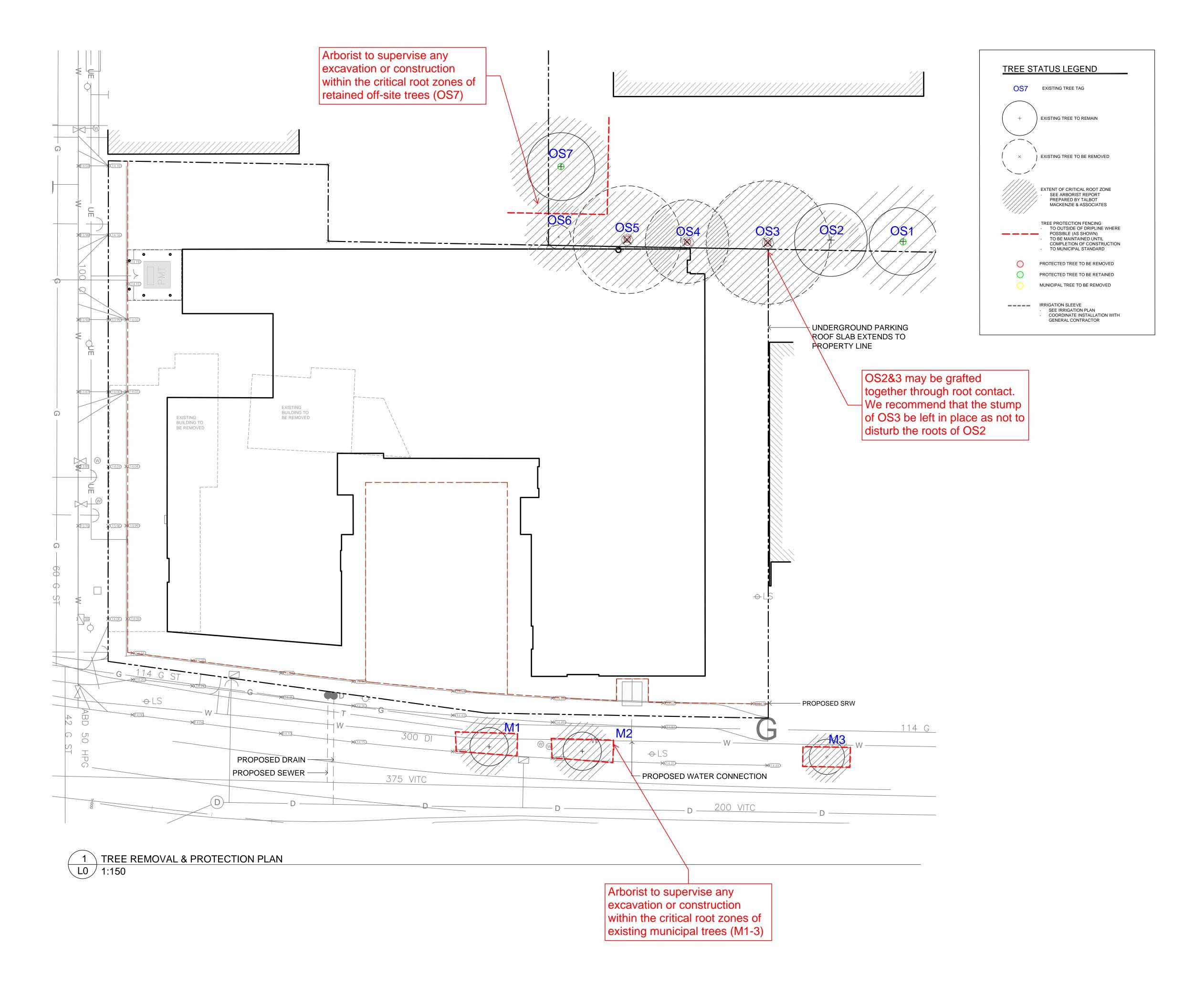
Appendix C: 1-Page Protective Tree Fencing Specification

Appendix D: 2-page Tree Inventory Definitions

Tog	Surveyed	Location	Bulow	Bylaw Name			Critical	Dripline	Condition					
Tag or ID #	Yes/No)	(On, Off, Shared, City)	protected ? (Yes/No)	Common	Botanical		root zone	diameter	Condition	Structural	Relative tolerance	General field observations/remarks	Tree retention/location	Retention status
#	(Tes/NO)	Shared, City)	r (res/NO)	Common	Dotanical	dbh (cm)	radius (m)	(m)	пеаш	Structural	tolerance	observations/remarks	comments	Status
OS1	No	Off-site	Yes	Norway Maple	Acer platanoides	38 over ivy	4.6	8	Fair	Fair	Moderate	Topped historically.		Retain
				Norway	Acer								May be impacted by OS3 stump removal. OS3 stump	
OS2	No	Off-site	No	Maple	platanoides	21	2.5	6	Fair	Fair	Moderate	Deadwood.	should be left intact.	Retain*
				Norway	Acer							Topped historically, included bark		
OS3	Yes	Off-site	Yes	Maple	platanoides	44	5.3	10	Fair	Fair	Moderate	in unions.	Conflict with P1, P2.	X
												Topped historically, included bark		
OS4	Yes	Off-site	Yes	Norway Maple	Acer platanoides	30	3.6	7	Fair	Fair-poor	Moderate	in unions, decay in pruning wounds.	Conflict with P1, P2.	x
				Norway	Acer							Topped historically, included bark in unions, epicormic growth,		
OS5	Yes	Off-site	Yes	Maple	platanoides	34	4.1	9	Fair	Fair-poor	Moderate	decay in pruning wounds.	Conflict with P1, P2.	Х
				Pyramidal	Thuja			_						
OS6	No	Off-site	No	Cedar	occidentalis	11,9,9,6,5	2.8	2	Fair	Fair	Good	Ivy on trunks.	Conflict with P1, P2. May be impacted by	X
													excavation for P1, P2. The project arborist should be	
				Norway	Acer								consulted if over excavation of the northern property line	
OS7	No	Off-site	Yes	Maple	platanoides	36	4.3	7	Fair	Fair	Moderate	Approximately 5m north of PL.	should occur.	Retain*
M1	Yes	Municipal	Municipal	Red Maple	Acer rubrum	20	2.4	3	Good	Fair-poor	Moderate	Included bark in unions.		Retain
		manapar							CCOU		incustato			
M2	Yes	Municipal	Municipal	Red Maple	Acer rubrum	19	2.3	3	Good	Fair-poor	Moderate	Included bark in unions.		Retain
M3	Yes	Municipal	Municipal	Red Maple	Acer rubrum	18	2.2	3	Good	Fair-poor	Moderate	Included bark in unions.		Retain

# Appendix A: Tree Resource Inventory

Appendix B: Tree Removal & Preservation Plan





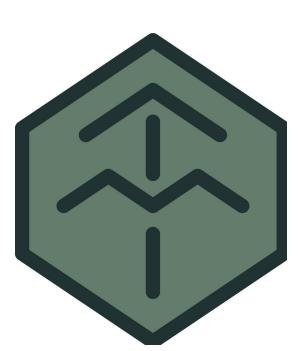
1608 Camosun Street, Victoria BC V8T 3E6 Info@biophiliacollective.ca 250 590 1156

OWNER/CLIENT: ARYZE Developments

PROJECT NAME: FACTORY BLOCK

PROJECT ADDRESS: 480 + 492 Esquimalt Rd. Victoria, BC

DESIGNED BY: BIANCA BODLEY DRAWN BY: KARIANNE HOWARTH



Talmack Urban Forestry Limited

Modified Date: 22/05/26

Modified by: BB

Reference Drawing: Tree Removal & Protection Plan - Biophilia Collective, See above for details

SEAL



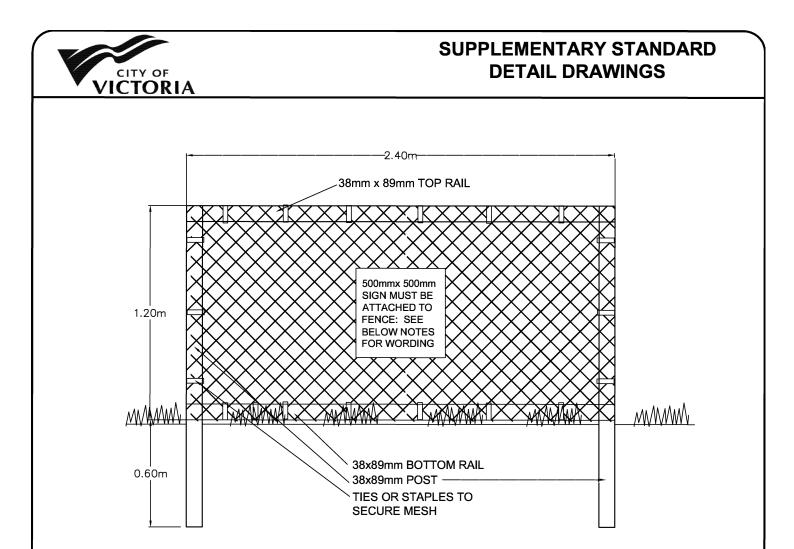
DRAWING TITLE:

TREE REMOVAL & PROTECTION PLAN

DWG NO:

SCALE: 1:150

**Appendix C: Protective Tree Fencing Specification** 



## TREE PROTECTION FENCING

- 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.
- ATTACH A 500mm X 500mm SIGN WITH THE FOLLOWING WORDING: PROTECTED ROOT ZONE - NO ENTRY. 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

# TREE PROTECTION FENCING AND SIGNAGE DETAIL

**REVISIONS** DRAWING NUMBER:



2011

# **Appendix D: 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 meters to the dripline of the longest limbs. \* For this report, dripline is expressed as a diameter.

**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 consider individual tree characteristics, such as health and vigor. 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 meters 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
- $10 \times DBH = Good$

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 (i.e., 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