



TALBOT MACKENZIE & ASSOCIATES

CONSULTING ARBORISTS

Fisgard Courtyard, Victoria, BC

Construction Impact Assessment & Tree Management Plan

PREPARED FOR: Salient Group
#225-209 Carrall Street
Vancouver, BC
V6B 2J2

PREPARED BY: Talbot, Mackenzie & Associates
Noah Talbot – Consulting Arborist
ISA Certified # PN-6822A
Tree Risk Assessment Qualified

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1. INTRODUCTION

Talbot Mackenzie & Associates was asked to complete a tree inventory, construction impact assessment and management plan for the trees at the following proposed project:

Site:	539 – 545 Fisgard Street (Fisgard Courtyard)
Municipality	City of Victoria
Client Name:	Salient Group
Dates of Site Visit:	October 19, 2020
Site Conditions:	Existing Courtyard. Ongoing renovations to building interior
Weather During Site Visit:	Clear and Sunny

The purpose of this report is to address requirements of the City of Victoria arborist report terms of reference, and Tree Preservation Bylaw No. 05-106. The construction impact assessment section of this report (section 7), is based on plans reviewed to date, including the Architectural (HAP) design drawings – prepared by Waymark. At this time we have not reviewed a detailed landscape plan.

2. TREE INVENTORY METHODOLOGY

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. Each tree was visually examined on a limited visual assessment basis (level 1), in accordance with Tree Risk Assessment Qualification (TRAQ) methods (Dunster *et al.* 2017) and ISA Best Management Practices.

3. EXECUTIVE SUMMARY

The onsite tree resource consists of 3 trees, including: 2 European plum (*Prunus domestica*), and 1 Scots pine (*pinus sylvestris*). Note that plum (tag# is 1793) is not protected by the current municipal tree bylaw. A glass canopy structure is proposed to be installed which will require the removal of 1 bylaw protected plum (tag# 1792). The bylaw protected plum tree has pre-existing structural defects (asymmetric crown) due to its proximity to the existing building and crown clearance pruning that has occurred historically. The 2 trees that are required to be planting in compensation for the removal of 1 bylaw protected tree will be provided via cash in lieu. The tree management plan ([appendix A](#)) provides mitigation recommendations for the 2 onsite trees proposed for retention.

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.

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."

- 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

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 #	Surveyed ? (Yes / No)	Bylaw protected ? (Yes / No)	Name		dbh (cm)	Ht (m)	Critical Root Zone(m)	Dripline radius (m)	Condition		Retention Suitability (onsite trees)	Relative Tolerance	Remarks	Tree Retention/Location Comments	Action
			Common	Botanical					Health	Structural					
1792	No	Yes	European plum	<i>Prunus domestica</i>	24,26,28	6	7.3	5	Good	Fair/poor	Conditional	Moderate	Tridominant stems form at .5 - 1m above grade - included/narrow unions with active growth tissue, crown has been heavily pruned historically on North side for building clearance - resulting in major asymmetry, decay forming in old pruning wounds - appears localized at this time, some suckering at lower trunk, shallow soil conditions, surface rooted on West side - injuries to topsides of surface roots, existing concrete surface over East side of CRZ. Concrete cracking, back filled over North side of crz with soil and small boulders, stucco cracking on wall adjacent to North side of tree - 1.1m from root collar. Basal suckers on North side.	Will be heavily impacted by excavation required to install the proposed new timber posts that support the proposed glass canopy structure. Will be heavily impacted by crown reduction required to install the proposed glass canopy.	Remove
1793	No	No	European plum	<i>Prunus domestica</i>	21	5	2.6	3	Good	Fair/poor	Conditional	Moderate	Suppressed by 1792 - poor stem taper - major crown asymmetry due to shading, shaded by existing wall on West side as well, branches beginning to conflict with wall on West side, basal suckers, rooted in crushed gravel - does not appear to be compacted at this time. Historic pruning wounds with decay forming - appears to be localized at this time, growing 2m from existing wall on West side.	*Sloped pavers proposed to be installed within the crz. Project arborist to supervise all excavation required within the crz. Any required crown pruning for clearance from the proposed glass canopy to be performed to ANSI A300 standards.	Retain*
1794	No	Yes	Scots pine	<i>Pinus sylevstris</i>	35	12	4.4	5	Fair	Fair/poor	Conditional	Moderate	Growing within confined area - .6m from existing wall and concrete sidewalk on South side, 1.2m from existing retaining wall on West side, branches beginning to conflict with wall on South side, recent branch tearout injury on West side - lowest limb. Seam on East side of lower trunk - active - pitching. Poor growing location for a tree of this species - large growth potential. In Center of path and gate to adjacent property, branches likely rub against adjacent building on East side in the wind.	*timber post proposed to be installed within the crz. Project arborist to supervise all excavation required within the crz.	Retain*

5. SITE INFORMATION & PROJECT UNDERSTANDING

The site consists of an outdoor courtyard area (Fisgard Courtyard) at the Southwest corner of the 539 – 545 Fisgard Street building, in Victoria, B.C.. It is our understanding that the proposal is to renovate the existing building structure, including the restoration of an existing concrete slab within the courtyard, and addition of a glass canopy cover.

6. FIELD OBSERVATIONS

The onsite tree resource consists of 3 trees, including: 2 European plum (*Prunus domestica*), and 1 Scots pine (*Pinus sylvestris*). Note that plum (tag# 1793) is not protected by the current municipal tree bylaw. The bylaw protected plum (tag# 1792) is growing within close proximity to the Northern wall of the building and has been heavily pruned over the years for building clearance, resulting in an asymmetric canopy form. The non-bylaw protected plum (tag# 1793) is suppressed and shaded by plum (tag# 1792). The bylaw protected Scots pine (tag# 1794) is growing within 0.6 meters of the wall of the neighbouring building to the South.

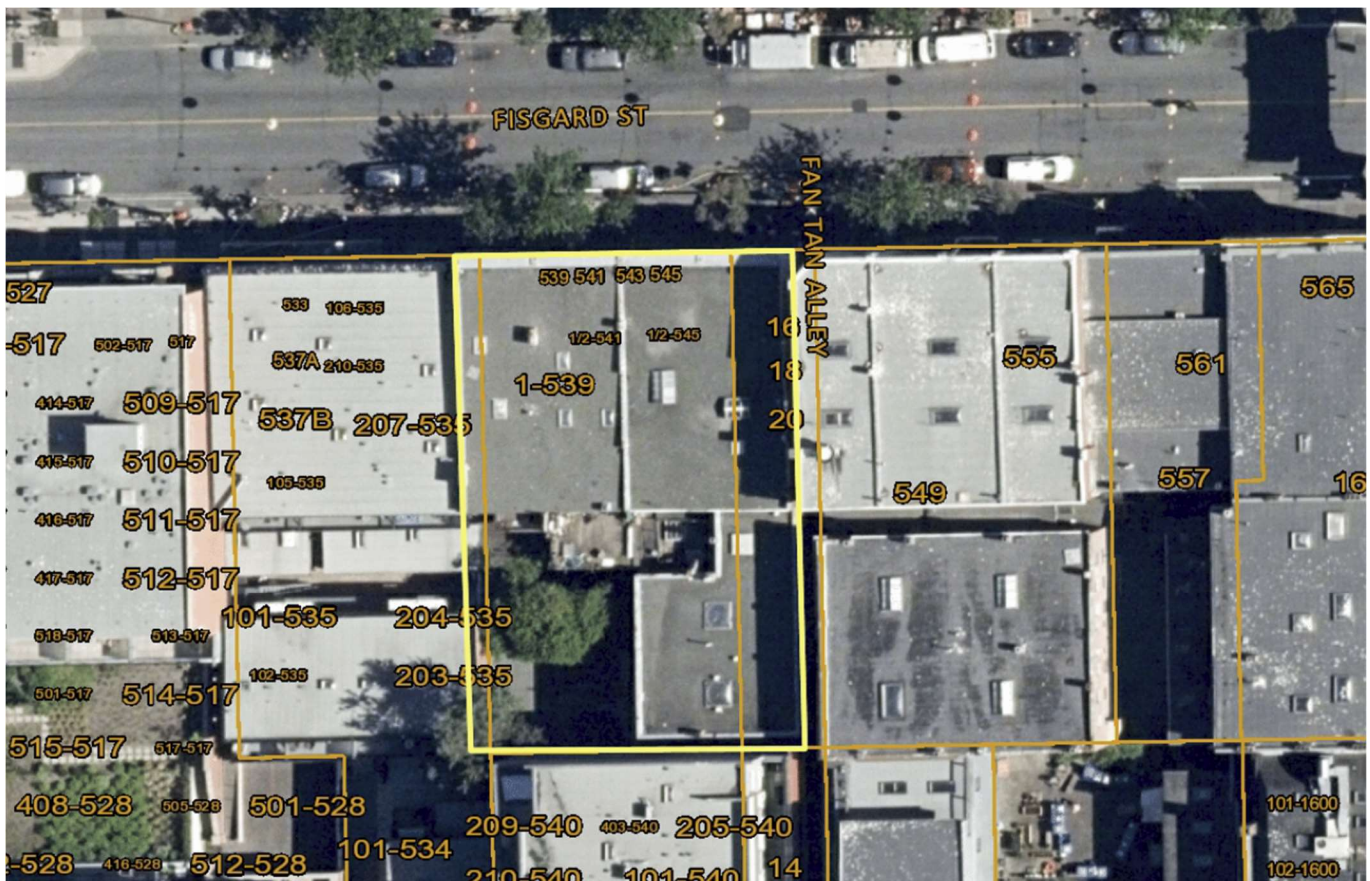


figure 1: Site context air photo: The approximate boundary of the subject site is outlined in Yellow.

7. CONSTRUCTION IMPACT ASSESSMENT

7.1. RETENTION AND REMOVAL OF ONSITE TREES

The following bylaw protected onsite tree (indicated by tag #) is located where it is possible for retention providing that its critical root zone can be adequately protected during construction. The project arborist must be onsite to supervise and excavation or fill placement required within the critical root zones (shown on the tree management plan in *appendix A*):

Retain:

- 1794

The following non bylaw protected onsite tree (indicated by tag #) is located where it is possible for retention providing that its critical root zone can be adequately protected during construction. The project arborist must be onsite to supervise and excavation or fill placement required within the critical root zones (shown on the tree management plan in *appendix A*):

Retain:

- 1793

The following bylaw protected tree is located where it will be heavily impacted by crown reduction required to install the proposed glass canopy and root impacts to required install the proposed timber post and is proposed for removal:

Remove:

- 1792

8. TREE REPLACEMENT

Pursuant to City of Victoria Tree Preservation Bylaw No. 05-106, the tree replacement calculations are as follows:

Quantity of Existing trees	# of Trees Retained	# of Trees Removed	Replacement Tree Ratio	Replacement Trees Required	Replacement Trees Proposed	Replacement Trees in Deficit
Onsite (non bylaw protected)						
1	1	0	N/A	N/A	N/A	N/A
Onsite (bylaw protected)						
2	1	1	2:1	2	0	2
City owned Trees						
0	N/A	0	N/A	<u>N/A</u>	N/A	N/A
Private offsite Trees						
0	N/A	0	N/A	N/A	N/A	N/A
			Total:	<u>2</u>	<u>0</u>	<u>2</u>

Based on bylaw criteria, 2 trees are required to be planted in compensation for the proposed removal of 1 bylaw protected tree (2:1 replacement ratio). A review of the existing soil conditions, the existing canopy cover and proposed glass canopy cover, within the courtyard area found that there will be inadequate planting space or soil volumes to plant onsite replacement trees. The tree replacement deficit will be provided via a cash in lieu payment by the owner.

9. IMPACT MITIGATION

Tree Protection Barrier: The areas surrounding the by law protected 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, the 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 trees to be retained 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 required within the critical root zone of pine (tag# 1794) to install the proposed wood support beam.
- Excavation required within the critical root zone of plum (tag# 1793) for the proposed sloped pavers.
*Note that this tree is not protected by the current municipal tree bylaw.

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.

Paved Surfaces Above Tree Roots:

If the new paved surfaces within the CRZ of tree to be retained require excavation down to bearing soil and roots are encountered in this area, this could impact their health and structural stability. If tree retention is desired, perimeter of proposed curbs of planter beds may need to be amended to limit encroachment of critical root zone of retained trees.

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.

10. DISCLOSURE STATEMENT

This arboricultural field review report was prepared by Talbot Mackenzie & Associates 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 Talbot Mackenzie & Associates. 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. Talbot Mackenzie & Associates accepts no responsibility for damages, if any, suffered by any third party as a result 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 Talbot Mackenzie & Associates 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 new information is discovered in the future during such events or other activities, Talbot Mackenzie & Associates 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

11. 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:



Noah Talbot, BA
ISA Certified Arborist PN – 6822A
Tree Risk Assessment Qualification
Email: tmtreehelp@gmail.com

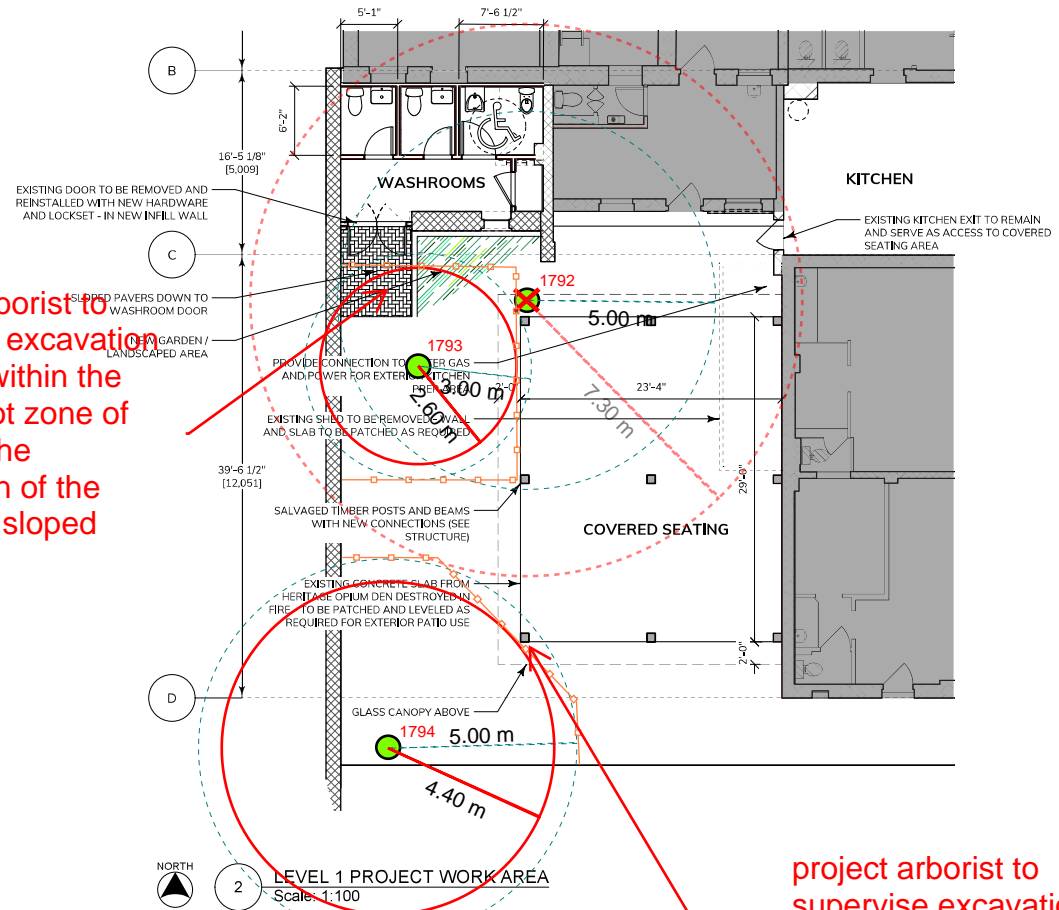
12. REFERENCES

The City of Victoria Tree Preservation Bylaw No. 05-106.

APPENDIX A - TREE MANAGEMENT PLAN



1 New Glass Canopy Structure
Scale: 1:150



ARBORIST LEGEND

- Tree with tag #
- Critical root zone
- Dripline
- Tree protection fencing
- Tree proposed for removal

project arborist to supervise excavation required within the critical root zone of 1794 for the installation of the proposed timber post



www.waymarkarchitecture.com
1826 Government Street
Victoria, BC V8T 4N5

No.	Date	Appr	Revision Notes
6	2021-02-11		Heritage Alteration Permit
No.	Date	Issue Notes	

IMPORTANT: This drawing is not to be used for construction until issued for that purpose by the Architect.
Prior to commencement of the Work, the Contractor shall review and verify drawing dimensions, datums, and levels to identify all discrepancies between information on this drawing and 1) actual site conditions; and 2) the remaining Contract Documents. The Contractor shall bring these items to the attention of the Architect for clarification before proceeding with the Work.

Soil	
Owner:	
Project Title:	
539-545 1/2 Fisgard Street	
Sheet Title:	
Courtyard Canopy Structure	
Scale:	Sheet Number:
n/a	
Architect of Record:	HAP403
Will King	
Drawn by:	
WK, KT, CL	
Reviewed by:	
GMV	
Project ID:	
2019-005	



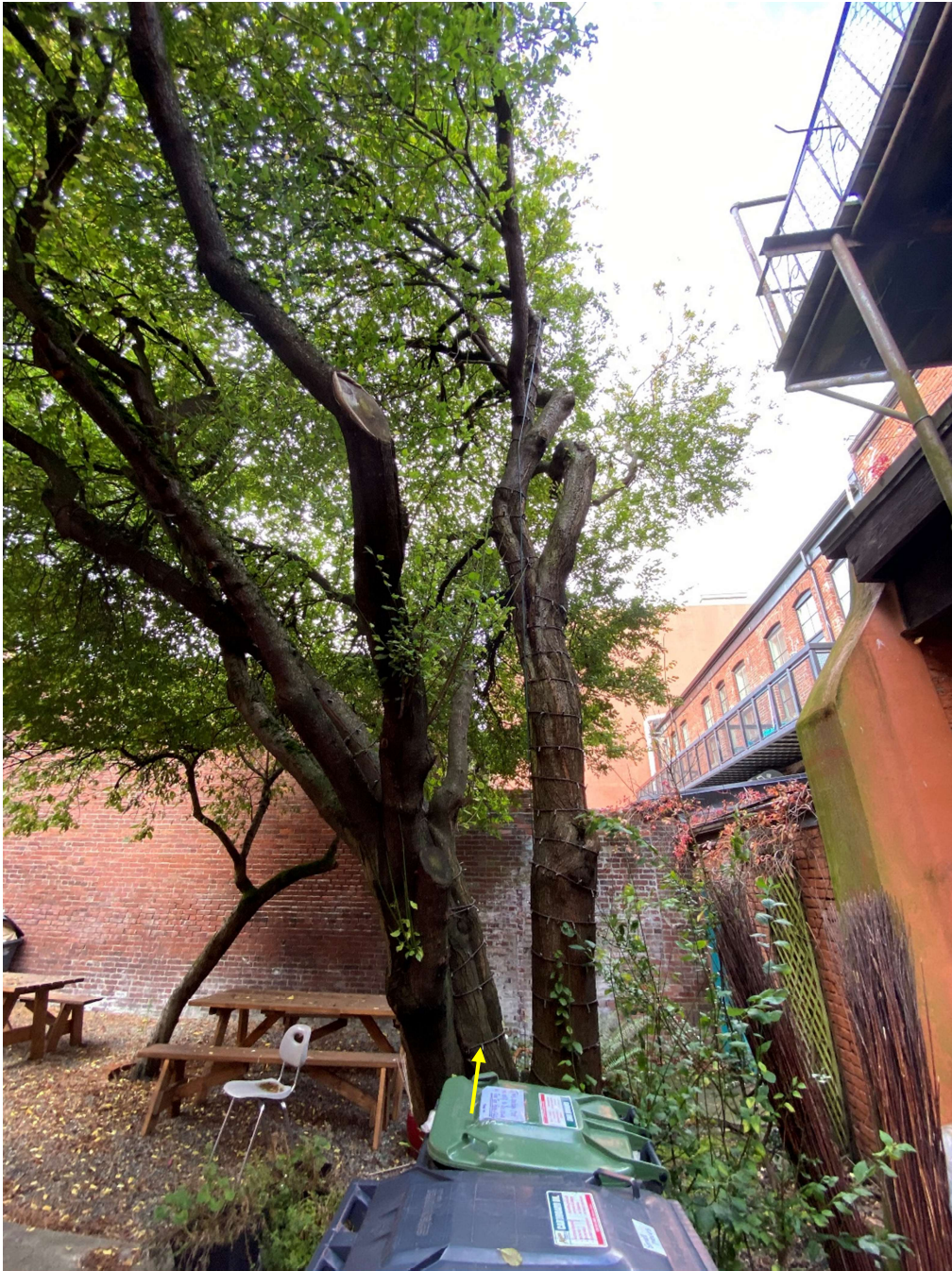
WAYMARK

IMPORTANT: copyright reserved, This design and drawing is the exclusive property of Waymark Architecture and cannot be used for any purpose without the written consent of the Architect.

APPENDIX B - PHOTOGRAPHS



Photograph 1- Yellow arrows indicated bylaw protected plum (tag# 1792) on the right and non bylaw protected plum (tag# 1793) on the left.



Photograph 2 – yellow arrow indicates bylaw protected plum (tag# 1792). Note large historic pruning wounds on the West side of the crown from building clearance pruning.



Photograph 3 – Yellow arrow indicates non bylaw protected plum (tag# 1793.



Photograph 4 – Yellow arrow indicates bylaw protected Scots pine (tag# 1794).

APPENDIX C – TEMPORARY ACCESS WITHIN CRITICAL ROOT ZONE DETAIL

Temporary access or storage area within critical root zones

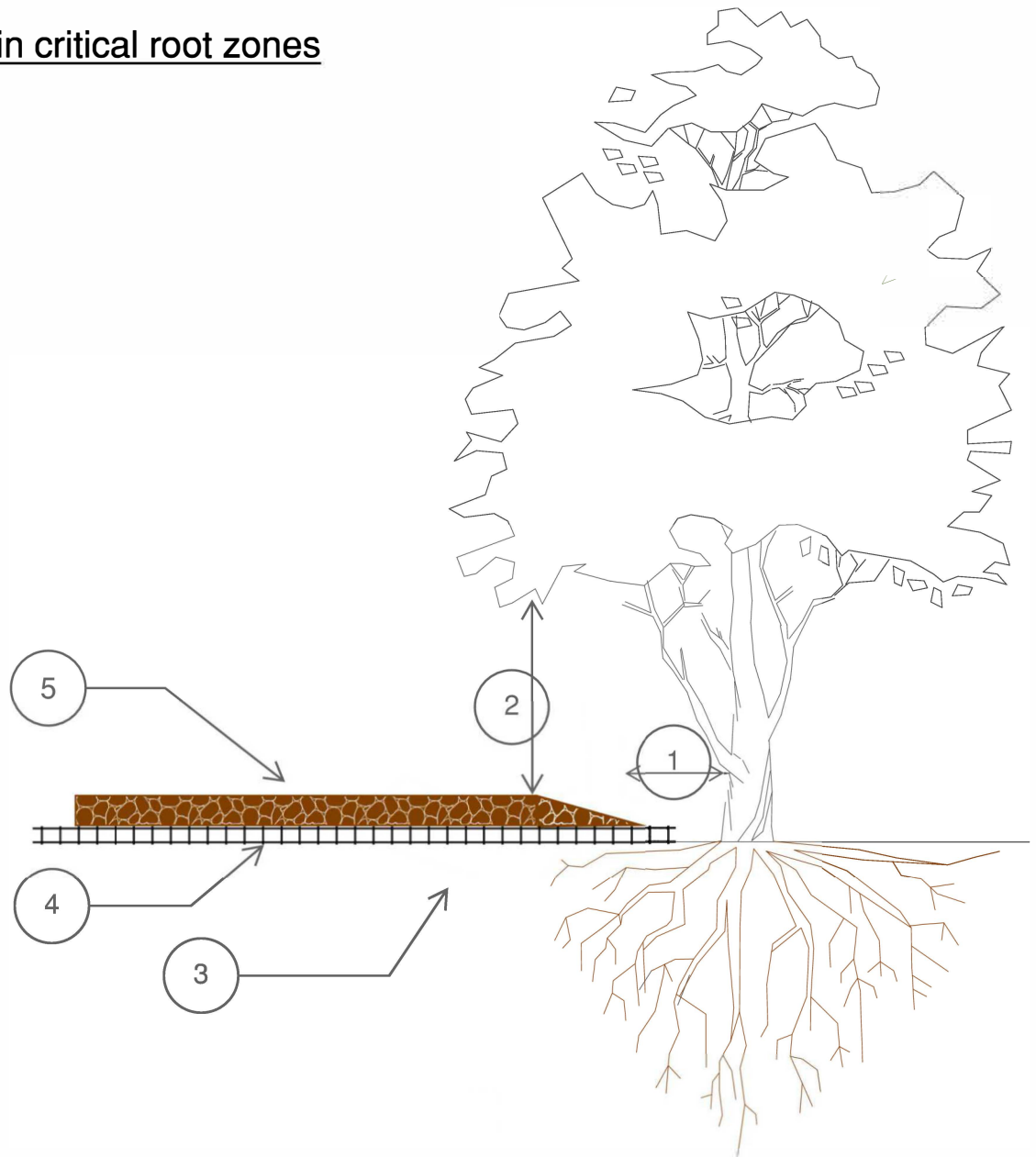
Cross section View

Construction notes:

1. Maintain as large a setback between fill area and tree trunk as possible or practical.
2. Ensure there is adequate limb clearance for any machinery.
3. Leave existing soil and organics in place or lightly excavate to remove turf or level ground under the direction of the project arborist.
4. Install a layer of Combigrid 30/30 geogrid or similar.
5. Install a 20-25 cm layer of hog fuel or coarse wood chip, or clear crush gravel directly over the geogrid layer. Maintain in good condition and at required coverage and depth for the duration that the area is being used.

Reinstating the area:

After the hog fuel, coarse wood chip or gravel and geogrid are removed under the direction of the project arborist, it may be necessary to loosen and amend any compacted soil using an airspade. The area can then be re-sodded or landscaped as desired.



Talbot Mackenzie & Associates

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