

## CONSULTING ARBORISTS

# Construction Impact Assessment & Tree Management Plan

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## CONTENTS

<b>1. INTRODUCTION .....</b>	<b>1</b>
<b>2. TREE INVENTORY METHODOLOGY .....</b>	<b>1</b>
<b>3. EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>4. TREE INVENTORY DEFINITIONS .....</b>	<b>2</b>
<b>5. SITE INFORMATION &amp; PROJECT UNDERSTANDING .....</b>	<b>6</b>
<b>6. FIELD OBSERVATIONS .....</b>	<b>6</b>
<b>7. CONSTRUCTION IMPACT ASSESSMENT .....</b>	<b>7</b>
7.1. Retention and Removal of Municipal Trees.....	7
7.2. Retention and removal of private offsite trees .....	7
7.3. Retention and removal of onsite trees .....	8
<b>8. TREE REPLACEMENT .....</b>	<b>8</b>
<b>9. IMPACT MITIGATION .....</b>	<b>9</b>
<b>10. DISCLOSURE STATEMENT .....</b>	<b>11</b>
<b>11. IN CLOSING.....</b>	<b>12</b>
<b>12. REFERENCES .....</b>	<b>12</b>

## TABLES

Table 1. Tree Inventory .....	4
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## APPENDICES

Appendix A Tree Management Plan (T1)

Appendix B Site Photographs

Appendix C Civil plan

Appendix D Hard surface above tree roots detail

Appendix E Temporary access or storage within crz detail

## REVISION RECORD

REVISION	DESCRIPTION	DATE (YYYY-MM-DD)	ISSUED BY
0	Original TPP report dated June 08, 2021	2021-06-08	NT
1	Revision to original report dated June 08, 2021 to reflect review of the updated Landscape plans (dated October 20, 2021), Civil plans (dated November 01, 2021), and architectural plans (dated October 26, 2021).	2021-11-05	NT

# 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:	2848 and 2852 Shelbourne Street Street
Municipality	City of Victoria
Client Name:	Jesse Baidwan
Dates of Site Visit:	May 07, 2021
Site Conditions:	A consolidation of 2 urban lots, no ongoing construction activity
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 site plan - prepared by Stellar Architectural Consulting (dated October 26, 2021), and civil plan - prepared by Calid (dated November 01, 2021) and Landscape plan – prepared by Biophilia Design Collective (dated October 20, 2021).

# 2. TREE INVENTORY METHODOLOGY

Prior to our site visit, we were provided with a site plan with surveyed tree locations. 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 or neighbouring properties were not tagged. 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

Based on review of the architectural site plan and civil plans provided, 3 onsite bylaw protected trees are located where they will require removal to facilitate construction of the proposed townhome building. 6 replacement trees are required in compensation for the proposed removal of 3 onsite bylaw protected trees (2:1 ratio). The Tree Planting Plan prepared by Biophilia shows locations for 6 designated replacement trees, which meets bylaw requirements. A municipal London plane, and 5 private offsite trees must be protected during construction, using measures outlined on this report. All excavation within the critical root zones of the municipal London plane and offsite trees to be retained must be performed under the supervision of the project arborist.

## 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 or ID #	Surveyed ? (Yes / No)	Location (On, Off, Shared, City)	Bylaw protected ? (Yes / No)	Name		dbh (cm)	Ht (m)	Critical root zone radius (m)	Dripline radius (m)	Condition		Retention Suitability (onsite trees)	Relative tolerance	General field observations/remarks	Tree retention comments	Retention status
				Common	Botanical					Health	Structural					
M1	Yes	City	Yes	London plane	<i>Platanus x acerifolia</i>	98	20	10.3	13	Good	Fair/good		Good	Growing within existing 2m wide Boulevard strip, existing sidewalk lifted by the root collar of the tree, asphalt has been used for section of sidewalk at base of tree, multiple leaders form at 3m above grade - no major weaknesses visible at stem unions, 2 scaffold limbs removed historically with associated surface decay- calloused around wounds, asymmetric crown on East side due to clearance pruning from Shelbourne Street, existing overhead utility lines run through canopy, existing manhole within 1m of root collar.	*Excavation required within the crz for the proposed new sidewalk alignment, new driveway, curb and gutter, walkways, sanitary sewer, storm drain, water, hydro/tel and to exposed and cap existing services. Project arborist to supervise all excavation required within the crz. Any required clearance pruning for building clearance or scaffolding installation to be performed to ANSI A300 standards.	Retain*
OS1	Yes	Off	Yes	English hawthorn	<i>Crataegus laevigata</i>	72~	10	7.6	4	Good	Poor		Good	Tridominant stems form at 1 meter above grade - narrow angles of attachment, 2 stems are separating.	*Driveway proposed within the critical root zone. Project arborist to supervise all excavation required within the crz. Crown raise pruning for driveway clearance to be performed to ANSI A300 standards.	Retain*
OS2	No	Off	No	Spruce	<i>Pricea sp.</i>	12~	5	1.9	1.5	Good	Good		Poor	Young tree, no visible defects.	Project arborist to supervise all excavation required within the crz	Retain
092	Yes	On	No	Leyland Cypress	<i>Cupressus x leylandii</i>	24	10	2.5	3	Good	Good	Unsuitable	Good	Young tree, no visible defects.	Located within the footprint of the proposed driveway.	Remove
093	Yes	On	Yes	Pear	<i>Pyrus sp.</i>	41	8	5.1	2	Fair	Poor	Unsuitable	Moderate	Topped historically at 5m above grade - water sprouts have not been maintained, large diameter topping wounds.	Located within the footprint of the proposed driveway.	Remove
094	Yes	On	Yes	Trembling aspen	<i>Populus tremuloides</i>	32,33	15	8.1	4	Good	Fair/poor	Unsuitable	poor	Codominant leaders form at3m above grade - included and narrow stem union, 10cm diameter limb headed back on East side.	Will be heavily impacted by excavation required to construct the foundation of the proposed townhome.	Remove
OS 095	Yes	Off	Yes	Trembling aspen	<i>Populus tremuloides</i>	16,16,6,3	5	4.5	2.5	Good	Poor		Poor	Topped historically at 4m above grade - small regrowth leaders emerge near topping location, stem removed at 1m above grade.	*Townhome foundation and patio proposed within the crz. Project arborist to supervise all excavation required within the crz	Retain*
1222	No	On	No	Plum	<i>Prunus sp.</i>	10,10,9,6,6	5	2.7	3	Fair/good	Fair/poor	Unsuitable	Moderate	Fruiting plum, multiple stems with narrow angles of attachment.	Located within the footprint of the proposed driveway.	Remove
1223	No	On	No	Apple	<i>Malus sp.</i>	6,6,4,4,3,3	3	1.5	2	Fair/good	Fair/poor	Unsuitable	Moderate	Multiple stems cluster.	Located within the footprint of the proposed driveway.	Remove
1224	No	On	No	Apple	<i>Malus sp.</i>	5,5,4,4,3,3,3	3	1.3	2	Fair	Fair	Unsuitable	Moderate	Multiple stems form at3m above grade. Tent caterpillar infestation.	Located within the footprint of the proposed driveway.	Remove
1225	No	On	No	Quince	<i>Cydonia oblonga 'champion'</i>	3,5,6,7,8	3	2.0	2	Fair/good	Fair	Unsuitable	Moderate	Multiple stems form at 1m above grade with included bark.	Located within the footprint of the proposed townhome.	Remove
1226	No	On	Yes	Plum	<i>Prunus sp</i>	6,8,3,4,4,5,6,10	4	2.3	2	Fair	Fair	Unsuitable	Moderate	Fruiting plum, multiple stems with included bark.	Located within the footprint of the proposed townhome.	Remove

Tag or ID #	Surveyed ? (Yes / No)	Location (On, Off, Shared, City)	Bylaw protected ? (Yes / No)	Name		dbh (cm)	Ht (m)	Critical root zone radius (m)	Dripline radius (m)	Condition		Retention Suitability (onsite trees)	Relative tolerance	General field observations/remarks	Tree retention comments	Retention status
				Common	Botanical					Health	Structural					
1227	No	On	No	Plum	<i>Prunus sp.</i>	6,5,3,2,2	4	1.4	2	Fair	Fair/poor	Unsuitable	Moderate	Fruiting plum, multiple stems cluster, growing within close proximity to existing building foundation.	Will be impacted by excavation required to construct the foundation of the proposed townhome and patio.	Remove
OS3	No	Off	No	Cherry	<i>Prunus sp.</i>	5,2,2,7	4	1.4	2	Fair/good	Fair		Moderate	Fruiting cherry, multiple stems form at 1m above grade with included bark.	*Patio proposed within the crz. Project arborist to supervise all excavation required within the crz.	Retain*
OS4	No	Off	No	Plum	<i>Prunus sp.</i>	12,9,4,5,4	4	2.6	3	Fair/good	Fair		Moderate	Multiple stems form at 1m above grade with included bark and narrow angles of attachment.	*Patio proposed within the crz. Project arborist to supervise all excavation required within the crz.	Retain*

*\*Note – An extra ½ dbh was added to the critical root zone in the calculation above.*

## 5. SITE INFORMATION & PROJECT UNDERSTANDING

The site consists of two urban lots (2848 and 2852 Shelbourne Street), in Victoria, B.C.. It is our understanding that the proposal is to renovate the existing buildings and construct a new townhome building.

## 6. FIELD OBSERVATIONS

The onsite tree resource consists of a mixture of native and non-native trees growing in open landscape conditions. The trees are primarily fruit trees, which have not been maintained. A mature London plan is located on the municipal frontage of the subject site.



*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 MUNICIPAL TREES

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The following municipal trees (indicated by ID #) is located where they are possible for retention providing that the critical root zones are adequately protected during construction. The project arborist must be onsite to supervise and excavation or fill placement required within its critical root zone (shown on the tree management plan (T1) in [appendix A](#)):

Retain and protect 1 municipal tree:

- M1\*

\*5 branches (between 2cm - 5cm diameter) on the west side of the crown (see photograph 3 in [appendix B](#)) will likely require pruning for building clearance and possibly for scaffolding installation. It is recommended that this pruning is performed after the first floor is constructed and the scaffolding is installed (so precise pruning requirements are known) All pruning to be performed to ANSI A300 standards.

\*The sidewalk and driveway drop grades shown on the civil plan ([appendix C](#)) may require modification, depending on the extent and depth of root structures that are encountered during excavation for the proposed new sidewalk (Typ.). The alignment of the proposed 1.75-meter-wide sidewalk can avoid root collar conflicts (note that the new sidewalk has been shifted approximately 0.5 meters West of the existing sidewalk alignment), provided that grades can be adjusted to float base materials over the roots that are encountered during grading for the new sidewalk. Hard surface above tree roots specifications (see [appendix D](#)) are recommended for the portion of sidewalk and driveway that encroaches within the critical root zone.

\*New curb and gutter is proposed within the critical root zone. The existing curb and gutter is located 60cm from the East side of the root collar. Working space to form a new curb and gutter will require excavation close to the root collar of the tree. It is recommended that the section of existing curb and gutter that is located adjacent to the root collar be left undisturbed, to avoid root collar conflicts.

### 7.2. RETENTION AND REMOVAL OF PRIVATE OFFSITE TREES

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The following private offsite trees (indicated by tag or ID #) are located where they are possible for retention providing that the critical root zones are adequately protected during construction. The project arborist must be onsite to supervise and excavation or fill placement required within its critical root zone (shown on the tree management plan (T1) in [appendix A](#)):

Retain and protect 5 private offsite trees:

- OS1\*, OS2, OS3, OS4, OS 095.

\* OS1 will require crown raise pruning of small lower branches (2 – 3cm diameter) for clearance from the proposed driveway. All pruning to be performed to ANSI A300 standards.

\*Hard surface above tree roots specifications (see [appendix D](#)) to be used for the portion of driveway that encroaches within the critical root zone.

Note that neighbouring owner will need to provide written consent, prior the removal of any trees that are located on neighbouring properties.

### 7.3. RETENTION AND REMOVAL OF ONSITE TREES

The following bylaw protected onsite trees (indicated by tag #) are located where they will be impacted by proposed onsite construction and are proposed for removal:

Remove 3 bylaw protected onsite trees:

- 093, 094, 1226.

The following non bylaw protected onsite trees (indicated by tag #) are located where they will be impacted by proposed onsite construction and are proposed for removal:

Remove 6 non bylaw protected onsite trees:

- 092, 1222, 1223, 1224, 1225, 1227.

## 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
<b>Onsite (non bylaw protected)</b>						
6	0	6	N/A	N/A	N/A	N/A
<b>Onsite (bylaw protected)</b>						
3	0	3	2:1	6	6	0
<b>City owned Trees</b>						
1	1	0	N/A	<u>N/A</u>	N/A	N/A
<b>Private offsite Trees</b>						
5	5	0	N/A	N/A	N/A	N/A
<b>Total:</b>				<b><u>6</u></b>	<b><u>6</u></b>	<b><u>0</u></b>

Based on bylaw criteria, 6 trees are required to be planted in compensation for the proposed removal of 3 bylaw protected trees (2:1 replacement ratio). The landscape plan (prepared by Biophilia) shows locations for 6 designated replacement trees, which meets bylaw requirements. If the site cannot accommodate the required quantity of replacement trees, the deficit will be compensated to the City via a cash in lieu payment by the owner. Current arboricultural best management practices and BCSLA/BCLNA standards apply to; quality, root ball, health, form, handling, planting, guying/staking and establishment care of replacement trees.



## 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:

- All excavation required within the crz of municipal London plane (M1) to remove the existing hard sidewalk and driveway surfaces, curb and gutter and to install the new sidewalk, driveway and curb and gutter.
- All excavation required within the crz of municipal London plane (M1) to expose and cap the existing underground utilities and install the proposed storm sewer, sanitary sewer, water service and underground hydro/tel and future streetlighting conduits (hydro excavation is our recommended excavation method for future streetlighting conduit installation).
- If required, all excavation required within the crz of municipal London plane (M1) to replace the existing curb and gutter.
- All excavation required within the crz of offsite hawthorn (OS1) to install the proposed new driveway.
- All excavation required within the crz of offsite aspen (OS 095) for the footprint of the proposed townhome and patio.
- All excavation required within the crz of offsite trees OS3 and OS4 for the footprint of the proposed patio.

**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:

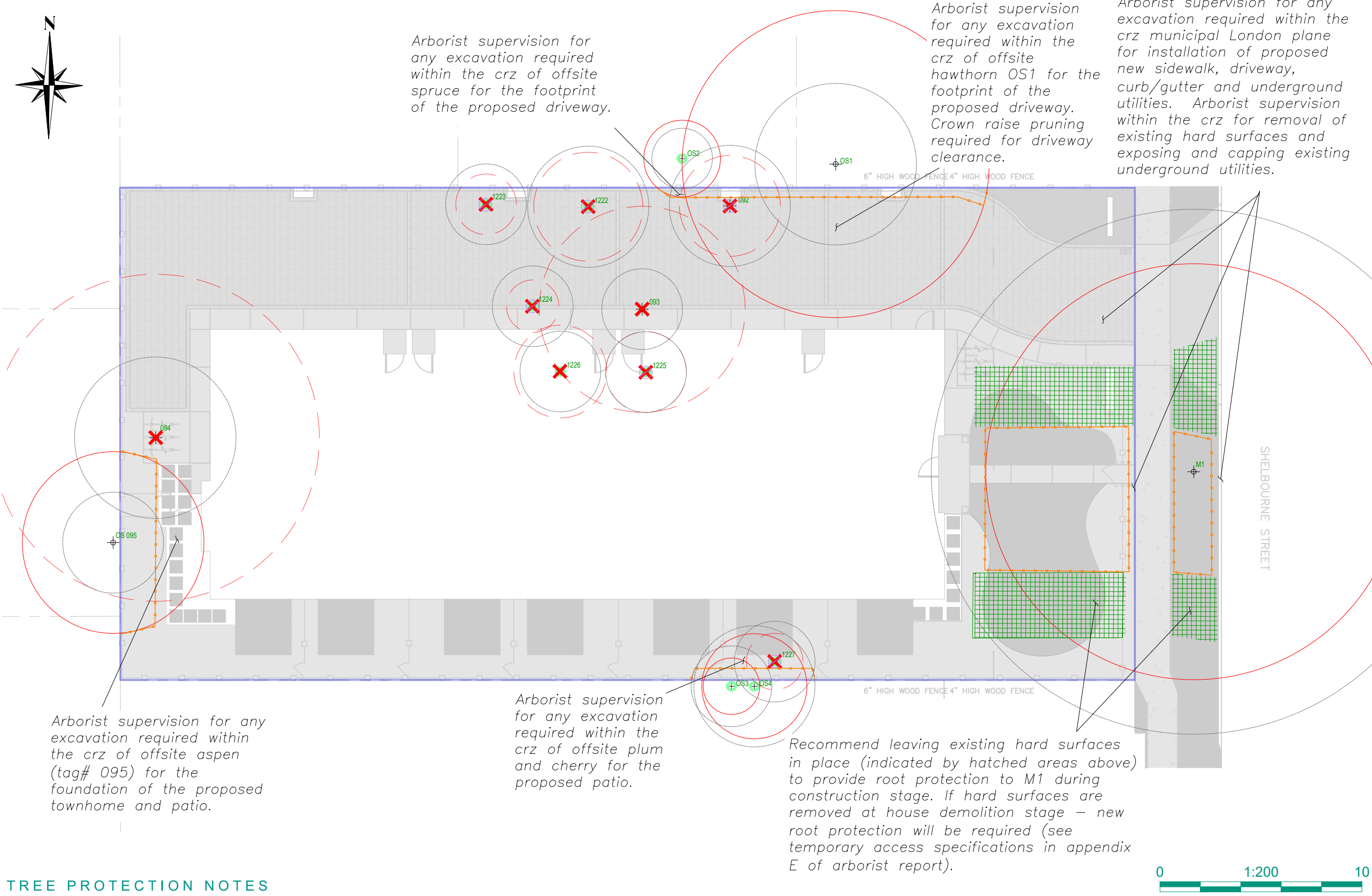


Noah Talbot, BA  
ISA Certified Arborist PN – 6822A  
Tree Risk Assessment Qualification  
Email: tmtreehelp@gmail.com

## 12. REFERENCES

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

## **APPENDIX A - TREE MANAGEMENT PLAN (T1)**



## TREE PROTECTION NOTES

**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.

**Demolition:** The demolition of the existing houses, driveways, 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 of the project arborist. If temporarily removed for demolition, barrier fencing must be erected immediately after the supervised demolition.

**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 surface be made of a permeable material (instead of conventional

health or 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 paving material and base layers). Final grading plans should take this 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.

**Blasting and rock removal:** Care must be taken to ensure that the area 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 technical 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 the tree health and can lead to root and trunk decay.

**Arborists 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 and machine access corridors where required.
- Supervising excavation for any areas within the critical root zones of trees to be retained including any proposed retaining wall footings and review any proposed fill areas near trees to be retained.

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 take into account the critical root zones of the trees to be retained. Prior to installation, we recommend the irrigation technical 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 the tree health and can lead to root and trunk decay.

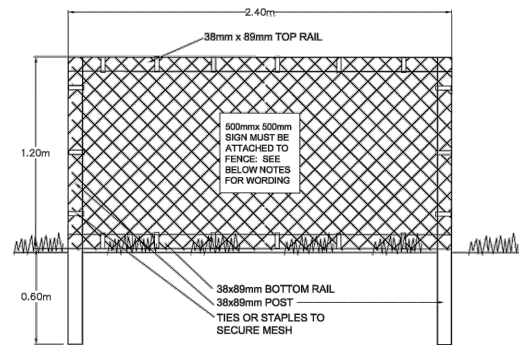
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- Locating the barrier fencing.
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## LEGEND

- Existing tree with tag or ID #
- Dripline radius (m)
- Tree protection fencing
- Critical root zone radius (m)
- Bylaw tree proposed for removal
- Non-bylaw undersize tree
- Unsurveyed tree (approx. loc'n)
- Site boundary

## TREE PROTECTION FENCING



### TREE PROTECTION FENCING

1. 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.
  2. 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 Management Plan- T1 Baidwan Townhouse 2848 and 2852 Shelbourne Street Victoria, BC

DATE: November 05, 2021  
PREPARED FOR: Jesse Baidwan  
SCALE: 1 : 200 @ 11" X 17"  
DRAWN BY: NT  
REVISION: 1  
Reference Dwg: October 15, 2021 Landscape base plan

TALBOT MACKENZIE & ASSOCIATES  
CONSULTING ARBORISTS  
BOX 48153  
VICTORIA, BC, V8Z 7H2  
TEL: 250-479-8733  
EMAIL: [tmtreehelp@gmail.com](mailto:tmtreehelp@gmail.com)  
[www.treehelp.ca](http://www.treehelp.ca)



## APPENDIX B - PHOTOGRAPHS



*Photograph 1- Yellow arrow indicates municipal London plane (M1).*





*Photograph 2 – Yellow arrow indicates municipal London plan M1.*





*Photograph 3 – Yellow arrows indicate low branches of municipal London plane M1 that may require pruning for clearance from the proposed townhome building and possibly for scaffolding clearances.*





*Photograph 4 – Yellow arrow indicates offsite Hawthorn (OS1).*





*Photograph 5 – Offsite Hawthorn (OS1) – Yellow arrow indicates separating stem union.*





*Photograph 6 – Yellow arrow indicates onsite Trembling aspen (tag# 094).*





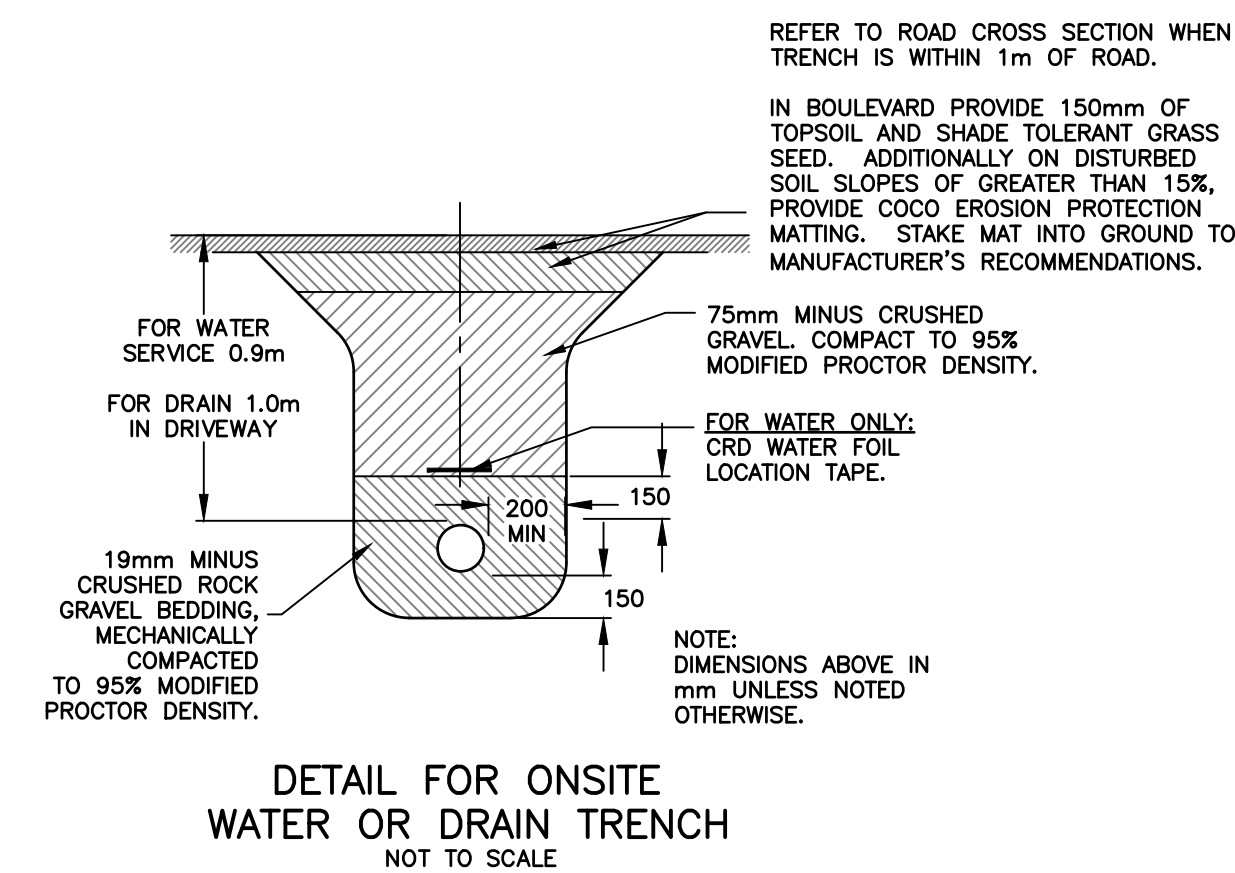
*Photograph 7 – Image of the rear yard of the 2852 Shelbourne Street site – looking West to East.*

## **APPENDIX C – CIVIL PLAN**









THE CONTRACTOR IS TO  
CALL B.C. ONE CALL, AND  
HAVE EXISTING U/G  
SERVICES STAKED PRIOR TO  
ANY CONSTRUCTION

PRELIMINARY  
Not for Construction

207-2750 QUADRA ST.  
VICTORIA, B.C. V8T-4E8  
PHONE: (250) 388-6919  
FAX: (250) 381-6919  
engineer@calld.ca

775-02	
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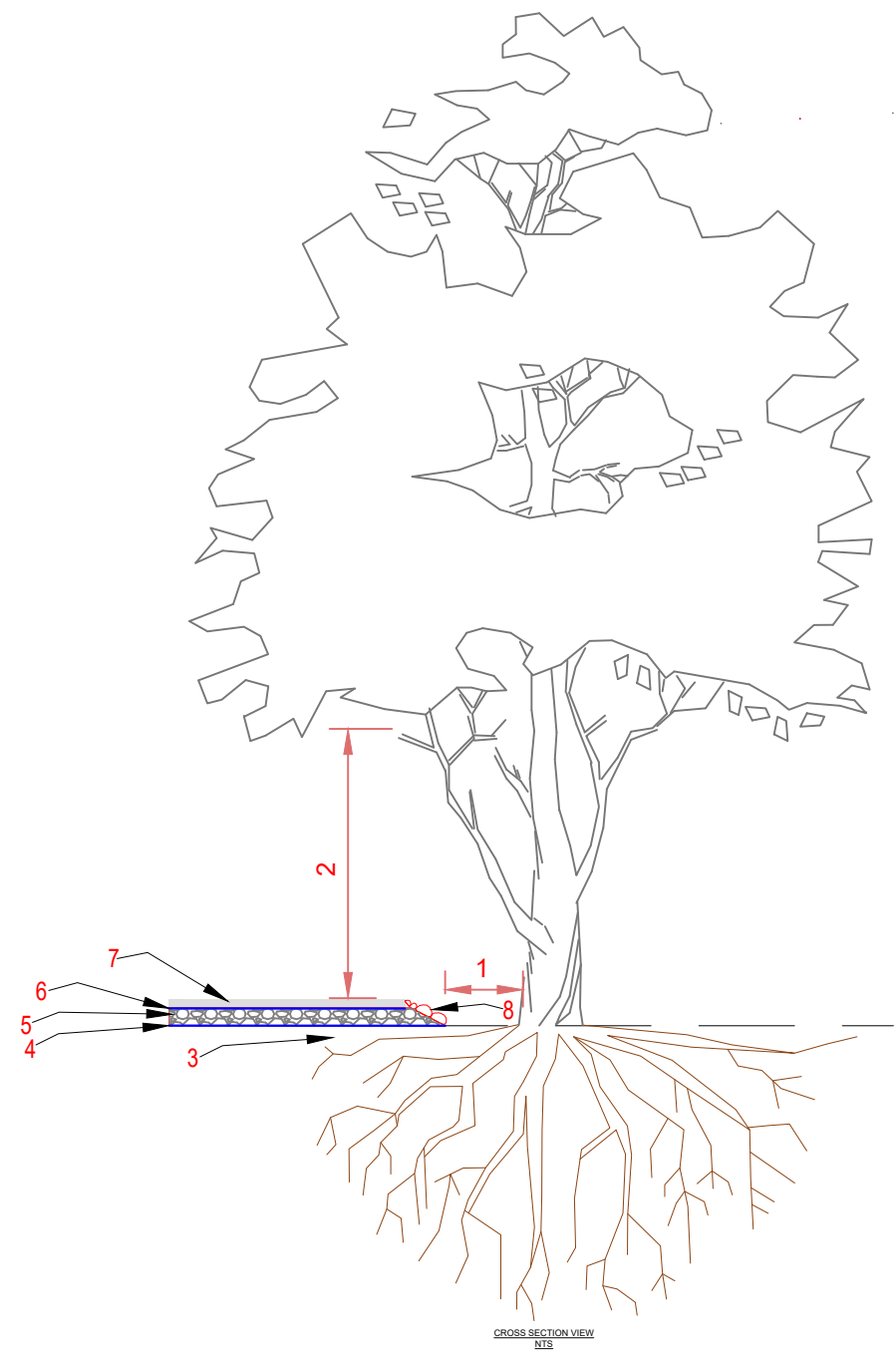
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Dwg. No.	REFERENCE DRAWINGS	DATE

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## **APPENDIX D –HARD SURFACE ABOVE TREE ROOTS DETAIL**



# HARD SURFACE ABOVE TREE ROOTS DETAIL



# HARD SURFACE ABOVE TREE ROOTS NOTES

1. Maintain as large a setback between the fill encroachment and the root collar 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 layer. Excavation around root structures must be performed by hand, airspade, or hydroexcavation.
4. Install a two-dimensional (such as Combigrid  $\frac{30}{30}$ ) 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 - the depth may be less than 150mm in some situations (dependant on grading constraints).
6. Install meduim weight geotextile fabric (such as Nilex 4535 or similar) over the clear crushed gravel layer to prevent fine particles of sand from 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 the footprint of the 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 the trunk of a tree.



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[www.treehelp.ca](http://www.treehelp.ca)



## **APPENDIX E – TEMPORARY ACCESS OR STORAGE WITHIN CRZ DETAIL**

## Temporary access or storage area within critical root zones

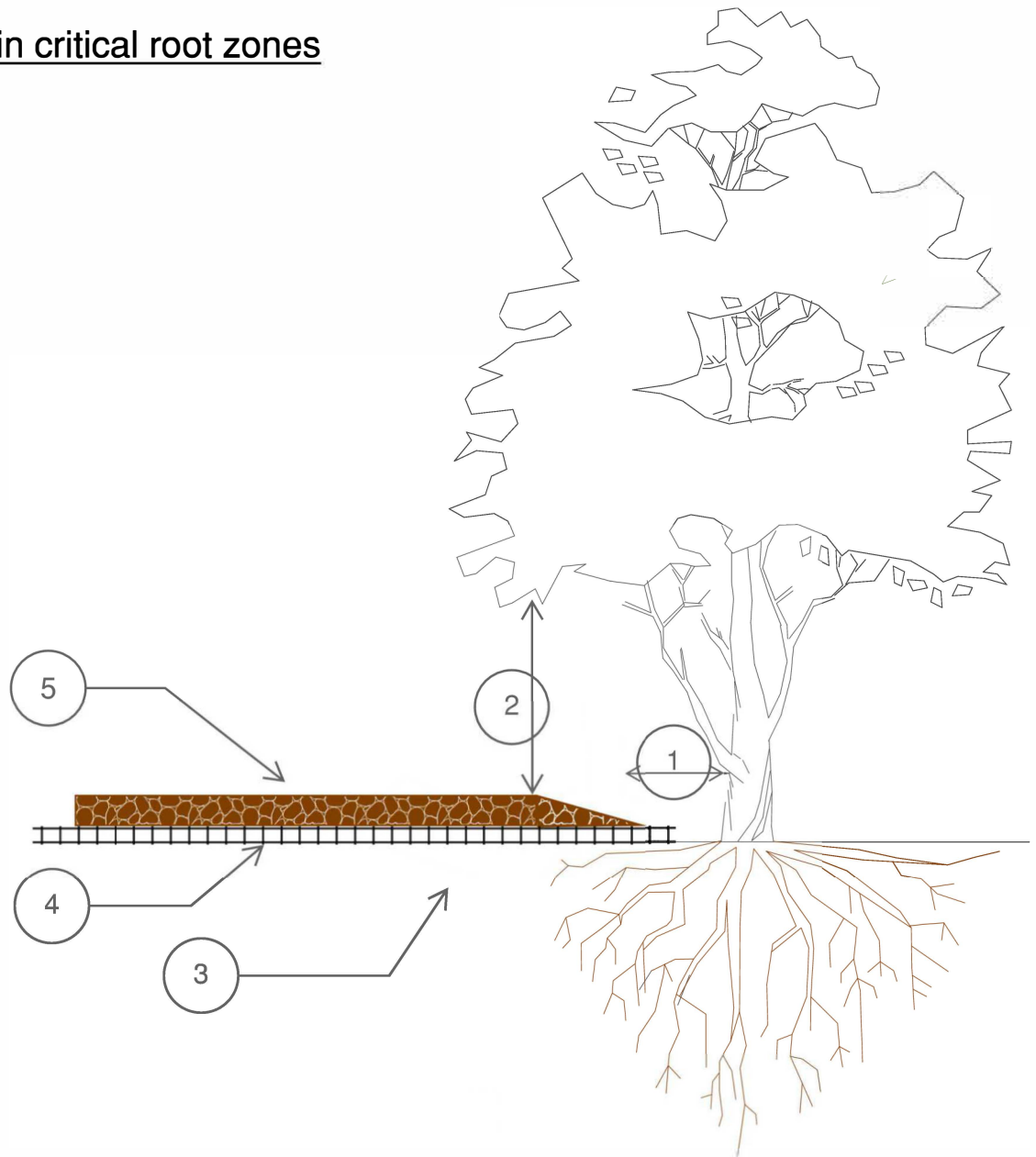
### Cross section View

#### 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](mailto:tmtreehelp@gmail.com)