



Talbot Mackenzie & Associates
Consulting Arborists



**1100-1108 Esquimalt Road and
610-612 Lampson Street, Esquimalt**
Construction Impact Assessment &
Tree Preservation Plan

PREPARED FOR: GT Mann Contracting Ltd.
1551 Broadmead Ave.
Victoria, BC
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PREPARED BY: Talbot, Mackenzie & Associates

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Jobsite Property: 1100-1108 Esquimalt Rd and 610-612 Lampson St, Esquimalt
Date of Site Visit: January 1-15 and July 4, 2018
Site Conditions: Five lots. No ongoing construction activity. Gradually increasing in elevation from south to north, with exposed rock outcrops at the north end.

Summary: All trees on the subject property are within or immediately adjacent to the proposed building or parkade footprints and will require removal (NT1-2, #1-32, #917-918, and #996-1000).

Trees NT3-NT11 are either under the ownership of the west neighbour or shared. Trees NT3-NT5 are likely to be at least moderately impacted and we anticipate NT6 will likely be significantly impacted. It is our understanding the applicant would like to make an effort to retain these trees. There is also the potential for trees NT7-NT11 to be significantly impacted during construction of the proposed building and underground parkade. We recommend the project arborist supervise all excavation within the CRZs of these trees and determine at the time of excavation whether they remain suitable for long-term retention based on the number and size of roots encountered. We further recommend shoring techniques be used to minimize the extent of excavation outside the underground parkade footprint to limit root impacts to NT6-NT11. The project arborist must supervise any construction-related activity within their critical root zones, including demolition of the existing building and removal of the driveway slab at 1108 Esquimalt Rd.

Scope of Assignment:

- To inventory the existing bylaw protected trees and any trees on neighbouring properties that could potentially be impacted by construction or that are within three metres of the property line
- Review the proposal to demolish the existing buildings and construct a housing complex with underground parking
- 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 in the attached Tree Resource Spreadsheet. All by-law protected trees on the five lots had numeric metal tags attached to their lower trunks; trees on municipal and adjacent properties were given identification numbers with a “NT” (No Tag) prefix. Information such as tree species, diameter at breast height (DBH, measured at 1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory. The by-law protected trees with their identification numbers were labelled on the attached Site Plan. The conclusions

reached were based on the information provided within the site and floor plans from Praxis Architects Inc. (dated 2020.08.24), and preliminary servicing plan from JE Anderson & Associates (dated 2018.12.14).

Limitations: No exploratory excavations have been requested and thus the conclusions reached are based solely on critical root zone calculations 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.

Summary of Tree Resource: 52 trees were inventoried. There are several large English Elms and European Ash trees along the south property boundary near Esquimalt Rd, as well as a grove of Garry Oaks in the backyards of the properties on Esquimalt Road growing among rock outcrops. Many of the trees have significant proportions of their trunks covered with ivy preventing a thorough examination of their trunks.

Trees to be Removed: 41 trees will require removal due to construction-related impacts:

- **Trees NT1-2, #1-32, #917-918, and #996-1000** are located within or immediately adjacent to the footprint of the proposed building and/or parkade

Trees with Retention Status “To be Determined”:

- **Elms NT3 (~70cm DBH) and NT5 (~55cm DBH):** Numerous large roots from these trees are likely to be encountered during excavation for construction of the ramp to the underground parkade, the surrounding retaining wall, and the footing for the support beam. The retaining wall is located approximately 5-5.5m from NT3 and 3.5m from NT5. We anticipate the health of NT5 is likely to be, at least, moderately impacted. Depending on the extent of excavation required west of the retaining wall to construct a footing, and the number and size of roots encountered, the health and possibly structural stability of these trees may be significantly impacted and they may require removal. It is our understanding that the applicant would like to attempt to retain these trees. Therefore, we recommend an arborist be on site to supervise all excavation within the trees' CRZs, including removal of the existing driveway slab, and determine at the time of excavation whether they remain suitable for long-term retention. We recommend an effort be made to minimize the extent of excavation outside the footprint of the retaining wall.

Elm trees have extensive root systems and we anticipate a large number of roots to be encountered. They typically exhibit moderate to good tolerance to root disturbance, however. Root growth may be somewhat limited by the presence of the existing driveway to the east, depending on its permeability.

A parking space is also proposed to be constructed in the same location as the existing driveway adjacent to these trees. We recommend the existing base layers be used where possible to limit root disturbance. It will likely not be possible to excavate any farther without impacting the health and structure of the trees. To construct the new parking space, we recommend the methods in the “Paved Surfaces Above Tree Roots” section below are followed.

- **Garry Oak NT4** (~60cm DBH) is located approximately 3.5m from the proposed building and retaining wall to be constructed west of the ramp to the underground parkade. Depending on the extent of excavation required west of the wall, the extent of excavation required to construct the footing for the support beam, and the number and size of roots encountered, the health and possibly structural stability of the tree may be significantly impacted and it may require removal. We recommend an effort be made to limit the excavation towards the tree. The health of this tree is also likely to be significantly impacted by the crown pruning required to attain building clearance. Two ~15cm and one ~10cm limb, in addition to several smaller branches, will have to be pruned. We estimate at least one-third of the tree's crown will be removed. We recommend the pruning be conducted in two stages. The tree should first be pruned to provide only the necessary working room for building construction. Once framing is complete and interfering branches can be identified more definitively, overhanging branches should be pruned back to suitable laterals where possible. All pruning should be performed by an ISA Certified Arborist to ANSI A300 pruning standards.

It is our understanding that the applicant would like to attempt to retain this tree. We anticipate the health of this tree will be at least moderately impacted. We recommend the project arborist evaluate the cumulative impacts (crown and root pruning) and determine at the time of excavation whether the tree remains suitable for long-term retention.

A parking space is also proposed to be constructed in the same location as the existing driveway adjacent to this tree. We recommend the existing base layers be used where possible to limit root disturbance. It will likely not be possible to excavate any farther without impacting the health and structure of the tree. To construct the new parking space, we recommend the methods in the "Paved Surfaces Above Tree Roots" section below are followed.

- **Garry Oak NT6** (56cm DBH): The underground parkade footprint is proposed to be constructed approximately 2m to the northeast of this tree. A retaining wall along the west side of the parkade ramp is also located approximately 3.5m to the east. It is our understanding the applicant would like to attempt to retain this tree. We anticipate, however, that both the health and structural stability of this tree will be significantly impacted, and it will probably have to be removed. If an effort will be made to retain this tree, shoring techniques will need to be used to limit the extent of excavation at the southeast corner of the underground parkade and west of the ramp down to the parkade, as large structural roots are likely to be encountered in these areas. We anticipate several metres of excavation will be required within the ramp footprint and do not anticipate retaining any roots in this direction. We recommend an arborist be on site to supervise all excavation within the tree's critical root zone and determine at the time of excavation whether the tree is viable for long-term retention.
- **Trees NT7-NT11:** These trees are located west of the property boundary at the following distances from the underground parkade footprint:
 - **Elms NT07 and NT08** (both 8cm DBH): approximately 1.25m away
 - **Garry Oak NT09** (42cm DBH): approximately 2.25m away
 - **Douglas-fir NT10** (14cm DBH): approximately 3m away

- **Douglas-fir NT11** (28cm DBH): approximately 3.5m away

If these trees are to be retained, particularly NT09 and NT11, excavation cannot occur up to the property line. If the trees are to be retained, shoring techniques will need to be used for construction of the underground parkade. Large structural roots are likely to be encountered and depending on the number and size of roots lost, the trees may not be suitable for long-term retention.

We recommend the project arborist be on site to supervise any excavation within the critical root zone of these trees. The neighbour should be notified of the proposed impacts to their trees. It should be noted that Douglas-firs NT10 and NT11 are in poor structural condition.

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Garry Oaks #101** (36cm DBH) and **#102** (30, 20cm DBH) are located approximately 2m from the property line. The architectural site plans provided show the edge of the underground parkade will be constructed approximately 3-3.5m to the east. Health impacts could be significant if excavation occurs up to the property boundary, and we therefore recommend shoring techniques be used to limit the extent of excavation within their CRZs and that the project arborist supervise all excavation within their CRZs. The neighbour should be notified of the proposed impacts to their trees.
- **Service Connections:** Based on discussions with the applicant, it is our understanding that the underground water, storm, and sewer connections may be shifted slightly from where they are shown on the preliminary site servicing plan. We do not anticipate any of the trees to be retained will be impacted as long as no excavation occurs west of the driveway entrance ramp off Esquimalt Road. We were not provided any plans showing underground hydro connections.
 - **Water:** According to the preliminary servicing plans, the proposed water lateral will be located at the east side of the property off Lampson Street and should not impact any trees to be retained.
 - **Storm and Sewer:** According to the preliminary servicing plans provided, the storm drain and sanitary sewer laterals will be installed east of the entrance to the underground parkade, outside the critical root zones of any trees to be retained.
- **Barrier fencing:** 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 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.

- Barrier fencing must be erected around trees NT3-NT11 as shown on the attached tree management plan (Sketch T1) following removal of the existing driveway slab to minimize soil compaction and to avoid damaging critical roots. The existing shrubbery at the base of the trees will provide a natural barrier to construction equipment accidentally damaging their trunks until the fencing is erected.
- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. Any severed or severely damaged roots must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound. In particular, the following activities should be completed under the direction of the project arborist:
 - Excavation for construction of the ramp, support beam, and underground parkade within the CRZs of trees NT3-NT11 and Garry Oaks #101 and #102.
 - Removal of the existing building and driveway slab at 1108 Esquimalt Road, which will occur within the CRZs of trees NT3-NT6
- **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.
- **Demolition of the Existing Buildings:** 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 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 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, a raised and permeable paved surface should be constructed in the areas within the critical root zone of the trees. The “paved surfaces above root systems” diagram and specifications is attached.

The objective is to avoid root loss and to instead raise the paved surface and its base layer above the roots. This may result in the grade of the paved surface being raised 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.

- **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.
- **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 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

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- 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.

Yours truly,

 Digitally signed by Noah Talbot
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ISA Certified: #PN-6822A

Tree Risk Assessment Qualified

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Encl. 4-page tree resource spreadsheet, 1-page Tree Management Plan (Sketch T1), 1-page preliminary servicing plans, 1-page specification for constructing paved surfaces above tree roots, 2-page tree resource spreadsheet methodology and definitions

Disclosure Statement

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.

Tree ID	Common Name	Latin Name	DBH (cm) *over ivy ~ approximate	CRZ (m)	Crown Spread (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	By-Law Protected	Retention Status
1	Lawson Cypress	<i>Chamaecyparis lawsoniana</i>	42, 32, 22...	9.0	5	Good	Fair/poor	Moderate	Codominant union at base. Previously topped	Y	X
2	European Ash	<i>Fraxinus excelsior</i>	~15, 15, 12, 12	3.5	6	Good	Fair/poor	Moderate	Codominant union at base	Y	X
3	Western Red Cedar	<i>Thuja plicata</i>	28	4.0	4	Fair/poor	Fair	Poor	Asymmetric and sparse crown. Codominant union at 2m with included bark	Y	X
4	Western Red Cedar	<i>Thuja plicata</i>	40	6.0	6	Fair/poor	Fair	Poor	Sparse crown. Codominant union at 2m with included bark	Y	X
5	Western Red Cedar	<i>Thuja plicata</i>	34, 16	6.5	5	Fair/poor	Fair	Poor	Asymmetric and sparse crown. Codominant union at base. Crossing limbs	Y	X
6	Garry Oak	<i>Quercus garryana</i>	17	1.5	4	Fair	Fair	Good		Y	X
7	European Ash	<i>Fraxinus excelsior</i>	~50	6.0	10	Fair	Poor	Moderate	Ivy covering most of tree. Acute trunk bend, likely topped at 5m	Y	X
8	English Elm	<i>Ulmus minor</i>	~35	4.0	10	Fair	Fair	Moderate	Ivy covering most of tree. Leaning towards subject property. Secondary stem at base	Y	X
9	English Elm	<i>Ulmus minor</i>	~80	9.5	12	Fair	Poor	Moderate	Ivy covering most of tree. Leaning towards subject property. Previously topped at 2m	Y	X
10	European Ash	<i>Fraxinus excelsior</i>	43	5.0	3	Fair	Poor	Moderate	Ivy covering most of tree. Previously topped	Y	X
11	English Elm	<i>Ulmus minor</i>	66	8.0	10	Fair	Poor	Moderate	Previously topped at 3m. Cavities and poor limb attachments	Y	X
12	European Ash	<i>Fraxinus excelsior</i>	79*	9.5	12	Fair	Poor	Moderate	Ivy covering most of tree. Codominant union at 3m. One stem significantly decayed. Damaged surface roots	Y	X

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1100-1108 Esquimaht Rd and 610-612 Lampson St
Tree Resource

Tree ID	Common Name	Latin Name	DBH (cm) * over ivy ~ approximate	CRZ (m)	Crown Spread (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	By-Law Protected	Retention Status
13	European Ash	<i>Fraxinus excelsior</i>	16, 16, 15, 15	4.0	10	Good	Fair/poor	Moderate	Codominant union at base	Y	X
14	European Ash	<i>Fraxinus excelsior</i>	39	4.5	10	Fair	Fair	Moderate	Asymmetric crown. Deadwood. Minor trunk wounds	Y	X
15	Garry Oak	<i>Quercus garryana</i>	28*	3.0	8	Fair	Fair/poor	Good	Ivy covering most of tree leaning east	Y	X
16	Garry Oak	<i>Quercus garryana</i>	57, 48*	8.5	12	Fair	Fair/poor	Good	Ivy covering most of tree. Codominant union at base. 48cm stem nearly dead. Large deadwood. Leaning east over shed	Y	X
17	Garry Oak	<i>Quercus garryana</i>	69*	7.0	12	Fair	Fair	Good	Ivy covering most of tree. Codominant union at 3m. Growing next to rock outcrop	Y	X
18	Plum	<i>Prunus spp.</i>	25, 24*	4.5	6	Fair/poor	Fair/poor	Moderate	Ivy covering most of tree. Deadwood.	Y	X
19	English Elm	<i>Ulmus minor</i>	84*	10.0	12	Fair	Fair/poor	Moderate	Codominant union at 3m. Previously topped at 6m. Large cavity at 6m. Epicormic growth. Poor limb attachments. Ivy at base	Y	X
20	English Elm	<i>Ulmus minor</i>	75	9.0	10	Fair	Fair/poor	Moderate	Previously topped at 5m. Competing with oak. Large deadwood. Epicormic growth	Y	X
21	Garry Oak	<i>Quercus garryana</i>	33, 32	5.0	5	Good	Fair	Good	Clothesline in 32cm trunk. Leaning south. Small deadwood. Competing with oak	Y	X
22	Garry Oak	<i>Quercus garryana</i>	42	4.0	6	Good	Fair	Good	Few branches in lower crown. Slight lean	Y	X
23	Garry Oak	<i>Quercus garryana</i>	65	6.5	8	Fair	Fair	Good	Growing next to rock outcrop. Codominant union at 8m. Surface rooted. Cracks on branches in upper crown.	Y	X
24	Garry Oak	<i>Quercus garryana</i>	67*	6.5	10	Fair/poor	Fair/poor	Good	Ivy covering most of tree. Deadwood and dieback. Slight lean west	Y	X

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25	Garry Oak	<i>Quercus garryana</i>	24	2.5	4	Poor	Fair/poor	Good	Dieback. Leaning south	Y	X
26	Garry Oak	<i>Quercus garryana</i>	14	1.5	2	Fair/poor	Fair/poor	Good	Nearly dead. Leaning southwest	Y	X
27	Garry Oak	<i>Quercus garryana</i>	43	4.5	8	Fair	Fair	Good	Leaning west slightly. Branch stub at 7m	Y	X
28	Garry Oak	<i>Quercus garryana</i>	36	3.5	6	Good	Fair	Good	Small deadwood. Surface rooted	Y	X
29	Garry Oak	<i>Quercus garryana</i>	48*	5.0	6	Fair	Fair	Good	Ivy covering half of tree. Leaning slightly southwest. Deadwood. Competing with oak. Growing on rock outcrop	Y	X
30	Garry Oak	<i>Quercus garryana</i>	64*	6.5	14	Good	Fair	Good	Ivy covering most of trunk. Growing on rock outcrop	Y	X
31	Garry Oak	<i>Quercus garryana</i>	42	4.0	4	Fair/poor	Poor	Good	Severe trunk bend. Deadwood	Y	X
32	Garry Oak	<i>Quercus garryana</i>	33, 26	5.0	8	Fair/poor	Fair/poor	Good	Codominant union at base. Large deadwood. Acute trunk bends	Y	X
101	Garry Oak	<i>Quercus garryana</i>	36	3.5	8	Fair	Fair	Good	Neighbour's. 2m from fence	Y	Retain
102	Garry Oak	<i>Quercus garryana</i>	~30, 20	4.0	8	Fair	Fair	Good	Neighbour's. 2m from fence	Y	Retain
917	Garry Oak	<i>Quercus garryana</i>	39	4.0	8	Fair/poor	Fair	Good	Small deadwood. Large pruning wounds on main stem	Y	X
918	Garry Oak	<i>Quercus garryana</i>	33, 25, 18	6.0	8	Fair/poor	Fair/poor	Good	Tridominant union at base. Small deadwood. Damage to buttress root	Y	X

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Tree ID	Common Name	Latin Name	DBH (cm) *over ivy ~ approximate	CRZ (m)	Crown Spread (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	By-Law Protected	Retention Status
996	Garry Oak	<i>Quercus garryana</i>	22	2.0	6	Fair	Fair	Good	Some dieback. Codominant union at 3m	Y	X
997	Garry Oak	<i>Quercus garryana</i>	16	1.5	4	Fair/poor	Poor	Good	Large deadwood. Growing on a slope	Y	X
998	Garry Oak	<i>Quercus garryana</i>	21	2.0	5	Fair	Fair	Good	Leaning north. Growing at the top of slope	Y	X
999	Garry Oak	<i>Quercus garryana</i>	16	1.5	6	Fair	Fair	Good	Growing on slope	Y	X
1000	Garry Oak	<i>Quercus garryana</i>	60	6.0	12	Fair	Good	Good	Growing at top of slope	Y	X
NT1	European Ash	<i>Fraxinus excelsior</i>	~60	7.0	4	Fair	Poor	Moderate	Ivy covering most of tree. Deadwood. Previously topped	Y	X
NT2	English Elm	<i>Ulmus minor</i>	~100	12.0	8	Fair	Poor	Moderate	Ivy covering most of tree. Codominant union at 2m. Previously topped	Y	X
NT3	English Elm	<i>Ulmus minor</i>	~70	8.5	14	Fair	Fair	Moderate	Neighbour's. 2m from property line. Codominant union at 5m. Epicormic growth. Ivy at base	Y	TBD
NT4	Garry Oak	<i>Quercus garryana</i>	~60	6.0	12	Fair	Fair	Good	Shared. Codominant union at 3m. Ivy covers most of main stems. Competing with adjacent trees. Branch stubs. Minor dieback	Y	TBD
NT5	English Elm	<i>Ulmus minor</i>	55	6.5	10	Fair	Fair/poor	Moderate	Shared. Trunk bend at 2m, correcting. Competing with oak	Y	TBD
NT6	Garry Oak	<i>Quercus garryana</i>	56	5.5	8	Fair	Fair/poor	Good	Shared. Suppressed by elm. Deadwood. 1m X 20cm cavity at 6m. Large stub on main stem	Y	TBD
NT7	English Elm	<i>Ulmus minor</i>	8	1.0	2	Good	Fair	Moderate	Neighbour's. Adjacent to property line	N	TBD

Tree ID	Common Name	Latin Name	DBH (cm) *over ivy ~ approximate	CRZ (m)	Crown Spread (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	By-Law Protected	Retention Status
NT8	English Elm	<i>Ulmus minor</i>	8	1.0	2	Good	Fair	Moderate	Neighbour's. Adjacent to property line. Ivy at base	N	TBD
NT9	Garry Oak	<i>Quercus garryana</i>	42	4.0	8	Fair/poor	Fair	Good	Neighbour's. 1m from fence line. Sparse crown. Deadwood	Y	TBD
NT10	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	2.0	3	Fair	Poor	Poor	Neighbour's. 1m from fence line. Failed top	Y	TBD
NT11	Douglas-fir	<i>Pseudotsuga menziesii</i>	28	4.0	5	Good	Fair	Poor	Neighbour's. 1m from fence line	Y	TBD

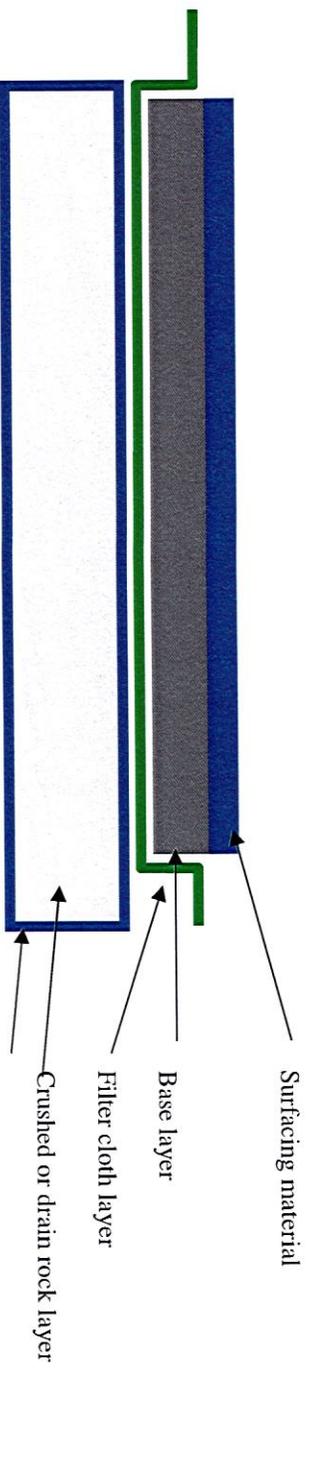
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Diagram – Site Specific Driveway, Parking and Walkway



Specifications for Paved Surfaces Above Tree Roots (Driveway, Parking and Walkway Areas)

1. Excavation for construction of the driveway/parking/walkway areas must remove only the top layer of sod and not result in root loss
2. A layer of medium weight feltd Geotextile fabric (Nilex 4535, or similar) is to be installed over the entire area of the critical root zone that is to be covered by the paved surface. Cover this Geotextile fabric with a layer of woven Amoco 2002 or Tensor BX 1200. Each piece of fabric must overlap the adjoining piece by approximately 30-cm.
3. A 10cm layer of torpedo rock or 20-mm clean crushed drain rock, is to be used to cover the Geotextile fabric (depth dependent on desired finished grade).
4. A layer of feltd filter fabric is to be installed over the crushed rock layer to prevent fine particles of sand and soil from infiltrating this layer.
5. The bedding or base layer and permeable surfacing can be installed directly on top of the Geotextile fabric.
6. Two-dimensional (such as CombiGrid 30/30 or similar) or three-dimensional geo-grid reinforcements can be installed in combination with, or instead of, the geotextile fabric specified in the attached diagram.
7. Ultimately, a geotechnical engineer should be consulted and in consultation with the project arborist may specify their own materials and methods that are specific to the site's soil conditions and requirements, while also avoiding root loss and reducing compaction to the sub-grade.



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Tree Resource Spreadsheet Methodology and 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

Crown Spread: Indicates the diameter 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

Retention Status:

- X - 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
- TBD (To Be Determined) - The impacts on the tree could be significant. However, in the absence of exploratory excavations and in an effort to retain as many trees as possible, we recommend that the final determination be made by the supervising project arborist at the time of excavation. The tree might be possible to retain depending on the location of roots and the resulting impacts, but concerned parties should be aware that the tree may require removal.
- NS - Not suitable to retain due to health or structural concerns

IMPACT MITIGATION

Tree Protection Barrier: The areas, surrounding the trees to be retained, should be isolated from the construction activity by erecting protective barrier fencing. 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 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.

Excavation: We recommend that no excavation occur within the critical root zones of trees that are to be retained. Any excavation that is necessary, within the critical root zone must be completed under the direction of the project arborist. If it is found, at the time of excavation, that the excavation cannot be completed without severing roots that are critical to the trees health or stability it may be necessary to remove additional trees.

Demolition: If tree removal is proposed to be undertaken in conjunction with demolition operations, tree removal permits may be necessary. Note that some municipalities may not approve tree removal at this phase. If the municipality relaxes the requirement for barrier fencing installations prior to demolition (subject to onsite arborist supervision during demolition operations) a letter of assurance may be required by the municipality. The project arborist must be onsite to supervise/monitor demolition activities during the specific instances listed below:

- Removal of all existing onsite building structures and their foundations.
- Removal of existing hard surfaces and underground utilities.

Mulch layer or plywood over heavy traffic areas: Should it be necessary to access tree protection areas during the construction phase of the project, and heavy foot traffic or vehicular encroachment is required, we recommend that a layer of wood chip horticultural mulch or plywood be installed to reduce compaction. The project arborist must be consulted prior to removing or moving the protection barrier for this purpose.

Pruning:

- Once tree clearing has taken place we recommend that trees to be retained be pruned to remove deadwood, and to address any structural flaws.
- We recommend that any pruning of bylaw-protected trees be performed to ANSI A300 standards and Best Management Practices.

Stump removal: We recommend that, if stumps require removal, they are removed under arborist supervision, or ground using a stump grinder to avoid disturbing root systems of trees in close proximity, that are shown on the tree management drawing to be retained.

Paved areas over critical root zones of trees to be retained: Where paved areas cannot avoid encroachment within driplines of trees to be retained, construction techniques, such as floating permeable paving, may be required. (specifications can be provided by the project arborist, in consultation with the design consultant).

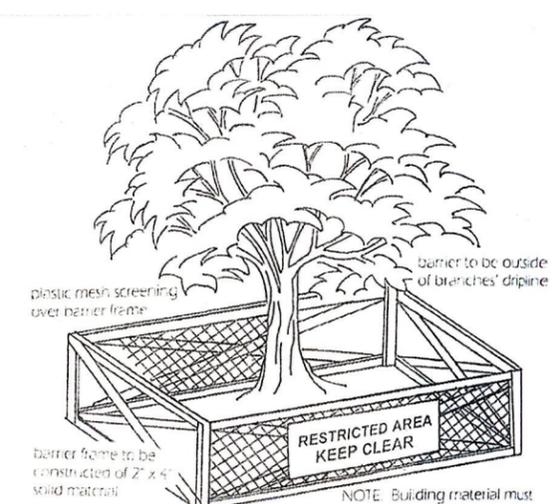
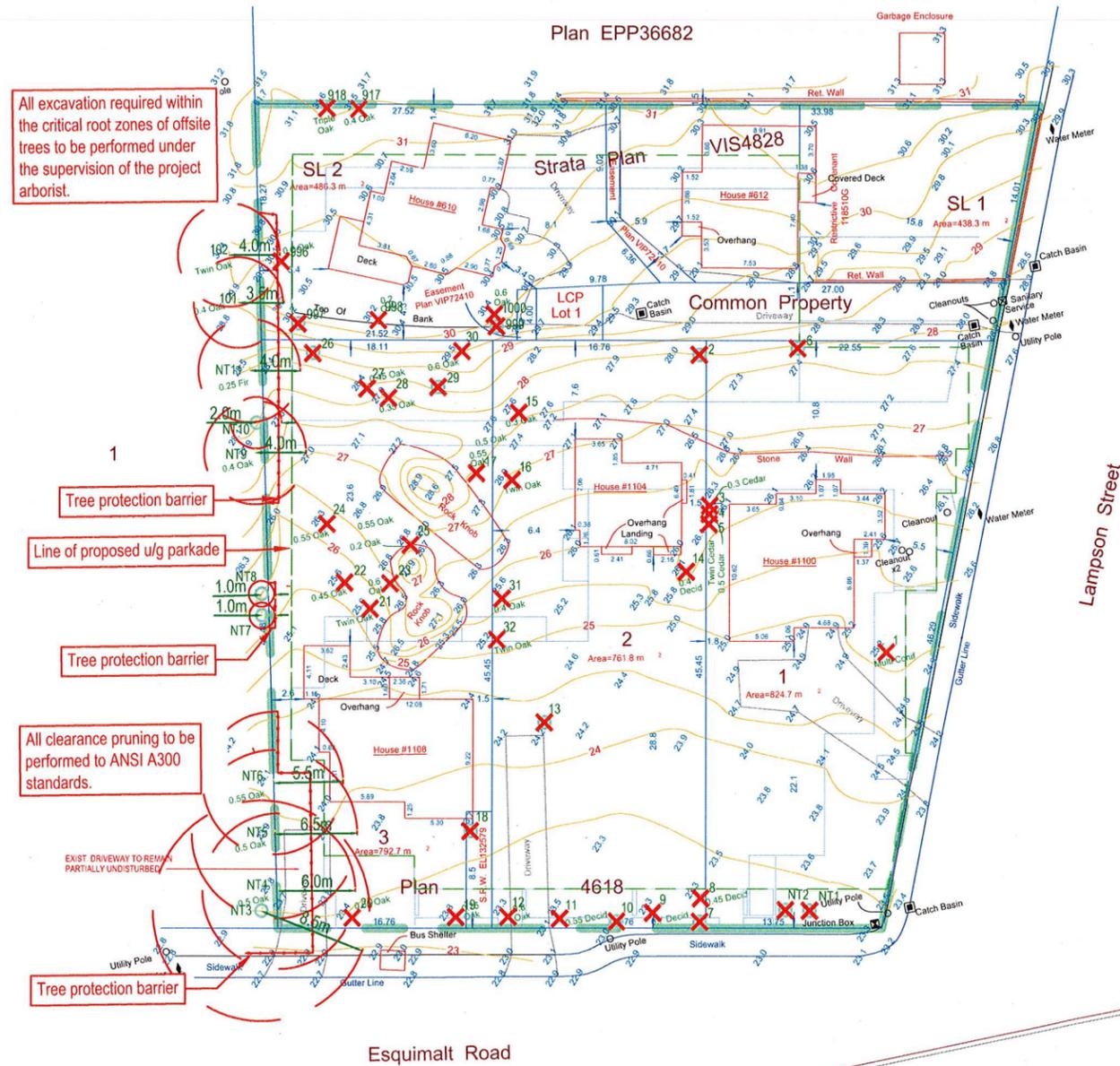
Landscaping: Any proposed landscaping within the critical root zones of trees to be retained must be reviewed with the project arborist.

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 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.

LEGEND

- Tag or ID number
- Critical Root Zone (CRZ)
- Tree protection barrier
- ✗ Tree to be removed (proposed)
- Unserved tree (approximate location)



Sketch T1
 Tree Management Plan
 1100+1104+1108 Esquimalt Road
 & 610 + 612 Lampson Street
 Esquimalt, BC

DATE: August 28, 2020
 PREPARED FOR: GT Mann Contracting Ltd.
 SCALE: 1 : 500 @ 11" X 17"

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January 12, 2021

GT Mann Contracting
1551 Broadmead Avenue
Victoria, BC V8P 2V1

Attention: Graeme Mann

RE: 1100-1108 Esquimalt Road, 610-612 Lampson Street

At your request we met at the above-mentioned address on December 18, 2020 and January 6, 2021 to review the potential to retain additional Garry oak trees on the property given the proposed development that is anticipated. Our most recent tree protection plan for the proposal is dated November 20, 2020. Since that report has been submitted, we were asked to comment on potential building revisions and the ability to retain trees: 26, 27, 28, 917, 918, 996, 997 and 998.

During our November 18, 2020 meeting and based on the proposed building revisions and on-site discussions, we determined that:

- It will likely be possible to retain tree numbers 917 and 918, providing their critical root zones can be adequately retained during the blasting for the underground parking. They will require significant pruning for the building and ultimately their retention status will have to be determined at the time of construction. It is our understanding that the desire is to retain the trees, and all reasonable efforts will be made to retain these two trees.
- Tree numbers 998, 27 and 28 will not be possible to retain even with the suggested revisions due to the proximity of the proposed underground parking area and the existing grades the trees are growing on.
- Tree number 26 is nearly dead and not suitable to retain.
- Trees numbered 996 and 997 would likely be possible to retain given the proposed revisions but given their current health and structure and the impacts their retention will have on the proposed building design, it may be more desirable to construct the building as originally proposed and replant with healthy young trees that can better adapt to the new environment that is going to be introduced.

During our January 6, 2021 meeting, we did not review any proposed building revisions, but visually examined an area further South on the property where there are additional Garry oak trees (trees 21-25) and discussed the potential to retain any of them. The oaks are growing on a rocky

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outcrop with shallow soil pockets and limited rooting environment. Given these growing conditions and the new exposure that is anticipated from the removal of surrounding trees, we feel that a significant portion of the surrounding rock and possibly additional trees around these trees will need to be retained to ensure a good potential for the trees to be successfully retained. Based on our onsite discussions and a review of the existing and proposed elevations, it is our understanding that such a revision will have too great an impact on the proposed building design and providing additional trees to replant is the more desirable option. By providing new, healthy young Garry oak trees in adequate growing conditions it will ensure there are healthy well structured trees in the future.

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

Thank you,



Graham Mackenzie
ISA Certified # PN-0428
TRAQ – Qualified

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Disclosure Statement

Arborists are professionals who examine trees and use their training, knowledge and experience to recommend techniques and procedures that will improve the health and structure of individual trees or group of trees, 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 nor 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.