



Talbot Mackenzie & Associates

Consulting Arborists

CONSTRUCTION IMPACT ASSESSMENT
&
TREE PRESERVATION PLAN

324/328 Cook Street and 1044-1054 Pendergast
Street, Victoria

PREPARED FOR: Aragon Properties Ltd.
201 – 1628 West 1st Avenue
Vancouver, BC, Canada V6J 1G1

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DATE OF ISSUANCE: November 10, 2017

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Jobsite Property: 324/328 Cook Street and 1044-1054 Pendergast Street, Victoria

Date of Site Visit(s): October 24, 2017

Weather conditions: Sunny, 12° Celsius

Site Conditions: Even terrain. No construction activity present. One CR-3M (Commercial Residential Apartment Modified) and three R-K (Medium Density Attached Dwelling) lots.

Summary: Based on the site plans provided, the two protected trees on the subject property (**Plum #673** and **Cedar #674**) will require removal as they are located within the proposed building envelope. We anticipate it will also be necessary to remove trees on the neighbouring property to the west numbered **NT 09-12** to accommodate the proposed excavation for the underground parking area, as well as municipal tree **NT 01**, which is in the path of the proposed driveway. The remaining trees located on municipal property have a good potential for being retained providing their critical root zones can be adequately protected during the construction process and the proposed excavation does not go beyond the property line of the subject property.

Scope of Assignment: To inventory the existing bylaw protected trees and any trees on neighbouring properties that could be potentially impacted by construction or that are within 3 meters of the property line. Review the proposal to demolish the existing buildings and construct a 4-6 storey mixed commercial and residential building, and 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. Each by-law protected tree was identified using a numeric metal tag attached to its lower trunk. Municipal trees and neighbours' trees were not tagged. Information such as tree species, DBH (1.4m), crown spread, critical root zone (CRZ), health, structure, and relative tolerance to construction impacts were included in the inventory. The 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 attached plans.

Summary of Tree Resource: 17 trees were inventoried. Eight are municipal trees and seven are on neighbouring properties. There are two protected trees on the subject property: Plum #673 and Cedar #674.

Trees to be Removed:

- **Plum #673 and Western Red Cedar #674** on the subject property will have to be removed for construction of the 4-6 storey building.
- **Trees NT 9-12 and NT 15** are on neighbouring properties within 1m of the property line. We anticipate that excavation for the underground parkade will result in substantial root loss, significantly impacting the health and stability of the trees. The trees should be removed prior to construction.
- **Municipal tree NT 01** is in the path of the driveway entrance on Pendergast Street to the underground parkade.

Potential Impacts on Trees to be Retained and Mitigation Measures

- **Underground Parking Excavation:** The excavation for the portions of the underground parking that encroach into the critical root zones of trees to be retained, must be supervised by the project arborist. This will be particularly important when excavating next to trees NT 02-08 and NT 13-14 if they are going to be successfully retained. To minimize the extent of the excavation into the critical root zones, it will likely be necessary to use shoring techniques such as sheet piling, shotcrete or similar methods to reduce the requirements for cut slope and over excavation. Any roots critical to the trees survival must be retained and any non-critical roots in direct conflict with the excavation must be pruned to sound tissue to encourage new root growth. It may be necessary to excavate using a combination of hand digging, small machine excavation and hydro excavation to expose roots in conflict with the proposed excavation and determine if they can or cannot be pruned without having a significant impact on the trees. If it is found that large structural roots must be pruned to accommodate the proposed construction, it may be necessary to remove additional trees to eliminate any risk associated with them. Once the excavation is complete the proposed new underground parking walls may have to be constructed using blind forming or similar techniques to reduce the amount of necessary working room required. Once the project is given approval and before the excavation work commences, we recommend a meeting take place with the excavation contractor, blasting contractor, the project arborist and a representative from the City of Victoria Parks department to go over the methods of excavation, blasting and shoring that may be required.

- **Municipal trees NT 02-08:** Excavation for the underground parkade will encroach within the estimated critical root zones of some of these trees, though we do not predict the impacts will be significant enough to warrant removal. If shoring techniques are used, we estimate that excavation will occur approximately 4-5m from **NT 06**, 7-8m from **NT 07**, and 11-12m from **NT 08**. As this is within the CRZ of all three trees, large roots may be encountered. Exploratory digging to determine if roots are present at the property boundary is precluded by the presence of the sidewalk.

Of the municipal trees on Pendergast St. (**NT 03-05**), structural roots from **Cherry NT 03** are most likely to be encountered during excavation. Exploratory digging to confirm their presence within the property boundary, however, is currently precluded by the presence of a private laurel hedge. We do not anticipate the tree's health will be significantly compromised by excavation for the underground parkade, and will likely be able to be retained.

An arborist should also be present to supervise all excavation within the CRZs of trees NT 02-08. If large structural roots are encountered, the arborist should re-assess the viability of the trees. If they are to be retained, the arborist should prune non-critical roots back to sound tissue to encourage rapid compartmentalization of wounds and root re-growth.

- **Trees NT 13 and 14** are located on the west neighbour's property, 1.5m and 1m from the property line, respectively. Excavation for the underground parkade will extend to the property boundary, which may significantly impact the trees' root systems. Both are fruit trees, with moderate tolerance to construction related impacts. The trees are located at the edge of a parking lot, which may limit root spread to the west and may exacerbate the impacts of excavation. We anticipate that the trees may require removal, particularly NT 13, but that determination should be made at the time of excavation when an arborist can evaluate the extent of root loss.
- **Clearance Pruning:**
 - **NT 03:** Limbs from this municipal cherry overhang the property line by 4-5 metres and will require clearance pruning to accommodate the building. According to the site plans provided, the southeast side of the proposed building's first and second storey is set back approximately 2.5-3m and 4.5m from the property line, respectively. The building does not encroach within the northwest portion of the tree's canopy. Provided that building scaffolding does not encroach additionally into the tree's canopy, the pruning required should be minor and not significantly impact the tree's health.
 - **NT 06-08:** Clearance pruning may be required on the Horsechestnuts located on the Cook St municipal frontage. NT 06 overhangs the property line approximately 2m, NT 07 overhangs approximately 4-5m, and NT 08 overhangs approximately 3.5m in the direction of the proposed building. The building's first storey is located 1m from the property line near NT 06, and 3-3.5m from NT 07 and 08; the second storey is set farther back from the property line where it will not interfere with the canopies. Therefore, we anticipate the pruning required will be minor and not significantly impact the trees' health.
- **Underground Services:** It is our understanding that connections for underground services (water, sewer, drain) will be made at the southwest corner of the subject property, off Pendergast St. Given that trees NT 09-12 will require removal for construction of the underground parking area, servicing will not impact any additional trees.
- **Hydro connection:** No information was provided regarding the location of a hydro connection.
- **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 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 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.

- All municipal trees identified in the inventory should be protected with barrier fencing to reduce the risk of accidental mechanical injury and limit unnecessary soil compaction.
- **Arborist Supervision:** All excavation occurring within the critical root zones of protected trees should be completed under supervision by the project arborist. Any roots encountered must be pruned back to sound tissue to reduce wound surface area and encourage rapid compartmentalization of the wound.
- **Methods to avoid soil compaction:** In areas where construction traffic must encroach into the critical root zones of trees to be retained, efforts must be made to reduce soil compaction where possible by displacing the weight of machinery and foot traffic. This can be achieved by one of the following methods:
 - Installing a layer of hog fuel 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 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.
- **Mulching:** Mulching is an important proactive step to maintaining the health of the trees to be retained 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. As much of the area within two times the dripline of the tree should be mulched, both inside and outside of the critical root zone. No mulch should be touching the trunk of the tree. See “methods to avoid soil compaction” if the area is to have heavy traffic.
- **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 demolition, site clearing or other construction activity occurs.

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

Yours truly,
Talbot Mackenzie & Associates
ISA Certified Consulting Arborists

Encl. 2-page tree resource spreadsheet, 1-page site plan with trees, 12-page building plans, 1-page barrier fencing specifications

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.

**Cook St. and Pendergast St.
Tree Resource Spreadsheet**

Tree ID	Common Name	Latin Name	DBH (cm) * over ivy approximate	~ Crown Spread (m)	CRZ (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	Retention Status
NT 01	Cherry	<i>Prunus spp.</i>	29	6	3.5	Fair	Fair	Moderate	Municipal.	Remove
NT 02	Cherry	<i>Prunus spp.</i>	17	4	2.0	Fair	Fair	Moderate	Municipal.	Retain
NT 03	Cherry	<i>Prunus spp.</i>	35	10	4.0	Fair	Fair	Moderate	Municipal. Limbs overhang property line.	Retain
NT 04	Cherry	<i>Prunus spp.</i>	15	4	2.0	Fair/poor	Fair	Moderate	Municipal. Minor dieback.	Retain
NT 05	Cherry	<i>Prunus spp.</i>	15	4	2.0	Fair/poor	Fair/poor	Moderate	Municipal. Dieback and deadwood.	Retain
673	Purple Leaf Plum	<i>Prunus cerasifera</i>	36, 32, 23, 22	12	10.0	Good	Fair/poor	Moderate	Codominant unions at base. Epicormic growth.	Remove
NT 06	Horsechestnut	<i>Aesculus hippocastanum</i>	51	12	6.0	Good	Fair	Moderate	Municipal. Y-pruned for utility line clearance. Asymmetric crown. Damaged surface roots.	Retain
NT07	Horsechestnut	<i>Aesculus hippocastanum</i>	118	18	14.0	Fair/poor	Fair/poor	Moderate	Municipal. Surface rooted and swelling at base (possible decay). Some exposed roots pruned. Significant dieback and large deadwood. Y-pruned for utility line clearance. Large pruning wounds throughout. Codominant union at 2m.	Retain
NT 08	Horsechestnut	<i>Aesculus hippocastanum</i>	112	18	13.5	Fair/poor	Fair/poor	Moderate	Municipal. Y-pruned for utility line clearance. Large wound on stem overhanging road with possible decay. Reaction wood and included bark at codominant union.	Retain
NT 09	Holly	<i>Ilex aquifolium</i>	20, 15	5	3.0	Good	Fair	Good	Neighbour's. 0.5m from property line.	Retain
NT 10	Western Red Cedar	<i>Thuja plicata</i>	55	10	8.5	Good	Good	Poor	Neighbour's. 0.5m from property line.	Remove
NT 11	Lawson Cypress	<i>Chamaecyparis lawsonii</i>	57	8	7.0	Fair	Good	Moderate	Neighbour's. 0.5m from property line.	Remove

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Tree Resource Spreadsheet**

Tree ID	Common Name	Latin Name	DBH (cm) * over ivy approximate	~ Crown Spread (m)	CRZ (m)	Health	Structure	Relative Tolerance	Remarks and Recommendations	Retention Status
NT 12	Leyland cypress	<i>Cupressus x leylandii</i>	59	12	7.0	Fair	Fair	Moderate	Neighbour's. 0.5m from property line.	Remove
NT 13	Cherry	<i>Prunus spp.</i>	20, 20	8	4.0	Fair	Fair	Moderate	Neighbour's. 1.5m from property line.	TBD
NT 14	Apple	<i>Malus spp.</i>	35	8	4.0	Fair/poor	Fair/poor	Moderate	Neighbour's. 1m from property line.	TBD
NT 15	Cherry	<i>Prunus spp.</i>	40	10	5.0	Fair	Fair	Moderate	Neighbour's. Adjacent to fence.	Remove
674	Western Red Cedar	<i>Thuja plicata</i>	61	12	9.0	Good	Good	Poor	Minor dieback and browning foliage.	Remove