MEMO

DATE:	March 29, 2020
SUBJECT:	5 Orchard Drive = Tree Conservation Report Memo
FROM:	Byron Lester, Senior Landscape Designer, WSP Landscape Architecture & Urban Design
TO:	Mr. Brent Payne, AECOM Canada Inc. C/O Shell Canada

The following memo is to be read in conjunction with "Tree Conservation Report and Environmental Impact Statement – Revised," as submitted October 2, 2018 (by Muncaster Environmental Planning Inc.) for Campanale Homes' Plan of Subdivision (City file number: D07-16-18-0020) application for 5 Orchard Drive. On July 25, 2019, it was confirmed with, Colette Gorni, Planner I and File Lead at the City of Ottawa, the Tree Conservation Report requirement can be a brief memo addressing the relevant parts of the completed Tree Conservation Report for Campanale Homes.

This memo includes: an inventory of individual trees anticipated to be impacted by the proposed development activities on site; tree mitigation measures; and tree compensation recommendations. The information herein is to accompany the anticipated forthcoming site plan application for the NTI site located at 5 Orchard Drive (project site) in Ottawa, Ontario.

Site Inventory Study Limit

The project site is located at the southwest corner of Fringewood Drive and Hazeldean Road in Stittsville, Ottawa Ontario. The project site's proposed lease area is 3,065 m². Site development plans include a gas station with two (2) small buildings (retail and car wash), surface parking, underground fuel storage and pumps.

All trees over 10cm DBH within and immediately adjacent the project site were assessed and inventoried. Trees which were dead were not assessed. Trees were assessed for species, quantity, trunk size, condition and approximate location. The assumed limit of work / disturbance to determine potential impacts to existing trees is based on site design plans as issued for review 2019/11/22. In select locations, trees were inventoried outside of the project site where the limit of construction was assumed to be near / coincide with the limit of project site. Potential impacts to these trees may include limbing and pruning and / or impacts to the roots within the drip line / critical root zone. Recommendations have been provided for tree protection, tree injury and removals based on the anticipated limit of work / grading.

Methodology

The assessment provided in this memo, and the criteria applied during field investigations follows standard arboriculture techniques. Site inventory was conducted on February 11, 2020. All

Suite 300 2611 Queensview Drive Ottawa, ON, Canada K2B 8K2

T: +1 613 829-2800 F: +1 613 829-8299 wsp.com assessments were made by a visible inspection of the above ground portions of the tree viewed from ground level. No climbing, physical coring, excavation or probing examination of the trees were made. Binoculars were used to assess the tree(s) in areas inaccessible due to physical or perceived safety barriers.

The memo herein includes trees inventoried within the project site, and those determined to be close enough to proposed construction works to be potentially impacted.

Existing trees have been assessed and inventoried in accordance with City of Ottawa *Urban Tree Conservation By-law* and the *Municipal Trees and Natural Areas Protection By-law (2009-200)*. The tree assessment includes a visual inspection of:

- trunk and branch condition, structure, foliage condition, and evidence of abiotic (environmental, mechanical and physical damage) and biotic (insects and disease) stressors;
- tree trunk integrity (TI) including an assessment of the trunk for any defects;
- tree canopy structure (CS) including an assessment of the scaffold branches and canopy of the tree;
- tree canopy vigor (CV) including assessment of the amount of deadwood versus live growth in the tree crown while also considering the size, colour and amount of foliage. Note that site inventory was completed in February. As such no canopy vigor assessment was completed for deciduous trees.

Vegetation recommended to be 'retained' is deemed to be minimally affected by the proposed development and/ orbeyond of the anticipated limits of construction. Vegetation recommended to be 'removed' is deemed to be within the proposed limits of development / construction and would not be able to withstand construction related activities or changes to grading. This designation is also applied to trees that are dead, in poor condition or trees that could pose future safety risks.

All trees over 10cm DBH within the project site were assessed and inventoried. Trees which were dead were not inventoried. Individual trees and tree groupings were located on site using draft site plans and aerial mapping. Trees with an unobstructed canopy and of significant size (over 50cm DBH) were located individually. Trees were located as a grouping where the canopies overlapped. Group limits were arranged based on:

- Physical perimeter of the tree group (drip line);
- Similar group characteristics (similar species composition, size and health);
- Anticipated limits of disturbance and protection.

The following table includes tree inventory criteria derived from the International Society of Arboriculture (ISA) best management practices. These criteria were applied during the tree inventory field work.

Tree ID #/ Tree Group ID #	The number assigned to the individual / group of trees assessed and located on the mapping which corresponds to the appropriate number in the tree inventory table.							
Tree Grouping	A tree grouping is more than one (1) tree located within proximity of other trees with no separation between the canopies.							
DBH	This refers to the trunk diameter (in centimetres) at breast height ar is measured at 1.4 m above the ground for each tree.							
Tree Protection Zone	This to the area around a tree that is to be protected through tree protection measures e.g. hoarding. No construction activities are to be undertaken within this zone.							
Suppressed	Refers to trees that have their crowns completely overtopped by adjacent trees and received limited to very limited sunlight.							
Irregular Tree Form	Refers to branches and stems that have formed irregularly often resulting in contorted growth, weak attachments, weakly formed unions and codominant stems. The irregular growth of scaffold (lateral) branches typically leads to damage to other scaffold branches.							
Imminently Hazardous Tree	Refers to a destabilized or structurally compromised tree that is in imminent danger of causing damage or injury to life or property.							
Critical Root Zone	The minimum area of the root system necessary to maintain vitality or stability of the tree. Typically, this area extends to the drip line of the tree. The severing of one root can cause approximately 5-20% loss of the root system. A reduction of this area by greater than 30% can pose stability concerns for the tree.							
Trunk Integrity (T.I.)	This is an assessment of the trunk for any defects or weaknesses. It is measured on a scale of poor, fair, good.							
Canopy Structure (C.S.)	This is an assessment of the scaffold branches, unions and the canopy of the tree. This is measured on a scale of poor, fair, good.							
Canopy Vigour (C.V.)	This is an assessment of the health of the tree and assesses the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category. This is measured on a scale of poor, fair, good.							
Good condition	Tree displays less than 15% deficiency/defect within the given tree assessment criteria (TI, CS, CV).							

Fair condition	Tree displays 15%-40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).							
Poor condition	Tree displays greater than 40% deficiency/defect within the given tree assessment criteria (TI, CS, CV).							

Field Observations

Field observations were undertaken on February 11, 2020 to confirm the health, species composition, diameter at breast height (DBH) and number of trees within the project site / with potential to be impacted by construction activities. Trees were inventoried and assessed in accordance with the City of Ottawa Tree Conservation Report Guidelines and Urban Tree Conservation By-law (2009-200). A total of seven (7) trees were inventoried within the project property. An additional single tree and five (5) tree groupings were inventoried immediately adjacent the project property. One dead tree within the property was not included in the inventory but is recommended to be removed.

Species inventoried consist of a variety of native and non-native deciduous and coniferous trees including: Norway Maple (*Acer platanoides*), Manitoba Maple (*Acer negundo*), Ash Species (*Fraxinus sp.*), Elm Species (*Ulmus sp.*), Norway Spruce (*Picea abies*), Eastern Cottonwood (*Populus deltoides*), Trembling Aspen (*Populus tremuloides*). Refer to inventory table and existing conditions sketch below for tree location condition, recommendation, and quantity:



					Hoight	Condition			Delation		
Tree ID #	Botanical Name	Common Name	No.	DBH (cm)	(m)	ті	cs	cv	Radius	Recommendation	Remarks
1	Acer platanoides	Norway Maple	1	35	-	G	F	-		Retain / Protect	Broken stems
2	Picea pungens	Blue Spruce	1	25	~10	G	G	G		Remove	-
3	Picea pungens	Blue Spruce	1	29	~10	F	G	G		Remove	Trunk w ound, exposed cambrium
4	Picea pungens	Blue Spruce	1	29	~10	G	G	G		Remove	-
5	Picea pungens	Blue Spruce	1	26	~10	G	G	G		Remove	-
6	Picea pungens	Blue Spruce	1	28	~10	G	G	G		Remove	-
7	Picea abies	Norway Spruce	1	48	~10	F	F	G		Remove	Lean, broken stems, suppresssed canopy
8	Picea abies	Norway Spruce	1	38	~10	G	F	G		Remove	Broken stems
G1	Fraxinus sp.	Ash Tree	9	10-20	-	Ρ	Р	Ρ		Remove	EAB damage, dead / dying
G2	Ulmus pavifolia	Chinese Elm	5	10-20	-	F	F	-		-	Multi-stem, suppressed canopy vigour
G3	Ulmus pavifolia	Chinese Elm	4	12-18	-	F	F	-		-	Multi-stem, suppressed canopy vigour
G4	Populus deltoides	Eastern Cottonwood	13	14-36	-	F	F	-		Retain / Protect	Lean, suppressed canopy vigour, frost crack, trunk w ound, tw isted form
	Acer negundo	Manitoba Maple	1	26	-	F	F	-			
G5	Populus tremuloides	Trembling Aspen	55	10-34	-	F	F	-		Retain / Protect	Lean, broken stems, suppressed canopy vigour, EAB damage
	Fraxinus sp.	Ash Tree	2	15-20	-	Ρ	Р	-			

Tree Inventory Table

wsp



Existing Conditions Plan

Tree Recommendations / Assumptions

To facilitate the proposed construction works, tree removals are necessary. A recommendation to remove trees is determined by the anticipated degree of excavation / disturbance within the critical root zone, considering: tree species, size, condition and the number of critical roots that would be impacted that are vital to sustaining the trees overall health and stability. Trees that are dead, in poor condition or trees that could pose future safety concerns and trees dying because of a disease

or insect infestation may also be recommended for removal. It is anticipated that seven (7) individual trees (ID# 2-8) and one tree grouping (G1) will require removal. Refer to existing conditions map and tree inventory table above.

Trees immediately adjacent proposed / anticipated construction activities shall be preserved and protected where limbing and pruning and / or impacts to the roots within the drip line / critical root zone is anticipated. Preservation of trees is considered where an encroachment, excavation or disturbance into the CRZ is expected to be minor or nil and that tree health and stability will not be adversely impacted. The CRZ is the Critical Root Zone measured at 10 cm radius for every cm of trunk diameter (e.g. a trunk diameter is 20cm than the CRZ is $20 \times 10 = 200$ cm radius).

Trees >10cm DBH beyond the limits of construction, grading or easements can be protected through tree protection hoarding. Some mitigative measures may apply. Refer to Mitigation Measure section below.

Trees shall be replaced at a 2:1 ratio minimum. Replacement plant material shall be as per City of Ottawa specifications and standards. Monoculture planting of single tree species is not permitted. All replacement tree species shall be selected to be low maintenance, tolerant of urban conditions including winter maintenance practices and native species where possible / feasible. All plant material shall meet the requirements of the Canadian Standards for Nursery Stock. Refer to sketch below for proposed limits of tree protection fencing.



Proposed development and Conserved Vegetation Plan*

*Note: proposed plan as shown is draft only – refer to latest site plan. All trees within project site are anticipated to require removal.

Tree Mitigation Measures

Mitigation measures are recommended to limit the impact within the root zone of trees. The following mitigation measures are recommended to be applied where possible / feasible to limit negative impacts to existing trees:

• Any roots exposed during grading are to be pruned using good arboricultural practices and per the guidelines in this report;

- Water trees periodically during construction;
- To minimize damage to roots it is recommended that excavators scrape soil within the same direction of the roots and not across. Any roots exposed are too pruned neatly and cleanly;
- After construction, it is recommended that a 75mm depth layer of mulch be placed in a 2m radius around the trunks of these trees.
- Hydro Vacuum / Air Spade Excavation;
- Horizontal Root Protection;
- Radial aeration; and
- Grade Change measures.

Air Spade / Hydro Vacuum Excavation

Where excavation and/or grading that requires a CRZ to be temporarily reduced and occurs within the reduced CRZ, air spade / hydro vac excavation is recommended. The aim of this measure is to reduce the damage to roots from construction by exposing and pruning roots prior to any construction activities, so that pruned root ends will have the opportunity to sprout new roots, thus minimizing root loss, changes to health and structural stability. The following methods may be applied:

- At the limit of the critical root zone and proposed grading or construction activity, airspade / hydro vacuum excavate to a depth of 300mm along the length of the CRZ distance and at a width of 0.5m to expose roots;
 - Roots approved for pruning by air-spade excavation, hydro vacuum excavation or by hand are to be pruned using a low pressure hydraulic (water) excavation. This root-sensitive excavation must be undertaken by an experienced operator under the supervision of a qualified and experienced arborist. The water pressure for hydraulic excavation must be low enough that root bark is not damaged or removed. This will allow a proper pruning cut and minimize tearing of the roots.
- Once the area has been exposed, roots are to be pruned using ISA Best Management Practices, by a ISA certified Arborist or under the supervision of a certified Arborist. Refer to pruning Section;
- Backfill with excavated material or better, immediately after completion of air spade excavation and root pruning to prevent roots from drying out;
- Apply a layer of 75mm depth mulch in a 2m radius around the trees;
- Upon completion reinstate tree protection fencing to original location;
- Water trees periodically during construction.

Horizontal Root Protection

Where staging areas and/or construction activities will encroach into and require a reduction of a CRZ of existing trees, horizontal root protection is recommended to be applied to minimize potential root damage e.g. compaction, suffocation and or damage. This measure is to be applied prior to construction. The following methods may be applied:

- Prior to construction, install tree protection hoarding and prior to placement of horizontal root protection;
- Place horizontal root protection prior to any construction activities;
- Horizontal root protection may consist of:
 - Placement a 100mm depth base of shredded bark mulch between the reduced CRZ to the full extent of the CRZ. E.g. if a minimum CRZ of 3m has been reduced to 2m then the horizontal root protection shall be placed between the reduction (2m) and the full extent (3m) so that the full CRZ can be protected and maintained. Upon completion spread mulch throughout the root zone to a minimum depth of 50mm;
 - Placement of 20mm thick plywood or a 100x100mm wood beams over a 100mm thick layer of wood chip mulch. Upon completion remove the plywood and spread the mulch throughout the root zone to a minimum depth of 50mm;
 - Placement of 100 to 300mm depth granular or gravel over a taut, staked geotextile fabric. Upon completion of construction removal gravel and geotextile and lightly scarify soil;
 - Placement of commercial logging or road mats on top of a mulch layer. Upon completion of construction remove mats and materials. Leave mulch and spread throughout the root zone to a minimum depth of 50mm;
 - Placement of sand as a levelling course to protect the CRZ. Place steel plates along the length of the CRZ. Field fit where necessary depending on size and width of plates. Plate width and size may vary. Remove steel plates at completion of construction and spread sand evenly so it forms a top dress layer on top of soil / sod.
- Restore disturbed areas.

Radial Aeration

Areas where air-spade or horizontal root protection are not possible, and compaction of soil / roots may occur, radial aeration is recommended to be completion after construction to reduce the detrimental effects of compaction and root loss. The following methods may be applied:

- Air spade excavate radial trenches within the CRZ in the direction of the roots. Size, spacing and depth of trenches to be determined prior to construction;
- Trenches to be filled with top dressing or organic mulch.

Grade Changes

Grade changes that cannot be avoided, that will result in cut or fill within a CRZ, have the potential to significantly affect tree health and structural stability. To reduce the detrimental effects of a grade change, the following methods may be applied:

- Apply air spade / hydro vac excavation along the limit of the grade change to expose roots;
- Prune roots as per the Air Spade / Hydro Vacuum Excavation section;
- Supplement the grade change by installing ledgerocks / armourstone, railway ties, stone or other methods that are approved equal.

Tree Appraisal

Any trees identified to be preserved and are damaged during construction may require an appraisal to determine the value of the trees. Tree Appraisals would need to be completed by an ISA Certified Arborist using the 'Guide for Plant Appraisal – 10^{th} Edition, prepared by the Council of Tree & Landscape Appraisers.

Root Pruning Practices

- All approved root pruning is to take place by or under the supervision of an ISA Certifed Arborist and in accordance with ISA Best Management Practices;
- Pruned root ends shall be neatly and squarely trimmed and the area shall be backfilled with clean native fill as soon as possible to prevent desiccation and promote root growth;
- The exposed roots shall not be allowed to dry out and an appropriate watering schedule shall be undertaken (e.g. water bi-weekly to field capacity between June 1st and September 15th) so that the roots maintain optimum soil moisture during construction and backfilling operations;
- Backfilling shall occur immediately and shall be with clean uncontaminated topsoil from an approved source. It is recommended that texture of backfill be coarser than existing soils, and that backfill comes into clean contact with existing soils (remove air pockets, sod, etc.).

Branch Pruning Practices

- All approved branch pruning is to take place by, or under the supervision of an ISA Certified arborist and in accordance with ISA Best Management Practices;
- All limbs damaged or broken during the course of construction should be pruned cleanly, utilizing by-pass secateurs in accordance with approved horticultural practices. Should there be a potential risk of transfer of disease from infected to non-infected trees, tools must be disinfected after pruning each tree by dipping in methyl hydrate. This practice is particularly important during periods of tree stress and when pruning many members of the same genera, within which a disease could be spread quickly (i.e., Verticillium Wilt on Maples or Fireblight on genera of the Rosaceae family);
- All pruning cuts should be made to a growing point such as a bud, twig or branch, cut just outside the branch collar (the swollen area at the base of the branch that sometimes has a bark ridge), and perpendicular to the branch being pruned rather than as close to the trunk

as possible. This minimizes the site of the wound. No stubs should be left. Poor cut location, poor cut angle and torn cuts are not acceptable;

- Extensive pruning is best completed before plants break dormancy. Pruning should be limited to the removal of no more than one third (1/3) of the total bud and leaf bearing branches. Pruning should include the careful removal of:
 - o Deadwood;
 - Branches that are weak, damaged, diseased and those which will interfere with construction activity;
 - o Secondary leaders of conifers;
 - o Trunk and root suckers;
 - o Trunk waterspouts; and,
 - o Tight V-shaped or weak crotches (included unions).
- Any branches that overhang the work area and require pruning are to be pruned using good arboricultural practices utilizing by-pass secateurs in accordance with approved horticultural practices and/or American National Standard (ANSI) A300 (Part 1) – 2008 Pruning;
- The Contractor must report immediately any damage to trees such as broken limbs, damage to roots, or wounds to the main trunk or stem systems so that the damage can be assessed immediately.

Transplanting

Within the limits of construction, planted trees within urban parks, trees that are young and in good condition may be good candidates for transplanting. Should this measure be considered the following guidelines may apply:

- Prior to any site clearing, a meeting will be held between the Contractor and the transplanting contractor to;
 - o Identify trees that will be transplanted through spray paint or flagging tape;
 - Review and finalize transplanting location;
 - Discuss and outline transplanting measures e.g. tree spade size, slow release fertilizer application;
- Transplanting shall be as per City of Ottawa standards;
- During transplanting, on-site supervision by WSP Canada Group Limited is recommended to document the transplanting through photos and a written site visit report;

Migratory Bird Protection

• To reduce the possibility of contravention of the Migratory Birds Convention Act (MBCA), vegetation removal should be scheduled to occur outside of the overall bird nesting season of March 31 to August 31. Some birds may nest before and after this peak

bird nesting season due to annual seasonal fluctuations. A migratory bird nest within the construction area still receives protection if found outside of this nesting period;

- If vegetation must be removed during the overall bird nesting season:
 - Nest and nesting activity searches will be conducted in areas defined as simple habitat by a qualified Biologist no more than 24 hours prior to vegetation removal. Nesting activity will be documented when it consists of confirmed breeding evidence, as defined by OBBA criteria (Cadman, 2009);
 - If an active nest or confirmed nesting activity of a migratory bird is observed in simple habitat, regardless of the timing window recommended, a speciesspecific buffer area following ECCC guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC 2018), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity;
 - The results of all nest searches will be documented at the end of each survey day in a Technical Memorandum, including information on the searcher, date, time conducted, weather conditions, habitat type, vegetation community type, observations of breeding activity, observations of confirmed nests including coordinates, and, if required, the buffer applied to identified breeding/nesting sites.
- If vegetation removal must occur in complex habitats within the above-listed timing windows and absolutely cannot be avoided, the same Best Management Practices (BMPs) such as nest and nesting activity searches described above will be undertaken.

Establishment of Critical Root Zone (CPZ) Protection

- Tree preservation measures, including the establishment of Critical Root Zone (CRZ) shall apply to the individual trees denoted for preservation on the Tree Conservation Plans, as well as all vegetated areas noted for retention;
- Trees located within the project site that are to be preserved will have tree protection fencing installed at the drip line plus 1 meter to establish a Tree Protection Zone. All trees located on adjacent properties shall be preserved unless otherwise stated in this Report;
- No grade changes shall occur within Tree Protection Zone. In the advent that grade changes occur either as a cut or fill situation, the consulting arborist must be notified so that precautions to preserve the tree can be determined prior to the placement of fill or excavation activities;
- Every precaution must be taken to prevent damage to trees and root systems from damage, compaction and contamination resulting from the construction to the satisfaction of the consulting arborist;
- Any damage to trees such as broken limbs, damage to roots, or wounds to the main trunk or stem systems are to be reported to the consulting arborist so that the damage can be assessed immediately, and mitigation can be promptly implemented.

Tree Protection Fencing

- Trees that are well beyond construction limits with no encroachment into the tree protection zone can be retained. These trees will not require tree protection hoarding. Trees where construction limits will either encroach into the tree protection zone or will be within proximity of the TPZ and / or dripline, will require tree protection hoarding.
- The tree Critical Root Zone (CRZ) shall be established by the installation of tree protection fencing;
- Hoarding to consist of materials and construction approved by the City of Ottawa. Hoarding types can consist of a:
 - Snow fence: 1.2m high Orange plastic web fencing attached to wood or t-bars frames;
 - Solid board fence: 1.2m high solid board plywood fence attached to a wood frame;
 - Fast Fence: 1.8m high portable mesh fencing;
 - Silt Fence: 1.2m high paige wire silt fence
- Temporary Tree Protection Measures:
 - Protection of retained trees will be provided by the installation of temporary protective fencing as per the details provided on the Tree Conservation Report and Appendices; and
 - All the tree protection measures are to be installed and approved prior to commencement of site grading. Periodic inspection and maintenance of the tree protection measures will be required throughout construction.

Construction

- Prior to the commencement of construction, tree protection barriers shall be installed in accordance with the City of Ottawa tree protection Guidelines;
- Tree protection barriers shall be maintained in good condition and shall not be altered, moved or removed unless and until authorized by the City's Forestry Services Department;
- The owner shall notify all contractors and other parties working on site of the approved Tree Protection Plans and the Tree Conservation Report, Memo and Appendices, and shall ensure that all contractors and other parties adhere strictly to the requirements of the tree protection plan;
- Should a permit to injure or remove trees be issued, the work shall be carried out by or under the supervision of an ISA certified arborist;
- The following activities are prohibited within a CRZ:
 - demolition, construction, replacement or alteration of permanent or temporary buildings, structures or pathways of any kind;
 - o installation of large stones or boulders;

- altering grade by adding or removing soil or fill, excavating, trenching, topsoil or fill scraping, compacting soil or fill, dumping or disturbance of any kind;
- storage of construction materials, equipment, wood, branches, leaves, soil or fill, construction waste or debris of any sort;
- application, discharge or disposal of any substance or chemical that may adversely affect the health of a tree;
- causing or allowing water or discharge, to flow over slopes or through natural areas;
- o access, parking or movement of vehicles, equipment or pedestrians;
- cutting, breaking, tearing, crushing, exposing or stripping tree's roots, trunk and branches;
- nailing or stapling into a tree, including attachment of fences, electrical wires or signs;
- o stringing of cables or installing lights on trees;
- o soil remediation, removal of contaminated fill;
- o excavating for directional or micro-tunneling and boring entering shafts.

Ash materials may be removed from the site and disposed of within the 'Regulated Area Prior to construction, a site meeting shall be held to review the clearing limits and confirm the installation location for the temporary tree protection fence;

- Tree protection barriers shall be clearly staked in the field and approved by the City of Ottawa Forestry Services Department prior to construction to ensure correct positioning of fencing and avoid unnecessary disturbance;
- To avoid root zone impacts on trees to be retained, excavated material shall not be stored against the tree protection barrier;
- Inspection of the tree protection fencing, including photographic records and deficiency notes, shall be undertaken by the site supervisor and submitted to City of Ottawa Forestry Services Department prior to the commencement of construction, during construction and after construction is completed;
- 100-200mm of organic amendment and 500-750mm of wood chip mulch shall be applied to the area within the dripline of trees to be retained in parking islands within the subject property to retain moisture and promote survival. Upon completion of construction, all but 100mm of excess mulch shall be removed;
- All removals should be felled into the work area to ensure that damage does not occur to the trees within the tree preservation zone. Upon completion of the tree removals, all felled trees are to be removed from the site, and all brush chipped. All brush, roots and wood debris should be shredded into pieces that are smaller than 25 mm in size to ensure that any insect pests that could be present within the wood are destroyed;

- The tree removals must be coordinated to be completed outside of the nesting season, approximately between March 31 to August 31, or a visual survey must be undertaken by an ecologist to ascertain that there are no nests present within the nesting season;
- Tree removal along the tree retention limit must be carefully felled away from the tree retention limit and into the construction / development area; and,
- Stumps adjacent to trees identified for retention are to be flush cut and not chipped or grubbed to avoid impacts to retained trees.
- Periodic inspections shall be undertaken to ensure that the mitigation measures are being maintained during construction;
- The temporary protection fence is to be maintained throughout the entire construction period. No equipment storage, flushing of fuel, washing of construction equipment, and storage of spoil or construction debris is to occur behind the temporary protection fence;
- To avoid root zone impacts on trees to be retained, excavated material will not be stored against the tree protection barrier; and,
- Where the root system of trees to be preserved are exposed or damaged through construction activities, the cut ends are to be neatly and squarely trimmed back to the limits of disturbance and the area is to be backfilled with clean native fill as soon as possible to prevent desiccation and promote root growth. Proportional selective thinning of the canopy is not recommended as canopy pruning is only recommended if the health of the tree declines.

Post-Construction

The temporary protection fence will be removed last after all the construction has ended, soils are stabilized, and all of the equipment has been removed.

Routine inspections are recommended to identify dead trees or limbs adjacent to the project site that require removal or maintenance for reduction of safety risks. It is recommended that a ISA Certified Arborist inspect and assess trees on-site within and immediately adjacent the project site annually for the duration of construction activities.

Limitations of Assessment

The assessment of the trees presented in this memo has been made using accepted arboricultural techniques. These include a visual examination of all the above ground parts of the tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the trees and the surrounding site, and the proximity of property and people. Except where specifically noted, the trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations. Due to winter conditions deciduous trees did not have foliage present. As such, deciduous tree canopy vigour was not assessed.

Notwithstanding the recommendations and conclusions made in this memo, trees are living organisms and their health and vigour change over time, and in a response to changes in site conditions and / or seasonal variations in the weather conditions.

While reasonable efforts have been made to ensure that the subject trees are healthy, no guarantees are offered, or implied, that these trees or any of their parts will remain standing. It is both professionally and practically impossible to predict with absolute certainty the future condition / potential risk of any single tree or its component parts under all circumstances. Inevitably, a standing tree will always pose some level of risk. Most trees have the potential for failure under adverse weather conditions, and the risk can only be eliminated if the tree is removed.

Furth

Byron Lester, MLA, OALA Associate Senior Landscape Designer