CITY OF VANCOUVER

CITY CLERK'S DEPARTMENT
Access to Information & Privacy

File No.: 04-1000-20-2020-209

June 8, 2020

s.22(1)

Dear s.22(1)

Re: **Request for Access to Records under the Freedom of Information and Protection of Privacy Act (the "Act")**

I am responding to your request of March 31, 2020 for:

> **Records regarding the rezoning application for 3084 West 4th Avenue and 2010 Balaclava Street submitted to the City of Vancouver (MIRHPP) on January 21, 2020,**
> **specifically:**
> 1. **Applicant's arborist report,**
> 2. **Applicant's original project CAD file of proposed building in .dwg format or equivalent, and**
> 3. **Applicant's original project CAD file of proposed building shadow study in .dwg format or equivalent.**

All responsive records are attached. Some information in the records has been severed, (blacked out), under s.22(1) of the Act. You can read or download this section here: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/96165_00.

Please note that there are no CAD files; however, the building plans, including the shadow study, are available online through the City's website here: https://rezoning.vancouver.ca/applications/3084w4thaveand2010balaclavast/index.htm

Under section 52 of the Act you may ask the Information & Privacy Commissioner to review any matter related to the City's response to your request. The Act allows you 30 business days from the date you receive this notice to request a review by writing to: Office of the Information & Privacy Commissioner, info@oipc.bc.ca or by phoning 250-387-5629.

If you request a review, please provide the Commissioner's office with: 1) the request number assigned to your request (#04-1000-20-2020-209); 2) a copy of this letter; 3) a copy of your original request for information sent to the City of Vancouver; and 4) detailed reasons or grounds on which you are seeking the review.

Please do not hesitate to contact the Freedom of Information Office at foi@vancouver.ca if you have any questions.

Yours truly,

Cobi Falconer, FOI Case Manager, for

[Signature on file]

Barbara J. Van Fraassen, BA
Director, Access to Information & Privacy
Barbara.vanfraassen@vancouver.ca
453 W. 12th Avenue Vancouver BC V5Y 1V4

*If you have any questions, please email us at foi@vancouver.ca and we will respond to you as soon as possible. Or you can call the FOI Case Manager at 604.871.6584.

Encl.

:kt

TREE MANAGEMENT REPORT FOR DEVELOPMENT APPLICATION PURPOSES

Initial Issuance Date: **January 20, 2020** ACL File: **19218**

Revision # **0**: City File:

Attn: **James Evans, Development Manager**
Retna Ivestments
s.22(1)

Prepared by: **Norman Hol**
Principal and Senior Consultant

Project: **Proposed Multi-Family Development**
3084 W 4th Ave and 2010 Balaclava St Vancouver BC

BACKGROUND

This report is intended to meet municipal tree bylaw and/or other regulations for tree preservation relative to a development application. The study area for this project consists of the address(es) noted above, along with treed in the city road that directly front the site, as well as trees on neighbouring lands that are determined from our experience to be within influencing distance of the project. No trees outside of the study area were assessed. Our site investigation was performed on September 16 2019 and September 24, 2019.

Reference documents provided by the client include; ***Tree Location and Topographic Survey*** dated July 8, 2019, the current ***Architectural Site Plan***, received January 16, 2020. The design for the locations of proposed services/utility infrastructure designs were not available for review.

We have undertaken an assessment of existing trees within the study area that may include stand assessment methods where appropriate, and/or tree by tree analysis. For individually assessed trees, we have; tagged or assigned a unique ID, identified the species, measured the size (trunk diameter, height and spread), rated the current condition (health and structure), and determined the age class, structural class, visual presence/absence of tree disease and the ecological or functional role in the landscape. We analyzed our findings to determine the value and viability as well as priority rankings of the trees considering the proposed project.

This report is not intended as a tree risk analysis, however the structural form and presence and severity of defects were factors in our condition assessment. Considering Tree Risk Assessor Qualification (TRAQ) methods, our assessment includes *Level 1 Limited Visual Assessment* factors such as topography, site changes, soil, drainage, history of past tree failures, and other relevant tree or site factors. Trees within the study area that may present undue risk toward current targets will be brought to the attention of the owner for further assessment and/or action. We strongly recommend that the tree owner of such trees commission additional assessment to *Level 2 Basic Assessment* or *Level 3 Detailed Assessment* standards as appropriate based on TRAQ protocols.

Figure 1. Aerial Photo of the Subject Site

TREE ASSESSMENT AND TREE RETENTION PLANNING

There are no on-site bylaw sized trees observed on the subject properties. Four undersized trees were observed and are noted for location, diameter and type on the tree management drawing (Appendix C). The off-site trees within influencing of this site consist of a windrow of three cedar trees in the boulevard between the sidewalk and the property line (trees C01 to C03) and one off-site Katsuratree located in the neighbouring multi-family property near the southeast corner of the subject site. Refer to the Tree Photos (Appendix A), Tree Inventory (Appendix B) and the Tree Management Drawing (Appendix C) for details and location references.

Individual trees and certain groups of trees (groves or stands) have been ranked for viability based on three categories:

> ***Priority 1*** – denoting a tree or grove of trees in good to excellent health and structural condition and with a size, location and species that make it or them a valuable candidate with good long term prospects for retention if the project can reasonably accommodate the required protection measures. Some of the trees or groves in this category may also warrant special measures implemented in design and construction of the project in order to preserve them.
>
> ***Priority 2*** – denoting a tree or grove in fair condition with correctable or minor defects, and with reasonable value for retention. Some such trees may benefit from retention along with other adjacent trees as a "strength in numbers" strategy.
>
> ***Low Priority*** – denoting a tree or grove in poor or worse condition with limited to nil retention viability due to significant pre-existing health or structural impairments. Some trees in this category may be viable in passive landscape zones and in conjunction with other retained trees. However some may present risks of failure from pre-existing defects combined with new growing conditions and presence of targets such that would present a hazard to people or property in the current or future land uses.

For consideration in the project planning and design phase, the client has been supplied with our preliminary tree inventory list and our tree assessment drawing showing the priority rankings of all trees along with the preliminary tree protection setbacks for the priority 1 and 2 trees.

Detailed Testing – Root Mapping

The windrows of city owned cedar trees (C01 to C03) were observed to have limited root potential within the subject site due to site conditions that are not conducive to fertile root growth. These limitations included a hardscape patio extending from the property line and southward, which appear to have been historically excavated to install it.as well as a planter and compost installed adjacent to the patio. There is also a grade change consisting of a sloped boulder retaining wall along the common property line between the tres and the site which has the potential to restrict tree root growth. For these reasons we found it prudent to undertake root mapping to determine the actual root conditions below grade. Our investigation was undertaken at a setback of 2.5m south of the centre of tree C01 and parallel to the common property line. Our findings are as follows:

Photo 1. Root mapping in patio area.

Photo 2. Root mapping in planter area.

Observations:

- The patio area of the site adjacent to the trees is primarily sand based sub-base to a depth of 0.6m and highly compacted subsoil below that depth. We encountered sparse woody roots of 1.5 cm average diameter and very minimal fine roots directly in the interface of the patio pavers and the sandy sub-base. The subsoils contained no tree roots and there appears to be no opportunity for cedar roots to have colonized those soils.
- The planter area was excavated to 0.75m below the surface (depth of compacted subsoil) of the site where we found no woody roots from the cedar, and minimal fine roots in the upper 0.1m depth only. The subsoil contained no roots. One woody root and some fine roots from the adjacent maple tree were found in the upper 10 cm depth mixed with the sparse cedar roots.

Conclusions:

- The scope of cedar roots that were found is not consistent and vastly lacking as compared with what would be expected in this proximity if fertile soils were present. No structural roots and negligible feeder roots were found, therefore the trees are not reliant on the areas of the subject site to the south of the alignment where the testing was performed.
- The soil conditions within the site are not productive and have limited potential for future root growth.
- We suspect that the opportunistic growth pattern of trees has resulted in the root system having developed in the boulevard and likely within the formerly disturbed areas of the road corridor where service trenches have been dig and backfilled and where cedar trees commonly colonize in urban growing conditions.
- For these reasons, we find that the root protection setbacks can be reduced to a 2.5m setback as measured from the centre of tree C01 without impacting the health and structure of the subject trees.
- These findings should be provided to the park board for their consideration of approval.

TREE PRESERVATION FINDINGS

The available project designs and details were carefully reviewed with consideration of the tree locations relative to our tree assessment findings and priority rankings, the protection setbacks required to preserve the trees and the anticipated impacts from construction. The trees within influencing distance of the project are proposed to be treated as summarized below. The tree inventory (see appendix B) and the tree retention and protection detail (see Appendix C) include the tree retention specifications.

ON-SITE TREES:

Not applicable. NO on-site bylaw sized trees were observed on site.

STREET TREES (City Owned):

Protect:
Preserve City trees as follows:

- **Protect 3 City Trees, Tag/ID's: C01, C02 and C03 (a codependent windrow)**

OFF-SITE TREES ((privately owned):

Protect:
Preserve off-site trees within influencing distance of the project as follows:

- **1 Off-Site trees is located near the site but requires no protection measures, Tag/ID's: N01**

Table1. Tree Retention/Removal by Ownership

Ownership:	Total:	Remove:	Retain:
On-Site Trees	0	0	0
City Street Trees	3	0	3
Off-Site Private Trees	1	0	1
TOTAL	**4**	**0**	**4**

TREE PROTECTION PRESCRIPTION

Our specified ***Tree Protection Zone*** **(TPZ)** consists of 3 main components;

- ***Crown Protection Zone*** (**CPZ**): denotes the dripline is the furthest extent of branches and foliage projected to the ground below, and is a zone where aerial encroachment is not desirable. Buildings should be set back from the CPZ sufficiently to allow working space to; install the envelope/glazing, undertake future maintenance, and to accommodate future growth of the crown as the tree matures. Any encroachments within 1m of the CPZ (i.e. construction of buildings, operation of machinery, cranes, lifts or other equipment, passage of pedestrian or vehicles, erection of scaffolding, etc) may affect viability for tree retention and will require an impact assessment by the project arborist to determine feasibility and to specify mitigation measures as necessary.
- ***Root Protection Zone*** (**RPZ**): a setback prescribed by the project arborist representing the closest proximities of soil and root disturbance toward a tree that are deemed manageable and tolerable based on our assessment findings, and conditional to certain mitigation measures and compensatory treatments that may be specified. Minor encroachments may be possible but such encroachments would require a detailed analysis by the project arborist and may benefit from detailed testing before confirming (i.e. root mapping).
- ***Working Space Setback*** (**WSS**)**:** is a setback outside of the RPZ as specified by the project arborist where soil disturbances may occur (i.e. excavation or site preparation), conditional to the on-site supervision and direction by the project arborist, implementation of mitigation measures and undertaking of certain best management practices and treatments (i.e. root pruning).

All dimensions and protection setbacks are relative to the center of the tree trunk where it emerges from the ground in accordance with arboricultural best management practices and the practices of design professionals.

It is incumbent on the client and/or the design consultants to keep this office apprised of any revisions or additional details that may impact the tree preservation scheme and protection zones presented herein so that we can keep our documentation up to date with the most current project design.

The tree protection measures and treatments will require coordination and cooperation with the general contractor and/or their subcontractors or trades, and may also require that they undertake certain work to remain in compliance. Refer to Tree Management Drawing (Appendix C), Tree Protection Specifications (Appendix D) and Letter of Undertaking (Appendix E) for additional details. The owner is required to seek guidance and/or arrange on-site field services or supervision by the project arborist from this office, as specified on those documents.

It is important to include our report and appendices in the tendering and contract documents for the project. Prior to construction, the Issued for Construction (IFC) drawings should be forwarded to this office, and the client should schedule a pre-con meeting between the project arborist, the general contractor and certain subcontractors to review the tree protection specifications, restrictions, treatments and other measures.

TREE REPLACEMENT

Tree replacement requirements will be confirmed by the municipality in relation to their policies. The municipality requires one or two replacement trees for each bylaw tree to be removed (1:1 or 2:1 quota), depending on the species selected for replacement. We recommend limiting the quantity of trees to an appropriate quantity relative to the available space for planting and meeting arboricultural best management practices. The replacement trees must meet city requirements for minimum size at planting (i.e. 6 cm calliper for deciduous species and 3.5 m height for coniferous species) and other criteria. The project landscape architect will specify the replacement trees.

Certified by;

Norman Hol, Company Principal and Senior Consultant

ISA Certified Arborist #PN-0730A
ISA Qualified Tree Risk Assessor (TRAQ)
PNWISA Certified Tree Risk Assessor #0076
BC Certified Wildlife and Danger Tree Assessor #P2529
ASCA Qualified Tree and Plant Appraiser (TPAQ)
Land Surveying Technologist

APPENDICES;
APPENDIX A – PHOTOS
APPENDIX B – TREE INVENORY LIST
APPENDIX C – TREE MANAGEMENT DRAWING
APPENDIX D – TREE PROTECTION ZONE SPECIFICATIONS
APPENDIX E – LETTER OF UNDERTAKING (LETTER OF ASSURANCE)

Assumptions and Limiting Conditions:

This report was prepared for and on the behalf of the client as addressed herein. Upon receipt of payment of our account in full, this report will become the property of the client. This report is intended for the exclusive use of our client, but in its entirety. Arbortech Consulting shall not accept any liability derived from partial, unintended, unauthorized or improper use of this report.

This report is restricted only to the subject trees as detailed herein, and no other trees were inspected or assessed.

The inner tissue of the trunk, limbs and roots, as well as the majority of the root systems of trees are hidden within the tree and below ground and trees have adaptive growth strategies that can effectively mask defects. Our assessment is limited by relying on presence or absence of outward signs or symptoms of defect and non-destructive testing to identify the severity of defects that may be indicators of structural deficiencies. We use our training, experience and judgement in this regard, however not all defects can be diagnosed through available methods. It may not be feasible to identify certain defects, or to measure the severity, without causing mortal injury to the tree. Further, we must acknowledge that extreme weather and environmental influences are unpredictable, and that any tree has risk of failure in such events. We do not guarantee or warrant that a tree that we have assessed is free of defect or that it will not fail.

The ownership of trees is determined based on the location of the trunk where it emerges from the ground relative to the property line. This determination may require the advice from a duly qualified professional surveyor.

Third party information provided to the consultant may have been relied upon in the formation of the opinion of the consultant in the preparation of this report, and that information is assumed to be true and correct. We have not verified that information, and we do not warrant it as correct.

The use of maps, sketches, photographs and diagrams are intended only as a reference for the readers' use in understanding the contents and findings of this report, and are not intended as a representation of fact.

Approvals from a municipality and/or regulatory agency may be required prior to carrying out treatments that may be recommended in this report. The owner or client is responsible to make application for, pay related fees and costs, and meet all requirements and conditions for the issuance of such permits, approvals or authorizations.

APPENDIX A: TREE PHOTOS

Tree # C01-C03

Tree # C01-C03

Tree # C03

Tree # C01-C03 (from within the site)

Tree # N01 (with undersize elm in foreground)

Undersize tree near northwest corner of site

Undersize maple near northeast corner of site

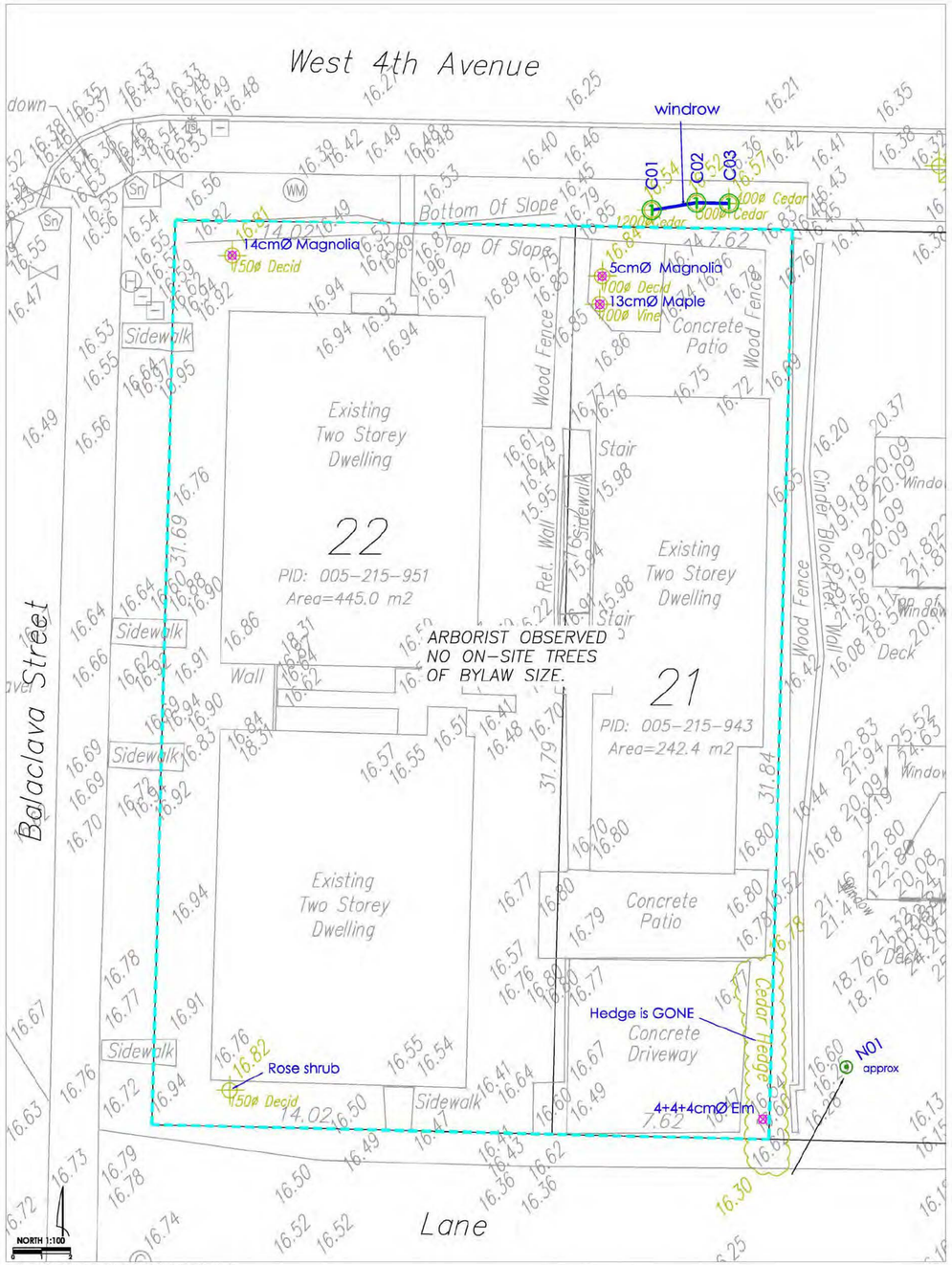
Undersize magnolia near northeast corner of site

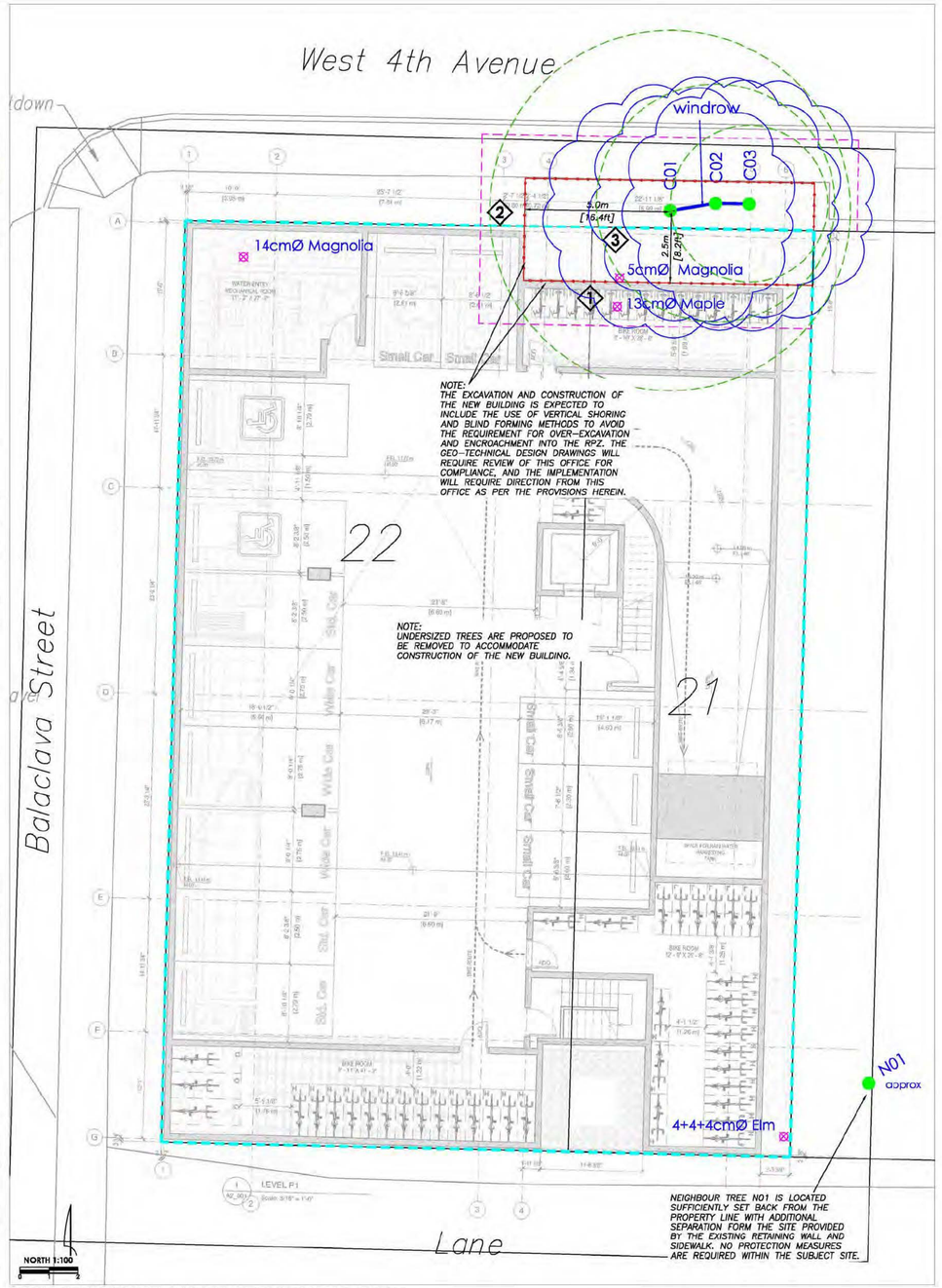
APPENDIX B: TREE INVENTORY LIST: (all dimensions are metric)

Tag/ID denotes the arborist tag # or serial ID number as referenced in report and drawing documentation.
Survey denotes whether tree is shown on the tree and topogrpahic survey provided by client (Y/N). If we are relying on survey tag #'s we include it for reference.
Loc denotes locaiton as from survey; **ON** (on site), **SHARED** (stradding PL), **OFF** (off site private), **CITY** (road frontage or other), **EPA** (environmental protection area), **PARK** (city park - existing or propsoed)
Dbh denotes the trunk diameter in cm at 1.4 m above grade or to arboricultural standards (i.e. below scaff union). The dbh may be estimated or derived from survey data.
Multiple stems; attached above the root crown used trunk area method for equivalent single stem dbh; attached below the root crown references the largest stem.
Ht denotes the height of the tree in metres as measured or estimated by the assessor.
Spr denotes the spread RADIUS of the branches and foliage (dripline) in metres as measured or estimated by the assessor.
LCR denotes the live crown ratio based on percent of live crown observed in relation to a tree of normal form and with a full crown.
Class denotes the structural class of a tree. **Landscape Trees;** considers exposure: **O** denotes open, **G** denotes Grove, **E** denotes Edge
Condition represents the **Health** and **Structural** characteristics as observed by arborist. **VP** denotes Very Poor, **P** denotes Poor, **F** denotes Fair, **G** denotes Good
Value rating considers **Condition** and **Contribution** to the proposed land use; **VL** denotes Very Low. **L** denotes Low, **M** denotes Medium, **H** denotes High, **VH** denotes Very High
Priority denotes preservation ranking for consideration in tree retention planning considering multiple factors including; condition, value rating, age, species, etc.
Priority rankings; **1, 2** and **L (Low). NOTE;** if prefix **S** is included, it denotes stand tree suitable for retention only with special measures and in grove/stand form.
Individual trees within forest stands are generally deemed Nil priority for selective retention except when sufficiently large stands are protected.
Assessment Findings includes; our summary of overt defects, noteworthy growing condition factors, preservation and protection considerations and treatmetn rationale.
Action denotes proposed treatment in context to the project design; **RETAIN**, **REMOVE or PROTECT**. Removal of Shared and Off-Site trees **require owner consent**.
CPZ and **RPZ;** arborist setbacks for Crown and Root protection (measured from centre of trunk). A **WSS** (working space setback) is additional to the RPZ (see drawing). All 3 form the Tree Protection Zone (**TPZ**).
6X Dbh is an arbitrary city guideline for minimum root protection, not a specification. The calcualation includes radius of the trunk and is dimensioned relative to the center of trunk. **Use RPZ plus WSS.**

Tag/ID	# of Trees	Loc	Survey	Bylaw Y/N	Common name, (*Botanical*)	Dbh (cm)	Ht (m)	Spr (m)	LCR (%)	Class	Condition	Value	Priority	Stand Y/N	Assessment Findings:	ACTION	CPZ (m)	RPZ (m)	6X Dbh (m)
C01	1	CITY	Y	Y	Western redcedar (Thuja plicata)	**94.9**	15	4.0	80	G	G	VH	**1**	N	• DBH of a single stem equivalent is calculated based on the area of measured stems (59+41+62cmø) at 1.4m above grade for protection setback calculation purposes. • Codependent with C02 and C03, forming a windrow. • The three main stems of this tree have narrow unions and are inherently weak, however there are no active cracks apparent and the crowns of the 3 stems merge extensively, partly mitigating the weakness. There is risk of splitting however with TRAQ methods considered we rate the proability of failure as imprpobable and the tree as low risk at this time. • Root mapping was undertaken and very limted roots were observed within the site. Details are provided in the body of the report. RATIONALE: CITY TREE TO BE PROTECTED TO SETBACKS AS SHOWN ON DRAWING. ROOT MAPPING RESULTS SHOW NEGLIGIBLE ROOTS WITHIN THE SITE. MITIGATION: Root pruning required by arborist concurrent with excavation for new building.	**PROTECT**	4.0	2.5 min	6.2

Tag/ID	# of Trees	Loc	Survey	Bylaw Y/N	Common name, (*Botanical*)	Dbh (cm)	Ht (m)	Spr (m)	LCR (%)	Class	Condition	Value	Priority	Stand Y/N	Assessment Findings:	ACTION	CPZ (m)	RPZ (m)	6X Dbh (m)
C02	1	CITY	Y	Y	Western redcedar (Thuja plicata)	**63**	15	4.0	80	G	G	VH	**1**	N	• Codependent on trees C01 and C03. RATIONALE: AS PER C01 MITIGATION: as per C01	**PROTECT**	4.0	see dwg	4.1
C03	1	CITY	Y	Y	Western redcedar (Thuja plicata)	**41**	15	4.0	80	G	G	VH	**1**	N	• Codependent on trees C01 and C02 RATIONALE: AS PER C01 MITIGATION: as per C01	**PROTECT**	4.0	see dwg	2.7
N01	1	OFF	N	Y	Katsuratree (Cercidiphyllum japonicum)	**30**	7	4.0	70	O	G	VH	**1**	N	RATIONALE: NOT WITHIN INFLUENCING DISTANCE OF THE PROPOSED CONSTRUCTION. MITIGATION: None	**NONE**	4.0		2.0





DRAWING USE AND COORDINATION:

- This drawing relies on information and drawings supplied by the client or their consultants. Refer to original drawings from the consultants (i.e. surveyor, engineer, architect or other design professionals) for accurate locations and dimension of site features.
- All tree protection measures specified herein should be included and coordinated with the designs for the project, including but not limited to: architectural, landscape, civil and geo-technical. It is the responsibility of each design professional to understand and review the tree protection measures and determine any conflicts. If conflicts are identified, the design professional and/or the client should bring those to the attention of the project arborist from this office to review and resolve.
- Tendering and contracts for site preparation, land clearing, civil works and/or construction should include specifications for tree protection measures to be implemented as per this drawing and any reference documents.
- It is the responsibility of the owner or their agent to obtain all necessary approvals for the tree retention and removal scheme presented herein. Any changes that the municipality requests should be brought to the attention of the project arborist from this office to review and resolve.
- Some existing trees may not be shown on this drawing (i.e. understire or bylaw exempt trees, or grouped trees). It is the responsibility of the contractor(s) to confirm that all necessary municipal approvals are in place, and to determine the full scope of tree removal work. Only the trees shown to be retained and protected are to remain on site, unless otherwise directed by the owner.
- Trees and stumps to be removed from within the tree protection zone (including CPZ, RPZ and WSS) are to be removed as directed and with on-site supervision from an arborist from this office.
- Stump grinding may be required for the removal of trees within the tree protection zone, at the discretion of an arborist from this office.
- Certain tree removals in proximity of retained trees or power lines may require assistance from a suitably qualified professional, such as but not limited to:
  - i. ISA Certified Arborist (tree removal, rigging, pruning and other tree service work) working to ANSI A300 and ANSI Z133 Standards and Best Management Practices.
  - ii. Certified Utility Arborist (tree removals, pruning and other tree service work) working to ANSI A300 and ANSI Z133 Standards and Best Management Practices and following BC Hydro policies and procedures.

STANDARD MEASURES:

The project arborist must be called to attend and review, approve, direct and/or supervise certain works from time to time during the demolition, site preparation, construction and landscaping, at critical milestones or activities:

A. Tree Protection Barrier Installation:
Prior to site works commencing, to direct and inspect the installation of tree protection barriers. We will sign off once they are approved, so that city approvals can be enabled.

B. Tree Health Management Treatments:
Prior to construction, the project arborist will undertake or direct the installation of soil protection and enhancement treatments where deemed necessary or appropriate, such as but not limited to;
  a. Soil amender may be applied within TPZ (i.e. 10mm-minus well composted bark mulch, Nutri-Mulch, or equivalent) to a depth of 100 mm (or as directed by the Project Arborist).
  b. Interim watering progam and system (i.e. manual sprinkler on a timer, temporary irrigation, or truck delivery) by developer/owner or by the project arborist. Note that log books of the watering may be required. The watering shall achieve even coverage within the RPZ to deliver the equivalent of up to 5 cm (2 inches) depth on a twice monthly schedule in April through June and September, and to a weekly schedule for July and August. Watering events will be exempted by the project arborist when natural rainfall for a period is sufficient to sustain the tree.

C. Access within TPZ:
Whenever access into the tree protection zone (TPZ) is contemplated or desired for any reason.

D. Work within TPZ:
Whenever any grading, trenching, excavation or landscape work occurs within a TPZ, including the root protection zone (RPZ) and the working space setback (WSS) offset from a RPZ as specified by the project arborist.

E. Pruning:
Certain retained trees may require pruning as recommended by the project arborist to treat one or more of the following: restoration of form, aesthetics, mitigation of defect(s), building clearance, sight lines, crown raising clearance for vehicles or pedestrians and/or construction access. All tree pruning work is to be carried under the direction of the project arborist from this office and by an ISA Certified Arborist employed by a qualified tree service firm working in conformance with applicable ANSI standards (A300 and Z133), and meeting the city, contractor and/or developer/owner insurance and licensing requirements.

F. Low Impact Tree or Stump Removal:
For any tree removal or stump removal from within a RPZ or WSS.

G. Landscape Finishing:
All landscaping activities must be reviewed by this office in advance of commencing and on-site direction and guidance from the project arborist planned accordingly, such as but not limited to;
  a. Preparation works and construction of landscape finishing works including but not limited to; sidewalks, paths, patios, decks, retaining walls, fencing, irrigation, conduit, benches, patio pavers, soil placement, grass or turf installation, planting or other landscape items.
  b. Turf within TPZ's is discouraged, however if desired we may support it as long as a suitable mulch zone setback is implemented around the base of the tree.
  c. Certain landscape features may be excluded or will require specific materials and methods to be utilized that meet tree root protection compliance requirements.
  d. Note that the planting of any plants, shrubs or hedges within the TPZ is restricted to small pot sizes (i.e. #1 or #2 depending on species) and using "pocket planting" standards. Planting holes are minimized in size, dug into existing grade to avoid damage to woody roots, and backfilled with minimal addition of growing medium.

SPECIAL MEASURES:

The following items within a TPZ require project arborist direction, treatment or supervision/monitoring. See the Tree Management Drawing for additional references to locations where special measures are required.

1. 1. Root Pruning for Site Excavation:
The project arborist must be on site concurrently with any excavation adjacent to the tree protection zone to identify tree roots, provide root protection measures and/or undertake root pruning treatments as necessary.

2. 2. Root Pruning for Services Adjacent to TPZ:
The project arborist must approve the method of excavation (i.e. excavator, hydro-vac, air-vac, air spade etc) and also must be on site concurrent with trenching to identify tree roots, provide root protection measures and/or undertake root pruning treatments as necessary.

3. 3. Fence Construction:
The digging of fence posts and construction of a fence must be reviewed in advance by the project arborist. Low impact digging methods and siting of fence posts may require adjustment depending on the scope of root impacts.

TREE ASSESSMENT DETAIL

LEGEND-TREE ASSESSMENT:

- XXX — denotes **TAG NUMBER** or **ID REFERENCE**
- XXX — denotes **SURVEY TAG NUMBER** or **ID REFERENCE** (if applicable)
- approx — denotes **APPROXIMATE LOCATION** for an un-surveyed tree (if contemplated to be retained we recommend that the tree be accurately located before design is finalized)
- 1 — denotes **PRIORITY 1** tree **SUITABLE** for preservation (retainable if design can accommodate it)
- 2 — denotes **PRIORITY 2** tree **MARGINAL** for preservation, (possible candidate subject to design and other conditions)
- 3 — denotes **PRIORITY NIL** tree **UNSUITABLE** for preservation (not viable)
- denotes **UNDERSIZE TREE** that is smaller than bylaw defined size (consult municipality to determine if it is a bylaw protected tree)
- denotes **OFF-SITE** tree within influencing clearance (neighbour or city to be advised or consulted)
- denotes **PRELIMINARY TREE PROTECTION SETBACK** (for planning and design consideration)

Condensed Tree Inventory and Assessment Data:
(see report and appendix B for further details)

Tag/ID	# of Trees	Survey	Loc	Common name, (*Botanical*)	Dbh	Ht	Spr	LCR	Class	Condition	Contribution	Priority	Action	CPZ	RPZ	EX Dbh
C01	1	Y	CITY	Western redcedar (Thuja plicata)	95	15	4.0	80	G	G	VH	1	PROTECT	4.0	2.5 min	6.2
C02	1	Y	CITY	Western redcedar (Thuja plicata)	53	15	4.0	80	G	G	VH	1	PROTECT	4.0	see dwg	4.1
C03	1	Y	CITY	Western redcedar (Thuja plicata)	41	15	4.0	80	G	G	VH	1	PROTECT	4.0	see dwg	2.7
N01	1	N	OFF	Katsuratree (Cercidiphyllum japonicum)	80	7	4.0	70	O	G	VH	1	NONE	4.0		2.0

TREE RETENTION AND PROTECTION DETAIL

LEGEND-TREE RETENTION:

(AGED TREES)
(see arborist report and details herein for further details)

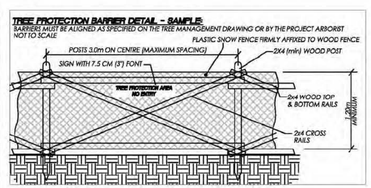
- XXX — denotes **ARBORIST TAG NUMBER** or **ID REFERENCE** (see tree inventory and assessment list)
- XXX — denotes **SURVEY TAG NUMBER** or **ID REFERENCE** (if applicable)
- approx — denotes **APPROXIMATE LOCATION** for an un-surveyed tree (if contemplated to be retained we recommend that the tree be accurately located before design is finalized)
- denotes **RETENTION** tree (protection measures as specified)
- denotes **REMOVAL** tree (municipal permit or approvals required as applicable)
- denotes **HIGH RISK** tree to be **REMOVED** or **ACCESSED** (municipal permit or approvals required as applicable)
- denotes **UNDERSIZE TREE** that is smaller than bylaw defined size (if to be retained **consult this office for protection measures**) (if to be removed **a permit may be required from municipality**)

LEGEND-TREE PROTECTION:

Notes:
- Tree Protection Zones (TPZ) are comprised of the CPZ, RPZ and WSS as detailed below.
- All tree protection setbacks are dimensioned from the centre of tree trunk and/or from property line as shown on drawing.
- Some barriers are aligned with existing buildings or hardscape elements as appropriate. Where applicable, the barriers may require adjustment if demolition of such features occurs.
- The project arborist should be consulted to provide on-site direction for barrier installation as well as to inspect and provide sign off once they are constructed.

- denotes **CROWN PROTECTION ZONE - CPZ** Exclusion zone - no aerial encroachment (if buildings to within 1.2m min)
- denotes **ROOT PROTECTION ZONE - RPZ** This is the minimum alignment for **TREE PROTECTION BARRIERS** (see detail)
- denotes **WORKING SPACE SETBACK - WSS** Offset from RPZ as specified by Project Arborist - Site works within WSS requires approval and on-site supervision by the Project Arborist
- denotes **SPECIAL MEASURES** required See arborist report for further details. Project Arborist to direct or implement. (number in diamond box refers to items in Letter of Understanding - appendix I)
- denotes **PARKS STANDARD TREE BARRIER** (see detail herein for construction detail)
- denotes **6X DBH SETBACK GUIDELINE** from Municipal bylaw (note that our specifies CPZ, RPZ and WSS supersede the municipal guidelines)

TREE PROTECTION BARRIER DETAIL - SAMPLE:
BARRIERS MUST BE ALIGNED AS SPECIFIED ON THE TREE MANAGEMENT DRAWING OR BY THE PROJECT ARBORIST
NOT TO SCALE



APPENDIX C: TREE MANAGEMENT DRAWING

aclgroup.ca
ARBORTECH CONSULTING
SUITE 145 - 12051 HORSESHOE WAY, RICHMOND, BC V7A 4V4 604 275 3484

PROJECT:	PROPOSED MULTI-FAMILY DEVELOPMENT
ADDRESS:	3084 W 4TH AVE AND 2021 BALACLAVA ST VANCOUVER, BC
CLIENT:	RETNA INVESTMENTS - JAMES EVANS
CITY REF:	ACL FILE: 19218
PLOT SIZE:	22"X34" REV #: 0 DATE: JAN 20, 2019

APPENDIX D: TPZ SPECIFICATIONS

1. **CONTACT INFORMATION:**

All tree protection questions, clarifications and coordination, should be directed to:

ARBORTECH CONSULTING *OFFICE:* ***604 275 3484*** *EMAIL:* ***trees@aclgroup.ca***

A project arborist will be assigned by our office to schedule a pre-construction meeting, and coordination of supervision protocols will be established.

2. **TREE PROTECTION ZONES (TPZ):**

Tree protection setbacks are defined on our drawings and documents relative to the centre of the tree trunk where it emerges from the ground and/or the actual extent and spread of the crown or roots of the tree. The ***TPZ*** is comprised of three main components:

- ***Crown Protection Zone*** (**CPZ**): the dripline is the furthest extent of branches and foliage projected to the ground below, and is a zone where aerial encroachment is not desirable. Buildings should be set back from the CPZ sufficiently to allow working space to; install the envelope/glazing, undertake future maintenance, and to accommodate future growth of the crown as the tree matures. Any encroachments (i.e. for building encroachments, machinery or equipment operation, pedestrian or vehicle access, operation of cranes or lifts etc) may affect viability for tree retention and will require an impact assessment by the project arborist to determine feasibility and to specify mitigation measures as necessary.
- ***Root Protection Zone*** (**RPZ**): a setback prescribed by the project arborist representing the closest proximities of soil and root disturbance toward a tree that are deemed manageable and tolerable based on site and tree factors, and conditional to mitigation measures and compensatory treatment that may be specified. Minor encroachments may be possible but such encroachments would require a detailed analysis by the project arborist.
- ***Working Space Setback*** (**WSS:** a setback outside of the RPZ as specified by the project arborist where soil and root disturbances may occur (i.e. for excavation or site preparation), conditional to the on-site supervision and direction by the project arborist, implementation of mitigation measures and undertaking of certain best management practices and treatments (i.e. root pruning).

3. **TREE PROTECTION ZONE RESTRICTIONS:**

Trees that are specified to be retained must be protected from damage during all phases of development related work on the site. Any access or construction related work within the TPZ (CPZ, RPZ and/or WSS) requires advance approval, guidance and on-site direction or supervision by the project arborist. General restrictions in the ***TPZ*** are as follows:

- No soil disturbance of any scope or to any depth for cuts or fills, including but not limited to; trenching, stripping of over-burden, bulk excavation, fill placement, site preparation, grade transitions, topsoil placement, etc.,
- No passage or operation of machinery, trucks, vehicles or equipment (including small track machines, skid steers, lifts, etc), except as approved and directed by the project arborist, and subject to special measures.
- No storage of soil, spoil, gravel, construction materials, waste materials, etc.,
- No waste or washing of concrete, stucco, drywall, paint, or other potentially harmful materials,
- No placement of temporary structures or services,
- No affixing lights, signs, cables or any other device to retained trees,
- No pruning or cutting of retained trees, except as approved and directed by the project arborist, and performed by a qualified tree service firm employing ISA Certified Arborists and working to ANSI A300 and ANSI Z133 Standards.
- No landscape finishing, such as but not limited to; installing retaining walls, digging planting holes, placing growing medium, installing irrigation or conduit, etc., except as approved and directed by the project arborist.

4. **TENDERING, IFC DRAWINGS AND CONSTRUCTION MANAGEMENT:**

Tendering of the project, issuance of the IFC drawings and documents (architectural, civil, landscape, mechanical, geo-technical, etc.) as well as planning of the construction (demolition, site clearing, excavation, shoring, access/egress, crane operations, etc.) should be coordinated with the tree protection specifications herein and the measures outlined as specified on the ***Tree Management Drawing*** prepared by this office. Any conflicts with the TPZ's identified by the project team or the contractor will require additional detailed review by the project arborist in advance of proceeding.

5. **BARRIERS – TREE PROTECTION FENCES:**

Barriers should be erected at the CPZ setback where possible, but must be installed no closer to the RPZ specified alignments as a minimum tree protection measure. Signs stating "TREE PROTECTION ZONE - NO ENTRY" must be placed on the tree protection fence at a suitable frequency at the direction of the project arborist. The contractor, sub-contractors and trades should be made aware of the restrictions therein (see above). The barriers must be maintained at those alignments in good condition, and may not be removed for any reason (including landscaping), unless prior approval from the project arborist is obtained.

6. **SURVEYING:**

Tree locations are derived from the project survey, and any discrepancies should be coordinated with their office directly and reported to the project arborist. Tree barriers aligned with or within close proximity to a property line, a design feature, a restrictive covenant line, and/or an environmentally sensitive or protected area may require a survey in advance to enable accurate barrier installation.

7. **TREE PRUNING, TREATMENTS, ENHANCEMENTS AND SPECIAL MEASURES:**

The developer and their contractors are responsible to ensure completion of enhancement or remedial tree treatments, and proactive tree protection measures for retained trees as specified by the project arborist, including but not limited to;

- Pruning for risk mitigation, crown restoration, form, building or overhead clearance, and/or sight lines.
- Pre-treatments such as root mapping, vertical aeration, advance root pruning and other treatments.
- Installation of soil amender (i.e. mulch) within the ***RPZ*** to mitigate soil desiccation and to improve soil fertility.
- Supplemental watering to compensate for soil hydrology changes.
- Low impact removal for stumps located within a ***CPZ*** (i.e. stump grinding or cutting with project arborist supervision).

- Windfirming of new forest edges created by clearing of the development lands, including; re-assessment, tree removals, pruning, modification to wildlife tree, or other treatments as specified by the project arborist.

See the tree management drawing for further details.

8. **DEMOLITION OR PRE-CONSTRUCTION OPERATIONS:**

If tree removal permits are issued at this stage, please review next item also. Note that some municipalities will not approve tree removal at the demolition phase. Tree barriers may need to be installed prior to demolition and/or the municipality may require on-site direction and supervision by the project arborist during the process of demolishing existing structures and hardscapes. In some cases tree protection barriers must be realigned, and restoration of the zone undertaken, after demolition is complete. A letter of undertaking (***LOU***) confirming supervision may be required by, or may be on file with, the municipality. The demolition contractor will need to coordinate with the project arborist accordingly.

9. **TREE REMOVAL/CLEARING OPERATIONS:**

A copy of the tree permit must be provided to the project arborist to check for congruency with our tree management drawing. Note that neighbour approvals, additional municipal permits and/or authorizations from regulatory bodies may be required and are the responsibility of the developer or their assigned representative. Certain trees requiring removal may not be shown or referenced on the drawing or documents prepared by this office (i.e. undersize or non-bylaw trees or untagged trees assessed in groups). There are often removal trees (identified or unidentified on our drawings) that require felling, extraction and stump removal from TPZ's using low impact methods. Only the trees shown for retention within a tree protection zone as specified on our tree management drawing shall be retained (unless otherwise directed by the developer). The contractor and/or the land clearing subcontractor should verify the tree removal and clearing scope based on their own site investigation. The developer/owner and their contractor should also coordinate with the project arborist in advance to identify retained trees, identify low impact removal trees, review the work plan, and to ensure contractor compliance with the tree protection measures specified.

10. **CONSTRUCTION OPERATIONS:**

A letter of undertaking (***LOU***) for arborist supervision may be on file with the municipality. The contractor (project manager/site superintendent) and the developer are encouraged to proactively meet with the project arborist in advance of commencing work on the project to; establish communication and procedural protocols, review responsibilities for tree protection measures at specific milestones of the project, and identify and resolve any anticipated tree protection related challenges. Pursuant to the Tree Protection Zone Restrictions noted above, the trunks, branches, foliage and roots of retained trees, as well as the soil within the TPZ, must not be damaged by construction activities. Careful attention to excavation, access/egress, servicing, and machinery equipment and crane operation in proximity to the height and size of the TPZ's is recommended. Note that pruning to reduce the height of retained trees (topping or heading) CANNOT be accommodated. It is recognized that certain unpredictable construction conflicts with a TPZ may arise that could interfere with the protection of the selected trees, however any proposed encroachment into a TPZ and/or changes to the tree retention scheme are subject to approval in advance by the project arborist and the municipality. Special measures required for tree protection compliance related to construction work in the ***CPZ*** or within an ***RPZ*** may be feasible to accommodate managed encroachments into a ***TPZ***, such as but not limited to:

- Root mapping by the project arborist.
- Installing armour or suspended structures over the soil within the ***RPZ*** to accommodate temporary worker or equipment passage within a ***TPZ***. Several types of armouring may be available. Implementation is at the discretion of the project arborist and may be conditional to municipal approvals.
- Low impact trenching using air-vac or hydro-vac, with arborist supervision, to accommodate underground services or utilities. This option is restricted as to viability by; proximity, scope, depth, shoring needs, tree species, site/soil conditions and other factors.

11. **LANDSCAPING OPERATIONS:**

Removal of the tree barriers requires advance coordination and approval by the project arborist. The operation of equipment of any size or type, the placement of growing medium, all grading and sub-base preparation for hard landscape features. (i.e. sidewalks and patios), site preparation for retaining walls and footings, excavation for fences, signs and other landscape features, digging of planting holes for new plants and trees, the digging of trenches for irrigation, drainage and lighting infrastructure, and the placement of turf and other surface finishing, all have a high potential for causing damage to trees, roots or soil. Advance coordination between the landscape contractor and our office prior to landscape operations commencing is required to avoid tree protection non-compliance and bylaw issues.

APPENDIX E: LETTER OF UNDERTAKING (LETTER OF ASSURANCE)

PROOF OF CONTRACT FOR FIELD SERVICES TO BE PROVIDED BY PROJECT ARBORIST DURING CONSTRUCTION

January 20, 2020 ACL File: **19218**

Client:	**Retna Investments** **c/o James Evans**
Project:	**Multi-Family Development**
Site Address:	**3084 W 4th Ave and 2010 Balaclava St Vancouver BC**
Ref Documents:	**Tree Management Report and Drawing, ACL Group** (please contact this office for a copy of the most current version)

Pursuant to city bylaws and/or policies, we confirm that we are under contract to the developer/owner to provide **Project Arborist** consulting services for the above noted construction project. Our scope of work will include a pre-construction assessment and review of the city approved project design drawings in order to review the full scope of potential tree impacts and mitigation measures for retained and protected trees, as well as to provide on-going assistance during the construction phase to undertake, direct, supervise and/or monitor certain project activities. The purpose of our involvement is to assist the developer/owner and the contractor in remaining compliant with the tree protection requirements and related city bylaw and policies.

BACKGROUND AND GUIDELINES:

Project arborist consultation and attendance is required whenever access or work is planned or scheduled to occur within a ***Tree Protection Zone*** of a retained or protected tree. See below and the reference documents for more information about tree protection zones.

Note: Failure of the project to fully meet the tree protection conditions and prescribed restrictions and measures may jeopardize the release of bonds or securities that the city may be holding for tree protection compliance purposes. The project arborist's role is to assist the project in meeting those responsibilities in the most cost-effective manner. This firm is very adept and well experienced in implementing solutions and troubleshooting the various construction challenges related to tree protection. Instances of non-compliance may result in the city issuance of a stop work order or equivalent, effectively delaying the progress of construction, and/or requirement for remedial measures that can also be costly and time consuming.

For project reference a ***Tree Protection Zone*** (**TPZ**) consists of 3 areas:

- The ***CPZ*** – crown protection zone for ensuring the aerial components of the tree are not damaged,
- The ***RPZ*** – root protection zone which is the minimum setback where ground and soil disturbances are exempted or restricted, and
- The ***WSS*** – working space setback where work may occur conditional to project arborist approval and/or supervision.

Note: In some cases TPZ setbacks have been reduced or minimized to the extent possible subject to certain conditions such as the implementation of root zone enhancement treatments, regular tree health maintenance and/or special measures.

The project is hereby requested to coordinate with this office as follows:

- PRE-CONSTRUCTION:
  The IFC or approved project drawings will be review in context to the tree management drawing and related documents so that the restrictions and the responsibilities of the project are clearly identified and so that scheduling and communication protocols can be established.
- DURING CONSTRUCTION:
  The project arborist will attend the site;
  - proactively on a monthly schedule in order to check on compliance,
  - as scheduled with the contractor when special measures are required,
  - or on call for occasions when the contractor wishes to access or undertake works within the tree protection zone.
- PRE-LANDSCAPE:
  The tree protection zone setbacks and restrictions, timing and conditions of tree barrier removal, as well as the special measures will be reviewed with the landscape contractor so that scheduling and work procedures are established.
- POST CONSTRUCTION ASSESSMENT AND SIGN-OFF:
  At the completion of the construction and landscaping, and to assist with the release of city held tree protection bonds or securities, the city requires that the project arborist inspect the condition of the trees and sign off on the construction and landscape as having been compliant to the satisfaction of the project arborist.

To schedule reviews or site visits as described above, we require a minimum of 3 business days advance notice.

STANDARD MEASURES:

The project arborist must be called to attend and review, approve, direct and/or supervise certain works from time to time during the demolition, site preparation, construction and landscaping, at critical milestones or activities:

A. Tree Protection Barrier Installation:
Prior to site works commencing, to direct and inspect the installation of tree protection barriers. We will sign off once they are approved, so that city approvals can be enabled.

B. Tree Health Management Treatments:
Prior to construction, the project arborist will undertake or direct the installation of soil protection and enhancement treatments where deemed necessary or appropriate, such as but not limited to;

- **a.** Soil amender may be applied within TPZ (i.e. 10mm-minus well composted bark mulch, Nutri-Mulch, or equivalent) to a depth of 100 mm (or as directed by the Project Arborist).
- **b.** Interim watering program and system (i.e. manual sprinkler on a timer, temporary irrigation, or truck delivery) by developer/owner or by the project arborist. Note that log books of the watering may be required. The watering shall achieve even coverage within the RPZ to deliver the equivalent of up to 5 cm (2 inches) depth on a twice monthly schedule in April through June and September, and to a weekly schedule for July and August. Watering events will be exempted by the project arborist when natural rainfall for a period is sufficient to sustain the tree.

C. Access within TPZ:
Whenever access into the tree protection zone (TPZ) is contemplated or desired for any reason.

D. Work within TPZ:
Whenever any grading, trenching, excavation or landscape work occurs within a TPZ, including the root protection zone (RPZ) and the working space setback (WSS) offset from a RPZ as specified by the project arborist.

E. Pruning:
Certain retained trees may require pruning as recommended by the project arborist to treat one or more of the following; restoration of form, aesthetics, mitigation of defect(s), building clearance, sight lines, crown raising clearance for vehicles or pedestrians and/or construction access. All tree pruning work is to be carried under the direction of the project arborist from this office and by an ISA Certified Arborist employed by a qualified tree service firm working in conformance with applicable ANSI standards (A300 and Z133), and meeting the city, contractor and/or developer/owner insurance and licensing requirements.

F. Low Impact Tree or Stump Removal:
For any tree removal or stump removal from within a RPZ or WSS.

G. Landscape Finishing:
All landscaping activities must be reviewed by this office in advance of commencing and on-site direction and guidance from the project arborist planned accordingly, such as but not limited to;

- **a.** Preparation works and construction of landscape finishing works including but not limited to; sidewalks, paths, patios, decks, retaining walls, fencing, irrigation, conduit, benches, patio pavers, soil placement, grass or turf installation, planting or other landscape items.
- **b.** Turf within TPZ's is discouraged, however if desired we may support it as long as a suitable mulch zone setback is implemented around the base of the tree.
- **c.** Certain landscape features may be excluded or will require specific materials and methods to be utilized that meet tree root protection compliance requirements.
- **d.** Note that the planting of any plants, shrubs or hedges within the TPZ is restricted to small pot sizes (i.e. #1 or #2 depending on species) and using "pocket planting" standards. Planting holes are minimized in size, dug into existing grade to avoid damage to woody roots, and backfilled with minimal addition of growing medium.

SPECIAL MEASURES:

The following items within a TPZ require project arborist direction, treatment or supervision/monitoring. See the Tree Management Drawing for additional references to locations where special measures are required.

1. Root Pruning for Site Excavation:
The project arborist must be on site concurrently with any excavation adjacent to the tree protection zone to identify tree roots, provide root protection measures and/or undertake root pruning treatments as necessary.

2. Root Pruning for Services Adjacent to TPZ:
The project arborist must approve the method of excavation (i.e. excavator, hydro-vac, air-vac, air spade etc) and also must be on site concurrent with trenching to identify tree roots, provide root protection measures and/or undertake root pruning treatments as necessary.

3. Fence Construction:
The digging of fence posts and construction of a fence must be reviewed in advance by the project arborist. Low impact digging methods and siting of fence posts may require adjustment depending on the scope of root impacts.

DOCUMENTATION:

In progress site review reports will be issued to; the owner, the prime consultant and the general contractor through the construction phase. If non-compliance is observed, the project arborist is required by the city to report to them in the form of an impact and mitigation assessment. The post construction assessment and/or sign off report will be issued to the project group and the city.

CONFIRMATION AND ENDORSEMENT:

By signing below, the developer/owner agrees that they;

- Have been informed of and understand the restrictions and measures related to ***Tree Protection*** for the project,
- Will notify the project arborist of any potential tree protection conflicts with construction in advance of those occurring,
- Will ensure that the project arborist is contacted with a minimum of **3 business days advance notice** to arrange proactive attendance by the project arborist at required times,
- Will comply with project arborist directed and supervised work in conformance with arboricultural standards and best management practices, using low impact materials and methods as directed, and facilitate any remedial work or treatments that may be prescribed or required by the project arborist or the city.

Certified by;  **Norman Hol** For Scheduling: Phone: **604 275 3484** Email: **trees@aclgroup.ca**	**Signature of Developer/Owner:** _____ **Printed Name:** _____ Phone: Email:

	Signature of Contractor: _____ **Printed Name:** _____ Phone: Email: