North Vancouver School District 44
[redacted]
2121 Lonsdale Avenue
North Vancouver, BC
V7M 2K6
[redacted]

RE: Arborist Memo Concerning Trees Impacted by the Demolition Phase of Development.

BC Plant Health Care Inc. has been contracted by the North Vancouver School District (NVSD) to provide arboricultural consultation for the Cloverley Elementary School replacement project at 440 Hendry Avenue, North Vancouver. The purpose of this memo is twofold: firstly, to support the issuance of a demolition permit for the existing school by clearly differentiating the demolition phase from the construction phase; and secondly, to pursue permits for the removal of dead or dying trees to ensure site safety. This memo specifically focuses on the protection and removal of trees impacted by the demolition. It also identifies trees that are dying or dead and may pose risks to contractors beyond conflicts arising from site development.

Trees Conflicting with the Demolition Phase of Development

Out of a total of 15 trees that directly conflict with the demolition, [8] are recommended for retention, while [7] are recommended for removal due to various conflicts. One particular tree, identified as #311, is exempt from The Corporation of the City of North Vancouver Bylaw, 2022, No. 8888 due to its smaller size (19cm DBH). It should also be considered that trees #312 and 313 are ingrown in the sidewalk along the retaining wall. They are not specimen trees which are artifacts of the lack of site maintenance.

According to the arborist report, trees #316, 317, and 318 have been recommended for removal due to their conflict with the play field and the demolition. Retaining these trees is unlikely to result in their survival during the demolition process. These trees are being highlighted and prioritized primarily due to their conflict with the demolition.

The following tables illustrate the trees involved in these conflicts, along with their rationale and corresponding recommendations.

Trees that are Recommended for Removal due to their Inability to Survive the Demolition Process.							
Tree #	Species	Tree Notes	Diameter (cm)	Condition	Recommendation	Rationale	Permits Required
310	*Malus fusca*	Cavities in trunk. Poor quality tree. No fruit set.	31	Poor	Remove	Conflict with demolition	Yes
311	*Alnus rubra*	Ingrown in planter.	19	Good	Remove	Conflict with demolition	No
312	*Populus trichocarpa*	Interfacing with asphalt sidewalk and retaining wall. Ingrown.	21	Good	Remove	Conflict with demolition	Yes
313	*Populus trichocarpa*	Interfacing with asphalt sidewalk and retaining wall. Ingrown.	22	Good	Remove	Conflict with demolition	Yes
316	*Acer palmatum*	Proximate to building	33	Fair	Remove	Conflict with demolition	Yes
317	*Pinus sylvestrus*	Interfaces with building	50	Fair	Remove	Conflict with demolition	Yes
318	*Prunus laurocerasus*	Roots and crown interface with foundation and building.	90	Good	Remove	Conflict with demolition	Yes
TOTALS					**7**	**-**	**6**

Trees Managed for Preservation Through the Demolition Phase of Development							
Tree #	Species	Diameter (cm)	CRZ for Health (x10) (m)	Condition	Suitability for Retention	Recommendation	Prescription
301	*Acer platanoides*	52	5.2	Good	/	Retain	Tree protection barrier. Canopy raise and crown clean. Arborist oversight during driveway / retaining wall removal
302	*Acer platanoides*	59	5.9	Good	Moderate	Retain	
303	*Acer platanoides*	60	6	Good	Moderate	Retain	
304	*Acer platanoides*	56	5.6	Good	Moderate	Retain	
306	*Acer platanoides*	80	8	Good	Moderate	Retain	
307	*Acer platanoides*	78	7.8	Good	Moderate	Retain	
308	*Acer platanoides*	88	8.8	Good	Good	Retain	
309	*Acer platanoides*	75	7.5	Good	Moderate	Retain	

Dead / Dying Trees

During my inventory in August 2023, I observed [35] dead or dying trees. All except for tree #327, are *Alnus rubra*. [29] of these trees are on NVSD property. [6] are on CNV property. Tree #446 is a wildlife tree. It is worth noting that *Alnus rubra*, along with *Thuja plicata* and *Tsuga heterophylla*, is experiencing a significant dieback event in the lower mainland. These tree species are not well-suited to hot and dry climates.

As C3 plants, their process of photosynthesis involves fixing a 3-carbon compound. But when temperatures exceed 30°C, they close their stomata in their leaves to reduce water loss. This results in a pause in evapotranspiration, carbon uptake, and an accumulation of oxygen in the leaf mesophyll. Unfortunately, due to the abundance of oxygen and scarcity of carbon dioxide, the enzymes responsible for producing glucose, the primary photosynthetic byproduct for plants, start fixing oxygen instead. This process, known as photorespiration, is inefficient and consumes ATP, ADP, and glucose to produce ammonia and carbon dioxide among others as waste products. The tree becomes unable to produce the energy necessary to sustain life and begins to spiral into senescence. Another way of explaining this phenomenon in more relatable terms, this oxidative stress is similar to a person holding their breath, and the damage caused by the body's inability to dispose of waste gasses of respiration.

These trees, except for #327, are not only suffering from prolonged drought but also from progressively warmer seasons. They are dying of oxidative heat stress. The remaining trees that are still alive are expected to continue deteriorating rapidly. As these dying trees become colonized by fungi and fauna, their structure further deteriorates, hastening their decay. Considering the broader scope of the proposed future land use, it is advisable for NVSD to address this emerging risk at the project's outset, rather than dealing with it during the building phase of development. Taking action early will provide more design options and prevent the unnecessary removal of healthy trees.

Dead and Dying Trees Recommended for Removal							
Tree #	**Species**	**Ownership**	**Diameter (cm)**	**Condition**	**Suitability for Retention**	**Recommendation**	**Permits Required**
81	*Alnus rubra*	SD44	30	Dead	Poor	Remove	Yes
327	*Acer saccharum*	SD44	41	Dead	Poor	Remove	Yes
398	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
399	*Alnus rubra*	SD44	27	Dying	Poor	Remove	Yes
402	*Alnus rubra*	SD44	41	Dead	Poor	Remove	Yes
423	*Alnus rubra*	SD44	90	Dying	Poor	Remove	Yes
432	*Alnus rubra*	SD44	32	Dead	Poor	Remove	Yes
434	*Alnus rubra*	SD44	30	Dying	Poor	Remove	Yes
438	*Alnus rubra*	SD44	50	Dead	Poor	Remove	Yes
440	*Alnus rubra*	SD44	35	Dying	Poor	Remove	Yes
446	*Alnus rubra*	SD44	30	Dead	Poor	Remove	Yes
451	*Alnus rubra*	SD44	50	Dying	Poor	Remove	Yes
464	*Alnus rubra*	SD44	50	Dying	Poor	Remove	Yes

Dead and Dying Trees Recommended for Removal							
Tree #	**Species**	**Ownership**	**Diameter (cm)**	**Condition**	**Suitability for Retention**	**Recommendation**	**Permits Required**
941	*Alnus rubra*	SD44	30	Dead	Poor	Remove	Yes
942	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
945	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
946	*Alnus rubra*	SD44	24	Dying	Poor	Remove	Yes
947	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
948	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
949	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
950	*Alnus rubra*	SD44	60	Dead	Poor	Remove	Yes
951	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
952	*Alnus rubra*	SD44	105	Dying	Poor	Remove	Yes
953	*Alnus rubra*	SD44	30	Dying	Poor	Remove	Yes
954	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
955	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
963	*Alnus rubra*	SD44	40	Dying	Poor	Remove	Yes
970	*Alnus rubra*	SD44	23	Dead	Poor	Remove	Yes
972	*Alnus rubra*	SD44	22	Dying	Poor	Remove	Yes
TOTALS						**29**	**29**

Dead of Dying Trees on CNV Property				
Tree #	**Species**	**Ownership**	**Diameter (cm)**	**Condition**
395	*Alnus rubra*	CNV	20	Dead
396	*Alnus rubra*	CNV	27	Dying
401	*Alnus rubra*	CNV	28	Dead
428	*Alnus rubra*	CNV	30	Dying
429	*Alnus rubra*	CNV	35	Dying
447	*Alnus rubra*	CNV	32	Dying

Summary of Conclusions

[6] trees subject to The Corporation of the City of North Vancouver Bylaw, 2022, No. 8888 are recommended for removal due to their inability to survive the demolition process.

[29] trees subject to The Corporation of the City of North Vancouver Bylaw, 2022, No. 8888 are dead or dying, and by nature of this condition, possess risk manifest to future site occupancy and use.

Respectfully,

[redacted]

[redacted]

18465 53rd Avenue
Surrey, BC V3S 7A4
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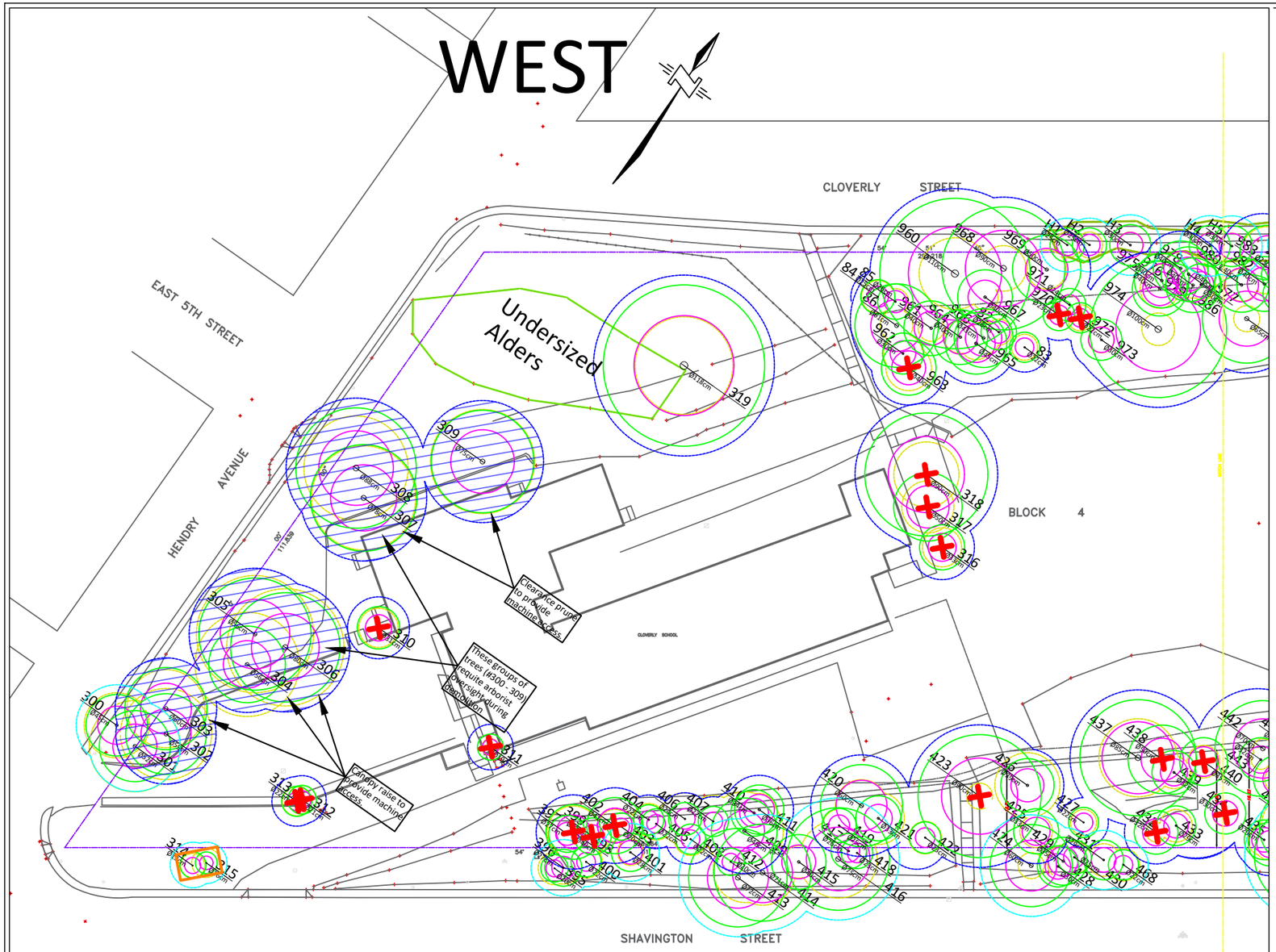
[redacted]



Tree #	Species	Diameter (cm)	Condition	Suitability for Retention	Recommendation	Rationale
81	*Alnus rubra*	30	Dead	Poor	Remove	Dead/dying tree
301	*Acer platanoides*	52	Good	/	Retain	Canopy conflict with machinery
302	*Acer platanoides*	59	Good	Moderate	Retain	Canopy conflict with machinery
303	*Acer platanoides*	60	Good	Moderate	Retain	Canopy conflict with machinery
304	*Acer platanoides*	56	Good	Moderate	Retain	Canopy conflict with machinery
306	*Acer platanoides*	80	Good	Moderate	Retain	Canopy conflict with machinery
307	*Acer platanoides*	78	Good	Moderate	Retain	Canopy conflict with machinery
308	*Acer platanoides*	88	Good	Good	Retain	Canopy conflict with machinery
309	*Acer platanoides*	75	Good	Moderate	Retain	Canopy conflict with machinery
310	*Malus fusca*	31	Poor	Poor	Remove	Conflict with demolition
311	*Alnus rubra*	19	Good	Poor	Remove	Conflict with demolition
312	*Populus trichocarpa*	21	Good	Poor	Remove	Conflict with demolition
313	*Populus trichocarpa*	22	Good	Poor	Remove	Conflict with demolition
316	*Acer palmatum*	33	Fair	Moderate	Remove	Conflict with demolition
317	*Pinus sylvestrus*	50	Fair	Poor	Remove	Conflict with demolition
318	*Prunus laurocerasus*	90	Good	Moderate	Remove	Conflict with demolition
327	*Acer saccharum*	41	Dead	Poor	Remove	Dead/dying tree
395	*Alnus rubra*	20	Dead	/	Remove	Dead/dying tree
396	*Alnus rubra*	27	Dying	/	Remove	Dead/dying tree
398	*Alnus rubra*	40	Dying	Poor	Remove	Dead/dying tree
399	*Alnus rubra*	27	Dying	Poor	Remove	Dead/dying tree
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952	*Alnus rubra*	105	Dying	Poor	Remove	Dead/dying tree
953	*Alnus rubra*	30	Dying	Poor	Remove	Dead/dying tree
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LEGEND

	Critical Root Zone (DBH x 6) - No impact - Minimum radius from tree required for tree stability.
	Critical Root Zone (DBH x 10) - Minimal Impact - Minimum radius from tree required for tree health.
	Surveyed Canopy Spread - Canopy Management Area - No aerial movement. Pruning may be required.
	Tree Management Area - On-Site - Arborist oversight required during any operations within this area.
	Tree Management Area - Off-Site - Arborist oversight required during any operations within this area.
372	Tree Tag Number corresponding with aluminum tree tags fixed to inventoried trees.
	Property Line
	Hedge Line (extents)
	Tree Line Extent (Undersized Tree Stand)

Drawing No.: 1 of 2	Sheet Title: Phase 1 Demolition Tree Removal and Protection Plan (WEST)	Project Title: Cloverley School Replacement	Project Address: 440 Hendry Avenue, North Vancouver	0 5 10 All Units in Meters	BC Plant Health Care Inc. 18465 53rd Avenue, Surrey, BC. P: 604-575-8727 F: 604-576-2972 E: info@bcplanthealthcare.com 24 Hour Emergency Pager: 604-607-1616
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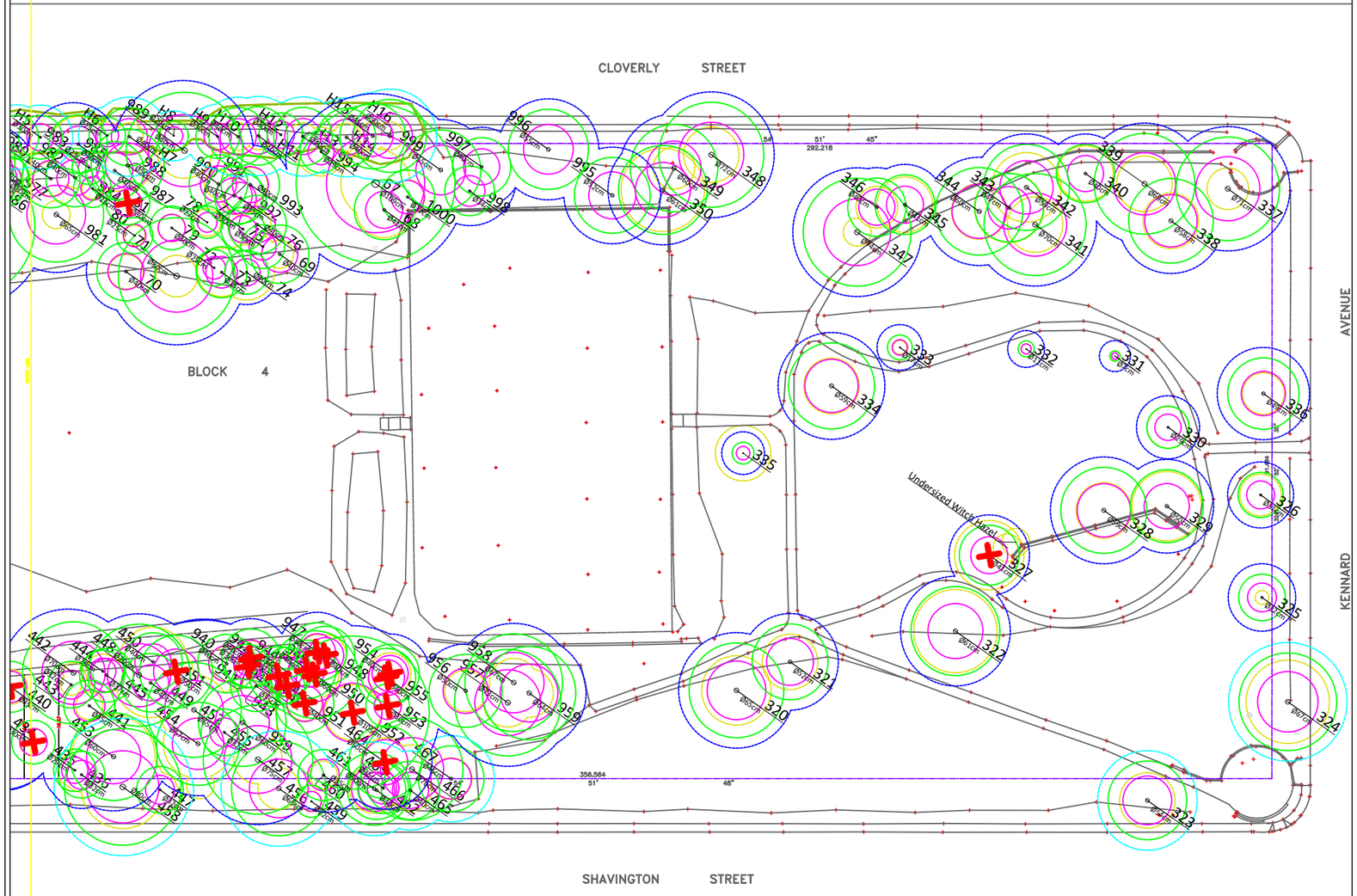
EAST



LEGEND
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Drawing No.: 2 of 2	Sheet Title: Phase 1 Demolition Tree Removal and Protection Plan (EAST)	Project Title: Cloverley School Replacement	Project Address: 440 Hendry Avenue, North Vancouver	0 5 10 All Units in Meters
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[redacted]

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BC PHC

Limitations of this Assessment

It is BC Plant Health Care Inc.'s policy to attach the following clause regarding limitations. We do this to ensure that developers or owners are clearly aware of what is technically and professionally realistic in retaining trees.

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of the above-ground parts of each tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of insect attack, discolored foliage, the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the tree(s) and the surrounding site, and the proximity of property and people. Except where specifically noted in the report, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations involving excavation were not undertaken.

Notwithstanding the recommendations and conclusions made in this report, it must be raised that trees are living organisms, and their health and vigor constantly change over time. They are not immune to changes in site conditions, or seasonal variations in the weather conditions.

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

Although every effort has been made to ensure that this assessment is reasonably accurate, the trees should be re-assessed periodically. The assessment presented in this report is valid at the time of inspection.