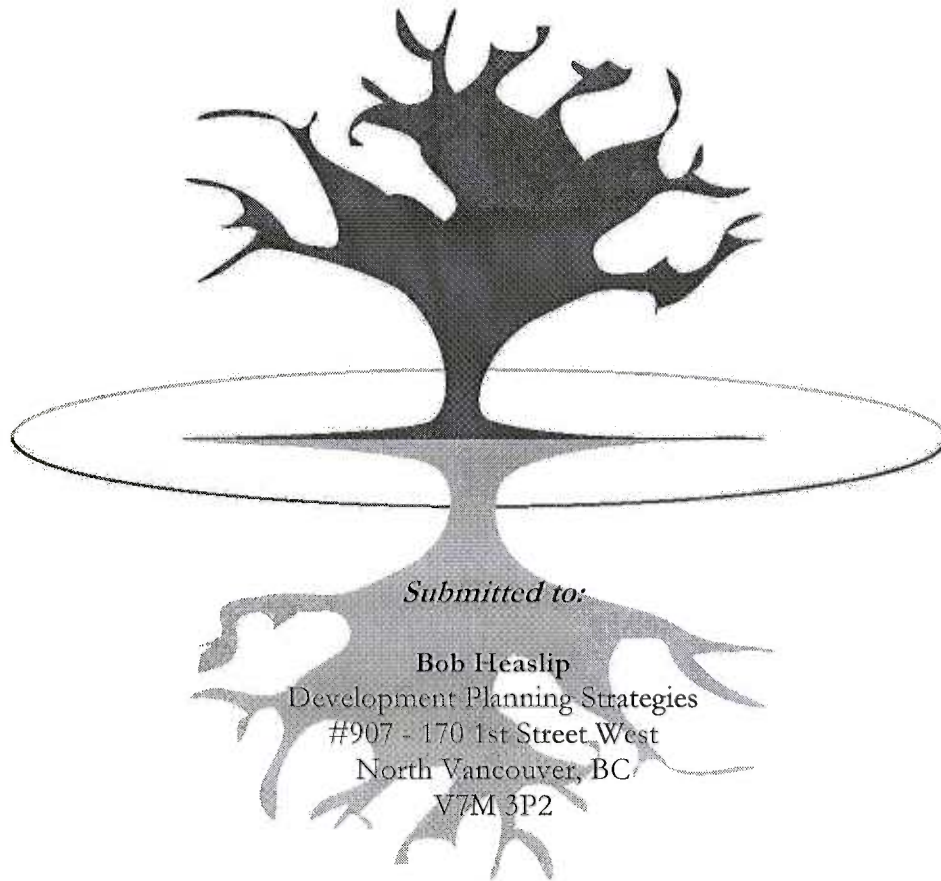


Arboriculture Assessment for 3707-3739 Dollarton Highway, North Vancouver BC



Submitted to:

Bob Heaslip
Development Planning Strategies
#907 - 170 1st Street West
North Vancouver, BC
V7M 3P2

Submitted by:

Diamond Head Consulting Ltd.
342 West 8th Ave
Vancouver BC
V5Y 3X2
604-733-4886

January 2008

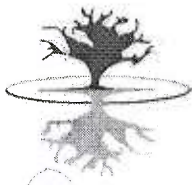


Table of Contents

TABLE OF CONTENTS 3

OVERVIEW 4

DISCUSSION..... 4

 Stand Overview 4

 Tree Retention Potential..... 5

TREE INVENTORY..... 6

 Tree Protection Zones..... 9

 Excavation adjacent to trees 9

 Regulation of Soil Moisture and Drainage..... 10

FINAL REMARKS.....10

LIMITATIONS:..... 11

Overview

Diamond Head Consulting Ltd. (DHC) was asked to perform a tree assessment for the trees located on the proposed development site located at 3707-3739 Dollarton Highway in North Vancouver BC. The last site was visited on January 7, 2008. All trees that were greater than 20 cm in diameter were assessed including: species type, diameter at breast height (dbh), estimated height and general health and defects. These trees were also assessed for tree hazards according to WorkSafe BC's Urban Tree Hazard Assessment standards and future recommendations will be made for their retention or removal based on the proposed site plans. All the trees >20cm dbh have been tagged and surveyed their locations are illustrated in Figure 1.

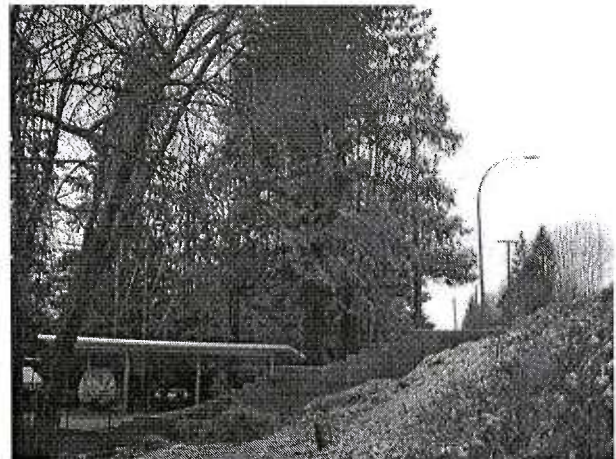
Discussion

Stand Overview

The proposed development site is located along the southern edge of Dollarton Highway adjacent to the ocean. The western edge of the property includes a small creek which is adjacent to a District of North Vancouver right of way. In the right of way are a number of taller Western hemlock (*Tsuga heterophylla*), big leaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*) trees. The middle part of the property is quite open with a hedgerow of young Western hemlock and spruce (*Picea* spp.) and scattered cherry (*Prunus* spp.) and apple trees (*Malus* spp.). The southern end of the site is at the foreshore where there is a steep drop off to the water. At this edge there are a couple of larger Western redcedar trees (*Thuja plicata*), red alder and scattered smaller bigleaf maple and cherry trees. On the adjoining property to the east, there are a number of larger western hemlock, and bigleaf maple trees that are within 10 meters of the property boundary.



Looking west at the western boundary of trees, near the creek (the majority of which are located on the right of way). The house in the foreground will remain on the site.



Looking at the northwest corner of the site.



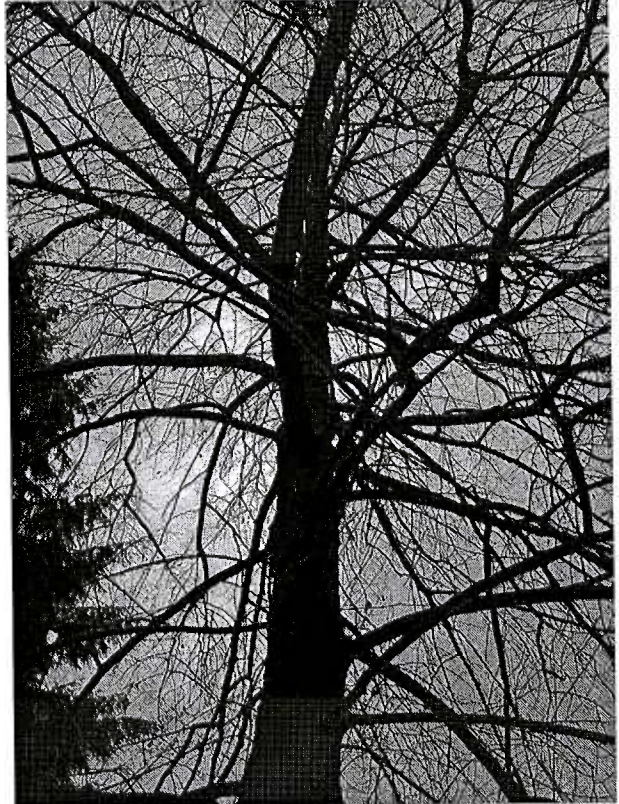
Looking to the south (in the western corner) at the larger cedars near the foreshore, with the creek at the right edge of the photo.



Looking east at the larger trees located in the southeast corner of 3739 and the adjoining property. Note that in the middle of the lots there are a number of small, young trees.



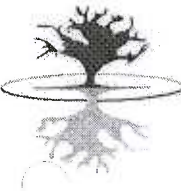
Looking at tree # 237. This tree has a codominant stem and boring dust at its base.



Tree # 236

Tree Retention Potential

Four trees of significance were found on the proposed development site. Tree #'s 236 a linden (*Tilia* spp.) and 923, 50 and 892 Western redcedars. The linden tree is significant due to its species size and form and the western redcedars due to their size. Retention areas will have to focus on the edges of the development where trees must be retained (by the creek and foreshore), or where there is enough room for healthy root development and where it is possible due to the proximity of adjacent trees to ensure a windfirm group.



Tree Inventory

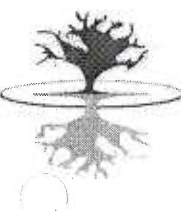
The following is an inventory of the trees that were assessed. Their locations are illustrated on Figure 1.

Tree #	Species*	Diameter at Breast Height	Height	Tree Protection Zone (m)	Notes
		(cm)	(m)		
243	Pr	36,31	11	4	Codominant stem - no defects
235	Pr	34	10	4	Minor wounds
243	Pr	19,42,28	12	4	Small stem has a dead top
242	Pr	21	10	3	Healthy
246	Mb	42	16	5	Healthy - roots may have been impacted by driveway
248	Cw	64	22	6	Healthy
234	Hw	83	25	-	Codominant stem - major inclusion, severe sweep at base - remove
247	Mb	14,18,13	12	3	Coppice from an older cut stem
239	Mb	28,20,26,38,30	13	3	Multiple stems (except one on own)
16	Dr	26	13	3	At outlet of culvert for creek
240	Mb	39	22	4	Healthy
249	Mb	40	19	4	Healthy
250	Juniper	27	10	-	In decline
23	Hw	32	19	3	Undercut by creek - stable with group
23A	Hw	45	23	5	West edge of creek - not surveyed
241	Mb	64	24	5	Codominant stem with moderate inclusion - future issue - can remove western stem now
244	Juniper	18	8	3	Codominant stem with moderate inclusion - poor health - size of part very small
237	Hw	48,62	29	-	Codominant stem with moderate inclusion - boring dust at base - likely impacted by deck installation - Remove
236	Tilia	68	17	6	Good health, nice form
24	Mb	40,48	28	5	Codominant stem with minor inclusion

*Species codes: Pr – Cherry, Mb – bigleaf maple, Hw – Western hemlock, Cw – Western redcedar, Ep – paper birch, Dr – red alder

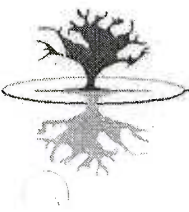
Tree #	Species	Diameter at Breast Height	Height	Tree Protection Zone	Notes
923	Cw	82,49	33	6	Codominant stem with minor inclusion – good
892	Cw	73	30	6	Good – cutslope at base of tree – erosion concern
822	Dr	34	22	4	Healthy
15	Mb	23,14,28, 20,18,26, 32	18	4	Good – multiple stems but young
899	Ep	35	18	4	Large sweep at base – no target
B	Dr	60	24	4	Lean off of top of bank – no target
917	Dr	28	20	3	Extreme lean over water
921	Dr	38,60	22	4	Two separate stems – healthy lean
21	Cw	48	21	5	Healthy
904	Pr	12	8	2	Fair
884	Hw	16	10	2	Good
909	Hw	16	11	2	Good
918	Hw	20	12	2	Good
883	Hw	18	11	2	Healthy
238	Holly	30	8	3	Healthy
890	Cw	96	28	6	Decay cavity at base – but good stem shell thickness
885	Mb	15,16	10	2	Two separate stems – healthy
902	Mb	15,18,14	11	2	Good – multiple stems but young
888	Mb	10,14,13,8,18	10	2	
C	Mb	15	8	2	Wounds on east side
D	Apple	12	6	2	Good
E	Plum	12	4	2	Good
F	Apple	12,8,6	5	2	Good
222	Pr	13,16,19	10	3	Good
221	Apple	26	6	3	Good
220	Apple	18	6	3	Good
G	Pr	23	8	3	Good
219	Hw	38	18	4	Roots impacted – driven over by driveway
218	Hw	61	20	5	Roots impacted – driven over by driveway
223	Hw	22	14	3	Shaded out – 10% live crown

*Species codes: Pr – Cherry, Mb – bigleaf maple, Hw – Western hemlock, Cw – Western redcedar, Ep – paper birch, Dr – red alder



Tree #	Species	Diameter at Breast Height	Height	Tree Protection Zone	Notes
216	Cw	42	14	5	Healthy
214	Hw	36	14	4	Good
224	Dogwood	12	9	2	Good
226	Cw	14,16,10	12	-	Multiple stems - future hazard
227	Cw	13	6	2	Healthy
H	Pr	14	8	2	Healthy
I	Apple	26	10	3	Healthy
228	Apple	21	4	3	Healthy
229	Apple	43	8	3	Healthy
206	Hw	18	5	3	Healthy
233	Hw	51	22	-	Severe inclusion, broken top - remove
230	Hw	28	n/a	-	Blew over already
205	Hw	28	10	-	Leaning - about to fail - remove
204	Pr	18	10	3	Healthy
209	Pr	38	14	5	Great older cherry, nice form
210	Pr	30,16	8	4	Good
207	Apple	10,8,6	4	2	Poor health
211	Apple	10,6	3	2	Poor health
215	Pr	19	7	3	Good
232	Pr	12,12	10	3	Healthy - codominant stem
217	Dr	36	14	3	
225	Pr	16	9	3	
51	Hw	38	13	-	On an old cedar stump - tree hazard - remove
213	Pr	10,12,10	6	2	
J	Pr	28,22	8	3	
212	Dr	30	15	4	Lean, healthy
17	Hw	52	28	5	
19	Hw	85	26	-	Topped, multiple stems coming out from topping - 8 m in length - tree hazard
18	Hw	48	6	-	Dead - remove
50	Cw	88	28	6	Ivy growing throughout - cut ivy at base - otherwise healthy

*Species codes: Pr - Cherry, Mb - bigleaf maple, Hw - Western hemlock, Cw - Western redcedar, Ep - paper birch, Dr - red alder



Tree Protection Zones

Prior to any excavation on the site, tree protection zones (TPZ) should be established using the guidelines established by the District of North Vancouver. The fencing must be erected prior to any excavation or construction and remain intact throughout the entire period of construction.

This protection zone is required to retain good health and vigour of all trees to be retained. The following are guidelines and standards for the TPZ:

- No soil disturbance or stripping is permitted in this zone
- The natural grade shall be maintained
- No storage, dumping of materials, parking, underground utilities or fires are permitted
- Utilities should be routed around the TPZ
- Surface drainage should not be altered so as to direct water into or out of the zone
- Site drainage improvements should be designed to maintain the natural water table levels within the TPZ
- Any planned excavation within the tree protection zone should be supervised by the consulting arborist
- Any construction activities planned within the TPZs including special foundations, footings and paving designs must be designed and constructed carefully as to have no short or long term impacts on the subject trees. These designs must be reviewed and supervised by the consulting arborist.

Respecting these guidelines will prevent changes to the soil and rooting conditions, wounding of the trees and contamination due to spills, and waste. Any plans for work or activities within the TPZ that are contrary to these guidelines should be discussed with the project arborist so that mitigation measures can be implemented and work within the zone can be monitored.

Excavation adjacent to trees

The following design and construction guidelines should be followed to minimize the long term impacts to these trees:

- Any excavation activities in the TPZ should be monitored by the project arborist. Excavation should remove and disturb as little of the rooting zone as possible and all roots greater than 5cm should be hand pruned.
- The natural grade of the rooting zone should be maintained. If the grade is altered it should be raised and not reduced in height.
- The long term health of the tree is directly dependent on the volume of available below-ground growing space. Any new paved areas should not be closer than 2 meters on more than two sides of a tree. This will provide enough volume to sustain the long term health of the subject trees.
- Compacted subgrade below paved surfaces causes the trees to develop shallow rooting systems. This can contribute to long term damage to pavement surfaces as these roots grow. This can be prevented by minimizing the compaction of subgrade materials through the use of structural soils and increasing the strength of the pavement to reduce the reliance on subgrade for strength.
- If it is not possible to minimize the compaction of subgrade materials, subsurface root barriers should be considered to help direct roots downward into the soil and prevent them from growing directly under the paved surfaces.

Regulation of Soil Moisture and Drainage

The excavation and construction activities adjacent to the TPZs can influence the moisture availability to the subject trees. This is due to a reduction in the total rooting mass, changes in drainage conditions and changes in exposure including reflected heat from adjacent hard surfaces. To mitigate these concerns the following guidelines should be followed:

- Soil moisture conditions within the tree protection zones should be monitored during hot and dry weather. When soil moisture conditions are dry, supplemental irrigation should be provided. Irrigation should wet the soil to the depth of the root system (approximately 30 cm deep).
- Any planned changes to the surface grades within the TPZs including the placement of mulch should be designed so that the water will flow away from the trunk of the trees.
- Excavation adjacent to trees can alter the soils hydrological processes by draining the water faster than it had naturally. The placement of a layer of heavy-duty plastic between the soil profile and the shot crete will help to prevent this. Also, trees within 6 meters of the excavation should be irrigated more frequently.

Final Remarks

This overview assessment provides a detailed inventory of trees located within the planned development site along with their health and initial recommendations for retention. Development plans should be finalized using this information as guidance. The arborist is available to discuss options during this planning stage. It should also be noted that prior to clearing of the site a Raptors nest survey must be completed to ensure compliance with *The Wildlife Act*.

If there are any questions or concerns as to the contents of this report please contact me at any time.

Sincerely,



Trevor Cox, MCIP
ISA Certified Arborist

604-733-4886

**Limitations:**

The assessments of the trees discussed in this correspondence have been made using acceptable arboricultural techniques. These include a visual tree assessment of the trees discussed 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), the surrounding site and the proximity of property and people. Except where specifically noted in this correspondence, none of the trees examined were dissected, cored, probed, or climbed, and detailed root crown examinations were not undertaken.

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

While reasonable efforts have been made to ensure that the trees recommended for retention are healthy, no guarantees are offered, or implied, that the trees recommended for retention are healthy, no guarantees are offered or implied, that these trees, or all 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 all their component parts, in all given 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. In accordance with standard practice, the assessment presented in this correspondence is valid at the time it was undertaken.

Approval and implementation of any recommendations made within this correspondence is the responsibility of the owner of the trees, and in no way implies any inspection or supervisory role on the part of Diamond Head Consulting Ltd. unless we have specifically been requested to examine said implementation activities, and have been able to do so. In the event that inspection or supervision of all or part of the implementation plan is requested, said request shall be in writing and the details agreed to in writing by both parties. Any on site inspection or supervisory work undertaken by Diamond Head Consulting Ltd. shall be restricted to the items requested, and shall be recorded in written form and submitted to the client as a matter of record.

Sketches, diagrams and photographs contained in this report, being intended as visual aids, should not be construed as engineering reports or legal surveys. If a tree prescribed for removal is not situated wholly on the owners' property, then permission from the additional owner(s) must be obtained before treatment is undertaken.