

Colliers International 200 Granville Street, 19th Floor Vancouver, BC V6C 2R6

June 13, 2016

University Endowment Lands 5495 Chancellor Boulevard Vancouver, BC V6T 1E2

Attention: Jonn Braman, Manager

RE: Block F Tree Height Clarification

The Block F project team consists of a number of consulting firms, each specializing in a particular field and each member of the team was selected for this project because of their expertise in their respective fields. Two of these firms; Diamond Head Consulting Ltd. and R.F. Binnie have been actively involved in the proposed development of the Block F site and have worked with the balance of the team since proposed development plans were first brought forward.

Diamond Head Consulting Ltd. is an arborist whose forte is evaluating tree health, determining tree species and establishing windfirm edges where selective tree removal is contemplated. From the onset of their involvement of the project, they have not been tasked with detailed tree location or establishment of tree height as these services were provided by R.F. Binnie.

R.F. Binnie is a civil engineering company who also provides legal survey work throughout B.C. They were retained to provide civil engineering services as well as legal survey work inclusive of establishing the property boundary, establishing tree location and height, parcelization (subdivision) and topography. They have provided tree heights and other locational data since 2013 with a number of additional surveys as recently as 2015.

It should be noted that both of these firms have worked closely with PWL Partnership in the evolution of the park design culminating in the design/layout set out in the May 20, 2015 rezoning resubmission. This document contained both the R.F. Binnie survey data with respect to trees as well as PWL's simplification of the tree survey data for the purposes of establishing a windfirm edge and an opportunity for more active park space immediately adjacent to the forested area.

As noted above, Diamond Head Consulting Ltd. was retained by MCC in order to evaluate the health, quality and species of existing trees as these relate to the proposed dedicated park space and more recently to advise on establishing a windfirm edge that coincides with the PWL Partnership proposed landscape plans for the park and immediately adjacent open space areas. Diamond Head issued two reports; the first was issued on August 20/13 and contained a general assessment of the trees forming a windfirm edge around the preliminary park boundary. This report formed part of the Technical Appendices attached to the December 8, 2013 rezoning submission.



Diamond Head Consulting Ltd. carried out additional work during March 2015 culminating in an updated report dated April 8/15. This report focused on the overall site opportunities for tree retention and the feasibility of the updated park design vis-a-vis a wind firm edge in that localized area. The heights of trees were not a specific focus of Diamond Head's work leading up to the issuance of the two reports although Diamond Head Consulting Ltd. did make approximations for the tree height using a methodology as per the memo attached. This second report formed part of the Technical Appendices attached to the May 20, 2015 rezoning resubmission.

R.F. Binnie has carried out all of the survey work related to the project thus far including all location based tree survey work. The original survey work included the tree locations. The March 22, 2013 survey captured the tree heights for a number of trees focusing on the tallest and the windfirm trees. On April 19, 2013 and January 8, 2015 additional trees were added to the survey for additional information and to confirm the feasibility of the proposed park plan. Locations and tree heights were surveyed. The survey methodology used by R.F. Binnie is noted in the attached memo.

The Diamond Head Consulting Ltd. report was not previously updated with the surveyed tree heights as its focus was on overall health, retention opportunities and park design feasibility and because another professional had acquired the new tree height information. The dates of the R.F. Binnie field work and the increased accuracy of the survey work superseded the Diamond Head Consulting Ltd. height estimates for the purposes of the planning work from March 22, 2013. All of the survey information was contained in the Dec 8/13 and May 20/15 rezoning submissions.

In the CACWG meeting of May 18/16, questions were raised about the tree heights contained in the Diamond Head Consulting Ltd. Report (April 8, 2015) which was available on the UEL website. After reviewing the Diamond Head Consulting Ltd. April 8, 2015 report and the R.F.Binnie survey data (March 22, 2013 to January 8, 2015), it was decided to update the Diamond Head Consulting Ltd. Report with the survey data so that all documents had consistent and accurate information. The differences in tree heights were discussed between PWL and Diamond Head Consulting Ltd. with the understanding that the techniques used by the surveyor would yield more accurate results. In order to have maximum clarity around which tree heights had been changed in the report, these were noted to have come from the R.F. Binnie Survey.

Subsequent to the Public Open House on May 31, 2016 and further to the statements made during the questions and comments period regarding the process by which the Diamond Head Consulting Ltd. report was updated PWL spoke with Mr. Coulthard from Diamond Head. Mr. Coulthard clarified that he was not pressured into changing the document; that exact heights are not usually critical in an arborist report and that it was his assumption that the surveyor would be able to calculate more exact heights than their own methodology.

The records show the tree heights have been known since 2013 as accurately measured in the R.F. Binnie survey and have been used to inform the planning and design currently put forward and further have been included in the project updates and accessible to the public over time. It is important to note that the two firm's work (Diamond Head Consulting Ltd. and R.F. Binnie) are important to look at together as they effectively are aimed at providing different information.



I trust the above clarification is helpful in understanding the relevant information regarding tree health and location as well as height.

Sincerely,

COLLIERS INTERNATIONAL CONSULTING

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Gordon Easton Managing Director +1 604 662 2642 Gordon.Easton@colliers.com



June 3, 2016

Re: 1266 UEL - Tree height measurement methodology

Tree heights are included in most arborist inventories, however the exact height of trees is usually not required. The focus of arborist reports is the tree health, structural stability and rooting condition. To measure heights we use laser rangefinders (Haglof Vertex Laser or the TruPulse 200). These calculate distance to and height when there is a clear view to the top of the tree.

For a closed stand of trees such as those at 1266 UEL, it is difficult to see the tops of trees when inside the stand. While outside of the stand we stand back on the street and measure the heights of a number of trees to determine the average height of the main canopy. When inventorying trees within the stand we use this as a reference to estimate heights of the trees relative to their position in the canopy. In this way we are able to determine heights that are relatively close. These are however not as accurate as measuring each tree individually.

If there are any questions or concerns about this memo, please feel free to contact me at any time.

Sincerely,

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Mike Coulthard RPF (#3772) RPBio (#1338) 604-831-9163



Memorandum

То:	Gordon Easton	From:	Russell Warren, P.Eng.
Cc:	Jason Wegman	Date:	May 25, 2016
Project Title:	Block F	File No.:	12-125
Re:	Tree Survey Methodology		

As requested, the following is a general description of the methodology used in establishing the heights of the existing trees at Block F. The survey was completed by our survey crews in January, 2015. In order to determine the heights of the existing trees the survey crews used two different strategies: Reflectorless Total Station and Total Station Transit. In the Reflectorless Total Station methodology a specific piece of equipment called a reflectorless total station uses a laser beam to measure the distance to the object (in this case the top of the tree). In the Total Station Transit methodology a standard total station is used to measure the angle between the top and the bottom of the tree and the height of the object is calculated. Both methodologies provide a high level of accuracy and are commonly used in the surveying industry.

If you have any questions please feel free to contact us for more information.