January 21, 2021

Scott Davies, Cube Project Management Ltd., 1605 - 728 Yates St., Victoria BC V8W 0C8

Dear Mr. Davies.

As requested I have visited the site and reviewed the trees on site. Figure 1 is a survey plan of the trees. Table 1 provides details about each tree.

There are 11 bylaw sized trees on site. One tree (# 2074) is on City property. There is also a bylaw sized sequoia tree on the adjacent property in the south west corner. Two trees straddle the property line. One of those (# 2073) is between the site and City land. The other (# 2090) is at the west end of the site. The proposed works will require removal of all but four of the trees on site. That means removal of 16 trees, of which 8 are not protected trees, and 8 are protected trees. The four trees to be retained are one Garry Oak (# 2082), and 3 hawthorns ((#2089, #2090, #2091).

Table 1 provides details about the trees located. Specific actions for the trees to be retained are described below.



Figure 1. Location of trees on site.

Tag #	Species	Trunk Diameter	TPZ. radius	Protected Tree (PT)	Retain Y/N	Reason for removal	Comments
2073	Purple Leaf Plum	22	(m) 3.96	UP	N	Engineering upgrades	Street Tree. Poor condition
2074	Puple Leaf Plum	22	3.96	UP	N	Engineering upgrades	Straddles property line. Fair condition
2075	Blue spruce	35	6.30	PT	N	Within footprint of new design	Good condition
2076	Pine	22	3.96	UP	N	Within footprint of new design	
2077	Douglas-fir	67/40	16.38	PT	N	Within footprint of new design	Twin stems joined at 70 cm
2078	Pine	39	7.02	PT	N	Within footprint of new design	
2079	Pine	34	6.12	PT	N	Within footprint of new design	
2080	Pine	34	6.12	PT	N	Within footprint of new design	
2081	Pear	56	10.08	PT	N	Within footprint of new design	
NT 1	Apple	18	3.24	UP	N	Within footprint of new design	Poor condition
NT 2	Apple	16	2.88	UP	N	Within footprint of new design	Poor condition
2082	Garry Oak	74	13.32	PT	Y		
2083	Apple	27	4.86	UP	N	Within footprint of new design	
2085	Apple	18	4.86	UP	N	Within footprint of new design	
2086	Western Redcedar	36	6.48	PT	N	Within footprint of new design	
2087	Pear	29/12	6.52	PT	N	Within footprint of new design	
2088	Apple	20	3.60	UP	N	Within footprint of new design	
2089	Hawthorn	22/14	2.26	PT	Y		Multiple stems
2090	Hawthorn	18/14/9	5.72	PT	Y		Multiple stems - straddles property line
2091	Hawthorn	30	5.40	PT	Y		
138	Sequoia	105	18.90	PT	Y		Off site - considered for development impact

### The Development Proposed

Figure 2 shows the footprints of the eight units planned. I have also included the tree protection zones for the trees to be retained. The three hawthorn trees along the west boundary (#2089, #2090, #2091) are all small and are also being retained. There may be a need to prune back some parts of them to clean them up after many years of bramble growth. Since that part of the site is a rear yard there will not be a major disturbance affecting them.



Figure 2. Proposed design with building footprints.

#### **ACTION - install tree protection fencing**

Before any other site work commences the hawthorn trees to be retained shall be fenced off at a distance of 1.0 metres from the base of trees # 2091. This fence shall extend to a distance of 1.5 metres to the south of tree # 2090. See Figure 3.



Figure 3. Fencing Plan.

The oak tree (# 2082) shall be fenced off as shown in figure 4 below.



Figure 4. Fencing detail by tree # 2082.

The tree protection zone (TPZ) is set at a radial distance of 5 metres from the centre of the tree (the green area in figure 4). The fence shall extend 5 metres to the east and 5 metres to the south. Using a north - south line from the centre of the tree (dashed blue line in figure 4), set the west side of the fence 1.5 metres to the west of that centreline. Closer to the tree, angle the fence over towards the boundary.

The original design had this unit set further back to offer more protection for the tree. Council rejected that design on the basis that the rear yard would be too small, so the unit is now located in line with the other unit in the south west corner. In the new design the corner of new house is 3.2 metres from the centre of the oak tree. In order to try and ensure effective retention of the Garry oak tree I have worked with the design team to come up with a way to minimise the disturbance to the ground and roots in this area. The new design will see the north east corner of the house built on a grade beam installed on helical piles. The base of the beam is designed to be above ground, and the slab beyond it is poured on top of a gravel base so that there is no disturbance of the existing soils within the 5 metre TPZ. The parking space for the unit to the east has been modified to get it away from the TPZ, the patio for the unit in the north west corner has been modified, and the landscape irrigation will be surface drip lines or spray heads installed outside of the TPZ.

In order to make this approach work the following actions shall be implemented under the supervision of the project arborist.

1 **Prior to any other site preparation**, the oak tree shall be fenced off at as shown in detail in Figure 4.



Figure 5. Conceptual layout of plywood beyond fence, and under grade beam and slab.

2 Once the protection fence is in place around the oak tree, sheets of 5/8" plywood shall be laid down on the ground as shown in figure 5. The sheets should be screwed together with wood strips or plywood overlaps.

The intent of this plywood is to protect the ground below from any further compaction, and root damage. The area beyond the wall will create a working space of 6 feet or about 1.83 metres (1 and half sheets of plywood wide). The rest of the plywood protects the ground that will be under the grade beam and slab.

The grade beam will be placed onto a series of helical piles. The machine used to drive these piles shall operate from the west side and shall approach the location by driving on the plywood area that will be inside the planned building footprint. If necessary, double the plywood within the footprint area to sustain the machine load. Once the piles are installed, the formwork for the grade beam can be created. That will need a base layer for the bottom of the form, so that can be created with plywood on the native soil. Minor flattening of the existing soil will be fine in order to create the formwork, but no excavation is permitted without first checking with the project arborist. NOTE. The base of the grade beam is above ground not recessed into the ground. It may be wise to place that base layer of the beam form on wood spacers. These can then be knocked out after curing so that the plywood can be stripped off from the beam.

Once the grade beam is poured and cured the slab can be created. Within the TPZ area the plywood can be removed and a layer of gravel placed right onto the native soil grade, to a minimum depth of 100 mm or whatever depth beyond that is required to create a flat surface. The gravel is to be placed but not packed. The slab can be poured straight onto the gravel. Beyond the TPZ area a standard foundation and slab can be installed and native soils stripped as necessary.

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Figure 6 shows a detail of the grade beam and slab. NOTE: within the TPZ there shall be no drainage along the two walls affected.



Figure 6. Detail of the grade beam and slab within the TPZ.

The plywood between the fence and the new house shall be retained in place until all construction work is completed, and the site is ready for final landscaping.

It is possible that once the new building's location is laid out on site, there may be a need for some pruning of the oak tree canopy to create a minimum distance of 2 metres between the walls or roof and the oak tree. The exact extent of pruning required will not be known until the project is underway. Preliminary investigations suggest that it will not be extensive. Any such work is to be reviewed on site by the project arborist and conducted under that person's supervision.

Finally, it is noted that there is a large sequoia tree on the property to the south. It is located about five metres from the property line. The construction of the new unit in that area will not cause damage to this tree at this distance. This report shall form part of the materials to be read and implemented by the contractor, and said contractor shall be solely responsible for ensuring that the items listed above are implemented as specified.

In summary, I have revised the plans to accommodate the new location of the unit in the northwest corner. To retain the oak tree # 2082 will require care. It will be possible if the specifications provided above are followed carefully. If there are any questions please let me know.

Yours truly, On Behalf of Dunster & Associates Environmental Consultants Ltd.



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