DUNSTER & ASSOCIATES
Environmental Consultants Ltd.

Tree Preservation Plan

Redevelopment at 55-43 Gorge Road East, 2831, 2833, 2827 and 2829 Irma Street Victoria, BC.

Prepared for PCUrban

June 10, 2020

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Executive Summary

Dunster & Associates Environmental Consultants Ltd. has been asked to prepare a Tree Preservation Plan for PC Urban as a part of their development permit application process. The site has been surveyed to locate bylaw sized trees, and tree over 10 centimetres in diameter. A total of 46 trees were identified:

- **6 are street trees** (#1, #5, #14, #15, #16, #17) and all of them will be removed and replaced under the statutory right of way designed into the proposal with new street trees being planted along the road edges.

Of the other 40 trees **10 are offsite on adjacent properties**. Of those 2 are bylaw sized (#42, #46) and 8 are unprotected trees (#36, #37, #39, #40, #41, #43, #44, #45).

Of the **30 trees on site**:

- 3 bylaw sized trees will be retained (#2, #34, #35).
- 16 bylaws trees will be removed (#3, #4, #6, #7, #8, #13, #18, #19, #20, #21, #22, #23, #31, #32, #33, #38).
- 11 unprotected trees will be removed: (#9, #10, #11, #12, #24, #25, #26, #27, #28, #29, # 30).

The plan is to focus on successful retention of the two large Garry Oak trees #2 and # 34, and #35, and the Douglas-fir tree # 46. The elm tree # 42 is offsite, and has a small part of its critical root zone affected, but I do not feel it will make any difference to the tree.

The suggested works required to successfully retain trees has been specified in this report. If followed carefully, the trees should be able to continue on the site in good health.

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Background

The properties at 55-43 Gorge Road East, 2831, 2833, 2827 and 2829 Irma Street are being considered for redevelopment. Figure 1 shows these properties in plan view.

Figure 1. The properties to be redeveloped.

Figure 2 shows the location of bylaw sized trees and trees between 10 cm and bylaw sized.

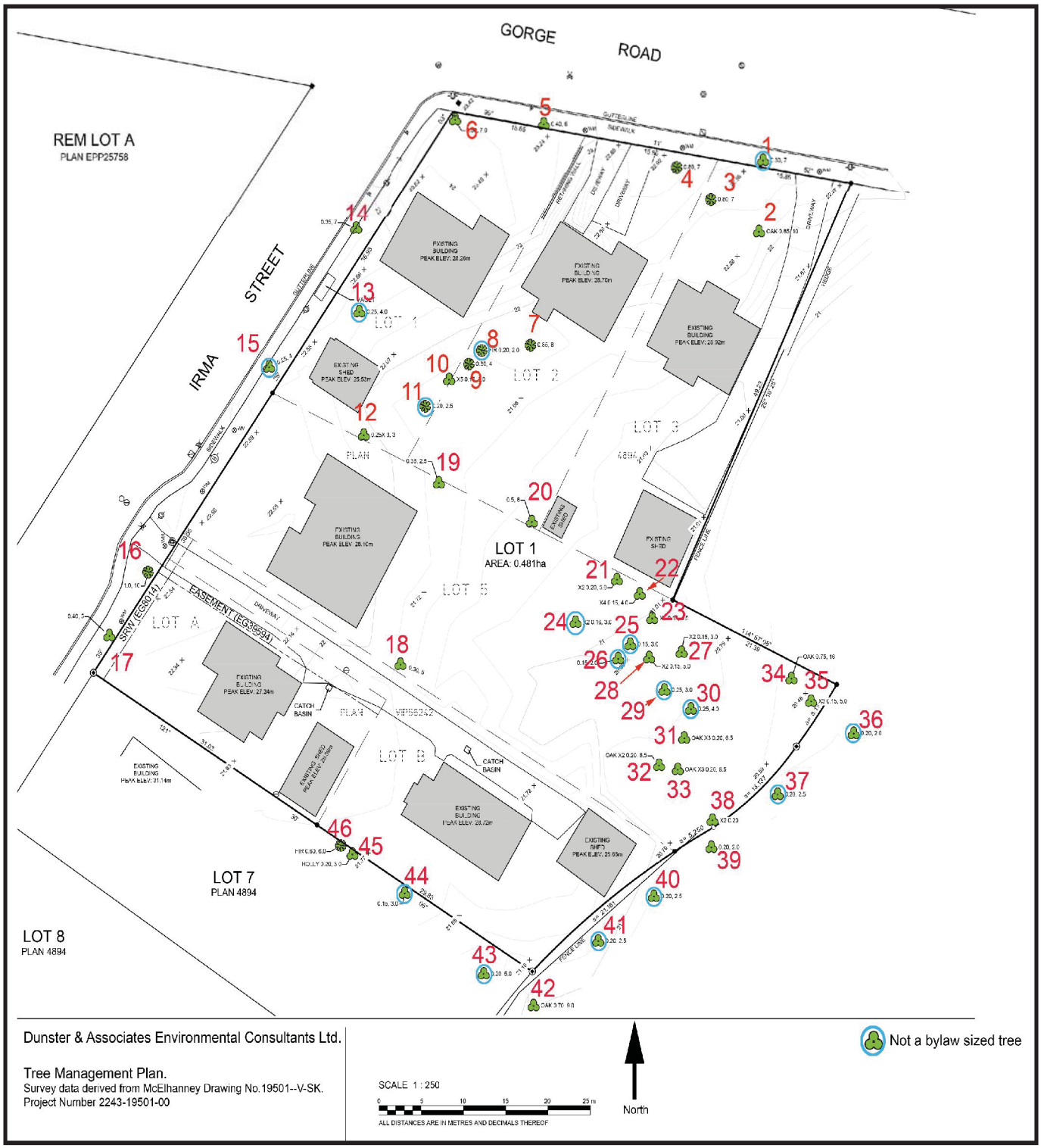

Figure 2. Location of trees.

Table 1 provides details of the trees identified in Figure 2.

Table 1. Details of the trees shown in Figure 2.

ID #	Species	DBH (cm)	Condition	Critical Root zone (m) DBH x 18	Comments	Bylaw sized tree Yes or No	Retained. Yes or No
1	Cherry	26	Poor	4.68	**Street tree**	N	N
2	Garry Oak	88	Good-fair	15.84	Good-fair. Sparse crown, heavy looper infestation. Crown spread is asymmetrical. ~ 7 metres to the south. A 4.5 metre setback would be suitable for the set back from the edge of disturbance.	Y	Y
3	Silver Fir	80	Good	14.40		Y	N
4	Douglas-fir	83		14.94	Good overall, Base swept, top vertical. Previously topped.	Y	N
5	Cherry	43	Fair	7.74	**Street Tree**	Y	N
6	Cherry	56	Poor	10.08		Y	N
7	Douglas-fir	62	Good	11.16		Y	N
8	Deodar Cedar	33	Good	5.94		Y	N
9	Deodar Cedar	21	Good	3.78		N	N
10	Cherry	10+10 +10	Fair	1.8	3 stems joined at base	N	N
11	Norway spruce	18	Good	3.24		N	N
12	Cherry	10	Fair	1.8		N	N
13	Red Maple	30	Good	5.4		Y	N
14	Plum	37	Good	18.00	**Street Tree**	Y	N
15	Plum	30	Good	4.86	**Street Tree**	Y	N
16	Douglas-fir	100	Fair	18.00	**Street Tree**. Overall good condition but the west face is severely cut back to allow for hydro wire clearance	Y	N
17	Plum	30	Fair	5.40	**Street tree**	Y	N
18	Hawthorn	48	Good	8.64		Y	N
19	Hawthorn	40	Good	7.20		Y	N
20	Horse Chestnut	62	Good	11.16		Y	N
21	Hawthorn	20+20	Fair	3.60	A patch of long abandoned land supporting an area of dense vegetation, mainly overgrown with hawthorn trees, hawthorn suckers, and brambles. Some limbs on the hawthorns have failed and resprouted new limbs. None of the trees are in excellent condition.	Y	N
22	Hawthorn	4x15	Fair	2.70		Y	N
23	Hawthorn	5x15	Fair	2.70		Y	N
24	Holly	2x16	Fair	2.88		N	N
25	Hawthorn	15	Fair	2.70		N	N
26	Hawthorn	15	Fair	2.70		N	N
27	Hawthorn	2x15	Fair	2.70		N	N
28	Hawthorn	2x15	Fair	2.70		N	N
29	Hawthorn	25	Fair	4.50		N	N

Table 1. Details of the trees shown in Figure 2.

ID #	Species	DBH (cm)	Condition	Critical Root Zone (M) DBH x 18	Comments	Bylaw sized tree Yes or No	Retained Yes or No
30	Hawthorn	25	Fair	4.50	A patch of long abandoned land supporting an area of dense vegetation, mainly overgrown with hawthorn trees, hawthorn suckers, and brambles. Some limbs on the hawthorns have failed and resprouted new limbs. None of the trees are in excellent condition.	N	N
31	Hawthorn	3x20	Fair	3.60		Y	N
32	Hawthorn	2x20	Fair	3.60		Y	N
33	Hawthorn	3x20	Fair	3.60		Y	N
34	Garry Oak	71	Good	12.78	Fair. Sparse crown due to looper defoliation. Crown is asymmetrical and larger to the north. Crown spread to the south is 8.0 metres. Use a 4.5 metres set back from the edge of disturbance.	Y	Y
35	Cherry	3x15	Fair	2.70		Y	Y
36	Maple	22	Good	3.96	**Off site**	N	Y
37	Maple	21	Good	3.78	**Off site**	N	Y
38	Hawthorn	2x20	Fair	3.6		Y	N
39	Maple	19	Good	3.42	**Off site**	N	Y
40	Maple	20	Good	3.60	**Off site**	N	Y
41	Maple	22	Good	3.96	**Off site**	N	Y
42	Elm	76	Good	13.68	**Off site**	Y	Y
43	Apple	20	Good	3.6	**Off site**	N	Y
44	Apple	15	Good	2.7	**Off site**	N	Y
45	Holly	20	Fair	3.6	**Off site**	N	Y
46	Douglas-fir	60	Good	10.80	**Off site.** Plan allows a 4.5 metre setback from the edge of disturbance.	Y	Y

Using the data shown in Table 1, Figure 3 shows the identified trees with the critical root zone (CRZ) superimposed, based on diameter multiplied by 18. The CRZ data is depicted as trees to be removed or trees to be retained, based on the proposed development plans provided to Dunster & Associates, and in particular the excavation required for the underground car parking area (shaded blue area).

Figure 3. Critical Root Zones and the planned footprint.

Discussion

The survey located a total of 46 trees. Of those six of the trees are street trees along Gorge Road and Irma Street and all of them will be removed and replaced under the statutory right of way designed into the proposal with new street trees being planted along the road edges. In addition, ten of the trees are off site, either on the property at 2815 Irma Street (4 trees), or on the lands to the east at the Gorge Road Hospital. That leaves 30 trees on site.

The development proposal will necessitate removal of 20 bylaws trees on site and 8 non bylaw sized trees. The plan is to focus on successful retention of the two large Garry Oak trees #2 and # 34, and the offsite Douglas-fir tree # 46. The elm tree # 42 is offsite. A small part of its critical root zone will be affected, but I do not feel it will make any difference to the tree.

Specific Tree Retention Details

Tree # 2

This is a Garry Oak and I understand that the discussions with the city focussed on retaining this tree due to its high profile on Gorge Avenue. I have discussed options with the client and concluded that we can retain the tree with a 4.5 metre setback from the edge of the excavation to the centre of the tree. There will be a need to prune back some of the south face of the tree canopy, but again, this should be feasible and still allow for retention of a reasonably complete tree at the end of the work.

The current plans show a new sidewalk along Gorge Road. The location of that will encroach on the protected root zone of this oak tree. The best option to reduce the amount of potential damage to the tree is to retain the existing sidewalk location, coming from the east, for about 18 metres and then bring it inwards. That will minimise root damage issues and place the curvature of the new sidewalk at the edge of the protected root zone. If the current design is retained, the new sidewalk will need to be floated over all parts of the oak root zone and if necessary grades of the sidewalk will need to be adjusted. The starting point for that work will be that the existing soil grade cannot be lowered. This means that the new sidewalk will need to be designed as a placement on top of a geotextile and biaxial geogrid material that sits right on top of the existing soil grades. The slab will need to be reinforced with rebar and expansion joints planned to be at the edges of the root zone with a continuous slab in between. None of that is especially difficult to accomplish. Final design details can be provided once the overall proposal is approved.

The work schedule for this tree will be as follows:

Step 1. Once the house is vacant and before any other work commences, the oak tree will need pruning. The anticipated pruning work is shown in Figure 4. It shall be done under my supervision.

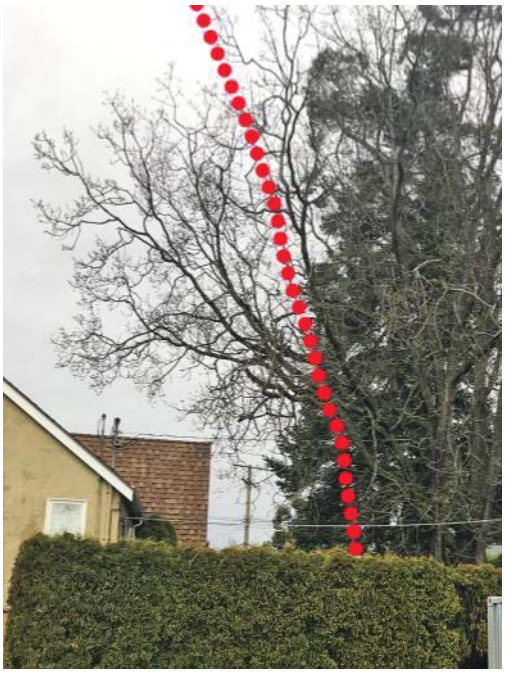

Figure 4. Pruning work for tree # 2.

Step 2. Once the pruning work has been completed, the front yard will be fenced off along the edge of the existing driveway, across the front of the house up to the front steps and across to the base of tree # 3 and then to the edge of the property. That fence shall stay in place during demolition. Figure 5 shows this first stage.

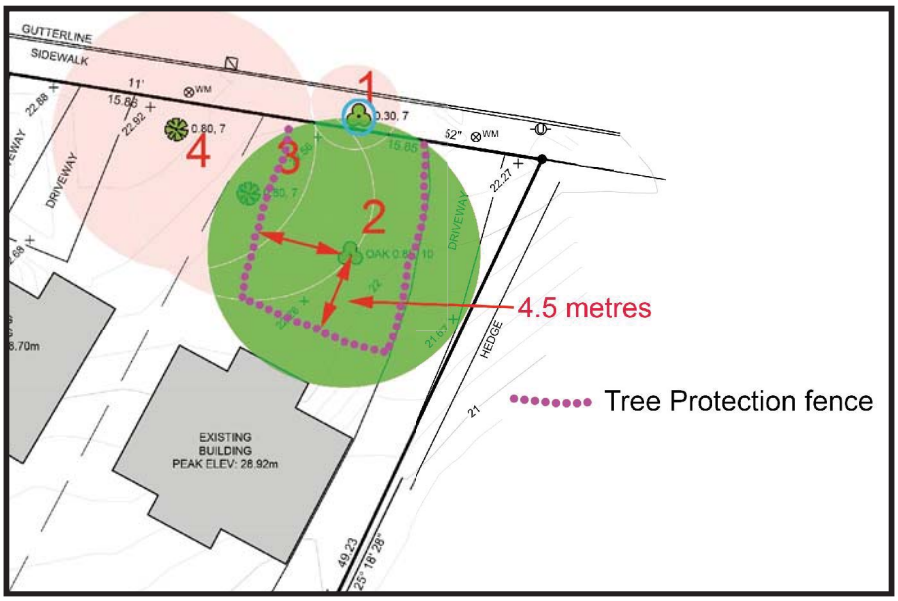

Figure 5. Tree # 2 fencing details - step 1.

The house shall be demolished from the back yard area, and the existing driveway and small edge retaining wall will be dug up and removed to the backyard under my supervision. Once the existing driveway and side wall has been removed, new soil will be imported right away and the grade raised to match the base of the tree. At that time trees # 3 and 4 shall be cut down, and the stump of tree # 3 shall be ground out, not grubbed up. The stump of tree # 4 may be grubbed up. Once that work is completed, the tree protection fence shall then be extended to be along the edge of the property along Gorge Avenue and from the east boundary across the site in front of the house at a setback distance of 4.5 metres from the centre of the tree trunk. The fence shall extend to the east by 8 metres to match the defined critical root zone in that area. This fence shall then remain in place until the construction work is completed and the site is ready for final landscaping. Figure 6 shows the fence location at the completion of step 2.

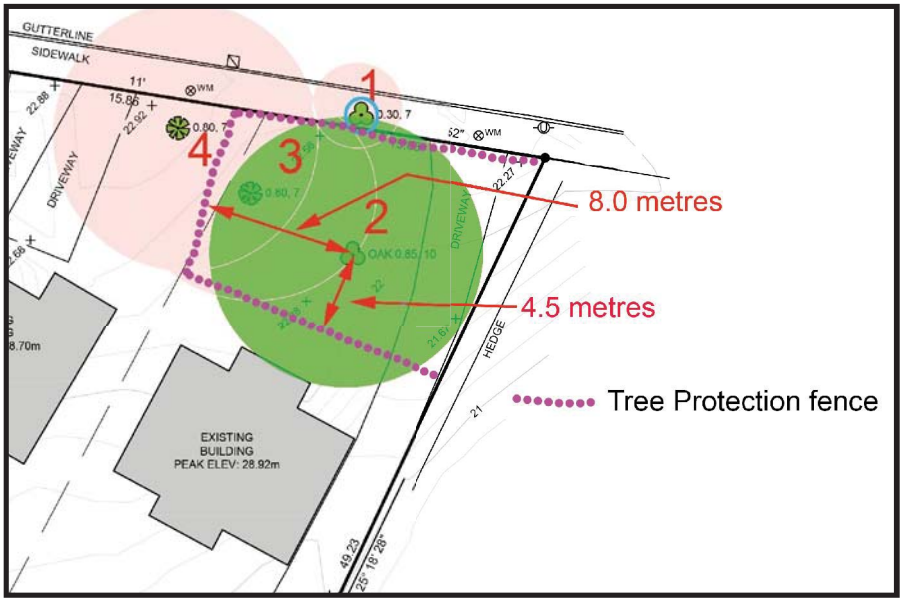

Figure 6. Tree # 2 fencing details - step 2.

Step 3.

This depends on the final design of the new sidewalk. If the existing sidewalk is retained to a point beyond the protected root zone, it will be necessary to remove the existing sidewalk to replace the entryway access point to the house at 55 Gorge Road, grub up the hedge materials along Gorge Road, and then install the new sidewalk beyond that point. If the new sidewalk follows the current design, the tree protection fenced shall be moved back to a point 40 centimetres beyond the edge of the new sidewalk location. Then the existing sidewalk, and hedge materials can be removed and the new sidewalk installed. The tree protection fence can be removed once that work has been completed.

Tree # 34
The large Garry Oak on the east boundary is in fair condition. I have reviewed it on site, cut the ivy at the base, examined the tree trunk and canopy (to the extent possible with the ivy in place in the crown), and concluded that there are no obvious structural or health problems with the tree trunk or initial scaffold branches. When I first observed it on June 28th 2019 the crown foliage showed signs of looper defoliation. That is not an insurmountable problem, and the tree may recover. I have recommended a setback distance of 4.5 metres from the centre of the tree to the excavation for that tree.

The work schedule for this tree will be as follows:

Step 1. Once the site is vacant the ground vegetation at the base of the oak tree shall be cleaned off by hand to a radial distance of 6.3 metre to the west, along the property line, and 5 metres to the south. That will include tree # 35, but the stump of that small tree is to be left on the ground. There will be a need for some crown pruning to accommodate the above ground building on the south side. That work shall be conducted under my supervision. Because the site is currently overgrown it is not possible to know exactly which limbs will need pruning back. Once the ground vegetation has been cleaned away, I will lay out the 4.5 metre setback line on the ground and then work with the tree crew retained to carefully reduce some limbs and remove others. That will remove the potential for limbs growing into the new building, but retain as much canopy as possible. Figure 7 is a concept sketch and will be refined once access to the site is feasible.

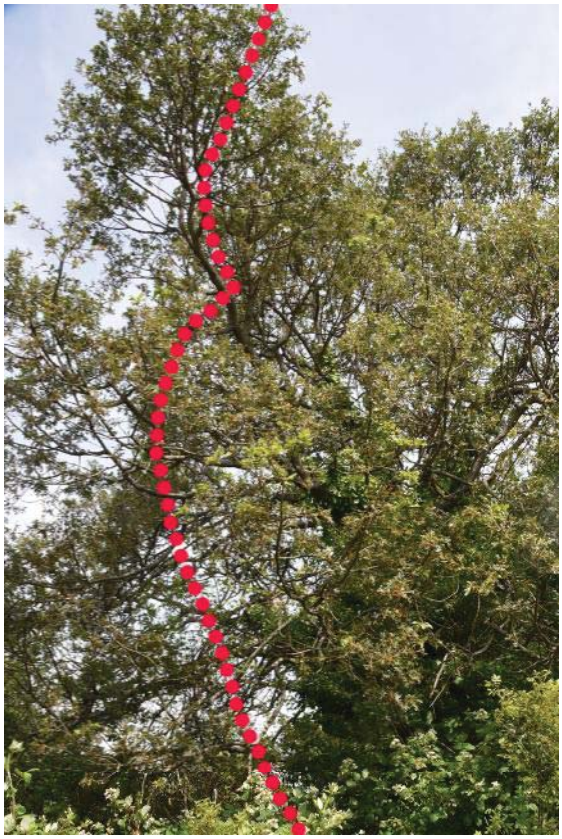

Figure 7. Tree # 34 - pruning concept.

Step 2. Once the pruning work has been completed the tree protection fence shall then be installed as shown in Figure 8, and that fence shall be maintained in place until the construction work is completed and the site is ready for final landscaping. I have assumed that there will be a perimeter security fence in place here, so the tree protection fence can be connected to that. This fence will also protect tree # 35.

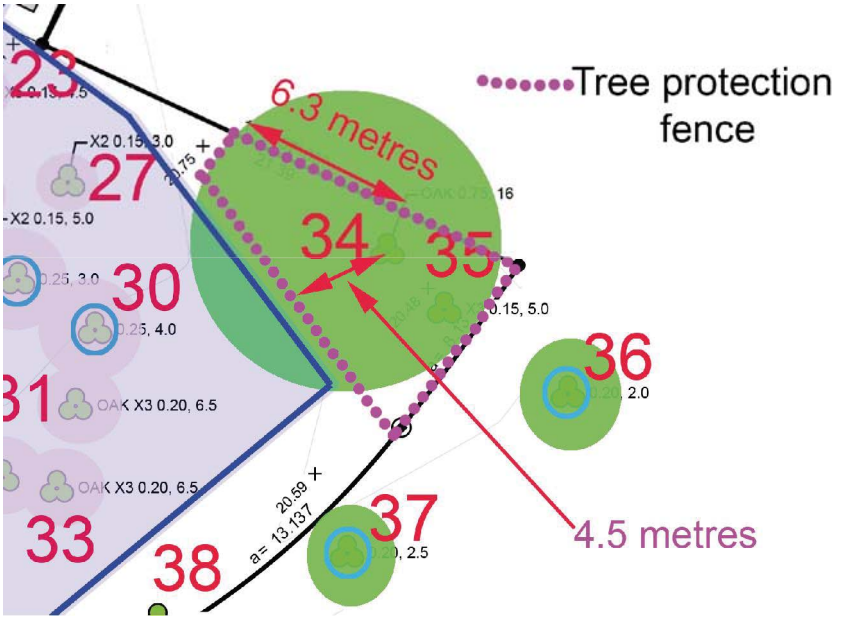

Figure 8. Fencing at tree # 34.

Tree # 46

This is the Douglas-fir tree close to the boundary and located on 2815 Irma Street. I have recommended a setback of 4.5 metres from the centre of the tree to the excavation, and the underground footprint has been adjusted to reflect that. This should be sufficient room to accommodate the tree roots and the above ground branches.

The work schedule for this tree will be as follows:

Step 1. Once the site is vacant, the existing carport will be demolished. There is one branch on the north east side of the tree that is far longer than the others, and that should be pruned back, under my supervision, to the extent of the rest of the crown. Once the pruning and car port removal is completed a temporary fence shall be erected at a distance of 4 metres around the base of the tree to the property line and up to one metre away from the back of the house at 2827 Irma Street.

Step 2 The adjacent houses will be demolished using the existing concrete pavers by the carport as a running surface. Once the two houses have been demolished the concrete pavers are to be very carefully removed under my supervision. This may be done by machine. Once all the pavers have been removed a final tree protection fence shall be installed at a distance of 4.5 metres to the north and 5.4 metres on either side along the boundary line. Figure 9 shows this detail.

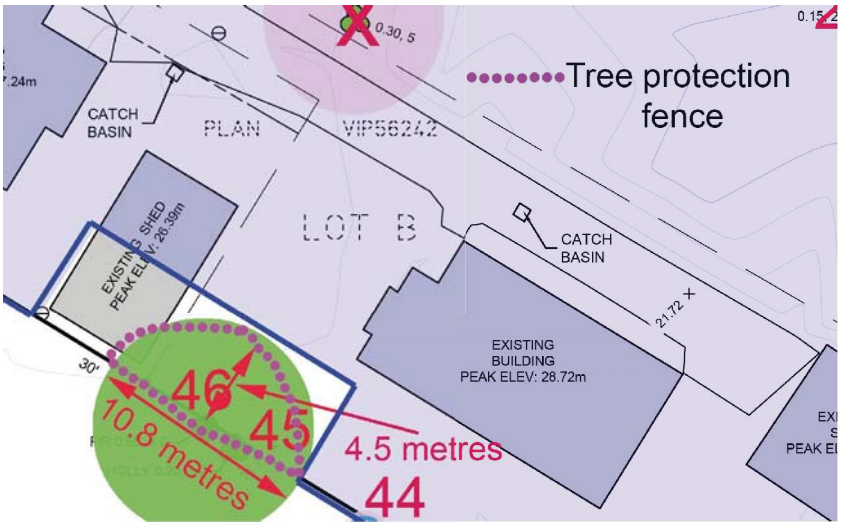

Figure 9. Fencing at tree # 46.

Work by trees #2, # 34, and # 46.

In order to successfully retain trees 2,34, and 46 the design of the underground car park will need to utilise a vertical excavation face with the current design. This will require the following steps.

The setback shall be 4.5 metres from the centre of the tree. The excavated face shall be vertical at or beyond that 4.5 metre mark. The footing shall be an L form not a T form. A drain mat can be placed over the vertical cut face. If required by the geotechnical engineer, the cut face can be shotcreted and soil nails used to maintain stability. The formwork shall be a blindform approach. The back formwork shall be placed right up against the vertical cut face with the intent of leaving it in place after concrete is poured. Figure 10 shows the concept.

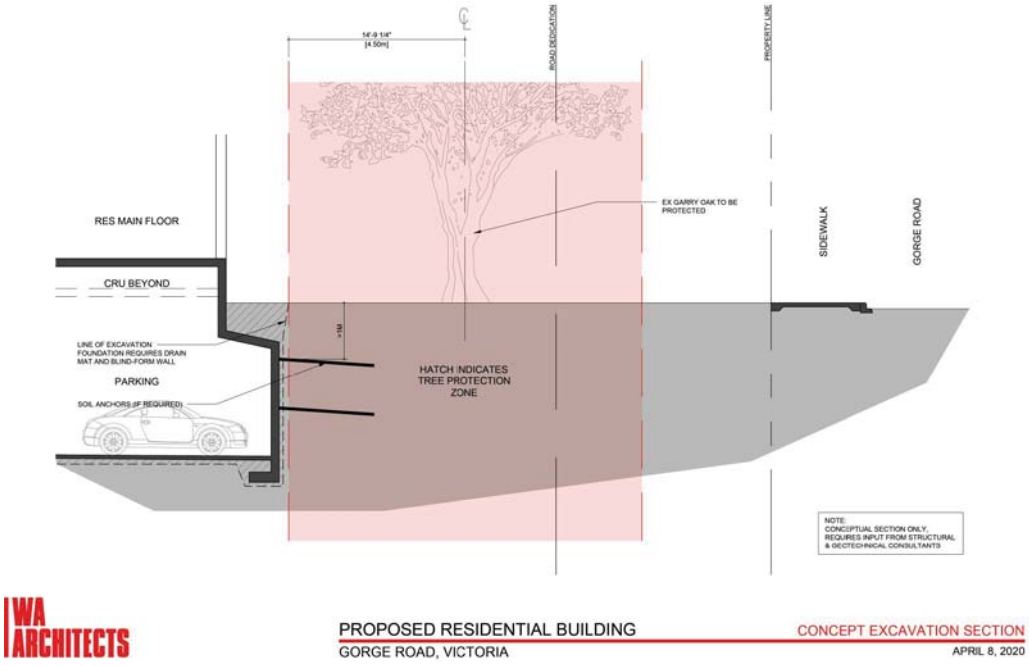

Figure 10. Blindforming detail.

Under no circumstances can the setback be reduced to be less than 4.5 metres for these three trees. In the event the geotechnical engineer feels a vertical cut face would not be feasible a battered slope would be required. This would mean that the top of the slope batter would daylight at 4.5 metres from the centre of the tree and the underground footprint would need to be adjusted inward.

Summary

The proposed development will necessitate removal of some bylaw and non bylaw sized trees. I have had discussions with the applicant to retain the two large Garry Oak trees on site (#2, #34), the cherry tree #35 by oak tree #34,and avoid damage to all offsite trees, including the large Douglas-fir tree (#46) to the south west. This report lays out the approaches required to ensure successful tree retention. If the development is approved, it will be the responsibility of the applicant to implement the suggested work as specified. Dunster & Associates Environmental Consultants Ltd. will undertake to supervise the specified works if we are requested to do so. No responsibility for that work is assumed or implied unless agreed to in writing.

This report was prepared by Dunster & Associates exclusively for use by PC Urban. The contents reflect Dunster & Associates' best assessment of the trees in light of the information available to it at the time of preparation of this report. Any use which a third party makes of this report, or any reliance on or decisions made based upon this report, are made at the sole risk of any such third parties. Dunster & Associates accepts no responsibility for any damages or loss suffered by any third party or by the Client as a result of decisions made or actions based upon the use or reliance of this report by any such party.

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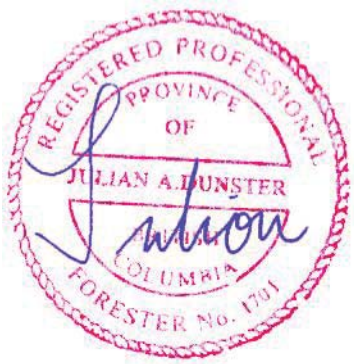

On Behalf of Dunster & Associates Environmental Consultants Ltd.

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