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August 19, 2019

Ellis Don  
7330 Fisher Street SE  
Suite #300  
Calgary, Alberta T2H 2H8

Re: Tree Impact Assessment: West Calgary Ring Road DB1

Attn: Dean Jacobs

### ***Executive Summary***

205 trees in four separate locations on the West Calgary Ring Road project were assessed to determine the likely impact of proposed construction activities upon the trees, and to determine whether attempts to retain any or all of the trees would be likely to succeed based upon the severity of the impact, up to or including the risk of immediate structural instability. See the attached Role Plot Map attached as Figure 10 for the relative locations of the areas listed below.

Area 1 - There are 67 trees on the East side of the site within the boundaries of the proposed new Greenbriar Storm Line excavation that will be required to be removed prior to excavation of material as a component of the installation of the storm line, an additional 10 trees that are anticipated to experience some significant root loss, and 13 trees where no impact should be expected providing the critical root zone is protected during construction.

Area 2 - There are 33 trees in proximity to the new 900 Water Feeder Main that will be required to be removed due to the proposed scope of the required excavation, one tree that will be impacted requiring root pruning and/or localized branch removal, and 15 trees that should not be expected to be impacted providing the critical root zone is protected during construction.

Area 3 - The Stand-Alone Retaining Wall construction will impact 11 adjacent trees, all of which will be required to be removed for Stand Alone Retaining Wall and road construction.

Area 4 - 55 trees adjacent to the new Westbound offramp from Valley Ridge to Highway One are located adjacent to the proposed work, with 24 trees known to be required to be removed prior to excavation for structural and safety considerations. As the exact placement and scope of work has not been finalized in this area, the encroachment limits have been given but no final recommendation for tree retention or removal could be made for trees with a minimum distance for structural impact of less than 3 meters.



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***Background, Scope, and Intended Use***

On July 30, 2019 ArborCare Tree Service was contacted to provide an assessment of the poplar trees along the Greenbriar Storm Line to determine if the trees could be retained or if they would need to be removed as a result of the excavation process for the storm line installation.

During the first on-site consultation on August 1, additional trees were added to the scope in various locations throughout the site. On August 12, the scope increased further to include a new total of 205 potentially-impacted trees, now clarified as Areas 1, 2, 3, and 4. The findings of the assessment and recommendations for remedial actions were to be communicated in a written report.

This report is intended for use by the Prime Contractor for submission to Alberta Transportation to communicate the potential impact of the proposed construction activity on the trees. This report, and the data and conclusions it contains, are subject to the attached statement of Qualifications, Assumptions, and Limiting Conditions.



*Figure 1: Typical Poplar in Area 1*



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## Observations

In Area 1, there are approximately 90 trees adjacent to the “Greenbriar Storm Line” scope of work (approximate location indicated by the bubbled area depicted from 603+300 to 603+800 on the drawing attached as Appendix 1). Primarily poplar trees (*Populus spp.*), these trees were affixed with numbered flagging from 1 to 90 ascending from West to East.

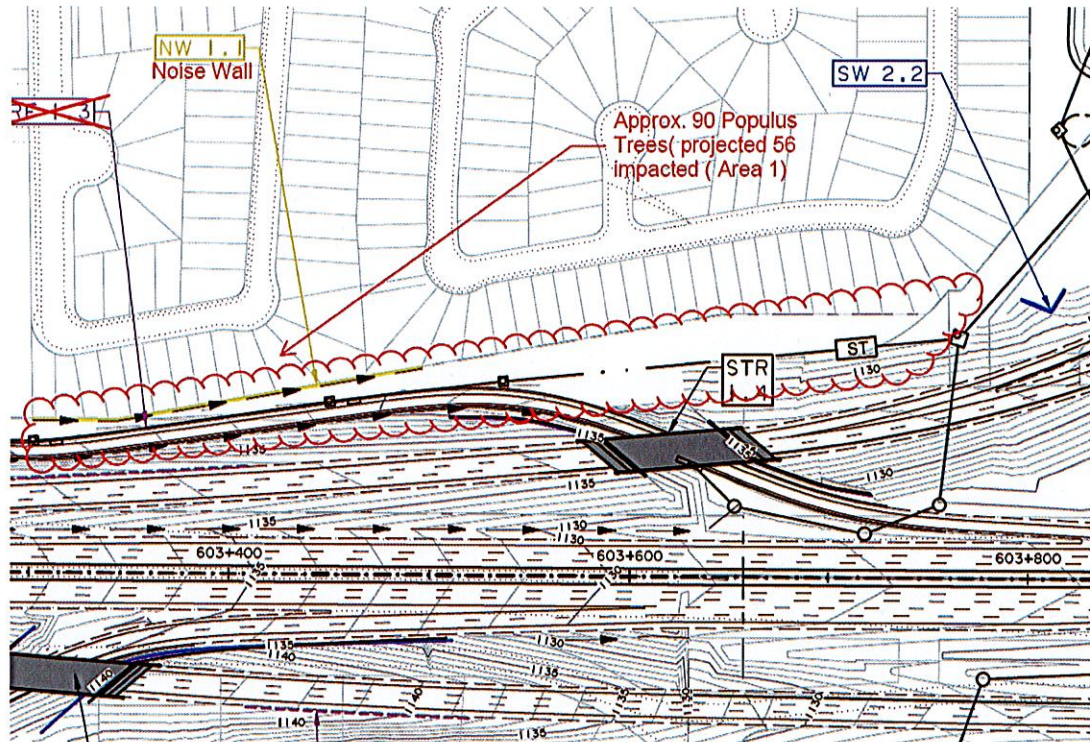


Figure 2: Detail of Area 1 excerpted from Roll Plot Map

Area 2, to the west across Valley Ridge Boulevard, is a mixed stand of primarily spruce trees (*Picea spp.*) with a few poplar, located at approximately 603+000 on the attached drawing. These trees are located within the northern leg of the new 900 Water Feeder Main scope of work. As with the Greenbriar trees, these trees were numbered sequentially, 91 through 131.



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Figure 3: Poplar Tree in Area 2



Figure 4: Spruce Tree in Area 2

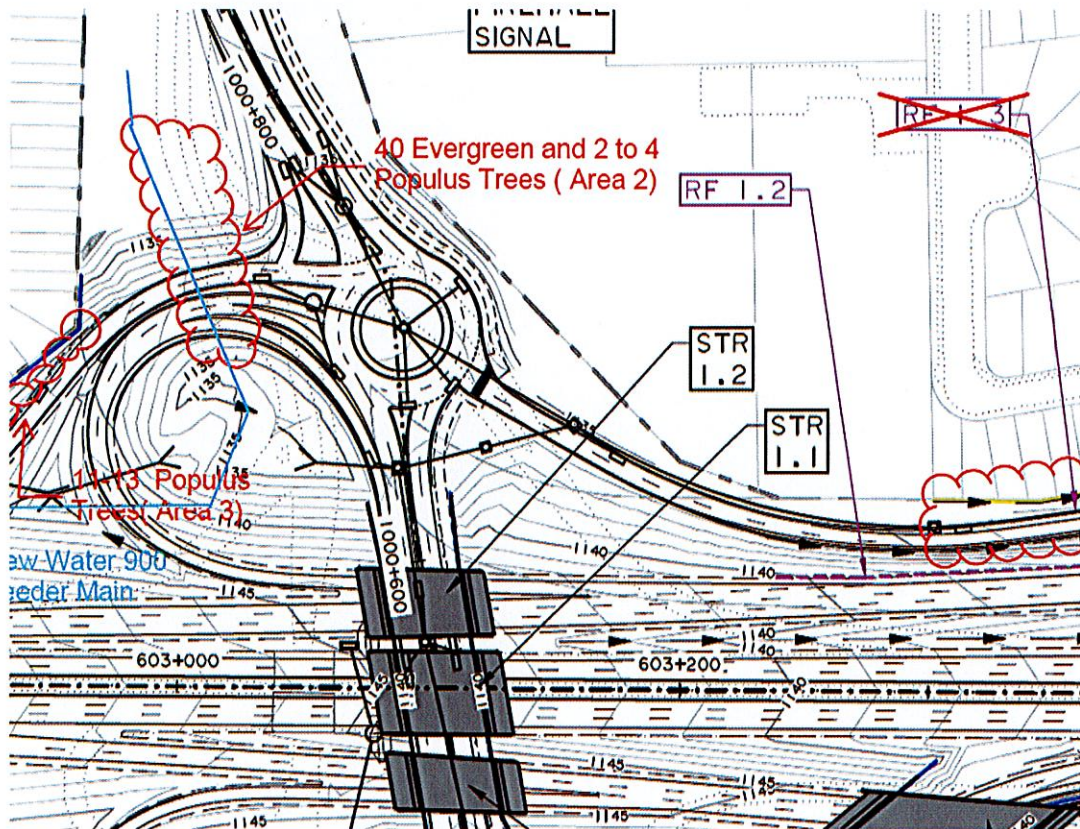


Figure 5: Detail of Area 2 excerpted from Roll Plot Map



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Area 3 is just West of the new 900 Water Feeder Main. There are 11 poplar trees, located in a bubbled area at approximately 602+900 on the drawing. These trees are located primarily adjacent to the Stand-alone Retaining Wall scope of work. The 2 southern-most trees are also proximal to the western leg of the new 900 Water Feeder Main and culvert CV-111 scopes of work. These trees have been labelled trees 150-160.

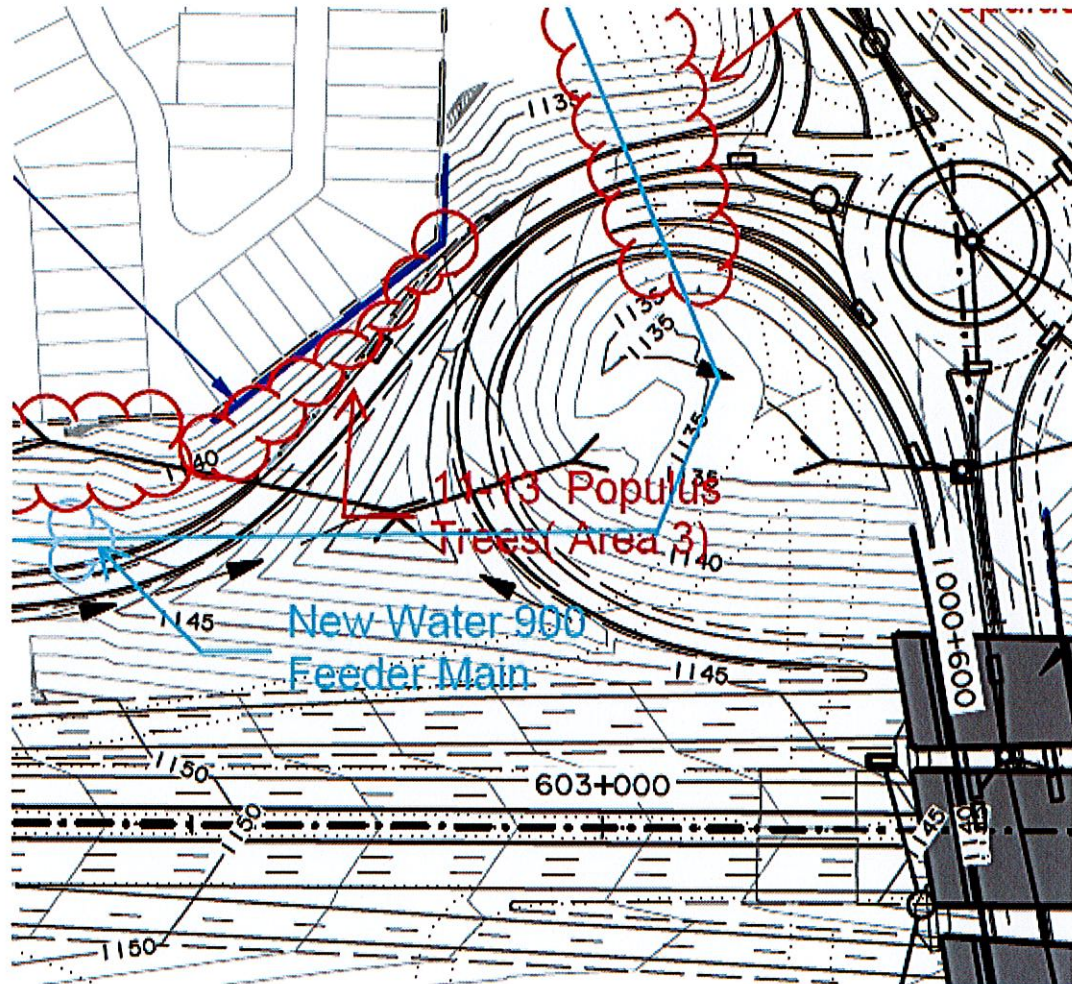


Figure 6: Detail of Area 3 excerpted from Roll Plot Map

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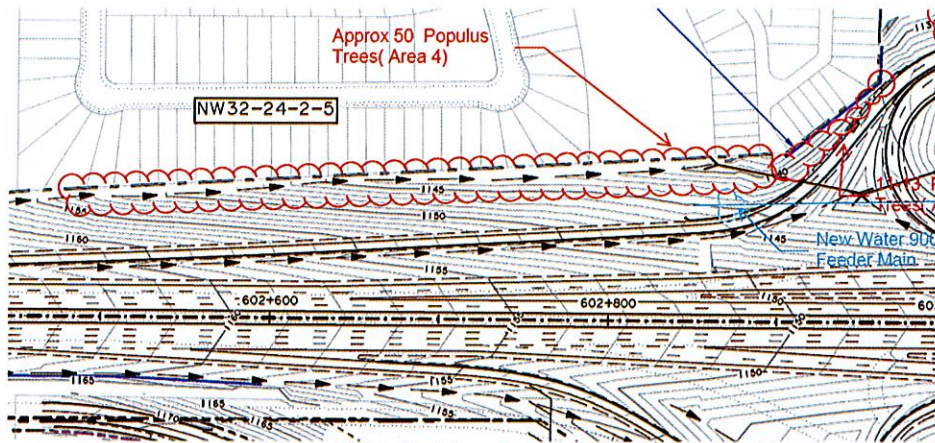


*Figure 7: Typical Poplar in Area 3*

Area 4 is to the west of the Stand-alone Retaining Wall. The scope of work is the new WB Exit Ramp from Valley Ridge to Highway One. There are approximately 55 trees in this area, labelled 161 to 215. The trees are located from approximately 602+300 to 602+900 on the attached drawing. Survey data to confirm potential impacts to the trees is only available up to approximately 3 meters from the trees. As the remaining extent of the footprint of proposed activities in this area has not yet been finalized, only the inventory attribute data and required distance to avoid damage and/or structural failure are available for all of the trees in this area. Where there is data to support that the known 3-meter footprint of the construction will encroach upon the Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure, a recommendation was made for removal, indicating at least 24 trees will be required to be removed. For the remaining 31 trees, although root and/or canopy loss is certain, additional data is required to determine whether attempts to retain the trees would be prudent. It is understood at this point that the overland drainage (west to east) also has the potential to impact any retained trees.



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*Figure 8: Detail of Area 5 excerpted from Roll Plot Map*



*Figure 9: Poplars in Area 4*



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Each of the above trees was inventoried, tagged, and catalogued. The species, diameter, and approximate height were collected. The trees were assessed for condition and ranked as Good, Fair, or Poor. A tree catalogued as Good is in above-average condition, Fair represents a near-average tree in reasonably good condition for the type in this area, and Poor represents a tree in lesser condition or with more substantial defects than should be expected on a typical tree of the age and type in this area. Various volunteers and shoots resulting from sucker-growth in the area were not included in the inventory.

At the time of inventory, the trees were measured to determine their relative distance from the proposed scope of work to which they were adjacent, and/or the distance to the fence(s) located at the perimeter of the work area. Where the location of planned works was identified by stakes or painted markings on site, these markings were used to determine the distance from adjacent work. Where the areas of activity were not marked, measurements used are those provided by members of the construction team. This distance was compared to the Critical Rooting Distance to Minimize Tree Damage in Coder's "Construction Damage Assessments: Trees and Sites"<sup>1</sup>, and to the Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure in from the same work.

The Critical Rooting Distance to Minimize Tree Damage represents a threshold measured from the base of the trunk, outside of which development or other soil-impacting activity should not be expected to negatively impact adjacent trees. If activity takes place in this first area, some impact to the roots and/or the tree health should be expected.

The Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure identifies how near to the trunk roots can be cut or damaged before creating an unacceptable risk of whole-tree failure. While activity further than this threshold from the trunk may still result in an impact to the health of the tree, root damage closer than the minimum distance required may impact the overall structural stability of the tree and/or the root plate. At this point, the stability of the tree has been compromised. In general, encroachment upon the Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure should be expected to expose the tree to a potential for whole-tree failure in the near- to mid-term, potentially immediately.

## ***Conclusions and Recommendations***

The tree attributes were collected in a table, attached as Appendix 2. Also included in this table are the distances for each tree from the proposed activity, the anticipated impact to the tree(s), and a recommendation to: 1) retain the tree without expected impact; 2) to retain and monitor for potential adverse effects arising from root loss expected to range from significant to severe; or, 3) or to remove the tree prior to excavation. In the latter case, it is expected that the proposed activity will encroach on the Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure. Tree removal should be conducted prior to excavation or other development activity in order to reduce the risk of sudden whole-tree failure during the proposed activity. The Prime Contractor anticipates that tree removal will be carried out during September and October of 2019.

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<sup>1</sup> Coder, Kim D; University of Georgia; 1996



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Where the proposed activity encroaches nearer than the Critical Rooting Distance to Minimize Tree Damage without the expectation that the Structural Critical Rooting Distance to Minimize Catastrophic Tree Failure will be compromised, root and/or branch pruning should be expected to be required. This pruning should be conducted to prevent inadvertent damage to the canopy or the root system, and should be executed by an ISA Certified Arborist in order to minimize unintended consequences as well as to aid in determining where tree-specific conditions exist that may require amendment to either the pruning prescription, the development activity proposed, or where the determination to attempt to retain the tree post-construction is no longer viable. It is worthy of note that fills and/or compaction can be as detrimental to root systems as cuts and can also impact the health or eventual stability of tree trunks.

Various tools exist to aid in predicting the consequence of fills, cuts, and compaction in various soil types. Project-specific sloping requirements may exacerbate the anticipated effects of the activity, up to or including a recommendation to remove additional trees. The recommendations to attempt to retain specific trees were based on known physical encroachment of disclosed activities and may not have considered any sloping that may eventually be required, or the impact of ancillary traffic, haul road, storage, or laydown areas, all of which can contribute to root damage and potential tree decline. Where accepted methods indicate that root damage is anticipated to the point where successful retention is unlikely, additional removals may be recommended.

Based upon the inventory, the listed references, and available information on the scope of the construction activity, 137 trees have been recommended for pre-emptive removal, and an additional 10 trees are anticipated to experience root loss or canopy pruning to accommodate proposed activities. The requirements for the the final 31 trees in Area 4 are unknown at this time, pending the clear establishment of the boundaries of the activity required adjacent to these trees.

Where trees are required to be removed for safety considerations or to facilitate required construction activity, trees may be required to be replaced. Where this is deemed to be the case, future growth requirements should be considered. This is in addition to finished grades, required allowances for underground infrastructure, and access to irrigation to establish the newly planted trees. For this project, replacement trees are required to comply with Schedule 18, Section 200.2.13.7.2 of the technical requirements. In addition, it is a local supplier recommendation that replacement poplar trees not exceed 50-60mm caliper, and that any spruce trees not exceed 2-2.5 meters in height. This size of tree will establish more readily after planting than a larger tree of the same species. In general, the larger a tree at time of planting the longer the period of establishment will be. Although larger stock offers greater height and width at planting, minor differences in initial size are generally lost after establishment. (Harris, Clark, Matheny, 2004)



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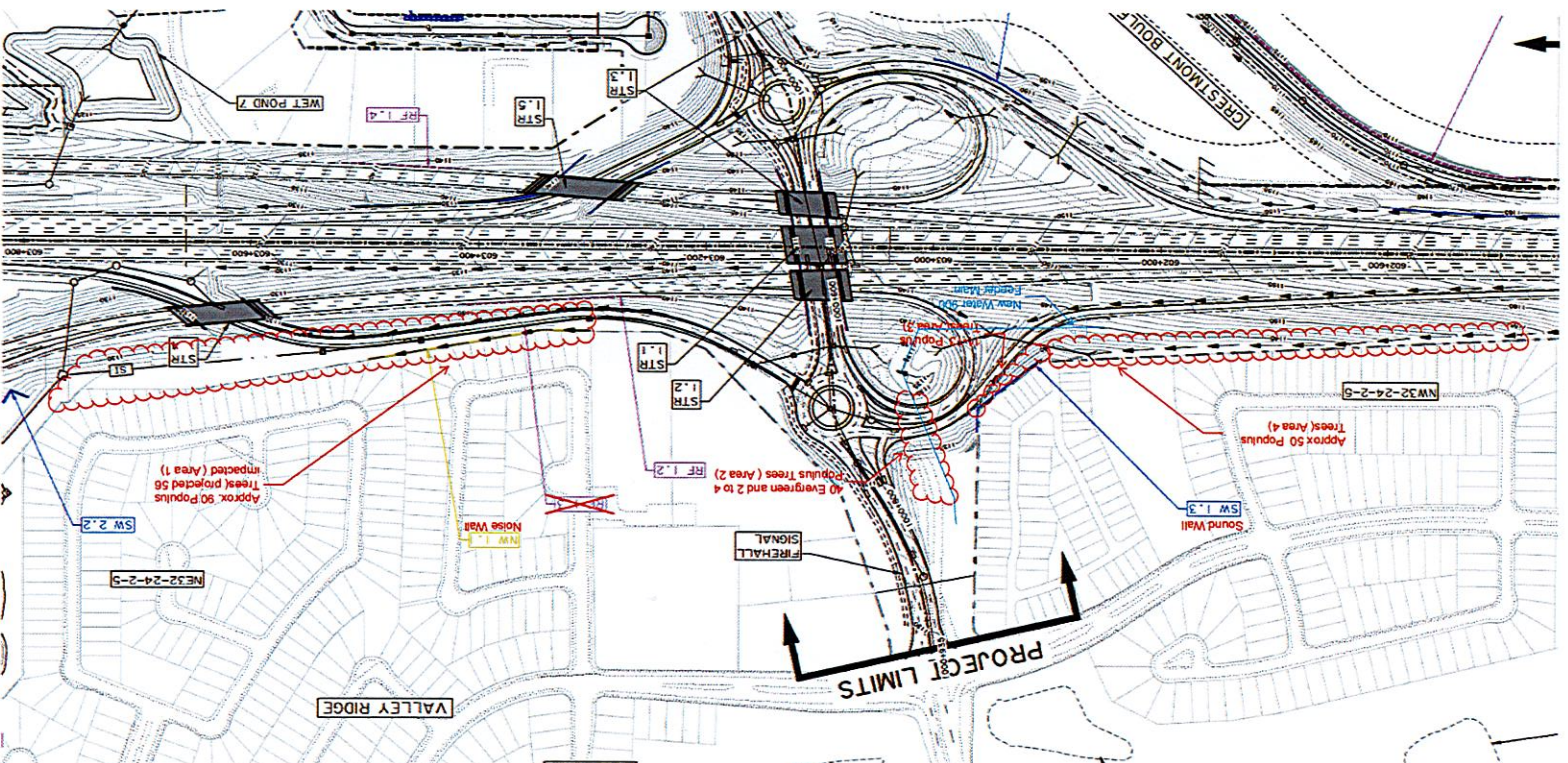


Figure 10: Roll Plot Excerpt showing areas 1-4



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Existing Tree Schedule														
Area 1 - Greenbriar Feeder Main														
Tree Number	Species	Diameter (m)	Condition	Canopy Radius (m)	Height (m)	Distance to Center Line of Trench (m)	Depth of Excavation From Early Survey Stakes Area 1 only (m)	Prime Contractor Proposed Excavation Depth (m)	Proposed width of Activity from Centerline (m)	Distance of Activity from Trunk (m)	Distance Required From Trunk to Minimize Risk of Tree Failure (m)	Distance Required From Trunk to Minimize Tree Damage (m)	Impact	Recommendation
1	Populus x jackii'northwest'	0.27	fair	5	9	5	6.3	9.0	9.0	-4.0	1.5	4.0	Structural Loss	Remove
2	Populus x jackii'northwest'	0.30	fair	5	9	5	6.3	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
3	Populus x jackii'northwest'	0.30	fair	5	9	5	7.1	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
4	Populus x jackii'northwest'	0.30	fair	5	9	5	7.1	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
5	Populus x jackii'northwest'	0.30	fair	5	9	5	7.1	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
6	Populus x jackii'northwest'	0.26	poor(dieback)	5	9	5	7.6	9.0	9.0	-4.0	1.5	4.0	Structural Loss	Remove
7	Populus x jackii'northwest'	0.25	fair	5	9	5	7.6	9.0	9.0	-4.0	1.5	4.0	Structural Loss	Remove
8	Populus x jackii'northwest'	0.26	fair	5	9	5	7.6	9.0	9.0	-4.0	1.5	4.0	Structural Loss	Remove
9	Populus x jackii'northwest'	0.30	fair	5	9	5	7.7	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
10	Populus x jackii'northwest'	0.36	fair	5	9	5	7.7	9.0	9.0	-4.0	2.0	5.5	Structural Loss	Remove
11	Populus x jackii'northwest'	0.30	fair	6	13	6	7.7	9.0	9.0	-3.0	2.0	4.5	Structural Loss	Remove
12	Populus x jackii'northwest'	0.27	fair	6	13	6	7.7	9.0	9.0	-3.0	1.5	4.0	Structural Loss	Remove
13	Populus x jackii'northwest'	0.31	fair	6	13	6	7.6	9.0	9.0	-3.0	2.0	4.5	Structural Loss	Remove
14	Populus x jackii'northwest'	0.31	fair	6	13	6	7.6	9.0	9.0	-3.0	2.0	4.5	Structural Loss	Remove
15	Populus x jackii'northwest'	0.31	fair	5	13	5	7.6	9.0	9.0	-4.0	2.0	4.5	Structural Loss	Remove
16	Populus x jackii'northwest'	0.35	poor(cankers)	5	13	5	7.6	9.0	9.0	-4.0	2.0	5.5	Structural Loss	Remove
17	Populus x jackii'northwest'	0.40	fair	5	15	5	7.6	9.0	9.0	-4.0	2.5	6.0	Structural Loss	Remove
18	Populus x jackii'northwest'	0.49	fair	7	15	5	7.6	9.0	9.0	-4.0	3.0	7.0	Structural Loss	Remove
19	Populus x jackii'northwest'	0.54	fair	8	20	5	7.6	9.0	9.0	-4.0	3.0	8.0	Structural Loss	Remove
20	Populus x jackii'northwest'	0.52	fair	8	20	4	7.4	9.0	9.0	-5.0	3.0	7.5	Structural Loss	Remove
21	Populus x jackii'northwest'	0.40	fair	8	20	2	7.4	9.0	9.0	-7.0	2.5	6.0	Structural Loss	Remove
22	Populus x jackii'northwest'	0.35	fair	6	20	2	7.4	9.0	9.0	-7.0	2.0	5.5	Structural Loss	Remove
23	Populus x jackii'northwest'	0.49	fair	8	20	2	6.5	9.0	9.0	-7.0	3.0	7.0	Structural Loss	Remove
24	Populus x jackii'northwest'	0.48	fair	8	20	1.5	6.5	9.0	9.0	-7.5	3.0	7.0	Structural Loss	Remove
25	Populus x jackii'northwest'	0.49	fair	8	20	0.1	6.5	9.0	9.0	-8.9	3.0	7.0	Structural Loss	Remove
26	Populus x jackii'northwest'	0.50	fair	8	20	0	5.7	9.0	9.0	-9.0	3.0	7.5	Structural Loss	Remove
27	Populus x jackii'northwest'	0.48	fair	8	20	0.2	5.7	9.0	9.0	-8.8	3.0	7.0	Structural Loss	Remove
28	Populus x jackii'northwest'	0.45	fair	8	20	0.5	5.7	9.0	9.0	-8.5	2.5	7.0	Structural Loss	Remove
29	Populus x jackii'northwest'	0.40	fair	6	20	1	5.6	9.0	9.0	-8.0	2.5	6.0	Structural Loss	Remove
30	Populus x jackii'northwest'	0.45	fair	8	20	1	5.6	9.0	9.0	-8.0	2.5	7.0	Structural Loss	Remove
31	Populus x jackii'northwest'	0.45	fair	8	20	1.5	5.6	9.0	9.0	-7.5	2.5	7.0	Structural Loss	Remove
32	Populus x jackii'northwest'	0.42	fair	7	20	1.5	5.6	9.0	9.0	-7.5	2.5	6.0	Structural Loss	Remove
33	Populus x jackii'northwest'	0.51	fair	8	20	2	5.2	9.0	9.0	-7.0	3.0	7.5	Structural Loss	Remove
34	Populus x jackii'northwest'	0.48	fair	8	20	2	5.2	9.0	9.0	-7.0	3.0	7.0	Structural Loss	Remove
35	Populus x jackii'northwest'	0.52	fair	8	20	2.5	5.2	9.0	9.0	-6.5	3.0	7.5	Structural Loss	Remove
36	Populus x jackii'northwest'	0.52	fair	8	20	2.5	4.6	5.0	5.0	-2.5	3.0	7.5	Structural Loss	Remove
37	Populus x jackii'northwest'	0.49	fair	8	20	3	4.6	5.0	5.0	-2.0	3.0	7.0	Structural Loss	Remove
38	Populus x jackii'northwest'	0.48	fair	8	20	3	4.6	5.0	5.0	-2.0	3.0	7.0	Structural Loss	Remove
39	Populus x jackii'northwest'	0.50	fair	8	20	4	4.3	5.0	5.0	-1.0	3.0	7.5	Structural Loss	Remove
40	Populus x jackii'northwest'	0.48	fair	8	20	4	4.3	5.0	5.0	-1.0	3.0	7.0	Structural Loss	Remove
41	Populus x jackii'northwest'	0.50	fair	8	20	4	4.3	5.0	5.0	-1.0	3.0	7.5	Structural Loss	Remove
42	Populus x jackii'northwest'	0.51	fair	8	20	5	4.3	5.0	5.0	0.0	3.0	7.5	Structural Loss	Remove
43	Populus x jackii'northwest'	0.48	fair	7	20	5	4.1	5.0	5.0	0.0	3.0	7.0	Structural Loss	Remove
44	Populus x jackii'northwest'	0.40	fair	8	20	5	4.1	5.0	5.0	0.0	2.5	6.0	Structural Loss	Remove
45	Populus x jackii'northwest'	0.45	fair	8	20	5	4.1	5.0	5.0	0.0	2.5	7.0	Structural Loss	Remove



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Existing Tree Schedule

Area 1 - Greenbriar Feeder Main														
Tree Number	Species	Diameter (m)	Condition	Canopy Radius (m)	Height (m)	Distance to Center Line of Trench (m)	Depth of Excavation From Early Survey Stakes Area 1 only (m)	Prime Contractor Proposed Excavation Depth (m)	Proposed width of Activity from Centerline (m)	Distance of Activity from Trunk (m)	Distance Required From Trunk to Minimize Risk of Tree Failure (m)	Distance Required From Trunk to Minimize Tree Damage (m)	Impact	Recommendation
46	Populus x jackii'northwest'	0.40	fair	8	20	5	4.1	5.0	5.0	0.0	2.5	6.0	Structural Loss	Remove
47	Populus x jackii'northwest'	0.45	fair	8	18	6	4.2	5.0	5.0	1.0	2.5	7.0	Structural Loss	Remove
48	Populus x jackii'northwest'	0.42	fair	8	18	6	4.2	5.0	5.0	1.0	2.5	6.0	Structural Loss	Remove
49	Populus x jackii'northwest'	0.40	fair	8	18	6	4.2	5.0	5.0	1.0	2.5	6.0	Structural Loss	Remove
50	Populus x jackii'northwest'	0.40	fair	8	18	6	4.5	5.0	5.0	1.0	2.5	6.0	Structural Loss	Remove
51	Populus x jackii'northwest'	0.42	fair	8	18	7	4.5	5.0	5.0	2.0	3.0	6.0	Structural Loss	Remove
52	Populus x jackii'northwest'	0.50	fair	8	19	7	4.5	5.0	5.0	2.0	3.0	7.5	Structural Loss	Remove
53	Populus x jackii'northwest'	0.52	fair	8	19	7	4.6	5.0	5.0	2.0	3.0	7.5	Structural Loss	Remove
54	Populus x jackii'northwest'	0.45	fair	8	19	7	4.6	5.0	5.0	2.0	2.5	7.0	Structural Loss	Remove
55	Populus x jackii'northwest'	0.42	fair	8	12	7	4.6	5.0	5.0	2.0	2.5	6.0	Structural Loss	Remove
56	Populus x jackii'northwest'	0.40	fair	8	12	7	5.6	7.0	7.0	0.0	2.5	6.0	Structural Loss	Remove
57	Populus x jackii'northwest'	0.40	fair	8	12	7	5.3	7.0	7.0	0.0	2.5	6.0	Structural Loss	Remove
58	Populus x jackii'northwest'	0.40	fair	8	12	7	5.3	7.0	7.0	0.0	2.5	6.0	Structural Loss	Remove
59	Populus x jackii'northwest'	0.40	fair	7	20	8	5.3	7.0	7.0	1.0	2.5	6.0	Structural Loss	Remove
60	Populus x jackii'northwest'	0.50	fair	8	20	8	5.3	7.0	7.0	1.0	3.0	7.5	Structural Loss	Remove
61	Populus x jackii'northwest'	0.48	fair	8	20	10	5.3	7.0	7.0	3.0	2.5	7.0	Root Loss	Retain and monitor
62	Populus x jackii'northwest'	0.38	fair	8	15	11	5.3	7.0	7.0	4.0	2.5	6.0	Root Loss	Retain and monitor
63	Populus x jackii'northwest'	0.57	fair	8	20	12	4.9	5.0	5.0	7.0	3.0	8.5	Root Loss	Retain and monitor
64	Populus x jackii'northwest'	0.47	fair	8	20	13	4.9	5.0	5.0	8.0	2.5	7.0	No Impact	Retain
65	Populus x jackii'northwest'	0.49	fair	8	20	14	4.9	5.0	5.0	9.0	2.5	7.0	No Impact	Retain
66	Populus x jackii'northwest'	0.45	fair	8	20	14	4.9	5.0	5.0	9.0	2.5	7.0	No Impact	Retain
67	Populus x jackii'northwest'	0.46	fair	8	20	14	4.5	5.0	5.0	9.0	2.5	7.0	No Impact	Retain
68	Populus x jackii'northwest'	0.55	fair	8	20	15	4.5	5.0	5.0	10.0	3.0	8.5	No Impact	Retain
69	Populus x jackii'northwest'	0.48	fair	8	20	15	4.5	5.0	5.0	10.0	2.5	7.0	No Impact	Retain
70	Populus x jackii'northwest'	0.48	fair	8	20	16	4.5	5.0	5.0	11.0	2.5	7.0	No Impact	Retain
71	Populus x jackii'northwest'	0.49	fair	8	20	16	6.8	9.0	9.0	7.0	2.5	7.0	No Impact	Retain
72	Populus x jackii'northwest'	0.46	fair	8	20	18	6.8	9.0	9.0	9.0	2.5	7.0	No Impact	Retain
73	Populus x jackii'northwest'	0.50	fair	8	20	18	6.8	9.0	9.0	9.0	3.0	7.5	No Impact	Retain
74	Populus x jackii'northwest'	0.55	fair	8	20	18	6.8	9.0	9.0	9.0	3.0	8.5	No Impact	Retain
75	Populus x jackii'northwest'	0.65	fair	8	20	18	6.8	9.0	9.0	9.0	3.0	9.5	Root Loss	Retain and monitor
76	Populus x jackii'northwest'	0.55	fair	8	20	17	6.8	9.0	9.0	8.0	3.0	8.5	No Impact	Retain
77	Populus x jackii'northwest'	0.49	fair	8	20	16	6.8	9.0	9.0	7.0	2.5	7.0	No Impact	Retain
78	Populus x jackii'northwest'	0.50	fair	8	20	16	6.8	9.0	9.0	7.0	3.0	7.5	Root Loss	Retain and monitor
79	Populus x jackii'northwest'	0.51	fair	8	20	14	6.8	9.0	9.0	5.0	3.0	7.5	Root Loss	Retain and monitor
80	Populus x jackii'northwest'	0.50	fair	8	20	14	6.8	9.0	9.0	5.0	3.0	7.5	Root Loss	Retain and monitor
81	Populus x jackii'northwest'	0.49	fair	8	20	13	6.8	9.0	9.0	4.0	2.5	7.0	Root Loss	Retain and monitor
82	Populus x jackii'northwest'	0.49	fair	8	20	12	6.8	9.0	9.0	3.0	2.5	7.0	Root Loss	Retain and monitor
83	Populus x jackii'northwest'	0.52	fair	8	20	12	6.8	9.0	9.0	3.0	3.0	7.5	Root Loss	Retain and monitor
84	Populus x jackii'northwest'	0.50	fair	8	20	11	6.8	9.0	9.0	2.0	3.0	7.5	Structural Loss	Remove
85	Populus x jackii'northwest'	0.49	fair	8	20	10	6.8	9.0	9.0	1.0	2.5	7.0	Structural Loss	Remove
86	Populus x jackii'northwest'	0.50	fair	8	20	10	6.8	9.0	9.0	1.0	3.0	7.5	Structural Loss	Remove
87	Populus x jackii'northwest'	0.55	fair	8	20	10	6.9	9.0	9.0	1.0	3.0	8.5	Structural Loss	Remove
88	Populus x jackii'northwest'	0.26	fair	8	12	10	6.9	9.0	9.0	1.0	1.5	4.0	Structural Loss	Remove
89	Populus x jackii'northwest'	0.26	fair	8	12	10	6.9	9.0	9.0	1.0	1.5	4.0	Structural Loss	Remove
90	Populus x jackii'northwest'	0.51	fair(frost crack)	8	20	9	6.9	9.0	9.0	0.0	3.0	7.5	Structural Loss	Remove



**Tree Impact Assessment**  
**West Calgary Ring Road DB1**  
 Prepared for Ellis Don

Area 2 - 900 Water Feeder main													
Tree Number	Species	Diameter (m)	Condition	Canopy Radius (m)	Height (m)	Distance to Center Line (m)	Prime Contractor Proposed Excavation Depth	Proposed width of Activity (m)	Distance of Activity from Trunk (m)	Distance Required From Trunk to Minimize Risk of Tree Failure (m)	Distance Required From Trunk to Minimize Tree Damage (m)	Impact	Recommendation
91	<i>Picea pungens</i>	0.15	fair	1	7	12		9.0	3.0	1.0	3.0	No Impact	Retain
92	<i>Picea pungens</i>	0.15	fair	1	7	12		9.0	3.0	1.0	3.0	No Impact	Retain
93	<i>Populus x jackii</i> 'northwest'	0.35	fair	0.5	10	0		9.0	-9.0	2.0	5.5	Structural Loss	Remove
94	<i>Populus x jackii</i> 'northwest'	0.30	fair	0.5	10	5		9.0	-4.0	2.0	4.5	Structural Loss	Remove
95	<i>Populus x jackii</i> 'northwest'	0.33	fair	1	10	5		9.0	-4.0	2.0	5.5	Structural Loss	Remove
96	<i>Populus x jackii</i> 'northwest'	0.30	fair	0.5	10	0.5		9.0	-8.5	2.0	4.5	Structural Loss	Remove
97	<i>Picea pungens</i>	0.15	fair	1	7	13		9.0	4.0	1.0	3.0	No Impact	Retain
98	<i>Picea pungens</i>	0.12	fair	2	6	14		9.0	5.0	1.0	1.5	No Impact	Retain
99	<i>Picea pungens</i>	0.15	fair	2	7	15		9.0	6.0	1.0	3.0	No Impact	Retain
100	<i>Picea pungens</i>	0.05	poor	1	2	13		9.0	4.0	0.5	1.0	No Impact	Retain
101	<i>Picea pungens</i>	0.15	fair	1	7	8		9.0	-1.0	1.0	3.0	Structural Loss	Remove
102	<i>Picea pungens</i>	0.15	fair	1	7	6		9.0	-3.0	1.0	3.0	Structural Loss	Remove
103	<i>Picea pungens</i>	0.15	fair	1.5	7	8		9.0	-1.0	1.0	3.0	Structural Loss	Remove
104	<i>Picea pungens</i>	0.15	fair	1	7	4		9.0	-5.0	1.0	3.0	Structural Loss	Remove
105	<i>Picea pungens</i>	0.15	fair	1	9	6		9.0	-3.0	1.0	3.0	Structural Loss	Remove
106	<i>Picea pungens</i>	0.12	fair	1	5	2		9.0	-7.0	1.0	1.5	Structural Loss	Remove
107	<i>Picea pungens</i>	0.15	fair	1.5	10	2		9.0	-7.0	1.0	3.0	Structural Loss	Remove
108	<i>Picea pungens</i>	0.15	fair	1.5	7	1.5		9.0	-7.5	1.0	3.0	Structural Loss	Remove
109	<i>Picea pungens</i>	0.08	fair	1	2	2		9.0	-7.0	0.5	1.0	Structural Loss	Remove
110	<i>Picea pungens</i>	0.15	fair	2	10	0		9.0	-9.0	1.0	3.0	Structural Loss	Remove
111	<i>Picea pungens</i>	0.15	fair	2	8	3		9.0	-6.0	1.0	3.0	Structural Loss	Remove
112	<i>Picea pungens</i>	0.10	fair	1	7	0		9.0	-9.0	1.0	1.5	Structural Loss	Remove
113	<i>Picea pungens</i>	0.15	fair	1.5	7	1		9.0	-8.0	1.0	3.0	Structural Loss	Remove
114	<i>Picea pungens</i>	0.10	fair	1	6	5		9.0	-4.0	1.0	1.5	Structural Loss	Remove
115	<i>Picea pungens</i>	0.12	fair	2	8	6		9.0	-3.0	1.0	1.5	Structural Loss	Remove
116	<i>Picea pungens</i>	0.12	fair	1.5	8	8		9.0	-1.0	1.0	1.5	Structural Loss	Remove
117	<i>Picea pungens</i>	0.12	fair	1.5	3	3		9.0	-6.0	1.0	1.5	Structural Loss	Remove
118	<i>Picea pungens</i>	0.12	fair	1.5	10	10		9.0	1.0	1.0	1.5	Root Loss	Retain and monitor
119	<i>Picea pungens</i>	0.12	fair	1	8	8		9.0	-1.0	1.0	1.5	Structural Loss	Remove
120	<i>Picea pungens</i>	0.15	fair	2	3	3		9.0	-6.0	1.0	3.0	Structural Loss	Remove
121	<i>Picea pungens</i>	0.15	fair	1.5	6	6		9.0	-3.0	1.0	3.0	Structural Loss	Remove
122	<i>Picea pungens</i>	0.08	fair	1	8	8		9.0	-1.0	0.5	1.0	Structural Loss	Remove
123	<i>Picea pungens</i>	0.12	fair	1.5	8	8		9.0	-1.0	1.0	1.5	Structural Loss	Remove
124	<i>Picea pungens</i>	0.12	fair	1.5	3	3		9.0	-6.0	1.0	1.5	Structural Loss	Remove
125	<i>Picea pungens</i>	0.12	fair	1.5	6	6		9.0	-3.0	1.0	1.5	Structural Loss	Remove
126	<i>Picea pungens</i>	0.12	fair	1.5	8	8		9.0	-1.0	1.0	1.5	Structural Loss	Remove
127	<i>Picea pungens</i>	0.15	fair	0.5	6	6		9.0	-3.0	1.0	3.0	Structural Loss	Remove
128	<i>Picea pungens</i>	0.12	fair	1.5	3	3		9.0	-6.0	1.0	1.5	Structural Loss	Remove
129	<i>Picea pungens</i>	0.15	fair	1.5	8	8		9.0	-1.0	1.0	3.0	Structural Loss	Remove
130	<i>Picea pungens</i>	0.15	fair	2	3	3		9.0	-6.0	1.0	3.0	Structural Loss	Remove
131	<i>Picea pungens</i>	0.15	fair	1.5	7	14		9.0	5.0	1.0	3.0	No Impact	Retain
132	<i>Picea pungens</i>	0.15	fair	1	6	14		9.0	5.0	1.0	3.0	No Impact	Retain
133	<i>Picea pungens</i>	0.15	fair	1.5	7	16		9.0	7.0	1.0	3.0	No Impact	Retain
134	<i>Picea pungens</i>	0.12	fair	1	5	16		9.0	7.0	1.0	1.5	No Impact	Retain
135	<i>Picea pungens</i>	0.15	fair	1	5	16		9.0	7.0	1.0	1.5	No Impact	Retain
136	<i>Picea pungens</i>	0.15	fair	1	5	18		9.0	9.0	1.0	3.0	No Impact	Retain
137	<i>Picea pungens</i>	0.15	fair	1.5	7	18		9.0	9.0	1.0	3.0	No Impact	Retain
138	<i>Picea pungens</i>	0.10	fair	0.5	4	18		9.0	9.0	1.0	1.5	No Impact	Retain
139	<i>Picea pungens</i>	0.10	fair	0.5	4	18		9.0	9.0	1.0	1.5	No Impact	Retain



**Tree Impact Assessment**  
**West Calgary Ring Road DB1**  
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Area 3 - Stand Alone Sound Wall													
Tree Number	Species	Diameter (m)	Condition	Canopy Radius (m)	Height (m)	Distance to Center Line (m)	Prime Contractor Proposed Excavation Depth	Proposed width of Activity (m)	Distance of Activity from Trunk (m)	Distance Required From Trunk to Minimize Risk of Tree Failure (m)	Distance Required From Trunk to Minimize Tree Damage (m)	Impact	Recommendation
150	Populus x jackii'northwest'	0.30	fair	4	10	0	N/A	Beyond tree trunks	0.0	2.0	4.5	Structural Loss	Remove
151	Populus x jackii'northwest'	0.25	fair	4	10	0	N/A	Beyond tree trunks	0.0	1.5	4.0	Structural Loss	Remove
152	Populus x jackii'northwest'	0.35	fair	4	10	0	N/A	Beyond tree trunks	0.0	2.0	5.5	Structural Loss	Remove
153	Populus x jackii'northwest'	0.30	fair	4	10	0	N/A	Beyond tree trunks	0.0	2.0	4.5	Structural Loss	Remove
154	Populus x jackii'northwest'	0.30	fair	4	10	0	N/A	Beyond tree trunks	0.0	2.0	4.5	Structural Loss	Remove
155	Populus x jackii'northwest'	0.40	fair	6	10	0	N/A	Beyond tree trunks	0.0	2.5	6.0	Structural Loss	Remove
156	Populus x jackii'northwest'	0.45	fair	6	10	0	N/A	Beyond tree trunks	0.0	2.5	7.0	Structural Loss	Remove
157	Populus x jackii'northwest'	0.48	poor (cankers)	6	10	0	N/A	Beyond tree trunks	0.0	3.0	7.0	Structural Loss	Remove
158	Populus x jackii'northwest'	0.35	fair	6	10	0	N/A	Beyond tree trunks	0.0	2.0	5.5	Structural Loss	Remove
159	Populus x jackii'northwest'	0.29	fair	6	10	0	N/A	Beyond tree trunks	0.0	2.0	4.5	Structural Loss	Remove
160	Populus x jackii'northwest'	0.38	fair	6	10	0	N/A	Beyond tree trunks	0.0	2.5	6.0	Structural Loss	Remove
Area 4 - New West Ramp													
Tree Number	Species	Diameter (m)	Condition	Canopy Radius (m)	Height (m)	Distance to Center Line (m)	Prime Contractor Proposed Excavation Depth	Proposed width of Activity (m)	Known Distance of Activity from Trunk (m)	Distance Required From Trunk to Minimize Risk of Tree Failure (m)	Distance Required From Trunk to Minimize Tree Damage (m)	Impact	Recommendation
161	Populus x jackii'northwest'	0.49	fair	5	10	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
162	Populus x jackii'northwest'	0.35	fair	6	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
163	Populus x jackii'northwest'	0.30	fair	5	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
164	Populus x jackii'northwest'	0.35	fair	5	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
165	Populus x jackii'northwest'	0.35	fair	5	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
166	Populus x jackii'northwest'	0.35	fair	5	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
167	Populus x jackii'northwest'	0.32	fair	5	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
168	Populus x jackii'northwest'	0.30	fair	5	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
169	Populus x jackii'northwest'	0.30	fair	5	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
170	Populus x jackii'northwest'	0.35	fair	5	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
171	Populus x jackii'northwest'	0.35	fair	5	10	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
172	Populus x jackii'northwest'	0.28	fair	4	10	TBA	TBA	TBA	3	1.5	4.0	Root Loss	Verify Measurement
173	Populus x jackii'northwest'	0.30	fair	4	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
174	Populus x jackii'northwest'	0.40	fair	5	10	TBA	TBA	TBA	3	2.5	6.0	Root Loss	Verify Measurement
175	Populus x jackii'northwest'	0.28	fair	4	10	TBA	TBA	TBA	3	1.5	4.0	Root Loss	Verify Measurement
176	Populus x jackii'northwest'	0.30	fair	4	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
177	Populus x jackii'northwest'	0.38	fair	5	10	TBA	TBA	TBA	3	2.5	6.0	Root Loss	Verify Measurement
178	Populus x jackii'northwest'	0.30	fair	5	10	TBA	TBA	TBA	3	2.0	4.5	Root Loss	Verify Measurement
179	Populus x jackii'northwest'	0.46	poor (cankers)	6	10	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
180	Populus x jackii'northwest'	0.40	fair	6	10	TBA	TBA	TBA	3	2.5	6.0	Root Loss	Verify Measurement
181	Populus x jackii'northwest'	0.38	fair	5	10	TBA	TBA	TBA	3	2.5	6.0	Root Loss	Verify Measurement
182	Populus x jackii'northwest'	0.48	fair	6	10	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
183	Populus x jackii'northwest'	0.48	fair	6	10	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
184	Populus x jackii'northwest'	0.45	fair	6	10	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
185	Populus x jackii'northwest'	0.50	fair	6	10	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
186	Populus x jackii'northwest'	0.60	fair	8	18	TBA	TBA	TBA	3	3.0	9.0	Structural Loss	Remove
187	Populus x jackii'northwest'	0.55	fair	8	20	TBA	TBA	TBA	3	3.0	8.5	Structural Loss	Remove
188	Populus x jackii'northwest'	0.58	fair	8	20	TBA	TBA	TBA	3	3.0	9.0	Structural Loss	Remove
189	Populus x jackii'northwest'	0.60	fair	8	20	TBA	TBA	TBA	3	3.0	9.0	Structural Loss	Remove
190	Populus x jackii'northwest'	0.52	fair	8	20	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
191	Populus x jackii'northwest'	0.50	fair	8	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
192	Populus x jackii'northwest'	0.50	fair	8	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
193	Populus x jackii'northwest'	0.52	fair	8	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
194	Populus x jackii'northwest'	0.52	fair	5	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
195	Populus x jackii'northwest'	0.52	fair	5	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
196	Populus x jackii'northwest'	0.52	fair	5	18	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
197	Populus x jackii'northwest'	0.60	fair	5	20	TBA	TBA	TBA	3	3.0	9.0	Structural Loss	Remove
198	Populus x jackii'northwest'	0.60	fair	8	20	TBA	TBA	TBA	3	3.0	9.0	Structural Loss	Remove
199	Populus x jackii'northwest'	0.56	fair	6	18	TBA	TBA	TBA	3	3.0	8.5	Structural Loss	Remove
200	Populus x jackii'northwest'	0.50	fair	5	16	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
201	Populus x jackii'northwest'	0.52	fair	5	16	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
202	Populus x jackii'northwest'	0.52	fair	5	16	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
203	Populus x jackii'northwest'	0.48	fair	5	15	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
204	Populus x jackii'northwest'	0.50	fair	6	15	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
205	Populus x jackii'northwest'	0.48	fair	5	15	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
206	Populus x jackii'northwest'	0.50	fair	5	15	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
207	Populus x jackii'northwest'	0.50	fair	5	15	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
208	Populus x jackii'northwest'	0.50	fair	5	15	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
209	Populus x jackii'northwest'	0.52	fair	5	15	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
210	Populus x jackii'northwest'	0.48	fair	5	15	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
211	Populus x jackii'northwest'	0.48	poor (cankers)	4	16	TBA	TBA	TBA	3	2.5	7.0	Root Loss	Verify Measurement
212	Populus x jackii'northwest'	0.50	fair	5	16	TBA	TBA	TBA	3	3.0	7.5	Structural Loss	Remove
213	Populus x jackii'northwest'	0.35	fair	4	14	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
214	Populus x jackii'northwest'	0.35	fair	4	14	TBA	TBA	TBA	3	2.0	5.5	Root Loss	Verify Measurement
215	Populus x jackii'northwest'	0.40	fair	4	14	TBA	TBA	TBA	3	2.5	6.0	Root Loss	Verify Measurement



**Tree Impact Assessment**  
**West Calgary Ring Road DB1**  
Prepared for Ellis Don

*Statement of Qualifications, Assumptions, and Limiting Conditions*

1. I am a Registered Member of the American Society of Consulting Arborists (RCA #568), a Board-Certified Master Arborist (PR-0174BUTM), an ISA Certified Tree Worker, Municipal Specialist, and Utility Specialist, a Qualified Tree Risk Assessor, and I am qualified to perform this assessment
2. My assessment is based on information known to me at this time. If more information is disclosed, I may have further opinions.
3. Loss or alteration of any part of this report invalidates the entire report.
4. Possession of this report, or a copy thereof, does not imply right of publication or use for any purpose by any other than the person to whom it is addressed without the prior expressed written permission of the consulting arborist.
5. Care has been taken to obtain all information from reliable sources. While efforts were taken to verify all data, the consultant can neither guarantee nor be held responsible for the accuracy of information provided by others.
6. Where a field inspection was made, unless otherwise stated: a) the information in this report covers only those items which were examined and reflects the condition of those items at the time of examination; b) the inspection was limited to visual inspection of accessible items without dissection, excavation, probing, or coring; and c) no tree risk assessment nor hazard assessment was performed.
7. This report is intended only to provide a reasonable assessment of the condition of the tree(s) identified, or the potential impact of procedure(s) identified. It should not be construed as a tender to perform any task or procedure that may be outlined or recommended in the report.
8. This report, and any conclusions or values reported herein, represent my opinion, and my fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Arborist's Disclosure: Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of the trees and attempt to reduce the risk of living near trees. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Since trees are living organisms, conditions are often hidden within the tree and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time. Likewise, remedial treatments cannot be guaranteed. Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk, and the only way to associate all risk associated with trees is to eliminate all of the trees.<sup>i</sup>



Codie Anderson  
Registered Consulting Arborist#568



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<sup>i</sup> Attributed to Dennis Yniguez RCA#362