



**Tree Management Report
for Hwy 1 264th Street to
Whatcom Road - Bradner
Road Rest Area**

2024-02-29 | Revision #0

Submitted to: Ministry of Transportation &
Infrastructure

Prepared by McElhanney

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1. Introduction

McElhanney Ltd. was asked to complete a tree inventory and impact assessment for the trees at the following proposed development:

Site Address	Hwy 1 264 th Street to Whatcom Road (north side) - Bradner Road Rest Area
McElhanney Project #	2111-00815-00
Client Name	Ministry of Transportation & Infrastructure
Dates of Site Visits	January 20 & 24, May 9 2023
Weather During Site Visits	Wet and cloudy in January, Sunny

The purpose of this report is to address the Tree Evaluation Reporting requirements within the Tree Management Plan components of the Abbotsford Development Bylaw, 2022 Bylaw No. 3260-2022.

The impact assessment section of this report is based on plans provided to date, including the current versions of the architectural site plan.

2. Tree Inventory Methodology

For the purpose of this report, the size, health, and structural condition of trees located within 5 m adjacent to the existing Road, Statutory Right of Way (SROW) or offset alignment were documented. For ease of identification in the field, numerated metal tags were attached to the lower trunks of each tree (existing tag numbers were also recorded for cross referencing prior tree surveys and arborist reports. Each tree was visually examined on a limited visual assessment basis, in accordance with Tree Risk Assessment Qualification (TRAQ) methods (Dunster *et al.* 2017) and ISA Best Management Practices. The following information was included in the tree inventory table ([Table 1](#)).

- Tag or ID #
- Surveyed (Y/N)
- Species
- Diameter at breast height (dbh measured in cm)
- Root Protection Zone (m)
- Dripline (radius, m)
- Health and structural condition (good, Fair, poor or a combination)
- General remarks
- Tree Retention/Location Comments

3. Definitions

- **DBH** – diameter at breast height. The diameter of trunk measured to the nearest centimetre at 1.4 metres above ground level.
- **Dripline** – Indicates the radius of the crown spread, measured in metres, from the centre of the tree to the dripline of the longest limbs.
- **MUP** – Multi-Use Pathway.
- **Root Protection Zone (RPZ)** – The observed tree dripline was used to determine the root protection zone. The root protection zone is a radial distance (in metres) measured from the center of the trunk where it emerges from the ground, and is the optimal, no-disturbance setback that is required for a tree to stand a reasonable chance of long-term survival. If the root protection zone does not provide sufficient protection to the entire tree (canopy and root system), the project arborist will specify a larger setback.
- **Working Space Setback** – A 1-meter setback, or other setback specified by the project arborist, beyond the RPZ, where the buildings/structures, hard landscape features and/or finished grades must be designed so minimal over excavation within the RPZ is required for working space, cut slopes, fill slopes, retaining walls, etc. Any excavation within the Working Space Setback must be performed under the supervision of the project arborist.

The condition of the health / structure of each tree was evaluated with the following criteria:

- **Good:** No visible or minor health or structural flaw.
- **Fair:** Health or structural flaw present that can be corrected through normal arboricultural or horticultural care.
- **Poor:** Significant health or structural defects that compromise the long-term survival or retention of the specimen.

Descriptive information for each tagged tree is recorded in the tree inventory table ([Table 1](#)). The locations and retention/removal recommendation for each tagged tree is detailed on the attached tree management plan in [Appendix A](#).



Table 1. Tree Inventory

Tree ID	Common name	Scientific name	DBH (cm)	Height (m)	Drip line / RPZ (m)	Health Condition	Structural Condition	Retention Suitability	General Remarks	Significant tree? (Good - Excellent)	Retain/Remove	Comments
7842	Western hemlock	<i>Tsuga heterophylla</i>	104	40	6	Good	Fair	Poor	Tridominant stems from 9m		Retain	
7843	Western redcedar	<i>Thuja plicata</i>	113	38	6	Fair Good	Fair Good	Moderate	Sparse canopy leaning south 5°		Retain	
7844	Western redcedar	<i>Thuja plicata</i>	113	37	6	Good	Good	Good		Good	Retain	
7845	Western redcedar	<i>Thuja plicata</i>	116	35	6	Good	Good	Good	Possible culturally modified Tree with peeled-off bark within 2-3years	Good	Retain and protect	Potential CMT tree
7846	Western redcedar	<i>Thuja plicata</i>	77	26	7	Fair Good	Fair Good	Moderate	Asymmetric natural cavities at the see for rodents		Retain	
7847	Western redcedar	<i>Thuja plicata</i>	103	29	7	Good	Fair	Poor	Dead stem embed and small codominant.		Retain	
7848	Western redcedar	<i>Thuja plicata</i>	83	30	6	Fair Good	Good	Good	Stump to Tree's E with high habitat potential	Good	Retain	
7849	Western redcedar	<i>Thuja plicata</i>	75	27	6	Fair Good	Fair Good	Moderate	Small stream to S. Most major roots to N.		Retain	
7850	Western redcedar	<i>Thuja plicata</i>	121	38	7	Fair	Fair Good	Poor	Asymmetric lack of light at SW side		Retain	
7851	Western redcedar	<i>Thuja plicata</i>	122	36	7	Fair	Fair	Poor	Cavity at the base codominant at 10 m 3 main stems. Red alder attached to the base in poor condition. Not a critical tree; recorded due to tree species.		Impacted. Analyze accurate tree position	Impacted by the new grading proposed
7852	Western redcedar	<i>Thuja plicata</i>	91	29	6	Fair Good	Good	Good	Twin of Tree 7852	Good	Retain	
7853	Western redcedar	<i>Thuja plicata</i>	86	29	6	Fair Good	Fair Good	Moderate	Habitat for small mammals along base. Retain with 7852. Some decay along root plate		Retain	
7854	Western redcedar	<i>Thuja plicata</i>	137	38	6	Fair Good	FAIR	Poor	7m NW potential cavity see picture asymmetrical canopy		Retain	
7855	Western redcedar	<i>Thuja plicata</i>	86	26	6	Fair Good	Fair Good	Moderate	Asymmetric canopy lack of branches west side sparse foliage		Retain	
7856	Western redcedar	<i>Thuja plicata</i>	124	38	7	Fair Good	Fair Good	Moderate	Sparse canopy at the top decent Tree		Retain	
7857	Douglas fir	<i>Pseudotsuga menziesii</i>	123	39	8	Good	Fair Good	Good	Codominant stem at 4.5m. Some hangers with more than ø10cm Mitigate aerial risk. Potential for critical Tree	Good	Retain	
7859	Western hemlock	<i>Tsuga heterophylla</i>	86	33	7	Good	Good	Good	Leaning corrected keep as group with 7860, good tree. Reaction wood at 4 m.	Good	Retain	
7860	Western redcedar	<i>Thuja plicata</i>	151	38	7	Good	Fair Good	Good	Column of decay base southeast, codominant at 12m. On all stump close to base. Good structure		Retain	
7861	Western redcedar	<i>Thuja plicata</i>	78	20	7	Fair Good	Good	Good	Good successional tree potential		Retain	
7862	Western redcedar	<i>Thuja plicata</i>	110	36	6	Good	Fair Good	Good	Small side branch from 7m 1/4 diameter of the main stem		Retain	
7863	Western redcedar	<i>Thuja plicata</i>	85	33	7	Good	Good	Good		Good	Retain	
7864	Western redcedar	<i>Thuja plicata</i>	112	35	8	Good	Fair Good	Good	Small side stem at 15m height, 1/3 diameter of main stem		Retain	
7865	Western hemlock	<i>Tsuga heterophylla</i>	103	38	6	Fair Good	Fair	Poor	Evidence of fungal NE Phaeolus sp? Sign of concern		Impacted. Analyze accurate tree position.	Impacted tree by the new proposed sidewalk & proposed grading
7867	Western redcedar	<i>Thuja plicata</i>	86	26	6	Good	Fair Good	Good	Bifurcation at the top. Decent critical Tree		Retain	
7868	Western hemlock	<i>Tsuga heterophylla</i>	83	33	6	Fair Good	Fair Good	Moderate			Impacted. Analyze accurate tree position.	Impacted by the grading proposed

Tree ID	Common name	Scientific name	DBH (cm)	Height (m)	Drip line / RPZ (m)	Health Condition	Structural Condition	Retention Suitability	General Remarks	Significant tree? (Good - Excellent)	Retain/Remove	Comments
7869	Western redcedar	<i>Thuja plicata</i>	88	33	7	Good	Good	Good	Good critical Tree	Good	Impacted. Analyze accurate tree position.	Impacted tree by the proposed sidewalk & proposed grading
7871	Western hemlock	<i>Tsuga heterophylla</i>	110	42	7	Good	Good	Good		Good	Impacted. Analyze accurate tree position.	Impacted by the grading proposed
7872	Western hemlock	<i>Tsuga heterophylla</i>	130	42	7	Good	Fair Good	Good	Decay at base structurally ok, codominant stem at 12m		Retain	
7873	Western redcedar	<i>Thuja plicata</i>	162	31	8	Good	Fair Good	Good	Dominant Tree with decaying nurse log below root crown as a habitat feature	Good	Retain	
7874	Western redcedar	<i>Thuja plicata</i>	127	36	6	Good	Good	Good	More foliage along N & NW due to lower competition	Excellent	Retain	
7875	Western redcedar	<i>Thuja plicata</i>	118	38	6	Fair Good	Fair Good	Poor	Sparse canopy		Retain	
7876	Western hemlock	<i>Tsuga heterophylla</i>	86	38	7	Good	Good	Good	Good critical Tree	Good	Retain	
7877	Western redcedar	<i>Thuja plicata</i>	99	0	6	FAIR	Fair Good	Poor	Low vigour, sparse foliage, asymmetric. Retain as a group 7876		Retain	
7878	Western redcedar	<i>Thuja plicata</i>	75	37	6	Fair Good	Good	Good			Impacted. Analyze accurate tree position	Impacted by the grading proposed
7879	Western redcedar	<i>Thuja plicata</i>	98	0	6	Fair Good	Good	Good	Dead stump at base northeast, adapted reaction wood		Retain	
7880	Western redcedar	<i>Thuja plicata</i>	114	38	6	Fair Good	Fair Good	Moderate			Retain	
7881	Western redcedar	<i>Thuja plicata</i>	75	34	7	Good	Good	Good	Good critical Tree	Excellent	Retain	
7882	Western hemlock	<i>Tsuga heterophylla</i>	134	38	6	Fair Good	FAIR	Poor	Sparse foliage, low vigor. Decay at base with cavity east, leaning 5° west. Corrected. Retain as a group with 7890		Retain	
7883	Western redcedar	<i>Thuja plicata</i>	71	36	6	Good	Good	Good		Good	Retain	
7884	Western redcedar	<i>Thuja plicata</i>	84	30	6	Good	Good	Good	Good foliage density for wildlife	Excellent	Retain	
7885	Western hemlock	<i>Tsuga heterophylla</i>	97	38	6	Good	Fair Good	Good	Some exposed dead wood sections along S & W near soil line		Impacted. Analyze accurate tree position	Potential impacted by the grading proposed
7886	Western redcedar	<i>Thuja plicata</i>	102	36	6	Fair Good	Fair Good	Moderate	Sparse foliage southwest. Leaning 10° corrected S 3-4. Retain as a group 7896		Retain	
7887	Western redcedar	<i>Thuja plicata</i>	109	38	6	Fair Good	Good	Good	Asymmetric canopy sparse northwest cavity south at the he base good structure		Retain	
7889	Western redcedar	<i>Thuja plicata</i>	113	38	7	Fair Good	Good	Good	Sparse at the top		Retain	
7890	Western hemlock	<i>Tsuga heterophylla</i>	82	0	7	Good	Good	Good	Good critical Tree	Excellent	Retain	
7891	Western redcedar	<i>Thuja plicata</i>	123	37	7	Fair Good	Fair	Poor	Codominant hemlock 35° leaning north column of decay with crack. Sparse foliage southeast. Codominant at 22m		Retain	
7892	Western redcedar	<i>Thuja plicata</i>	98	38	7	Good	Good	Good	Good critical tree 3m to the stream NE.	Excellent	Retain	
7893	Bigleaf maple	<i>Acer macrophyllum</i>	99	37	6	Fair Good	Fair Good	Moderate	Decent Tree		Retain	
7894	Western redcedar	<i>Thuja plicata</i>	100	31	7	Good	Good	Good	Well-formed structure, good successional Tree	Good	Retain	
7895	Western redcedar	<i>Thuja plicata</i>	101	36	8	Good	Good	Good	Good dominant Tree. Some soil loss adjacent to root plate along S	Good	Retain	
7896	Western redcedar	<i>Thuja plicata</i>	102	33	7	Good	Fair	Poor	Standing along a previously fallen log in E-W orientation. Good amount of buttressing.		Retain	



Tree ID	Common name	Scientific name	DBH (cm)	Height (m)	Drip line / RPZ (m)	Health Condition	Structural Condition	Retention Suitability	General Remarks	Significant tree? (Good - Excellent)	Retain/Remove	Comments
7897	Western hemlock	<i>Tsuga heterophylla</i>	103	42	6	Fair Good	Fair Good	Moderate	Few branches tending N & E.		Impacted. Analyze accurate tree position	Impacted by the grading proposed
7898	Western redcedar	<i>Thuja plicata</i>	104	37	6	Good	Good	Good		Good	Retain	
7899	Western hemlock	<i>Tsuga heterophylla</i>	105	33	8	Good	Good	Good	Some crown asymmetry; heavier foliage along N	Good	Retain	
7900	Western redcedar	<i>Thuja plicata</i>	106	33	8	Good	Good	Good	Nice crown symmetry, excellent retention value	Good	Retain	
7901	Western redcedar	<i>Thuja plicata</i>	107	38	7	Good	Good	Good	Good crown structure and density	Good	Retain	
7902	Western redcedar	<i>Thuja plicata</i>	108	33	6	Good	Good	Good	Suitable Tree for succession	Excellent	Retain	
7907	Western redcedar	<i>Thuja plicata</i>	109	36	6	Fair Good	Fair Good	Moderate	Leaning 5° corrected swamp area southwest		Impacted. Analyze accurate tree position	Impacted by the grading proposed
7913	Western hemlock	<i>Tsuga heterophylla</i>	110	40	6	Good	Good	Good		Good	Retain	
7914	Western hemlock	<i>Tsuga heterophylla</i>	111	40	6	Good	Good	Good		Good	Retain	
7915	Western hemlock	<i>Tsuga heterophylla</i>	112	40	10	Good	Good	Good	More foliage along N due to 7914	Good	Retain	
7916	Western redcedar	<i>Thuja plicata</i>	113	36	7	Fair Good	Good	Good			Impacted. Analyze accurate tree position	Impacted by the grading proposed
7917	Western redcedar	<i>Thuja plicata</i>	114	37	6	Fair Good	Fair Good	Moderate	Most foliage along SW due to competition in other direction		Retain	
7918	Western redcedar	<i>Thuja plicata</i>	115	37	7	Fair Good	Good	Good	Tree along forest edge.		Retain	
7919	Western redcedar	<i>Thuja plicata</i>	116	39	8	Fair Good	Fair Good	Moderate	Most foliage tending S due to adjacent trees		Retain	
7920	Western redcedar	<i>Thuja plicata</i>	117	39	6	Fair Good	Fair Good	Moderate	Low LCR due to adjacent trees.		Retain	
7921	Western redcedar	<i>Thuja plicata</i>	118	40	6	Fair Good	Fair Good	Moderate	Forest edge dominant Tree, large buttresses		Retain	
7922	Western redcedar	<i>Thuja plicata</i>	119	34	7	Good	Fair Good	Good	Good foliage density. Root asymmetry with large buttressing to E	Good	Impacted. Analyze accurate tree position	Impacted by the new grading proposed
7923	Western redcedar	<i>Thuja plicata</i>	120	31	6	Good	Fair Good	Good	Good trunk taper, side branch extending from 2m height, 1/2 diameter of main stem		Retain	
2572	Western hemlock	<i>Tsuga heterophylla</i>	90	39	6	Fair Good	Fair Good	Moderate	Crown slightly asymmetric, heavier along E		Impacted. Analyze accurate tree position	Impacted by the new grading proposed
2569	Western redcedar	<i>Thuja plicata</i>	168	9	0	Poor	Poor	Good	Hollow trunk, excellent habitat for bats and small mammals, 1/2 original height		Retain	
2573	Western redcedar	<i>Thuja plicata</i>	130	6	0	Poor	Poor	Good	Snapped trunk along advanced stages of decay, many bird foraging opportunities. 1/2 original height.		Retain	
2574	Western redcedar	<i>Thuja plicata</i>	147	6	0	Poor	Poor	Good	Hollow trunk, excellent habitat for bats and small mammals, 1/2 original height		Retain	
2300	Western redcedar	<i>Thuja plicata</i>	65	29	7	Fair	Fair Good	Good as a group	Tree class 1. Sparse foliage 1/3 top of the tree. Asymmetric canopy Growing in density with 2302,2301,2306, 2307. Leaning 6 d, N corrected. No signs of concernNA		Retain	
2301	Western redcedar	<i>Thuja plicata</i>	97	35	7	Fair	Fair Good	Good as a group	Tree class 1. Column of decay south from base to 5m. Cavity at 35 cm south 45 cm deep, 15 cm wide. Asymmetric canopy 2306 2305. Sparse foliage 1/3 of the tree. Roots impacted by concrete slab south of the tree. Root exposed south of the tree. Tree lean 3° East corrected.		Retain	



Tree ID	Common name	Scientific name	DBH (cm)	Height (m)	Drip line / RPZ (m)	Health Condition	Structural Condition	Retention Suitability	General Remarks	Significant tree? (Good - Excellent)	Retain/Remove	Comments
2302	Western redcedar	<i>Thuja plicata</i>	65	29	6	Fair	Fair	Moderate	Tree Class 1 Dominated. Sparse canopy. Epicormic shootings. Root impacted by concrete slab NE. Leaning 3° corrected.		Retain	
2303	Western redcedar	<i>Thuja plicata</i>	126	36	7	Good	Good	Good as a group	Tree class 1 Asymmetric canopy affected by 2304. Development to SW. Leaning 5° SW. No structural defects. Some dead branches NE < 10 cm diameter Internal cavity with decay, evidence of carpenter ants located at the base to 1 m with 35 cm deep. No signs of concern		Retain	
2304	Western redcedar	<i>Thuja plicata</i>	99	34	7	Fair	Poor	Poor	Codominant stem at 6m (potential cavity with extended decay. Concrete slab 2m North from the stem. Internal decay NE 70 cm deep. There is a dead root south. Reaction wood NE and SW evidence of internal friction. Sign of concern: Bisector crack between codominant.		Retain	Level 3 Risk Assessment to analyze structural condition and decay. Monitor crack status in 12 months
2305	Western redcedar	<i>Thuja plicata</i>	75	35	6	Fair	Fair	Poor	Class 2 Dead top. Dead branches <10 cm. Stem damage abiotic factors located south of the tree. Tree in decline condition. Monitor tree.	Dead top	Analyze structural condition in 12 months	
2306	Western redcedar	<i>Thuja plicata</i>	87	34	6	Fair Good	Fair Good	Good	Two stems from different seeds grow in limited space. Asymmetric canopy, dead branches < 15 cm diameter. Leaning 5° SE.		Retain	
2307	Western redcedar	<i>Thuja plicata</i>	102	36	6	Fair Good	Fair Good	Good	Impacted by the sidewalk. No concerns		Impacted. Analyze accurate tree position	Impacted by the proposed sidewalk and grading.
2308	Western redcedar	<i>Thuja plicata</i>	107	35	7	Fair Good	Fair Good		Ok tree.		Retain	
2309	Norway maple	<i>Acer platanoides</i>	40	12	5	Fair Good	Fair	Good	It was heavily pruned on the south side of the tree, regrowing OK, Topped tree. Root development is damaging the curb and lifting the sidewalk. Root exposed with mechanical damage.		Retain	
2310	Norway maple	<i>Acer platanoides</i>	40	14	5	Fair Good	Fair	Good	Tridominant stems at 2.5 m. Tree-topped, Heavily pruned, Low branch stem damage with internal decay. Exposed roots. Root system creating damage in the curb.		Retain	
2311	Norway maple	<i>Acer platanoides</i>	39	16	6	Fair Good	Fair Good	Good	Codominant stems at 1.8 m, heavily pruned, exposed roots, no concerns		Retain	
2312	Norway maple	<i>Acer platanoides</i>	23	16	6	Fair Good	Fair Good	Good	Codominant at 4m. Good tree		Retain	
2313	Norway maple	<i>Acer platanoides</i>	40	16	6	Fair Good	Fair Good	Good	Lower broken branch NW with internal decay in insertion, Broken branches E < 10 cm diam. Exposed Roots. Good Tree		Retain	
2299	Western redcedar	<i>Thuja plicata</i>	84	36	6	Fair Good	Fair Good		Codominant at 8 m bark included with reaction wood SE and NW (evidence of internal friction), exposed roots, concrete slab possible root impact East of the tree. Competence with 2298 and 2297 Sparce foliage top ¼ of the tree. No concerns		Retain	
2298	Western redcedar	<i>Thuja plicata</i>	98	38	8	Fair Good	Fair Good	Good	Root damage < 15 ° located south, lignified (No concern). Sparse canopy 1/7 top tree, Leaning 6°SW not corrected, Good tree.		Retain	
2297	Douglas fir	<i>Pseudotsuga menziesii</i>	85	37	6	Good	Fair Good	As a Group	Reaction wood at 10m. Potential internal decay.		Retain	
2296	Douglas fir	<i>Pseudotsuga menziesii</i>	85	36	6	Good	Good	Good	No structural defects. Some low dead branches <10 cm	Good	Retain	
2295	Douglas fir	<i>Pseudotsuga menziesii</i>	115	38	10	Good	Good	Good	Exudations SW at 0.5 m. Dead, broken branch >15 cm at 12 m concern. Nest on the overextended branch above the road.		Retain	Remove branch



4. Site Information & Project Understanding

The Bradner Road Rest Area is located between Mt. Lehman Interchange and 264th St interchange along the westbound lanes of Highway 1. As part of the proposed work, the Ministry of Transportation MoTI offers to upgrade the rest area's infrastructure (including pavement areas and Sani-Station) and construct a new truck parking facility northwest of the existing facility plan.

5. Field Observations

North of Bradner rest Area: Trees located on the Western Half of this property were inventoried for this development application. Trees in the study area were found in natural forested stand conditions. Some open-grown trees comprised of a mixture of native coniferous and deciduous species. Some mature trees were observed in the project area with an estimated age of up to 250 years. The site is located along the Coastal Western Hemlock Biogeoclimatic (BEC) unit, very dry maritime subzone (CWHxm1) (Green, 1994). Unlike typical constituent tree species in this BEC subzone that are usually Douglas-fir dominant, this site's tree species consisted of 75% Western redcedar, 20% western hemlock and 5% Douglas-fir and bigleaf maple. The terrain is mostly flat, with high soil moisture and high-water tables particularly along the existing alignment of Nathan Creek.

Trees 2309 to 2313, located southwest of the existing washroom facility, were observed to have been planted as part of previous landscaping works.

5.1. TREES OBSERVED

A total of 93 trees were inventoried. In the following [Figure 1](#), the distribution of trees along the subject site can be observed. In the north area marked as a section 1, 69 significant trees were assessed. Additional trees were assessed in section 2 on request.

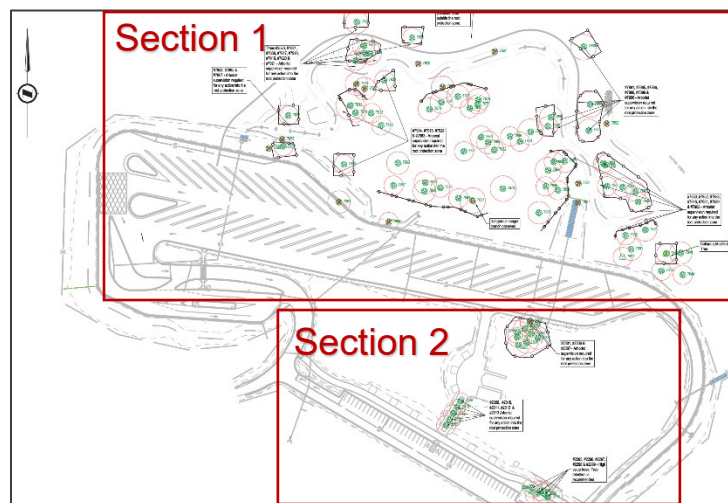


Figure 2. Tree Inventory



6. Tree Risk Assessment

During site visits conducted on January 20 & 24 and May 9 2023, and in conjunction with the tree inventory, trees were assessed for risk on a limited visual assessment basis and in the context of the current and proposed land uses. We only observed trees deemed moderate, high or extreme risk that would require hazard abatement to eliminate present and future risks (within a 1-year timeframe of the tree inventory).

Tree locations were ascertained using a GPS unit with an approximate accuracy of $\pm 5\text{m}$ below the cover of tree canopies. As such, a topographic land survey is required to determine exact tree locations prior to any decision related to removal or retention, as imposed by proximate alignments of proposed construction works e.g. soil excavation.

7. Impact Assessment

7.1. TREES TO BE IMPACTED

It is understood that landscape planting will be performed along the existing channels; no excavation for planting purposes should be conducted into the root protection zones.

The proposed plan will impact the following 13 trees:

Tag #7878, 7868, 7869, 7865, 7916, 2572, 7922, 7871, 7897, 7851, 7907, 2307 & 7892. Tree characteristics are defined in the tree inventory ([Table 1](#)).

Final accurate locations should be confirmed on-site to analyze each particular impact before take the decision to remove any tree.

It is essential to mention that seven (Tag #7878, 7869, 7916, 7922, 7871, & 2307) of the thirteen trees impacted are considered good significant trees based on the analyzed factors: health, structure, diameter, species and habitat

The project arborist is to be present for all excavations within the Root Protection Zones (shown on the Tree Management Plan in [Appendix A](#)) of impacted trees located on private or public property. The project arborist will document impacts, prune any roots encountered to sound tissue (to encourage wound healing/closure and new root generation), and provide additional mitigation recommendations in the field.

7.2. TREES TO BE IMPACTED

79 trees are proposed to be retained.

The following trees require tree protection barriers to avoid potential soil compaction into the root protection zone: Tag #2574, 7891, 7872,7876, 7923, 7921, 2573, 7920, 7918, 7919, 7917, 7914, 7915, 7887, 7885, 7867,7860, 7884,7857, 2300 to 2308, 7845, 7902, 7889, 7886 to 7889, 7847 to 7853, 7856, 7854, 7861, 7862, 7899, 7881,7896 & 7886.

The following trees require arborist supervision for any action into the root protection zone. Tag #2295 to 2299, 2309 to 2313, 2306, 2301, 7850, 7861, 7853,7852, 7848, 7889, 7902,7900,7899,7881,7896, 7886,



7885, 7887, 7928, 7915, 7914, 7883, 7821, 2573, 7918, 7917, 7919, 7889 and 7920. It is expected to excavate into the root protection zone.

It was observed that perimetral plantation along the channel will be performed; no excavation for planting purposes should be conducted into the root protection zone.

8. Tree Replacement & Securities Calculation

According to City of Abbotsford Tree Protection Bylaw 2010 No. 1831-2009, the tree replacement calculation is shown below.

Size of Tree to be Removed (DBH)	Number of Replacement Trees Required for Each Tree Cut (a)	Number of Trees to be Removed (hazardous trees, cottonwood, alder excluded) (b)	Total Replacement Trees (a*b)
< 20cm	0	0	0
20 - 30cm	2	0	0
> 30cm	3	13	39
Total recommended replacement trees (in future)			39

Table 3. City of Abbotsford Replacement Tree Criteria

A topographic land survey for the 13 impacted trees is required to determine their exact locations, in order to accurately ascertain the extent to which they may be impacted through the construction process.

9. Impact Mitigation

Tree Protection Barrier: The areas, surrounding the trees to be retained, should be isolated from the construction activity by erecting protective barrier fencing (see Appendix A). Where possible, the fencing should be erected at the perimeter of the tree dripline. The barrier fencing to be erected must be a minimum of 4 feet in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.



Excavation: We recommend that no excavation occur within tree protection zones of trees that are to be retained. Any excavation that is necessary, within the working space setback of trees to be retained must be completed under the direction of the project arborist. If it is found, at the time of excavation, that the excavation cannot be completed without severing roots that are critical to the trees health or stability it may be necessary to remove additional trees.

Material storage: Areas must be designated for material storage and staging during the construction process. Ideally these areas will be located outside of the tree protection areas that will be isolated by barrier fencing. Should it be necessary to store material temporarily within any of the tree protection areas, the project arborist must be consulted.

Mulch layer or plywood over heavy traffic areas: Should it be necessary to access tree protection areas during the construction phase of the project, and heavy foot traffic or vehicular encroachment is required, we recommend that a layer of wood chip horticultural mulch or plywood be installed to reduce compaction. This project arborist must be consulted prior to removing or moving the protection barrier for this purpose.

Pruning: We recommend that any pruning of bylaw-protected trees to be retained be conducted to ANSI A300 Standards and Best Management Practices.

Stump removal: We recommend that, if stumps require removal, they are removed under arborist supervision or ground using a stump grinder to avoid disturbing root systems of trees in close proximity to retained trees in plan.

Demolition: If tree removal is proposed to be undertaken in conjunction with demolition operations, tree removal permits may be necessary. Note that some municipalities may not approve tree removal at this phase. If the municipality relaxes the requirement for barrier fencing installations prior to demolition (subject to onsite arborist supervision during demolition operations) a Letter of Undertaking may be required by the municipality.

Windthrow: Where forest edge trees are proposed to be removed, we recommend that trees that may experience an increase in wind exposure be re-examined, once tree clearing has taken place, to ensure that they are structurally stable, and suitable for retention as leading-edge trees.

Blasting and rock removal: If it is necessary to blast areas of bedrock near critical root zones of trees to be retained, the blasting to level these rock areas should be sensitive to the root zones located at the edge of the rock. Care must be taken to assure that the area of blasting does not extend into the critical root zones beyond the building and road footprints. The use of small low-concussion charges, and multiple small charges designed to pre-shear the rock face, will reduce fracturing, ground vibration, and reduce the impact on the surrounding environment. Only explosives of low phytotoxicity, and techniques that minimize tree damage, are to be used. Provisions must be made to store blast rock, and other construction materials and debris, away from critical tree root zones.



Washout area: It may be necessary to designate any area on the property for washing out cement and masonry tools and equipment. This area should be located away from the critical root zones of any trees to be retained.

Paved areas over critical root zones of trees to be retained: Where paved areas cannot avoid encroachment within critical root zones of trees to be retained, construction techniques, such as floating permeable paving, may be required. (specifications can be provided by the project arborist, in consultation with the design consultant).

Landscaping: Any proposed landscaping within the critical root zones of trees to be retained must be reviewed with the project arborist.

Review and site meeting: Once the project receives approval, it is important that the project arborist meet with the principals involved in the project to review the information contained herein. It is also important that the arborist meet with the site foreman or supervisor before any demolition, site clearing, or other construction activity occurs.

10. Comments received February 22, 2024

An earlier draft of the Tree Management Plan was submitted, which included an analysis of impact to trees and options for retention, to discuss compatibility with the proposed development. The following comments were received from Grant Ngieng, P.Eng., Manager, Municipal Transportation:

Trees #2299 #2298, #2297, #2296 & #2295 High-value trees. Retention is recommended. Integrating paths that minimize the impact on existing trees would be an interesting option.

- Designs will attempt as best they can to avoid these trees. It looks like the GPS location you have for some of these trees may be showing a little too far north

Tree #2307 will be heavily impacted. It's considered a High-value tree. It's located over the existing sidewalk. I want to analyze project options for its retention.

- Impacts to 2307 and 2306 will be unavoidable as there will be 6-8 inches of grade change at the sidewalk. We have noted these two trees for removal on drawings. To avoid the trees and retain them, we would need to re-grade the whole truck parking area



11. Limitations of Report

This arboricultural field review report was prepared by McElhanney for the exclusive use of the Client and may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client without the prior written consent of McElhanney. Any unauthorized use of this report, or any part hereof, by a third party, or any reliance on or decisions to be made based on it, are at the sole risk of such third parties. McElhanney accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report, in whole or in part.

Arborists are professionals who examine trees and use their training, knowledge, and experience to recommend techniques and procedures that will improve a tree's health and structure or to mitigate associated risks. Trees are living organisms whose health and structure change and are influenced by age, continued growth, climate, weather conditions, and insect and disease pathogens. Indicators of structural weakness and disease are often hidden within the tree structure or beneath the ground. The arborist's review is limited to a visual examination of tree health and structural condition, without excavation, probing, resistance drilling, increment coring, or aerial examination. There are inherent limitations to this type of investigation, including, without limitation, that some tree conditions will inadvertently go undetected. The arborist's review followed the standard of care expected of arborists undertaking similar work in British Columbia under similar conditions. No warranties, either express or implied, are made as to the services provided and included in this report.

The findings and opinions expressed in this report are based on the conditions that were observed on the noted date of the field review only. The Client recognizes that passage of time, natural occurrences, and direct or indirect human intervention at or near the trees may substantially alter discovered conditions and that McElhanney cannot report on, or accurately predict, events that may change the condition of trees after the described investigation was completed.

It is not possible for an Arborist to identify every flaw or condition that could result in failure nor can he/she guarantee that the tree will remain healthy and free of risk. The only way to eliminate tree risk entirely is to remove the entire tree. All trees retained should be monitored on a regular basis. Remedial care and mitigation measures recommended are based on the visible and detectable indicators present at the time of the examination and cannot be guaranteed to alleviate all symptoms or to mitigate all risk posed.

Immediately following land clearing, grade changes or severe weather events, all trees retained should be reviewed for any evidence of soil heaving, cracking, lifting or other indicators of root plate instability. If new information is discovered in the future during such events or other activities, McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein.



12. In Closing

We trust that this report meets your needs. Should there be any questions regarding the information within this report, please do not hesitate to contact the undersigned.

Yours truly,

McELHANNEY LTD.

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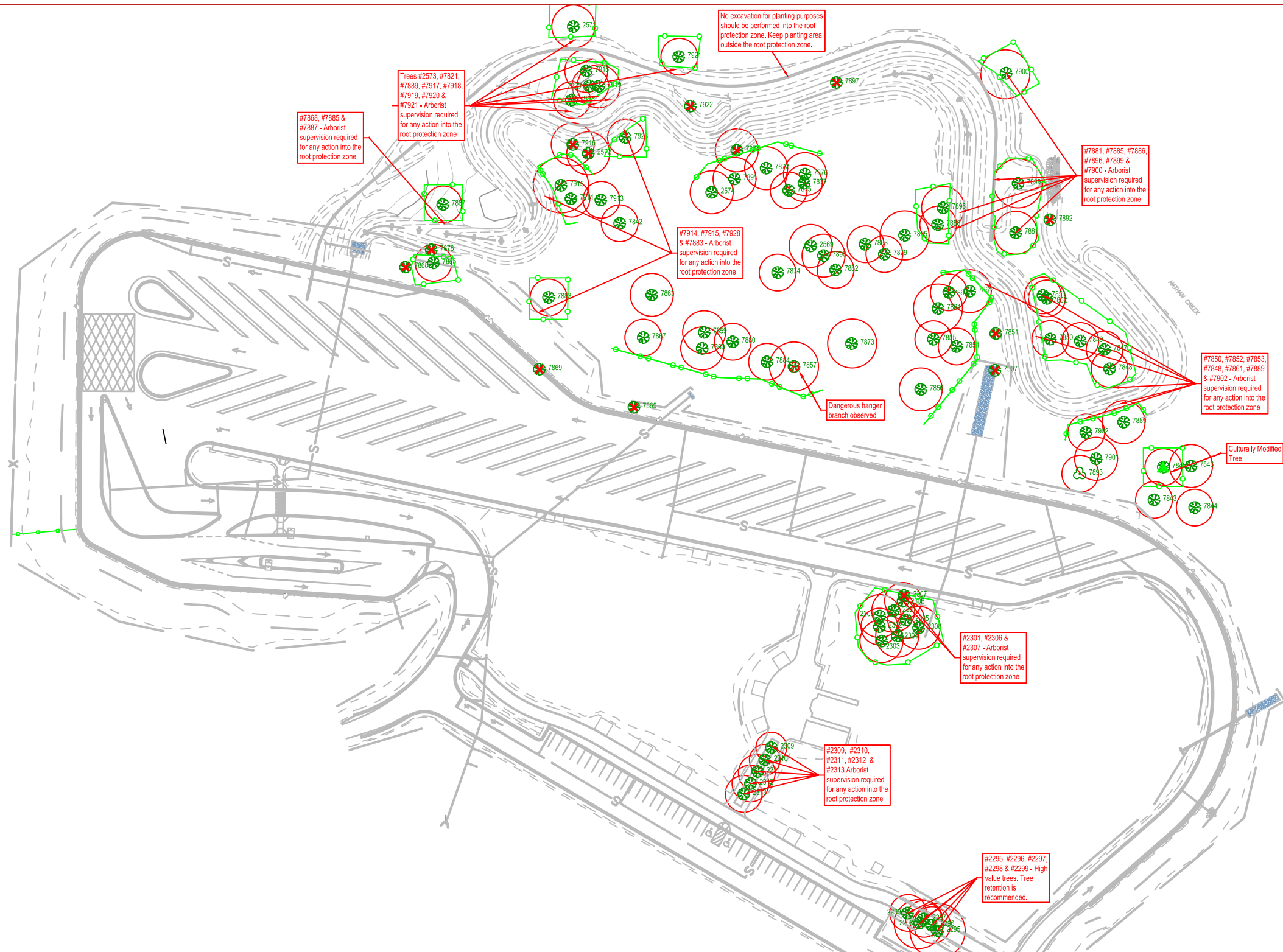
13. References

City of Abbotsford. 2010. Tree Bylaw No. 1831-2009.

Dunster, J.A., E.T. Smiley, N. Matheny, and S. Lily. 2017. Tree Risk Assessment Manual, International Society of Arboriculture (ISA).



APPENDIX A – TREE MANAGEMENT PLAN



LEGEND

- Site boundary
- Root protection zone (RPZ)
- Deciduous tree w/Tag No.
- Coniferous tree w/Tag No.
- Tree to be impacted
- Tree protection barrier
- CMT Tree
- Hazardous tree

IMPACT MITIGATION

Tree Protection Barrier: The areas, surrounding the trees to be retained, should be isolated from the construction activity by erecting protective barrier fencing. Where possible, the fencing should be erected at the perimeter of the tree protection zones. The barrier fencing to be erected must be a minimum of 1200mm in height, of solid frame construction that is attached to wooden or metal posts. A solid board or rail must run between the posts at the top and the bottom of the fencing. This solid frame can then be covered with plywood, or flexible snow fencing. The fencing must be erected prior to the start of any construction activity on site (i.e. demolition, excavation, construction), and remain in place through completion of the project. Signs should be posted around the protection zone to declare it off limits to all construction related activity. The project arborist must be consulted before this fencing is removed or moved for any purpose.

Excavation: We recommend that no excavation occur within tree protection zones of trees that are to be retained. Any excavation that is necessary, within the working space setback of trees to be retained must be completed under the direction of the project arborist. If it is found, at the time of excavation, that the excavation cannot be completed without severing roots that are critical to the trees health or stability it may be necessary to remove additional trees.

Demolition: If tree removal is proposed to be undertaken in conjunction with demolition operations, tree removal permits may be necessary. Note that some municipalities may

not approve tree removal at this phase. If the municipality relaxes the requirement for barrier fencing installations prior to demolition (subject to onsite arborist supervision during demolition operations) a Letter of Undertaking may be required by the municipality.

Material storage: Areas must be designated for material storage and staging during the construction process. Ideally these areas will be located outside of the tree protection areas that will be isolated by barrier fencing. Should it be necessary to store material temporarily within any of the tree protection areas, the project arborist must be consulted.

Mulch layer or plywood over heavy traffic areas: Should it be necessary to access tree protection areas during the construction phase of the project, and heavy foot traffic or vehicular encroachment is required, we recommend that a layer of wood chip horticultural mulch or plywood be installed to reduce compaction. This project arborist must be consulted prior to removing or moving the protection barrier for this purpose.

Pruning:

- Once tree clearing has taken place we recommend that trees to be retained be pruned to remove deadwood, and to address any structural flaws.
- We recommend that any pruning of bylaw-protected trees be performed to ANSI A300 standards and Best Management Practices.

Stump removal: We recommend that, if stumps require removal, they are removed under arborist supervision, or ground using a stump grinder to avoid disturbing root systems of

trees in close proximity, that are shown on the tree management drawing to be retained.

Windthrow: Where forest edge trees are proposed to be removed, we recommend that trees that may experience an increase in wind exposure, be re-examined, once tree clearing has taken place, to ensure that they are structurally stable, and suitable for retention as leading edge trees.

Paved areas over critical root zones of trees to be retained: Where paved areas cannot avoid encroachment within critical root zones of trees to be retained, construction techniques, such as floating permeable paving, may be required. (specifications can be provided by the project arborist, in consultation with the design consultant).

Landscaping: Any proposed landscaping within the critical root zones of trees to be retained must be reviewed with the project arborist.

Arborists Role: It is the responsibility of the client or his/her representative to contact the project arborist for the purpose of:

- Locating the barrier fencing.
- Reviewing the report with the project foreman or site supervisor.
- Locating work zones and machine access corridors where required.
- Supervising excavation for any areas within the critical root zones of trees to be retained including any proposed retaining wall footings and review any proposed fill areas near trees to be retained.

DRAFT - FOR DISCUSSION ONLY

SKETCH T1

Tree Management Plan
Hwy 1 264th St to Whatcom Road (North side)
Bradner Rest Area
Abbotsford, BC

DATE: February 29, 2024
PREPARED FOR: MOTI
SCALE: 1 : 1500 @ 11" X 17"
McE PROJECT: 2121-00815-00

McElhanney
Suite 2300 13450 - 102 Avenue Surrey BC Canada V3T 5X3
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APPENDIX B – SITE PHOTOGRAPHS



Photo 1. Trees #2309-2313. Group of trees located center of section 2



Photo 2. Trees 2295-2299. Group of trees located east of section 2





Photo 3. #2306 & #2307. Tree with potential to be impacted by the proposed sidewalk





Photo 4. Tree #7869 with potential to be impacted by proposed sidewalk and grading.



Contact

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McElhanney

