APPENDIX

G TREE INVENTORY

WSP

HIGHWAY 417 BRIDGE REPLACEMENTS / REHABILITATION AND OPERATIONAL IMPROVEMENTS

GWP 4173-15-00 TREE INVENTORY REPORT

OCTOBER 2017

HIGHWAY 417 BRIDGE REPLACEMENTS / REHABILITATION AND OPERATIONAL IMPROVEMENTS

TREE INVENTORY REPORT

WSP

PROJECT NO.: 16M-01636-01
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WSP

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QUALITY MANAGEMENT

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APPENDICES

A SITE PHOTOS (12/10/16)

B SITE PHOTOS (3-4/10/17)

1 INTRODUCTION

The Ministry of Transportation (MTO) retained MMM Group Limited, a WSP company, to undertake the detail design for Highway 417 Midtown Bridge Improvements in Ottawa, Ontario. The project limits and structure locations are identified in Figure 1. The study is being carried out in accordance with the approved environmental planning process for Group 'B' projects under the MTO *Class Environmental Assessment for Provincial Transportation Facilities* (2000), and will be documented in a Design and Construction Report (DCR).
This document has been prepared for the Ministry of Transportation to provide an inventory of trees in vicinity of proposed Highway 417 works including the replacement and rehabilitation of ten (10) bridges at five (5) sites: Preston Street, Rochester Street, Booth Street, Bronson Avenue, and Percy Avenue. The proposed works also include operational improvements on Highway 417 from Island Park Drive to east of Lyon Street including the replacement of existing noise barriers on the north side of the highway, from Island Park Drive to east of Parkdale Avenue; from the Rochester westbound on-ramp, east to Bronson Avenue; and on the south side of the highway, from west of Island Park Drive to west of the CPR/OTrain Overpass. Figure A below indicates the ares of tree groupings reviewed within the proposed Highway 417 construction limits of work.

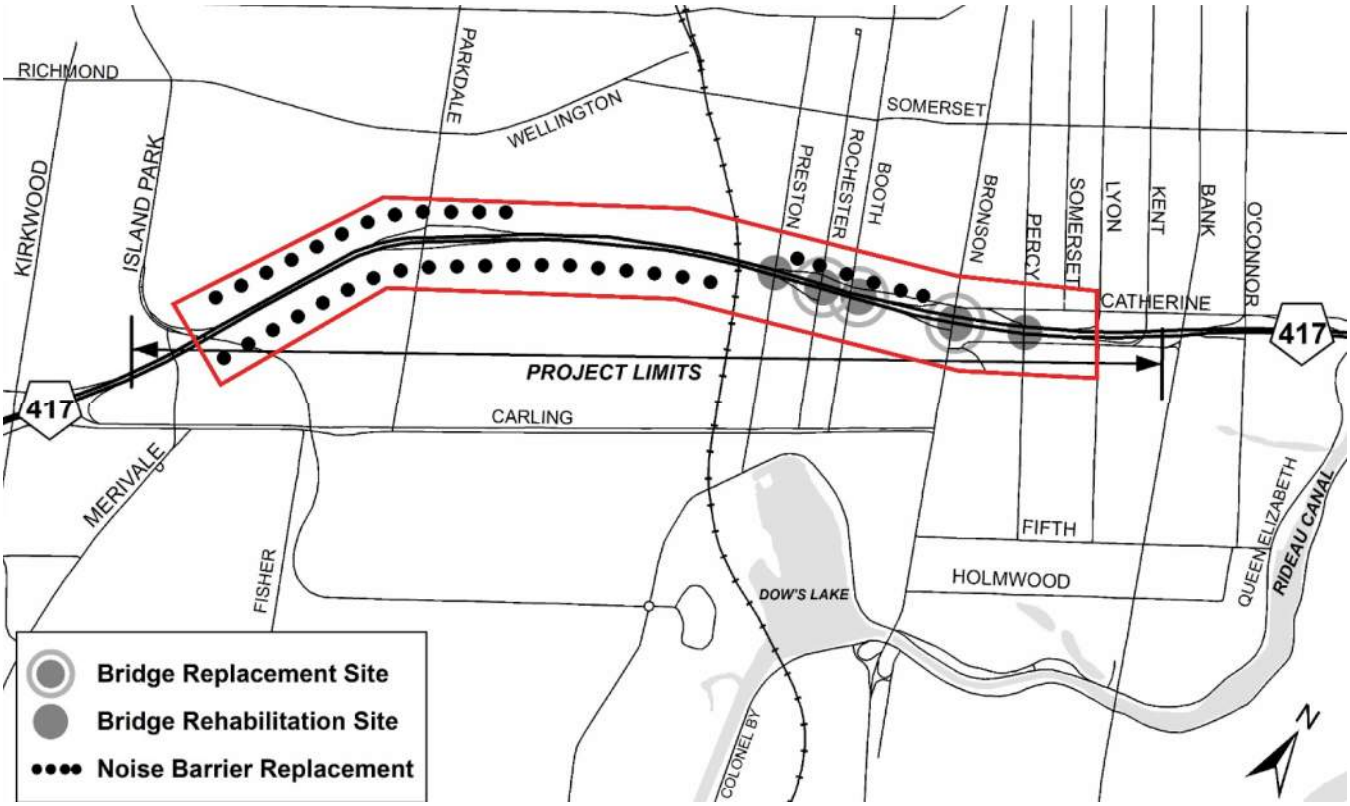


Figure A: Proposed Highway 417 Project Limits and Tree Inventory Study Area

1.1 PROJECT DESCRIPTION

The tree inventory study area included in this report is in vicinity of proposed construction works for Highway 417 between Island Park Drive and Lyon Street. The tree inventory study includes areas of proposed bridge replacement / rehabilitation, noise wall replacement and related operational improvements and identified staging areas.

1.2 METHOD OF EVALUATION

1.2.1 ASSESSMENT

Vegetation has been reviewed through on an on-site visual inspection of the trunk and branch condition, structure, foliage condition, and evidence of abiotic (environmental, mechanical and physical damage) and biotic (insects and disease) stressors. This assessment is recorded in the tree inventory tables included in this report. The inventory tables include the following:

- Tree species: botanical and common names;
- Tree diameter at breast height (**DBH**) - +/- 130cm above ground;
- Number of Trees (**No**.) – approximate number of trees present;
- Trunk Integrity (**TI**): An assessment of the trunk for any defects or weaknesses;
- Canopy Structure (**CS**): An assessment of the scaffold branches, unions and the canopy of the tree;
- Canopy Vigor (**CV**): An assessment of the health of the tree and the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category, and;
- Additional remarks.

Tree condition assessment is based on the following scale of poor-fair-good:

- Good Tree Condition (**G**): Tree displays less than 15% deficiency/defect within the given tree assessment criteria;
- Fair Tree Condition (**F**): Tree displays 15%-40% deficiency/defect within the given tree assessment criteria;
- Poor Tree Condition (**P**): Tree displays greater than 40% deficiency/defect within the given tree assessment criteria.

1.2.2 LIMITATIONS OF ASSESSMENT

The assessment of the trees presented in this report has been made using accepted arboricultural techniques. These include a visual examination of all the above ground parts of the tree for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, the condition of any visible root structures, the degree and direction of lean (if any), and the general condition of the trees and the surrounding site. Access to some tree groupings was restricted by existing fencing and private property. Tree assessment in these areas was conducted from outside the fencing / property line, and as such, the tree diameter as recorded is approximate only and provided as a range. The trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations. The assessment presented in this report is valid at the time of inspection, October 12, 2016 (tree # 1-95) and October 4, 2017 (tree # 96-202).

2 VEGETATION SUMMARY

Twenty-seven (27) tree grouping locations were identified and assessed within the proposed limits of work as identified in Figure B below. Within the tree inventory study area, a total of approximately eight-hundred-and-two (802) trees were reviewed for their approximate location, size and overall condition on October 12, 2016 and October 3-4, 2017.

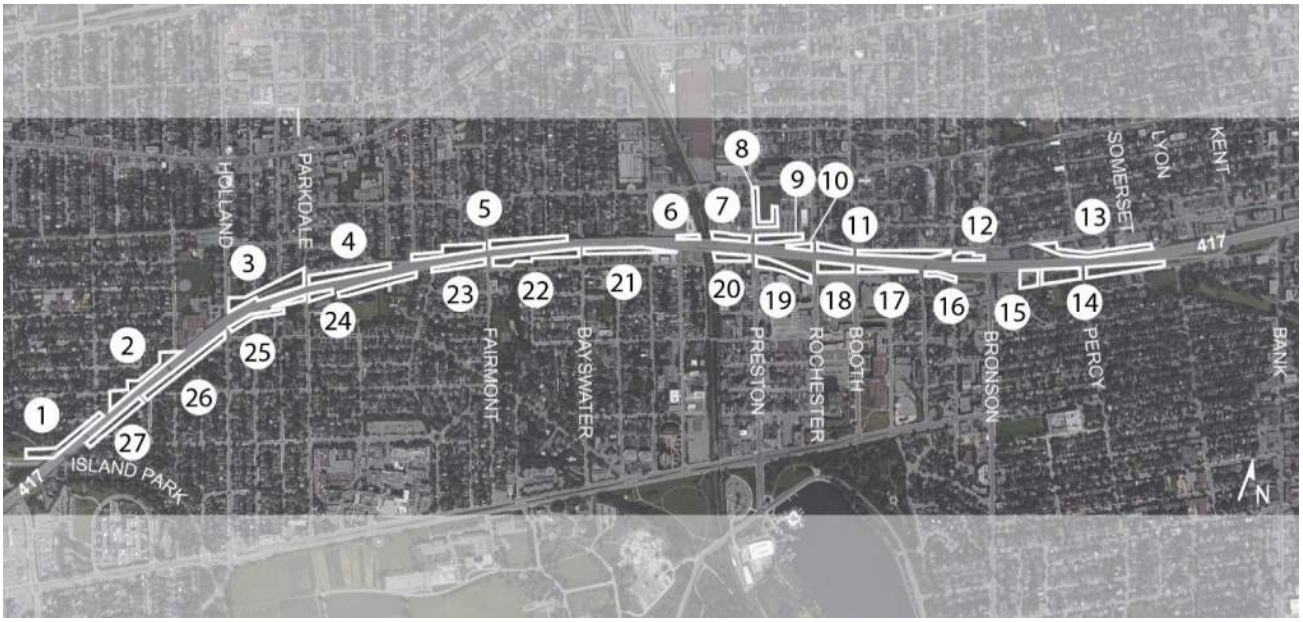


Figure B: Tree Inventory Study Area - Tree Grouping Locations

2.1 TREE GROUPING 1: EMBANKMENT NORTH OF 417

ISLAND PARK CRESCENT EMBANKMENT

Tree Grouping 1 is north of Highway 417 adjacent the existing noise wall and retaining wall on the embankment parallel Island Park Crescent. The vegetation present is a mix of mature native and non-native coniferous and deciduous tree species with grass and shrub understory. Fourteen (14) trees were identified within this grouping. Refer to Table 1 and Figure 1 below for tree mapping and conditions.

Table 1: Tree Grouping 1 Inventory – Island Park Crescent Embankment

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
96	*Ulmus*	Elm	1	20		G	G	G	Adjacent light pole
97	*Acer platanoides*	Norway Maple	1	25		G	G	G	-
98	*Elaeagnus angustifolia*	Russian Olive	1	17		F	F	F	Suppressed canopy growth
99	*Acer platanoides*	Norway Maple	1	27		G	G	G	-
100	*Acer platanoides*	Norway Maple	1	25		G	F	F	Suppressed canopy growth
101	*Ulmus pumila*	Siberian Elm	1	13		G	F	F	Suppressed canopy growth
102	*Ulmus pumila*	Siberian Elm	1	17		G	F	F	Suppressed canopy growth
103	*Ulmus pumila*	Siberian Elm	1	32		F	P	P	Suppressed canopy vigour, 70%CV
104	*Acer platanoides*	Norway Maple	1	31		G	G	G	Suppressed canopy vigour, 70%CV
105	*Picea glauca*	White Spruce	1	25		G	F	F	Suppressed canopy growth
106	*Picea glauca*	White Spruce	1	24		G	G	F	Suppressed canopy growth
107	*Pinus resinosa*	Red Pine	1	31		P	F	P	Suppressed canopy growth, 60% CV
108	*Pinus resinosa*	Red Pine	1	18		G	F	P	Suppressed canopy growth, 50% CV
109	*Ulmus pumila*	Siberian Elm	1	20		G	F	F	Suppressed canopy growth, 90% CV

Figure 1: Tree Grouping 1 Mapping - Island Park Crescent Embankment

2.2 TREE GROUPING 2: ADJACENT EXISTING NOISE WALL NORTH OF 417

EXISTING NOISE WALL: CLARENDON AVE. TO HARMER AVE.

Tree Grouping 2 is north of Highway 417 adjacent the existing noise wall from Clarendon Ave. to Harmer Ave. The vegetation present is a mix of mature native and non-native deciduous tree species. Several of the trees inventoried are on private property. It is anticipated that select limbing and pruning will be required to facilitate the construction of the replacement noise wall. Fifty-six (56) trees were identified within this grouping. Refer to Table 2 and Figure 2 below for tree mapping and conditions.

Table 2: Tree Grouping 2 Inventory – Clarendon Ave. to Harmer Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
110	*Acer platanoides*	Norway Maple	1	50-60		F	G	G	Slight lean, large tree
111	*Acer platanoides*	Norway Maple	1	30		G	G	F	-
112	*Acer platanoides*	Norway Maple	1	22		F	F	F	Slight lean, suppressed canopy growth
113	*Acer platanoides*	Norway Maple	1	17		G	F	F	Suppressed canopy growth
114	*Acer platanoides*	Norway Maple	1	20		G	F	F	Suppressed canopy growth, 5% dead wood
115	*Prunus sp.*	Cherry sp.	1	12		F	F	F	Extends over existing noise wall, limb/prune

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
116	*Acer platanoides*	Norway Maple	1	24		G	G	F	Extends over existing noise wall, limb/prune
117	*Prunus sp.*	Cherry sp.	1	10		F	F	F	Suckering at base, immediately adjacent noise wall, remove
118	*Acer platanoides*	Norway Maple	1	20		P	F	F	Exposed roots, adjacent noise wall, limb/prune
119	*Acer platanoides*	Norway Maple	1	12-15		F	F	F	Adjacent existing noise wall on private property, limb/prune as required
120	*Acer negundo*	Manitoba Maple	1	40-60		F	F	F	Multiple stems, adjacent existing noise wall on private property, limb/prune as required
121	*Acer platanoides*	Norway Maple	1	-		-	G	G	Adjacent existing noise wall on private property, limb/prune as required
198	*Acer negundo*	Manitoba Maple	1	~20		F	G	G	Weak union, limb/prune
199	*Acer negundo*	Manitoba Maple	1	~20		F	G	G	Limb/prune as required
200	*Acer negundo*	Manitoba Maple	1	-		-	F	G	Adjacent existing noise wall on private property side, limb/prune as required
122	*Acer saccharinum*	Silver Maple	1	-		-	F	F	Suppressed canopy growth
123	*Acer saccharinum*	Silver Maple	1	-		-	G	G	Large canopy
124	*Picea glauca*	White Spruce	1	-		-	F	F	Multiple stems (2), suppressed canopy growth
125	*Acer platanoides*	Norway Maple	1	44		G	G	G	-
G126	*Acer saccharum*	Sugar Maple	30	10-25		G	F	F	Tight spacing, suppressed canopy growth
127	*Ulmus pumila*	Siberian Elm	1	13		G	G	G	-
128	*Ulmus pumila*	Siberian Elm	1	24		G	P	F	Suppressed canopy growth
129	*Ulmus pumila*	Siberian Elm	1	51		F	F	F	Leans towards road
130	*Acer platanoides*	Norway Maple	1	14		G	F	F	Suppressed canopy growth
131	*Acer negundo*	Manitoba Maple	1	23		F	F	P	Extends over existing noise wall, limb/prune
132	*Ulmus pumila*	Siberian Elm	1	40-45		G	F	F	On private property
133	*Acer sp.*	Maple species	1	40-50		-	G	G	Large canopy tree, adjacent existing noise wall on private property side, limb/prune as required

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
134	*Acer sp.*	Maple species	1	-		-	F	G	Medium canopy tree, adjacent existing noise wall on private property side, limb/prune as required
135	*Acer sp.*	Maple species	1	-		-	F	F	Suppressed canopy growth, adjacent existing noise wall on private property side, limb/prune as required
136	*Acer sp.*	Maple species	1	-		-	F	F	Suppressed canopy growth, adjacent existing noise wall on private property side, limb/prune as required
G137	*Acer saccharum*	Sugar Maple	3	15-20		F	F	F	Tight spacing, suppressed canopy growth, adjacent existing noise wall on private property side, limb/prune as required
G138	*Acer negundo*	Manitoba Maple	2	12-15		F	F	F	Suppressed canopy growth

Figure 2: Tree Grouping 2 Mapping – Clarendon Ave. to Harmer Ave.

2.3 TREE GROUPING 3: EMBANKMENT NORTH OF 417

EMBANKMENT FROM HOLLAND AVE. TO PARKDALE AVE.

Tree Grouping 3 is north of Highway 417 adjacent the existing noise wall and embankment from Holland Ave. to Parkdale Ave. The vegetation present is a mix of mature native and non-native deciduous and coniferous tree species with a dense shrub understory. Forty-eight (48) trees were identified within this grouping. Refer to Table 3 and Figure 3 below for tree mapping and conditions.

Table 3: Tree Grouping 3 Inventory – Holland Ave. to Parkdale Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G139	*Acer negundo*	Manitoba Maple	8	15-30		F	F	P	Suppressed canopy growth, growing on steep embankment
G139	*Ulmus sp.*	Elm species	1	~22		F	P	F	Lean, suppressed canopy growth (70% CV), growing on steep embankment
G139	*Acer platanoides*	Norway Maple	4	10-20		F	F	G	Growing on steep embankment
G139	*Pinus resinosa*	Red Pine	1	-		-	-	-	Adjacent existing noise wall
G140	*Acer platanoides*	Norway Maple	2	~24		G	F	F	Vine in canopy, suppressed canopy growth
G140	*Acer negundo*	Manitoba Maple	20	15-20		F	F	F	Vine in canopy, suppressed canopy growth
G140	*Ulmus pumila*	Siberian Elm	1	~15		F	F	F	Vine in canopy, suppressed canopy growth
141	*Picea glauca*	White Spruce	1	~25		G	G	G	Vine in canopy, on private property
G142	*Acer negundo*	Manitoba Maple	5	15-20		P	P	P	Growing on steep embankment
G142	*Celtis occidentalis*	Hackberry	2	~15		G	F	F	-
143	*Acer negundo*	Manitoba Maple	1	~25		F	F	G	Growing on steep embankment
144	*Acer negundo*	Manitoba Maple	1	~24		F	F	G	Growing on steep embankment
145	*Acer negundo*	Manitoba Maple	1	~22		F	F	G	Growing on steep embankment

Figure 3: Tree Grouping 3 Mapping – Holland Ave. to Parkdale Ave.

2.4 TREE GROUPING 4: EMBANKMENT NORTH OF 417

PARKDALE WESTBOUND OFF-RAMP EMBANKMENT

Tree Grouping 4 is north of Highway 417 adjacent the existing noise wall and retained embankment on the westbound Parkdale Ave. off-ramp. The vegetation present is non-native deciduous tree species with a dense shrub understory. Twelve (12) trees were identified within this grouping. Refer to Table 4 and Figure 4 below for tree mapping and conditions.

Table 4: Tree Grouping 4 Inventory – Parkdale Off-ramp Embankment

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G146	*Acer negundo*	Manitoba Maple	6	15-20		F	F	F	-
G147	*Ulmus pumila*	Siberian Elm	2	-		-	-	F	-
G147	*Elaeagnus angustifolia*	Russian Olive	3	-		-	-	F	-
148	*Ulmus pumila*	Siberian Elm	1	-		P	P	P	-

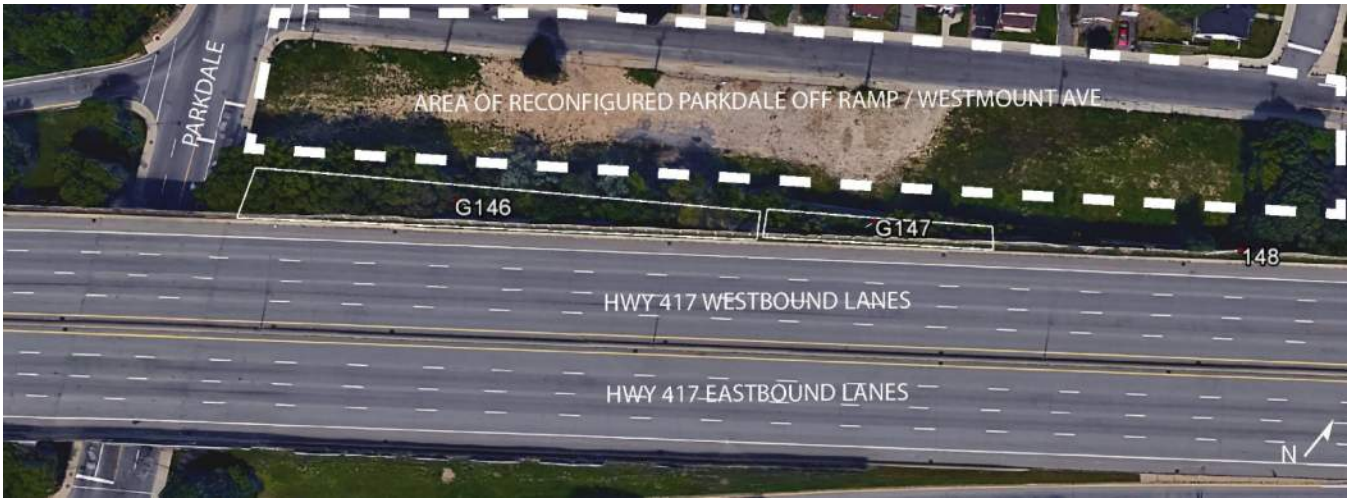


Figure 4: Tree Grouping 4 Mapping – Parkdale Off-ramp Embankment

2.5 TREE GROUPING 5: EMBANKMENT NORTH OF 417

ST FRANCIS ST. TO BAYSWATER AVE. EMBANKMENT

Tree Grouping 5 is north of Highway 417 adjacent the existing noise wall and embankment from St. Francis St. to Bayswater Ave. The vegetation present is a mix of mature native and non-native deciduous tree species with a dense shrub understory. One-hundred-and-forty-six (146) trees were identified within this grouping. Refer to Table 5 and Figure 5 below for tree mapping and conditions.

Table 5: Tree Grouping 5 Inventory – St Francis St. to Bayswater Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
149	*Ulmus pumila*	Siberian Elm	1	23		F	G	G	Weak union
150	*Acer negundo*	Manitoba Maple	1	19		P	P	P	Suppressed canopy growth (10%CV)
G151	*Acer negundo*	Manitoba Maple	39	10-30		F	F	F	Vine in canopy
G151	*Acer platanoides*	Norway Maple	15	15-20		F	F	F	Limb/prune select trees extending over existing noise wall
G151	*Juglans nigra*	Black Walnut	1	-		G	F	F	Suppressed canopy growth
G151	*Quercus macrocarpa*	Bur Oak	1	-		G	F	P	Suppressed canopy growth
G152	*Acer platanoides*	Norway Maple	18	15-25		F	F	F	Suppressed canopy growth
G152	*Acer negundo*	Manitoba Maple	26	20-35		F	F	F	Suppressed canopy growth, weak unions
G153	*Acer negundo*	Manitoba Maple	3	15-20		F	F	G	Limb/prune select trees extending over existing noise wall
G153	*Acer platanoides*	Norway Maple	4	10-20		F	F	G	Limb/prune select trees extending over existing noise wall
G154	*Acer negundo*	Manitoba Maple	7	10-15		F	F	F	Weak Unions, limb/prune select trees extending over existing noise wall
G154	*Acer platanoides*	Norway Maple	5	10-15		F	F	F	Limb/prune select trees extending over existing noise wall
G155	*Acer negundo*	Manitoba Maple	10	10-20		F	F	F	Growing on steep embankment
G155	*Acer platanoides*	Norway Maple	15	10-20		F	F	F	Growing on steep embankment, limb/prune select trees extending over existing noise wall

Figure 5: Tree Grouping 5 Mapping – St Francis St. to Bayswater Ave.

2.6 TREE GROUPING 6: ADJACENT EXISTING NOISE WALL NORTH OF 417

RETAINED EMBANKMENT AT CITY OF OTTAWA TRAFFIC OPERATIONS BUILDING

Tree Grouping 6 is north of Highway 417 adjacent the existing noise wall and retained embankment at the City of Ottawa Traffic Operations Building. The vegetation present is non-native deciduous tree with shrub understory. One (1) tree was identified within this grouping. Refer to Table 6 and Figure 6 below for tree mapping and conditions.

Table 6: Tree Grouping 6 Inventory – Retained Embankment at City of Ottawa Traffic Operations Building

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
156	*Elaeagnus angustifolia*	Russian Olive	20	~20		P	F	F	Growing on existing fence line

Figure 6: Tree Grouping 6 Mapping – Retained Embankment at City of Ottawa Traffic Operations Building

2.7 TREE GROUPING 7: EMBANKMENT NORTH OF 417

ST. ANTHONY STREET AT PRESTON STREET

Tree Grouping 7 is north of Highway 417 on the embankment parallel St. Anthony Street. The vegetation present is a mix of mature native and non-native coniferous and deciduous tree species with grass and shrub understory. The nine (9) trees present in this grouping include: Manitoba Maple, American Elm, Hackberry and Russian Olive. Refer to Table 7 and Figure 7 below for tree mapping and conditions.

Table 7: Tree Grouping 7 Inventory – St. Anthony Street at Preston Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
54	*Acer negundo*	Manitoba Maple	1	35-4	8	P	F	F	Growing at base of retaining and fence.
55	*Acer negundo*	Manitoba Maple	1	15-20	8	P	F	F	Growing at base of retaining and fence.
62	*Ulmus americana*	American Elm	1	25-30	15	F	G	F	
63	*Celtis occidentalis*	Hackberry	1	20-25	10	F	F	F	Multi-stem. Weak union.
64	*Celtis occidentalis*	Hackberry	4	20-25	10	F	F	F	Mluti-stem.
65	*Elaeagnus angustifolia*	Russian Olive	1	15	6	F	G	F	Vine in canopy.

Figure 7: Tree Grouping 7 Mapping – St. Anthony Street at Preston Street

2.8 TREE GROUPING 8: PROPOSED STAGING AREA NORTH OF 417

SOCCER PITCH AT PRESTON STREET AND GLADSTONE AVENUE

Tree Grouping 8 is located north of Highway 417 adjacent to the soccer pitch running north-south along Preston Street. The vegetation present is predominantly mature deciduous non-native tree species alongside a vine covered fence line. The forty-six (46) trees present in this grouping include: Honey Locust, Manitoba Maple and American Elm. Refer to Table 8 and Figure 8 below for tree mapping and conditions.

Table 8: Tree Grouping 8 Inventory – Soccer Pitch at Preston Street and Gladstone Avenue

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
38	*Gleditsia triacanthos*	Honey Locust	1	15	7	G	G	G	Vine growth in canopy.
39	*Gleditsia triacanthos*	Honey Locust	1	14	7	G	G	G	Vine growth in canopy.
40	*Gleditsia triacanthos*	Honey Locust	1	14	7	G	G	G	10 degree lean. Vine growth in canopy.
41	*Gleditsia triacanthos*	Honey Locust	1	12	7	G	G	F	vine growth in canopy.
42	*Gleditsia triacanthos*	Honey Locust	1	13	7	G	F	F	10 degree lean. Vine growth in canopy.
43	*Acer negundo*	Manitoba Maple	1	10-15	10	P	P	F	Growing on fence line. Multi-stem.
44	*Acer negundo*	Manitoba Maple	1	12	5	P	F	P	Growing on fence line. Suppressed.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
45	*Ulmus americana*	American Elm	1	40-50	15	G	F	F	10% dead wood. On fence line. Pruned under hydro.
46	*Acer negundo*	Manitoba Maple	1	15-20	10	F	F	P	Vine in canopy.
47	*Acer negundo*	Manitoba Maple	1	" "	5	F	F	P	Vine in canopy. Suppressed.
48	*Ulmus americana*	American Elm	1	40-50	15	G	F	P	Insect damage on leaves. Pruned under hydro.
49	*Acer negundo*	Manitoba Maple	1	15-20	5	F	F	F	Pruned under hydro.
50	*Acer negundo*	Manitoba Maple	1	40-50	8	P	P	F	Growing on fence line. Pruned under hydro.
50a	*Acer negundo*	Manitoba Maple	4	10	-	P	P	F	
51	*Acer negundo*	Manitoba Maple	1	30-40	10	P	P	F	Growing on fence line. Pruned under hydro.
51a	*Acer negundo*	Manitoba Maple	3	10	10	P	P	F	Growing on fence line. Pruned under hydro.
52	*Acer negundo*	Manitoba Maple	1	30-40	8	F	F	G	Growing on fence line. Pruned under hydro.
52a	*Acer negundo*	Manitoba Maple	5	10	8	F	F	G	Growing on fence line. Pruned under hydro.
53	*Acer negundo*	Manitoba Maple	19	8-12	8	F	F	G	Small Manitoba Maple growing on inside of fence line.

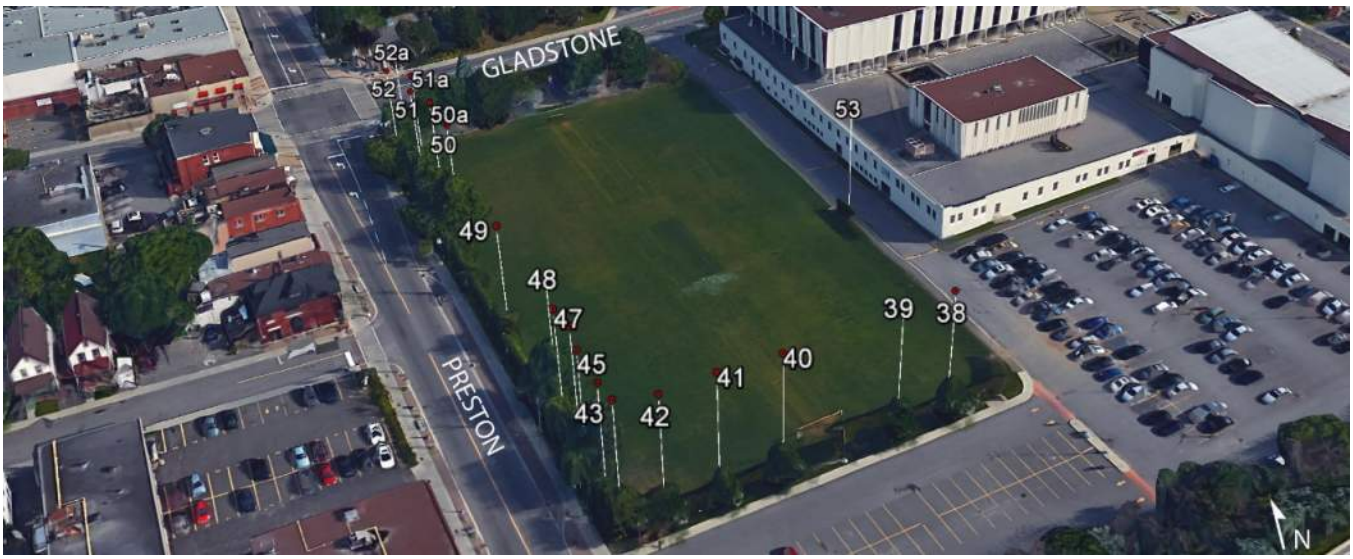


Figure 8: Tree Grouping 8 Mapping – Soccer Pitch at Preston Street and Gladstone Avenue

2.9 TREE GROUPING 9: EMBANKMENT NORTH OF 417 ON-RAMP

EMBANKMENT AT ROCHESTER ST. ON-RAMP

Tree Grouping 9 is north of Highway 417 on an embankment adjacent the Rochester St. on-ramp. Vegetation present is a mix of native and non-native deciduous trees with dense shrub understory. A significant number of dead Ash trees are present in this tree grouping. Thirty-two (32) trees were identified within this grouping. Refer to Table 9 and Figure 9 below for tree mapping and conditions.

Table 9: Tree Grouping 9 Inventory – Rochester St. On-ramp Embankment

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G157	*Acer negundo*	Manitoba Maple	16	10-25		F	F	F	Suppressed canopy growth
G157	*Elaeagnus angustifolia*	Russian Olive	15	10-20		F	F	F	Suppressed canopy growth
G157	*Prunus sp.*	Cherry sp.	1	19		F	F	G	Multiple stems (2), weak union

Figure 9: Tree Grouping 9 Mapping – Rochester St. On-ramp Embankment

2.10 TREE GROUPING 10: EMBANKMENT NORTH OF 417

ROCHESTER STREET AT 417 WESTBOUND ON-RAMP

Tree Grouping 10 is located north of Highway 417 on the embankment parallel Raymond Street Highway 417 on-ramp and west of Tree grouping A. The vegetation present is a mixture of deciduous and coniferous tree species amongst a maintained grassed embankment. The seven (7) trees present in this grouping include: Norway Maple, Red Pine and Blue Spruce. Refer to Table 10 and Figure 10 below for tree mapping and conditions.

Table 10: Tree Grouping 10 Inventory – Rochester Street at 417 westbound on-ramp

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
30	*Acer negundo*	Manitoba Maple	1	25-30	6	P	P	P	Multi-stem. 10 degree lean. Vines in canopy.
31	*Acer platanoides*	Norway Maple	1	10-15	5	P	P	G	Multi-stem. Poor union.
32	*Acer platanoides*	Norway Maple	1	15	6	F	F	F	Co-dominant leader.
33	*Pinus resinosa*	Red Pine	1	35	7	G	F	F	Internal branching. Suppressed canopy growth.
34	*Picea pungens*	Blue Spruce	1	28	5	G	F	F	Co-dominant leader.
35	*Pinus resinosa*	Red Pine	1	25	8	G	G	G	-
36	*Pinus resinosa*	Red Pine	1	25	8	G	G	G	-
37	*Pinus resinosa*	Red Pine	1	25	8	G	G	G	-

Figure 10: Tree Grouping 10 Mapping – Rochester Street at 417 westbound on-ramp

2.11 TREE GROUPING 11: EMBANKMENT NORTH OF 417

RAYMOND STREET - CAMBRIDGE STREET NORTH TO ROCHESTER STREET

Tree Grouping 11 is located north of Highway 417 on the embankment parallel to Raymond Street. The vegetation present is a mix of mature native and non-native coniferous and deciduous tree species with grass and shrub understory. The thirty (30) trees present in this grouping include: White Ash, Red Pine, White Spruce, Manitoba Maple, American Elm, Russian Olive and Hackberry. Refer to Table 11 and Figure 11 below for tree mapping and conditions.

Table 11: Tree Grouping 11 Inventory - Raymond Street: Cambridge Street North to Rochester Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
1	*Fraxinus americana*	White Ash	1	15-20	7	P	P	P	Emerald Ash Borer Damage. Suckering Multi-Stem.
2	*Pinus resinosa*	Red Pine	1	20-25	5	G	G	G	-
3	*Pinus resinosa*	Red Pine	1	20-25	5	F	G	G	Slightly deformed trunk.
4	*Pinus resinosa*	Red Pine	1	20-25	5	G	F	G	Co-dominant leader.
5	*Pinus resinosa*	Red Pine	1	20-25	5	G	G	G	-
6	*Picea glauca*	White Spruce	1	15-20	5	G	G	G	-
7	*Acer negundo*	Manitoba Maple	1	30-45	7	P	P	F	Growing on existing fence line. Multi-stem vigorous.
8	*Pinus resinosa*	Red Pine	1	20-25	6	G	G	G	-
9	*Pinus resinosa*	Red Pine	1	20-25	5	F	F	F	Suppressed growth. Crowded by Maple.
10	*Pinus resinosa*	Red Pine	1	20-25	7	G	G	G	-
11	*Pinus resinosa*	Red Pine	1	20-25	8	G	G	G	-
12	*Pinus resinosa*	Red Pine	1	20-25	7	P	F	G	Weak vigor. Co-dominant leader. Internal branching
13	*Pinus resinosa*	Red Pine	1	25-30	7	G	G	G	-
14	*Pinus resinosa*	Red Pine	1	25-30	9	G	G	G	-
15	*Pinus resinosa*	Red Pine	1	20-25	8	F	F	G	Co-dominant leader. Weak vigor.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
16	*Ulmus americana*	American Elm	1	20-25	8	G	F	F	Suppressed growth. Growing on existing noise wall alignment.
17	*Ulmus americana*	American Elm	1	15-20	8	G	G	G	-
18	*Acer negundo*	Manitoba Maple	1	15-20	6	P	F	F	Multi-stem. Weak union.
19	*Acer negundo*	Manitoba Maple	1	20-25	7	P	F	F	Multi-stem. Weak union.
20	*Elaeagnus angustifolia*	Russian Olive	1	15-20	7	F	F	F	Growing on existing noise wall alignment.
21	*Picea glauca*	White Spruce	1	25-30	12	G	G	G	-
22	*Ulmus americana*	American Elm	1	40-50	16	G	F	F	5% dead wood. Large canopy tree.
23	*Acer negundo*	Manitoba Maple	1	20-30	7	P	P	P	Mutli-stem. Poor union. Large canopy tree.
24	*Acer negundo*	Manitoba Maple	1	20-25	6	P	P	P	Mutli-stem. Poor union. Large canopy tree. Straight
25	*Acer negundo*	Manitoba Maple	1	20-25	10	P	P	P	Mutli-stem. Poor union. Large canopy tree. 20 degree lean.
26	*Ulmus americana*	American Elm	1	30-35	16	F	F	F	10% dead wood. 5 degree lean.
27	*Ulmus americana*	American Elm	1	25-30	15	F	F	F	10% dead wood.
28	*Celtis occidentalis*	Hackberry	1	15-20	7	F	F	F	Refer to sample 1. Multi-stem. 5 degree lean.
29	*Acer negundo*	Manitoba Maple	1	15-20	5	P	P	P	70% dead wood. Vine covered.

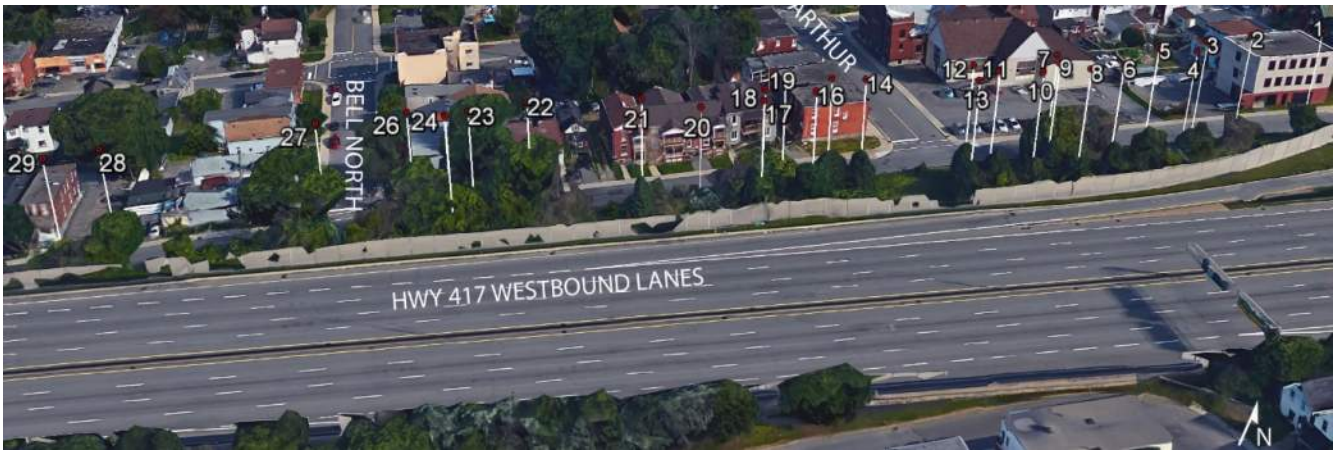


Figure 11: Tree Grouping 11 Mapping - Raymond Street at Arthur Lane and Bell Street

2.12 TREE GROUPING 12: EMBANKMENT NORTH OF 417

EMBANKMENT AT CATHERINE ST. AND BRONSON AVE.

Tree Grouping 12 is north of Highway 417 on an embankment adjacent the Bronson Ave. / Catherine St. westbound on-ramp. Vegetation present is a mix of native and non-native deciduous and coniferous trees on a mown turf embankment. Seventeen (17) trees were identified within this grouping. Refer to Table 12 and Figure 12 below for tree mapping and conditions.

Table 12: Tree Grouping 12 Inventory – Embankment at Catherine St. and Bronson Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G186	*Pinus resinosa*	Red Pine	9	15-22		G	G	F	-
G186	*Acer platanoides*	Norway Maple	7	10-20		F	F	F	Multiple stems, suppressed canopy growth
187	*Acer platanoides*	Norway Maple	1	~14		F	F	G	Multiple stems

Figure 12: Tree Grouping 12 Mapping – Embankment at Catherine St. and Bronson Ave.

2.13 TREE GROUPING 13: EMBANKMENT NORTH OF 417

EMBANKMENT AT LYON ST. ON-RAMP AND BRONSON AVE. WESTBOUND OFF-RAMP

Tree Grouping 13 is located north of Highway 417 on an embankment adjacent the Bronson Ave. westbound off-ramp and on a retained embankment adjacent the Lyon St. on-ramp. Vegetation present is non-native deciduous trees with shrub / grass understory. Eighteen (18) trees were identified within this grouping. Refer to Table 13 and Figure 13 below for tree mapping and conditions.

Table 13: Tree Grouping 13 Inventory – Embankment at Lyon St. On-ramp and Bronson Ave. Off-ramp

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G188	*Acer platanoides*	Norway Maple	2	12		P	F	F	Tight spacing, suppressed canopy growth
G188	*Acer negundo*	Manitoba Maple	10	10-12		P	F	F	Tight spacing, suppressed canopy growth
G189	*Ulmus pumila*	Siberian Elm	1	~12		F	F	F	Growing on embankment between crib wall + existing noise wall
G189	*Acer negundo*	Manitoba Maple	3	10-12		F	F	F	Growing on embankment between crib wall + existing noise wall
190	*Acer negundo*	Manitoba Maple	1	~11		P	F	P	Growing on embankment between crib wall + existing noise wall
191	*Ulmus pumila*	Siberian Elm	1	14		P	F	F	Growing on existing fence line

Figure 13: Tree Grouping 13 Mapping – Embankment at Lyon St. On-ramp and Bronson Ave. Off-ramp

2.14 TREE GROUPING 14: EMBANKMENT SOUTH OF 417

EMBANKMENT ON CHAMBERLAIN AVE.

Tree Grouping 14 is located south of Highway 417 on an embankment adjacent Chamberlain Ave. Vegetation present is a mix of native and non-native deciduous trees with dense shrub / grass understory. Seventy-four (74) trees were identified within this grouping. Refer to Table 14 and Figure 14 below for tree mapping and conditions.

Table 14: Tree Grouping 14 Inventory – Embankment on Chamberlain Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
192	*Acer negundo*	Manitoba Maple	1	15-22		P	F	F	Multiple stems (3), weak unions
193	*Acer negundo*	Manitoba Maple	1	15-22		P	P	P	Multiple stems
194	*Elaeagnus angustifolia*	Russian Olive	1	20-25		F	F	F	Multiple stems, suppressed canopy growth
192	*Acer negundo*	Manitoba Maple	1	15-22		P	F	F	Multiple stems (3), weak unions
193	*Acer negundo*	Manitoba Maple	1	15-22		P	P	P	Multiple stems
194	*Elaeagnus angustifolia*	Russian Olive	1	20-25		F	F	F	Multiple stems, suppressed canopy growth
195	*Ulmus pumila*	Siberian Elm	1	25-30		F	F	F	Multiple stems (2), suppressed canopy growth (60% CV), 10% deadwood
G196	*Acer negundo*	Manitoba Maple	8	15-25		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Acer platanoides*	Norway Maple	11	15-20		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Elaeagnus angustifolia*	Russian Olive	5	15-20		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Prunus sp.*	Cherry sp.	3	10-15		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Picea pungens*	Blue Spruce	3	15-25		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G196	*Ulmus pumila*	Siberian Elm	5	20-30		F	F	F	Vine in canopy, suppressed canopy growth (reduced CV)
G197	*Ulmus pumila*	Siberian Elm	7	15-25		F	F	F	-
G197	*Acer negundo*	Manitoba Maple	10	10-25		F	F	F	-
G197	*Acer platanoides*	Norway Maple	2	15-25		F	F	F	-
G197	*Elaeagnus angustifolia*	Russian Olive	5	10-20		F	F	F	-

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
G197	*Ulmus americana*	American Elm	3	45-50		F	F	F	-
G197	*Picea pungens*	Blue Spruce	5	15-20		F	F	F	-

Figure 14: Tree Grouping 14 Mapping – Embankment on Chamberlain Ave.

2.15 TREE GROUPING 15: PROPOSED STAGING AREA SOUTH OF 417

CHAMBERLAIN AVENUE BETWEEN BRONSON AVENUE AND PERCRY STREET

Tree Grouping 15 is located south of Highway 417 on an open site parallel Chamberlain Avenue. The vegetation present is comprised of native deciduous tree species growing alongside an existing fence-line. The six (6) trees present are American Elm trees. Refer to Table 15 and Figure 15 below for tree mapping and conditions.

Table 15: Tree Grouping 15 Inventory – Chamberlain Avenue between Bronson Avenue and Percy Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
90	*Ulmus americana*	American Elm	1	25-35	-	F	F	F	Multi-stem (3). 8% deadwood.
91	*Ulmus americana*	American Elm	1	25-35	-	F	F	F	Mulit-stem (4). Suppressed canopy growth. Leaf insect damage.
92	*Ulmus americana*	American Elm	1	25-35	-	G	F	F	5 degree lean. 5% deadwood.
93	*Ulmus americana*	American Elm	1	25-35	-	P	P	F	Weak union. Suppressed canopy growth. 5% deadwood.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
94	*Ulmus americana*	American Elm	1	25-35	-	P	P	F	Granular fill at base.
95	*Ulmus americana*	American Elm	1	45-50	-	G	F	G	-

Figure 15: Tree Grouping 15 Mapping – Chamberlain Avenue between Bronson Avenue and Percy Street

2.16 TREE GROUPING 16: EMBANKMENT SOUTH OF 417

EMBANKMENT ADJACENT BRONSON AVE. OFF-RAMP

Tree Grouping 16 is located south of Highway 417 on an embankment adjacent the Bronson Ave. eastbound off-ramp. Vegetation present is non-native deciduous trees with shrub understory. Thirteen (13) trees were identified within this grouping. Refer to Table 16 and Figure 16 below for tree mapping and conditions.

Table 16: Tree Grouping 16 Inventory – Embankment at Bronson Ave. Off-ramp

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
G201	*Acer negundo*	Manitoba Maple	11	15-20		F	F	F	Growing adjacent existing noise wall
G202	*Acer negundo*	Manitoba Maple	2	15-25		-	F	G	-

Figure 16: Tree Grouping 16 Mapping – Embankment at Bronson Ave. Off-ramp

2.17 TREE GROUPING 17: EMBANKMENT SOUTH OF 417

ORANGEVILLE STREET BETWEEN BOOTH STREET AND BELL STREET

Tree Grouping 17 is located between Orangeville Street and Highway 417 eastbound lanes. The landscape in this area is comprised of a dense mix of mature native and non-native coniferous and deciduous trees. Site access was restricted in this location. Trees were assessed from outside an existing fence. Overall tree conditions were observed to be fair with observed suppressed canopy growth from crowding. Approximately sixty-eight (68) trees were observed. Refer to Table 17 and Figure 17 below for tree mapping and conditions.

Table 17: Tree Grouping 17 Inventory – Orangeville Street between Booth Street and Bell Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G1	*Acer negundo*	Manitoba Maple	~35	10-30	-	-	-	-	-
G1	*Ulmus americana*	American Elm	2	10-30	-	-	-	-	-
G1	*Elaeagnus angustifolia*	Russian Olive	~11	10-30	-	-	-	-	-
G1	*Acer platanoides*	Norway Maple	~6	10-30	-	-	-	-	-
G1	*Pinus resinosa*	Red Pine	~8	10-30	-	-	-	-	-
G1	*Celtis occidentalis*	Hackberry	~4	10-30	-	-	-	-	-
88	*Celtis occidentalis*	Hackberry	1	15	-	P	P	P	-

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
89	*Celtis occidentalis*	Hackberry	1	15	-	P	P	P	-

Figure 17: Tree Grouping 17 Mapping – Orangeville Street between Booth Street and Bell Street

2.18 TREE GROUPING 18: EMBANKMENT SOUTH OF 417

ORANGEVILLE STREET BETWEEN ROCHESTER STREET AND BOOTH STREET

Tree Grouping 18 is located south of Highway 417 on the embankment parallel Orangeville Street. The vegetation present is a mix of mature native and non-native deciduous tree species with grass and shrub understory, located on the lower portion of the embankment. The twenty-five (25) trees present in this group include: Manitoba Maple, American Elm and Cherry sp. Refer to Table 18 and Figure 18 below for tree mapping and conditions.

Table 18: Tree Grouping 18 Inventory – Orangeville Street between Rochester Street and Booth Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
72	*Acer negundo*	Manitoba Maple	4	15-25	10	F	F	F	Grouping of multi-stems.
73	*Ulmus americana*	American Elm	1	10-15	8	F	F	F	Multi-stem.
74	*Ulmus americana*	American Elm	1	20-35	8	F	F	F	Multi-stem. Suppressed canopy growth.
75	*Ulmus americana*	American Elm	1	25-30	15	F	F	G	5% deadwood. Multi-stem.
76	*Ulmus americana*	American Elm	1	20-25	10	F	F	G	Multi-stem.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
77	*Ulmus americana*	American Elm	1	10-15	5	P	P	P	Multi-stem. Adjacent highway. Suppressed growth.
78	*Ulmus americana*	American Elm	1	15-20	12	F	F	G	Multi-stem.
79	*Acer negundo*	Manitoba Maple	1	15	5	P	P	P	Growing on fence line.
80	*Acer negundo*	Manitoba Maple	1	15-20	10	F	F	F	Suppressed growth. 15% deadwood.
81	*Acer negundo*	Manitoba Maple	1	20-25	10	F	F	F	Multi-stem.
82	*Celtis occidentalis*	Hackberry	1	15-20	8	F	F	F	Multi-stem.
83	*Acer negundo*	Manitoba Maple	8	10-25	8	F	F	F	Grouping.
84	*Acer negundo*	Manitoba Maple	1	15-25	8	F	F	F	-
85	*Prunus sp.*	Cherry sp.	1	12	6	F	F	G	Multi-stem.
86	*Acer platanoides*	Norway Maple	1	20	-	F	P	F	Multi-stem. Grouping on fence. Suckering.
87	*Acer negundo*	Manitoba Maple	1	12	-	P	P	P	Multi-stem. Suppressed canopy. Suckering.

Figure 18: Tree Grouping 18 Mapping – Orangeville Street between Rochester Street and Booth Street

2.19 TREE GROUPING 19: EMBANKMENT SOUTH OF 417

ROCHESTER STREET HIGHWAY OFF-RAMP AT PRESTON STREET

Tree Grouping 19 is located south of Highway 417 on the embankment south of the Rochester off-ramp at Preston Street. The vegetation present is a mix of mature native and non-native coniferous and deciduous tree species with grass and shrub understory. The eight (8) trees present in this grouping include: Blue Spruce, White Spruce, Honey Locust and Manitoba Maple. Refer to Table 19 and Figure 19 below for tree mapping and conditions.

Table 19: Tree Grouping 19 Inventory – Rochester Street Highway off-ramp at Preston Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
68	*Picea pungens*	Blue Spruce	1	10	4	G	G	G	On City of Ottawa R.O.W.
69	*Picea glauca*	White Spruce	1	10	4	G	G	G	On City of Ottawa R.O.W.
70	*Gleditsia triacanthos*	Honey Locust	1	10	5	G	G	G	On City of Ottawa R.O.W.
71	*Celtis occidentalis*	Hackberry	1	15-20	10	F	F	F	-
72	*Acer negundo*	Manitoba Maple	4	15-25	10	F	F	F	Grouping of multi-stems.

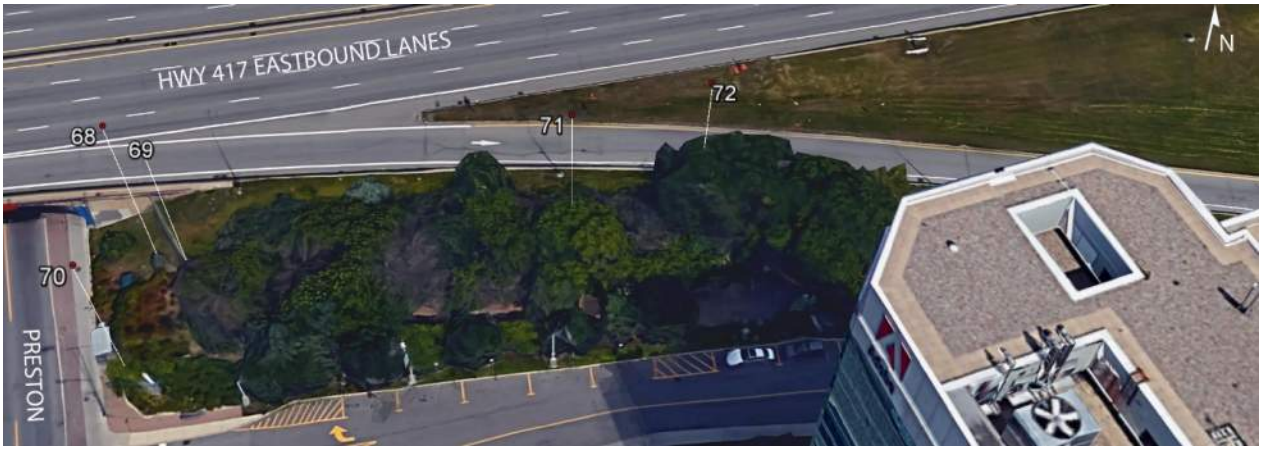


Figure 19: Tree Grouping 19 Mapping– Rochester Street Highway off-ramp at Preston Street

2.20 TREE GROUPING 20: EMBANKMENT SOUTH OF 417

YOUNG STREET AT PRESTON STREET

Tree Grouping 20 is located south of Highway 417 on the embankment parallel to Young Street, intersecting Preston Street. The vegetation present is mix of mature native and non-native coniferous and deciduous tree species with grass and shrub understory directly alongside the existing chain-link fence. The eight (8) trees present in this grouping include: White Spruce, Blue Spruce, American Elm, Manitoba Maple and Norway Maple. Refer to Table 20 and Figure 20 below for tree mapping and conditions.

Table 20: Tree Grouping 20 Inventory – Young Street at Preston Street

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
56	*Picea glauca*	White Spruce	1	10	4	G	G	G	On City of Ottawa R.O.W.
57	*Picea pungens*	Blue Spruce	1	10	4	G	G	G	On City of Ottawa R.O.W.
58	*Picea glauca*	White Spruce	1	10	4	G	G	F	On City of Ottawa R.O.W.
59	*Ulmus americana*	American Elm	1	30-40	20	G	F	F	5% deadwood. Internal bunching. Insect damaged leaves.
60	*Ulmus americana*	American Elm	1	50-60	20	F	G	F	5% deadwood. Internal bunching. Insect damaged leaves.
61	*Ulmus americana*	American Elm	1	30	15	F	G	F	Suckering at base. Insect damaged on leaves.
62-65 – Refer to Table 7: Tree Grouping 7 Inventory – St. Anthony Street at Preston Street									
66	*Acer negundo*	Manitoba Maple	1	15-20	10	P	P	F	Growing on fence line.
67	*Acer platanoides*	Norway Maple	1	15-20	8	F	F	F	Multi-stem. Suppressed canopy growth,

Figure 20: Tree Grouping 20 Mapping – Young Street at Preston Street

2.21 TREE GROUPING 21: EMBANKMENT SOUTH OF 417

EMBANKMENT ON YOUNG ST. FROM CHAMPAGNE AVE. TO BAYSWATER AVE.

Tree Grouping 21 is located south of Highway 417 on an embankment between the existing noise wall and private property from Champagne Ave. to Bayswater Ave. Vegetation present is a mix of native and non-native deciduous trees with dense shrub understory. Ten (10) trees were identified within this grouping. Refer to Table 21 and Figure 21 below for tree mapping and conditions.

Table 21: Tree Grouping 21 Inventory – Embankment on Young St.: Champagne Ave. to Bayswater Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
158	*Ulmus pumila*	Siberian Elm	1	~16		F	F	F	Suppressed canopy growth (70%CV)
159	*Acer ginnala*	Amur maple	1	-		P	P	P	Multiple stems (2), weak union, suppressed canopy growth (70%CV)
160	*Acer negundo*	Manitoba Maple	1	20-25		-	F	F	-
G161	*Acer negundo*	Manitoba Maple	5	15-20		P	F	P	Poor condition
G162	*Acer negundo*	Manitoba Maple	2	15-20		F	F	F	-

Figure 21: Tree Grouping 21 Mapping – Embankment on Young St.: Champagne Ave. to Bayswater Ave.

2.22 TREE GROUPING 22: EMBANKMENT SOUTH OF 417

EMBANKMENT ON YOUNG ST. FROM BAYSWATER AVE. TO FAIRMONT

Tree Grouping 22 is located south of Highway 417 on an embankment between the existing noise wall and private property from Champagne Ave. to Bayswater Ave. Vegetation present is non-native deciduous trees with dense shrub understory. Twenty-six (26) trees were identified within this grouping. Refer to Table 22 and Figure 22 below for tree mapping and conditions.

Table 22: Tree Grouping 22 Inventory – Embankment on Young St.: Bayswater Ave. to Fairmont

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G163	*Acer negundo*	Manitoba Maple	3	-		F	F	F	-
G164	*Acer platanoides*	Norway Maple	2	15-20		-	G	G	-
G164	*Acer negundo*	Manitoba Maple	16	10-25		-	G	G	-
G165	*Acer negundo*	Manitoba Maple	3	15-20		F	F	G	-
166	*Acer negundo*	Manitoba Maple	1	15-20		F	G	G	-
167	*Acer negundo*	Manitoba Maple	1	10-15		F	F	P	-

Figure 22: Tree Grouping 22 Mapping – Embankment on Young St.: Bayswater Ave. to Fairmont Ave.

2.23 TREE GROUPING 23: EMBANKMENT SOUTH OF 417

EMBANKMENT ON YOUNG ST. FROM FAIRMONT AVE. TO REID AVE.

Tree Grouping 23 is located south of Highway 417 on an embankment adjacent Young St. between Fairmont Ave. and Reid St. Vegetation present is non-native deciduous trees on mown lawn. Two (2) trees were identified within this grouping. Refer to Table 23 and Figure 23 below for tree mapping and conditions.

Table 23: Tree Grouping 23 Inventory – Embankment on Young St.: Fairmont Ave. to Reid Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
168	*Acer platanoides*	Norway Maple	1	22		P	F	F	Severe trunk damage
169	*Acer platanoides*	Norway Maple	1	20		F	P	P	Defoliated on highway-side of tree

Figure 23: Tree Grouping 23 Mapping – Embankment on Young St.: Fairmont Ave. to Reid Ave.

2.24 TREE GROUPING 24: EMBANKMENT SOUTH OF 417

EMBANKMENT ON EASTBOUND PARKDALE HWY ON-RAMP

Tree Grouping 24 is located south of the eastbound Highway 417 Parkdale Ave. on-ramp and adjacent the existing noise wall / retaining north of Reid Park. Vegetation present is a mix of native and non-native deciduous trees with dense shrub understory. Seventy-nine (79) trees were identified within this grouping. Refer to Table 24 and Figure 24 below for tree mapping and conditions.

Table 24: Tree Grouping 24 Inventory – Embankment on Eastbound Parkdale HWY On-ramp

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
G170	*Acer negundo*	Manitoba Maple	16	10-25		F	F	P	Suppressed canopy growth (60-80%CV)
G170	*Acer platanoides*	Norway Maple	9	10-20		F	F	F	Suppressed canopy growth (60-80%CV)
G170	*Ulmus pumila*	Siberian Elm	3	20-25		F	F	P	Suppressed canopy growth (60-80%CV)
171	*Malus sp.*	Apple sp.	1	15-20		F	F	G	Multiple stems
172	*Malus sp.*	Apple sp.	1	14		F	F	F	Weak union
G173	*Acer negundo*	Manitoba Maple	29	20-35		F	F	F	-
G173	*Ulmus pumila*	Siberian Elm	3	25-30		F	F	F	Suppressed canopy growth (70-80%CV)
G173	*Elaeagnus angustifolia*	Russian Olive	3	20-25		F	F	F	Suppressed canopy growth (70-80%CV)
G173	*Acer ginnala*	Amur maple	9	10-15		G	F	F	Suppressed canopy growth (70-80%CV), multiple stems, weak unions
G173	*Acer platanoides*	Norway Maple	2	15-20		G	G	G	-
174	*Acer platanoides*	Norway Maple	1	~25		F	F	G	-
175	*Acer negundo*	Manitoba Maple	1	~15		P	F	F	Weak unions, multiple stems
176	*Acer negundo*	Manitoba Maple	1	~12		P	F	F	Weak unions, multiple stems

Figure 24: Tree Grouping 24 Mapping – Embankment on Eastbound Parkdale HWY On-ramp

2.25 TREE GROUPING 25: EMBANKMENT SOUTH OF 417

EMBANKMENT ON EASTBOUND PARKDALE HWY OFF-RAMP

Tree Grouping 25 is located south of the eastbound Highway 417 Parkdale Ave. off-ramp. Vegetation present is non-native deciduous trees with shrub understory. Twenty-one (21) trees were identified within this grouping. Refer to Table 25 and Figure 25 below for tree mapping and conditions.

Table 25: Tree Grouping 25 Inventory – Embankment on Eastbound Parkdale HWY Off-ramp

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
G177	*Acer negundo*	Manitoba Maple	9	20-25		F	F	F	Weak unions, multiple stems
G178	*Acer negundo*	Manitoba Maple	5	15-25		F	F	F	Weak unions, multiple stems
G179	*Acer negundo*	Manitoba Maple	7	20-25		F	F	F	Weak unions, multiple stems

Figure 25: Tree Grouping 25 Mapping – Embankment on Eastbound Parkdale HWY Off-ramp

2.26 TREE GROUPING 26: EMBANKMENT SOUTH OF 417

EMBANKMENT FROM HOLLAND AVE. TO FAIRFAX AVE.

Tree Grouping 26 is located south of Highway 417 from Holland Ave. to Fairfax Ave. in a strip of land between the existing noise wall and private property. Vegetation present is a mix of native and non-native deciduous trees with dense shrub understory. Sixty-eight (68) trees were identified within this grouping. Refer to Table 26 and Figure 26 below for tree mapping and conditions.

Table 26: Tree Grouping 26 Inventory – Embankment: Holland Ave. to Fairfax Ave.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION TI	CS	CV	REMARKS
G180	*Acer ginnala*	Amur maple	6	10-15		F	F	F	Suppressed canopy growth
G180	*Prunus sp.*	Cherry sp.	3	10-20		P	F	F	Suppressed canopy growth
G180	*Acer platanoides*	Norway Maple	8	20-25		F	F	F	Suppressed canopy growth
G180	*Ulmus pumila*	Siberian Elm	3	20-25		F	F	F	Suppressed canopy growth
G180	*Acer negundo*	Manitoba Maple	10	20-30		F	F	F	Suppressed canopy growth
G180	*Populus tremuloides*	Trembling Aspen	1	~45		F	F	F	Suppressed canopy growth
G181	*Ulmus pumila*	Siberian Elm	12	10-15		F	F	F	Adjacent existing noise wall, limb/prune as required
G182	*Ulmus pumila*	Siberian Elm	19	25-45		G	G	F	Adjacent existing noise wall, limb/prune as required
G182	*Acer platanoides*	Norway Maple	6	20-25		F	F	F	-

Figure 26: Tree Grouping 26 Mapping – Embankment: Holland Ave. to Fairfax Ave.

2.27 TREE GROUPING 27: EMBANKMENT SOUTH OF 417

BOULEVARD ON RUSKIN ST.

Tree Grouping 27 is located south of Highway 417 along the boulevard on Ruskin St. Vegetation present is non-native deciduous trees with limited areas of shrub understory. Three (3) trees were identified within this grouping. Refer to Table 27 and Figure 27 below for tree mapping and conditions.

Table 27: Tree Grouping 27 Inventory – Boulevard on Ruskin St.

TREE #	BOTANICAL NAME	COMMON NAME	NO.	DBH (CM)	HEIGHT (M)	CONDITION			REMARKS
						TI	CS	CV	
183	*Acer negundo*	Manitoba Maple	1	15		P	P	F	-
184	*Ulmus pumila*	Siberian Elm	1	52		G	F	F	10% deadwood, large tree
185	*Acer platanoides*	Norway Maple	1	13		P	F	P	Suppressed canopy growth (50%CV)

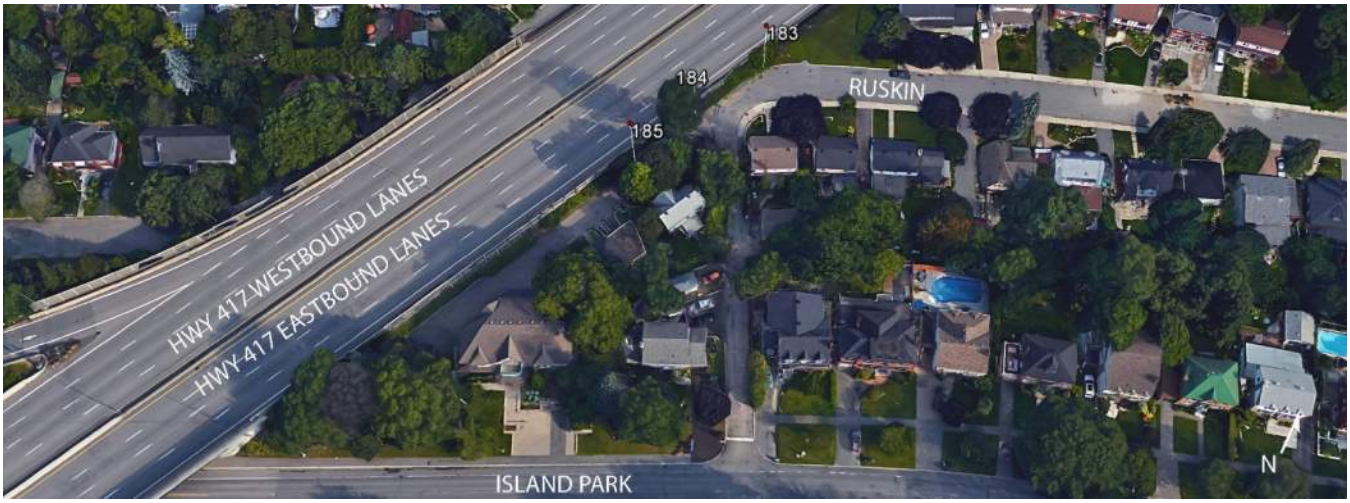


Figure 27: Tree Grouping 27 Inventory – Boulevard on Ruskin St.

3 CONCLUSION

Within the tree inventory study area, a total of approximately eight-hundred-and-two (802) trees were reviewed for their approximate location, size and overall condition on October 12, 2016 and October 3-4, 2017. The study area is located in vicinity of proposed bridge replacement / rehabilitation and noise wall construction works for Highway 417 between Island Park Drive and Lyon Street. A majority of trees present are non-native species. It is anticipated that proposed works relating to noise wall replacement will have limited impact on existing trees located on private property. It is anticipated that impact to trees adjacent the proposed noise wall replacement locations will require limbing and pruning and select trees removals in limited areas.

The required number of tree removals to facilitate construction will be determined as part of the proposed landscape mitigation. Conservation of existing plant material is recommended where possible. Where conservation is not feasible a minimum tree replacement ratio of 2:1 is recommended as a considered best-management practice. It is recommended that new/replacement tree species be selected to provide visual interest through a mix of deciduous, coniferous and indigenous species, with an emphasis on the use of urban tolerant native plants as appropriate, and in keeping with the Context Sensitive Design (CSD) program for the highway corridor.

APPENDIX

A SITE PHOTOS (12/10/16)

Tree Grouping 11 Site Photos









APPENDIX A

Tree Grouping 11 Site Photos









Tree Grouping 10-11 Site Photos









APPENDIX A

Tree Grouping 8 + 10 Site Photos









Tree Grouping 8 Site Photos







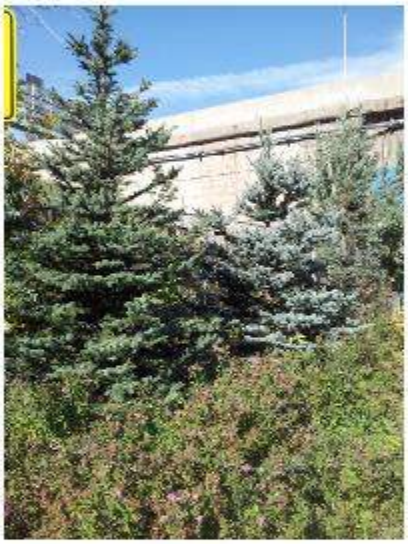
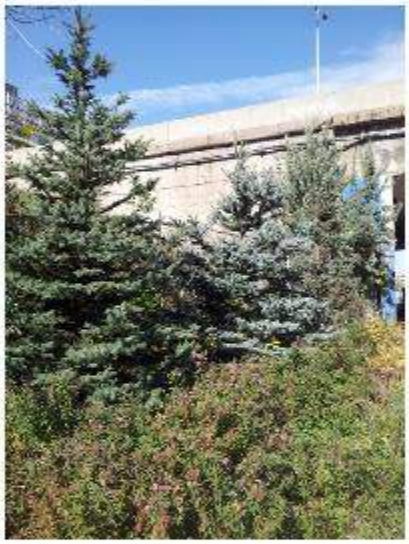


APPENDIX A

Tree Grouping 7-8 Site Photos






Tree Grouping 19-20 Site Photos












APPENDIX A

Tree Grouping 17-18 Site Photos









Tree Grouping 15 + 17 Site Photos









APPENDIX A

Tree Grouping 11 Site Photos









Tree Grouping 11 Site Photos

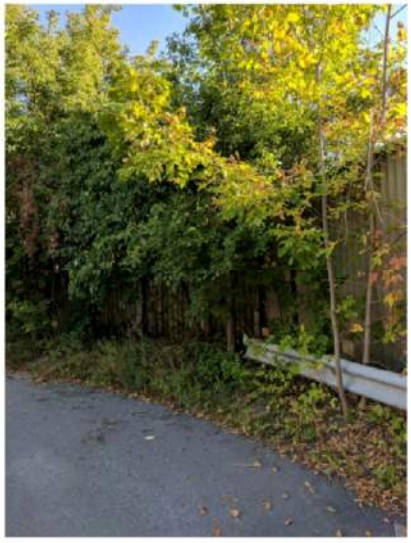
APPENDIX

B SITE PHOTOS (3-4/10/17)

Tree Grouping 1-2 Site Photos



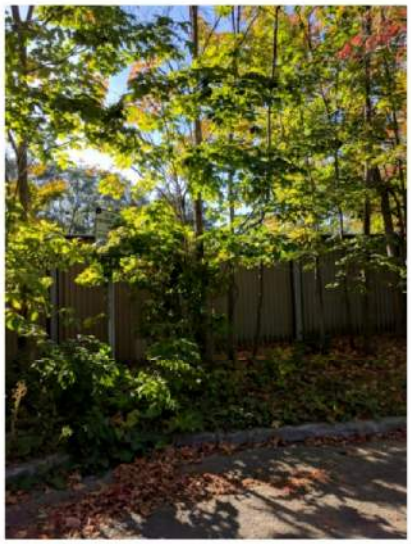






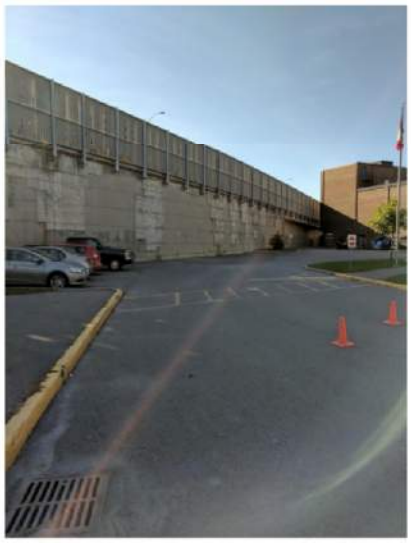
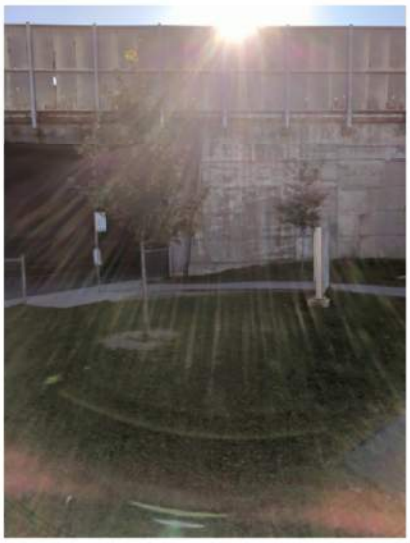
APPENDIX B

Tree Grouping 2 Site Photos

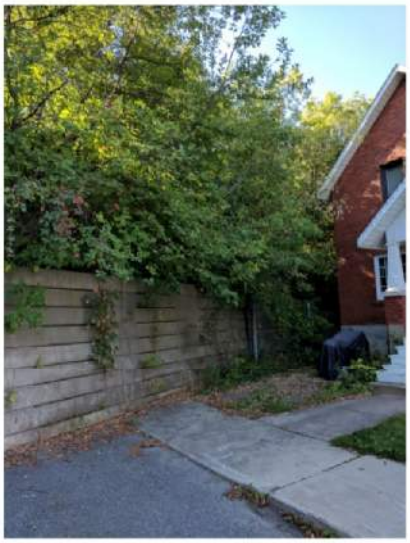




Tree Grouping 3 Site Photos



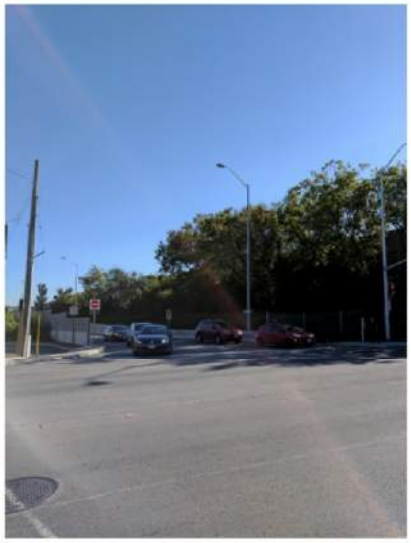
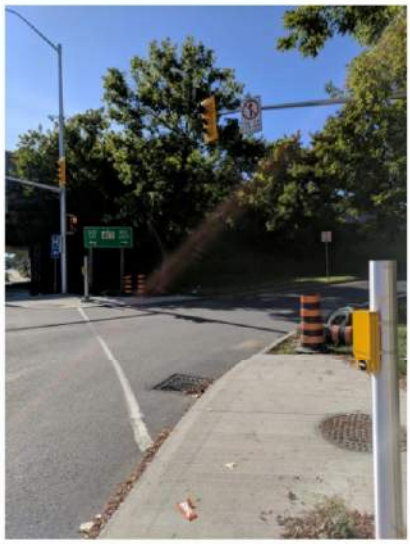
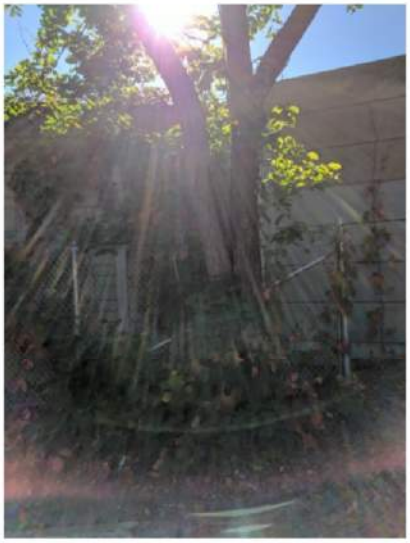






APPENDIX B

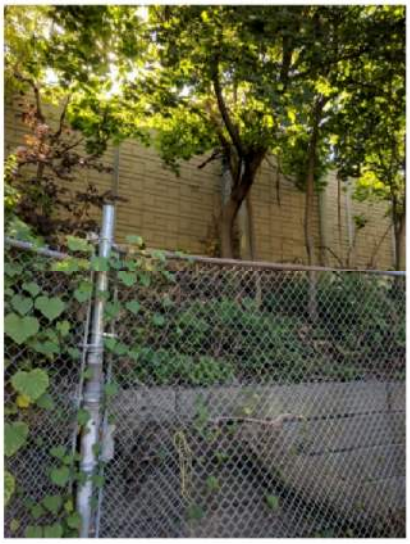
Tree Grouping 4-5 Site Photos

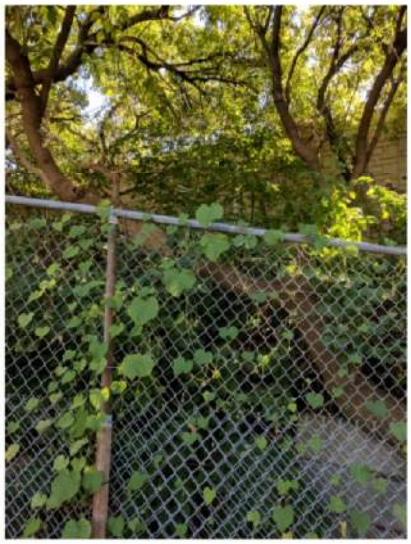








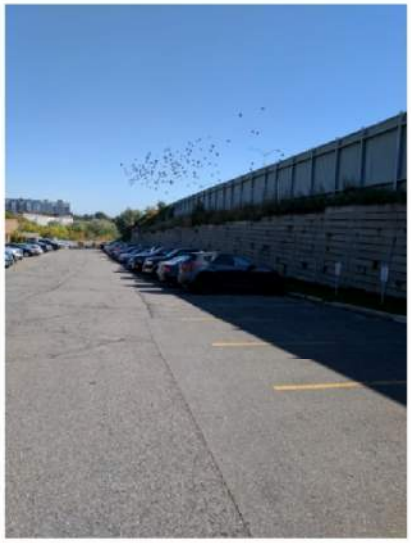
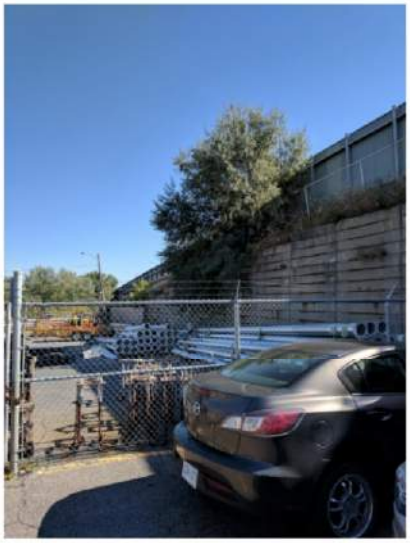
Tree Grouping 5 Site Photos



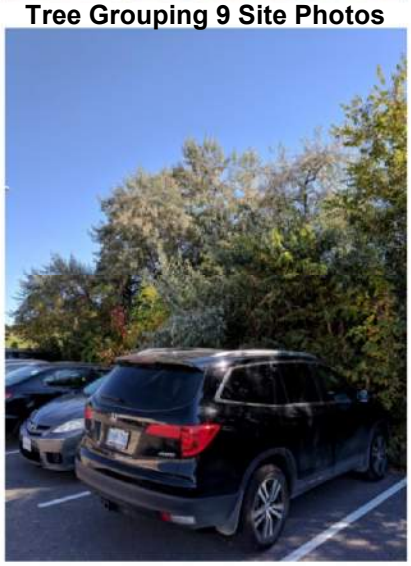


APPENDIX B

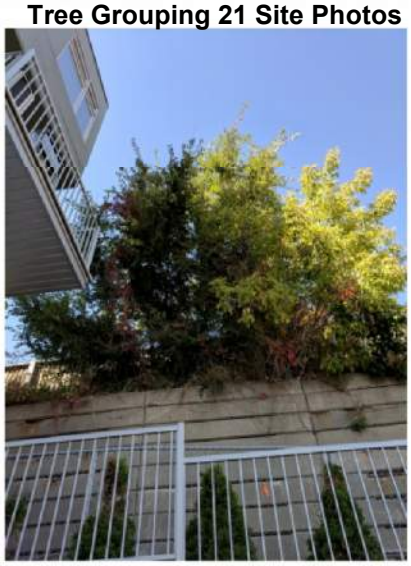
Tree Grouping 5-6 Site Photos

Tree Grouping 9 Site Photos



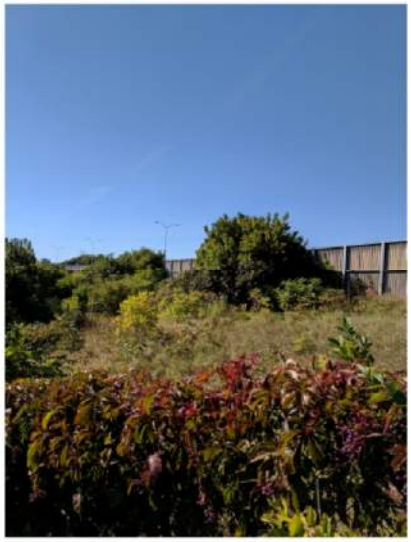
Tree Grouping 21 Site Photos

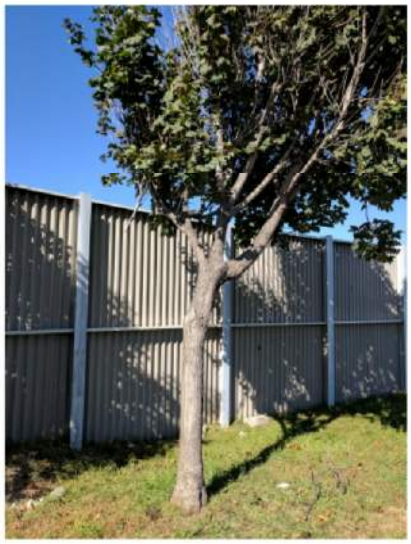


Tree Grouping 21-23 Site Photos









APPENDIX B

Tree Grouping 24 Site Photos



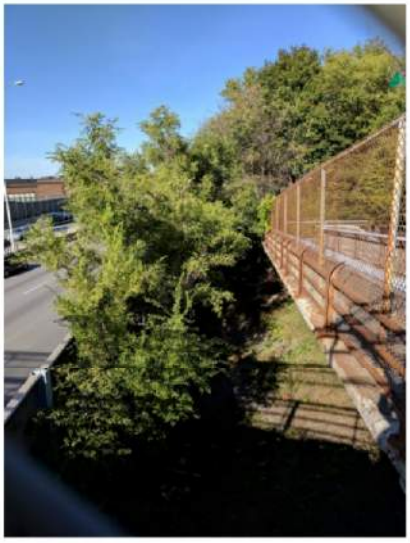
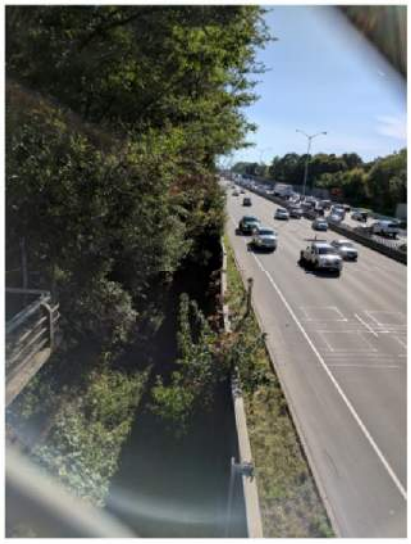
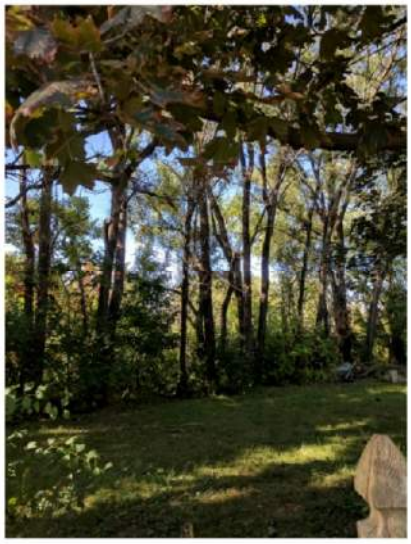
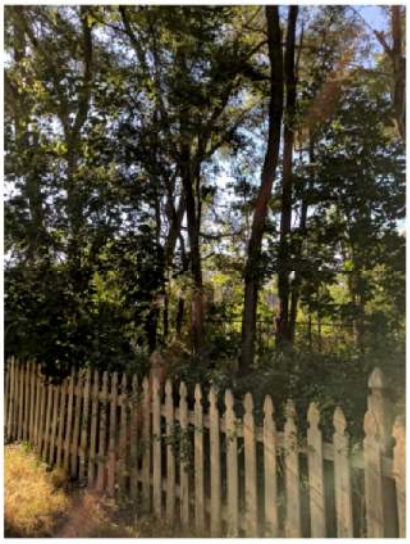






Tree Grouping 25-27 Site Photos



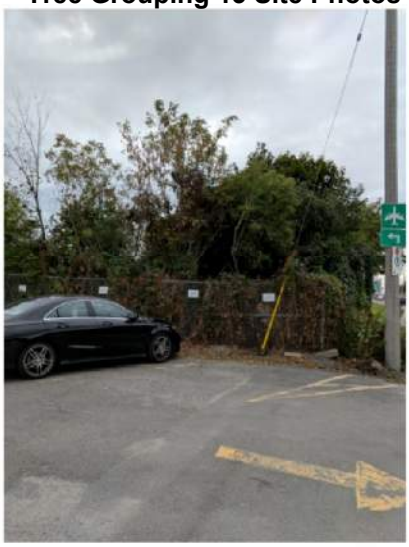





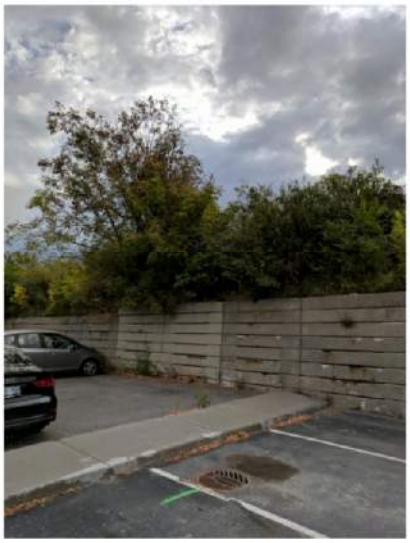
APPENDIX B

Tree Grouping 12 Site Photos

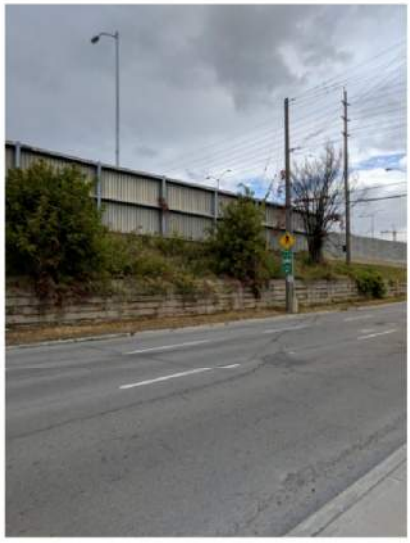
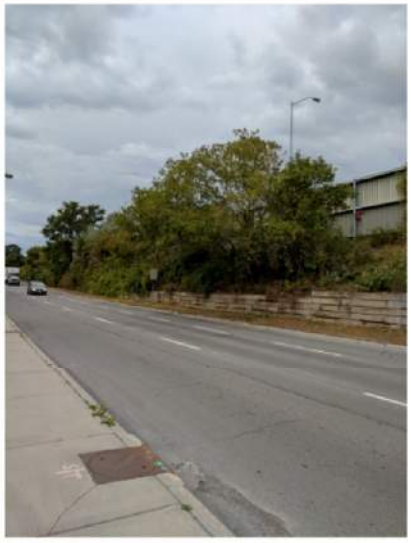


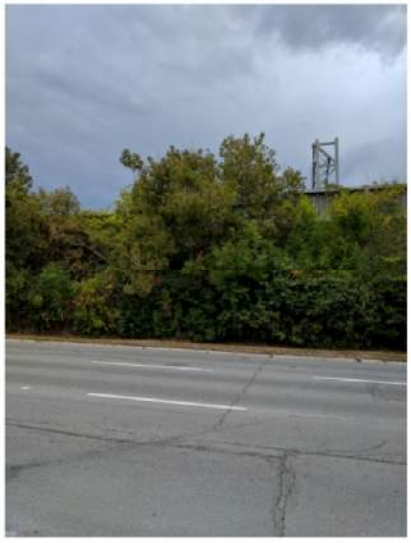
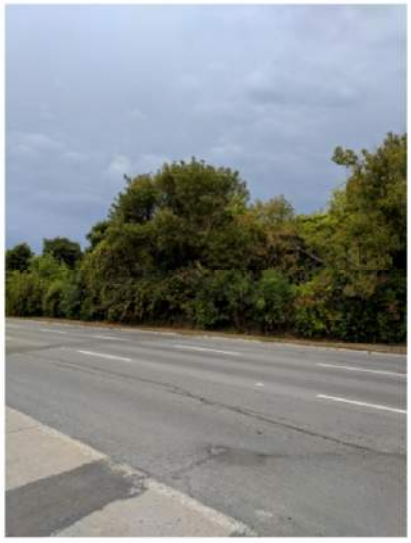
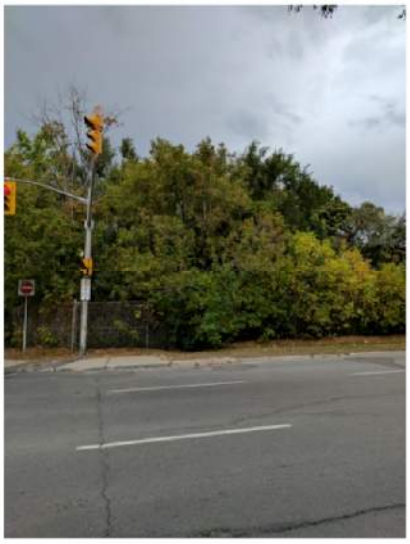
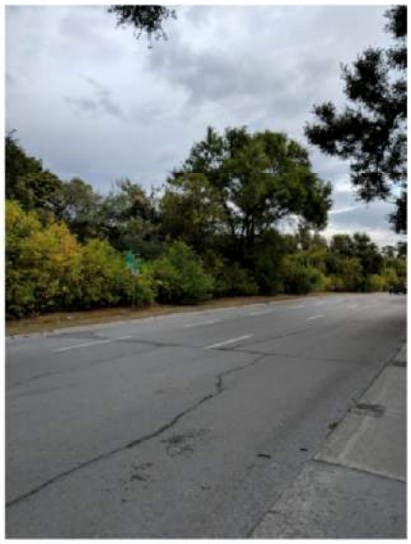
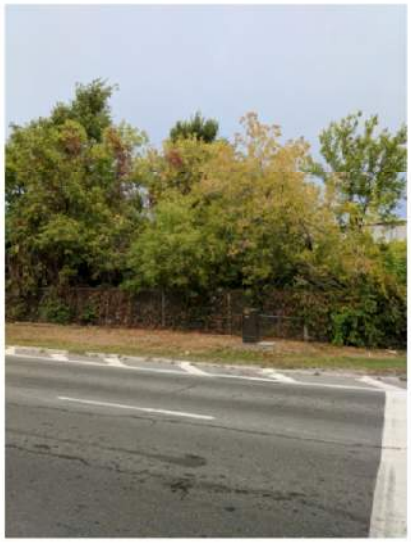
Tree Grouping 13 Site Photos






Tree Grouping 14 Site Photos


MEMO

TO: Ken Rogers, P. Eng., MTO Senior Project Engineer

FROM: Byron Lester, WSP Senior Landscape Designer and Meghan MacMillan, WSP Environmental Planner

SUBJECT: **GWP 4173-15-00 – Tree Inventory Report: Ottawa Community Housing Staging Area**

DATE: **September 22, 2020**

The Ontario Ministry of Transportation (MTO) retained WSP to undertake the detail design for the Highway 417 Midtown Bridge replacements in Ottawa, Ontario. On-site tree inventories were conducted in October 2016 for the overall project. Tree inventory locations included areas within construction limits and proposed staging locations. Since the initial tree inventories were conducted in 2016 an additional staging area has been identified for the project. The proposed staging area is located at 79-83 Raymond Street between Raymond Street, Rochester Street and Booth Street. The site is owned by the Ottawa Community Housing Corporation (OCH). The area to be used for staging purposes is the southern half of this property. As part of a separate contract, a tree inventory report was prepared by GHD for OCH in July 2019; this report has been provided to WSP for reference. Since this report was submitted the residential units on-site have been demolished and removed.

On June 25, 2020 WSP completed a follow-up on-site review to verify the condition and quantity of trees present on site to confirm the previous report's findings and to document any changes. The following memo summarizes the quantity and condition of the trees present within the staging area. This memo will be included as Appendix C of the report: Highway 417 Bridge Replacements / Rehabilitation and Operational Improvements (GWP 4173-15-00) Tree Inventory Report.

The Tree Inventory Report prepared by GHD including the mapping and inventory table was used to review and confirm tree species, conditions and locations on site. The GHD report included an inventory of the entire OCH site; however, the proposed MTO staging area is only the southern half of this site. Eighty-three (83) trees were identified within the MTO staging area and are anticipated to require removal. Note that this includes trees within OCH property and sixteen (16) trees at the perimeter / within City of Ottawa right-of-way (ROW).

The following table and map represent an updated tree assessment as completed by WSP in June 2020. The inventory table below only includes trees within the staging area and adjacent City ROW. The tree ID numbers have been maintained consistent with the previously submitted Tree Conservation Report (GHD). Most of the remaining trees are unchanged in size and condition since July 2019. However, seventeen (17) trees have either died or been removed since that time.

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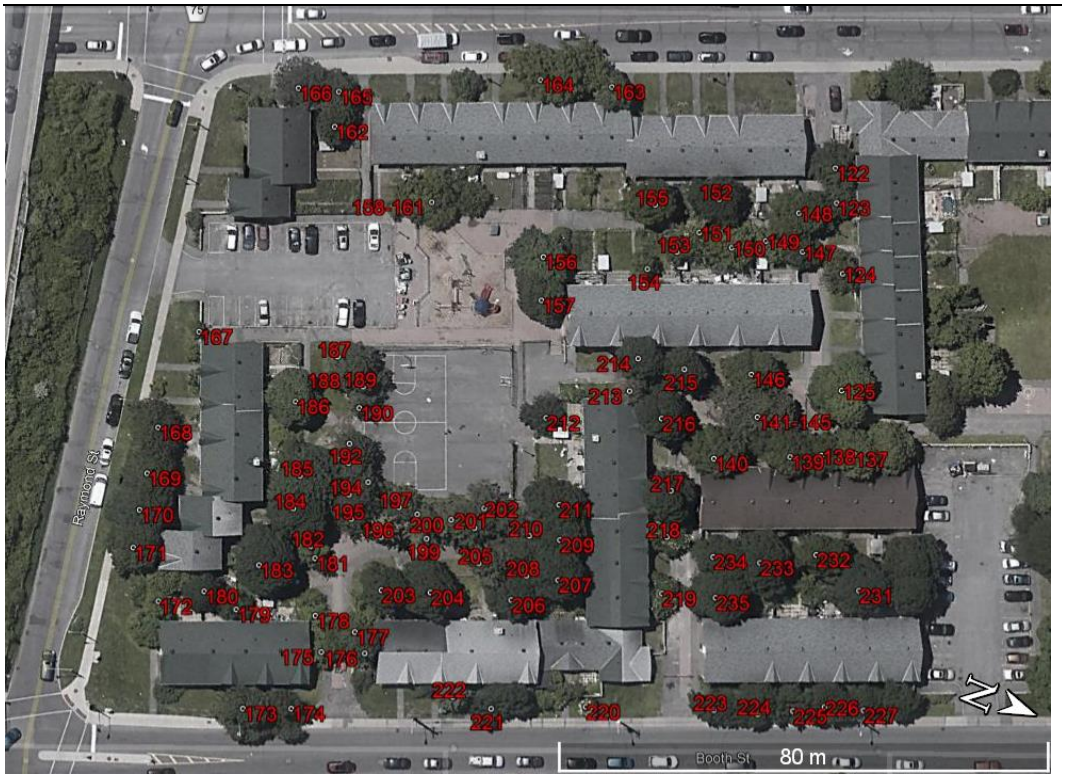
Also, additional trunk and canopy damage was noted. This can likely be attributed to the demolition and removal of the residential units.

Additional remarks have been included in the table as appropriate. Please note that the assessment of trees presented in this memo has been made using accepted and standard arboricultural techniques. However, there are some discrepancies in recorded health assessment and tree size due to difference in measurement equipment and the visual / qualitative nature of the assessment.

Byron Lester
Senior Landscape Designer

TREE INVENTORY MAP

79-83 Raymond Street



TREE INVENTORY & PRESERVATION CHARTS

Project: **79-83 Raymond Street (MTO Staging Area) Tree Memo**	Field Work Completed By: Byron Lester
Date of Field Work: June 25, 2020	Weather: 25 degree, Sunny — Tree Conditions: **G**ood, **F**air, **P**oor, Dead (**x**)

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
122	*Malus sp.*	Apple Species	31.5	P	F	F	Damaged trunk, broken stems

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
123	-		-	-	-	-	Removed since 2019 TCR report
124	*Malus sp.*	Apple Species	30	F	P	F	-
125	*Malus sp.*	Apple Species	49	P	P	F	-
137	*Tilia cordata*	Littleleaf Linden	41.5	F	F	F	-
138	*Tilia cordata*	Littleleaf Linden	24	F	F	F	-
139	*Tilia cordata*	Littleleaf Linden	38	F	F	F	-
140	*Tilia cordata*	Littleleaf Linden	38	F	F	F	-
141	*Pinus nigra*	Austrian Pine	30	F	F	P	-
142	*Pinus nigra*	Austrian Pine	24	F	F	F	-
143	*Pinus nigra*	Austrian Pine	22.5	F	F	P	-
144	*Pinus nigra*	Austrian Pine	27	F	F	F	-
145	*Pinus nigra*	Austrian Pine	31.5	F	F	F	-
146	*Tilia cordata*	Littleleaf Linden	40	F	F	F	-
147	*Tilia cordata*	Littleleaf Linden	34.5	P	P	P	-
148	*Tilia cordata*	Littleleaf Linden	38	F	F	F	Branch and tip die-back, 5% deadwood
149	*Tilia cordata*	Littleleaf Linden	42	F	F	F	-
150	*Acer rubrum*	Red Maple	24.5	F	F	F	-
151	*Acer rubrum*	Red Maple	28	F	F	F	-
152	*Tilia cordata*	Littleleaf Linden	36.5	F	F	F	-
153	-	-	-	-	-	-	Removed since 2019 TCR report
154	-	-	-	-	-	-	Removed since 2019 TCR report
155	*Tilia cordata*	Littleleaf Linden	42	F	F	F	-
156	*Acer platanoides*	Norway Maple	31.5	P	F	F	-

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
157	*Acer platanoides*	Norway Maple	40	F	F	F	-
158	-	-	-	-	-	-	Removed since 2019 TCR report
159	-	-	-	-	-	-	Removed since 2019 TCR report
160	-	-	-	-	-	-	Removed since 2019 TCR report
161	-	-	-	-	-	-	Removed since 2019 TCR report
162	*Tilia cordata*	Littleleaf Linden	55.5	F	F	F	-
163	*Tilia cordata*	Littleleaf Linden	34	F	F	F	-
164	*Acer negundo*	Manitoba Maple	74	F	F	F	-
165	*Pinus nigra*	Austrian Pine	41.5	F	F	F	-
166	*Pinus nigra*	Austrian Pine	45.5	F	F	F	-
167	*Juniperus virginiana*	Eastern Red Cedar	17.5	F	F	F	-
168	*Tilia cordata*	Littleleaf Linden	45.5	P	F	F	-
169	*Tilia cordata*	Littleleaf Linden	46	F	F	F	-
170	*Tilia cordata*	Littleleaf Linden	48.5	F	F	F	-
171	*Tilia cordata*	Littleleaf Linden	45.5	P	F	F	-
172	-	-	-	-	-	-	Removed since 2019 TCR report
173	*Tilia cordata*	Littleleaf Linden	43.5	F	F	F	-
174	*Tilia cordata*	Littleleaf Linden	33.5	F	F	F	-
175	-	-	-	-	-	-	Removed since 2019 TCR report
176	*Pinus nigra*	Austrian Pine	38.5	F	F	F	-
177	-	-	-	-	-	-	Removed since 2019 TCR report
178	-	-	-	-	-	-	Removed since 2019 TCR report
179	-	-	-	-	-	-	Removed since 2019 TCR report

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
180	*Tilia cordata*	Littleleaf Linden	27.5	F	F	F	
181	-	-	-	-	-	-	Removed since 2019 TCR report
182	-	-	-	-	-	-	Removed since 2019 TCR report
183	*Tilia cordata*	Littleleaf Linden	50	F	F	F	-
184	*Tilia cordata*	Littleleaf Linden	48	P	F	F	-
185	*Acer platanoides*	Norway Maple	51.5	F	F	F	-
186	*Acer platanoides*	Norway Maple	44.5	F	F	F	-
187	*Pinus nigra*	Austrian Pine	43	F	F	F	-
188	*Pinus nigra*	Austrian Pine	26.5	F	F	F	-
189	*Pinus nigra*	Austrian Pine	30.5	F	F	F	-
190	*Pinus nigra*	Austrian Pine	26	F	F	F	-
191	*Pinus nigra*	Austrian Pine	38	F	F	F	-
192	*Pinus nigra*	Austrian Pine	28	F	F	F	-
193	*Pinus nigra*	Austrian Pine	35	F	F	F	-
194	*Pinus nigra*	Austrian Pine	33	F	F	F	-
195	*Pinus nigra*	Austrian Pine	22	F	F	F	-
196	*Picea pungens*	Blue Spruce	34	F	F	F	-
197	*Acer x freemanii*	Freeman Maple	32	P	F	P	-
198	*Pinus nigra*	Austrian Pine	34	F	F	F	-
199	*Picea pungens*	Blue Spruce	22	F	F	F	-
200	*Pinus nigra*	Austrian Pine	30	F	P	F	-
201	*Pinus nigra*	Austrian Pine	30	F	F	F	-

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
202	*Pinus nigra*	Austrian Pine	35.5	F	F	P	-
203	*Tilia cordata*	Littleleaf Linden	40	F	F	F	-
204	*Tilia cordata*	Littleleaf Linden	49	F	F	F	-
205	*Pinus nigra*	Austrian Pine	44.5	F	F	F	-
206	-	-	-	-	-	-	Removed since 2019 TCR report
207	*Tilia cordata*	Littleleaf Linden	46.5	F	F	F	-
208	*Pinus nigra*	Austrian Pine	28	F	F	F	-
209	*Tilia cordata*	Littleleaf Linden	40	F	F	F	-
210	*Pinus nigra*	Austrian Pine	35	F	F	F	-
211	*Tilia cordata*	Littleleaf Linden	45.5	F	F	F	-
212	-	-	-	-	-	-	Removed since 2019 TCR report
213	*Pinus nigra*	Austrian Pine	30.5	F	F	P	-
214	*Tilia cordata*	Littleleaf Linden	41	F	F	F	-
215	*Tilia cordata*	Littleleaf Linden	44	F	F	F	-
216	*Tilia cordata*	Littleleaf Linden	45.5	F	F	F	-
217	*Tilia cordata*	Littleleaf Linden	40.5	F	F	F	-
218	-		-	-	-	-	Removed since 2019 TCR report
219	*Syringa reticulata*	Ivory Silk Tree	28	P	P	P	Significant trunk and canopy damage, in severe decline / dead
220	*Syringa reticulata*	Ivory Silk Tree	13	F	F	F	-
221	*Tilia cordata*	Littleleaf Linden	39.5	F	F	F	-
222	*Picea glauca*	White Spruce	29	F	F	F	-
223	*Tilia cordata*	Littleleaf Linden	32	F	F	F	-

TREE ID #	BOTANICAL NAME	COMMON NAME	DBH (CM)	CONDITION*			ADDITIONAL REMARKS (POST 2019 TCR REPORT)
				TI	CS	CV	
224	*Tilia cordata*	Littleleaf Linden	35.5	F	F	F	-
225	*Tilia cordata*	Littleleaf Linden	34	F	F	F	-
226	*Tilia cordata*	Littleleaf Linden	34.5	F	F	F	-
227	*Tilia cordata*	Littleleaf Linden	27.5	F	F	F	-
231	*Tilia cordata*	Littleleaf Linden	43.5	F	F	F	-
232	*Tilia cordata*	Littleleaf Linden	42.5	F	F	F	-
233	*Tilia cordata*	Littleleaf Linden	57	P	F	F	Lean, exposed roots & trunk damage.
234	*Tilia cordata*	Littleleaf Linden	45	P	F	F	Lean, exposed roots & trunk damage.
235	*Tilia cordata*	Littleleaf Linden	45.5	P	F	F	Lean, exposed roots & trunk damage.

* TI refers to Trunk Integrity, an assessment of the trunk for any defects or weaknesses.

CS refers to Canopy Structure, an assessment of the scaffold branches, unions and the canopy of the tree.

CV refers to Canopy Vigor, an assessment of the health of the tree and the amount of deadwood and live growth in the crown as compared to a 100% healthy tree. The size, colour and amount of foliage are also considered in this category.