

Tree Inventory & Preservation Plan

Infill Development 425 King Street East Cobourg, ON

Prepared for:

Mason Homes 6-30 Pennsylvania Avenue Concord, ON

Prepared by:

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February 2018 REVISED AUGUST 2019

Treescape Consulting Project TC258

Introduction

Treescape Certified Arborists was retained by Mason Homes of 6-30 Pennsylvania Avenue Concord, ON, to complete a Tree Inventory and Preservation Plan as part of a development application for preliminary site plan approval of an infill development located at 425 King Street East, Cobourg, ON.

The work plan for the tree inventory included the following:

- Utilize site plans provided by the client
- Inventory trees on proposed development site.
- Assess the physiological and structural condition of the trees as compartments and/or any individual trees as appropriate.
- Assess scope of proposed development, identify potential conflicts with tree resources and make recommendations to remove and/or retain any trees or treed compartments based on information found within the preliminary site plan and grading plans (if available).
- Record the assessments in the form of a written report identifying the surveyed tree compartments and/or individual trees on the supplied plan.
- Provide details of aftercare (management recommendations) of trees to be preserved.
- Provide details of how retained trees will be successfully preserved during construction and post-construction.

Table 1 below includes the assessment of all trees and treed compartments within the proposed development area. The appended plan TC258-01 identifies the locations of the individual trees and treed compartments. Plan TC258-02 shows removals and tree protection to be read in conjunction with Table 2 below.

Supporting Documents

- Mason Homes 425 King Street E Draft Plan preliminary site plan provided by Mason Homes
- 4-4771 Topo_v3 Topo Survey, drafted by IBW Surveyors and supplied by Mason Homes

Limitations of Assessment

The assessment of the tree resources presented in this report has been made using accepted arboricultural techniques. These include a visual examination of the above ground parts of the trees for structural defects, scars, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, discoloured foliage (if in leaf), the condition of any visible root structures, the degree and direction of lean (if any), the general condition of the trees and the surrounding site and the proximity of property and people and the frequency of use within the context of development. Except where specifically noted, the trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations.

Notwithstanding the recommendations and conclusions made in this report, it must be recognized that trees are living organisms, and their health and vigour constantly change over time. They are not immune to site changes or seasonal variations in weather conditions.

Although every effort has been made to ensure that this assessment is accurate, the trees must be reassessed periodically. The assessment presented in this report is valid at the time of inspection. The tree inventory and assessment took place in November, 2017. Assessment and inclusion of trees along Molly Baker trail took place in April as well as in August, 2019.

This urban development property fronts King Street East and is bounded on all sides by residential properties. This site has a long history of settlement and has recently been vacated with all buildings being demolished. An asphalt circular drive and parking area is all that remains of the former residential footprint.

Tree resources at this infill site consist of:

- Mix of early mature to mature trees located on the former manicured areas of property. These are primarily broadleaf trees with a compliment of coniferous trees mixed throughout.
- A grouping of middle mature coniferous trees along the east side of site (CPT2).
- A mix of early mature to mature trees (primarily broadleaf trees) located along south eastern, southern and western property lines. A large amount of young volunteer broadleaf trees and Buckthorn has become established in these compartments (CPT4, 5 and 6) and continues to spread inward.
- Numerous Ash trees located around the property with heavy concentrations in CPT 3 and CPT7.
- Trees with Butternut characteristics were found throughout property with majority being located on the east side. Trees are predominantly young with two larger mature trees situated in the southeast section of property. These trees have been assessed by a Certified Butternut Assessor and have been confirmed to be Butternut Hybrids.

Proposed Development

The proposed development is situated on an infill site located at 425 King Street E., Cobourg.

The preliminary site plan proposes the construction of:

- 27 freehold townhouses divided into five separate blocks
- construction of a municipal road allowance and related infrastructure
- underground storm water management system
- sanitary and other related services.

Development Impacts

Construction impacts upon the retained public and private trees, hedges and larger shrub masses are likely to comprise the following:

- Soil compaction with subsequent shearing, suffocation and death of roots
- Physical severance of roots during construction.
- Accumulation of toxic substances in the root zones.
- Physical damage to the trunks and branches of trees due to the operating requirements of plant and machinery.

In order to determine the impact of construction it is necessary to plot the likely distribution and pattern of the root systems of the trees, hedges and larger shrubs identified for retention in the tree inventory. Conversations with Cobourg's Urban Forester, Rory Quigley, suggested that minimum root protection distances for trees, hedges and larger shrubs during construction be similar to other municipal tree protection models found throughout the GTA. In general, 6cm of protection area for every 1cm of trunk diameter (Dbh).

These distances are broadly in line with those quoted within the International Society of Arboriculture (ISA) Best Management Practice: Managing Trees During Construction, (companion publication to ANSI Standard A300 Part 5).

The distances are shown in the inventory are based upon a radius of protection measured from the edge of the tree trunk and are minimum protection distances. The tree protection areas are shown on the TC258-02

The specification for barrier fencing has been adopted from OPSD 219.130, and 220.010 and is outlined in Appendix 1.

Results

Detailed results of individual and small compartment tree assessment are reproduced in Table 1 below. The data establishes:

- predominant species
- upper and lower diameter range
- average diameter at breast height (1.4m)
- approximate numbers of significant trees
- age range
- crown radius (where possible)
- overall condition (structural and physiological)
- retention rating for each tree (based on species, overall condition and location)
- development conflicts (yes/no)
- recommendations including tree protection zones (TPZ) where necessary.

Table 2 elaborates on the development impacts upon the assessed tree resources and details the recommendations for management within the context of development.

Table 1

Infill Development Site

425 King St. E., Cobourg, ON Tree Inventory & Assessment

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
				(cm)	(cm)	(cm)			(m)						
Individ	ual Signifi	cant trees													
1818	Р	American Elm	1			35rf	Em	10	5	G		2	Yes	R	
1819	Р	American Elm	1			28rf	Em	10	5	G		2	Yes	R	
1820	Р	Black Walnut	1			37	Mm	14	6	G	Bifurcation at 4m	2	Yes	R	
1821	Р	Norway Maple	1			31	Em	10	5	G		2	Yes	R	
1822	Р	Norway Spruce	1			42	Mm	20	5	G		2	Yes	R	
1823	Р	Norway Spruce	1			48	Mm	18	6	F-P	Significant die back at top of crown.	0	Yes	Rx	
											Tree appears to be in decline.				
1824	Р	White Spruce	1			43	М	16	4	G		2	Yes	R	
1825	Р	Norway Spruce	2			50rf	Em	15	5	Mb	North stem is dead. Retention of	0	Yes	Rx	
											south stem not feasible once North				
											stem is removed.				
1826	Р	Norway Maple	1			46	Mm	10	6	F	Tree leans to the south with a very	1	Yes	R	
											heavy crown spread and weight to				
											the north west. Tree lost				
											codominant stem on east side of				
											tree. Large 1m wound remaining				
											with average reaction wood.				
1828	Р	Norway Maple	1			35	Em	10	6	Mb	Tree is in drastic decline.	0	Yes	Rx	
1829	Р	Black Walnut	1			30	Em	14	6	G		2	Yes	R	
1830	Р	Norway Maple	1			19	Em	10	3	G	Suppressed by Black walnut.	1	Yes	R	
1831	Р	Scots Pine	1			37	Em	9	6	F	Significant kink in stem starting at	1	Yes	R	
											2m.				
1832	Р	Horsechestnut	4			50rf	Em	8	6	F	Four stems originating at base.	1	Yes	R	
											Stems irregular in shape. Health is				
											good but structurally a poor				
											specimen.				
1833	Р	Red Maple	1			58	М	19	8	F	Large open cavity at 3 m bulbous	1	Yes	R	
											reaction wood.				

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
1834	Р	Red Maple	1	(cm)	(cm)	(cm) 75	М	19	(m) 9	F	Mature tree bifurcating at 2.5 m	1	Yes	R	4.8
100.	•		-			(@.75m			5		with three significant threaded rod	-			
)					braces. North side of inclusion is				
						,					quite bulbous reaction wood. Some				
											dieback on several stems. Tree				
											located on edge of "tree buffer"				
											zone.				
1835	Р	Austrian Pine	1			80rf	М	15	10	G	Crown weighted heavily to the east	2	Yes	R	5.4
											and south. Tree is just inside "tree				
											buffer" zone				
1837	Р	Black Walnut	1			20	Em	9	4	G	Tree is inside "tree buffer" zone	2	No	Р	1.8
1838	Р	Butternut Hybrid	1			35@1m	Em	11	6	F	Deadwood throughout crown.	1	No	Р	2.4
											Significant butternut canker at base				
											of stem. East side of crown is				
											impeding on adjacent house. Tree is				
											inside "tree buffer" zone				
1839	Р	Norway Maple	1			31	Em	9	5	G	Characteristics typical of Norway	1	Yes	R	
											maple.				
1840	Р	Norway Maple	3			27/15/2	Em	9	5	F-G	Primary inclusion of all three stems	1	Yes	R	
						5					is at the base of the tree. Those				
											routes on east side due to				
											significant grade change. Significant				
1041	D	Namura Cramar	1			70	N.4	22	6	6	girdeled roots.	2	Vee	D	
1841	Р	Norway Spruce	T			72	IVI	23	6	G	Tree is inside tree buffer zone	Z	res	к	
18/12	D	Furopean Larch	1			/12	Mm	19	6	G	Tree located on edge of "tree	2	Vec	R	
1042			-			45		15	Ŭ	, C	huffer" zone	2	105	i v	
1843	Р	Norway Spruce	1			63	М	20	4	G		2	Yes	R	
1844	Р	Sugar Maple	1			74	М	25	7	F	Crown somewhat Finney	2	Yes	R	
1845	Р	Sugar Maple	1			68	М	22	6	G	Bifurcates at 4 m with long tight	2	Yes	R	
											inclusion that is ribbed and bulbous				
											along the main stem				
1846	Р	Sugar Maple	1			70	M	15	6	F	Somewhat thinning crown	2	Yes	R	
1847	P	Norway Spruce	1			44	M	18	5	G		2	Yes	ĸ	
1850	Р	Butternut Hybrid	2			/rt	Y	2.5	1	Р	Tree sits just outside the tree buffer	1	res	КХ	
											zone and it is infected with				
		1	1					1	1	1	putternut canker				1

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition	_	Rating			
				(cm)	(cm)	(cm)			(m)						
1851	Р	Butternut Hybrid	1			S	Y	1	0.5	F	Tree is in infected with butternut canker	1	Yes	Rx	
1852	Р	Butternut Hybrid	2			10	Em	6	3	Р	Tree is severely infected with butternut canker	1	Yes	Rx	
1848	Р	Crab Apple	1			36	Mm	8	6	F-G	Characteristic of typical Crabapple. Significant deadwood throughout crown.	1	Yes	R	
1849	Ρ	Butternut Hybrid	1			14rf	Em	6	2	G	Tree is inside tree buffer zone. No obvious signs of butternut canker.	2	No	Р	1.8
1853	Р	Butternut Hybrid	1			Sapling	Y					2	Yes	R	
1854	Р	Ash	2			109rf	М	22	6	F	Main inclusion right at the base of tree. Tree likely to succumb to EAB if not treated	1	Yes	Rx	
1855	р	Butternut Hybrid	4			130rf	Pm	20	9	F	Primary inclusion at base of tree. East, south and west stems lean in their respective directions. Some evidence of butternut canker upon initial VTA. More extensive inspection required to determine overall extent of canker infection.	1	Yes	R	
1856	Р	Sugar Maple	1			46	Mm	18	7	G		2	Yes	R	
1857	Р	Ash	1			34	Mm	18	6	F-P	Crown is thinning significantly and appears to be in a state of day back.	0	Yes	Rx	
1858	Ρ	Ash	1			111	Pm	15	8	Ρ	Tree is in significant decline. There is a smaller Ash growing adjacent this tree and is intertwined in the canopy.	0	Yes	Rx	
1859	Р	Sugar Maple	1			54	М	18	5	G	Slight lean to south	2	?	?	3.8
1860	Р	Sugar Maple	1			70rf	М	18	6	G	Crown is heavy to the south	2	?	?	4.2

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
-				(cm)	(cm)	(cm)			(m)						
1861	Р	Butternut Hybrid	1			55	М	12	8	F	Thin crown suppressed by trees to	1	?	?	
											the east. Orientation and heavy lean				
											to the west. Bifurcates at 4m.				
											Inclusion appears to be bulbous.				
											Stress fracture or old wound on				
											west side from base to 2 m, reaction				
											wood poor. VTA - no butternut				
											canker.				
1863	Р	European Larch	1			43	М	18	4	G		2	No	Р	3.8
1864	Р	White Pine	1			29	Mm	18	3	G		2	No	Р	1.8
1865	Р	White Spruce	1			41	М	18	4	G		2	No	Р	3
1866	Р	White Spruce	1			22	Em	15	3	G		2	No	Р	1.8
1867	Р	European Larch	1			38	Mm	15	4	G		2	No	Р	2.4
1868	Р	Maple	1			28	Em	12	5	G		2	No	Р	1.8
1869	Р	White Spruce	1			30	Mm	15	3	G		2	No	Р	2.4
1870	Р	Silver Maple	1			38	Em	12	6	G		2	Yes	R	
1871	Р	Norway Spruce	2			113	М	18	8	G		2	Yes	R	
1872	Р	Manitoba Maple	1			48	М	15	9	G	Significant lean to the north west	2	No	Р	3
1873	Р	Horsechestnut	1			13	Em	7	5	G		2	No	Р	1.8
1877	Р	Butternut Hybrid	1			26	Em	14	6	F-P	Significant deadwood in lower	1	Yes	Rx	
											crown as well as significant				
											butternut canker on main stem from				
											base to 5m.				
1878	Р	White Spruce	1			50	М	14	5	G	Tree is on outer edge of tree buffer	2	Yes	R	
											zone. Tree protection fencing will				
											have to extend beyond buffer				
											zone.				
1879	Р	Ash	1			58	М	18	9	F		0	Yes	Rx	
1880	Р	Butternut Hybrid	1			30	Em	12	5	F	Sparse crown and deadwood	1	Yes	R	
											throughout. Advanced inspection				
											required to determine extent of				
											decline. Tree may be a candidate for				
											removal.				
1886	Р	Ash	1			63	М	18	7	F		0	Yes	Rx	
1887	Р	Norway Spruce	1			97rf	М	18	8	G	Tree is inside "tree buffer" zone	2	Yes	R	

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
				(cm)	(cm)	(cm)			(m)						
1888	Р	Sugar Maple	1			49	Mm	16	8	G	Cavity on north east side @ 2m with	2	Yes	R	
											fungus growing in side				
1889	Р	Sugar Maple	2			53rf	Mm	15	8	G		2	Yes	R	
1890	Р	Norway Spruce	1			80	М	18	5	G	Tree is inside "tree buffer" zone	2	Yes	R	
1891	Р	Sugar Maple	1			77	М	18	10	G	Tree leans and is crown heavy to the	2	Yes	R	
											south west. Tree is inside "tree				
											buffer" zone.				
Munici	pal / Priva	ate trees													
68	M	European Larch	1			51	М	14	6	3	Hydro pruning			Р	3.8
69	М	White Spruce	1			37	MM	16	3.5	4	Hydro pruning			Р	2.4
70	М	White Spruce	1			55	М	19	6.5	4	Hydro pruning			Р	3.8
71	М	Norway Maple	1			22	EM	15	5	5				Р	1.8
72	М	White Spruce	1			44	М	18	4.5	5				Р	3
73	М	White Spruce	1			28	MM	19	3	5				Р	1.8
74	М	White Spruce	1			25	EM	16	3	5				Р	1.8
75	М	Silver Maple	1			98rf	PM	17	6	3	Basal decay, lower north leaders cut			Р	6
											off, heavy lean to south				
76	М	Silver Maple	2			77	PM	18	4	3	Heavily pruned tree, not much			Р	4.8
											foliage				
77	М	Butternut	1			33	MM	15	5	4	Heavily cankered, most likely hybrid			Р	2.4
78	М	Silver Maple	2			88rr	PM	24	6	4				Р	5.4
79	М	Silver Maple	2			119rf	PM	24	10	4				Р	7
80	М	Silver Maple	2			95rf	PM	24	9	4	could be red maple or hybrid			Р	6
81	М	White Spruce	1			32	MM	16	4	G-F	Grapevine intertwined throughout	3	No	Р	2.4
											crown	-			
82	М	White Spruce	1			28	MM	16	2.5	G-F		3	No	Р	1.8
83	М	Black Cherry	1			68rf	М	17	8.5	G-F	Large over extended limb to the	3	No	Р	4.2
		,									south at 1m				
											Mainstem bifurcates at 2m. Cupped				
											union with included bark appears				
			1								sound.				
84	М	Ash	2			43	EM	17	3	G-F	Stem Dbh 27/16. No outward signs	3	No	Р	3
											of EAB				

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
85	Μ	Silver Maple	1	(cm)	(cm)	(cm) 83	PM	19	(m) 10	Fair	Mainstem knuckles into several primary branches at 4 meters. Large branch torn out at inclusion at base of tree east side exposing open cavity behind included bark	3	No	Р	5.4
86	М	White Spruce	1			31	MM	18	3.5	G		3	No	Р	2.4
87	М	White Spruce	1			29	MM	17	3.5	G		3	No	Р	1.8
88	М	White Spruce	1			34	MM	17	3.5	G		3	No	Р	2.4
89	М	White Spruce	1			38	MM	18	3.5	G		3	No	Р	2.4
90	М	White Spruce	1			41	MM	21	5	G		3	No	Р	3
91	М	White Spruce	1			29	MM	20	3.5	G		3	No	Р	1.8
92	М	White Spruce	1			42	MM	22	4.5	G		3	No	Р	3
93	М	Black Walnut	1			30	MM	18	6	G		3	No	Р	2.4
94	М	White Spruce	1			29	EM	17	3.5	G-F	West side of crown suppressed by younger Maples	3	No	Р	1.8
95	Μ	Maple	1			103	PM	25	10	Fair	Species unidentified. Tree bifurcates into 2 large primary stems at 1m with significant inclusion and included bark. North stem bifurcates at 2m, again, with significant included bark.	3	No	Ρ	6.2
96	М	Norway Maple	1			38	MM	19	8	G-F	North side of crown suppressed by adjacent sugar maple	3	No	Р	2.4
1836	Ν	Blue Spruce	1			49	М	17	4.5	G	West side of stem is very close to property line	3	No	Р	3
1862	Μ	Sugar Maple	1			66	М	15	5	Р	Municipal tree. Significant cavity decay and cankers present. Tree is structurally unsound. Tree should be removed but requires municipal consent.	0	?	?	4.2
1874	?	Norway Maple	1			30	Em	15	6	G	Ownership unknown	2	No	Р	2.4
1875	?	Norway Maple	1			23	Em	15	6	G	Ownership unknown	2	No	Р	1.8
1876	М	European Larch	1			42	Mm	8	8	G	Ownership unknown. Tree has been cut for utility line clearance.	2	No	Р	3
1881	?	Black Walnut	1			60	М	18	10	G	Ownership unknown	2	No	Р	3.8

Tree	Owner	Species	# of	Max	Max	Avg	Age	Height	Crown	Overall	Comments/Management	Retention	Conflict	Action	TPZ
ID			Stems	Dbh	Dbh	Dbh	Range	(m)	Radius	Condition		Rating			
1882	2	Black Walnut	1	(cm)	(cm)	(cm)	М	18	(m) 10	G	Ownershin unknown	2	No	D	3.8
1883	; ?	Black Walnut	1			60	M	18	10	G	Ownership unknown	2	No	P	3.8
1884	?	Black Walnut	1			60	M	18	10	G	Ownership unknown	2	No	P	3.8
1885	?	Black Walnut	1			73	M	18	10	G	Ownership unknown, appears to be	2	No	P	4.8
1000	•		-			,5		10	10	•	neighbours	-		•	
-	Ν	Blue Spruce	1			24	Em	10	2	G	East of tree #1849	3	No	Р	1.5
	Ν	Sugar Maple	1			55	М	15	7	G	North of tree #96	3	No	Р	3.8
	Ν	Sugar Maple	1			65	М	18	7	G	North of tree #96	3	No	Р	4.2
Treed C	Compartm	ents (CPT)									· · · ·				
CPT1	P	Butternut Hybrid	4			<10	Y	varies	varies	G	Sapling clusters of Elm, Sugar	2	varies	R	СРТ
-		,				-				-	Maple, Manitoba Maple, Spruce and				boundary
											Buckthorn in addition to the				
											inventoried Butternut				
CPT2	Р	White Spruce	15	15	40	30	Y-Em	15	varies	G		2	varies	varies	varies
CPT3	Р	Ash	5	15	56	30	Em-M	18	varies	F		3	Yes	Rx	
	Р	Black Walnut	9	15	20	15	Y	varies	varies	G	Buckthorn dispersed throughout	2-3	Yes	R	
	Р	Sugar Maple	100+	<10	20	<10	Y	varies	varies	G	compartment				
	Р	Manitoba Maple	100+	<10	35	<10	Y	varies	varies	F					
Т4	Р	Crab Apple	2		45		Em	varies	varies	F					
5	Р	Eastern White Cedar	10			<20	Y	varies	varies	G	_				
	Р	American Elm	12			<15	Y	varies	varies	F					
	Р	Ash	5			<10	Y	varies	varies	F					
	Р	Scots Pine	1			35	Mm	varies	varies	F					
	Р	Sugar Maple	4			<20	Y	varies	varies	F-G		2-3	Yes	R	
	Р	Manitoba Maple	shou												
μ	Р	White Birch	oug												
CPI	Р	Black Walnut	par												
	P	Crab Apple	nse												
	P	Siberian Elm	De												
CDTC	P	White Spruce	7			10	V	6	varias	6	Cooling elustered of Manitoba Manla	2	Vac	D	
CPT6	Р	Black Walnut	/			10	Ŷ	6	varies	G	Sapling clusterd of Manitoba Maple	Z	res	К	
											throughout compartment				
		N 4 1 -	-	.40	20	10	N E				Noth portion has several	2-3	varies	varies	varies
	Р	wapie	9	<10	20	10	Y-EM	varies	varies	G	neighbouring trees along the west				
Ę	Р	Ash	30+	<10	45	25	Y-Mm	varies	varies	F	property line which are thoroughly				
C	Р	Black Cherry	2			15	Em	8	3	G	protected by the designated the south west. Tree is inside "tree				
	Р	Horsechestnut	1			10	Y	7	4	G	buffer" zone				

Headings & Abbreviations

Tree ID	Reference number. Refer to plan or numbered tags where applicable
Owner Code	P = Private client owned tree, N = Neighbour (private) owned tree, M = municipal tree, S = Shared ownership with adjacent property (private or municipal) ? = ownership undetermined, more accurate survey information needed
Species	Common name
Age Range	Y = Young, Em = Early mature, Mm = Middle mature, M = Mature, Pm = Post mature
Height	Other than where the height of a tree is critical to the outcome of the risk assessment, approximately 1 in 10 trees are measured and the remainder estimated against the measured trees
Crown Spread	Measured or estimated radius of crown at the widest point
Stem Dbh	Stem diameter - measured at a height of approximately 1.4 metres above grade, rf = measurement at root flare
Overall Condition	A combined measurement of physiological and structural condition. Good (G) = Safe & free from defects with a healthy crown, Fair (F) = Safe but with some defects, generally healthy crown, Poor (P) = Significant structural defects, and/or poor health & vitality, or Moribund (MB) = Tree is in noticeable decline Dead (D) = Tree is standing dead
Retention Rating	 3 = Trees that MUST be retained including; endangered species, heritage trees and private boundary trees 2 = Specimen trees and trees with good overall condition that warrant consideration of minor adjustments to development and/or grading plans in order to retain. 1 = Trees with fair to poor overall condition worthy of retention but only in the absence of development conflict. 0 = Poor quality specimens overall with short safe useful life expectancy. Readily expendable for the purpose of development.
Conflict	 No = Limits of excavation and/or grading are NOT in direct conflict with assessed tree or compartment of trees Yes = Limits of excavation and/or grading are in direct conflict with assessed tree or compartment of trees. CP = Limits of excavation and/or grading are in close proximity with assessed tree or compartment of trees . Varies = Limits of excavation and/or grading are in direct conflict and/or close proximity with a portion of a treed compartment. Refer to <i>Development Conflicts</i> section of the report for details.
Action	 P = Preserve & retain tree. Tree protection and/or minor adjustment to the development and/or grading plan may be required. R = Remove tree due to conflict(s) with development or grading plan that are not feasible or possible to alter. Rx = Remove tree; specimen is dead, dying or hazardous. Also includes Ash trees located within 25kms of known Emerald Ash Borer infestation and not scheduled for treatment. TBD = Decision deferred to detail design phase (requires reassessment against development conflicts with final site plan and grading plans). In the interim, the tree will be designated as "P". * = Permission from adjacent landowner required
TPZ	Recommended radius of tree protection zone relative to tree's Dbh (adapted from City of Toronto tree protection model). DL = Drip line of tree





Table 2Infill Development Site425 King St. E., Cobourg, ONTree Removal & Preservation Plan

Compartment (CPT) / Tree #	Development Impact	Recommendation
68-96	These trees are municipal trees found along the Molly Baker Trail and are in proximity to various elements of the development footprint. Trees < 30cm Dbh were not assessed for development impact as suggested by Rory Quigley, Town Arborist.	Preserve trees - establish prescribed tree protection zone (TPZ) and install protective fencing as specified.
1836, 1837, 1838, 1849, 1872, 1873, 1874, 1875, 1881, 1882, 1883, 1884 and 1885	These trees are significant specimens worth retaining that are within, or encroaching, the development footprint. The overall impact to these trees is deemed to be minimal. Final grading plan is required to confirm this.	Preserve trees - establish prescribed tree protection zone (TPZ) and install protective fencing as specified.
1863, 1864, 1865, 1866, 1867, 1868, 1869 and 1876	These trees are significant specimens worth retaining that are within, or encroaching, the development footprint. They also fall within an 8m offset area from the property line to be reviewed.	Preserve trees - establish prescribed tree protection zone (TPZ) and install protective fencing as specified.
1859, 1860, 1861 and 1862	These trees are significant specimens worth retaining but their crown and/or root system is in extremely close proximity to, or in direct conflict with the development footprint. The preliminary site plan suggests these trees will be impacted to varying degrees during construction. The extent of injury can be mitigated to a tolerable level through a combination of acceptable aboricultural practices and/or design modifications.	 Preservation of trees is preferred. During the detail design stage, have consulting arborist review final grading plan and reassess proximity of trees to the development footprint. Species specific relative tolerance to development impacts (Matheny & Clark) should be considered. For trees that are ultimately retained, an experienced ISA certified arborist needs to be retained to: set appropriate crown reduction limits and supervise crew performing the pruning (prior to any excavation), determine acceptable modifications to the recommended root protection zone and supervise the adjustment to all tree protection fencing, determine the feasibility of installing tree wells adjacent to road grading as

		 a mitigating option, provide onsite supervision of all excavation and grading that encroaches TPZ, perform, or oversee, any required root pruning. prescribe and oversee post construction plant health care measures, and reassess trees annually for a prescribed period of time. Note: Permission will be required from municipality if tree 1862 is to be removed.
CPT 2	Limits of excavation for the development footprint encroaches the western portion of this compartment. Removal of some, or all trees is required. There will be approximately 3 Spruce trees remaining all of which have been crown raised significantly (assuming by adjacent neighbour) and will no longer provide any significant screening or privacy. In addition, root disturbance due to required removal and grubbing of Buckthorn and scrub brush around tree will have a negative impact on these trees.	Removal of all trees is recommended and replant more suitable specimens to create a natural screen to adjacent neighbouring property. OR Remove and/or prune trees as necessary for development. Provide TPZ fencing along drip line of remaining retained trees adjacent to the construction (preferably to the edge of construction/grading limits).
CPT 5 and CPT6	Limits of excavation for the development footprint encroaches the southern portion of these compartments. Removal and/or pruning of some trees is required.	Remove and/or prune trees as necessary for development. Provide TPZ fencing along drip line of remaining retained trees adjacent to the construction (preferably to the edge of construction/grading limits).
CPT 7	Limits of excavation for the development footprint encroaches the eastern portion of this compartment. Removal and/or pruning of some trees is required.	Remove and/or prune trees as necessary for development. Provide TPZ fencing along drip line of remaining retained trees adjacent to the construction (preferably to the edge of construction/grading limits).

Compartment (CPT) / Tree #	Development Impact	Recommendation
CPT 1	Overall development impact on trees in this compartment is deemed to be minimal to nil. With the exception of marked individual trees, this compartment consists of young, insignificant volunteer broadleaf trees, related saplings and Buckthorn.	Removal of all trees is recommended and replant more suitable specimens to create a natural screen to adjacent neighbouring property. OR Retain a portion of compartment as a naturalized buffer to adjacent property by removing and/or pruning trees as necessary. Provide TPZ fencing along drip line of remaining retained trees adjacent to the construction (preferably to the edge of construction/grading limits).
1818-1826, 1828-1833, 1834, 1835, 1839, 1840- 1848, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1970, 1971, 1877, 1878, 1879, 1880, 1886, 1887, 1888, 1889, 1890, 1891, CPT 3 and CPT 4	These trees are in direct conflict with various elements of design footprint. Modifications to the design and/or grading plan is neither practical nor feasible.	Remove trees. Notes: Tree 1841 is included as a removal due its close proximity to rear catch basin construction and final grading as well as the imminent, and significant, root disturbance due to required removal and grubbing of Buckthorn and scrub brush around tree. Trees 1870 & 1871 fall within the 8m zone for review but need to be removed to accommodate construction and grading limits of southwest unit.



Summary

The tree inventory and preservation assessment at the King Street infill site was carried out on the tree resources located within and adjacent to all boundaries of the site.

Together with an inventory of trees in accord guidelines set by the town arborist, the assessment sought to identify significant trees for retention that;

- Have a safe useful life expectancy that justifies their retention, and any design changes and costs associated with that; i.e., extend into the future for an acceptable period in the design life of the intended development,
- Are likely to survive the construction process,
- Are likely to survive within any changed growth environment and,
- Are compatible with, and sustainable within the context of new development.

Previous management of the tree resources on this site would have amounted to general maintenance and removal on an as needed basis when the property was occupied. Once the site was vacated and buildings were demolished, the property was left unattended and allowed to naturalize with a prevalence of invasive understory species such as Buckthorn and Norway Maple.

Development impact highlights are as follows:

- Trees 68-96 are municipal trees along Molly Baker trail and must be preserved. Proposed design elements and final grading encroach trees 90-93 but currently respect the tree protection recommendations outlined in this report. Remainder of the proposed design satisfies this preservation requirement. This will need to be reassessed during detail design stage of this project to ensure the long term viability of these trees is protected.
- Trees 1836, 1837, 1838, 1849, 1872, 1873, 1874, 1875, 1881, 1882, 1883, 1884 and 1885 are significant specimens worth retaining.
- Trees 1863, 1864, 1865, 1866, 1867, 1868, 1869 and 1876 are located within an 8m offset area from the property line for review and preservation.
- Trees 1859, 1860, 1861 and 1862 are significant specimens worth retaining but require further assessment during the detail design stage to determine their suitability for retention. Note: permission will be required from municipality if tree 1862 is to be removed.
- CPT 1 and 2 have trees within the eastern portion of the compartment that could be preserved. However, the remaining material is not worth retaining and/or will sustain significant root disturbance due to required removal and grubbing of Buckthorn and scrub brush around the trees. It is my recommendation that both these areas are removed in their entirety and replaced with more suitable specimens to create a natural screen to adjacent neighbouring property.
- CPT 7 borders the west side of the infill site and will require the removal and/or pruning of some trees to accommodate the development footprint.
- The remaining trees and treed compartments are in direct conflict with the development footprint. Modifications to the design and/or grading plan is neither practical nor feasible. Trees 1870 & 1871 fall within the 8m zone for review and preservation set by the town arborist but must be removed to accommodate construction and grading limits of southwest unit.

It is my professional opinion that this report clearly identifies all woody vegetation within, and adjacent to, the development site. Furthermore, it outlines sufficient preservation measures for the maximum number of trees possible/feasible given the extent of the proposed development and grade changes across the site. Recommendations outlined in this report are based on the preliminary Site Plan provided by the client. Development impacts will need to be reassessed during the detail design phase.

Tree Preservation

Pre-construction

Prior to any construction work, establishment of storage compounds, site offices, latrines, contractor parking or storage of any materials; all approved tree works shall be undertaken in accord with the recommendations detailed in both the tree inventory and development impact summary in accord with the current ISA Best Management Practice – Tree Pruning (companion publication to ANSI standard A300 Part 1 (2008) Tree, Shrub and other Woody Plant Management – Standard Practices, Pruning).

Following this, all trees identified for retention within the schedule (Table 2) shall be protected using appropriate tree protection methods such as barriers installed in the locations identified on the plans TC255-02 to create tree protection zones (Subject to revision as required by final design). Where this is not possible, trunk/lower branch protection and/or soil and root protection within the TPZ shall be as detailed below. Other precautions such as tying back branches, modification of construction techniques, thrust boring and the use of special surfaces may be required as necessary.

Soil and Root Protection Within the TPZ

"If traffic cannot be kept outside of the TPZ for the entire duration of construction, actions can be taken to disperse the vehicular load and protect roots, minimizing soil compaction and mechanical root damage. These include:

- Applying 15-30cm (6-12") of wood chip mulch to the area
- Laying 2cm (¾") thick plywood or 10 x 10cm (4x4") wood beams over a 10+ cm (4+ ") thick layer of wood chip mulch
- Applying 10-15cm (4-6") of gravel over a taut, staked geotextile fabric; or
- Placing commercial logging or road mats on top of a mulch layer
- Stone, geotextile and mulch exceeding 10cm (4") thick will need to be removed from the TPZ once the threat of soil or root damage has passed."

Figure 3. Soil and root protection options within the TPZ.

Trunk Protection

"When trees are so close to construction activities that the trunk or buttress roots may be mechanically damaged, those parts should be protected. This can be done by installing 5cm (2") thick wood planks, such as 5x10cm or 5x15cm (2x4"s or 2x6"s) around the trunk, preferably on a closed-cell foam pad. Straps or wire are used to bind the planks in place. No fasteners should be driven into the tree. Trunk protection should be adjusted to allow growth if it is in place during periods of trunk diameter growth."

Figure 4. Trunk protection structure.

During construction

Throughout the construction an ISA Certified Arborist shall be retained for the following:

- Advise and oversee any site activities where construction impacts upon retained trees.
- Advise on root severance and pruning.
- Advise on tree damage caused by, or occurring during construction, including storm events, and specify and detail remediation methods.
- Advise on location of boring and excavation methods in the root zone of trees where appropriate.
- Advise on grade changes within the critical root zone of trees.
- Monitor tree health and advise on cultural requirement of trees during construction.
- Advise on any unforeseen changes to construction that are likely to be detrimental to retained trees.
- Monitor the Tree Protection Zone (TPZ) barriers and TPZ signage.
- Supervise the removal/dismantling of all the approved tree protection systems at the completion of construction.

Post-Construction Care

Following the completion of construction and the removal of all tree protection, the Arborist will re-inspect all retained trees and assess their current health and vitality. The Arborist will advise on the requirement for irrigation, deep-root fertilizing and de-compaction, as appropriate to ensure the continued health and sustainability of the retained trees.