

From: [sebastian bravo](#)
To: [Toronto East York Community Council](#); [Councillor McMahon](#); [tpprsouth](#)
Subject: Item TE11.19 - Application to Remove a Private Tree - 45 Leuty Avenue Visual Assessment Report
Date: Friday, October 2, 2015 1:31:10 PM
Attachments: [45 & 43 Leuty Avenue - Visual Risk Assessment - #574 Slippery Elm.pdf](#)

To whom this may concern

Hello My name is Sebastian Bravo with Tree and Ravine Inc. and I am an ISA Certified Arborist. I have been hired by Mrs. Magdeleine Leonard to perform a visual inspection on a Slippery Elm Bordering her property at 45 Leuty Ave and the neighbouring property at 43 Leuty Ave. I have attached a copy of the report for your reference before the meeting on October 6th. Here are some of the observations included in that report. The report goes more in depth on these issues as well as discussing other observations as well.

- The majority of the root zone of this tree is paved and covered by the walkway. Using a Tree Protection Zone (TPZ) of 3.0m diameter as the radius of the Critical Root Zone (CRZ) for this tree, only 39% of the CRZ is available for roots to grow in.
- The rooting problem is compounded by the fact that the entire North half of the potential root area is inaccessible to the tree due to the paved driveway. Due to its poor root environment, the tree has an elevated root plate causing the buttress roots on the South side of the tree to lift the surrounding pavers
- The largest buttress root of the tree is growing South under the walkway pavers, lifting the paver that is closest to the tree. This root re-surfaces on the South side of the cedar hedge where it is exposed, girdling and growing on a 90 degree bend. The sudden change in direction of growth is due to the concrete slab and foundation under the wood deck. This exposed root is also an indication that the soil is most likely too compacted for proper root depth growth.
- Since this is a shallow rooted tree, and the majority of the roots are located under the walkway, we can conclude that the tree has been compensating , using the weight load of the pavers over its roots for structural stability.
- The orientation of the houses at 45 and 43 Leuty Avenue create a wind tunnel in the immediate area where the tree is located. The western facing gap creates stronger winds than usual, increasing the wind load on the tree, adding to the probability of failure.
- The base of the tree only shows root flare on the South side of the trunk. The

entire North side of the trunk shows no visible root flare. The tree is growing on a slight lean North towards the home located at 45 Leuty. Furthermore, the tree is co-dominant at 4m in height resulting in included bark at the branch union.

- The tree has a full canopy with good structural form. The branches of the tree overhang the houses at 45 and 43 Leuty as well as the adjacent driveway and the walkway. All of these factors combined create a top heavy tree that is structurally weak at its base. The full canopy actually exacerbates the structural weak point at the base of the tree and increases the risk to people and property in the vicinity.

I look forward to discussing these and other issues at the hearing on Tuesday October 6th and answering any questions you may have. Thank you in advance for taking the time to read this email as well as the accompanying report.

Regards,

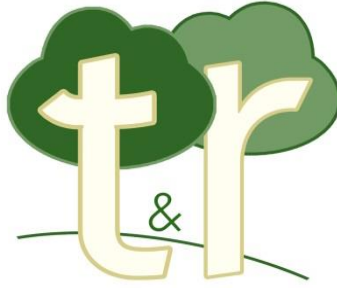
Sebastian



Sebastian Bravo
B.E.S., ISA Certified Arborist

Treeandravine.com

[\[416\] 557-9298](tel:4165579298)



Tree and Ravine Inc.

3315 Tallmast Cres. Mississauga ON L5L 1K1
416-557-9298 | sb@treeandravine.com | www.treeandravine.com

VISUAL TREE ASSESSMENT REPORT

Project Address:
45 and 43 Leuty Avenue
Toronto, ON
M4E 2R2

Prepared by:
Tree and Ravine Inc.
Sebastian Bravo
Adam Walicki

Report created: 30 September 2015

**VISUAL TREE ASSESSMENT REPORT
45 and 43 LEUTY AVENUE
(WARD 32: BEACHES EAST YORK)
TORONTO, ON M4E 2R2**

Tree and Ravine Inc. have been retained by Ms. Magdeleine Leonard to prepare this Visual Tree Assessment Report for Tree #574, a 42cm diameter Slippery Elm (*Ulmus rubra*). The tree is jointly-owned, located on the South property line of 45 and 43 Leuty Avenue in Toronto, Ontario, Ward 32: Beaches East York.

The Visual Tree Assessment was completed on 22 September 2015 according to the guidelines set forth by the International Society of Arboriculture (ISA) and Toronto Urban Forestry (TUF). The purpose of this report is to assess Tree # 574, taking into consideration species profile and characteristics, defects, as well as the immediate growing environment and site conditions that might exacerbate any defects of the tree. This report will also note any potential target(s) in the vicinity should the tree fail. Except where specifically noted, the tree was not cored, probed or climbed and there was no detailed inspection of the root crown involving excavations, or samples taken to be scientifically tested.

Tree #574, a 42 cm dia. Slippery Elm (*Ulmus rubra*), is a privately-owned deciduous tree growing on the South property line between 45 and 43 Leuty Avenue. The tree is situated approximately 2.8m from the South-east corner of the dwelling at 45 Leuty Avenue and approximately 2.8m from the North-East corner of the dwelling at 43 Leuty Avenue. A significant portion of the Critical Root Zone (CRZ) of this tree is either paved driveway or pre-cast paver walkway (see Photo #1 and #2 and sheet T1).

An application to remove this tree was previously submitted indicating the reason for removal was to address concerns that the tree is located too close to the houses at 45 and 43 Leuty Avenue, and that the tree was lifting the driveway and walkway adjacent to the tree, causing potential tripping hazards created by the tree roots lifting the walkway pavers.

Toronto Urban Forestry staff had inspected the tree and determined that it was healthy and structurally sound, with a balanced and upright crown and that the walkway could be repaired without requiring removal of the tree. The previous application for removal was denied on this basis. However, my client is appealing this decision based on new and more detailed information gathered and presented in this report.

TREE SPECIES CHARACTERISTICS

Slippery Elm (*Ulmus rubra*) is a native, medium-sized deciduous tree named after its slick, mucilaginous inner bark. Also known as Red Elm (in reference to its reddish brown heartwood), this tree can reach 18m (60 feet) tall by 15m (50 feet) wide, when found in ideal open conditions.

Growing environment - Slippery Elm prefer moist, deep, rich soils of variable pH, but are often found in soils that are dry and of average composition. Its winged seeds disperse over a wide area in the spring, and the root structure of seedlings is initially taprooted, but the tree quickly develops into a fibrous system that matures to shallow roots with age. It thrives in and is found in zones 3 to 9.

Potential problems - Slipper Elm is susceptible to Dutch Elm disease, but not to the degree of American Elm. It is not immune, it is just less susceptible than other Elms. There are many cases of Slippery Elm succumbing to this disease.

SITE CONTEXT

Tree #574, a 42 cm dia. Slippery Elm (*Ulmus rubra*), is a privately-owned deciduous tree growing on the South property line between 45 and 43 Leuty Avenue. The tree is situated approximately 2.8m from the South-East corner of the dwelling at 45 Leuty Avenue and approximately 2.8m from the North-East corner of the dwelling at 43 Leuty Avenue. The area directly North of the tree is the paved driveway at 45 Leuty Avenue. The area directly South of the tree is the pre-cast paver walkway at 43 Leuty Avenue (see sheet T1).

ROOT AREA

The majority of the root zone of Tree #574 is paved and covered by the walkway. If we use the Tree Protection Zone (TPZ) of 3.0m diameter as the radius of the Critical Root Zone (CRZ) for this tree, only 39% of the CRZ is available for roots to grow in.

Based on our visual inspection of Tree #574 on the 22nd of September 2015, sheet T1 illustrates a representation of the existing site conditions, roots and rooting environment. The roots cannot grow to the North due to the paved driveway at 45 Leuty Avenue. Furthermore, the roots cannot grow directly South as there is a concrete slab with foundation under the wood deck at 43 Leuty Avenue approximately 1.8m away from the tree. As a result, 61% of the CRZ of Tree #574 is not accessible for roots to grow. Furthermore, an additional 31% of the CRZ is covered by the pre-cast paver walkway or the wood deck, resulting in slow water infiltration and uptake by the roots. The remaining 8% of the CRZ that is a viable rooting area is a soil planting bed where the cedar hedge is growing.

The root problems are further compounded by the fact that the entire North half of the potential root area is inaccessible to the tree due to the paved driveway. Due to its poor root

environment, Tree #574 has an elevated root plate causing the buttress roots on the South side of the tree to lift the surrounding pavers (see Photo #4).

“Root spread may not be symmetrically situated beneath the canopy, even in unrestricted soil, especially if a tree is leaning. For example, Tubbs (1977) documented root systems that were approximately the same diameter as the canopy spread, but the distribution was not directly beneath the canopy.... Tubbs (1977) also observed the root systems were generally distributed away from the lean of the tree.” (Day, et al, 2010)

Tree #574 Slippery Elm (*Ulmus rubra*), (41 cm dia.)



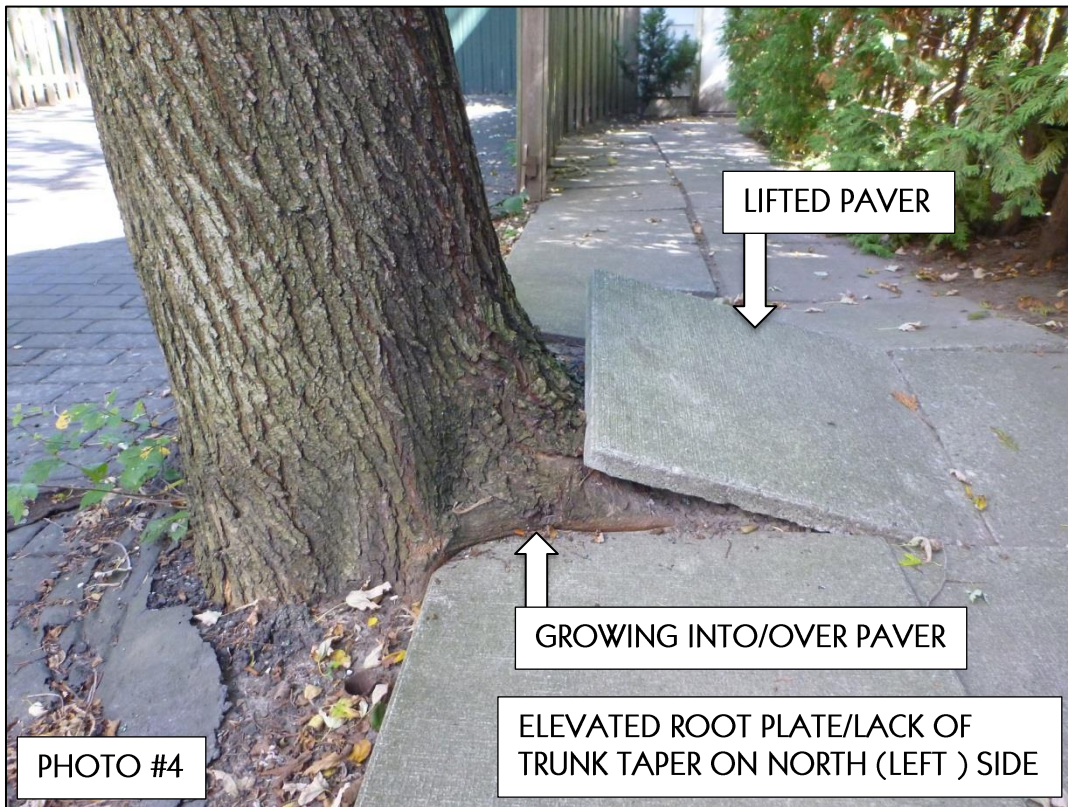
MAJOR TREE ROOTS

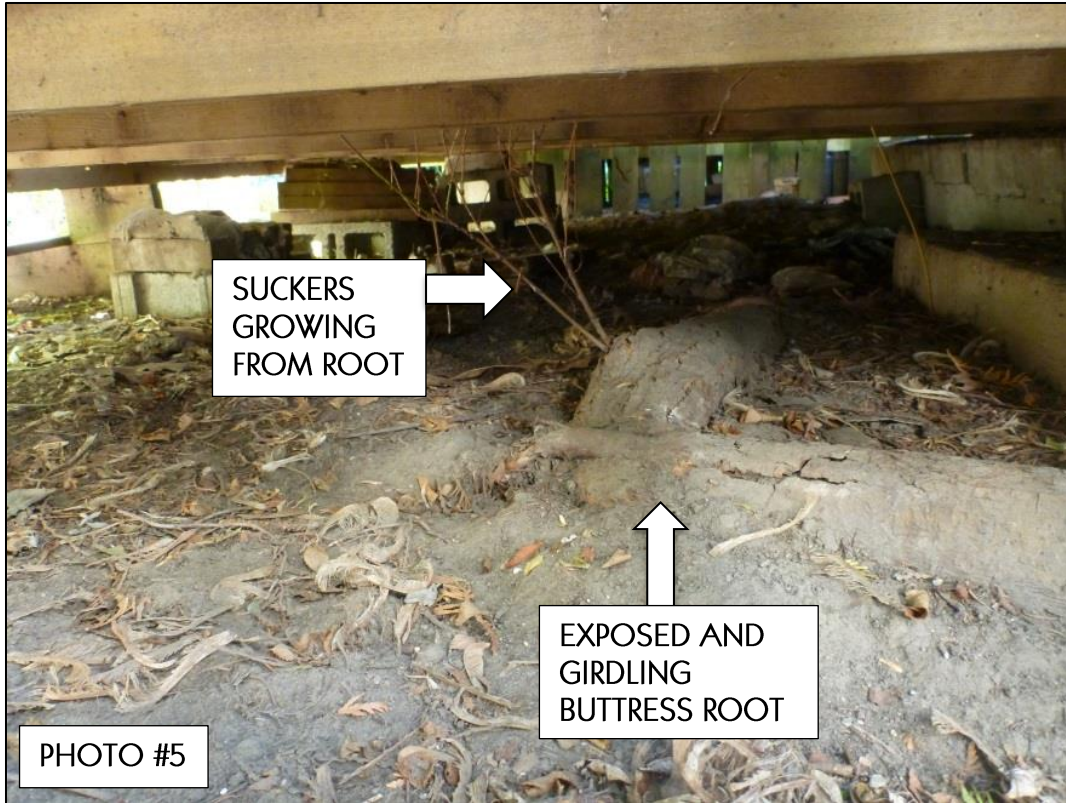
The largest buttress root of the tree is growing South under the walkway pavers, lifting the paver that is closest to the tree (see Photo #4 and #7). This root then grows South in a downward direction, and re-surfaces on the South side of the cedar hedge, under the wood deck, where it is exposed, girdling and growing on a 90 degree bend before straightening out again (see Photo #5 and sheet T1). The sudden change in direction of growth is due to the concrete slab and foundation under the wood deck blocking the root and forcing it to change course. This exposed root is also an indication that the soil is most likely too compacted for proper root depth growth. Furthermore, this root also had suckers growing from it that had died off due to lack of sunlight under the wood deck (see Photo #5).

The second largest buttress root is growing South-West directly into and over one of the pavers at the base of the tree (see Photo #4). Removing the paver would injure the tree and potentially contribute to its structural instability. Since this is a shallow rooted tree, and the majority of the roots are located under the walkway, we can conclude that the tree has been compensating, using the weight load of the pavers over its roots for structural stability. Therefore, the pavers provide for structural support for the root plate of the tree and play an integral part of the current structural profile of Tree #574. If the pavers are removed to accommodate for future growth, this could result in the structural instability of the tree and potential failure at its base. It is the professional opinion of Tree and Ravine Inc. that any major excavation necessary for relocating the walkway or repairing of the driveway next to the tree may cause the tree to fail during the construction process.

As stated by TUF in their response to the previous arborist report on this tree, “Roots are not physically capable of exerting force required to lift or crack concrete or asphalt. They are however, capable of growing into any available space that offers water and air. Tree roots cannot damage a properly constructed walkway. However, if proper drainage has not been provided, heaving may occur as a result of freezing and thawing creating space that tree roots may grow into. Roots do not and cannot go where there is no water. Where a walkway has been damaged, repair can be typically be undertaken without requiring tree removal.”

It appears that a significant source of water for Tree #574 is what infiltrates through the wood deck, lifted pavers of the walkway, and what drains out of the downspout and overflows from the eaves troughs at 43 Leuty Avenue (see Photo #6). This is evident by the path of lifted pavers that the roots have created leading to the foundation of the house at 43 Leuty Avenue where water flows from the downspout and overflows from the eaves troughs (see Photo #3). A paver located next to the corner of the house at 43 Leuty Avenue was lifted during the site visit on the 22nd of September 2015 to examine damages, and there were several feeder roots present growing at the foundation of the house (see Photo #6).







MICROCLIMATE

The orientation of the houses at 45 and 43 Leuty Avenue create a wind tunnel in the immediate area where the tree is located (see Photo #1). The western facing gap creates stronger winds than usual, increasing the wind load on tree #574, adding to the probability of failure.

“ Baker and Bell (1992) suggest that because “bending moment is reasonably dependent upon turbulence intensity,” that trees in urban areas can be expected to experience greater moments (bending force) than those in rural areas for the same mean wind speed.” (Matheny, Clark, 2009)

TRUNK AREA

The trunk of Tree # 574 has several key structural defects. The base of the tree only shows root flare on the South side of the trunk. The entire North side of the trunk shows no visible root flare (see Photo #4). The tree is growing on a slight lean North towards the house located at 45 Leuty Avenue (see Photo #1). There is also a minor cavity at the base of the tree. Furthermore, the tree is co-dominant at 4m in height resulting in included bark at the branch union (see Photo #8).

“ Codominant trunks are weaker than single-trunked trees. The strength of branch attachments is reduced by the presence of included bark.” (Matheny, Clark, 2009)

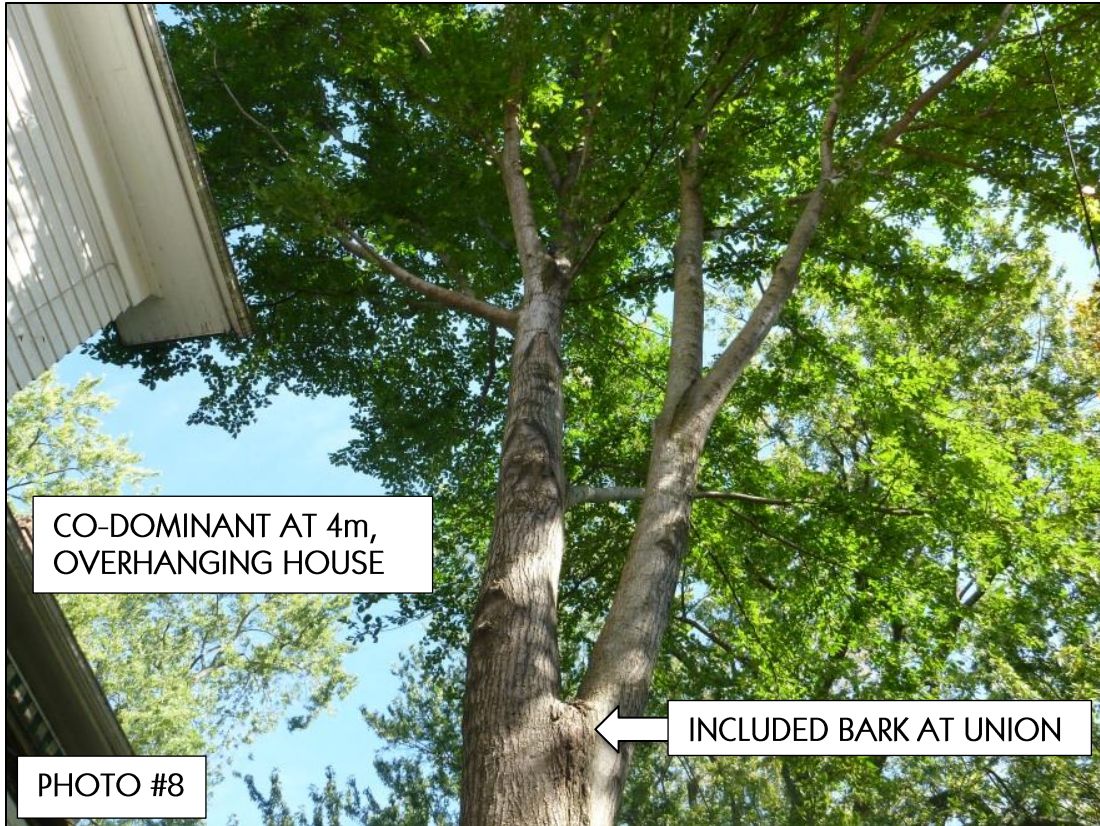
“ (included) bark does not have the structural strength of wood, and the union is much weaker than one that does not have included bark. The included bark may also act as a wedge and force the branch union to split apart. Trees with a tendency to form upright branches, such as elm and maple, often produce weak branch unions. “ (USDA- Forest Service, 1996)

CANOPY CONDITION

Tree #574 has a full canopy with good structural form. The branches of the tree overhang the houses at 45 and 43 Leuty Ave., as well as the adjacent driveway and the walkway (see Photo #8). The leaves on the lower portion of the canopy exhibit minor signs of insect damage as the foliage has leaf spots as well as minor dieback (see Photo #9).

A tree growing with good canopy vigour is usually a positive trait when it is growing in optimal conditions. However in this case, what might seem like a positive may in fact be a liability. Since only 39% of the CRZ is available as a suitable rooting environment for this shallow rooted tree; with the tree also exhibiting an elevated root plate; having exposed and girdling roots; is also growing on a lean North, and the tree lacks root flare and trunk taper. All of these factors combined create a top heavy tree that is structurally weak at its base. The full canopy actually exacerbates the structural weak point at the base of the tree and increases the risk to people and property in the vicinity.

“ Trees with root problems may blow over in wind storms. They may even fall without warning in summer when burdened with the weight of the tree’s leaves.” (USDA- Forest Service, 1996)



CONCLUSION

Due to the poor growing environment of Tree #574, a 42 cm dia. Slippery Elm (*Ulmus rubra*) as outlined in this report; The myriad of other root problems, the lack of root flare and lean of the tree, and the full canopy load exerting force on the structurally weak base of the tree, it is the professional opinion of Tree and Ravine Inc. that Tree #574 is a hazard to both people and property and should be removed.

It is recommended that no pavers be removed from the base of the tree, and that no excavation take place at the base of the tree until the tree is removed. Any significant changes to the root environment of Tree #574 could potentially contribute to its structural instability since this is a shallow rooted tree. Any major excavation necessary for relocating the walkway or repairing of the driveway next to the tree may cause the tree to fail during the construction process. It is the professional opinion of Tree and Ravine Inc. that due to the combination of all the factors mentioned in this report that Tree #574 be recommended for removal due to maintenance reasons.

REFERENCES

- Susan, D., Day, E., Wiseman, S., Dickinson, & Harris, J. (2010, July 7). *Contemporary Concepts of Root System Architecture of Urban Trees*. Retrieved from http://www.isa-arbor.com/education/resources/educ_portal_rootgrowth_auf.pdf
- Nelda, Matheny & Clark, J. (2009, February). *TREE RISK ASSESSMENT What We Know (and What We Don't Know)* Retrieved from http://www.isa-arbor.com/education/resources/educ_portal_risk_an.pdf
- United States Department of Agriculture – Forest Service (1996, January). *HOW to Recognize Hazardous Defects in Trees*. Retrieved from http://na.fs.fed.us/spfo/pubs/howtos/ht_haz/ht_haz.pdf
<http://www.fs.fed.us/database/feis/plants/tree/ulmrub/all.html>

LIMITATIONS OF ASSESSMENTS

It is the policy of Tree and Ravine Inc. to attach the following clause in regards to limitations. This is to ensure that the client is fully aware of what is technically and professionally realistic in the preservation and assessment of trees in the urban environment.

The assessment of the trees in this report has been done in conjunction with and according to accepted arboriculture methods and techniques. These include an examination of the above ground parts of the tree for structural defects, scars, cracks, the overall condition of the root structures, the severity and direction of lean (if any), the general condition of the trees and the surrounding environment, external indications of decay such as fungal fruiting bodies, evidence of attack by insects, symptoms of infestation and pathogens, discoloured foliage, and the proximity of potential targets should a tree fail. Except where specifically noted, the trees were not cored, probed or climbed and there was no detailed inspection of the root crowns involving excavations, or samples taken to be scientifically tested.

Notwithstanding the recommendations and conclusions presented in this report, it must be acknowledged that trees are living organisms. They are not immune to changes in site conditions, dramatic weather events or seasonal variations in climate. Therefore it should always be recognized that trees are ever evolving and their health and vigour constantly vary over time. While all reasonable efforts have been made to ensure that the subject trees are healthy, no guarantees are offered or implied that these trees or part(s) of any trees will remain intact.

It is professionally and practically impossible to predict with absolute certainty the behaviour of any tree or its component parts under all circumstances and variables. Most trees have the potential for failure under adverse weather conditions and the risk can only be completely eliminated if the tree is removed. Inherently, a standing tree will always pose some level of risk. Although every effort has been made to ensure that this assessment is reasonably accurate, trees should be re-assessed periodically. The assessment presented in this report is valid at the time of inspection.

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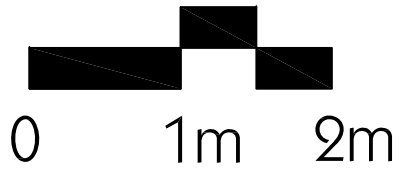
On behalf of Tree and Ravine Inc.



Sebastian Bravo, ISA ON-1852A - Certified Arborist
3315 Tallmast Cres
Mississauga, ON, L5L 1K1
416-557-9298 sb@treeandravine.com



ON-1852A



45 LEUTY AVENUE
EX. 2-1/2 STOREY
FRAME DWELLING

EX. TWO-S
FRAME DEC

EXISTING PAVED DRIVEWAY

TREE #574
SLIPPERY ELM
(42cm Ø)

EXISTING
STUMP

EXISTING PRE-CAST
CONCRETE PAVERS

PROPERTY LINE

0.93m N74°11'40"E 42.99m 1.00m

0.47m

EXISTING DOWNSPOUT
AND EAVES TROUGH

EXISTING CONCRETE
SLAB WITH FOUNDATION
UNDER WOOD DECK

EXISTING
CEDAR
HEDGE

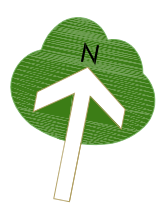
EXISTING
VERANDAH

43 LEUTY AVENUE
2- 1/2 STOREY DWELLING

EXISTING WOOD DECK
OVER CONCRETE SLAB

EXPOSED
BUTTRESS
ROOT
GROWING
ON SOIL
UNDER DECK

Tree and Ravine Inc.
3315 Tallmast Cres. Mississauga ON L5L 1K1
416-557-9298 | sb@treeandravine.com
www.treeandravine.com
Contact: Sebastian Bravo, ISA Certified Arborist



Project Address
Magdeleine Leonard
45 Leuty Avenue
Toronto, ON M4E 2R2

Title		Site Context
Scale	1:50	Sheet T1
Drawn	AW	
Checked	SB	
Date	Sept. 2015	
Project #	#2015005	