TREE HAZARD EVALUATION FORM 2nd Edition

Site/Address: 28 Queens Drive
Map/Location:
Owner: Mr E.G. Drewitt
Date: 11/1/14 Inspector/Arborist: W. Fielding-Cotterell
Date of last inspection: _____

HAZARD RATING:
3 + 4 + 4 = 11
Failure Potential + Size of part + Target Rating = Hazard Rating
✓ Immediate action needed
✓ Needs further inspection
F.S.U.L.E. 40 years.

TREE CHARACTERISTICS

Tree #: _____ Species: Tilia tomentosa – Silver lime
DBH: _____ # of trunks: 3 Height: 23-0 Spread: 20-0 metres
Form: ☑ generally symmetric ☐ minor asymmetry ☐ major asymmetry ☐ stump coppice ☐ stag headed ☐ sucker growth
Crown class: ☑ dominant ☐ co-dominant ☐ intermediate ☐ suppressed ☐ understorey
Live crown ratio: 60 % Age class: ☐ young ☐ semi-mature ☑ mature ☐ over-mature/senescent
Pruning history: ☑ crown cleaned ☐ excessively thinned ☐ topped ☑ crown raised ☐ pollarded ☐ crown reduced ☐ flush cuts
☐ none ☐ multiple pruning events ☐ utilities clearance ☐ road clearance ☐ end-weight reduction Dates
Special Value: ☑ specimen ☑ heritage/historic ☐ wildlife ☐ unusual ☐ street tree ☐ screen ☐ shade ☐ indigenous
☑ scientific/botanical ☐ avenue R.N.Z.I H Notable Tree? Y (N) Is tree protected? (Y) N

TREE HEALTH

Foliage colour: ☑ normal ☐ chlorotic ☐ necrotic Epicormics: Y (N)
Foliage density: ☑ normal ☐ sparce Leaf size: ☑ normal ☐ small
Annual shoot growth: ☐ excellent ☑ average ☐ poor Twig die-back? Y (N)
Woundwood development: ☐ excellent ☑ average ☐ poor ☐ none
Vigour class: ☐ excellent ☑ average ☐ fair ☐ poor ☐ dead
Major pests/diseases: None

Growth obstructions:
☐ stakes ☐ wire ☐ signs ☐ cables
☐ curb/pavement ☐ guards ☐ o/h lines / poles
☐ building ☐ wall Other: Concrete slab path
Raised brick container
Tarsealed pathway.

SITE CONDITIONS

Site Character: ☑ residence ☐ commercial ☐ industrial ☐ park ☐ open space ☐ natural ☐ woodland/forest
Landscape type: ☐ parkway ☐ raised bed ☐ container ☐ mound ☑ lawn ☐ shrub border ☐ wind break
Irrigation: ☑ none ☐ adequate ☐ inadequate ☐ excessive ☐ trunk wetted
Recent site disturbance: Y (N) ☐ construction ☐ soil disturbance ☐ grade change ☐ line clearing ☐ site clearing ☐ paving

% dripline paved:	0%	10-25%	25-50%	50-75%	75-100%	pavement lifted?: Y (N)
% dripli ne w/ fill soil:	0%	10-25%	25-50%	50-75%	75-100%	Depth:
% dripline grade lowered:	0%	10-25%	25-50%	50-75%	75-100%	Depth:

Soil problems: ☐ drainage ☐ shallow ☐ compacted ☐ droughty ☐ saline ☐ alkaline ☐ acidic ☐ small volume ☐ disease centre
☐ history of fail ☑ clay ☐ expansive ☐ slope _____ = aspect: _____ ☐ erosion ☐ flooding
Obstructions: ☐ lights ☐ signage ☐ line-of-sight ☐ view ☐ overhead lines ☐ underground utilities ☐ traffic ☐ adjacent veg.
☐ pedestrians ☐ _____
Exposure to wind: ☑ single tree ☐ below canopy ☐ above canopy ☐ recently exposed ☐ windward, canopy edge
☐ area prone to wind-throw
Prevailing wind direction: N.E. main gale direction N.W. & S.W. Occurrence of snow/ice storms: ☐ never ☑ seldom ☐ regularly
Earthquake damage prone: ☐ Damage caused to tree: None When?

TARGET

Use Under Tree: ☑ building ☐ parking ☐ traffic ☐ pedestrian ☐ recreation ☑ landscape ☑ hardscape ☐ small features
☐ utility lines ☐ traffic signs ☐ organised public events/markets
Can target be moved? Y (N) Can use be restricted? Y (N) Practicable or desirable in terms of site use? Y N
Occupancy: ☐ occasional use ☐ intermittent use ☐ frequent use ☑ constant use

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Angles of lean: Stem 2: 27° towards adjacent property dwelling
Stem 3: 14°

TREE DEFECTS

LEAN: _____ deg. From vertical ☑ natural ☐ unnatural ☐ self corrected **Decay in plane of lean?** (Y) N

Stem 3 old pruning wound

ROOT DEFECTS

Suspect root rot: Y (N) **Mushroom/conk/bracket present:** Y (N) **ID:** _____

Exposed roots: ☐ severe ☐ moderate ☐ low **Undermined:** ☐ severe ☐ moderate ☐ low ☐ **Surface root damage** Y (N)

Root pruned: None distance from trunk **Root area affected:** _____ % **Buttress wounded:** Y (N) **When?** _____

Restricted root area: ☐ severe ☐ moderate ☑ low **Potential for root failure:** ☐ severe ☐ moderate ☑ low

Roots broken: Y (N) **Soil cracking:** Y N **Soil heaving:** Y (N) **Earthquake root damage:** ☐ **What?** _____

Compounding factors: _____ **Combined factor severity:** ☐ severe ☐ moderate ☑ low

CROWN DEFECTS: Indicate presence of individual defects and rate their severity (s = severe, m = moderate, l = low)

DEFECT	ROOT CROWN	Stem / TRUNK	SCAFFOLDS	BRANCHES
Poor taper				
Bow, sweep				
Co-dominanants/forks			L	
Multiple attachments				
Included bark		All Stems M to S		
Excessive end weight			L	
Cracks/splits				
Hangers				
Girdling				
Wounds/seam		M		
Decay				
Cavity		Stem 3 L		
Conks/mushrooms/bracket				
Bleeding/sap flow				
Loose/cracked bark				
Nesting hole/bee hive				
Deadwood/stubs		Base of stem 3 L		
Borers/termites/ants				
Cankers/galls/burls				
Crossing branches				
Previous failure				

MECHANICAL/STRUCTURAL SUPPORT

☑ Cable bracing ☐ bolts ☐ cavity treatment ☐ guying ☐ other Cobra synthetic rope supporting all three stems. One rope has failed.

HAZARD RATING

Tree part most likely to fail: Any of three main stems

Failure potential: 1- low 2 - medium 3- high 4- severe

Inspection period: _____ annual _____ biannual _____ other _____

Size of part: 1 - <6" (15 cm); 2 - 6-18" (15-45 cm); 3 – 18-30" (45-75 cm); 4 - >30" (75 cm)

Failure Potential + Size of Part + Target Rating = Hazard Rating

3 + 4 + 4 = 11

Target rating: 1 – occasional use; 2 – intermittent use; 3 – frequent use; 4 – constant use;

HAZARD ABATEMENT

Prune: ☐ remove defective part ☐ reduce end weight ☐ crown clean ☐ thin ☐ raise canopy ☐ crown reduce ☐ restructure ☐ shape

Cable/Brace: All three stems together **Inspect further:** ☐ root crown ☐ decay ☑ aerial ☑ monitor

Remove tree: Y (N) **Replace** Y N **Move target:** Y (N) **Other:** _____

Effect on adjacent trees: ☑ none ☐ evaluate

Future Safe Useful Life Expectancy (F.S.U.L.E.) after abatement work: 40 years

Notification: ☐ owner ☐ manager ☑ consent authority Other **Date:** 21/1/2014

COMMENTS

Diameter Breast Height (DBH)

Stem	Centimetres
1	61
2	85
3	79

Signed by Inspector/Arborist: W. Fielding-Botterell **Date:** 21/1/2014

Signed by: ADC Manager _____ **Date:** _____

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Evaluation System-Explanation

Evaluation system
The evaluation system I have used for the survey is basically the Tree Hazard Evaluation Guide (second edition) as developed by the International Society of Arboriculture (I.S.A) specifically for this purpose but amended to suite the New Zealand situation.

Procedure
The procedure I have used for assessing the trees is the Visual Tree Assessment (V.T.A.) method. This I have carried out from the ground level noting on the attached field record sheet a wide range of environmental and tree health/condition factors, also checking for obvious defects and symptoms of hidden defects in the trees.

The height of the trees was obtained by using and Abney level and measuring tape.

The angle of lean was obtained by using a hand held spirit level and protractor device.

Evaluation Form Information and Hazard rating

Hazard Rating – explanation

The I S A .Tree Hazard Evaluation System provides a concise numerical means of assessing and recording the hazard rating for trees. This is based on the following:

Failure potential of the whole or any part of the tree that is **most likely to fail** expressed as:
1 – low; 2 – medium; 3 – high; 4 – severe

Size of part **(most likely to fail)** rated by its diameter size and shown in centimetres:
1 – up to 15 cm, 2 – 15 to 45 cm, 3 - 45 to 75 cm, 4 – 75 cm plus
x1 Stem x 2 Stems

Target rating: this relates to persons, property, structures or any assets that are at risk of injury or damage should any part of a tree fail. The numerical ratings for these are:
1 - occasional use; 2 - intermittent use; 3 – frequent use; 4 – constant use

Explanation relating to lime at 28 Queens Drive
In determining the target rating, consideration is given to the period of occupancy of the target. For example, a house, building (and garden/grounds) that has people permanently residing in it will be given a *constant use* target rating of 4.

The lime if it was wind-thrown or suffered stem breakage, could reach Mr. Drewitts house or those of his neighbours, depending on the direction that it fell.

Factors assessed
The hazard evaluation forms are divided into sections that contain fields designed to record a wide range of specific information on any tree being assessed such as
Tree characteristics
Tree health
Site conditions
Target
Tree defects
Mechanical/structural support
Hazard rating
Hazard abatement
Comments

All the above fields/factors have been assessed as part of the hazard evaluation of the lime.

It has to be remembered however, that a tree is only a hazard if there is a person, property or other asset target of some sort within falling range to make it so.

As well as considering work on the trees, there may be options relating to the targets themselves.

Under the target section on the forms, the questions are asked: "*Can the target be moved?" "Can use be restricted?" and "Desirable in terms of site use?"*

In the Queens Drive lime situation, *hazard abatement* in the form of moving or restricting the use of the main targets (residential properties) is obviously entirely undesirable and impractical.

As well as the options described above, the term ***hazard abatement*** also refers to the remedial treatment of hazards or defects in the tree, immediate or potential, as identified in the evaluation/inspection process. Work such as timely pruning will often eliminate, or minimize a range of hazards in healthy trees. In the case of the Queens Drive lime, the cable support work recommended will be sufficient to abate the hazard relating to the stem structure. Where a tree is unsafe and there is no such remedy, the only safe option may be to remove it.

Survey analysis
The survey form provides for hazard rating scores between 1 and 12.

It is emphasized that because a tree may have a hazard rating score in the range of 6 to 12 it does not mean it is necessarily unduly hazardous or that it needs to be felled. It may mean that there is a target nearby that itself has been rated highly and elevated the score accordingly. The score is an indication of the level of risk and action required.

In the case of the Queens Drive lime, not only are there highly rated targets in the form of dwellings but the tree itself has highly rated hazard defects hence the total score of 11 (out of 12) points. These defects require action to abate the hazard. The cabling together of the three stems together with more frequent monitoring of the situation will achieve this.

An estimate of the Future Safe Useful Life Expectancy (F.S.U.L.E.) of the tree is included on the evaluation form. In the case of the lime tree I have estimated this as forty (40) years. This should only be taken as a reasonable possibility rather than a certainty as there are many factors, natural and caused by man, that could affect the safety and longevity of trees over the time periods stated. Also, the natural longevity of many exotic trees growing in New Zealand conditions is yet to be determined.

W. Fielding-Cotterell January 2014