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- Tree Protection Plan -

LACEY FR22-64

8324 Quinault Drive Ne
Lacey WA 98516

Prepared for: City of Lacey – Community and Economic Development Dept.

Prepared by: Washington Forestry Consultants, Inc.

Date: May 11, 2022

Introduction and Overview

The project proponent is planning to develop a 3.02-acre parcel at 8324 Quinault Drive NE in Lacey. The City of Lacey has retained WFCI to:

- Evaluate all existing trees on the site, pursuant to Chapter 14.32 (August, 2006) of the Lacey Tree Protection and Vegetation Preservation Ordinance.
- Make recommendations for trees suitable to be saved in open space or tree tract areas, along with required protection and cultural measures.

Observations

Methodology

WFCI has evaluated all trees ≥4-inches diameter at breast height (DBH) in the project area and assessed their potential to be incorporated into the new project. All trees are labeled at the base with a number corresponding to the table in Attachment 3. Healthy trees with a blue number and unhealthy trees with an orange number.

The tree evaluation phase used methodology developed by Nelda Matheny and Dr. James Clark in their 1998 publication Trees and Development: A Technical Guide to Preservation of Trees during Land Development.

Site Description

The 3.02-acre site is a mostly flat rectangular parcel. The site has been cleared and graded for 26+ years. No buildings or other improvements were found. The property is bordered by Interstate 5 to the north, single-family homes to the east Quinault Drive NE to the south, and commercial businesses to the west.

Soil Depth and Productivity

According to the NRCS Soil Survey the one soil type on the site is the Spanaway gravelly sandy loam, a very deep, somewhat excessively drained soil found on terraces. It is formed in glacial outwash and volcanic ash. Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is low. The effective rooting depth for trees is 48 inches or more. The potential for windthrow of trees is slight under normal conditions. New trees require irrigation for establishment. The site has been altered with a large amount of fill.

Figure 1. Soil Map of Lacey FR22-64 site.

110- Spanaway gravelly sandy loam

Tree Conditions

There is one forest cover type for the purposes of description.

Type I.- This cover type consists of native and introduced tree species. The majority of the trees have been planted along the eastern property line to act as a screen between the site and the adjacent single-family homes. Species found on the site include bird cherry (*Prunus avium*), black cottonwood (*Populus trichocarpa*), Douglas-fir (*Pseudotsuga menziesii*), Leyland cypress (*Cupressus* × *leylandii*), Norway spruce (*Picea abies*), shore pine (*Pinus contorta var. contorta*), and sweetgum (*Liquidambar styraciflua*). Tree size ranges from 4 to 20 inches DBH.

Table 1. Summary of Trees on the Lacey FR22-64 site.

Species	DBH Range (in.)	Condition Range	# Healthy Trees	# Unhealthy Trees	Total # of Trees
Bird Cherry	7 – 9	Very Poor – Fair	4	3	7
Black Cottonwood	14 – 20	Fair – Poor	1	1	2
Douglas-fir	6	Fair	2	0	2
Leyland Cypress	4 – 18	Poor – Good	19	1	20
Norway Spruce	13 – 22	Very Poor – Fair	6	5	11
Shore Pine	6 – 20	Fair – Good	2	0	2
Sweetgum	7 – 15	Very Poor – Fair	9	3	12
Totals	**4 – 20**	Very Poor – Good	**43**	**13**	**56**

The condition of trees ranges from 'Very Poor' to 'Good' condition, with about 77% of trees described as bring in 'Fair' condition or better. There are 43 healthy, long-term trees and 13 unhealthy trees on the site. A complete tree list is located in Attachment 3.

The understory has been mostly kept clear. The plants that are growing include Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus* armeniacus), grasses, and broadleaved weeds.

Photo 1. View of trees in Type I on Lacey FR22-64 site.

Forest Practices Permit

Trees removed from this parcel will not contain more than 5,000 board feet. **Therefore, a forest practices permit from the City of Lacey is not required**.

Recommendations

Tree Retention in Tree Tract

The City of Lacey Tree and Vegetation: Urban Forest Management Ordinance (Chapter 14.32) requires that a minimum of 5% of the gross project area be set aside as a dedicated tree tract.

The following is a summary of the tree tract calculations:

Total Project Area:	3.02 acres
5% Minimum Requirement for Tree Tract:	0.15 acres

There is no designated tree tract located on the site plan. The area recommended for a tree tract is along the eastern property line of the site. This area is already stocked with healthy Norway spruce and Leyland cypress trees.

Lot Tree Planting Requirement

The City of Lacey Tree and Vegetation Protection and Preservation Ordinance (Chapter 14.32) requires 2 trees to be retained per 10,000 ft.^{2} of land for developing commercial or industrial projects.

The following is a summary of tree retention requirements:

Total Project Area:	3.02 acres
Required Tree Tract Area:	0.15 acres
Net Project Acreage:	2.87 acres

Required Tree Retention (2 Trees/10,000 ft.^{2}): 25 trees

Twenty-five trees are required to be retained or planted on the site, in addition to the 5% tree tract area.

Street Tree Planting Requirement

Red oak (*Quercus rubra*) street trees are already planted along Quinault Drive NE. No additional street trees will be required.

Hazard Tree Removal

All save trees within range of the proposed project or other targets should have a hazard tree evaluation completed after staking. Trees that will be hazardous to the new buildings or other targets should be removed during the clearing operation; this includes trees in the designated tree tract.

Tree Protection Requirements

Trees and tree tracts to be saved must be protected during construction by temporary chain-link fencing on driven posts, located at the edge of the critical root zone. The individual critical root zones are 5 feet outside the dripline of all edge trees unless otherwise delineated by WFCI in the tree table in Attachment 3.

There should be no equipment activity (including rototilling) within the critical root zone. No irrigation lines, trenches, or other utilities should be installed within the critical root zone. If roots are encountered outside the critical root zone, they should be cut cleanly with a saw and covered immediately with moist soil. Noxious vegetation within the critical root zone should be removed by hand. If a proposed save tree must be impacted by grading or fills, then the tree should be re-evaluated by WFCI to determine if the tree can be saved and mitigating measures, or if the tree should be removed.

Timeline for Tree Protection Activity

1. Submit a proposed site plan to the City of Lacey for approval. The plan should include the tree tract boundaries, the locations of tree protection fencing, a tree protection fence schematic and this 'Timeline for Tree Protection Activity.' The tree protection plan map should be part of the construction drawings packet sent out to contractors for bid.
2. Heavily flag and stake the clearing limits.
3. Conduct a pre-job conference with WFCI prior to the start of clearing.
4. WFCI will re-evaluate all trees within the tree tract at this time with the clearing limits marked. In particular, we want to examine edge trees in the tree tract to determine if any additional trees can be saved, or if any proposed save trees require mitigation or removal due to probable construction/grading damage. A final count of trees to be retained can be made at this time.
5. Complete the logging. Hazard trees and unhealthy, short-term trees should be thinned from the tree tract at this time.
6. Install tree protection fences after logging but prior to the start of land clearing. Maintain fences throughout construction.
7. WFCI should be contacted to inspect the fences prior to the start of grading.
8. Construct project.

Summary

A site plan showing proposed development including tree tract boundaries needs to be submitted. At least 0.15 acres of the site must be designated as tree tract. The recommended location for the tree tract is along the eastern property line of the parcel.

No new street trees will need to be planted.

Twenty-five trees need to be saved or planted on the lot, outside of the tree tract. These should be shown on the landscape plan.

Please give us a call if you have any questions.

Respectfully submitted,

Washington Forestry Consultants, Inc.

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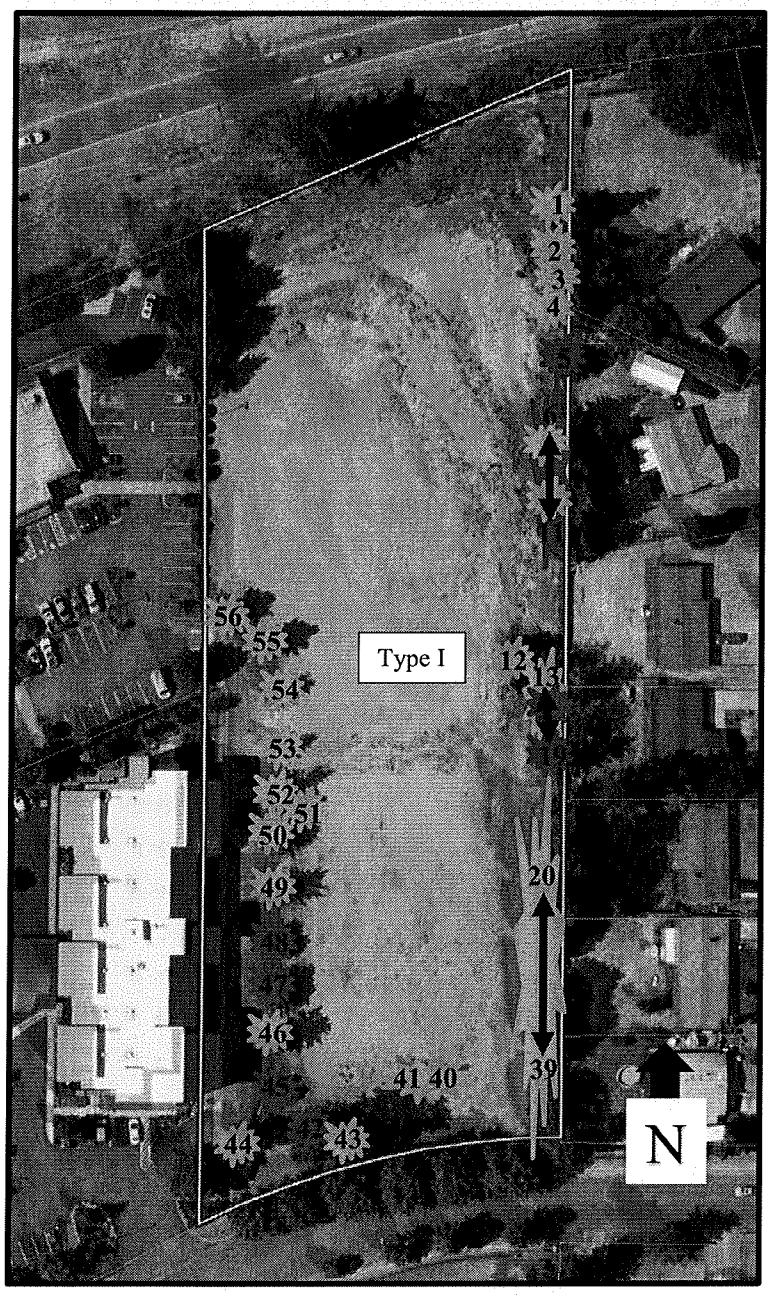
Attachment 1. Aerial Photo of Lacey FR22-64 Project Area

(2018 Thurston County GeoData)

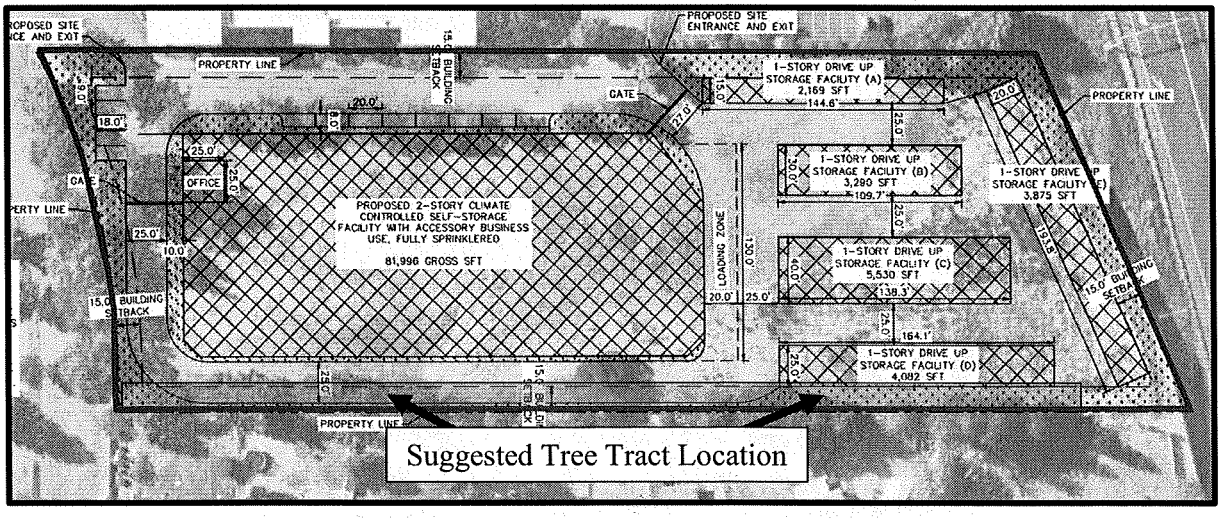


Project Area Boundary

Location of Healthy Tree

Location of Unhealthy tree

Attachment 2. Proposed Site Plan for Lacey FR22-64



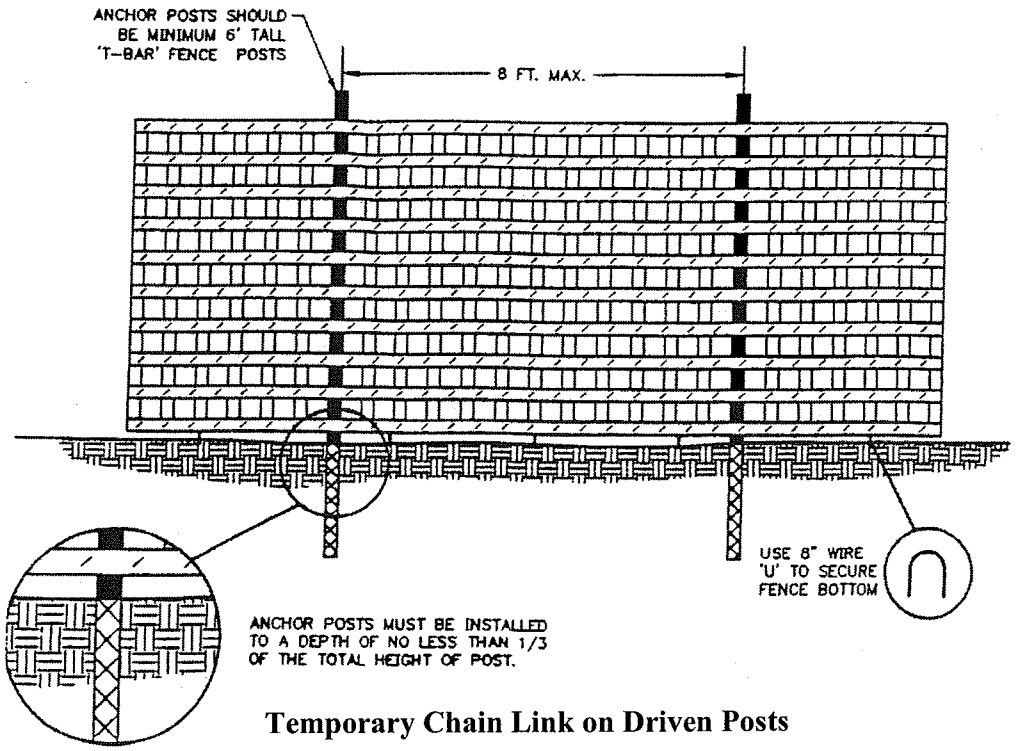
— Parcel Boundary

Attachment 3. List of Trees in Lacey FR22-64 Project Area

Tree #	Species	Diameter of Breast Height (Inches)	Condition	Save Based on Condition? Yes or No	Minimum Root Protection Zone Radius (ft.)	Notes
1	Norway Spruce	16	Fair	Yes	11	
2	Norway Spruce	18	Fair	Yes	13	
3	Norway Spruce	15	Fair	Yes	11	
4	Norway Spruce	19	Fair	Yes	13	
5	Norway Spruce	14	Very Poor	No		90% dead
6	Norway Spruce	13	Poor	No		dead top
7	Norway Spruce	13	Fair	Yes	9	
8	Norway Spruce	13	Poor	No		poor form
9	Norway Spruce	14	Fair	Yes	10	
10	Norway Spruce	22	Poor	No		poor form
11	Norway Spruce	15	Poor	No		poor form, no top
12	Shore Pine	20	Fair	Yes	14	broken top but ok for species
13	Bird Cherry	6,9	Fair	Yes	8	remove dead 6" stem
14	Bird Cherry	7	Fair	Yes	6	
15	Bird Cherry	7,7	Fair	Yes	7	
16	Bird Cherry	7	Fair	Yes	6	
17	Bird Cherry	8	Poor	No		poor form
18	Bird Cherry	7	Poor	No		poor form
19	Bird Cherry	7	Very Poor	No		stem decay
20	Leyland Cypress	10	Good	Yes	7	
21	Leyland Cypress	8,12	Good	Yes	10	
22	Leyland Cypress	6	Good	Yes	6	
23	Leyland Cypress	4,5	Good	Yes	6	
24	Leyland Cypress	6	Good	Yes	6	
25	Leyland Cypress	6	Poor	No		
26	Leyland Cypress	7	Good	Yes	6	
27	Leyland Cypress	18	Good	Yes	13	
28	Leyland Cypress	12	Good	Yes	8	
29	Leyland Cypress	4,4	Good	Yes	6	
30	Leyland Cypress	12	Good	Yes	8	
31	Leyland Cypress	6	Good	Yes	4	
32	Leyland Cypress	14	Good	Yes	10	
33	Leyland Cypress	16	Good	Yes	11	
34	Leyland Cypress	11	Good	Yes	8	
35	Leyland Cypress	9	Good	Yes	6	

Tree #	Species	Diameter of Breast Height (Inches)	Condition	Save Based on Condition? Yes or No	Minimum Root Protection Zone Radius (ft.)	Notes
36	Leyland Cypress	8,8	Good	Yes	8	
37	Leyland Cypress	10	Good	Yes	7	
38	Leyland Cypress	13	Good	Yes	9	
39	Leyland Cypress	8	Good	Yes	6	
40	Douglas-fir	6	Fair	Yes	6	
41	Douglas-fir	6	Fair	Yes	6	
42	Cottonwood	13,19,20	Poor	No		poor co-dominant stems
43	Cottonwood	14	Fair	Yes	10	
44	Sweetgum	11	Fair	Yes	8	
45	Sweetgum	14	Poor	No		poor form
46	Sweetgum	13	Fair	Yes	9	
47	Sweetgum	12	Poor	No		poor form, stem damage
48	Sweetgum	13	Very Poor	No		poor form, stem damage
49	Sweetgum	10	Fair	Yes	7	
50	Sweetgum	10	Fair	Yes	7	
51	Shore Pine	6,8	Good	Yes	7	
52	Sweetgum	11	Fair	Yes	8	
53	Sweetgum	7	Fair	Yes	6	
54	Sweetgum	8	Fair	Yes	6	
55	Sweetgum	15	Fair	Yes	11	
56	Sweetgum	10	Fair	Yes	7	

Attachment 4. Tree Protection Fence Detail



Temporary Chain Link on Driven Posts

THE TREE PROTECTION FENCE SHOULD BE MAINTAINED THROUGHOUT THE CONSTRUCTION AND GRADING, AND NOT TO BE REMOVED UNTIL FINAL LANDSCAPING IS IN PROGRESS. AT NO TIME SHALL EQUIPMENT ENTER INTO THE ROOT PROTECTION ZONE (RPZ). ALL BRUSH CLEANUP WITHIN THE RPZ SHOULD BE COMPLETED BY HAND TO PREVENT DISTURBANCE OF NATIVE GROUND COVERS NO CUTS OR FILLS, UTILITY TRENCHING, MODIFICATIONS TO DRAINAGE, OR CONCRETE RISE WATER SHOULD IMPACT THE RPZ. NO WIRES, CABLES, OR OTHER DEVICES SHOULD BE ATTACHED TO PROTECTED TREES DURING CONSTRUCTION.

IF IMPACTS MUST OCCUR WITHIN THE RPZ, CONTACT WFCI PRIOR TO THE OPERATIONS TO DETERMINE THE PROPER PROCEDURE TO PROTECT THE TREE'S HEALTH.

Attachment 5. Glossary of Forestry and Arboricultural Terminology

DBH: Diameter at Breast Height (measured 4.5 ft. above the ground line on the high side of the tree).

Crown: Portion of a trees stem covered by live foliage.

Crown Position: Position of the crown with respect to other trees in the stand.

Dominant Crown Position: Receives light from above and from the sides.

Codominant Crown Position: Receives light from above and some from the sides.

Intermediate Crown Position: Receives little light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

Suppressed Crown Position: Receives no light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

Live Crown Ratio: Ratio of live foliage on the stem of the tree. Example: A 100' tall tree with 40 feet of live crown would have a 40% live crown ratio. Conifers with less than 30% live crown ratio are generally not considered to be long-term trees in forestry.

Root Protection Zone/Critical Root Zone: A radius from the trees stem of 1 foot for each 1 inch of DBH unless otherwise determined by WFCI. For example, a 7 inch DBH tree would have a critical root zone radius of 7 feet.

Condition Class Descriptions:

CONDITION CLASS	CHARACTERISTICS
Excellent	Single stem; Normal foliage color; No branch dieback; No apparent insect or disease problems; No other apparent problems;
Very Good	Single stem; Normal foliage color; No branch dieback or only a few minor branches died back; No apparent insect or disease problems; No other apparent problems, or they are minor and do not impact the long-term survival of the tree;
Good	Single stem; Normal foliage color; Minor branch dieback; Minor problems such as crown unbalanced; Minor foliage problems; Expected to be a long-term tree;
Fair	Single stem or double stem that is not expected to fail soon; Crown may be slightly thinned due to exposure or reduced vigor; Minor branch dieback and 1 or 2 major branches died back; Minor insect or disease problems; Tree expected to survive;
Poor	Single or Multiple stem tree; Thinning crown; Foliage color yellowed; Inadequate live crown ratio; Major and minor branch dieback; Not a long-term tree or quality tree for development;
Very Poor	Single or Multiple stem tree; Severe thinning crown; Yellow foliage; Major branch dieback; Expected to die within 5 years or so;
Hazard Tree	Dead, dying, diseased, defective; Would be hazardous to new development or if other targets are placed within reach of tree;

Attachment 6. Assumptions and Limiting Conditions

1) Any legal description provided to the Washington Forestry Consultants, Inc. is assumed to be correct. Any titles and ownership's to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

2) It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations, unless otherwise stated.

3) Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, Washington Forestry Consultants, Inc. can neither guarantee nor be responsible for the accuracy of information.

4) Washington Forestry Consultants, Inc. shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

5) Loss or alteration of any part of this report invalidated the entire report.

6) Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of Washington Forestry Consultants, Inc.

7) Neither all or any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of Washington Forestry Consultants, Inc. -- particularly as to value conclusions, identity of Washington Forestry Consultants, Inc., or any reference to any professional society or to any initialed designation conferred upon Washington Forestry Consultants, Inc. as stated in its qualifications.

8) This report and any values expressed herein represent the opinion of Washington Forestry Consultants, Inc., and the fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence neither of a subsequent event, nor upon any finding in to reported.

9) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.

10) Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the tree or other plant or property in question may not arise in the future.

Note: Even healthy trees can fail under normal or storm conditions. The only way to eliminate all risk is to remove all trees within reach of all targets. Annual monitoring by an ISA Certified Arborist or Certified Forester will reduce the potential of tree failures. It is impossible to predict with certainty that a tree will stand or fail, or the timing of the failure. It is considered an 'Act of God' when a tree fails, unless it is directly felled or pushed over by man's actions.