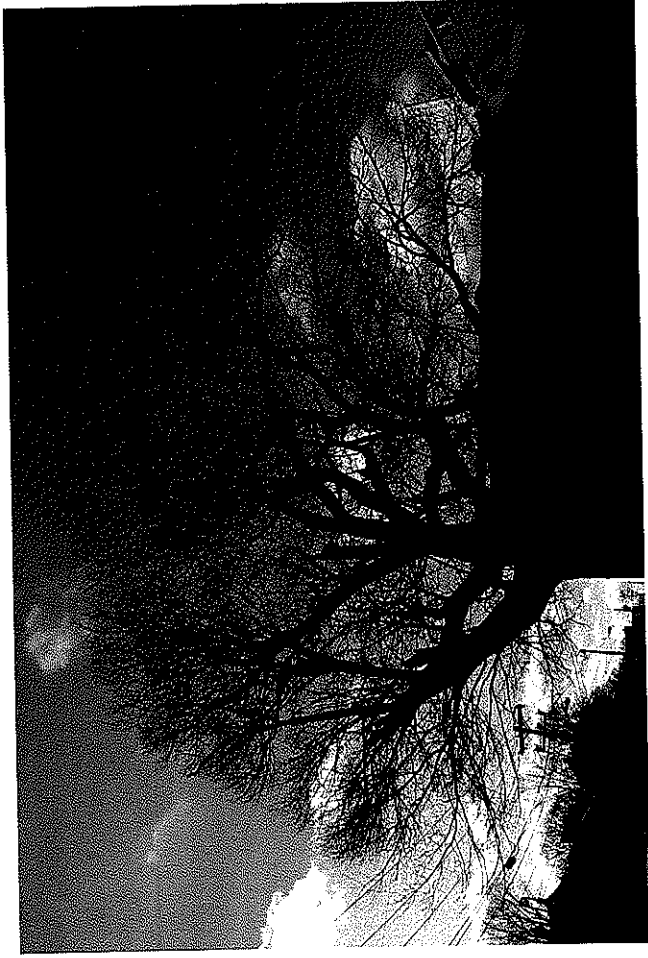


ELLIOT STREET ANCIENT BLACK OAK TREE EVALUATION

for

Historic

Town of Milton, Massachusetts



Largess Forestry, INC

450 Davit Ave.

Jamestown, Rhode Island 02835

401 849-9191

[largesstree@aol.com](mailto:largestree@aol.com)

Consulting Arborist: Matthew Largess, NE 0802

Lead Scientist: Amy McGowan Ph.D.

Lead Tree Climber: Peter Largess

Largess Forestry, INC
450 Davit Ave.
Jamestown, Rhode Island 02835
401 849-9191
largesstree@aol.com

Re: Elliot Street Ancient Black Oak Evaluation
Milton, Massachusetts.

INTRODUCTION:

Largess Forestry INC is honored to be evaluating this Ancient Black Oak Tree (Quercus velutina). It is not often we can evaluate and study such a rare native 200 plus year old, Old Growth tree. This is a rare healthy tree that started its life in 1808 as an acorn

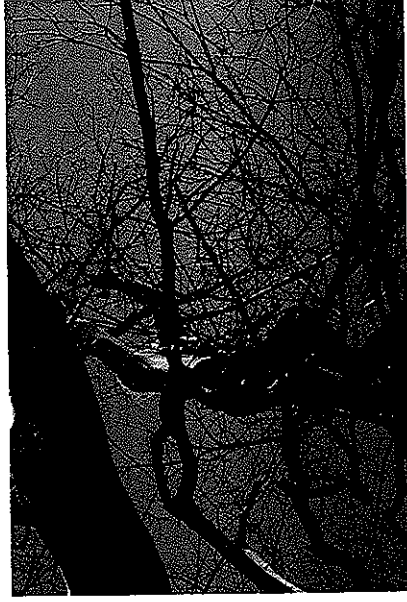
1. QUANTITATIVE DETAILS:

Measure the height, crown spread, and diameter breast height, and estimate the age of the tree.

Table 1: Elliot Street Black Oak Tree Statistics as of February 2, 2011

Height	50 ft
Average Crown Spread	77.5 ft
Circumference at Breast Height (4.5 ft)	15' 3"
Diameter at Breast Height (4.5 ft)	58.4"
Age of Core Sample (10 3/8 inches)	70 yrs
Estimated Age of the Elliot Street Black Oak Tree	202 yrs

To measure the height of the tree, professional tree climber Peter (PineTree) Largess hand climbed the tree, a tape was then used measure to the very top of the tree. (Figures 1-2)



Figures 1-2: Peter (PineTree) Largess is at various stages of climbing the Elliot Square Ancient Black Oak tree in harness and helmet.

The crown spread was measured by taping on the ground the widest and narrowest crown spreads perpendicular to each other. Then an average of the measurements was used for the calculation of the crown spread. (Figure 3)

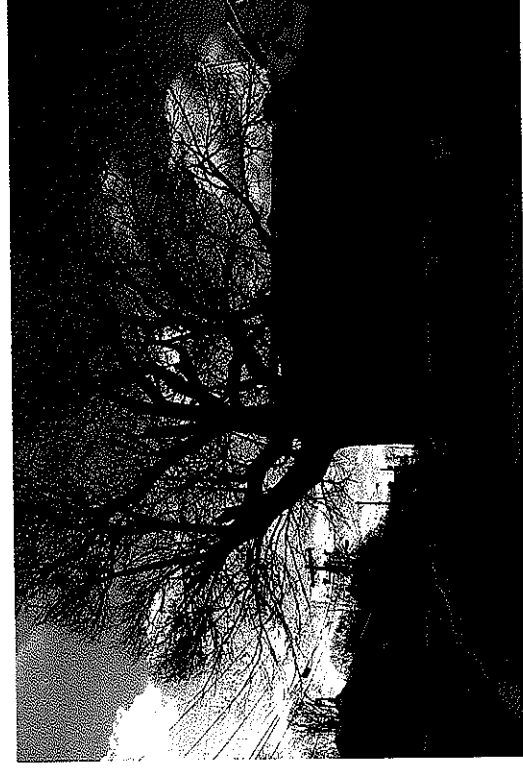


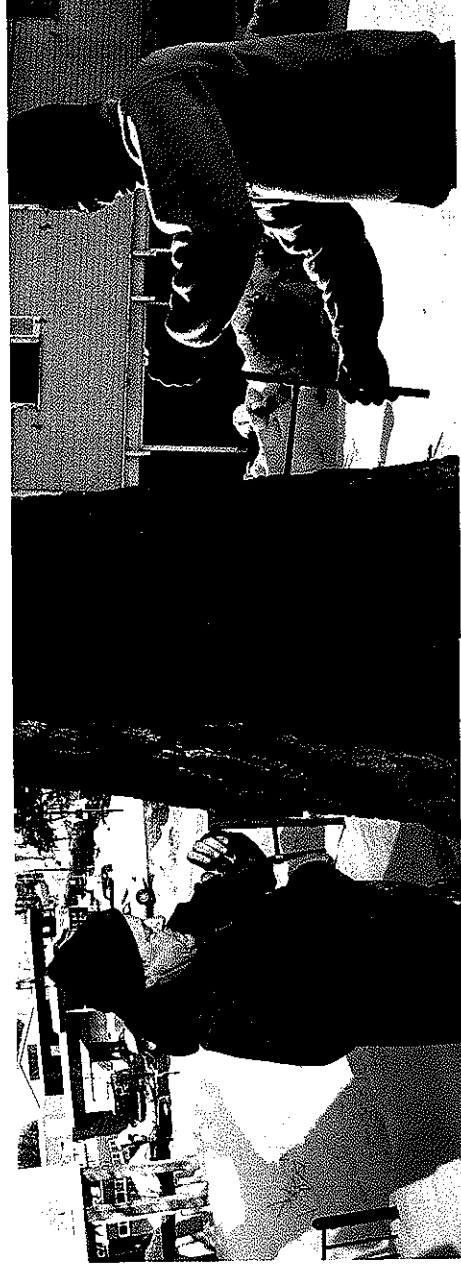
Figure 3: The Crown Spread measured by selecting the maximum spread of branches from the ground.

A Forestry DBH tape was used to measure the circumference and the diameter of the tree at 4.5 ft from the ground, at Breast Height.



Figure 4: ISA Certified Arborist Matthew (Twig) Largess measuring the circumference and diameter of the tree at 4.5 ft (DBH).

An eighteen inch long Haglop tree corer was used to obtain the 10.375 inch core sample. The core was then encapsulated in plastic until it could be stabilized and the rings counted. The entire length of the core sample consisted of healthy white wood. In the 10.375 inch sample there were 70 growth rings.



Figures 5-6: ISA Certified Arborist Matthew (Twig) Largess (left) and Peter (PineTree) Largess are taking tree core samples of this champion tree.

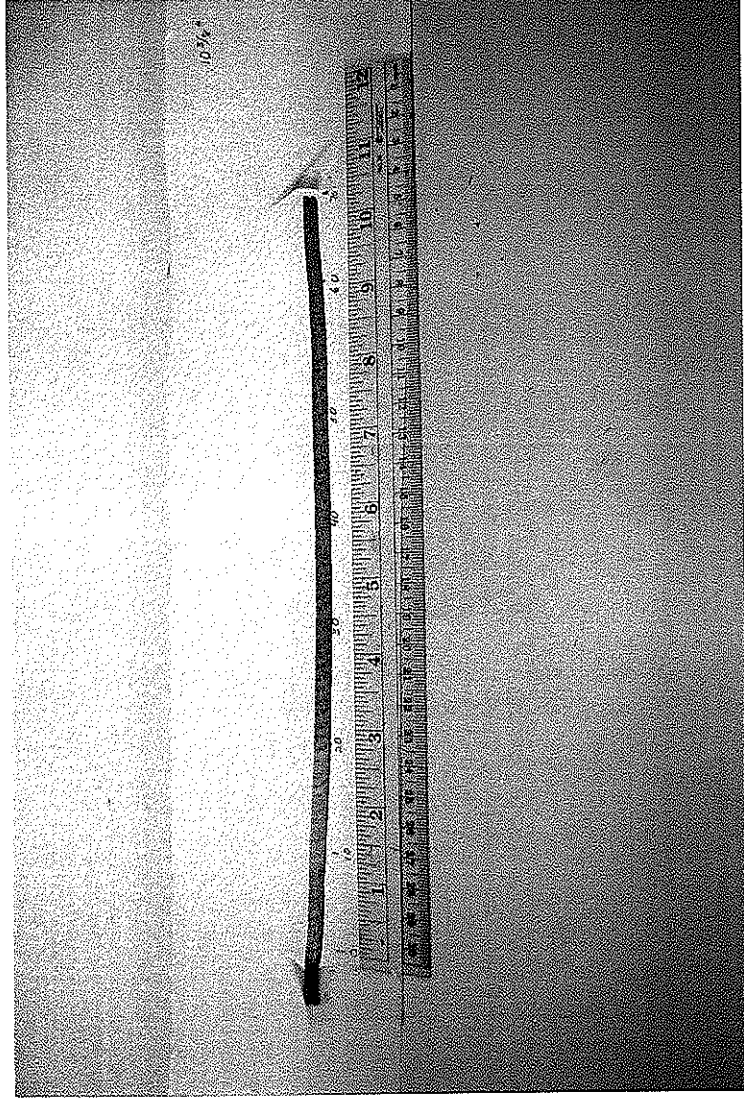


Figure 7: Tree Rings Don't Lie. Eliot Street Black Oak core sample, 10.375 inches, 70 rings.

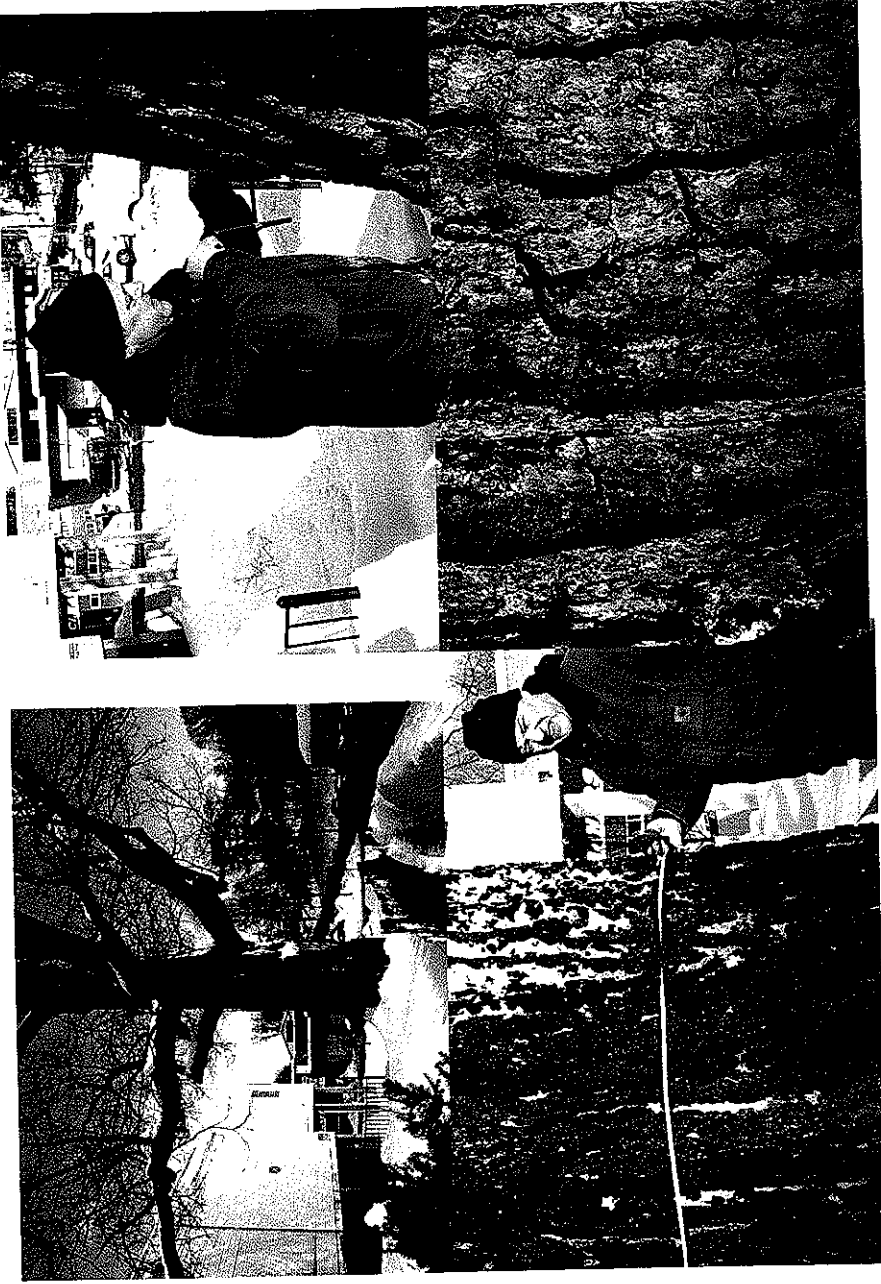
$$\frac{\text{Age of Tree}}{\text{Age of sample}} = \frac{\text{Radius of Tree}}{\text{sample length}}$$

$$\frac{\text{Age of Tree}}{70 \text{ yrs}} = \frac{58.4 \text{ inches}/2}{10.375 \text{ inches}}$$

$$\text{Age of Tree} = 197 \text{ yrs} + 5 \text{ yrs (for 4.5 DBH)} = 202 \text{ yrs}$$

2. STRUCTURAL CONDITION OF TRUNK AND CROWN

The trunk of the Elliot Street Ancient Black Oak is extremely healthy with thick old bark. The trunk of this tree shows no evidence of insect damage or disease. When calculating wood strength of a trunk, a ratio of healthy versus decayed trunk is calculated. Since this tree has no decay in the main trunk it maintains 100% of the tree's strength.¹ This tree also has large beautiful root flare which is another indication of great strength.



Figures 8-11: These pictures show extremely healthy old growth bark from the trunk of the Eliot Street Black Oak Tree at increasing magnifications.

The Crown has some heart rot, but is extremely healthy for an old tree. Some of the declined areas are due to man's use of the tree for wire anchors. Next to the declined areas, large healthy leads exist. Where the tree was used to hold a light, the bark and lead are surprisingly healthy and rot free. (Figures 12-13) The areas of heart rot are surrounded by healthy leads and branches as seen in figures 14 and 15. About 25% of the branches in the crown have some defects. Some of these defects should be pruned out of the tree. Near the defects to be pruned are healthy leads with 100% of their strength intact. During this extremely harsh winter there was no limb failure. The crown is full of healthy new bud growth, showing an intact canopy.

The trunk of this tree has 100% strength, no defects, the crown shows new bud growth and no limb failure. These combined attributes demonstrate an healthy 202 year old forest matriarch.

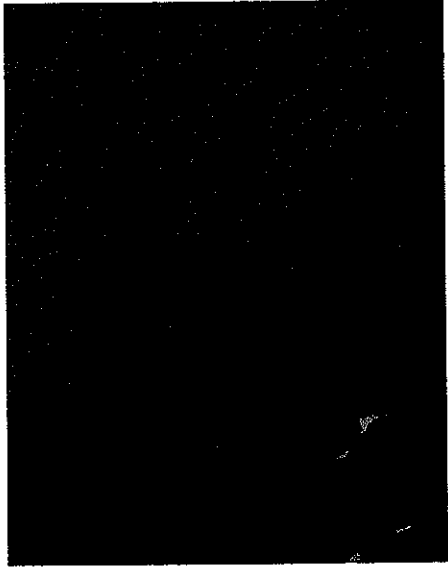


Figure 12: Black Oak tree used as a Wire Anchor causing declining area.

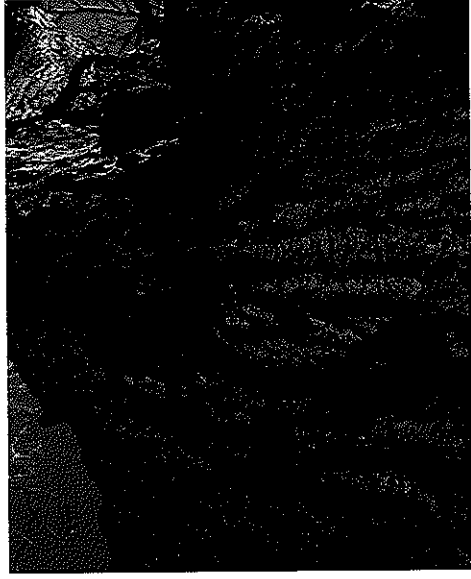
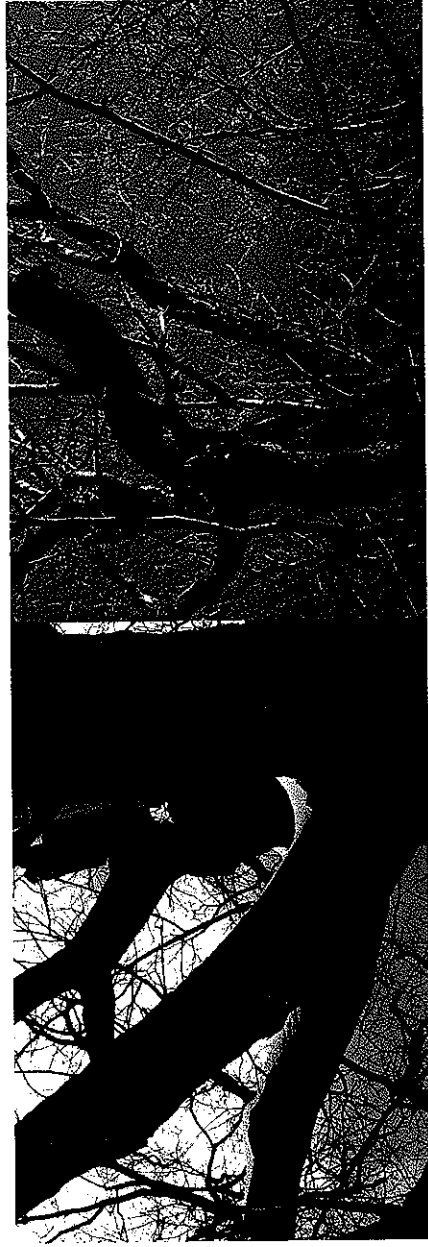


Figure 13: Use of Black Oak for lighting stand leaves Human Mark on tree



Figures 14-15: Areas of decline with heart rot surrounded by healthy leads and branches.

Matheny and Clark detail the ISA's Hazard Rating in their book, A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas. There are some limbs in the crown with heart rot and should be removed. Roughly 75% of the crown is healthy. After trimming out defects from the crown, the risk of failure for any section of this tree is extremely low.

3. HEALTH AND VITALITY ASSESSMENT BASED UPON TEN YEAR GROWTH NODE ANALYSIS

Several samples were obtained from the Elliot Street Black Oak tree, these were taken back for growth node analysis. The following table shows the growth of the samples over time. Year 1 being the most recent year, 2010, and 10 being 2001. The data shows healthy growth throughout the ten year period. Some years show more growth than others. The growth over time is similar, but not exact from one sample to the next. Measurements on samples were taken in inches the last column of the table is the average of the available year's sample growths. See figures 16 and 17 for the growth nodes and samples.

Table 2: Ten Year Growth Node Analysis (measurements in inches)

Year	Year	Sample A	Sample B	Sample C	Sample D	Average
1	2010	2.6	2.1	4.0	2.25	2.75
2	2009	3.0	3.5	4.0	3.5	3.5
3	2008	2.6	3.0	2.75	3.0	2.84
4	2007	5.5	5.25	6.5	5.25	5.62
5	2006	3.0	4.75	5.0	4.75	4.38
6	2005	3.25	3.75	3.62	3.75	3.59
7	2004	3.0	3.62	4.75	3.5	3.72
8	2003	n/a	3.5	4.0	3.62	3.71
9	2002	n/a	4	3.5	4	3.92
10	2001	n/a	n/a	2.75	n/a	2.75

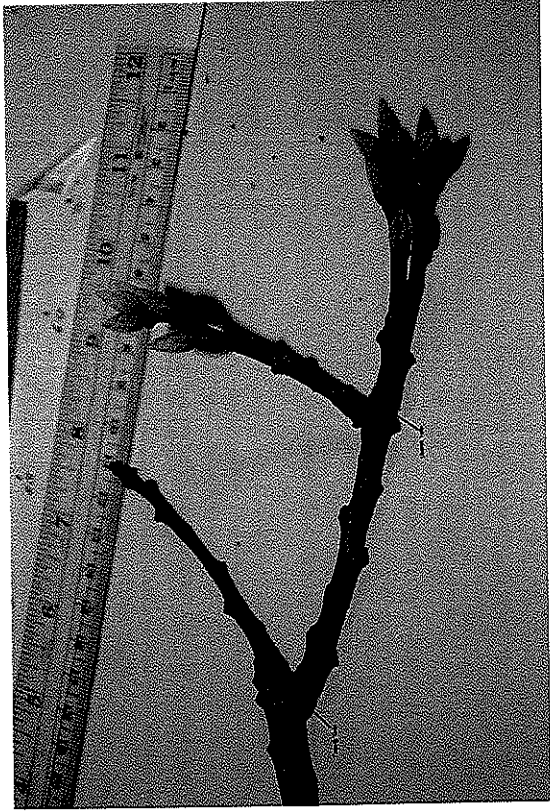


Figure 16: Sample for Node Growth Study showing healthy new bud growth and terminal nodes.

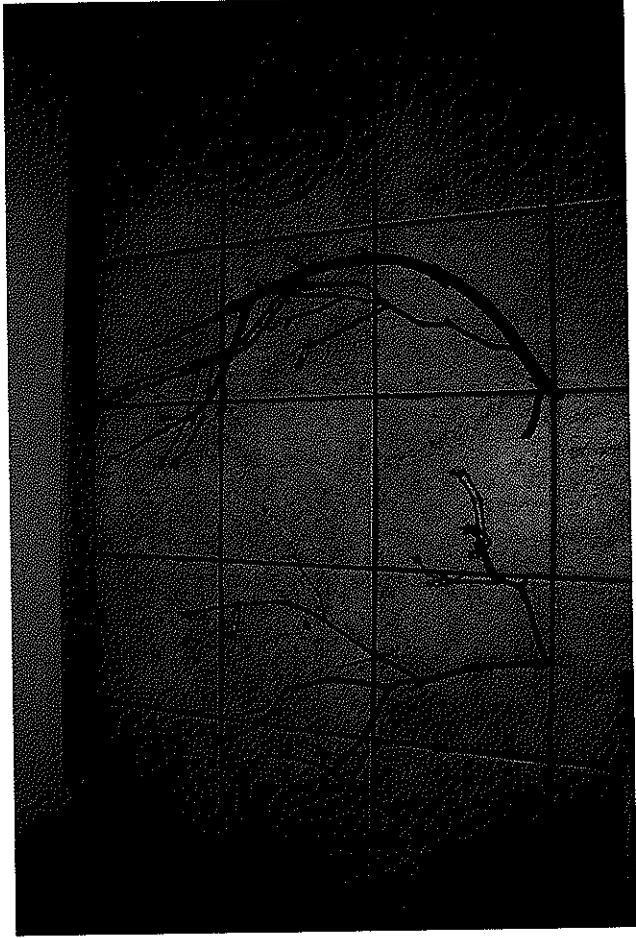


Figure 17: Samples A-D of Node Growth Study each tile is 12 inches square.

4. PEER REVIEW OF DEVELOPER'S CONSULTING ARBORIST

Table 3: Elliot Street Black Oak Tree Statistics as of February 2, 2011 Comparison

	Largess Forestry INC	Horticulture Technologies, Inc
Height	50 ft	50 ft
Average Crown Spread	77.5 ft	60 ft
Circumference at Breast Height (4.5 ft)	15' 3"	
Diameter at Breast Height (4.5 ft DBH)	58.4"	58"
Age of Core Sample (10 3/8 inches)	70 yrs	
Estimated Age of the Elliot Street Black Oak Tree	202 yrs	

George N. Ackerson is a qualified certified arborist. His site visit and assessment of the Elliot Street Black Oak Tree on July 14th, 2010 was limited. He seems to have underestimated the crown spread. His assessment that some of the large scaffolding limbs having decay is correct. But he did not mention the other healthy limbs and their great limb attachment. He never mentioned the health of the entire trunk. Adventitious growth, is not from damage, it is natural to Black Oak species and should never be removed.

CONCLUSION

This tree has been through 202 years of storms and has grown to withstand the New England weather. It's 50 foot height is common for Old Growth Oak near the coast line. Its giant trunk with its large root flare keeps it intact. This tree could use a skilled safety pruning. This tree is not a hazard and could live for another century. Original Old Growth Forest Trees are extremely rare especially in urban areas. This Ancient Black Oak's preservation should be a top priority.

Appendix I: History and Science of Black Oak Trees²

Black Oak- scientific name: *Quercus velutina* – Also known as Eastern Black Oak, very similar in appearance to Red Oak, differences include its ability to thrive on poor and varied soils. Naturally occurring trees are often found on poor sandy or clay hillsides. Deeply furrowed bark on mature trees is nearly black. In the northern part of its range, black oak is a relatively small tree, reaching a height of 20-25 m (65-80 ft) and a diameter of 90 cm (35 in), but it grows larger in the south and center of its range, where heights of up to 42 m (140 ft) are known. Black oak is well known to readily hybridize with other members of the red oak (*Quercus* sect. *Lobatae*) group of oaks being one parent in at least a dozen different named hybrids. The bark of this species (*quercitron*) is rich in tannins and was once an important source of these chemicals used for tanning leather. (The yellow dye obtained from the bark is also called *quercitron*.)

In forest stands, black oak begins to produce seeds at about age 20 and reaches optimum production at 40 to 75 years. It is a consistent seed producer with good crops of acorns every 2 to 3 years. In Missouri, the average number of mature acorns per tree was generally higher than for other oaks over a 5-year period, but the number of acorns differed greatly from year to year and from tree to tree within the same stand.

The number of seeds that become available for regenerating black oak may be low even in good seed years. Insects, squirrels, deer, turkey, small rodents, and birds consume many acorns. They can eat or damage a high percentage of the acorn crop in most years and essentially all of it in poor seed years.

Black oak acorns from a single tree are dispersed over a limited area by squirrels, mice, and gravity. The blue jay may disperse over longer distances.

Black oak is monoecious. The staminate flowers develop from leaf axils of the previous year and the catkins emerge before or at the same time as the current leaves in April or May. The pistillate flowers are borne in the axils of the current year's leaves and may be solitary or occur in two- to many-flowered spikes. The fruit, an acorn that occurs singly or in clusters of two to five, is about one-third enclosed in a scaly cup and matures in 2 years. Black oak acorns are brown when mature and ripen from late August to late October, depending on geographic location.

In southern New England, black oak grows on cool, moist soils. Elsewhere it occurs on warm, moist soils.

The most widespread soils on which black oak grows are the Udalfs and Udolls. These soils are derived from glacial materials, sandstones, shales, and limestone and range from heavy clays to loamy sands with some having a high content of rock or chert fragments. Black oak grows best on well drained, silty clay to loam soils.

Black oak grows on all aspects and slope positions. It grows best in coves and on middle and lower slopes with northerly and easterly aspects. It is found at elevations up to 1200 m (4,000 ft) in the southern Appalachians.

The most important factors determining site quality for black oak are the thickness and texture of the A horizon, texture of the B horizon, aspect, and slope position. Other factors may be important in localized areas. For example, in northwestern West Virginia increasing precipitation to 1120 mm (44 in) resulted in increased site quality; more than 1120 mm (44 in) had no further effect. In southern Indiana, decreasing site quality was associated with increasing slope steepness.

Near the limits of black oak's range, topographic factors may restrict its distribution. At the western limits black oak is often found only on north and east aspects where moisture conditions are most favorable. In southern Minnesota and Wisconsin it is usually found only on ridge tops and the lower two-thirds of south- and west-facing slopes.

REFERENCES

- 1 Matheny, Nelda P. and Clark, James R.; A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas, International Soc. Of Arboriculture, 1994.
- 2 <http://www.Trees-online.com>
- 3 <http://harvardforest.fas.harvard.edu/research/oldgrowth.html>