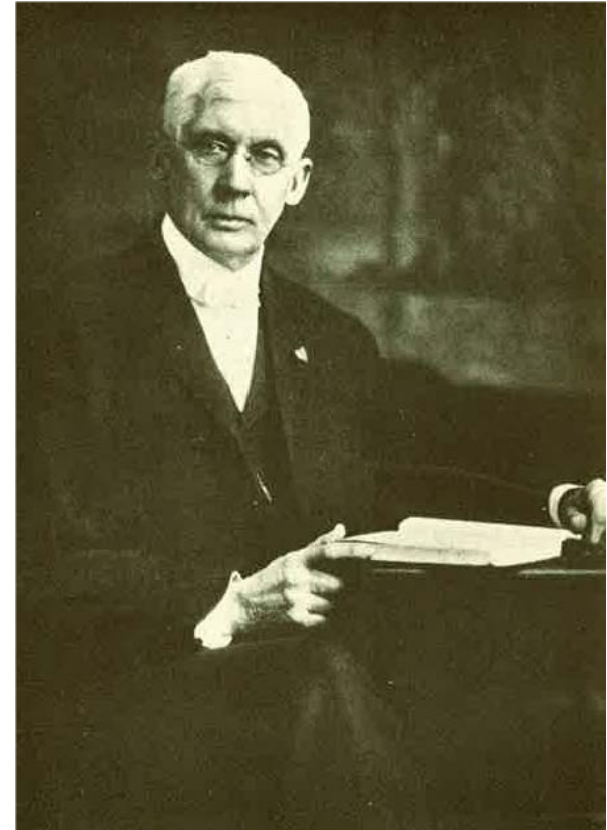



Tree Protection During Design & Construction

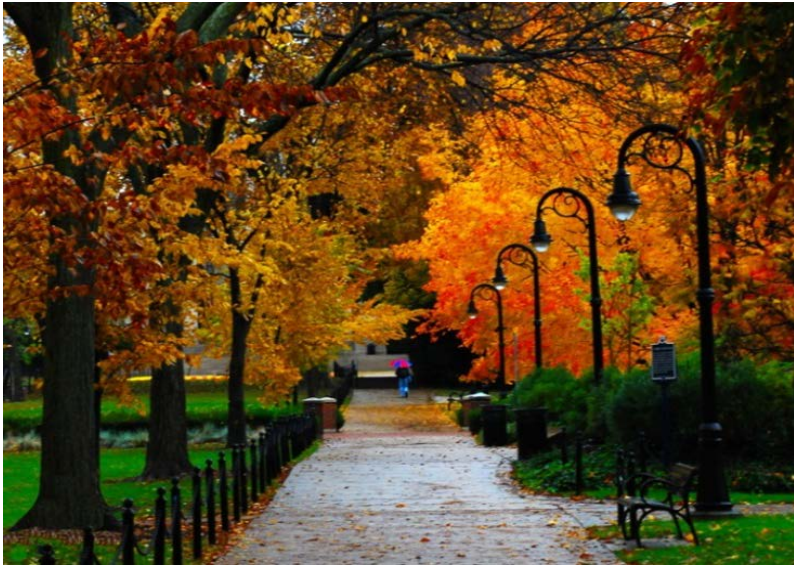
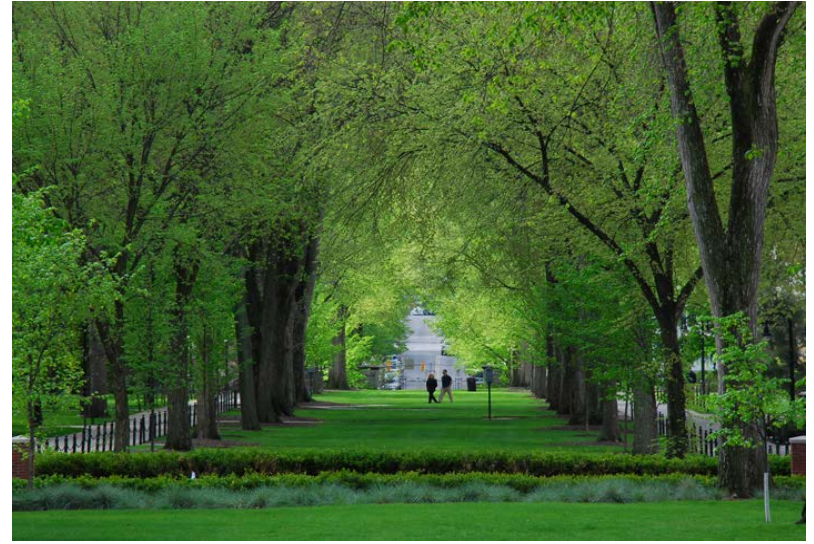
“What ought we to do, what can we do, for the generations still to come, that will cause the citizens of this county in the succeeding centuries to bless us?

Grateful to the past, and anxious to show your gratitude, what can you do for the future?

You can plant a tree.”



John Hamilton, Professor of Agriculture Penn State College, November 1919





2.11 Tree Canopy/Tree Root Protection Zones

- **A. General**
- **1. Intent:**
 - **a. The Pennsylvania State University is committed to tree protection.**
 - **b. The tree canopy/tree root zones shall be protected during the entire construction process.**
 - **c. Tree trunks and branches shall not be damaged by equipment and/or workers and tree root protection zones shall be protected from soil compaction, damage by trenching or excessive grade changes, and hazardous materials or waste products.**

Soil Protection Zones

Soil protection areas outlined on the plan to not be disturbed shall be protected from unnecessary excavation, compacting, and/or spoiling during the entire construction process. Protection of these zones shall be by the placement of temporary fencing as outlined in Part B.1.b - Materials. (1) NO REMOVAL OF OR ENCROACHMENT INTO SOIL PROTECTION ENCLOSURES SHALL BE PERMITTED UNLESS COORDINATED WITH THE UNIVERSITY REPRESENTATIVE.

- c. The Contractor shall be responsible for the installation and maintenance of all soil protection fencing. Protective fencing shall remain undisturbed until all construction activities have been completed. The Contractor shall remove.**

Inspections

1. Pre-Construction

- Tree Canopy/Root Zone Protection
- Lay down areas and construction limit fencing

2. Plant Material Acquisition and Delivery

- General plant material quality
- Branch structure
- Free from damage
- True to specification (size / species / cultivar)

3. Sub-Grade Inspection

- Scarified to specified depth
- Removal of debris / trash and rocks over 2” any dimension

4. Topsoil Placement Inspection

- Visual inspection of soil (free of adverse materials)
- Meets topsoil specification
- Depth/ and correct quantity

5. Plant Material Post-Installation

- Planting height/depth – root collar
- Removal of baskets and burlap
- Plant spacing as per specification to meet the design intent

6. Substantial Completion

- Verify any mortality of newly planted material

7. Final Inspection



Construction Management Suggestions

- Never compromise the structural integrity of a tree – Safety must be your highest priority

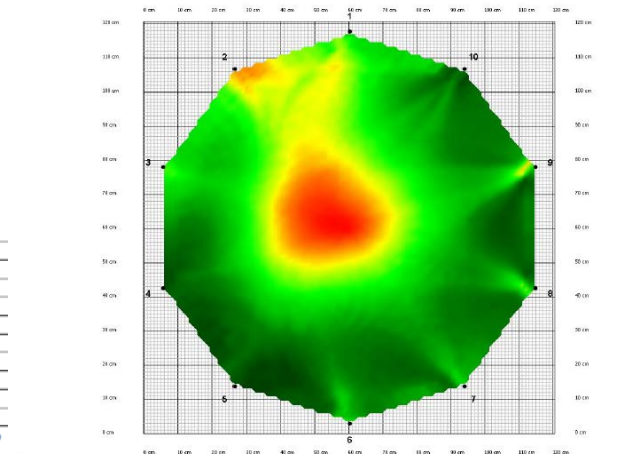
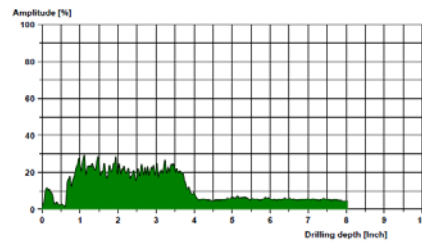


Construction Management Suggestions

- Accurately Assess Tree Health



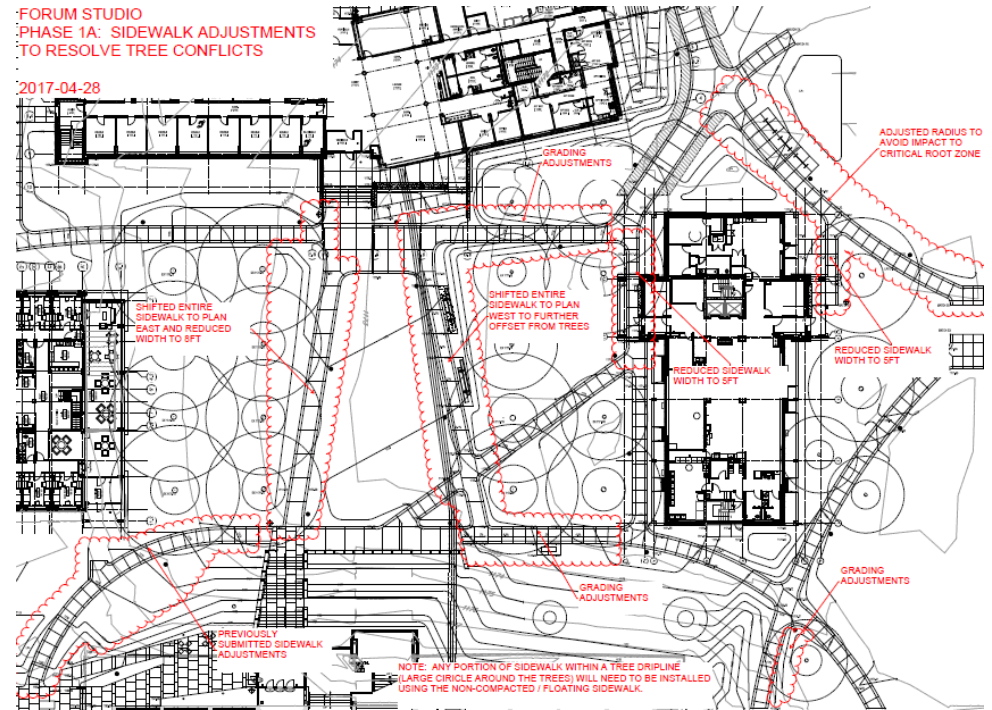
Tomograph of Lower Stem



Construction Management Suggestions



- Understand “Constructability” and the space required to build



Construction Management Suggestions



- Moving Trees Has A Huge Impact on Construction Cost


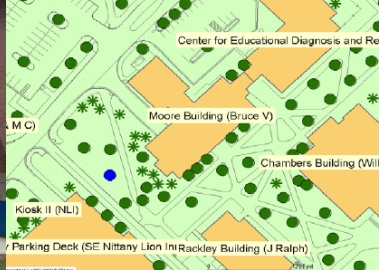


Construction Management Suggestions

- Expect to be challenged and be prepared to provide quality information



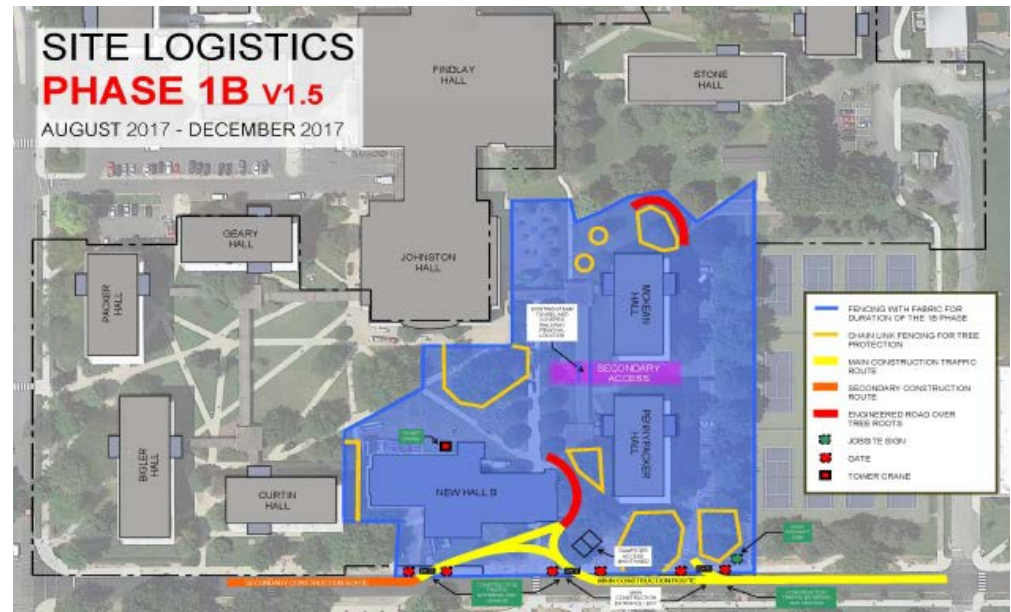
Penn State University Office of Physical Plant Tree Assessment Summary

Date 6/18/2017	Job Number	Inspector Jeff Dice	Phone Number 814-777-2701
Location West side of Moore Building		Project Manager Chad Spackman	Phone Number 814-280-2519
Reason for Inspection: Facility renovation - Building addition		Contact Person	Phone Number
Comments:			
Tree Number A658	Species (Common Name) Willow Oak	Estimated Value (as appraised using guidelines from Council of Tree and Landscape Appraisers) \$7,483.92	Critical Approach Distance (Health) (measured in feet) 30
Diameter (inches) 30	Species (Scientific Name) Quercus phellos	Tree Health / Condition Rating (100 point scale) 63%	Critical Approach Distance (Structural) (measured in feet) 30
Spread (feet) 58	Age planted pre 1940	TRAQ Risk Assessment Low	Critical Approach Distance (Failure) (measured in feet) 10
Height (feet) 66	Heritage No	Commemorative No	Elm Management Zone No
			
Recommendation: Please establish a tree protection detail on all construction documents using guidelines from the OPP Construction Standards: (http://www.opp.psu.edu/construction/standards/design_standards/DIVISION31.DOC , http://www.opp.psu.edu/construction/standards/design_standards/DIVISION32.DOC). Questions, please contact Jeff Dice (814-865-2701)			

Construction Management Suggestions



- Recognize that lay down areas are negotiable.



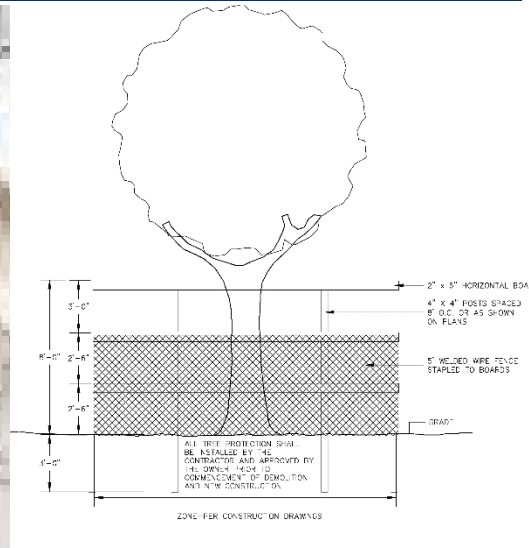
Construction Management Suggestions



- Facilitate Construction



The Architect



The Arborists



The Construction Manager



The Contractor



Case Study – Pollock Road Improvement Project

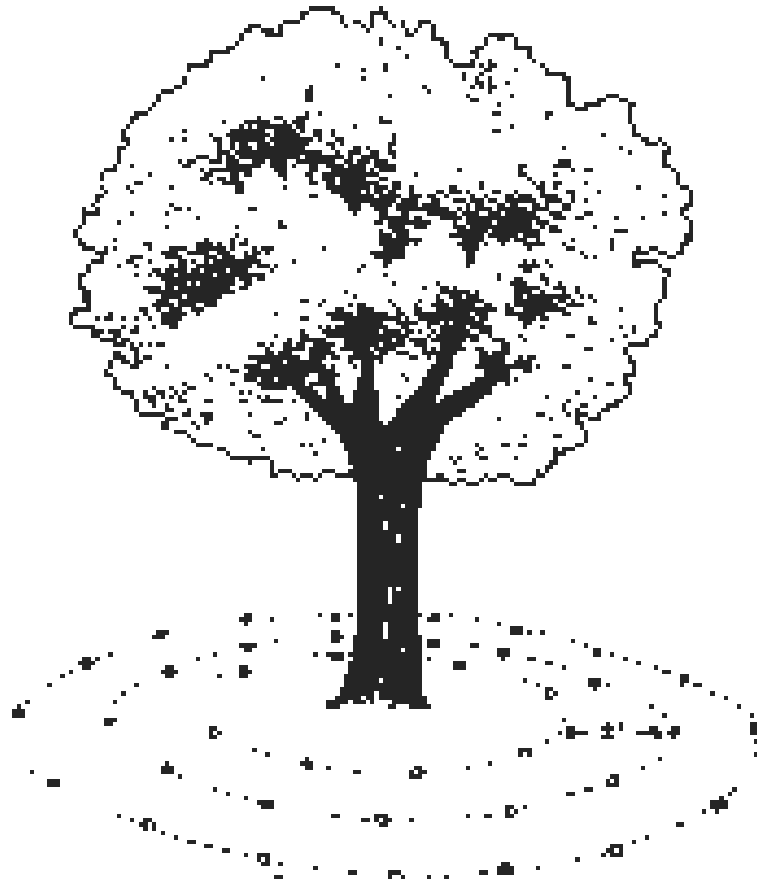








ROAD CLOSED
ACCESS TO
PITENOUR ROAD



Tree Number A658	Species (Common Name) Willow Oak
Diameter (inches) 30	Species (Scientific Name) Quercus phellos
Spread (feet) 58	Age planted pre 1940
Height (feet) 66	Heritage No

Estimated Value (as appraised using guidelines from Council of Tree and Landscape Appraisers)

\$7,483.92

Tree Health / Condition Rating (100 point scale)

63%

TRAQ Risk Assessment

Low

Critical Approach Distance (Health) (measured in feet)

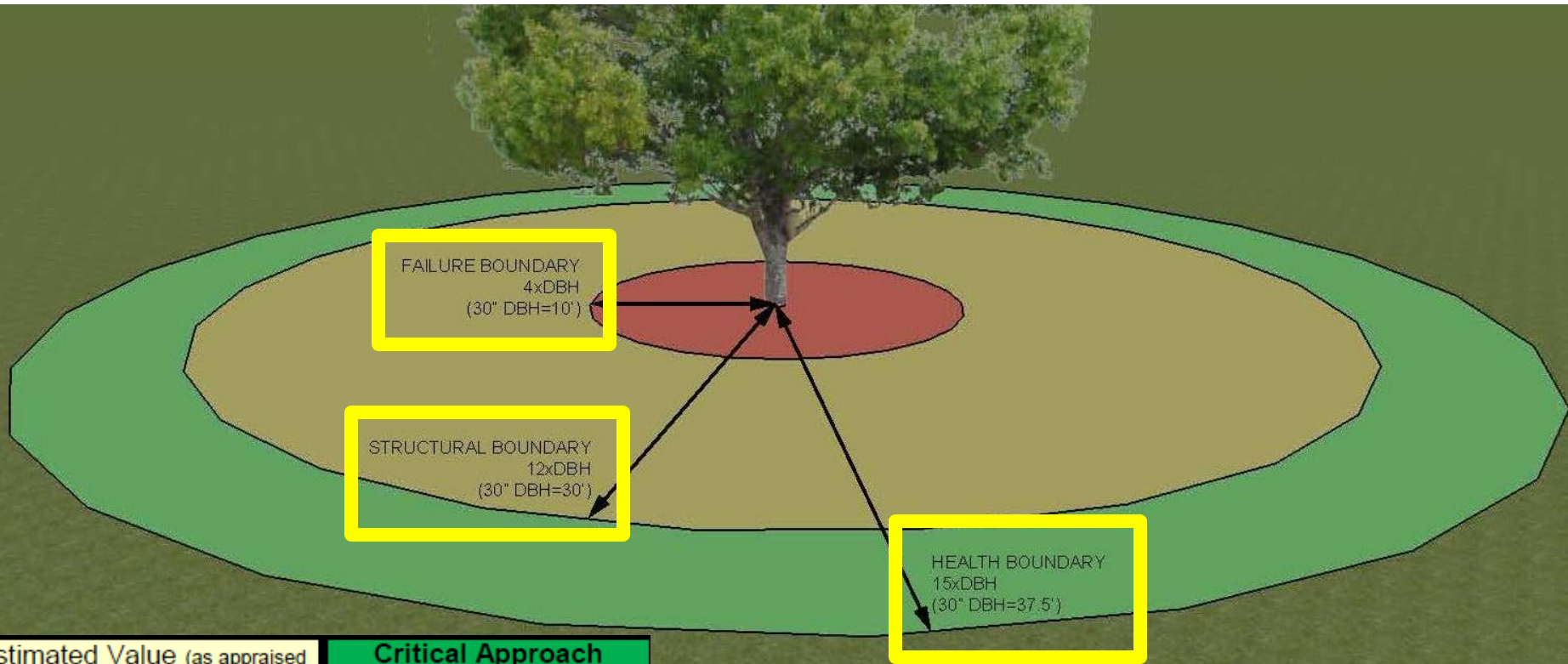
38

Critical Approach Distance (Structural) (measured in feet)

30

Critical Approach Distance (Failure) (measured in feet)

10



Estimated Value (as appraised using guidelines from Council of Tree and Landscape Appraisers)	Critical Approach Distance (Health) (measured in feet)
\$7,483.92	38
Tree Health / Condition Rating (100 point scale)	Critical Approach Distance (Structural) (measured in feet)
63%	30
TRAQ Risk Assessment	Critical Approach Distance (Failure) (measured in feet)
Low	10

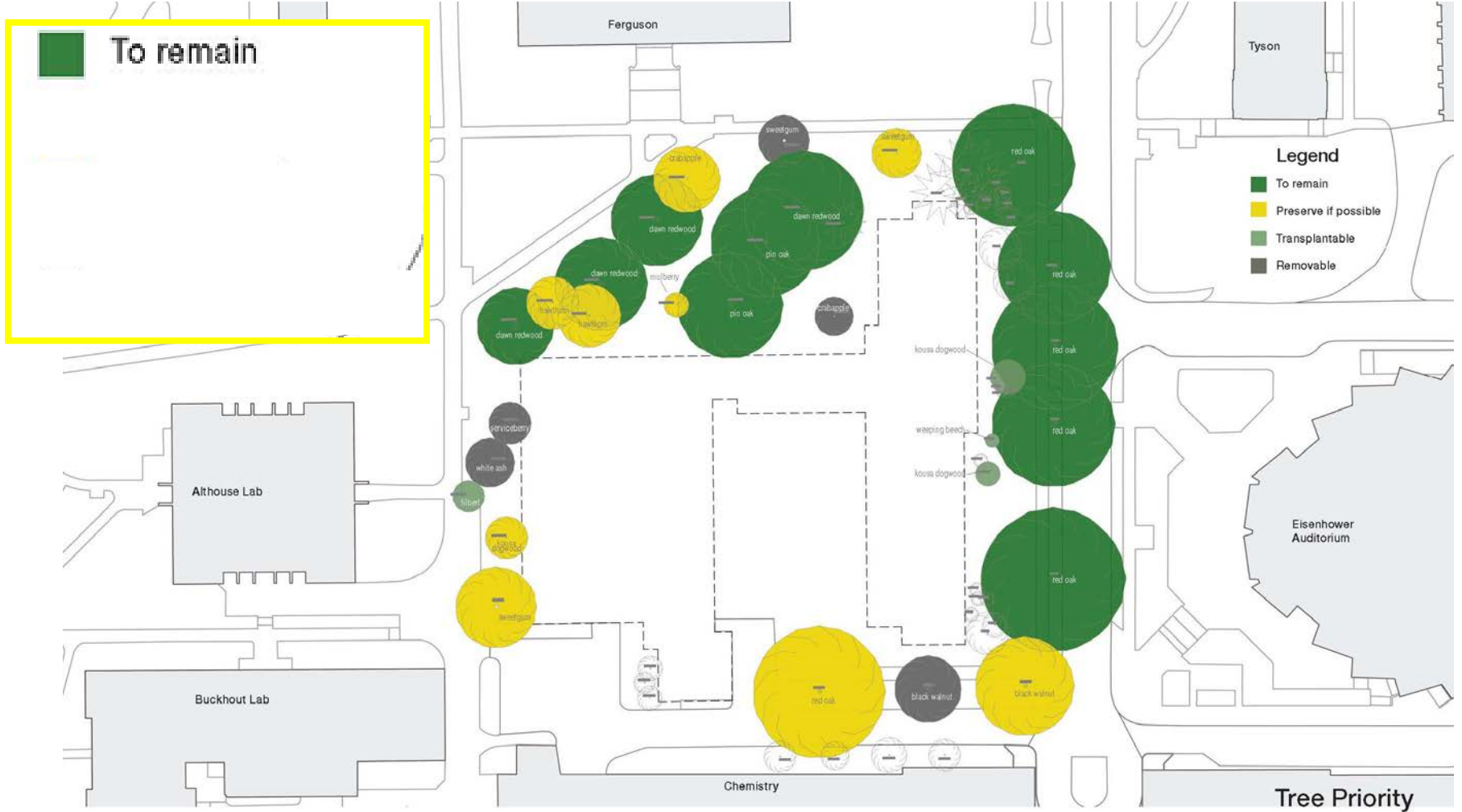


Tree Protection Process

1. Tree Inventory and Survey
2. Tree Assessment and Evaluation
3. Determine Approach Boundaries
4. Assess Potential Impacts
5. Determine Locations for Future Trees
6. Pre-Construction Site Inspection – Establish Tree Protection
7. Ongoing Site Inspections During Construction
8. Site Restoration Following Construction



Step #2: Tree Assessment and Evaluation – (Arborist / Horticulturist)



PSU Chemical Engineering and Biomedical Engineering Building
Slate College, PA 11.19.2015

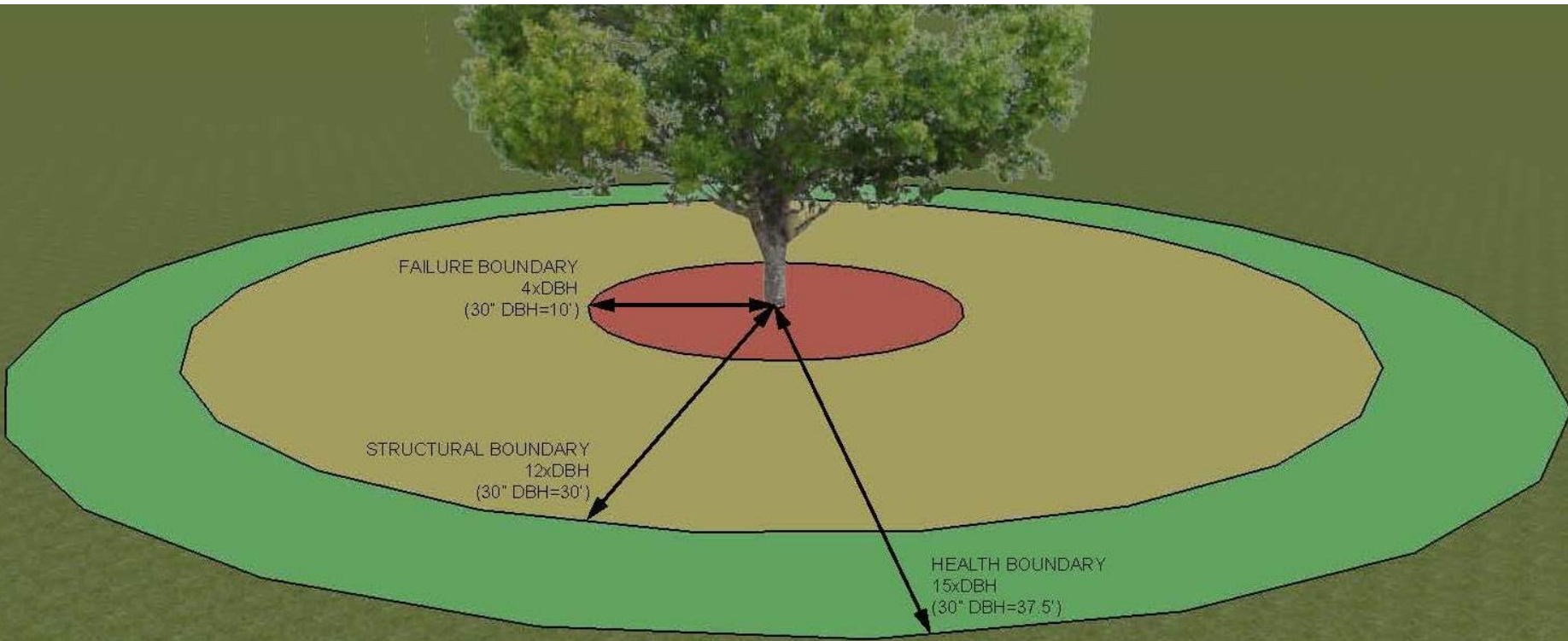
Tree Priority
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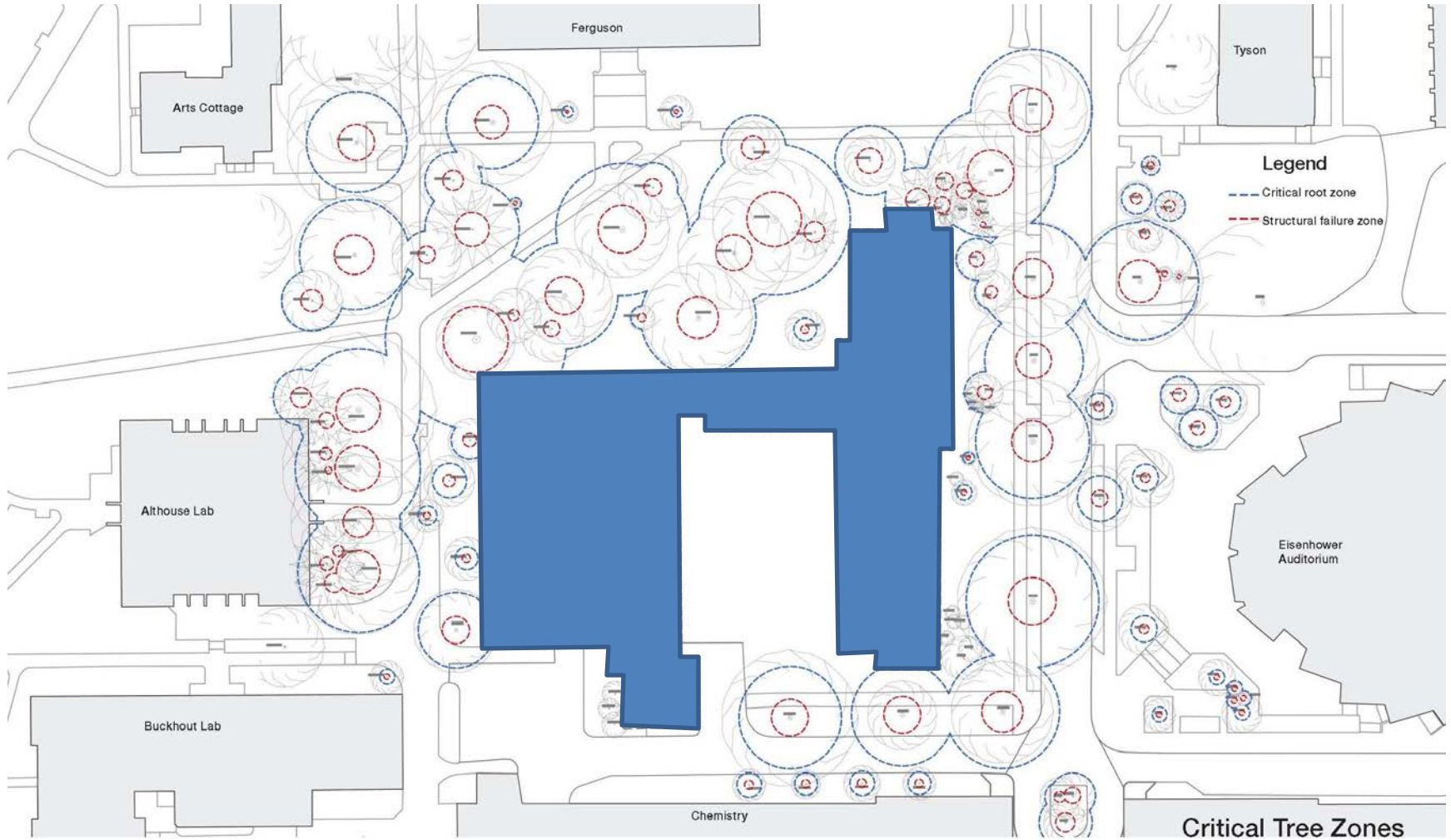
Step #2: Tree Assessment and Evaluation – (Arborist / Horticulturist)



Step #3: Determine Approach Boundaries - (Arborist / Horticulturist)



Step #3: Map Approach Boundaries – (Architect / Landscape Architect)

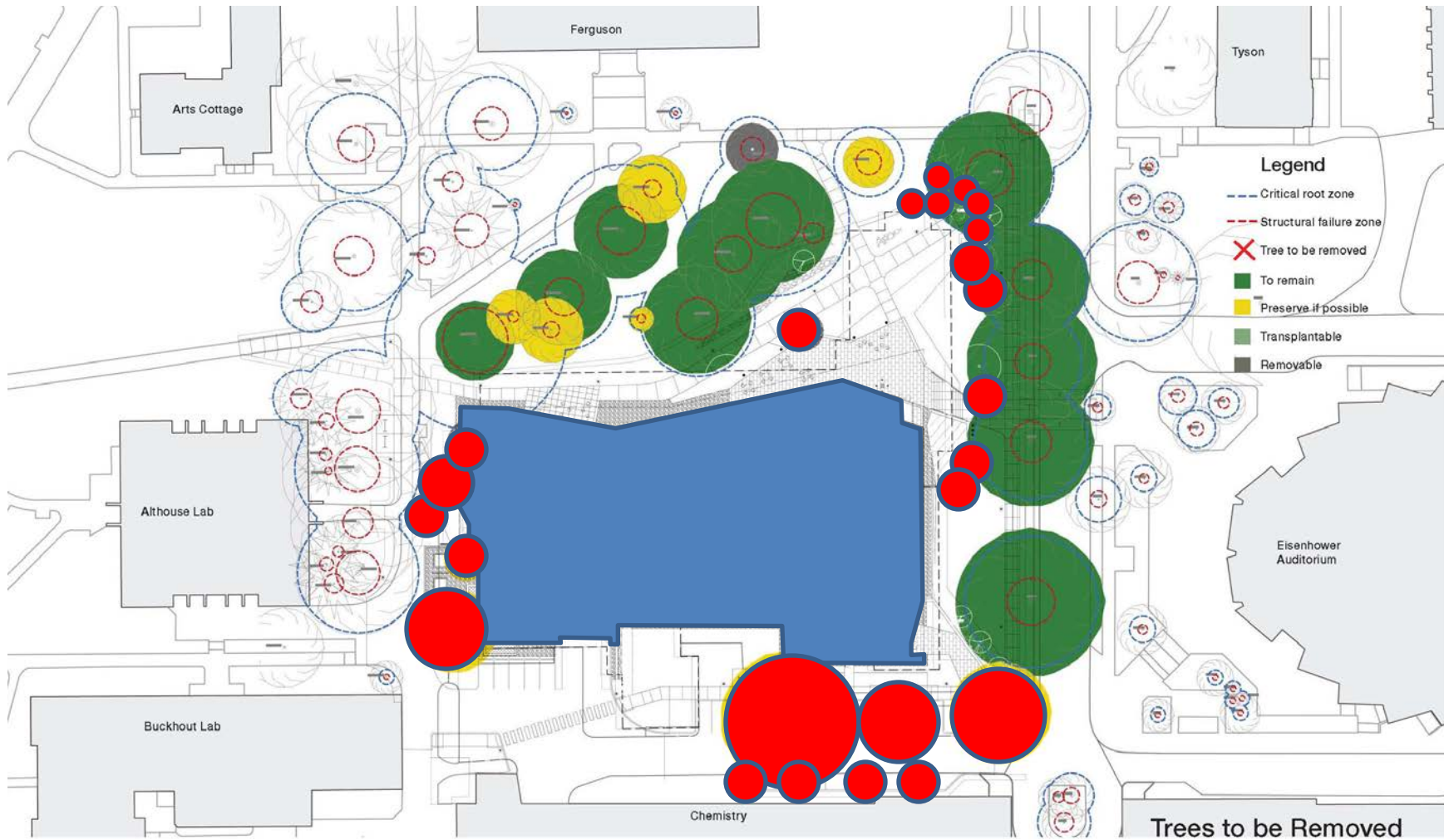


PSU Chemical Engineering and
Biomedical Engineering Building
Slate College, PA 11.19.2015

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Step #4: Assess Potential Construction Impacts – Design Team



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Trees to be Removed



Step #5: Determine Potential Locations for New Trees



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Step #6: Project Review and Approval – University Tree Commission



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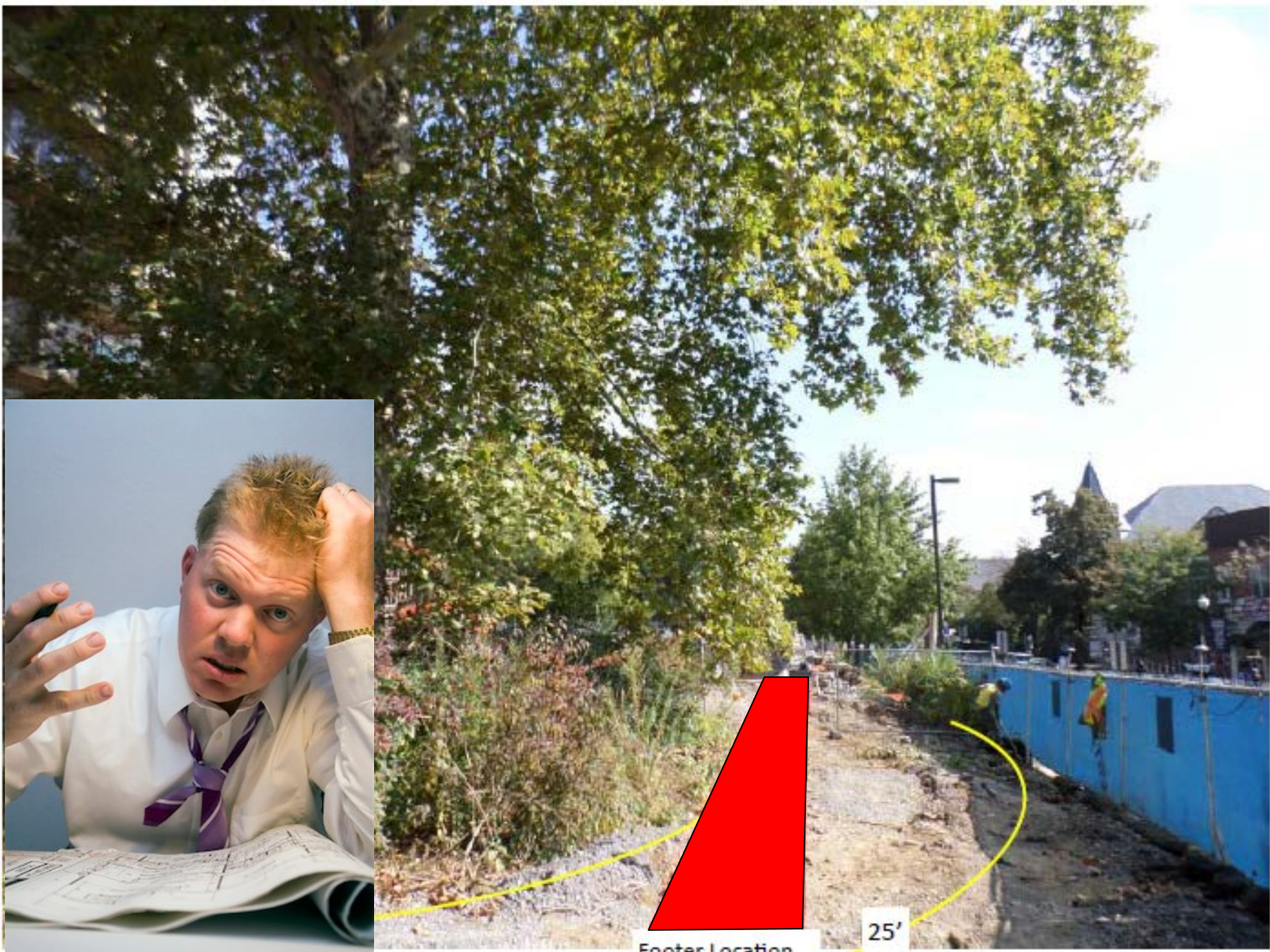


Case Study – Individual Tree – Nurses Education Sycamore



<p>Estimated Value (as appraised using guidelines from Council of Tree and Landscape Appraisers)</p> <p>\$27,561.92</p>	<p>Critical Approach Distance (Health) (measured in feet)</p> <p>59</p>
<p>Tree Health / Condition Rating (100 point scale)</p> <p>79%</p>	<p>Critical Approach Distance (Structural) (measured in feet)</p> <p>47</p>
<p>TRAQ Risk Assessment</p> <p>Low</p>	<p>Critical Approach Distance (Failure) (measured in feet)</p> <p>16</p>
<p>Commemorative</p> <p>No</p>	<p>Elm Management Zone</p> <p>No</p>





Footer Location

25'



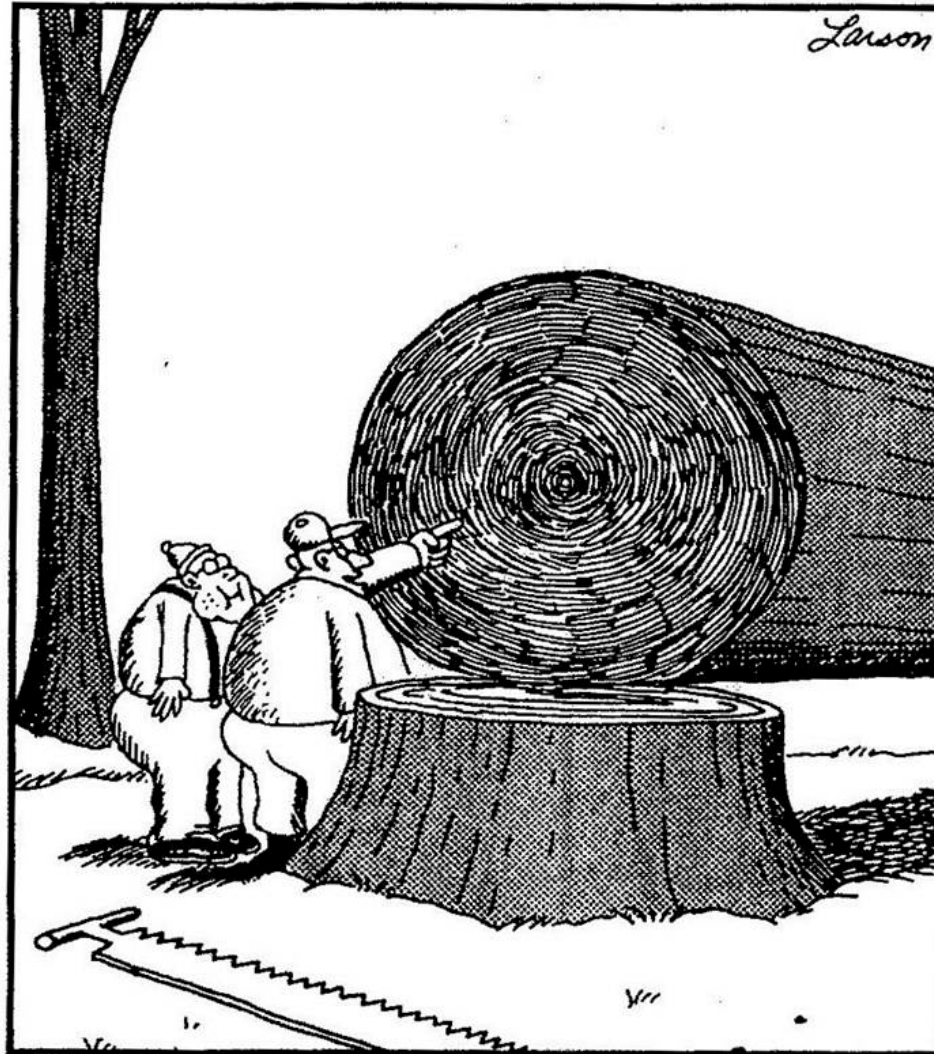


Tree Protection During Construction









"And see this ring right here, Jimmy? ...
That's another time when the old fellow
miraculously survived the campus master plan."

