PRESERVING THE HERITAGE OAKS:

An Innovative Tree Root Crossing Solution For Pathways On The Wake Forest University Campus

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PRESENTERS







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OUR AGENDA

- Wake Forest University's Heritage Tree Protection Program
- North Dining Hall/Q Lot Project: Design Challenges & Solutions
- Davis Field Road: Design Challenges & Solutions



Wake Forest in the 1950s



Orientation of Campus Alignment with between Pilot Mountain and axis of downtown Winston Salem



WFU'S HERITAGE TREE PROTECTION PROGRAM

- 65+ years in the making
- History of the, Elm Oak and Magnolia trees on campus
- Pressure to keep the trees and protect them with new construction
- WFU Tree Campus Care Plan includes Committee for protection of Heritage & Memorial Trees along with best practices for construction.



Access for students to dining hall through ex. grove of mature Oak trees



Challenge: Tree Protection

- Planning before Construction includes review with University Arborist – Jim Mussetter
- Tree Protection Fencing a must
- 10-12 weeks of intense work usually in summer. Conduct weekly site meetings w/Jim & GC to address any concerns



Challenge: Preserve Beauty

- Protect the aesthetics & beauty of the area In the backdrop of a newly completed \$60M business school (Farrell Hall)
- Students enjoy fire pit and microclimate in this special place.
- Boardwalk in the background.



Challenge: ADA Compliance

- Maintain ADA compliance while going up and over the tree roots at different heights & elevations
- Parking impacts at Q-lot to be minimal
- Working with ex. grades, around tree root locations and elevations.



Challenge: Minimize Tree Impacts

- Tree roots need air infiltration/air circulation as much as water.
- Critical Root Zones large anchor roots and fibrous roots
- Arborist versus Structural Engineer



Challenge: Student Safety

- Needed non-slip texture to accommodate high pedestrian traffic in all seasons
- Wanted materials to blend in with campus features
- Safety and ADA were key



Challenge: Minimize Maintenance Needs

• Wanted a solution and material that was longlasting and would endure without needing maintenance on 300 acre campus



Solution: Elevated Boardwalk

Walkway would have students traversing to the new dining hall, residence halls and soccer fields.

How best to protect heritage oaks, allow for drainage and min impact?



CRITICAL ROOT ZONES (top view)

Critical Root Zone (CRZ) is the distance from the trunk that equals one foot for every inch of the tree's diameter. For example: if the tree has a trunk 12 inches in diameter, the CRZ is a 12 foot radius around the tree. Root Zone (ICRZ)

Disturbance in this area would cause significant impact to the tree, potentially life threatening.

Critical Root Zone or (CRZ)

Perimeter Critical Root Zone (PCRZ)

The greater the disturbance in this area, the greater post care treatment is needed. ° tree trunk

Coordination between Stimmel Associates & PermaTrak to locate tree roots and build foundation plan.



Survey of large roots + their elevations gave intel for location of support post spacing to min. impacts.



Drawings with slopes & elevations to get over tree roots





NORTH DINING HALL/ Q LOT

Railings measured & completed after construction, placement of posts onto treads for pedestrian protection. Wide 10' clearance.

ADA slopes at 8.33% maximum to traverse over roots.

Standard railing and site lighting per campus standards.



Re-establishing a roadway and pedestrian walkway in the heart of the Wake Forest Campus



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Challenge: Preserving the beauty & functionality of Davis Field, the heart of campus life for students. Band Practices, whimsical swings, Scales Fine Arts Center to the north.



Challenge: Tree Growth

Since the Davis Field road section was removed in the early 1990's, the trees have been growing uninterrupted for 25+ years

Ex. U/G utilities remained.



Challenge: Reinstalling Roadway with minimal impacts to large oaks.

- 10-12 weeks of intense work with arborist, including site meetings to address any concerns
- Pruning & Prep 6 months ahead
- Approval of disturbed limits was required by University Arborist before start of construction



Challenge: Utilities Coordination

- Ex. Sewer lines, add future tie
- Ex. Public & Private pressurized Water lines
- New U/G SWM in lower Davis Field was installed as current regulations required treatment.



Solution: Use elevated boardwalk to go up over tree roots, following vehicular road

Ex. 60" + Oak on south side was in close proximity.

Realign roadway w/bike and service lanes, axis to Hearn Plaza

New Site Lighting in median









Construction Sequence

Survey

Precast piers

Field adjustments

Protection of pavement



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DAVIS FIELD PROJECT

Installation

Protection of Paving

Leveling of treads and Tie in with new walks.





Solution:

Boardwalk offset by 2ft with railings to give clearance from road. Riverstone added for easy maintenance.

Grade can follow street and comply with ADA.



Solution: Elevation over tree roots

Ex. Magnolia at NE corner has continual leaf drop. Concerns on how to manage long term and screen?



Solution:

Critter Fence system with polymer fencing. Specifically this spec was for anti-climb with feral cats on campus and buried 12" min.

Shrubs were added for additional screening.



OTHER EXAMPLES







STIMMELASSOCIATES

QUESTIONS?