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Building Elevated Pedestrian Walkways While Protecting Trees

November 4, 2026 | 2:00 PM ET



WELCOME

Your speakers



Katie Rose Levin
ISA Board Certified Master Arborist
Colorado State Forest Service

Manages the 41,000-acre Forest Legacy Program and supports urban forestry statewide. Previously urban forestry manager for the Town of Cary, North Carolina.



Jason Philbin, P.E.
President
PermaTrak North America

PermaTrak was awarded a US patent for its tree root crossing system in 2026.

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AGENDA

1 **What roots do**

Trees, roots, fungi and soil

2 **What we do**

Protect the soil, save the tree

3 **How we build**

Elevated tools of the trade

4 **Projects & case studies**

Wake Forest University, Dayton Avenue, & Zilker Park

5 **Q&A**

Questions from the chat throughout.

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What roots do

Roots are the bones and belly of the tree



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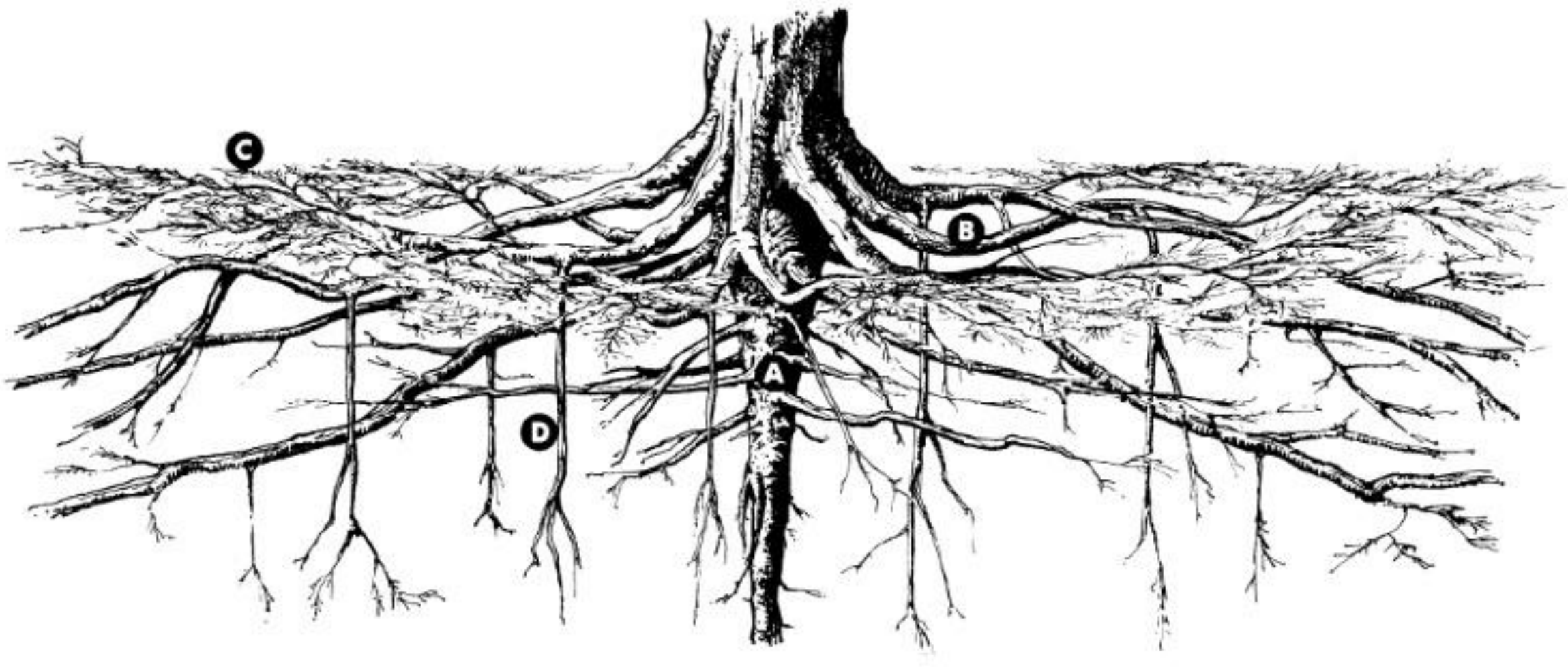
Woody and Fine

- Stability (woody)
- Health (fine)
  - (water uptake)
  - (nutrient uptake)
  - (hormonal signaling)
  - (defense)
  - (communication)



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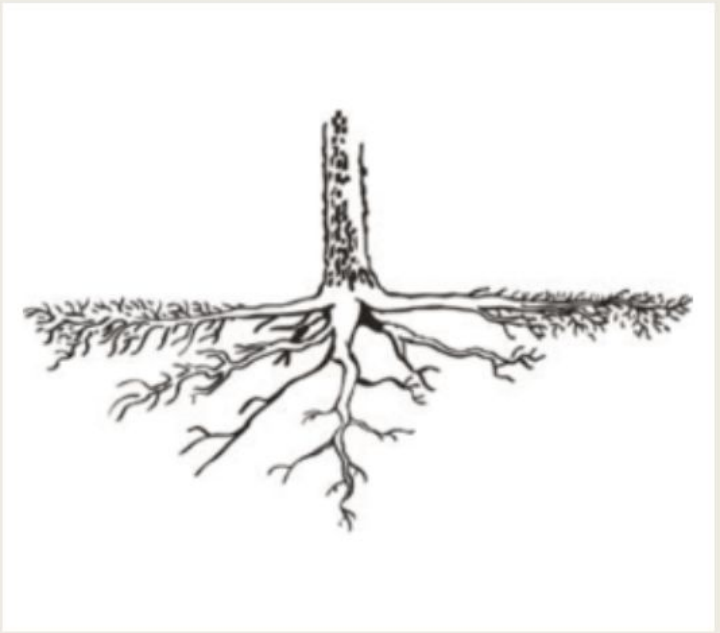




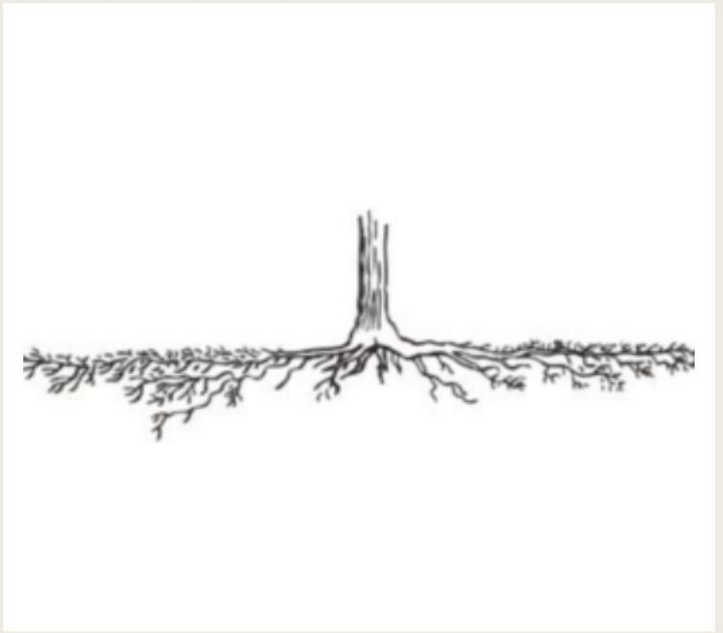
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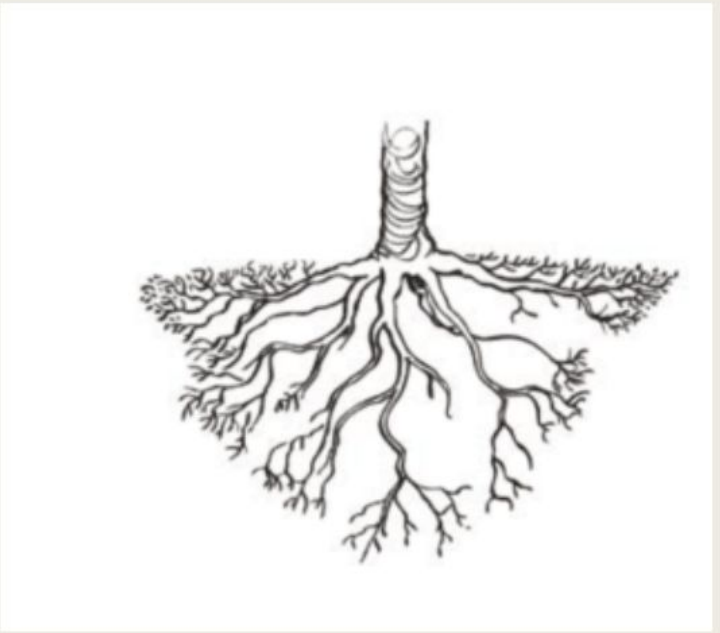
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Tap root system



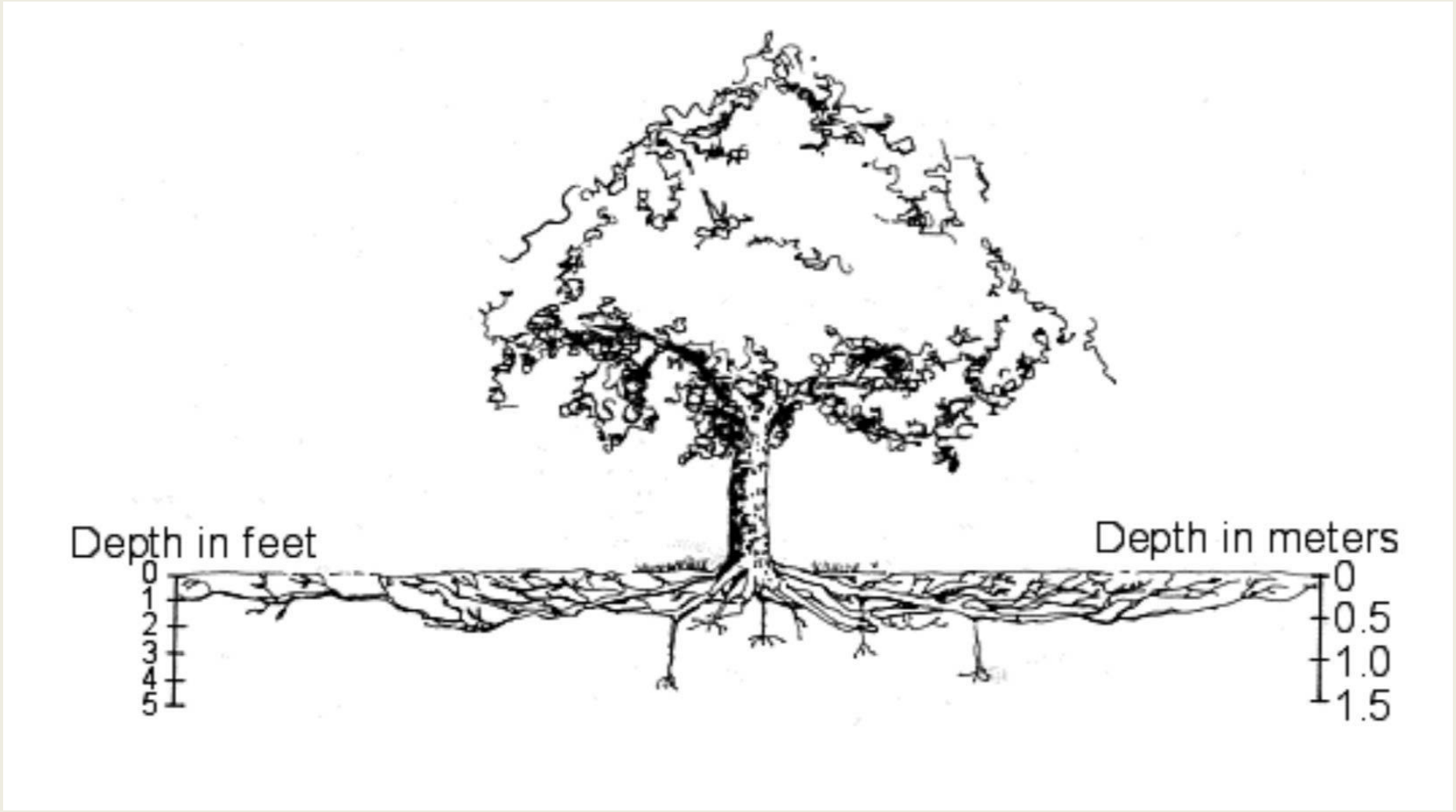
Lateral root system



Heart root system

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Soil availability determines root shape!

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Woody and Fine

1. Stability (woody)
2. Health (fine)
    1. (water uptake)
    2. (nutrient uptake)
    3. (hormonal signaling)
    4. (defense)
    5. (communication)



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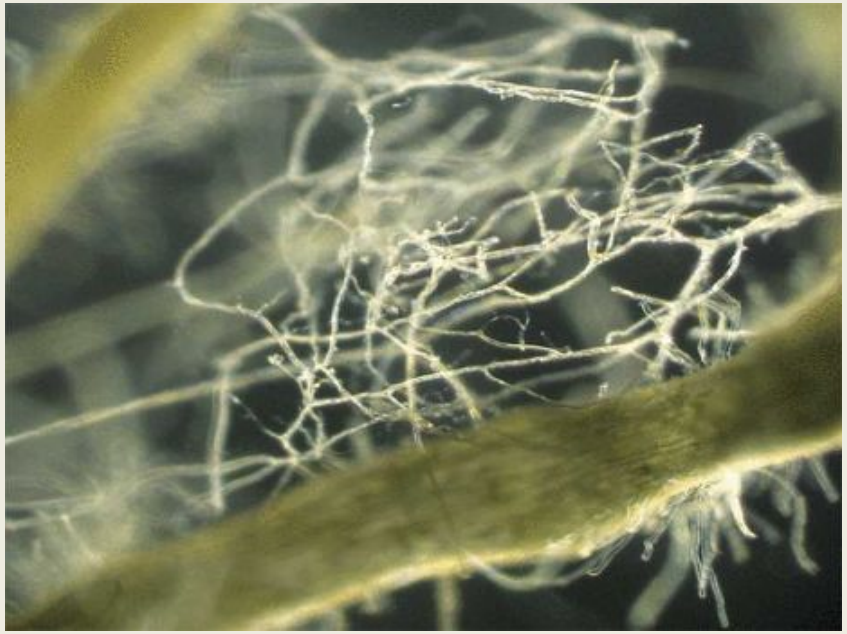
Fine Roots

- Short lived
- Absorb water and nutrients
- Create hormone signals
- Feed the soil

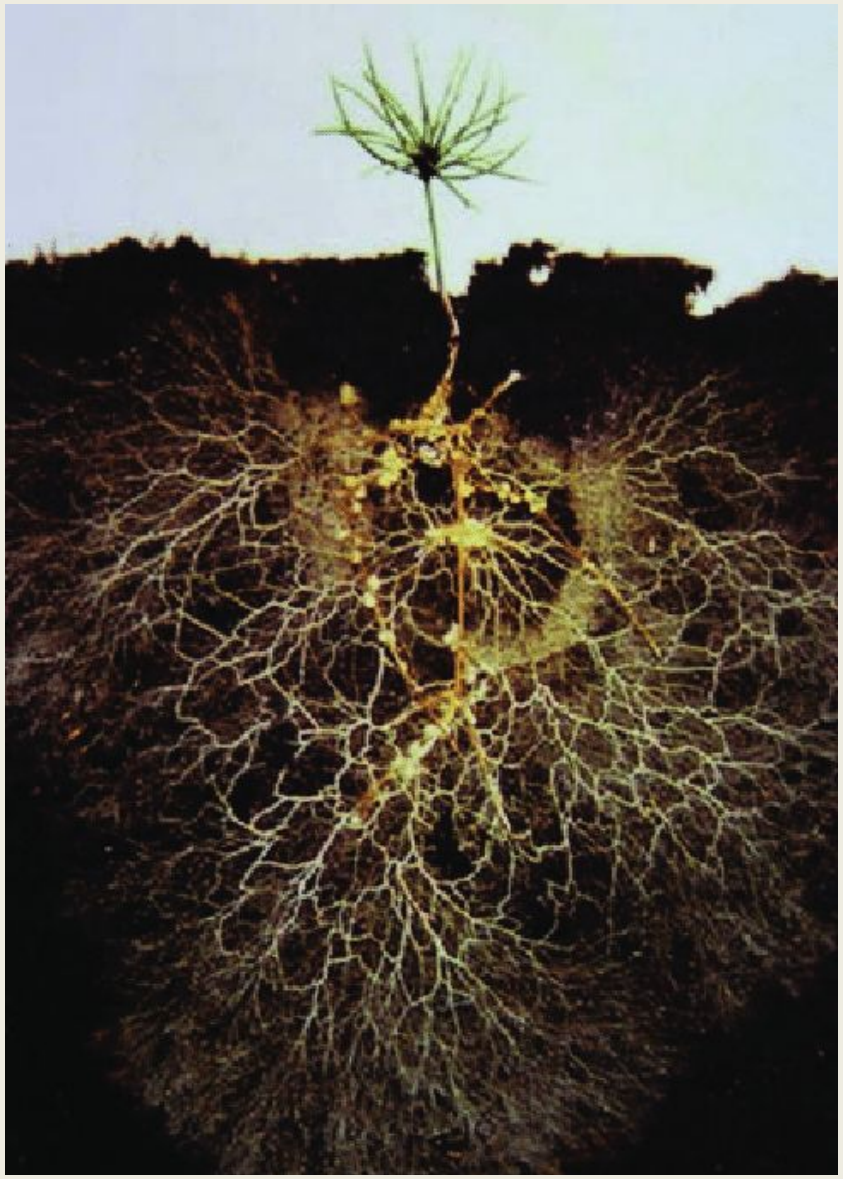
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Mycorrhizal Fungi!



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Directly provide:

- Enhanced nutrient uptake
- Drought resistance
- Hormonal stimulation
- Defense

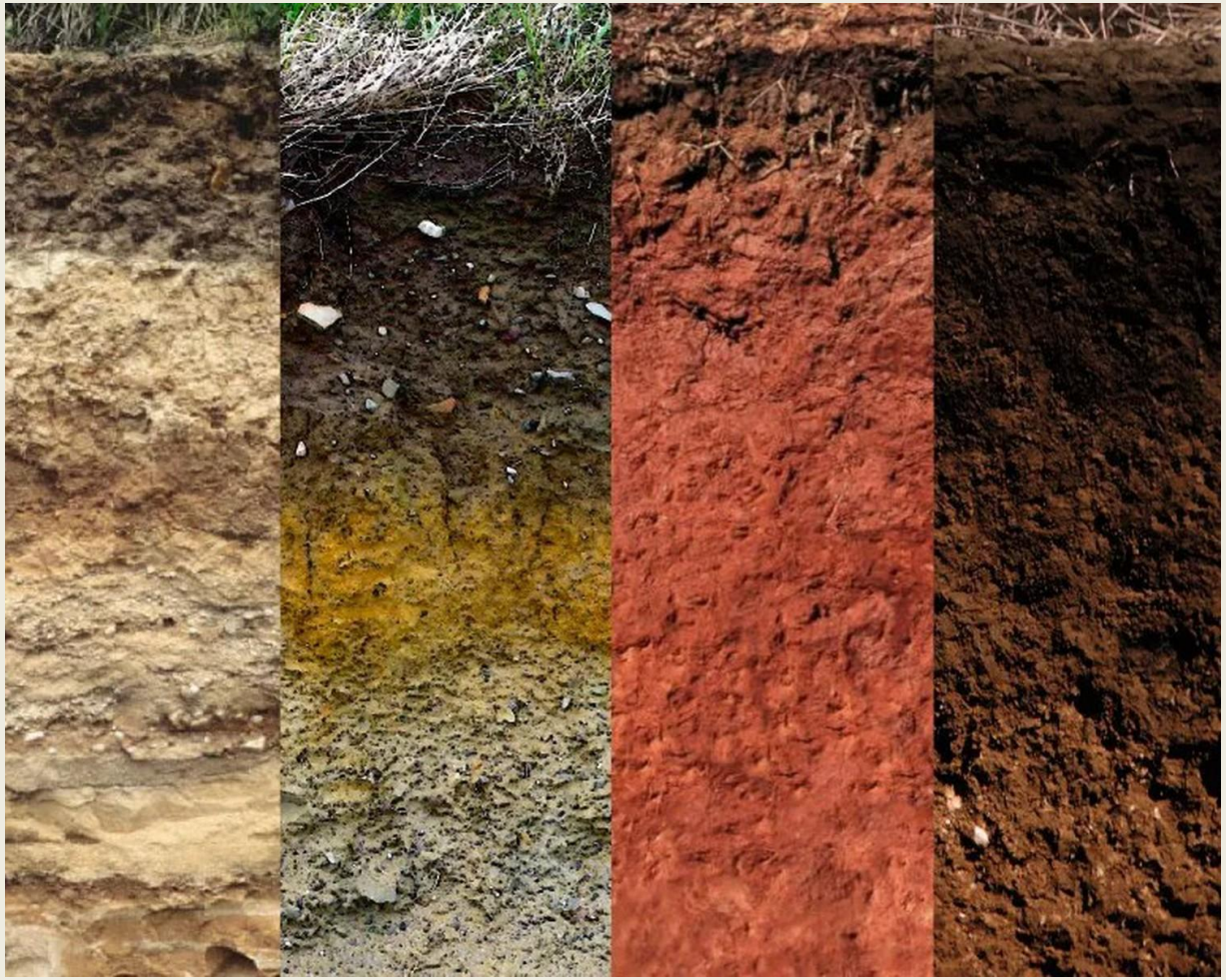
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Indirectly provide:

- Communication
- Ecosystem stabilization
- Climate change resilience



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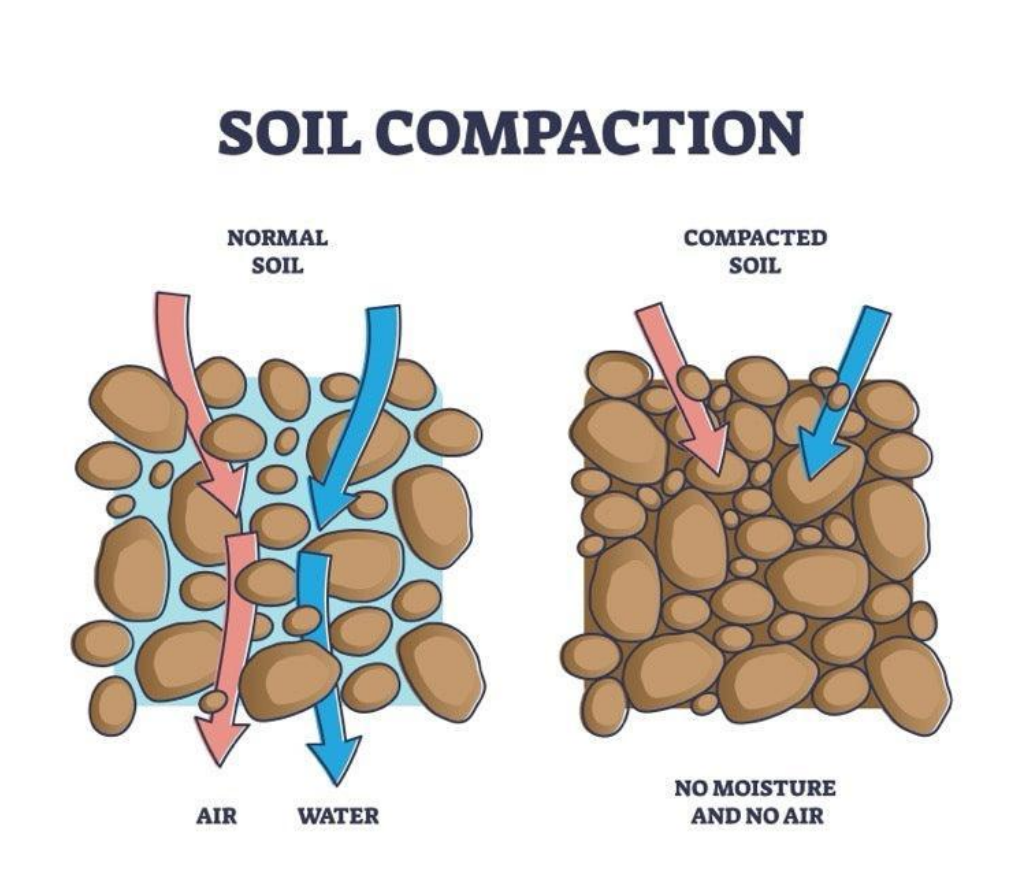


Soil horizons. Structure varies enormously over a short distance.

Good soil is four things:

1. Nutrients
2. Water
3. Drainage
4. Organics

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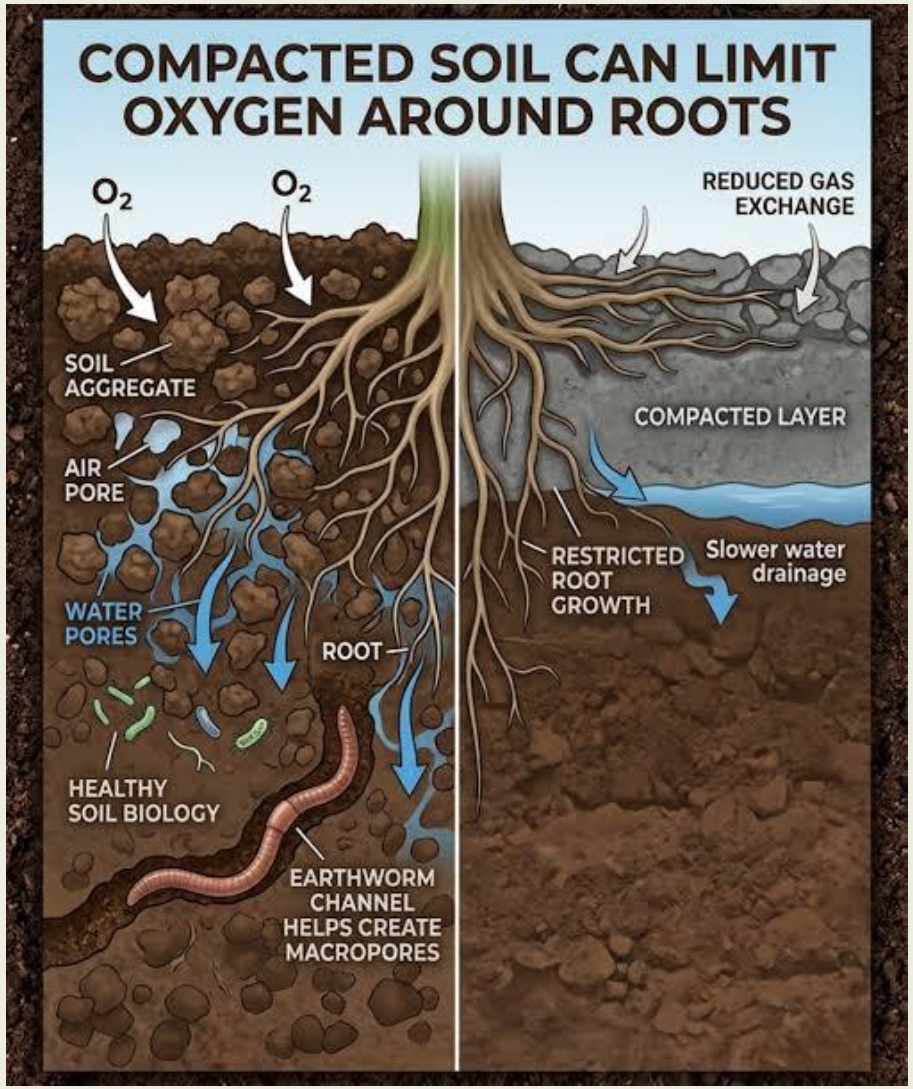


Healthy soil is open soil.

Compacted soil prevents the movement of air, water and roots

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Healthy soil is open soil.

Compacted soil prevents the movement of air, water and roots

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Remember…how you treat the soil, is how you treat the tree!



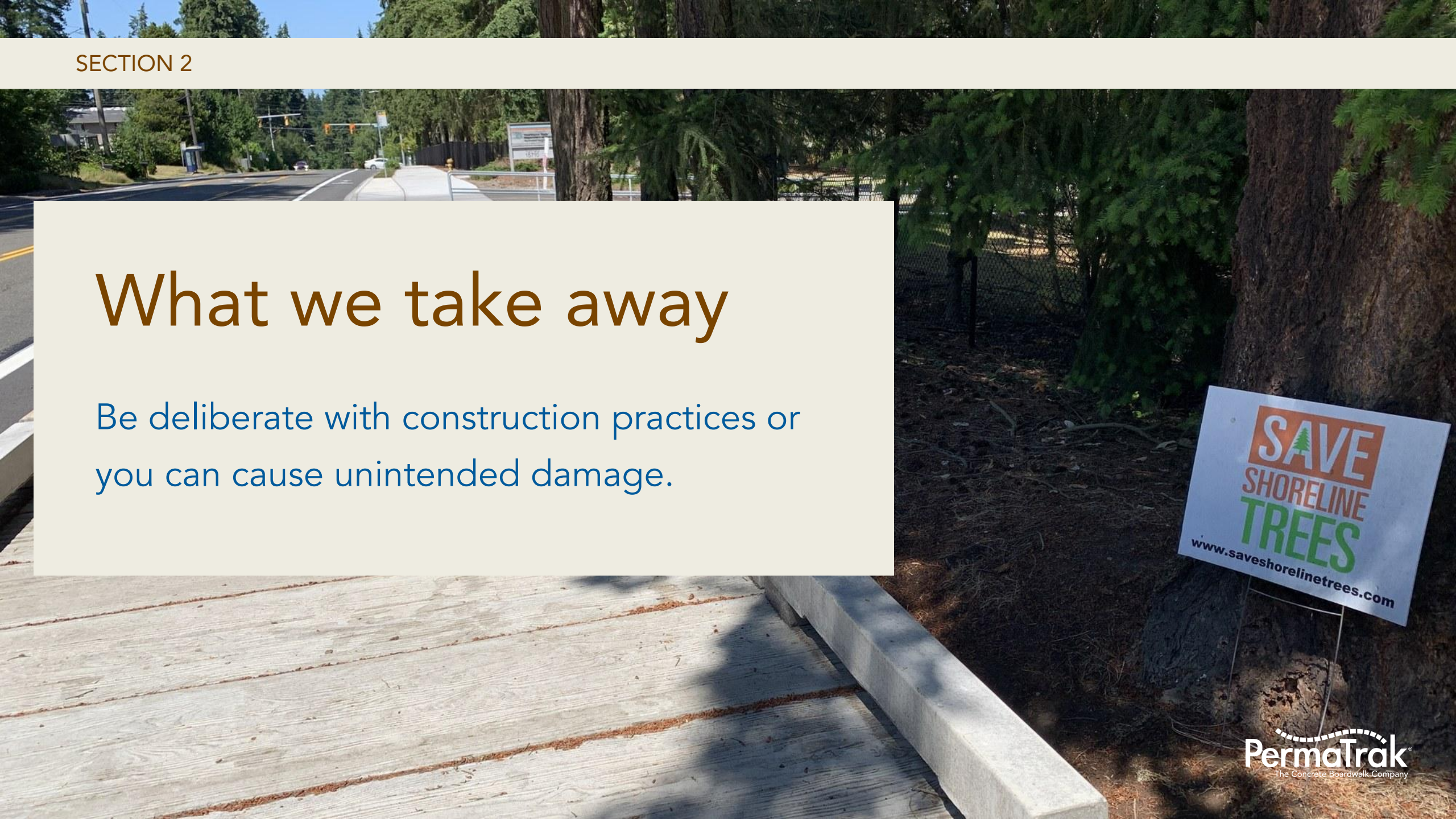


And now for…95% Proctor

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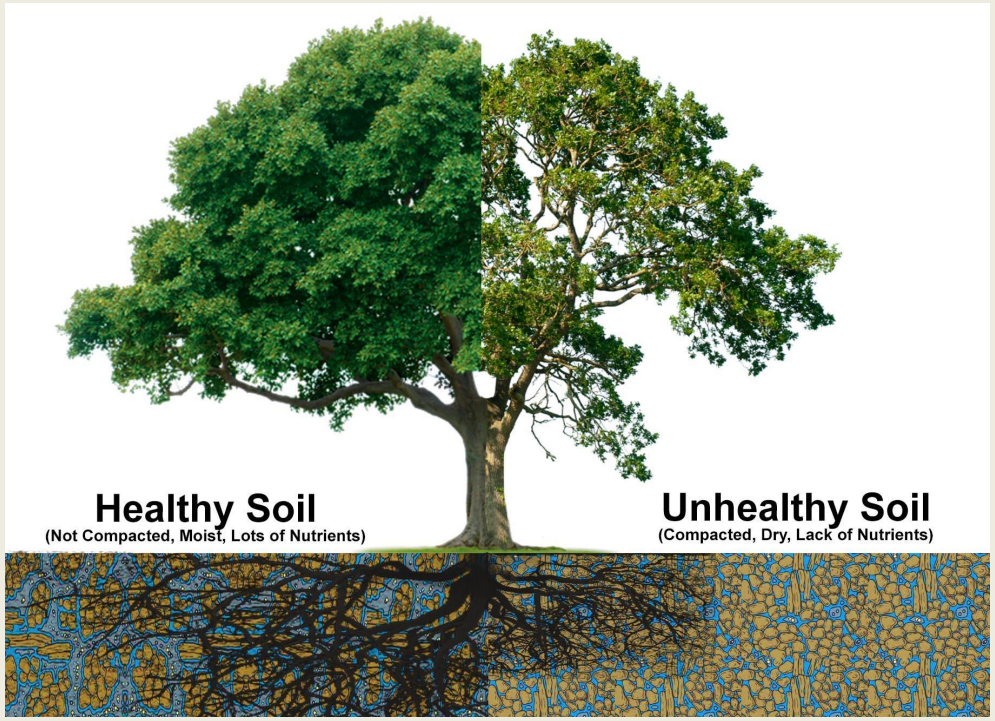
What we take away

Be deliberate with construction practices or you can cause unintended damage.



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Compaction damages soil, and leads to tree decline





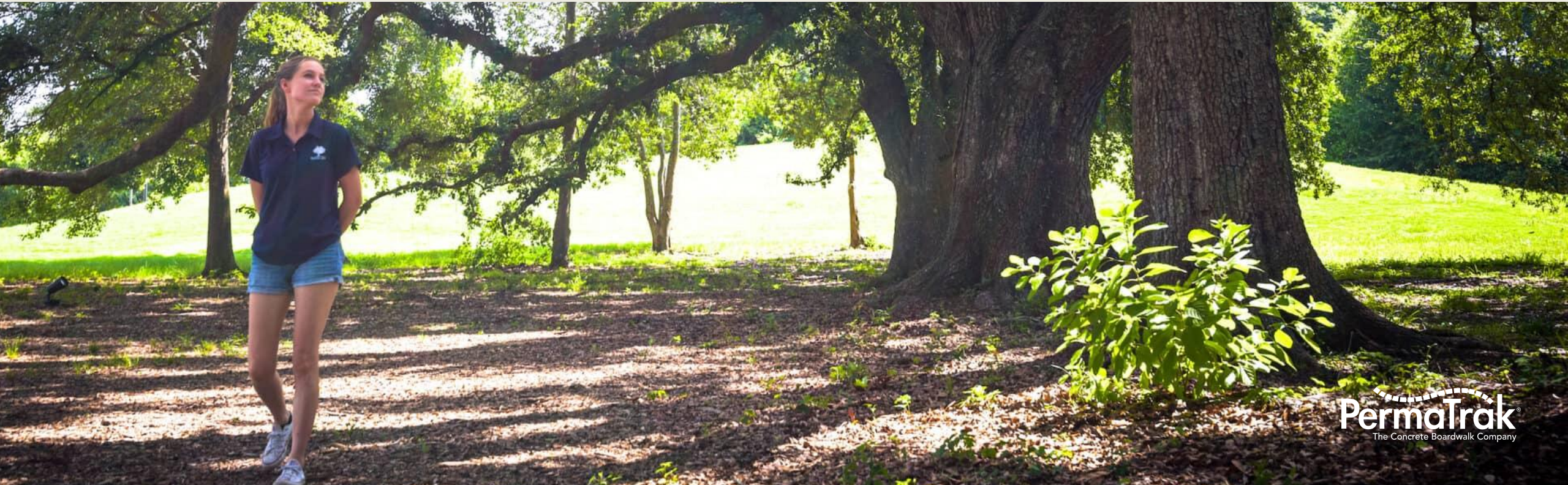
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One time compaction can be repaired.

A path never stops compacting

Social compaction from daily use is an ongoing injury, not a one-time impact.



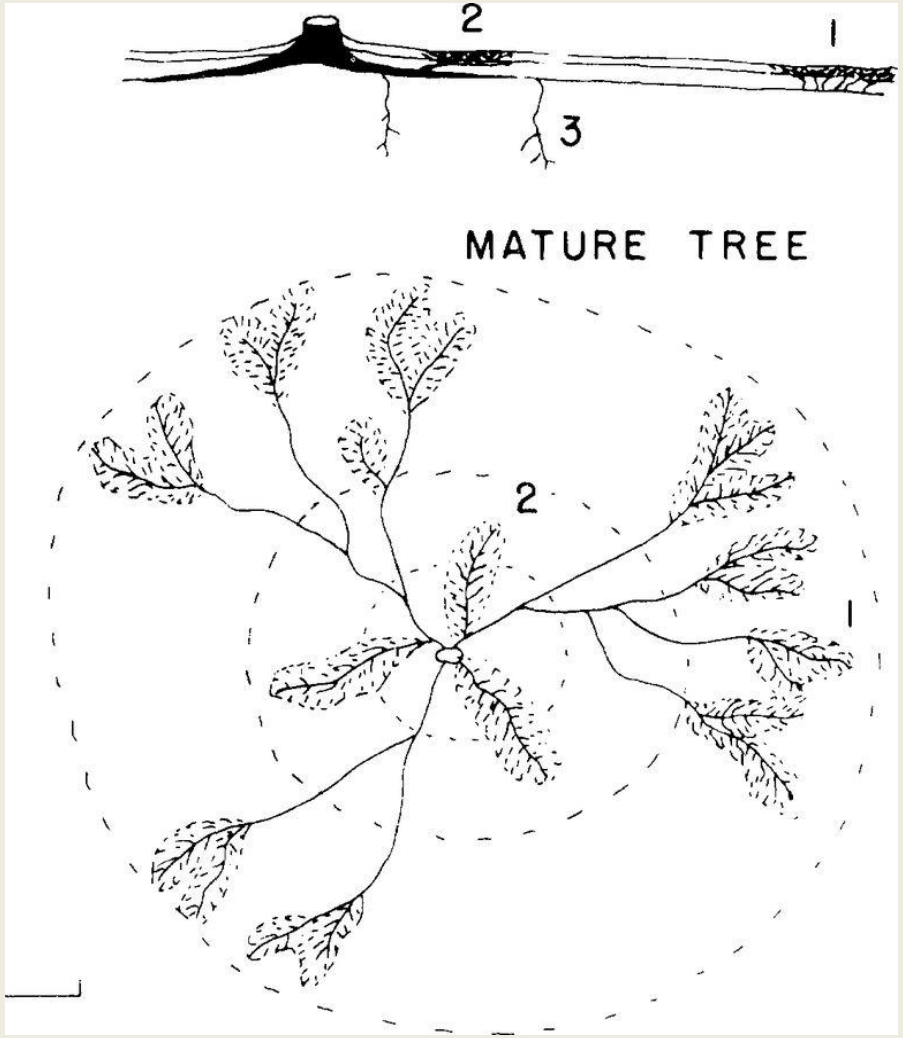
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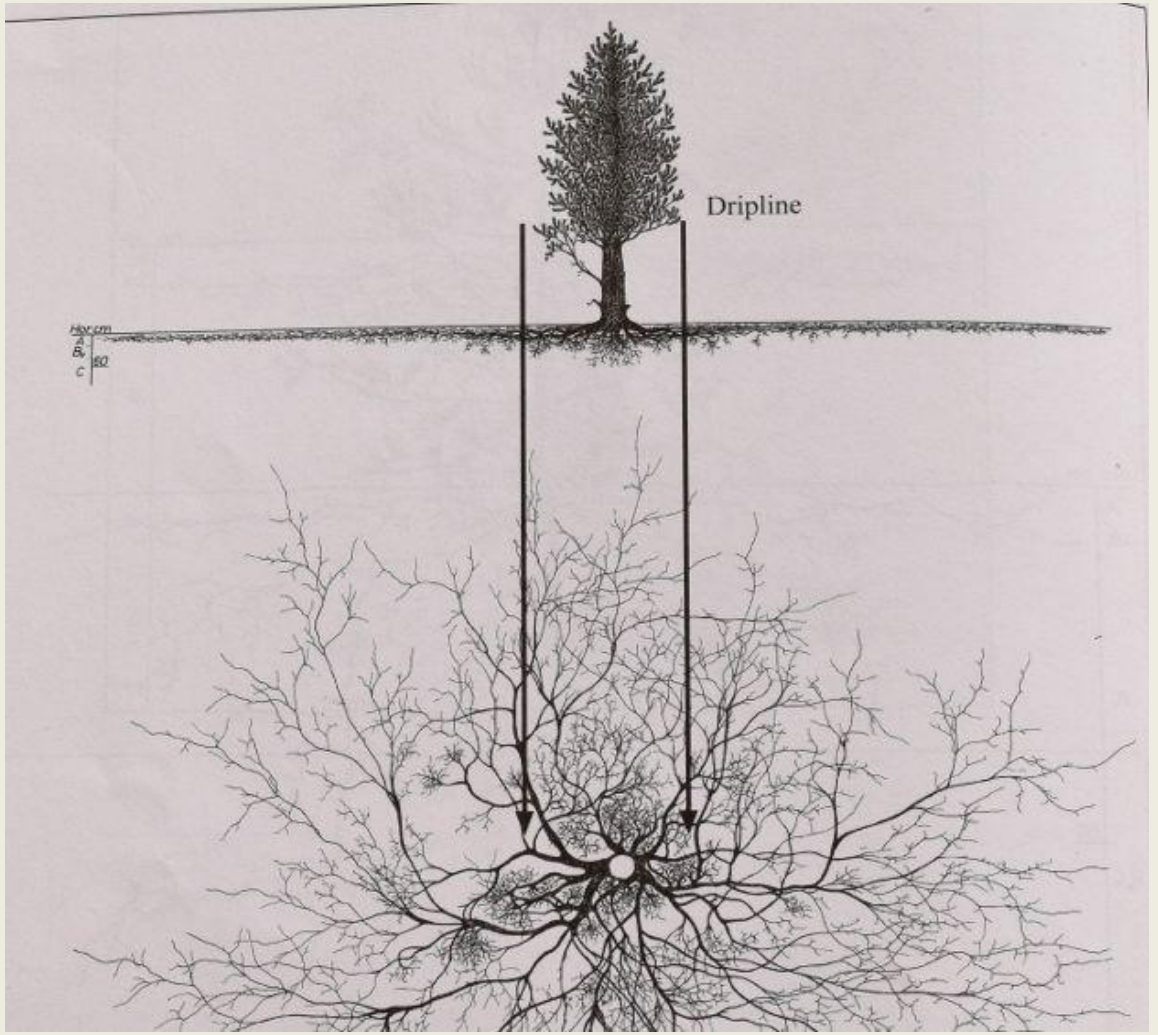
For high value trees, protect the soil by preventing now and future compaction



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Protecting trees (soil) means understanding roots





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Percentage of soil impacted is only part of the equation.

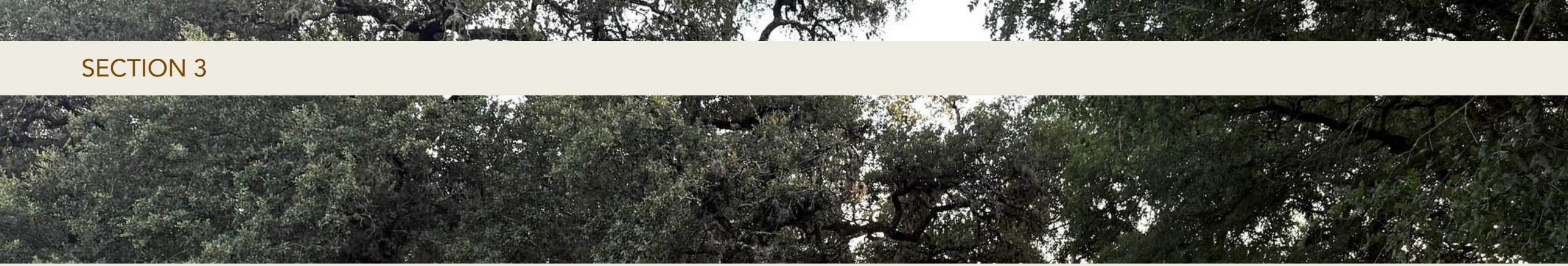
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One percent cut out of the soil can cost thirty percent of the roots

Cut a main root and you lose everything it feeds.



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What gets built

Protection, remediation and end product. The trifecta of a successful project



Bring the arborist in at concept.



Root zone work on a street tree project.

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Raised walkways provide protection

Protects the roots and the soil, the bones and the belly

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Footings on grade.

Nothing goes into the ground, so easy to miss the structural roots.



Dayton Avenue, Shoreline WA. Precast piers placed to miss structural roots.

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Zilker Park, Austin. Helical pier foundations.

Piers go into the soil.

Torqued in beside the roots to minimize impact

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Smaller footers are more nimble

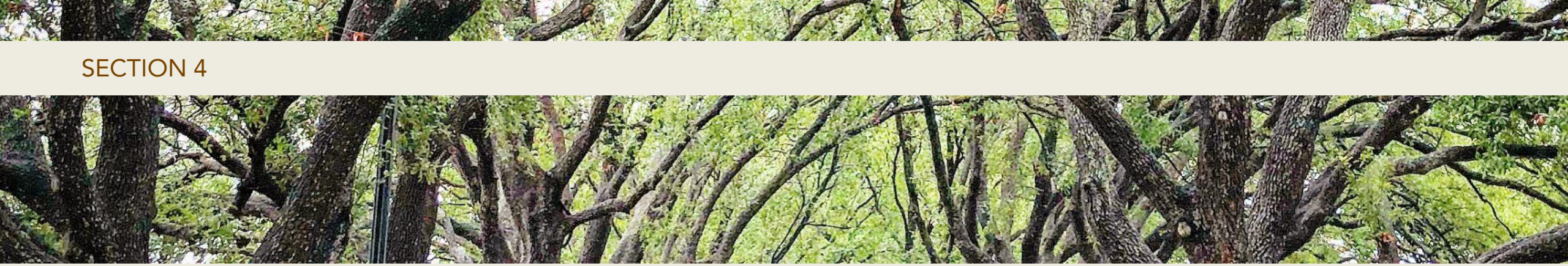
In highly complex situations, easier to shift smaller footers to respond to subsurface conditions



Longer spans mean bigger footings

Span concentrates load into fewer points. Fewer, larger points strategically place conserve more soil, may be better for larger trees



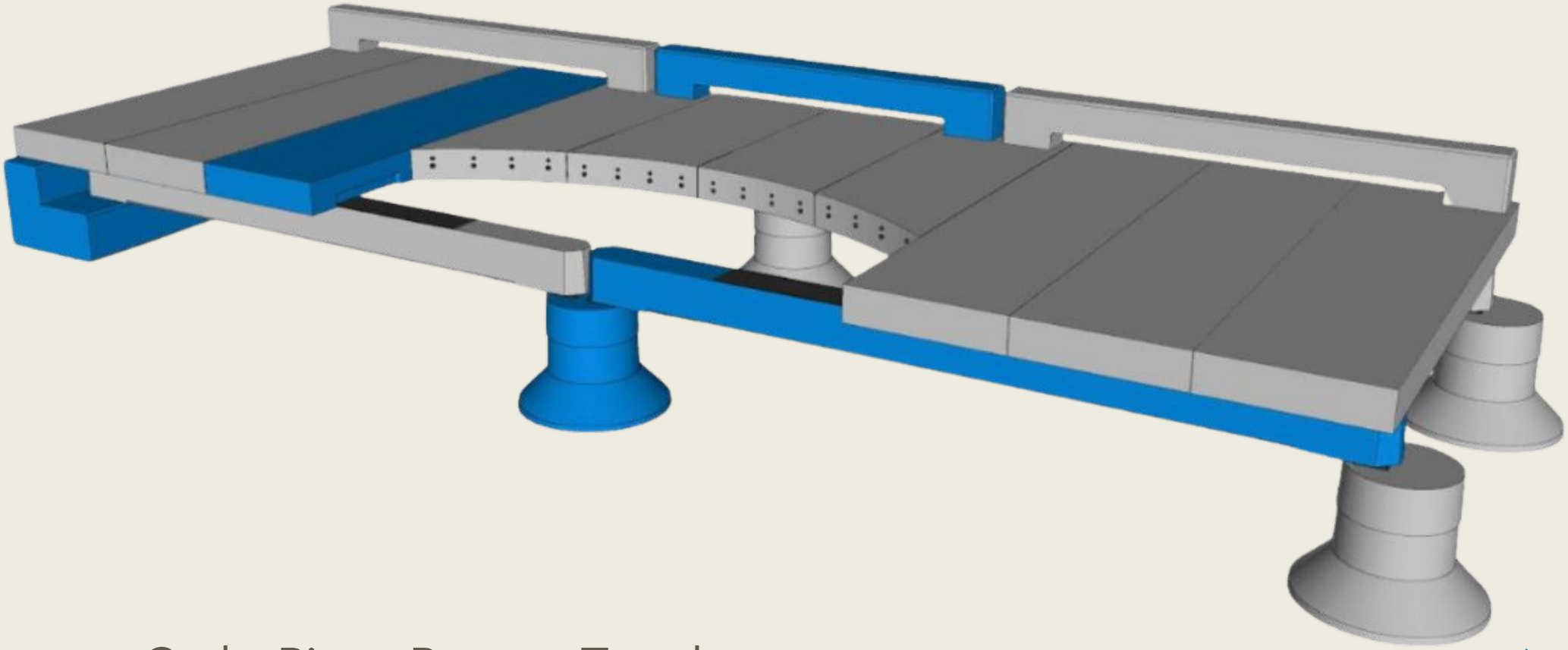


What is PermaTrak?

PermaTrak is a modular, durable, maintenance-free commercial boardwalk system.



PermaTrak System Schematic



Abutment, Curb, Piers, Beams, Treads

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SECTION 4

What is PermaTrak?



Treads

Precast concrete walking surface: PermaPlank or PermaGrip texture, integral color. Never stained, never fades, ADA compliant

Beams + Piers

Precast beams carry all loads. Piers driven, precast or cast in place, minimal soil disturbance.

Curbs (No Rails)

Precast curbs replace handrails in qualifying designs. Lowers cost, improves experience.

750+ Installs

Across the US & Canada.

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Three projects

Case studies for elevated walkways and paths that protect tree roots.



Wake Forest University

📍 Winston-Salem, NC



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North Dining Hall/Q Lot Project

Challenge #1: Minimize Tree Impacts

- Tree roots need air infiltration/air circulation as much as water
- Structural Critical Root Zone
- Arborist versus Structural Engineer



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North Dining Hall/Q Lot Project

Challenge #2: ADA Compliance

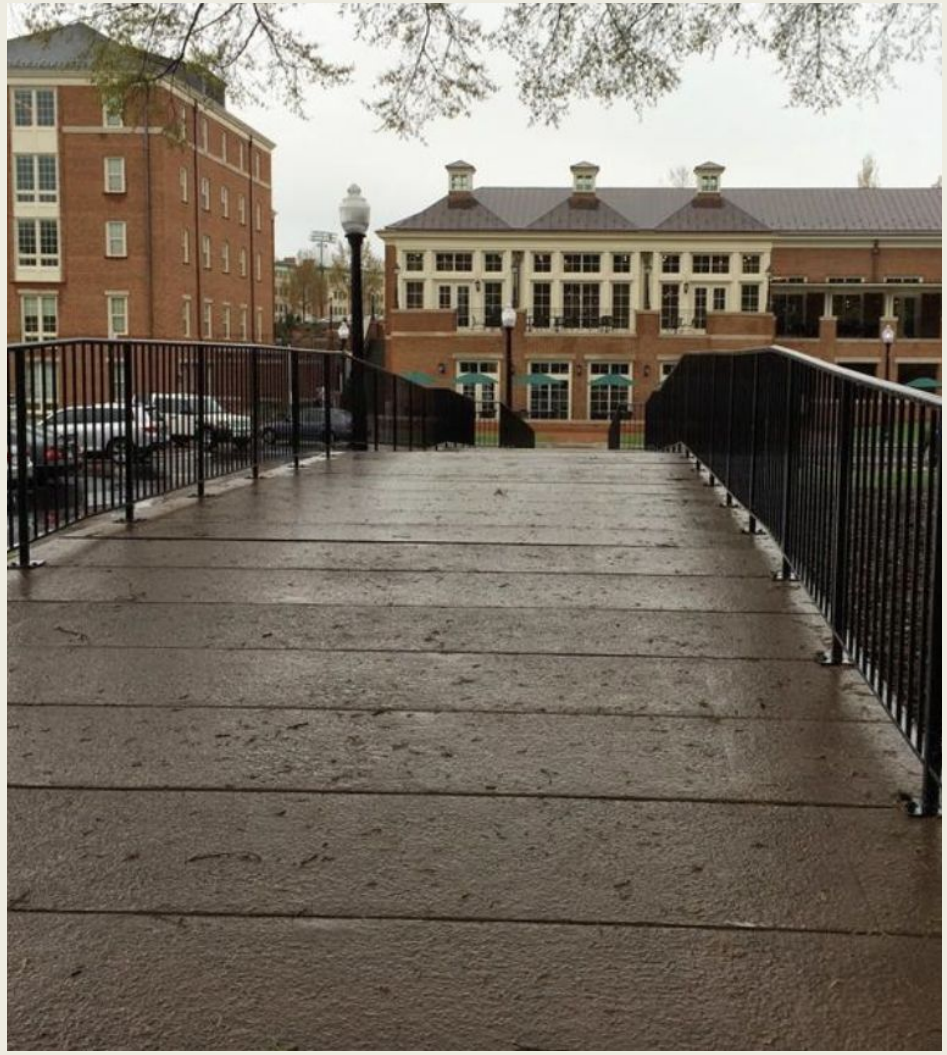
- Maintain ADA compliance while going up and over the tree roots at different heights & elevations
- Parking at Q lot was not to be affected



North Dining Hall/Q Lot Project

Challenge #3: 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



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PermaTrak's Solution:



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Dayton Avenue

📍 Shoreline, Washington

WSDOT Dayton Avenue tree root crossing. Built on precast piers.

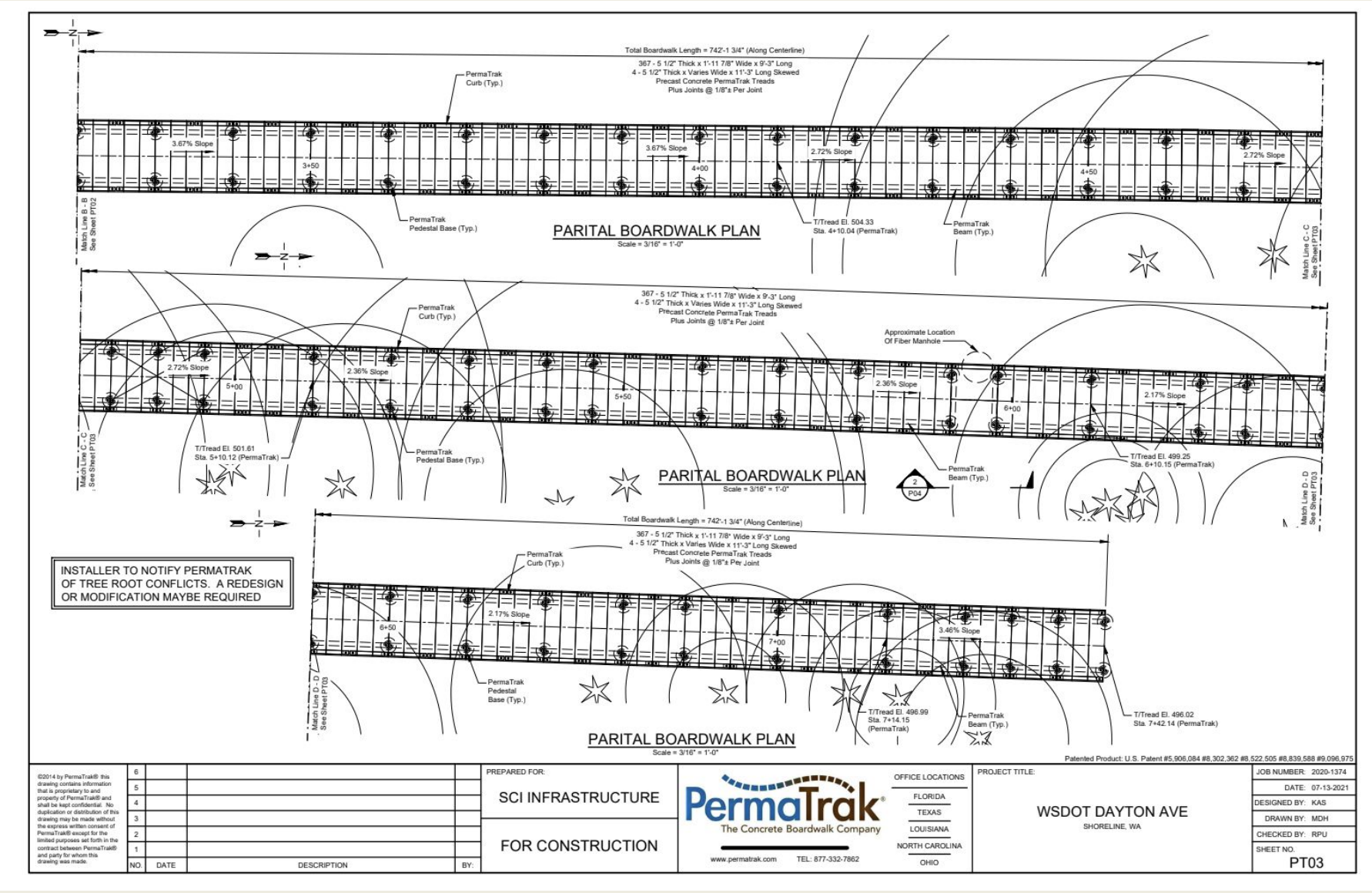


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Existing site conditions:



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PermaTrak's solution:



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Zilker Park

📍 Austin, Texas

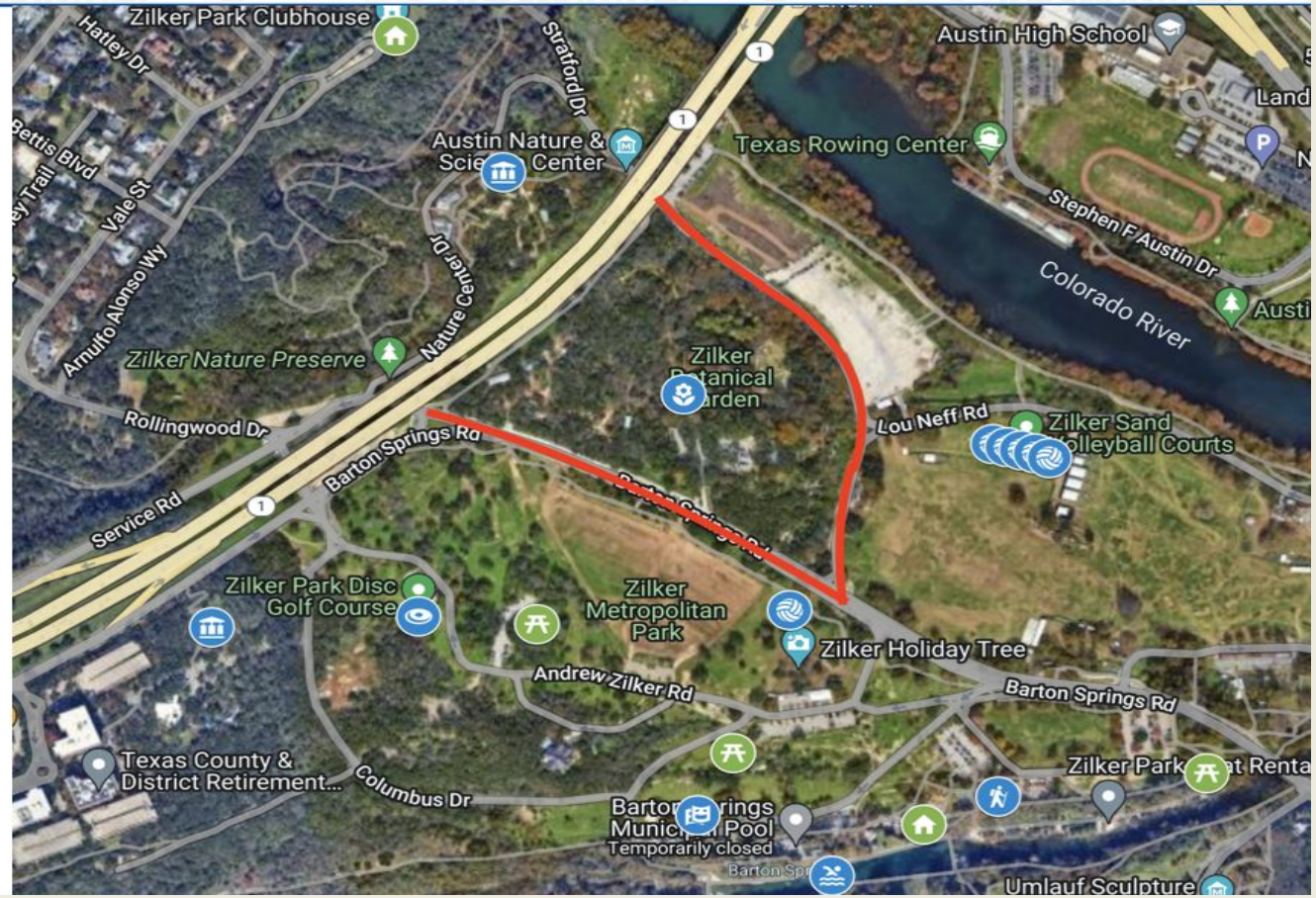
Helical pier foundations through mature canopy.

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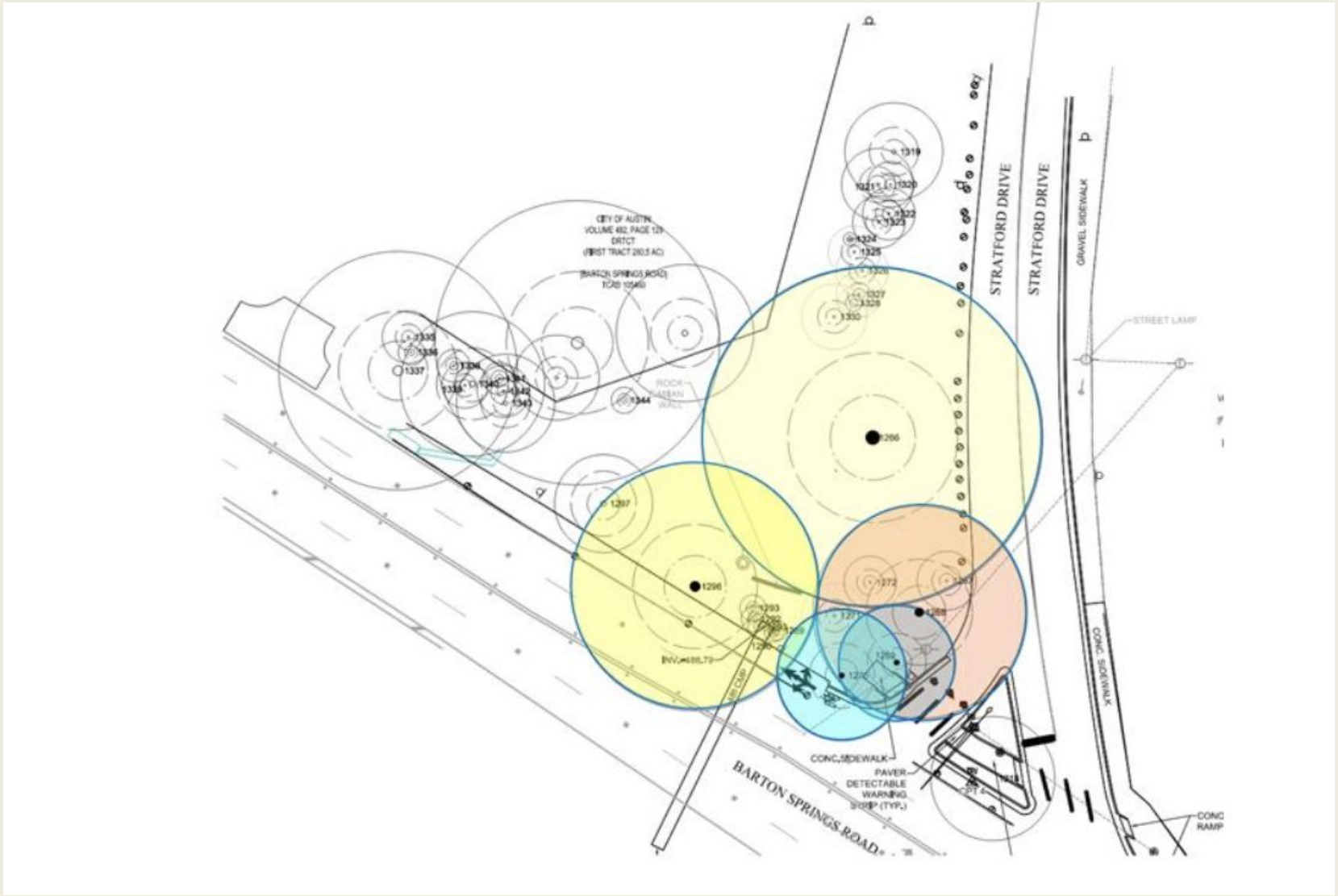
TRANSPORTATION PUBLIC WORKS

Project Goals

- Improve accessibility and safety
- Address pedestrian and bicycle access around botanical gardens



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Balancing Accessibility and Tree Preservation

- Unique challenge with Heritage trees
- Why standard construction techniques were inadequate
- Code Compliance



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Tree Protection During Construction

Typical approaches

- Required by code:
  - Fencing
  - Trunk Planning
  - Mulching/LD panels where CRZ is outside fencing
- Exploratory air spading

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Long-term Impacts of Construction on Trees

- Delayed visual evidence of damage
- Common types of construction-related tree damage
- Post-construction monitoring/support plan for trees

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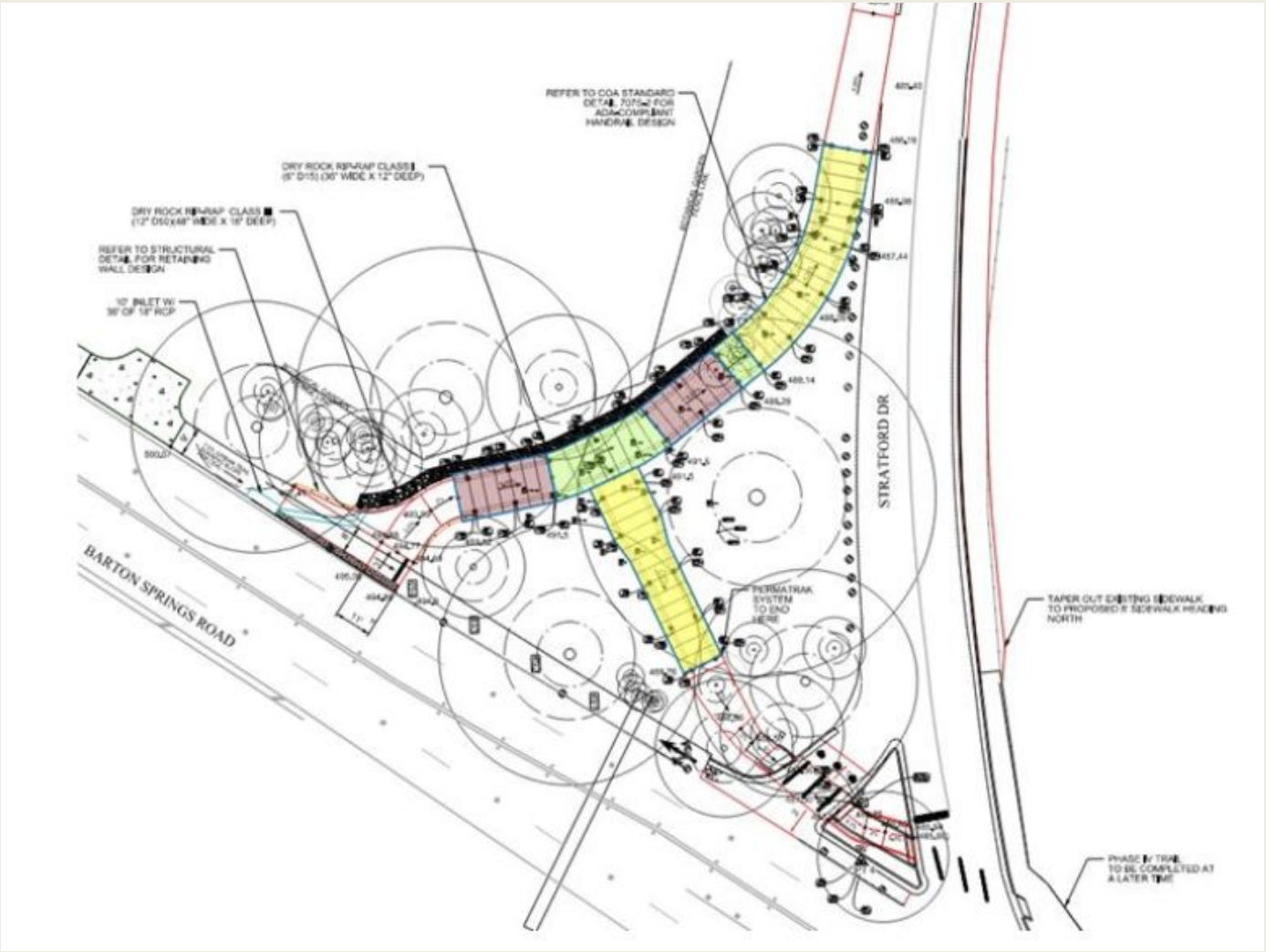


Exploratory air spade excavation



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May 2024



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Q&A

Submit your questions in the chat



RESOURCES

Where to go next

permatrak.com/tree-root-crossing-series

The full project series, foundation options and installation video.

Send us your plans

Our engineers return a preliminary layout, span sizing and a foundation recommendation. No cost, no obligation.

LACES & ISA Credit

We will be following up with Google Forms to fill out to obtain certificates for LACES & ISA credit.



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