



**Texas Chapter
International Society
of Arboriculture**

Summer Webinar Series: The Tree-Informed Design Series Presents:

Preserving Trees Through Design and Construction

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Tree Mann Solutions

Tuesday July 21, 2026
12:00-1:00



Your Presenter

Education & Credentials

BSAG in Horticultural Business from Texas State University
International Society of Arboriculture Board Certified Master Arborist
American Society of Consulting Arborists Registered Consulting Arborist
ISA Certified Urban Forest Professional
Tree Risk Assessment Qualified
Texas Oak Wilt Qualified
Tree and Plant Appraisal Qualified
TDA Commercial Applicator
Texas Licensed Irrigator

Areas of Practice

Planning, Permitting, Preservation, & Property Management Solutions
Tree inventories
Condition/Risk Assessments
Design/Permitting/Asset Management Consulting
Oak Wilt Assessment/Mapping/Management Plans
Tree Care Plans
Construction Monitoring
Tree Appraisals
Litigation/Expert Witness



Learning Objectives



Understand why successful tree preservation begins during planning and design—not construction.



Recognize how construction activities impact tree health, particularly root systems.



Identify the key planning, design, and construction strategies that improve tree preservation success.



Describe the consulting arborist's role throughout the project life cycle.



Apply practical tree protection best practices that increase long-term tree survival and project success.

Why Save Trees?



Trees are valuable green infrastructure.



People value shade, green space, and memorable places.



Existing trees can increase property value and marketability.



Many municipalities require it!

Benefits of Preserving Existing Trees

- **Environmental**
 - Improved Air Quality
 - Reduced Runoff/Improved Infiltration
 - Heat Reduction
- **Economic**
 - Increased Property Values
 - Reduced Energy Costs
 - Reduced Landscape Installation Costs
- **Social**
 - Community Character/Neighborhood Appeal
 - Human Health
 - Reduced Violence



Role of the Arborist

Planning

- Inventory
- Assessments
- Design Review

Construction

- Monitoring
- Inspections
- Conflict Resolution

Protection

- TPZ
- Care Plans
- Mitigation

Communication

- Owner
- Contractor
- Municipality



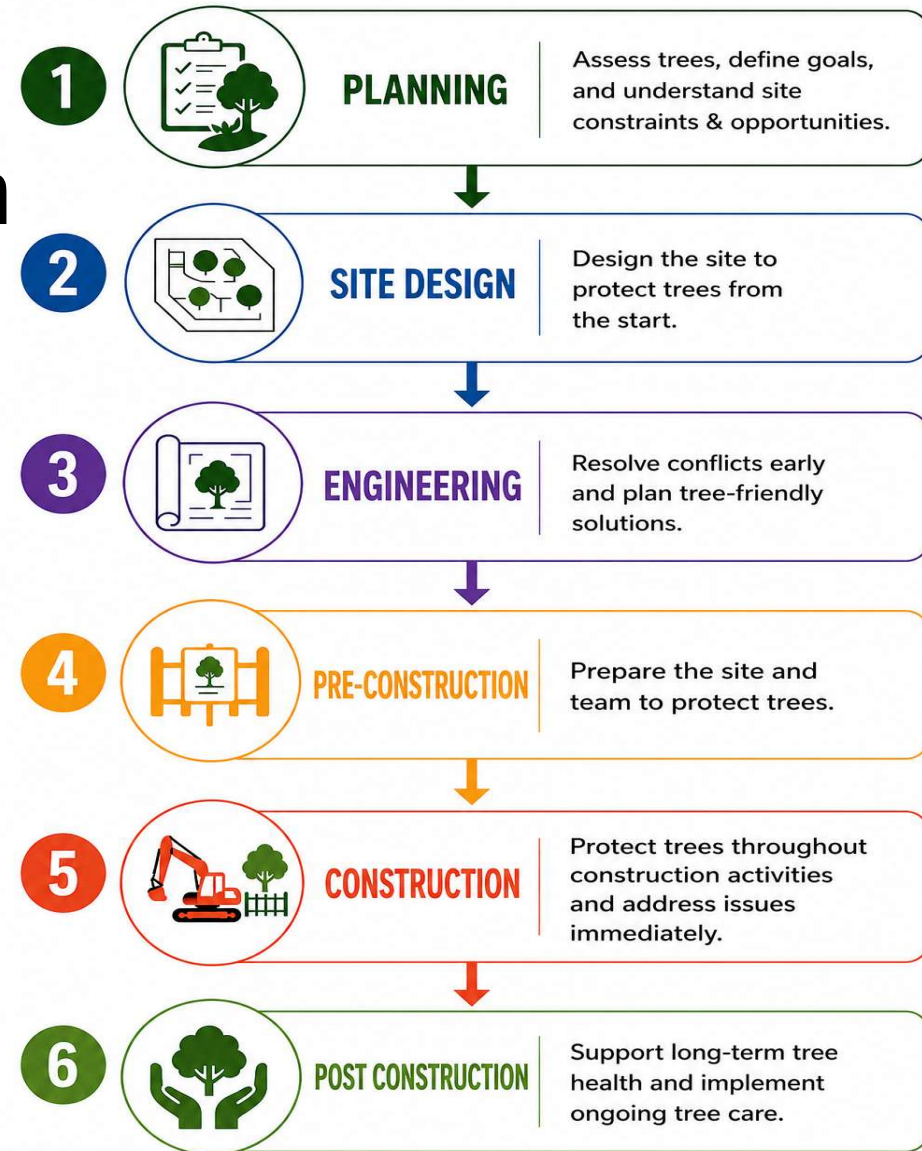
**CONSULTING
ARBORIST**



Project Timeline for Successful Preservation



Fail to Plan? Plan to Fail.



Understanding Tree Biology

- **Above Ground (Canopy)**
 - Branches/Leaves/Trunk
 - Photosynthesis
 - Transportation of water/minerals
 - Translocation of sugars/carbohydrates
 - **Below Ground (Roots)**
 - Root System
 - Anchorage
 - Carbohydrate Storage
 - Water/Nutrient Uptake
- These two systems work together.



Construction Impacts on Trees

- **Roots**

- COMPACTION
- Root cutting
- Grade/Hydrology Changes
 - Cut/Fill
- Trenching/Utility Installation
- Material Storage
- Equipment Traffic

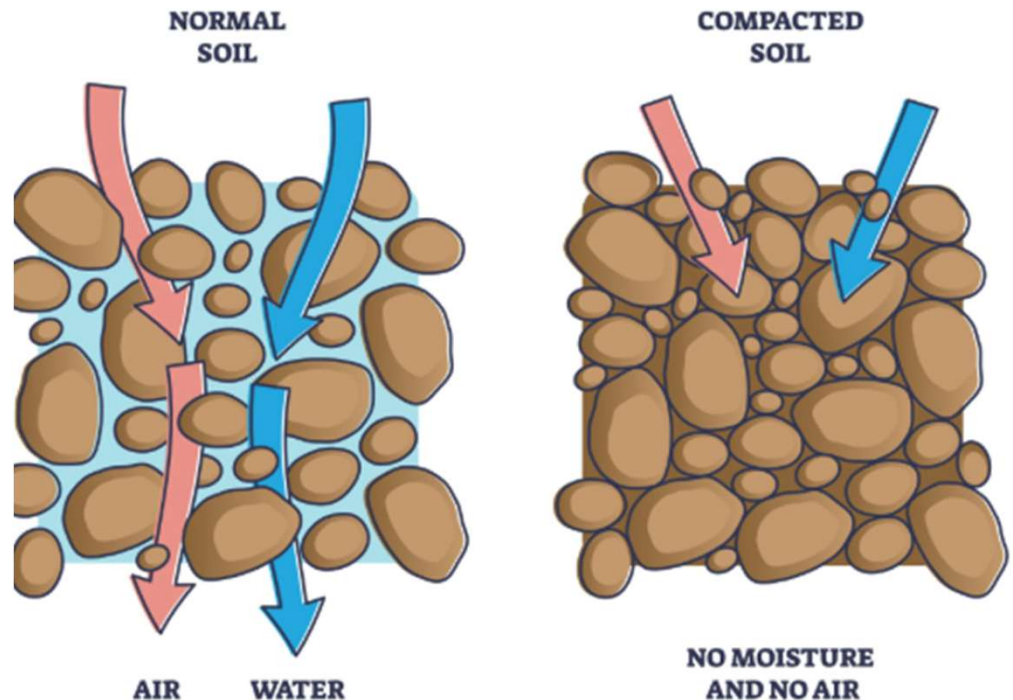
- **Canopy**

- Haphazard/unaccounted for pruning
- Mechanical damage



Soil Compaction: The Silent Killer

- Loss of pore space
- Reduced oxygen
- Reduced infiltration
- Restricted root growth
- Limited nutrient uptake
- Long-term decline



Root Systems in the Real World

- Improvement conflicts
- Utilities
- Building footprints
- Grading/Site work
- Hardscape
- Construction access



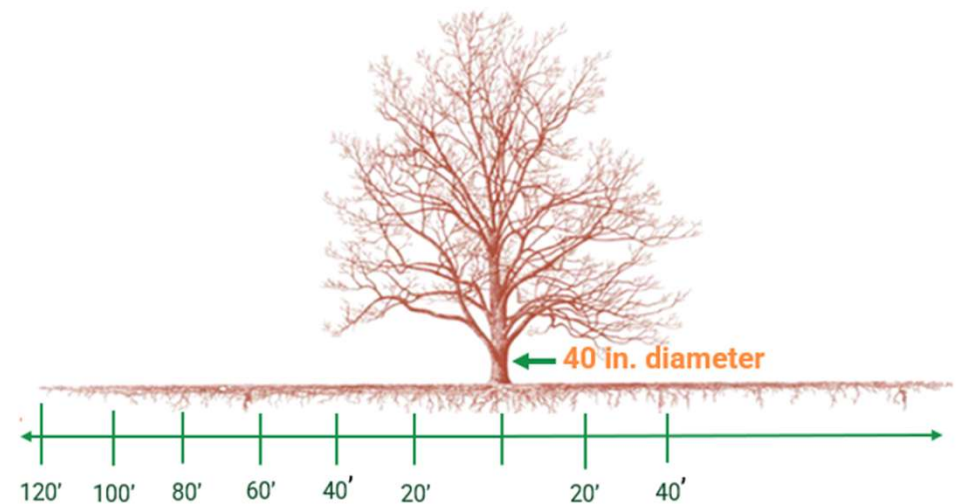
What is the Critical Root Zone (CRZ)?

The portion of the root system that is the minimum necessary to maintain vitality or stability of the tree.

Encroachment or damage to the critical root zone will put the tree at risk of failure, decline or death.

CRZ is derived from DBH (diameter at breast height – typically 54")

1 foot of radius for every 1 inch of DBH



Roots do not stop at the dripline or CRZ!

What is the CRZ Used For?

- Review / Modify Design Elements
- Modify Construction Procedures
- Prescribe Tree Protection/Mitigation Measures



CRZ Rules of Thumb:

- **¼ CRZ** (25% of radius) – NO IMPACTS - structural
- **½ CRZ** (25-50% of) radius – Minimal Impacts – no cut or fill >4" (no impacts in some municipalities)
- **Full CRZ** (100% of radius) – 50% of area or greater preserved at natural grade/groundcover
- **EXAMPLE 20" tree:**
 - **¼ CRZ:** trunk to 5'
 - **½ CRZ:** 5-10'
 - **Full CRZ:**
 - $(3.14 \times 20 \times 20) = 1256$ total sqft.
 - * 50% = 628 sqft. or more preserved.
 - The more the better!

The Critical Root Zone - Development Impact Zones

Example: 20 inch diameter tree

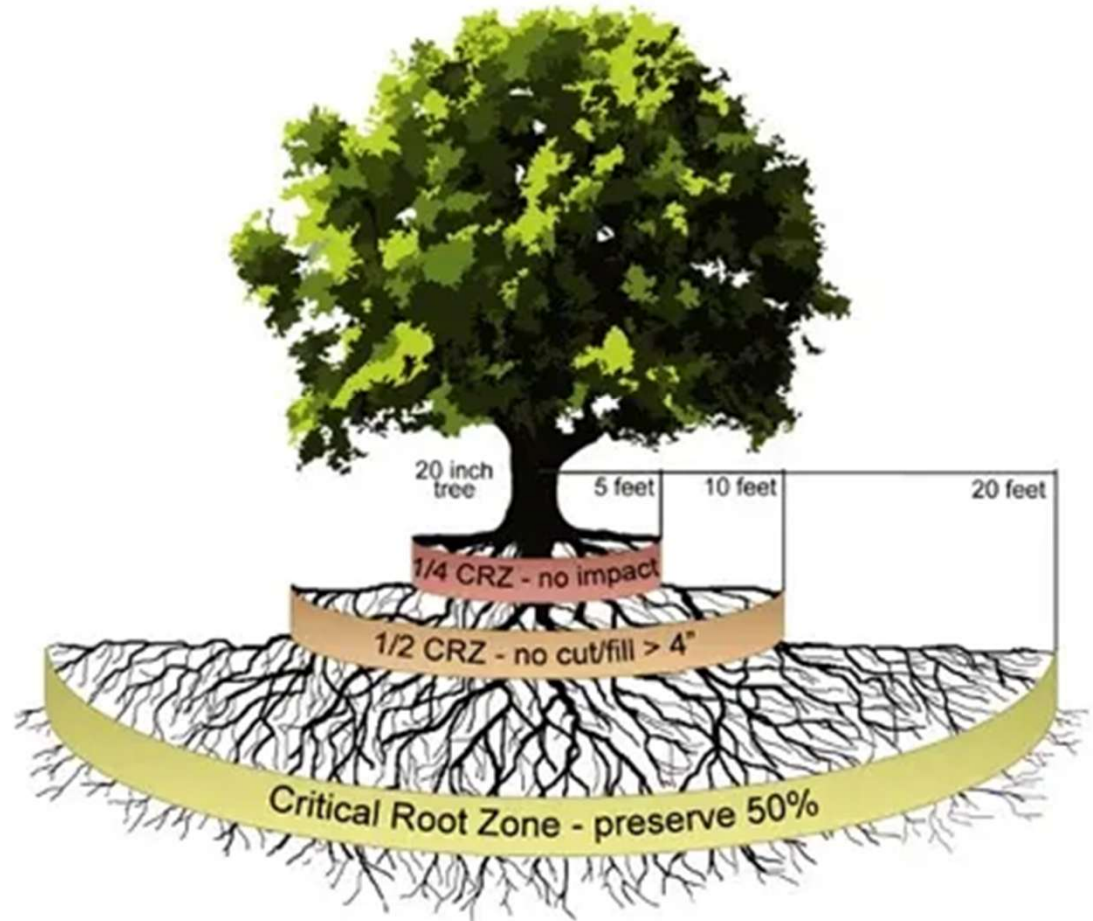


Image source: City of Austin Development Services

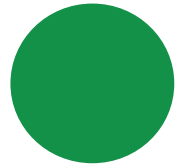
Tree Inventory & Assessment

- GOOD DATA IS KEY!
 - Species
 - Size (DBH)
 - Condition rating (health/structure/form)
 - Structural defects
 - Risk Assessment
 - Current/Future Targets
 - Tree Appraisal (preconstruction value)
 - Crown Spread
 - Construction tolerance (species profile)
 - Expected longevity
 - Determine preservation priorities/feasibility



Identifying Trees Worth Saving

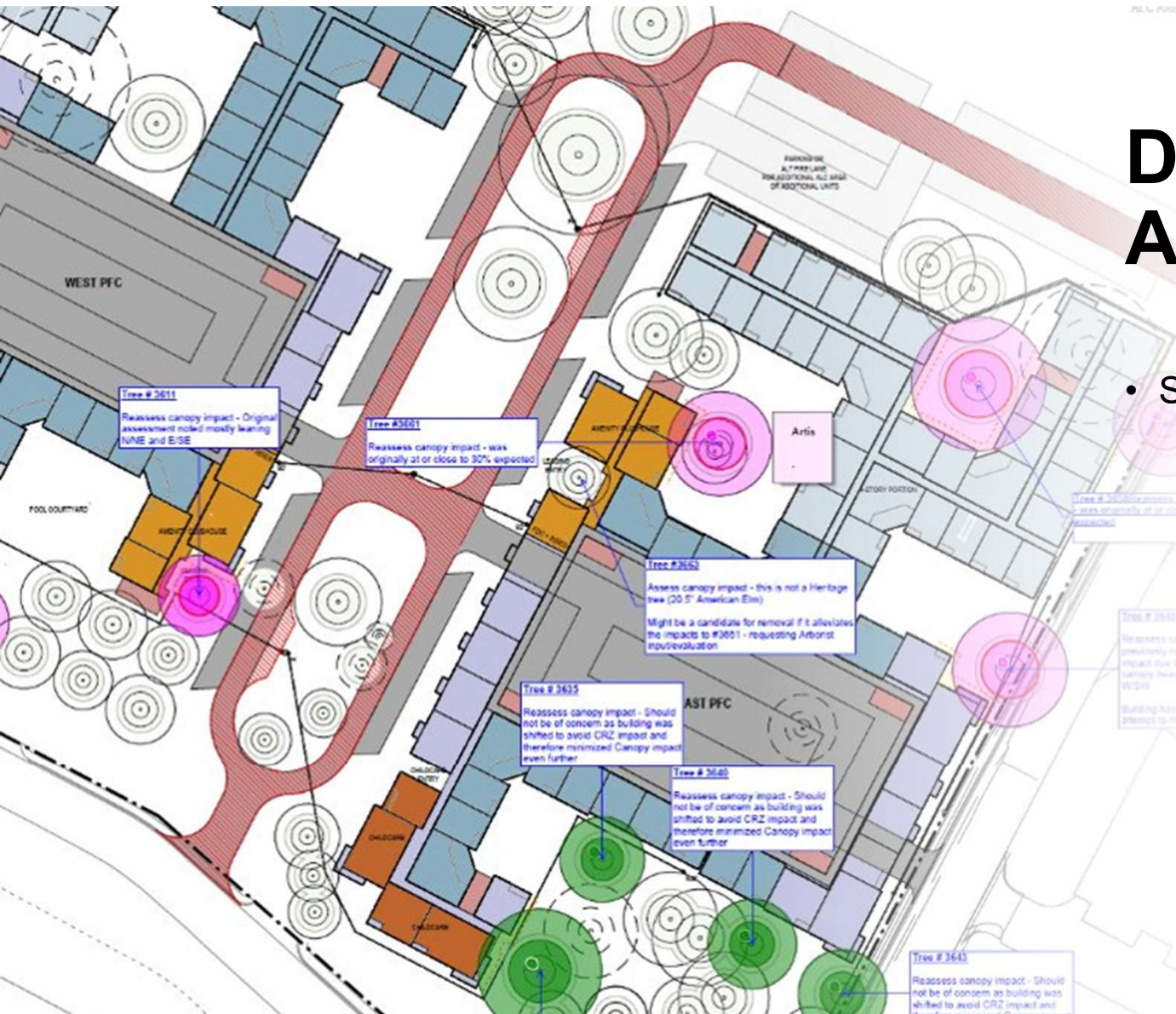
- Is it healthy?
- Is it structurally sound?
- Is it adapted to the site?
- Does it provide significant value?
- Can it feasibly be saved or are there other site design conflicts?
- Can it realistically survive construction?



Designing Around Trees

- Strategies

- Shift buildings
- Modify road alignment
- Reduce grading
- Preserve natural grade/drainage
- Cluster development
- PROACTIVE APPROACH/ARBORIST ENGAGEMENT



Utilities Without Destroying Roots

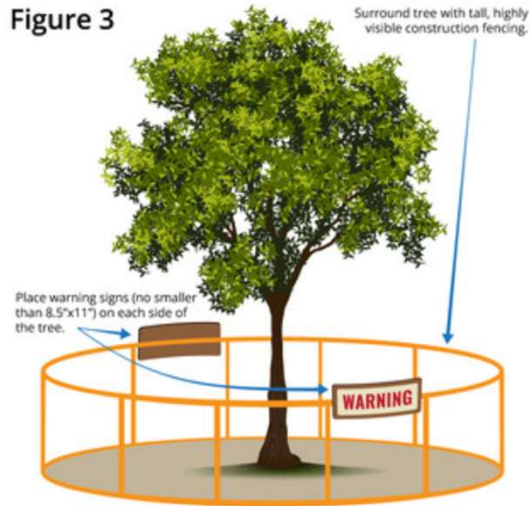
- Alternative Options
 - Boring
 - Air excavation
 - Hydrovac
 - Utility corridors
 - Shared trenches
 - Flexible alignments



Root Protection Fundamentals

- Rigid, Chain link fencing (orange poly does not work)
- Clear Signage (English/Spanish)
- Mulch Layer
 - With plywood decking over mulch for frequent access paths/machinery access.
- Penalties for violations
- Inspection schedule

Figure 3



Under Turf

Under Mulch



Pre-Construction Meeting

- **Who attends?**

- Owner
- Contractor
- Arborist
- Landscape Architect
- Civil engineer
- Superintendent
- City arborist/environmental inspector

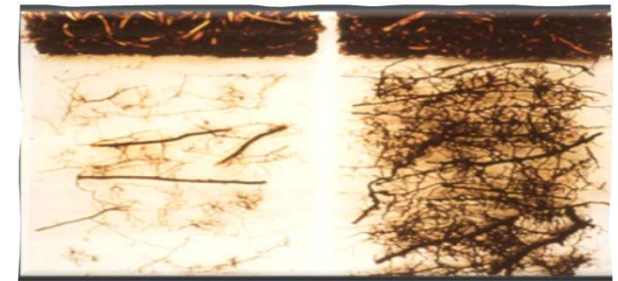
- **Review**

- Tree protection requirements
- Expectations
- Managing unexpected conflicts
- Communication protocol
- Documentation procedures
- Arborist contact



Pre-Construction Services

- Initial Arborist Inspection and Report to establish baseline
- Tree Protection
- Mulch
- Pruning
- Fertilization?
- Growth regulator?



Under Turf

Under Mulch

Construction Phase Services

- Ongoing Arborist Monitoring and Reporting
- Watering
- Air Excavation
- Root Pruning
- Clearance Pruning
- Mulch replacement?



How Much Can I Prune?

- Should be determined by objectives, condition of tree, pruning cycle, and species profile (ability to tolerate pruning).
 - No more than necessary to achieve goals.
- Often expressed as percentage of whole
 - Ex. 25% per annual growing season.
- Can be set by municipal code.
 - Typically, 25-30%
- Good starting point but too broad to apply to all trees.
- SHOULD BE PROACTIVE



During Construction

Managing Unexpected Conflicts in the Field

- **Ongoing Arborist Monitoring:**
 - Fence integrity
 - Root exposure
 - Excavation methods
 - Utility conflicts
 - Canopy conflicts
 - Contractor compliance
 - Alternative methods for flexible design
 - Subtle changes in tree condition
 - Documentation of efforts

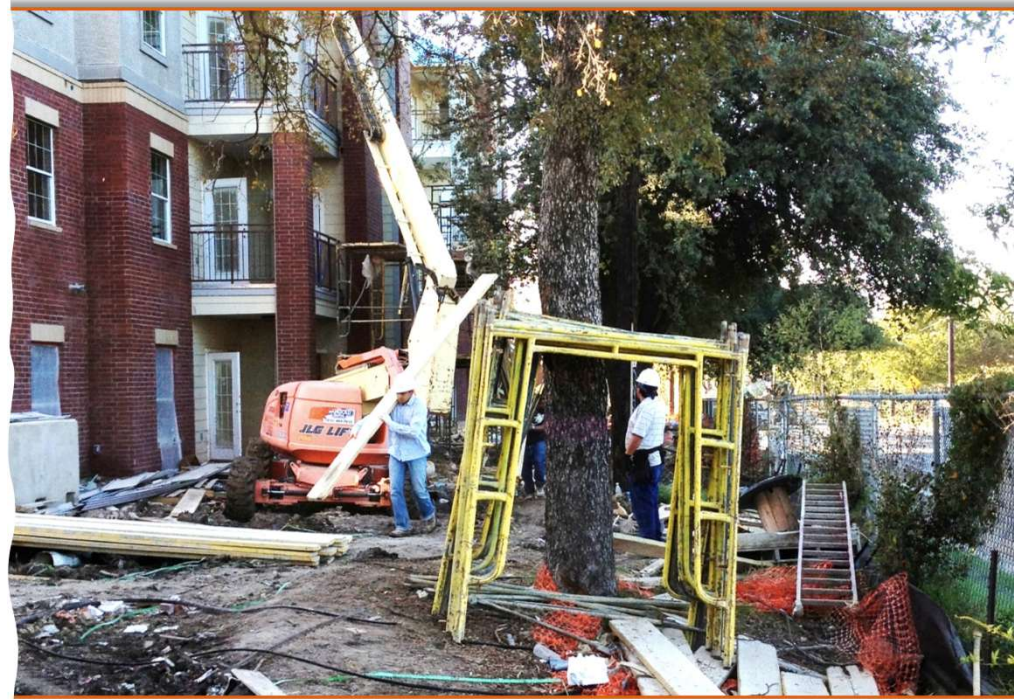


What's Wrong with These Pictures?



Common Mistakes

- Protecting only the trunk
- Fencing moved/damaged during construction
- Storage inside TPZ (equipment/materials/personal vehicles in shade)
- Grade changes
- Unaccounted for canopy impacts
- Last-minute arborist involvement (reactive vs. proactive)



Good News: Stressed Trees Can Recover!



Post-Construction Services

- Final Close Out Inspection/Report
- Trees often need:
 - Irrigation
 - Mulching
 - Structural/detail pruning
 - Soil remediation
 - Decompaction/Amendments
 - Post Construction Monitoring
 - Introduction to property management
- Tree preservation doesn't end at project completion!



Lessons Learned

- What successful projects have in common:
 - Early arborist involvement
 - Good data to drive planning and design decisions
 - Collaboration among involved parties
 - Clear communication
 - Commitment from the entire project team
 - Contractor education and accountability
 - Ongoing monitoring and adaptive management
 - Flexibility to address field conditions while protecting trees



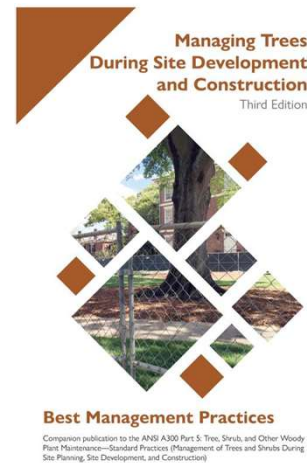
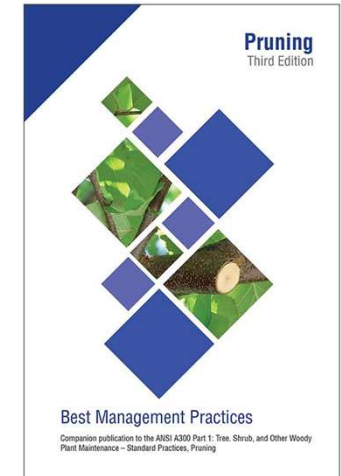
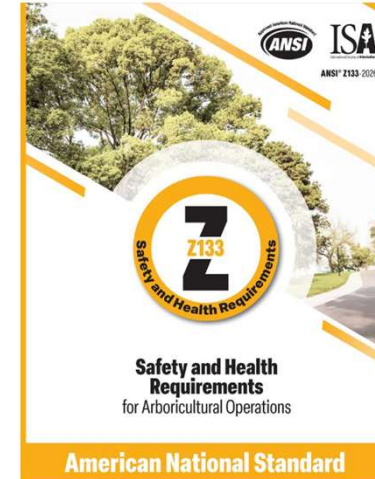
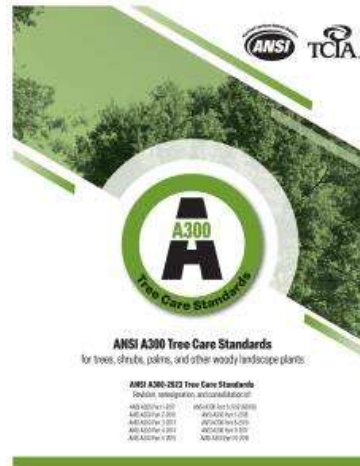


Key Takeaways

- Start Early
- Know Your Trees
- Design Around Trees
- Protect During Construction
- Monitor & Adapt
- Think Long-Term

Additional Resources

- ANSI A300 Standards
- ISA Best Management Practices (BMPs)
- Z133 Arboricultural Operations Safety
- Local tree protection ordinances
- Municipal guidance documents
- Your favorite, knowledgeable third-party arborist!





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**Thank You for
Attending!**

Questions?

