PMPD

Construction site protection and restoration standards

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Why is landscape protection important?

- "Cornell's landscapes are its most distinguishing physical feature.

  They are essential not only to the image of the Ithaca campus, but also to the university's academic mission and quality of life."

  2008 Cornell Master Plan

Tree Campus USA: 2009 - 2023

What have we accomplished in 15 years?

Cornell by the numbers:

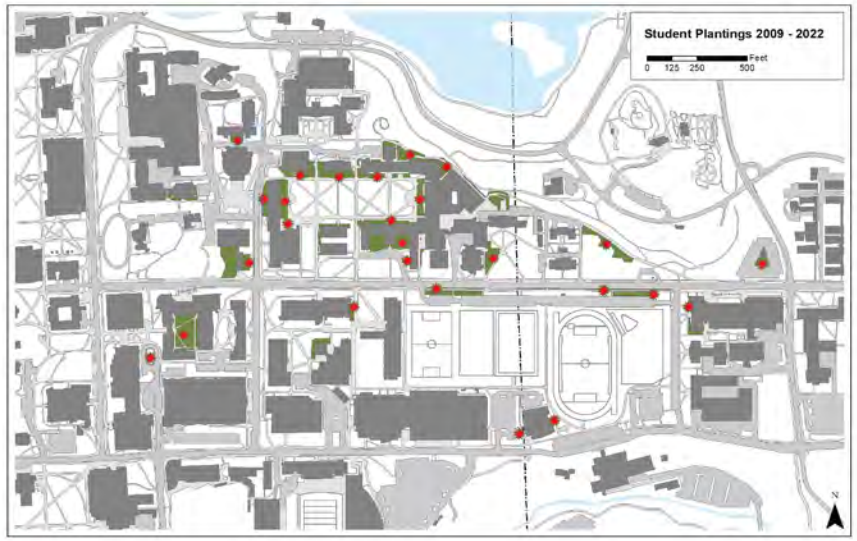
9,100+ Trees measured and located in GIS

4,500 Trees planted

9,800 Trees pruned

15 Arbor Day Celebrations

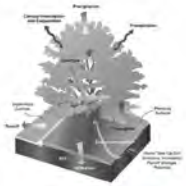
25 Student-designed & installed plantings

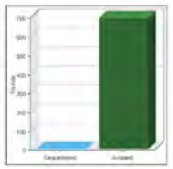


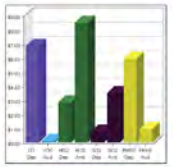
What benefits does this Hickory provide?

- intercepts 6,300 gallons of runoff per year
- absorbs pollutants through its leaves
- intercepts dust and smoke
- releases oxygen
- reduces atmospheric carbon by 695 pounds

And that's just one mature tree...







Three easy ways to kill a tree in five years or less:

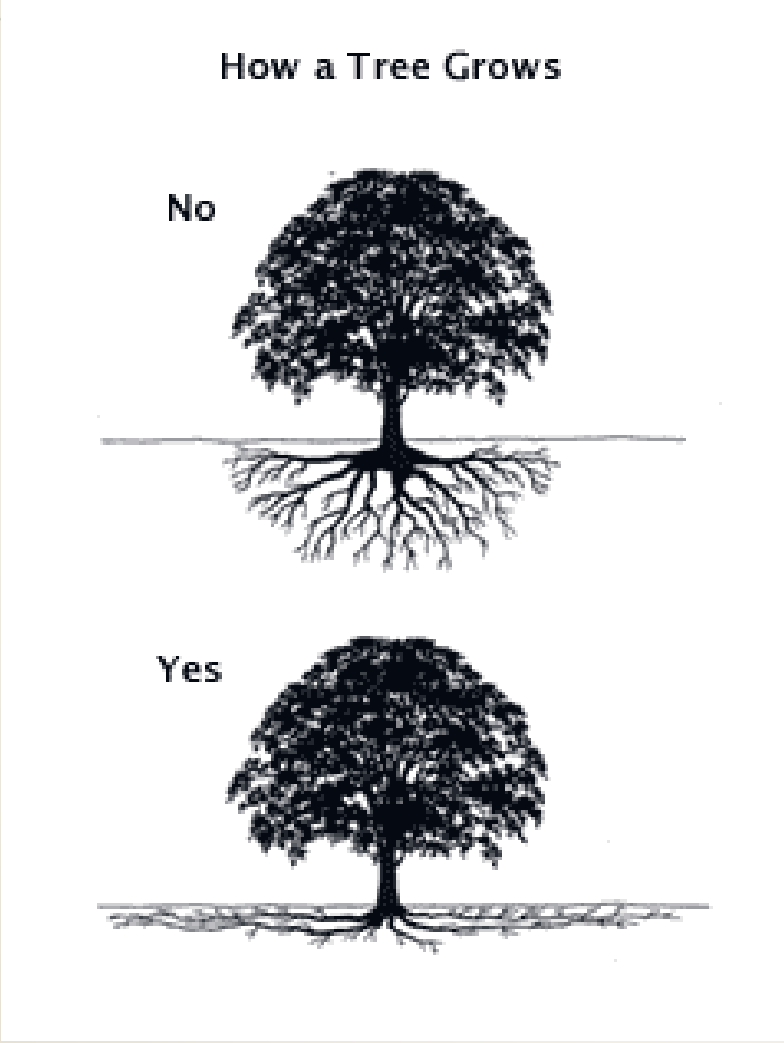
- Soil Compaction in the Critical Root Zone
- Cutting the Roots
- Backfilling over the Roots

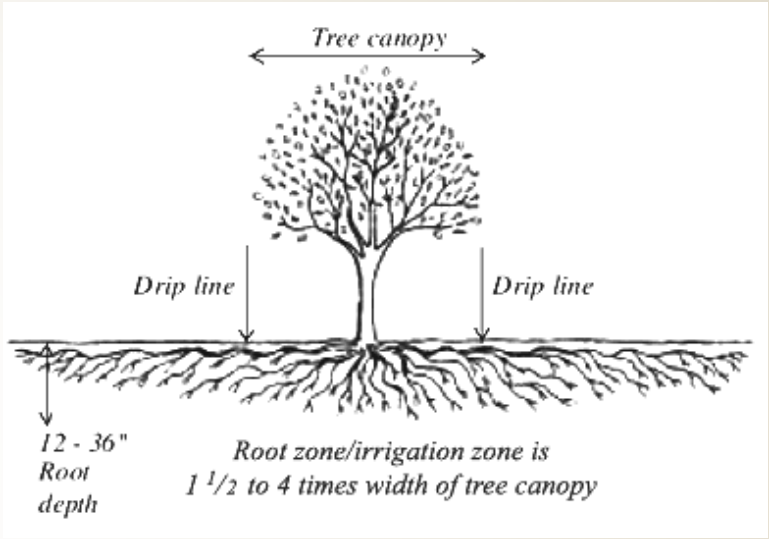
Results of poor protection

Tree/Landscape Preservation Concepts

- Requires planning for all construction components & phases.
- Tree protection is soil and root protection.
- Properly identify tree protection zone and maintain tree protection fencing.
- Respect the critical root zone and no cut zone.
- Plan for site restoration, including soil.

What should we be protecting?





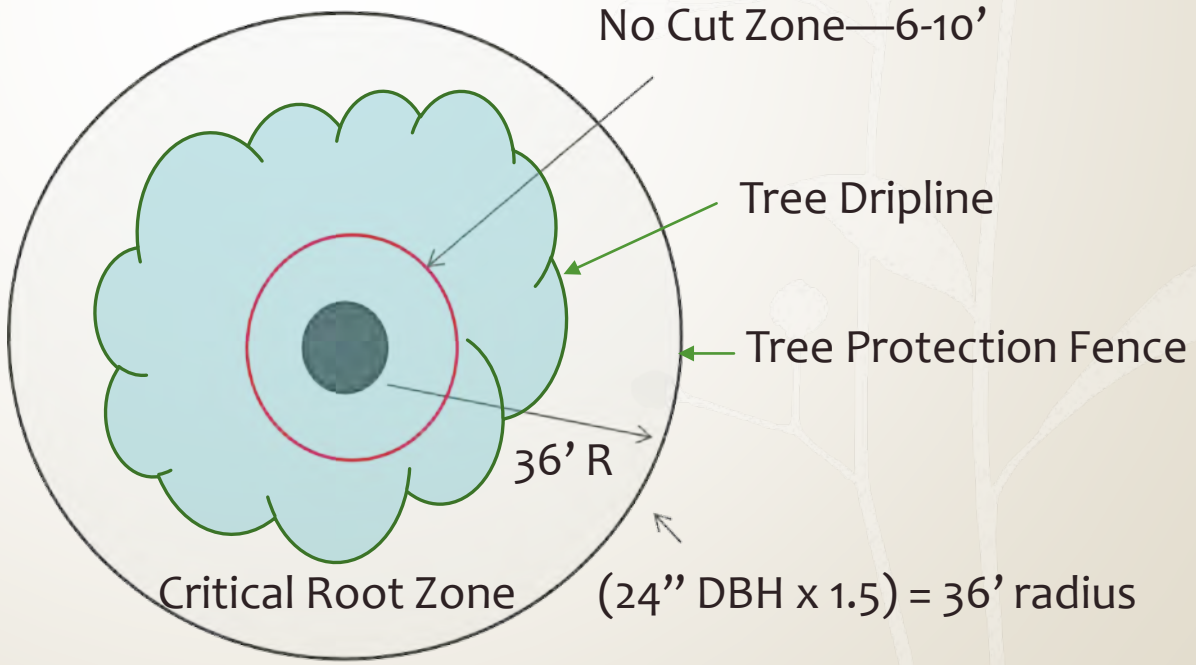
Where are the majority of the roots?

No Cut Zone

- Typically within 6’ – 10’ of a mature (24” dbh) tree
- Cutting within this radius can destabilize the tree

Critical Root Zone

- Radius = 1.5’ x DBH of tree or 5’ beyond the dripline
- No vehicles, equipment, stockpiling or grading



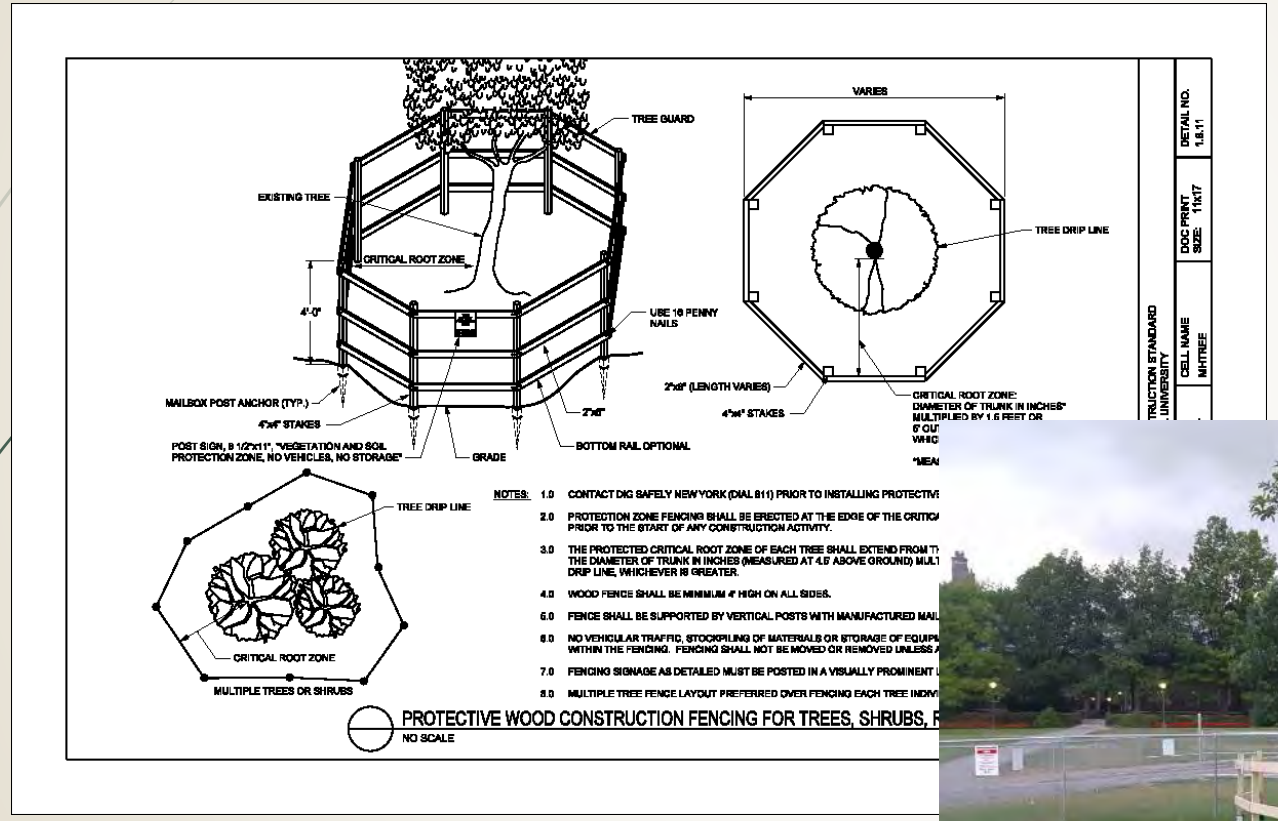
Critical Root Zone (CRZ)

- 50% of the root system is in the top one foot of soil and over 90% is in the top three feet.
- Construction equipment with large tires or tracks tends to go deep within the soil, 12-20 inches, whereas compaction associated with pedestrian traffic is often restricted to the surface 3 to 6 inches. Both types of compaction are harmful to tree roots.
- A single pass by a cement or dump truck can sever or crush roots.
- Wet soils will compact to a greater degree than dry soils.
- Smothered roots have their oxygen supply cut off. The most common method of smothering roots is changing the grade. This also cuts off water supply too. For some tree species, like red oak, only a few inches of fill is enough to do serious damage. Roots can be smothered by 'temporary' piles of soil placed inside the tree's dripline or by pools of water impounded by construction activities.
- Soil compaction should be considered permanent. Recovery for significant compaction is at least two human generations. Soils do not 'come back' from compaction.

From: *Construction damage causes and remedies* – Minnesota Dept. of Natural Resources.

Soil Compaction Impacts on Tree Roots – Dr. Kim Coder, University of Georgia

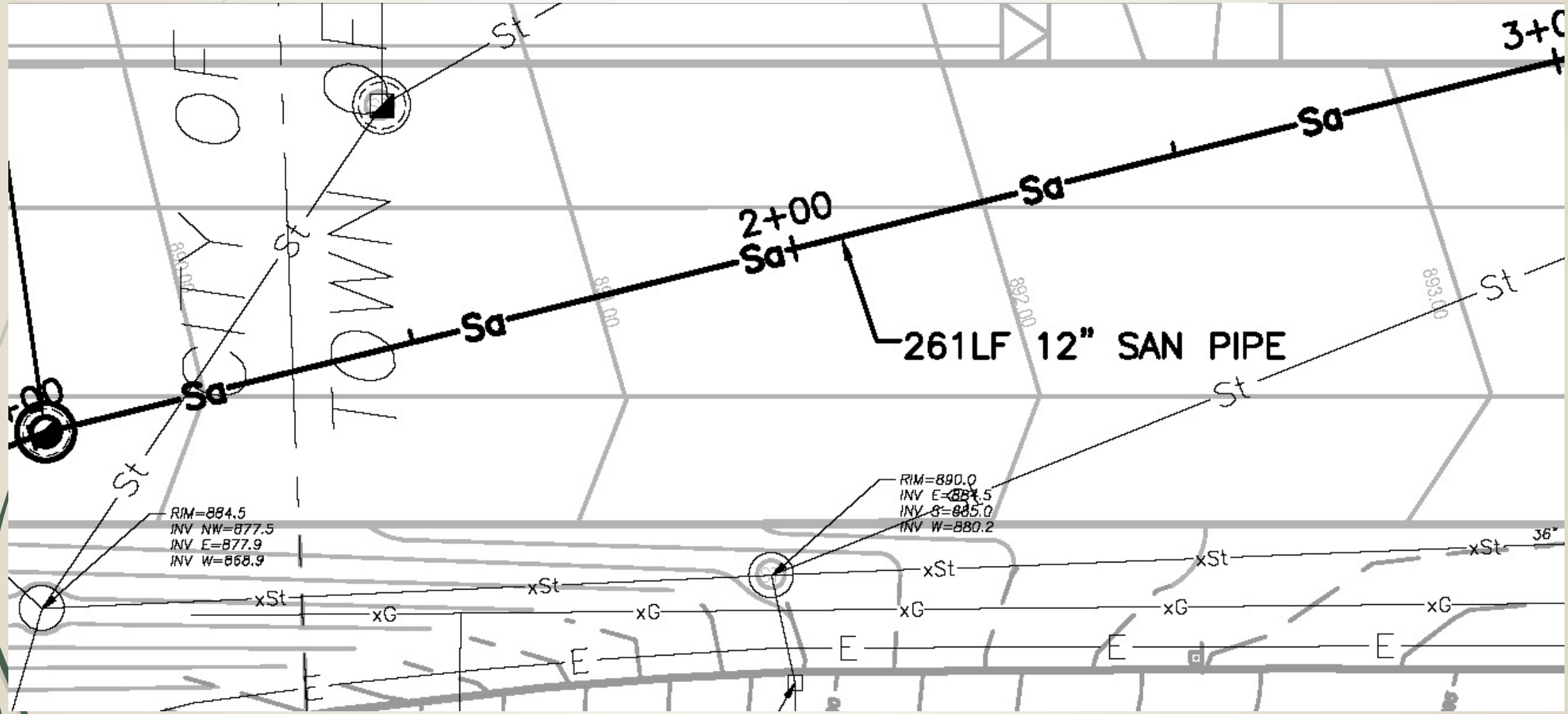
Protection detail



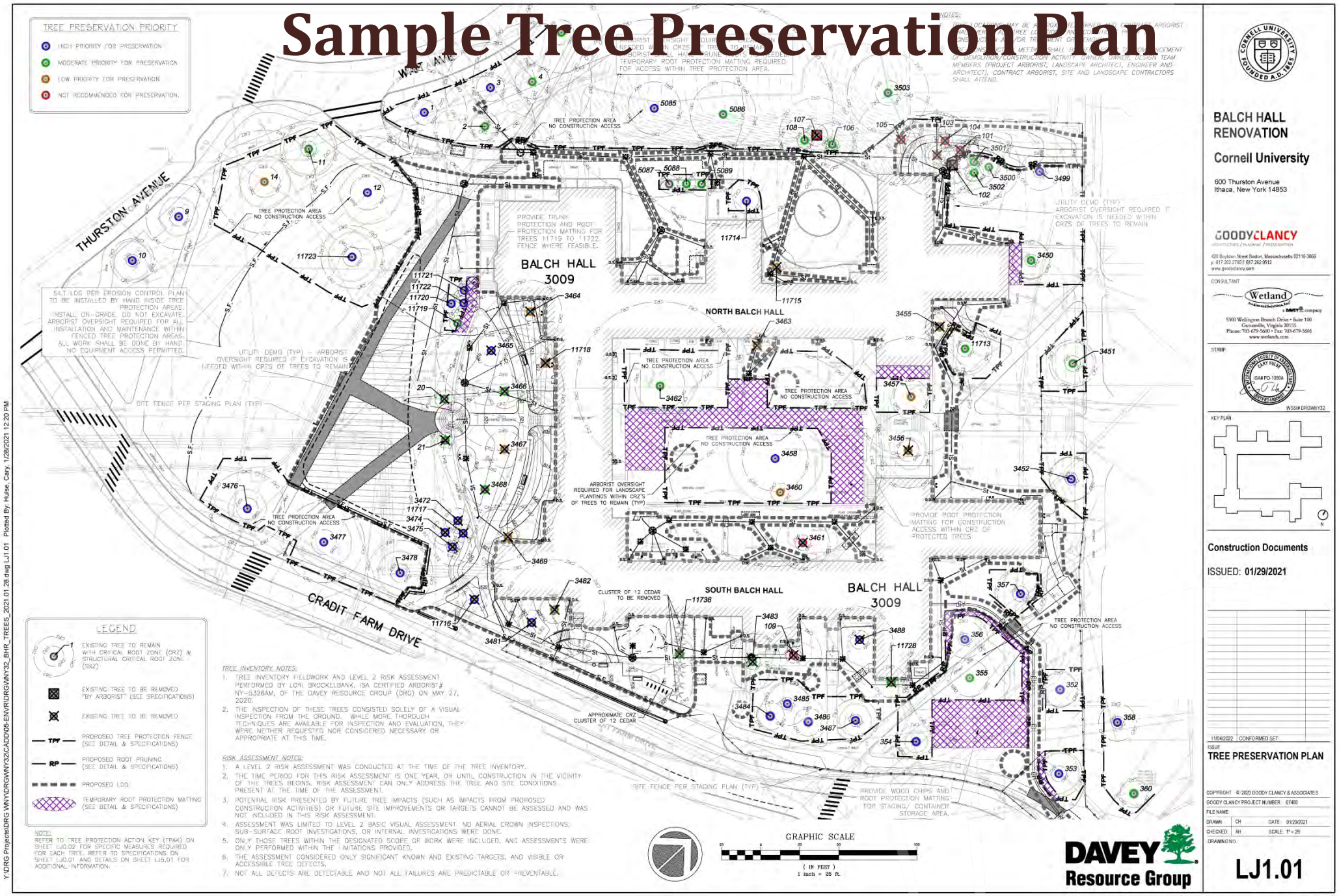
What Goes on a Tree Preservation Plan

- Trees labeled and CRZs noted
- Trees to be removed labeled
- Tree protection fence
- Access routes
- Mulched areas for access inside the CRZs of trees
- Areas for boring or air spading within CRZs
- Storage areas, parking areas
- Tree protection notes
- Details

Anticipate construction methods



Sample Tree Preservation Plan



Protecting Tree Roots From ConstructionDamage

Poor or no root protection

Protecting Tree Roots From ConstructionDamage

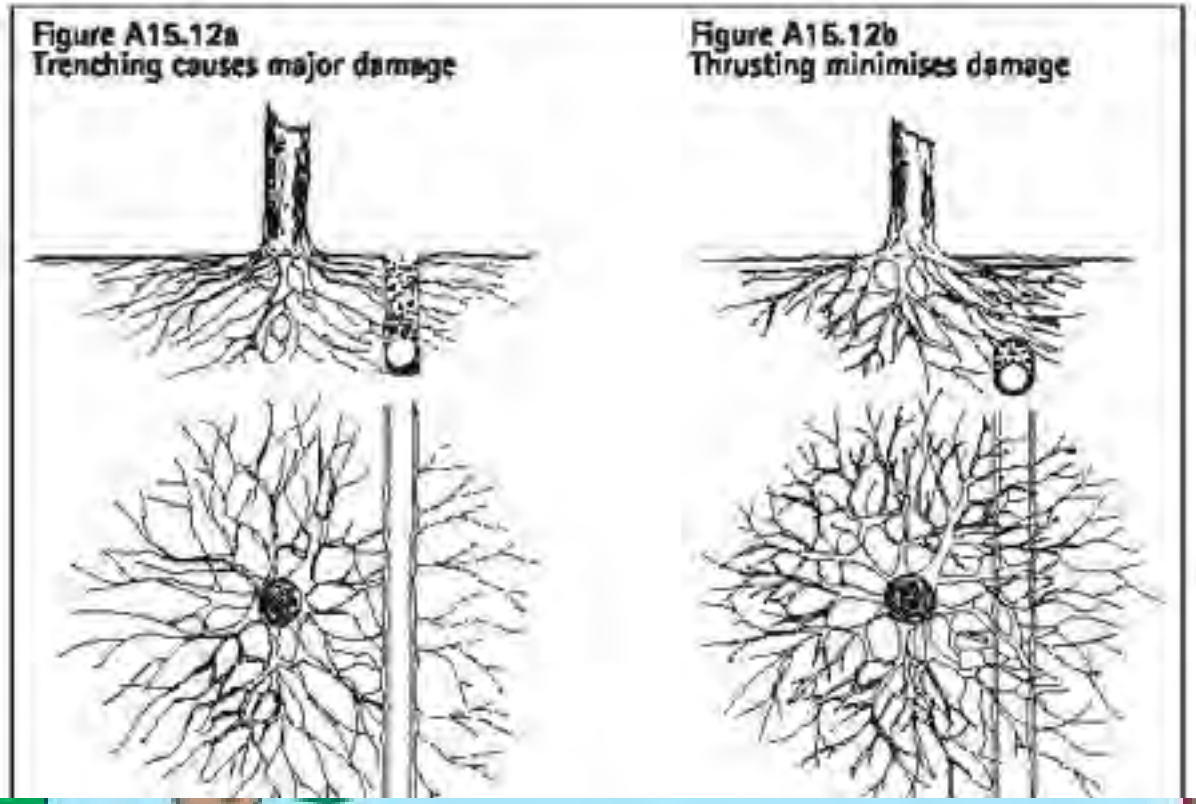
Poor or no root protection

Good root protection

Mitigating Work Inside a CRZ

- Work has to be done inside at least some of the trees' CRZs

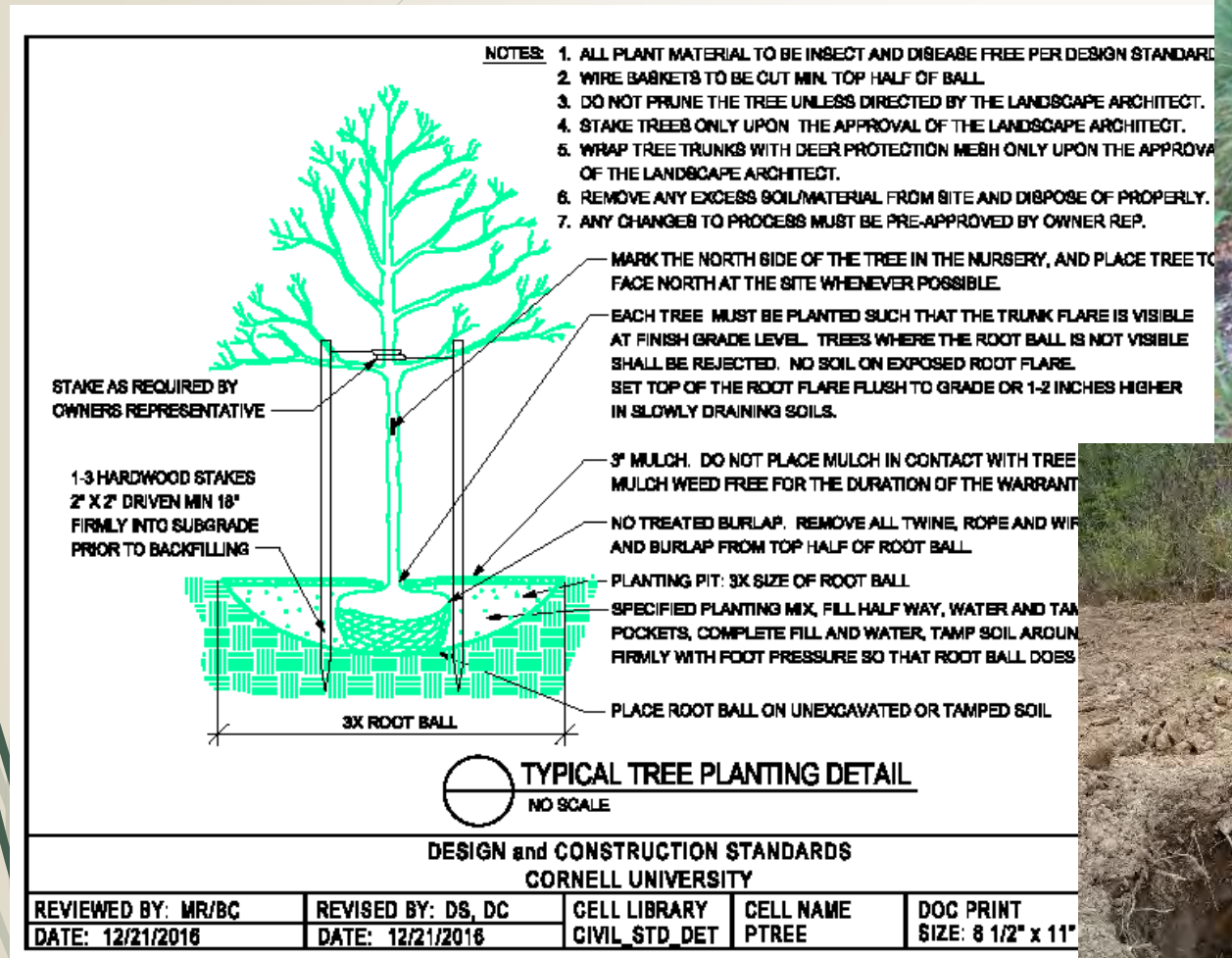
Boring
(HDD Horizontal Directional Drilling)



Use of Air Spade

Soils, importance of getting them right!

Proper planting



Take aways

- Restoration plan in place prior to project start, staging areas identified
- Site protection in place prior to mobilization and maintained throughout project – protect critical root zone from compaction
- Methods for construction within critical root zone identified
- Soils specified located, tested, approved, secured and procured
- Proper planting techniques followed – landscape contractors with proper experience