

# Guideline for Tree Protection and Preservation for Planners and Project Managers

## INTRODUCTION

1 Review of the project site trees should be coordinated with the Yale Tree Management Plan. Each tree on campus has been surveyed for maintenance practices and environmental benefit. Recommendations for maintenance include tree inspections, pruning, cabling, and removals. The environmental benefits include air quality, stormwater retention, carbon sequestration, and storage. These factors should be considered before taking any action for all trees on campus. Specific data for each tree is available through the ArcGIS application developed as part of the [Yale Tree Management Plan's critical root zone map](#).

1.1 Project team deliverables include the following items.

A. Predesign

- i. Area of interest (AOI) with critical root zone (CRZ): Determine the project area showing the critical root zone of trees within that area.
- ii. Tree protection and preservation method: Determine this by using the tree protection flowchart.

B. Schematic Design

- i. Site plan: Show the locations of all trees identified that require protection.
- ii. Project arborist: If determined, the project owner will engage the services of a project arborist.
- iii. Tree protection action key (TPAK): Provide a list of trees within in the area of interest with conditions and recommendations.

C. Design Development through Construction Documents

- i. Tree protection action key: Coordinate with the site conditions.
- ii. Tree protection zones (TPZ): Determine the extent of these zones with reference to the critical root zone.

D. Preconstruction

- i. Schedule a tree protection kickoff meeting with the owner, project arborist, design and construction teams, and contract arborist.
- ii. Tree protection barriers: Install and coordinate prior to site activity.

E. Construction

- i. Project arborist: Prepares a site visit and reports on tree protection and preservation as implemented by the

contract arborist.

## F. Post-construction

- i. Final inspection: The project arborist performs a site visit and prepares a report where any outstanding items are executed by the contract arborist.
- ii. Monitoring trees for the period of time required for the species planted, completed by the contract arborist.

## GENERAL DESIGN REQUIREMENTS

### I. Project Formulation and Predesign

- 1.1 Utilize the critical root zone map from the campus-wide tree inventory to generate an area of interest report to determine what trees may be impacted by the project. The area of interest should include all locations where construction will occur and all potential access routes for transporting materials and equipment to the site.
- 1.2 Refer to the tree protection flowchart below for project requirements per identification of the critical root zones within area of interest, or project development area.
- 1.3 Only follow tree protection methods determined by the flowchart throughout the project. A full description of each tree protection method is found in the Tree Protection and Preservation Specification and should be followed. The specification is templated for the design team and is included within the project manual standard Division 01 specifications that cover the university's general requirements. It should not be considered a standalone document for tree protection. The intention is for it to be used by the owner, design team, and contractors to incorporate tree protection guidelines from a design concept to a successfully completed project.

Find the [design standard](#) online: [01 56 40 Requirements for Tree Protection and Preservation Specification](#).

### II. Schematic Design

- 1.1 Once an area of interest is identified, the site boundaries should be marked on plans and in the field to delineate which trees, and stands of trees, will be protected. If it is determined that a project arborist is needed, the owner is needs to engage the services of a project arborist. The project arborist is an arboricultural consulting firm contracted to provide planning and design services, technical assistance, and advice to the owner and design team. The project arborist's duties include but are not limited to the following: [1] site investigation and



soils can be preserved during and after construction activities for the preservation of all trees onsite.

### III. Design Documents and Construction Documents

- 1.1 Communicate with the project team to accurately site structures and utilities and determine the trees that will remain onsite. Conserve and protect trees in stand or in groups, where possible. Make sure the trees and stands of trees selected to be saved go into plans and construction documents.
- 1.2 Include in all plans the tree protection zone – an area indicated on the drawings that surrounds individual trees, or groups of trees, to be protected during construction – for all saved trees to avoid conflict with the protected area and placement of structures and utilities during construction.

#### Considerations

- Consider protecting trees beyond the critical root zone to further protect the roots and soil that are essential to health and structural stability.
- If there are grade changes occurring onsite, work with the landscape architect and/or engineer to incorporate the use of tree islands and wells to prevent disturbance to tree roots.

### IV. Preconstruction

- 1.1 During the tree protection kickoff meeting with the owner, project arborist, design and construction teams, and contract arborist will discuss the tree locations for protection and preservation with reference to the tree protection action key.
- 1.2 Prior to preconstruction activities, including tree removal, access roads, construction staging areas, and building layout, erect tree protection barriers to visually indicate the tree protection zones. Be sure to complete the following.
  - A. Coordinate with the Tree Protection and Preservation Specification.
  - B. Use tree protection barriers that are highly visible, sturdy, and restrict entry into the tree protection zone.
  - C. Install or erect signs along the tree protection barrier stating that no one can disturb or enter this area.
  - D. Remove any branches or trees that pose an immediate risk to structures or people prior to any construction activities.
- 1.3 Communicate the intent of the tree protection barriers to the construction team to ensure that tree protection zones are not disturbed during construction activities. Have the construction team sign a contract of compliance.

1.4 Prohibit these activities in the tree protection zone.

- A. Stockpiling of any type, including construction material, debris, soil, and mulch.
- B. Altering soils, including grade changes, surface treatment, and compaction due to vehicle, equipment, and foot traffic.
- C. Trenching for utility installation or repair and irrigation system installation.
- D. Attaching anything to trunks or use of equipment that causes injury to the tree.

## V. Construction

1.1 Schedule the project arborist site visits to ensure that the contract is being met by the construction team and that tree health is not being compromised by construction activity. Inspect and monitor trees for any decline or damages.

- A. The project arborist should coordinate visits with the construction and design teams to determine if there are any specific issues to address. Construction and design teams do not need to be present during the visit(s).
- B. The project arborist is required to provide a summary report following each visit that documents any violations or areas of concern that are identified.

1.2 Keep in place all tree protection barriers until the project is complete.

### Considerations

- Apply at least six inches (6”) of mulch within the tree protection zone to prevent disturbance to tree roots and soil.
- Prior to any construction activity, consider taking photographs of the trees that will be saved and surrounding areas to identify any construction damage caused to the trees during construction.
- Add a penalty clause in the contract of compliance that prevents moving or altering the tree protection barrier and entering the tree protection zone.

## VI. Post-construction

1.1 The project arborist performs a final inspection and report. The contract arborist continues monitoring for a period after construction as is determined necessary for the tree species. Monitoring includes maintaining mulch, managing soil moisture, assessing tree damage, inspecting for insects and pests, and fertilization if needed.

Date	Description of Change	Pages / Sections Modified	ID
05/25/21	New document	N/A	KC, MW

This flowchart should be used with reference to the Yale Tree Management Plan and the Yale Tree Protection and Preservation Specification. Use the Yale Tree Management Plan's ArcGIS tool and critical root zone map to select the potential area of interest for the proposed project, including all access routes and storage areas.  
*Does the critical root zone of any tree cross the area of interest?*

**Yes**

**No**

Is an excavation expected within the critical root zone of any tree or does only a potential access route cross the zone?

Neither the project arborist nor tree protection measures are needed for the project.

**Excavation**

**Access route only**

Can the design be altered so that all excavation occurs outside of critical root zones?

Is this a long-term or short-term project? Long-term projects require a constant access route for construction vehicles. Short-term projects may require one or two deliveries of materials and/or last less than a week.

**Yes**

**No**

**Long-term**

**Short-term**

Shift all excavation outside of critical root zones and install temporary protection fencing to prevent accidental damage. Follow the Yale Tree Protection and Preservation Specification for fencing and install.

Retain the project arborist to create a tree protection plan per the Yale specification.

Can the access route be shifted to avoid all critical root zones?

**Yes**

**No**

Shift all routes out of the critical root zone and install temporary tree protection fencing to prevent accidental damage.

Install root protection prior to using an access route over the critical root zone of any tree. Install temporary tree protection fencing to maintain one access route.

Shift the access route outside of the critical root zone, if possible. If not, install plywood, Alternamat, or similar material over the critical root zone.