

# **BARD COLLEGE**

## **Landscape & Tree Care Guidelines, Standards & Considerations Manual**

**(Revised: March 2015)**



**Bard College  
Horticulture Department  
Landscape & Arboretum Program at Bard  
Physical Plant  
Annandale-on-Hudson, New York**

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# I. INTRODUCTION

This manual of *Landscape & Tree Care Guidelines, Standards & Considerations* establishes the minimum standards for all related work done on Bard College campus. Bard staff and subcontractors must consult and conform to these guidelines while engaged in related work on the Bard College campus grounds.

## **Responsible Department**

The Grounds and Horticulture Departments at Bard College Tree & Landscape Advisory Committee are responsible for **enforcing the standards** in this manual. Any questions related to this manual may be directed to:

**Bard College  
Building and Grounds, Physical Plant  
PO Box 5000  
30 Campus Road  
Annandale-on-Hudson, NY 12504  
phone: 845-758-7465  
fax: 845-758-9654**

## **A. PURPOSE**

The purpose of this manual is to inform all Bard staff, subcontractors and community members of the minimum tree and landscape-related standards that are expected while they are engaged in work on the Bard College campus and arboretum. This manual provides clear guidelines for planting, maintaining and removing trees and landscape material. It also acts as an educational resource about the importance of the campus forest and the protection and maintenance of trees and plantings as part of the growth and land development process.

## **B. PRIMARY GOAL & OBJECTIVE**

The *primary goal* of this manual is to assist decision-makers, planners, staff, facility, subcontractors and grounds managers in the stewardship of campus landscape resources while accommodating future change. It also acts to ensure a safe, attractive, and sustainable campus forest.

Recommendations are based on standard industry best practices and compiled input from various Buildings and Grounds staff members and resources. The *Landscape & Tree Care Guidelines, Standards & Considerations Manual* should be viewed as a complement to contracted work details and documents, as well as personal communication.

Ideally, this manual will guide future planning efforts on campus and will be used as an informational tool by members of Bard staff as they consider how best to care for, maintain, and preserve the landscape and grounds resources that exist on campus. Many resources were consulted in the writing of this document. The overall idea and basic structure of this document came from Cornell University's *Comprehensive Master Plan and Landscape Guidelines* (2006). See the *References* section of this document for a complete listing of other resources.

The *primary objective* of this manual is to provide basic landscape industry standards and guidelines. Whether the work is landscape specific or simply related to or in contact with various landscape features this document should be utilized as a reference.

- 1. Standards and guidelines.** Provide standards and guidelines for building and site design considerations, landscape specifications, landscape maintenance, general tree care, fertilization, plant health care and integrated pest management, temporary installations, conservation landscaping, and roads and path specifications and historic tree preservation. Ensure proper species selection, high-quality nursery stock acquisition, and industry-consensus planting procedures
- 2. Perpetuate best practices.** This document should be updated as the industry evolves to better understand all the various aspects of landscaping and hardscaping work. Promote tree health and safety by utilizing ISA’s best management practices when maintaining campus trees.
- 3. Address sensitivity to the landscape.** The campus’ natural and landscaped resources should be considered during planning, development and implementation. Promote species diversity and proper age structure in the tree population. Ensure that trees are reasonably replaced when there is mortality due to weather, pest infestations, injury, or construction displacement
- 4. Evaluation.** This manual provide a standard that allows new projects or major renovations to be properly evaluated and assessed.

### C. TREE & LANDSCAPE ADVISORY COMMITTEE

The Tree and Landscape Advisory Committee was formed as a decision-making group to assist with the protection, maintenance, removal, and planting of trees and gardens on the Bard College campus; to advise and consult on issues pertaining to the campus landscape; to determine the College’s needs in connection with trees; and to pursue the establishment of a comprehensive Landscape Master Plan.

**NOTE: All underlined terms in the manual’s text body are defined in the in “Definitions of Terminology” in the Addendum.**

**DISCLAIMER:** The original *Landscape and Tree Care Guidelines, Standards, and Considerations* manual was printed in 2006, with a reprinting in subsequent years. Updates and revisions are to be expected on a regular basis. Check with Bard College staff for the most recent updates, if any. This manual was revised as partial fulfillment of Arbor Day Foundation’s standards for Tree Campus USA designation and does not reflect official College policy on all matters. However, many of these policies, procedures, and practices are currently in place and administered. The Tree and Landscape Committee is seeking to have the plan officially adopted by the College.

# II. GOALS & OBJECTIVES

## A. PRIMARY GOAL

The **primary goal** of this manual is to assist decision-makers, planners, staff, and facility and grounds managers and the community in the stewardship of campus landscape resources while accommodating for future change.

## B. OVERALL GOALS

There are additional **overall goals** that one must consider while engaged in work on the Bard College Campus, these include:

- 1. Respect cultural, environmental and historic resources.** Bard's landscape should create a "sense of place" considering that it lies within the context of the Hudson Valley River regional landscape and a national register historic district. Encourage campus community members to respect and value the campus urban forest. Proper consideration of the natural and historic resources should be considered in accordance with Bard's Master Plans and the Preservation Master Plan (2008). Protect high-value campus trees during construction and renovation projects
- 2. Promote intellectual and social interaction.** The landscape exists for the purposes of both aesthetics and function. It is a resource that guides the development of the Bard community, both intellectually and socially.
- 3. Create a sense of outdoor comfort and security.** Micro and macro-environments on the campus should lend themselves to the comfort and well being of the community.
- 4. Value sustainable design.** Bard's physical environment should contain a rich diversity plants, exemplifying New York's native flora. Practice stewardship of the lands and its flora and fauna. Ensure proper species selection, high-quality nursery stock acquisition, and industry-consensus planting procedures
- 5. Follow the mission of Landscape & Arboretum Program at Bard:**  
*To preserve and enhance the natural and landscaped resources of the Bard campus and to promote knowledge and appreciation of horticulture and conservation. Provide a campus environment rich in horticultural diversity and beauty that can be readily enjoyed by the College and surrounding community.*
- 6. Respect cultural, environmental and historic resources.** Bard's landscape should create a "sense of place" considering that it lies within the context of the Hudson Valley River regional landscape and a national register historic district. Encourage campus community members to respect and value the campus urban forest. Proper consideration of the natural and historic resources should be considered in accordance with Bard's Master Plans and the Preservation Master Plan (2008). Protect high-value campus trees during construction and renovation projects



### C. CAMPUS LANDSCAPE AND TREE CARE GOAL & TARGET

For the purposes of the Arbor Day Foundation and Tree Campus USA, the ongoing **GOAL** of the Landscape and Arboretum Program's Campus Tree Plan is to complete a campus-wide tree inventory. Each year the Arboretum Director, college student workers and a summer intern work to complete this enormous task by completing tree hazard evaluations, mapping and entering data into the Arboretum's BG BASE software. The **TARGET** each year will be measured by how many more trees are entered into the software, how many tree hazard evaluations and tree maps are completed.

Other Arboretum and horticulture projects that encourage either student and/or community engagement at Bard include:

- 1) Annual Arbor Day tree planting on Arbor Day
- 2) Monthly Arboretum educational Walks with the Director
- 3) Collection of tree hazard evaluation data
- 4) Tree and garden memorial archival documentation
- 5) Tree/plant interpretive label installation and archival documentation
- 6) Summer Arboretum internship, work study student jobs or student labor positions
- 7) Bloom data collection for Project Bud Burst
- 8) Curatorial documentation of campus plant and tree inventory
- 9) Landscape mapping of plants and trees
- 10) GPS mapping of specimen trees

### D. COMMUNICATION STRATEGY

The **communication strategy** that will help disseminate the information in this manual to the college community and contractors to heighten awareness about policies and procedures as well as the goals of the institution will be as follows:

1. Adopted by Buildings and Grounds Department at Bard College and distributed to all current and new staff and contractors employed by Bard College.
2. Added to the Bard Horticulture website: <http://inside.bard.edu/horticulture/>
3. Verbally communicated to staff, faculty, students, contractors, project managers, etc. as needed.

# III. DESIGN PRINCIPLES

Contractors and consultants should be aware that the College has adopted some basic design principles that apply toward the maintenance of a cohesive campus landscape, preserving and reinforcing the best of its existing structure and setting a framework for future development. While campus plans will change from year to year these principles should remain firm and serve as the foundation for the plans. One encompassing principle applies--*sustain a supporting and inspiring environment for people to learn and live.*

The design principles and landscape elements are very important in enhancing the campus environment and maintaining its distinctive character. These principles are the basis for creating a campus environment, which is cohesive and preserves its sense of continuity.

- A. **CAMPUS CHARACTER** – Maintain Bard’s small-scale ambiance, mixed-use environment, and informal landscape setting. Historical landscape treatment and precedence dictates several landscape techniques that should also be respected and maintained (ie. Picturesque landscape of the Hudson River Valley and the formal Italian Garden at Blithewood). Preserve Bard’s important physiographic features that contribute to the character of the campus in its regional context.
- B. **CAMPUS IMAGE** – As a historic campus with an exquisite collection of varied architectural components, the landscape must act as the unifying component that brings the pieces together as a whole. The campus grounds should exist as a narrative, telling the story of its history through the elements in the landscape.
- C. **OPEN SPACE** – The distinctive quality of expansive lawns, meadows, fields, allees, overlooks, vistas, etc. should be maintained. Dedicated open space should be protected, preserved and enhanced as appropriate.
- D. **CAMPUS ENVIRONS** - The campus emerged out of a village and estate context, hence the human interaction component is a key component of the landscape and should be facilitated and considered at all times. Bard will preserve important stands of native vegetation. Any new plantings are to be placed with reference to a campus-wide comprehensive landscape plan and the Bard College Preservation Master Plan (2008) that sets forth broad objectives for regions of the campus. Campus exterior design should allow for optimum accessibility for all. ADA (American Disabilities Act) should be incorporated into all exterior design plans whenever possible.

# IV. BUILDING AND SITE DESIGN

## A. SITE SUREVEY AND EXISTING CONDITIONS

1. Review and evaluate all existing conditions prior to any work that would affect the existing natural or maintained landscape. Refer to this document's *Addendum: Bard's Historic Tree List*.
2. Review property boundaries, easements, and rights-of-ways, environmental impact statements, deed restrictions and legal descriptions.
3. Review available utility services and lines, both public and private, above and below grade, including: manholes, pedestals, hydrants, light poles, transformers, power poles, etc.
4. Review existing features such as walls, fences, pavement, gravel, signs, outcroppings, etc.
5. Review existing vegetation including: plant type, size, canopy, and other significant vegetation.
6. Extent of landscape work should be shown on drawings and schedules.

## B. SITE CLEARING, DEMOLITION AND EROSION CONTROL

1. Notify Bard's Horticulture Department of any site clearing, digging, demolition or erosion control work to be done.
2. Indicate all plant materials that are designated to remain, be protected, relocated or removed. Plant material to remain will be protected by construction fence, which encompasses its drip line. No construction equipment, materials or debris shall be located within tree protection boundaries.
3. A site-grading plan should be developed which satisfies the projects functional requirements such as drainage and accessibility. It must also provide an aesthetic setting, which complements the buildings architecture and respects the existing campus landscape features.
4. Grading and excavations *will not* occur within the drip line of existing plant materials that have been identified to remain. It will additionally avoid as much of the root system as possible. Air spade around root systems whenever it is needed to avoid root removal.
5. To minimize storm water impacts on the existing watershed, post development discharges should not exceed present condition discharges.

## C. PROTECTION OF EXISTING PLANT MATERIALS

1. Consult with the Horticulture Department regarding all proposed site improvements or proposed construction sites before final planning is underway. All construction documents must include protection for trees identified by College personnel. When necessary, due to changes in grade, placement of improvements or for other causes, provide drawings and specifications that give instructions for the preservation of individual trees/shrubs. The College/contractor must employ qualified, trained individuals to perform or oversee pruning and other operations necessary for the survival of existing trees.
2. The most effective way to save trees during construction is to carefully site buildings, roads and driveways, utility lines, and other features so that they avoid the specimen or desirable trees.
3. Whenever possible, start protecting a tree located within a construction site up to a year in

advance of the construction start date. Extra irrigation, fertilization, and aeration of the tree during this time will create a healthier, stronger tree and will increase survival following the stress of damaging work.

## D. PRESEVATION DURING DESIGN PHASE

On the site survey map, identify all trees whose root systems are likely to be impacted by construction equipment, cut and fill activities, utility corridors, proposed walks and roads, and potential construction staging areas; and whose branches may be damaged by construction equipment. NOTE: if trees are grouped in a forest or woodlot, then only the location of the woodlot and any trees greater than 24 inches diameter at 4.5 feet above the ground (DBH) need to be identified

### 1. Not salvageable

a. All trees that are within the footprint or in close proximity to the footprint of a proposed building. (Note: alternative footprints to save large, valuable trees should be considered, provided that the alternatives maintain the desired features and costs of the proposed building)

b. Trees of undesirable species or in very poor health. Examples include, but are not limited to species that have low landscape and educational value, and heavily diseased or damaged trees that have little chance of recovering desirable form and function, even if protected from construction damage.

### 2. Low priority for protecting

a. Small trees (less than 10 inches DBH) that fall outside of the building footprint, but are likely to be impacted by construction activities.

b. Larger trees outside of the building footprint with relatively low landscape value. Examples include but are not limited to, trees with poor form, species of relatively low landscape and educational value, or trees with inadequate space to accommodate current or future growth even if the site is ameliorated.

### 3. High priority for protecting

a. Medium (> 10 inches DBH) to large (> 24 inches dbh) trees of desirable species with good form, good health, and room to continue to grow.

### 4. Avoid locating the general construction site around low and high priority trees where possible by:

a. Planning all construction activities including new utility corridors, staging areas, new sidewalks and new roads for a minimum clearance of 15 feet away from the base of trees, and not within the edge of the canopy drip line. Greater distances are desirable.

b. High priority trees should receive more consideration than low priority trees in planning corridors, staging areas, walks, and roads.

### 5. When possible, all trees deemed “heritage, historic or landmark” trees on the College campus should be preserved and protected as trees with special status.

a. Defining Heritage, Historic or Landmark trees

- i. Size- Usually measured as the diameter at breast height (DBH) or 4.5' from the ground. The relationship between the size of the trunk and the canopy usually indicates age, depending on species. Also, if the tree is on the National Register of Big Trees for American Forests or is determined to be a local Champion tree it is a protected tree.
- ii. Species – Special status may be conferred only to certain species of trees that are important local native species, or species rare in an area (weedy trees are exempt from this qualification).
- iii. Age – Especially old trees are a link to the past. If the DBH for a particular species is calculated to estimate age, and its age is over 100 years old it is a protected tree. Since DBH is an estimate and varies with species, site quality, management history, and other factors should also be considered.
- iv. Historic significance – A tree may be associated with a notable local or regional historical structure or landscape. Determining whether the historical significance of a tree is notable is a subjective matter. Historic tree status is typically deemed by a governing (ie. Town Council) or advisory body (ie. Tree Commission). Some ordinances confer historic status on trees designated as historical landmarks by certain other organizations (ie historical societies). In addition, ordinances may assign special status to trees dedicated as public memorials. Refer to *Defining Trees: Heritage, Historic, and Landmark Trees, Provision 31*. (International Society of Arboriculture).
- v. Ecological value – All trees serve a variety of ecological functions. Certain trees or groups of trees have especially high ecological value because of their location, size, species, and/or condition. For example, a given tree may be an important roost, nesting site, or food source for certain wildlife or it may be situated in a where it plays a critical role in stabilizing soil or providing shelter for other plant or animal species or it may be an important genetic resource for a local tree population species as a whole.

SPECIAL NOTE: All dead trees and live Shagbark Hickory (*Carya ovata*) trees are identified as roost sites for the endangered Indiana bat (*Myotis sodalis*). Tree removal should occur between October 1 and March 31 to prevent disturbing bats during the maternity season. Minimize access to areas known to contain roost sites to prevent bats from abandoning the roost trees. Avoid access to hibernacula from September 1 through April 30. Minimize road and trail construction, logging and construction near hibernacula within a 100 foot buffer zone.

When mitigating for Indiana bat habitat disturbance, it is best to install an appropriate number of well-placed metal or plastic bat houses to provide a temporary (20 year) roost alternative. Meanwhile, a number of Shagbark hickory tree saplings should be planted in areas appropriate for long term (200+ year) bat management. Similar to a bat house, at least some Shagbarks should be planted where direct southern exposure will be

guaranteed when the tree matures enough to start becoming attractive to bats (20-30 years old). Ideally, shagbarks of various ages (seedlings to 10' tall or more as available) should be planted so the stand is sustainable.

vi. Aesthetics – Subjective quality that may be due to its form (ie. especially perfect and symmetrical or notably craggy and idiosyncratic), function (ie. a landmark tree framing an entrance) or other noteworthy characteristics.

vii. Location – Trees in particular locations may be given special status in recognition of aesthetic or ecological functions that they serve. Proximity to a street (ie county/ state right-of-way tree) or trees located along or within set distance from water bodies can be given special status due to their importance in stabilizing stream banks or providing shade.

viii. Tree Retention – A healthy campus is one with young, middle age and old trees. In order for Bard to retain trees and allow them to grow old, we need a certain population of each age group to remain on campus. Designated trees should be preserved to ensure tree retention.

6. Tree Protection - Contractors must provide protection to existing trees and planting areas on the site. The greater the distance of tree protection provided, the greater the instance of tree success in construction areas.
  - a. Tree roots are typically found growing a distance of 1-3 times the height of the tree and sometimes miles from the trunk. A large majority of a tree root system is found in the upper 12- 18” of the soil.
  - b. Protective fencing should be chain link on secure footings that will not fall over into the trees. Only on special permission, will safety fence or snow fence, supported with heavy duty 6’ metal T-posts be allowed. Install these barriers allowing for the greatest distance from the trunk of the tree.
  - c. A general rule is to allow for one foot of space from the trunk for each inch of trunk diameter. However, minimally 10’ beyond the drip line of deciduous trees and minimally 20’ beyond the drip line of evergreens, or along the perimeter of existing planting areas to prevent damage or disturbance during construction activities. These barriers should be installed prior to any construction activity and maintained throughout the course of the project.
7. Whenever possible, construction access to the work site should be limited to only one access route on and off the property, this is to ensure nearby trees and plantings are not damaged due to compaction elsewhere on or off the work site.
8. Protect overhanging tree canopies from construction damage.
9. There should be no grade change within a minimum of 10 feet within the trunk of existing trees and preferably none within the entire root zone. Native oaks are particularly sensitive to grade changes.
10. Construction parking on existing grass or in planted areas is prohibited. No disturbance to any trees, planting areas or soil, and no construction materials or equipment are allowed

within the limits of these protective barriers. Construction debris will not be allowed to accumulate in these areas. No foot traffic will be allowed to move through these protected areas. 90% of the fine roots that absorb water and minerals are in the upper 12 inches of soil.

11. Existing trees should be monitored weekly and irrigated as needed during the course of construction.
12. Clear-cutting – If clear-cutting is required by a construction project then it must be undertaken in a sustainable and ecologically responsible manner with appropriate levels of oversight by Bard College. It should be done in a manner that 1) promotes long-term sustainability of the forest and the temporary establishment of early successional forest habitat, 2) maintains the presence of shade intolerant species, and 3) enhances biological diversity. The following are clear-cutting considerations:
  - 1) Minimization of negative visual impacts to the surrounding.
  - 2) Appropriate actions should be taken to prevent any foreseeable negative impacts on stream bank stability, channel stability, water quality, or soil erosion levels. Special management of zones and protection of buffers along permanent and intermittent streams and wetlands and travel corridors (including, but not limited to designated recreation trails, public forest access roads and municipal highways) within and bisecting the clear-cut area.
  - 3) The land on which the clearing takes place should have a slope of less than 30 degrees from the horizontal.
  - 4) Overall soil disturbance for or resulting from the removal of vegetation should be minimized.
  - 5) Trees must be felled in such a way that damage to remaining vegetation is minimized.
  - 6) Trees must not be felled into streams or wetlands.
  - 7) Debris resulting from the clearing must be chipped and removed from site. It should be made available to Bard for college purposes.
  - 8) Useable firewood should be stockpiled outside of the dump gate and offered up to Bard College employees. Bard College Firewood Policy and the 50-mile radius limit for firewood transport must be followed to prevent moving of invasive insects.
13. Vista Clearing – The Historic Hudson Valley is notable for its historic picturesque views of the Hudson River from its uplands. All tree clearing projects within 1000 ft. of the Hudson River MUST obtain permission from the Town of Red Hook before proceeding with the work. If permission is granted, then select trees should be targeted that would provide the most visual impact. All trees should be felled following the same guidelines as the clear-cutting guidelines. Additionally, minimal damage to surrounding lawn areas is required, with a single road in/out of the work area whenever possible. All stumps should be left in place to protect against erosion and brush should be ground up into chips and either spread out on site or taken off site. Future plans on how to maintain the site should be discussed/made provisions for, to prevent unwanted invasives from taking over site.
14. Timber Harvesting – Whenever trees must be removed due to construction, their economic value should be considered. This amount per tree varies annually depending on the market

and the condition and type of the tree. A local arborist should be able to guide your decision making.

15. Reforestation requirements

- a. Revegetation should occur within 12 months of canopy removal or allowed to naturally regenerate.
- b. Plant 100-200 saplings per acre of clearcut land should be planted (even if not on direct project site). Quantity depends on type of seedling planted.
- c. Ensure saplings are “free-to-grow” meaning competing vegetation is controlled.
- d. If planting area is contiguous and similar in soil type with clearcut site, plant similar tree species, with the exception of if other species are better adapted to the site or less susceptible to forest health problems. Avoid exotic or non-native species. Use local, native species whenever possible.
- e. Also, employ seeding wherever possible. That is, plant seeds collected from mature trees in or nearby the project site.
- f. Use bareroot seedlings wherever possible. Container or “plug” seedlings are also acceptable if acquired with the largest root system available.
- g. If large areas cannot be reforested, then replanting the same area or areas nearby with similar species that were removed is always advised.

16. No construction waste materials shall be stored, dumped, poured or buried, in the proximity of any trees or any other plant materials on site. These waste materials may include but are not limited to: fuels, solvents, paints, detergents, caustics, etc.. The contractor shall report the occurrence of any soil contamination incident. In the event that soil contamination does occur, the contractor shall be responsible for the removal and replacement of the affected topsoil and the replacement of existing plant materials.

13. Trenching-All trenching should conform to the following guidelines:

- a. If possible, water tree(s)/plantings a few days before work will be done. And water tree(s)/plantings again thoroughly once work is done.
- b. Work only on dry soil. If soil is wet, any weight will compact the soil which will cause more stress on the tree.
- c. Roots larger than 2” in diameter should not be severed without calling the proper College personnel for cutting or review. Severing one major root can cause the loss of 5-20% of the root system.
- d. Digging under roots, rather than cutting is preferred.
- e. Digging within a trees root zone should be avoided. If it is necessary, hand digging should be used for any trenching within the tree’s root zone.
- f. All roots that must be cut should be cleanly cut, not torn.
- g. Make sure cut roots are covered with soil and wood chips as soon as possible. If roots are going to be exposed for more than an hour, cover roots with a damp cloth. Be sure to keep cloth moist until soil and mulch can be used for permanent cover.
- h. Trenches should only be dug on one side of the tree. To find the minimum distance from the tree trunk that the trench can be dug, determine diameter of tree at breast height (DBH) and multiply by 0.5 feet to get the minimum distance from tree to start trenching. (DBH x 0.5 feet = minimum distance from tree to start trenching (in feet)).



- i. Auguring -When auguring for fence posts, deck footings, etc. multiply DBH x 1 foot to get the minimum distance from tree to auger (in feet)
  - j. No more than 25% of the root system should be removed.
  - k. Soil should not be removed within 3 feet of the trunk.
  - l. Take no more than 2 inches of soil off the top of tree roots, located 3 feet away from the base of the tree. If more soil needs to be removed – build a retaining wall.
14. Aerate within the protected root zone before and after grade changes. Starting 3 feet from the base of the tree, drill 2-inch diameter holes into the soil about 1-1 ½ feet dep. Drill the holes in a circle 3 feet away from the trunk, spacing them 2 feet apart, then go out 5 feet and drill again in a circle. Continue every 2 feet within the protected root zone.
15. In the event that damage does occur to a protected or nearby tree or planting area, due to the following: physical injury to the trunk or crown, cutting of roots, soil compaction, smoothing roots by adding soil, uprooting of a tree due to nearby trenching, etc. then proper replacement arrangements must be made and installed appropriately under the supervision of the College.

# V. LANDSCAPE SPECIFICATIONS

## A. QUALITY ASSURANCE

1. Subcontract landscape work to a single firm specializing in landscape work that has an accredited work history and qualifications.
2. Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
3. Do not make substitutions: If specified, landscape material is not obtainable, submit proof of non-availability, together with proposal for use of equivalent material.
4. Inspection: The College may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. The College retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.
5. Any damage to lawn areas, garden beds, paths, etc. by equipment or trucks that includes rutting, running over plants, breaking of tree limbs or destruction of property in any manner, will require the contractor to restore and repair the damage to original condition.

## B. SUBMITTALS

1. Certification: Submit certificates of inspection as required by governmental authorities. Submit manufacturers or vendors certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
2. Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.
3. Planting Schedule: Submit proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reason for delays.
4. Maintenance Instructions: Submit typewritten instructions recommending procedures to be established by the College for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period(s), as per contract or other acceptable means of retaining moisture.
5. Do not remove container-grown stock from containers until planting time.

## C. DELIVERY, STORAGE AND HANDLING

1. Packaged Materials: Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while storage at site.
2. Sod: Time delivery so that sod will be placed within twenty-four hours after stripping. Protect sod against drying and breaking of rolled strips.
3. Trees and Shrubs: Provide freshly dug trees and shrubs. Do not prune prior to delivery unless otherwise approved by the College. Do not bend or bind-tie trees or shrubs as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped stock during delivery.

4. Deliver trees and shrubs after preparations for planting have been completed, plant immediately. If planting is delayed more than six hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.
5. Do not remove container-grown stock from containers until planting time.

## D. JOB CONDITIONS

1. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.
2. Utilities: Determine location of underground utilities and perform work in a manner, which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
3. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify College before planting. Avoid using heavy equipment on wet soils to avoid compaction.
4. Planting Time: Plant or install materials during normal planting seasons for each type of landscape work required. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.
5. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the College. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

## E. PROJECT WARRANTY

1. Warranty lawns through specified lawn maintenance period, which requires that the lawn is established and acceptable to Bard personnel after the first mowing, and until final acceptance.
2. Warranty trees and shrubs, for a period of one year after date of substantial completion, against defects including death and unsatisfactory growth, except for defects resulting from neglect by the College, abuse or damage by others, or unusual phenomena or incidents which are beyond landscape installer's control.
3. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition during warranty period. Make replacements during growth season following end of warranty period. Replace trees and shrubs, which are in doubtful condition at the end of warranty period; unless, in opinion of the College, it is advisable to extend warranty period for a full growing season.
4. Conduct inspection at end of extended warranty period, if any, to determine acceptance or rejection. Only one replacement (per tree, shrub or plant) will be required at end of warranty period, except for losses or replacements due to failure to comply with specified requirements.

## F. TOPSOIL

1. Topsoil (the top 4-6 inches of surface material) existing on site may be reused for lawns and plant beds, provided it meets the following topsoil requirements: friable loam with minimal amounts of clay and free of subsoil, roots, grass, weeds, stones, debris, and foreign matter, therefore screening of topsoil might be required as needed according to the College. A pH range of 5.5 to 7.0 and

- containing a minimum of 6% and a maximum of 25% organic matter. If this is not met, then soil must be purchased and brought on site. See Horticulture Supervisor for acceptable vendors.
2. Existing topsoil may be stockpiled on site at a convenient spot for re-spreading. In areas previously compacted by vegetative clearing and demolition activities, the soil must be scarified to loosen the imbedded topsoil before it is removed.
  3. As soil types vary widely in different parts of the campus, and as general construction activities may have a serious impact on soil structure, modifications to the growing medium should be specified.
  4. Soil modifications should be carried out as necessitated by the site conditions, soil testing and the requirement of the specified plant types. Wherever possible, it is recommended that plant selection be made in accordance with on site soil conditions.
  5. Topsoil mix for planting beds:  $\frac{3}{4}$  topsoil and  $\frac{1}{4}$  composted organic material.
  6. Topsoil tests will be made by an independent agency before topsoil delivery and placement. Tests will also determine requirements for topsoil additives. For lawn areas where topsoil pH is below 5.0, limestone shall be added at a rate of 2-1/2 (two and one half) pounds per cu yd of topsoil to raise the pH value one full point.
  7. Where topsoil pH is above 7.0, aluminum sulfate shall be added at a rate of 2-1/2 pounds per cubic yard of topsoil to lower the pH value one full point.
  8. Where topsoil pH is above 7.0, aluminum sulfate shall be added at a rate of 2-1/2 pounds per cubic yard of topsoil to lower the pH value one full point.
  9. Limestone: Shall be raw, ground agricultural limestone containing not less than 85 percent calcium carbonate and shall be ground to such a fineness that 50 percent shall pass through a 100 mesh sieve, and 90 percent through a 20-mesh sieve.
  10. Aluminum sulfate: In dry powder form.

## G. SOIL AMENDMENTS

1. Lime: Natural dolomitic limestone containing not less than 85% of total carbonates with a minimum of 30% magnesium carbonates, ground so that not less than 90% passes a 10 mesh sieve, and not less than 50% passes a 100 mesh sieve.
2. Aluminum Sulfate: Commercial grade
3. Peat Humus: Limited use only. FS Q-P-166 decomposed peat with no identifiable fibers and with pH range suitable for intended use.
4. Bone meal: Commercial, raw, finely ground; 4% nitrogen and 20% phosphoric acid.
5. Super phosphate: Soluble mixture of treated minerals; 20% available phosphoric acid.
6. Sand: Clean, washed sand, free of toxic materials.
7. Perlite: Conforming to National Bureau of Standards PS 23
8. Vermiculite: Horticultural grade, free of toxic substances
9. Manure: Well rotted, unbleached stable or cattle manure containing not more than 25% by volume of straw, sawdust or other bedding materials and containing no chemicals or ingredients harmful to plants.

10. Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs or plants and consisting of one of the following: shredded hardwood, ground or shredded bark, wood chips. No dyed mulch allowed.
11. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources.
12. For trees and shrubs, provide fertilizer with not less than 5% total nitrogen, 10% available phosphoric acid and 5% soluble potash.
13. For lawns, provide fertilizer with percentage of nitrogen required to provide not less than 1 lb of actual nitrogen per 1,000 sq ft of lawn area and not less than 4% phosphoric acid and 2% potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50% of nitrogen to be in organic form.

## H. MINIMUM PLANT SIZES

Plant materials installed on the Bard campus will have the following minimum sizes (unless special case is presented):

Deciduous shade type trees	2" caliper
Deciduous ornamental trees	2" caliper
Deciduous shrubs, dwarf & semi-dwarf	15-18"
Deciduous shrubs, medium	18-24"
Deciduous shrubs, large	24-30"
Evergreen Trees	7-8'
Evergreen shrubs, dwarf & semi-dwarf	15-18"
Evergreen shrubs, large	18-24"
Evergreen shrubs, medium	24-30"
Perennials, 2 year plants	plug
Roses, No. 1 grade	2 gal.
Groundcovers, 2 year plants	plug
Bulb	Top size
Annual flowers	4 pack

## I. PLANT SELECTION CRITERIA

1. Three general categories of plants: Preferred, Acceptable, and Prohibited
  - a. **Preferred/Recommended plants** are essentially the most suited to the actual site conditions. However, there are innumerable combinations of factors affecting the selection of appropriate plants. Water conservation, low maintenance, and regionally native plants are preferable. Plants that are salt tolerant, deer resistant, and ice damage-resistant are also preferred where deemed necessary. US Arboretum Gold Metal trees, Perennial Plant Association's Perennial Plants of the Year and Philadelphia Horticultural Society's Gold Metal Winners that are suited for Bard's hardiness zone are also highly recommended. Good deer resistance and multiple season's of interest is also preferred. Preferred plants are also dictated by the predetermined Bard Arboretum collection's policy and campus mapped layout for collections. See Addendum.

- b. **Acceptable plants** are those that satisfy minimum performance standards for the site area and are easily maintained.
  - c. **Prohibited plants** are those, which do not satisfy the minimum performance standards for the site area. In addition there are a number of invasive species that are not allowed in any landscaped or natural area, as per New York State's DEC guidelines (last updated 2013). Where existing these plants shall be eradicated.
2. Plant material must be selected from nurseries that are located in hardiness zones similar to Bard College.
  3. Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work complying with recommendations and requirements of ANSI Z60.1, "American Standard for Nursery Stock." Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sunscald, injuries, abrasions, or disfigurement.
  4. Plants shall be selected based upon the site characteristics including soil type, drainage, and adjacent improvements. Plants selected should grow to maturity without impacts to sidewalks, curbs and other public improvements.
  5. Avoid the use of plant materials that are prone to infestation or that require more than minimal pest-control measures. Utilize varieties within the species that are recognized to be highly disease resistant.
  6. Selected varieties of plant materials must be suitable for the site conditions and have appropriate heat, drought, and cold tolerance. Utilize varieties of species that are tolerant to the range of anticipated conditions and that are appropriate for the available moisture, light and exposure conditions at the site. Consider material availability and replacement availability.
  7. Plant materials that are prone to litter should be used sparingly, and only in locations where the litter will not pose a problem to vehicles or pedestrians. This may be a significant consideration for various projects types such as parking lots, building entrances, sidewalks, screen plantings and other situations where fallen fruit, seeds, large leaves, stems, flower parts, or peeling bark may be objectionable or even hazardous in certain vehicular or pedestrian areas.
  8. Avoid the use of plant materials with hazardous characteristics such as thorns or sharp-edged leaves in locations where pedestrians are likely to come in contact with them. Avoid trees that tend to have weak wood or that develop narrow crotches, which are more susceptible to wind and ice damage. Trees with low branch characteristics or shrubs with broad-spreading growth habits should not be placed near walkways or parking lots in order to prevent overgrowth near walk surfaces or damage to cars.
  9. Avoid placement of trees that develop shallow root systems near paved areas in order to prevent cracking or heaving of the pavement. Shallow rooted trees may also uproot or blow over in heavy winds and should be placed only in suitable areas.
  10. It is recommended that landscape projects are a minimum of 10% of the construction cost. Also, a minimum of 3-5% of the plant material budget be held out for replacement of materials that do not survive the first year. High risk materials or materials installed in locations likely to receive low maintenance should have a higher percentage reserve than materials that can readily establish or that are located in higher frequency maintenance zones. Other considerations for determining the percentage of plant material replacement budget are

the site accessibility and potential for damage or disturbance to materials in place, size, replacement material availability, and potential replacement cost of materials.

11. All plant materials that are removed due to loss by damage, vandalism, etc. shall be replaced with material of the same species, variety and size originally installed for that project, unless otherwise deemed unacceptable. Replacement materials shall also be placed in the same unless authorization is received to modify approved plans.
12. In order to maintain and stabilize existing projects, infill and replacement of missing materials from previous and/or current projects shall be given priority before proceeding with new projects.
13. Trees should not be located any closer to a structure than a distance equal to the tree's mature spread.

## **J. COMMON CHARACTERISTICS OF INVASIVE PLANTS** *(according to the Invasive Plant Council of New York State)*

1. The following characteristics define plants as “invasive”:
  - Habitat generalists; able to invade a range of sites
  - Primarily from temperate latitudes of Eurasia
  - Early germination; leaf out before native plants
  - Out-compete native plants through shading and nutrient competition
  - Few natural predators here
  - Adaptations such as toxins or thorns that render them unpalatable
  - Reproduce both sexually and vegetatively
  - Long flowering and fruiting periods
  - Pollination by wind or by generalist pollinators
  - High reproductive outputs
  - Long-distance dispersal (e.g., birds, water, construction equipment)
  - Ability to store large amounts of food in roots and rhizomes
  - A tendency to form large monotypic stand
2. No plant with multiple “invasive” characteristics will be allowed to be planted on the Bard College campus.

## **K. PREFERRED/ RECOMMENDED PLANT SPECIES (PARTIAL LIST)**

### **US Arboretum Gold Metal Trees**

Acer rubrum ‘Brandywine’, ‘Somerset’, ‘Sun Valley’

Juniperus conferta ‘Blue Lagoon’

Magnolia ‘Ann’, ‘Betty’, ‘Jane’, ‘Judy’, ‘Pinkie’, ‘Randy’, ‘Ricki’ and ‘Susan’, ‘Galaxy’

Platanus x acerifolia ‘Columbia’, ‘Liberty’

Prunus ‘Dream Catcher’, ‘First Lady’

Thuja ‘Green Giant’

Ulmus ‘Frontier’, ‘Patriot’

Ulmus Americana ‘Valley Forge’, ‘New Harmony’

### **Perennial Plant Association’s Perennial Plants of the Year**

Hakonechloa macra ‘Aureola’ (2009)

Geranium 'Rozanne' (2008)  
 Nepeta 'Walker's Low' (2007)  
 Dianthus gratianopolitanus 'Feuerhexe' (also known as Firewitch) (2006)  
 Helleborus x hybridus (2005)  
 Anthyrium niponicum 'Pictum' (2004)  
 Leucanthemum 'Becky' (2003)  
 Phlox 'David' (2002)  
 Calamagrostis x acutiflora 'Karl Foerster' (2001)  
 Scabiosa columbaria 'Butterfly Blue' (2000)  
 Rudbeckia fulgida var. sullivantii 'Goldsturm' (1999)  
 Echinacea purpurea 'Magnus' (1998)  
 Salvia 'Maninacht' (May Night) (1997)  
 Penstemon digitalis 'Husker Red' (1996)  
 Astilbe 'Sprite' (1994)  
 Veronica 'Sunny Border Blue' (1993)  
 Coreopsis verticillata 'Moonbeam' (1992)  
 Heuchera micrantha 'Palace Purple' (1991)  
 Phlox stolonifera (1990)

#### **Philadelphia Horticultural Society's Gold Metal Winners**

Abies koreana	Cornus sericea 'Silver and Gold'
Abies nordmanniana	Cornus Venus™
Acer buergerianum	Crataegus viridis 'Winter King'
Acer griseum	Cryptomeria japonica 'Yoshino'
Acer palmatum var. dissectum 'Tamukeyama'	Daphne × transatlantica 'Jim's Pride'
Acer palmatum var. dissectum 'Waterfall'	Deutzia gracilis 'Nikko'
Acer triflorum	Enkianthus perulatus 'J. L. Pennock'
Aesculus parviflora	Fothergilla gardenii 'Blue Mist'
Aesculus pavia	Gelsemium sempervirens 'Margarita'
Aronia arbutifolia 'Brilliantissima'	Halesia diptera var. magniflora,
Betula nigra 'Cully' Heritage®	Hamamelis × intermedia 'Diane'
Buxus 'Green Velvet'	Hamamelis × intermedia 'Pallida'
Buxus sempervirens 'Dee Runk'	Heptacodium miconioides
Buxus sempervirens 'Vardar Valley'	Hydrangea arborescens 'Annabelle'
Callicarpa dichotoma,	Hydrangea macrophylla 'Blue Billow'
Calycanthus floridus 'Michael Lindsey'	Hydrangea paniculata 'Limelight'
Carpinus japonica	Hydrangea quercifolia 'Snow Queen'
Cephalotaxus harringtonii 'Prostrata'	Ilex 'Harvest Red'
Cephalotaxus harringtonii 'Duke Gardens'	Ilex 'Sparkleberry'
Cladrastis kentukea	Ilex × meserveae 'Mesid' Blue Maid™
Clematis viticella 'Betty Corning'	Ilex glabra 'Densa'
Clethra alnifolia 'Hummingbird'	Ilex opaca
Clethra alnifolia 'Ruby Spice'	Ilex verticillata 'Scarlett O'Hara'
Cornus 'Rutban' Aurora®	Ilex verticillata 'Winter Gold'
Cornus 'Rutlan' Ruth Ellen®	Ilex verticillata 'Winter Red'
Cornus mas 'Golden Glory'	Itea virginica 'Henry's Garnet'



Juniperus virginiana Emerald Sentinel™ ‘Corcorcor’  
 Linderia glauca var. salicifolia  
 Lonicera pileata  
 Magnolia ‘Daybreak’  
 Magnolia ‘Elizabeth’  
 Magnolia stellata ‘Centennial’  
 Magnolia virginiana "Jim Wilson" Moonglow™  
 Mahonia bealei,  
 Malus ‘Adirondack’  
 Malus ‘Donald Wyman’  
 Malus ‘Jewelberry’  
 Metasequoia glyptostroboides  
 Osmanthus heterophyllus ‘Goshiki’  
 Parrotia persica  
 Physocarpus opulifolius ‘Diablo’  
 Picea orientalis  
 Pinus strobus ‘Fastigiata’  
 Prunus ‘Hally Jolivette’  
 Prunus ‘Okame’  
 Quercus alba  
 Quercus palustris "Pringreen" Green Pillar®

Rhus aromatica, ‘Gro-Low’  
 Rhus typhina ‘Bailtiger’ Tiger Eyes®  
 Sarcococca hookeriana var. humilis  
 Schizophragma hydrangeoides ‘Moonlight’  
 Sciadopitys verticillata  
 Spiraea thunbergii ‘Ogon’ Mellow Yellow®  
 Stewartia pseudocamellia var. koreana  
 Syringa meyeri ‘Palibin’  
 Syringa reticulata ‘Ivory Silk’  
 Viburnum ‘Eskimo’  
 Viburnum × burkwoodii ‘Mohawk’  
 Viburnum × burkwoodii ‘Conoy’  
 Viburnum dilatatum ‘Erie’  
 Viburnum nudum ‘Winterthur’  
 Viburnum plicatum f. tomentosum ‘Shasta’  
 Vitex agnus-castus ‘Shoal Creek’  
 Wisteria frutescens ‘Amethyst Falls’  
 Zelkova serrata ‘Green Vase’

## L. PROHIBITED PLANT SPECIES (ALSO COMMONLY KNOWN TO BE “INVASIVE”)

### Botanical Name

Heracleum mantegazzianum  
 Polygonum cuspidatum a.k.a Fallopija japonica  
 Microstegium vimineum  
 Polygonum perfoliatum  
 Vincetoxicum rossicum a.k.a. Cynanchum rossicum  
 Trapa natans  
 Acer platanoides  
 Ailanthus altissima  
 Robinia pseudo-acacia  
 Ulmus pumila  
 Rhamnus cathartica & R. frangula  
 Elaeagnus umbellata & E. angustifolia  
 Lonicera maackii, L. morrowii, Lonicera japonica  
 Euonymus atropurpureus  
 Ligustrum amurense, L. obtusifolium, L. vulgaris  
 Celastrus orbiculatus  
 Ampelopsis brevipedunculata  
 Phragmites australis  
 Lythrum salicaria  
 Rosa multiflora  
 Berberis thunbergii

### Common Name

Giant Hogweed  
 Japanese Knotweed  
 Japanese Stiltgrass  
 Mile-a-Minute Vine  
 Pale Swallow-wort  
 Water Chestnut  
 Norway maple  
 Tree of Heaven  
 Black Locust  
 Siberian Elm  
 Buckthorns  
 Ornamental Olives  
 Shrub Honeysuckles  
 Winged Burning Bush  
 Privets  
 Oriental Bittersweet  
 Porcelainberry  
 Common Reed  
 Purple Loosestrife  
 Multiflora Rose  
 Japanese Barberry

Tsuga canadensis  
Fraxinus pennsylvanica  
Fraxinus Americana  
Fraxinus nigra  
Fraxinus quadrangulata

Eastern Hemlock  
Green Ash  
White Ash  
Black Ash  
Blue Ash

## M. PARTNERSHIPS FOR REGIONAL INVASIVE SPECIES MANAGEMENT (PRISM) LIST OF PLANTS "TO WATCH" IN NEW YORK

Cynanchum louiseae (Syn: Vincetoxicum nigrum)  
Brazilian Water-weed (brazilian eloda)  
Brittle Naiad (Brittle Water-nymph, Lesser Naiad)  
Caper Spurge (Mole Plant)  
Chinese Privet  
Chinese Silver Grass (Eulalia)  
Common Frogbit (European Frog-bit)  
Common Valerian (Garden Heliotrope)  
Cup-plant (Indian Cup-plant)  
Dog Rose  
Eurasian Water-milfoil  
European Bird Cherry  
European Speedwell  
European Spindle-tree (Spindle-tree)  
European Swallow-wort  
Floating Primrose Willow  
Fuller's Teasel (Common Teasel, Wild Teasel)  
Japanese Black Pine  
Japanese Stiltgrass  
Japanese Wisteria  
Kudzu  
Marsh Thistle (European March Thistle)  
Mile-a-minute Weed  
Parrot-feather  
Porcelain Berry  
Professor-weed  
Rambler Rose (Multiflora Rose)  
Thunberg's Geranium  
Velvet-leaf  
Water Chestnut  
Wineberry  
Winged Burning Bush  
Yellow Floating-heart  
Yellow Foxglove

Black Swallow-wart  
Egeria densa  
Najas minor  
Euphorbia lathyrisLI ISMA  
Ligustrum sinense  
Miscanthus sinensis  
Hydrocharis morsus  
Valeriana officinalis  
Silphium perfoliatum  
Rosa canina  
Myriophyllum  
Prunus padus  
Veronica beccabunga  
Euonymus europaeus  
Cynanchum rossicum  
Ludwigia peploides  
Dipsacus fullonum  
Pinus thunbergiana (Pinus thunbergii)  
Microstegium vimineum  
Wisteria floribunda  
Pueraria montana var. lobata  
Cirsium palustre  
Persicaria perfoliata  
Myriophyllum aquaticum  
Ampelopsis brevipedunculata  
Galega officinalis  
Rosa multiflora  
Geranium thunbergii  
Abutilon theophrasti  
Trapa natans  
Rubus phoenicolasius  
Euonymus alatus  
Nymphoides peltata  
Digitalis grandiflora (D. pupurea)

## N. GRASS SEED

1. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture

composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

2. Establishing a new general lawn area - Use a 50-50 mix of Perennial Ryegrass and Creeping Red Fescue. Lawn must become established and tolerate at least one mowing to be adequate.
3. The Bard College soccer field sod consists of a mix of Excursion Kentucky Blue Grass (27.20%), Moon Shadow Kentucky Blue Grass (25.98%), Quantum Kentucky Blue Grass (24.77%), and Langara Kentucky Blue Grass (20.67%).
4. Some types of fertilizers Bard has used in the past include:
  - i. Starter fertilizer for newly planted areas and then one application after lawn is established.
  - ii. General Maintenance use organic fertilizer, such as Nature Safe 10-2-8.
5. If there are specific soil problems, soil samples should be taken to determine corrective measures.
6. Allow for settling. Refill as needed, if additional settling occurs.

## O. MISCELLANEOUS LANDSCAPE PRODUCTS

1. Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley OR use Penn Mulch as specified.
2. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.
3. Filtration/Separation Fabric: Water permeable filtration fabric of fiberglass or polypropylene fabric is only to be used in specified areas – not in general planting beds.
4. Tree Wrapping: not permitted.
5. Stakes and Guys: Provide stakes of sound new hardwood, treated softwood, or redwood, free of knotholes and other defects. Provide wire ties and guys of 2-strand, twisted, pliable galvanized iron wire not lighter than 12 gauge with zinc-coated turnbuckles. Provide not less than 1/2" diameter rubber or plastic hose, cut to required lengths and of uniform color, material and size to protect tree trunks from damage by wires.

# VI. LANDSCAPE SITE PREPARATION

1. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure College's acceptance before start of planting work. Make minor adjustments as needed.

## A. PREPARATION OF PLANTING SOIL

1. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
2. Fertilizer shall be complete, partially organic, containing by weight: 10% nitrogen, 10% phosphorous, 10% potash.
3. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
4. Mix lime with dry soil prior to mixing of fertilizer.
5. Prevent lime from contacting roots of acid-loving plants.
6. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to sub grade before applying planting soil and tilling.

## B. PREPARATION FOR PLANTING LAWNS

1. Loosen sub grade of lawn areas to a minimum depth of 4" (four inches). Allow for settling. Refill as needed, if additional settling occurs. All edges and pavements should be carefully hand raked to achieve a consistent and neat junction with adjacent pavements and planting beds.
2. Remove stones over 1 1/2" in any dimension and sticks, roots, rubbish and other extraneous matter.
3. Limit preparation to areas, which will be planted promptly after preparation.
4. Spread topsoil to minimum depth required to meet lines, grades and elevations shown, after light rolling and natural settlement.
5. Place approximately 1/2 of total amount of topsoil required. Work into top of loosened sub grade to create a transition layer and then place remainder of planting soil.
6. Add specified soil amendments and mix thoroughly into upper 4" (four inches) of topsoil.

## C. PREPARATION OF UNCHANGED GRADES

1. Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows:
  - a. Till to a depth of not less than 4" (four inches); apply soil amendments and initial
  - b. Allow for sod thickness in areas to be sodded.
  - c. Apply specified commercial fertilizer at rates specified and thoroughly mix into upper 2" (two inches) of topsoil.
  - d. Delay application of fertilizer if lawn planting will not follow within a few days.
  - e. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Rake and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades.
  - f. Limit fine grading to areas, which can be planted immediately after grading. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns.

- g. Do not create a muddy soil condition.
- h. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.
- i. Avoid disturbing vegetation and soil on slopes near surface water.

#### D. PREPARATION OF PLANTING BEDS

1. Loosen subgrade of planting bed area to a minimum depth of 6" (six inches) for perennials and annuals, but minimum 18" for trees and shrubs. Allow for settling. Refill as needed, if additional settling occurs.
2. Remove stones over 1 1/2" in any dimension, and sticks, stones, rubbish and other extraneous matter.
3. Spread planting soil mixture to minimum depth required to meet lines, grades and elevations shown, after light rolling and natural settlement.
4. Place approximately 1/2 of total amount of planting soil required. Work into top of loosened sub grade to create a transition layer, then place remainder of the planting soil.
5. Dig beds not less than 6" (six inches) deep and mix with specified soil amendments and fertilizers.

#### E. EXCAVATION FOR TREES AND SHRUBS

1. Excavate pits, beds and trenches, with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation.
2. For balled and burlapped (B&B trees and shrubs), make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus following allowance for setting of ball on a layer of compacted backfill: Allow for 3" setting layer of planting soil mixture.
3. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.
4. Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use as backfill.
5. Fill excavations for trees and shrubs with water and allow to percolate out before planting.

#### F. PLANTING TREES AND SHRUBS

1. Set balled and burlapped (B&B) stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball at same elevation or slightly higher as adjacent finished landscape grades. Remove burlap and wire cage from sides of balls; retain on bottoms, if needed. Remove all tags, labels, strings, roping of any kind. Dispose of properly. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3-full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.
2. Create "bowl" with backfill to allow for mulching and watering.
3. Mulch tree pits, trenches and planted areas. Provide not less than following thickness of mulch and work into top of backfill and finish level with adjacent finish grades.
4. Provide 2" (two inch) thickness of mulch.
5. Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice.

Prune trees to retain required height and spread. Unless otherwise directed by the College, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune shrubs to retain natural character.

6. Remove and replace excessively pruned or malformed stock resulting from improper pruning.
7. Guy and stake trees immediately after planting, if needed. Remove guys and stakes after one season.

## G. PLANTING UNDER A TREE CANOPY

1. Do not add more than 4" total of soil and/or mulch.
2. Keep mulch away from base of tree, any wood chips or soil that come in contact with the trunk of the tree will promote rot of the tree trunk.
3. Never till soil under canopy, do no overwork the soil under the tree.
4. Work with hands or hand tools only, no large equipment.
5. Do not plant within 3 feet of the tree trunk.
6. Do not plant anything within drip line that will compete with the tree for moisture and nutrients such as another tree or large shrubs.
7. Avoid cutting roots from 1-inch diameter or greater.

## H. SEEDING NEW LAWNS

1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
2. Sow seed using a spreader or seeding machine at seeding rate indicated herein. Please note that there must be at least 75% grass germination coverage before any final payment for grass seeding can be made and before final approval of project. An appropriate fertilizer must be added to the slurry. And no seed will be allowed to come in contact with mulched beds. Use of a drop seeder around these areas might be necessary.
3. Do not seed when wind velocity exceeds 5 miles per hour.
4. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
5. Sow grass seed at a rate of 4.0 lbs per 1,000 sq ft.
6. Protect seeded slopes against erosion with erosion control or other methods acceptable to the College.
7. Protect seeded areas against erosion by spreading straw mulch within 24 hours after seeding. Place straw mulch uniformly in a continuous blanket at the rate of 2-50 lb bales per 1,000 sq ft of area. A mechanical blower may be used for straw mulch application when acceptable to the College.
8. Contractor responsible for getting the new seed established. Responsible for watering or reseeding as needed until the first complete mowing.

## I. SEEDING SLOPES

1. Use Ernst Conservation Seed to determine appropriate seed mixture. Confirm selection with B&G personnel, if not already specified.
2. Use anti-erosion mulch, discussed earlier.

## J. TIME OF SEEDING

1. Seed immediately after preparation of seedbed. Seeding shall be done between April 1 and June 1, or between August 15 and October 15. When delays in operations carry the work

beyond the seasons specified, or when conditions of high winds (winds that exceed 5 mph velocity), drought, excessive moisture or ice are such that satisfactory results are not likely to be obtained at any stage of the work, the work will stop and it shall be resumed only when the desired results are likely to be obtained, or when approved corrective measures and procedures are adopted.

2. Seed indicated areas within contract limits and areas adjoining contract limits disturbed as a result of construction operations.
3. Work notification: Notify College at least seven (7) working days prior to start of seeding operations.
4. Protect existing utilities, paving, and other facilities from damage caused by seeding operations.
5. Perform seeding work only after planting and other work affecting ground surface has been completed.
6. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.
7. Provide hose and lawn watering equipment as required.

## K. METHOD OF SEEDING

1. Mechanical drills or seeders shall place the seed to a depth not exceeding 1/4" (one quarter inch). Two passes of seeder shall be made over each area, the second pass being made at right angles to the direction of the first, one-half of the required amount of seed being sown in each pass.
2. Broadcast seed shall be covered to a depth not exceeding 1/4" (one-quarter inch) by raking, brush or chain harrowing, or other approved method. Broadcast seeding shall not be done during windy weather. After sowing, the seeded areas shall be lightly rolled and watered with fine spray.
3. Rollers for firming the seedbed before and after seeding shall weigh not more than 65 pounds per foot of width. Cultipaker, or similar equipment, may be used in one operation to cover the seed and firm the seedbed after seeding.

## L. RECONDITIONING EXISTING LAWNS AND PLANTING AREAS

1. Recondition existing lawn and planting areas damaged by contractor's operations, including damage due to storage of materials and equipment and movement of vehicles. Also, recondition existing lawn and planting areas where minor re-grading is required.
2. Provide fertilizer, seed or sod, plants and soil amendments as specified for and as required, to provide a satisfactorily reconditioned lawn or planting area.
3. Cultivate bare and compacted areas thoroughly to provide a satisfactory planting bed. Allow for settling. Refill as needed, if additional settling occurs.
4. Remove deceased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from contractor's operations, including oil drippings, stone, gravel, and other loose building materials.
5. Where substantial lawn remains, but is thin, mow. Rake aerate if compacted, fill low spots, remove humps, and cultivate soil, fertilize, and seed. Remove weeds before seeding, if extensive, apply selective chemical weed killers as required. Apply a seedbed mulch, if required, to maintain moist condition.
6. Water newly planted lawn/planting areas and keep moist until new roots are established.
7. Begin maintenance immediately after planting.

## M. SODDING NEW LAWNS

1. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
2. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to sub grade or sod. Tamp or roll lightly to ensure contact with sub grade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass.
3. Water sod thoroughly with a fine spray immediately after planting

## N. CLEAN-UP AND PROTECTION

1. During landscape work, keep pavements clean and work area in an orderly condition.
2. Protect landscape work and materials from damage during landscape operations, operations by other contractors, and trades and trespassers.
3. Maintain protection during installation and maintenance periods.
4. Treat, repair or replace damaged landscape work as directed.

## O. DISPOSAL OF REFUSE AND OTHER MATERIALS

1. All landscape related items must be disposed of properly.
2. Permission must be granted before disposal of items on Bard College property is allowed.
3. Confirm disposal requirements with Building and Grounds.

## P. INSPECTION AND ACCEPTANCE

1. When landscape work is completed, including maintenance, the College will, upon request, make an inspection to determine acceptability.
2. Landscape work may be inspected for acceptance in parts agreeable to the College, provided work offered for inspection is complete, including maintenance.
3. Where inspected, if landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by the College and found to be acceptable. Remove rejected plants and materials promptly from project site.



# VII. LANDSCAPE MAINTENANCE

- All plants and newly seeded lawn areas will have an agreed upon survival rate and replacement guarantee when installed by subcontractors specified in the work contract.
- In general, the Standards for Organic Land Care Practices for Design and Maintenance of Ecological Landscapes should be followed at all times. (see *References*). Also, refer to Landscape Specifications in this manual for specific landscape maintenance tasks.

## A. IRRIGATION

1. Trees/shrubs/perennials shall be watered deeply, but infrequently, to promote deeper rooting, and shall be fertilized as required by ANSI A300.

## B. DEAD PLANTS

1. Dead plants shall be removed and replaced. Damaged branches shall be removed and overgrown areas shall be thinned by the selective removal of unnecessary plants.

## C. ACCESSIBILITY

1. Shrubs and vines used for screening trash enclosures and service areas shall be pruned to maximize screening while allowing access to the storage/service areas.

## D. PRUNING

1. Depth pruning should always be practiced for all shrubs in addition to any hedge trimming to allow for proper air circulation.
2. Proper pruning cuts on all plant material are expected.

## E. WEEDS

1. The preferred method of weeding is to do so after it has rained or with a hand tool to ensure that most of the root is removed. Basic hand weeding is not acceptable if the root remains in the grounds.

## F. EDGING

1. A “Victorian” straight edge is preferred. Clean, straight lines.
2. Mulch up to edge only.

## G. MULCHING

1. Natural, brown, double ground mulch is recommended.
2. Mulch should only be applied if needed, or if existing mulch is less than 2”.
3. Apply mulch at a maximum of 3- 4” only.
4. Newspaper or cardboard can be used as a weed barrier. No fabric is allowed.
5. No mulch should be piled around the base of the plant.

## H. TRANSPLANTING

1. All transplants should be pruned prior or just after planting of all broken branches or awkward/dead limbs.
2. They should be planted at the proper soil level and no soil should be piled around the base of the plant. The soil must be tamped down, but not compacted such that air is not able to penetrate the root system at all, especially for spring plantings.
3. Transplants should be watered during and/or after planting is finished. Monitor all transplants for 1 year.

## I. CLEAN-UP

1. Debris and trimmings produced by thinning and pruning shall be removed from the site.

## J. EQUIPMENT

1. All landscape maintenance equipment that is the property of Bard College and used on Bard grounds must be returned in the condition it was found in. Failure to return equipment will result in compensation or disciplinary action.
2. All handheld power equipment must be secured when traveling in the bed of a truck to prevent rollover and breakage.
3. No faulty equipment should be returned to the Horticulture tool cage. It must be repaired, disposed of properly and/or replaced.
4. JLG Manlift: Use of the Bard College JLG man lift requires the contractor to fill out an agreement form and to perform a visual inspection of the equipment prior to operation. Agreement and inspection forms are available at B&G.
5. String Trimming: No scalping of the lawn is permitted. String trimming is not be allowed around the base of tree trunks.

## K. WILDLIFE

1. If any form of living wildlife (including bird eggs) is encountered, precautions should be made to not disturb or gently move the wildlife to a nearby location without disturbing it.
  - a. The Arboretum is part of the first “bird-friendly” campuses in the United States. We work in conjunction with a student-run group and the National Audubon Society to feed, house and water birds on campus. Whenever possible, bird-friendly and wildlife-friendly plants should be selected and protected.
2. If dead wildlife is encountered, it should be disposed of using proper methods to reduce infection and disposed of in a College dumpster or perimeter location.

## L. LANDSCAPE MAINTENANCE SCHEDULE (TYPICAL FOR BARD COLLEGE HORTICULTURE DEPARTMENT)

Please coordinate all contracted landscape projects with already scheduled landscape campus work. See schedule below.

<b>January</b>	<b>Intercession Tree Work on main campus and dorm areas</b>
<b>February</b>	<b>Tree Work campus-wide</b>
<b>March</b>	<b>Tree Work campus-wide; Prune Crabapples, red twig/yellow twig dogwoods, viburnums; prune wisteria at Blithewood; cut down lirope</b>
<b>April</b>	<b>Prep for Commencement (Admissions, Faculty Circle and commencement field are priority); Plant trees; Arbor Day/Earth Day; Pansies out; Treat Ailanthus; Spray Hemlocks; open Blithewood pool</b>
<b>May</b>	<b>Prep for Commencement; Mulching; Planting; Containers</b>
<b>June</b>	<b>Planting; landscape projects</b>
<b>July</b>	<b>Landscape projects; hedge trimming; prep for 1<sup>st</sup> year students</b>
<b>August</b>	<b>Hedge trimming; cut back ivy; landscape projects</b>
<b>September</b>	<b>Cut back ivy; landscape projects; plant trees</b>
<b>October</b>	<b>Plant trees; Leaf Clean up; Family Weekend (clean up Admissions/Fisher Lot); Close up Blithewood Pool</b>
<b>November</b>	<b>Leaf clean up; perennials cut back</b>
<b>December</b>	<b>Continue leaf clean up; DR mowing; tree work campus wide</b>

# VIII. GENERAL TREE CARE

## 1. Goals and Targets

**Goal #1** of the tree care policies outlined below is to promote the health and care of our tree collection as well as the safety of our staff, in accordance with ANSI A300 requirements (2012 version) for the well-being of the Bard community. All ANSI Z133.1 safety requirements for tree care operations must be followed.

The **Target** is to have zero safety violations and zero safety concerns from community members, staff and contractors. This goal will be measured on an annual basis by the Horticulture Supervisor reviewing all complaints and workman's compensation claims.

**Goal #2** is to inventory all the recognized canopy specimen trees and secondary ornamental trees as well as the naturalized trees within the Arboretum.

The **Target** is to conduct ongoing tree hazard evaluations of these trees, with repeating tree evaluations every 5 years. All specimen trees will be labeled with interpretive labels and all records will be kept in the Arboretum office on BG Base Collection Management software and all trees will be mapped using GPS data.

**Goal #3** is to increase the campus tree canopy each year.

The **Target** is to replace as many trees to the campus as are removed each year, as well as add to the canopy each year by as many as the budget will allow through Arbor Day plantings, memorial plantings and new construction plantings.

2. All tree alterations (pruning, removals, attachments of any kind, etc.) must be approved by the College Horticulture Supervisor prior to the commencement of work.
3. All tree contractors must be licensed, certified, and insured for \$2 million dollars prior to the commencement of agreed upon work.

## A. MULCHING

1. Mulch should be placed 2 to 4 inches deep and cover the entire root system, which may be as far as 2 or 3 times the diameter of the branch spread of the tree. If the area and activities happening around the tree do not permit the entire area to be mulched, it is recommended that you mulch as much of the area under the drip line of the tree as possible
2. Only mulch 2 to 4 inches deep around the base of trees, shrubs and perennials, allowing enough space for airflow to the roots. Avoid "mulch volcanoes" entirely. If mulch is piled against the stems or tree trunks, pull it back several inches so that the base of the trunk and the root crown are exposed. If there are drainage problems, a thinner layer should be used. Avoid placing mulch against the tree trunks. Place mulch out to the tree's drip line or beyond.

3. Use only organic mulches including wood chips, pine needles, hardwood and softwood bark, cocoa hulls, leaves, compost mixes, and a variety of other products usually derived from plants. It should be well aerated and, preferably, composted. Avoid sour-smelling mulch. No dyed mulches permitted.
4. Weed barrier fabric is not permitted as an effective barrier between soil and much. Plastic also should not be used because it interferes with the exchange of gases between soil and air, which inhibits root growth.
5. Inspect plants and soil in the area to be mulched. Determine whether drainage is adequate. Determine whether there are plants that may be affected by the choice of mulch.
6. If mulch is already present, check the depth. Do not add mulch if there is a sufficient layer in place. Rake the old mulch to break up any matted layers and to refresh the appearance.

## B. PRUNING

1. Pruning is often desirable or necessary to remove dead, diseased, or insect-infested branches and to improve tree structure, enhance vigor, or maintain safety. Because each cut has the potential to change the growth of (or cause damage to) a tree, no branch should be removed without a reason.
2. Refer to the Best Management Practices Tree Pruning (International Society of Arboriculture).
3. Plants shall be pruned in accordance with ANSI A300 to maintain their intended shapes and sizes and to insure the health of the specimen and safety of the Bard community. All ANSI Z133.1 safety requirements for tree care operations must be followed.
4. It is required that only qualified individuals with sufficient training and experience shall be allowed to perform major tree pruning and thinning operations. Light trimming, grooming, or minor storm damage repair may be performed by semi-skilled personnel under the guidance or direction of trained personnel.
5. Pruning of newly planted trees should be limited to corrective pruning. Remove torn or broken branches, and save other pruning measures for the second or third year.
6. Proper selective pruning and thinning of major limbs should be performed as necessary to eliminate crossing and parallel wood, to remove damaged or diseased wood, to maintain open branching and to improve the overall structure of the tree. As trees mature, they will also require occasional lifting of the canopy to maintain ground clearance for pedestrian circulation, maintenance operations, and possibly vehicular access.
7. Do not use wound dressings on tree cuts.
8. Most routine pruning to remove weak, diseased, or dead limbs can be accomplished at any time during the year with little effect on the tree. As a rule, growth is maximized and wound closure is fastest if pruning takes place before the spring growth flush. Some trees, such as maples and birches, tend to “bleed” if pruned early in the spring. It may be unsightly, but it is of little consequence to the tree. Heavy pruning just after the spring growth flush should be avoided.
9. Pruning cuts should be made just outside the branch collar. The branch collar contains trunk or parent branch tissue and should not be damaged or removed. If the trunk collar has grown out on a dead limb to be removed, make the cut just beyond the collar. Do not cut the collar.
10. Major limb removals shall be properly cut at the base of the limb and shall not include collar removal. Flush cutting or collar removal of a large limb requires longer for the wound to heal which causes the tree to be at greater risk to heartwood rot, disease, pest penetration, etc. It is more desirable to have a smaller cross-sectional area cut that will heal or callus over, in a shorter length of time.
12. Plants shall be pruned to avoid blocking walks, roads, road signs, light poles, and

sight distance views for vehicular traffic.

13. Debris and trimmings produced by thinning and pruning shall be removed from the site.
14. Only remove up to one-third of the total canopy at a time to allow the tree or shrub to recover properly.
15. Do not top or pollard trees unless specified in maintenance operations.

### C. PRUNING SCHEDULE

1. The maintenance pruning schedule shall be dictated by tree species, age, function, and placement.
2. Trees less than 7 years old should receive structural pruning on an annual or biennial basis
3. Trees 7-20 years old should receive structural pruning every two to five years
4. Trees 20 years old and older receive maintenance pruning every five to seven years to clean dead, diseased, dying, and defective branches from the crown
5. Trees adjacent to roadways, walkways, signs, and street lights are annually inspected for safety and clearance issues and maintenance pruned as necessary

### D. PRUNING TECHNIQUES

Specific types of pruning may be necessary to maintain a mature tree in a healthy, safe, and attractive condition.

1. **Cleaning** is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches from the crown of a tree.
2. **Thinning** is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.
3. **Raising** removes the lower branches from a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas.
4. **Reduction** reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, reduction helps maintain the form and structural integrity of the tree.

### E. CABLING, BRACING AND GUYING

1. All cabling, bracing and guying of new or mature trees must be approved by the College.
2. Only trees, which are not self-supporting, shall be staked or guyed. Tree guys and stakes ties shall be inspected and adjusted periodically and removed when necessary, to insure that they are adequately surrounding the tree without girdling trunks or branches.
3. Refer to and abide by the Best Management Practices Tree Support Systems: Cabling, Bracing, and Guying. (International Society of Arboriculture) and ANSI A300 (Part 3) Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Support Systems a. Cabling, Bracing, and Guying). International Society of Arboriculture.

### F. TREE REMOVAL

1. Removal is recommended when a tree:

- is dead, dying, or considered irreparably hazardous
  - is causing an obstruction or is crowding and causing harm to other trees and the situation is impossible to correct through pruning
  - is to be replaced by a more suitable specimen
  - should be removed to allow for construction (only when needed and cannot be avoided)
2. All tree removals must be approved by the College prior to the start of the work.
  3. Only qualified individuals will be allowed to perform tree removals.
  4. All individuals involved in tree removals must refer to and abide by ANSI Z133.1 American National Standard for Tree Care Operations (International Society of Arboriculture).
  5. The Tree Ordinance Guidelines, Provision 31. (International Society of Arboriculture) must be consulted prior to any tree removal if the tree to be removed has the ability to qualify as a heritage or historic tree.
  6. Any tree that is located less than 25' from the center line of the road (on Annandale Road) is considered in the right-of-way and a "county tree." These trees should be pruned or removed by County personnel, unless other approval is granted.
  7. Tree brush, debris, chips and logs should be disposed of properly. Bard personnel must approve alternative disposal methods.
  8. All stumps must be cut as flush to the ground as possible. If this is not possible, Bard personnel must be consulted.
  9. All Ailanthus and other weedy trees that resprout once cut, must be cut high to allow recutting in the spring season and treated with systemic.

## G. STUMP GRINDING

1. Contract a professional-for-hire.
2. Consult College personnel on the specifications concerning whether to leave grindings in place, otherwise, remove them and fill hole with topsoil, grass seed and mulch hay.
3. Grind entire stump and surrounding roots.
4. Any damage, ruts, or disturbance to lawn or garden beds during the grinding process, must be repaired to its original condition by subcontractor.
5. Leave a safety device (safety flagging or safety cone) if a hole in the ground is left from the grinding process overnight.
6. All grindings must be removed, topsoil added and left slightly mounded to allow for decay and settling to occur.

## H. HAZARD AND EMERGENCY TREE REMOVAL

1. A tree is deemed "hazardous" based on the ISA Hazardous Evaluation. Currently trees on campus are being evaluated using this method. Contact the Horticulture Department for more information.
2. If a tree is considered "hazardous" it is scheduled for removal. Tree removals are usually done by Bard staff or contractor.
3. All hazardous or emergency tree removals should be cleaned up in a timely manner.
4. If the hazardous tree has damaged any College or other property, it must be documented. Photos must be taken, College Security notified and in some cases the State Police must be notified.

## I. MANAGING FOR CATASTROPHIC EVENTS

1. In the event of severe weather conditions such as tornadoes, hurricanes, ice, snow, and wind storms, falling trees will be removed by Bard College staff or a subcontractor.
2. Roads and streets shall be cleared first, then access to critical buildings, administration, library, student center, dorms, etc., in that order.
3. All trees damaged or broken will then be pruned to restore their health and structure.
4. In advance of severe weather conditions, all necessary equipment shall be checked for readiness and safety by staff.
5. All hazardous areas that cannot be cleaned up in advance car or pedestrian traffic, the area must be barricaded off with barricades, cones, caution tape, etc. for the safety and protection of the community.
6. If during the course of the event, trees damage any College or other property, it must be documented. Photos must be taken, College Security notified and in some cases the State Police must be notified.
7. If the Horticulture Department budget permits, lost trees will be replaced to restore the structure and function of the campus forest in a reasonable time frame.

## J. FLOODING

1. Floodwaters are contaminated with raw sewage, so vegetables from flooded gardens should be handled with caution.
2. Give the soil a chance to dry out before replanting. Working wet soils will lead to large dirt clots and soil compaction in the future.  
Established landscape plants have a better chance of survival, depending on how long they were under water and how resilient the species. It is hard to predict which plants will survive, and which will have a slow or immediate reaction to low soil-oxygen levels. Most will show effects quickly and die or recover quickly, while others may not show the full signs of flood stress until next year or the year after.
3. Cover any exposed roots and remove excess silts and soils covering tree trunks and crowns. Some tree species are more resilient to flooding conditions and will survive, while others will slowly show signs of lack of aeration (too much water around the roots and not enough oxygen). Leaves will turn yellow, drop off and eventually the plant will respond with branch dieback. Anticipate that plants may be stressed, with poor growth and more diseases. Excessively wet soils encourage root and crown diseases like *Fusarium* spp., *Phytophthora* spp., *Pythium* spp. and *Rhizoctonia solani*.
4. Reduce stress and disease by improving the site's drainage. Replace lost soils with organic matter. Maintain plant health by avoiding excessive nutrients while plants are recovering. Use fertilizers sparingly – they can accelerate disease populations. Organic matter will replace lost soil microbes as well as slow-release nutrients to promote plant health.
5. During this growing season, cut back only the branches that are dead or broken from the storms. Wait to see if other parts of the plant start to bud out in the next month or two.
6. Too much water can be just as damaging to turfgrasses as a severe drought. Although flooded turfs may be prone to erosion, turfgrass plants may not be directly injured by water. Unfortunately, saturated soils and the debris left on the turf surface after water recedes can be especially problematic.
7. Soil erosion is greatest when flood waters flow rapidly in channels across a turf. Several factors influence the amount of damage resulting from turf being covered with water. The level of turfgrass injury resulting from submersion also depends on the water temperature and depth, and the amount of time the turf is



submerged. Turfgrass plants with leaves extending above the water surface usually survive longer than those that are completely submerged. When soils remain too wet for too long, oxygen becomes limiting near turfgrass roots and the carbon dioxide level rises. When the soil is saturated, the soil oxygen may be depleted within a few hours, and plants are less able to take up water and nutrients. The yellowing of turfgrass plants after being submerged may be due to a lack of nitrogen. More soil and debris are deposited by flood waters when water is moving slowly. Soil and debris two or more inches deep should be removed from the turf as soon as possible after flooding. It is often very difficult to remove a thin (e.g., one inch or less) layer of soil or debris. If the thin layer of soil and debris begins to restrict the rate at which water moves from the turf surface into soil, consider core aerifying during favorable weather.

# IX. FERTILIZATION

1. When necessary, complete soil tests prior to fertilization to make sure that the appropriate type, quantity and frequency of fertilization applications corresponds to the needs of the soil. Refer to *Landscape Specifications, Soil Amendments*.
2. Whenever possible, use a slow-release fertilizer on all annuals, perennials, trees and shrubs, with at least 50% of the ingredients derived from natural organic sources. Processed or aged compost or leaf mulch may be used if appropriate.
3. Refer to the Best Management Practices Tree and Shrub Fertilization. (International Society of Arboriculture.) and ANSI A300 Tree Fertilization Standard. (International Society of Arboriculture).
4. New lawn fertilization/mature lawn fertilization. Some types of fertilizers Bard has used in the past include:
  - a. Starter fertilizer for newly planted areas and then one application after lawn is established.
  - b. General Maintenance use organic fertilizer such as Nature Safe 10-2-8.
5. Garden bed plantings. Some types of fertilizers Bard has used in the past include:
  - a. Newly planted trees-Dry Roots, Ironite.
  - b. Annuals and perennials - Osmocote.
  - c. Perennials and shrubs—Ironite or Epsoma.
6. If there are specific soil problems, soil samples should taken to determine corrective measures.
7. Fertilizer should be applied during April to June, if possible. Application of a granular or liquid fertilizer should avoid contact with all nearby leaves, to prevent leaf burn and applied according to manufacturer's directions.
8. Apply fertilizer before a rain event, otherwise water fertilizer into soil.
9. If large-scale fertilizers are applied, make sure to review type, quantity and location with College personnel prior to application.

# X. PLANT HEALTH CARE & INTEGRATED PEST MANAGEMENT

1. Use Plant Health Care (PHC) whenever possible. The objective of PHC is to maintain or improve the landscape's appearance, vitality and—in the case of trees—safety, using the most cost-effective and environmentally sensitive practices and treatments available. Plant Health Care involves monitoring and using preventive treatments.
2. When needed use Integrated Pest Management (IPM), which is the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazard to people, property, and the environment.
3. Use *IPM Standards for Schools Tactics and Resources for Reducing Pests and Pesticide Risks in Schools and Other Sensitive Environments* (see References).
4. Hire licensed and trained specialist for consultations and pesticide or herbicide applications.
5. All herbicides, pesticides, dormant oils and other potentially toxic applications must be approved by the College before application.
6. Appropriate and approved signage must be installed around the perimeter of the sprayed area 24 hours prior to the application and must remain in place for 24 hours after the application occurs.

# XI. SUSTAINABLE LANDSCAPING PRINCIPLES

1. We are in a temperate region of the US with hot, humid, summers (greater than 68 F) and cold winters (less than 32 F) and all site planning and design should seek to control winter winds, and promote solar gain and storage. Structures should be sited on southerly slopes for solar gain in winter. Avoid northern entrances to buildings.
2. Plant deciduous trees for afternoon shade. Site structure on middle to upper slope for access to light winds, but protection from high winds.
3. Solar Power: Plant trees to the east and west of the building, rather than to the south to cool the building in the summer and warm the building in the winter.
4. Plant trees or shrubs to shade air conditioning compressor units – it can increase cooling efficiency as much as 10%.
5. Slowing the wind: For an average frame house, air infiltration from wind can cause about 1/3 of the winter heat loss. Heat loss can be significantly reduced by planting a windbreak in the direction from which prevailing winds blow. Plant evergreen trees close together to create a complete wall against the wind. Choose trees adapted to this region with branches close to the ground. Maximum protection from wind occurs when the windbreak is no more than the distance of one or two tree heights from the building.
6. Landforms, plants, and structures can be used to divert northerly winter winds while allowing cooling summer breezes. Windbreaks prevent or greatly reduce snow drifting around buildings, on walkways, and roadways. Windbreaks lower the costs of a home heating bill (up to 30%).(National Arbor Day Foundation – Conservation Trees).
7. Use of retention/detention ponds for storm water provides for evaporative/cooling of the site. Foundations for structures and pavement must drain well to prevent damage from frost/thaw action.
8. Riparian buffers slow water flow, reducing the likelihood of downstream flooding. They also filter and spread water, and help hold stream bank soil during flooding. Grasses, trees and shrubs in the strip catch and hold sediments and attached pollutants from adjacent fields before they can wash into the stream.
9. Riparian forests trap and retain significant amounts of nutrients in runoff from agricultural fields. More than 80 % of nitrogen and phosphorus can be kept from entering the stream.
10. Use native or regional plants whenever possible to reduce the need for irrigation, pesticides and fertilizers.
11. Naturalistic design should include plants that produce fruits, nuts or berries that are wildlife friendly.

12. Design should avoid products that require frequent replacement or regular maintenance (to reduce future waste).
13. Right place, right plant.
14. Plant for long term, by selecting healthy and long-lived plant varieties.
15. Strive for diversity and biomass by establishing and protecting areas of biological richness.
16. Use plants to capture airborne pollutants.
17. Design plantings and irrigation for efficient water use.
18. Design should lessen soil compaction while construction is on-going.
19. Use mulch to conserve water on garden beds and around trees.
20. Consider using storm water, grey water and /or condensate water for irrigation.
21. Irrigate early in the day.
22. Use of micro-irrigation is preferred whenever possible. Micro-irrigation (also known as drip, trickle, or dribble irrigation), rather than overhead sprinklers is a method of irrigation in which water is applied directly to the root zone of the plant in a small but frequent quantity in such a way as to maintain the most active part of the soil at an optimum moisture.
23. Refer to the latest version of the *Sustainable Sites Initiative—Guidelines for Performance Benchmarks*.
24. Strive for green infrastructure technologies (bioretention, bioswales, buffers, porous asphalt, porous Pavers, green roofs) whenever possible.

# XII. ROAD & PATH SPECIFICATIONS

## A. ROADS & PARKING LOTS

1. For **asphalt** areas such as roads and parking lots there should be a 6" to 8" base of Crusher Run Item #4, well compacted. The first course should be a base coat of 3" course binder and a top coat of 2" for total thickness of 5."
  - a). **Clay conditions** – Remove 8-12" of existing soils, install road fabric, regrade to desired height with College approved materials and compact. Install required amount of asphalt and compact to College approved finish height.
  - b) **Gravel conditions** – Remove existing gravel to a depth to be determined by the College, install road fabric and College approved materials and compact. Install required amount of asphalt and compact to College approved finish height.
2. For **porous asphalt**, consider the NYSDOT specification used at Olin Parking Lot (403.2999- XX). Olin's Detail included (from surface) 4" porous asphalt, 4" choker course 4" thickness of AASHTO No. 57, 8" thickness of No. 2 Stone, ADS 0801T nonwoven geotextile fabric and ADS biaxial Geogrid BX124GG reinforcement on native soil. Site specific conditions must be evaluated through perc tests for proper design.

## B. PATHS

1. For asphalt areas such as walk ways, they should have a 4" to 6" base of Crusher Run Item #4, well-compacted. The first course of asphalt should be at least 2" of a course binder and topcoat of 1" for a total thickness of 3".
2. For colored and stamped-asphalt paths, they should follow the same guidelines as above, but also have every stamp pressed out clearly, matching given path curves and grade. Two coats of paint should be applied such that it does not completely fill in the stamped pattern, but allows the pattern to show clearly.
3. For paver/stone paths, a good base must be established (4-6" base of Crusher Run Item #4, well-compacted). High traffic flagstone walks must be grouted and sealed. Paver paths must have outside edging and selected paver must be approved by College.
4. Stamped asphalt paths should be painted with abrasive paint (sand or nut shell) or other similar product.
5. Concrete installations should always have a broom finish for traction unless they are painted and then the same applies as above for stamped asphalt.
6. For permeable paving, consider Olin Parking Lot's detail (minimum width of all new sidewalks to be six feet): Eco-Prioria Permeable Interlocking Concrete Paver (by Unilock) or equivalent, ASTM No. 8 stone chip filled joints, Permedge PICP Edge Restraint by SEK Surebond or equivalent (extend bedding course 6" beyond restraint), 1.5"-2" ASTM No. 8 Stone Chip bedding course, 4" ASTM No. 57 Open graded base course, 12" ASTM No. 2 Stone Open graded subbase course. Permeable bricks were 9.45"x4.72" in the standard finish with color approved by Bard Horticulturist.

# XIII. PROTECTION & PRESERVATION POLICIES & PROCEDURES FOR TREES

These policies and procedures must be followed for every project including construction and cut and fill activities, utility corridors, proposed walks and roads, and potential construction staging areas and trenching. Also, if there is any possibility that tree branches may be damaged by construction equipment the procedures below must be followed.

## A. GENERAL PRESERVATION OF HISTORIC OR MATURE TREES

1. Refer to “Defining Special Trees: Heritage, Historic and Landmark Trees”, Provision 31 and “Conservation of Forest and Woodland During Development,” Provision 32, International Society of Arboriculture. <http://phytosphere.com/treeord/heritage.htm>
2. Maintain mature trees unless the trees are dying, dead, diseased or pose a safety hazard to the public or structure . Refer to Guidelines for the Treatment of Cultural Landscapes, established by the Department of the Interior, National Park Service.  
Visit:[http://www.nps.gov/history/hps/hli/landscape\\_guidelines/index.htm](http://www.nps.gov/history/hps/hli/landscape_guidelines/index.htm). For more information on mature tree care, consult the brochures produced by the International Society of Arboriculture (ISA) available for download at <http://www.treesaregood.com/treecare/treecareinfo.asp> or for order at 888-472-8733.
3. Perform regular inspections that will help assess the vitality of the tree(s) and identify any problems, such as dead limbs, signs of disease, detrimental insects or trunk decay. Refer to *Mature Tree Care* brochure, International Society of Arboriculture.
6. Spread organic mulch at a depth of 2-4” and cover as much of the tree’s root system as possible.
7. Aerate compacted soil around the tree’s root zone to increase the tree’s oxygen supply, root growth and water uptake.
6. Control for insect and disease problems. Depending on the situation, treatment might involve application of insecticides or horticultural oils, or removal of an infected limb, among other solutions.
7. Cabling involves the installation of steel cables, attached to screws or bolts that are placed in the tree’s limbs, to provide support or limit a tree’s movement. Cabling can help prevent the large limbs of a mature tree from breaking during storms or heavy wind, thereby extending the life of a tree. Cabling is a specialized job that should be performed only by a certified arborist. In addition, follow-up inspections by a certified arborist are essential to assess the effectiveness of the cable system.
8. Pruning may be necessary to remove dead or diseased limbs, to improve the overall tree structure or to influence the growth of the tree by increasing light and air penetration.

9. Mature trees must be pruned carefully, as they will not tolerate as aggressive a pruning as young trees and the job may require climbing and the use of special equipment. “Topping” or the removal of branches at the tree’s crown to reduce overall height—is never recommended. Topping causes severe stress on the tree and can create hazards. Refer to *Pruning Mature Trees* brochure, International Society of Arboriculture.
10. Girdling roots are tree roots that encircle the base of the tree trunk usually as a result of planting the tree too deeply or raising the grade, which may compromise the tree’s vascular system, and, ultimately, result in death. If detected early, girdling roots may be removed by a certified arborist, thereby extending the life of the tree.

## B. PROTECTION PROCESS

1. All new construction, initial project layout, design and grading shall recognize the desirability of protection and preservation of historic or mature trees with appropriate modifications and adjustments to accommodate preservation and maintenance. Design of the grading and other improvements shall reflect consideration of the following safeguards:
  - a. Disruption or removal of structural feeder roots is prohibited without consent of Bard staff.
  - b. Fencing of trees at or beyond their drip lines during grading and construction activities is required.
  - c. Filling, cutting, development or compaction of soils within the drip line is prohibited.
  - d. Perform other measures required by the species of tree to be preserved as recommended by the consulting arborist, horticulturist or landscape architect.

**Step One: Perform a tree stand delineation.**

This is an overview of the trees that includes: species composition, stocking density, diameter, distribution, age class and condition at a stand level. Stand delineations are useful at the conceptual stage of project planning to identify areas best suited or unsuitable for retention.

2. It is recognized that the complete preservation of healthy trees may sometimes conflict with normal land developmental considerations such as proper drainage, grading, circulation, safety and provision of utilities. In such instances, the design of the development must address preservation of the most desirable and significant of the healthy trees and the developer is encouraged to utilize creative land planning techniques to achieve this end.

**Step Two: Survey Trees within the development area.**

This level of the evaluation collects detailed information about either a defined segment of the trees present or all trees, depending on their proximity to construction.

**Step Three: Identify trees suitable for preservation.**

Trees that are retained should be healthy and structurally sound. Each tree is evaluated for species tolerance to impacts, tree condition, and potential longevity. For suitable trees, a tree protection zone is identified based on other species tolerance, size, age, and condition.



**Step Four:** Assess the potential impacts to trees.

Review all development and construction plans for possible impacts to trees.

3. Bard College, when reviewing development plans, shall determine the adequacy and appropriateness of the proposed protection plan.

**Step Five:** Suggest modification to development plans.

Identify areas where impacts are too severe and suggest modifications to reduce impacts to trees. On expansive clay soils, consider the trees' effects on soil movement.

4. Following approval of such a development, the developer shall submit grading, improvement and precise landscaping plans detailing the approved preservation plan. Such plans shall be approved by the project engineer and/or the approved architect, as appropriate. Prior to the commencement of construction, the preserved trees shall be trimmed for balance, structural integrity, and ornamental appearance and treated for any diseases.

**Step Six:** Identify the tree work needed prior to clearing and grading.

Arboricultural treatments such as pruning, irrigation, fertilization, mulching and pest management may be needed to provide clearance for construction activities and to invigorate the trees.

5. If trees are grouped in a forest or woodlot, then only the location of the woodlot and any trees greater than 24 inches diameter at 4.5 feet above the ground (DBH) need to be identified.

**Step Seven:** Prepare specifications for tree preservation.

Specifications dictate what work will occur and how it will be performed. Specifications should include requirements for protective fencing.

6. Not salvageable

- a. All trees that are within the footprint or in close proximity to the footprint of a proposed building. (Note: alternative footprints to save large, valuable trees should be considered, provided that the alternatives maintain the desired features and costs of the proposed building)
- b. Trees of undesirable species or in very poor health. Examples include, but are not limited to species that have low landscape and educational value, and heavily diseased or damaged trees that have little chance of recovering desirable form and function, even if protected from construction damage.

7. Low priority for protecting

- a. Small trees (less than 10 inches DBH) that fall outside of the building footprint, but are likely to be impacted by construction activities.
- b. Larger trees outside of the building footprint with relatively low landscape value. Examples include but are not limited to, trees with poor form, species of relatively low landscape and educational value, or trees with inadequate space to accommodate current or future growth even if the site is ameliorated.

8. High priority for protecting

- a. Medium (> 10 inches DBH) to large (> 24 inches dbh) trees of desirable species with good form, good health, and room to continue to grow.
- b. Also, trees of specimen quality, regardless of size. To be determined by Bard

Horticulture Supervisor.

9. For specific protection requirements, refer to “Protection of Existing Plant Materials on Construction Sites” in section *IV. Building and Site Design and Considerations* of this manual. Also, consult Chapter 11, Preserving Existing Trees in *Arboriculture, Integrated Management of Landscape Trees, Shrubs, and Vines* (2004).

**Step Eight:** Monitor trees during construction.

The arborist should be on hand to evaluate and treat any damage or change in health to trees that occurs, answer questions and tree care, and respond to design changes.

**Step Nine:** Prepare a post construction maintenance plan.

Trees affected by construction need routine monitoring for health and structural stability so that appropriate treatments can be applied.

# XIV. BARD COLLEGE COMMEMORATIVE GIFT POLICY

(TREES, GARDENS OR PLANTINGS, OBJECTS, AND PLAQUES)

## A. DEFINITION

1. Commemorative trees are those, which are appropriate for our geographical location.
2. Commemorative plantings may include but are not limited to annual or perennial flowers, bulbs, and shrubs.
3. Commemorative objects may include, but are not limited to benches, plazas, walkways and special features such as fountains, pavilions, sculptures, books, etc.

## B. QUALIFICATIONS

1. Commemorative trees, plantings, and objects recognize gifts from one or more donors to the College. These gifts may be given to an endowment fund, a current use fund, or they may be a gift-in-kind. The donor must fill out a "Gift Application" to apply. See Horticulture Supervisor for a copy.
2. All gifts are to be processed through the Bard College Office of Development and Horticulture Department.
3. Commemorative trees, plantings and objects may be located on campus, or on associated campus property.
4. The Bard College Horticulture Supervisor reserves the right to determine the type and placement of all trees, plantings and objects which are subject to review by the Director of Buildings and Grounds and appropriate College officials.

## C. FUNDING

1. To have a commemorative tree, planting, or object placed on campus, a monetary gift or a gift-in-kind must be made to the campus. The Horticulture Department will recommend minimum gift levels, approved by the Office of Development.
2. The Horticulture Department will provide the following:
  - a. The actual tree, planting or object, unless it is a gift-in-kind.
  - b. All materials and labor as required to install and maintain the commemorative tree, gift planting or object.
  - c. All labor required to install and maintain standard campus identifying tags.
  - d. All costs in conjunction with the replacement of commemorative trees and plantings will be incurred by Buildings and Grounds.

## D. WARRANTY

1. If a commemorative tree, or planting dies or becomes unsightly due to disease, vandalism, or acts of God (aesthetic judgments to be determined by Buildings and Grounds) within ten years of the planting or installation, it will be removed and a replacement will be installed in the name of the donor.
2. A standard campus identification label or plaque, will be attached to the tree or object, or placed near a planting and maintained. Must follow guidelines in *Bard College Sign Standards*, April

2007, if appropriate.

3. If unforeseen construction (such as new buildings or roads) causes the removal of a commemorative tree, planting, or object within twenty (20) years of the time it is planted, it will be relocated or replaced in an appropriate location in the name of the donor.
4. The location, size, and selection of all replacement trees, plantings and objects will be determined by the Horticulture Supervisor.

#### **E. RECORDS AND RECOGNITION FOR TREES, PLANTINGS AND OBJECTS**

1. After installation, each commemorative tree, planting and object will be photographed, sited from two or more reference points and its description will be recorded. This record will then be placed on file with Buildings and Grounds, and a copy will be forwarded to the donor of the gift and the Office of Development.
2. Each commemorative tree, planting and object will be recognized by means of a standard campus identification plaque or sign.
3. Items of information to be included on each sign will be limited to the following:
  - a. Person for whom the tree, planting, or object commemorates
  - b. Common and botanical names of trees and plantings.
  - c. Name of donor (optional); when more than one donor is involved, a collective name such as “Friends of” or “Family of” will be implemented.
  - d. Date planted or installed.
  - e. See example below for standard (3”x 5”) layout of campus standard tag for commemorative trees and plantings. It is made from a state-of-the-art aluminum material, whose images and text are embedded within a sapphire-hard anodized layer that meets the most stringent military specifications for durability. Branch tie or sign stake are optional.

## **KOBUS MAGNOLIA**

*Magnolia kobus*

Family: Magnoliaceae

**In Memory of Jane Doe**

**Bard Arboretum 2007**

- f. If the donor would like a bronze plaque instead of or in addition to a campus standard tag, then they would need to be in contact with the Director of the Physical Plant to find out about costs and wording specifications.

4. The Bard Horticulture Supervisor and Office of Development will develop exact wording and layout for each tag after receiving advice from the donor. Prior to printing of each tag, a mock-up will be sent to the donor for a review of accuracy.
5. For the duration of its life span, each commemorative tree, planting, and object will be maintained by the appropriate campus department.
8. All records associated with each commemorative tree, planting and object will be maintained for the duration of each tree's life span by Buildings and Grounds.

# XV. TEMPORARY INSTALLATIONS

1. A **temporary installation** is any and all alterations to the physical environment to the Bard College campus. This includes: outdoor artwork, sculpture, structures, performances, that include: digging, removal or addition of any materials to the landscape or buildings, and the alteration of any of Bard's property in any way. It is also an installation that will be removed at a foreseen date or time.
2. All temporary installations on Bard Campus must be approved by Bard faculty, staff and/or administration before installation begins.
3. Location, duration of installation, materials, set up, time of removal etc. must be agreed upon.
4. Failure to remove installation by agreed upon time will result in a fine/charge on individual's personal account.
5. Refer to Addendum: *Temporary Installation Agreement Contract*.

# XVI. VEGETATION DAMAGE ASSESSMENT

1. All trees or vegetation on campus property that becomes damaged will be assessed by the Horticulture Supervisor using the *Property Damage or Loss* notice form (see Addendum) and submitted to the proper College authorities and a copy will additionally be submitted to the person or party responsible for the damage (if known) within seven (7) business days of the violation.
2. The results from the initial evaluation will determine whether the tree or vegetation should be removed, pruned, or receive treatment such as fertilization and insect/disease control.
4. All removed trees and plants will be removed from the campus-wide inventory list.
5. Assessment of the value of the repair will be determined using the ISA Guide for Plant Appraisal.
6. Enforcement – Enforcement of tree protection measures is performed by the Horticulture Supervisor and project managers. Student Accounts, Bard personal accounts administration will oversee proper enforcement of applied charges.
7. Penalty - If known, the person or party responsible for the damage will be charged for any repairs, removals, or replanting in order to restore the vegetation to its original or close to original state, purpose and appearance.
8. Appeals – If the person or party responsible for the damage chooses to appeal the charges, then the appropriate authorities must be notified in writing and then hear the appeal in person, in order to make their own judgments based on individual cases.

# XVII. PROHIBITED PRACTICES

1. No faculty, staff, student, resident or contractor may alter the campus environment, trees, shrubs or other plantings without permission or in direct opposition to the best practices described in this manual. This includes additional plantings, art installations or any form of digging in and around campus trees.
2. Grading and excavations will not occur within the drip line of existing plant materials that have been identified to remain. It will additionally avoid as much of the root system as possible. Air spade around root systems whenever it is needed to avoid root removal.
3. When trenching, no more than 25% of the root system should be removed.
5. No construction waste materials shall be stored, dumped, poured or buried, in the proximity of any trees or any other plant materials on site. These waste materials may include but are not limited to: fuels, solvents, paints, detergents, caustics, etc. The contractor shall report the occurrence of any soil contamination incident. In the event that soil contamination does occur, the contractor shall be responsible for the removal and replacement of the affected topsoil and the replacement of existing plant materials.
5. No plant with multiple “invasive” characteristics will be allowed to be planted on the Bard College campus.
6. Trees should not be located any closer to a structure than a distance equal to the tree’s mature spread.
7. Do not plant within 3 feet of the tree trunk.
9. Do not plant anything within drip line that will compete with the tree for moisture and nutrients, such as another tree or large shrubs.
9. Do not cut roots 1-inch diameter or greater.
10. Do not use wet grass seed or seed that is moldy or otherwise damaged in transit or storage.
11. No dyed mulches permitted.
12. Do not use wound dressings on tree cuts.
13. Only remove up to one-third of the total canopy at a time to allow the tree or shrub to recover properly.
14. Do not top or pollard trees unless specified in maintenance operations.
15. No vandalization of any kind to campus plantings is tolerated.
16. No weed barrier fabric is permitted in planting beds or around trees.
17. Topping, heading, hat-racking, or any other form of inappropriate crown/branch reduction pruning shall not be permitted except in emergency situations or in executing a crown restoration procedure.
18. No bike locking to trees.



19. Parking enforcement of any vehicle on top of or near tree roots.
20. No removal of campus vegetation of any sort, without permission from the Horticulture Department.
21. All temporary or permanent installations on campus property **MUST** be granted permission by Buildings and Grounds before they are installed, otherwise they are subject to removal.

# XVIII. REFERENCES

## **Flood Information for Landscape and Garden**

Beth Babbit, Urban Horticulture Specialist & Dr. Tom Sample, Turf Specialist  
Plant Sciences Department University of Tennessee Extension, 5/10/10

## **Integrated Pest Management**

IPM Standards for Schools Tactics and Resources for Reducing Pests and Pesticide Risks in Schools and Other Sensitive Environments. Version 3.2, July 22, 2004. <http://www.ipminstitute.org>, IPM Institute of North America, Inc.

## **Land Management**

American Society of Landscape Architects, Ladybird Johnson Wildflower Center, United States Botanic Garden. Sustainable Sites Initiative—Guidelines and Performance Benchmarks, Draft 2008.

Clouting, Jennifer, Eleanor Hoffman, Todd Martin, and James Siesfeld. Management Recommendations for Blithewood's Northwest Forest. Graduate School of Environmental Studies, Ecology Tutorial. 1993.

Standards for Organic Land Care Practices for Design and Maintenance of Ecological Landscapes. NOFA Organic Land Care Committee, Connecticut and Massachusetts Chapters, Northeast Organic Farming Association, 2<sup>nd</sup> Edition, January 2003.

## **Landscape Architecture and Design**

Time-Saver Standards for Landscape Architecture: Design and Construction Data. Second Edition. McGraw Hill Publishing Company. New York. 1998.

## **Landscape Maintenance**

Dictionary of Standard Definitions for the Green Industry 2005-2006. Tree Care Industry Association, Inc. Manchester, NH 2005.

## **Plant Material**

American Standard for Nursery Stock, ANSI Z60.1, latest edition. published by the American Nursery and Landscape Association (ANLA), 1000 Vermont Avenue, NW, Suite 300, Washington, DC 20005. 2004. [www.anla.org](http://www.anla.org), ISBN 1-890148-06-7.

## **Trees**

Harris, Richard W., James Clark and Nelda Matheny. Arboriculture – Integrated Management of Landscape Trees, Shrubs and Vines. 4<sup>th</sup> Edition. Prentice Hall: Upper Saddle River, NJ. 2004

Georgia Tech Campus Tree Care Plan. 2008

Gilman, Edward F. and Sharon J. Lilly. Best Management Practices Tree Pruning. International Society of Arboriculture. Champaign, IL . 2002

International Society of Arboriculture. Tree Ordinance Guidelines, Provision 32, and Guidelines Defining Special Trees. , PO Box 3129, Champaign, IL 61826. 2006. <http://www.isa-arbor.com/publications/tree-ord/heritage.aspx>

Smiley, Thomas, Sharon J. Lilly, and Patrick Kelsey. Best Management Practices Tree and Shrub Fertilization. International Society of Arboriculture. Champaign, IL 2002.

Smiley, E. Thomas, Sharon Lilly. Best Management Practices Tree Support Systems: Cabling, Bracing, and Guying. International Society of Arboriculture. Champaign, IL. 2001.

Virginia Tech Campus Tree Care Plan. 2008.

ANSI Z133.1 American National Standard for Tree Care Operations. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826. 2006.

ANSI A300 Transplanting Standards. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826. 2006.

ANSI A300 Construction Management Standards. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826. 2006.

ANSI A300 Pruning Standard. International Society of Arboriculture. PO Box 3129, Champaign, IL 61826. 2006

ANSI A300 Tree Fertilization Standard. International Society of Arboriculture, PO Box 3129, Champaign, IL 61826. 2006.

ANSI Z133.1 Pruning, Repairing, maintaining and Removing Trees and Cutting Brush – Safety Requirements. International Society of Arboriculture. Champaign, IL . 2000.

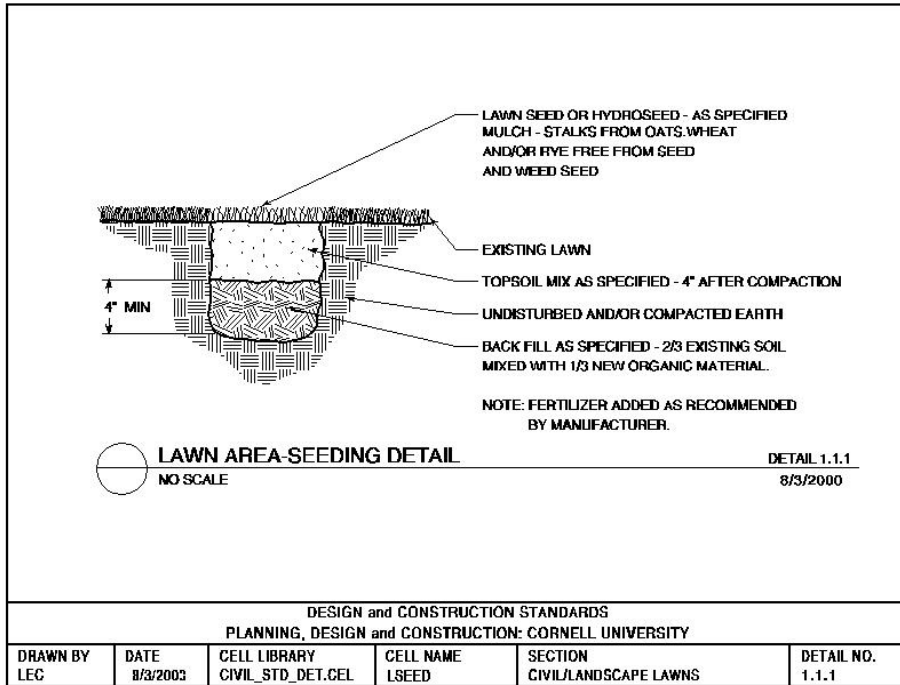
ANSI A300 (Part3) Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Support Systems a. Cabling, Bracing, and Guying). International Society of Arboriculture. Manchester, NH. 2000.

## **Topsoil**

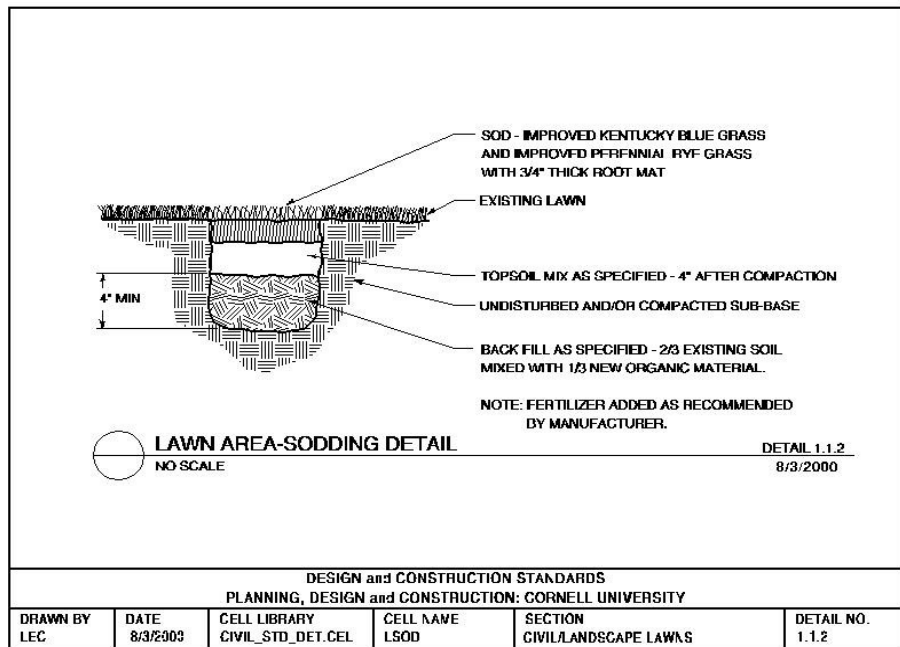
Active Standard: D5268-02 Standard Specification for Topsoil Used for Landscaping Purposes. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA

# XIX. LANDSCAPE DETAILS

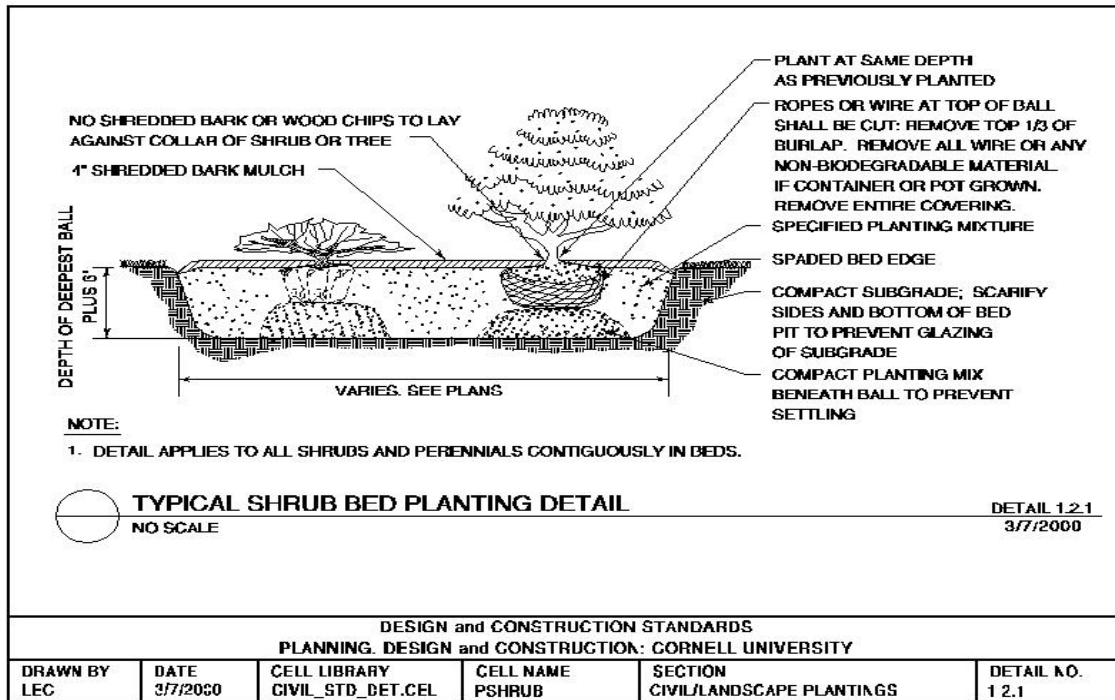
## A. LAWN AREA SEEDING DETAIL



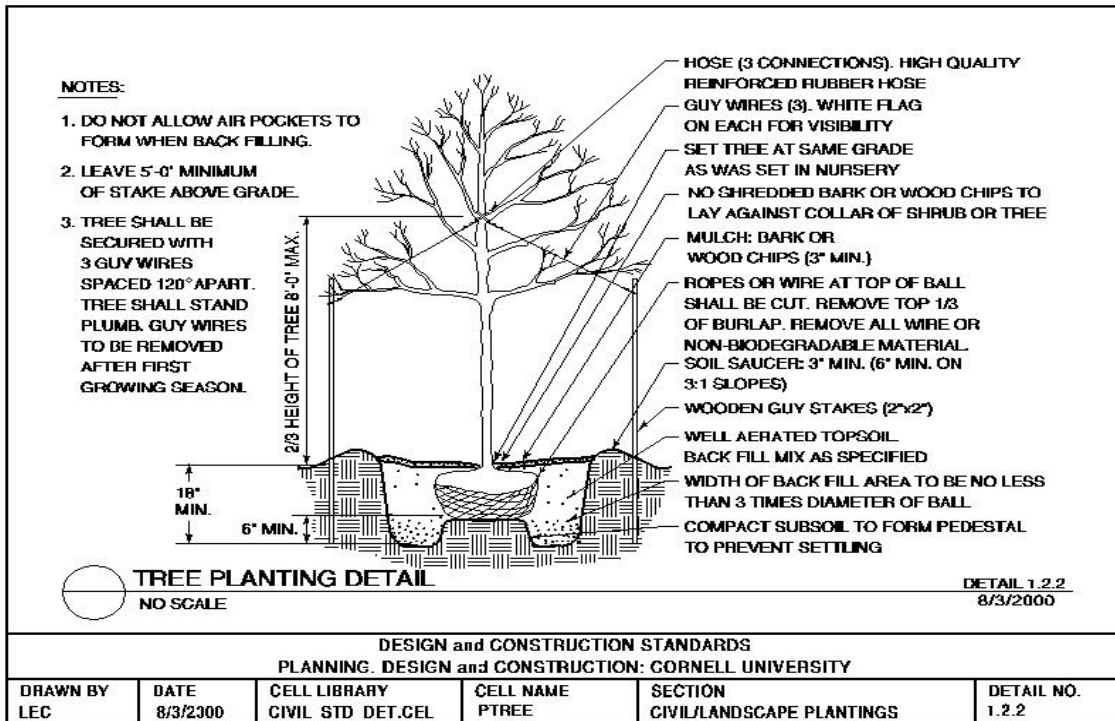
## B. LAWN AREA-SODDING DETAIL



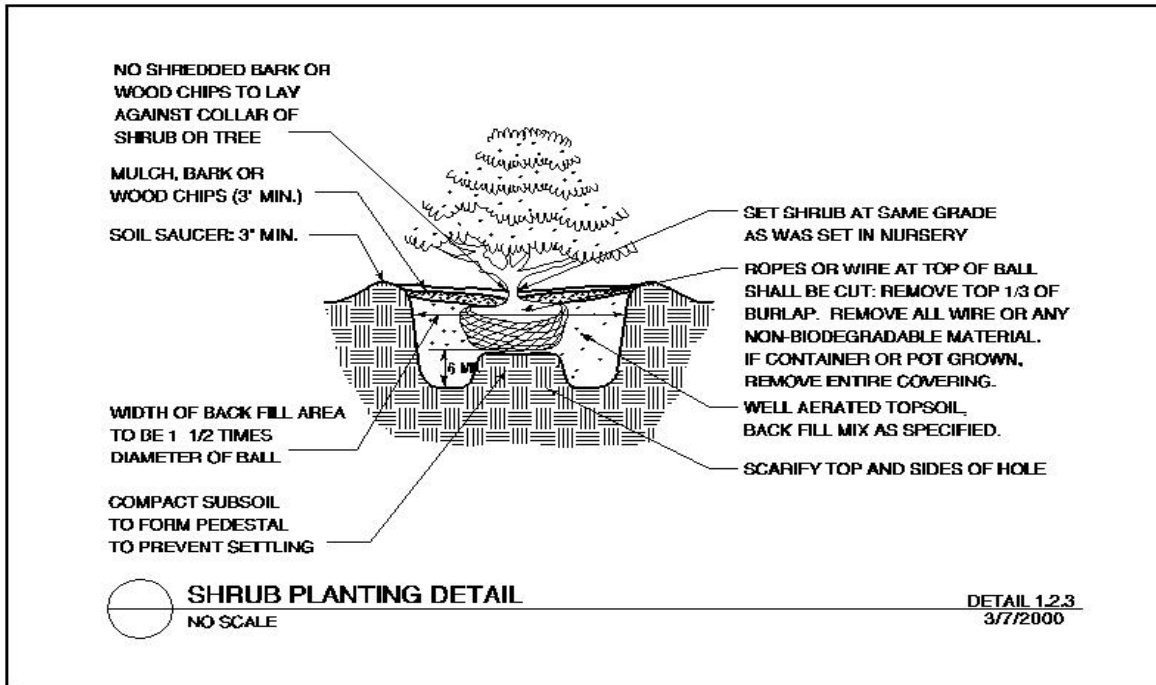
### C. TYPICAL SHRUB BED PLANTING DETAIL



### D. TREE PLANTING DETAIL



# E. SHRUB PLANTING DETAIL



<b>DESIGN and CONSTRUCTION STANDARDS</b>					
PLANNING, DESIGN and CONSTRUCTION: CORNELL UNIVERSITY					
DRAWN BY LEC	DATE 3/7/2000	CELL LIBRARY CIVIL STD DET.CEL	CELL NAME PSHRUB	SECTION CIVIL/LANDSCAPE PLANTINGS	DETAIL NO. 1.2.3

## XX. ADDENDUM

A. BARD COLLEGE HISTORIC TREE LIST

B. TEMPORARY INSTALLATION AGREEMENT CONTRACT

C. PROPERTY DAMAGE OR LOSS NOTICE

D. PRELIMINARY ARBORETUM COLLECTION POLICY

E. ARBORETUM LAYOUT MAP

F. DEFINITIONS OF TERMINOLOGY

G. MEMORANDUM OF UNDERSTANDING

# A. BARD COLLEGE HISTORIC TREE LIST

The trees listed below have been deemed “historic” by Bard College. If any alterations to the tree itself or within the root zone of the tree(s) are planned, the Horticulture Dept. must be contacted prior to the commencement of the site work. Please refer to the Preservation Guidelines for Historic Guidelines for Historic Trees in this document. (Compiled March 6, 2008 using Bard’s Hazardous Tree Evaluations. Contact the Bard College’s Horticulture Department for more information.)

## **Former NY State Champion**

Tree Number: 5

Common Name: Red/Silver Maple Hybrid

Latin Name: *Acer rubrum x saccharinum*

Location: NE corner of field at Blithewood, near parking lot

Approximate Age:

Height: 84 ft

DBH: 200 cm

Hazard Rating (Overall Condition): 9; some problems resulting from lightning damage; decay in trunk and scaffold, but overall tree seems in fair condition.

Comments: Former NY State champion, has survived lightning and fire, but continues to be one of the most notable trees on campus. Labeled for Bard Arboretum.

## **Twin Locusts**

Tree Number: 6&7

Common Name: Black Locust

Latin Name: *Robinia pseudoacacia*

Location: South side of Blithewood mansion between driveway and Blithewood Ave.

Approximate Age:

Height: 85 ft.

DBH: 183cm.

Hazard Rating (Overall Condition): 8&9; northern tree has split in trunk and decay, posing a possible hazard; tree is cabled for stability. South tree is in better health, problems mainly consist of decay in branches.

Comments: These twin locusts are some of the first trees one see at the Blithewood mansion. South tree labeled for Bard Arboretum

## **Tree Number: 8**

Common Name: Black Maple

Latin Name: *Acer nigrum*

Location: Blithewood mansion; SE side near fire hydrant

Approximate Age:

Height: 101 ft

DBH: 108 cm

Hazard Rating (Overall Condition): 6; Some problems in the root crown and buttress from mower damage, but overall tree appears in good health

Comments: Labeled as historic tree for Bard Arboretum

## **Tree Number: 9**

Common Name: Black Maple

Latin Name: *Acer nigrum*

Location: Blithewood Garden; at top of steps just south of path.

Approximate Age:

Height: 86 ft.

DBH: 104 cm.

Hazard Rating (Overall Condition): 5; tree stands at the top of a steep hill, causing some problems with exposed roots and low, heavily weighted branches. Generally tree appears in good condition.

Comments: This tree is a significant part of the landscape of Blithewood Garden. It is labeled for the Bard Arboretum.



**Tree Number: 10**

Common Name: White Oak

Latin Name: *Quercus alba*

Location: On west side of Annandale Path, directly in front of Village Dorms J&K.

Approximate Age:

Height: 105 ft.

DBH: 152 cm.

Hazard Rating (Overall Condition): 8; tree suffers from flooding during heavy rains and a close proximity to the paved path.

Some branches appear weak, but overall tree health is good.

Comments: This tree is particularly noticeable because of its large, impressive appearance and its proximity to a frequently used path and road. It has been labeled for the Bard Arboretum.

**Tree Number: 11**

Common Name: Black Birch

Latin Name: *Betula lenta*

Location: North of Tilotson walk by Village Dorms J&K, 10-20 feet into the woods

Approximate Age:

Height: 93 ft.

DBH: 75 cm.

Hazard Rating (Overall Condition): 8; tree is naturally growing and is located off of the path and away from any buildings. It has never been pruned, but has some dead branches. Trunk has been injured.

Comments:

**White Pine Allee**

Tree Number: 12-13, 37-55, more that have not been evaluated

Common Name: White Pine

Latin Name: *Pinus strobus*

Location: Lining either side of Blithewood Ave. from Annandale Rd. to the Levy Economics Institute

Approximate Age: (may vary)

Height: Average 90-100 ft.

DBH: Average around 75 cm.

Hazard Rating (Overall Condition): Varies greatly between trees. Some trees recently removed due to failure in scaffold or decay. Other trees remain in good health.

Comments: Although the trees are now gradually declining in number, this same allee that once lined the carriage road to the Blithewood Estate remains a significant part of the Bard College landscape.

**Tree Number: 24**

Common Name: White Pine

Latin Name: *Pinus strobes*

Location: At intersection of North Ravine Road and Annandale Road, in front of Annandale house.

Approximate Age:

Height: 79ft

DBH: 74cm

Hazard Rating (Overall Condition): 6. Tree has cement covering one of its roots and one dead scaffold.

Comments:

**Tree Number: 27**

Common Name: White Pine

Latin Name: *Pinus strobus*

Location: West of Stone Row Path, north of Ludlow

Approximate Age:

Height: 94 ft.

DBH: 92.5 cm.

Hazard Rating (Overall Condition): 7; tree has experienced some mower damage to roots and buttress. Some branches are dead or broken. Overall condition of tree is good.

**Tree Number: 28**

Common Name: White Pine

Latin Name: *Pinus strobus*

Location: North side of Campus Path, west of Ludlow, across from north entrance to RKC

Approximate Age:

Height: 93 ft.

DBH: 90 cm.

Hazard Rating (Overall Condition): 8; most visible problems are of decay in branches, however, the full effects of the construction of the RKC may still appear

Comments: Tree has been labeled as part of the Bard Arboretum

**Tree Number: 30**

Common Name: White Pine

Latin Name: *Pinus strobus*

Location: Campus Path and Annandale Rd.; tree farthest west of Ludlow on east side of road.

Approximate Age:

Height: 83 ft.

DBH: 80 cm.

Hazard Rating (Overall Condition): 7; tree has some damage to branches and there are mushrooms present on the trunk that could indicate decay.

Comments:

**Twin Yews**

Tree Number: 31&32

Common Name: Yew

Latin Name: *Taxus cuspidata*

Location: Bard Cemetery

Approximate Age:

Height: 39 ft.

DBH: 127.5 (10 trunks) and 97.5 (5 trunks)

Hazard Rating (Overall Condition): 4&5; both trees in good condition, through some branches are weak or at bad angles.

Comments:

**White Pines on Richard Griffith's Walk**

Tree Number: 25, 33-36

Common Name: White Pines

Latin Name: *Pinus strobus*

Location: Richard Griffiths Walk, west side

Approximate Age:

Height: Average around 85 ft.

DBH: Average around 80 cm.

Hazard Rating (Overall Condition): 7-10, most 8; most common problem is suspected pine adelgid and pine scale. For the most part, trees are in fair to good condition.

Comments:

**“Granddaddy” Oak**

Tree Number: 14

Common Name: White Oak

Latin Name: *Quercus alba*

Location: North of Village Dorm A

Approximate Age:

Height: 92ft

DBH: 143cm

Hazard Rating (Overall Condition): 10. There is a branch that needs to be pruned, but it is not threatening to building.

Comments: When the Village Dorms were built, they were planned in order to be able to preserve this Oak.

**Shag Bark Hickory**

Tree Number: 15

Common Name: Shag Bark Hickory

Latin Name: *Carya ovata*

Location: Between the Campus Center and the Fischer Studio Arts Pavilion, to the West of Campus Center Path

Approximate Age:

Height: 60ft

DBH: 84cm

Hazard Rating (Overall Condition): 5. Tree poses no hazard; however, it is probably experiencing some decay because it has lost much of its crown.

Comments:

**American Sycamore**

Tree Number: 16

Common Name: Sycamore

Latin Name: *Platanus occidentalis*

Location: In Ward Manor Meadow, North of intersection of Manor and Robbins Road

Approximate Age:

Height: 116ft

DBH: 136cm

Hazard Rating (Overall Condition): 4. This tree is very healthy and robust.

Comments: The Sycamore was probably used as a shade tree when this field was used for livestock, and also likely shaded the vegetable garden that was here in the early 20<sup>th</sup> century. It is well-known as one of the favorite campus trees.

**Paper Birch at Finberg House**

Tree Number: 17

Common Name: Paper Birch

Latin Name: *Betula papyrifera*

Location: In a raised bed in the middle of the driveway at Finberg House

Approximate Age:

Height: 70ft

DBH: 148cm (5 trunks)

Hazard Rating (Overall Condition): 6.

Comments:

**European Beech at Henderson Circle**

Tree Number: 18

Common Name: European Beech

Latin Name: *Fagus sylvatica*

Location: Henderson Circle, West side (just East of Ludlow on the road)

Approximate Age:

Height: 64ft

DBH: 73cm

Hazard Rating (Overall Condition): 6.

Comments:

**Red Oak in Henderson Courtyard**

Tree Number: 21

Common Name: Red Oak

Latin Name: *Quercus rubrum*

Location: Henderson Courtyard, just outside Old Henderson

Approximate Age:

Height: 64ft

DBH: 71cm

Hazard Rating (Overall Condition): 8. Tree has some dead branches, but is generally in good condition. New landscaping and walkway just put it, but tree seems to be faring well.

Comments:

### **Oak Grove on the Ludlow Slope**

Tree Number: 56-61

Common Name: White Oak

Latin Name: *Quercus alba*

Location: West of Ludlow, clustered in a grove at the bottom of the slope

Approximate Age: (On average)

Height: between 95-108ft

DBH: between 70-123cm (most around 95cm)

Hazard Rating (Overall Condition): between 6 and 9; almost all are 7. Most trees have some dead branches but are overall in good condition.

Comments: These trees sit on the location of the former tennis courts (which explains the flat landscaping), and the former site of commencement.

### **Tree Number: 62**

Common Name: Linden

Latin Name: *Tilia cordata*

Location: Kline Lawn, 30ft North of Campus Walk

Approximate Age:

Height: 79ft

DBH: 71cm

Hazard Rating (Overall Condition): 8. Has some decay and girdling in roots and dead branches.

Comments:

### **Tree Number: 63; 67**

Common Name: White Oak

Latin Name: *Quercus alba*

Location: Just south of Faculty Dining Room windows in Kline Commons.

Approximate Age:

Height: 105ft

DBH: 93-108cm

Hazard Rating (Overall Condition): 8, 9. These trees do not seem to have been pruned recently, and have some dead branches.

Comments:

### **Silver Maples on the Kline Lawn**

Tree Number: 64-66

Common Name: Silver Maple

Latin Name: *Acer saccharinum*

Location: just South of the Kline Commons retaining wall

Approximate Age: (On average)

Height: 89-92ft

DBH: 58cm; 74cm; 208cm (this tree has seven separate trunks, so it has a very large DBH, but most of these trunks individually are about 25cm)

Hazard Rating (Overall Condition): Hazard ratings of 6 and 7

Comments: These trees form a triangle of shade trees for the picnic tables on the Kline lawn.

### **Black Birch at Blithewood**

Tree Number: 69

Common Name: Black Birch

Latin Name: *Betula lenta*

Location: just East of the old storage barn at Blithewood (on the far West edge of the property)

Approximate Age:

Height: 91ft

DBH: 70cm

Hazard Rating (Overall Condition): 5.

Comments: This tree appears to be in excellent condition, and seems to be large for a Birch.

### **London Plane Trees**

Tree Number: 70; 74

Common Name: London Plane Tree

Latin Name: *Platanus x acerifolia*

Location: Northeast of the Campus Center, in a pair next to Annandale Road

Approximate Age:

Height: 105ft; 107ft

DBH: 71cm

Hazard Rating (Overall Condition): Both have a Hazard Rating of 7, but exhibit very little sign of decay.

Comments: Plane Trees are often used as street trees; these appear to be very hardy.

### **American Beech Grove**

Tree Number: 75-82

Common Name: American Beech

Latin Name: *Fagus grandifolia*

Location: Along the road to Woods, just south of the Stevenson Gymnasium. The largest tree is about 40ft North of Woods road.

Approximate Age:

Height: 87-108ft

DBH: between 33cm-55cm

The largest tree's measurements are:

Height: 118ft

DBH: 89cm

Hazard Rating (Overall Condition): between 6 and 9; almost all are 6. Many of these trees have dead branches and suckers on their roots, but are overall in good condition.

Comments: Something about the ecological makeup of the soil in this area—ranging from Stevenson gymnasium to Ravine Road—seems to be especially suited to Beeches, which is what allows so many to grow in this area.

### **Oak Grove on PAC Lawn**

Tree Number: 88-93

Common Name: White Oak

Latin Name: *Quercus alba*

Location: Just South of the Fisher Performing Arts Center

Approximate Age: (On average)

Height: between 89-114ft

DBH: between 71cm-156cm

Hazard Rating (Overall Condition): They range from 5-10; the tree with a Hazard Rating of 10 is very close to the PAC and will probably be removed.

Comments: These trees used to be part of a woodland area until the PAC was built in early 2000, and much of the under story was thinned out.

### **American Elm**

Tree Number: (not yet inspected)

Common Name: American Elm

Latin Name: *Ulmus americanus*

Location: Along Campus Walk, connecting Stone Row with Annandale Road

Approximate Age:

Height: unknown

DBH: unknown

Hazard Rating (Overall Condition): unknown.

Comments: This tree is the last surviving member of an important historic allee of elms. Each year, the graduating class would walk through the "tunnel" made by the U-shape of the trees, and each class would plant a new tree to add to the allee. Tragically, all but this tree succumbed to Dutch Elm Disease in the mid-20<sup>th</sup> century.

**Norway Spruce Allee**

Tree Number: (not yet evaluated)

Common Name: Norway Spruce

Latin Name: *Picea abies*

Location: Lining either side of the road from Manor Gatehouse to the Manor dormitory.

Approximate Age: (unknown)

Hazard Rating (Overall Condition): Some have been taken down over the years. None have been evaluated, but for the most part trees seem to be in fair to good condition.

Comments: These trees are the remnants of the pine allee that lined the original carriage road for Ward Manor.

# B. TEMPORARY INSTALLATION AGREEMENT CONTRACT PAGE ONE

## **What is a “Temporary Installation”?**

Temporary installations include any and all alterations to the physical environment on the Bard campus. This includes: outdoor artwork, sculpture, structures, performances, that include: digging, removal or addition of any materials to the landscape or buildings, and the alteration of any of Bard’s property in any way. It is also an installation that will be removed at a foreseen date or time.

*To propose a Temporary Installation on the Bard Campus, then you **must** fill out this form and give it to the appropriate individuals prior to the commencement of the installation or performance. Failure to do so may result in the removal of your project without notice and a charge for the clean up.*

**Project Manager Contact Name:**

**Address:**

**Phone Number:**

**Email:**

**Description of Project:**

**Location of Project:**

**Installation/Removal Dates:**

**Maintenance Plan** (include who will be responsible for maintenance, what materials will be used/needed, budget, special considerations, etc.):

**Reason for Project:**

## **Temporary Installations Contract Agreement**

1. All temporary installations on Bard Campus must be approved by: College Vice President for Administration, Director of Buildings and Grounds, and at least the Grounds and Horticulture Supervisors, as well as other related maintenance department supervisors also involved - **before** installation begins.
2. Location, duration of installation, materials, set up, time of removal etc. must be agreed upon. Cost of materials is the responsibility of the project manager.
3. Failure to remove installation by agreed upon time will result in a fine/charge on individual’s personal account.

***By signing here, I have read and understand the above contract agreement conditions and agree to take full responsibility for the proposed temporary installation project, including any unforeseen events that may occur during the installation and removal.***

Signature: \_\_\_\_\_  
Temporary Installation/Performance Project Manager                      Date

# TEMPORARY INSTALLATIONS AGREEMENT CONTRACT PAGE TWO

## Bard College Guidelines for Safety

All individuals will be given instruction in basic safety procedures before they are allowed to work with equipment or other potentially hazardous items and materials. Any tools or materials needed for the project will need to be signed out with the permission of the various trade supervisors. All individuals should be made aware of where First Aid kits and Eye Wash stations are located before starting the project.

### Safety Responsibilities

1. Every person is responsible for their own safety and health, including all participants/volunteers.
2. Use of illegal drugs and alcohol is prohibited on the property.
3. I shall take every reasonable precaution to prevent accidents and injury to myself, other employees and the public.
4. I have the responsibility to report unsafe conditions or practices to my immediate supervisors.
5. I shall report all injuries and accidents to my immediate supervisor as within 72 hours.
6. I shall also report to supervisors all "near-miss" accidents, which could have resulted in injury, death and/or property damage.
7. I shall be aware of all hazards in their work locations and practice safe habits on all occasions. Hazards such as: heavy equipment noise, impact and penetration, back strain, harmful dust and other eye hazards, ticks, poison ivy, etc.
8. Ticks are commonly found in natural or landscaped areas. When working in these areas wear light colored clothing with tight cuffs at ankles and wrists. Use insect repellent with DEET on clothing, not on skin. Inspect skin frequently. Pull out tick immediately with tweezers. If rash or other symptoms develop notify your doctor immediately.
9. Poison ivy is active all year long; although contact it is more likely to occur in spring and summer. The best prevention is to avoid contact. Wear clothes that cover arms and legs. Wash skin thoroughly as soon as possible after exposure.
10. My immediate supervisor must approve any use of equipment. Employees under the age of 18 cannot use power equipment or ladders.
11. Tools and equipment shall not be used for any purpose other than their intended use.
12. Personal protective clothing and/or equipment (safety glasses, ear protection, gloves, head protection, sun block, bug protection, etc.) required by Bard shall be furnished by the Department and its use strictly enforced.
13. I shall furnish my own: hard shoes and weather-appropriate clothing and outerwear. No loose clothing or jewelry should be worn that might interfere with a job.
14. Reasonable effort should be made to minimize or eliminate exposure to blood borne pathogens. For example: use shovels, latex gloves, forks or tongs to handle roadside debris. Carry trash bags away from the body to avoid skin punctures. Practice good hygiene, such as washing hands thoroughly after contact with potentially infectious material. Disinfect tools and equipment. Use containers to collect "sharps" (needles, razors, knives, broken glass, etc.)

If I believe I have been exposed to potentially infectious materials I must report exposure immediately to my supervisor. The safety officer must be immediately notified and I will be directed to a hospital for treatment. The safety officer will help me complete an exposure incident report and will direct me to a physician.

I, \_\_\_\_\_ (print name) have read and understand the above safety guidelines. I agree to comply with the safety guidelines during the time I am working on the above-described temporary installation.

\_\_\_\_\_ **Signature**                      \_\_\_\_\_ **Date**



# C. PROPERTY DAMAGE OR LOSS NOTICE

BARD COLLEGE Buildings and Grounds Horticulture Dept. PO Box 5000 30 Campus Road Annandale-on-Hudson, NY 12504 (phone) 845-758-7465 (fax) 845-758-9654		Date of Claim	
		Date if Previously Reported	
		Date and Time of Occurrence	Date: Time: AM/PM:
<b><u>Insured Department / Individual Information</u></b>			
Name	Code/Account #	Contact Name	Phone Number
Where to contact	When to contact	2 <sup>nd</sup> phone number	
<b><u>Loss Information</u></b>			
<u>Location of Loss</u>		<u>Type of Loss</u>	
		<input type="checkbox"/> Accident <input type="checkbox"/> Fire <input type="checkbox"/> Theft <input type="checkbox"/> Vandalism <input type="checkbox"/> Other: _____	
Cause of Damage (include description of how damage occurred)			
<u>Description of Occurrence (include property involved, repairs, replacements, clean up, etc.)</u>			
REMARKS:			
Insurance Co. Name	Policy Number	Coverage	Amount
Reported By (name)	Date and Time Reported	Reported to:	

# D. PRELIMINARY ARBORETUM LIVING COLLECTION POLICY & DEVELOPMENT PLAN

## A. MISSION & VISION

### 1. Landscape and Arboretum at Bard's Mission

To preserve and enhance the natural and landscaped resources of the Bard College campus and to promote knowledge and appreciation of ornamental horticulture and conservation. To provide a campus environment rich in horticultural diversity and beauty that can be readily enjoyed by the College and surrounding community.

### 2. Vision

The Bard Arboretum will become a destination for individuals to understand and appreciate a nationally-significant historical landscape in the Hudson Valley.

## B. OBJECTIVES

### 1. Purpose of Living Collections Policy

The Living Collections Policy of the Landscape and Arboretum Program at Bard guides the development, management, and enhancement of the institution's Living Collections and applies to all plants. The Living Collections Policy is written and administered by the Arboretum Director. The Living Collections Policy is reviewed on a regular basis and revised as needed.

### 2. Purpose of the Living Collections

The Living Collections of the Bard Arboretum are essential to achieving its mission and vision as a component of the Horticulture Department dedicated to preserving, enhancing and promoting appreciation of plants. As a regional resource for research study, the Arboretum's Living Collections are actively developed and managed to support scientific investigation and study.

### 3. Botanic Gardens and Arboreta: More than Just a Pretty Garden. Behind the scenes at botanic gardens and arboreta in America hundreds of staff and scientists study, document and teach a bewildering array of subjects related to plants, plant conservation, plant propagation, creation of new and improved selections, plant insect, fungal, bacteria and virus pathogens, soil science, ecological research related to plant communities and conservation of historic cultivars and rare native plants. While some of these activities have been glamorized by fiction writers, the actual day-to-day activities are carried out by dedicated staff with a commitment to making the world a better place in which to live, for plants and animals alike.

## C. LIVING COLLECTIONS

1. The Living Collections are divided into three primary collection categories: Core, Historic and Other Collections.

a). Core Collections: The Core Collections are of the highest priority and receive the greatest focus with respect to development, management and enhancement. These collections are vital to the mission of the Bard Arboretum through their research use.

1. Oaks

2. Maples
3. Elms
4. Magnolias
5. Redbuds
6. Dogwoods

b). Historic Collections: The Arboretum's early contributions to campus landscaping and horticultural improvement are manifested in a number of Historic Collections. In general, these collections are maintained, but not actively developed except in cases where authentic material of Arboretum origin can be propagated and is sufficiently unique to warrant accessioning.

1. Oaks (Oak Grove, PAC; various other locations campus-wide)
2. Elms (Elm Walk)
3. Norway Spruce Allee (Annandale Road)
4. White Pine Allee (Blithewood Avenue)

c). Other Collections: In addition to those within the above collection categories, The Living Collections comprise a number of plants grown to achieve display effects, for interpretation, for evaluation, or may fall outside of traditional scope and not even be accessioned. However, because they play important roles in the Arboretum's research, horticultural and educational work, they are included within the Living Collections. The Arboretum landscape contains several natural areas with native plants that representative of the Hudson Valley flora. Generally, these are maintained through natural regeneration of the present vegetation; however development may occur under certain circumstances (e.g., restoration following major disturbance). Spontaneous generation of native, as well as exotic, plants occurs throughout the Arboretum's cultivated landscape. As a matter of course, some of these plants are removed because of their noxious characteristics, some are left in place, while others are accessioned (in particular spontaneous interspecific hybrids or landscape specimens).

1. Native Plants
2. Beech
3. Crabapples
4. Natural Areas
5. Thematic Gardens
  - a) Urban Meadow - Center for the Performing Arts Lot
  - b) Woodland Garden - Fisher Center for Performing Arts
  - c) Chinese Garden Honorarium - Robbins Dormitory
  - d) Native Garden - Village Dormitory
  - e) Elizabethan Knot Garden - Chapel of Holy Innocents
  - f) Anna Jones Memorial Meditation Garden Chapel of Holy Innocents
  - g) Karen Wilcox Garden Admission Office, Hopson Cottage
  - h) Xeriscape and Butterfly Garden Campus Center Parking Lot
  - i) Alumni II Dormitories Catmint Border
  - j) Grass Garden Henderson Computer Center Lab II
  - k) Shade Garden Blithewood Gatehouse
  - l) Bard Community Garden Along Blithewood Road, across from Tewksbury Dormitory
  - m) Blithewood Garden Levy Economics Institute

## D. ACQUISITION CRITERIA

1. Living plants acquired by the Landscape & Arboretum Program at Bard should meet the goals and objectives of the Arboretum, as defined by the mission statement, and be in accordance with the selection criteria delineated in this policy. New plants to be specified in contracts for new buildings on campus should fall within the campus Arboretum's selection criteria.
2. It is of fundamental importance that plants only be acquired by the Arboretum when proper maintenance and care can be assured for them in terms of staff time, water, facilities, and space. Collaboration with personnel in Buildings and Grounds, various facility managers, campus planners and administration will enable good communication regarding appropriate plant material.
3. Selection Criteria
  - a) Plants selected for acquisition by the Bard Arboretum should have an emphasis on adaptation to our current climatic conditions or serve some educational value. Acquisitions should be adapted to the specific cultural conditions of the site. In addition to the environmental criteria, the primary plant selection criteria to be applied to potential acquisitions are:
    - i) educational/interpretive or research potential
    - ii) functional or landscape potential
    - iii) preservation of rare cultivated plants, especially those which honor the College's heritage
    - iv) dominance or importance within a pertinent eco-geographic region
    - v) economic or ethnobotanic utility
    - vi) *Ex situ* conservation of taxa
  - b) Acquisitions may be field collected (with proper permits and documentation), salvaged from sites undergoing construction (if properly documented), or come from other botanical institutions, field collectors, commercial sources, or gifts.
4. Initiation and Approval of Acquisitions
  - a) Recommendations for acquisitions to the collections can be initiated by staff, volunteers, persons serving on the Arboretum Advisory Board or Board Committees, or interested members of the campus community and the general public.
  - b) Project plant lists will be approved by the Horticulture Supervisor and/or Arboretum Director as part of the design review process.
5. Legal and Ethical Aspects of Acquisitions
  - a) The Bard Arboretum is committed to adhering to all laws, regulations, and conventions, be the state, national or international in scope, which govern and regulate the taking and transport of protected taxa.
  - b) The Bard Arboretum shall have on file a current copy of the policies and lists of the Convention on International Trade of Endangered Species (CITES). The Bard Arboretum recognizes that other botanical gardens and arboreta may choose to adhere to those policies in acquisition of living plants, propagules and seeds; our policy will be one of cooperation and respect for those

institutions' guidelines.

c) The Arboretum will not acquire such taxa if any doubt or apprehension exists concerning their origin or method of acquisition. Properly documented donations of protected taxa will be accepted. Where doubt exists as to origin of an individual taxa, appropriate authorities will be consulted.

#### 6. Donations/Gifts

a) All potential acquisitions presented to the Arboretum as gifts are subject to the same policies and selection criteria as outlined for acquisitions in general. Acquisitions received as gifts are considered unconditional in regard to the eventual disposition of the gift. The Arboretum reserves the right to display or not display, give away, or destroy the acquired gift.

### C. OPERATING PROCEDURES

1. The living collections of the Bard Arboretum are to be maintained in as healthy and attractive a state as is practical by Facilities Management, given the ambient conditions of Bard Campus and its many uses. Collections of rare or valuable species shall receive priority care. High public profile plants are considered as high priority collections as far as level of maintenance is concerned. If an item in the collections is not performing adequately under the above regime, it should be considered for deaccessioning.

2. Pro-active salvage and propagation efforts are valuable. Collaboration between the Campus Arboretum and Campus and Facilities Planning will allow propagation of species that may be vulnerable to construction projects or that are not performing well, as well as identification of valuable trees that may be protected in place during construction. Salvage is possible with some species, though not all species warrant the risk.

3. Deaccessioning - It is the policy of the Bard Arboretum that its collections be maintained in the public interest. It is realized, though, that at times it may be in the public interest to remove certain materials from the collections. The following policy applies to material owned by and accessioned into the permanent collections of the Arboretum.

a) Deaccessioning and disposition of dead or hazardous plants shall be handled in accordance with established Bard College procedures. Discussion between Grounds Services and a member of the Arboretum staff is preferred prior to removal.

b) The decision to deaccession an individual plant may be made for the following purposes:

- i) To insure that dead accessions are properly reflected in the Arboretum's record system
- ii) To remove plants that are damaged beyond reasonable recovery such that they do not retain their value
- iii) To record stolen plants or missing plants in the collection system
- iv) To make reasonable accommodations to UA construction projects or infrastructure changes; however, every effort shall be made to preserve or transplant accessioned living specimens during planning stages of the project, as noted above
- v) To permit destructive analysis, provided that the information expected to be obtained is deemed to outweigh the value of the specimen and its possible future use
- vi) To remove material that is potentially hazardous to other collections or to human health; or which may become invasive and damaging to the environment

- vii) To transfer to another arboretum, botanical garden, zoo, museums, or educational or scientific institution, material that is deemed by the Campus Arboretum to be significantly more useful and relevant to the collections and programs of the other institution than to those of the Arboretum
- viii) To carry out mutually beneficial exchanges of materials with other arboreta, botanical gardens, zoos, museums, or other educational or scientific institutions

## E. DIVERSITY

1. The importance of biological diversity in the living collections is of high priority. Diversity of taxon and within taxon is important to maintain in the Arboretum's collection.

## F. DEPTH

1. Once the diversity of taxon is determined, it is important to maintain a certain number (or depth) of individual specimens to represent each. If specimens need to be removed, it should be replaced with an appropriate replacement.

## G. DOCUMENTATION

1. Plants collected by early Arboretum staff may lack sufficient documentation, or be of garden origin. However, because they represent important historical chapters in the development of the institution, they are maintained in the Living Collections. In some cases, these accessions may represent genotypes no longer extant in the wild because of local extinction and thus have high conservation value.

2. All trees, shrubs, perennials and biennials planted on the Bard campus will be documented according to the requirements of the BG BASE collection software management system as a collection inventory of all campus plants.

3. Plant labels- For visitors, curators, visiting scientists, students and educators, the Bard Arboretum provides labels that identify the plant by scientific name, common name, plant family (native origin) or cultivar name. Silver lettered with a black background metal labels are provided for permanent plants.

## H. VERIFICATION

1. Prior to accessioning plants to campus inventory database, the curator must perform a literature search for proper verification. Only trusted resources may be used for verification purposes.

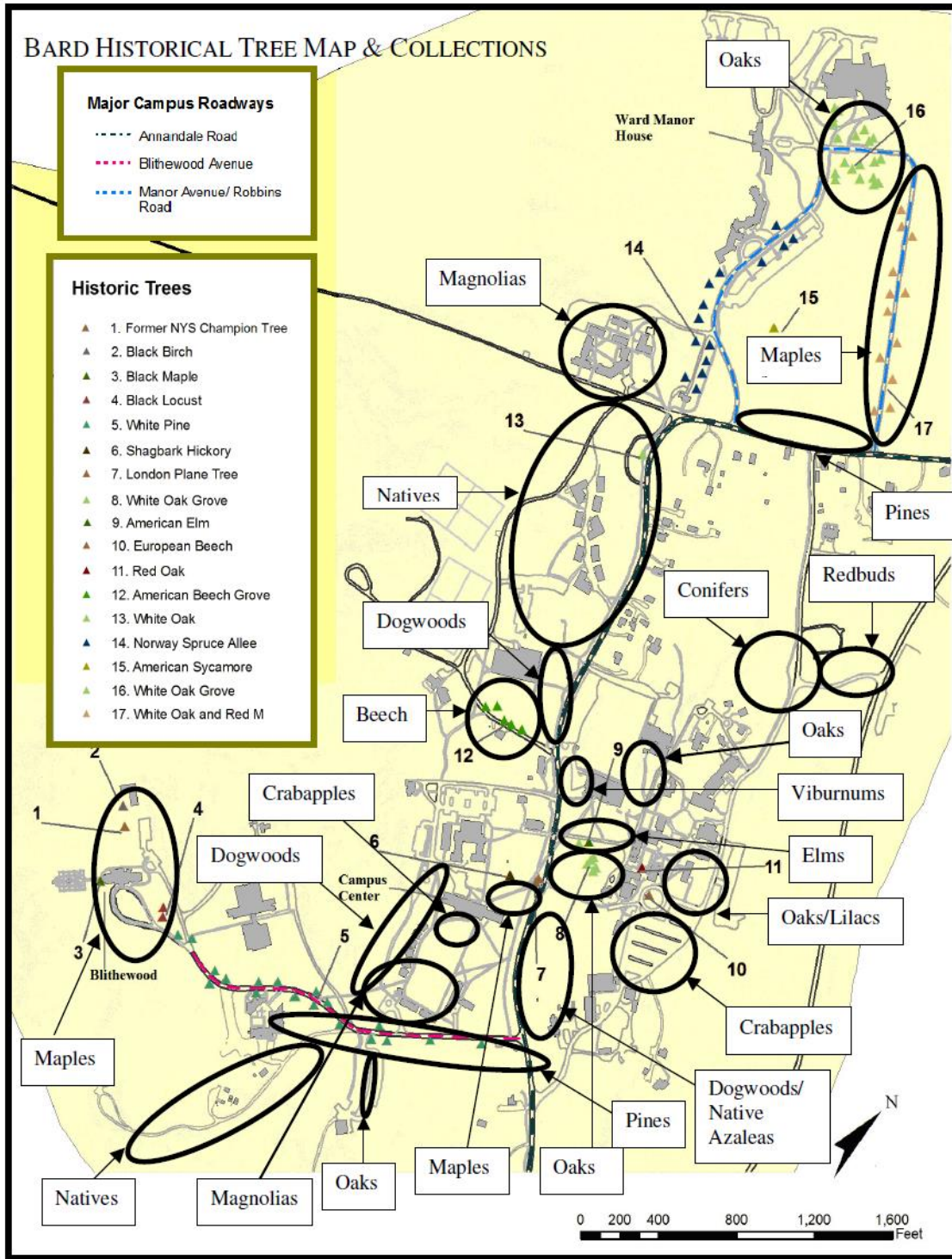
## I. RELEVANCE TO SCIENCE AND SOCIETY FOR MULTIPLE GENERATIONS

1. The Bard Arboretum's relevance is as a teaching and research outdoor classroom for use by the Bard and public communities. It is more than a place to visit; it is a center of research and conservation. It is committed to developing, documenting, verifying, maintaining, sharing, propagating, and disseminating the plant collection. It serves as a reference center for plant identification, nomenclature, and plant exploration. For some threatened species, arboreta have become the last hope for their precarious survival. Simply put, modern botanical gardens are scholarly places for the research and conservation of plants.

2. The Bard Arboretum accepts the responsibility of conservation of its living collections. This is accomplished by wise management. Conservation is not always synonymous with preservation. Conservation implies wise management. Preservation means to put aside. Preservation can be a conservation strategy, however, for a natural resource that is rare, nonrenewable, or irreplaceable.

Conservation of individual plants along with their respective ecosystems is at the forefront of the care of the Arboretum's collections.

# E. ARBORETUM LAYOUT MAP





# F. DEFINITIONS OF TERMINOLOGY

**Air spade** - rugged and durable handheld tool that produces a stream of supersonic air; effectively penetrates and dislodges most types of soil, but is harmless to non-porous objects such as plant roots, buried pipes, or cables

**Allee** – passage formed by two rows of trees where canopies grow together to form a long, continuous row

**Balled and burlapped** – type of nursery stock in which the plant is dug with soil surrounding the roots, then wrapped with protective material

**Bare root** – type of nursery stock in which the plant is sold without soil around the roots

**Bleeding** – the flow of sap from wounds or other injuries; maybe accompanied by foul odor or insects

**Branch bark ridge** – enlarged area of bark tissue on the upper side of a branch junction; a normal pattern of development

**Branch collar**- a swelling at the base of a branch where it joins the trunk or larger branch resulting from overlapping of tissues of the two.

**“Bow”** – mulching technique where soil and mulch is mounded at the edge of the root zone of a newly planting tree to hold in water long enough to saturate roots, instead of run off; mulch should not touch the base of the trunk

## **Cabling, bracing and guying**

**Cabling** – installation of thick heavy wire (often in strands) and associated hardware in the crown of a tree to provide support

**Bracing** – installation of metal rods through weak portions of a tree

**Guying** - a rope, cable, or hardware used to guide and steady a tree being hoisted or lowered, or to secure anything likely to shift its position

**Caliper** – synonym for trunk diameter used to measure the size of nursery stock; by convention, measured 6 inches above the ground for stems less than 4 inches and at 12 inches above ground for stems greater than 4 inches.

**Cleaning** is the removal of dead, dying, diseased, crowded, weakly attached, and low-vigor branches from the crown of a tree.

**Compaction**- the compression of soil, causing a reduction of pore space and an increase in the density of the soil. Tree roots cannot grow in compacted soil.

**Crown** – the leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree

**Corrective pruning** - an essential part of good health care for shrubs and other plantings, discouraging disease and other problems caused by the invasion of pests; also enhances appearance, and promotes proper growing characteristics. Corrective pruning will help your plantings adapt to their surroundings and improve and beautify the entire area

**Deciduous** – perennial plant that loses all its leaves at one time during the year

**Diameter at Breast Height (DBH)** – diameter of the trunk, measured at breast height (54 inches above the ground)

**Dieback** – progressive death of twigs and small branches, generally from tip to base

**Excavation** - digging, unearthing, disinterring, quarrying, exhuming, scooping out, digging out, scouring, shoveling, blasting, removal, using a back hoe, using a trencher, cut and fill, burrowing, tunneling, pick and shoveling, mucking out

**Evergreen** – plant that retains its leaves for more than one growing season

**Flush (flush cut)** – pruning technique in which both branch and stem tissue are removed

**Girdling (roots)** – roots that grow around the trunk in a circular manner, constricting other roots or restricting trunk growth

**Hazardous** - a tree with structural defects likely to cause failure of all or part of the tree, which could strike a ‘target.’ A target can be a vehicle, building, or a place where people gather such as a park bench, picnic table, street, or backyard.

**Integrated Pest Management (IPM)** – system of controlling pests and their damaging effects through mechanical, chemical, biological, cultural and regulatory techniques.

**Invasive** - a species that does not naturally occur in a specific area and whose introduction does or is likely to cause economic or environmental harm or harm to human health

**National Register Historic District**

**Native** - A population of plants within a defined geographic area that exist there without direct or indirect human introduction

**Picturesque** – an aesthetic ideal first introduced into English cultural debate in 1782 by William Gilpin; Enlightenment rationalist ideas about aestheticism based on experiences of beauty and sublimity as being non-rational (instinctual); naturalistic

**Plant Health Care (PHC)** – a multidimensional strategy for plant care that focuses on plant vigor and relies on plant selection and integration of a broad range of techniques aimed at protecting and enhancing plant health; an outgrowth of integrated pest management

**Pollard** – pruning technique where young trees or branches are initially headed, then reheaded on an annual basis without disturbing the callus knob.

**Raising** removes the lower branches from a tree in order to provide clearance for buildings, vehicles, pedestrians, and vistas.

**Reduction** reduces the size of a tree, often for clearance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut stem). Compared to topping, reduction helps maintain the form and structural integrity of the tree.

**Restoration** – reshaping a tree that has been damaged to a more natural form

**Riparian buffers** - Riparian buffers are vegetated areas next to water resources that protect water resources from nonpoint source pollution and provide bank stabilization and aquatic and wildlife habitat.

**Root zone** - the area and volume of soil around the tree in which roots are normally found. May extend to three or more times the branch spread of the tree, or several times the height of the tree

**Sense of Place** - a characteristic that some geographic places have and some do not, while to others it is a feeling or perception held by people (not by the place itself). It is often used in relation to those characteristics that make a place special or unique, as well as to those that foster a sense of authentic human attachment and belonging

**Shallow rooted trees** – a majority of the roots are found just below the ground's surface; usually very susceptible to drought

**Stewardship** - an ethic that embodies cooperative planning and management of environmental resources with organizations, communities and others to actively engage in the prevention of loss of habitat and facilitate its recovery in the interest of long-term sustainability

**Subcontractors** - is an individual or in many cases a business that signs a contract to perform part or all of the obligations of another's contract.

**Taproot** – the primary descending root of a seedling, usually lost as the tree enlarges in size

**Temporary installation** - any and all alterations to the physical environment to the Bard College campus. This includes: outdoor artwork, sculpture, structures, performances, that include: digging, removal or addition of any materials to the landscape or buildings, and the alteration of any of Bard's property in any way. It is also an installation that will be removed at a foreseen date or time.

**Thinning** is the selective removal of branches to increase light penetration and air movement through the crown. Thinning opens the foliage of a tree, reduces weight on heavy limbs, and helps retain the tree's natural shape.

**Tree protection zone** - A designated area around trees where maximum protection and preservation efforts are implemented to minimize soil compaction, etc.

**Topping** – pruning technique to reduce height by heading of large branches

# G. MEMORANDUM OF UNDERSTANDING

## BARD COLLEGE

PO Box 5000

30 Campus Road

Annandale-on-Hudson, New York 12504

845-758-6822 (switchboard)

845-758-7465 (Buildings and Grounds)

845-758-7179 (Horticulture Department)

Attn:

Date:

## CONTRACTOR Memorandum of Understanding

As the contractor, I have read through the document entitled, *Landscape and Tree Care Guidelines, Standards, and Considerations Manual, Revised March 2009 (Bard College)* and I understand and agree to abide by the established set of minimum standards as indicated in this document, for all related work done on Bard College campus.

I will consult and conform to these guidelines while engaged in related work on the Bard College campus grounds.

Subcontractor Signature: \_\_\_\_\_

Date: \_\_\_\_\_

*Your signature is the acceptance of these guidelines, standards and considerations outlined in the above document and authorizes Bard College to enforce these guidelines to ensure an established level of quality work.*

**Please sign and return this document to:** Horticulture Supervisor  
(Phone) 845-758-7179, (Fax) 845-758-9654

