UNIVERSITY AT ALBANY
State University of New York

University at Albany Design Guidelines

Fall 2010 - Landscape Masterplan

TWLA
Trowbridge & Wolf
Landscape Architects LLP

THIS PAGE INTENTIONALLY LEFT BLANK

Contents

List of Figures

List of Figures

THIS PAGE INTENTIONALLY LEFT BLANK

Introduction

The campus landscape is greater than the sum of its parts. The landscape as a whole functions as the environment for much of daily life on the campus. In this way the landscape spaces add up to a campus environment that can facilitate the campus community with opportunities for exploration, studies, learning and growth.

Observations on many campuses indicate that a great deal of the casual interchange, chance meetings, entertainment, and study between classes takes place outdoors.

- Clare Cooper Marcus, People Places

"Campus life occurs to a great extent between scheduled events and specific buildings; some would argue that this is the very stuff of life. Certainly, in an academic setting this type of interaction is at the heart of the concept of collegiality." (Marcus)

It is important for a campus to design spaces in the landscape that allow for and encourage relaxation, recreation, congregating and studying; a campus so enriched has the elements of a collegial landscape. It is imperative that these spaces, once created, not be ignored or left untended. The risk of losing the function of the space through neglect, unforeseen reappropriation or other developments is always present. Once lost the result is often a seemingly fragmented campus falling short of providing the ideal of the collegial landscape.

Cohesive campus landscape design is the result of careful planning and implementation. To this end these guidelines represent a road map from planning to implementation by providing definition to design and material choices. As such, guidelines can be viewed as a planning analysis tool when applied to design proposals as a metric of campus design standards. Further, guidelines

Fig. 1: Architectural symmetry and uniformity of material is definitive of the academic core at the University at Albany campus

serve to ensure work is implemented in a manner consistent with the campus vision by defining the appropriate course of action. These guidelines are intended to shape future development and create a consistent vocabulary of both design concepts as well as materials. Through application of design standards and consistency of work the campus will continue to develop and nurture its collegial landscape.

Organization

The goal of the Design Guidelines - Landscape Master Plan is to provide a useful set of design tools for the University at Albany that relate to specific site conditions. These include the assessed campus spaces at building entrances, service areas, recreational areas, campus community areas and outdoor learning spaces. The traffic calming and paving section gives guidance on paving for walkways, plazas, roads and in particular where pedestrians interface with vehicles. ADA and code compliance guidance is also provided for a variety of settings across the campus.

The Design Guidelines - Landscape Master Plan is divided into seven subsections:

- Introduction
- Campus Spaces

- Site Materials
- A.D.A. and Code Compliance
- Site Furnishings
- Plants & Landscaping
- LEED Considerations

The planting and landscaping section presents proper site assessment for planting and techniques to ensure a healthy and long-lived campus landscape. The site furnishings section recommends campus standards for site amenities such as bicycle racks, benches and lighting.

Each section states the rationale for the design intent along with objectives, and then demonstrates several examples of implementation. These guidelines are not meant to be prescriptive, but to allow a range of design solutions to achieve the primary principle at hand.

Policies

The Design Guidelines are intended to be a framework by which new site and landscape projects are assessed and critiqued. The goals of the guidelines are as follows:

- Achieve consistency in design across the campus;
- Increase the level of aesthetics of the landscape in a manner that is appropriate for an institution of higher education; and
- Provide a high level of amenity for students, faculty, staff and visitors.

The University at Albany should incorporate these guidelines into the review process for new site projects, whether they are large-scale capital projects, or smaller scale projects sponsored by individual departments or programs. In effect, any proposal that falls within the campus landscape should adhere to these guidelines. Projects should also be reviewed in the broader view of the overall campus, the specific campus zone, and for specific items such as furnishings.

The Design Guidelines cannot anticipate every project proposal that may arise. Therefore, each project should be reviewed on a case-by-case basis, and if necessary, an independent third party may be consulted. Generally, project reviewers should:

1. Identify the Campus Zone (e.g. Academic Podium, The Commons, Residential Courtyards, etc.)
2. Identify the surrounding architectural and landscape context
3. Determine whether the project proposal is compatible with the campus context, including:
    - Architectural style
    - Consistent context
    - Appropriate scale
    - Durable materials
4. Determine whether small projects can be consolidated into larger projects, to create a more contextual landscape space
5. Determine the appropriate furnishings selections
6. Determine appropriate landscape treatment
7. Make any necessary recommendations/modifications

Architectural Context

The majority of the campus was built during a period from 1963 to 1971. The primary material used for construction of campus architecture was pre-cast concrete. Owing to the design and planning process of Ed Stone, which saw the campus constructed as a wholistic project, the university campus has a very unified architecture. Buildings from this period, representing the majority of the campus, share many architectural details within an overarching architectural language applied across the campus.

The architecture extends its order into the surrounding landscape both in scale and form. Plantings nearest to the academic podium are regularly spaced and organized in relation to the buildings, entries and circulation systems. Courtyards reflect the scale of the residential quads, and in their angular dimensions carry on the language used to order the buildings. Gridded planting layouts are reminiscent of the colonnaded architecture within the core campus, while as you travel outwards from the campus center plantings become more and more naturalistic in their arrangement.

Plantings are integral to the architecture. Numerous planters are built into the internal spaces of the podium and residential courtyards. There are numerous large cast concrete planters lining the edge of the podium. Planter walls often serve as seating options, benches have been variously built into the architecture. Overall, the architecture meets and embraces the landscape as part of a unified campus plan.

Fig. 2: The integration of architecture and site amenities is strongest on the academic podium, where planting, furnishing and architectural form have been married

For a complete overview of The University at Albany campus architecture and history see the Getty sponsored *Campus Heritage and Preservation Plan*

Campus Spaces

The University at Albany campus can be seen as a collective set of spaces, each serving a programmatic role in the function of the university. The spaces may be primarily divided into: the Academic Podium, The Commons, residential courtyards, parking lots, and University Drive. There are also informal gathering spaces, recreation spaces, interior road streetscapes, and loading and service areas. The following are guidelines for each.

The Podium

The podium is the academic center of the campus. It is located at the intersection of the four residential quads and on axis with the primary entrance at Collins Circle. Housed here are classrooms, offices, library, performing arts center, bookstore, dining facilities, and administrative functions. This is the heart of the campus through which high amounts of pedestrian traffic circulates.

The podium is often first visible to visitors entering from Washington Avenue via the Collins Circle Drive. Here, a clear line of sight should be maintained. Visitor parking in this area should be intuitive in its location and well indicated through signage.

Fig. 3: The ceremonial entrance at Collins Circle offers an iconic view of the academic podium

Many of the facilities located on the podium are elevated above grade. While giving the podium architectural definition, the raised elevation presents an obstacle to access. In addressing this transition it would be preferable to provide universal access routes along the front of the podium in character with the architecture and material typical of the podium. (See Sec. 4: ADA & Code Compliance)

The podium contains numerous planting areas integrated into the architecture. These areas should adhere to the formal nature of the central campus planting schemes. Larger plants, when used, should be maintained in proportion to the scale of the surrounding architecture. This can be accomplished by regular pruning performed by a certified arborist. Plants should not be allowed to outgrow their area. This result could best be attained by selecting varieties which are size appropriate to their location. Rooftop planters, such as those throughout the podium, due to their isolation from the water table need attention paid to their soil moisture levels.

Fig. 4: Built in planters break up the architecture of the inner podium, and provide seasonal variation and shade to the large open spaces there

During droughty summer periods these areas should be maintained by watering so as to keep the soil at a moisture level consistent with the needs of the planting. Drought stress leads to reduced growth and tissue damage, and opens the way to disease and failure of the planting.

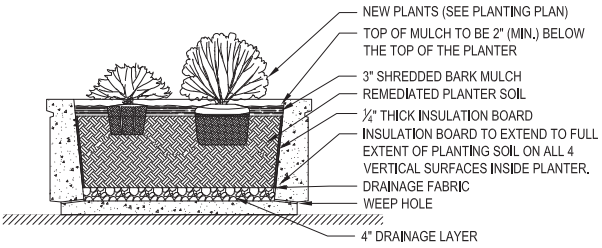


Fig. 5: Podium planters typical proposed installation

Regular annual mulching will aid in keeping soil moisture balanced. Planted areas not receiving any precipitation should be irrigated. An example of a suitable planting scheme for such conditions can be found in Appendix A, *Planting Plans for Light Wells*.

The planters along the podium perimeter should be maintained as part of the original architecture, as suggested in the *Campus Heritage and Preservation Plan*. Plantings should be selected as appropriate for conditions intrinsic to container plantings. This includes ability to withstand harsh environmental conditions such as drought, desiccating winter winds, deep shade or full solar exposure, and temperature extremes fluctuating wider than relative environmental conditions in ground. Plant selection should also respect the scale of the container and environs. To this effect a plant palette consisting of varieties durable in this setting should be developed and adhered to. Plant lists for these conditions have been supplied for both sun and shade conditions, and can be found in Appendix B, *Plant Groupings for Containers*.

The Commons

The Commons are composed of the residential quads and courtyards. These areas lay at the periphery of the Podium. The formal language of the architecture and plantings is maintained here. High levels of pedestrian traffic moves between The Commons and the Academic Podium. As the

living quarters for much of the university student body The Commons should provide opportunity for recreation and relaxation in a safe environment. (See Appendix C, *Proposals for Quad (Commons) Redesign*)

Residential Courtyards

The area between the podium and respective residential courtyards is occupied by a series of formally organized landscape spaces. The Commons buffer the semi-public residential courtyards from the public Academic Podium, and provide a flexible open space. These areas serve as conduits for students traveling to and from classes and events in and around the podium.

Travel between the podium and the residential courtyards should be made easy and safe. These are primary pedestrian routes. "Pedestrian First" goals can be facilitated by providing continuous paved and adequate width walkways, as well as clear lines of sight, adequate lighting and traffic calming devices where appropriate, and giving priority to pedestrians over vehicular traffic.

Checklist:

- ☑ Organize Commons and courtyards around buildings creating landscape spaces
- ☑ Primary building entrances must face the interior courtyards
- ☑ Canopy trees and lawn
- ☑ Safe pedestrian walkways
- ☑ Accommodations for informal gathering

Building Entrances

Building entrances should strive to be easily recognizable and easy to access. It should be a priority to provide universal access to campus buildings wherever the opportunity exists. For example, within the residential courtyards, unnecessary grade changes may be corrected to provide gentle transitions between exterior and interior spaces. As noted earlier, access to the podium wherever possible should strive to conform to ADA guidelines, while doing so in a manner that respects the integrity of the architecture in situ.

Fig. 6: The main entrance of a residence hall at Cazenovia College demonstrating the main qualities of a successful primary building entrance

Primary Building Entrances

All doors should be in plain view and well-lit with no potential hiding places. Well designed primary entrances can provide security both within and outside campus buildings. Ideally, all primary entrances should be ADA compliant and wheelchair accessible. Universal access should be a goal.

The primary building entrance should be clearly visible and well-defined architecturally. Possibilities include entrance canopies and building articulation. In addition, building-mounted or ground-based signage and landscape amenities such as decorative plantings, lighting and seating should be provided to further define the entrance.

Where practical, an entrance plaza or courtyard that spatially defines the entrance to a building is ideal. This area acts as the "front porch" to the building, and should allow for casual studying, eating and socializing. Groups of people using building facilities will collect in these spaces upon entering and departing. Therefore, the fronting plaza should provide gathering space out of the way of the flow of traffic, both into and out of the building.

Academic building entrances should include *human scale* elements such as benches, seat walls, low growing shrubs, and shade trees.

Primary Entrance Checklist:

- ☑ Must be the most-used entrance
- ☑ Provides universal access
- ☑ Architecturally distinguishable from other entrances
- ☑ Associated gathering space that is out of the way of foot and bicycle traffic
- ☑ Appropriately-scaled landscaping
- ☑ Appropriately-scaled signage to reinforce its identity, and aid wayfinding
- ☑ Adequate, pedestrian-scaled lighting

Secondary Building Entrances

Secondary entrances should be clear and visible but should not compete in scale and detail with the primary entrance. Not all secondary entries need to be wheelchair accessible, but it is recommended, and may be necessary if the entrance is a required emergency egress.

Secondary building entrances need to announce building access, but can be much simpler than primary building entrances. Elements such as stairways, seat walls, benches or simple plantings can serve to announce the entrance and create comfortable spaces outside the buildings.

The scale of paving associated with a secondary plaza should relate to the frequency of use. A widened sidewalk with a small amount of decorative planting may be all that is needed at a secondary entrance.

Secondary Entrance Checklist:

- ☑ Scale and design should not compete with the primary building entrance
- ☑ Provide appropriately-scaled gathering space that is out of the way of foot and bicycle traffic
- ☑ Appropriately-scaled landscaping
- ☑ Adequate, pedestrian-scaled lighting

Residence Hall Entrances

The landscape character around residence halls is different from that of academic buildings. The scale should be more intimate, and should allow informal gathering for smaller groups. The primary entrance to a residence hall needs to be safe, secure and well-lit while separating the public use of the campus from the more semi public use of a residence hall. Landscape character, low walls and subtle change of grade can help achieve these effects. Benches, vegetation, architectural detailing and formal paving gives the entrance to a large dormitory an intimate scale. Use of residentially oriented site furnishings is recommended with pedestrian scaled-lighting and site materials that are rich and comfortable. The quality security and scale of the area adjacent to a primary entrance should give clear cues to the visitor that this is the primary residence hall entrance. For a detailed example see Appendix D, *Indian Quad*.

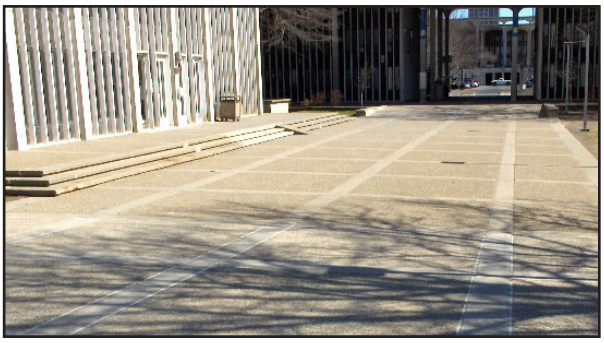


Fig. 7: This entrance to a residential tower does not meet the criteria for the design of primary entrances at residence halls

Residence Hall Checklist:

- ☑ Enhanced character should be that of a 'front porch'.
- ☑ Provide gathering space outside the entrance.
- ☑ Provide durable, yet comfortable furnishings.
- ☑ Provide adequate lighting
- ☑ Provide smaller scale, detailed landscape

Service Zones

Traditionally, service areas have been separated from pedestrian or other vehicular areas. On the University at Albany campus this is largely accomplished through below grade service areas entering into the buildings. However, with future expansion this option will not always be viable. And given limited space and multiple buildings close together, it is not always possible to have a "back side" to a building.

By their nature, service areas are utilitarian in appearance with heavy duty paving for vehicles and loading docks associated with buildings. Service areas are essential to the functioning of buildings but their use is often limited to a few times per week. It is essential that enough paving be provided to allow vehicles to easily circulate. However, it is equally important to mitigate the appearance of service areas by minimizing the paved area to only what is necessary and screening the service area from direct view so that it does not dominate the viewer's perception of the building.

Since service areas are often infrequently used, the paved areas can serve dual purposes and function as decorative pedestrian ways when not in use for service. When decorative paving is used, the cue is given that the area accommodates pedestrians as well as service functions and vehicles should proceed cautiously. This is an important cue to give in areas where service areas cannot be separated from pedestrian circulation.

Loading docks associated with campus buildings can be screened in order to obscure dumpsters and truck zones. Service areas need to be highly functional, but do not need to be visible to passersby. For example, at Ithaca College, Ithaca, NY, the service area is below grade and screened by a masonry wall that matches the materials of the building, and by appropriate landscaping.

Fig. 8: Sunken and visually obscured loading area at Ithaca College

Screening can be accomplished by building walls, planting tall and dense vegetation, and changing surface grades. Effective screening will be an extension of the landscape and architectural context.

Loading areas can be enhanced to serve multiple purposes, thereby diminishing the undesirable visual effect that a single purpose loading dock may have.

Service Zone Checklist:

- ☑ When possible (new construction or substantial building rehabilitation), locate loading docks away from primary entrances. Avoid conflict with pedestrian access.
- ☑ When possible, locate loading docks away from primary views, or angle the access so that the dock and trucks are out of the viewshed.
- ☑ Provide screening with site walls and landscape grading and planting.
- ☑ When it is not possible to locate loading docks away from pedestrian ways, use paving materials that give preference to pedestrians. For example, use heavy duty concrete or unit pavers instead of asphalt.

Recreational Zones

Organized sports and competitive recreational areas and facilities of the campus are concentrated close to Western Avenue. The separation is appropriate as the fields take up large areas that would be inappropriate on the core campus. However, more casual and intramural recreational opportunities exist throughout the campus. For example, The Commons between the residential courtyards and the Academic Podium offer space for informal sport. When not in use, these areas provide pleasant green spaces on the periphery of the residential campus.

There are myriad other recreational spaces nearby to the residential quads. Dutch field is another popular location for intramural activities and informal sport. Some designated playing fields/ surfaces have been provided by the campus, such as a sand volleyball court at Dutch Commons and a softball field at State Commons. These areas must receive regular inspection to insure that facilities are in playable condition and do not pose any safety risk.

The Purple Path project is a proposal to loop the campus with a multi use recreational path system. This would provide a continuous running, biking, and in-line skating surface easily accessible from anywhere on campus. This path should be well lit for user safety and security. Lighting for this project should follow from the University's established lighting masterplan. (See *Lighting Master Plan*). Construction of the Purple Path should strive to follow the precedent established by the already constructed portion located at the Western Avenue entrance.

It is important that the turf be maintained in good condition for recreational safety and environmental quality. Healthy turf provides a quality recreational surface with sufficient grip and cushioning characteristics for activity levels typical of usage in these spaces. In comparison bare soils, once compacted will be dangerous when too wet and or too dry. Adequate maintenance can prevent soil compaction and poor drainage, two major causes of turf deterioration. Loss of turf and exposed soil lead to erosion and sediment deposits down slope and into storm drainage, while further detracting from the desirability of the space. Where turf can not be managed under normal conditions due to heavy traffic levels or infrequent need for vehicular access reinforced turf should be considered.

Recreational Zones Checklist

- ☑ Provide open lawn areas for pickup sports such as frisbee and touch football close to residence halls.
- ☑ For heavily used lawn areas, especially if vehicles are allowed in an area, use reinforced turf using tall fescue lawn to help minimize maintenance and ensure long term durability.
- ☑ Provide levels of maintenance for lawn areas appropriate to the intensity of usage, including semiannual inspection and fertilization, aeration, topdressing and overseeding.

Fig. 9: Heavily used turf area between residential courtyards and academic podium in need of rehabilitation after a construction project

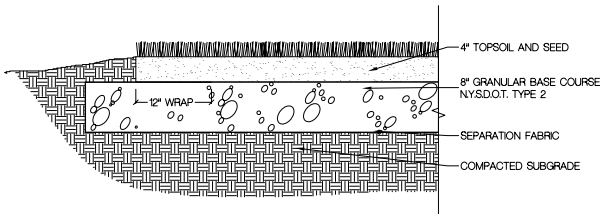


Fig. 10: Reinforced turf

Campus Community Areas

It is important that areas be set aside on campus as gathering spaces for both small and large groups. These areas need to be flexible outdoor spaces that groups can occupy, so they should not be filled with site features that make it difficult for a group to assemble. Gathering spaces can be formal, and may take the form of plazas, or informal areas, as in lawn panels in residential courtyards or Commons. They should be adaptable spaces that can handle a diverse number of uses.

Gathering spaces of different scales are recommended for different size groups. A central space on campus where large groups can gather lends a sense of community and ties the campus together spatially. The academic podium provides significant gathering spaces both internally and to the north where a spacious plaza, designed by Thomas Balsley Associates, and the Collins Circle lawn may host groups. The central location of these spaces makes them appropriate for large gatherings. In other cases, where smaller groups may assemble more frequently, paving and associated landscape and furnishings may be called for.

It is important to consider smaller gathering spaces associated with the residence halls. These spaces serve to foster a sense of ownership and identity for the residents if they have an area identified for their use in close proximity. The residential courtyards may serve this purpose.

Outdoor learning spaces should have structures to allow small group gathering and to allow seating focused on a central speaker's area. Outdoor learning spaces should be located in places where disturbance or distraction from the surrounding campus is limited. These outdoor spaces should be a convenient distance from primary classroom buildings. Outdoor study areas can be more informal, allowing students to study alone or in groups. Garden areas on the academic podium can allow for outdoor spaces for teaching and learning.

Plaza/Large Gathering Space Checklist:

- ☑ Plazas should be located on a major pedestrian route into or through campus.
- ☑ Large gathering spaces should be flexible, so they don't appear empty when not being used for an event.
- ☑ Provide areas along the edges of the large plazas for smaller groups, waiting, people-watching, eating, studying and socializing.
- ☑ Provide a focal point such as a sculpture in a large plaza.

Small Gathering Space Checklist

- ☑ Small gathering spaces should be located off major pedestrian routes to allow for quiet studying, eating lunch, and smaller group socializing.
- ☑ Small gathering spaces should have appropriate seating and lighting arranged to allow for conversation or for privacy.
- ☑ Small gathering spaces may include shelters that provide for seasonal use as well as open air spaces.

Outdoor Learning Space Checklist

- ☑ Formal and informal outdoor learning spaces should be located in places that are separated from major pedestrian flows where distractions are limited.
- ☑ Provide comfortable seating, lighting and furnishings where appropriate for eating and/or studying.
- ☑ Utilize sustainable site design as a teaching and learning opportunity, see section on LEED considerations for further discussion.

Memorials, Gifts and Donations

Memorials are integral to a campus, whether they commemorate a loved one or a donor. It is important that the memorials be long-lasting, and that they clearly depict the donor or honoree's name. While it is important that the memorial be visible, it also must integrate into the overall landscape. Some types of memorials are:

- Plaques
- Benches
- Sculptures
- Gardens and ornamental plantings

Individual tree memorial plantings are not recommended, due to the possibility that the tree may die, creating the loss of a memorial. Masses of shrub or perennial plantings are preferred, as units may be replaced without sacrificing the integrity of the memorial. An informal grove of trees can also be planted as a memorial.

Larger scale memorials can include named walks, plazas and gardens.

In order to adhere to the goals of the Design Guidelines, an overall Memorial Program should be developed, identifying areas for future memorials in a variety of scales and costs. This will allow the campus to develop a cohesive vocabulary suited to the overall campus landscape. It may be appropriate not to identify every memorial in place, but rather in a memorial recognition book prominently displayed in a public space such as the library.

The memorial program should recognize that a portion of any gift should include an endowment to support maintenance and upkeep. The program should also provide a duration or other criteria for the lifetime of memorial installations.

Memorials, Gifts and Donations Checklist

- ☑ Coordinate with the Office of Institutional Advancement for size, type and location of memorials.
- ☑ Donor catalogs and a Memorial Directory for the Campus should be developed and kept on file with the Office of Institutional Advancement and publicly displayed in appropriate locations.
- ☑ A portion of every donation should include an endowment for maintenance and upkeep.
- ☑ Plan in advance for memorials that may expand over time. For example, gifts by class year will need space for future donors.
- ☑ Individual memorial trees are not recommended.
- ☑ If undertaking a bench program, take care to select one type of bench as a standard.
- ☑ Locate memorials in quiet seating areas away from high-traffic areas. Consider placement to reduce visual "clutter" on the campus.
- ☑ Consider memorial recognition at a common/public location, such as in a memorial recognition book(s).

Streetscape

The quality of the streetscape on the University at Albany campus is important in defining circulation ways and enhancing pedestrian character. Providing a high level of amenity and narrowing roadway widths will help slow traffic and promote walking and bicycling on campus. Developing a hierarchy of streets will also clarify wayfinding.

Primary streets should include basic amenities such as adequately-sized, concrete sidewalks, lighting, tree plantings, furnishings, and where space permits, bicycle lanes. The primary street on campus is University Drive.

Secondary streets should allow safe vehicular access, sidewalks where warranted, and safe levels of lighting. They should not compete in appearance with primary roadways.

Primary Streets Checklist

- ☑ Provide 12’ travel lanes in each direction. Use granite curbing.
- ☑ Provide 4-5’ wide bicycle lanes where possible
- ☑ Provide concrete sidewalks 10’ wide, or as appropriate for the amount of pedestrian traffic
- ☑ Provide appropriate street trees spaced at 30’ on center (See Appendices H, I: *Campus Vegetation Selection*)
- ☑ Adhere to University Lighting Standards (See *Lighting Master Plan*).
- ☑ Provide benches when appropriate (See Appendix G: *University Standard Furnishings*).

Secondary Streets Checklist

- ☑ Provide 12’ travel lanes in each direction. Use granite curbing or concrete curbing in lesser used areas.
- ☑ Provide 10’ sidewalks where warranted. Concrete shall be used for permanent application, whereas asphalt should be used for temporary application.
- ☑ Provide 4’ - 5’ wide bicycle lanes where possible.
- ☑ Provide University standard lighting.

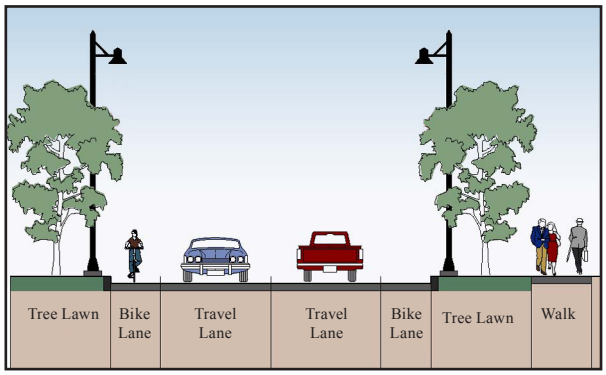


Fig. 11: Typical roadway section

Continuity of Sidewalks

Sidewalks should physically continue across a driveway. The visual and physical cues give pedestrians priority at the intersection of driveways and sidewalks. Pedestrians are also given clear direction for movement.

The material of the sidewalk (including curbs) should be maintained as it passes through the driveway. The driveway elevation should rise from the road to meet the elevation of the sidewalk. This provides for positive drainage to occur with stormwater moving to the street edge. Heavy duty sidewalk pavements and reinforcing should be used for sections of walks crossing driveways.

Curb cuts, where curbs have radii to allow for vehicular turning movement, should occur only at primary vehicular intersections where non-stop, continuous vehicular traffic is encouraged.

Fig. 12: Curb transition and dropped curb at a driveway entrance

Sidewalk Checklist

- ☑ Provide uninterrupted sidewalks wherever possible.
- ☑ Maintain a consistent material.
- ☑ Use a heavy duty sidewalk detail for constructing sidewalks wherever vehicular traffic is anticipated.
- ☑ Minimize interruptions in the sidewalk caused by curb cuts.

Traffic Calming

Traffic calming encompasses interventions such as stop and yield signs, vehicular pavement narrowing and paved crosswalks. The purpose of traffic calming is to send visual and physical cues to vehicles to proceed with caution because pedestrians are in the area.

The type of paving chosen for an area can provide a positive message about appropriate area use and delineate vehicular circulation from pedestrian areas. Concrete unit pavers can be used in crosswalks to create textural and color cues to vehicles to slow down. Other paving materials that can be used are: scored and/or colored concrete and thermoplastic inlaid materials such as Imprint or Duratherm.

Throughout the campus, there are many occasions where traffic calming techniques should be used when pedestrian and vehicular traffic patterns must cross. Where crossings occur within the City of Albany right-of-way, City staff should be consulted for approval.

Recommended locations for traffic calming measures include:

- Crosswalks and entrances along University Drive
- Interior drives near residential quads, such as State, Colonial, Dutch and Indian
- Interior drives around the Academic Podium

Each of these locations should be assessed for the type and scale of traffic calming on a case by case basis. For further consideration of this topic see the report *Pedestrian and Traffic Safety Improvement Study (Delta Engineers, 2010)*

Crosswalks

Striped crosswalks at traffic intersections can ameliorate pedestrian-vehicular conflicts, but paint on a street has limited impact and becomes faded and dirty, quickly. Concrete unit paver or brick crosswalks have a long serviceable life and provide both a color and textural difference (*Figure 13*). For standards refer to *Appendix J: University Standard Crosswalk Detail & Striping*.

At particularly busy intersections with a high level of conflict between pedestrians and vehicles, stop signs in all directions may be necessary. However, site details, including slightly raised crosswalks, as well as landscaping can provide cues to drivers that this is a busy pedestrian zone. Several traffic calming techniques may need to be implemented at intersections where frequent vehicular and pedestrian conflict occurs.

Traffic Calming Checklist

- ☑ Assess site to determine appropriate traffic calming techniques
- ☑ For crosswalks, determine appropriate material and design for intensity of use. See *Pedestrian and Traffic Safety Improvement Study* for specific treatments.
- ☑ Where striping is used adhere to campus standard for striping detail
- ☑ Stamped asphalt is not recommended due to its short-term color and form retention.
- ☑ NYS Law states that pedestrians have the right of way in the crosswalk. Signage reflecting this law should be placed in the crosswalk where possible.
- ☑ See *Pedestrian and Traffic Safety Improvement Study* for further information.
- ☑ See *Appendix J: University Standard Crosswalk Detail & Striping*

Fig. 13: Concrete unit pavers provide a durable material option for crosswalks that is visually and texturally distinct.

Fig. 14: Typical campus crosswalk

Fig. 15: Raised crosswalk in the City of Ithaca, N.Y.

Fig. 16: View from parking lot interior looking at berm

Fig. 17: Earthen berm and associated vegetative screening

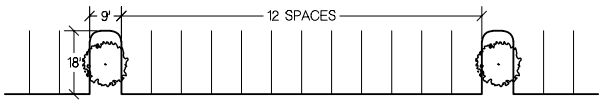


Fig. 18: Parking layout with 1 tree island for every 12 spaces. For species selections refer to Appendix H: Campus Vegetation Selection.

Parking Lots

The undesirable visual effects of parking lots on campus can be mediated by screening the view of parking from roads and walks, both on and off campus. This can be done by building berms or increasing the density of vegetation around parking lots. In addition, the inclusion of trees with broad canopies can mitigate the heat loading attributed to solar exposure of asphalt parking areas. Be sure to use drought tolerant tree species (see *Campus Vegetation Selection in Plants and Landscaping Section*). Screening can also be provided by planting shrubs and hedges.

Caution needs to be taken when using berms to be sure that surface storm water can continue to be directed to a stormwater drainage system. Figures 16 & 17 show examples of earthen berms that screen parking.

In addition, it is recommended that street tree planting islands be located in parking lots to mitigate the large expanses of asphalt.

The recommended spacing is one tree for every twelve parking spaces. If the planting area can not be designed to the recommended size, structural soil should be used below paving to maximize the available rooting volume. (See CU Structural Soil on Urban Horticulture Institute website: *http://www.hort.cornell.edu/UHI/*)

Providing lighting and sidewalks are a minimum requirement to allow safe use of the parking lots.

Parking Lot Checklist

- ☑ Where space permits, provide parking lot screening in the form of a berm or landscaping.
- ☑ Provide tree islands in parking lots where feasible. Islands should be designed on a case by case basis, typical minimum size shown in *Fig. 18*.
- ☑ Provide adequate lighting using University Standards. See *Lighting Master Plan*.
- ☑ Provide sidewalks where appropriate and connect to external campus walks. Design of pedestrian circulation should be addressed on a case-by-case basis.
- ☑ For snow plowing, plow perpendicular to parking lines.
- ☑ For ADA recommendations see section on *ADA and Code Compliance, fig. 38* and *Accessible Parking Checklist*.

Site Materials

Paving Materials

Paving materials must be appropriate for their use and installed properly to ensure their durability. Heavy duty versions of pavements are recommended on campus since at some point in time, nearly all paving is driven on, especially by emergency and service vehicles. All of the pavements shown could be designed with a light duty profile if it was clear it would never be driven on. If vehicles drive on pavement that is not designed for the loads, the pavement will fail prematurely.

A typical paving section consists of the compacted earth subgrade, a base course and the finish paving material. The soil must be compacted as much as possible in order to avoid subsidence. Some soils, particularly those with high organic content are inappropriate for supporting pavements and must be removed and replaced with an appropriate structural fill material. The base course is typically a crushed limestone as it is readily available and compacts very reliably.

Asphalt paving is appropriate for streets and less formal or secondary walkways. It is the least expensive and has the shortest usable life (*Figure 19*). Heavy duty concrete is more expensive than asphalt but will last approximately twice as long. Scored concrete is appropriate for walkways and plazas (*Figure 20*). Unit pavers or bricks are the most expensive but they are likely to last much longer than concrete and can be reset if disturbed by underground work such as utilities. Unit pavers or bricks are appropriate for special walkways, plazas and crosswalks such as in the Commons (*Figure 21*). Pavers may be set on a rigid or semi-flexible base. Pavers or brick should be sealed using a siloxane based penetrating sealer such as shown in *Appendix K: Example Paver and Brick Sealer (Materials to be sealed must be tested for compatibility).*

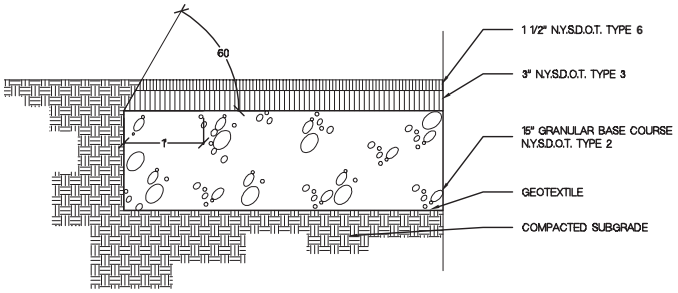


Fig. 19: Heavy duty asphalt paving

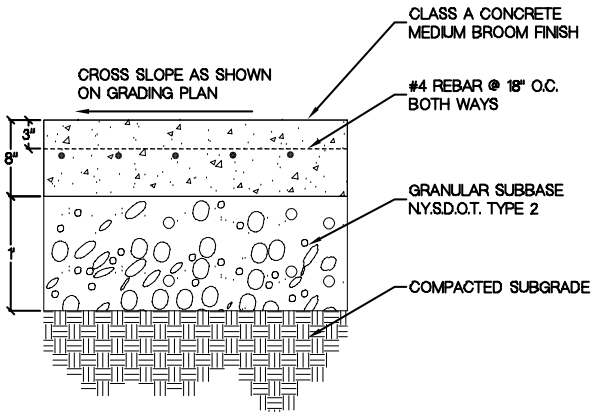


Fig. 20: Heavy duty concrete paving

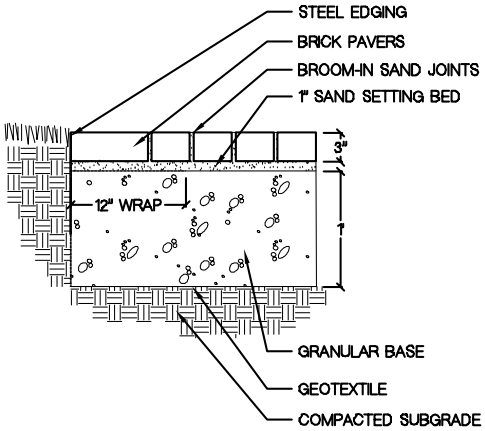


Fig. 21: Heavy duty brick pavers

Permeable Paving

According to the New York State Department of Environmental Conservation (NYS DEC) Stormwater Management Design Manual, chapter 5: Green Infrastructure, "permeable paving is a broadly defined group of pervious types of pavements used for roads, parking, sidewalks, and plaza surfaces. Permeable paving provides an alternative to conventional asphalt and concrete surfaces and are designed to infiltrate rainfall through the surface, thereby reducing stormwater."

There are two main categories of permeable paving: porous pavement and permeable pavers. Porous pavement is a porous concrete or asphalt paving material designed to allow water to run through the surface and into an underlying reservoir. Porous pavement is essentially similar to traditional pavement but is designed to exclude the fine particle sizes that would otherwise fill the void spaces in the paving material. Permeable pavers may be any material, such as concrete brick or natural stone. These are often designed with openings or joints that will permit the flow of water through to an underlying reservoir or infiltration bed rather than run off to the storm system.

Both systems are a good fit for green infrastructure in an institutional setting, and should be considered wherever new projects will expand paved surfaces or to replace existing impervious surfaces. Porous asphalt offers a potentially large impact on the overall impervious footprint through replacement of traditional paving technologies in parking lots or service drives. Permeable pavers offer a breadth of design opportunities for green infrastructure and stormwater best practices in plazas and pedestrian spaces.

For complete material specifications and construction guidelines refer to the NYS DEC Stormwater Design Manual, Chapter 5.3.11: Green Infrastructure.

Porous Pavement Checklist

- ☑ Porous pavements should be considered in locations with medium or light duty traffic. Parking lots and sidewalks are good applications.
- ☑ Porous pavements are not to be used for: loading docks, fire lanes, truck routes.
- ☑ Porous asphalt has a similar life cycle as conventional asphalt paving.
- ☑ Good maintenance practices reccomend that porous pavements be swept and vacuumed a minimum of once per year and preferably twice.
- ☑ Repair and replacement of porous pavements require removal to the sub base surface. **Porous pavements can not be sealed or overlaid.**
- ☑ In winter months de-icing salts are acceptable. **Sand may not be used.**
- ☑ Maintain green space around the pavement, do not allow surface errosion to enter onto the paved surface.
- ☑ During construction period maintain errosion control and soil stabilization practices. Keep vehicles with mud/soil on tires of the pavement.
- ☑ Typical porous asphalt section is 2-1/2" to 3" porous aspahlt pavement, with 1" to 2" choker course of #1 crushed stone, and 18" to 24" subbase of #2 and #3 stone with 40% void space. Slopes shoulod not exceed 5%.

Fig. 22: Traditional asphalt paving (Left) next to porous asphalt paving (Right) showing the comparative surface texture.

Materials Checklist

- ☑ Determine whether heavy duty paving section is required.
- ☑ Primary and secondary roads often receive heavy truck traffic to access loading docks, etc., material selection should be addressed on a case-by-case basis.
- ☑ Determine paving material:
  - ☑ Decorative pavers for plazas and important walkways or accents.
  - ☑ Concrete should be used for primary sidewalks and walkways especially adjacent to roadways
  - ☑ Asphalt should only be used in roadways and selected secondary paths or as temporary measure.

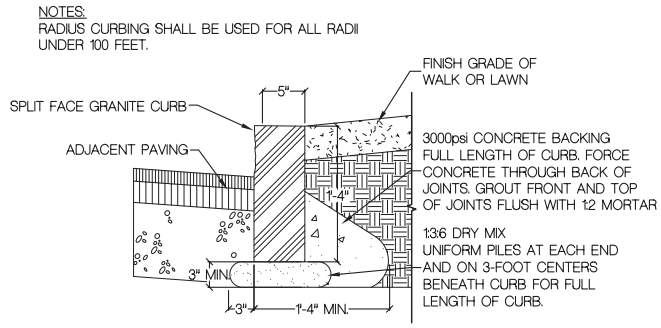


Fig. 23: Granite curb

Curbing

Curbing provides a neat edge to paved areas and eliminates damage caused by automobiles driving off the road. Curbing also clearly separates pedestrian areas from automobile areas. Curbing may also be used to edge planting beds, though should be considered carefully so as not to give a road-like appearance to pedestrian areas. This has been accomplished on campus by utilizing a flush curbing in areas such as The Commons.

Granite curbing, though more costly, provides a more durable alternative to concrete curbing. Its use should be required along all primary roadways. It does not spall like concrete and is more resistant to chipping as a result of being hit with snow plows. In the case of street repairs, it can also be lifted and reset (*Figure 24*).

Mountable or chamfered curb should be considered for use in pedestrian locations that need infrequent or emergency access. The use of mountable curb gives the average driver the cue that vehicular access is not permitted. (*Figure 25*)

Concrete curbing is cost effective and can be easily formed into a variety of sizes and radii. It is prone to snowplow damage and so may not be as suitable for heavy traffic areas where snow plowing is frequent (*Figure 26*). Its use should be limited to areas with infrequent vehicular and snowplow usage, perhaps on the interior of campus or for planting beds.

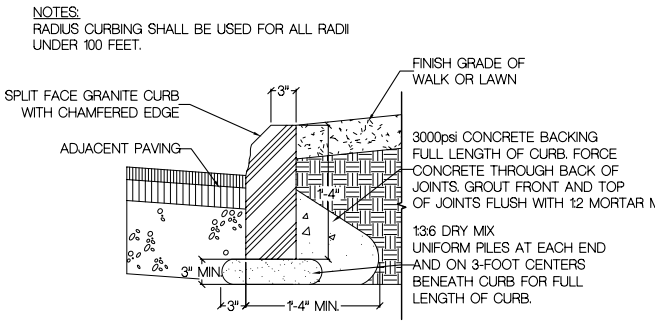


Fig. 24: Mountable curb

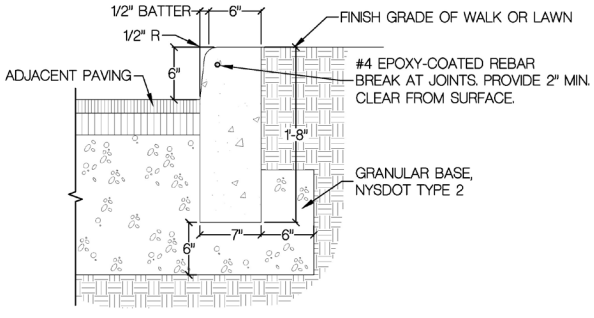


Fig. 25: Concrete curb

Fig. 26: Inadequate radii on campus walkways results in erosion and soil compaction

Fig. 27: Walkways in quadrangle on SUNY Oneonta campus

Fig. 28: Campus walkways defined by wide radii intersections

Walkway Intersections

When sidewalk intersections are designed with radii that are too small or with no radii, an unsightly landscape area results (*Figure27*). Inadequate radii do not accommodate pedestrian traffic, creating worn areas of compacted soil, and on sloped sites, soil erosion. This lack of or insufficient pavement radii creates continuous maintenance problems with attempts to re-establish lawns and associated landscaping. Where such conditions occur, new pavement should be installed in the area of intersecting walks with sufficient radii.

Widening walkway intersections with increased radii and change of paving materials can discourage snowplow damage, allow for easy negotiation by large crowds of students and staff, and decrease the occurrence of informal paths in the lawn. (*Figure 28*)

Granite sets, used to create paving radii at intersecting walks are a distinct paving material. They can define a corner and create a walkable surface with a high quality character. Less expensive alternatives include concrete unit pavers or cast-in-place concrete scored with a smaller pattern than the main sidewalk.

Wide radii at campus crosswalks are a practical means of linking walkways, facilitating movement of large crowds of pedestrians and preserving lawn quality (*Figure 29*). These wide radii also provide for emergency and service vehicles to occasionally use sidewalks without damage to lawns and associated landscaping.

Typical radii are a minimum of 5', but consideration must be given to the angle of intersection and other layout concerns. Radii should not be made excessive, as the increase in the amount of pavement encourages vehicular usage.

Walkway Checklist:

- ☑ Sidewalk intersections should include a standard 5' min. radii at intersecting corners with obtuse angles, acute angles may call for smaller radii.
- ☑ Sufficient radii at walkway intersections facilitate the movement of emergency and service vehicles when required.
- ☑ Walkway intersections may feature distinct paving materials to announce the intersection.
- ☑ For a walkway maintenance program see the *Pedestrian and Traffic Safety Improvement Program* report.

Fence

Across the campus there is various need for fence. Sometimes this need is mandated for safety and security purposes. In such cases fences would be used to keep people away from areas that are dangerous or sensitive such as electric service areas or stormwater detention ponds. In other cases barriers provide definition to boundaries and suggest levels of access. Where access is intended to be controlled or some privacy is intended, such as in the vicinity of residential areas fences may be used to suggest a level of access. Fences can also be used as screening elements. In this manner the fence serves to break up wind and snow drifts thus reducing maintenance needs. For all of these purposes fences will be located on the campus.

It will suit the University to have a uniform product for most of these applications, and one that is in alignment with the character of the campus. By adopting a standard fence a uniform vocabulary of access and boundaries will be established. A uniform fence will allow easier maintenance. If standard components are kept on hand, repairs will always be a simple procedure.

When fence is being selected, primary consideration should be given to the functional character of the fence. If the fence is to provide a practical boundary it should be of sturdy construction and material. If a permanent application is intended the durability of the fence will justify a higher initial cost. Appropriate heights should be determined for each case. It is recommended that a fence which can accommodate a range of site constraints such as slope, access areas, and visibility be selected. A fence system which is meets these criteria has been recommended (see Appendix E, *Campus Standard Fence*).

Fence Checklist:

- ☑ A dark colored fence, which will blend in with the landscape, should be chosen. Avoid light colors that highlight the fence.
- ☑ Use fence in areas where security or privacy are desired. Adhere to campus standard whenever possible.
- ☑ Use fence for screening and windbreak. Adhere to the campus standard whenever possible.
- ☑ Allow for maintenance access when laying out fence. Do not block snow removal.
- ☑ Provide reusable chain link fence for construction projects.

Fig. 29: This fence is intended to be as unobtrusive as possible, but seems out of place for an academic campus

ADA and Code Compliance

The spirit of the American with Disabilities Act is to provide equal access to amenities for individuals with physical impairments. The most stringent requirements are to provide wheelchair access but the laws also provide for individuals with other impairments such as impaired sight or limited mobility. The regulations dictate that changes in the ground plane will not exceed 1/4" or 1/2" with a beveled edge. Surfaces need to be smooth and navigable by a person in a wheelchair. Walkways that are part of an accessible route shall not exceed 5% in slope or shall be considered ramps. All stairs and ramps of greater than 5% shall have handrails with extensions at both top and bottom. Accessible parking shall be provided at the location closest possible to the destination and an accessible route provided.

The following guidelines relate to Americans with Disabilities Act compliance in the landscape. The issues involve providing accessible parking, accessible routes and compliant entrances to buildings. Where stairs and ramps are required, they must comply with accessibility codes. The requirements include allowable gradient and hand and barrier railings.

These guidelines cover the major issues required by the ADA, but are not intended to be used as a codes manual. A full review of the ADA Accessibility Guidelines for Buildings and Facilities or the *Uniform Federal Accessibility Standards* should be made before constructing or rehabilitating landscape areas. The codes are constantly evolving and are subject to revision. Further information and design checklists can be found on the Federal Access Board website:

http://www.access-board.gov/indexes/pubsindex.htm

Accessibility to Building Entrances

When a ramp is required to enter a building, if it is at all possible, the ramp should be positioned in the direction of the main flow of traffic. The ramp should be part of a universal route for all users.

Fig. 30: Accessible entrance to an academic building on the SUNY Oswego campus

The entrance to the academic building at SUNY Oswego shows this situation (*Figure 31*). When the difference in elevation is too great to accommodate the length of the ramp in the main direction, the ramp (and stairs as necessary) must converge on a landing. When ramps are less than 5% in slope, handrails are not required, which makes the ramp less obtrusive.

When handrails are required on a ramp they must extend one foot beyond the sloped pavement surface on both top and bottom. This allows a person with physical impairments to grab on to or let go of the handrail while standing on a level surface. *Figure 33* shows a sectional view of a compliant ramp with railing.

Much of the University's campus predates accessibility standards and requirements. As a result there is a lack of accessibility overall, and where retrofits exist the solution does not always seem to be well integrated. The campus has made an effort to rectify this shortcoming by providing ramps at various locations. The measures taken to provide access may seem out of place unless care is taken to make them fit with the architectural and pedestrian context of the campus.

Ramp Checklist

- ☑ The maximum gradient allowed for a ramp is 8.33% (1:12).
- ☑ If the ramp must slope at 5% or greater, handrails are required on both sides.
- ☑ Railings must extend one foot beyond the sloped pavement surface on both top and bottom of a ramp and must return to either the post or adjacent wall.
- ☑ The width of the ramp cannot be less than 36” between handrails.
- ☑ If a ramp exceeds 30’ in length, a landing is required every 30’.
- ☑ Sidewalks/ramps less than 5% gradient do not require rails.

Fig. 31: This temporary access ramp near the library clashes with its surrounding. Broad universal access (at less than 5%) would be more appropriate

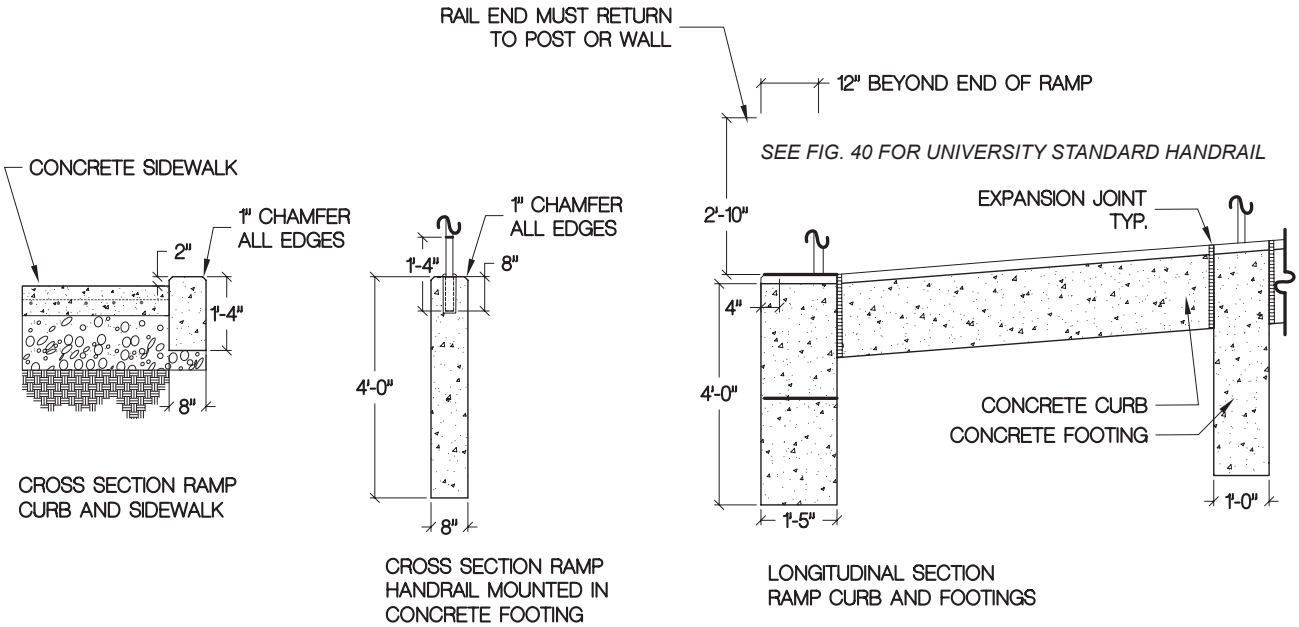


Fig. 32: Typical ramp details

Fig. 33: Wide, Gentle Curb ramp at Empire Commons

Fig. 34: Curb ramp with Cast Iron Detectable Warning: Oxidized iron provides the required contrast with adjacent pavement

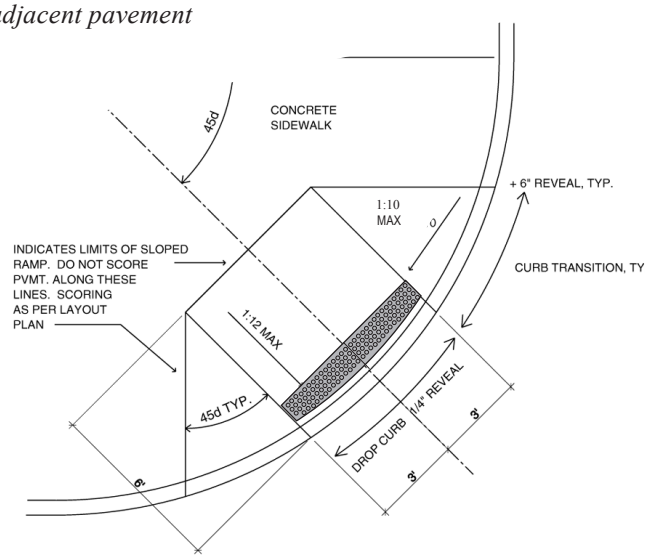


Fig. 35: Plan drawing of typical curb ramp at a radiused intersection with detectable warning area

Curb Ramps

Curb ramps are required whenever a sidewalk that is a part of an accessible route meets a curbed street. The ramp allows a smooth transition for a person in a wheelchair. The minimum width is 36", but in high traffic areas a greater width may be more practical and less obtrusive. The curb ramp shown at Empire Commons is a wide, smooth area where the curb is dropped (*Figure 34*). The pavement should slope subtly without following the lines of the scoring. These relate to the overall paving pattern and not the curb ramp itself. *Figure 36* shows a plan view of a typical curb ramp at a corner. Detectable warning strips (*Figure 35*) are necessary within the flush portion of the curb ramp. The University standard for the detectable warning strip is recommended in Appendix F, *University Standard for Detectable Warning Strip*.

Code Compliant Curb Ramp Checklist

- ☑ Slope of ramped portion shall not exceed 1:12 or 8.3%.
- ☑ Flared sidesshall not exceed 1:10 or 10% where pedestrians would normally walk across the ramp.
- ☑ Transitions from walk or street to ramp should be free of abrupt grade changes. Level changes shall not exceed 1/4" or 1/2" with a beveled edge.
- ☑ The minimum width of a curb ramp is 36", but should be constructed to match the width of the adjoining sidewalk or context (perpendicular to the curb).
- ☑ The bottom 2' of the ramp must have a detectable warning surface, in a color that contrasts at least 70% from the surrounding pavement (note: University standard recommended in Appendix F).

Fig. 36: An accessible parking space showing striped access aisle and sign

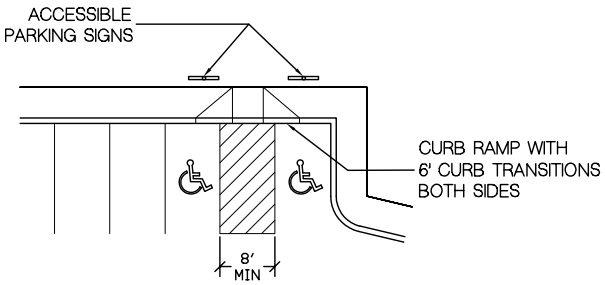


Fig. 37: Plan drawing of typical accessible parking spaces with shared access aisle

Accessible Parking

Accessible parking must be provided for all buildings and all outdoor facilities. The amount of accessible parking required is prescribed by New York State building codes and based on the Americans with Disabilities Act Accessibility Guidelines (ADAAG) but exceptions are often made in the case of Colleges and Universities. In these cases, the College or University must agree to provide an accessible space for each person who needs one plus a number of visitor accessible spaces. Subsequently, the amount of accessible parking can vary depending on need. *Figures 37* and *38* show typical compliant parking.

Accessible Parking Checklist

- ☑ Accessible parking spaces serving a particular building shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance (ADAAG 4.1.2).
- ☑ A curb ramp or drop curb must be provided.
- ☑ An accessible parking sign must be located for each space (Compliant with ADAAG 4.6.4). The space must also be stencilled as shown in *Figure 38* (and ADAAG 4.30.7).
- ☑ An access aisle must be located adjacent to each space with a minimum width of 8'-0". Two spaces may share an aisle. The aisle should be signed "No Parking"
- ☑ An accessible route must be provided from the parking space to the destination.
- ☑ Parking spaces and access aisles shall be level with surface slopes not exceeding 2% in all directions.
- ☑ Passenger loading zones shall provide an access aisle at least 60" wide and 20' long adjacent and parallel to the vehicle pull-up space (Compliant with ADAAG 4.6.6)
- ☑ Striping shall be of color based on University standards.
- ☑ Wherever possible the accessible route serving accessible parking shall not require people to cross traffic in order to access the curb.

Stairs and Hand Rails

The University has both conventional and unique stairs typical of the modern design that defines the campus. Stairs have multiple requirements in both New York State building code and ADA requirements.

Stair Checklist

- ☑ Stairs must have uniform riser heights and tread depths.
- ☑ Nosings must not be not abrupt and cause tripping.
- ☑ Tread and landing surfaces must slope so water does not accumulate (1/4" per 1'-0").
- ☑ Size width of stairs appropriately in relation to intensity of use.

Handrails are required on all stairs and must always comply with the following requirements:

Stair Handrail Checklist

- ☑ Railings are required on both sides of stairs.

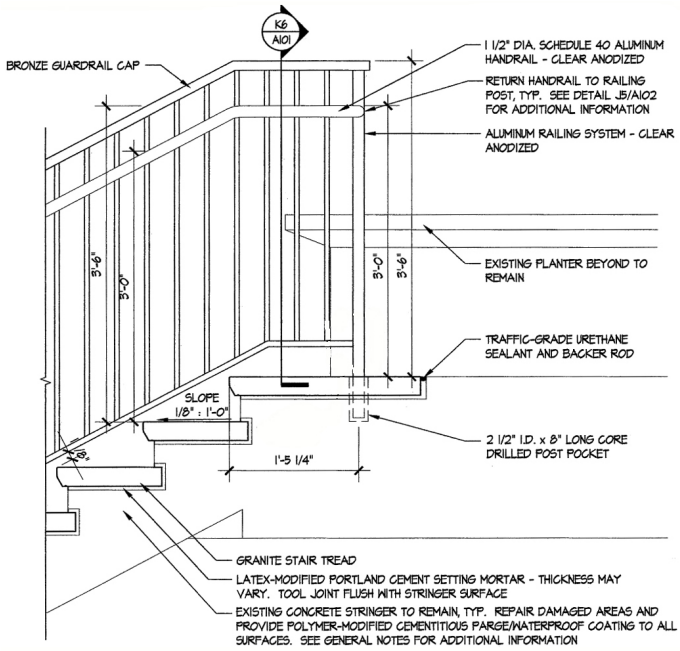


Figure 38: Elevation drawing of code-compliant University standard railing

- ☑ Intermediate handrails are required so that all portions of the stairway width required for egress capacity are within 30 inches of a handrail. On monumental stairs, or unique conditions, handrails shall be located along the most direct path of egress travel.
- ☑ Handrails must extend 12" beyond the nose of the top riser and 12" plus the dimensional depth of the tread beyond the bottom riser, unless this protrudes into the primary path of travel. In the case that the handrail extension would protrude into the primary path of travel "turned out" extension may be used.
- ☑ Railings must be smooth and continuous although they may break at landings if they have the appropriate extensions.
- ☑ Railing extensions should not present a hazard in the form of a rail end extending straight towards oncoming pedestrians. Rail ends should be rounded down or radiused.
- ☑ Railings shall be constructed of aluminum as per the University Standard detail, see *Figs 40, 41 and 42*.
- ☑ Railings shall be constructed to comply with NYS Building Code, ADAAG and the University Standard detail, see *Fig. 40*.

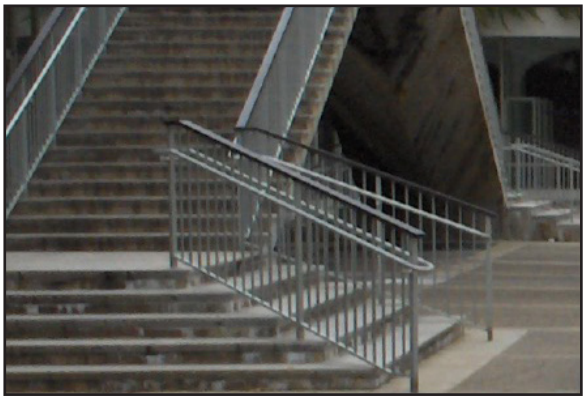


Fig. 39: University at Albany typical standard handrail

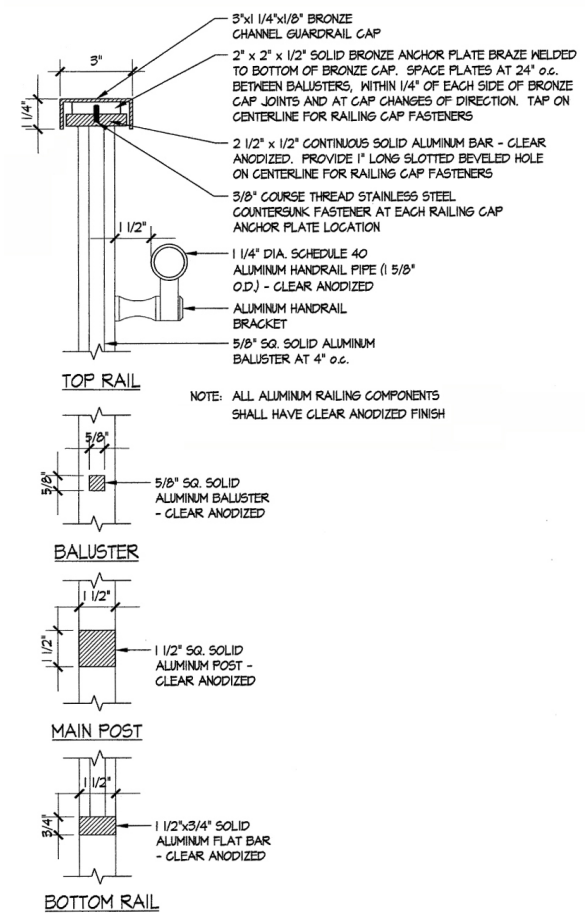


Fig. 40: Section drawing of University standard railing

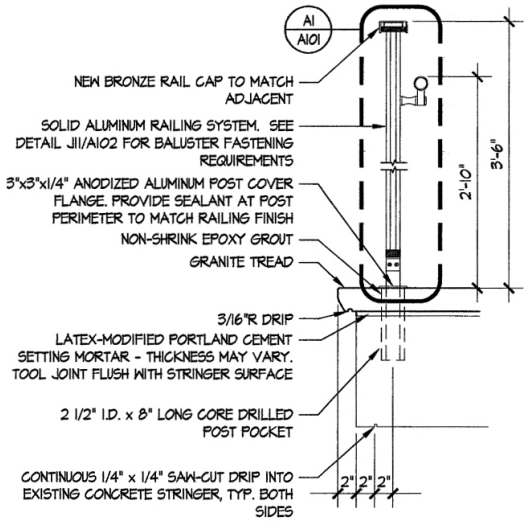


Fig. 41: Section drawing of University standard railing

Barrier Railings

According to the New York State Building Code, all instances where a falling hazard of more than 30" exists, a barrier rail or barrier wall is required. This is especially important in areas where pedestrians are invited to walk up to an edge, of a retaining or free standing wall. Instances of grade separation of 30" or more occur in many locations across campus, but this is especially common on the podium and the residential courtyards.

Where possible, drops of more than 30" should be avoided, to minimize railing. This can often be accomplished through regrading in the area of site walls.

Figure 43 shows an example of a compliant barrier railings.

Barrier railings must comply with the following requirements:

- ☑ Railings must be at least 42" high.
- ☑ The spaces between pickets (vertical) for railings must be less than 4".
- ☑ Railings shall be constructed of a non-corrosive material. Aluminum is acceptable. Stainless steel or steel are preferred.
- ☑ Powder coat finish is more durable, and should be chosen during rail design.

Fig. 42: Barrier railing at a site wall at SUNY Cortland

Site Furnishings

Furnishings for the campus should have a variety of styles depending on their location in the campus. In academic or administrative portions of the campus, furnishings should have an institutional or "public" styling that makes them appropriate, extremely durable and not appear temporary or residential in character. Near residence halls, furnishings could be different to create a more relaxed, comfortable setting.

It is important that furnishings can stand up to the occasional abuse they receive in a campus setting. In general they should be anchored in place and be of a durable material that can be repaired or painted if need be. Light colors seem to show wear and rust sooner so a dark green or gray or black painted finish is recommended.

When it is obvious that an area has become a "smokers area," ash receptacles should be provided and emptied as often as necessary.

Benches

Benches are an integral part of gathering spaces on campus. Benches should be durable, yet comfortable, and should also reflect the character of the campus or a particular campus area.

A bench similar to that shown in *Figure 44* may be an ideal selection for campus because it is available with a number of seat surface options including metal, wood and recycled plastic. It is also a semi contemporary style that is neither too historic nor too stark and will complement the different architectural styles on campus.

Different seat materials can be specified for different locations or applications, while maintaining a consistent frame material and color. This type of bench will allow the campus some design flexibility within a common furnishing vocabulary. For the proposed University standard see Appendix G, *University Standard Site Furnishings*.

Fig. 43: A simple, wood-and-metal bench family

Bench Checklist

- ☑ Wooden benches may be used for commemorative purposes, or in garden-like settings where high traffic and vandalism are not issues such as the podium gardens. A quality bench will be more durable than a lighter weight residential version that may look very similar.
- ☑ Adopting a "Bench Family" will allow variations in surface treatment and features while maintaining a consistent design style.
- ☑ Metal benches should be used in more high-traffic areas, as they are more durable. This may be more appropriate in the academic core of a campus, such as the podium.
- ☑ Benches should be permanently mounted, except in those areas where moveable furniture is called for, such as the fountain terrace on the podium.

- ☑ Benches should be located at all residence halls, community spaces, and other public-oriented areas. In addition, benches should occur where people congregate or wait, such as drop-off areas or bus stops.
- ☑ Benches should be grouped in small numbers, at right angles to each other where possible to encourage conversation.
- ☑ Locate benches in residential courtyards near entrances and in gathering spaces.

Bike Racks

It is important, for many reasons, that the University provide convenient and secure bicycle parking near all campus buildings. Convenient bicycle parking is not only an amenity for the campus; it encourages the campus community to ride bikes to and around campus, and it discourages people from locking bikes to handrails, trees, and light poles. The repeated wrapping of locks around trees and light poles can cause damage, and bikes locked to handrails can block accessibility to the railing for someone who needs its support.

Surface mounted bike racks are sturdier and take up less space than freestanding bike racks. Bike racks can be surface mounted when they occur on paved areas such as concrete (*Figure 45*). Inverted "U" racks can be purchased from several manufacturers but can also be easily fabricated locally. Colors and finishes for bike racks should be coordinated with other furnishings in an area on campus.

For further discussion see report titled *University at Albany Bike Parking Plan*.

Fig. 44: Inverted "U" bicycle rack surface mounted onto pavement

Bike Rack Checklist

- ☑ Locate bicycle racks in front of or near all buildings
- ☑ Located bicycle racks off of sidewalks on separate pad if necessary to ensure that they do not impede pedestrian traffic
- ☑ Provide surface mounted racks wherever possible. Gang racks with rail mounts where surface mounting is not possible.
- ☑ Consider bike rack requirements consistent with LEED criteria (5% building FTE, See section on LEED considerations)

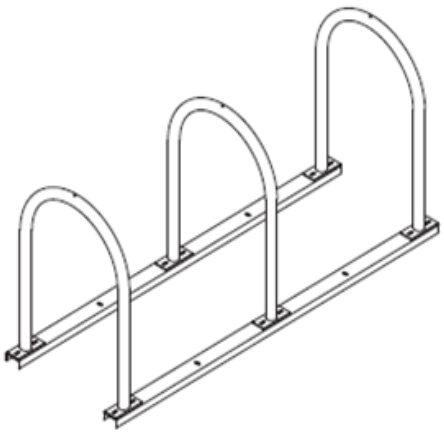


Fig. 45: Inverted "U" bicycle rack, alternatively, rail mounted for use on podium and other areas where direct surface mounting is not possible.

Trash and Recycling Receptacles

Trash and ash receptacles are essential elements in maintaining campuses. While they provide no guarantee that campus community will use them, if trash and ash receptacles are not provided in a needed location, trash quickly becomes a problem. Trash receptacles should be provided periodically throughout the campus along major walks and at all building entrances. Any area that has clearly become a "smoker's area" should be provided with an ash can. Recycling receptacles shall also meet these guidelines.

Bins must have openings of various shapes to distinguish between refuse types.

Colors and finishes for trash and ash receptacles should be coordinated with other campus furnishings such as benches. See Appendix G, *University Standard Site Furnishings* for recommended furnishing options.

Fig. 46: A high quality example of a refuse bin that meets all the criteria on the checklist and comes in a variety of finishes

Trash and Recycling Checklist

- ☑ One trash and ash style should be chosen to be used uniformly for each campus zone, as follows: the podium and residence halls, landscape spaces, during events. Should a recycling receptacle be used, it should also match the trash receptacles.
- ☑ Receptacles should reflect appropriate campus character. Receptacles should be durable and modern in nature.
- ☑ Ash tops on trash receptacles should not be used because they collect rain and snow and are difficult to maintain. Domed lids are recommended for this reason.
- ☑ Both trash and recycling receptacles should be placed outside major campus buildings and intermittently across campus.
- ☑ Top-opening trash receptacles are not practical, as they collect rain and snow. Side opening receptacles or protective lids are preferred.
- ☑ Side doors are recommended for ease of opening. Many litter receptacles have an internal liner. Minimal maintenance should be a priority.
- ☑ Refuse units designed to accept recycling must accept each of the following refuse types: 1. Glass, plastic and cans 2. Mixed paper 3. Trash
- ☑ Receptacles should be chosen or placed to prevent vandalism. Where surface mounting anchorage is not feasible consider epoxy or receptacles of significant weight.
- ☑ When choosing colors for trash and recycling receptacles, dark colors are recommended, with appropriate openings and stencils.

Lighting

Lighting is necessary on campuses primarily for security issues, but can also serve to characterize a landscape theme or idea. Pedestrian-scale light poles or bollard lights can help reinforce a streetscape or important pedestrian walk. Refer to the report by Naomi Miller for University standard lighting options.

Various lighting types have been proposed in the *Lighting Master Plan* to be used in different contexts. Different fixtures and pole heights may be used in pedestrian versus vehicular zones. Similar fixtures can be purchased from other manufacturers.

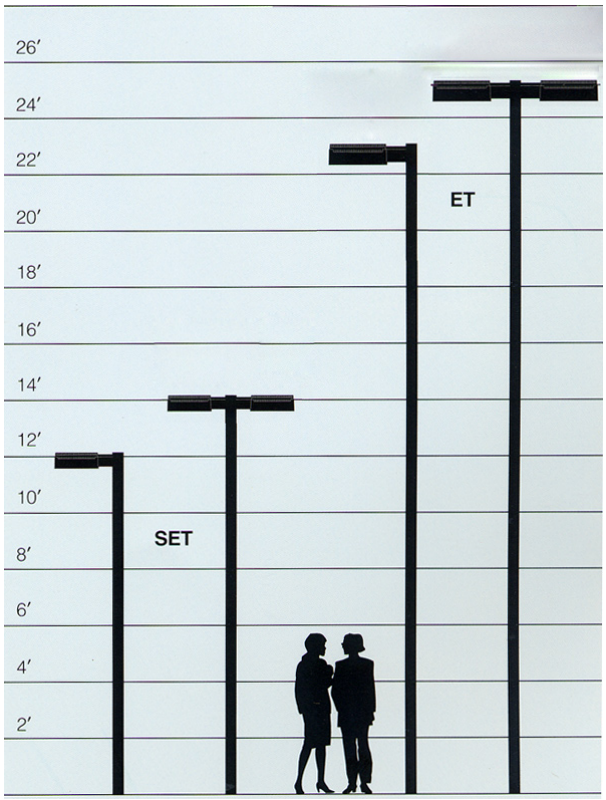


Fig. 47: Scale chart for appropriate pole heights

Lighting Checklist

- ☑ Simple, black "shoebox" style light fixtures are appropriate for large parking lots.
- ☑ Decorative light poles are appropriate for pedestrian areas. (Refer to Miller report for University standard)
- ☑ High-intensity wall packs should not be used on buildings, as they increase the glare and can actually reduce visibility for a person approaching a building.
- ☑ 12'-14' poles should be used in pedestrian areas to provide a more human scale (*Figure 48*). Taller poles are appropriate for lighting large areas such as parking lots. For specific application of pole heights see the *Lighting Master Plan* in bibliography.
- ☑ Cutoff or full cutoff fixtures should be used to reduce uplighting. Photometrics should be prepared to ensure adequate light levels, without overlighting or off-property spillage.
- ☑ House-side shields should be used to reduce glare on pedestrian walks and near residential halls and classrooms.

Directory Pull-Off

A pull-off near significant campus entrances with a campus map, directory and available paper copies of campus maps orients visitors and guides them to their destination and close visitor parking areas.

Figure 49 shows an example of a campus directory sign.

The pull-off should be 10 feet wide and 30 feet long parallel to the main campus road, and near a main campus entrance. This will allow for cars and buses to pull off and use the campus directories.

The campus directory pull-off should include a large campus map, a corresponding campus directory, a campus phone, and waterproof containers for paper maps and brochures. Directories should be consistent and coordinated with existing wayfinding signage.

Directory Checklist

- ☑ Locate directories near major campus entrances.
- ☑ Provide a pull-off for vehicles
- ☑ Provide campus map and directory
- ☑ Provide paper maps and campus phone if practical.

Wayfinding Signage

The purpose of campus signage is to inform and direct. Well executed signage will blend unobtrusively into the landscape as background where it will serve a support role to the larger structure and infrastructure of the campus. Signage, though playing a support role, remains as an element of the landscape and should be designed to fit into the larger campus context. This should be carried out without sacrificing the informational content of the sign.

Uniformity is especially important in the case of signage. The ability of visitors to locate and recognize signage is critical to the day to day operations of the University. This goal can best be served by establishing and adhering to standards for campus signage, including typesetting and material specifications. While the particulars of this design objective are outside the scope of this guideline it is recommended that all campus signage go through proper review channels to maintain the standards already in place. Wayfinding signage has been recently designed and installed. Any future signage should be consistent with the *University Signage Manual*.

The placement of signs in the landscape is of equal importance to their form. Consistency and uniformity in the act of setting the sign will further aid visitors in their ability to recognize and interpret signage. Specifics should be an extension of the sign program. General aspects have been included here:

Fig. 48: Campus directory information sign with vehicle pull-off

Fig. 49: University standard wayfinding signage

Exterior Sign Checklist

- ☑ When possible and where appropriate signs shall be located in existing shrub beds to reduce detailed maintenance
- ☑ Where a sign is related to a vehicular intersection, signs shall be located as close to the signed intersection as practicable. Maintain safe sight lines.
- ☑ Wherever possible signs shall be oriented at 90º from the street. Building Identification signs shall be located parallel to the face of the building.
- ☑ Signs shall be installed with cast in place concrete footings or pads.
- ☑ The number of words on a given sign shall be kept to a minimum. Wherever possible signs should not exceed six lines of type.

Fig. 50: A new planting along the lower pond trail. Many new plantings will be done throughout the campus over the next decade to repair the declining canopy

Plants and Landscaping

The Plants and Landscaping section of this document includes guidelines and standards to improve the quality of planting and landscape maintenance on the University at Albany campus. High quality landscaping will not only enhance the aesthetics of the campus, but will also mediate the environmental conditions associated with some of the buildings and exterior spaces.

It is recognized that some areas of campus have distinct landscapes characterized by a historical and ecological relevance to the campus setting. For example the Podium East Garden exhibits a symbiotic relationship notable to the region in the planting group of Larix and Azaleas.

This section describes how to protect existing trees during construction and provide the best practices for maintaining trees throughout the year. A summary of the canopy composition and health is presented with analysis. Best practices for tree maintenance are recommended. Also included are considerations for new plantings.

Adherence to these guidelines will both improve the quality of existing landscaping and ensure healthy, long-lived trees in future installations.

Fig. 51: Consolidated utilities

Fig. 52: A durable tree protection fence in use on a construction site

Protecting the Campus Landscape

Consolidated Utilities

Consolidated site utilities in identified corridors can reduce widespread landscape disturbance during upgrades and infrastructure reconstruction (*Figure 52*). Care should be taken regarding layout of utilities in order to reduce or eliminate disturbance of surrounding landscape areas during construction. This will require adopting landscape construction barrier details (*Figures 53* and *54*) and using shoring when deep excavations for utilities occur in near proximity to significant landscape areas.

- Develop a plan for the consolidation of utilities over time, especially as new construction and rehabilitation of site infrastructure occurs.

Tree Protection Fence

The campus should adopt tree protection standards and details which keep excavation, vehicles and material storage well away from existing trees. The use of 4 x 4" wooden posts and lumber fence sections or chain link will reduce the risk of protective barriers from being removed or relocated during construction.

- Develop and adopt a uniform set of details for protection of the landscape during construction activities.

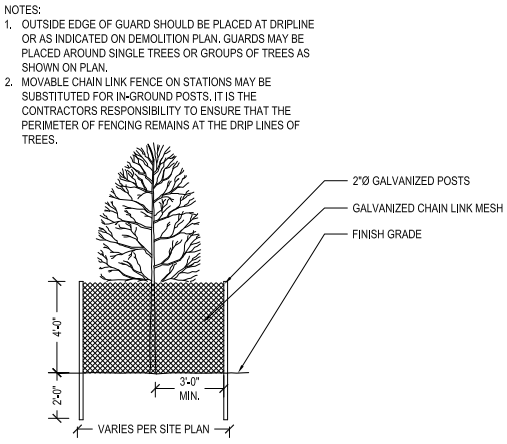


Fig. 53: Standard tree construction fence detail

Assess Tree Planting Conditions

Knowing the conditions of your site, both above and below ground, and having available a list of appropriate tree species can help determine which trees are best for your site.

Structural Considerations

The presence of physical barriers to tree growth above ground such as narrow building setback from the street or utility corridors require a tree that will not interfere with these structures. Likewise it is important that structures, cars or pedestrian traffic not interfere with tree growth. This applies to both above and below ground parts where damage may occur.

- Carefully consider the size of the tree relative to the volume of soil in which it has to grow. Avoid planting trees in places where the growth of the tree may be restricted by structures, or places where the tree may interfere with the function of buildings, signs or below grade utilities. Trees grown in planters must be carefully sized relative to the availability of water.

Soil Texture

Underground obstacles, and compacted soil near curbs and driveways can restrict tree rooting space, and can limit root access to the proper amount of water, oxygen and nutrients (*Figure 56*). Compacted soils reduce root growth and subsequently diminishes the vigor of plantings. When soil structure is damaged on a site, mitigation measures must be employed prior to planting to improve soil drainage and texture. Compacted soils are extremely difficult and costly to mitigate. The best measure would be to avoid soil compaction whenever possible. The University should adopt a soil specification for new soils. The specification should take into consideration the cultural requirements of vegetation to be included. For instance, when native vegetation is being selected, soils should be designed to match historically indigenous soils.

- Consider soil texture. A sandy soil, typical of the University at Albany campus, will help resist compaction, but a soil that is too sandy will not hold water long enough for a tree to take up the amount of water it needs. Likewise, a heavy clay soil is more vulnerable to compaction. The campus should adopt a soil specification for new soils imported, or manufactured and amended on site, to best suit the needs of the project constraints such as vegetation selection. New soil depths should occur to 2'-0" for trees and woody plants and not just shallow soils typically specified for turf grass.

Fig. 54: Tree trunk damage due to trees being planted too close to parking lot curb line

Fig. 55: Characteristics of compacted soils

Fig. 56: Ponding in an urban condition due to poor drainage near trees

Fig. 57: Test pit with exposed soil strata

Poor Drainage

Soil compaction often leads to poor site drainage. Poor drainage can limit or totally eliminate root access to oxygen. Poor drainage is often due to compaction, soil texture, and underground obstacles.

Nothing kills or reduces the vigor of trees and shrubs more than poor drainage. Water saturated soil kills or weakens plantings very quickly (except for certain flood plain species).

Checklist for Soil Drainage

- ☑ Test soil drainage by digging a hole where planting will take place, saturate sides and bottom of test pit, fill with water in and observing how long it takes to drain.
- ☑ Observe textural quality of soils across the profile of the planting pit. Soils with high levels of fine particles (silts and clays) should be expected to be poorly drained.
- ☑ Include in future technical specifications the requirement for percolation testing prior to planting.
- ☑ Percolation tests should be employed for each planting pit or bed. If soil doesn't drain 4.0" per hour, mitigation measures should be employed to improve drainage before planting occurs.
- ☑ Consult with University personnel for solutions.
- ☑ Adjust vegetation selection based on mitigation measures.
- ☑ Require a texture particle analysis for imported/amended soils in new landscape areas. Consult with University personnel for alternate solutions.

Fig. 58: Marginal scorch on tree leaves due to salt damage

Salt Damage

Excessive use of de-icing salts can cause disfigurement, disease and sometimes death in trees (*Figures 59 and 62*). This is especially a problem for those trees that are very sensitive to salts such as sugar maples, lindens, many other deciduous trees and shrubs as well as evergreen species such as certain pines.

- In places where high levels of deicing salts must be used, choose salt tolerant species.

Alkaline Soils

The use of limestone-based materials such as concrete along with other construction debris in soil can result in a high pH (*Figure 60*). This causes many species of plants to develop interveinal chlorosis due to their inability to take up certain nutrients and results in plant decline and death. Chlorosis is a common problem on the University at Albany campus found especially in a species of o ak, *Quercus palustris.*

It is important to test soil pH. Most soils in highly maintained and constructed places have a high pH (near neutral to alkaline) due to limestone used in concrete and other paving materials. Soils at the University at Albany campus tend to be mildly acidic to neutral (pH 5.6-7.0). Actual pH will vary across locations of the campus. Soil pH testing should be a part of technical specifications. New soils specifications should include pH, USDA soil texture, organic content, and available nutrients.

Fig. 59: Construction debris in soils can modify pH. NO construction debris should be dumped in planters.

Fig. 60: Pin oak (Quercus palustris) leaves exhibiting the classic symptoms of interveinal chlorosis

Fig. 61: Environmental damage and winter kill of tree buds

Fig. 62: Symptomatic dieback caused by Diplodia pinea in a stand of P. nigra

Climate

Microclimates, physical features and above ground conditions can place stress on trees, especially in an intensively used campus environment. Excessive wind, heat or in some cases lack of light, can place trees under stress. Trees in windy sites may need extra water to prevent them from drying out.

Surrounding building surfaces, cars, asphalt, and concrete re-radiate sunlight onto trees, causing them to lose water faster than they would normally. In this case it is advisable to use drought tolerant trees.

USDA Hardiness Zone

The University at Albany is in USDA Zone 5b. Plants in containers are more susceptible to cold winter temperatures than those planted in the ground. The roots of container grown plants are more exposed to freezing temperatures, and container grown plants experience wider fluctuations of freeze and thaw cycles. Due to this additional pressure, only exceptionally root hardy plants should be specified for above grade planters. Conversely, there are some especially sheltered areas on campus (e.g., the courtyard gardens of the podium and the courtyards around the residential towers) that would support marginally hardy plantings. The USDA hardiness zone should be used as a point of reference and adjusted for during planting selection based on microclimatic features.

Severe winter winds exacerbated with salt and poor drainage can result in trees that exhibit witches brooms or secondary bud break along a branch. Terminal buds in marginally hardy trees can be killed resulting in unsightly clustering of shortened branches (*Figure 62*). The risk of salt damage should be taken into account when selecting and siting plantings. Some salt tolerant species are available, see Appendix H, *Recommended Plants*. It should be noted that *Pinus nigra*, widely planted on campus, is salt tolerant but should not be planted due to the presence of a wasting disease *Diplodia pinea*.

Landscape Assessment

During the fall of 2008, and spring of 2009 Trowbridge and Wolf, L.L.P., conducted a campus landscape assessment for the University at Albany uptown campus. The study consists of soils and vegetation assessments for the entire campus. Vegetation assessment was conducted as a field study on a tree-by-tree basis.

Soils

Soils samples were collected and analyzed from seven areas across the campus in order to generate a survey of the general soil conditions. Samples were sent to be analyzed at the labs of Hummel & Co. Inc. The full report is included in the TWLA report "Overall Campus Landscape Assessment" (provided July 2009), henceforth OCLA.

In general soils are mildly acidic (ranging in pH from 5.6-6.7). One outlier near Fuller Road was found to be slightly alkaline (pH 7.1). Current pH levels do not reflect historic conditions. Before the area was developed it is assumed to have been occupied by inland pine barren. Reference sites suggest a pH of 5.0 is typical of this historic condition.

Soils on campus tend to be sandy, sandy loams, and loamy sands. Some soils consist of more fine silty particles and range into loams, and silty loams. Due to the textural qualities of the soils on campus there exists a high risk of soil compaction. This feature of the soils should be taken into account during construction activities in order to reduce the potential negative impact of such activities.

Where there is pedestrian and vehicular traffic, around building and along desire lines it is very likely that soils are compacted and exhibit poor drainage characteristics. Compacted soils are a major limiting factor for most vegetation. Poor growth due to soil compaction is evident on campus. Once compacted, soils are very difficult to repair.

Sample	pH	Texture
Western Ave	6.6	Sandy Loam
Washington Ave West	6.3	Loamy Sand
Washington Ave East	5.9	Sand (fine)
Fuller Road	7.1	Loamy Sand
Collins Circle	5.6	Loam
North Podium	6.7	Sandy Loam
South Podium	6.2	Silt Loam

Fig. 63: Table of soil characteristics by pH and texture

Vegetation

The vegetation assessment was conducted as a field study on a tree-by-tree basis, over the 2008-2009 field season. Each of the campus's 3194 specimens was identified by species and size (recorded as diameter at breast height, or DBH). General observations were recorded with a ranking of each plant relative to health, form, and disease. Diseases and other conditions, such as chlorosis were identified for each specimen during the study.

Data collection consisted of:

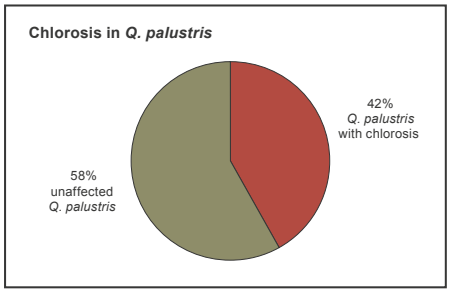
- Verification of tree location on the survey map available at the time of the assessment
- Species of tree
- DBH
- Comments which included general condition for each tree; and a percentage factor for ranking which included:

1. *Dead. To be removed.*
2. *> 50 - 75% Poor condition. To be removed due to disease, form or mechanical damage.*
3. *> 25 - 50% Average condition. Requiring significant remediation.*
4. *> 10 - 25% Good condition. Minor pruning needed.*
5. *< 10% Excellent condition.* No obvious remediation.

The ranking system is an index of general plant health (*Figure* 65). Plants ranked 1 and 2 are dead or dying, and should be removed. Those ranked 3 and 4 are in need of various degrees of remediation. And, those ranked 5 are in good health and should be maintained with regular care.

Survey data was compiled and cross referenced to a master drawing (see OCLA). From this data set the following conditions can be observed:

- The campus landscape is represented by several dominant species often planted in large monocultures. The dominant species include: *Pinus nigra* (Austrian Pine), *Quercus palustris* (Pin Oak), *Gleditsia triacanthos* (Honey Locust), *Acer spp.* (Red & Sugar Maples).
- *Pinus nigra* has a devastating disease (*Figure* 63). The dominant evergreen tree on the campus is *Pinus nigra*. Unfortunately this salt-tolerant evergreen is dying across New York State from a fungal disease, *Diplodia pinea*, which has no cure. It spreads quickly especially amongst young plants. There is evidence of widespread infection across the campus' pine population, which is characterized by upper level dead branches and tip blight leading to death. ***While not curable, the spread of the disease can be slowed by good hygiene practices.*** These include removal of the leaf (needle) litter where the disease incubates over winter, as well as removal of infected trees.
- Quercus palustris is widely planted on campus. This species is demanding of acidic soil conditions and is native to swampy areas. The fact that it is not in its ideal habitat is evident from the high rate of chlorosis (seen as yellowing of the leaf and reduced vigor/die back, see *Figure 61*). It is often found in or near parking areas. As a result, many are growing in highly compacted soils and many have died or been removed.
- Species selection needs more consideration. Some



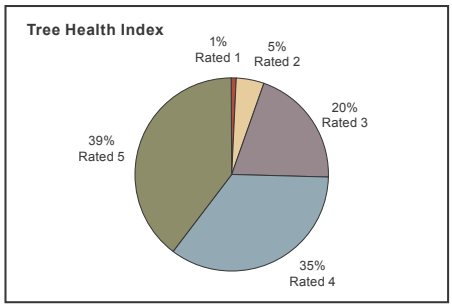


Fig. 64: The campus wide landscape assessment reveals the majority of trees on campus will need some degree of remediation. A small, but significant, portion of trees will need to be removed.

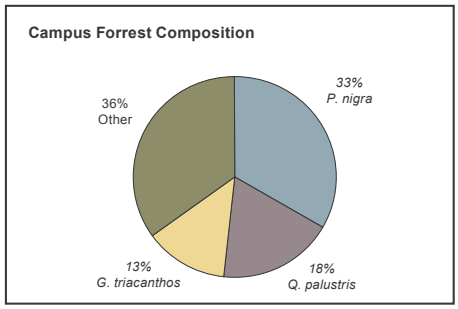


Fig. 65: A graph of species composition shows that three species make up two thirds of the campus's roughly 3200 specimens.

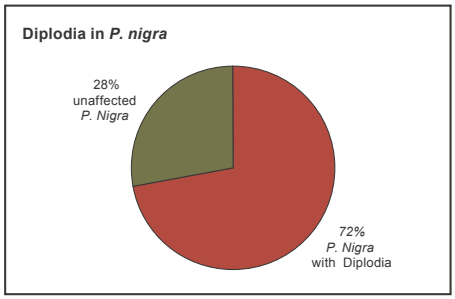


Fig. 66 (Above): The majority of P. nigra on campus is infected with the fungal disease Pine diplodia. Once infected there is no cure and treatment is expensive.

Fig. 67 (Left): Nearly half of all Quercus palustris on campus exhibit signs of chlorosis - indicating poor growing conditions often leading to stunted growth and dieback

recently planted trees such as *Fraxinus spp.* (Ash) and *Acer platanoides* (Norway Maple) should no longer be planted on campus. *Fraxinus spp.* are likely to be decimated by an insect that has killed all species of Ash as nearby as Southern Ontario and Eastern Ohio/Western NY. Many existing specimens show signs of ash decline. These trees are not likely to survive. Norway Maple is a very invasive tree that is on "no-planting" lists for the surrounding counties of the University as well as NYSDOT and other state agencies.

- The numerous *Gleditsia triacanthos* (Honey Locust) while generally healthy, were sometimes not selected as inermis (or "thornless"). Needless to say, large and dangerous thorns exist on these trees. This is not a condition that effects tree health, but rather an on-going maintenance issue to remove large clusters of thorns at a level on the trees that may cause injury to members of the campus community.
- The plantings are in need of the services of a professional arborist. Pruning practices need to be improved. While pruning needs to occur at some level on the majority of the trees it is particularly apparent on the *Quercus palustris* (Pin Oak). The trees could generally benefit from periodic evaluation and pruning by a trained arborist.

Landscape Assessment Checklist

The following should be considered relative to future campus landscape development and management practices, including scheduling of maintenance practices. Consultation with a certified professional arborist is recommended:

- ☑ Remove and reconsider preserving trees that are deemed of poor quality due to mechanical damage, form or disease. Regular maintenance for pruning and removal of debris should be executed. To develop scheduled maintenance on campus see *Community Maintenance Pruning*, and *Pruning Mature Trees* in *Appendix L: Pruning Guidelines*.
- ☑ Maintenance priority should focus on problems outlined in this section. These include fungal disease in some pine spp., dieback in some oak spp., and potential problems with pests and established decline in ash spp.
- ☑ Regular maintenance should focus on good hygiene as it relates to campus tree disease. This includes removal of diseased and dying specimens as a priority and removal of leaf litter wherever feasible. Diseased trees should not be replaced in kind.
- ☑ Consider the selection of new species and contemporary cultivars appropriate for site and soil conditions and not prone to disease or invasiveness. Eliminate diseased and dying species.
- ☑ Consider increasing biodiversity in future plantings by including a wider variety of species. It is possible to develop planting groups which appear similar but are distinct enough to prevent epidemic spread of disease. The selection of trees that appear similar would be consistent with the original campus design featuring large monocultures. See *Appendix I: Visual Similarity & Biological Diversity*.
- ☑ Promote appropriate horticultural practices including mulching around trees for water-holding capacity of soils and to eliminate grass mowing near tree trunks. Good pruning practices should occur. Debris removal should be practiced, as this is possible material for harboring disease.
- ☑ A maintenance guide should be developed for the University to reduce damage caused to trees through turf grass maintenance and snow removal.
- ☑ Prevent compaction wherever possible. This is particularly important for future construction project areas. Contractors should be limited to construction zones that are not landscape areas or to become landscape areas. Once soils are compacted it is difficult and costly to correct. Left uncorrected, compacted soils are unsuitable for most landscape plantings.

Planting Considerations

It is critical that during the process of transplanting, every effort is made to allow the plant to establish quickly by encouraging the regeneration and growth of the root system. *Figure 69* shows an appropriate planting pit and placement of a tree ball. This is done by:

Digging an Appropriate Planting Hole

- ☑ The planting hole should be 2-3 times the diameter of the root ball and no deeper than the depth of the root ball.
- ☑ If possible, the entire planting bed should be loosened or tilled rather than individual planting holes.
- ☑ Where trees are planted in lawn areas, no imported topsoil is required, unless the existing soil has exceptionally poor structure or texture. Mix (50:50 by volume) organic compost with existing soil to improve soil texture and moisture retention.
- ☑ Untie, cut away and remove natural burlap from the trunk of the tree, a minimum 1/3 of root ball.
- ☑ Remove any synthetic burlap.
- ☑ Cut wire baskets and remove when plants are placed in planting pits (final position).

Placing the Tree in the Hole and Backfilling

- ☑ Place the plant in the hole by handling the root ball only, never the trunk or stem.
- ☑ Plant the tree at the proper depth. The trunk flare should be lined up exactly with the existing surrounding grade for loamy or sandy soils, and slightly above the existing grade in clayey or poorly drained soils.
- ☑ Backfill firmly without overly compacting the soil.
- ☑ Do not cover the trunk with soil. A small amount of soil should cover the root ball.
- ☑ Staking is generally *NOT* recommended. For bare root or extremely windy conditions staking may be necessary.
- ☑ When staking, tree staples should be considered as an alternative.

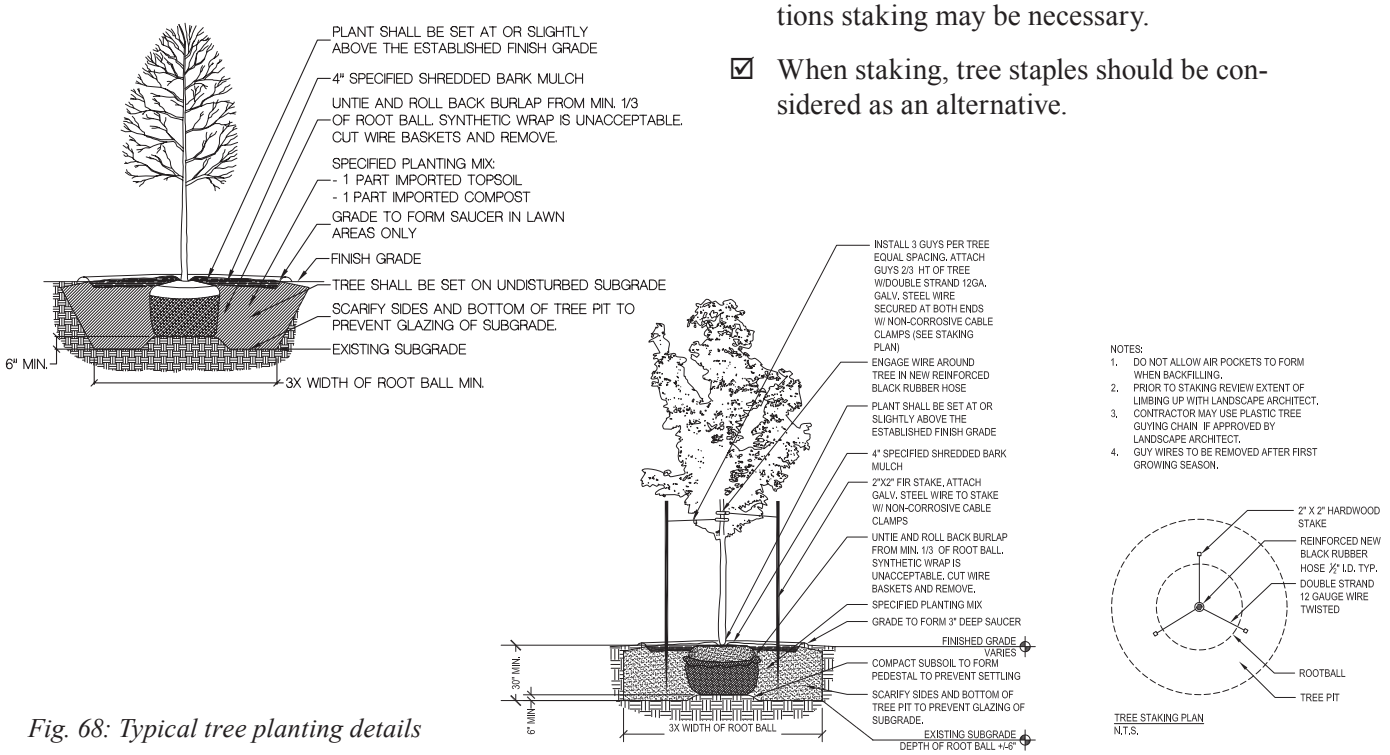


Fig. 68: Typical tree planting details

Fig. 69: Mulch rings

Fig. 70: Trees damaged by lawn maintenance machinery

Completing the Planting

Trees planted in lawn should have a large mulch ring at the base to help maintain moisture for roots, and protect the base of the tree from lawn maintenance machinery. The mulch ring should be maintained for the life of the plant. The following is the checklist for completing the planting:

- ☑ Create a mulch ring using a layer of 3-4" of shredded bark mulch. Do not over-apply mulch and keep away from the trunk. Mulch ring should have a diameter of approximately 5' for new trees. Re-evaluate mulch yearly and apply new mulch as needed (*Figure 70*).
- ☑ Use only composted mulch. Do not use wood chips from tree maintenance programs.
- ☑ Water the tree in well when it is planted. Continue a regular watering schedule of equivalent one inch/week for one growing season until the tree is well established. This will largely determine the success of the planting.
- ☑ Prune to remove dead, diseased, damaged, crossing branches and competing leaders only. Do not perform crown reducing pruning. Consult an arborist.
- ☑ Stake the tree only if necessary, such as on exceptionally windy sites or in areas where there is extreme potential for vandalism. Any tree wrap or other material used on a tree must be removed within a year maintenance period prior to the growing season to prevent girdling or the harboring of insect pests.

Mulch Rings and Prevention of Girdling

Lawn mowers and string trimmers used adjacent to trees can damage the bark and are likely to girdle the tree, eventually cutting short its life (*Figure 71*). It is important to use mulch around trees and plantings to keep equipment away from plants. Training on proper use of equipment is also necessary to prevent the loss of plants and associated costs. If none is in place, a maintenance guideline should be developed.

Planting Bed Considerations

Planting beds provide an attractive feature in the landscape, and can also reduce the amount of lawn area that would require frequent maintenance. The following guidelines should be adhered to in future landscaping to increase visual interest and reduce maintenance requirements.

Appropriate Plant Selection and Placement

- ☑ Plants should be chosen with early spring and fall seasonal interest to coincide with the times that the greatest number of faculty, staff and students are on campus.
- ☑ Plantings should not obscure walkways, doorways, or windows.
- ☑ Lower plantings should be placed adjacent to walkways to maintain visibility.
- ☑ Effective screening, such as in parking areas, will break up the visual field while maintaining essential sight lines for security. Many planting schemes are available. Where screening is desired, refer to plant selection list.
- ☑ Trees should be limbed up as they mature to provide clearance and visibility beneath their canopies. See Appendix L: *Pruning Guidelines*.
- ☑ Individual shrub plantings should be avoided. Plantings should be consolidated to one larger planting bed for ease of maintenance and mowing of surrounding lawn areas (*Figure 72*).

Fig. 71: Grouping plants together minimizes maintenance and weeding

Fig. 72: Shrubs can be selected for color to provide low maintenance and interest. A large mass of the same species creates one large color field.

- ☑ Landscape plantings should be planted in sufficient quantity and close spacing that will provide "instant impact" for grand openings and ribbon cutting. Dense plantings will also minimize weed growth. A rule of thumb is to space plantings at 2/3 their mature growth, to allow for a balance of plant density while not overcrowding.
- ☑ Natural form of plantings shall be considered when determining future maintenance. Some plantings benefit from pruning, while others should be allowed their natural growth to allow the plantings to form a mass, rather than the appearance of several individual plants.
- ☑ Refer to Appendix H, *Campus Vegetation Selection* for a list of potential plant species for the University at Albany Campus
- ☑ Refer to Appendix I, *Visual Similarity & Biological Diversity* for tree groupings and selection criteria
- ☑ Also see Appendix A, *Planting Plans for Podium Light Wells* and Appendix B, *Planting Groups for Containers* for the Podium Containers

Plant Diversity Considerations

The selection and placement of trees in the campus environment is a complex task requiring the consideration of many factors. Issues such as visual and spatial constraints and disease and insect resistance can sometimes conflict with other design objectives. Perhaps the most troubling conflict arises between the preference for visual uniformity and the practical need for species diversity. Until recently, a typical street tree planting internationally consisted of uniform rows of a single species, generally selected for its attractive appearance and high tolerance to urban stresses. However, as over planting has brought about the decline of a number of such favorite species, it is clear that design objectives must be balanced against the practical need for species diversity in tree plantings.

Current Strategies

Faced with the difficulty of balancing aesthetic and ecological concerns, designers all too often shortchange or even abandon one or the other objective. Where they may have once planted an entire campus with the a few species, those favoring uniformity over practicality might continue to plant a single species in large blocks. Planting trees in somewhat smaller 'same species' blocks will not necessarily prevent the kinds of devastation associated with monocultures, particularly if the species selected are already heavily planted on the campus.

For those favoring an ecologically sensible approach, the alternative to monocultures is sometimes to plant wonderfully diverse selections of trees that share no common characteristics whatsoever. The results of such efforts can be aesthetically disappointing, and have in a number of cases led to public outcry. Unfortunately, this type of plant selection has served to fuel the idea that the only way to achieve uniformity in design is through the exclusive use of one species.

The Case for Visual Uniformity

What makes uniform plantings so appealing in the first place? What makes them so difficult to give up? The advantages to uniformity are primarily aesthetic and have a long-standing tradition over many centuries internationally. A street lined with rows of more or less identical trees brings to most observers a sense of order and tranquillity. Even in the most heterogeneous of environments, a uniform allee of trees can have a cohesive influence, tying together diverse elements and creating a sense of identity.

The Case for Species Diversity

Unfortunately, the appeal of same species plantings is ultimately outweighed by disadvantages. Even if aesthetics were the only consideration, the fact that unhealthy or dead trees are unattractive makes the need to diversify unavoidable. A quick review of disease and pest problems in tree populations reveals numerous cases of devastation due to over planting or the exclusive planting of a single species throughout a campus. Some of the most notable examples include the American elm (Dutch elm disease), American chestnut (chestnut blight), Honey locust (honey locust plant bug), Norway maple (giant tar spot and verticillium wilt) London planetree (anthracnose) and crabapple (scab, fireblight, cedar apple rust, and powdery mildew). Over planting of some popular species can also lead to serious maintenance problems. Species with characteristics such as weak wood, a tendency to develop chlorosis, and messy fruits can certainly be used in campus plantings, but are only manageable when planted in moderation. Examples include Norway maple (girdling roots) and Silver maple (weak wood).

Another factor that makes monocultures impractical is the tremendous diversity inherent in the urban environment. The challenges and stresses for trees can change dramatically within very small spaces, often making it impossible for a single species to thrive uniformly throughout a given area. Variables such as light, temperature, drainage, soil compaction, root space, soil pH, avail-

ability of water, exposure to salt, and restrictions to crown development can vary tremendously even from one tree space to the next. A careful assessment of site conditions prior to plant selection rarely points to the selection of a single species. Even those who are aware of this fact often make the mistake of selecting one species that will purportedly survive under any and all difficult conditions. Such widely adaptable species dominate the aforementioned list of over planted trees that have suffered decline, become unmanageable, or both.

A Solution

To avoid similar problems in the future, it is clear that uniform plantings of a limited number of species must be avoided. But, is it possible to gain the practical advantages of diversity without giving up the aesthetic advantages of uniformity? Fortunately, the answer is yes. Through careful selection and grouping of plants, communities of trees can be created which, despite their genetic diversity can satisfy our desire for visual uniformity.

By breaking down the visual characteristics that distinguish one species or cultivar from another into basic categories, we have selected a set of ***four*** criteria for putting trees into aesthetically compatible groups (*exhibited in tables, opposite*). The first two criteria, size and shape, are of primary importance in grouping trees because they have greater and more immediate impact on the visual impression an individual tree makes. This is particularly true as a tree matures or as the distance from the tree to the observer increases. The other two criteria, branching density and foliage texture, are given secondary consideration because they generally are not as obvious to the casual observer and can even become difficult to distinguish as the distance from the observer increases.

For specific plant grouping examples, see Appendix I: *Visual Similarity & Biological Diversity: Street Tree Selection and Design*

Primary Criteria

1	SIZE	Large	Greater than 30' at 30 years (5 – 6 M)
		Small	Less than 30 feet at 30 years (5 – 6 M)
			Height to first branch
2	SHAPE	Round	Width > or = height of canopy
		Oval	Width < height
		Vase	Narrow at the base, becoming distinctly wider at the top
		Columnar	Width distinctly < height

Secondary Criteria

3	Branching Density	Dense	Greater than 50% opaque
		Open	Less than 50% opaque
4	Foliage Texture	Coarse	Large leaves (or leaflets) with blunt ends or lobes
		Fine	Smaller leaves (or leaflets) with acute apexes
			Foliage color

Clearly, these categories are broad, but when applied with a measure of subjective analysis and common sense, they yield some very practical and appealing groups of trees. Trees with medium or borderline characteristics have been placed subjectively on the basis of their subtle characteristics. For example, trees of the genus Fraxinus have medium-textured foliage but because of the narrow apexes of their leaflets have been placed in fine-textured groups. In some cases the basic groups are presented with subgroups that work particularly well together. Plant lists in Appendix I are for temperate areas and have been designated for hardiness using USDA zones appropriate to the University at Albany.

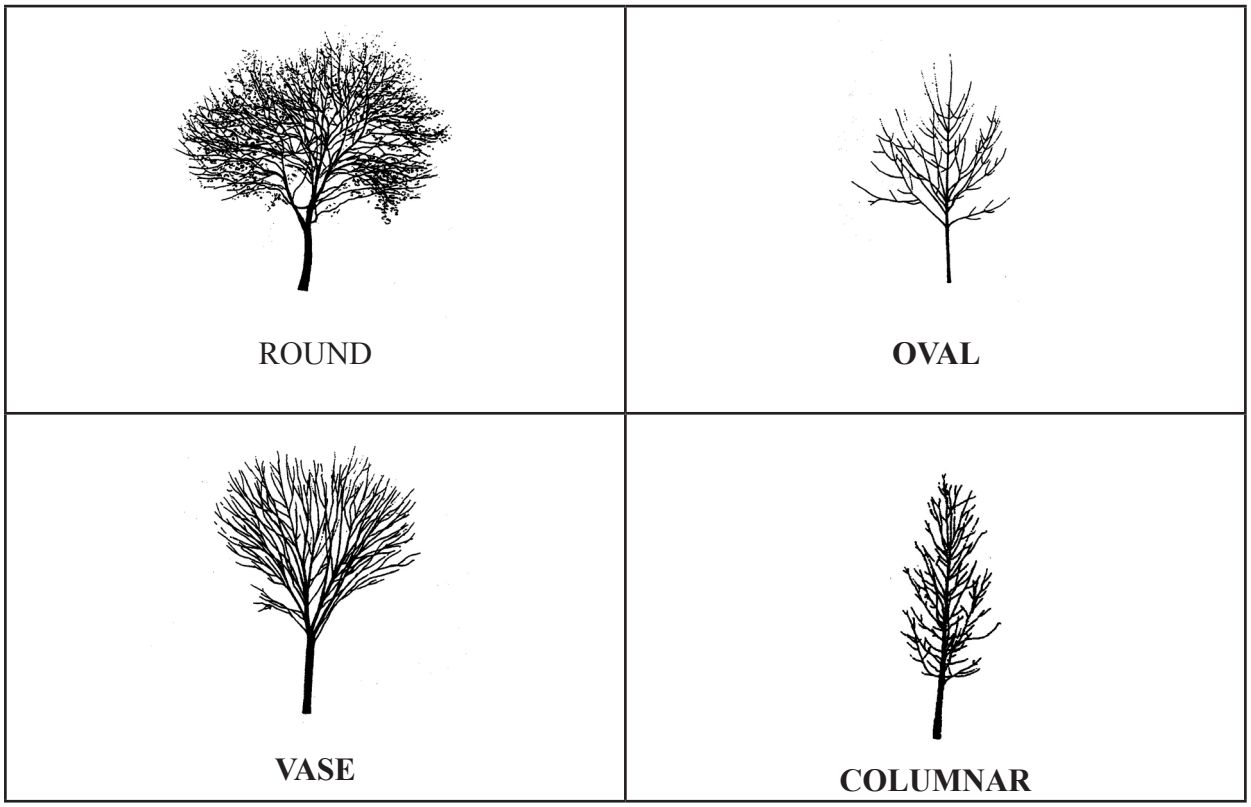


Fig. 73: Example canopy shapes

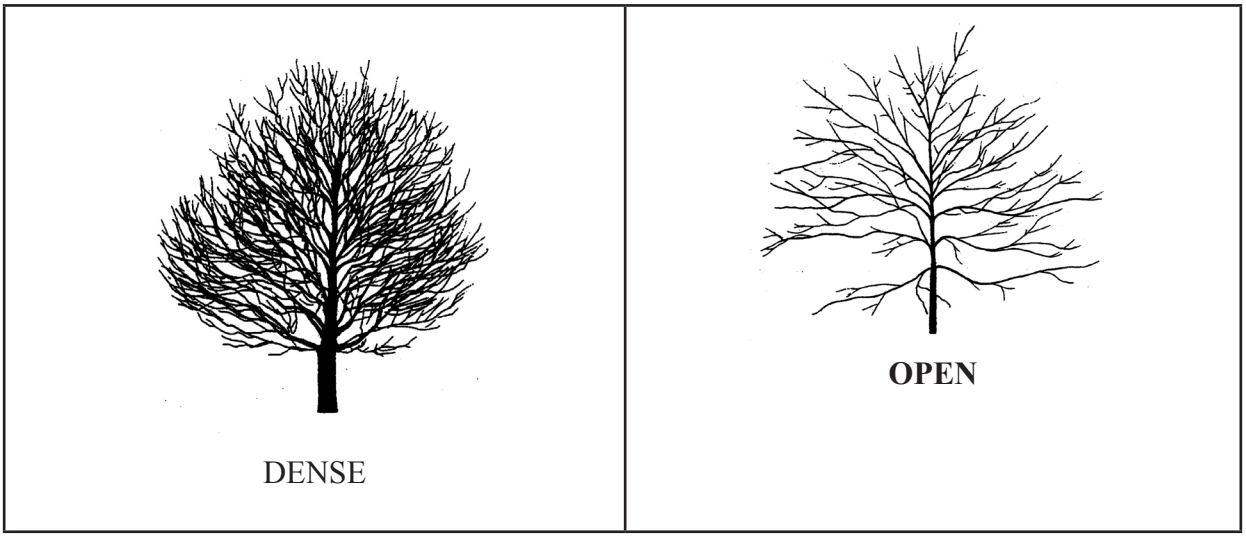


Fig. 74: Example branching density

See Appendix I: Visual Similarity & Biological Diversity for Tree Grouping Selections

Tree Pruning Guidelines

In order to maintain the health of the campus forest attention must be given to regular maintenance. This effort will pay back with longer lived and healthier individual specimens with a lower replacement rate and higher environmental benefits. As a part of regular maintenance, trees and shrubs should be inspected for pruning needs. The University should require as a part of a scope of services a maintenance guide related to every landscape installation.

Pruning should be conducted by trained professionals. For large jobs a certified arborist should be consulted. For smaller jobs pruning should be done by properly trained and knowledgeable staff. Training can consist in familiarity with an accepted pruning guideline. We have outlined several appropriate technical manuals below, these are available for purchase through their respective organizations and a current copy is inserted into the appendices of this document:

For Pruning Young Trees:

International Society of Arboriculture brochure series. http://www.treesaregood.com/treecare/pruning_young.aspx

For Training Young Trees:

USDA Forest Service Northeast Center for Urban and Community Forestry Urban and Community Forestry Factsheets. http://www.umass.edu/urbantree/factsheets/6trainingyoungtrees.html

For Pruning Mature Trees:

International Society of Arboriculture brochure series. http://www.treesaregood.com/treecare/pruning_mature.aspx

For Maintenance pruning:

USDA Forest Service Northeast Center for Urban and Community Forestry Urban and Community Forestry Factsheets. http://www.umass.edu/urbantree/factsheets/33maintenancepruning.html

Why Topping Hurts Trees:

International Society of Arboriculture brochure series. http://www.treesaregood.com/treecare/topping.aspx

LEED Considerations

Green building design strives to balance environmental responsibility, resource efficiency, occupant comfort and well-being, and community sensitivity. The LEED Green Building Rating System is based on accepted energy and environmental principles and strikes a balance between established practices and emerging concepts. It evaluates environmental performance from a whole-building perspective, providing a definitive standard for what constitutes a "green building." Using the LEED guidelines will help ensure the best practices in sustainable project design. The rating system is organized into five environmental categories: Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality. An additional category, Innovation & Design Process, addresses sustainable building expertise as well as design measures not covered under the five environmental categories. (LEED NC v. 2.2).

Governor George E. Pataki signed Executive Order 111 for "Green and Clean" state buildings and vehicles on June 10, 2001, requiring that the State University Construction Fund (SUCF) follow guidelines set forth by the Green Building Tax Credit and the US Green Buildings Council's LEED Rating System in the design, construction, operation and maintenance of new buildings, to the maximum extent possible.

The latest LEED Rating System Version 2.2 (still in use as of this writing) was used to develop this checklist. The University should reference the latest version of the LEED Rating System when undertaking a new project.

For the intents and purposes of this manual, only the LEED points relevant to site development are reviewed. They are as follows:

Erosion and Sedimentation Control

The intent of this LEED point is to control soil erosion to reduce negative impacts to water and air quality. The requirements are to:

- Prevent loss of soil during construction by stormwater runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.
- Prevent sedimentation of storm sewer or receiving streams.
- Prevent polluting the air with dust and particulate matter.

The NYS Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for stormwater discharges from construction activities requires project applicants to meet similar objectives as the LEED credit. For projects greater than one acre of disturbance, and with greater than 30% impervious surface planned, a full Stormwater Pollution Prevention Plan (SWPPP) is required by NYSDEC. Components of the full SWPPP include:

- Erosion & Sediment Control Plan
- Water Quality Volume Control
- Water Quantity Volume Control

Erosion & Sediment Control plans may be required regardless of the area of disturbance. Practices for erosion and sediment control include:

- ☑ Silt fencing around the project perimeter
- ☑ Protection around catch basins and other drain inlets
- ☑ Dust control during construction

SPDES requirements should be reviewed for each project that the University undertakes, including site projects.

Alternative Transportation

The intent of this LEED point is to reduce pollution and land development impacts from automobile use. This LEED category is an important one for the University at Albany campus, as the campus is experiencing an ever-increasing need for parking, with limited land resources. The following points should be considered with new

projects:

Public Transportation Access

This point is achieved by locating the project within 1/4 mile of two or more public or campus bus lines usable by building occupants.

The campus is already well-served by four CDTA bus routes (10, 11, 12 & 90) and three campus shuttles (Uptown Campus Apartments, Western Ave & Grocery Shuttle). New projects can easily be located near two or more of these routes, and with minor improvements to bus stop locations and signage, can achieve this LEED point.

Bicycle Storage/Showers

This point requires secure bicycle storage with convenient changing/shower facilities (within 200 yards of the building) for 5% or more of regular building occupants. While this may not be practical for typical academic buildings, this point may be achieved in buildings that house athletic functions, as they may already incorporate shower facilities. For residential buildings, covered bicycle storage facilities are required for 15% or more of building occupants in lieu of changing/shower facilities.

Alternative Fuel Vehicles

This point is achieved by providing alternative fuel vehicles for 3% of building occupants and providing preferred parking for these vehicles. Another way of achieving this point is by installing alternative fuel refueling stations for 3% of the total vehicle parking capacity of the site. This point may be easily achieved, since the campus is already providing staff with Global Electric Motorcars (GEM), and would only require additional signage to provide preferred parking for these vehicles.

Alternatively, the campus may choose to install an alternative fuel refueling station as part of their fleet service facility, should the campus demand require it.

Parking Capacity

Controlling parking capacity will help reduce land development impacts, pollution, and traffic on the University at Albany campus. The requirements of this point are to size parking capacity to meet, but not exceed, minimum local zoning requirements and provide preferred parking for carpools or vanpools capable of serving 5% of building occupants. Alternatively, add no new parking for rehabilitation projects and provide preferred parking for carpools or vanpools capable of serving 5% of the building occupants.

Achieving this point would promote carpooling on campus, and promote campus-wide thinking toward reducing the number of cars on campus.

Fig. 75: Indoor bicycle lockup at SUNY Cortland

Fig. 76: GEM cars used at SUNY Cortland

Reduced Site Disturbance

The intent of this point is to conserve existing natural areas and restore damaged areas to provide habitat and promote diversity. While the campus is primarily in an urban setting with little habitat value, the overall objective of restoring open space can improve the campus' "green" appearance. Reducing paved surfaces will also reduce long-term maintenance costs associated with snow plowing and repairs.

Development Footprint

In order to achieve this point, the project must reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. The alternative is to designate open space area adjacent to the building that is equal to the development footprint. The campus should bear in mind that the certification for this point requires that the open space will be conserved for the life of the building.

Stormwater Management

The intent of this point is to limit the disruption and pollution of natural water flows by managing stormwater runoff, or by eliminating stormwater runoff, thereby increasing on-site infiltration and eliminating contaminants.

Fig. 77: Stormwater treatment basin

Fig. 78: Overflow parking for infrequent events can be accommodated in reinforced turf areas to eliminate impervious surface

Rate and Quantity

The requirements for this point are as follows: If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24-hour peak discharge rate from exceeding the pre-development 1.5 year, 24-hour peak discharge rate. Alternatively, if existing imperviousness is greater than 50%, the point can be achieved by implementing a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.

These requirements are similar to the NYSDEC's requirements for the SPDES permit, and may be achieved through modification of practices employed to reduce peak discharge rates.

Treatment

This LEED point requires construction of site stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm. This may be achieved either by using the Environmental Protection Agency's (EPA) Best Management Practices, or the local (NYSDEC) best management practices.

While the LEED requirements for stormwater treatment are similar to the NYSDEC requirements, it should be noted that the practices acceptable to NYSDEC are geared toward non-urban areas and require open space for ponds, swales, or channels. These requirements should be reviewed on a project-by-project basis.

Heat Island Effect

The intent of this point is to reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat. The means by which the following points are achieved also provide additional environmental and aesthetic benefits. Providing tree planting areas in parking areas reduces stormwater runoff, and improves the appearance of parking lots. Green roofs also mitigate the stormwater runoff volumes, and can be designed as a feature to viewers in higher buildings that may look down on them.

While it may not be practicable to achieve these points for every project, striving toward these goals would still improve the overall campus sustainability and appearance.

Non-Roof

This point requires that a project provide shade within 5 years and/or use light-colored/high albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways and plazas. Alternatively, the point can be achieved by placing a minimum of 50% of parking spaces underground or covered by structured parking; or by using an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area.

Fig. 79: Green roof

Roof

This point can be achieved by using Energy Star compliant (highly reflective) and high emissivity roofing for a minimum of 75% of the roof surface; or by installing a "green" vegetated roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

Light Pollution Reduction

The intent of this LEED category is to eliminate light trespass from the building and site, improve night sky access and reduce development impact on nocturnal environments. While the campus is situated near a downtown area that is significantly lit, it would be a good practice to try to achieve this point on future projects. Eliminating light trespass also shows consideration toward the adjacent residential neighborhoods.

Eliminate Light Trespass

In order to achieve this LEED point, the project must meet or provide lower light levels and uniformity ratios than those recommended by the Illuminating Engineering Society of North America's (IESNA) *Recommended Practice Manual: Lighting for Exterior Environments* (RP-33-99). Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded, and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior lighting

Fig. 80: Example of porous pavement

shall fall within the property. Any luminaire within a distance of 2.5 times its mounting height from the property boundary shall have shielding such that no light from that luminaire crosses the property boundary.

Existing campus lighting does not meet these requirements. However, as the poles and fixtures age and require replacement, newer fixtures that meet the light trespass and dark sky requirements should be considered. All new poles should meet these requirements with careful selection.

Issues related to light pollution and light trespass are addressed by the *Lighting Master Plan*.

Water Efficient Landscaping

The intent of this LEED point is to limit or eliminate the use of potable water for landscape irrigation. In our climate, the low-maintenance plantings typically specified for campus landscaping generally do not require installed irrigation systems, and usually need watering only during the establishment period and times of drought. These points can be easily achieved by not installing irrigation. While eliminating irrigation systems as a sustainable practice is achievable, irrigation needs may also be met in a sustainable manner by utilizing captured site water such as

Fig. 81: Examples of sharp cut off light fixtures

from the pond on campus.

If irrigation systems are required for athletic fields, or can not make use of the pond source, it would be a good practice to attempt to achieve the 50% reduction point.

50% Reduction

The requirement for this LEED point is to use high-efficiency irrigation technology or use captured rain or recycled site water to reduce potable water consumption for irrigation by 50% over conventional means.

No Permanent Irrigation

In order to obtain this credit, the project must either use only captured rain or recycled site water to eliminate all potable water use for site irrigation (except for initial watering during establishment), or not install permanent landscape irrigation systems.

Innovation in Design

This category intends to provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

In order to obtain the possible four points, one

must identify the intent of the proposed innovation credit, the proposed requirements for compliance, the proposed submittals to demonstrate compliance, and the design approach (strategies) that might be used to meet the requirements.

In addition, another goal is to support and encourage the design integration required by a LEED Green Building project and to streamline the application and certification process. This point may be obtained if at least one principal participant of the project team has successfully completed the LEED Accredited Professional exam.

The following checklist is a summary of many of the site- and landscape-related LEED points a new project on the University at Albany campus might achieve:

LEED Checklist:

Sustainable Sites

- ☑ Prerequisite 1: Erosion & Sedimentation Control (required)
- ☑ Credit 4.1: Alternative Transportation, Public Transportation Access
- ☑ Credit 4.2: Alternative Transportation, Bicycle Storage & Changing Rooms
- ☑ Credit 4.3: Alternative Transportation, Alternative Fuel Vehicles
- ☑ Credit 4.4: Alternative Transportation, Parking Capacity
- ☑ Credit 5.d: Reduced Site Disturbance, Development Footprint
- ☑ Credit 6.1: Stormwater Management, Rate and Quantity
- ☑ Credit 6.2: Stormwater Management, Treatment
- ☑ Credit 7.1: Heat Island Effect, Non-Roof
- ☑ Credit 7.2: Heat Island Effect, Roof

Water Efficiency

- ☑ Credit 1.1: Water Efficient Landscaping, Reduce by 50%
- ☑ Credit 1.2: Water Efficient Landscaping, No Potable Use or No Irrigation

Innovation & Design Process

- ☑ Credit 1.1: Innovation in Design
- ☑ Credit 1.2: Innovation in Design
- ☑ Credit 1.3: Innovation in Design
- ☑ Credit 1.4: Innovation in Design
- ☑ Credit 2: LEED Accredited Professional

Listed is a total of 17 possible points, which contribute to the following certification requirements:

- Certified: 26-32 points
- Silver: 33-38
- Gold: 39-51
- Platinum: 52-69

Sustainable Sites Initiative

The Sustainable Sites Initiative (SITES) is an interdisciplinary partnership led by the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center at The University of Texas at Austin and the United States Botanic Garden to transform land development and management practices with the nation's first voluntary rating system for sustainable landscapes, with or without buildings. As a site based program, SITES provides a mode for campuses and universities to measure their projects against accepted best practices and sustainable development methodologies, much as LEED has accomplished for the building construction industry. The U.S. Green Building Council, a stakeholder in the Sustainable Sites Initiative, anticipates incorporating the guidelines and performance benchmarks into future iterations of its LEED Green Building Rating System. As these guidelines become the accepted practices by professionals and non-professionals alike institutions will gravitate to developing projects within the framework of the program.

An example of the subject material covered in the SITES program follows:

Stormwater Management

- Reduce impervious surfaces, increase infiltration/porous paving.

Soil Management:

- Reduce erosion , sediment loading

Vegetation:

- Reduce urban heat island effect, increase carbon sequestration

Materials Selection:

- Use locally sourced materials

Human Health and Well-Being:

- Increase outdoor and physical activities

Construction Techniques:

- Best Practices

Operations and Maintenance:

- Reduce intensive landscape maintenance practices

Monitoring and Innovation:

- Evaluate performance over long-term

Participation in the SITES program is a means by which the University will be able to distinguish itself as a leader in sustainable development amongst its peer institutions. Participation will also provide a gauge by which efforts to achieve healthy and sustainable landscapes on campus may be measured. For more information, visit *www.sustainablesites.org.*

Summary

These design guidelines are intended to be a living document. They are provided to the University in a format that can be easily updated and contemporized as changes and revisions occur related to landscape master plan efforts.

THIS PAGE INTENTIONALLY LEFT BLANK

Bibliography

ADA. 1998. ADA Guidelines and Standards, ICC/ANSI A117.1-1998 (NYS Building Codes References) www.ada.gov/stdspdf.htm

Thomas Balsley Associates. Concept Design Presentation. 31 West 27th St 9th Floor • NY, NY 10001

Delta Engineers & Architects, P.C. 2010, Forthcoming. Pedestrian & Traffic Improvement Plan, 184 Court Street • Binghamton, NY 13901

Marcus, Clare Cooper. 1998. People Places: Design Guidelines for Urban Open Space, with Carolyn Francis (Eds.), John Wiley & Sons, 2nd Revised Edition.

Mesick, Cohen, Wilson, Baker Architects. 2009. The Campus Heritage and Preservation Plan, Prepared by the office of: Mesick, Cohen, Wilson, Baker Architects. 388 Broadway • Albany, NY 12207

Ben Fischer , Mark Jakubiak. 2009. University at Albany Bike Parking Plan, 2009 Transportation Planning Studio. University at Albany.

Naomi MIller. 2008. University at Albany Lighting Masterplan, prepared by the office of: Naomi Miller Lighting Design. 46 23rd St • Troy, NY 12180

New York State Department of Environmental Conservation. 2010. Stormwater Management Design Manual. 625 Broadway • Albany, NY 12233-3505

Edward Durrell Stone. 1968. 1974 Comprehensive Site Plan Updating, Prepared by the office of Edward Durell Stone and Associates.

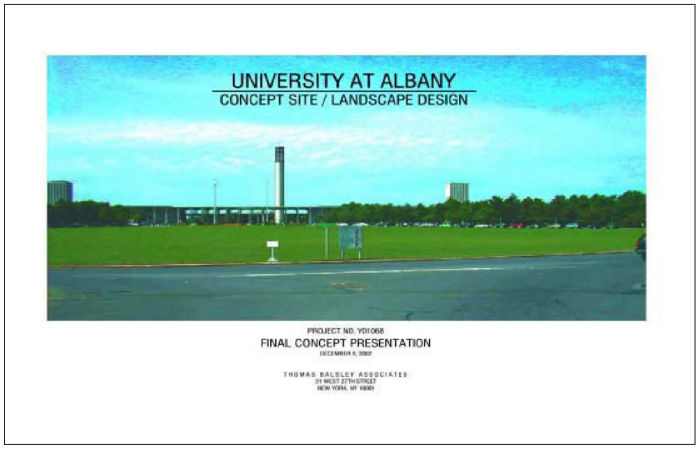
Trowbridge & Wolf, LLP. 2009. Landscape Master Plan: Overall Campus Landscape Assessment, Prepared by the office of Trowbridge & Wolf, LLP, Landscape Architects. 1001 West Seneca St Ste 101 • Ithaca, NY 14850

United States Green Building Council. 2005. LEED-NC Version 2.2 Reference Guide, by USGBC. www.usgbc.org/leed

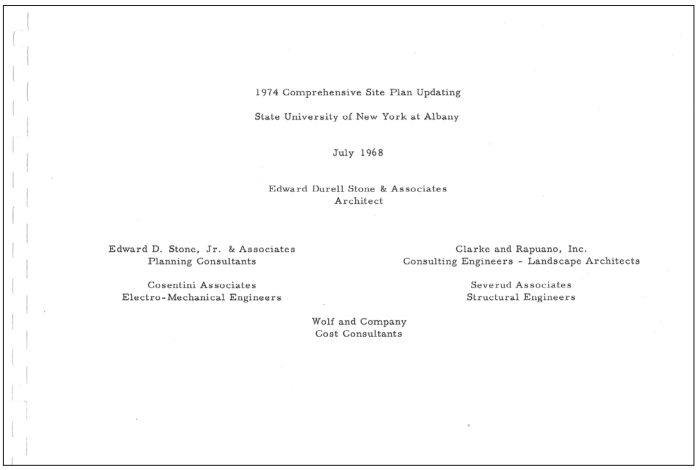
Urban Horticulture Institute. 2003. Recommended Urban Trees, Site Assessment and Tree Selection for Stress Tolerance, Cornell University • Ithaca, NY

Urban Horticulture Institute. 2003. Visual Similarity and Biological Diversity: Street Tree Selection and Design, Cornell University • Ithaca, NY

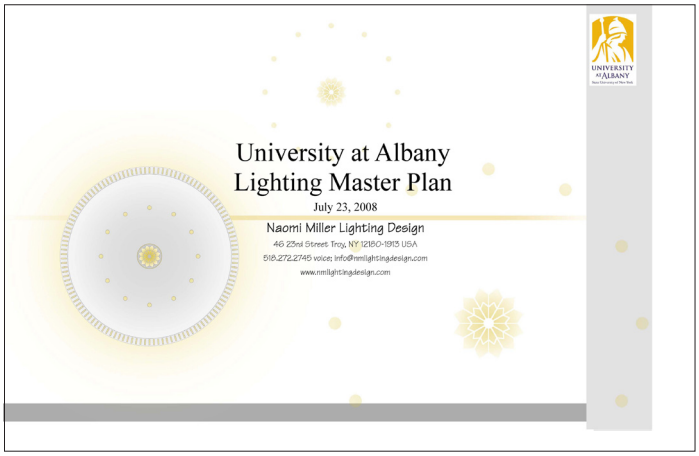
Woodward & Curran. 2008. A plan for the Campus Nature Walk



Thomas Balsley Assoc. - Concept Design Presentation

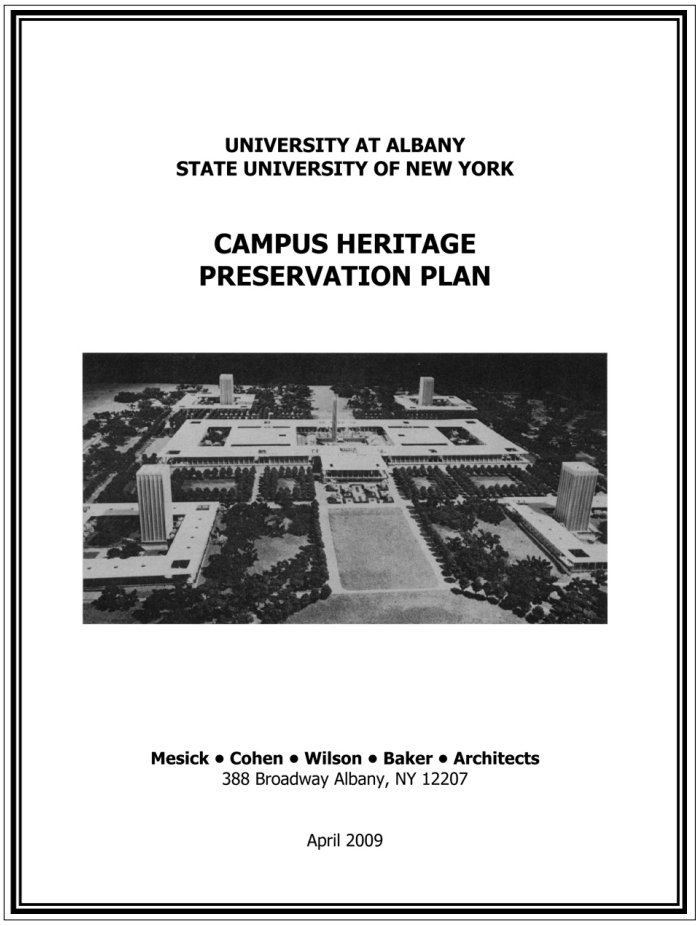


Ed Stone - Comprehensive SIte Plan

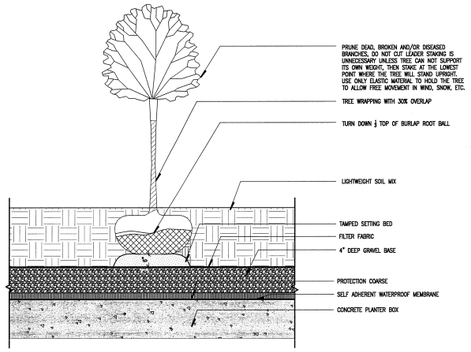


Naomi Miller - Lighting Master Plan

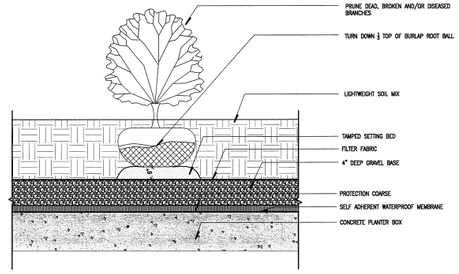
Robert Siegel - Podium Skylight Domes



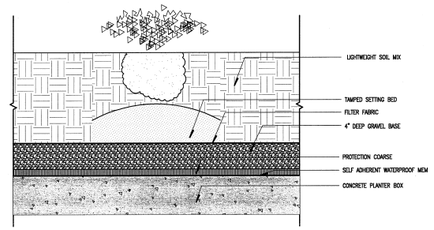
Mesick, et al - Campus Heritage Preservation Plan



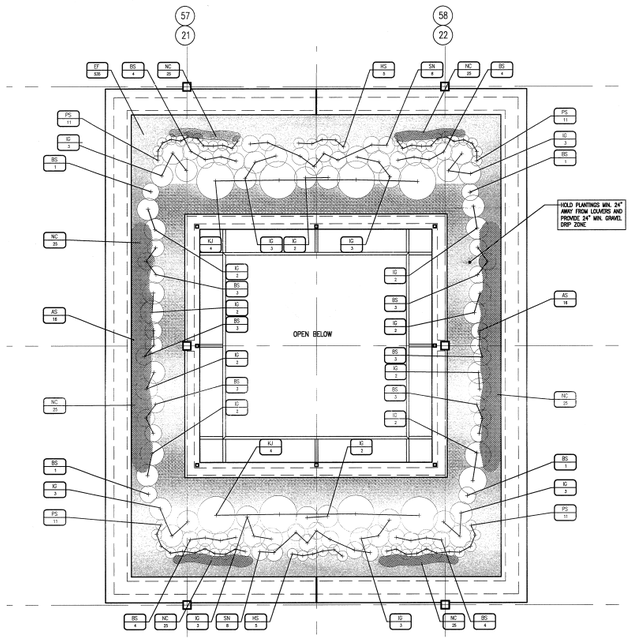
1 A2.3 DECIDIOUS TREE PLANTING
NTS



4 A2.3 SHRUB PLANTING
NTS



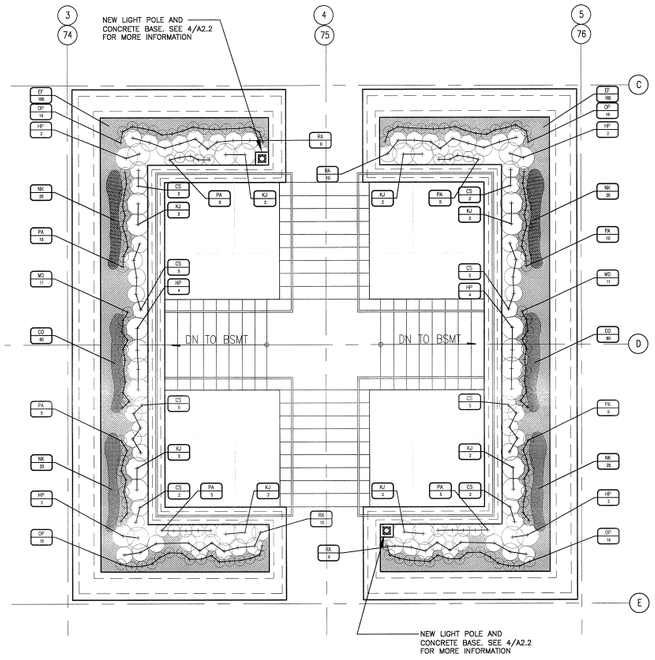
3 A2.3 PERENNIAL PLANTING
NTS



1 A2.3 PODIUM LEVEL PLANTER LANDSCAPING PLAN (LIGHTWELLS #7 AND #13)
1/4" = 1'-0"

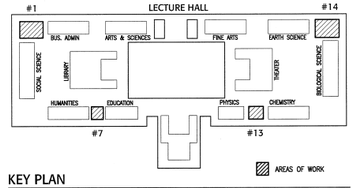
PLANTING SCHEDULE

PLANT SYMBOLS	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
NORTH SIDE LIGHT WELL PLANTERS 1 AND 14					
EF	740	EUONYMOUS FORTUNII	WINTER CREEPER	1 GAL CONT	SPACE AT 8"OC
HP	32	HYDRANGEA PANICULAE	PINK DIAMOND PEE GEE HYDRANGEA	5 GAL CONT	
NK	200	NARCISSUS 'KING ALFRED'	KING ALFRED DAFFODIL	TOP SIZE BULB	SPACE AT 6"OC
OP	152	OPHIOPOGON PLANISCAPUS 'NIGRESCENS'	BLACK MONDO GRASS	1 GAL CONT	
RA	78	RHUS AROMATICA 'GRO LOW'	GRO LOW FRAGRANT SUMAC	5 GAL CONT	
CO	240	COLCHICUM AUTUMNALE	AUTUMN CROCUS	TOP SIZE BULB	SPACE AT 4"OC
CS	56	CORNUS SANGUINEA 'MIDWINTER FIRE'	'MINDWINTER FIRE' REDTWIG DOGWOOD	3 GAL CONT	
KJ	32	KERRIA JAPONICA 'PLENIFORA'	JAPANESE GLOBE FLOWER	5 GAL CONT	
MD	44	MICROBIOTA DECUSSATA	RUSSIAN ARBORVITAE	3 GAL CONT	
PA	116	POLYSTICHUM ACROSTICHOIDES	CHRISTMAS FERN	2 GAL CONT	
SOUTH SIDE LIGHT WELL PLANTERS 7 AND 13					
AS	32	ALLIUM SCHUBERTII	ALLIUM/TUMBLEWEED ONION	3 GAL CONT	SPACE AT 8"OC
BS	34	BUXUS SEMPERVIRENS 'WINTER GEM'	WINTER GEM BOXWOOD	3 GAL CONT	
EF	535	EUONYMOUS FORTUNII	WINTER CREEPER	1 GAL CONT	SPACE AT 8"OC
PS	44	PENNISETUM SETACEUM 'ATROPURPUREA'	LITTLE BUNNY FOUNTAIN GRASS	2 GAL CONT	
SN	16	SPIREA NIPPONICA 'SNOWMOUND'	'SNOWMOUND' SPIREA	3 GAL CONT	
KJ	8	KERRIA JAPONICA 'PLENIFORA'	JAPANESE GLOBE FLOWER	5 GAL CONT	
HS	10	HELICTOTRICHON SEMPERVIRENS	SAPPHIRE FOUNTAIN BLUE OAT GRASS	2 GAL CONT	
NC	150	NARCISSUS 'CARLTON'	CARLTON DAFFODIL	TOP SIZE BULB	SPACE AT 6"OC
IG	44	ILEX GLABRA	INKBERRY	3 GAL CONT	



2 A2.3 PODIUM LEVEL PLANTER LANDSCAPING PLAN (LIGHTWELLS #1 AND #14)
1/4" = 1'-0"

AREAS OF WORK



KEY PLAN
NO SCALE

ENVISION
architects
52 James Street
Albany, NY 12207
518 462 - 1848
Fax 462 - 2529
www.envisionarchitects.com

STRUCTURAL ENGINEER
Novelli Engineering
369 Daniels Rd. P.O. Box 637
Shaftsbury, Vermont 05262
TEL: 802 447-4950 FAX: 802 447-4951
email: Novelli@adelphia.net

MECH/ ELECTRICAL ENGINEERS
Excel Engineering, P.C.
29 British American Blvd
Latham, NY 12110
TEL: 518 464 - 0412 FAX: 464 - 0834
email: general@excelengin.cc

HAZARDOUS MATERIALS
Ambient Environmental, Inc.
12 Colvin Avenue
Albany, NY 12206
TEL: 518 482-0704 FAX: 518 482-0750
email: preservationarchitecture@verizon.net

NORTH

STATE UNIVERSITY CONSTRUCTION FUND
SUCF #01A37

SUNY ALBANY REHABILITATION OF LIGHT WELLS PHASE II
1400 WASHINGTON AVE.
ALBANY, NY 12222

ENV 709.04.01.0050

REVISIONS

LANDSCAPING PLANS

A2.3

12 AUGUST 2009

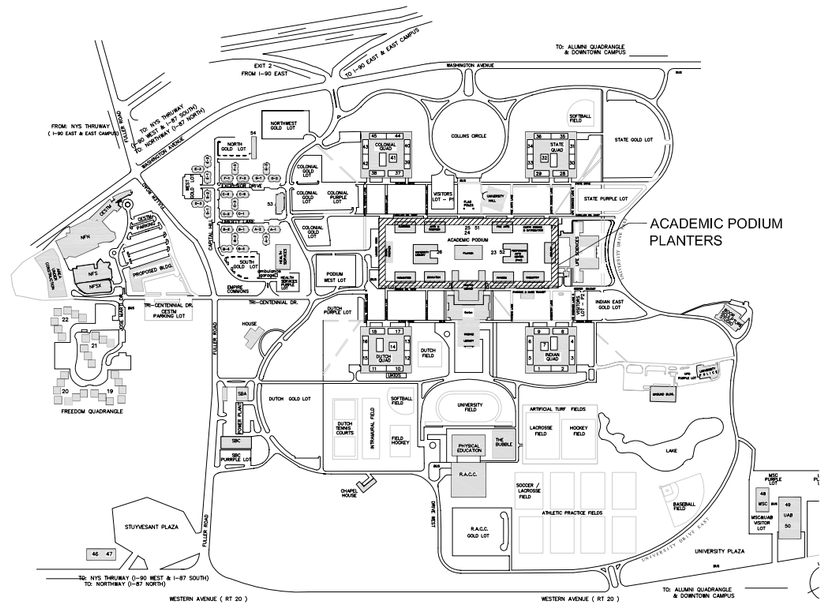
Appendix A: Planting Plan for Podium Light Wells

STATE UNIVERSITY OF NEW YORK AT ALBANY
PODIUM PLANTER IMPROVEMENTS

SUNY ALBANY PROJECT No. A09-14529
TWLA PROJECT No. 2008021
SPRING 2009

UALBANY
State University of New York

OFFICE OF ARCHITECTURE/ENGINEERING/
CONSTRUCTION MANAGEMENT
SERVICE BUILDING C
1400 WASHINGTON AVENUE
ALBANY, NEW YORK 12222
v. 518. 442. 3434
f. 518. 437. 3640
www.albany.edu



WORK LOCATION PLAN

NORTH

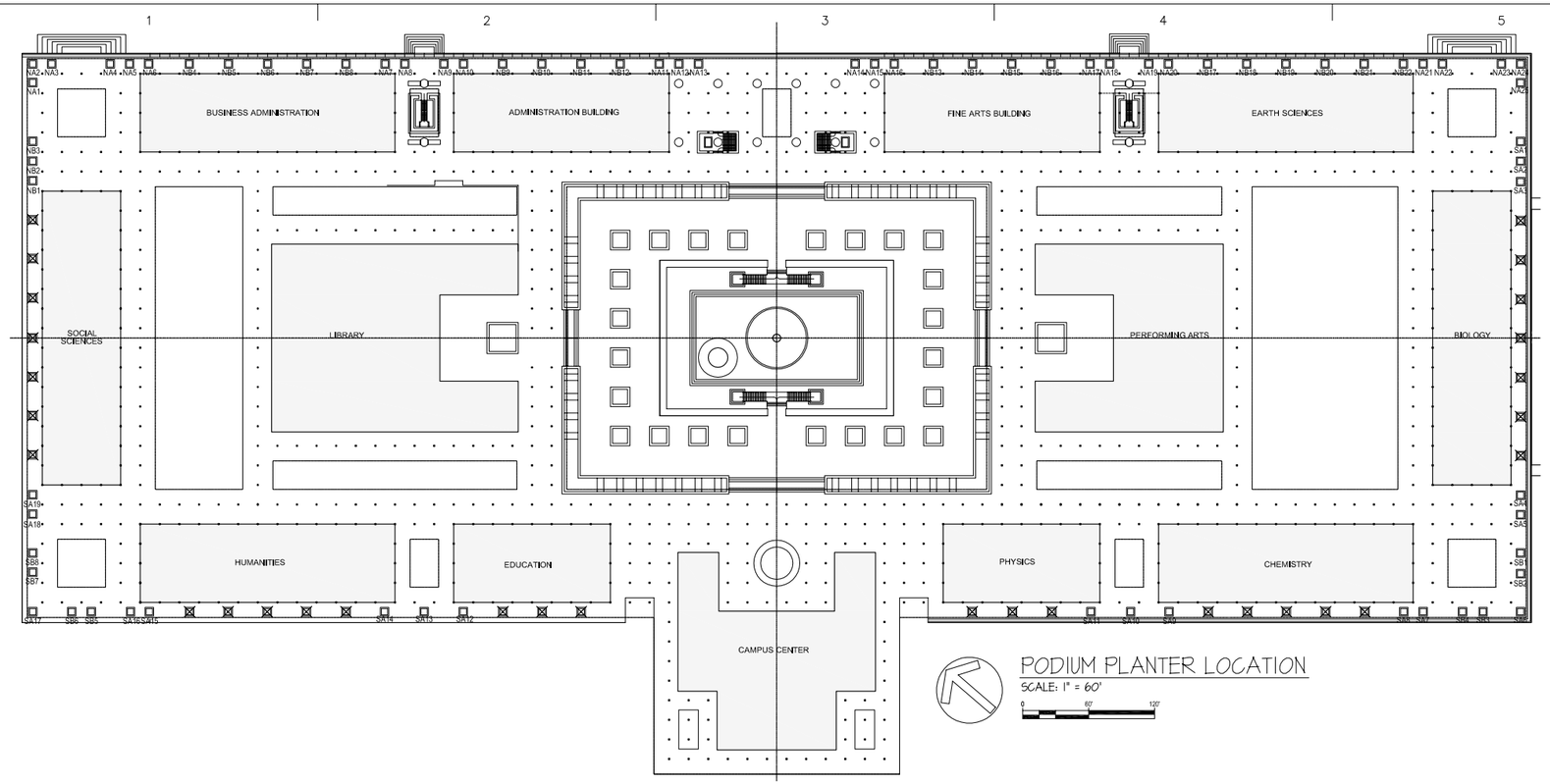
DRAWING INDEX

PROJECT APPROVALS

DIRECTOR - PHYSICAL PLANT

DIRECTOR - ENVIRONMENTAL HEALTH & SAFETY

DIRECTOR - AECM



PODIUM PLANTER LOCATION

SCALE: 1" = 60'

0 60' 120'

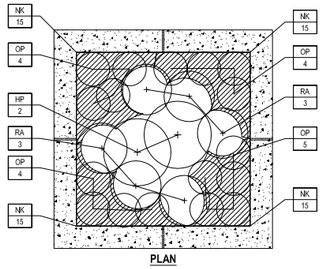
PLANTING NOTES:

1. REMOVE AND STOCKPILE EXISTING TOPSOIL FOR REUSE IN PLANTERS. STOCKPILED TOPSOIL MUST BE SCREENED AND AMENDED TO MEET PROJECT SPECIFICATIONS. CONTRACTOR'S OPTION TO REMOVE AND DISPOSE OF EXISTING TOPSOIL AND PROVIDE NEW, AMENDED TOPSOIL THAT MEETS PROJECT SPECIFICATIONS.
2. ALL PLANTERS TO BE PREPARED AS SPECIFIED.
3. AFTER PLANTERS ARE PREPARED, THE LANDSCAPE CONTRACTOR IS TO PLANT A SINGLE PLANTER OF EACH TYPE, TO BE APPROVED BY LANDSCAPE ARHITECT BEFORE THE REMAINDER ARE PLANTED.
4. ALL TREES AND PLANTS TO COMPLY WITH APPLICABLE REQUIREMENTS OF ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK".
5. MAINTAIN AND WARRANTY ALL LIVING PLANT MATERIAL AS PER SPECIFICATIONS.

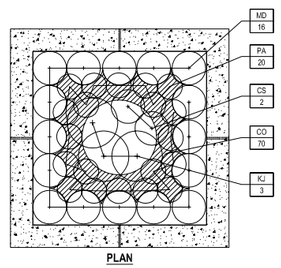
LEGEND

PLANTERS TO BE RE-VEGETATED (74)

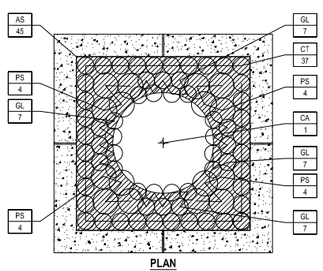
PLANTERS TO REMAIN NON-VEGETATED AND HAVE GRANITE PAVERS INSTALLED (30)



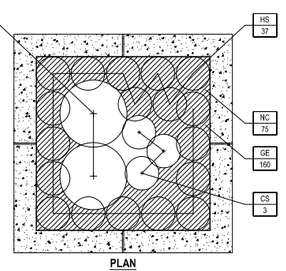
N-A NORTH SIDE PLANTER - TYPE A (TYPICAL OF 25)
Scale: 1/2"=1'-0"



N-B NORTH SIDE PLANTER - TYPE B (TYPICAL OF 22)
Scale: 1/2"=1'-0"



S-A SOUTH SIDE PLANTER - TYPE A (TYPICAL OF 19)
Scale: 1/2"=1'-0"

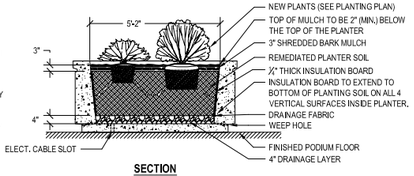


S-B SOUTH SIDE PLANTER - TYPE B (TYPICAL OF 8)
Scale: 1/2"=1'-0"

PLANTING SCHEDULE						
PLANTER I.D.	PLANT SYMBOLS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
NORTH SIDE PLANTERS - GROUP "A"						
N-A (25 TOTAL)	HP	50	Hydrangea paniculata 'Pink Diamond'	Pink Diamond Pee Gee Hydrangea	5 gal. Cont.	
	NK	1,500	Narcissus 'King Alfred'	King Alfred Daffodil	Top size bulb	Space at 6" O.C.
	OP	425	Ophiopogon planiscapus 'Nigrescens'	Black Mondo Grass	1 gal. Cont.	
	RA	150	Rhus aromatica 'Gro Low'	Gro Low Fragrant Sumac	5 gal. Cont.	
NORTH SIDE PLANTERS - GROUP "B"						
N-B (22 TOTAL)	CO	1,540	Colchicum autumnale	Autumn Crocus	Top size bulb	Space at 4" O.C.
	CS	44	Cornus sanguinea 'Midwinter Fire'	Bloodtwig Dogwood	3 gal. Cont.	
	KJ	66	Kerria japonica 'Pleniflora'	Japanese Globe Flower	5 gal. Cont.	
	MD	400	Microbiota decussata	Russian Arborvitae	3 gal. Cont.	
	PA	440	Polystichum acrostichoides	Christmas Fern	2 gal. Cont.	
SOUTH SIDE PLANTERS - GROUP "A"						
S-A (19 TOTAL)	AS	855	Allium schubertii	Allium/Tumbleweed Onion	Top size bulb	Space at 8" O.C.
	CA	19	Caragana arborescens pendula 'Walker'	Fernleaf Siberian Weeping Peashrub	4" Ht., Cont.	Standard form
	CT	703	Cerastium tomentosum	Snow-in-Summer	1 gal. Cont.	
	GL	532	Gaura lindheimeri 'Blaze'	Blaze Wand Flower	2 gal. Cont.	
	PS	304	Pennisetum setaceum 'Atropurpurea'	Little Bunny Fountain Grass	2 gal. Cont.	
SOUTH SIDE PLANTERS - GROUP "B"						
S-B (8 TOTAL)	CS	24	Cornus sanguinea 'Midwinter Fire'	Bloodtwig Dogwood	3 gal. Cont.	
	GE	1,280	Galanthus elwesii	Giant Snowdrop	Top size bulb	Space at 4" O.C.
	HS	296	Helictotrichon sempervirens 'Saphirsprude'	Sapphire Fountain Blue Oat Grass	2 gal. Cont.	
	NC	600	Narcissus 'Carlton'	Carlton Daffodil	Top size bulb	Space at 6" O.C.
	SA	16	Sambucus canadensis 'Aurea'	Aurea Elderberry	3 gal.Cont.	

NOTES FOR PLANTERS TO BE RE-VEGETATED:

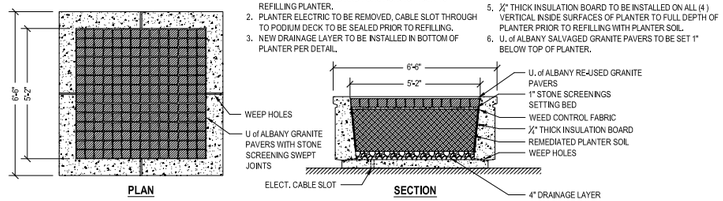
1. PLANTERS TO BE COMPLETELY EMPTIED OF SOIL AND WEEP HOLES TO BE CLEANED AND FUNCTIONING PRIOR TO REFILLING PLANTER.
2. PLANTER ELECTRIC TO BE REMOVED, CABLE SLOT THROUGH TO PODIUM DECK TO BE SEALED PRIOR TO REFILLING.
3. NEW DRAINAGE LAYER TO BE INSTALLED IN BOTTOM OF PLANTER PER DETAIL.
4. SOIL FOR PLANTING TO BE REMEDIATED AS PER LABORATORY SPECIFICATIONS PRIOR TO REFILLING PLANTERS.
5. ½" THICK INSULATION BOARD TO BE INSTALLED ON ALL (4) VERTICAL INSIDE SURFACES OF PLANTER TO FULL DEPTH OF PLANTER PRIOR TO REFILLING WITH PLANTER SOIL.



1 EXISTING PRECAST CONCRETE PLANTER ON EXTERIOR OF ACADEMIC PODIUM TO BE REVEGETATED
Scale: 3/8"=1'-0"

NOTES FOR PLANTERS TO REMAIN NON-VEGETATED:

1. PLANTERS TO BE COMPLETELY EMPTIED OF SOIL AND WEEP HOLES TO BE CLEANED AND FUNCTIONING PRIOR TO REFILLING PLANTER.
2. PLANTER ELECTRIC TO BE REMOVED, CABLE SLOT THROUGH TO PODIUM DECK TO BE SEALED PRIOR TO REFILLING.
3. NEW DRAINAGE LAYER TO BE INSTALLED IN BOTTOM OF PLANTER PER DETAIL.
4. SOIL FOR PLANTING TO BE REMEDIATED AS PER LABORATORY SPECIFICATIONS PRIOR TO REFILLING PLANTERS.
5. ½" THICK INSULATION BOARD TO BE INSTALLED ON ALL (4) VERTICAL INSIDE SURFACES OF PLANTER TO FULL DEPTH OF PLANTER PRIOR TO REFILLING WITH PLANTER SOIL.
6. U. of ALBANY SALVAGED GRANITE PAVERS TO BE SET 1" BELOW TOP OF PLANTER.



2 EXISTING PRECAST CONCRETE PLANTER ON EXTERIOR OF ACADEMIC PODIUM NOT TO BE REVEGETATED - GRANITE PAVER OPTION
Scale: 1/2"=1'-0"

UALBANY
State University of New York

CONSULTANT

TWLA
TROWBRIDGE & WOLF
LANDSCAPE ARCHITECTS LLP

1001 W. Seneca St., Ste. 101 Ithaca, New York 14850
607-277-1400 Fax 607-277-6892

CLIENT:

MARK	DATE	DESCRIPTION
REV#2		
REV#1		
CD		
DD		
SD		

PROJECT NO: U-ALBANY A09-14529
DRAWING ID:
DRAWN BY: JVB CHK'D BY: PJT
SCALE: AS SHOWN

SHEET TITLE

PODIUM PLANTER LOCATIONS & PLANTING PLAN

L101

SHEET 1 OF 1

PROJECT:

PODIUM PLANTER IMPROVEMENTS

LANDSCAPE MASTER PLAN SPRING 2009

Appendix B: Planting Groups for Container Plantings

South Side / Full Sun Planters on Podium

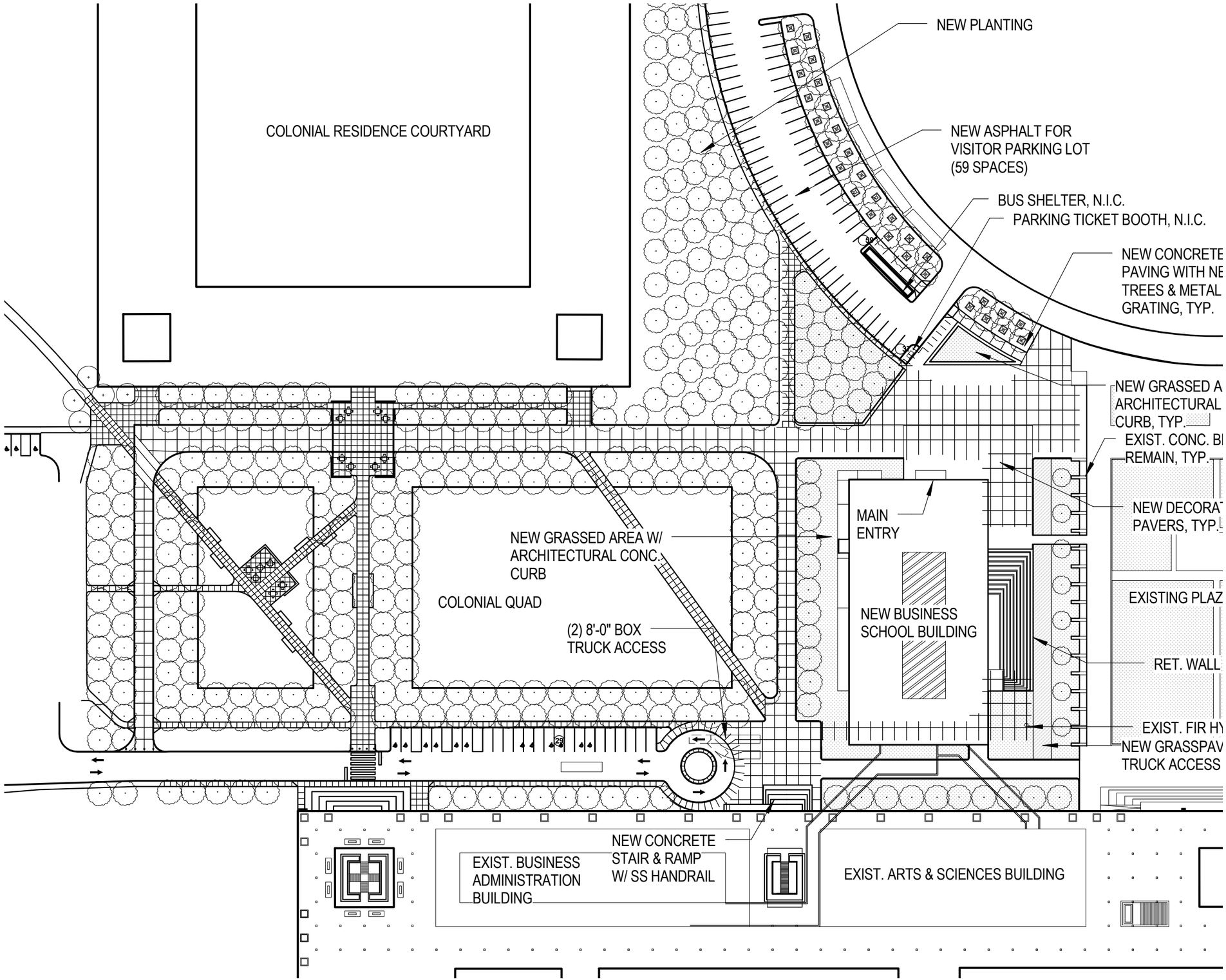
OPTIONS:	LATIN NAME	COMMON NAME	TYPE/SIZE	DESCRIPTION	INTEREST:
Grouping #1:	Salix matsudana 'Tortuosa'	Dragon's Claw Willow	Tree	Twisted leaves and foliage	All seasons
	Tulipa humilis 'Persian Pearl'	Persian Pearl Crocus Tulip	Bulb; 4 - 6"H	Goblet-shaped magenta/white flowers with yellow centers	Spring
	Narcissus 'Dutch Master'	Dutch Master Daffodils	Bulb; 12 - 18"H	Bright yellow	Spring
	Rhus aromatica 'Gro Low'	Gro Low Sumac	Shrub; 3' x 2.5'	Scarlet-orange leaves in fall	Fall
Grouping #2:	Spirea nipponica 'Pink Parasols'	Pink parasols Spirea	Shrub; 3'H x 4'W	Pink parasol-like flowers	Summer
	Hemerocalis 'Just So'	Just So Daylily	Perennial; 15 - 18"H	Fucshia flowers with yellow centers	Spring
	Gaura lindheimeri 'Whirling Butterflies'	W.B. Wand Flower	Perennial; 24 - 30"H	Panicles of white flowers on red stems	Spring
	Festuca glauca (cinerea) 'Elijah Blue'	Elijah Blue Fescue	Grass; 8 - 10"H	Coarse, powdery blue foliage that lasts through winter	All seasons
	Sternbergia lutea	Autumn Daffodil	Bulb; 4 - 5"H	Yellow flowers	Fall
Grouping #3:	Hydrangea paniculata 'Pinky Winky'	Pinky Winky Pee Gee Hydrangea	Shrub	12 - 16"L flower heads that emerge white and deepen to pink	All seasons
	Cornus stolinifera farrow 'Arctic Fire'	Arctic Fire Dogwood	Shrub; 3 - 4'H	Dwarf form of Baileyii; bright red twigs	Winter
	Miscanthus sinensis v. purpurascens	Flame Grass	Grass; 60"H	Brilliant orange-red	Fall/Winter
	Crocus speciosus 'Albus'	White Fall-Blooming Crocus	Bulb; 3 - 5"H	Goblet-shaped white flowers on yellowish-green stalks	Fall
Grouping #4:	Miscanthus sinensis v. purpurascens	Flame Grass	Grass; 60"H	Brilliant orange-red	Fall/Winter
	Rosa 'Knock Out'	Knock Out Rose	Shrub	Bright pink flowers	Summer/Fall
	Rudbeckia 'Indian Summer'	Indian Summer Black-Eyed Susan	Perennial; 36 - 42"H	Wide yellow flowers carried on stems that are branched instead of long and straight	Summer/Fall
	Artemesia Schmidtiana	Silver Mound	Perennial; 6 - 8"H	Fine silky, silvery foliage	Summer/Fall
	Tulipa cartouche	Cartouche Tulip	Bulb; 20 - 24"H	Double-flowered, vase-shaped, hot pink and white blooms; 3 or 4 blooms per stem	Late spring
	Iris Hollandica	Dutch Iris	Bulb; 18 - 20"H	4 - 5"W blooms in a mix of blue, maroon, yellow, and white	Late spring
	Geranium x "Orion'	Orion Cranesbill	Perennial; 24 - 30"H	Large, violet-blue flowers in spring; upright green foliage	Spring
	Colchicum cilicicum	Colchicum	Bulb; 4 - 6"H	Honey-scented purplish-pink flowers	Fall
Grouping #5:	Sambucus nigra ‘Aurea'	Aurea Elderberry	Shrub; 4 - 6'	Golden foliage in spring turns lime green in summer; white flowers	Spring/Summer
	Sambucus nigra ‘Black Lace'	Black Lace Elderberry	Shrub; 4 - 6'	Dark, maroon foliage with fragrant 6'W pale pink flowers and berries for birds	Spr/Sum/Fall
	Lycoris squamigera	Resurrection Lily	Bulb; 2.5'H	3'W pink flowers with golden centers	Fall
	Helictotrichon sempervirens 'Saphirsprudel'	Sapphire Fountain Blue Oat Grass	Grass; 24 - 30"H	Bright, steel-blue foliage; straw-colored flowers in summer	Winter
	Galanthus elwesii	Giant Snowdrop	Bulb; 8 - 10"H	White 3-petaled blossoms	Winter (Feb)
Grouping #6	Cornus sanguinea 'Winter Flame'	Winter Flame Dogwood	Shrub; 6'H	Orange/red/yellow stems	Winter
	Spirea japonica 'Limemound'	Limemound Spirea	Shrub; 4'H	Chartreuse-colored foliage	Summer
	Achillea x 'Moonshine'	Moonshine Yarrow	Perennial; 24"H	Light yellow flowers all summer long with silvery-gray foliage	Summer
	Hyacinthoides hispanica Excelsior	Spanish Bluebells	Bulb; 12"H	Deep violet-blue flowers	Late spring
Grouping #7:	Yucca Filamentosa 'Bright Edge'	Bright Edge Adam's Needle	Perennial; 30"H	Dark green foliage with golden edges	All seasons
	Euphorbia dulcis 'Chameleon'	Chameleon Spurge	Perennial; 18 - 24"H	Purple-bronze leaves with lime green Canterbury bell-like flowers	Spring
	Coreopsis grandiflora 'Early Sunrise'	Early Sunrise Tickseed	Perennial; 18 - 24"H	Showy, semi-double bright yellow blooms	Summer
	Calluna vulgaris 'Blazeaway'	Blazeaway Heather	Shrub; 18"H	Foliage yellow in spring, green in summer, and bright red in autumn; fuschia flowers	Summer
	Rhus aromatica 'Gro Low'	Gro Low Sumac	Shrub; 3' x 2.5'	Scarlet-orange leaves in fall	Fall
Grouping #8:	Caragana arborescens pendula 'Walker'	Fernleaf Weeping Siberian Pea	Shrub	Yellow flowers; yellow-green foliage in the fall	Spring/Fall
	Pennisetum setaceum ‘Atropurpurea’	Purple Fountain Grass	Grass; 48"H	Dark purple grass with purple flowers	Fall/Winter
	Allium schubertii	Allium/Tumbleweed Onion	Bulb; 12 - 18"H	Fragrant, pink flowers on an 18"D ball	Spring
	Cerastium tomentosum	Snow-in-Summer	Groundcover; 3 - 6"	Mass of white flowers on silver foliage	Spring
	Gaura lindheimeri 'Blaze'	Blaze Wand Flower	Perennial; 12 - 24"H	Dark pink flowers on maroonish-green stems	Spring

Grouping #9:	Miscanthus sinensis 'Graziella'	Graziella Maiden Grass	Grass; 50 - 60"H	Green foliage; beautiful white plumes; stands in heavy snowfalls	Sum/Fall/Wint
	Kerria japonica 'Pleniflora'	Japanese Globe Flower	Shrub 5' x 5'	Bright green leaves and stems; double yellow flowers	Spring
	Calluna vulgaris 'Firefly'	Firefly Scots Heather	Shrub; 18 - 24"H	Bronze-gold foliage in summer turning to fiery shades of orange-red in winter; mauve flowers	All seasons
	Gaura lindheimeri 'Passionate Pink'	Passionate Pink Wand Flower	Perennial; 12 - 24"H	Profusion of pink flowers on maroonish-green stems	Spring
	Gallardia x grandiflora 'Goblin'	Blanket Flower	Perennial; 12"H	Maroon flowers with ragged yellow edges	Summer
	Tulipa 'Blue Parrot'	Blue Parrot Tulip	Bulb; 20 - 22"H	Blue-purple curly flowers	late spring
FALL BULBS:	Colchicum autumnale 'Alboplenum'	Colchicum	Bulb; 4 - 6"H	Double, creamy white flowers 4"W	Fall
	Crocus speciosus	Fall-blooming Crocus	Bulb; 3 - 5"H	Purple striped petals with yellow center	Fall
SPRING BULBS:	Anemone blanda	Grecian Windflower	Bulb; 6 - 12"H	Deep purpley-blue star-like flowers form a mat	Spring
	Crocus sieberi 'Tricolor'	Crocus	Bulb; 3 - 4"H	Purple petals with gold and white at base on brown stems	Early spring
SUMMER BULBS:	Camassia cusickii	Camassia	Bulb; 30"H	Ice blue/purplish-blue star-shaped florets on racimes	May/June
	Lilium lancifolium 'Flore Pleno'	Double-Flowered Tiger Lily	Bulb; 36 - 48"H (can reach 6')	Layers and layers of orange petals with brown spots	Summer/Fall
PERENNIALS:	Achillea Millefolium 'Summerwine'	Summerwine Yarrow	Perennial; 24 - 30"H	Deep wine-red flowers all summer long	Summer
	Geum x 'Flames of Passion'	Flames of Passion	Perennial; 12 - 15"H	Bright red-orange flowers on wine-colored stems	Spring
	Echinops ritro 'Veitch's Blue'	Veitch's Blue Globe Thistle	Perennial; 36"H	Globular heads of steel blue flowers, darker than regular species	Summer
	Ceratostigma plumbaginpodes	Blue Plumbago	Perennial; 12"H	Flat, open peacock-blue flowers. Green foliage turns maroon in autumn	Late spring/Fall
	Papver orientale 'Flamenco Dancer'	Flamenco Dancer Poppy	Perennial; 30"H	4 - 6" blossoms with fringed red petals	Spring
	Asclepias tuberosa	Butterfly Milkweed	Perennial; 18 - 24"H	Rounded, bright orange flowerheads with dark green foliage	Summer
	Gallardia x 'Oranges and Lemons'	O&L Blanket Flower	Perennial; 18"H	Apricot-orange with yellow petal tips; dark green foliage	Summer
	Centhranthus ruber 'Coccineus'	Red Valerian	Perennial; 24 - 36"H	Fragrant, showy, tiny carmine-red flowers in clusters on gray-green foliage	Summer
	Achillea Millefolium 'Red Velvet'	Red Velvet Yarrow	Perennial; 24"H	Dark red flowers and fern-like foliage	Summer
SHRUBS:	Syringa patula 'Miss Kim'	Miss Kim Lilac	Shrub; 6'H	Purplish-pink fragrant flowers	Summer
	Chamaecyparis obtusa 'Tsatsumi Gold'	Tsatsumi Gold Hinoki Cypress	Shrub; 8'H	Bright gold contorted foliage and contorted reddish stems	All seasons
	Pieris japonica 'Mountain Fire'	Mtn. Fire Japanese Andromeda	Shrub; 6'H	Vivid orange-red new growth; glossy foliage	Winter
	Chamaecyparis obtusa 'Jean Iseli'	Jean Iseli Hinoki Cypress	Shrub; 12"H	Dwarf, circular mound; dark green foliage	All seasons
	Daphne caucausica	Caucasian Daphne	Shrub; 4'H	Clusters of fragrant white flowers; blue-green leaves often semi-evergreen	Spring
	Daphne burkwoodii 'Carol Mackie'	Carol Mackie Daphne	Shrub 3' x 3'	Cream-colored leaf margins; fragrant pink flowers in May	Spring
	Spirea japonica 'Shibori'	Shibori Spirea	Shrub; 2 - 3'H	Red, pink, and white flowers on green foliage	Summer/Fall
	Spirea japonica 'Mellow Yellow'	Mellow Yellow Spirea	Shrub; 18"H x 24"W	Bright gold foliage turns to russet in the fall; bright pink flowers	
	Hydrangea macrophylla 'Blushing Bride'	Blushing Bride Hydrangea	Shrub; 3' x 5'	Red foliage on top; green underneath (at nursery; not online)	
	Cytisus scoparius 'Lucky'	Lucky Scotch Broom	Shrub; 5'H	Apricot-colored sweetpea shaped flowers (Protection from winter winds)	Spring
	Cornus foemina (racemosa)				
GRASSES:	Pennisetum alopecuroides 'Hameln'	Dwarf Fountain Grass	Grass; 20 - 30"H	Bottlebrush seedheads persist into winter	Sum/Fall/Win
	Pennisetum orientale 'Tall Tales'	Tall Oriental Fountain Grass	Grass; 40 - 60"H	Most floriferous of all grasses. 6-8" flowers are white/pink	
	Miscanthus sinensis 'Malepartus'	Malepartus Maiden Grass	Grass; 50 - 60"H	Early bloomer; white plumey foliage 3'H (on top of the 50-60" plant height!)	

North Side / Shade Planters on Podium

OPTIONS:	LATIN NAME	COMMON NAME	TYPE/SIZE	DESCRIPTION	INTEREST:		
Group #1:	Hydrangea paniculata 'Pink Diamond'	Pink Diamond Pee Gee Hyndrangea	Shrub	S/PS			
	Rhus aromatica 'Gro Low'	Gro Low Sumac	Shrub	S/PS			
	Ophiopogon planiscapus 'Nigrescens'	Black Mondo Grass	Grass	S			
	Epimedium ogisui	White Epimedium	Perennial	S/PS			
Group #2:	Kerria japonica 'Pleniflora'	Japanese Globe Flower	Shrub	S			
	Microbiota decussata	Russian arborvitae	Shrub	S/PS			
	Helleborus niger	Christmas Rose	Bulb	S/PS			
	Matteuccia struthiopteris		Perennial	S			
Group #3:	Rhus aromatica	Fragrant Sumac	Shrub	S/PS			
	Hakonechloa macra 'Aureola'	Japanese Forest Grass	Grass	S/PS			
	Dicentra spectabilis	Bleedingheart	Perennial	S/PS			
	Convallaria majalis	European Lily of the Valley	Bulb	S/PS			
PARTIAL SHADE:							
Group #1:	Buxus sempervirens (fastigiate)	Boxwood (upright form)	Shrub	S/PS			
	Tulipa tarda		Bulb	PS			
	Astilbe simplicifolia 'Hennie Graafland'		Shrub	S/PS			
Group #2:	Euonymus fortunei		Shrub	S/PS			
	Crocus zonatus	Fall crocus	Bulb	S/PS			
	Epimedium ogisui	White Epimedium	Perennial	S/PS			
Group #3:	Cephalotaxus harringtonia 'Prostrata'	Prostate Japanese Plum Yew	Shrub	S/PS			
	Clematis terniflora		Shrub	PS			
	Liriope muscari		Grass	PS			
	Crocus zonatus	Fall crocus	Bulb	S/PS			

TYPE	LATIN NAME	COMMON NAME	HEIGHT	WIDTH	ZONE	SHADE/PART SHADE	DROUGHT TOLERANT
BULBS:	Epimedium ogisui	White Epimedium	10"	18-24"	5 to 9	S/PS	no
	Tulipa tarda	Tulip				PS	x
	Helleborus niger	Christmas Rose	10-12"	12-15"	3 to 8	S/PS	
	Colchicum autumnale	Colchicum				PS	
	Crocus zonatus	Fall crocus	3-5"		5 to 9	S/PS	x
	Convallaria majalis	European Lily of the Valley	8-10'	4-6"	3 to 7	S	
PERENNIALS:	Clematis terniflora					PS	
	Chasmanthium latifulium	Sea Oats				S	x
	Dicentra spectabilis	Bleedingheart				S	
	Matteuccia struthiopteris					S	
	Hakonechloa macra 'Aureola'					S	
	Vinca minor					S	
	Geranium maculatum					S	
	Liriope muscari					PS	
	Astilbe simplicifolia 'Hennie Graafland'	Astilbe simplicifolia 'Hennie Graafland'	10-18"	24"	4 to 8	S/PS	no
SHRUBS:	Cornus alba	White Dogwood				S	
	Kerria Japonica					S	once established
	Cornus sericea	Red Twig Dogwood				S	
	Euonymus fortunei					S/PS	once established
	Picea glauca 'Conica'					PS	
	Hydrangea macrophylla Penny Mac	Penny Mac' Hydrangea	5'	4'	5 to 9	PS	
	Berberis thunbergii					PS	x
	Hydrangea anomala petiolaris	Climbing Hydrangea	30-40'	24-36"	4a to 7b	S/PS	no
	Buxus sempervirens					S/PS	once established
	Buxus microphylla					S/PS	once established
	Hydrangea arborescens 'Annabel'	Annabel Hydrangea				PS	
	Pieris japonica 'Red Mill'	Red Mill Japanese Andromeda	6'	6'	5 to 7b	S/PS	
	Kalmia latifolia					S/PS	once established
	Taxus x media 'Hatfieldii"					S	once established
	Cephalotaxus harringtonia 'Prostrata'	Prostate Japanese Plum Yew	2-3'	2-3'	5	S/PS	x
	Taxus cuspidata 'Columnaris'					S	x



PERKINS
+WILL

215 Park Avenue South
4th Floor
New York, NY 10003
t 212.251.7000
f 212.251.7111
www.perkinswill.com

Construct New Business School

State University of New York at Albany

1400 WASHINGTON AVENUE
ALBANY, NY 12222

SUCF Project No. 01A51

Site/Civil Engineer
Watts Arch. & Engineering
95 Perry Street, Suite 300
Buffalo, NY 14203
t 716.208.5100
f 716.206.5199

Landscape Architecture
Thomas Balsley Associates
31 West 27th Street, 9th Floor
New York, NY 10001
t 212.684.9230
f

Structural Engineer
Leslie E. Robertson Assoc.
30 Broad Street, 4th Floor
New York, NY 10004
t 212.750.9000
f 212.750.9002

MEP/FP Engineer
BR+A Consulting Engineers
150 Madison Avenue
New York, NY 10016
t 212.840.0060
f 212.730.7807

Lighting Design
HLB Lighting Design
200 Park Avenue South, Suite 1601
New York, NY 10001
t 212.674.5580
f 212.254.2712

Audio-Visual Programming
Sextant Group
730 River Avenue, Suite 600
Pittsburgh, Pa 15212
t 412.323.8580
f 412.323.8538

Acoustical Consulting
Cerami and Associates, Inc.
404 Fifth Avenue
New York, NY 10018
t 212.370.1776
f 212.370.1736

IT/Security Consulting
TM Technology Partners, Inc.
250 West 39th Street
New York, NY 10018
t 212.398.2424
f 212.398.5959

Revisions

NOT FOR CONSTRUCTION

NO	ISSUE	DATE
2	ISSUE FOR DM SUBMISSION	2-26-10
1	ISSUE FOR DM PRICING	2-18-10

Sheet Information

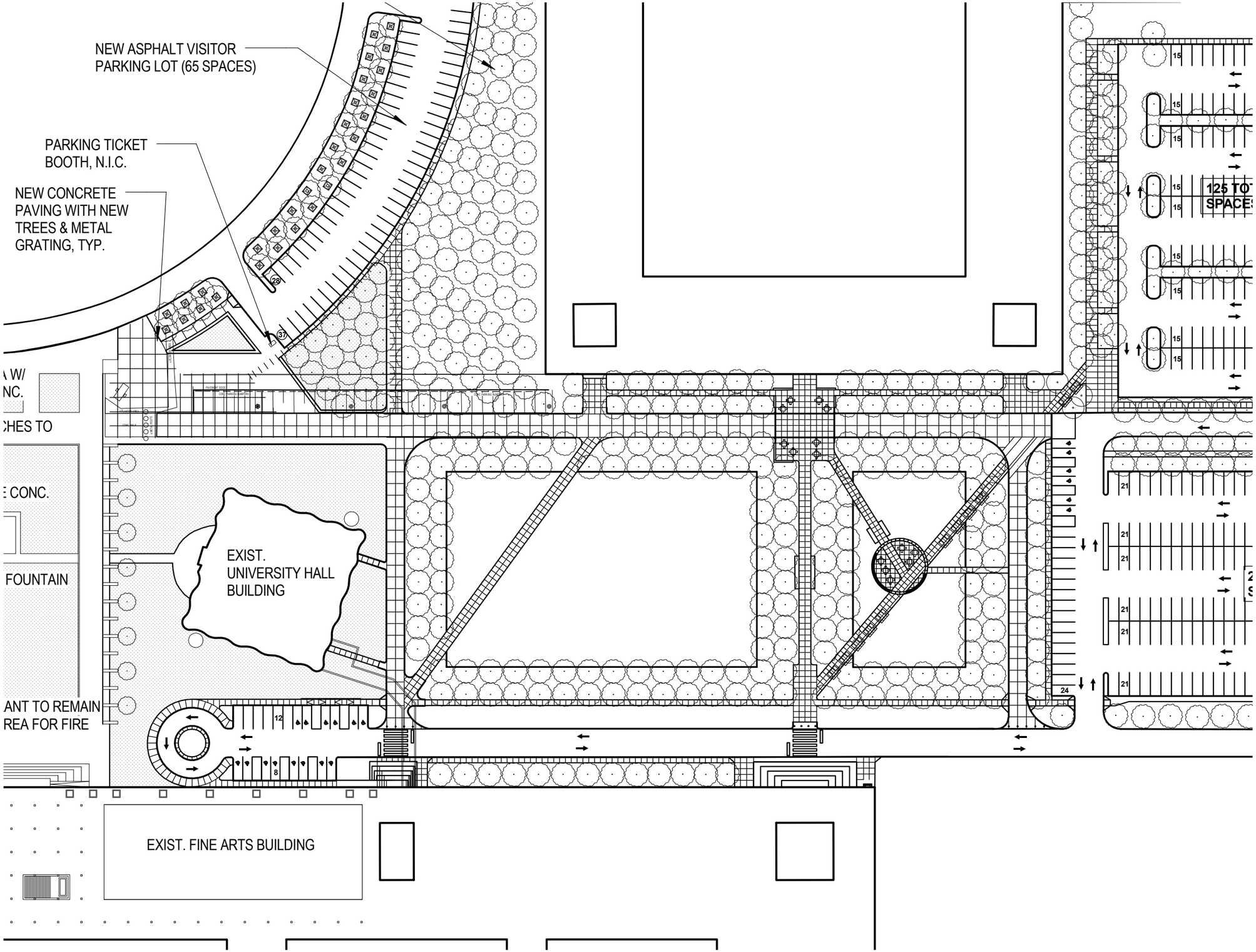
Date	DM Submission 2-26-10
Job Number	031529.000
Drawn	Author
Checked	Checker
Approved	Approver

Title

ARCHITECTURAL SITE PLAN

Sheet

A-050



PERKINS + WILL

215 Park Avenue South
4th Floor
New York, NY 10003
t 212.251.7000
f 212.251.7111
www.perkinswill.com

Construct New Business School

State University of New York at Albany

1400 WASHINGTON AVENUE
ALBANY, NY 12222

SUCF Project No. 01A51

Site/Civil Engineer
Watts Arch. & Engineering
95 Perry Street, Suite 300
Buffalo, NY 14203
t 716.206.5100
f 716.206.5199

Landscape Architecture
Thomas Balsely Associates
31 West 27th Street, 9th Floor
New York, NY 10001
t 212.684.9230
f

Structural Engineer
Leslie E. Robertson Assoc.
30 Broad Street, 4th Floor
New York, NY 10004
t 212.750.9000
f 212.750.9002

MEP/FP Engineer
BR+A Consulting Engineers
150 Madison Avenue
New York, NY 10016
t 212.840.0060
f 212.730.7807

Lighting Design
HLB Lighting Design
200 Park Avenue South, Suite 1601
New York, NY 10001
t 212.674.5580
f 212.254.2712

Audio-Visual Programming
Sextant Group
730 River Avenue, Suite 600
Pittsburgh, Pa 15212
t 412.323.8580
f 412.323.8538

Acoustical Consulting
Cerami and Associates, Inc.
404 Fifth Avenue
New York, NY 10018
t 212.370.1776
f 212.370.1736

IT/Security Consulting
TM Technology Partners, Inc.
250 West 39th Street
New York, NY 10018
t 212.398.2424
f 212.398.0699

Revisions

NOT FOR CONSTRUCTION

NO	ISSUE	DATE
2	ISSUE FOR DM SUBMISSION	2-26-10
1	ISSUE FOR DM PRICING	2-18-10

Sheet Information

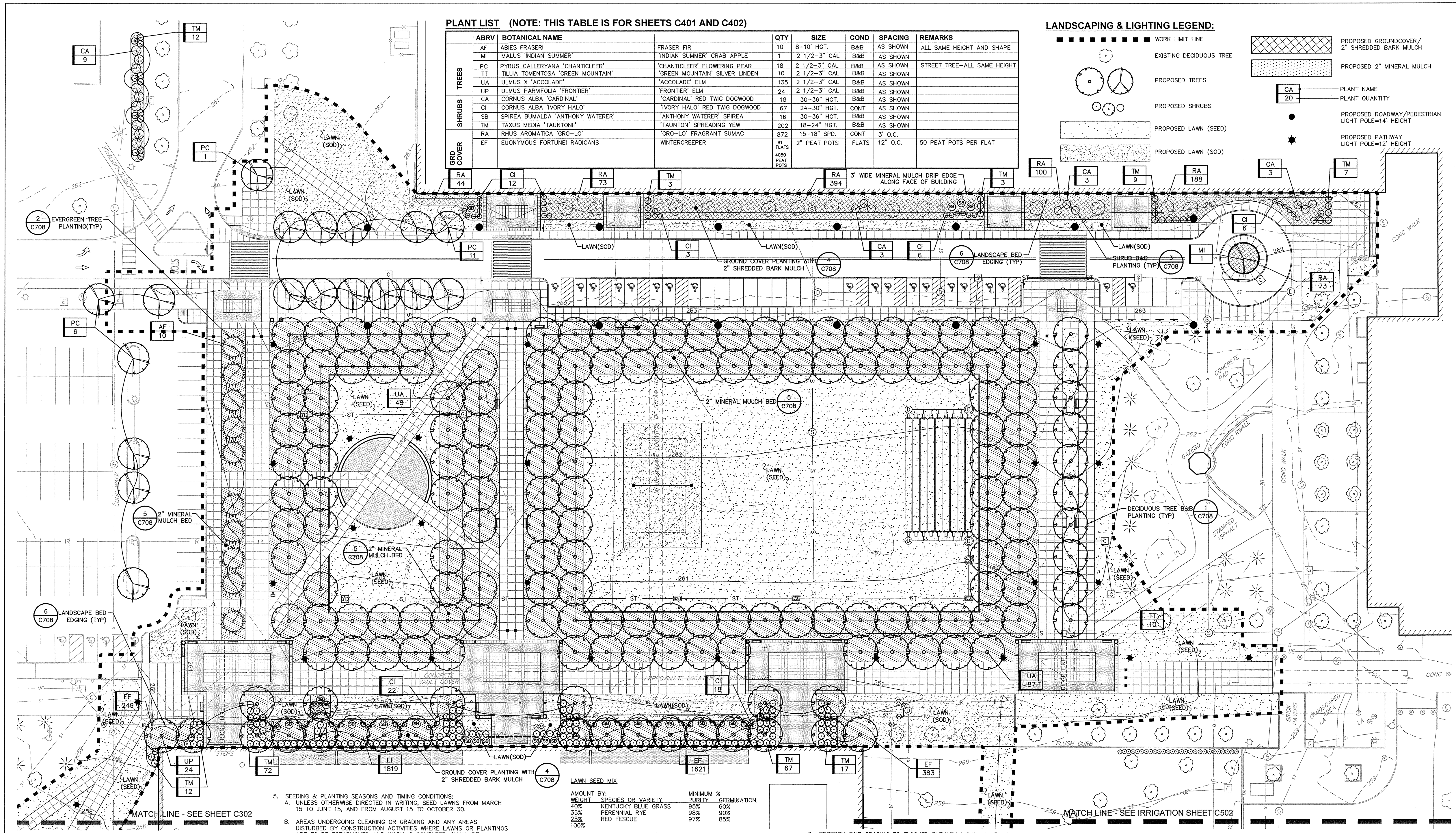
Date	DM Submission 2-26-10
Job Number	031529.000
Drawn	Author
Checked	Checker
Approved	Approver

Title

ARCHITECTURAL SITE PLAN

Sheet

A-050



PLANT LIST (NOTE: THIS TABLE IS FOR SHEETS C401 AND C402)

	ABRV	BOTANICAL NAME		QTY	SIZE	COND	SPACING	REMARKS
TREES	AF	ABIES FRASERI	FRASER FIR	10	8-10' HGT.	B&B	AS SHOWN	ALL SAME HEIGHT AND SHAPE
	MI	MALUS 'INDIAN SUMMER'	'INDIAN SUMMER' CRAB APPLE	1	2 1/2-3" CAL	B&B	AS SHOWN	
	PC	PYRUS CALLERYANA 'CHANTICLEER'	'CHANTICLEER' FLOWERING PEAR	18	2 1/2-3" CAL	B&B	AS SHOWN	STREET TREE-ALL SAME HEIGHT
	TT	TILLIA TOMENTOSA 'GREEN MOUNTAIN'	'GREEN MOUNTAIN' SILVER LINDEN	10	2 1/2-3" CAL	B&B	AS SHOWN	
	UA	ULMUS X 'ACCOLADE'	'ACCOLADE' ELM	135	2 1/2-3" CAL	B&B	AS SHOWN	
	UP	ULMUS PARVIFOLIA 'FRONTIER'	'FRONTIER' ELM	24	2 1/2-3" CAL	B&B	AS SHOWN	
SHRUBS	CA	CORNUS ALBA 'CARDINAL'	'CARDINAL' RED TWIG DOGWOOD	18	30-36" HGT.	B&B	AS SHOWN	
	CI	CORNUS ALBA 'IVORY HALO'	'IVORY HALO' RED TWIG DOGWOOD	67	24-30" HGT.	CONT	AS SHOWN	
	SB	SPIREA BUMALDA 'ANTHONY WATERER'	'ANTHONY WATERER' SPIREA	16	30-36" HGT.	B&B	AS SHOWN	
	TM	TAXUS MEDIA 'TAUNTONII'	'TAUNTON' SPREADING YEW	202	18-24" HGT.	B&B	AS SHOWN	
GRD COVER	RA	RHUS AROMATICA 'GRO-LO'	'GRO-LO' FRAGRANT SUMAC	872	15-18" SPD.	CONT	3' O.C.	
	EF	EUONYMOUS FORTUNEI RADICANS	WINTERCREEPER	81 FLATS 4050 PEAT POTS	2" PEAT POTS	FLATS	12" O.C.	50 PEAT POTS PER FLAT

LANDSCAPING & LIGHTING LEGEND:

- WORK LIMIT LINE
- EXISTING DECIDUOUS TREE
- PROPOSED TREES
- PROPOSED SHRUBS
- PROPOSED LAWN (SEED)
- PROPOSED LAWN (SOD)
- PROPOSED GROUNDCOVER/ 2" SHREDDED BARK MULCH
- PROPOSED 2" MINERAL MULCH
- CA / 20 — PLANT NAME / PLANT QUANTITY
- PROPOSED ROADWAY/PEDESTRIAN LIGHT POLE=14' HEIGHT
- PROPOSED PATHWAY LIGHT POLE=12' HEIGHT

LANDSCAPING NOTES:

1. THE LANDSCAPE CONTRACTOR SHALL CAREFULLY COORDINATE CONSTRUCTION ACTIVITIES WITH THAT OF THE EARTHWORK CONTRACTOR AND OTHER SITE DEVELOPMENT.
2. THE CONTRACTOR SHALL VERIFY DRAWING DIMENSIONS WITH ACTUAL FIELD CONDITIONS AND INSPECT RELATED WORK AND ADJACENT SURFACES. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF ALL FINISH GRADES WITHIN THE WORK AREA. THE CONTRACTOR SHALL REPORT TO THE LANDSCAPE ARCHITECT/ENGINEER AND OWNER ALL CONDITIONS WHICH PREVENT PROPER EXECUTION OF THIS WORK.
3. THE EXACT LOCATION OF ALL EXISTING UTILITIES, STRUCTURES AND UNDERGROUND UTILITIES, WHICH MAY NOT BE INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITY SERVICES AND IS RESPONSIBLE FOR THEIR REPLACEMENT IF DAMAGED.
4. THE CONTRACTOR SHALL KEEP THE PREMISES FREE FROM RUBBISH AND ALL DEBRIS AT ALL TIMES AND SHALL ARRANGE MATERIAL STORAGE SO AS NOT TO INTERFERE WITH THE OPERATION OF THE PROJECT. ALL UNUSED MATERIALS, RUBBISH AND DEBRIS SHALL BE REMOVED FROM THE SITE.
5. SEEDING & PLANTING SEASONS AND TIMING CONDITIONS:
   A. UNLESS OTHERWISE DIRECTED IN WRITING, SEED LAWNS FROM MARCH 15 TO JUNE 15, AND FROM AUGUST 15 TO OCTOBER 30.
   B. AREAS UNDERGOING CLEARING OR GRADING AND ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WHERE LAWNS OR PLANTINGS ARE TO BE ESTABLISHED AND WORK IS COMPLETE, SHALL BE RESTORED WITH PERMANENT VEGETATIVE COVER AS SOON AS SITE AREAS ARE AVAILABLE AND WITHIN 14 DAYS AFTER WORK IS COMPLETE; WORK SHALL BE WITHIN THE SEASONAL LIMITATIONS FOR EACH KIND OF LANDSCAPE WORK REQUIRED. PROVIDE STABILIZATION WITH TEMPORARY VEGETATIVE COVER (TOPSOIL AND TEMPORARY COVER SEED MIX) WITHIN 14 DAYS AFTER WORK IS COMPLETE, FOR SEEDING OUTSIDE PERMITTED SEEDING PERIODS.
6. PRODUCTS:
   A. IMPORTED TOPSOIL: PROVIDE TOPSOIL CONFORMING TO THE FOLLOWING:
      i. ORIGINAL LOAM TOPSOIL, WELL DRAINED HOMOGENEOUS TEXTURE AND OF UNIFORM GRADE, WITHOUT THE ADMIXTURE OF SUBSOIL MATERIAL AND FREE OF DENSE MATERIAL, HARDPAN, CLAY, STONES, SOD OR OTHER OBJECTIONABLE MATERIAL.
      ii. CONTAINING NOT LESS THAN 5% NOR MORE THAN 20% ORGANIC MATTER IN THAT PORTION OF A SAMPLING PASSING A 1/4" SIEVE WHEN DETERMINED BY THE WET COMBUSTION METHOD ON A SAMPLE DRIED AT 105°C.
      iii. CONTAINING A PH VALUE WITHIN THE RANGE OF 6.5 TO 7.5 ON THAT PORTION OF THE SAMPLE WHICH PASSES A 1/4" SIEVE.
      iv. CONTAINING THE FOLLOWING WASHED GRADATIONS:

SIEVE DESIGNATION	% PASSING
1"	100
1/4"	97-100
NO 200	20-60

   B. SEED MIXTURE:
   PROVIDE FRESH, CLEAN, NEW-CROP SEED MIXED IN THE PROPORTIONS SPECIFIED FOR SPECIES AND VARIETY, AND CONFORMING TO FEDERAL AND STATE STANDARDS. PROVIDE THE FOLLOWING MIXTURES:

LAWN SEED MIX

AMOUNT BY: WEIGHT	SPECIES OR VARIETY	MINIMUM % PURITY	GERMINATION
40%	KENTUCKY BLUE GRASS	95%	60%
35%	PERENNIAL RYE	98%	90%
25%	RED FESCUE	97%	85%
100%			

TEMPORARY COVER SEED MIX

AMOUNT BY: WEIGHT	SPECIES OR VARIETY	MINIMUM % PURITY	GERMINATION
100%	ANNUAL RYEGRASS	98%	90%

   C. LIME: NATURAL LIMESTONE CONTAINING AT LEAST 85% OF TOTAL CARBONATES, GROUND TO SUCH FINENESS THAT AT LEAST 90% PASSES A 10-MESH SIEVE AND AT LEAST 50% PASSES A 100-MESH SIEVE.
   D. FERTILIZER:
      i. FOR STARTER FERTILIZING: COMMERCIAL STARTER FERTILIZER, GRANULAR, NONBURNING PRODUCT CONTAINING 5% NITROGEN, 10% AVAILABLE PHOSPHOROUS, AND 5% WATER SOLUABLE POTASH (5-10-5).
      ii. FOR FINAL FERTILIZING: IF APPLIED IN SPRING SEASON, SHALL BE A SLOW RELEASE COMMERCIAL FERTILIZER, GRANULAR, WITH 3-1-2 NPK. IF APPLIED IN FALL SEASON, SHALL BE AS SPECIFIED IN (8.D.i) ABOVE.
   E. MULCH:
      i LAWN AREAS
      OAT OR WHEAT STRAW, FREE OF WEEDS.
      II PLANT BED AREAS
      MINERAL MULCH TO BE USED IN ALL AREAS OTHER THAN GROUND COVER BEDS.
7. EXECUTION:
   A. LANDSCAPE WORK SHALL BE UNDERTAKEN AS SOON AS SITE AREAS ARE AVAILABLE.
   B. TOPSOIL SHALL BE SPREAD NO LESS THAN 4" OVER SUB-GRADE MATERIAL. SOIL AMENDMENTS SHALL BE THOROUGHLY MIXED INTO THE TOP 4" OF TOPSOIL, FOLLOWING THE SPECIFICATIONS STATED BELOW.
   C. PERFORM FINE GRADING TO FINISHED ELEVATION ONLY IMMEDIATELY PRIOR TO PLANTING. PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN SURFACE, FREE OF DEPRESSIONS OR RIDGES WITH A UNIFORM LOOSE, FINE TEXTURE.
   D. FERTILIZING:
      i THE SOIL SHALL BE TESTED FOR PH AND LIME ADDED AS NECESSARY. ALL AMENDMENTS SHALL BE CHECKED AND APPROVED BY LANDSCAPE ARCHITECT BEFORE AMENDMENTS ARE MADE.
      ii. APPLY FERTILIZER AT RATE OF 4 LBS/1000 SF FOR LAWN AREAS.
   E. LAWN:
      1. LAWN SEED MIX: SEED AT THE RATE OF 5 TO 6 LBS PER 1,000 SF.
      2. TEMPORARY COVER SEED MIX: SEED AT THE RATE OF 3 TO 4 LBS PER 1,000 SF.
      3. TEMPORARY COVER SEED MIX TO BE APPLIED ONLY FOR LATE FALL OR SUMMER SOIL STABILIZATION OUTSIDE ALLOWED SEEDING PERIODS.
      4. TURFGRASS SOD: REFER TO SPECIFICATIONS.
   F. ALL SEEDED AREAS SHALL BE PROTECTED FROM EROSION BY A UNIFORM BLANKET OF STRAW APPLIED AT A RATE OF 2 TONS/ACRE MIN, TO BE APPLIED ONCE SEEDING IS COMPLETE.
   G. ALL NEWLY PLANTED AREAS SHALL BE KEPT MOIST BY WATERING UNTIL GRASSES AND GROUND COVERS ARE WELL ESTABLISHED. THE LANDSCAPE CONTRACTOR MUST WATER PLANT MATERIAL WHEN NECESSARY FOR 60 DAYS AFTER INSTALLATION. CONTRACTOR TO SUPPLY ALL MATERIALS NECESSARY FOR WATERING OPERATION AND COORDINATE WITH SUNYA FOR LOCATION AND ACCESS TO WATER SOURCE(S).
   H. LAWNS ARE TO BE WARRANTED UNTIL THEY BECOME ESTABLISHED, UNTIL FINAL ACCEPTANCE, AND NOT LESS THAN 60 DAYS AFTER COMPLETION OF ALL WORK. TREES, SHRUBS, AND GROUND COVERS SHALL BE WARRANTED AGAINST DEFECTS INCLUDING POOR GROWTH AND DEATH, EXCEPT WHEN RESULTING FROM OWNER NEGLECT, INCIDENTS THAT ARE BEYOND THE CONTROL OF THE LANDSCAPE INSTALLER AND DAMAGE OR ABUSE BY OTHERS, FOR AT LEAST ONE FULL YEAR AFTER PROJECT COMPLETION.

UTILITY NOTE:

1. PORTIONS OF EXISTING UTILITY INFORMATION SHOWN HEREIN ARE AS PROVIDED BY SUNYA AND REFLECT INFORMATION DEPICTED ON MAPPING ENTITLED "COMPOSITE UTILITY SYSTEMS", DATED NOVEMBER 2008, PREPARED BY WOODARD & CURRAN, AND WERE NOT VERIFIED IN THE FIELD.

LAWN NOTE:

1. ALL DISTURBED AREAS NOT RECEIVING PAVEMENTS OR SHRUB BEDS SHALL BE TOPSOILED, SEEDED OR SOD(AS NOTED ON PLAN), AND MULCHED(AS NOTED ON PLAN) ACCORDING TO SPECIFICATIONS.

0' 30' 60' 90'
1"=30'-0"

ISSUED FOR BID

UALBANY
State University of New York

CONSULTANT

THE Chazen COMPANIES®
Engineers/Surveyors
Planners
Environmental Scientists
Landscape Architects

Capital District Office:
547 River Street
Troy, New York 12180
Phone: (518) 273-0055

PROJECT NUMBER: 30925.00

PROJECT

UPTOWN CAMPUS
DUTCH CORNER
INFRASTRUCTURE &
LANDSCAPING
PHASE II

A07-05073

DECEMBER 22, 2009

REV#2		
REV#1		
CD		
DD		
SD		
MARK	DATE	DESCRIPTION

PROJECT NO: A07-05073
DRAWING ID: CONTRACT #T002175

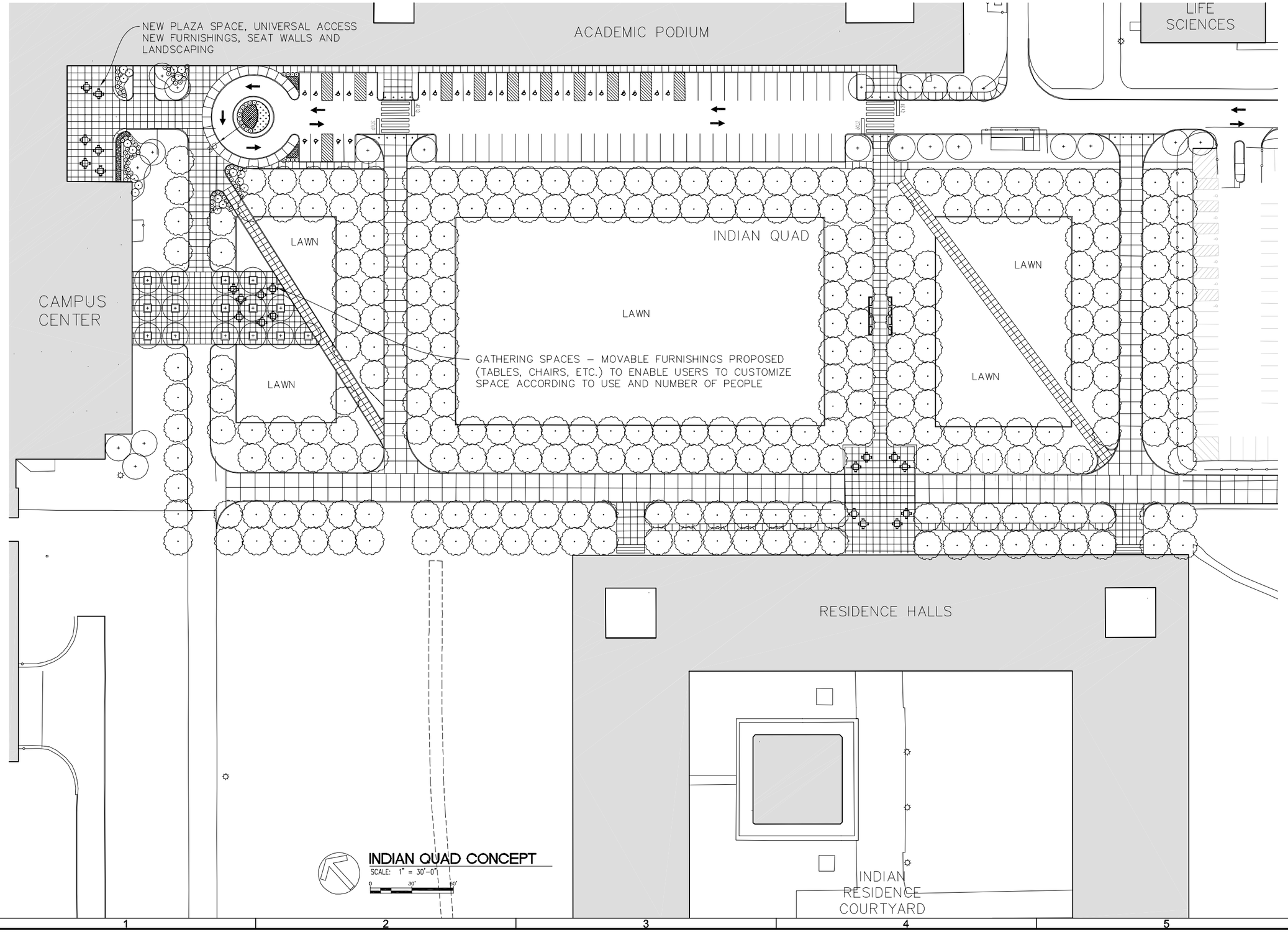
DRAWN BY: KPW CHK'D BY: CNT
SCALE: 1"=30'

SHEET TITLE

LANDSCAPING &
LIGHTING PLAN

C601

SHEET 15 OF 29



TWLA
TROWBRIDGE & WOLF
LANDSCAPE ARCHITECTS LLP
1001 W. Seneca St., Ste. 101 Ithaca, New York 14850
607-277-1400 Fax 607-277-6502

PROGRESS PRINT

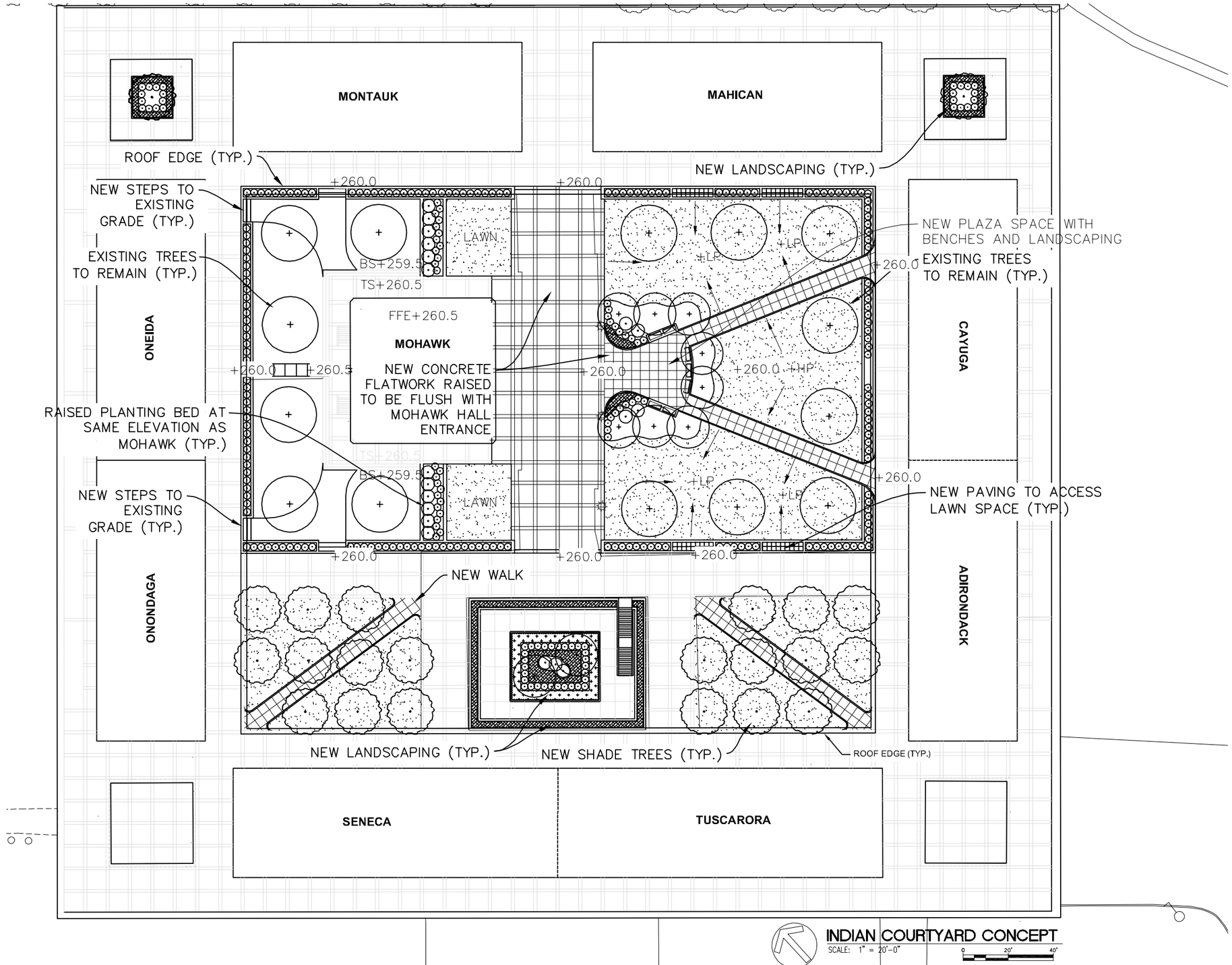
UNIVERSITY AT ALBANY
QUAD CONCEPT DESIGNS
ALBANY, NEW YORK

PHASE:	CONCEPT DESIGN
DATE:	10-27-2009
PROJECT:	TWLA 2008021
DRAWN BY:	JVB
CHECKED:	PJT

INDIAN QUAD CONCEPT PLAN

L004

Plot Date: 10/28/2009
File: T:\Projects\SUNY Albany Landscape Master Plan\ACAD\TWLA2008021 UAlbany Parking and Quad Plans.dwg



INDIAN COURTYARD CONCEPT
SCALE: 1" = 20'-0"
0 20' 40'

TWLA
TROWBRIDGE & WOLF
LANDSCAPE ARCHITECTS LLP
1001 W. Seneca St., Ste. 101 Ithaca, New York 14850
607-277-1400 Fax 607-277-6502

PROGRESS PRINT

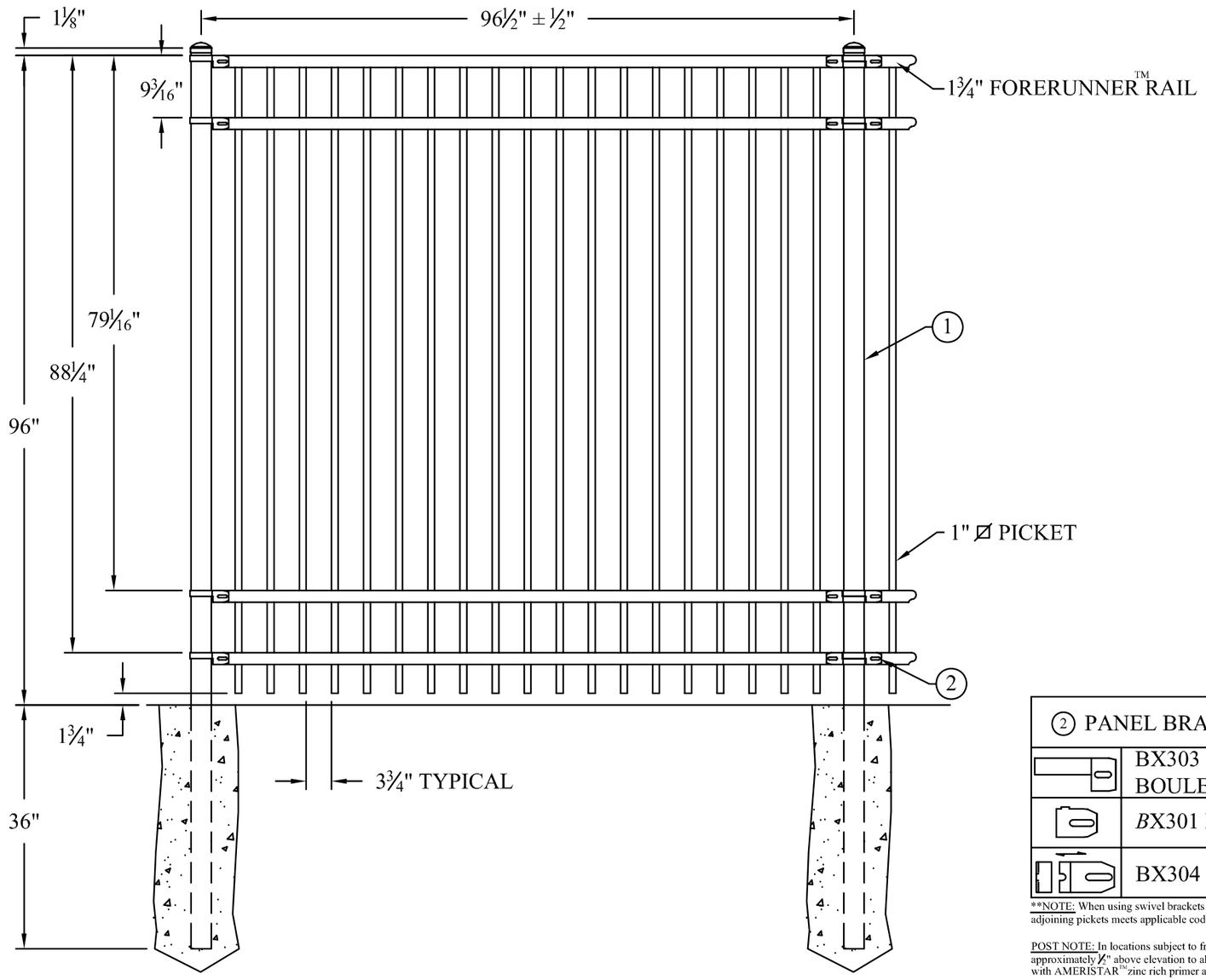
UNIVERSITY AT ALBANY
QUAD CONCEPT DESIGNS
ALBANY, NEW YORK

PHASE:	CONCEPT DESIGN
DATE:	10-27-2009
PROJECT:	TWLA2008021
DRAWN BY:	JVB
CHECKED:	PJT

INDIAN COURTYARD CONCEPT PLAN

L004-A

Appendix D: Indian Residential Courtyard Redesign



② PANEL BRACKET OPTIONS		① POST TO POST 8' NOMINAL	
	BX303 UNIVERSAL (AS SHOWN) BOULEVARD BRACKET	*96½" ± ½"	3"Ø
	*B*X301 FLAT MOUNT BRACKET	*96½" ± ½"	3"Ø
		*97½" ± ½"	4"Ø
	BX304 SWIVEL BRACKET**	*96½" ± ½"	3"Ø
		*97½" ± ½"	4"Ø

**NOTE: When using swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This may require trimming one or both ends of the panel as needed.

POST NOTE: In locations subject to freezing, where posts are grouted into core-drilled holes, a ¼" diameter hole should be drilled in the post approximately ½" above elevation to allow for drainage of built-up ground water. The drilled hole must be wiped clean and dry and sprayed with AMERISTAR™ zinc rich primer and AMERISTAR™ color match finish.

FROST LINE: Footer depth shown is minimum recommendation. In some cases local restrictions of freezing weather conditions may require a greater depth.

*PANEL RAKING: Drawing shows fence panel at level ground elevation: for installations that must be raked to follow sloping grades, the post spacing dimension shown must be measured along the grade.

Title:
ECHELON II PANEL MAJESTIC 4R EXT 4"GAP 8'H 8'W

Drawing Number:	Old Part Number:
280-639	2AMX40948
SH . 1 of 1	SCALE: DO NOT SCALE
Date 07/01/09	REV:

AMERISTAR®
1555 N. Mingo
Tulsa, OK 74116
1-888-333-3422

Appendix F: University Standard Detectable Warning Surface Recommendations

CAST IRON DETECTABLE WARNING PLATES,

Manufactured by,
East Jordan Iron Works Inc. &
Neenah Foundry Co.

LANDSCAPE FORMS- AUSTIN WOOD SURFACE BENCH

UNIVERSITY STANDARD TRASH/RECYCLING RECEPTACLE
FOR USE ON PODIUM AND RESIDENCE HALLS

UNIVERSITY STANDARD TRASH RECEPTACLE
FOR TEMPORARY USE DURING SPECIAL EVENTS

LANDSCAPE FORMS - KALEIDOSCOPE SHELTER

LANDSCAPE FORMS -
PLAINWELL RECEPTACLE
FOR USE IN LANDSCAPE SPACES

LANDSCAPE FORMS - UNIVERSAL RECYCLING
FOR USE IN LANDSCAPE SPACES

UALBANY
State University of New York

CONSULTANT

TWA
TROWBRIDGE & WOLF
LANDSCAPE ARCHITECTS LLP

1001 W. Seneca St., Ste. 101 Ithaca, New York 14850
607-277-1400 Fax 607-277-6002

PROJECT:

LANDSCAPE
MASTER PLAN
SPRING 2009

MARK	DATE	DESCRIPTION
REV#2		
REV#1		
CD		
DD		
SD		

PROJECT NO: U-ALBANY A09-14528
DRAWING ID:
DRAWN BY: JVB CHK'D BY: PJT
SCALE: N/A

SHEET TITLE

CAMPUS
FURNISHINGS

L001

SHEET 1 OF 1

Appendix H: Campus Vegetation Selections

The following trees, shrubs and groundcovers were selected for USDA Zone hardiness, soil conditions, including pH, and ease of maintenance. Some selections are also salt tolerant for planting near roadsides or areas of salt usage (indicated *).

	Botanical Name	**Common Name/Cultivar**
	Small Trees	
1.	**Acer campestre*	Hedge Maple 'Schichtel's Upright'
2.	*Acer truncatum*	Shantung Maple
3.	*Amelanchier canadensis*	Serviceberry
4.	*Crataegus phaenopyrum*	Washington Hawthorn
5.	*Crataegus viridis 'Winter King'*	Winter King Hawthorn
6.	*Malus spp.*	'Adams', 'Donald Wyman', 'Indian Summer', 'Liset', 'Ormiston Roy', Jackii Crabapple
7.	*Prunus virginiana 'Canada Red'*	Canada Red Chokeberry
8.	*Syringa reticulata 'Ivory Silk'*	Ivory Silk Japanese Tree Lilac
9.	**Zelkova serrata 'Schmidtlow'*	Wireless Japanese Zelkova

	Botanical Name	**Common Name/Cultivar**
	Medium to Large Trees	
1.	*Acer x freemanii*	Autumn Blaze Freeman Maple
2.	**Acer pseudoplatanus 'Spaethii'*	Spatheii Sycamore Maple
3.	*Betula nigra 'Heritage'*	Heritage River Birch
4.	*Carpinus betulus 'Fastigiata'*	European Hornbeam
5.	*Celtis occidentalis 'Prairie Pride'*	Prairie Pride Hackberry
6.	*Cercidiphyllum japonicum* (Moist Site)	Katsura Tree
7.	*Corylus colurna*	Turkish Filbert
8.	**Ginkgo biloba* (male only)	'Autumn Gold', 'Lakeview', and 'Princeton Sentry Ginkgo
9.	**Gleditsia t. inermis 'Shademaster'*	Thornless Honeylocust
10.	*Gymnocladus dioicus*	'Espresso' Kentucky Coffee Tree
11.	**Koelreuteria paniculata*	'September' Goldenrain Tree
12.	*Liquidambar styraciflua*	'Rotundaloba' Sweetgum
13.	*Maclura pomifera inermis (male)*	'Park' and 'Wichita' Osage Orange
14.	*Ostrya virginiana*	American Hophornbeam
15.	*Picea abies*	Norway Spruce
16.	*Picea omorika*	Serbian Spruce

Appendix H: Campus Vegetation Selections

17.	**Platanus x acerifolia*	'Columbia', 'Liberty', and 'Bloodgood' London Planetree
18.	**Prunus sargentii*	'Columnaris' Sargent Cherry
19.	**Pyrus calleryana*	Callery Pear 'Aristocrat', 'Autumn Blaze', 'Chanticleer', 'Fauriei', and 'Whitepire'
20.	*Quercus acutissima*	Sawtooth Oak
21.	*Quercus imbricaria*	Shingle Oak
22.	*Quercus macrocarpa*	Bur Oak
23.	*Quercus muehlenbergii*	Chinkapin Oak
24.	**Quercus robur*	'Attention', and 'Skymaster' English Oak
25.	**Quercus rubra*	Northern Red Oak
26.	*Quercus schumardii*	Schumard Oak
27.	*Sorbus alnifolia*	Korean Mountain Ash
28.	**Styphnolobium japonicum* (syn. *Sophora japonica*)	'Princeton Upright' and 'Regent' Japanese Scholar Tree
29.	**Taxodium distichum*	'Shawnee Brave' Bald cypress
30.	*Thuja occidentalis*	Arborvitae
31.	*Tilia americana*	'Redmond' Basswood
32.	*Tilia cordata*	'Chancellor', 'Glenleven', 'Greenspire', and 'Rancho'
33.	*Tilia x euchlora*	'Laurelhurst' Crimean Linden
34.	*Tilia tomentosa*	'Sterling Silver', 'Green Mountain' Silver Linden
35.	*Ulmus x spp*.	'New Harmony', 'Valley Forge', 'Frontier', 'Homestead', 'Pioneer', 'Accolade' Elm
36.	*Ulmus parvifolia*	Chinese Elm
37.	*Zelkova serrata*	'Green Vase', 'Halka', 'Village Green' Japanese Zelkova

Botanical Name		**Common Name/Cultivar**
Shrubs		
1.	*Aesculus parviflora*	Bottlebrush Buckeye
2.	*Amelanchier canadensis*	Shadblow Serviceberry
3.	**Berberis koreana*	Korean Barberry
4.	**Berberis thunbergii*	Japanese Barberry
5.	*Chionanthus virginicus*	Fringetree
6.	*Clethra alnifolia*	Summersweet Clethra
7.	*Cornus alba*	Tatarian Dogwood
8.	*Cornus kousa*	Japanese Dogwood
9.	*Cornus mas*	Cornelian Dogwood

Appendix H: Campus Vegetation Selections

10.	*Corylus avellana*	European Filbert
11.	*Cotinus coggygria*	Smokebush
12.	*Diervilla sessilifolia*	Southern Bush Honeysuckle
13.	*Euonymus alatus*	Burning Bush
14.	*Forsythia x intermedia*	Border Forsythia
15.	*Fothergilla gardenii*	Dwarf Fothergilla
16.	*Hamamelis mollis*	Chinese Witch-hazel
17.	*Hamamelis virginiana*	Common Witch-hazel
18.	*Hibiscus syriacus*	Rose-of-Sharon
19.	*Hydrangea paniculata*	Panicle Hydrangea
20.	*Ilex glabra*	Inkberry
21.	*Ilex verticillata*	Winterberry
22.	*Juniperus chinensis cultivars*	Chinese Juniper
23.	*Juniperus horizontalis cultivars*	Creeping Juniper
24.	*Juniperus sabina cultivars*	Prostrate Juniper
25.	*Kolkwitzia amabilis*	Beautybush
26.	*Magnolia x soulangiana*	Saucer Magnolia
27.	*Magnolia x stellata*	Star Magnolia
28.	*Morella pensylvanica* (syn. *Myrica pensylvanica*)	Bayberry
29.	*Potentilla fruticosa*	Shrubby Cinquefoil
30.	*Prunus tomentosa*	Nanking or Manchu Cherry
31.	*Rhus aromatica 'Gro-low'*	'Gro-low' Aromatic Sumac
32.	*Rosa rugosa*	Rugosa Rose
33.	*Spiraea x bumalda*	Bumald Spiraea 'Limemound', 'Anthony Waterer'
34.	*Spiraea japonica*	Japanese Spiraea
35.	*Stephanandra incisa*	Cutleaf Stephanandra
36.	*Syringa patula 'Miss Kim'*	Miss Kim Lilac
37.	*Syringa microphylla*	Littleleaf Lilac
38.	*Syringa vulgaris*	Common Lilac
39.	*Taxus baccata 'Repandans'*	English Yew
40.	*Taxus x. media*	'Densiformis Imp' (low growing) Dense Yew
41.	*Viburnum x burkwoodii*	Burkwood Viburnum
42.	*Viburnum plicatum*	Doublefile Viburnum
43.	*Virburnum sieboldii*	Siebold Viburnum

Appendix H: Campus Vegetation Selections

	Botanical Name	Common Name/Cultivar
Groundcovers		
1.	*Diervilla sessilifolia*	Southern Bush Honeysuckle
2.	*Euonymus fortunei 'Coloratus'*	Purpleleaf Wintercreeper
3.	*Hedera helix*	English Ivy
4.	*Pachysandra terminalis*	Japanese Pachysandra
5.	*Rhus aromatic 'Gro-Low'*	'Gro-Low' Aromatic Sumac
6.	*Vinca minor*	Common Periwinkle

Note: Shrubs and groundcovers have limited tolerance to deer browse.

Bassuk, Nina,. Trowbridge, Peter,. Grohs, Carol

VISUAL SIMILARITY AND BIOLOGICAL DIVERSITY: STREET TREE SELECTION AND DESIGN

Introduction

The selection and placement of trees in the urban environment is a complex task requiring the consideration of many factors. Issues such as visual spatial constraints and disease and insect resistance can sometimes conflict with other design objectives. Perhaps the most troubling conflict arises between the preference for visual uniformity and the practical need for species diversity. Until recently a typical street tree planting internationally consisted of uniform rows of a single species, generally selected for its attractive appearance and high tolerance to urban stresses. However, as over planting has brought about the decline of a number of such favorite species it is clear that design objectives must be balanced against the practical need for species diversity in street tree plantings.

Current Strategies

Faced with the difficulty of balancing aesthetic and ecological concerns, current designers all too often shortchange or even abandon one or the other objective. Where they may have once planted an entire neighborhood with the same species, those favoring uniformity over practicality might now plant a single species for one or two blocks of a given street. Although this sort of compromise may feel like a bow to diversity, it isn't a true solution to the problem. Planting trees in somewhat smaller 'same species' blocks will not necessarily prevent the kinds of devastation associated with monocultures on a block by block basis, particularly if the species selected are already heavily planted in the community.

For those favoring an ecologically sensible approach, the alternative to monocultures is sometimes to plant wonderfully diverse selections of trees that share no common characteristics whatsoever. The results of such efforts can be aesthetically disappointing, and have in a number of cases led to public outcry. Unfortunately, this type of plant selection has served to fuel the idea that the only way to achieve uniformity in design is through the exclusive use of one species.

The Case for Visual Uniformity

What makes uniform plantings so appealing in the first place? What makes them so difficult to give up? The advantages to uniformity are primarily aesthetic and have a long-standing tradition over many centuries internationally. A street lined with rows of more or less identical trees brings to most observers a sense of order and tranquillity. Even in the most heterogeneous of neighborhoods, a uniform allee of trees can have a cohesive influence, tying together diverse elements and creating a sense of neighborhood identity. At a more political level, what could be more democratic than a uniform planting of trees that does nothing to reflect differences in the people, lawns, and homes just beyond the sidewalk? Street trees can also soften the potentially jarring transitions from residential to commercial areas.

The Case for Species Diversity

Unfortunately, the appeal of same species plantings is ultimately outweighed by disadvantages. Even if aesthetics were the only consideration, the fact that unhealthy or dead trees are unattractive makes the need to diversify unavoidable. A quick review of disease and pest problems in street tree populations reveals numerous cases of devastation due to over planting or the exclusive planting of a single species throughout a community. Some of the most notable examples include the American elm (Dutch elm disease), American chestnut (chestnut blight), Honey locust (honey locust plant bug), Norway maple (giant tar spot and verticillium wilt) London planetree (anthracnose) and crabapple (scab, fireblight, cedar apple rust, and powdery mildew). Over planting of some popular species can also lead to serious maintenance problems. Species with characteristics such as weak wood, a tendency to develop chlorosis, girdling roots, and messy fruits can certainly be used in street tree plantings, but are only manageable when planted in moderation. Examples include Norway maple (girdling roots) and Silver maple (weak wood).

Another factor that makes monocultures impractical is the tremendous diversity inherent in the urban environment. The challenges and stresses for trees can change dramatically within very small spaces,

often making it impossible for a single species to thrive uniformly throughout a given area. Variables such as light, temperature, drainage, soil compaction, root space, soil pH, availability of water, exposure to salt, and restrictions to crown development can vary tremendously even from one tree space to the next. A careful assessment of site conditions prior to plant selection rarely points to the selection of a single species. Even those who are aware of this fact often make the mistake of selecting one species that will purportedly survive under any and all difficult conditions. Such widely adaptable species dominate the aforementioned list of overplanted trees that have suffered decline, become unmanageable, or both.

A Solution

To avoid similar problems in the future, it is clear that uniform plantings of a limited number of species must be avoided. But, is it possible to gain the practical advantages of diversity without giving up the aesthetic advantages of uniformity? Fortunately, the answer is yes. Through careful selection and grouping of plants, communities of trees can be created which, despite their genetic diversity can satisfy our desire for visual uniformity.

By breaking down the visual characteristics that distinguish one species or cultivar from another into basic categories, we have selected a set of four criteria for putting trees into aesthetically compatible groups. The first two criteria, size and shape, are of primary importance in grouping trees because they have greater and more immediate impact on the visual impression an individual tree makes. This is particularly true as a tree matures or as the distance from the tree to the observer increases. The other two criteria, branching density and foliage texture, are given secondary consideration because they generally are not as obvious to the casual observer and can even become difficult to distinguish as the distance from the observer increases.

Primary Criteria

1	Size	Large	Greater than 30' at 30 years (5 – 6 M)
		Small	Less than 30 feet at 30 years (5 – 6 M)
			Height to first branch
2	Shape	Round	Width > or = height of canopy
		Oval	Width < height
		Vase	Narrow at the base, becoming distinctly wider at the top
		Columnar	Width distinctly < height

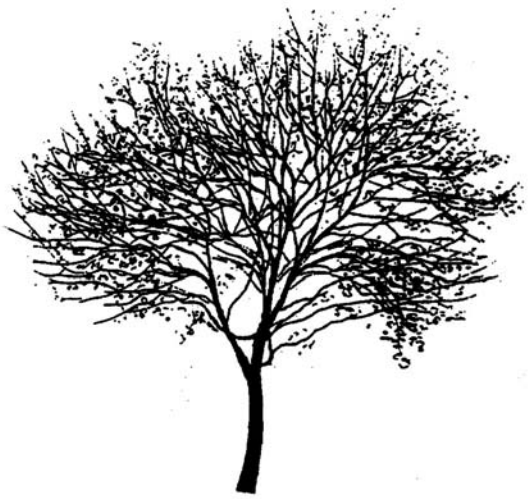
Secondary Criteria

3	Branching Density	Dense	Greater than 50% opaque
		Open	Less than 50% opaque
4	Foliage Texture	Coarse	Large leaves (or leaflets) with blunt ends or lobes
		Fine	Smaller leaves (or leaflets) with acute apexes
			Foliage color

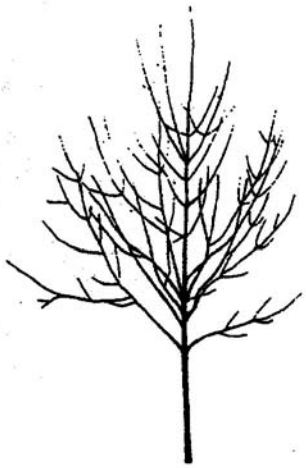
Clearly, these categories are broad, but when applied with a measure of subjective analysis and common sense, they yield some very practical and appealing groups of trees. Trees with medium or borderline characteristics have been placed subjectively on the basis of their subtle characteristics. For example, trees of the genus *Fraxinus* have medium-textured foliage but because of the narrow apexes of their leaflets have been placed in fine-textured groups. In some cases the basic groups are presented with subgroups that work particularly well together. And in other cases, a special characteristic shared by a number of trees called for the creation of an additional recommended group. The following plant lists are for temperate areas and have been designated for hardiness using U.S.D.A. zones.

Appendix I: Visual Similarity & Biological Diversity: Street Tree Selection and Design

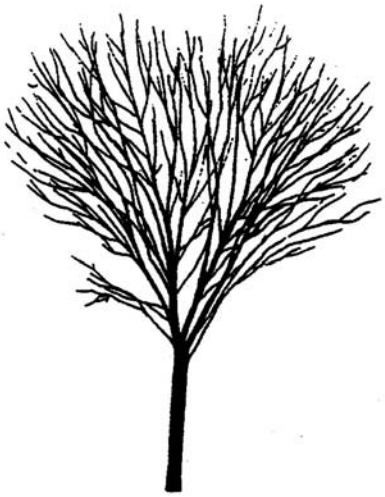
Examples of Canopy Shapes



Round



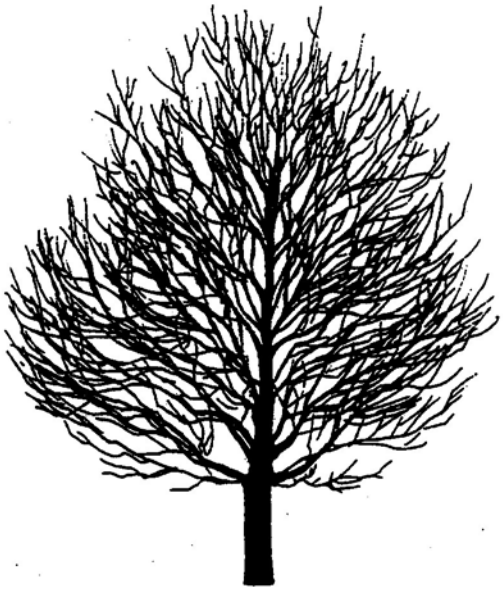
Oval



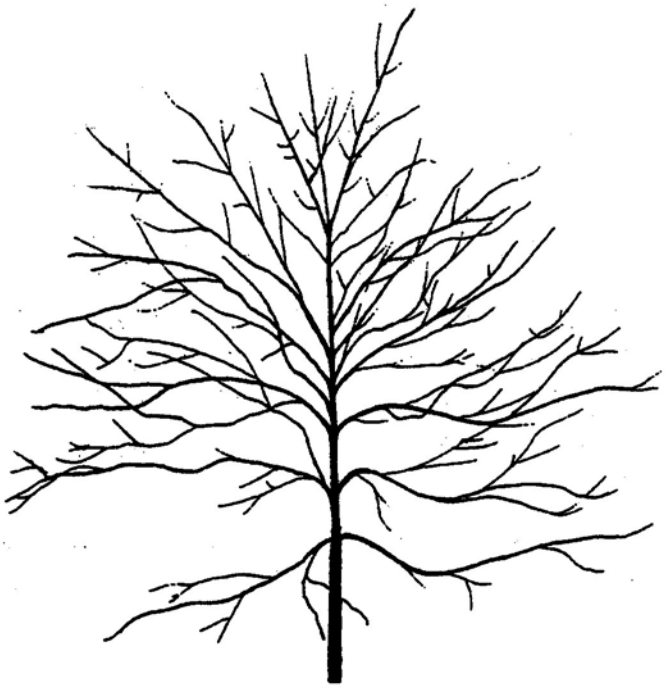
Vase

Columnar

Examples of Branching Density



Dense



Open

Appendix I: Visual Similarity & Biological Diversity: Street Tree Selection and Design

RECOMMEDED GROUPS OF VISUALLY COMPATIBLE TREES

In addition to cold hardiness zones, all trees have been designated using the following site characteristics typically found in urban areas which include the following:

W = tolerates poorly drained soil	A= requires acidic soil - pH < 7.0
MWD = requires moist, well drained soil	N = tolerates neutral soil - pH < 7.4
MD = tolerates moderate drought	AL = tolerates alkaline soil - pH < 8.2
SD = tolerates severe drought	

The following lists include the primary and secondary characteristics previously discussed for size, shape, and foliar texture:

Large Trees with Round Canopies, Dense Branching, and Coarse-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Acer platanoides 'Emerald Queen'	Emerald Queen Norway Maple	4a	MD	AL
Acer platanoides 'Summershade'	Summershade Norway Maple	4a	MD	AL
Acer platanoides 'Superform'	Superform Norway Maple	4a	MD	AL
Acer rubrum 'Autumn Flame'	Autumn Flame Red Maple	3b	W	A
Acer rubrum 'Northwood'	Northwood Red Maple	3b	W	A
Acer rubrum 'October Glory'	October Glory Red Maple	3b	W	A
Platanus x acerifolia ' Bloodgood'	Bloodgood London Planetree	5b	W/MD	AL
Platanus x acerifolia 'Columbia'	Columbia London Planetree	5b	W/MD	AL
Platanus x acerifolia 'Liberty'	Liberty London Planetree	5b	W/MD	AL

Large Trees with Round Canopies, Open Branching, and Fine Textured Foliage

Group 1		Cold Hardy to Zone	Moisture	pH
Celtis laevigata 'All Seasons'	All Season Sugar Hackberry	5b	MD	AL
Celtis laevigata 'Magnifica'	Magnifica Sugar Hackberry	5b	MD	AL
Celtis occidentalis 'Prairie Pride'	Prairie Pride Hackberry	3b	SD	AL
Eucommia ulmoides	Hardy Rubber Tree	5b	SD	AL
Maclura pomifera 'Park'	Park Osage Orange	5b	W/SD	AL
Maclura pomifera 'Wichita'	Wichita Osage Orange	5b	W/SD	AL
Pyrus calleryana 'Faurei'	Faurei Callery Pear	5a	W/SD	AL
Group 2				
Cladrastis kentukea	Yellowood	4b	MD	AL
Fraxinus americana 'Autumn Purple'	Autumn Purple White Ash	4a	W/MD	AL
Fraxinus pennsylvanica 'Emerald"	Emerald Green Ash	3a	W/MD	AL
Gymnocladus dioicus	Kentucky Coffee Tree	4a	SD	AL
Phellodendron amurensis	Amur Cork Tree	4b	MWD	AL
Phellodendron amurensis 'Macho'	Macho Amur Corktree	4b	MWD	AL
Group 3				
Gleditsia triacanthos var. inermis	Thornless Honey Locust	4b	MD	AL
Gleditsia triacanthos var. inermis 'Halka'	Halka Honey Locust	4b	MD	AL
Gleditsia triacanthos var. inermis 'Moraine'	Moraine Honey Locust	4b	MD	AL
Gleditsia triacanthos var. inermis 'Shademaster'	Shademaster Honey Locust	4b	MD	AL
Sophora japonica 'Princeton Upright'	Princeton Upricht Scholar Tree	5b	SD	AL

The trees in this group may be used in any combination but have been presented in three subgroups which work particularly well together. The first, second and third groups contain trees with simple, compound, and very fine compound leaves respectively.

Large Trees with Round Canopies, Open Branching, and Coarse-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Quercus macrocarpa	Bur Oak	3a	W/SD	AL
Quercus muehlenbergii	Chinkapin Oak	5a	MD	AL
Quercus ruba	Red Oak	3b	MD	N
Quercus robur	English Oak	5b	MD	AL

Large Trees with Oval Canopies, Dense Branching, and Fine-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
*Metasequoia glyptostroboides	Dawn Redwood	5b	MWD	N
*Taxodium distichum	Bald Cypress	5a	W	N
*Taxodium distichum 'Shawnee Brave'	Shawnee Brave Bald Cyrpess	5a	W	N
Cercidiphyllum japonicum	Katsura Tree	5a	MWD	AL
Corylus colurna	Turkish Filbert	5a	SD	AL
Fraxinus pennsylvanica 'Bergeson'	Bergeson Green Ash	2a	W/MD/SD	AL
Fraxinus pennsylvanica 'Cimmaron'	Cimmaron Green Ash	2a	W/MD/SD	AL
Fraxinus pennsylvanica 'Newport'	Newport Green Ash	2a	W/MD/SD	AL
Fraxinus pennsylvanica 'Patmore'	Patmore Green Ash	2a	W/MD/SD	AL
Fraxinus pennsylvanica 'Summit'	Summit Green Ash	2a	W/MD/SD	AL
Fraxinus pennsylvanica 'Urbanite'	Urbanite Green Ash	5b	W/MD/SD	AL
Nyssa sylvatica	Tupelo	5a	W	N
Ostrya virginiana	American Hophornbeam	3b	MD	AL
Pyrus calleryana 'Autumn Blaze'	Autumn Blaze Gallery Pear	5a	W/SD	AL
Pyrus calleryana 'Whitehouse'	Whitehouse gallery Pear	5a	W/SD	AL
Sorbus alnifolia	Korean Mountain Ash	4b	MWD	AL
Tilia cordata 'Chancellor'	Chancellor Littleleaf Linden	3b	MD	AL
Tilia cordata 'Glenleven'	Glenleven Littleleaf Linden	3b	MD	AL
Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	3b	MD	AL
Tilia cordata 'Olympic'	Olympic Littleleaf Linden	3b	MD	AL
Tilia cordata 'Rancho'	Rancho Littleleaf Linden	3b	MD	AL
Tilia x euchlora	Crimean Linden	4b	MD	AL

*conifers which constitute a subgroup in this category

Large Trees with Oval Canopies, Dense Branching, and Coarse-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Acer x freemanii 'Autumn Blaze'	Autumn Blaze Maple	4	W/MD	N
Acer x freemanii 'Autumn Fantasy'	Autumn Fantasy Maple	4	W/MD	N
Acer x freemanii 'Celebration'	Celebration Maple	4	W/MD	N
Acer x freemanii 'Marmo'	Marmo Maple	4	W/MD	N
Acer x freemanii 'Morgan'	Morgan Maple	4	W/MD	N
Acer x freemanii ‘Scarlet Setenal;'	Scarlet Sentinal Maple	4	W/MD	N
Acer pseudoplatanus 'Spaethii'	Spaethii Sycamore Maple	5b	MD	AL
Acer platanoides 'Cleveland'	Cleveland Norway Maple	4a	MD	AL
Acer platanoides 'Parkway'	Parkway Norway Maple	4a	MD	AL
Acer rubrum 'Red Sunset'	Red Sunset Maple	3b	W	N
Acer saccharum 'Caddo	Caddo Sugar Maple	3b	MWD	N
Acer saccharum 'Commemoration'	Commemoration Sugar Maple	3b	MWD	N

Large Trees with Oval Canopies, Dense Branching, and Coarse-Textured Foliage (cont.)

		Cold Hardy to Zone	Moisture	pH
Acer saccharum 'Green Mountain'	Green Mountain Sugar Maple	3b	MWD	N
Acer saccharum 'Legacy'	Legacy Sugar Maple	3b	MWD	N
Acer saccharum 'Majesty'	Majesty Sugar Maple	3b	MWD	N
Tilia americana 'Redmond'	Redmond Basswood	3a	MD	AL
Tilia tomentosa	Silver Linden	5a	MD	AL

Large Trees with Oval Canopies, Open Branching, and Fine-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Alnus glutinosa	Black Alder	4a	W	N
Alnus glutinosa 'Pyramidalis'	Pyramidal Black Alder	4a	W	N
Alnus glutinosa 'Fastigiata'	Upright Black Alder	4a	W	N
Betula nigra 'Heritage'	Heritage River Birch	4a	W	A
Betula platyphylla 'Japonica'	Asian White Birch	2b	MWD	A
Betula platphylla 'Whitespire'	Whitespire Birch	2b	MWD	A
Faxinus americana 'Autumn Applause'	Autumn Applause White Ash	4a	W/MD	AL
Fraxinus americana 'Champaign County'	Champaign Country White Ash	4a	W/MD	AL
Fraxinus americana 'Rose Hill'	Rose Hill White Ash	4a	W/MD	AL
Fraxinus americana 'Skyline'	Skyline White Ash	4a	W/MD	AL
Fraxinus excelsior 'Hessei'	Hess European Ash	4a	MD/SD	AL
Ginkgo biloba 'Autumn Gold'	Autumn Gold Ginkgo	4b	SD	AL
Gleditsia triacanthos inermis 'Skyline'	Skyline Honey Locust	4b	MD	AL
Pyrus calleryana 'Aristocrat'	Aristocrat Callery Pear	5a	W/SD	AL
Quercus imbricaria	Shingle Oak	5a	MD	N
Quercus phellos	Willow Oak	6b	W	A
Robinia pseudoacacia	Black Locust	4b	W/MD	AL
Ulmus carpinifolia x parvifolia 'Frontier'	Frontier Elm	5b	W	AL
Ulmus 'Homestead	Homestead Elm	5a	W	AL
Ulmus 'Pioneer	Pioneer Elm	5a	W	AL
Ulmus 'Urban'	Urban Elm	5a	W	AL

Large Trees with Oval Canopies, Open Branching, and Coarse Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Aesculus x carnea 'Briotti'	Briotti Red Horsechestnut	5a	MWD	AL
Aesculus x camea 'O'Neill'	O'N'eill Red Horsechestnut	5a	MWD	AL
Catalpa speciosa	Catalpa	4a	W	AL
Liquidambar styraciflua	Sweetgum	5b	MWD	N
Liquidambar styraciflua 'Moraine'	Moraine Sweetgum	5b	MWD	N
Liriodendron tulipifera	Tuliptree	5a	MWD	N
Quercus accutissima	Sawtooth Oak	5b	MD	N
Quercus bicolor	Swamp White Oak	4a	W	A
Quercus coccinea	Scarlet Oak	5a	MD	N
Quercus palustris 'Sovereign'	Sovereign Pin Oak T	5a	W/MD	A
Quercus palustris 'Crownright'	Crownright Pin Oak	5a	W	A
Quercus schumardii	Schumard Oak	5b	MD	N

Appendix I: Visual Similarity & Biological Diversity: Street Tree Selection and Design

Large Trees with Vase-Shaped Canopies and Fine-Textured Foliage

		Cold Hardy to Zone	Moisture	pH
Prunus sargentii 'Columnaris'	Upright Sargent Cherry	5a	MD	N
Ulmus americana 'Delaware #2'	Delaware American Elm	2b	W/MD	AL
Ulmus americana 'New Harmony'	New Harmony Elm	5	SD	AL
Ulmus americana 'Princeton'	Princeton American Elm	2b	W/MD	AL
Ulmus americana 'Valley Forge'	Valley Forge Elm	5	SD	AL
Ulmus americana 'Washington'	Washington American Elm	2b	W/MD	AL
Ulmus parvifolia 'Dynasty'	Dynasty Chinese Elm	5b	W/SD	AL
Ulmus parvifolia 'Ohio'	Ohio Chinese Elm	5	W/SD	AL
Ulmus parvifolia 'Prospector'	Prospector Chinese Elm	4	W/SD	AL
Ulmus parvifolia 'Pathfinder'	Pathfinder Elm	5a	SD	AL
Ulmus x 'Patriot'	Patriot Elm	4	SD	AL
Ulmus x 'Sapporo Autumn Gold'	Sapporo Autumn Gold Hybrid Elm	5a	W/MD	AL
Zelkova serrata 'Green Vase'	Green Vase Zelkova	5b	SD	AL
Zelkova serrata 'Halka'	Halka Zelkova	5b	SD	AL
Zelkova serrata 'Village Green'	Village Green Zelkova	5b	SD	AL

Large Trees with Columnar Canopies

		Cold Hardy to Zone	Moisture	pH
Acer x freemanii 'Armstorng'	Armstrong Hybrid Maple	4	W/MD	N
Acer nigrum 'Green Column'	Green Column Black Maple	5	SD	N
Acer platanoides 'Columnare'	Columnar Norway Maple	4a	MD	AL
Acer rubrum 'Bowhall'	Bowhall Red Maple	3b	W	A
Acer rubrum 'Columnar'	Columnar Red Maple	3b	W	A
Acer rubrum 'Karpick'	Karpick Red Maple	3b	W	A
Carpinus betulus 'Fastigiata'	Upright European Hornbeam	5a	MD	AL
Ginkgo biloba 'Lakeview'	Lakeview Ginkgo	4b	SD	AL
Ginkgo biloba 'Princeton Sentry'	Princeton Sentry Gingko	4b	SD	AL
Pyrus calleryana 'Capital'	Capital Gallery pear	5a	W	AL
Pyrus calleryana 'Chanticleer'	Chanticleer Gallery Pear	5a	W	AL
Quercus robur 'Attention'	Attention English Oak	5a	MD	AL
Quercus robur 'Fastigiata'	Upright English Oak	5a	MD	AL

Small Trees with Round Canopies

		Cold Hardy to Zone	Moisture	pH
Acer buergeranum	Trident Maple	6a	MD	A
Acer campestre	Hedge Maple	5a	SD	AL
Acer ginnala	Amur Maple	3a	MD	N
Acer tataricum	Tatarian Maple	3a	MD	A
Acer truncatum	Shantung Maple	4a	MD	AL
Carpinus caroliniana	American Hornbeam	3b	MD	AL
Cornua mas	Cornelian Cherry	5a	MD	AL
Crataegus phaenopyrum	Washington Hawthorn	4b	SD	AL
Crataegus punctata inermis 'Ohio Pioneer'	Thornless Ohio Pioneer Hawthorn	4a	SD	AL
Crataegus viridus 'Winter King'	Winter King Hawthorn	5a	SD	AL

Small Trees with Round Canopies (cont.)

		Cold Hardy to Zone	Moisture	pH
Koelreuteria paniculata	Goldenraintree	5b	SD	AL
Malus baccata 'Jackii'	Jackii Crabapple	3a	SD	AL
Malus 'Donald Wyman'	Donald Wyman Crabapple	4	SD	AL
Malus floribunda	Flowering Crabapple	4b	SD	Al
Malus 'Henry Kohankie'	Henry Kohankie Crabapple	4	SD	AL
Malus 'Professor Sprenger'	Professor Sprenger Crabapple	4	SD	AL
Malus 'Sugartyme'	Sugartyme Crabapple	4	SD	AL
Malus 'White Angel'	White Angel Crabapple	4a	SD	AL
Malus x zumi 'Calocarpa'	Calocarpa Crabapple	4a	SD	AL
Sorbus intermedia	Swedish Mountain Ash	5	SD	AL
Syringa reticulata 'Summer Snow'	Summer Snow Japanese Tree Lilac	3a	SD	AL

Small Trees with Oval Canopies and Dense Branching

		Cold Hardy to Zone	Moisture	pH
Acer platanoides x truncatum 'Norwegian Sunset'	Norwegian Sunset Maple	4a	MD	AL
Acer platanoides x truncatum 'Pacific Sunset'	Pacific Sunset Maple	4a	MD	AL
Acer campestre 'Deborah'	Deborah Hedge Maple	5a	SD	AL
Amelanchier 'Autumn Brilliance'	Autumn Brilliance Serviceberry	3b	MWD	N
Amelanchier 'Autumn Sunset'	Autumn Sunset Serviceberry	3b	MWD	N
Amelanchier 'Cumulus'	Cumulus Serviceberry	3b	MWD	N
Amelanchier 'Majestic'	Majestic Serviceberry	3b	MWD	N
Amelanchier 'Princess Diana'	Princess Diana Serviceberry	3b	MWD	N
Amelanchier 'Robin Hill'	Robin Hill Serviceberry	3b	MWD	N
Amelanchier 'Tradition'	Tradition Serviceberry	3b	MWD	N
Cornus kousa	Chinese or Kousa Dogwood	5a	MWD	N
*Malus 'Adams'	Adams Crabapple	4a	MD	AL
*Malus 'Baskatong'	Baskatong Crabapple	4	SD	AL
Malus 'Centennial'	Centennial Crabapple	4	SD	AL
*Malus 'Centurion'	Centurion Crabapple	4	SD	AL
Malus 'Dolgo'	Dolgo Crabapple	3b	SD	Al
Malus 'Doubloons'	Doubloons Crabapple	4	SD	AL
Malus 'Harvest Gold'	Harvest Gold Crabapple	4	SD	AL
*Malus 'Indian Summer'	Indian Summer Crabapple	4a	SD	AL
*Malus 'Liset'	Liset Crabapple	4a	SD	AL
Malus 'Madonna'	Madonna Crabapple	4	SD	AL
Malus 'Ormiston Roy'	Ormiston Roy Crabapple	4a	SD	AL
*Malus 'Prairie Fire'	Prairie Fire Crabapple	4	SD	AL
*Malus 'Purple Prince	Purple Prince Crabapple	4	SD	AL
*Malus 'Robinson'	Robinson Crabapple	4	SD	AL
Malus 'Silver Moon'	Silver Moon Crabapple	4	SD	AL
Malus 'Zumirang'	Zumirang Crabapple	4	SD	AL
*Prunus virginiana'Canada Red'	Canada Red Choke Cherry	3a	MD	AL
Sorbus thuringiaca 'Fastigiata'	Upright Oakleaf Mountain Ash	3b	MD	AL
Syringa reticulata 'Ivory Silk'	Ivory Silk Japanese Tree Lilac	3a	SD	AL
Syringa reticulata 'Regent'	Regent Japanese Tree Lilac	3a	MD	Al

* may have a purplish or bronze tint to the foliage and are subsequently seen as a compatible subgroup in this category.

Appendix I: Visual Similarity & Biological Diversity: Street Tree Selection and Design

Small Trees with Vase-Shaped Canopies

		Cold Hardy to Zone	Moisture	pH
Malus 'Adirondack'	Adirondack Crabapple	4	MD	AL
Malus 'Sentinal'	Sentinel Crabapple	4	SD	AL
*Malus 'Strawberry Parfait'	Strawberry Parfait Crabapple	4	SD	AL
Prunus 'Accolade'	Accolade Flowering Cherry	5	MD	N

* may have a purplish or bronze tint to the foliage

ADDITIONAL RECOMMENDED GROUPS

In addition to the prior categories which included tree size shape and foliar textures, the following trees have similar foliage and should be considered for this characteristic alone. Also, additional unique characteristics for species groups are provided.

Trees with Oak-Shaped Leaves

		Cold Hardy to Zone	Moisture	pH
Quercus rubra	Red Oak	3b	MD	N
Quercus palustris 'Sovereign Pin Oak'	Sovereign Pin Oak	5a	W/MD	A
Quercus palustris 'Crownright'	Crownright Pin Oak	5a	W	A
Quercus schumardii	Schumard Oak	5b	MD	N
Quercus coccinea	Scarlet Oak	4	MD	N
Quercus velutina	Black Oak	3b	MD	N

Large Round Trees with Maple-Like Leaves

		Cold Hardy to Zone	Moisture	pH
Acer platanoides 'Emerald Queen"	Emerald Queen Norway Maple	4a	MD	AL
Acer platanoides 'Summershade'	Summershade Norway Maple	4a	MD	AL
Acer platanoides 'Superform'	Superform Norway Maple	4a	MD	AL
Acer rubrum 'Autumn Flame'	Autumn Flame Red Maple	3b	W	A
Acer rubrum 'Northwood'	Northwood Red Maple	3b	W	A
Acer rubrum 'October Glory'	October Glory Red Maple	3b	W	A
Platanus x acerifolia 'Bloodgood'	Bloodgood London Planetree	5b	MD	AL
Platanus x acerifolia 'Columbia'	Columbia London Planetree	5b	MD	AL
Platanus x acerifolia 'Liberty'	Liberty London Planetree	5b	MD	AL

Large Oval Trees with Maple-Like Leaves

		Cold Hardy to Zone	Moisture	pH
Acer x freemanii 'Autumn Blaze'	Autumn Blaze Maple	4	W/MD	N
Acer x freemanii 'Autumn Fantasy'	Autumn Fantasy Maple	4	W/MD	N
Acer x freemanii 'Celebration'	Celebration Maple	4	W/MD	N
Acer x freemanii 'Marmo'	Marmo Maple	4	W/MD	N
Acer x freemanii 'Morgan'	Morgan Maple	4	W/MD	N
Acer x freemanii 'Scarlet Sentinal'	Scarlet Sentinal Maple	4	W/MD	N
Acer pseudoplatanus 'Spaethii'	Spaethii Sycamore Maple	5b	MD	AL
Acer platanoides 'Cleveland'	Cleveland Norway Maple	5b	MD	AL
Acer platanoides 'Parkway'	Parkway Norway Maple	4a	MD	AL
Acer rubrum 'Red Sunset'	Red Sunset Maple	3b	W	N
Acer saccharum 'Caddo'	Caddo Sugar Maple	3b	MWD	N

Large Oval Trees with Maple-Like Leaves (cont.)

		Cold Hardy to Zone	Moisture	pH
Acer saccharum 'Commemoration'	Commemoration Sugar Maple	3b	MWD	N
Acer saccharum 'Green Mountain'	Green Mountain Sugar Maple	3b	MWD	N
Acer saccharum 'Legacy'	Legacy Sugar Maple	3b	MWD	N
Acer saccharum 'Majesty'	Majesty Sugar Maple	3b	MWD	N
Liquidambar styraciflua	Sweeetgum	5b	MWD	N
Liquidambar styraciflua 'Moraine'	Moraine Sweetgum	5b	MWD	N
Liriodendron tulipifera	Tuliptree	5a	MWD	N

Large Oval Trees with Heart-Shaped Leaves

		Cold Hardy to Zone	Moisture	pH
Cercidiphyllum japonicum	Katsura Tree	5a	MWD	AL
Corylus columa	Turkish Filbert	5a	SD	AL
Tilia cordata 'Chancellor'	Chancelor Littleleaf Linden	3b	MD	AL
Tilia cordata 'Glenleven'	Glenleven Littleleaf Linden	3b	MD	AL
Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	3b	MD	AL
Tilia cordata 'Olympic'	Olympic Littleleaf Linden	3b	MD	AL
Tilia cordata 'Rancho'	Rancho Littleleaf Linden	3b	MD	AL
Tilia x euchlora	Crimean Linden	4b	MD	AL

Small Trees with Lobed Leaves

		Cold Hardy to Zone	Moisture	pH
Acer buergeranum	Trident Maple	6a	MD	A
Acer campestre	Hedge Maple	5a	SD	AL
Acer ginnala	Amur Maple	3a	MD	N
Acer tataricum	Tatarian Maple	3a	MD	A
Acer truncatum	Shantung Maple	4a	MD	AL
Crataegus phaenopyrum	Washington Hawthorn	4b	SD	AL
Crataegus punctata inermis 'Ohio Pioneer'	Thornless Ohio Pioneer Hawthorn	4a	SD	AL
Crataegus viridus 'Winter King'	Winter King Hawthorn	5a	SD	AL
Sorbus intermedia	Swedish Mountain Ash	5	SD	AL

Birch Trees

		Cold Hardy to Zone	Moisture	pH
Betula nigra 'Heritage'	Heritage River Birch	4a	W	A
Betula platyphylla 'Japonica'	Asian White Birch	2b	MWD	A
Betula platphylla ' Whitespire'	Whitespire Birch	2b	MWD	A

Large Round Trees for Severe Drought with Compound Leaves

		Cold Hardy to Zone	Moisture	pH
Gymnocladus dioicus	Kentucky Coffee Tree	4a	SD	AL
Sophora japonica 'Princeton Upright'	Princeton Upright Scholar Tree	5b	SD	AL
Robinia pseudoacacia	Black Locust	4b	SD	AL

Small Trees for Severe Drought

		Cold Hardy to Zone	Moisture	pH
Acer campestre	Hedge Maple	5a	SD	AL
Crataegus phaenopyrum	Washington Hawthorn	4b	SD	AL
Crataegus virdis 'Winter King'	Winter King Hawthorn	5a	SD	AL
Koelreuteria paniculata	Goldenraintree	5b	SD	AL
Malus (all the recommended cultivars)	Crabapple	3-4	SD	AL
Syringa reticulata 'Summer Snow'	Summer Snow Japanese Tree Lilac	3a	SD	AL
Syringa reticulata 'Ivory Silk'	Ivory Silk Japanese Tree Lilac	3a	SD	AL
Syringa reticulata ' Regent'	Regent Japanese Tree Lilac	3a	SD	AL

Large Round Trees for Cold Climates (Zone 3b or Lower)

		Cold Hardy to Zone	Moisture	pH
Celtis occidentatlis 'Prairie Pride'	Prairie Pride Hackberry	3b	SD	AL
Fraxinus pennsylvanica 'Emerald'	Emerald Green Ash	2a	MD	AL
Quercus macrocarpa	Bur Oak	3a	SD	AL
Quercus ruba	Red Oak	3b	MD	AL
Acer rubrum 'Autumn Flame'	Autumn Flame Red Maple	3b	W	A
Acer rubrum 'Northwood'	Northwood Red Maple	3b	W	A

SELECTING AND USING A GROUP

Before selecting a group of trees to work with, it is important that a thorough assessment of the planting site be made. Spatial constraints such as overhead wires, narrow building setbacks, or limited soil volume may reduce the size or shape options. Tolerance levels for cold temperatures, moisture, and pH have been assigned to each of the recommended trees, and only trees with tolerances matching the site should be used. Other factors which must be considered in selecting a group of trees include the desired visual effect and the practical function of the planting being considered. Is the objective simply visual appeal, or will the trees be expected to provide shade, break wind, or shield sights or sounds? What is the scale of surrounding buildings, gardens, or parks? Is a formal or informal appearance more appropriate? The table below provides some examples of how various factors may lead to the selection of a group appropriate to a given situation.

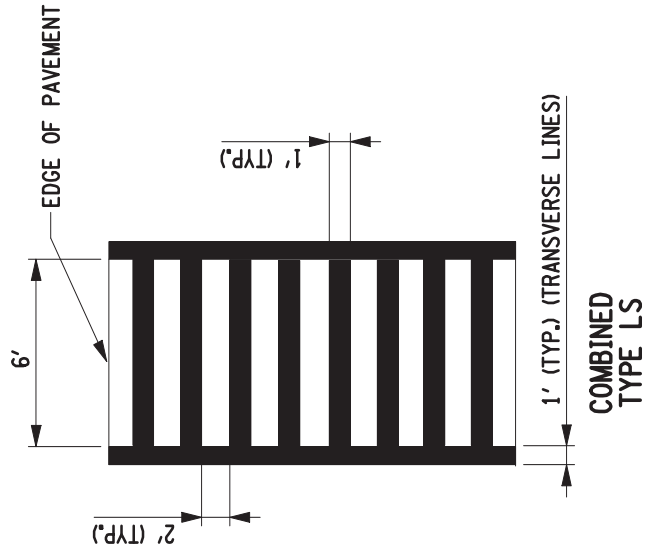
SELECTION FACTORS

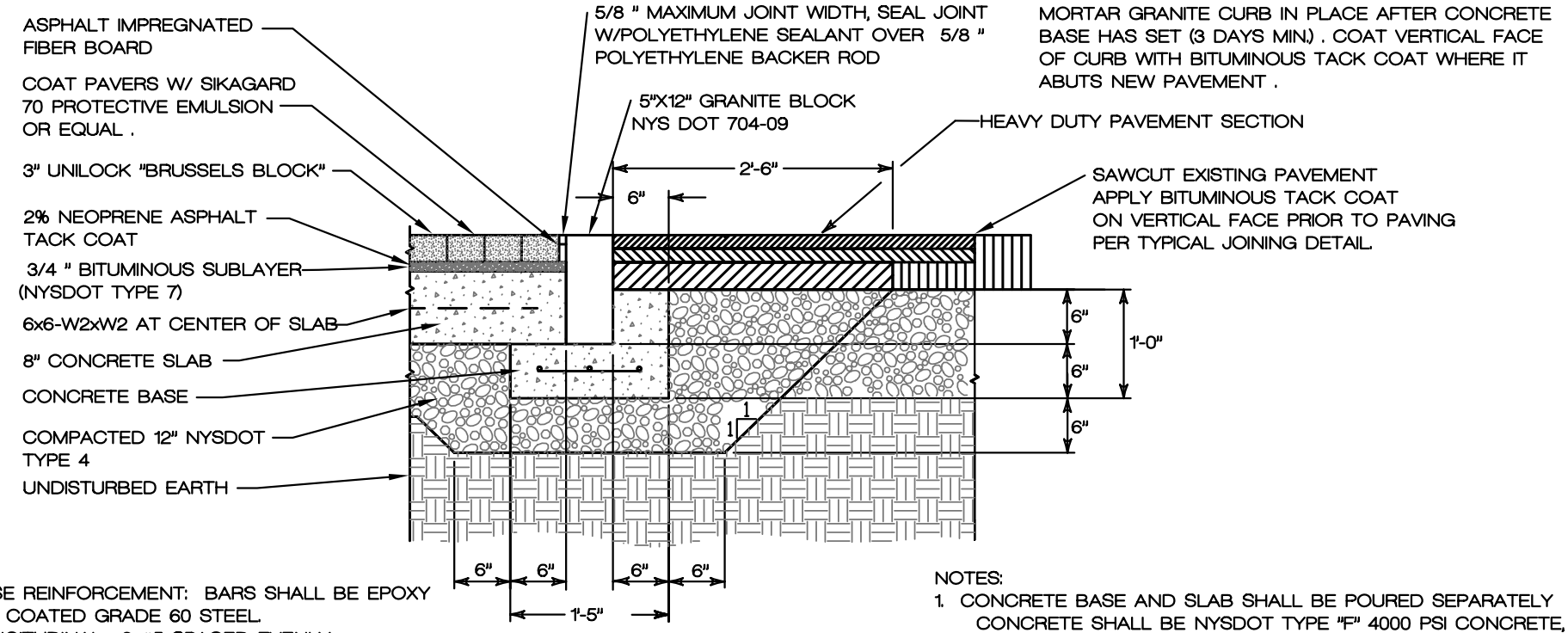
Factors to consider	Recommendations
Spatial constraints such as overhead wires, narrow setbacks, signage, or frequent truck traffic	may require **small trees** or narrower crown shapes such as oval or columnar
Limited soil volume	**small trees**
Screening of sight or sounds, wind break or heavy shade desired	**dense** branching possibly large trees where practicable
Trees growing with or near other plants such as turfgrass or flower beds	**open** less dense branching
Canopy effect desired	**vase-shaped** crowns (example)
Formal effect desired	**columnar** crowns (example)

Once a group of trees has been selected, it is best if at least three species or cultivars from that group be used in a given area. In making a selection, it is advisable to take into account the breakdown of species in the population around the site. Even if a wide variety of species is planted, new trees selected could be at risk if they are of a species which are already over planted in the area. Ideally, any one species should not make up more than 5 - 10% of the total tree population for a neighborhood or district. In general, the greater the number of genera used the lower the risk of serious pest or disease problems.

In the simplest situations, where site conditions and requirements are more or less consistent, trees from one group may be selected and used uniformly throughout an area. However, the groups can also be useful in more complex situations. By changing only one characteristic at a time, trees from different groups may be blended together as site conditions or the desired effect changes from one area to another. For example, if a cohesive planting is desired on a block where overhead wires limit the selection of trees on one side of the street, instead of simply planting all small trees with matching characteristics on both sides of the street, a designer could choose to plant small trees of a given shape, branching density and foliage texture on the side with overhead wires, and large trees with those same remaining characteristics on the other. Other site factors which might also call for such a blending technique include narrow setbacks, frequent truck traffic, and signage. Even within a given group, trees may need to be used selectively as factors such as pH and moisture change throughout the site.

The strategies for selecting and grouping street trees presented here provide the designer with many options for creating healthy and visually appealing street tree plantings. The recommendations made are based on careful consideration of both aesthetic and practical concerns, even when those concerns have been given more weight than aesthetic ones, it is only because, paradoxically, this practicality is ultimately the surest way to create a beautiful urban forest.





BASE REINFORCEMENT: BARS SHALL BE EPOXY COATED GRADE 60 STEEL.
LONGITUDINAL: 3 #5 SPACED EVENLY.
TRANSVERSE: #5 AT 6" O.C.
COVER: 3" MIN. ALL SIDES OF REBARS.

NOTES:
1. CONCRETE BASE AND SLAB SHALL BE POURED SEPARATELY CONCRETE SHALL BE NYSDOT TYPE "F" 4000 PSI CONCRETE, 6.5% AIR ENTRAINMENT.
2. WIDTH OF CROSSWALK SHALL BE AS SHOWN ON PLANS TO THE NEAREST FULL BRICK .

Techniseal® USA

iN Protector
for Pavers and Slabs

UPDATE

March 14, 2010

Make sure that you have an up-to-date technical data sheet in hand by consulting our Web site: techniseal.com

U.S.A. and Canada: dial 1 800 465-7325
Others: dial (514) 523-8324 (Canada)

APPLICATIONS

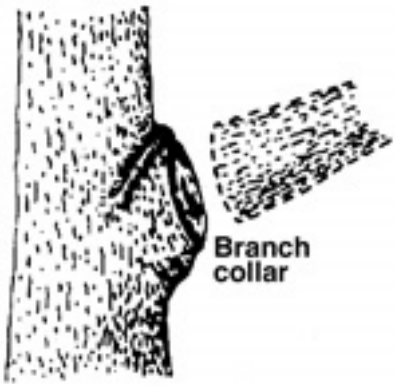
- Pavers, slabs and retaining walls made of concrete, poured concrete and natural stone
- Driveways, pool decks, patios, terraces, commercial parking lots, balconies, steps, sidewalks, pedestrian areas, etc.

PROPERTIES

- Two-coat application
- Can be applied immediately after paver installation and proper cleaning
- Penetrating. Will not make surfaces more slippery
- Also recommended for natural stones and retaining walls
- Non-film-forming
- Water-based

DESCRIPTION

Penetrating and invisible, TECHNISEAL® iN PROTECTOR FOR PAVERS AND SLABS is a microporous emulsion that is specially designed to protect porous materials such as pavers, slabs and walls made of concrete, poured concrete structures and natural stone. Its distinctive feature is its ability to protect without changing the appearance of the surface. As an oil repellent, it makes cleaning easier by preventing oil, grease (barbecue) and dirt from penetrating the material. As a water repellent, it prevents the appearance of mold and protects against water damage. Easy to apply, it provides maximum effectiveness and durability. Non-film-forming, it won't make surfaces more slippery and hence is ideal for protecting pool decks, balconies, steps, sidewalks, driveways, etc. It resists the elements (freeze-thaw cycles, sun, rain, etc.), as well as salt. Water-based, iN PROTECTOR does not give off unpleasant fumes. Containing very little solvent, it is environmentally friendly.



Pruning cuts should be made just outside the branch collar.

Cuts made along a branch should be made at a lateral branch or bud.

Bypass pruning shears

Never use hedge shears to prune your trees.

Pruning Young Trees

Proper pruning is essential in developing a tree with a strong structure and desirable form. Trees that receive the appropriate pruning measures while they are young will require little corrective pruning when they mature.

Keep these few simple principles in mind before pruning a tree:

* Each cut has the potential to change the growth of the tree. Always have a purpose in mind before making a cut.
* Proper technique is essential. Poor pruning can cause damage that lasts for the life of the tree. Learn where and how to make the cuts before picking up the pruning shears.
* Trees do not heal the way people do. When a tree is wounded, it must grow over and compartmentalize the wound. As a result, the wound is contained within the tree forever.
* Small cuts do less damage to the tree than large cuts. For that reason, proper pruning (training) of young trees is critical. Waiting to prune a tree until it is mature can create the need for large cuts that the tree cannot easily close.

Making The Cut

Where you make a pruning cut is critical to a tree's response in growth and wound closure. Make pruning cuts just outside the branch collar. Because the branch collar contains trunk or parent branch tissues, the tree will be damaged unnecessarily if you remove or damage it. In fact, if the cut is large, the tree may suffer permanent internal decay from an improper pruning cut.

If a permanent branch is to be shortened, cut it back to a lateral branch or bud. Internodal cuts, or cuts made between buds or branches, may lead to stem decay, sprout production, and misdirected growth.

Pruning Tools

When pruning trees, it is important to have the right tool for the job. For small trees, most of the cuts can be made with hand pruning shears (secateurs). The scissor-type, or bypass blade hand pruners, are preferred over the anvil type. They make cleaner, more accurate cuts. Cuts larger than one-half inch in diameter should be made with lopping shears or a pruning saw.

Never use hedge shears to prune a tree. Whatever tool you use, make sure it is kept clean and sharp.

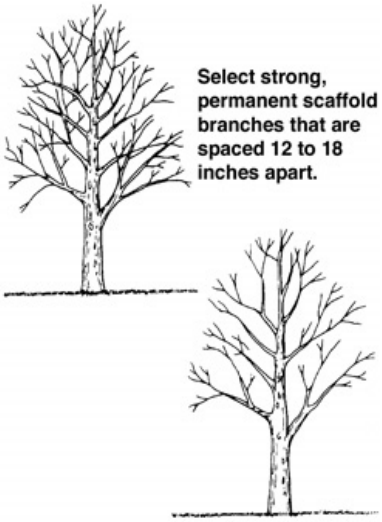
Establishing a Strong Scaffold Structure

A good structure of primary scaffold branches should be established while the tree is young. The scaffold branches provide the framework of the mature tree. Properly trained young trees will develop a strong structure that requires less corrective pruning as they mature.

Appendix L: Pruning Guidelines

The goal in training young trees is to establish a strong trunk with sturdy, well-spaced branches. The strength of the branch structure depends on the relative sizes of the branches, the branch angles, and the spacing of the limbs. Naturally, those factors vary with the growth habit of the tree. Pin oaks and sweetgums, for example, have a conical shape with a central leader. Elms and live oaks are often wide-spreading without a central leader. Other trees, such as lindens and Bradford pears, are densely branched. Good pruning techniques remove structurally weak branches while maintaining the natural form of the tree.

Trunk Development



Select strong, permanent scaffold branches that are spaced 12 to 18 inches apart.

For most young trees, maintain a single dominant leader growing upward. Do not prune back the tip of this leader. Do not allow secondary branches to outgrow the leader. Sometimes a tree will develop double leaders known as co-dominant stems. Co-dominant stems can lead to structural weaknesses, so it is best to remove one of the stems while the tree is young.

The lateral branches growing on the sides contribute to the development of a sturdy well-tapered trunk. It is important to leave some of these lateral branches in place, even though they may be pruned out later. These branches, known as temporary branches, also help protect the trunk from sun and mechanical injury. Temporary branches should be kept short enough not to be an obstruction or compete with selected permanent branches.

Permanent Branch Selection

When co-dominant stems develop, bark may become "included" in the crotch. It is best to prune one of the stems while the tree is young.

Nursery trees often have low branches that may make the tree appear well-proportioned when young, but low branches are seldom appropriate for large-growing trees in an urban environment. How a young tree is trained depends on its primary function in the landscape. For example, street trees must be pruned so that they allow at least 16 feet of clearance for traffic. Most landscape trees require only about 8 feet of clearance.

The height of the lowest permanent branch is determined by the tree's intended function and location in the landscape. Trees that are used to screen an unsightly view or provide a wind break may be allowed to branch low to the ground. Most large-growing trees in the landscape must eventually be pruned to allow head clearance.

The spacing of branches, both vertically and radially, in the tree is very important. Branches selected as permanent scaffold branches must be well-spaced along the trunk. Maintain radial balance with branches growing outward in each direction.

Branches should be well spaced radially and along the trunk as shown in the tree on the left.

A good rule of thumb for the vertical spacing of permanent branches is to maintain a distance equal to 3 percent of the tree's eventual height. Thus, a tree that will be 50 feet tall should have permanent scaffold branches spaced about 18 inches apart along the trunk. Avoid allowing two scaffold branches to arise one above the other on the same side of the tree.

Some trees have a tendency to develop branches with narrow angles of attachment and tight crotches. As the tree grows, bark can become enclosed deep within the crotch between the branch and the trunk. Such growth is called included bark. Included bark weakens the attachment of the branch to the trunk and can lead to branch failure when the tree matures. You should prune branches with weak attachments while they are young.

Avoid overthinning the interior of the tree. The leaves of each branch must manufacture enough food to keep that branch alive and growing. In addition, each branch must contribute food to grow and feed the trunk and roots. Removal of too many leaves can "starve" the tree, reduce growth, and make the tree unhealthy. A good rule of thumb is to maintain at least half the foliage on branches arising in the lower two-thirds of the tree.

Newly Planted Trees

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.

The belief that trees should be pruned when planted to compensate for root loss is misguided. Trees need their leaves and shoot tips to provide food and the substances that stimulate new root production. Unpruned trees establish faster with a stronger root system than trees pruned at the time of planting.

Wound Dressings

Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay.

However, research has shown that dressings do not reduce decay or speed closure and rarely prevent insect or disease infestations. Most experts recommend that wound dressing not be used. If a dressing must be used for cosmetic purposes, use a thin coating of a material that is not toxic to the plant.

This brochure is one in a series published by the International Society of Arboriculture as part of its Consumer Information Program. You may have additional interest in the following titles currently in the series:

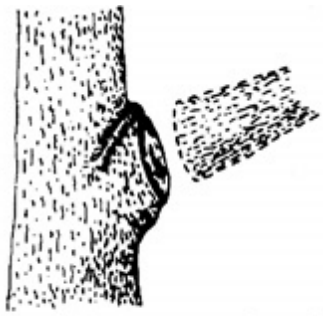
E-mail inquiries: isa@isa-arbor.com

UPDATED JULY 2005

Developed by the International Society of Arboriculture (ISA),
a non-profit organization supporting tree care research around the world and
dedicated to the care and preservation of shade and ornamental trees.
For further information, contact:
ISA, P.O. Box 3129, Champaign, IL 61826-3129, USA.
E-mail inquires: isa@isa-arbor.com

UPDATED SEPTEMBER 2005

Pruning Mature Trees



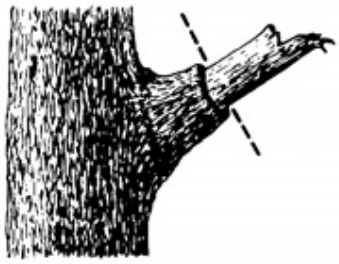
Pruning cuts should be made just outside the branch collar.

Pruning is the most common tree maintenance procedure. Although forest trees grow quite well with only nature's pruning, landscape trees require a higher level of care to maintain their safety and aesthetics. Pruning should be done with an understanding of how the tree responds to each cut. Improper pruning can cause damage that will last for the life of the tree, or worse, shorten the tree's life.

Reasons for Pruning

Because each cut has the potential to change the growth of the tree, no branch should be removed without a reason. Common reasons for pruning are to remove dead branches, to remove crowded or rubbing limbs, and to eliminate hazards. Trees may also be pruned to increase light and air penetration to the inside of the tree's crown or to the landscape below. In most cases, mature trees are pruned as a corrective or preventive measure.

Routine thinning does not necessarily improve the health of a tree. Trees produce a dense crown of leaves to manufacture the sugar used as energy for growth and development. Removal of foliage through pruning can reduce growth and stored energy reserves. Heavy pruning can be a significant health stress for the tree.



On a dead branch that has a collar of live wood, the final cut should be made just beyond the outer edge of the collar

Yet if people and trees are to coexist in an urban or suburban environment, then we sometimes have to modify the trees. City environments do not mimic natural forest conditions. Safety is a major concern. Also, we want trees to complement other landscape plantings and lawns. Proper pruning, with an understanding of tree biology, can maintain good tree health and structure while enhancing the aesthetic and economic values of our landscapes.

When to Prune

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.

A few tree diseases, such as oak wilt, can be spread when pruning wounds allow spores access into the tree. Susceptible trees should not be pruned during active transmission periods.

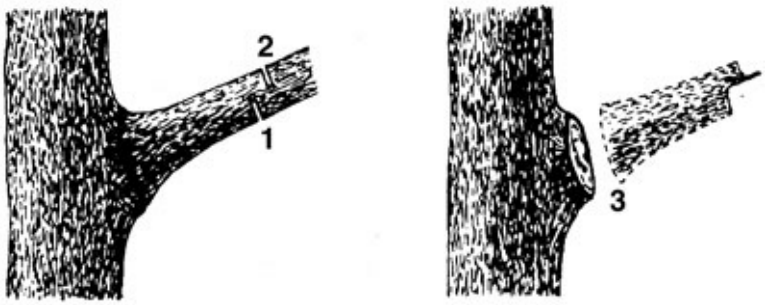
Heavy pruning just after the spring growth flush should be avoided. At that time, trees have just expended a great deal of energy to produce foliage and early shoot growth. Removal of a large percentage of foliage at that time can stress the tree.

Making Proper Pruning Cuts

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.

Appendix L: Pruning Guidelines

Before



Use the three-cut method to remove a large limb.

Crown Cleaning

If a large limb is to be removed, its weight should first be reduced. This is done by making an undercut about 12 to 18 inches from the limb's point of attachment. Make a second cut from the top, directly above or a few inches farther out on the limb. Doing so removes the limb, leaving the 12- to 18-inch stub. Remove the stub by cutting back to the branch collar. This technique reduces the possibility of tearing the bark.

Pruning Techniques

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

Crown Thinning

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

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.

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

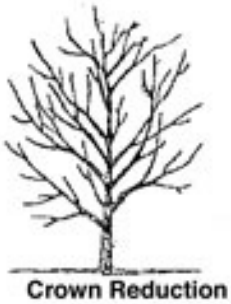
Reduction reduces the size of a tree, often for clear- ance for utility lines. Reducing the height or spread of a tree is best accomplished by pruning back the leaders and branch terminals to lateral branches that are large enough to assume the terminal roles (at least one-third the diameter of the cut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

Crown Raising

How Much Should Be Pruned?

The amount of live tissue that should be removed depends on the tree size, species, and age, as well as the pruning objectives. Younger trees tolerate the removal of a higher percentage of living tissue better than mature trees do. An important principle to remember is that a tree can recover from several small pruning wounds faster than from one large wound.

A common mistake is to remove too much inner foliage and small branches. It is important to maintain an even distribution of foliage along large limbs and in the lower portion of the crown. Overthinning reduces the tree's sugar production capacity and can create tip-heavy limbs that are prone to failure.



Crown Reduction

Mature trees should require little routine pruning. A widely accepted rule of thumb is never to remove more than one-quarter of a tree's leaf-bearing crown. In a mature tree, pruning even that much could have negative effects. Removing even a single, large-diameter limb can create a wound that the tree may not be able to close. The older and larger a tree becomes, the less energy it has in reserve to close wounds and defend

against decay or insect attack. The pruning of large mature trees is usually limited to removal of dead or potentially hazardous limbs.

Wound Dressings

Wound dressings were once thought to accelerate wound closure, protect against insects and diseases, and reduce decay. However, research has shown that dressings do not reduce decay or speed closure and rarely prevent insect or disease infestations. Most experts recommend that wound dressings not be used. If a dressing must be used for cosmetic purposes, then only a thin coating of a nontoxic material should be applied.

Hiring an Arborist

Pruning large trees can be dangerous. If pruning involves working above the ground or using power equipment, it is best to hire a professional arborist. An arborist can determine the type of pruning necessary to improve the health, appearance, and safety of your trees. A professional arborist can provide the services of a trained crew, with all of the required safety equipment and liability insurance.

There are a variety of things to look for when selecting an arborist:

* membership in professional organizations such as the International Society of Arboriculture (ISA), the Tree Care Industry Association (TCIA), or the American Society of Consulting Arborists (ASCA)
* certification through ISA's Certified Arborist program
* proof of insurance
* list of references (don't hesitate to check)

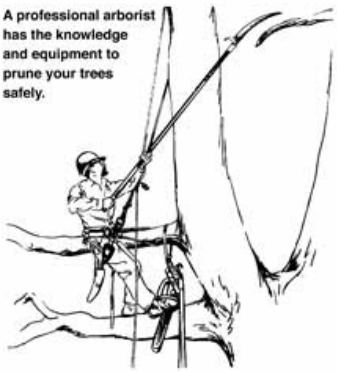
Avoid using the services of any tree company that

* advertises topping as a service provided; knowledgeable arborists know that topping is harmful to trees and is not an accepted practice
* uses tree climbing spikes to climb trees that are being pruned; climbing spikes can damage trees, and their use should be limited to trees that are being removed

This brochure is one in a series published by the International Society of Arboriculture as part of its Consumer Information Program. You may have additional interest in the following titles currently in the series:

E-mail inquiries: isa@isa-arbor.com

UPDATED JULY 2005



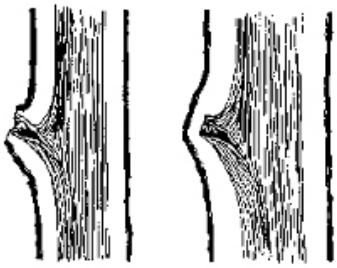
Developed by the International Society of Arboriculture (ISA),
a non-profit organization supporting tree care research around the world and dedicated to the care and preservation of shade and ornamental trees.
For further information, contact:
ISA, P.O. Box 3129, Champaign, IL 61826-3129, USA.
E-mail inquires: isa@isa-arbor.com

UPDATED SEPTEMBER 2005

International Society of Arboriculture

Topping is cutting branches back to stubs or lateral branches not large enough to sustain the remaining branch.

New shoots develop profusely below a topping cut.



The tree will close a well-positioned cut as new wood is produced. Normally it will compartmentalize any internal decay.

Leaving a stub maintains an open pathway to decay.

Why Topping Hurts Trees

Topping is perhaps the most harmful tree pruning practice known. Yet, despite more than 25 years of literature and seminars explaining its harmful effects, topping remains a common practice. This brochure explains why topping is not an acceptable pruning technique and offers better alternatives.

What is Topping?

Topping is the indiscriminate cutting of tree branches to stubs or lateral branches that are not large enough to assume the terminal role. Other names for topping include "heading," "tipping," "hat-racking," and "rounding over."

The most common reason given for topping is to reduce the size of a tree. Home owners often feel that their trees have become too large for their property. People fear that tall trees may pose a hazard. Topping, however, is not a viable method of height reduction and certainly does not reduce the hazard. In fact, topping will make a tree more hazardous in the long term.

Topping Stresses Trees

Topping often removes 50 to 100 percent of the leaf-bearing crown of a tree. Because leaves are the food factories of a tree, removing them can temporarily starve a tree. The severity of the pruning triggers a sort of survival mechanism. The tree activates latent buds, forcing the rapid growth of multiple shoots below each cut. The tree needs to put out a new crop of leaves as soon as possible. If a tree does not have the stored energy reserves to do so, it will be seriously weakened and may die.

A stressed tree is more vulnerable to insect and disease infestations. Large, open pruning wounds expose the sapwood and heartwood to attacks. The tree may lack sufficient energy to chemically defend the wounds against invasion, and some insects are actually attracted to the chemical signals trees release.

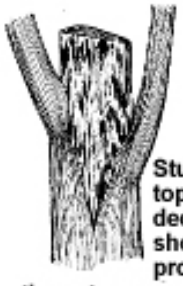
Topping Causes Decay

The preferred location to make a pruning cut is just beyond the branch collar at the branch's point of attachment. The tree is biologically equipped to close such a wound, provided the tree is healthy enough and the wound is not too large. Cuts made along a limb between lateral branches create stubs with wounds that the tree may not be able to close. The exposed wood tissues begin to decay. Normally, a tree will "wall off," or compartmentalize, the decaying tissues, but few trees can defend the multiple severe wounds caused by topping. The decay organisms are given a free path to move down through the branches.

Topping Can Lead to Sunburn

Branches within a tree's crown produce thousands of leaves to absorb sunlight. When the leaves are removed, the remaining branches and trunk are suddenly exposed to high levels of light and heat. The result may be sunburn of the tissues beneath the bark, which can lead to cankers, bark splitting, and death of some branches.

Appendix L: Pruning Guidelines



Stubs left from topping usually decay. The shoots that are produced below the cut are weakly attached, and often become a hazard.

Topping Creates Hazards

The survival mechanism that causes a tree to produce multiple shoots below each topping cut comes at great expense to the tree. These shoots develop from buds near the surface of the old branches. Unlike normal branches that develop in a socket of overlapping wood tissues, these new shoots are anchored only in the outermost layers of the parent branches.

The new shoots grow quickly, as much as 20 feet in one year, in some species. Unfortunately, the shoots are prone to breaking, especially during windy conditions. The irony is that while the goal was to reduce the tree's height to make it safer, it has been made more hazardous than before.

Topping Makes Trees Ugly

The natural branching structure of a tree is a biological wonder. Trees form a variety of shapes and growth habits, all with the same goal of presenting their leaves to the sun. Topping removes the ends of the branches, often leaving ugly stubs. Topping destroys the natural form of a tree.

Without leaves (up to 6 months of the year in temperate climates), a topped tree appears disfigured and mutilated. With leaves, it is a dense ball of foliage, lacking its simple grace. A tree that has been topped can never fully regain its natural form.

Trees that have been topped may become hazardous and are unsightly.

Topping Is Expensive

The cost of topping a tree is not limited to what the perpetrator is paid. If the tree survives, it will require pruning again within a few years. It will either need to be reduced again or storm damage will have to be cleaned up. If the tree dies, it will have to be removed.

Topping is a high-maintenance pruning practice, with some hidden costs. One is the reduction in property value. Healthy, well-maintained trees can add 10 to 20 percent to the value of a property. Disfigured, topped trees are considered an impending expense.

Another possible cost of topped trees is potential liability. Topped trees are prone to breaking and can be hazardous. Because topping is considered an unacceptable pruning practice, any damage caused by branch failure of a topped tree may lead to a finding of negligence in a court of law.

If the height of a tree must be reduced, all cuts should be made to strong laterals or to the parent limb. Do not cut limbs back to stubs.

Alternatives to Topping

Sometimes a tree must be reduced in height or spread. Providing clearance for utility lines is an example. There are recommended techniques for doing so. If practical, branches should be removed back to their point of origin. If a branch must be shortened, it should be cut back to a lateral that is large enough to assume the terminal role. A rule of thumb is to cut back to a lateral that is at least one-third the diameter of the limb being removed.

This method of branch reduction helps to preserve the natural form of the tree. However, if large cuts are involved, the tree may not be able to close over and compartmentalize the wounds. Sometimes the best solution is to remove the tree and replace it with a species that is more appropriate for the site.

Professional arborists can determine what type of pruning is necessary to improve the health, appearance and safety of your trees.

Hiring an Arborist

Pruning large trees can be dangerous. If pruning involves working above the ground or using power equipment, it is best to hire a professional arborist. An arborist can determine the type of pruning that is necessary to improve the health, appearance, and safety of your trees. A professional arborist can provide the services of a trained crew, with all of the required safety equipment and liability insurance.

When selecting an arborist,

* check for membership in professional organizations such as the International Society of Arboriculture (ISA), the Tree Care Industry Association (TCIA), or the American Society of Consulting Arborists (ASCA). Such membership demonstrates a willingness on the part of the arborist to stay up to date on the latest techniques and information.

* check for ISA arborist certification. Certified Arborists are experienced professionals who have passed an extensive examination covering all aspects of tree care.

* ask for proof of insurance.

* ask for a list of references, and don't hesitate to check them.

* avoid using the services of any tree company that

  o advertises topping as a service provided. Knowledgeable arborists know that topping is harmful to trees and is not an accepted practice.

  o uses tree climbing spikes to climb trees that are being pruned. Climbing spikes can damage trees, and their use should be limited to trees that are being removed.

This brochure is one in a series published by the International Society of Arboriculture as part of its Consumer Information Program. You may have additional interest in the following titles currently in the series:

E-mail inquiries: isa@isa-arbor.com

UPDATED JULY 2005

Developed by the International Society of Arboriculture (ISA), a non-profit organization supporting tree care research around the world and dedicated to the care and preservation of shade and ornamental trees.

For further information, contact:
ISA, P.O. Box 3129, Champaign, IL 61826-3129, USA.
E-mail inquires: isa@isa-arbor.com

UPDATED SEPTEMBER 2005

Training Young Community Trees

What does that mean?

- **Training means *pruning young trees for form* during the first few years of their existence.**
- Good nursery stock already has had quite a bit of training by the time it reaches the market. In fact, that is an important trait to look for when you buy.

Why is it done?

- Trees are trained
  - to direct growth
  - to correct structural weakness
  - to adapt the tree to its human environment
- In the long run, a trained tree will be stronger, healthier, safer--and cheaper to maintain.
- **Early training is better** because the extent of infection from wounding depends greatly upon 1) the size of the wound, and 2) the age of the tree. In general, the *smaller* the wound and the *younger* the tree, the less decay will result.

Amur maple after being trained for scaffold branches

How is it done?

- **Select a single *central leader* if the young tree does not have one, and prune out any competitors.** One central leader, or stem, is almost always preferable in street trees.
  - Some species (such as many conifers) usually produce a single leader and need no training, others (such as sugar maple) often produce multiple leaders and need quite a bit; most species are in the

middle, and do well with moderate training.

- **Select what will be the *lowest permanent ("scaffold") branch,* and prune out nearby competitors.** Choose a branch that 1) is vigorous, and 2) has the right clearance.
    - Remember that once a branch is formed at a given level, it never gets any higher.
- **Select and prune for *other scaffolding branches.***
    - Choose vigorous branches less than half the size of the central leader that are
        - well spaced apart (at least 18" for large trees)
        - well distributed around the trunk.
- **Finally, make *temporary branches* by cutting back branches you will not be keeping** that are below or between the scaffolding branches.
    - **do not remove** these branches for now, **just reduce** them to a few buds
    - the leaves on temporary branches produce food for the young tree, and protect the young bark from the sun; they can be removed later when shaded out.
    - **Don't take off more than 25%** of the leaves and buds at any one time.

When is it done?

- Prune nothing **the *first* growing season** after planting except broken, rubbing, or misshapen branches. The transplanted tree needs all its leaves to reestablish its roots.
- Many communities schedule the first training for the third year after planting, a time when remulching can also be done
- Most species are best trained in **late winter**, though badly resprouting species (such as lindens or crabapples) are better pruned soon after leaves have fully expanded.

Where can I get more information?

ISA, "Pruning Young Trees." For other information, advice and help on this topic, call offices of your State Urban Forestry Coordinator or University Extension service, or visit urban forestry web sites.

Community Maintenance Pruning

What does this mean?

- **Community maintenance pruning applies pruning to a community forest on a rational basis. It relies on a rotation program built on management units and pruning cycles.**
    - *Maintenance pruning* implies ongoing and routine pruning to clean, thin, raise, restore, or reduce tree crowns, as well as remove or reduce hazards.
    - *Management units* are discrete sections of the community that contain a certain number and type of trees.
    - *Pruning cycles* are the number of years between sytematic prunings of a management unit.

Why bother?

- **Rotational maintenance pruning is**
    - **safer**, because sporadically maintained trees are more damaged by storms and tend to fail unexpectedly more often
    - **easier and less costly**, because crews are concentrated in one area at one time, and make scheduled visits during regular hours
    - **more legally defensible**, because of the "prudent responsibility" shown by such a method.
- Many communities carry out annual pruning by relying on some combination of *request pruning* (from concerned citizens) and *crisis pruning* (from immediate needs).
- But, **request pruning is highly unreliable and usually insufficient** (since citizens do not always look, and are not professionals).
- And **crisis pruning is the least efficient method**, because much of crew time is spent in travel and set up.

How do you set up management units?

- First, look at the geography of your community. Natural units are often suggested by rivers, roads, etc.
- Sometimes, management units have already been established in the community for trash pickup, leaf or snow removal, road repair, etc.
- Then, calculate
    - how many trees are in each of those units (use inventory or windshield survey), and
    - how many trees you can prune in a given cycle.
- If necessary, break up the logical units into smaller units to equalize the load on work and budget.
- Number the units (and subunits, if they exist). This determines the order of units to be pruned.
- Choose one management unit as the place to begin. Your choice may be due to tree condition, unit location or importance, etc.
- Get some help from an arborist or forester experienced in municipal pruning questions.

How long should you make the pruning cycles?

- **Pruning cycles vary with average tree age, species, condition, as well as local climate.**
- In the northeast US, a 5-year cycle for most trees has been shown to be a reasonable goal.
- For young trees, and any others (like crabapples or declining trees) that need more frequent attention, a

3-year cycle often works best.

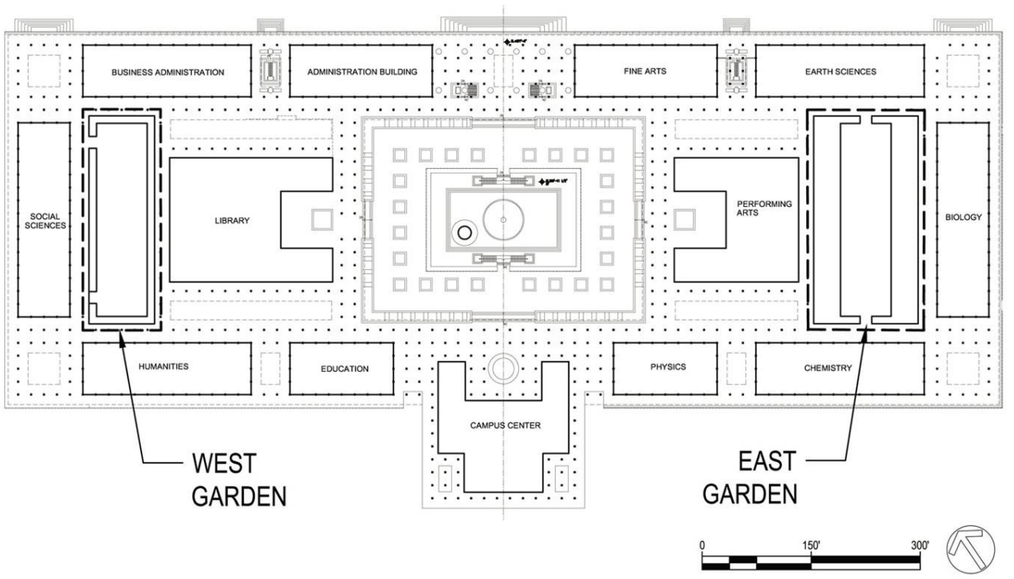
What else is needed to set up maintenance pruning?

- **Politics**: The shift to maintenance pruning may demand some serious politics, since initial pruning costs often go up. In the long run, you can expect savings of 50% or more on annual pruning budgets.
- **Specifications**: Put good pruning specifications in place, starting with the ANSI A300 standards. And set up an inspection system, getting training if you need it in recognizing poor work.
- **Contracts**: Decide whether you will be contracting out all or part of the pruning, and begin to sollicit bids for the work.
- **Communication**: Make sure you publicize and explain your changes in pruning policy, both to local officials and the entire community.

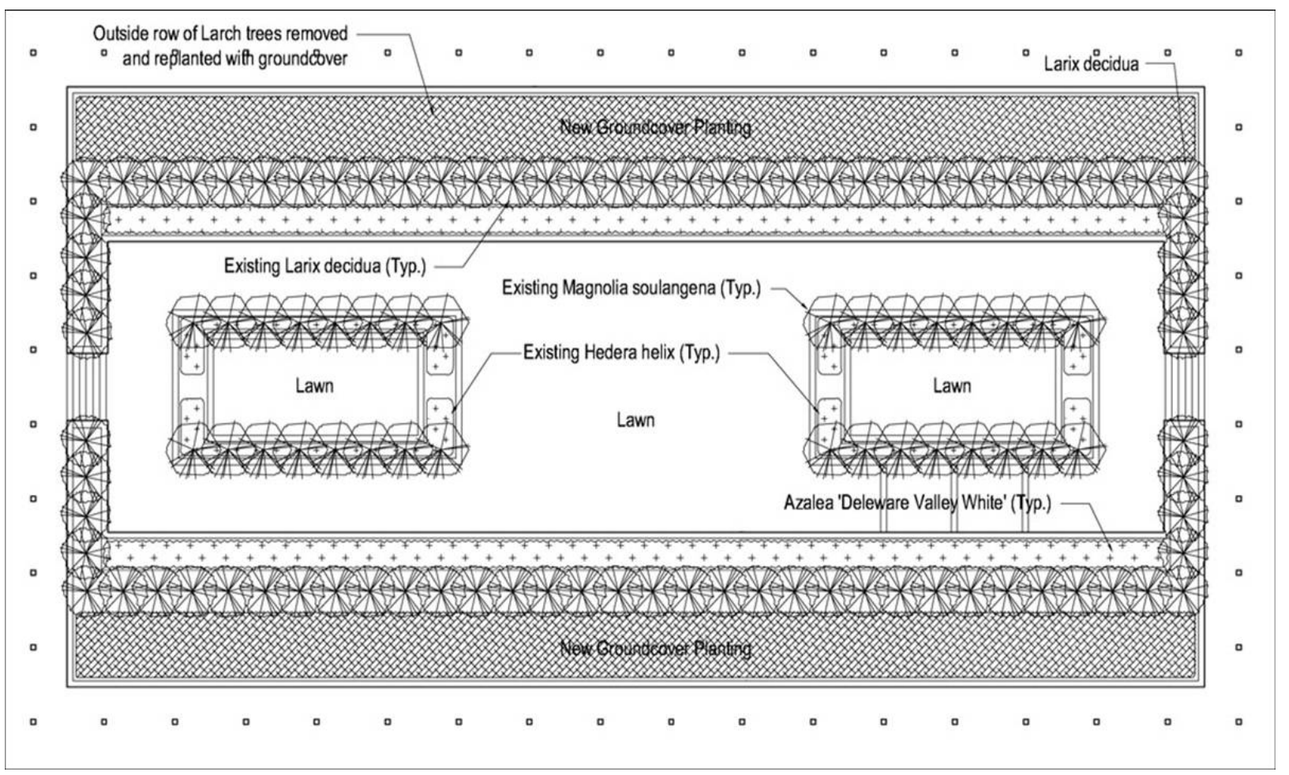
Where can I get more information?

Miller, Robert. 1997. *Urban Forestry. Planning and Managing Urban Greenspaces*. 2nd ed. Upper Saddle River NJ: Prentice Hall. For other information, advice and help on this topic, call offices of your State Urban Forestry Coordinator or University Extension service, or visit urban forestry web sites.

Podium Gardens Location Plan



Podium Garden East



Podium GardenWest