DIVISION S

SUSTAINABLE LANDSCAPE DESIGN GUIDELINES

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DIVISION S

SUSTAINABLE LANDSCAPE DESIGN GUIDELINES

S.1 GENERAL

A. The University of Pittsburgh is dedicated to achieving a unified, safe, *sustainable campus landscape* at the Pittsburgh Oakland campus, and at the four Western Pennsylvania regional campuses, including the Pymatuning Laboratory of Ecology. These sustainable landscape design guidelines will help lead to the creation of campus landscapes that reflect the core values of the University, including a commitment to the health and well-being of the University community, the wise stewardship of its natural systems, a unified campus aesthetic brought about by integrating intrinsically beautiful natural systems into the dynamic, urban and suburban campus conditions, and by creating harmony with the historical architecture and culturally significant landscapes and places that comprise the University of Pittsburgh.

B. At the discretion of the University Of Pittsburgh Facilities Management Division, designers may be required to collaborate with the University in seeking SITES certification, http://www.sustainablesites.org/certification for specific projects. In addition, other sustainable initiatives, such as LEED (Leadership in Energy and Environmental Design), http://www.usgbc.org/leed, Living Building Challenge and Living Community Challenge (International Living Futures Institute), https://living-future.org may be considered.

C. These guidelines are not prescriptive, but, rather provide the designer with a framework of *best practices* and performance goals to create sustainable landscape design outcomes rather than prescribe specific solutions and technologies. The designer shall comply with these guidelines in the design of exterior landscapes at the Pittsburgh Oakland Campus, and the regional campuses at Bradford, Johnstown, Titusville, and Greensburg, and the Pymatuning Laboratory of Ecology. On some projects certain guidelines may or may not apply. In these cases the designer shall confirm which guidelines are applicable to specific projects with Facilities Management's designated project manager and the Senior Manager of Grounds.

D. These guidelines apply to design of landscapes only. Sustainable guidelines for construction activities, and operation and maintenance are not included in the scope of this document.

S.2 BENEFITS OF A SUSTAINABLE LANDSCAPE

A. Promote the University and attract and retain students and staff.

B. Conserve water, improve storm water management and soil health.

C. Attract pollinator insects and create wildlife habitats.

D. Reduce *heat island effect* by increased shade from tree canopies.

E. Increase biodiversity and biomass through use of native plants.

F. Reduce use of harmful chemicals, pesticides, and herbicides.

G. Reduce landscape maintenance costs.

H. Improve air quality and sequester carbon.

I. Provide edible plants for food.

J. Improve mental and physical health and well-being.

K. Create a living laboratory and outdoor classrooms for collaborative research.

L. Return benefits in the form of goods and services from healthy ecosystems, such as clean air and water, and healthy soil.

M. Project an image, vis-a-vis first impressions of the campus, of a caring, welcoming, innovative campus with a vision that includes sustainability.

N. Improve building energy efficiency.

O. Make a positive impression on alumni and donors.

P. Demonstrate innovative sustainable practices.

S.3 SUSTAINABLE LANDSCAPE DESIGN PRINCIPLES

A. Do no harm by avoiding changes to the site that will degrade the natural environment and promote reuse and improvement of sites with previous disturbance or development. Minimize site disturbance including earthwork and grading. Ensure future resource supply and mitigate climate change by conserving water, eliminating pollutants, and recycling.

B. Do not create risk to human and environmental health (the Precautionary Principle). Examine options, even if it means taking no action.

C. Support local sustainability policies and practices.

D. Let the principles of *sustainability* guide design decisions. Strive to support preservation, conservation, and regeneration. Maximize the benefits of *ecosystem services* by preserving existing environmental features, conserving resources, and regenerating lost or damaged ecosystem services.

E. Support a living process: A rain garden with plants and healthy soil cleans and recharges pollutant laden runoff better than a storm sewer system.

F. Consider *regenerative systems* that provide future generations with a sustainable environment. Encourage biodiversity; provide multiple ecosystem services such as cleaning air and water, providing *habitat* for plants, pollinator insects and wildlife, as well as storing carbon.

G. In surface parking lots strive to increase planting areas beyond municipal requirements to provide more pollinator plantings and bee nesting areas, and use storm water collection systems such as bioswales and vegetated islands to improve storm water management.

H. Collaborate with the University Facilities Management Division in the design decision process. The University shall determine the make-up of user groups who may participate in the design process such as: University staff, students, community groups, municipal and state officials, and other stakeholders.

I. Promote opportunities for education and research in sustainable land care, green infrastructure, and native plants. Utilize interpretive signage to educate the campus community and general public on sustainability practices.

J. Respond to principles of *Biophilia* (Pittsburgh is a Biophilic City) (http://biophiliccities.org/): Focus design on aspects of the natural world that have contributed to human health and productivity. Connect the human inherent need to affiliate with nature in the built environment. Explore inclusion of art in the landscape sensitive to harmony with natural systems.

K. Respond to principles of permaculture by developing opportunities for permanent edible landscapes. Strive to create food forests using native trees and shrubs such as: paw paw, persimmon, serviceberry, hazelnut, blueberry, strawberry, hickory, black walnut, American chestnut, black chokeberry, American plum, New Jersey tea, and indigenous viburnums.

L. Consider the principles of the Triple Bottom Line of Sustainability (people, planet, profit) in making design decisions (John Elkington, "Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development," California Management Review 36, no. 2 (1994): 90-100.):

1. People - promote health and happiness, refuge, attraction of prospective students, relationship to adjacent neighborhoods and the City, crime prevention, traffic calming.

2. Planet - consider environmental impacts on the site; look at health of ecosystems, biodiversity, environmental pollutants such as ozone, Sulphur dioxide, nitrogen oxides, excessive soil nutrients, solid and hazardous waste management, invasive/noxious plants, impact on municipal infrastructure, storm sewer overflow.

3. Profit – examine the cost of excessive landscape maintenance, energy usage, cost of unnecessary chemicals, fertilizers, pesticides, herbicides, water usage. Look at cost of underemployment, job growth, job creation, taxes.

M. Promote functional plantings that provide shade to buildings and pavement, screen offensive views and frame quality views, direct pedestrian movement, block unfavorable winds and direct favorable winds. Select plants that require minimal pruning, cutback, and replanting.

1. Where appropriate, plant trees in staggered groups and groves to mimic natural woodland conditions. Honor and compliment historical design styles of architecture and landscape architecture as directed by University of Pittsburgh Facilities Management.

2. Limit large masses of single plant species.

3. Strive for a rich, diverse, composition of plants including canopy trees, understory trees, shrubs, and herbaceous plants. Maximize the types and numbers of understory, shrub and herbaceous/grass planting at transitional edge/ecotone conditions between woodlands and meadows or lawns.

N. Strive to create a unified aesthetic, with emphasis on simplicity, and contextual relationships to both the dynamic, urban environment of the Pittsburgh Oakland campus and the rural/suburban environments of the regional campuses, as well as the existing campus architecture and other campus cultural and landscape settings.

O. Strive to design landscapes that are easily maintained using the principles of sustainable landscape maintenance, such as NOFA (Northeast Organic Farm Associations of Connecticut) Standards for Land Care (http://www.nofamass.org). Reduce complex, time consuming maintenance processes and methods.

P. Strive to design a cost-effective landscape that addresses life-cycle costs.

Q. Use high quantities of native flowering perennials with large, vibrant, colorful flowers to maximize the visual impact of native plantings, especially from late April to early May and in mid to late August when Pitt students, families,

visitors, and prospective students are more likely to experience the outdoor landscape.

R. Support design decisions that reduce use of tall plants around foundation of buildings, especially where plants are a hindrance to the view of exceptional architecture. Do not obstruct windows or doors with plantings.

S. Consider reducing the use of plants for hedges that require excessive trimming. Separate plantings from walkways with appropriate plants that will not grow to impede pedestrian movement.

T. Strive to protect and enhance University of Pittsburgh campuses' ecosystem services which include goods and services of direct or indirect benefit such as:

1. Local and global climate regulation (shading, windbreaks, carbon sequestration).
2. Air and water cleansing (reduce pollutants in air and water).
3. Conservation and management of water and storm water runoff on site (improve ground water recharge).
4. Control of soil erosion and protection of soil.
5. Providing pollinator plantings for reproduction of plants and crops. Strive for 20% of planting area allotted for bee nesting habitat.
6. To increase ecosystem stability, protect existing wildlife habitat and create appropriate wildlife cover such as: non-hazardous *snags*, logs, dry-stacked stone walls, birds and bat houses, brush shelters, bee nesting blocks and boxes, and sand piles.
7. Encourage waste decomposition services through natural microbial activity and composting that recycle nutrients to soil on site.
8. Enhance human well-being through interaction with nature.
9. Produce food, fuel, and medicinal materials for human health from plants.

U. Review planting design concepts and designs with Campus Architect, Project Manager, Senior Manager of Grounds, and the University of Pittsburgh Police for safety and crime prevention goals.

V. Encourage the planting of deer resistant plants where necessary, particularly at regional campuses where destructive deer browsing is more likely. Control

mosquitos by grading and design that eliminates standing water conditions within the minimum mosquito breeding cycle of four days.

W. Strive to create an ecological "sense of place" based on the plants and rocks conspicuously identifiable as endemic to the local region. For example at the Oakland campus in Pittsburgh and the Greensburg campus, white oak, beech, sycamore, and fossiliferous Ames limestone and Pottsville quartz sandstone for use in hardscape (walls and pavement) would invoke an identifiable sense of place. Similarly, hemlock, beech, sugar maple, black birch, black cherry and Loyalhanna limestone would be identifiable with Johnstown, Bradford and Titusville regional campuses.

X. Include in the landscape design documents the requirement to enforce sustainability guidelines during construction and in operation and maintenance of sustainable landscapes. (Sustainable landscape guidelines for construction, operation and maintenance are Not included in scope of this document).

S.4 COMPLIANCE

A. Comply with Oakland Civic Center Designated Historic District review processes and requirements. (See map Appendix F)

B. Comply with or exceed applicable ordinances for landscaping and screening, street tree standards, landscaping for parking areas, and steep slope treatment in City of Pittsburgh Zoning Code, Title IX. (http://pittsburghpa.gov/dcp/zoning/zoning-code).

C. Honor and harmonize landscape design with historic architectural and landscape architectural context as identified by University of Pittsburgh Facilities Management Division. Review all designs with University of Pittsburgh Facilities Management Division, Senior Manager of Grounds.

D. Comply with PWSA, Allegheny County Conservation District, Pennsylvania Department of Environmental Protection (DEP), and Army Corps of Engineers regulations for storm water management, *Best Management Practices (BMP)* and soil erosion and sedimentation pollution control.

E. Respond to Sustainability, Tracking, Assessment, and Rating System (STARS) version 2.1 for Water Use (OP 22), Rainwater Management (OP 23), Landscape Management (OP9), Biodiversity (OP 10), and Campus as a Living Laboratory (AC 8).

F. Respond to best practices for sustainable landscape design contained in the Standards for Organic Land Care, Practices for the Design and Maintenance of Ecological Landscapes by the Northeast Organic Farming Association.

G. Deliver operations and maintenance manuals for specific sustainable landscape systems to University of Pittsburgh Facilities Management Division and the Senior Manager of Grounds.

S.5 DESIGN PROCESS REQUIREMENTS

A. Use the latest As-Built Topographic Survey and Property Survey of the project site that complies with the ASLA (American Society of Landscape Architects) requirements for as built topographic surveys, or as directed by University of Pittsburgh Facilities Management Division.

B. Strive to assemble an *integrated design team* consisting of design professionals who are knowledgeable in sustainable landscape design and construction practices and other professionals knowledgeable in vegetation, storm water and hydrologic engineering, soils, landscape ecology, historic buildings, sustainable use of materials, human health and well-being (as determined by the type of project).

C. Prepare a *Design Program* for the project that identifies design criteria and information such as: a hierarchy of needs, uses, activities, circulation, spatial relationships, and area requirements, among others, for the sustainable landscape design project as determined by the University of Pittsburgh and other stakeholders such as students, staff, local community and others. Include applicable sustainable design criteria, neighborhood adjacencies, relationships, and codes. Prepare a brief program narrative that succinctly states the design problem and objectives to solve it. Use an integrative and collaborative design approach. Identify project sustainability principles and performance goals.

D. Prepare a Site Analysis (see Pre-Design Site Assessment) that inventories the physical (natural) systems of the site, and social/cultural systems that apply to the project. Identify existing site factors, including but not limited to: ecosystems, vegetation, microclimate, soil, slope, drainage, wind, solar orientation, and shadows. Identify applicable pedestrian and vehicular circulation, historical features, and use areas. (See S-6, Pre-Design Site Assessment). Identify severe wind areas, noise and light pollution sources, traffic congestion, unsafe conditions, and drainage patterns and problem areas. Identify ecosystem services that apply to the site and prepare a brief narrative showing how these services can improve quality of life for students, faculty and staff, and the general community. Develop a map of opportunities and constraints for designing a sustainable landscape on the site.

E. Prepare a Conceptual Design that synthesizes the program with the opportunities and constraints of the site analysis. Prepare a conceptual design narrative that explains the concept.

F. Prepare a design development narrative that explains the design and describes the components and sustainable outcomes of the design.

S.6 PRE-DESIGN SITE ASSESSMENT

Map and assess existing site conditions and resources. Identify opportunities and constraints for sustainable landscape outcomes. Prepare a narrative and create a comprehensive map or individual maps at the same scale and orientation for each of the following (where applicable):

A. Site Context: Assess site location in relationship to community and connectivity including but not limited to: walkability, proximity to public transit, bicycle networks (if applicable).

B. Identify opportunities to protect and improve soil, water, and vegetative ecosystem services.

C. Hydrology (see Section S.8): identify existing hydrologic conditions including but not limited to: existing water courses, wetlands, FEMA 100-yr floodplain, topography/piped and surface drainage patterns, potential pollution sources, municipal storm water systems, and basement flooding conditions. Include data on local precipitation amounts. Discuss opportunities and constraints to employ Best Management Practices to capture and reuse rainwater.

D. Soils (see Section S.9): Identify existing healthy and disturbed soils. Identify slope gradient and orientation. Identify Soil Protection Zones that preserve healthy, permeable soils, and areas of compaction and erosion. Where feasible test soils and assess results of laboratory analysis related to organic matter content, compaction, infiltration, and soil chemical and biological characteristics. (Note: for previously developed sites or brownfield sites, comply with Federal and State laws and secure a certified environmental professional assessment for soil contamination testing and report on pollution by chlorinated pesticides and herbicides, lead, arsenic, heavy metals, airborne and other pollutants. Assess impact on public health for potential users of the site, and for on-site food production).

E. Vegetation (see Section S.10): If applicable, Identify existing vegetation, native plant community types of EPA level III *Ecoregion*, and habitats for state and federal threatened and endangered species. Inventory existing vegetation including native plant species and non-native plants species*, invasive plants*, plant communities, turf-grass and other monocultures, and data on individual tree specimens (measure tree trunk (*diameter at breast height DBH).* Identify plants and plant communities to be preserved. Discuss invasive plant removal

strategies, including removal of mature trees that are considered invasive. Consider risk of catastrophic wildfire. Identify vegetation protection zones.

F. Materials (see Section S.11): Identify and evaluate existing on-site materials such as walls, structures, features, paving, and other amenities for salvage, reuse, recycle, or safely leaving-in-place. Identify local suppliers of salvaged, recycled or reused materials, and potential sustainable suppliers and/or manufacturers of local or regional soil, plant, leaf compost, lumber, metal, stone and other materials.

G. Social Factors (see Section S.12): Identify social factors including but not limited to: cultural significance of existing historic buildings and structures, objects and cultural landscapes, views to and from the site, view corridors, site landmarks, off site connections and pedestrian routes, historic/special large shade trees, significant tree specimens, water features, natural and created, (note significance and/or special requirements or regulations).

H. Climate and Energy – Identify and discuss microclimate considerations such as wind directions, sun exposure and shade, partial shade and deep shade conditions, winter salt spray locations.

H. Bird-Building Collision Risk – Discuss risks of bird-building collision and steps to reduce risk in accordance with US Fish and Wildlife Service document, "Reducing Bird Collisions with Buildings and Building Glass Best Practices." (https://www.fws.gov/migratorybirds/pdf/management/reducingbirdcollisionswithbuildings.pdf.).

S.7 SITE CONTEXT - PITTSBURGH OAKLAND CAMPUS

A. Landscape Typologies – Refer to Appendix E, Pittsburgh Oakland Campus Landscapes Map for general types of landscapes that comprise the campus. Each landscape exhibits a character and a response to the existing urban and natural conditions that affect it. Based on these conditions certain, general sustainable design goals are identified for the landscape types.

1. Cathedral of Learning, Heinz Chapel, William Pitt Union Landscape:

a. High quality green space. Modified, historic quadrangles/pedestrian malls - Conform landscape design to existing historical and culturally significant architecture and landscape architecture and respect this highly visible and iconic landscape.

b. Where appropriate integrate native plants that will harmonize with historic character and existing functional and aesthetic uses of plantings.

c. Create opportunities for "low-impact, green" storm water infrastructure.

d. Introduce new, native trees and develop an age-structure of mature and young trees that addresses the on-going replacement of mature trees in decline.

e. Introduce *interpretive signage* to instruct and advocate for sustainable landscape design.

f. Maximize views to campus noteworthy architecture from surrounding streets, and maximize aesthetic impact of highly visible plantings.

g. Maximize accessibility and sense of welcome at pedestrian edges and entrances to this landscape.

2. Frick Fine Arts and Mervis Hall Landscape:

a. Same as Cathedral of Learning above.

b. Remove invasive plant species in adjacent wooded area between Joncaire Street and Frick Fine Arts Building.

c. Manage existing woods to restore to native woodland.

3. Hillman Library and Posvar Hall Landscape:

a. Large plazas - reduce paved, impervious pedestrian and vehicular surfaces.

b. Increase plantings along streets. Group trees and create understory plantings where possible.

c. Large roof areas - explore opportunities for roof gardens.

d. Pedestrian mall – maintain spatial quality, reduce pavement, introduce informal groupings of native trees.

e. Seek out and evaluate opportunities to replace lawn with native plantings.

4. High Density, Academic - Medical Landscape:

a. Sidewalk, streetscape-dominated environments – increase tree canopy with young, native trees. Increase root growing zone under trees in sidewalks. Consider removing unhealthy, non-native trees and shrubs where applicable.

b. At sloped lawn areas adjacent to sidewalks - reduce lawn and replace with native herbaceous and grass plants.

c. Consider opportunities for extensive green roof system on existing building roofs – using low depth soil with sedums and grasses.

d. Maximize pervious areas of native plantings in courtyard spaces.

5. Eberly Hall – University Drive Landscape:

a. Steep hillside landscapes – reduce lawn on steep slopes and introduce native canopy and understory trees to create wooded slopes. Integrate *successional vegetation* to gradually return grass slopes to woodlands/urban forests.

b. Remove invasive plants on hillsides and replace with successional plantings that will evolve into native woodlands.

c. Reduce paved, impervious surfaces where possible.

d. Remove pavement in surface parking areas where possible and introduce native trees and native pollinator perennial/grass plantings.

e. Incorporate DEP Best Management Practices such as bioswales and rain gardens at foot of hillsides to intercept runoff.

6. Sutherland Hall and Allequippa Street (O/C) Parking Lot Landscape:

a. Reduce lawn and pavement at building entry plazas where feasible. Replace with native plantings to create shade and or capture runoff.

b. Large surface parking areas – reduce heat island effect by introducing native canopy trees to create shade, and native pollinator perennial/grass plantings to improve storm water management through bio-retention strategies.

c. Steep hillside landscapes – reduce lawn and remove/manage invasive plants on steep slopes, and introduce native canopy and understory trees to create wooded slopes. Integrate successional vegetation to gradually return grass slopes to woodlands.

d. Incorporate bioswales and rain gardens at foot of hillsides to intercept runoff.

7. Petersen Events Center and Fitzgerald Fieldhouse Landscape:

   a. Existing wooded areas and scattered tree plantings – opportunity to manage and evolve into native woodlands.

   b. Recreational open space – use lawn areas for recreational activities. Replace unnecessary lawn areas with native plant communities such as successional woodland and meadows, and/or create non-mown edges and areas within existing lawns.

   c. Pedestrian plazas at building entry points – Increase tree canopy and reduce lawn and non-native shrub massing where possible. Replace with native herbaceous and grass plantings.

   c. Replace mulched hillsides with native tree/successional plantings.

   d. Incorporate bioswales and rain gardens at foot of hillsides to intercept runoff.

8. Multi-Unit Residential Landscape:

   a. Reduce lawn areas on hillsides and other areas where lawn is not needed. Replace with native herbaceous plants communities.

   b. Look for opportunities to replace non-native shrub/mulch plantings with native plant communities.

9. Petersen Sports Complex and Trees Field

   a. Steep hillside landscapes inundated with invasive plant species occupy the fill embankments between the sports fields and adjacent streets.

   b. Remove/manage invasive plants on steep, wooded slopes, and introduce successional vegetation to gradually return grass slopes to native woodlands/urban forests.

   c. Extensive retaining wall systems surround large areas of sports fields. Opportunity to reduce heat island effect reflectance by introducing vertical planting systems, both edible and inedible.

10. Site Context – All Campuses

   a. Enhance edges and entrances from surrounding community/urban framework to create visually positive,

welcoming image to pedestrian and visitors to the campus.

b. Re-establish areas of vegetated floodplain on brownfield or previously developed sites and manage invasive plant species where necessary.

c. Identify Vegetation and Soil Protection Zones.

d. Identify, protect, and conserve aquatic ecosystems including wetlands (Riverine, Lacustrine, palustrine). Prohibit development on wetland sites.

e. Conserve habitats for threatened and endangered species, including the recently listed rusty patched bumble bee (Bombus affinis).

f. Give preference to redeveloping degraded sites. Reduce pressure on undeveloped land and restore ecosystem services to damaged sites.

g. Locate projects within existing developed areas instead of undeveloped areas.

S.8 SUSTAINABLE LANDSCAPE DESIGN - WATER

A. Strive to replicate natural hydrologic conditions and manage precipitation on site by exceeding the requirements for low impact development and conservation design as outlined in the latest edition of the Pennsylvania Storm Water Best Management Practices Manual. For State BMP's refer to PA DEP website: http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8305.

B. Address storm water management and watershed analysis on a case by case basis. Support strategies to manage storm water on site, promote on-site infiltration, increase evapotranspiration, and reduce precipitation runoff volumes and pollutant discharges. Use plants and healthy soils as filters, such as *bioswales* and *rain gardens*, constructed wetlands, *riparian buffers*, or simple shallow depressions to intercept runoff. Select appropriate vegetation that will tolerate periods of precipitation inundation and drought. Select plants that reduce pollutant loading. For Federal storm water best practices refer to EPA LID website http://www.epa.gov/owow/NPS/lid/. For state regulations refer to Pennsylvania DEP Bureau of Watershed Management: http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/Facts/fs2248.htm

C. Protect and restore floodplain functions and provide riparian buffers 100 feet

wide minimum per PA DEP Riparian Forest Buffer Guidance on each side of streams. Locate projects on sites that do not contain any land in the 100-year floodplain. (http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-82308/394-5600-001.pdf).

D. Reduce impervious surfaces and consider opportunities for permeable pavement where applicable. Drain impervious surfaces into on-site landscape areas. Reduce storm water collection and removal from site. Avoid creating chutes off impervious surfaces that will cause erosion in the landscape areas.

E. Create living landscapes using soil and vegetation features such as vegetated roofs (http://www.greenroofs.org/), green walls, rain gardens, and bioswales.

F. Improve water retention quality of soil by addition of organic matter through addition of compost.

G. Use rainwater harvesting systems such as cisterns and ponds for plant irrigation and cooling tower and steam condensate makeup water. Reduce runoff volumes to municipal combined sewer systems.

H. Minimize material that could be a source of water pollutants such as treated lumber, galvanized steel, zinc, and copper materials. Minimize use of synthetic fertilizers, pesticides, herbicides, and de-icing salts that have adverse effects on plants.

I. Conserve water resources and minimize energy use by reducing or eliminating the use of potable water, natural surface water, and ground water/well withdrawals for landscape irrigation after the establishment period. Provide temporary irrigation for plants only during the establishment period. Hand watering during establishment of new plantings is preferred.

J. Plant during the optimal planting season to minimize use of excess water for irrigating plants.

K. Use low-water-use native plant species that will thrive in the Pittsburgh, PA climate with approximately 40" of annual rainfall.

L. Re-use grey water that meets local and state regulations. Re-use captured water, and condensate water where applicable.

M. Through on-site infiltration, evapotranspiration, and harvest use, retain or treat the maximum precipitation volume possible beyond the 60th percentile precipitation event.

N. Consider the design and maintenance of water features as amenities with natural ecosystems, water sources, and native plant communities. Employ low impact development strategies and Best Management Practices that emphasize

site design to mimic natural infiltration. Locate storm water amenities where they are highly visible to maximize human interaction, educational, and health and well-being opportunities.

O. Restore and protect aquatic ecosystems such as the Tunungwant Creek trout habitat at the University of Pittsburgh Bradford campus, or where applicable. Develop restoration and management practices that accommodate natural materials, natural processes, and re-establishment of native plant and animal habitats.

P. Minimize use of turf-grasses and select species with improved disease and insect resistance and lower water and fertilization after establishment.

Q. Rehabilitate lost or degraded stream channels, wetlands and associated native plant communities. Protect riparian and shoreline buffers where required by law and/or where feasible exceed requirements.

R. Encourage the use of educational/interpretive signage explaining hydrological and water conservation systems.

S.9 SUSTAINABLE LANDSCAPE DESIGN - SOILS

A. Support healthy plants, biological communities, and water storage and infiltration by restoring damaged soils, protecting healthy soils, and by limiting soil disturbance during construction.

B. Healthy soil provides ecosystem services in the form of water infiltration and filtration, carbon sequestration, increased vegetation biomass, reduction in potable water usage for irrigation and reduction in fertilizer and pesticide use. Healthy soil implies no disturbance/contamination from human development; soil horizons, *organic matter* content, cation exchange, and *bulk densities* are similar to referenced soil (as defined in appropriate Pennsylvania County Soil Survey); and presence of native plant communities are indicative of reference soil.

C. Maintain healthy soil ecosystems by preventing soil compaction, chemical contamination, avoiding excessively steep slopes, and by preventing the loss of organic matter and biological activity in the soil.

D. Identify and protect healthy soils and vegetation by mapping soils and creating *soil protection zones* that prevent disturbance during construction. Use fences or other physical barriers to create boundaries and prevent intrusion.

E. Limit/eliminate soil compaction. Where feasible, till or aerate compacted soil, or remove if necessary. Consider reusing compacted soil in earth mounds on site.

F. Salvage healthy top soil from site construction areas. Completely remove topsoil in the upper most soil horizon and avoid mixing with subsoil. Stockpile topsoil and protect from erosion in accordance with Soil Erosion and Sedimentation Pollution Control Plan (approved by County Conservation District).

G. Comply with Environmental Assessments (performed by others as directed by University Facilities Management) that identify contaminated soils and treatment of those soils

H. Where feasible test soils in order to determine chemical properties, classification, contaminants, organic matter and nutrient content in planting areas.

I. Restore *severely disturbed soils* resulting from construction or previous development. Restore soils to minimum 12" depth by amending with organic matter, tilling or ripping to reduce compaction and restoring nutrient profile of the soil.

K. Amend topsoil with *mature stable compost* from local sustainable and renewable sources, and with organic matter comprising 1-5% by weight of the topsoil. Amend topsoil on-site.

1. Compost shall have a carbon-to-nitrogen ratio below 25:1, pollutant concentration limits below US EPA regulations, and no viable weed seeds or invasive plant propagules.

L. Where feasible, balance quantities of cut and fill in the grading of the site and reuse existing soils in design instead of importing soils. Protect stockpiled soil by seeding or covering. Provide erosion and sedimentation pollution controls and best management practices in accordance with local and state laws.

S.10 SUSTAINABLE LANDSCAPE DESIGN - VEGETATION AND PLANTING

A. Non-native, invasive plants are expressly prohibited. Use native, *appropriate plant species*. Non-native, non-invasive plants are permitted on a case by case basis as determined by the University Senior Manager of Grounds. See Appendix B for recommended list of native plants, and http://www.dcnr.state.pa.us/forestry/plants/nativeplants/index. Also see "Terrestrial and Palustrine Plant Communities of Pennsylvania:" http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_001872.pdf

B. Use of appropriate native plants provides ecosystem services such as pollutant interception, water management, habitat for pollinator species, and aesthetic

and educational value. The use of native plants improves biodiversity by increasing vegetative cover, reducing pesticide use, conserving water, and reducing energy costs. Conserve and/or preserve existing native and high value plantings.

C. Reduce use of non-native, non-appropriate resource-intensive plantings. Reduce use of unnecessary, non-functional, turf-grass lawn areas by converting these areas to meadows or other types of native plant communities.

1. Remove existing lawn by sheet mulching (applying two to three layers of moistened, corrugated cardboard. Cover cardboard with a 2-3"layer of composted leaves. Leave cardboard in place until lawn grasses and weeds are smothered and killed).

2. Tilling, stripping and use of herbicides are prohibited.

D. Preserve existing native vegetation, especially high priority, healthy, mature trees and native plant communities. Allow *snags* to stand where they do not pose a hazard. Preserve historic, aesthetic, culturally significant vegetation, unless it is invasive.

1. Protect trees over 24" diameter above breast height (DBH) and native trees that are part of a forest community or woodlot.

2. Avoid locating buildings, pavement and general development around high priority trees. Avoid locating construction staging areas near same.

3. Provide tree protection fencing around the drip line of the existing tree canopy or 1.5 feet per each inch of trunk diameter (DBH). No construction work shall begin until tree protection fencing is in place. Fencing shall be maintained for the duration of the project.

E. *Control invasives* - by preventing, detecting, and managing invasive plants within the project area. Where feasible, identify and remove invasive species within the project area and coordinate with University Senior Manager of Grounds. See Pennsylvania DCNR Invasive Plant List, Appendix C, and http://www.dcnr.state.pa.us/forestry/plants/invasiveplants/.

F. Maintain and protect existing historic landscapes and plantings during construction, except invasive plants.

G. Comply with City of Pittsburgh and/or other municipalities at regional campuses - street tree planting regulations and standards. For example, in the City of Pittsburgh 30 SF is required for street tree planting area within sidewalks alongside streets. Strive to exceed municipal street tree for planting area and number of trees required. Coordinate tree and light pole locations to minimize tree canopy interference with street and pedestrian lighting.

H. Incorporate edible plantings where appropriate. Coordinate with University for soil testing and research on the historical use of a site that is under consideration for locating edible plantings. Consider alternative spaces for food production such as raised beds and containers where soils are known to be contaminated and have not been remediated.

I. Use appropriate native plants preferably designed to function as plant communities that will thrive in the climate and conditions of the EPA Level III Ecoregion: https://nctc.fws.gov/courses/csp/csp3200/resources/documents/epa_region_3_eco_desc.pdf. Also, see Appendix D, (Pennsylvania Ecoregions) showing where the campuses are located: University of Pittsburgh Oakland campus - Ecoregion 70c, Pittsburgh Low Plateau; University of Pittsburgh, Bradford - 62d, Glaciated Allegheny High Plateau; University of Pittsburgh, Johnstown - 69b, Uplands and Valleys of Mixed Land Use; University of Pittsburgh at Titusville - 62d; University of Pittsburgh at Greensburg - 70b, Monongahela Transition Zone; Pymatuning Laboratory of Ecology - 61b, Mosquito Creek/Pymatuning Lake Lowlands.

1. *Native plant communities* are assemblages of plant species whose composition and structure is typical of indigenous plant communities in a particular Ecoregion. Native plants are adapted to a particular region and maintain an evolved ecosystem of animals, microbes, and plants that grow best in a particular soil and climate. Hybrids, varieties, and cultivars of species native to this ecoregion are acceptable, too. Native plant communities include: wetlands, woodlands, woodland edges, grasslands, riparian buffers, successional old fields and woodland meadows. These areas may be further divided into specific terrestrial and palustrine plant communities (Terrestrial & Palustrine Plant Communities of Pennsylvania, by Joan Fike, Pennsylvania Natural Diversity Inventory). Some examples of native plant communities that she has identified include:

    a. Mixed Mesophytic Forest of the Appalachian Plateau

    b. Northern Hardwood Forest

    C. Sugar Maple Basswood Forest and Red Maple Forest

    d. Tuliptree-Beech-Maple Forest

    e. Red Oak, Mixed Hardwood Forest

    f. Dry Oak - Mixed Hardwood Forest

    g. Side-Oats - Gramma Calcareous grassland

h. Birch-Black Gum Rocky Slope Woodland

i. Dry White Pine, Hemlock, Oak Forest

j. Red-Cedar – Redbud Shrub-land

k. Little Bluestem – Pennsylvania Sedge Opening

l. Bottomland Oak – Hardwood Palustrine Forest

m. Red Maple – Mixed Shrub Palustrine Woodland

J. Give preference to native species/cultivars of native species that have been propagated in a local nursery from plants and seeds originally found in a local ecoregion. Plants native to the Eastern North America and not known to be invasive are permitted. Non-native, non-invasive plant species appropriate to a particular ecosystem and microclimate are allowed on a case by case basis. Maximize the use of native plants grown from certified organic sources. Select native plants that match the site, soil, moisture requirements, growing conditions, and ecological characteristics of a particular site. Give preference to plants grown from certified organic sources.

1. Plants treated with neonicotinoids are prohibited due to their systemic nature and long persistence and, therefore harmful impacts on non-target organisms, most notably bees and other pollinators and beneficial insects.

2. Provide for appropriate spacing between plants to achieve full coverage at maturity. Select plants that require minimal pruning and/or shearing and maintenance requirements.

K. Lawns and Lawn Alternatives:

1. Use cool season, sod-forming lawn grasses for recreation, athletic and special use areas, only. Limit the area of lawn as much as possible.

2. Use disease and insect-resistant grass seed cultivars with a variety of approved cultivars in the mix. Avoid a monoculture grass with only one species of grass used.

3. Mow to maintain a height of 3" or more. Mow to remove no more than one third the height of the grass leaf blade.

4. Pursue opportunities to leave areas of lawn un-mowed.

5. Tolerate weeds and nitrogen-fixing plants such as clover in the lawn.

6. Use lawn alternatives, such as "No Mow" seed mixes consisting of various species of fine fescues (festuca species) or Buffalo Grass (Bouteloua dactyloides).

7. Do not plant lawns in wetlands or riparian buffers.

8. Create lawn strips around native, naturalistic plantings to project an image of neatness and order.

9. Use native ground covers and low prostrate shrubs in place of lawns as a textural contrast and where and spatial and visual openness is desired.

L. Recommended Native Plant List (partial list). See Appendix B. Designer may supplement with other native plants and native plant cultivars subject to approval by University Senior Manager of Grounds. Use of non-native plants for certain historically and culturally significant conditions are subject to approval by University Senior Manager of Grounds.

M. Exceptions to the use of native plants:

1. Annual flowering plants for use in special planting arrangements to compliment certain architectural settings or cultural places.

2. Seasonal flowering bulbs such as daffodils and tulips.

3. Certain cultivars of native plants.

4. Special conditions such as green roofs or planters.

5. Edible, medicinal, or educational landscapes.

6. Non-native ornamental plants are permitted (subject to approval by University Senior Manager of Grounds) for use in harmonizing with existing historical architecture and/or cultural settings, special situations, unique events, memorial, dedications, commemorations and the like.

N. Use of synthetic fertilizers, pesticides, and herbicides is prohibited, except for starter fertilizer for use in establishing lawn grasses and the like.

O. Invasive Plants are strictly prohibited. (See Appendix C for Pennsylvania Department of Conservation and Natural Resources list of invasive species)

P. Permitted Soil Amendments:

1. Agricultural lime (dolomitic and calcitic)

2. Compost for use as mulch and as topsoil amendment shall be weed-free, organic matter source derived from agricultural, leaf, or yard trimmings, non-toxic to humans or plants and free of man-made foreign matter. Compost shall be certified by U.S. Composting Council's Seal of Testing Assurance Program.

3. *Compost tea* produced and applied in accordance with NOFA standards.

4. Cover crops and green manures, bone meal, fish hydrolysate, alfalfa meal. No more than 1 lb. of soluble nitrogen per 1000 sf of application.

5. Organic fertilizers and herbicides (allowed under National Organic Program)

Q. Mulching:

1. Mulch bare ground as soon as possible to prevent erosion and maintain until vegetative cover is achieved.

2. Provide a 3-4 inches layer around woody plants and 1-2 inches around herbaceous plantings.

3. Use compost certified by U.S. Composting Council's Seal of Testing Assurance Program, that exceeds EPA Class A standard 40 CFR for chemical contaminants and less than 1% physical contaminants - derived from partially decomposed leaves, un-composted, shredded leaves, and wood chips.

4. Shredded hardwood bark mulch is permitted around trees and shrubs only. Mulch volcanos at base of trees are prohibited. Dyed mulches and rubber mulches are prohibited.

R. Seasonal Interest: Design plantings for maximum color and interest when students are in classes on campus, and in the spring, especially late April and early May for graduation, and mid to late August (colloquially known as "Arrival Survival").

S. Sustainable Planting Design Documentation:

1. Planting Plan - delineating the layout of proposed, native plantings and planting details.

2. Plant List - with plant species botanical and common names, sizes, quantities, seeded areas, plant spacing and other remarks. Show existing and proposed topographic contours, vegetation and soil protection zone boundaries surrounding new native plantings, as well as native plantings to be restored or preserved. Show proposed buildings, pavement, structures, fencing, and amenities, and include background as-built topographic survey information.

3. Existing Tree and Vegetation Plan - identifying existing trees and vegetation to be protected and/or preserved during construction.

4. Existing Tree Salvage and Demolition Plan - showing all trees and vegetation to be relocated and/or removed.

5. Plant Warranty: Contractor agrees to repair or replace planting material and accessories that fail in materials, workmanship, or growth within a one year period from date of substantial completion. Failures of plant growth/health include: death and unsatisfactory growth except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomenon, acts of nature or incidents beyond the Contractor's control. Remove and replace dead or unhealthy plants during the warranty period. Plant at prescribed periods (i.e.: March 15 – May 15, and September 1 – October 15). Replace plants that are visibly unhealthy at end of warranty period. Provide extended warranty equal to original warranty for replacement plants. Warranty plants through one year period until final acceptance.

6. Initial Landscape Maintenance and Management: Begin initial maintenance immediately after planting. Maintenance period for all plants shall be one year. Provide maintenance by skilled employees of the contractor. Maintenance shall include weeding, watering, reseeding, replacing dead plans, mowing (use mulching mower), and mulching and any additional work in accordance with Designer's Landscape Management Plan.

7. Landscape Management Plan: – Prepare a Landscape Management Plan based on *NOFA Standards for Organic Land Care* that outlines initial and long-term performance standards for the holistic care of a landscape design project during and after installation.

S.11 SUSTAINABLE LANDSCAPE DESIGN - MATERIALS AND HARDSCAPE

A. Design to promote the use of material resources that are sourced and managed. Reuse salvaged materials. Where feasible a minimum of 20% of all materials, including plants used on site for landscaping should be salvaged materials.

B. Use regional materials. Where feasible, materials, plants, and soils should be sourced within the distances specified: soils and aggregates – 50 miles, plants – 250 miles, and other materials - 500 miles.

C. Where feasible, use sustainably harvested certified wood.

D. Where feasible, maintain or reuse existing structures, hardscape (walls and pavement), and landscape amenities such as benches, tables, and fountains.

E. Strive to *design for disassembly* for reuse and recycling.

F. Maximize use recycled content materials including compost and fertilizer made from recovered organic materials.

G. Where feasible, salvage and recycle construction, demolition, and land clearing waste.

H. Prohibit materials, including but not limited to: chemically treated wood and paper, dyed and chemically treated mulches, plastic and non-woven geotextile fabrics that contain PVC (polyvinyl chloride), synthetic burlaps, galvanized steel, mulch made from recycled rubber tires, synthetic fertilizer, synthetic pesticides and herbicides, sewage sludge, raw manure, triple superphosphate, muriate of potash, synthetically derived sulphates, calcium and magnesium, genetically modified seed.

I. Where feasible give preference to permeable pedestrian and vehicular pavement. Encourage use of *open grid pavement* in minimally used vehicular service pavement conditions.

J. Maximize use of hardscape materials with a minimum Solar Reflective Index of 29. (https://www.epa.gov/sites/production/files/2014-06/documents/coolpavescompendium.pdf).

K. Minimize use of retaining wall systems wherever possible. Select natural stone for use in retaining walls and curbs.

L. Maximize the use of excavated boulders in site landscaping. Do not haul from site.

M. Provide manufacturer's warranty (to University of Pittsburgh Facilities Management Division) for products and systems including but not limited to: permeable pavement systems and other hardscape pavement and wall systems, fences, railings, lighting, decking, shade structures, benches, seating, waste receptacles and the like used in site development.

S.12 SUSTAINABLE LANDSCAPE DESIGN - HUMAN HEALTH AND WELL BEING

A. Where directed by the University, design sustainable landscapes to consider the restorative and health benefits to the user. Gardens of all types, such as community gardens, contemplative gardens, roof gardens, courtyard gardens, vertical gardens, edible gardens, rain gardens, and the like promote community engagement, health and well-being, physical activity and mental restoration:

1. Provide outdoor spaces for various kinds of social interaction and connections to nature.

2. Enhance existing quality views and create new views throughout the landscape. Consider views from surrounding streets into the site as well as from the site to quality *viewsheds*.

4. Scrutinize landscape spaces, plantings and circulation routes to find ways to improve public safety.

B. Respect and protect significant historic and *cultural landscapes* as defined by the University.

1. Support social connections within the campus community by creating gathering and seating spaces for eating, studying, and working, but avoid conflict with University's mission, public safety, or where access could lead to damage of a particular landscape.

2. During site assessment/analysis process identify potentially quiet areas, places with good views, shade, and relaxing activity conducive to mental restoration.

C. Practice universal design to accommodate access by all.

1. Strive to exceed ADA accessibility requirements.

2. Conduct a *walkability audit* to assess the safety and desirability of walking routes.

3. Provide safe lighting levels of all outdoor public use landscape spaces and gardens that do not produce light pollution (comply with applicable codes). All outdoor lighting shall be dark sky compliant LED (***darksky****.org/lighting/lighting-basics*) in-ground luminaires and up lighting are prohibited.

4. Explore crime prevention issues related to the forms and hidden areas created by landscaping. Look for ways to allow the natural heights and forms of plants to remain when considering maintenance procedures.

D. Support outdoor physical activity.

1. Provide lawn spaces for outdoor physical activity and determine use areas for them in the program stage of the design process.

2. Design pathways along natural circulation routes that will discourage pedestrians from leaving paths and cutting corners. Provide paths that are appealing and comfortable for walkers. Provide physically challenging sections of walks where appropriate.

3. Provide places to seat spectators where there could be physical activity such as games and sports.

E. Maximize the use and placement of wayfinding signage and interpretive signage to inform and educate the users and general community about the benefits and workings of sustainable landscapes.

1. Where applicable, provide interpretive signage and individual plant labels identifying the genus and species of plants in sustainable plantings and provide educational signage describing the scientific and cultural background of a particular landscape.

2. Provide wayfinding signage that clearly directs users and visitors to pedestrian and transportation nodes, landscapes, buildings, historic and cultural locations, and other destinations.

F. There are many opportunities to create spaces in the landscape that promote health and well-being including:

1. Design a variety of smaller, restorative spaces located throughout a site rather than one large space. Where possible integrate outdoor landscapes with interior public spaces with windows to establish a connection to nature.

2. Locate landscape spaces away from noise sources and visual distractions such as traffic noise, mechanical systems and unsightly views. Mitigate unwanted noise by using earth mounds, and screen unsightly views with various types of vegetation.

3. Provide a variety of seating options including moveable seating.

4. Create sensory landscapes that focus on beautiful views, fragrant plants, and sound of water, colorful and texturally rich vegetation, and art.

S.13 REGIONAL CAMPUSES

A. In addition to the Pittsburgh campus, the preceding guidelines in their entirety shall also apply to the five Pitt regional campuses in Pennsylvania at: Bradford, Johnstown, Titusville, Greensburg, and the Pymatuning Laboratory of Ecology. Regional campuses and their primarily suburban locations present similar sustainable design challenges to the highly urban Oakland campus, but there are certain differences such as:

1. There are usually larger surface parking areas in relation to campus size. These surface parking areas require shading to reduce heat island effect.

2. Large surface parking areas require low impact, storm water management in conjunction with native plantings to capture and control runoff, particularly where the runoff is near riparian buffers along streams such as in Bradford and Greensburg.

3. Generally, there are larger, existing, woodland areas on the suburban campuses that should be preserved and expanded and integrated into the interiors of the campus. These wooded areas offer opportunities to expand existing native plant communities and create living laboratories.

4. Suburban campuses present unique challenges to preventing the spread of invasive plant species, because there are generally more invasive seed sources than urban areas.

5. Suburban campuses offer more area and more opportunities to recharge rainfall runoff than urban areas.

6. Comply with PA DEP regulations regarding riparian corridors/buffers for the Tunungwant Creek at University of Pittsburgh at Bradford, for Slate Creek at Pitt/Greensburg, and for the Shenango River at Pymatuning Laboratory of Ecology.

END OF DIVISION S

APPENDIX A.

PENNSYLVANIA INVASIVE PLANT LIST

(Pennsylvania Department of Conservation and Natural Resources)

Herbs and Forbs

COMMON NAME	SCIENTIFIC NAME	OTHER COMMON NAMES
Goutweed	Aegopodium podagraria	bishop's weed, snow-on-the-mountain
Garlic mustard	Alliaria petiolata	hedge mustard
Wild chervil	Anthriscus sylvestris	cow parsley, keck, bur chervil
Narrowleaf bittercress	Cardamine impatiens	bushy rock-cress
Musk thistle	Carduus nutans	nodding thistle
Brown knapweed	Centaurea jacea	horse-knobs, rayed knapweed
Black knapweed	Centaurea nigra	common knapweed, hardheads
Spotted knapweed	Centaurea stoebe	
Greater celandine	Chelidonium majus Tetterwort	
Canada thistle	Cirsium arvense	Canadian thistle
Bull thistle	Cirsium vulgare	
Poison hemlock	Conium maculatum	
Crown-vetch	Coronilla varia	
Jimsonweed	Datura stramonium	devil's trumpet, thorn apple
Hairy willow herb	Epilobium hirsutum	great willowherb
Hairy willowherb	Epilobium parviflorum	
Japanese knotweed	Fallopia japonica	fleeceflower, Mexican bamboo
Giant knotweed	Fallopia sachalinensis Sakhalin	knotweed
Goatsrue	Galega officinalis	professor-weed, Italian fitch
Giant hogweed	Heracleum mantegazzianum	giant cow parsnip or parsley
Dames rocket	Hesperis matronalis	dame's violet, dame's gillyflower
Yellow flag iris	Iris pseudacorus	
Moneywort	Lysimachia nummularia	creeping Jenny or Charlie
Purple loosestrife	Lythrum salicaria	swamp loosestrife
Star-of-Bethlehem	Ornithogalum nutans	silver bells, drooping star-of-Bethlehem
Wild parsnip	Pastinaca sativa	garden parsnip
Beefsteak plant	Perilla frutescens	Chinese basil, purple mint
Bristled knotweed	Persicaria longiseta	Asiatic smartweed
Lesser celandine	Ranunculus ficaria	fig buttercup, pilewort

Vines

Chocolate Vine	Akebia quinata	fiveleaf akebia, raisin vine
Porcelain berry	Ampelopsis brevipedunculata	Amur peppervine, porcelain vine
Oriental bittersweet	Celastrus orbiculatus	Asiatic or round-leaved bittersweet
Japanese hops	Humulus japonicus	
Wintercreeper	Euonymus fortunei	Climbing euonymus, fortune's spindle
English ivy	Hedera helix	Common ivy
Japanese honeysuckle	Lonicera japonica	Chinese honeysuckle
Mile-a-minute	Persicaria perfoliata	devil's tear-thumb
Kudzu	Pueraria lobata	vine that ate the South
Black swallow-wort	Vincetoxicum nigrum	Louise's swallow-wort
Pale swallow-wort	Vincetoxicum rossicum	European swallow-wort

APPENDIX A.

PENNSYLVANIA INVASIVE PLANT LIST

Trees

Norway maple	Acer platanoides	
Sycamore maple	Acer pseudoplatanus	
Tree of heaven	Ailanthus altissima	
Mimosa	Albizia julibrissin	Persian silk tree, silktree, silky acacia
European black alder	Alnus glutinosa	Common alder
Japanese angelica tree	Aralia elata	
Paulownia tomentosa	Empress tree	
Callery pear	Pyrus calleryana	
Siberian elm	Ulmus pumila	

Shrubs

Japanese barberry	Berberis thunbergii	red barberry
European barberry	Berberis vulgaris	common barberry
Russian olive	Elaeagnus angustifolia	oleaster, wild olive
Autumn olive	Elaeagnus umbellata	
Winged Euonymus	Euonymus alatus	burning bush
Glossy buckthorn	Frangula alnus	
Shrubby bushclover	Lespedeza bicolor	Shrubby lespedeza
Chinese bushclover	Lespedeza cuneata	Chinese Lespedeza
Japanese privet	Ligustrum japonicum	wax privet
Border privet	Ligustrum obtusifolium	regal privet
Chinese privet	Ligustrum sinense	
Common privet		
Amur honeysuckle	Lonicera maackii	
Morrow's honeysuckle	Lonicera morrowii	
Bell's honeysuckle	Lonicera xbella Bella	
Standish honeysuckle	Lonicera standishii	
Tartarian honeysuckle	Lonicera tatarica	
Common buckthorn	Rhamnus cathartica	purging buckthorn
Jetbead	Rhodotypos scandens	Black jetbead
Multiflora rose	Rosa multiflora	
Wineberry	Rubus phoenicolasius	
Japanese	Spiraea japonica	
Guelder rose	Viburnum opulus var. opulus	cranberrybush viburnum

Aquatic Plants

Carolina fanwort	Cabomba caroliniana	green Cabomba, fish grass
Didymo	Didymoshenia geminata	rock snot
Brazilian water-weed	Egeria densa	

APPENDIX A.

PENNSYLVANIA INVASIVE PLANT LIST

Hydrilla	verticillata	Esthwaite waterweed
Floating seedbox	Ludwigia peploides var.glabrescens	Water primrose
Parrot feather watermilfoil	Myriophyllum aquaticum	Parrotfeather
Eurasian water-milfoil	Myriophyllum spicatum	Eurasian milfoil, spike watermilfoil
Curly pondweed	Potamogeton crispus	crispy-leaved pondweed
European water chestnut	Trapa natans	devil pod
Narrow-leaved cattail	Typha angustifolia	narrow lead cattail, nail rod
Hybrid cattail	Typha x glauca	

Grasses

Poverty brome	Bromus sterilis	
Cheatgrass	Bromus tectorum	June grass
Japanese stiltgrass	Microstegium vimineum	Nepalese browntop, packing grass
Reed canary grass	Phalaris arundinacea	
Common reed	Phragmites australis ssp. australis	
Shattercane	Sorghum bicolor ssp. drummondii	
Johnson grass	Sorghum halepense	

Watch List

Amur maple	Acer ginnala	
Small carpetgrass	Arthraxon hispidus	Joint-head grass
Paper mulberry	Broussonetia papyrifera	
Butterfly bush	Buddleja davidii	Orange-eye butterfly bush
Orange day-lily	Hemerocallis fulva	
Velvet grass	Holcus lanatus Yorkshire fog	
Chinese silvergrass	Miscanthus sinensis	Eulalia, zebra grass, maidenhair grass
White mulberry	Morus alba	Chinese/Russian white mulberry
Wavyleaf basketgrass	Oplismenus undulatifolius	
Japanese pachysandra	Pachysandra terminalis	Japanese spurge, Chinese fever vine
Amur corktree	Phellodendron amurense	
Japanese corktree	Phellodendron japonicum	
Lavella corktree	Phellodendron lavellei	
Golden bamboo	Phyllostachys aurea	Yellow grove bamboo, fish pole bamboo
Rough bluegrass	Poa trivialis	
Ravenna grass	Saccharum ravennae	Hardy pampas grass
Tall fescue	Schedonorus arundinaceus	
Bee-bee tree	Tetradium daniellii	Korean Evodia
Linden viburnum	Viburnum dilatatum	arrowwood
Doublefile viburnum	Viburnum plicatum	Japanese snowball bush
Siebold viburnum	Viburnum sieboldii	Siebold's arrowwod
Bigleaf periwinkle	Vinca major	Greater periwinkle
Common periwinkle	Vinca minor	myrtle
Japanese wisteria	Wisteria floribunda	
Chinese wisteria	Wisteria sinensi	

APPENDIX B.

RECOMMENDED NATIVE PLANT LIST

(* denotes recommended street tree) (+ denotes thornless variety) (# denotes edible plant) (& denotes deer resistant plants)

Canopy Trees

Betula lenta (sweet birch) &

Acer rubrum (red maple) &

Betula nigra (river birch) &

Quercus alba (white oak) #

Nyssa sylvatica (black gum)&

Gleditsia tricanthos 'shademaster'(honeylocust)*&

Carya glabra (pignut hickory)

Acer saccharum (sugar maple)&

Quercus macrocarpa (bur oak)

Ulmus Americana (American elm cultivars) *

Gymnoccladus dioicus (Kentucky coffeetree)*

Prunus serotine (black cherry)

Quercus prunus (chestnut oak)

Quercus rubra (red oak)

Platanus occidentalis (American planetree)

{Prunus serotina (black cherry)

Fagus grandifolia (American beech) #&

Fagus grandifolia (American beech) #&

Liriodendron tulipifera (tuliptree) &

Carya tomentosa (mockernut hickory) #

Quercus bicolor (swamp white oak) #

Betula alleghaniensis (yellow birch)

Carya ovata (shagbark hickory)#

Aesculus glabra (Ohio buckeye)

Aesculus glabra (yellow buckeye)

Robinia oseydiacacua (black locust)

Betula populifolia (gray birch)

Celtis occidentalis (hackberry)* #

Tilia Americana (basswood) * &

Quercus palustris (pin oak)*

Populus grandidentata (big tooth aspen)

Populus tremuloides (quaking aspen)

Quercus cocinea (scarlet oak)

Quercus muehlenbergii (chinkapin oak)

Salix nigra (black willow)&

Betula nigra (river birch)

Acer nigrum (black maple)

Juglans nigra (black walnu

Juglans nigra (black walnut) #

Diospyros virginiana (persimmon) #

Morus rubra (red mulberry)#

Oxydendron arboretum (sourwood)

Evergreen trees

Tsuga Canadensis (eastern hemlock)&

Magnolia virginiana (sweetbay magnolia) &

APPENDIX B.

RECOMMENDED NATIVE PLANT LIST

Pinus strobus (eastern white pine)

Magnolia acuminate (cucumber magnolia)

Magnoia tripetala (umbrella magnolia)

Illex opaca (American Holly) &

Juniperus virginiana (red-cedar) &

Picea glauca (white spruce)&

Pinus rigida (pitch pine)

Understory Trees

Cornus florida (flowering dogwood)&

Cornus sericea (red twig dogwood)

Cercis Canadensis (eastern redbud)&

Crataegus crusgalli (Cockspur hawthorn) +

Crataegus punctate (Dotted hawthorn) +

Carpinus caroliniana (hornbeam)&

Corylus Americana (hazelnut)#&

Ostrya virginiana (hop-hornbeam)

Asimina triloba (paw paw)#&

Amelanchier laevis (smooth serviceberry) #&

Malus coronaria (American crabapple)+#

Prunus virginiana (chokecherry) #

Prunus Americana (American plum)+ #

Shrubs

Kalmia latifolia (mountain laurel)

Rhododendron periclyenoides (pinxter-flower)

Viburnum prunifolium (blackhaw viburnum)#

Potentilla fruticose (shrubby cinquefoil)&

Vaccinum angustifolium (low-bush blueberry)#

Aronia melancoarpa (black chokeberry)#

Corylus cornuta (beaked hazelnut)# &

Hamamelis virginiana (witch-hazel)

Viburnum acerifolium (maple-leaved viburnum)&

Aronia arbutifolia (red chokeberry)&

Itea virginaiana (sweetspire)

Rhus aromatic 'Gro-low (Gro-low sumac)

Viburnum lentago (nannyberry viburnum)#

Viburnum trilobum (highbush cranberry)#

Myrica pennsylvanica (bayberry) &

Viburnum dentatum (Nannyberry) &

Lindera benzoin (spice bush)#&

Rhododendron maximum (rosebay rhododen)&

Clethera alnifolia (sweet shrub)&

Calycanthus floridus (Carolina allspice)&

Cornus racemose (gray dogwood)

Ilex verticillata (winterberry)&

Physocarpus opulifolius (ninebark)

Ceanothus virginiana (New Jersey tea)

APPENDIX B.

RECOMMENDED NATIVE PLANT LIST

Cephalanthus occidentalis (buttonbush)

Cornus alternifolia (pagoda dogwood)

Viburnum alnifolium (hobblebush)#

Viburnum trilobum (American cranberrybush)#

Cornus sericea (Red-osier dogwood)&

Rosa Carolina (Carolina rose)

Gaylussacia baccatta (black huckleberry)#

Viburnum prunifolium (blackhaw viburnum)

Viburnum lentago (nannyberry)#

Vines

Parthenocissus cinquefolia (virginia creeper)

Cladastrus scandens (American bittersweet)

Aristolochia macrophylla (dutchman's pipe)

Herbaceous (Pollinator Species)

Allium cernum (nodding pink onion)

Agastache foeniculum (lavender hyssop)

Aster novae-angliae (New England Aster)&

Asclepias syriaca (common milkweed)

Asclepias tuberosa (butterfly weed)&

Chamaecrista fasciculate (partridge pea)

Dennstaedtia punctilobula (hayscented fern)&

Baptisia australis (blue false indigo)

Dalea purpurea (purple prairie clover)

Echinacea purpurea (purple coneflower)&

Eryngium yuccifolium (rattlesnake master)

Heliopsis hlianthoides (false sunflower)

Heuchera viloa (Alum root)

Liastris spicata (dense spicata)&

Monarda fistulosa (wild bergamot)

Aster laevis (smooth aster)

Silphium lacinatum (compassplant)

Silphium perfoliatum (cupplant)

Verbena hastata (blue vervain)&

Asarum canadense (wild ginger)

Asclepias incarnate (swamp milkweed)

Helianthus occidentalis (western sunflower)

Coreopsis lancelota (tickseed)&

Mitchella repens (partridge-berry)

Trillium grandiflorum (white trillium)

Comptonia perigrina (sweet-fern)

Sanquinaria canadensis (bloodroot)&

Phlox subulata (creeping phlox)

Anemone quinquefolia (wood anemone)

Arisaema triphyllum (jack-in-the-pulpit)&

Polystichum acrostichoides (Christmas fern)

Aster cordifolius (heart leaved aster)

APPENDIX B.

RECOMMENDED NATIVE PLANT LIST

Aster prenanthoides (crooked stem aster)

Aster divaricatus (white woodland aster)

Rudbeckia hirta (black eyed susan)&

Solidago ohionsis (ohio godenrod)

Solidago odora (anise scented goldenrod)&

Carex pennsylvaica (Pennsylvania sedge)

Asclepias quadrifolia (four leaved milkweed)

Asclepias incarnate (red milkweed)&

Penstemon digitalis (beardtongue)&

Aster macrophyllus (big leaved aster)

Aster lateriflorus (calico aster)

Dryopteris marginalis (evergreen wood-fern) &

Podophyllu peltatum (may-apple)

Smilacina racemose (false soloman's seal)

Geranium maculatum (wood geranium)

Monarda didyma (beebalm)&

Iris shrevei (wild iris)

Actaea racemose (black cohosh)&

Grasses

Panicum virgatum (switch grass) &

Andropogon virginicus (broomsedge)&

Eragrostis spectabilis (purple love grass)

Bouteloua curtipendula (side-oats gramma)&

Hierochloe odorata (vanilla sweet grass)

Schizachyrium scoparium (little bluestem)&

Spartina pectinate (prairie cordgrass)

Sorghastrum nutans (indian grass)&

Elymus Canadensis (Canada wild rye)&

Ground Covers

Arctostaphylos uva-ursi (bearberry)

Celastrus scandens (American bittersweet)

Fragaria virginiana (Virginia strawberry)

Gaultheria procumbens (wintergreen)

Parthenocissus quinquefolia (Virginia creeper)

Rhus aromatic (Fragrant sumac)

Asarum canadense (wild ginger)&

Clematis virginiana (virgin's bower)

Pachysandra procumbens (Allegheny spurge)

Juniperus horizontalis (creeping junipers)

Phlox stolonifera (Creeping pholox)

Vaccinum angustifolium (lowbush blueberry)

APPENDIX B.

RECOMMENDED NATIVE PLANT LIST

Moist Meadow/Rain Garden Plants

Chelone glabra (white turtlehead)

Carex muskingumensis (palm sedge)

(Pycnanthemum virginianum (mountain mint)

Coreopsis rosea (rose coreopsis)

Carex vulpinoidea (fox sedge)

Carex muskingumensis (palm sedge)

Eupatorium maculatum (Joe Pye weed)

Filipendaula rubra (Queen of the prairie)

Mimulus ringens (monkey flower)&

Physostegia virginicna (obedient plant)

Sclepias incarnate (red milkweed)

Eupatorium perfoliatum (boneset)

Verbena hastate (blue vervain)

Physotegia virginiana (obedient plant)&

Mimulus ringens (monkeyflower)

Phlox glaberrima (marsh phlox)

Veronia altissima (tall ironweed)

Liastris aspera (rough blazingstar)

Lobelia siphilitica (great blue lobelia)&

Lobelia cardinalis (cardinal flower)

Iris shrevi (wild iris)

Filipendula ruba (queen of the prairie)

APPENDIX C.

DEFINITIONS

100-year floodplain – includes all areas below the 100-year flood elevation of waterways of all sizes, including depression areas, wetlands, areas behind levees, ephemeral and intermittent streams, rivers, lakes, and shoreline and coastal areas.

Appropriate plant species – are plants adapted to site conditions, climate, and design intent. Consider the following attributes in determining whether a plant is appropriate for the site: cold hardiness, heat tolerance, salt tolerance, soil moisture range, plant water use requirements, soil volume requirements, soil pH requirements, sun/shade requirements, pest susceptibility, and maintenance requirements. Native and non-native plants are considered appropriate if they meet the above criteria subject to approval by Senior Manager of Grounds.

Best Practices – is a technique or methodology shown by research or experience to produce optimal results.

Best Management Practices (BMP) – are activities or structural improvements that help reduce the quantity and improve the quality of storm water runoff. BMPs include treatment requirements, operating procedures and practices to control and treat site runoff, and infiltration.

Biophillia – is a hypothesis that humans possess an innate tendency to seek connections with nature and other forms of life.

Bioswale – a linear storm water runoff conveyance system that is used as an alternative to storm sewers to partially treat water quality, attenuate flooding potential, and convey storm water away from critical infrastructure.

Bulk density - is an indicator of soil compaction and soil health. It affects infiltration, rooting depth/restrictions, available water capacity, soil porosity, plant nutrient availability, and soil microorganism activity, which influence key soil processes and productivity. It is the weight of dry soil per unit of volume typically expressed in grams/cm^3. Total volume of surface soil is about 50% solids, mostly soil particles (45%), and organic matter (generally < 5%); and about 50% pore space which are filled with air or water.

Compost tea – is a liquid inoculant made by fermenting compost in water either aerobically or anaerobically, and used to enhance or restore soil and leaf surface microflora (Reference: the Compost Tea Brewing Manual, Soil Food Web, 2005.)

Constructed Wetland – is an artificial wetland created for the purpose of treating storm water runoff.

APPENDIX C.

DEFINITIONS

Control of invasive (plants) – the appropriate eradication, suppression, reduction, or management of invasive plant species populations, the prevention of the spread of invasive (plant) species from areas where they are present and taking steps such as the restoration of native or appropriate plant species and habitats to reduce the effects of invasive (plant) species and to prevent further invasion.

Landscape – is a geographic area including both the cultural and natural resources associated with an historic event, activity, or person or exhibiting other cultural or aesthetic values.

Design for Deconstruction – is the design of buildings or products to facilitate future change and eventual disassembly in (part or whole) for recovery of systems, components and materials.

Design program – is a narrative that provides a clearly stated vision of the project, the desired outcomes of the project.

Diameter at Breast Height (DBH) – is a standard method for determining the trunk diameter of a standing tree, typically measured in inches at 4.5 feet off the ground on the uphill side.

Ecoregion – refers to areas within which ecosystems (and the type, quality, and quantity of environmental resources) are generally similar.

Ecosystem Services – describes the goods and services provided by healthy ecosystems; for example, the pollination of crops by bees, bats, or birds, the flood protection provided by wetlands, or the filtration of air and water by vegetation and soils.

Habitat – is the natural environment in which an organism normally live, made up of physical factors such as soil, moisture, range of temperature, light and biotic factors such as food availability and presence of predators.

Healthy soils – soils that have not been significantly disturbed by previous human development activities, and exhibiting qualities such as soil horizons, bulk densities, organic matter and soil pH similar to the reference soil.

Integrated design team – consists of the University of Pittsburgh Facilities Management representative, professionals knowledgeable in sustainable landscape design, and other team members needed to meet unique requirements of a particular project.

Interpretive signage - is signage designed to inform I instruct the public about the workings of a particular landscape feature, activity or system.

APPENDIX C.

DEFINITIONS

Invasive species – is a plant or animal that is not native to the ecosystem under consideration or that causes or is likely to cause economic or environmental harm to human, animal, or plant health.

Mature stable compost – is a soil amendment that exhibits stable biological breakdown, completeness of aerobic composting, and high suitability for favorable plant growth.

Native plant community – are groups of plant species, composition, and structure typical of communities native to the EPA Level III ecoregion or known to naturally occur within 200 miles of the site. At least two references (or local reference sites) are need to determine the dominant plant species, relative species abundances, and other characteristic elements of a particular plant community.

Neonicotinoids – a systemic agricultural insecticide with a chemical structure similar to nicotine that acts on the central nervous system of insects

Organic matter – in the soil is carbon-containing material composed of both living organisms and dead, decomposing plant and animal matter. Soil organic matter content can be supplemented with compost or other decomposed plant or animal matter.

Permaculture – is the holistic development of agricultural ecosystems intended to be sustainable and self-sufficient.

Open grid pavement – is pavement that is less than 50% impervious and contains vegetation in open cells.

Raingarden – is a depression formed on a natural slope and planted with deep-rooted native plants and grasses designed to hold and absorb rainwater from nearby impervious services.

Riparian Buffer is the portion of the adjacent terrestrial ecosystem that directly affects or is affected by the aquatic environment including streams, rivers, lakes and other aquatic environments. A riparian buffer provides shade, intercepts runoff, and helps prevent erosion.

Snags - In forest ecology a snag refers to a standing, dead or dying tree, often missing a top or most of the smaller branches. In freshwater ecology it refers to trees, branches, and other pieces of naturally occurring wood found sunken in rivers and streams.

Soil Protection Zone – is an area protected by a fence or barrier for the purpose of preventing damage to existing healthy soils, and/or preventing damage caused by compaction to tree roots.

APPENDIX C.

DEFINITIONS

Severely disturbed soils – are soils where topsoil has been removed or is not present. They also include subsoils that are compacted such that the compaction levels exceed the maximum allowable bulk density.

Solar reflective index – is a measure of a material's ability to reject solar heat, as shown by a small temperature rise. Standard black (reflectance 0.05, emittance 0.90) = 0. And standard white (reflectance 0.80, emittance 0.90) = 100. Materials with the highest SRI are the coolest choices for paving.

Successional Vegetation – is a dynamic, competitive, evolutionary process where plant communities replace one another over time, starting with highly reproductive, unstable plant community and evolving towards a stable, community characterized by a high diversity of long-lived plants with low reproductive powers.

Sustainability – is the continuous effort to meet the needs of the present generation without compromising the ability of future generations to meet their needs (1987 UN Brundtland Report).

Sustainability Campus Landscape – is a stable and productive ecosystem that incorporates ecological, social, and economic factors in the design of landscapes in order to create a cohesive aesthetic and a sense of place within the campus. A sustainable landscape protects habitat, promotes native plant communities and biodiversity, provides storm water management, and contributes to the health and well-being of the University and the greater community.

View shed – is an area that is visible from a specific location.

Walkability audit – is a tool designed to broadly assess pedestrian facilities, destinations, and surroundings along and near a walking route and identify improvements to make the route more attractive, safe, and convenient to pedestrians.

Wetlands – are areas that are inundated or saturated by surface or groundwater capable of supporting vegetation adapted to saturated conditions.

Level III and IV Ecoregions of EPA Region 3

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregions are directly applicable to the immediate needs of state agencies, including the development of biological criteria and water quality standards and the establishment of management goals for nonpoint-source pollution. They are also relevant to integrated ecosystem management, an ultimate goal of most federal and state resource management agencies.

The approach used to compile this map is based on the premise that ecological regions can be identified through the analysis of the spatial patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity (Wiken 1986; Omernik 1987, 1995). These phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. The relative importance of each characteristic varies from one ecological region to another regardless of the hierarchical level. A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions (Commission for Environmental Cooperation Working Group 1997). At level III, the continental United States contains 104 regions (United States Environmental Protection Agency [USEPA],1998). Level IV is a further subdivision of level III ecoregions. Explanations of the methods used to define the USEPA's ecoregions are given in Omernik (1995), Griffith and others (1994), and Gallant and others (1989).

The level III and IV ecoregion map on this map was compiled at a scale of 1:250,000 and depicts revisions. It revises and subdivides earlier level III ecoregions that were compiled at a smaller scale (USEPA 1998; Omernik 1987). It includes previously published level IV ecoregions (Woods and Omernik, 1996; Woods and others, 1996). It expands level IV coverage to include, for the first time, western West Virginia and the Coastal Plain and Piedmont of Delaware, Maryland, and Virginia. **Compilation of this map was part of a collaborative project with the United States Environmental Protection Agency (EPA) Region III Environmental Services Division, the EPA National Health and Environmental Effects Research Laboratory (NHEERL), and state environmental resource management agencies from Pennsylvania, Virginia, Maryland, and West Virginia.**

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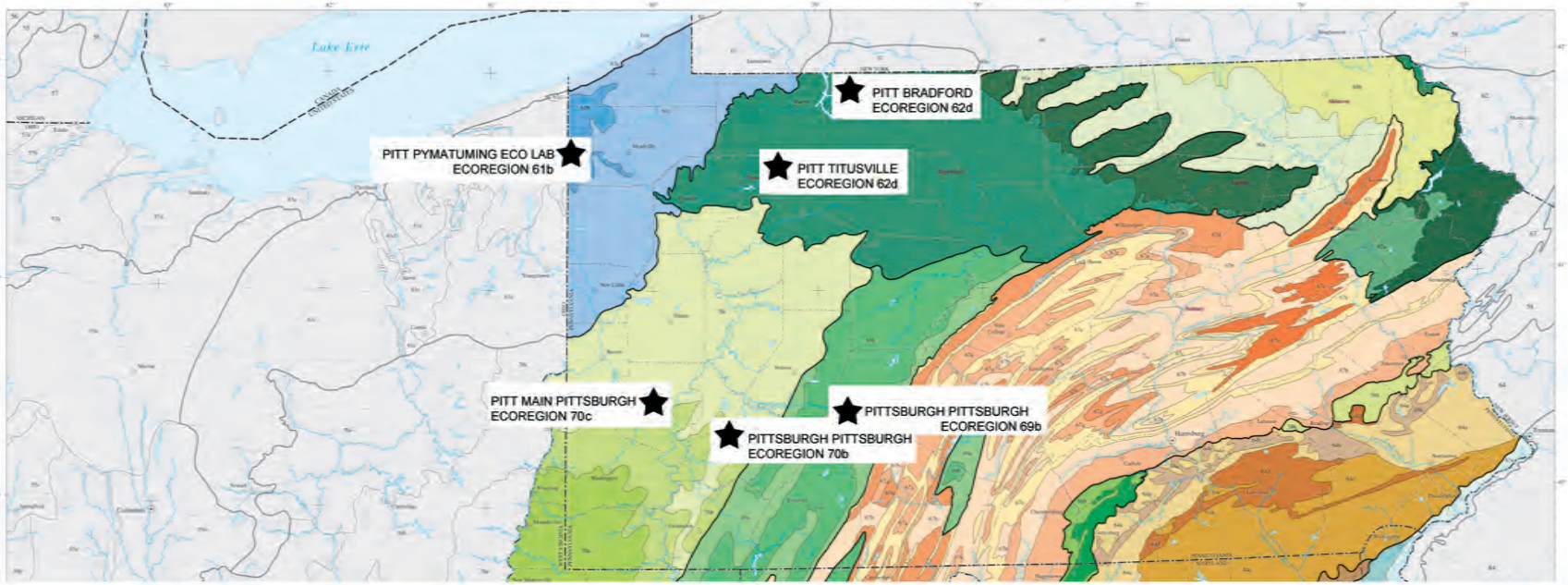


45 Piedmont
45c Carolina Slate Belt
45e Northern Inner Piedmont
45f Northern Outer Piedmont
45g Triassic Basins

58 Northeastern Highlands
58b Reading Prong

60 Northern Appalachian Plateau
60a Glaciated Low Plateau
60b Northeastern Uplands

61 Erie/Ontario Drift And Lake Plains
61b Mosquito Creek/Pymatuning Lowlands
61c Low Lime Drift Plain

62 North Central Appalachians
62a Pocono High Plateau
62b Low Poconos
62c Glaciated Allegheny High Plateau
62d Unglaciated Allegheny High Plateau
62e Low Catskills

63 Middle Atlantic Coastal Plain
63a Delaware River Terraces and Uplands
63b Chesapeake-Pamlico Lowlands and Tidal Marshes
63c Swamps and Peatlands
63d Virginian Barrier Islands and Coastal Marshes
63e Mid-Atlantic Flatwoods
63f Delmarva Uplands

SCALE 1:1 000 000

Albers Equal Area Projection

64 Northern Piedmont
64a Triassic Lowlands
64b Diabase and Conglomerate Uplands
64c Piedmont Uplands
64d Piedmont Limestone/Dolomite Lowlands

65 Southeastern Plains
65m Rolling Coastal Plain
65n Chesapeake Rolling Coastal Plain

66 Blue Ridge
66a Northern Igneous Ridges
66b Northern Sedimentary and Metasedimentary Ridges
66c New River Plateau
66d Southern Crystalline Ridges and Mountains
66e Southern Sedimentary Ridges
66f Limestone Valleys and Coves

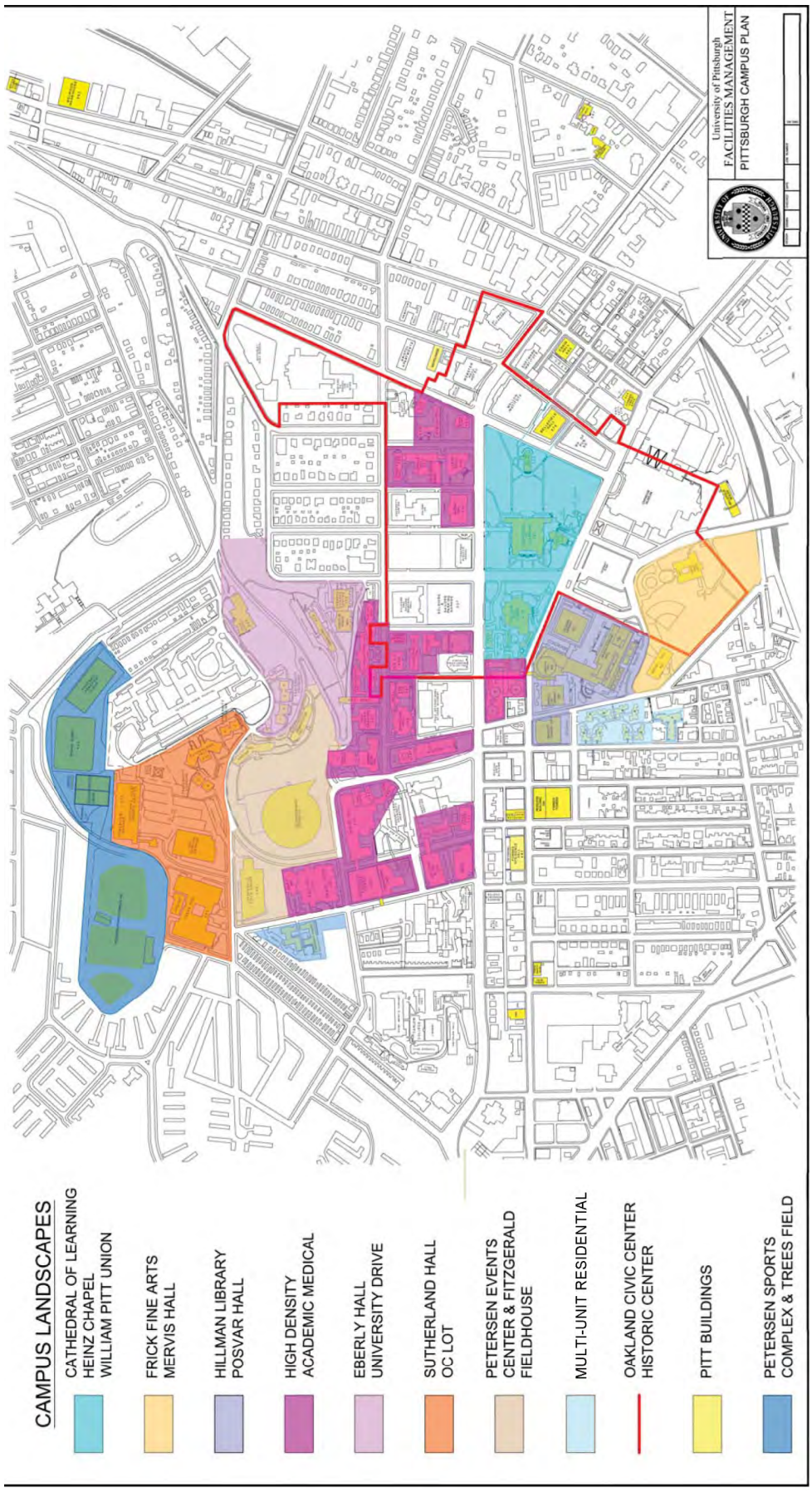
Level III Boundary
Level IV Boundary
State Boundary
County Boundary

67 Ridge and Valley
67a Northern Limestone/Dolomite Valleys
67b Northern Shale Valleys
67c Northern Sandstone Ridges
67d Northern Dissected Ridges
67e Anthracite Subregion
67f Southern Limestone/Dolomite Valleys and Low Rolling Hills
67g Southern Shale Valleys
67h Southern Sandstone Ridges
67i Southern Dissected Ridges and Knobs

69 Central Appalachians
69a Forested Hills and Mountains
69b Uplands and Valleys of Mixed Land Use
69c Greenbriar Karst
69d Dissected Appalachian Plateau
69e Cumberland Mountain Thrust Block

70 Western Allegheny Plateau
70a Permian Hills
70b Monongahela Transition Zone
70c Pittsburgh Low Plateau

83 Eastern Great Lakes and Hudson Lowlands
83a Erie Lake Plain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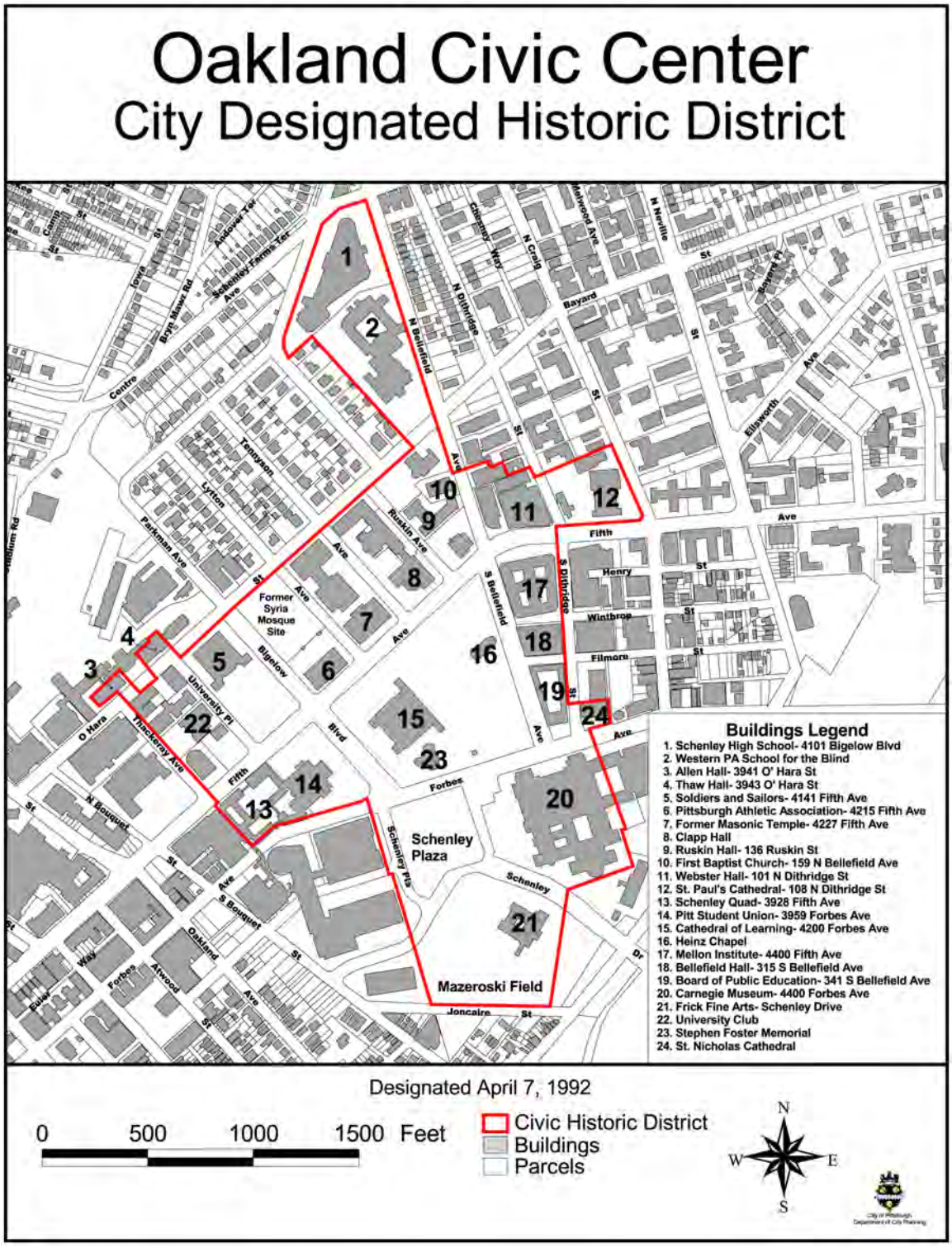
PITTSBURGH CAMPUS PLAN
CAMPUS LANDSCAPES
CATHEDRAL OF LEARNING
HEINZ CHAPEL
WILLIAM PITT UNION
FRICK FINE ARTS
MERVIS HALL
HILLMAN LIBRARY
POSVAR HALL
HIGH DENSITY
ACADEMIC MEDICAL
EBERLY HALL
UNIVERSITY DRIVE
SUTHERLAND HALL
OC LOT
PETERSEN EVENTS
CENTER & FITZGERALD
FIELDHOUSE
MULTI-UNIT RESIDENTIAL
OAKLAND CIVIC CENTER
HISTORIC CENTER
PITT BUILDINGS
PETERSEN SPORTS
COMPLEX & TREES FIELD


Oakland Civic Center
City Designated Historic District
Buildings Legend
1. Schenley High School- 4101 Bigelow Blvd
2. Western PA School for the Blind
3. Allen Hall- 3941 O' Hara St
4. Thaw Hall- 3943 O' Hara St
5. Soldiers and Sailors- 4141 Fifth Ave
6. Pittsburgh Athletic Association- 4215 Fifth Ave
7. Former Masonic Temple- 4227 Fifth Ave
8. Clapp Hall
9. Ruskin Hall- 136 Ruskin St
10. First Baptist Church- 159 N Bellefield Ave
11. Webster Hall- 101 N Dithridge St
12. St. Paul's Cathedral- 108 N Dithridge St
13. Schenley Quad- 3928 Fifth Ave
14. Pitt Student Union- 3959 Forbes Ave
15. Cathedral of Learning- 4200 Forbes Ave
16. Heinz Chapel
17. Mellon Institute- 4400 Fifth Ave
18. Bellefield Hall- 315 S Bellefield Ave
19. Board of Public Education- 341 S Bellefield Ave
20. Carnegie Museum- 4400 Forbes Ave
21. Frick Fine Arts- Schenley Drive
22. University Club
23. Stephen Foster Memorial
24. St. Nicholas Cathedral
Schenley Plaza
Mazeroski Field
Former Syria Mosque Site
Designated April 7, 1992
0 500 1000 1500 Feet
Civic Historic District
Buildings
Parcels
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