

Dickinson Landscape Design Guidelines

Dickinson is committed to educating for a sustainable world, reducing our ecological footprint, cutting our net emissions greenhouse gases to zero, and advancing sustainability goals globally, nationally and in the communities in which we reside, work and study. Our commitment follows from our long-standing mission – to prepare young people, by means of a useful education in the liberal arts and sciences, for engaged lives of citizenship and leadership in the service of society.



Guidelines Team + Acknowledgements

Dickinson College Acknowledgements

Nancy Roseman, President

Steering Committee

Sylvia Smith, Board of Trustees

Finance + Administration

Bronte D. Jones, Vice President for Finance and Administration Vicki Rotz, Executive Assistant **Thomas Queenan**, Former Vice President for Finance + Administration

Operations + Facilities Management

Ken Shultes, Associate Vice President for Campus Operations + **Director of Facilities Management** Randall Nenninger, Manager of Grounds Scott Nobel, Campus Arborist

Marketing + Communications

Stephanie Balmer, Vice President for Enrollment, Marketing +Communications + Dean of Admissions Kim Nichols, Director of Design Services

Landscape Design Guidelines Team

Dickinson College Steering Committee

Sylvia Smith Ken Shultes Randall Nenninger

Andropogon Associates

Manisha Kaul, Principal-in-charge Emily McCoy, Project Manager and Landscape Architect Marin Braco, Landscape Designer Donna Shumpert, Landscape Designer Ekta Gupta, Landscape Designer

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Dickinson **ndropogon**

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Introduction

Purpose + Goals

The purpose of the Landscape Management Guidelines and Landscape Management Plan is to provide Dickinson College a flexible, yet unifying framework for the design and management of the landscape. This guidance aims to balance several goals from the various stakeholders:

- Honor the character-defining features of the historic Dickinson College Campus,
- Unify the aesthetic of the Campus through material choices, and
- Reflect the values of the College through design and management, including the College's commitment to sustainability

Additionally, the purpose of the document is to serve as a "living document," a document which evolves and updates overtime as lessons are learned after implementation. The selection of this format is a recognition that master planning efforts never end at the time of printing and that such documents' purpose are not to be a prescriptive means to an end, but a flexible framework that communicates a conceptual framework to achieve one's goals and a canvas for record keeping.

Use

The guidelines are meant to be used by design teams and the university to ensure consistency in landscape design choices throughout the campus. The guidelines are not meant to restrict creativity or individual expression in building architecture and their immediate surroundings. The guidelines should be used to establish baselines for sustainability goals.

Scope

The scope of this effort is divided into 4 scope items:

- 1. Data Collections, Inventory + Review of Existing Information/ Reports
- 2. Site Analysis + Initial Recommendations
- 3. Landscape Design Guidelines Booklet
- 4. Landscape Management Plan

Process

The process of this effort to-date has occurred over the course of a year-and-a-half. Within that time frame, there have been a series of project update meetings, milestone presentations, and site visits with the Guidelines Team as listed below. The Steering Committee met at critical times within each phase to make major decisions. All meeting agendas, meeting notes, and site visit documentation can be found in the appendices.

Data Collections, Inventory + Review of Existing Information/ Reports

June 13, 2012	Site Visit
June 28, 2012	Site Visit
July 18, 2012	Campus Guidelines Kick-off and P

Site Analysis + Initial Recommendations

July 18, 2012	Site Visit
August 3, 2012	Initial Recommendations for Paver
August 23, 2012	Stafford-Kline-Guidelines Meeting
September 7, 2012	Initial Recommendations for Hards
October 22, 2012	Material and Site Furnishing Revie
February 20, 2013	Update-Tasks A and B 95% Comp

Landscape Design Guidelines Booklet and Landscape Management Plan

April 4, 2013	Planting, Signage and Hardscape
November 8, 2013	Landscape Design Guidelines Upo

* Indicate steering committee meetings

resentation*

- ment Systems Presentation*
- and Presentation and Site Visit
- scape Systems Presentation and Site Visit*
- w Presentation
- oletion
- Guidelines Progress Presentation date Presentation*

Introduction

Sustainability Goals



Dickinson College

- Adhere to sustainability goals set forth in the Master Plan and Dickinson Dimensions
- Create material palettes that create a unified outdoor environment and reflect the unique character of the College and region



Materials



Climate + Energy

- Contribute to the President's Climate Commitment (ACUPCC) and aim for net-zero carbon emissions
- Reduce emissions
- Increase tree canopy cover and protect existing trees to sequester carbon and cool buildings



Healthy Community

- oriented campus
- and support social activity



Ecology

- Reduce stormwater runoff and improve stormwater quality
- Create habitat for native wildlife that is also aesthetically pleasing

• Choose landscape materials that are local and have a low impact on the environment • Limit waste by reusing, recycling and composting

• Create a healthy environment for employees,

students and visitors Support a safe, pedestrian-

• Create spaces for passive and active recreation

• Be good neighbors by minimizing 'spillover' impacts to neighboring properties

• Create outdoor spaces that are educational

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Part II: Landscape Design Guidance

Character Zones

Overall





Character Zones

Existing Character















Inventory | Historic Campus



S.No.	MATERIALS	HISTORIC CAMPUS	HISTORIC CAMPUS
		(sq km)	(%)
1	ASPHALT	0.6018	47.21 %
2	ASPHALT-CONCRETE COMBO	0	0.00 %
3	BLUESTONE	0.0211	1.66 %
4	BRICK	0.0078	0.61 %
5	CONCRETE	0.5208	40.86 %
6	CONCRETE PAVER- BRICK COLOR	0.0071	0.56 %
7	CONCRETE PAVER - HEXAGONAL	0.0473	3.71 %
8	CONCRETE PAVER PARISIAN	0.0284	2.23 %
9	GRANITE PAVERS	0.0327	2.57 %
10	GRASS PAVERS	0.0077	0.60 %



Inventory | West Campus





S.No.	MATERIALS	ATHLETICS	ATHLETICS
		(sq km)	(%)
1	ASPHALT	3.3885	77.27 %
2	ASPHALT-CONCRETE COMBO	0	0.00 %
3	BLUESTONE	0	0.00 %
4	BRICK	0.0738	1.68 %
5	CONCRETE	0.921	21.00 %
6	CONCRETE PAVER- BRICK COLOR	0	0.00 %
7	CONCRETE PAVER - HEXAGONAL	0	0.00 %
8	CONCRETE PAVER PARISIAN	0.0018	0.04 %
9	GRANITE PAVERS	0	0.00 %
10	GRASS PAVERS	0	0.00 %



Inventory | Expanded Core





S.No.	MATERIALS	EXPANDED CORE	EXPANDED CORE
		(sq km)	(%)
1	ASPHALT	2.4203	77.11 %
2	ASPHALT-CONCRETE COMBO	0.1305	4.16 %
3	BLUESTONE	0	0.00 %
4	BRICK	0	0.00 %
5	CONCRETE	0.5759	18.35 %
6	CONCRETE PAVER- BRICK COLOR	0.0046	0.15 %
7	CONCRETE PAVER - HEXAGONAL	0.0013	0.04 %
8	CONCRETE PAVER PARISIAN	0	0.00 %
9	GRANITE PAVERS	0.0061	0.19 %
10	GRASS PAVERS	0	0.00 %

Asphalt - 77.11%

Granite pavers - 0.19% Concrete paver (hexagonal) - 0.04% Concrete paver (brick color) - 0.15% Concrete paving - 18.35% Asphalt - Concrete Combo - 4.16%

Inventory | Residential





S.No.	MATERIALS	RESIDENTIAL	RESIDENTIAL
		(sq km)	(%)
1	ASPHALT	2.2043	62.05 %
2	ASPHALT-CONCRETE COMBO	0.3012	8.48 %
3	BLUESTONE	0	0.00 %
4	BRICK	0.0009	0.03 %
5	CONCRETE	0.992	27.93 %
6	CONCRETE PAVER- BRICK COLOR	0.0243	0.68 %
7	CONCRETE PAVER - HEXAGONAL	0.002	0.06 %
8	CONCRETE PAVER PARISIAN	0	0.00 %
9	GRANITE PAVERS	0.0275	0.77 %
10	GRASS PAVERS	0	0.00 %

Asphalt - 77.11%

Granite pavers - 0.19% Concrete paver (hexagonal) - 0.04% Concrete paver (brick color) - 0.15% Concrete paving - 18.35% Asphalt - Concrete Combo - 4.16%

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Proposed Paving Materials

CHARACTER ZONE	DOMINANT PATH MATERIALS	DOMINANT PLAZA MATERIALS
Historic	Granite Cobble, Asphalt Pavement, Asphalt Paver	Granite Cobble, Granite Paver, Bluestone
Expanded Core + Residential	Granite Cobble, Asphalt Pavement, Asphalt Paver	Granite Cobble, Granite Paver
Athletics, West Campus + High Street	Concrete Pavement, Brick Paver, Limestone (adjacent to walls only)	Concrete Pavement, Brick Pavers, Granite Paver
Connective Corridors	Granite Cobble, Asphalt Pavement, Asphalt Paver	Granite Cobble, Granite Paver



Proposed | Paving Materials



Proposed | Major Paving Materials



Proposed | Minor Paving Materials



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Connective Corridors | Proposed





Proposed | Connective Corridors- Primary Path/ Dickinson Walk



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Proposed | Dickinson Walk Plaza Concepts

Concept 1- Building Entrance Plazas



When an opportunity presents itself to renovate Dickinson Walk; whether it be to correct drainage problems, replace aging materials, or improve pedestrian safety; the renovation could occur in 2 phases (previous page). Phase I would include maintaining that section's alignment, but fine tuning the grading and drainage and replacing the pavement materials.

Phase II could include similar renovations of Phase I, or offer an opportunity to re-align the existing limit of Phase II to be continuously in-line with Phase I. This realignment would only be desireable if the majority of the exisiting, historic trees on the historic green could be protected. If this realignment in Phase II were desirable, it could offer an opportunity to either expand plazas in front of the existing buildings (concept 1- left) or add plazas at key intersection nodes (concept 2- left).

Dickinson Walk | Precedents











Dickinson Walk Concept



Proposed | Connective Corridors- Secondary Paths



Hardscape I

Proposed | Connective Corridors- Secondary Paths Option 1



2-Jumbo 1.5 Landscape Granite Blocks Option 3

6.5-12" x 6" Asphalt-Block Pavers Running Bond

2-Jumbo 1.5 Landscape Granite Blocks



2-Jumbo 1.5 Landscape Granite Blocks 1- Jumbo

Pattern Options for Secondary Walkways

6.5-12" x 6" Asphalt-Block Pavers

1.5 Landscape Granite Blocks 1- Jumbo

Option 2



Triple Soldier Course Jumbo Blocks

6.5-12" x 6" Asphalt-Block Pavers Running Bond

Triple Soldier Course Jumbo Blocks

Proposed | Connective Corridors- Secondary Paths and Major Building Entrances



Paths, Plazas and Alcoves- Granite Cobble Alcove Option

Proposed | Connective Corridors- Secondary Paths and Major Building Entrances



Paths, Plazas and Alcoves- Limestone Aggregate Alcove Option

Proposed | Connective Corridors- Secondary Paths and Major Building Entrances



Paths, Plazas and Alcoves- Recycled Concrete Alcove Option

Proposed | Connective Corridors- Secondary Paths and Major Building Entrances



Paths, Plazas and Alcoves- Granite Cobble Alcove Option

Proposed | Connective Corridors- Secondary Paths and Major Building Entrances



Paths, Plazas and Alcoves- Limestone Aggregate Alcove Option

Proposed | Connective Corridors-Tertiary Paths





Proposed | Connective Corridors-Tertiary Paths





1-Jumbo Granite Cobble

Asphalt Pavement

1-Jumbo Granite Cobble



1-Jumbo Granite Cobble

6-12" x 6" Asphalt Block Pavers

1-Jumbo Granite Cobble

1-Jumbo Granite Cobble

6- 12" x 6" Asphalt Block Pavers

Option 2- approx. 8' wide



1-Jumbo Granite Cobble

Asphalt Pavement



1-Jumbo Granite Cobble

1-Jumbo Granite Cobble

Proposed | Curb Ramp Locations



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Hardscape

Proposed | Curb Ramp Materials





VA Mist, NC Granite





Basalt Black Granite, Hanover



Mount Airy Granite, NC Granite



Asphalt Paver, Hanover

Unit Paving and Aggregate Paving

All details in this section are intended for preliminary design only. They are not to scale (N.T.S) and are not intended for bid or construction purposes. They are subject to modification based on design calculations, local practices, and all applicable codes and regulations.

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SCORE JOINT

CONTRACTION JOINT

Concrete Pavement Joints Not for Construction

Concrete Pavement (Vehicular) Not for Construction



Unit Paving and Aggregate Paving





Concrete Unit Pavement Band on Aggregate Base Not for Construction





Concrete Unit Pavement Band on Concrete Base Not for Construction

Salvaged Concrete Pavement Not for Construction



6" - 12" JOINT FILLED WITH COMPACTED AGGREGATE

CONCRETE PAVERS CUT INTO RANDOM RECTANGULAR SHAPES FROM EXISTING SALVAGED CONCRETE

SAND SETTING BED NONWOVEN GEOTEXTILE

AGGREGATE BASE

WOVEN GEOTEXTILE

PREPARED SUBGRADE





Porous Unit Pavers (Pedestrian/Vehicular) Not for Construction Porous Concrete Pavement (Pedestrian/Vehicular) Not for Construction





Bluestone Pavement on Concrete Base Not for Construction

Porous Asphalt Pavement (Pedestrian/Vehicular) Not for Construction POROUS CONCRETE PAVEMENT WITH FIBER REINFORCEMENT

DRAINAGE COURSE

LEVEL BED BOTTOM

PREPARED SUBGRADE

 BLUESTONE PAVERS WITH POLYMERIC
SAND-SWEPT JOINTS

SAND SETTING BED

- NONWOVEN GEOTEXTILE

CONCRETE BASE WITH 2" DIAMETER WEEP HOLES AT 4'-0" O.C. FILLED WITH COARSE SAND

AGGREGATE BASE COURSE

WOVEN GEOTEXTILEPREPARED SUBGRADE

Unit Paving and Aggregate Paving





Bluestone Stepstone Not for Construction



Bluestone Pavement on Aggregate Base (Pedestrian/Vehicular)



Asphalt-Block Pavement on Bituminous Base (Pedestrian/Vehicular) Not for Construction

Asphalt Pavement (Light Duty) Not for Construction

Not for Construction



ASPHALT BLOCK PAVERS WITH SAND SWEPT JOINTS

NEOPRENE- MODIFIED ASPHALT ADHESIVE

BITUMINOUS SETTING BED

BITUMINOUS BINDER COURSE

PRIMER

AGGREGATE BASE COURSE

WOVEN GEOTEXTILE PREPARED SUBGRADE



WHERE EXISTING CONDITIONS DO

NOT ALLOW FOR IT



Granite-Unit Pavement Not for Construction

Porous Granite-Unit Pavement (Pedestrian) Not for Construction



Granite-Block Pavement on Aggregate Base (Pedestrian/Vehicular) Not for Construction

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GRANITE PAVERS WITH POLYMERIC SAND-SWEPT JOINTS

SAND SETTING BED NONWOVEN GEOTEXTILE

AGGREGATE BASE COURSE

WOVEN GEOTEXTILE PREPARED SUBGRADE

Unit Paving and Aggregate Paving



Granite - Block Edge: Obtuse Angle Corner Detail Not for Construction



CUT GRANITE BLOCK AT RADIUS UNDER 10', TYP.

TYPICAL GRANITE BLOCK EDGE

PAVEMENT MATERIAL VARIES

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Granite Curb Ramp



Raised Crosswalk

GRANITE EDGE GRADE NOT TO EXCEED ALGEBRAIC DIFFERENCE OF 8 WITH GRADES IN/OUT ASPHALT BASE

REINFORCED CONCRETE BASE

AGGREGATE BASE COURSE

WOVEN GEOTEXTILE PREPARED SUBGRADE

ASPHALT BLOCK PAVERS GRANITE EDGE

Curb Ramps



Concrete Curb Ramp with Granite Not for Construction

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Unit Paving and Aggregate Paving



Accessibility Ramp Not for Construction



Aggregate Pavement Not for Construction

Crushed Gravel Pavement Not for Construction

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AGGREGATE BASE COURSE

PREPARED SUBGRADE

NONWOVEN GEOTEXTILE

Not for Construction





6"

Granite Walkway Curb at Planting Edge Not for Construction

 MATERIAL VARIES
 GRANITE

CONCRETE BACKING, CONTINUOUS

AGGREGATE BASE COURSE

WOVEN GEOTEXTILE

CONCRETE CHAIR AT JOINTS AND MIDSECTION IF CURB LENGTH

PREPARED SUBGRADE

CONCRETE BACKING, CONTINUOUS

AGGREGATE BASE COURSE

WOVEN GEOTEXTILE CONCRETE CHAIR AT JOINTS AND **MIDSECTION IF CURB LENGTH EXCEEDS 7'** PREPARED SUBGRADE

Stone Curbs and Stone Steps



Edge Restraints



Metal Edge Restraint Not for Construction





Crushed Gravel Pavement with Granite-Block Edge Not for Construction

Grasnite-Block Edge Restraint Not for Construction

GRADED CRUSHED STONE AGGREGATE

GRANITE BLOCK SET IN CONTINUOUS CONCRETE BASE WITH REBAR



Miscellaneous Stone Work





Boulders in Landscape Not for Construction

Stone Drip Strip with Metal Edge Not for Construction





Stacked Boulders at Steps Not for Construction

Stone Mulch Not for Construction

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NOTE: 1. BURY BOULDER ¹/₃ BELOW GRADE

TOP STEP BEYOND, RELATIONSHIP TO BOULDERS VARIES

BOULDER WITH NATURAL CLEFT FINISH

PREPARED SUBGRADE

NOTE:

NONWOVEN GEOTEXTILE 12" THICK DRAINAGE STONE

WRAPPED IN NONWOVEN GEOTEXTILE

1. BURY BOULDERS $\frac{1}{3}$ BELOW GRADE

FINISH GRADE, MATERIAL VARIES

FINISH, 36" TO 60"

BOULDERS WITH NATURAL CLEFT

Miscellaneous Stone Work



NOTE: 1. OUTLETS FOR ROUND PIPES SIMII AR WITH ADDITIONAL 6" TOP

Stone Inlet and Outlet Not for Construction

Fences and Screens





Decorative Metal Fence Not for Construction





Chain Link Fence Not for Construction

Not for Construction

Decorative Metal Gate Not for Construction

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	FENCE POST
	FINISH GRADE
	SLOPE TOP OF FOOTING
_	
	PLANTING SOIL
	REINFORCED CONCRETE
	FOOTING
	STEEL TERMINAL POST (TYP)
	STEEL MESH
	TRUSS ROD
	STEEL INTERMEDIATE POST (TYP)
7	
	MATERIAL VARIES

Fences and Screens



All details in this section are intended for preliminary design only. They are not to scale (N.T.S) and are not intended for bid or construction purposes. They are subject to modification based on design calculations, local practices, and all applicable codes and regulations.

Metal Screen Enclosure Not for Construction

Specifications

SECTIO	ON 321313 - CONCRETE PAVING	1.4	FINISHING AND CURING
1.1	SUMMARY	А.	Pavement Finishes: Medium-to-fine-textured broom
А.	Driveways.	В.	Cure concrete by moisture curing, moisture-retaining
B.	Roadways.	1.5	FIELD QUALITY CONTROL
C.	Parking lots.	А.	Testing: By Owner-engaged agency.
D.	Curbs and gutters.	END O	F SECTION 321313
E.	Walks.	SECTI	ON 321400 - UNIT PAVING
1.2	QUALITY ASSURANCE		
А.	Quality Standard: ACI 301.	1.1	SUMMARY
B.	Mockups to demonstrate surface finish, texture, and color; curing; and standard of workmanship.	А.	Concrete pavers set in aggregate and bituminous sett
		B.	Salvaged concrete pavement set in aggregate setting
1.3	MATERIALS	C.	Asphalt-block pavers set in bituminous setting beds.
А.	Reinforcement:	D.	Stone pavers set in aggregate setting beds.
	1. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.	E.	Stone pavers set in mortar setting beds.
	 Welded Wire Reinforcement: Plain steel. Reinforcing Bars: [Deformed] [Epoxy-coated deformed] [Galvanized deformed] steel. 	F.	Aluminum edge restraints.
	4. Joint Dowel Bars: Epoxy-coated plain steel.	G.	Precast concrete curbs.
B.	Concrete:	12	OUALITY ASSURANCE
	 Portland Cement: ASTM C 150, gray. Normal-weight aggregate. Fly ash, pozzolan, blast-furnace, silica fume. 	А.	Mockups for each form and pattern of unit paver.
	 Air-entraining admixture. Compressive Strength: 4000 psi at 28 days. 	1.3	MATERIALS
	6. Detectable Warnings: Blockouts in concrete for detectable paving units.	А.	Regional Materials for LEED:
C.	Pavement Markings: Latex marking paint.		1. For products having recycled content, Credit M
D.	Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.		2. For products and materials required to comply
E.	Wheel Stops: Precast concrete with galvanized-steel dowels; or other hardware as standard with whel-stop manufacturer	В.	Concrete Pavers: Solid paving units.
			1. Manufacturers: Hanover Architectural Product

n finish.

g-cover curing, or curing compound.

ting beds.

beds.

MR 4

with requirements for regional materials, Credit MR 5

ets, Inc.; M1742, Finish 13.

Specifications

- Sizes: 2.
 - Pedestrian: a.
 - Thickness: 2-1/2 inches. 1)
 - Surface Dimensions/Shape: Maximum 36 inches; square or rectangular (not exceeding 1-1/2:1 2) proportion).
 - Vehicular: b.
 - 1) Thickness: 3 inches.
 - Surface Dimensions/Shape: Maximum 12 inches, square. 2)
- Salvaged Concrete Pavers: Solid units cut from Owner's existing concrete pavement. C.
- Asphalt-Block Pavers: Solid units with ground finish. D.
 - 1. Manufacturer: Hanover Architectural Products, Inc.; "Ground Tudor," Matrix #A80016.
 - 2. Sizes:
 - Pedestrian: а
 - Thickness: 2-1/2 inches. 1)
 - Surface Dimensions/Shape: 4 by 6 inches, 6 by 12 inches 2)
 - Vehicular: b.
 - Thickness: 3 inches. 1)
 - Surface Dimensions/Shape: 4 by 6 inches, 6 by 12 inches 2)
- E. Bluestone Pavers: Custom-cut paving units with thermal finish, made from quartz-based stone complying with ASTM C 616, Classification II Quartzitic Sandstone.
 - Manufacturers: Endless Mountain Stone Co., Susquehanna, PA. Color, "Light Grey Select." 1.
 - 2. Sizes:
 - Pedestrian: a.
 - Thickness: 2 inches 1)
 - 2) Surface Dimensions/Shape: Maximum 24 inches; square or rectangular (not exceeding 2:1 proportion).
 - b. Vehicular:
 - 1) Thickness: 3 inches.
 - Surface Dimensions/Shape: Maximum 12 inches; square or rectangular (not exceeding 1-1/2:1) 2)
- Bluestone Stepping Stones: Custom-cut paving slabs with thermal finish, made from quartz-based stone complying F. with ASTM C 616, Classification II Quartzitic Sandstone.
 - Manufacturers: Endless Mountain Stone Co., Susquehanna, PA. Color, "Light Grey Select." 1.
 - 2. Sizes:

- Thickness: 2-1/2 inches. a.
- b. proportion).
- G. Granite Pavers: Paving units made from granite with thermal finish, complying with ASTM C 615.
 - Products: 1.
 - Champlain Stone; "Woodcreek." a.
 - North Carolina Granite Corporation; "Virginia Mist." b.
 - North Carolina Granite Corporation; "Mt. Airy White." С.
 - 2. Sizes:
 - Pedestrian: a.
 - Thickness: 2 inches 1)
 - 2) proportion).
 - Vehicular: b.
 - Thickness: 3 (4) inches. 1)
 - 2)
- Rough-Stone Pavers: Rectangular tumbled granite blocks, with split faces and edges, made from granite complying H. with ASTM C 615.
 - Manufacturers: High Bridge Stone Co. 1.
 - 2. Color: Grey with fine grain.
 - 3. Finish: Light flame finish where indicated for ADA.
 - 4. Sizes:
 - 8 inches by 4 inches by 4 inches. a.
 - 10 inches by 7 inches by 4 inches. b.
 - 12 inches by 7 inches by 4 inches. C.
- I Edge Restraints: Aluminum.
 - Manufacturers: Permaloc Corporation; "Asphalt Edge." 1.
 - 2. Color: Black
- Curbs: Precast concrete. Made from normal-weight concrete with a compressive strength not less than 5000 psi and J. water absorption not more than 5 percent.
- K. Aggregate Setting-Bed Materials:
 - 1. 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
 - 2. Sand for Leveling Course: ASTM C 33.

Surface Dimensions/Shape: Maximum 24 inches; square or rectangular (not exceeding 1-1/2:1

Surface Dimensions/Shape: Maximum 24 inches; square or rectangular (not exceeding 2:1

Surface Dimensions/Shape: Maximum 12 inches; square or rectangular (not exceeding 1-1/2:1)

Graded Aggregate for Base: Graded mixture of gravel, crushed stone, and sand with 95 percent passing a

Specifications

	3.	Polymeric Sand for Joints: Manufacturer's mix of polymer binders and joint sand	SECTIO	DN 321343 – PERVIOUS CONCRETE PAVING
		a. Color: Grey.	1.1	SUMMARY
	4.	Separation Geotextile: Woven fabric.		
	5.	Drainage Geotextile: Nonwoven fabric.	А.	Driveways.
L.	Bitu	minous Setting-Bed Materials	B.	Roadways.
	1.	Sand for Setting Bed: Fine aggregate sand. ASTM D 1073, No. 2 or No. 3	C.	Parking lots.
	2.	Asphalt cement, ASTM D 3381 Neoprene-modified asphalt adhesive	D.	Walks.
	4.	Sand for Joints: Fine aggregate sand.Mortar Setting Bed:		
M.	Mor	tar Setting-Bed Materials	1.2	QUALITY ASSURANCE
	1.	Portland Cement-Lime and sand for setting-bed: Portand cement Type M complying with ASTM C 270,.	А.	Quality Standard: ACI 301 and ACI 522.
	2.	levelling course consisting of a mix of 1 part sand and 4 parts cement. Polymeric Sand for Joints: Manufacturer's mix of polymer binders and joint sand (Use only in bluestone application on concrete base and use sand-based product and not stone dust)	В.	Mockups to demonstrate surface finish, texture, and
		a. Color: Grev.	1.3	MATERIALS
			A.	Concrete:
1.4	INS	TALLATION		1. Portland Cement: ASTM C 150, gray, Type I/
A.	Join	t Pattern: As indicated		 Normal-Weight Aggregate: ASTM C 33, Clas Fly ash, pozzolan, ground granulated blast-fui
B.	Agg	regate Setting Bed:		4. Air-entraining admixture.
	1.	Aggregate base over compacted subgrade and geotextile.		5. Water-reducing admixture.
	2.	Leveling course of 1 to $1-1/2$ inches over geotextile.		7 Hydration stabilizer
	3.	Pavers set with 1/16- to 1/8-inch polymeric sand-inied joints.		
C.	Bitu	minous Setting Bed:	В.	Fiber Reinforcement: Monofilament, polypropylene.
	1. 2	Bituminous setting bed of 3/4-inch deep hot-mix asphalt on concrete slab or binder course.		
	2. 3.	Pavers placed with hand-tight, one part cement and three parts sand and fill joints after concrete has set.	1.4	INSTALLATION
D.	Mor	tar Setting Bed:	A.	Minimize shoveling and pulling concrete.
	1. 2	Portland Cement-Lime Setting-Bed Mortar: Type M complying with ASTM C 270. Leveling course of 1 to $1-1/2$ inches consisting of a mix of 1 part and 4 parts cement	B.	Strike-off with mechanical vibratory screed or hydra
	3.	Pavers placed with a minimum of 1/16 inch and a maximum of 1/8 inch joint width, one part cement and three parts sand and fill joints after concrete has set. Use polymeric sand in joints in case of bluestone	C.	Curing: Absorptive cover, moisture-retaining-cover
_		applications only.	1.5	FIELD QUALITY CONTROL
E.	Wet	Concrete Applications: Place payers before initial set of concrete occurs	*	Tooting Dr. Original and a discussion
	2.	Pavers placed with hand-tight, sand-filled joints.	А.	resting: By Owner-engaged agency.
	3.	Sweep sand-cement mix into joints until joints are filled. Force mix into joints to fill voids and refill joints.		
			END O	F SECTION 321343

56 END OF SECTION 321400 March 2014 d color; curing; and standard of workmanship.

/II. ss 5M; maximum ¹/₂-inch. urnace slag.

aulically actuated pipe roller.

curing or a combination of these.

Specifications

SECTION 321443 - POROUS UNIT PAVING

1.1	SUMMARY
٨	Danna navina accesiatina of whit navona act in ac

- Porous paving consisting of unit pavers set in aggregate setting beds. Α.
- Β. Porous paving consisting of unit pavers set on soil.
- Edge restraints for unit pavers. C.

QUALITY ASSURANCE 1.2

Mockups for each type and pattern of unit paver. А.

MATERIALS 1.3

Regional Materials: А.

- Pavers manufactured within 500 miles of Project site from aggregates extracted and manufactured within 1. 500 miles of Project site.
- Granite curbs manufactured within 500 miles of Project site from materials extracted and manufactured 2. within 500 miles of Project site.
- Aggregate and soil extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project 3. site.
- Concrete: Solid interlocking concrete pavers of shapes that provide openings between units. Salvaged concrete Β. paving units cut from Owner's existing concrete pavement
- Brick: Solid brick paves of shapes that provide openings between units. C.
- D. Edge Restraints: Aluminum.
- Graded Aggregate for Subbase: Open graded for stormwater storage. E.
- F. Graded Aggregate for Base: Well graded.
- Leveling Course: Sand for Leveling Course, ASTM C 33. Crushed stone. G.
- Paver Fill: Soil mix. Crushed stone. H.
- **INSTALLATION** 1.4
 - Aggregate subbase over compacted subgrade and geotextile. Α.
 - Β. Aggregate base over compacted subbase and geotextile.
 - Leveling course of 1 to 1-1/2 inches over geotextile. C.

Pavers filled with crushed stone or soil mix. D.

END OF SECTION 321443

SECTION 321217 - POROUS ASPHALT PAVING

- SUMMARY 1.1
 - A. Driveways.
 - Roadways. В.
 - Parking lots. C.
 - D. Walks.
- MATERIALS 1.2
- Asphalt Materials: A.
- В. Auxiliary Materials:
 - Paving Geotextile: Nonwoven polypropylene. 1.
 - Edge Restraint: L-shaped extruded aluminum. 2.
- С. area.
 - Bituminous Content: 5.75 to 6.0 percent by weight of total weight (dry aggregate) 1.
 - Binder Draindown: ASTM D 6390, maximum 0.3 percent. 2.
 - 3. Air Voids: Minimum 18 percent.
- **INSTALLATION** 1.3
 - Porous Hot-Mix Asphalt Paving: А.
 - Subgrade verified to support paving and imposed loads. 1.
 - 2. Single-Lift Course
 - Rolling limited to two passes. 3.

FIELD QUALITY CONTROL 1.4

Testing Agency: [Owner] [Contractor] engaged. А.

END OF SECTION 321217

1. Asphalt Binder: AASHTO M 320, performance grade binder 76-22; modified with elastomeric polymer.

Asphalt Mixes: Porous hot-mix asphalt plant mix, with history of satisfactory performance in the geographical

Specifications

SECTION 321216 - ASPHALT PAVING

- SUMMARY 1.1
 - Driveways. A.
 - Β. Roadways.
 - Parking lots. C.
 - Walks. D.

QUALITY ASSURANCE 1.2

Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of А. Commonwealth of Pennsylvania Department of Transportation (PENNDOT), Publication 408, latest revision with supplement, for asphalt paving work.

1.3 MATERIALS

- Asphalt Materials: А.
 - Asphalt Binder: AASHTO M 320, performance graded. 1.
 - Asphalt Cement: Class PG 64-22 complying with PADOT 408, Section 420.2 (a) 1 2.
 - Prime Coat: Asphalt emulsion. 3.
 - 4. Tack Coat: Emulsified asphalt.
 - 5. Fog Seal: Emulsified asphalt.
- Auxiliary Materials: В.
 - 1. Recycled Materials: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material.
 - 2. Herbicide.
 - 3. Paving Geotextile: Nonwoven polypropylene.

C. Mixes:

- Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less 1. than 10 percent or more than 15 percent by weight.
 - Surface Course Limit: No more than 10 percent by weight. a.
- Asphalt Mixes: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by PADOT; designed according to D. procedures in AI MS-2.
 - Base Course: Bituminous Binder Course ID-2 (Standard), complying with PADOT 408, Section 421. 1.
 - Surface Course: Bituminous Wearing Course ID-2 (Standard), complying with PADOT 408, Section 420. 2.

- Emulsified-Asphalt Slurry: ASTM D 3910. E.
- **INSTALLATION** 1.4
 - Cold Milling: 1-3 inches A.
 - Β. Patching Hot-Mix Asphalt Pavement: Base mix for full thickness of patch.
 - Patching Portland Cement Concrete Pavement with Hot-Mix Asphalt: C.
 - Cracked slabs broken and rolled. 1.
 - 2. Rocking slabs stabilized with pumped asphalt.
 - 3. surface layer.
 - D. Repairs to Existing Pavements: [Leveling course] [Cracks and joints filled].
 - Hot-Mix Asphalt Paving: E.
 - Subgrade proof rolled. 1.
 - Herbicide applied. 2.
 - Prime coat over unbound-aggregate base course. 3.
 - Base Course: As indicated 4.
 - 5. Surface Course: As indicated
 - F. Asphalt curbs.
- Asphalt Traffic-Calming Devices: Speed tables. G.
- H. Surface Treatment: Fog seal.
- FIELD QUALITY CONTROL 1.5
 - Testing: By Owner-engaged agency. А.

END OF SECTION 321216

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Badly cracked pavement excavated and filled with base mix for full thickness of patchand covered with

Specifications

SECTIO	ON 321500 - AGGREGATE PAVING	SECTIO	ON 321726 - TACTILE WARNING SURFACING
1.1	SUMMARY	1.1	QUALITY ASSURANCE
A.	Aggregate paving, pedestrian (ADA).	A.	Mockups for each type of tactile warning surfacing.
1.2	QUALITY ASSURANCE	B.	Accessibility Requirements: [The U.S. Architectural & ABA Accessibility Guidelines for Buildings and Facilit
A.	Mockups for each type of aggregate pavement.	1.2	MATERIALS
1.3	MATERIALS	A.	Regional Materials for LEED: For detectable warning un
A.	Regional Materials:	B.	Detectable Warning Granite Unit Pavers: Solid paving un
D	1. Aggregate extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.		1. Manufacturers: Hanover Architectural Products, In "Mt. Airy White.
В.	 AASHTO 10, unwashed. AASHTO 8, unwashed. 		2. Shapes and Sizes:a. Face Size: Nominal 12 by 12 inches.
C.	 Fines: Minus #200 (collector fines) Surface Course Mix: Volume basis: 1. AASHTO 10: 4 parts. 2. AASHTO 8: 4 parts. 3. Fines: 1 part. 	C. END O	 b. Thickness: 3 inches. Setting Bed: Aggregate or Mortar as indicated on details. F SECTION 321726
D.	Geotextile: Woven fabric, Class 2.		
E.	Edge Restraints: Aluminum.		
1.4 A.	INSTALLATION Aggregate drainage course over compacted subgrade and geotextile.	SECTIO	ON 321640 – STONE CURBS, EDGES AND STEPS
B.	Aggregate surface course drainage course; single lift; 3-4 inches thick.	1.1	SUMMARY
1.5	FIELD QUALITY CONTROL	A.	Stone curbs and edges.
А.	Testing Agency: Contractor engaged.	В.	Stone steps.
B.	Firmness and Stability Tests: Rotational penetrometer or narrow-wheeled bicycle or 40 pound stroller.	1.2	QUALITY ASSURANCE
END O	F SECTION 321500	А.	Mockups for each type of curb and edge.

Transportation Barriers Compliance Board's ADAities] [and] [ICC A117.1].

nit pavers.

nits, made from granite complying with ASTM C 615

nc. "Basalt Black"; North Carolina Granite Corporation;

Specifications

1.3	MATERIALS	1	.4	INS	TALLATION
А.	Regional Materials for LEED: For products and materials required to comply with requirements for region materials Credit MR 5 for materials that have been extracted, harvested, or recovered, as well as manufacture	nal ed,	A.	Cur	bs and Edges:
	with 500 miles of Project site.			1. 2.	Set on aggregate base with concrete chairs at jo
В.	Granite Curbs: Granite, ASTM C 615.		B.	Stor	ne Steps:
	1. Products:			1.	Mortar Setting Bed:
	a. North Carolina Granite Corporation; "Mt. Airy White."b. Swenson Granite Works; "Concord Gray."				a. Portland cement-lime.
	 Colors and Grains: White to light gray with medium grain. Dimensions: , minimum 3 feet long. Finish: Thermal top with split face. (Back Finish) 			2.	Step units placed with horizontal and vertical 3 (single component / multiple component), Grac substrate class O; Color to match color of grani
C.	Granite Edges: Granite, ASTM C 615.	E	END O	F SEC	CTION 321640
	1. Products:	ECTIO	ON 055	5213 -	PIPE AND TUBE RAILINGS
	a. North Carolina Granite Corporation; "Mt. Airy White."b. Swenson Granite Works; "Concord Gray."	.1	SUM	1MAR	Υ
	 Colors and Grains: White to light gray with medium grain. Dimensions: , minimum 3 feet long. Finish: Thermal on top with split face. 	A.	Stee	l pipe	and tube railings.
	5. (Back Finish)	.2	PER	FORM	AANCE REQUIREMENTS
D.	Granite Steps: Granite, ASTM C 615.	A.	Engi	neerin	ng design of railings by Contractor.
	1. Products:	3	FAR	RICA	TION
	a. North Carolina Granite Corporation; "Mt. Airy White."b. Swenson Granite Works; "Concord Gray."	Α.	Char	nges ir	Direction of Members: By bending or by inserting
	 Colors and Grains: White to light gray with medium grain. Dimensions: As indicated on drawings. Finish: Thermal on exposed faces 	B.	Con	nection	ns: Welded.
E	Concrete: Portland cement ASTM C 150	.4	MA	ΓERIA	LS
F.	Mortar: Portland cement, ASTM C 150, Type I or Type II. Hydrated lime, ASTM C 207, Type S.	A.	Regi	ional N	Materials for LEED:
G.	Grout: Job mixed, portland cement and sand; or prepackaged, standard sanded cement. (Color?)		1.	Con recy	nply with requirements for recycled content Cre- cled content plus one-half of preconsumer recycle
H.	Dowels: Stainless steel, Type 304.		2.	Con harv	nply with requirements for regional materials C vested, or recovered, as well as manufactured, with

joints and midsection.

3/8-inch joints filled with flexible joint material. Type S or M ade NS (non-sag), Class T (pedestrian/vehicular traffic), Joint nite

ting prefabricated fittings.

redit MR 4; Recycled Content of Steel: Postconsumer led content not less than 25 percent.

Credit MR 5 for materials that have been extracted, th 500 miles of Project site.

Specifications

- Stainless-steel pipe and tube railings; Type 316L. В.
 - Finish: Dull satin, No. 6. 1.
- C. Nonshrink, nonmetallic grout.
- 1.5 **INSTALLATION**
 - Set in formed or core-drilled holes; in nonshrink grout. A.
 - В. Base flange cover.

END OF SECTION 055213

SECTION 322113 – MISCELLANEOUS SITE STONEWORK

- **SUMMARY** 1.1
 - Stone drip strip. А.
 - Β. Boulders.
 - C. Stone benches.
- **QUALITY ASSURANCE** 1.2
 - Mockups for stone benches. A.
- MATERIALS 1.3
 - Regional Materials for LEED: А.
 - Β. Rounded Riverbed Gravel: Natural, local stone; natural colors.
 - Size Ranges: 1.
 - 1 inch to 3 inches. a.
 - b. 3 inches to 6 inches.
 - Sources: Pennsy Supply, Harrisburg, PA 2.
- Boulders and Stone Benches: Local limestone. C.
 - Sources: 1.

- Valley Quarries, Inc. a.
- Dickinson College's quarry b.
- 2. Sizes and Shapes: As indicated on Drawings.
- 3. Finish: As indicated on Drawings.
- Drainage Aggregate: Washed crushed stone, or crushed or uncrushed gravel; No. 57 stone. D.
- Edge Restraints: Aluminum. E.
 - 1. Product: Permaloc Corporation; "PermaStrip."
- F. Geotextile: Nonwoven.
- STONE FABRICATION 1.4
- Fabricate stone in sizes and shapes indicated. A.
- B. joint thickness not more than 1/16 - inch
- **INSTALLATION** 1.5
 - Stone Drip Strips: Α.
 - Drainage aggregate with perforated pipe on geotextile on prepared subgrade. 1.
 - Riverbed gravel over geotextile to depths as indicated on drawings. 2.
 - В. Boulders:
 - Drainage aggregate on geotextile on prepared subgrade. 1.
 - 2. Boulders placed on drainage aggregate and reviewed by Architect.
 - Stone Benches: C.
 - 1. Drainage aggregate on geotextile on prepared subgrade:
 - 2. Stone benches placed on compacted drainage aggregate and reviewed by Architect.

END OF SECTION 322113

SECTION 323119 - DECORATIVE METAL FENCES AND GATES

- SUMMARY 1.1
 - Decorative metallic-coated-steel tubular picket fences. A.
 - Swing gates. В.

Tolerances: Projection Tolerances not greater than ¹/₄-inch, variation in line not to exceed 3/8-inch and variation in

Specific	ations		
1.2	QUALITY ASSURANCE	C.	Horizontal Support: Rails.
А.	Mockups.	D.	Swing Gates: Steel.
		E.	Steel Finish: Zinc coated.
1.3	DECORATIVE METALLIC-COATED-STEEL TUBULAR PICKET FENCES	1.3	INSTALLATION
А.	Manufacturer: Ameristar Fence Products; "Montage Plus System."	А.	Chain-Link Fencing: ASTM F 567.
B.	ASTM F 2408 for industrial application (class).	B.	Post Setting: In concrete.
C.	Post Caps: Manufacturer's standard.		
D.	Picket Tops: Spear point shape.	END O	F SECTION 323113
E.	Picket Spacing: 4 inches clear, maximum.		
F.	Finish: Manufacturer's multi-stage pretreatment/wash, epoxy primer and acrylic topcoat.	SECTIO	ON 108200 – GRILLES AND SCREENS
1.4	GATES	1.1	SUMMARY
А.	Swing Gate Configuration: Single leaf and double leaf as indicated.	А.	Infill panels.
	1. Hinges: Hydraulic, self-closing.	B.	Banding and/or tube framing.
	2. Hardware: Magnetic gate lock, lever type, keyed, permitting operation from both sides of gate.	C.	Gates.
1.5	INSTALLATION	12	PERFORMANCE REQUIREMENTS
А.	Post Setting: In concrete.	Δ	Delegated design and engineering analysis by con
END O	E SECTION 222110	71.	Delegated design and engineering analysis by con
SECTIO	DN 323113 - CHAIN LINK FENCES AND GATES	1.3	QUALITY ASSURANCE
		A.	Mockups.
1.1	SUMMARY	1.4	METALLIC COATED METAL SODEEN
А.	Chain-link fences.	1.4	Menufacturen DemottDates Compression: "STL 1
В.	Swing gates.	A.	Manufacturer: BarnetiBates Corporation; STL-10
1.2	CHAIN-LINK FENCES AND GATES	В.	Materials:
А.	Fence Fabric: Steel wire mesh sized 2 inches.		 Main Bars: Formed louver aluminum extru Crossbars: Expanded tubular extrusions, AS Banding/Framing Pars: Pactongular alumin
B.	Posts and Rails: Light industrial strength; round shape.		5. Danung/Frammy Dars. Rectangular alumin

ntractor-engaged professional engineer.

00 System."

usion, ASTM B 221. STM B 210. num extrusions.

Specifications

- 4. Metals:
 - a. Aluminum Plate and Sheet: ASTM B 209.
 - b. Aluminum Extrusions: ASTM B 221.
 - c. Aluminum Castings: ASTM B 26
- C. Finish: Manufacturer's powder-coat system; black.

1.5 GATES

- A. Swing Gate Configuration: Single leaf and double leaf as indicated.
 - 1. Hinges: Hydraulic, self-closing.
 - 2. Hardware: Magnetic gate lock, lever type, keyed, permitting operation from both sides of gate.
 - 3. Cane Bolts.

1.6 INSTALLATION

A. Post Setting: In concrete.

END OF SECTION 108200

Lighting Proposed | Character







Existing Character



Historic Campus



Residential





Athletics & West Campus





Expanded Core

Traditional- to be maintained

Contemporary

65

Lighting

Proposed | Contemporary - Pedestrian





Location:	Carpinteria
California	

	Cost:	Medium
Jost: IVledium	2	N / 1'
	Cost:	Iviedium

Lamp Options: LED

Height Options: 13'-22'

Notes:

Symmetric or Asymmetric

Adjustable Reflector

LEED EA2: Optimize Energy Performance

LEED ER Credit 4: Recycled Content (34%)

Lighting

Proposed | Contemporary - Vehicular



/		
Kim Warp 9		
Location:	California	
Cost:	Medium	
Lamp Options:	LED	
Height Options:	12'-24'	
Notes:		
Dark Sky Compliant	t	
LEED EA2: Optimiz	e Energy Performance	
LEED ER Credit 4: I	Recycled Content (34%)	
)



Existing Conditions







Athletics & West Campus





Expanded Core





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Benches

Proposed | Contemporary

/	
Landscape Forms	
Neoliviano	
Location:	Kalamazoo, MI
Cost:	\$600 - 2020
Wood Options:	fsc black locust, fsc purple heart
Metal Options:	Aluminum
Notes:	100% Recyclable









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Benches

Proposed | Contemporary



Nooliviano Bench

To order Specify collection and product name. Select length, wood type, hacked or backless, and with or without intermediate arm. Specify surface mount, embedded or freestanding. Supports are cast aluminum. Backed bench comes standard with end arms. Bench ships fully assembled. FSD carbination woods available for 25% upcharge. Check Materials/Colors link on website for spacies.

description	size (d s h x l)	Promium Exterior Woods ou finish price (shipwi.)	Promium Interior Woods LF-80 price (sh)p.wt.)
Neoliviano Backless Bench, 24	20" x 17" x 24"	\$ 800 (78)	\$ 880 (78)
Neoliviano Backless Bench, 59*	20" x 17" x 59"	830 (150)	1090 (150)
Neoliviano Backless Bench, 118	-20' x 17' x 118'	1470 12280	1730 (228)
Neoliviano Backed Bench, 24	27° × 31° x 24°	760 (98)	1020 (98)
Neoliyiano Backed Bench, 69*	27" x 31" x 89"	1250 (196)	1510 (198)
Neoliyiano Backed Bench, 118 [*]	27" x 31" x 118"	1970 (279)	2230 (279)
Neoliviand Backed Bench, 118' w/center arm	27" x 31" x 118"	2020 (290)	2280 (290)



27" x 31" x 69"

Benches

Proposed | Traditional

Landscape Forms	
Wellspring	
Location:	Kalamazoo, MI
Cost:	\$530 - 1120*
Wood Options:	teak, fsc black locust*
Notes:	100% Recyclable
2.5	* extra cost for black locust- approx. times











Proposed | Traditional



Wellspring Bench

Wellspring bench design is protected by U.S. Patent Nos. D559,004; D564,247.

To order: Specify collection name, model description, length and seat height. Select freestanding or surface mount, and with or without center or intermediate arms. Bench comes standard in premium teak. Bench ships fully assembled with freestanding glides. Wellspring meets ANSI/BIFMA performance and safety standards.

description	size (d x h x i)	price (ship.wt.)		
Wellspring bench, 17.5" seat height, 24"	25° x 34° x 24°	\$ 530	(60)	
Wellspring bench, 19" seat height, 24"	25" x 36" x 24"	590	(60)	
Wellspring bench, 17.5" seat height, 48"	25" x 34" x 48"	800	(90)	
Wellspring bench, 19" seat height, 48"	25" x 36" x 48"	850	(90)	
Wellspring bench, 17.5" seat height, 72"	25" x 34" x 72"	1060	(115)	
Wellspring bench, 19" seat height, 72"	25° x 36" x 72"	1120	(115)	
Bike Racks and Shelters

Existing Conditions





Athletics & West Campus



Expanded Core

Historic Campus





Residential





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Bike Racks and Shelters

Proposed



Landscape Forms-Bola



Cora- Expo W Series Bicycle Rack

Waste Receptacles

Existing Conditions





Historic Campus



Expanded Core





Residential Use



Waste Receptacles

Proposed



Recycle Bin Decal

Band Outside of Receptacle



Not for Construction

Site Furnishings | Details









Bench - Wellspring (Landscape Forms) Not for Construction





Neolinanao Backless Bench (Landscape Forms) Not for Construction



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Site Furnishings I Details

Site Furnishings



STEEL CAP

FINISH

4 $\frac{1}{2}$ " OD STEEL TUBE WITH $\frac{1}{4}$ " WALL THICKNESS, WITH POWDERCOAT

MATERIAL VARIES

REINFORCED

CONCRETE

FOOTING



Cafe Table (Equinox Round Bistro Table) and Chairs (Florida Seating Chair AL-302 TK) Not for Construction



Metal Bollard Type A Not for Construction

য়া য

2'-11"

-0

CROWN CONCRETE 1⁄4" AT TOP REBAR, CENTERED IN CORE $5\frac{1}{2}$ " OD GALVANIZED STEEL PIPE FILLED WITH CONCRETE 3-0" ISOLATION JOINT MATERIALS VARIES MATERIAL VARIES 世日 3'-0" COMPACTED SUBGRADE REINFORCED CONCRETE FOOTING 4

Metal Bollard Type B Not for Construction Waste Receptacle

Bicycle Rack

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Site Furnishings I Details

Lighting



March 2014



SIDE

BOLLARD LIGHT

FINISH GRADE PLANTING

ALIGN DIAMETER OF FOOTING NECK WITH DIAMETER OF BASE PLATE

TOP OF FOOTING $\frac{1}{2}$ " Max. Above Finish grade



PLANTING SOIL

REINFORCED CONCRETE FOOTING 4 - #4

#3 TIES @ 1'-0"

PREPARED SUBGRADE

Site Furnishings I Details

Lighting



lighting facts

Light Output (Lumens)

Color Accuracy Color Rendering Index (CRI)

Light Color

product sent state and results

Registration Number (PRA-JVD118)

Model Number 0.0313040551052 Type: Outline pethylepital light

Lumens per Watt (Efficacy)

Warm White Bright White

All results are according to IESNA LM 79 2008: Approved Method for the Electrical and

Visit www.lightinglacts.com for the Label Reference Guide

Label references 30" luxrail fixture with a 55° beam spread in

High Output 3000K. Lighting Facts for additional beam spreads

and light output levels may be obtained from io Lighting.

easis: Neating of Solid-State Lighting. The U.S. Department of Energy (DOE) verified





Application

ANSI and ADA compliant, **Iuxrail** is an indoor/outdoor LED-based handrail that delivers functional illumination. Two intensities may be specified: standard output and high output. The standard light output version delivers illuminance levels appropriate for exterior applications (2 footcandles at grade) as well as for dark interior environments with low ambient illumination levels (e.g., themed environments, theatres and residential areas). The high output version delivers illuminance levels applicable to interior environments – providing in excess of 10 footcandles along the path of egress (ANSI required for stair treads). Independent photometric test reports and IES Format data are available at **www.iolighting.com**.

Iuxrail's standard handrail gripping surfaces are circular in cross section and meet 2004 ADAAG (Americans with Disability Act Accessibility Guidelines). Patented optical assemblies deliver 10°, 25°, and 55° beam spreads, as well as a 90° asymmetric option. The 25° and 55° beam patterns are most suitable for illuminating pathways, while the 10° beam spread offers accent lighting for optional glass or stainless steel cable railing infills. Reference page 54 of this catalog for information regarding infill options. **io** ensures that each LED is provided thermal and electrical management properties in accordance with the LED manufacturers recommendations. Projected average rated life is 50,000 hours at 70% of lamp lumen output. Contact factory for IES LM-80 compliance. To ensure proper performance, architectural details should allow for ventilation and air flow around the fixture. Ambient temperature surrounding the fixture shall not exceed 120°F (48.9°C).

Light Output

Two luminous intensities are available for white light. All values below are initial lumens per foot. IES LM-79 format files may be obtained from the factory or downloaded from **www.iolighting.com**.

	Standard Output	Mid Output	High Output	
2700K White:	63 lms/ft	171 lms/ft	234 lms/ft	
3000K White:	67 lms/ft	182 lms/ft	250 lms/ft	
3500K White:	71 lms/ft	194 lms/ft	265 lms/ft	
4000K White:	71 lms/ft	194 lms/ft	265 lms/ft	
5000K White:	80 lms/ft	217 lms/ft	296 lms/ft	

Construction

is lucal \$55, 36HO

292

14.4

20

83

2956 (Warm White)

Iuxrail may be post mounted or wall mounted. **io** recommends installation be completed by a qualified handrail installer. Mounting hardware (post or wall) is typically required up to 5' O.C., depending on the handrail alloy. Final post and wall bracket spacing must be determined by a licensed architect or structural engineer. **Iuxrail** is available in stainless steel and aluminum. **grab bars** are available in aluminum only. The lighting fixture component of the **Iuxrail** is a stand alone unit and is available in incremental nominal lengths that range from 6" to 60". Vandal resistant access chamber allows units to be removed for maintenance purposes.

All handrail component parts are engineered for quick installation. Field welding or cutting is typically not required. All parts are prefabricated to field dimensions and are assembled in the field with mechanical connection or epoxy. Contact **io** Lighting for recommended handrail installers.

The LED light fixture inside the caprail is UL Listed for wet locations. Handrail alloy options include stainless steel and aluminum. Contact factory for maintenance guidelines.

Electrical

Iuxrail houses a low voltage LED-based light fixture that is integrated into the underside of the handrail. 24 volt 100 watt power supplies are provided as a standard. For detailed information regarding daisy chain limitations, remote distance limitations, power supply options, and dimming options consult the **io** website **(www.iolighting.com)** or an **io** representative.

Driver Remote Distance

7'-0" (2.1m) w/22 AWG 18'-0" (5.5m) w/18 AWG 46'-0" (14.0m) w/14 AWG 71'-0" (21.6m) w/12 AWG

Dimming modules must be specified separately. For detailed information, see pages 106-107 of this brochure or download the power supply specification sheet from **www.iolighting.com**.

Power Consumption

Power consumption does not include power supply losses.

Handrail light Not for Construction

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Site Furnishings | Specifications

Specifications

SECTION 129300 - SITE FURNISHINGS

- SUMMARY 1.1
 - Chairs, benches and tables. Α.
 - В. Bicycle racks.
 - Bicycle locker/shelters. C.
 - D. Trash receptacles.
 - E. Bollard Types 1 and 2.

MATERIALS 1.2

- Adirondack Chairs: Owner's standard in size, configuration and color. A.
 - Installation Method: Free standing. 1.
- В. Benches:
 - Product: Landscape Forms; "Neoliviano," backless. 1.
 - 2. Frame: Cast aluminum, anodized.
 - Seat: FSC Black locust, unfinished; contoured. 3.
 - Dimensions: 17 inches high, 19 inches wide by 9 feet 10 inches long. 4.
 - 5. Installation Method: Anchored to substrate.
- Tables and Chairs: C.
 - Tables: 1.
 - Product: Barlow Tyrie; "Equinox Round Pedestal Table." a.
 - Frame: Stainless steel, Type 316. b.
 - Table Top: FSC Teak, parallel slats. c.
 - Dimensions: 39.75 inches diameter, 27.5 inches high. d.
 - Installation Method: Free standing. e.
 - 2. Chairs:
 - Product: Florida Seating; "FLS-A1-302." a.
 - Frame: Aluminum, anodized; with arms. b.
 - Seat and Back: Teak, ladder back. С.
 - d. Dimensions: 29 inches high, 19.5 inches wide, 18 inches deep.
 - Installation Method: Anchored to substrate. e.

- D. Bicycle Racks:
 - Product: Landscape Forms; "Bola." 1.
 - 2. Frame: Stainless steel, Type 304; manufacturer's "Electropolish" finish.
 - 3. Installation Method: Cast in concrete.
- E. Trash/Recycle Receptacles:
 - Product: Victor Stanley; "Ironsites Series" S-424 1.
 - 2. Facing Surrounds: Steel, parallel flat straps.
 - Support Frames: Steel. 3.
 - Lid with cable: Dual-flow lid for recycling receptacles, convex lids for trash only receptacles. 4.
 - 5. Capacity: 36 gal.
 - Finish: Galvanized and polyester-power coated 6.
 - a. Colors:
 - Facing and Frame: Black, blue band for recycling only receptacles. 1)
 - 2) Lid: black
 - Lettering/Graphics: 7.
 - Horizontal Band: a.
 - 1) Copy: "Recycle" Hoefler font, white color for recycle receptacles only
 - Lid: b.
 - 1)
 - Installation Method: Anchored to substrate. 8.
- F. Bollard Type A:
 - Product: Maglin Site Furniture Inc.; "MTB500-B1," fixed; "MTB500-B4," removable. 1.
 - Tubing: High-strength steel, 4.5-inch diameter. 2.
 - Dome top. 3.
 - Height: 36 inches. 4.
 - 5. Finish: Powder-coat, black.
 - 6. Installation Method: Cast in concrete.
- G. Bollard Type B:
 - Pipe: Schedule 40 steel pipe, galvanized. 1.
 - Height: 36 inches. 2.
 - 3. Installation Method: Anchored to substrate.

END OF SECTION 129300

Copy: "Recycle" and "Trash" white color for for dual-flow receptacles only

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Steps, Handrails, Ramps

Existing Conditions







85

























Place | Traditional



















Signage Wayfinding | Collegiate



















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Sustainable Features Integration











Wayfinding Regulatory









Graphic Design | Icons

Dickinson **Dickins** Dickinson Dickins/n Dickins









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Graphic Design | Dynamic Signage





Construction Signage



Building Features

Dickins alkfj lakdjf ;la;dlk a; lkdf; lk aldk fa;dl a ;dlkf alk a; a jljqaw3fkfyz Nblakstwoi ik;az va a; rakj valk;lak a ;ajfk ;zlks;ajff;gj e;ori ;zlfk vjs;origj ;ioj ffjv;asj;aerg ;sdfiy; ;s ;sisodrj g;lorj NTEXTUAL CIRCULATI

Systems Diagrams

Campus Map



Technology

Dickinson a;r ;akj v;alk;lak a ;aijf;k ;zlkc ;ori ;zlfk vjs;origj ;ioj ;fijv ;as

District Features



Forms | Modern Fleet





Options





Types | Identification

Purpose: This type of signage is used to mark entrances, gateways, buildings but can also express the character of the campus



Height range: 5-10'

Height range: 3-5'





Precedents

Secondary



Types | Orientation

Purpose: These signs display contextual maps of the entire campus





for use where vie allows visitor to lc



Horizontal

for use where space does not allow for an angled sign When information needs to be prominent



Height range: 3-4'



Height range: 5-7'

Precedents



Types | Directional

Purpose: These signs are used for wayfinding. They should be harmonious with surroundings while still remaining recognizable and obvious across the campus.



Can be designed for flexibility in number of signs to account for future growth of the campus.

Height range: 8-15'





Precedents





Types | Regulatory

Purpose: These signs will communicate campus rules and etiquette.



Tilted Regulation signs should be well integrated into the signage system, using the same typography and graphic language.

Height range: 2-3'

lease do not touc he artworks











Types | Sustainability

These signs will communicate natural processes and ecologically designed interventions across campus.





Systems Diagrams

to explain complex ecological process and engineering including rain gardens, green roofs, vegetative swales, permeable paving Height range: 3-4'





Height range: 3-4'

Precedents

Feature Labels

for individual plant indentification , native plant communities, sustainable materials and other smaller components





Material Palette



stainless steel



Pantone 186





Aluminum, black powder coat

glass





Planting

Planting Palette Concept

The image of Dickinson College and its character, today and in the past, has long been associated with the iconic architecture nestled within the grand setting of a cathedral-like outdoor environment, which can be attributed to the invaluable tree collection of the campus. Favorite places, such as the past "Lover's Lane" and Old West, cannot be imagined without the mature canopy trees that frame each important space. The campus's tree collection should be cherished and built upon for future generations, just as the founders of the College provided for us.

Additionally, Dickinson College has a long history as a college who places heavy emphasis on the importance of high quality outdoor environments. Starting at the beginning, Benjamin Rush, one of the founders of the College and the father of American psychiatry, was known for advocating for a clean environment, as he saw it closely tied to human health. Rush also started his profession as a physician and an apothecary and tinkered with botanical home remedies. Today, this tie to human health and the environment is still extremely relevant, although it has expanded from direct human health to indirect human health benefits, such as ecosystem services.

In order to extend the campus character into the future and fulfill the values of the College on the campus through the landscape, the landscape character and plant choices should be carefully considered. Three main goals of the landscape which support the guiding principles of the College should guide all landscape interventions. The landscape should support and enhance the following landscape approaches:

- Building on the Historic Arboretum and possibly expanding it to other parts of the campus
- Supporting the local ecology of the region by supplementing the horticultural plantings of the landscape with native plants in order to advance the habitat value of the campus
- Provide educational landscapes, to make the landscape part of the learning experience, and edible landscapes, to maintain the utilitarian view of the landscape and promote sustainable food systems.









Planting Palette Concept



Dickinson College Historic Arboretum

• Rush Campus Palette- 18th and 19th Century Campus Species

Native Plant Communities of the Region

- Reference Plant Communities- Mountain Creek, Tuscarora SP, LeTort Spring Run, Conodoguinet Creek, Cave Hill Nature Center, Mount Holly Marsh, Cactus Hill, Hoverter and Sholl Box Huckleberry Natural Area
- Seeps and Pools, Wet Meadow
- Floodplain and Wetland Forest
- Dry and Mesophytic Forest
- Shale and Limestone Bluffs
- Dry Woodland
- Quercus prinus (Quercus coccinea, Quercus velutina) Forest Alliance

Educational and Edible Gardens

- Food and Herb Gardens
- Department-specific Gardens



Planting

Existing Character







Existing Character









Planting Existing Landcover



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Opportunity Areas



Planting



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N
Service Landscape Character | Description



Service Landscape Character | Description





width 5ft +

trees 20'-25'o.c.

shrubs random scatter; approx. 17 per 2000 sq ft

small trees random scatter; approx. 5 per 2000 sq ft

width 5ft +

Service Landscape Character | Description





metal trellis

climbing vine

5ft min width

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Athletic - Recreational | Landscape Character Description





width 5ft - 15ft

Historic Arboretum Character | Description



Service Landscape Character | Description





Service Landscape Character | Description





width 5ft +

width 5ft +

trees 20'-25'o.c.

shrubs random scatter; approx. 17 per 2000 sq ft

small trees random scatter; approx. 5 per 2000 sq ft

Streetscape and Green Corridor | Character Description



Building Threshold or Educational Landscape | Imagery









- 1. PRUNE ONLY FOR CORRECTION, DO NOT THIN
- 2. AT END OF WARRANTY PERIOD, REMOVE SAUCER AND DISTRIBUTE, ADD, AND/OR **REPLACE MULCH AS NEEDED**

Planting



Plant Spacing Not for Construction



Reinforced Turf Pavement Not for Construction



Tree Protection





Root/Soil Protection-Heavy Duty Vehicles Not for Construction

Root/Soil Protection-Pedestrian Access Not for Construction



Root/Soil Protection-Light Duty Vehicles Not for Construction

Tree Protection



Utility Installtion in Tree Protection Zone Not for Construction

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Tree Protection



Tree Protection



Tree/ Root Protection Zone at New Retaining Wall Not for Construction

Speci	ications				
SECTIO	DN 329300 - PLANTS	1.5	FIELD CONDITIONS		
1.1	SUMMARY	А.	Planting Periods:		
A.	Plants.		1. Deciduous Trees, Shrubs and Vines:		
B.	Tree-watering devices.		a. Spring: March 1 to May 15.b. Fall: October 15 to November 30.		
1.2	QUALITY ASSURANCE		2. Evergreen Trees, Shrubs and Ground Covers:		
A.	Installer's Personnel Certifications: Landscape Industry Certified Technician - Exterior or Landscape Industry Certified Horticultural Technician.		a. Spring: March 1 to May 15.b. Fall: August 1 to September 15.		
			3. Perennials:		
1.3	WARRANTY		a. Spring: March 1 to May 15.b. Fall: October 15 to November 30.		
А.	Trees, Shrubs, and Vines: 12 months. Ground Covers, Perennials, and Other Plants: 12 months.		4 Rhizomes Bulbs and Tubers: March 1 to Max		
В.					
1.4	MATERIALS	1.6	INSTALLATION		
A.	Plants, General: Nursery-grown and complying with ANSI Z60.1.	А.	Pruning: Prune to remove broken branches, correct b		
B.	Mulches: Ground or shredded bark. Color: Natural.	В.	Ground Cover and Plant Planting: Space ground cover		
C.	Pesticides: Registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Use Pre-Emergent Herbicide (Selective and Nonselective) for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer. Use Post-Emergent Herbicide (Selective and Nonselective) for controlling weed growth that has already germinated	C.	 Mulching: Trees and Treelike Shrubs in Turf Areas: Org (600-mm) radius. Planting Areas: 3-inch (75-mm) thickness of control 		
D.	Tree Stabilization: none	1.7	MAINTENANCE		
E.	Landscape Edgings: [Aluminum] Shovel cut.	А.	Pruning, cultivating, watering, weeding, fertilizing, n		
F.	Tree-Watering Devices: Slow-release type. Color, Green.		treatments as required to maintain healthy plants.		
G.	Miscellaneous Products:	1.8	MAINTENANCE SERVICE		
	 Burlap (plastic fabrics not permitted). Mycorrhizal inoculant. Root dip. 	A. B.	Trees and Shrubs: 12 months. Ground Cover and Other Plants: 12 months.		

END OF SECTION 329300

ıy 15.

branching structure and to shape. Do not thin.

ver and plants other than trees, shrubs, and vines as indicated.

rganic mulch ring of 3-inch (75-mm) thickness, with 24-inch organic mulch over whole surface of planting area.

nulching resetting to proper grade or vertical position, pesticide

Specifications

SECTION 329200 - TURF AND GRASSES

- 1.1 **SUMMARY**
 - Seeded and sodded turf. А.
 - Β. Meadow grasses and wildflowers.
 - Turf renovation. C.
 - D. Erosion-control materials.
 - E. Grass paving.

1.2 **OUALITY ASSURANCE**

- Turf Installer's Personnel Certifications: Certified Landscape Technician Exterior, Certified Lawncare Manager Α. or Certified Lawncare Technician
- В. Meadow Installer Qualifications: Qualified installer with minimum of 5 year's experience in meadow establishment.

1.3 MATERIALS

- Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination 1.8 А. tolerances.
- Turfgrass Sod Blend: 90 percent turf-type tall fescue (Festuca arundinacea), a minimum of three cultivars. 10 Β. percent Kentucky bluegrass (Poa pratensis).
- Wildflower and Native-Grass Seed: As indicated on drawings. C.
- Mulches: Straw or fiber mulch and tackifier for hydroseeded areas. D.
- Pesticides: Approved by EPA. E.
- Erosion-Control Materials: Blankets, Fiber mesh, Mats. F.
- Grass-Paving Materials: Cellular plastic mats with planting soil fill. G.

FIELD CONDTIONS 1.4

- **Planting Periods:** A.
 - Turf: Spring (March 1 to May 31) or fall (August 15 to November 15). 1.
 - Meadows: Late Spring or fall. 2.

INSTALLATION 1.5 Seeding Method: Sow, Hydroseed. Α. В. Protect seeded areas with straw mulch or fiber mulch. 1.6 TURF MAINTENANCE Water, fertilize, weed, mow, trim and replant as needed to establish healthy turf. A. В. Watering: 1 inch per week unless rainfall precipitation is adequate. Mowing: To maintain 1-1/2 to 2 inches grass height and never more than one-third of grass height. C. MEADOW MAINTENANCE 1.7 Water, fertilize, weed, mow, trim and replant as needed to establish healthy viable meadow. А. Apply treatments as required to keep meadow and soil free of pests and pathogens or disease. Use integrated pest В. management practices whenever possible to minimize the use of pesticides and reduce hazards Mowing: Throughout the first growing season, mow meadow to 6 inches high when weed height exceeds 9 inches. C. MAINTENANCE SERVICE Turf: A. Seed: 60 days from date of Substantial Completion. 1. 2. Sod: 30 days from date of Substantial Completion. Meadows: 3 years from date of Substantial Completion. В. END OF SECTION 329200

Specifications

SECTION 329115 - SOIL PREPARATION (PERFORMANCE SPECIFICATION) C. PRECONSTRUCTION TESTING 1.1 FIELD QUALITY CONTROL 1.7 Preconstruction testing of existing, on-site soil and imported soil by Contractor's testing agency. Testing Agency: Owner engaged Α. Α. 1.2 MATERIALS END OF SECTION 329115 Regional Materials for LEED: For products and materials required to comply with requirements for regional Α. materials Credit MR 5 for materials that have been extracted, harvested, or recovered, as well as manufactured, with 500 miles of Project site. SECTION 015639 - TEMPORARY TREE, PLANT AND SOIL PROTECTION B. Planting soils produced by modifying the following soil sources: Existing, On-Site Surface Soil, Stockpiled On-Site. 1.1 SUMMARY 1. Imported Soil 2. 3. Manufactured Soil A. **QUALITY ASSURANCE** 1.3 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING 1.2 Contractor's Arborist Qualifications: Certified Arborist as certified by ISA. A. Excavate soil to a depth of 6 inches and stockpile until amended. Α. Screen soil with a 1 1/2-inch sieve to remove large materials. В. MATERIALS 1.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE Α. 1.4 Organic Mulch: Shredded hardwood or wood and bark chips. Β. Till subgrade to depth of 18 inches. Α. Spread unamended soil to total depth as indicated on planting plans and amend in place. C. В. fabric and flagging tape on top of fence. Compact each lift of planting soil to a maximum of 100lbs/sq in within the top 6 inches of soil profile. C. 1. Tree Guards: Wood cage of 2 by 4's constructed around tree trunk, 6 feet high. PLACING MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE D. 1.5 Sand bags. Till subgrade to depth of 18 inches. E. Α. Spread planting soil to total depth as indicated on planting plans. F. В. Mats: Heavy plywood or rubber mat. Compact each lift of planting soil to a maximum of 100lbs/sq in within the top 6 inches of soil profile. C. G. H. Gravel: 2B. **BLENDING PLANTING SOIL IN PLACE** 1.6 Geotextiles: Construction class, nonwoven. Ι Till unamended, existing soil to depth of 18 inches. Α. Apply amendments and blend. В.

Compact blended planting soil to a maximum of 100lbs/sq in within the top 6 inches of soil profile.

Protection and pruning of existing trees, plants and soils that are affected by execution of the Work.

Topsoil for Fill: Stockpiled or imported or manufactured and complying with ASTM D 5268.

Protection-Zone Fencing and Gates: Galvanized steel chain link with height of 6 feet, with dark green shade

Moveable Sections: 6 feet high by 12 feet wide, with base to support sand bags.

Protection-Zone Signage: Rigid plastic or metal sheet, 15 inches by 18 inches with 2-inch lettering.

Specifications

1.4	EXECUTION	SECTION 329500 - VEGETATED ROOF ASSEMBLIES		
A.	Pre-Construction Tree Care: Application of growth regulators, compost teas, and supplemental watering as determined by Arborist. Apply treatments one growing season in advance of construction and during the growing season(s) for the duration of construction	1.1	SUMMARY	
		А.	Continuous vegetated roof assemblies.	
В.	Protection Zones: Enclosed with protection-zone fencing and signage.	B.	Trav-type vegetated roof assemblies.	
C.	Root and Soil Protection for Temporary Construction Access: Mulch, aggregate and mats.	C		
D.	Trenching near Trees:	C. D	walkway pavers.	
	 Shallow Trenching: Hand excavated or air spaded under or around roots. Deep Burial: Air spaded or tunnel under the roots. 	12	OUALITY ASSURANCE	
E.	Crown Pruning: ANSI A300 (Part 1) standard. Pruning to compensate for root loss and as follows:	A.	Installer Qualifications: Approved, authorized, or licer	
	 Type of Pruning:Prune trees according to ANSI A300 (Part 1). Specialty Pruning: For cleaning and clearance. Removed branches chipped and stockpile in areas designated by Owner's Representative. 		 Professional Membership: Professional Land Association. Personnel Certifications: Personnel assigned to 	
F.	Root Punning: By Arborist.		Exterior or Certified Ornamental Landscape Pro	
G.	Regrading: Minor cut or fill within protection zone.	1.3	WARRANTIES	
H.	Post-Construction Tree Care: Application of soil sprays and drenches, growth regulators, supplemental watering, fertilization and aeration as determined by Arborist.	А.	Vegetated Roof Assembly: 15 years from date of Subs	
I.	Tree Replacement: Replacement of protected trees that are more than 25 percent dead or unhealthy due to construction operations.	В.	Plant Growth: 80 percent foliage cover over planting duration of this warranty measured from date of Substa	
	1. Small Trees: New trees of same size and species as those being replaced that measure 6 inches or smaller in caliper size.		 Trees and Shrubs: Two years. Ground Covers, Perennials, Vines, and Ornamer 	
	2. Large Trees: Tree(s) of 6-inch caliper size in sufficient quantity that the total aggregate diameter is equal to the diameter for each tree being replaced that measures more than 6 inches in caliper size. Species as selected by Owner.		MAINTENANCE SERVICE	
		A.	Initial Maintenance Service: 24 months from date of S	
1.5	FIELD QUALITY CONTROL			
А.	Owner-engaged arborist to direct plant-protection measures and prepare inspection reports.	1.5	PRODUCTS	
		A.	Continuous or Tray-Type Vegetated Roof Assembly:	

1.

2.

3.

4.

thickness.

Plantings: As shown on Drawings.

END OF SECTION 015639

ensed by membrane roofing manufacturer.

dcare Network or the American Nursery and Landscape

to the work shall be Certified Landscape Technician, CLTofessional, COLP, from the Professional Landcare Network.

bstantial Completion.

ing area commencing 24 months after planting through the stantial Completion.

ental Grasses: Two years.

f Substantial Completion.

Depth: Manufacturer's standard for required plantings, including growing medium. Assembly Weight: Include growing medium and plants and saturated with captured water for the designed

Manufactured Growing Medium: Vegetated roof assembly manufacturer's lightweight, manufactured soil

Specifications

	or designed for plants indicated on Drawings.	1.3	MATERIALS
В.	Walkway Pavers:	А.	Sheet: EPDM.
	 Walkway Pavers: As indicated on drawings Heavyweight Concrete Walkway Pavers: As indicated on drawings Setting Method: As indicated on drawings. 		1. Seams: Manufacturer's standard.
	. Geofoam Fill: Extruded-polystyrene board insulation.	1.4	SOURCE QUALITY CONTROL
C.	Accessories:	А.	Testing Agency: Contractor engaged.
	 Access Boxes: Manufacturer's standard boxes with removable, rigid covers for accessing drains, valves, and switches beneath the finish elevation of growing medium; secure each cover with four noncorrosive screws Soil Retainer: Extruded-aluminum edging, with drainage openings in L-shaped or T-shaped configuration 	В.	Seams: Tested and inspected for peel adhesion and bond
		1.5	INSTALLATION
	and in black color.	А.	Installation Method: In anchor trench or attached to con
1.6	FLOOD TESTING	1.6	FIELD QUALITY CONTROL
А.	Flood test each area.	A.	Testing: By Contractor-engaged agency per visual inspec
1.7	FIELD QUALITY CONTROL	END OI	F SECTION 334713

A. Manufacturer's Field Service: Division 07 membrane roofing manufacturer's authorized service representative's inspection of vegetated roof assembly installation.

SECTION 334713 - POND AND RESERVOIR LINERS

1.1 PERFORMANCE REQUIREMENTS

- A. Geomembrane liners that prevent the passage of water in ponds and reservoirs.
- 1.2 WARRANTY
 - A. Materials and Workmanship: 10 year(s).

ded seam strength according to ASTM D 4545.

ncrete as indicated on Drawings.

ection and nondestructive seam testing.

END OF SECTION 329500

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Watersheds

With a topographic gradient of white to dark blue, representing higher elevations in white and lower elevations increasing in blue, this map illustrates the landforms of Dickinson College. Ranging from approximately 465 to 490 feet across the campus, elevations decrease in gradient towards the northeast corner. This pattern replicates the overall flow directions in the larger landscape.

Within Cumberland County, the town of Carlisle drains to the Letort Spring watershed, a sub-watershed of the larger Conodoguinet Creek watershed. Letort Spring flows from the south to the north and is located to the east of Carlisle, hence the natural north-east drainage patterns of Dickinson College. "The stream is fed by an estimated 21 natural limestone springs, resulting in high quality water" (1). The limestone springs are a natural feature of the unique geology below the college. Underlaying the Dickinson College lands and surrounding area are largely sedimentary rocks- sandstone, shale, limestone, and dolomite. The limestone and dolomite rocks are highly soluble in acidic water, they can form sinkholes, underground streams, and other karst features. As a result of the karstic geology, surface drainage can directly pass into groundwater systems creating a high potential for groundwater contamination.

According to the EPA National Summary of Impaired Waters, Pennsylvania has the largest number of degraded streams. However, the surrounding areas of Letort Spring are fortunate to have naturally high quality water. Because of this, development within Dickinson College should meet or exceed regulatory policy to prevent excess runoff and pollutant loads from entering the surrounding watershed.

(1) Cumberland County Stormwater Management Plan. Prepared for Cumberland County Planning Commission, Carlisle PA. Prepared by Skelly and Loy, Inc., Harrisburg, PA. September 29, 2010.



high

Cumberland County



Watersheds

Zooming in closer to the site and analyzing the contours provides more detail on the hydrologic flow patterns within the campus boundaries. The campus can be divided into six larger sub-watersheds, with two draining interior to the campus boundary, the orange and the green, and three with sources interior to the campus but with major flow paths dispersing exterior to the campus boundary, the tan, pink, purple, and grey.

All of the roads throughout the college have a crowned slope, meaning the roads were designed to drain from the center to each side. This pattern essentially puts each block as its own sub-watershed. Looking beyond the individual block watersheds to understand the larger connections, high points within the landscape can be analyzed to determine dominant flow paths. Water naturally runs perpendicular to the contour lines, for the purpose of summarization the flow lines depicted show the dominate direction the water will ultimately take.

Understanding major flow patterns and watersheds are important in future development scenarios for two primary reasons. First, to recognize areas that have flow patterns outside of campus boundaries, in which any construction without management practices will detrimentally effect the sites where water is going, including Letort Spring. Second, all of the water that is flowing interior to the campus boundary is all going to one low spot near the intersection of W. Louther and Cherry Streets. Surface ponding during storm events is already present and thus any future development in this subwatershed will exacerbate the problem without proper management, even small storm events can have significant impacts.

"Pennsylvania is the most flood prone state in the country. The average annual precipitation ranges from 37 inches to more than 45 inches per year, and reflects a humid pattern. Nearly all of the annual rainfall occurs in small storm events. Precipitation of an inch or less is frequent and well distributed throughout the year"

Pennsylvania Office of Watershed Management. Pennsylvania
 Best Management Practices Manual. Document Number 363-0300-002.
 Dec. 2006.



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Best Management Practices

To mitigate stormwater during future development, stormwater best management practices should be included in the design process. The Pennsylvania Best Management Practices Manual outlines ten structural BMP's designed to reduce stormwater runoff volumes and water quality (http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-8305). Most are based on natural systems, but are given the designation of structural BMP's, as they often contain manufactured materials such as engineered soil media. Although BMP should be utilized whenever possible, due to the karst geology careful planning and design details should be evaluated to prevent the development of sinkholes. For example, rain garden and rain tanks should be lined and concrete cisterns should be used for underground storage near buildings, but these are general considerations and each intervention should be evaluated on a site specific basis prior to implementation.

All BMP implementations are useful to Dickinson College, however some are better suited to certain areas. For example, the high cost of tree trenches would make them more applicable in high profile areas, such as the Historic Arboretum, Plazas or Educational Landscape. Conversely, a less expensive rain gardens might be a better option in service landscapes.

The table below outlines five BMP practices and the most appropriate locations based on landscape character. The graph below ranks each system based on cost, percent runoff reduction, and percent Nitrogen removal. A rain garden would be the lowest cost option with the best runoff reduction and N removal, below that would be porous pavement, stormwater planters, cisterns, and green roofs would be the least effective at runoff reduction and N removal and be a higher cost option.

BMP FOR CHARACTER ZONES							
Historic Arboretum	•	1					
Expanded Arboretum / Quad	•						
Building Threshold or Educational Landscape	•	۲					
Special Garden or Plaza	•						
Borough Residential Landscape							
Streetscape + Green Corridors	•	-					
Service Landscape					٩		
Athletic Field							
tree trenches and bioretention street bump outs green roofs rain gardens							
cisterns or rain barrels pervious pavement							



Schueler, Tom, and Chesapeake Stormwater Network. "Technical Memorandum: The Runoff Reduction Method."

Center for Waterhsed Protection. Ellicott City, MD www.stormwatercenter.net (2008). Montalto, Franco, et al. "Rapid assessment of the cost-effectiveness of low impact development for CSO control."

Landscape and urban planning 82.3 (2007): 117-131.

Best Management Practices

As noted in the matrix on the previous page, some BMP's are better suited in different locations around campus. This map identifies possible locations for the various BMP's, however many other opportunities may exist. During future construction implementation each site should be identified for its unique characteristics and potential opportunities, including soil tests. The unique character of the historic arboretum warrants special consideration in future design initiatives.

General location suggestions include:

- Tree trenches: in plaza areas, educational landscapes, historic arboretum
- Rain gardens: in larger open space areas •
- Cisterns + Rain Tanks: underground tanks can be used to store water •
- Curb bump outs: adjacent to streets to improve stormwater and reduce traffic speeds •
- Porous Pavement: parking areas and pathways •
- Green Roofs: large flat roof areas provide excellent opportunities for retrofitting • with green roofs, when the structural loading of a building permits such use.





Best Management Practices

There are several structural BMPs that may be possible to implement within the lowest subwatershed on the site, the orange sub-watershed, to alleviate existing surface ponding issues.

Flat roofs on larger buildings are excellent places to retrofit green roofs, if the existing structure can support it. The Public Safety building and the Facilities Management building are both large flat roofs that roughly total 160,000 sq ft. Estimating the media depth at 4" and accounting for 20% water holding pore space, if these areas were retrofitted with green roofs 10,675 cu ft or 1400 gal. of water could be captured

Parking areas and other impervious surfaces account for a large portion of stomrwater run off. If 293,000 sq ft of impervious surface was retrofitted to porous concrete or asphalt with a 3' stone sub-base, approximately 350,000 cu ft or 47,000 gal of water could be captured to reduce peak flows.

Rain gardens, lined or unlined, not only help reduce run off volumes but provide significant wildlife habitat. Although Dickinson College is in a densely populated area even small rain gardens can improve hydrology. If small rain gardens were installed in various locations throughout the watershed, totalling 14,000 sq ft and averaging 6ft deep of media depth, 16,800 cu ft or 2245 gal of stormwater could be captured.

Cisterns and lined rain tanks provide conservation opportunities throughout the campus, particularly in the quad spaces and arboreta. Concrete cisterns can be used underground adjacent to new and existing buildings to capture stormwater for site re-use, such as irrigation. Rain tanks are a less expensive option, with less infrastructure, that can provide storage in some of the open lawn areas without compromising the aesthetics of the arboreta, with careful consideration of tree root systems. The R-tank by ACF Environmental is a variable rain tank that can be costumed built to any shape and ranges in heights from 9" to 7'. Standard concrete cisterns range from 5000- 30,000 gals but can be made to varying specifications to fit the College's needs.



The pictures below were taken by Andropogon Associates at a site visit to the campus on July 19,2012. On that day rain totals for Harrisburg, PA were recorded at 1.02 inches, slightly below the 95th percentile storm event of 1.5-1.6 inches



W. Louther and Cherry St.



Courtyard



Stormwater I Details

Stormwater

All details in this section are intended for preliminary design only. They are not to scale (N.T.S) and are not intended for bid or construction purposes. They are subject to modification based on design calculations, local practices, and all applicable codes and regulations.





Rain Garden Outfall Not for Construction

Stormwater | Details

Stormwater





Tree Trench Not for Construction

Tree Trench with Stone Mulch Not for Construction

142 Final March 2014 MATERIAL VARIES, MUST BE PERVIOUS

6" ROUND CAST IRON GRATE

6" ABS OR HDPE SCHEDULE 40 PIPE

NONWOVEN GEOTEXTILE AERATION PIPE: FLEXIBLE PERFORATED PE PIPE IN NONWOVEN GEOTEXTILE SOCK;

RIGID ABS OR HDPE TEE FITTING, COMPACTED STRUCTURAL

Stormwater I Details



Stone Swale

Not for Construction

Grass Swale Not for Construction TREE AND SHRUB PLANTINGS PER PLANTING PLAN

PERENNIAL PLUGS PER PLANTING PLAN

CONTINUOUS ANGULAR STONE IN SWALE - 4" DEEP IN CENTER MAX., HAND PLACED

MULCH

۹<u>/، او</u>

SWALE LINING - CIVIL COORDINATE WITH CIVIL ENGINEER SWALE SOIL MIX PREPARED SUBGRADE

SIDE SLOPE (CONDITION VARIES)

JUTE EROSION CONTROL FABRIC OVER 1/2" STRAW MULCH AT SLOPES 4:1 OR STEEPER, TUCK-IN SIDES & OVERLAP ENDS FACING DOWNHILL PER MANUFACTURER'S INSTRUCTIONS, SECURE WITH WOOD STAKES 24" O.C. (TYP)

OCCASIONAL BOULDER ±36" DIAM (20' OC. AVERAGE, IRREGULAR SPACING)



HERBACEOUS PLANTING SWALE PLANTING SOIL MIX

PREPARED SUBGRADE

COIR EROSION CONTROL FABRIC, ALONG SWALE BOTTOM, TUCK-IN SIDES & OVERLAP ENDS FACING DOWNHILL PER MANUFACTURER'S INSTRUCTIONS (TYP)

6" (D) CONTINUOUS 6"-24" ANGULAR STONE ALONG SWALE BOTTOM, FILL GAPS WITH $\frac{3}{4}$ " TO 2" RIVER-JACK

Stormwater I Details

Stormwater



Non-Curbed Rain Garden

144 Final March 2014 LIGHT DUTY DOME W/ DOME STRAINER CAP. SEE CIVIL, (TYP.) OUTFLOW PIPE TO WATER QUALITY FACILITY

EPDM LINER

JUTE EROSION CONTROL FABRIC, FROM OUTFALL TO LOW POINT OF RAIN GARDEN ALONG SWALE BOTTOM

INFILTRATION SOIL MIX

AGGREGATE BASE

PROTECTION FABRIC

EXISTING SUBGRADE

1" SAND SETTING BED

HDPE PERFORATED PIPE IN DRAINAGE AGGREGATE

NOTE:

1. TEST SOIL MIXTURES, REPORT TO ARCHITECT, AND AMEND TO MEET THE REQUIRED INFILTRATION RATE IF NECESSARY PRIOR TO SOIL PLACEMENT

2. SEE C-SERIES DWGS. FOR PIPE, CONNECTIONS AND SIZING
Stormwater | Details

Stormwater



Stormwater I Details

Stormwater



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Part III: Planting + Landscape Management Plan

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Proposed | Character Zones



Purpose

The purpose of the Landscape Management Guidelines is to offer a framework for maintaining the aesthetic character and functionality of the proposed character zones. The intent of the guidelines is not to offer prescriptive direction for landscape management, but to offer a clear vision of what the agreed upon hopes and aspirations are for each character zone and an organizational framework for keeping records of management practices in each character zones. Essentially the goals are not to offer HOW, but WHAT, as the facilities staff are the experts of HOW.

The philosophy of this landscape management plan is derived from four sources. All four entities offer unique and varied experiences and approaches to landscape management and all were equally considered for inclusion in this document. These sources include:

- Dickinson College administration and the College's sustainability goals
- The knowledge and experiences of Dickinson College's staff
- Standards of practice and care of the professions of horticulture and landscape architecture
- The knowledge and experiences of Andropogon Associates

Finally, the management guidelines are organized to reflect the standards put forth through the Sustainable Sites Initiative (SITES), voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practice, formed 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. The inclusion of the Sustainable Sites Initiative requirements and philosophy is two-fold— the standards were created by the leaders in the horticulture and design professions and it streamlines the application process for any future Dickinson College landscape project that may wish to pursue the SITES certification.

The management plan offers the following sections:

- Management guidance
 - Plant stewardship
 - Organic materials management
 - Irrigation and water use
 - Recyclable materials
 - Maintenance equipment

- Snow and ice
- Sensitive site features
- Adaptive management
- Charazter zone specific considerations
- Record-keeping forms

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General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outc				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
PLANT STEWARDSHIP						
Plant maintenance:	Improving and maintaining overall plant health and vigor while maintaining the desired aesthetic for the noted landscape character.	Mulching Pruning Weeding Clean-up / Removal	Laborer with supervision	Mulching once a season with an organic non-dyed mulch. All exposed landscape beds should be mulched annually in spring. Mulch should be kept a minimum of 3" away from tree trunks. Pruning on all woody plant material should be done annually in late winter unless it is spring flowering and then it should be pruned shortly after flowering. Weeding weekly or bi-weekly as needed during the growing season. Herbaceous plant material should be cleaned up in late winter. The dormant plant material will provide wildlife value and aesthetic interest in the winter months.	manua activiti fuel us Trees, should standa be mo establ health additid	
Plant health :	To ensure overall landscape health through the use of an Integrated Pest Management Program (IPM) that uses minimal to no synthetic products.	Monitoring Mechanical methods Biological methods Chemical methods	Certified Arborist State Extension Agent Trained Horticulturalist Laborer to the above noted professionals	Visual scouting inspections should be done weekly during the growing season to prevent infestations. Monitoring traps can be set for known pests to monitor infestation. Pests and diseases should be treated on a problem specific basis and in accordance with State guidelines when applicable. Treatment methods and timeline for treatment application will depend on the insect / disease life cycle and control method.	A log l locatic metho Recor to a su All fed qualifit treatm	



General Maintenance	10-year desired outcome from	Required actions to achieve 10 year desired outco				
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
PLANT STEWARDSHIP						
Site safety :	The removal, maintenance, and monitoring of all landscaped areas to ensure proper visibility for site safety.	Pruning Removal	Trained Horticulturalist Laborer with supervision	Inspect and prune all vegetation along roadways and driveways in accordance with State Regulations at a minimum of two times during the growing season unless otherwise noted in State Regulations. Pruning should follow guidelines noted in plant maintenance section above. Regular inspections should be made with a representative from the Department of Public Safety and necessary actions completed as necessary.	Lands achiev dialog the Co best n all use	
Plant replacement :	The usage of plant material appropriate and well adapted to the site environmental conditions to ensure plant health and longevity with minimal need for replacements in the landscape.	Vegetation Removal and Installation	Laborer with supervision	As needed during the spring and fall to avoid plant stress. Should installation be required during the season care should be taken to ensure water availability appropriate to the plant species.	See ir a list c area.	
Pest management	The use of a campus wide pest management protocol that eliminates the use of chemical and synthetic control methods with a focus instead on the use of monitoring and prevention methods to ensure aesthetic thresholds.	Mechanical methods Biological methods Cultural methods	Problem Appropriate Professional for monitoring and identification (horticulturalist, arborist, control specialist, etc.) Laborer with supervision for control task.	Utilize record keeping to determine when typical pests appear in the area and use control methods and timing appropriate to the species and control method. Hand pick and prune small infestations immediately upon identification. For multi-generational insect pests apply control methods early in the season. Weed landscape beds weekly or bi-weekly to remove alternate host material for pests. Use catch and release traps for larger pest species and preventative methods appropriate to the species.	Chem should neces regula	



General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outco				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
INVASIVE SPECIES MANAGEMEN	т					
Invasive Species List	Invasive plant species will most likely be a continual problem but can be controlled with non- chemical methods. Regular maintenance visits and informed personnel will prevent unwanted weeds and invasive plants. It is also anticipated that with correct soil biology the desired plants will outcompete any invasive intruders.	Mechanical methods Biological methods Cultural methods	Laborer with supervision	Landscapes should be monitored and treated as necessary on a weekly or bi- weekly basis with the regular maintenance scheduled weeding. Depending on methodology and plant phenology, treatment scheduling may vary and appropriate techniques should be utilized.	Depart nationa for inva A Fede found a http://p A State found a http://w s/invas	
Invasive Management Plan	The suppression of invasive and noxious plant species intrusion into the landscape through the use of preventative and non- chemical practices.	Monitoring Mechanical methods Biological methods Chemical methods	Laborer with supervision	 Plants should be hand pulled when young and the root systems left to dry thoroughly before composting. Any plants with seeds must be disposed of and not composted. If weeds or invasive plants persist the plants can be treated with an organic control method. Invasive plant materials are separated from other organic material and properly disposed of in ways that are appropriate to the species. 	It is improbler as pos should plants reason should immed the ma treated	

me Other details tment supervisors should monitor al and local government websites asive and noxious species alerts. eral list of Invasive Species can be at the USDA website: plants.usda.gov/java/noxious te list of Invasive Species can be at the DCNR website: www.dcnr.state.pa.us/forestry/plant siveplants/ perative that invasive and matic weeds be removed as soon ssible. All maintenance personnel be instructed to know what the look like. At any site visit for any

n if invasive plants are seen it I be noted and if not pulled liately must be communicated to aintenance personnel so it can be d at the next rotation visit.

General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outcome				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
ORGANIC MATERIALS MANAGEN	IENT					
Healthy plant material management	The recycling and re-use of all healthy plant material debris to add organic matter back to the landscape.	Use of mulching mowers. Regular collection of excess organic plant material during routine maintenance	Laborer	Turf areas should be mowed when it reaches 1/3 to 1/2 of the recommended height for the grass species. All clippings should be mulched in place with a mulching mower. Fallen leaves should be mulched back into the soil with use of a mulching mower as seasonally appropriate. Excess leaves and other healthy plant materials should be composted in a designated location.	It is red facilitie Howev outside that is treatme certifyi the cor	
Diseased plant disposal	The appropriate elimination of diseased plant material to prevent infestation.	Mechanical removal of diseased vegetation.	Laborer	Diseased plant material should be removed of immediately. All equipment used for removal should be sterilized with an organic sterilizer such as an alcohol based product. Diseased plant material should be collected in an area separate from healthy plant material and disposed of in a method appropriate to the species; example spores can sometimes be spread through burning and thus this would not be an appropriate disposal technique diseased plant material with such dispersal mechanisms was present.		



General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outco						
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule				
ORGANIC MATERIALS MANAGEMENT								
Soil amendments and fertilizers	Soil amendments and plant fertilizers should be used in a new or renovated landscape in order to build a healthy plant to soil structure. If there is a healthy, functioning system in place, additional amendments may not be necessary over time.	Compost applications Compost tea applications Soil testing Organic fertilizer applications	Certified Testing Facilities Laborer	All landscape beds should be tested upon installation, yearly for the first two years of establishment, and then every three years thereafter. Only materials approved by the Organic Materials Review Institute should be used.	Follow			
Use of fertilizers	see above	see above	Laborer	Amendment applications should occur after a regular irrigation cycle, or timed appropriate to weather if irrigation is not used. The soil should be moist prior to amendment applications to optimize plant uptake and prevent soil leaching.	Follow recom			

ome
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product specific application mendations.
product specific application mendations.

General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outco				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
ORGANIC MATERIALS MANAGEN	IENT					
Erosion and compaction	An integration of maintenance best practices will be used to minimize soil erosion and compaction throughout the campus landscapes.	Compost tea applications Mechanical aeration Monitoring	Laborer	 To aide in foot traffic compaction, compost tea applications should be made to the lawn areas after significant social gatherings. Lawns shall be aerated at a minimum every three years to prevent compaction. Manual methods should be utilized whenever possible to reduce the use of heavy machinery in the landscape. All maintenance should be reduced during wet weather to avoid compaction. Monthly monitoring and monitoring after sign cant rain events should occur within the first two years to identify and repair any areas prone to stormwater erosion. Stormwater control practices should be cleaned regularly to ensure proper drainage and prevent system overflows. 	An add compo fall to a erosior Additic soil tes too hig bed sh additio remova necess	



General Maintenance Plan Topics	10-year desired	Required actions to achieve 10 year desired outc				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
IRRIGATION AND WATER USE						
Irrigation	With proper planning and monitoring irrigation can be significantly reduced or eliminated in some areas.	Monitoring	Laborer Irrigation Specialist	Any systems in place should be shut down and blown out in the fall prior to freezing temperatures. Systems should be monitored monthly during the growing season to ensure proper functioning. Water turf areas a minimum of 1" per week during dry periods. Monitor soil sensors and/or tensiometers weekly to determine soil moisture capacity.	A goo due to Many prope under key to lands	
STORMWATER MANAGEMENT F	EATURES AND BMPS (includes water feat	tures)			
Storm water features and BMPs effectiveness :	All stormwater BMP's should be monitored and maintained according to local and state regulations.	Clean outs Monitoring	Laborer with supervision	Trench drains should be inspected after each significant rain event and debris removed from the system. Outlet structures should be checked monthly and cleared of debris. EPA guidelines can be found at http://cfpub.epa.gov/npdes/stormwater/men uofbmps/index.cfm?action=factsheet_result s&view=specific&bmp=91		

ome Other details od deal of money and time are lost to the inefficient use of irrigation. Any plants can sustain themselves if erly established. Monitoring and erstanding any irrigation system is to its use and success in the healthy scape.

General Maintenance Plan Topics	10-year desired outcome from	Required actions to achieve 10 year desired outc				
	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
Water treatment :	The entire campus is part of a larger hydrologic system. To prevent negative impacts to the larger watershed all water features on site should be manually cleaned and only organic cleaning solutions used when necessary.	Clean outs Monitoring	Laborer with supervision	Decorative water features should be cleaned once season using OMRI approved cleaning solutions. Chlorine and bromine based products should not be used. All stormwater BMP's should be maintained regularly according to local and state regulations to ensure proper filtration. Sidewalks and other impervious surfaces should be swept regularly to prevent sediment build up and transport.	The u: and no site w. Resou http:/// enuofl ure&n http:// bmps.	

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Other details

use of good housekeeping methods non-structural BMP's can improve vater quality.

urces include;

/cfpub.epa.gov/npdes/stormwater/m fbmps/index.cfm?action=min_meas min_measure_id=6

/stormwaterpa.org/non-structurals.html

General Maintenance	10-year desired	Required actions to achieve 10 year desired outc			
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule	
MATERIALS MANAGEMENT					
Material replacement :	Replacement of any materials should be in- keeping with the aesthetic guidelines identified in the master plan.	Repair and / or replacement as necessary	Laborer with supervision	As needed.	All ma should All pro have b aesthi efficie be pro respo such a certific etc.
Functionality and extended use :	All hardscapes and other site amenities should be periodically surveyed for hazards and poor performance. Repairs and maintenance should be completed in a manor that reduces harm to human health and the environment.	Repair and / or replacement as necessary	Laborer with supervision	As needed. Skateboarding, bmx biking, and other recreational sports that can impact site furnishings should only be permitted in approved areas. Pavement stains should be removed with power washing. If a cleaning solution is necessary only OMRI certified products should be used. Only low-emitting adhesives, sealants, paints, and coatings should be used.	In add additio the US http://

Other details Other details Other details aterials outlined in the master plan d be sourced from local vendors. oducts outlined in the master plan been selected for both their netics and energy / environmental ency. Should alternative products oposed only environmentally onsible products should be used as, recycled content materials, ied wood, energy-efficient lightings,

dition to OMRI product guidelines ional guidelines are available from IS Green Building Council:

/www.usgbc.org/node/2639769

General Maintenance	10-year desired outcome from		Required actions to achieve 10 year desired outco		
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule	
Disposal of harmful materials :	Harmful materials should be used as minimally as possible and alternatives used whenever plausible. Harmful materials can be detrimental to both human and environmental health both immediately and over time.	Any harmful materials used should be disposed of in a manner that meets OSHA regulations and complies with all manufactures MSDS instructions	Laborer with supervision	As needed.	Regula harmfu obtain agenc Additio OSHA https:/ xicsub
RECYCLABLE MATERIALS (at a n	ninimum, for paper, gla	ss, plastics, and m	netals)		
Recyclable materials :	The college should continue with its existing recycling program. All refuse is collected as either trash or recycling, which is single stream. Compostable materials are collected from the dining hall and recycled at the campus farm. As new environmental stewardship opportunities are identified they should be evaluated for use throughout the campus and incorporated where possible.	Monitoring and maintenance.	Laborer	Additional recyclable receptacles may be necessary during event times and dorm clean outs. Prior to renovations site elements should be evaluated for re-use and kept in a storage facility for future integration. Examples include: stone, benches, light posts, and bike racks.	

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Other details

lation and recommendations and ful materials disposal can be ned from local and state regulatory cies.

- ional guidelines can be found at the A website;
- ://www.osha.gov/SLTC/hazardousto bstances/index.html

10-year desired	Required actions to achieve 10 year desired outc				
maintenance practices	Specific activities	Skill level required	Timeline/ Schedule		
QUIPMENT					
Using and maintaining landscape equipment in an efficient manner enhances the efficiency of equipment, thereby conserving energy and fuel and minimizing entire equipment replacements.	Monitoring and maintenance.	Laborer with supervision	Landscape maintenance activities should utilize manual methods primarily and supplemented with electrical machinery. Equipment that uses fossil fuels should only be used when there are no alternatives. Mowers and other landscape equipment should be serviced yearly and blades, belts, etc. should be replaced. Mower blades and other trimming equipment should be checked monthly and blades sharpened to maintain efficiency. Equipment used for invasive plant species removal should be washed thoroughly, including tires and human shoes. Any debris washed off should be collected and disposed of or treated on site to prevent germination.		
Landscape maintenance activities can have adverse effects on the human enjoyment of a space. Noise and air pollution as well as other disturbances should be kept at a minimum during high use times.	General	Laborer with supervision	Each campus site utilized for relaxation and recreation should be monitored to determine high use times. The use of maintenance machinery should be restricted during those times. Low smoke oil should be used in all machines to reduce air pollution. Signage of maintenance activities should be posted on site and in nearby classroom buildings so users can schedule their activities accordingly		
	10-year desired outcome from maintenance practices DUPMENT Using and maintaining landscape equipment in an efficient manner enhances the efficiency of equipment, thereby conserving energy and fuel and minimizing entire equipment replacements. Landscape maintenance activities can have adverse effects on the human enjoyment of a space. Noise and air pollution as well as other disturbances should be kept at a minimum during high use times.	10-year desired outcome from maintenance practicesSpecific activitiesSpecific activitiesCUIPMENTUsing and maintaining landscape equipment in an efficient manner enhances the efficiency of equipment, thereby conserving energy and fuel and minimizing entire equipment replacements.Monitoring and maintenance.Landscape maintenance activities can have adverse effects on the human enjoyment of a space. Noise and air pollution as well as other disturbances should be kept at a minimum during high use times.General	10-year desired outcome from maintenance practices Specific activities Skill level required Specific activities Skill level required CUPMENT Image: Specific activities Skill level required Using and maintaining landscape equipment in an efficient manner enhances the efficiency of equipment, thereby conserving energy and fuel and minimizing entire equipment replacements. Monitoring and maintenance. Laborer with supervision Landscape maintenance activities can have adverse effects on the human enjoyment of a space. Noise and air pollution as well as other disturbances should be kept at a minimum during high use times. General Laborer with supervision	10-year desired outcome from maintenance practices Required actions to achieve 10 year desired Specific activities Skill level required Timeline/Schedule	



General Maintenance	10-year desired	Required actions to achieve 10 year desired ou										
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule								
Managing snow/ice (REQUIRED only for site receiving snow/ice): Describe the process (including stockpiling) for managing snow/ice in ways that limit degradation of water quality and surrounding plants and soil health. Also describe the process for stockpiling areas and managing any snow- melt that will be used as a water source on site.	To maintain safe campus roadways and pathways in a manner that reduces environmental impacts to water quality and the exposure of chemicals to humans and wildlife.	Application of traction substances and products to prevent ice. Plowing and stockpiling.	Laborer with supervision	Weather reports should be monitored and de-icing chemicals and other traction applications only applied when necessary. Sodium chloride and calcium chloride based products should not be used. Shoveling and plowing should occur prior to the use of de-icing chemicals to reduce the amount of chemical used. Snow stockpiling should occur in hardscape areas not used during winter months, such as a portion of sitting area. Snow should not be piled on vegetation. If possible snow should be stockpiled in an area that when it melts it will travel through a site BMP or be made available for re-use, such as draining to a system that connects to a cistern.	The E organ for the de-icin alterna based sodiur chlorid should utilize produ http:// uide/a							
SENSITIVE SITE FEATURES												
Protect habitat :	With appropriate plant species selection and maintenance wildlife habitat value can be increased throughout the campus.	Maintenance and monitoring	Wildlife specialist Laborer with supervision	During routine site maintenance care should be taken to identify and avoid any wildlife habitats. If the habitats are in a location that overtime may compromise human or animal health the wildlife should be moved humanely to an appropriate location. Vegetation should be left during winter months for wildlife shelter. Plant species should be selected and installed that promote wildlife interaction without harm to humans or wildlife.								

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Other details

EPA and other government nizations are continuously searching e most environmentally appropriate ing compounds. Current accepted native include magnesium chloride d products, they are less toxic than m and calcium but are still a ide based product. College officials d keep current on all studies and e the least toxic recommended ucts possible.

/water.epa.gov/scitech/wastetech/g airport/

General Maintenance	10-year desired outcome from	Required actions to achieve 10 year desired out										
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule								
ADAPTIVE MANAGEMENT												
Update plan:	Keeping thorough maintenance records and reviewing them annually encourages efficient use of resources and best practice methods.											



General Maintenance	10-year desired outcome from		Required actions to achieve 10 year desired outcome									
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule	Other details							
CHARCTER ZONE SPECIFIC CONSIDERATIONS												
Athletic / Recreational :	Recreational turf areas may require additional aeration and compost tea applications to reduce soil compaction and promote healthy vegetation. Buffer plantings should be pruned minimally for optimal screening and wildlife habitat potential.											
Historic Arboretum :	Conflicts can arise between new initiated to evaluate the most a Any restoration products or pla	w technologies and the maintenance of historic structures and cultural landscapes. If significant conflicts occur, a feasibility study should be appropriate course of action.										
Special Garden or Plaza :	To maintain the character of th	e special garden or plaza a	dditional maintenan	ce may be necessary.								
Borough or Residential :	Buffer plantings should be prur	ned minimally for optimal s	screening and wildlife	habitat potential.								
Streetscape / Green Corridor :	Additional pruning of vegeta All stormwater BMP's should	tion may be necessary i adhere to State and Lo	n areas of power lir cal maintenance re	nes and other overhead structures. gulations to ensure efficiency.								
Building Threshold :	Additional pruning and plant	ng and plant maintenance may be necessary along building thresholds.										

General Maintenance	10-year desired outcome from	Required actions to achieve 10 year desired out										
Plan Topics	maintenance practices	Specific activities	Skill level required	Timeline/ Schedule								
Green Roofs :	Green roofs not only aide in building renovations and Int State and Local regulations s	e in stormwater management but also can help with building heating and cooling efficiency. Exte I Intensive systems are best integrated into new construction. Maintenance regimes will vary depoint should be adhered to ensure efficiency.										
Rain Gardens :	Rain gardens are one of the be completed in accordance	most cost effective stor with all State and Local	mwater BMPs and regulations to ensi	should be incorporated whenever possible ir ure efficiency.	ıto site							
Service Landscape :	The service landcsape's main The landscape should be de	n purpose is utilitarian singed to withstand abu	it is a landscape w se (high foot traffic	hose purpose is to service buildings and prov and large machinery), be low cost and low n	vide buf nainten							



Appendices

Final 165 March 2014

LEED Guidelines

LEED Campus

			Table	e 1. A(GMBC /	Applicat Design 8	bility for Constru	Credits and Prerequisites in LEED 2009 action Rating Systems		
		APPLIC	ABLE RAT	ING SYS	TEM				ELIGI	BILITY
LEED FOR NEW CONSTRUCTION	LEED FOR SCHOOLS	LEED FOR CORE AND SHELL	LEED FOR COMMERCIAL INTERIORS	LEED FOR HEALTHCARE	LEED FOR RETAIL; NEW CONSTRUCTION	LEED FOR RETAIL; COMMERCIAL INTERIORS	CREDIT	CREDIT NAME	CAMPUS CREDIT	GROUP CREDIT
							SUSTAI	NABLE SITES		
							<u>SSp1</u>	Construction Activity Pollution Prevention		G
							SSc1 [†]	Site selection	С	G
							SSc2 [†]	Development Density and Community Connectivity	C	G
							SSc3 [†]	Brownfield Redevelopment	c	G
			SSc3.1		SSc4	SSc3	SSc4.1 [†]	Alternative Transportation- Public Transportation Access	C	
			SSc3.2		SSc4	SSc3	<u>SSc4.2</u>	Alternative Transportation- Bicycle Storage and Changing Rooms	С	G
					SSc4	SSc3	<u>SSc4.3</u>	Alternative Transportation- LEV & FE vehicles	С	G
			SSc3.3		SSc4	SSc3	<u>SSc4.4</u>	Alternative Transportation- Parking Capacity	С	G
							<u>SSc5.1[†]</u>	Site Development- Protect or Restore Habitat	С	G
							<u>SSc5.2</u>	Site Development- Maximize Open Space	С	G
							<u>SSc6.1</u>	Storm water Design- Quantity Control	С	G
							<u>SSc6.2</u>	Stormwater Design- Quality Control	С	G
							<u>SSc7.1</u>	Heat Island Effect- Nonroof	С	G
							<u>SSc7.2</u>	Heat Island Effect- Roof		G
							SSc8 [†]	Light Pollution Reduction	С	G
							SSc9	Tenant Design and Construction Guidelines		G
							SSc9	Site Master Plan	С	G
							<u>SSc9.1</u>	Connection to the Natural World- Places of Respite		G
							<u>SSc9.2</u>	Connection to the Natural World- Direct Exterior Access for Patients		G
							<u>SSc10</u>	Joint Use of Facilities		G
							WATER	EFFICIENCY		
							WEp1	Water Use Reduction		
							WEp2	Minimize Potable Water Use for Medical Equipment Cooling		
							WEc1	Water-Efficient Landscaping	C	G
								Innovative wastewater Lechnologies		G
								Water Lee Reduction - Weasurement and Verification		G
			VVECI			VVECI		Process Water Lise Peduction		G
								Water Lise Reduction- Ruilding Equipment		G
							WEc4.1	Water Lise Reduction - Cooling Toward	C	G
							Wec4 3 [†]	Water Lise Reduction - Cooling Towers	0	6

			ENERGY AN	ID ATMOS
			EAp1 [†]	Fundame
			EAp2	Minimum
			EAp3 [†]	Fundame
			EAc1 [†]	Optimize
			EAc1.1	Optimize
			EAc1.2	Optimize
			<u>EAc1.3</u> [†]	Optimize
			<u>EAc1.4</u>	Optimize
			EAc1.5	Optimize
		EAc5	EAc2	On Site R
	EAc2	EAc2	EAc3	Enhanced
			EAc4	Enhanced
	EAc3	EAc3	EAc5	Measuren
			EAc5.1	Measuren
			EAc5.2	Measuren
	EAC4	EAC4		Green Po
		N		
			MRn1	Storage a
			MRp2	PBT Sour
			MRc1.1	Tenant Sr
М	Rc1		MRc1.1	Building F
			MRc1.2	Building F
			MRc2*	Construct
			MRc3	Sustainab
	MRc3.1	MRc3.1	MRc3	Materials
			MRc3.2	Materials
			MRc4	Recycled
			<u>MRc4.1*</u>	PBT Sour
			<u>MRc4.2</u>	PBT Sour
			MRc5	Regional
			MRc5	Furniture
			MRc6	Rapidly R
	Def		MRC6	Resource
M	RCD			
		INDO		Minimum
			IEQp2 [†]	Environm
			IEQn3	Minimum
			IEQp3	Hazardou only)
			IEQc1	Outdoor A
			IEQc2	Increased
			IEQc2	Acoustic E
IF	Qc3		IEQc3.1	Construct Construct

SPHERE		
antal Commissioning of Building Energy Systems		<u> </u>
		G
n Energy Performance	<u> </u>	G
	U	0
	_	G
Energy Performance- Lighting Power	_	
Energy Performance- Lighting Controls	_	
Energy Performance- HVAC		G
Energy Deformance, Equipment and Appliances		
Energy Performance- Equipment and Appliances		
	•	0
Renewable Energy	С	G
d Commissioning	_	
ed Refrigerant Management	С	G
ment and Verification	_	G
ment and Verification- Base Building	_	G
ment and Verification- Tenant Submetering		G
ower	С	G
nity Contaminant Prevention - Airborne Releases	С	
OURCES		
and Collection of Recyclables	С	G
Irce Reduction- Mercury		G
Space - Long-Term Commitment		
Reuse- Maintain Existing Walls, Floors, and Roof		G
Reuse- Maintain Interior Nonstructural Elements		G
ction Waste Management	С	G
bly Sourced Materials and Products		G
s Reuse		G
s Reuse: Furniture and Furnishings		G
d Content		G
rce Reduction- Mercury in Lamps	С	G
rce Reduction- Lead, Cadmium and Copper		
I Materials		G
e and Medical Furnishings		G
Renewable Materials		G
e Use- Design for Flexibility		
Wood		G
AL QUALITY		
n Indoor Air Quality Performance		
nental Tobacco Smoke (ETS Control)	С	G
Acoustical Performance		
us Material Removal or Encapsulation (Renovations		
Air Delivery Monitoring		
d Ventilation		
Environment		
ction Indoor Air Quality Management Plan - During		
rtion		G

LEED Guidelines

LEED Campus

						Construction Indoor Air Quality Management Plan- Before		
						Low Emitting Materials	C	C
						Low-Emitting Materials	C	G
					IEQ04.1	Low-Emitting Materials- Adhesives and Sealants	C C	G
					IEQ04.2	Low-Emitting Materials- Plants and Coatings		G
		-			<u>IEQC4.3"</u>	Low-Emitting Materials- Flooring Systems	C	G
					IEQc4.4*	Products	С	G
					IEQc4.5*	Low-Emitting Materials- Furniture and Furnishings	С	G
					IEQc4.5*	Low-Emitting Materials- System Furniture and Seating	С	G
					IEQc4.6	Low-Emitting Materials- Ceiling and Wall Systems		G
					IEQc5 [†]	Indoor Chemical and Pollutant Source Control		G
			IEQc6	IEQc6	IEQc6.1	Controllability of Systems- Lighting		
	IEQc6		IEQc6	IEQc6	IEQc6.2	Controllability of Systems- Thermal Comfort		
	IEQc7	IEQc7			IEQc7.1	Thermal Comfort- Design		G
		IEQc7			IEQc7.2	Thermal Comfort- Verification		
					IEQc7.2	Thermal Comfort- Employee Verification		
					IEQc8.1	Daylight and Views- Daylight		
					IEQc8.2	Daylight and Views- Views		
					IEQc9	Enhanced Acoustical Performance		
					IEQc10	Mold Prevention		
					INNOVATIO	ON AND DESIGN		
					IDp1	Integrated Project Planning and Design		G
					IDc1 [†]	Innovation in Design	С	G
					IDc2	LEED Accredited Professional		G
					IDc3	The School as a Teaching Tool		G
					IDc3	Integrated Project Planning and Design		G
					REGION	IAL PRIORITY		
					RPc1 [†]	Regional Priority	С	G
† Not eligible	e as campus or grou	p credit fo	r all comp	liance option	ons. Please	refer to application guidance for details.		

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Service Landscape | Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Street Tree Approved	рН
General Notes: the horticu	ltural trade provides nun	nerous variations on the plants specified. Choose																
cultivars or varieties (indica	cultivars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have the																	
potential to be a cross with	a non-native species.	bold																
botanical names indicate c	ommon availibility in th	e landsape trade							S	EASONAI	L INTEF	REST						
		very showy white blooms be aware the red flowering																
	native species include:	species is a non-native cross and should not be used;	sun to part															
Aesculus spp.	flava and parviflora	can tolerate water edges; moderate salt tolerance	sun	50-75						_					<u> </u>			6.8 - 7.2
		FACW; no salt tolerace; bogs and swamps; white	Court	20.20														40 77
Alnus Incana ssp. Rugosa	speckled alder	flower in spring	Sun	20-30														4.8 - 7.7
	species include: ovata,	several native species of this plant exist however they are difficult to obtain commerically as they are difficult to propogate: yellow orange fall color: puts	sun to nart															
Carva spp.	glabra, tomentosa	are edible	sun	50-75'														6.4 - 7.5
Celtis occidentalis	hackberry	good in windy areas and is resistant to dutch elm disease, may be suseptable to withces broom; FACU; edible fruit	sun to part	40-60'							purpl	e						6 - 7.8
Liriodendron tulipifera	tulip poplar	fast growing tree with straigh upright habit; unique flowers in spring and seed pods in fall; FACU; no salt tolerance	sun part sun	85'+														4.5 - 7.5
Ostrya virginiana	hop-hornbeam	native understory tree; can tolerate varying conditions of clay, drought, salt, smooth grey bark is slightly attractive; trunk can grow askew	part sun to shade	25-40'													x	4.2 - 7.6
Robinia pseudoacacia	Black Locust	FACU; low salt tolerance but does well in poor soil sites; spreads from root sprouts and masses in floodplains, thickets, and reclamation sites; large white flowers and yellow fall color	sun	30-70'														4.6 - 8.2
Tilia americana	American basswood	fragrant white blooms; bees attracted to blooms; large stately tree with heart shaped leaves and good canopy; moderate soil conditions; not salt tolerant	sun to part sun	50-70'														4.5 - 7.5

Service Landscape Evergreen | Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рH
General Notes : the horticultural trade provides numerous variations on the plants specified. Choose cultivars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have the potential to be a cross with a non-native species.							1	1.16.		<u>punc</u>							P
bold botanical names indicate	common availibility in the lar	dsape trade			SEASONAL INTEREST												
Juniperus virginiana	Eastern red cedar	readily colonises abandoned fields, can handle variable conditions; FACU	Sun	30-50'											blue be	rries	4.7-7.8
		a convient evergreen for small areas however there are multiple cultivars that have been crossed with non-native species and it can be difficult to purchase a true															
Thuja occidentalis	eastern arborvitae	species	Sun	30-75'													6.8 - 7.2

Service Landscape | Vines

General Notes: the horticultural trade provides numerous variations on the plants specified. Choose cultivars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have the potential to be a cross with a non-native species.					SEASONAL INTEREST										
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Νον
		vigerous vine with large unique	Sun to Pt.												
Aristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer; strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
		native to southern states, not PA													
Decumaria barbara	Woodvamp	warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.												
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											



Service Landscape | Seed

]		min. size at	
Botanical Name	Common Name			planting	Light
					sun part
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass			5 lb/1000 sq. ft.	sun
No. Mour Soud Mix, Dravia Nursery For no mour					aun nart
turf appearance	Red Forgue Sheen Forgue			$\Gamma \ln / 1000 cm ft$	sun part
	Red Fescue, sheep Fescue			5 lb/1000 sq. it.	sun
Native Detention Area Mix- FRNMX-183 For					
Areas where mowing is not anticipated				0.50 lb/ 1000 sa.ft.	sun
	25% Virginia Wildrye, PA Ecotype (Elymus	17% Deertongue 'Tioga' (Panicum	20% Fox Sedge PA Ecotype (Carey		
	virginicus PA Ecotype (Livinus	clandestinum (Dichanthelium c.) 'Tioga')	vulninoidea PA Ecotype		
	5% Autumn Bentgrass, PA Ecotype (Agrostis	2% Ticklegrass (Rough Bentgrass) PA	1% Path Rush PA Ecotype (Juncus tenuis PA		
	nerennans PA Ecotype	Ecotype (Agrostis scabra PA Ecotype)	Ecotype)		
Woodland Mix- FRNMX-140 Partially Shaded					
Area Roadside Mix				0.50 lb/ 1000 sq.ft.	part shade
				0.00 10/ 1000 34.11.	purt shude
	25% Little Bluestem, 'Camper' (Schizachyrium	20% Virginia Wildrye, PA Ecotype (Elymus	18% Deertongue, 'Tioga' (Panicum		
	scoparium, 'Camper')	virginicus, PA Ecotype)	clandestinum (Dichanthelium c.), 'Tioga')		
			3% Zigzag Aster, PA Ecotype (Aster		
	5% Partridge Pea, PA Ecotype (Chamaecrista		prenanthoides (Symphyotrichum p.), PA		
	fasciculata (Cassia f.), PA Ecotype)	4% Blackeyed Susan (Rudbeckia hirta)	Ecotype)		
			3% Marsh (Dense) Blazing Star (Spiked		
			Gayfeather), PA Ecotype (Liatris spicata, PA		
	3% Tall White Beardtongue (Penstemon digitalis)	3% Purple Coneflower (Echinacea purpurea)	Ecotype)		
	3% Golden Alexanders, PA Ecotype (Zizia aurea, PA	2% Ohio Spiderwort, PA Ecotype	2% Thimbleweed, PA Ecotype (Anemone		
	Ecotype)	(Tradescantia ohiensis, PA Ecotype)	virginiana, PA Ecotype)		
	2% Autumn Bentgrass, Albany Pine Bush-NY				
	Ecotype (Agrostis perennans, Albany Pine Bush-NY	2% Mistflower, VA Ecotype (Eupatorium	1% Oxeye Sunflower, PA Ecotype (Heliopsis		
	Ecotype)	coelestinum (Conoclinium c.), VA Ecotype)	helianthoides, PA Ecotype)		
	1% Wild Bergamot, PA Ecotype (Monarda	1% Blue False Indigo, Southern WV Ecotype	1% Slender Lespedeza, VA Ecotype		
	fistulosa, PA Ecotype)	(Baptisia australis, Southern WV Ecotype)	(Lespedeza virginica, VA Ecotype)		
	1% White (Silver Rod) Goldenrod, PA Ecotype				
	(Solidago bicolor, PA Ecotype)				

Service Landscape | Shrubs

				Average height at												
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
General Notes: the horticultural travarieties (indicated with quotations with a non-native species. common availibility in the landsap	ade provides numerous variations s or var.) not hybrids (indicated w re trade	on the plants specified. Choose cultivars or th an "x") these have the potential to be a cross bold botanical names indicate	5						SEAS	ONAL IN	TERES	т				
																1
Clethra alnifolia	Summersweet	FAC+; white fragrant flowers summer; can handle wet soils and moist woodlands; commerical cultivars readily availble ; not salt tolerant	sun to part sun	3-6'						fragrar	nt whil	e blo	oms			
Cornus racemosa	gray dogwood	thickets	shade	10-15'							flowe	rs				
Cornus stolonifera or sericea	red twig dogwood	attractive red twigs in winter several cultivars availble commerically; new growth produces brightest red; FACW+ good for stream bank restoration	sun to part sun	6-10'										brigh	t red s	stems
Diervilla sessilifolia	bush honeysuckle	PA is on its northernmost border; a tough plant that will naturalize if not maintained; suckering habit	sun	3-5'						yellow tubulai flowers	-					
Gaylussacia brachycera	Black Huckleberry	found in moist sandy soils; dense groundcover / shrub; difficult to obtain commerically	part sun	1-2'					white flower black	or pink rs turn to berries) in fall					
llex verticillata	Winterberry	must include at least one male per 5-6 females; Use 'Jim Dandy' as male cultivar: vellow berry cultivars availible	part sun	6-10'	red k	oerries nter										
Lindera benzoin	Spicebush	deer tolerant species found in woodlands; FACW	sun to part sun	6-12'												
Rhus copallinum	winged sumac	naturalizing habit; intresting "winged" bark	sun to part sun	15-20'												
Salix sericea	silky willow	OBL; no salt tolerance; good for stream bank stabilization	sun	4-12'												
Sambucus canadensis	Common Elderberry	moderate salt tolerance; varying cultivars availible	sun	6-8'					white	flowers						
Vaccinium angustifolium	Lowbush Blueberry	establish; strong fall color	sun	1-2'				small pink	pale lowers				brigh	t fall c	color	
Vaccinium corymbosum	highbush blueberry	FACW; native environments are acidic; edible fruits; strong fall color	sun to part sun					small pink t	pale Iowers				brigh	t fall c	color	
Viburnum acerifolium	macerifolium Mapleleaf Viburnum Color and bright blue berries															
Viburnum dentatum	FAC; good fall color and bright blue berries; several culitvars avaible commercially	sun to part sun	10-12'													

Service Landscape | Small Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Νον	Dec	Street Tree Approved	рН
General Notes: the ho	ticultural trade p	provides numerous variations on the plants specifie	d. Choose			-	-			-		-	-	-	-	-		
cultivars or varieties (ir	dicated with quo	otations or var.) not hybrids (indicated with an "x")	these have the															
potential to be a cross	with a non-native	e species.																
bold botanical names	ndicate commor	n availibility in the landsape trade							9	EASONAL	. INTER	EST						
Amelanchier arborea	shadbush	multi stem large shrub apperance; single stem availible; very popular landscape plant with seasonal intrest and edible fruit	Sun to Pt. Sun	15-35'			white	flowers	red pu edible	urple berries			orange red/ ye fall col	e/ ellow lor				5.5-7.5
Asimina triloba	paw paw	slow growing tree with edible fruit	sun to part sun	15-40'			maroo	n flowers										5.2-7.2
Carpinus caroliniana	American hornbeam	plant has several common names; FAC; low drought tolerance and no salt tolerance; good fall color; trunks are often crooked a bit	Sun to Pt. Sun	20-40'									red pui fall foli	rple age	grey ba	rk	x	4.0-7.2
Celtis occidentalis	hackberry	tolerant of dry and windy conditions; unique bark; FACU; tree can look narled in time	Sun	25-50'									fall ber wildlife	ries go food s	od			6-7.8

Service Landscape | Herbs

				Average height at								
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug
General Notes : the horticultural traver varieties (indicated with quotations with a non-native species.	ade provides numerous varia s or var.) not hybrids (indica	tions on the plants specified. Choose cultivars or ted with an "x") these have the potential to be a cross							SE	ASONAI	. INTER	REST
			sun to part									
Allium cernuum	Nodding Onion	drought tolerant; white to light pink globe flowers	sun	1-3'								
		sometimes called Canda anemone it is native to PA;	sun to part									
Anemone candensis	anemone	fast growing ground cover	sun	1-1.5'								
		no cultivars; FAC; one of the first flowers to	in out									
	Wild Columbias	picom in the spring, learniners usually present	pun	10 10"								
Aqueigia canadensis			snade	12-18								
Asciepids incornatio		UDL		3-5								
	whorled milkweed	very drought tolerant, good for difficult locations	sun	1-3								
Aster corditolus	Blue Wood Aster	rocky woods, drought tolerant; mizomatus nabit	part snade	2-3				<u> </u>				
divaricata)	White Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2'								
Athyrium filix-femina	Lady Fern	found in swamps and thickets	part sun	1-2'								
Baptisia australis	Indigo	blue flowers in spring; intresting seed pods for dried arrangements	sun	2-3'								
Baptisia tinctoria	Yellow Wild Indigo	yellow flowers in spring; intresting seed pods for dried arrangements	sun	2-3'								
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'								
Carex amphibola	Creek Sedge	a great native alternative to liriope, good clumping habit with wider distinctive blade than most carex sp	sun to part sun	12"								
Carex eburnea	Bristleleaf Sedge	soft thread like foliage; small habit; good naturalizer	part sun	6-8''								
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10''								
Carex sticta	Tussock Sedge	emergent aquatic plant found in wetlands; OBL; forms clumps with growth; no salt tolerance; spreads by rhizomes	sun to part sun	3'								
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'								
Cimicifuga racemosa	black snakeroot	large white flowers; best planted at the edge of a woodland for light shade	part sun to part shade	4-7'								
Coreopsis verticillata	Threadleaf Coreopsis	planted commerical perennial	sun	1-2'								
		native woodland habit, moist to average soils; vigorous spreader and makes a good shaded										
Dennstaedtia punctilobula	hay-scented fern	groundcover; orange fall color to fronds;	shade	15-24"								
Deschampsia flexuosa	Wavy Hairgrass	areas; semi-evergreen; tidy clumping habit	shade	6-18"								

Sept	Oct	Nov	Dec

Service Landscape | Herbs

		clumping fern; evergreen fern preferring shady edge	2						
Dryopteris marginalis	eastern wood fern	conditions	shade	12-18"					
		showy pink flowers in summer; unique seed heads	sun to part						
Echinacea purpurea	purple coneflower	in fall	sun	18-24"					
		many cultivars availible; native to open fields and	sun part						
Eupatorium purpurea	joe pye weed	woods; can tolerate varying conditions	sun	2-6'					
		many cultivars availible; will drop foliage early in full							
		sun; pink flowers and light fragrant foliage; can							
Geranium maculatum	Wild Geranium	handle dry soils; low maintenance	part shade	6-12"					
l l e l'ana dia na sella contra ante co		hardy perrennial plant adaptable to varying	sun to part						
Helianthus alvaricatus	wooalana sunflower	conditions	sun	3-5'					
Houchorg amoricana	Amorican alumroat	semi evergreen tollage, drought tolerant, tollage	chada	1.01					
	American alomioor	found along edges: do not hurv rhizomes: white to	Shaue	1-2					
lric cristata	Dwarf Crested Iris	blue flowers	nart shade	A 1 Z''					
	Dwdit Crested ins	OBL : great flowering perennial for wet areas:	part shade	4-10					
Iris versicolor	Blue Flag	moderate salt tolerance		2_3'					
	bioornag	IFACW: low salt tolerance: clump forming grass with		2.0					
		strong upright habit; brown seed heads in late							
Juncus effusus	soft rush	summer stand out against foliage	sun	4'					
		adaptable to varving conditions: purple flower							
		snikes in summer: feathery foliage and unright babit							
Liatris spicata	blazina star	spikes in summer, reachery ronage and upright habit		24.26"					
		EACW: large flowers on tall upright stems: good	sun	24-30					
		hummingbird attractant: best to interplant with other							
		perennials as flower heads can get heavy and weigh							
Lilium superbum	turk's cap lily	foliage down	sun	4-6'					
	, ,	spring ephemeral with bright blue flowers; very							
		attractive in massing; prefers moderately moist							
		woodland locations; companion plant to provide							
Mertensia virginica	virginia blue bells	seasonal interest	part sun	1-2'					
		great plant for butterflies and hummingbirds; can							
		tolerate varying conditions; reseeds regularly; bright	:						
Monarda didyma	beebalm	red flowers in summer	su n	2'					
		pale pink - lilac flowers in late summer; self seeds							
Monarda fistulosa	Wild Bergamot	and tolerate varying conditions	sun	1-3'					
		drought tolerant low growing plant; yellow							
		flowers in early summer; tough plant for hot dry							
Oenothera fruticosa	Sundrops	sites	sun	15-18"					
		clump forming fern;; native to moist woodland							
		conditions; looks nice in an ornamental border;	shade to						
Osmunda cinnamomea	cinnamon fern	cinnamon color spikes in fall	part shade	3-5'					
		meadow grass: unique thick foliage: tolerates poor							
Panicum clandestinum	Deer-tongue Grass	conditions	sun	2'					
	2.301 1011900 01033			-	+				
		tall clump forming native grass tolerant of							
		varying conditions; used ornamentally for its							
Panicum virgatum 'Shenandoah'	Red Switchgrass	strong fall color and structure in winter; FAC	sun	3-4'					

Service Landscape | Herbs

		dry fields and roadsides; drought tolerant; nice								
		perennial border plant: lavender flowers in late May	sun to part							
Penstemon hirsutus	Hairy Beardtonaue	to early July	shade	16-24"						
		creeping evergreep groundcover with white or	nart shade	10 24						
Phlox stolonifera	Creeping Phloy	ninkish blue blooms in spring: moist soils	to shade	8 10"						
	Creeping Thiox			0-10						
		evergreen groundcover with white or white flowers:								
Phlox subulata	Mass Bhlox	best in rock or alpine garden: drought tolerant	eun	A Z''						
		EACLE overgroop elumping form: strong habit shows	Sull part chado	4-0					 '	<u> </u>
Polystichum acrostichoidos	Christmas forn	well as a speciment form: dry woodlands	to chodo							
r oryslichom acroslicholdes	Chinsinids lent	well as a specifient left, dry woodlands	to shaue	2			<u> </u>		 '	<u> </u>
		FACU; found throughout most of the US; naturalizes								
		along woodland edges and ditches; rhizomatous	part sun to							
Pteridium aquilinum	Braken Fern	root growth creates natural massing effect	nart shade	3-6'						
			purt shuue	50					<u> </u>	
		EAC: large decorative vellow daisy like flowers in	sun to part							
Pudbeckia fulaida	coneflower	summer: adaptable to traditional garden conditions	sun	19.24"						
Roubeckid loigidd	conellower	EACU: drought tolerant grass for poor soil areas:	3011	10-24						
		and in massing: native to early successional								
		good in massing, native to early successional	0.00	0.41						
Schizachyrium scoparium	LITTIE BIUESTEM	meadows	Sun	2-4		<u> </u>				<u> </u>
		vellevy deiny flowers in early apring, evergroop in								
		yellow daisy llowers in early spring; evergreen in								
		wet areas; can nanale a wide range of								
		conditions but native to woodland edges; thick	part							
Senecio aureus	golden ragwort	tolerant groundcover	shade	1-2'						
		red flowers in late spring; low growing plant for	part							
Silene virainica	fire pink	ornamental borders; well drained soils	shade	12-18"						
		silvery-white flowers in late summer: grows best in								
Solidado bicolor	Silver-rod	infertile soils: dry: wooded edges or road sides	part sun	1-3'						
		vellow flowers in late summer: grows best in infertile								<u> </u>
Solidado nemoralis	Gray Goldenrod	soils: rhizomatous habit forms massings	sun	1-2'						
		LIPL : tolorant of varving conditions	oun		-					
Sorghasirum nutans	Indian Grass	OFL, toterally of varying conditions	Sun to port	3-8						<u> </u>
			sun to part							
sporobolus neterolepis	Prarie Dropseed	fine foliage; moderate drough tolerance	sun	2-3						
		white llowers in spring; good groundcover;								
		native to decidious woodiands; average to								
Tiarella cordifolia	foamflower	moist soils								
		native to most of the eastern US; found in wet								
		meadows; tall thin spikes of violet flowers; not salt								
Verbena hastata	blue vervain	tolerant	sun	4-6'						
		FAC; purple flowers in Aug; bright showy flowers								
		in late season; good for wet meadow; not salt	sun to							
Vernonia noveboracensis	New York ironweed	tolerant	part sun	4-6'						
		tight spacing; feathery foliage; attractive purple	part sun		+					
		flower in spring; may drop foliage in heavy sup:	to part							
Viola podata	Rindfoot Miclot	moist to average garden soil	shade	4 10"						
		Inansvilike miniture plant: used in dry meadows for		4-10	+					
Viola son		pansy-like minilure plant, used in dry meadows for	oun	6 10"						
		Spring COIDI, resetus	SUII	0-10						
_		FAC, moist meadows and floodplains; great plant for	sun to part	1.0						
Zizia aurea	Golden Alexanders	wiidiite	snade	1-3'						

Athletic - Recreational Landscape | Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Street Tree Approved	рН
General Notes: the b specified. Choose cu (indicated with an "> bold botanical name	norticultural trade pr Itivars or varieties (ir «") these have the po es indicate common	ovides numerous variations on the plants adicated with quotations or var.) not hybrids tential to be a cross with a non-native species. availibility in the landsape trade				·				SEASONA	LINTER	ST						
Carya spp.	species include: ovata, laciniosa, cordiformis, glabra, tomentosa	several native species of this plant exist however they are difficult to obtain commerically as they are difficlut to propogate; yellow orange fall color; nuts are edible	sun to part sun	50-75'														6.4-7.5
Cladrastis kentuckea	Yellowwood	nice park - campus tree; white showy flowers; low maintenance; yellow fall foliage	sun	30-50'													x	adaptable
Fraxinus americanus	white ash	showy white / purple flowers in spring and great fall color of reds, yellows, and purples; moderate drought tolerant; not good in windy areas; problems with emerald ash borer	sun	60-80'														5.0-7.5
Gleditsia triacanthos	Shademaster Honey Locust	poplar urban tree as its small leaves allow for filtered light underneath and grass grows easily; tolerant of varying conditions; some species have thorns; fruit can be considered a nuisance; yellow fall color; web worms can be a problem	sun to part sun	60-80'													X	adaptable
Liriodendron tulipifera	tulip poplar	fast growing tree with straigh upright habit; unique flowers in spring and seed pods in fall; FACU; no salt tolerance	sun part sun	85'+														4.5-7.5
Ostrya virginiana	hop-hornbeam	native understory tree; can tolerate varying conditions of clay, drought, salt, smooth grey bark is slightly attractive; trunk can grow askew	part sun to shade	25-40'													X	4.2-7.6
Quercus ilicifolia	Bear Oak	found on sandy, dry, and rocky areas; native to fire prone systems; askew trunk; forms a nice large shrub shape with single trunk; no fall color	Sun	3-12'														4.0-7.5
Quercus shumardii	Shumard Oak	UPL; drought tolerant and thrives in basic soils; red oak family and has various fall color	Sun	75' +													x	4.0-7.5

Athletic - Recreational Landscape | Evergreen Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the horticu cultivars or varieties (indica the potential to be a cross v bold botanical names indic	Itural trade provides num ted with quotations or va with a non-native species rate common availibility	erous variations on the plants specified. Choose r.) not hybrids (indicated with an "x") these have n the landsape trade								SEASONA	L INTER	EST					
Juniperus virginiana	Eastern red cedar	readily colonises abandoned fields, can handle variable conditions; FACU	Sun	30-50'											blue be	erries	4.7-7.8
Thuja occidentalis	eastern arborvitae	a convient evergreen for small areas however there are multiple cultivars that have been crossed with non-native species and it can be difficult to purchase a true species	Sun	30-75'													6.8-7.2

Athletic - Recreational Landscape | Vines

General Notes : the horticultural tr cultivars or varieties (indicated wit the potential to be a cross with a n	ade provides numerous vari h quotations or var.) not hy ion-native species.	ations on the plants specified. Choose brids (indicated with an "x") these have							SE	ASONA	L INTER	REST			
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	No
		vigerous vine with large unique	Sun to Pt.												
Aristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer;													
		strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
		native to southern states, not PA	1	1											
		but is found in DE and NY; in													
Decumaria barbara	Woodvamp	warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry	1	1											
		summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.		1	1									
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											



Athletic - Recreational Landscape | Small Trees

Potonical Namo	Common	Commonts	Light	Average height at	lon	Eab	Mor	0.07	May	luno	Lub.	A	Cont	Ort	Nev	Dec	Street Tree	
Botanical Name	Name	Comments	Light	maturity	Jan	Feb	Iviar	Apr	iviay	June	July	Aug	Sept	Uct	INOV	Dec	Approved	рн
General Notes: the h	orticultural trac	le provides numerous variations on the plants specified	l. Choose															
cultivars or varieties	(indicated with	quotations or var.) not hybrids (indicated with an "x") t	hese have															
the potential to be a	cross with a no	n-native species.			SEASONAL INTEDEST													
bold botanical name	s indicate com	non availibility in the landsape trade			SEASONAL INTEREST													
		multi stem large shrub apperance: single stem																
Amelanchier		availible; very popular landscape plant with seasonal	Sun to Pt.						red pur	ple edible			orange/	red/				
arborea	shadbush	intrest and edible fruit	Sun	15-35'			white fl	owers	berries				yellow fa	all color				5.5-7.5
						- -												
		plant has several common names; FAC; low drought																
	American	tolerance and no salt tolerance; good fall color;	Sun to Pt.										red purp	ole fall				
Carpinus caroliniana	hornbeam	trunks are often crooked a bit	Sun	20-40'									foliage	-	grey bar	·k	X	4.0-7.2
							flowers	/										
							berries	in 										
	+	single and multi stems availabe; good commerical	Current a Dt				spring;	white	1.1									
Correia concedencia	eastern	plant with many cultivars with varying sesonal	Sun to Pt.	20.20			and pin	K	cultivar	s can have	green, g	golden, d	or purple	wellew	fall as law		v	. 7 5
Cercis canadensis	reabua	aundules; FACU	Sun	20-30			cultivar	S	rollage					yellow	Tall color		Ā	>1.5

Athletic - Recreational Landscape | Shrubs

			1	1					I					<u> </u>	
		FAC+: white fragrant flowers summer: can handle													
		wet soils and moist woodlands: commerical	sun to nart											1	
Clethra alnifolia	Summersweet	cultivars readily available : not salt tolerant	sun	3.6'					fragrar	st while	o blo	oms		1	
	301111101300001		sun to	5-0					nugiui	white				┍──╉	
Cornus racemosa	aray doawood	rhizomateous shrub found natively in thickets	shade	10-15'						flowe	, arc				
	gray acgreea	lattractive red twigs in winter several cultivars	onado	10-13				+		110000	13			ł	
		availble commerically: new growth produces													
		brightest red: EACWL good for stroom bank	aun to												
Corpus stolopiforg or sorioog	rad twig dagwaad	Instantion	sonno	0.401									bright	i rea s	iems
Cornus stolonifera or sericea			parison	6-10									in win	iter	
		wide notive range abrub in North America: females	oup to part											i	
Condus corputa	booked bozelout	wide flative fange stifub in North America, females	sun to part											1	
	beakea nazeinui		sun	4-8					VOIDW					⊢−−−∔	
		DA is an its parthernmost harder: a taugh plant that							yenow	-				1	
		PA is on its northerninost border, a tough plant that		0.51					IUDUICI					1	
Diervilia sessilifolia	bush noneysuckie		sun	3-5			_		tiowers						
												bright	shade	es of	
												orang	e, yell	ow	
		PA is on its northernmost border: low										and re	d fall		
Fotherailla gardenii	fotherailla	manintenance: spreads by suckers	sun	3-6'								foliage	0		
			5011	5-0								Tonage			
			sun to part												
Hyporicum kalmianum	St. John's Wort		sun to part	21					Vellovy	flower	r.0				
Hypencom kalmianom		Imustingludo at logistiono malo, por 5.4	Sun	3			_		yellow	nowe	rs				
		formalized line Dandy' as made outliners												(I	
		iemales, use Jim Danay as male cullivar,			red berrie	es								(I	
llex verticillata	winterberry	yellow berry cultivars availible	part sun	6-10'	in winter										
			sun to part											i	
Lindera benzoin	spicebush	deer tolerant species found in woodlands; FACW	sun	6-12											
														red	
		spreading / naturalizing habit; dwarf culticars	sun to									bright	t fall	berrie	es in
Rhus aromatica	fragrant sumac	availible	part sun	2-6'								color		winte	r
			sun to				_					00101			
Rhus copallinum	winded sumac	naturalizing habit: intresting "winged" bark	part sun	15-20'											
		also known as pasture rose this shrub is well	sun to	10-20				+						 +	
Posa carolina	Carolina Pose	suited for dry conditions	part sup	1.2'										1	
		OBL: no salt tolerance: good for stream bank	pan son	1-5								$ \qquad \qquad$		┢───╋	
Salix sericea	silky willow	stabilization	eun	4 1 2 1										1	
		EACW: fast arowing shrub with moderate salt	Sun	4-12			_	-						┍━━╋	
Sambucus canadensis	Common Elderberry	tolerance: varving cultivars availible	sun	6-8'				white	flowers					1	
	Common Elderbeiry	IEACU: edible fruit: can be difficult to establish:	3011	0-0			small	ngle	1000013						
Vaccinium angustifolium	Lowbush Blueberry	strong fall color	su n	1.0'			nink	Pule				bright	t fall c	alar	
	EGWEDOSIT BIOEBEITY	EACW: native environments are acidic: edible	sun to	1-2			pirik					Digni	Tuirc	,0101	
	bighbush bluchom	fruits strong fall color	sort cup				smal	pule							
vaccinium corymbosum	nighbush bidebeny		panson				pink	lowers				Ingna	Tall C	:010f	
		LIDI for up of with Lip down, and Llaupane are align													
		upel round with Linderd and Hammamelis,													
		widely used commercial native plant; pretty	sun to												
viburnum aceritolium	Maplelear Viburnum	tollage, good fall color and bright blue berries	snaae	4-6'											
		FAC; good tall color and bright blue berries;	sun to												
Viburnum dentatum	arrow wood viburnum	several culitvars avaible commercially	part sun	10-12'											
		FACW; not salt tolerant; white flowers, blue fruit	sun to												_
Viburnum nudum var. cassinoide	es smooth withrod	in fall	shade	10-15'											

Athletic - Recreational Landscape | Seeds

		1		min.
Botanical Name	Common Name			plan
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass			5 lb/:
No-Mow Seed Mix- Prarie Nursery For no-mow	Red Fescue, Sheen Fescue			5 lh/
Native Detention Area Mix- ERNMX-183 For				<u> </u>
Areas where mowing is not anticipated				0.50
Woodland Mix EPNIMY 140 Partially Shadad	25% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype) 5% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype)	47% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga') 2% Ticklegrass (Rough Bentgrass), PA Ecotype (Agrostis scabra, PA Ecotype)	20% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype) 1% Path Rush, PA Ecotype (Juncus tenuis, PA Ecotype)	L
Area Roadside Mix				0.50
	25% Little Bluestem, 'Camper' (Schizachyrium scoparium, 'Camper')	20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)	18% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga') 3% Zigzag Aster, PA Ecotype (Aster	
	5% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)	4% Blackeyed Susan (Rudbeckia hirta)	prenanthoides (Symphyotrichum p.), PA Ecotype) 3% Marsh (Dense) Blazing Star (Spiked Gavfeather). PA Ecotype (Liatris spicata. PA	
	3% Tall White Beardtongue (Penstemon digitalis) 3% Golden Alexanders, PA Ecotype (Zizia aurea, PA Ecotype) 2% Autumn Bentgrass, Albany Pine Bush-NY	3% Purple Coneflower (Echinacea purpurea) 2% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype)	Ecotype) 2% Thimbleweed, PA Ecotype (Anemone virginiana, PA Ecotype)	
	Ecotype (Agrostis perennans, Albany Pine Bush-NY Ecotype)	2% Mistflower, VA Ecotype (Eupatorium coelestinum (Conoclinium c.), VA Ecotype)	1% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)	
	1% Wild Bergamot, PA Ecotype (Monarda fistulosa, PA Ecotype) 1% White (Silver Rod) Goldenrod, PA Ecotype (Solidago bicolor, PA Ecotype)	1% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype)	1% Slender Lespedeza, VA Ecotype (Lespedeza virginica, VA Ecotype)	

size at				
nting	Light			
	sun part			
'1000 sq. ft.	sun			
	sun part			
'1000 sq. ft.	sun			

0.50 lb/ 1000 sq.ft. sun

0.50 lb/ 1000 sq.ft. part shade
Athletic - Recreational Landscape | Herbs

				Average height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
General Notes : the horticultural trad varieties (indicated with quotations of with a non-native species.	e provides numerous varia or var.) not hybrids (indicat	tions on the plants specified. Choose cultivars or red with an "x") these have the potential to be a cross							SE	ASONAL	INTER	REST					
· ·		sometimes called Canda anemone it is native to PA;	sun to part														
Anemone candensis	anemone	fast growing ground cover	sun	1-1.5'													
Arisaema triphyllum	lack-in-the-pulpit	red berry clusters appear late summer to fall; unusual flower, spreads rapidly from seed; woodland native	part sun shade	1-3'													
Asclepias incarnata	Swamp Milkweed	OBL		3-5'													
Asclepias verticillata	Whorled milkweed	very drought tolerant; good for difficult locations	sun	1-3'													
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'													
Aster oblongifolius/ Symphyotrichu	Aromatic Aster	native to alcareous cliffs; fragrant leaves; longest blooming native aster; violet flowers; several commerical cultivars	sun	12-18"													
Athyrium filix-femina	Lady Fern	very tough easy to grow fern in part sun locations; found in swamps and thickets	part sun	1-2'													
Baptisia australis	Indigo	arrangements	sun	2-3'													
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'													
Carex amphibola	Creek Sedge	a great native alternative to liriope, good clumping habit with wider distinctive blade than most carex sp.	sun to part sun	12"													
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10''													
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'													
Coreopsis verticillata	Threadleaf Coreopsis	planted commerical perennial	sun	1-2'													
Dennstaedtia punctilobula	hav-scented fern	native woodland habit, moist to average soils; vigorous spreader and makes a good shaded groundcover: orange fall color to fronds:	shade	15-24"													
		showy pink flowers in summer; unique seed heads	sun to part	10 21													
Echinacea purpurea	purple coneflower	in fall	sun	18-24"													
		low maintenace clumping grass; drought tolerant and air pollution tolerant; used in dried															
Eragrostis spectabilis	Purple Lovegrass	many cultivars availible: native to open fields and	sun part	2-3													
Eupatorium purpurea	joe pye weed	woods; can tolerate varying conditions	sun	2-6'													
Geranium maculatum	Wild Geranium	sun; pink flowers and light fragrant foliage; can handle dry soils; low maintenance	part shade	6-12"													
Helianthus divaricatus	woodland sunflower	hardy perrennial plant adaptable to varying conditions	sun to part sun	3-5'													

Athletic - Recreational Landscape | Herbs

		semi evergreen foliage; drought tolerant; foliage									
Heuchera americana	American alumroot	remains low; good ground cover	shade	1-2'							
		found along edges; do not bury rhizomes; white to									
Iris cristata	Dwart Crested Ins	Dive flowers	part shade	4-16"							
Iris versicolor	Blue Flag	moderate salt tolerance		2_3'							
	blooridg	FACW: low salt tolerance: clump forming grass with		2.0							
		strong upright habit: brown seed heads in late									
Juncus effusus	soft rush	summer stand out against foliage	sun	4'							
		FAC; low growing clump forming grass; does will				 					
		with light foot traffic and can tolerate compacted									
Juncus tenuis	path rush	soils: cannot handle short mowing	part sun	2'							
			p an e e an	-							
		adaptable to varying conditions: purple flower									
		snikes in summer: feathery foliage and unright habit									
Liatris spicata	blazina star	adds taxture to the landscape		24.26"							
		FACW: large flowers on tall upright stems: good	Sull	24-30		 					
		hummingbird attractant: best to interplant with other									
		perennials as flower heads can get heavy and weigh									
Lilium superbum	turk's cap lily	foliage down	sun	4-6'							
		great plant for butterflies and hummingbirds; can									
		tolerate varying conditions; reseeds regularly; bright	t								
Monarda didyma	beebalm	red flowers in summer	su n	2'							
		pale pink - lilac flowers in late summer; self seeds				 					
Monarda fistulosa	Wild Bergamot	and tolerate varying conditions	sun	1-3'							
		fine blue green foliage with clouds of pink seed	sun to part								
Muhlenbergia mexicana	Satin Grass	heads in fall; requires good drainage	sun	2-3'							
		drought tolerant low growing plant; yellow									
		flowers in early summer; fough plant for hot dry									
Oenothera truticosa	Sundrops	sites	sun	15-18"							
		clump forming fern;; native to moist woodland									
		conditions; looks nice in an ornamental border;	shade to								
Osmunda cinnamomea	cinnamon fern	cinnamon color spikes in fall	part shade	3-5'							
			shade to								
		similar conditions to the cinnamon tern but	part								
Osmunda regalis	Royal Fern	without spore fronds and softer foliage	shade	2-4'		 					
			shade to								
		semi evergreen groundcover: moist woodlands	pun shade	10 10"							
Fachysandia procompens	Allegheny spurge	semi evergieen groondeover, moist woodands	sildue	12-10		 					
		meadow grass; unique thick foliage; tolerates poor		21							
Panicum cianaestinum	Deer-tongue Grass	conditions	sun	2						 	
		varving conditions: used ornamentally for its									
Panicum virgatum 'Shenandoah'	Red Switcharass	strong fall color and structure in winter: FAC	sun	3_4'							
		dry fields and roadsides; drought tolerant: nice		∪ -т							
		perennial border plant; lavender flowers in late May	sun to part								
Penstemon hirsutus	Hairy Beardtongue	to early July	shade	16-24"							
		creeping evergreen groundcover with white or	part shade								
Phlox stolonifera	Creeping Phlox	pinkish blue blooms in spring; moist soils	to shade	8-10"							

Athletic - Recreational Landscape | Herbs

Phlox subulata	Moss Phlox	evergreen groundcover with white or white flowers; best in rock or alpine garden; drought tolerant	sun	4-6''				
Polystichum acrostichoides	Christmas fern	FACU; evergreen clumping ferm; strong habit shows well as a speciment fern; dry woodlands	part shade to shade	2'				
Pteridium aquilinum	Braken Fern	FACU; found throughout most of the US; naturalizes along woodland edges and ditches; rhizomatous root growth creates natural massing effect	part sun to part shade	3-6'				
Rudbeckia fulgida	coneflower	FAC; large decorative yellow daisy like flowers in summer; adabtable to traditional garden conditions FACU: drought tolerant grass for poor soil areas:	sun to part sun	18-24"				
Schizachyrium scoparium	Little Bluestem	good in massing; native to early successional meadows	sun	2-4'				
Senecio aureus	golden ragwort	yellow daisy flowers in early spring; evergreen in wet areas; can handle a wide range of conditions but native to woodland edges; thick tolerant groundcover	part shade	1-2'				
Silene virginica	fire pink	red flowers in late spring; low growing plant for ornamental borders; well drained soils	part shade	12-18"				
Smilacina racemosa	false solomon's seal	woodland perennial with delicate white hanging bell shaped flowers at leaf tips in the spring; red berries follow flowers in late summer; prefers moist dappled shade	part shade	2-3'				
Solidago bicolor	Silver-rod	silvery-white flowers in late summer; grows best in infertile soils; dry; wooded edges or road sides	part sun	1-3'				
Sporobolus heterolepis	Prarie Dropseed	a short ornamental grass with good structure and fine foliage; moderate drough tolerance	sun to part sun	2-3'				
Thelypteris noveboracensis	new york fern	one of the most sun tolerant fern species; yellow green fronds; natualizes producing thick ground cover; prefers moist woodland conditions but will tolerate varying conditions	part sun to shade	1-2'				
Tiarella cordifolia	foamflower	white flowers in spring; good groundcover; native to decidious woodlands; average to moist soils						
Verbena hastata	blue vervain	native to most of the eastern US; found in wet meadows; tall thin spikes of violet flowers; not salt tolerant FAC; purple flowers in Aug; bright showy flowers	sun	4-6'				
Vernonia noveboracensis	New York ironweed	in late season; good for wet meadow; not salt tolerant tight spacing; feathery toliage; attractive purple	sun to part sun part sun	4-6'				
Viola pedata	Birdfoot Violet	tlower in spring; may drop foliage in heavy sun; moist to average garden soil	to part shade	4-10''				
Viola spp.		pansy-like miniture plant; used in dry meadows for spring color; reseeds	sun	6-10"				



Final 183 March 2014

Historic Arboretum | Trees

Common Name cultural trade provide th quotations or var.) ive species. licate common availi	Comments es numerous variations on the plants specified. Choose cultivars) not hybrids (indicated with an "x") these have the potential to	Light	Average height at maturity	Jan	Feb											
cultural trade provide th quotations or var.) ive species. licate common availi	es numerous variations on the plants specified. Choose cultivars) not hybrids (indicated with an "x") these have the potential to					Iviar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
th quotations or var.) ive species. licate common availi) not hybrids (indicated with an "x") these have the potential to							•		•		•	•	•	•	
, ive species. licate common availi																
licate common availi																
	ibility in the landsape trade							5	EASONA		REST					
	beautiful red, orange, yellow, fall color; can be slow growing;	sun to														
sugar maple	moderate drought tolerance; no salt tolerance; FACU	shade	60-75'													3.7-7.3
					1	1										
	good in windy areas and is resistant to dutch elm disease, may	sun to part														
nackberry	be suseptable to withces broom; FACU; edible fruit	sun	40-60'							purple	berries					6-7.8
Shademaster Honey Locust	poplar urban tree as its small leaves allow for filtered light underneath and grass grows easily; tolerant of varying conditions; some species have thorns; fruit can be considered a nuisance; yellow fall color; web worms can be a problem	sun to part sun	60-80'													adaptable
white oak	FACU; prefers deep moist well drained soils; moderate shade, drought, and salt tolerance; a very stately tree; slower growing then red oaks but live longer; mild fall color	Sun	50-60'													6.8-7.2
	fragrant white blooms; bees attracted to blooms; large stately															
	tree with heart shaped leaves and good canopy; moderate soil	sun to part														
American basswood	conditions; not salt tolerant	sun	50-70'													4.5-7.5
American Elm: Liberty, Princeton, lefferson, New Harmony, or Valley	adapts to wet and dry sites; tolerant of urban conditions; decorative fruit; very used landscape tree;some cultivars susceptable to dutch elm disease	sun	60-80'													5 5-8 0
	Jgar maple ackberry hademaster Honey ocust /hite oak /hite oak /merican basswood merican Elm: iberty, Princeton, efferson, New larmony, or Valley orge	Jgar maplebeautiful red, orange, yellow, fall color; can be slow growing; moderate drought tolerance; no salt tolerance; FACUackberrygood in windy areas and is resistant to dutch elm disease, may be suseptable to withces broom; FACU; edible fruitpoplar urban tree as its small leaves allow for filtered light underneath and grass grows easily; tolerant of varying conditions; some species have thorns; fruit can be considered a nuisance; yellow fall color; web worms can be a problemFACU; prefers deep moist well drained soils; moderate shade, drought, and salt tolerance; a very stately tree; slower growing then red oaks but live longer; mild fall colorfragrant white blooms; bees attracted to blooms; large stately tree with heart shaped leaves and good canopy; moderate soil conditions; not salt tolerantimerican Elm: iberty, Princeton, efferson, New adapts to wet and dry sites; 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Historic Arboretum | Vines

General Notes: the horticultural tra	ade provides numerous vari	ations on the plants specified. Choose													
cultivars or varieties (indicated with	h quotations or var.) not hy	brids (indicated with an "x") these have													
the potential to be a cross with a n	on-native species.								SE	ASONA	L INTEF	REST			
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	No
		vigerous vine with large unique	Sun to Pt.												
Aristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer;													
		strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
Decumaria barbara	Woodvamp	native to southern states, not PA but is found in DE and NY; in warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry													
		summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.												
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											

Historic Arboretum | Small Trees

				Average													
				height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the	horticultural trade	provides numerous variations on the plants specified. Choose cult	ivars or														
varieties (indicated	with quotations or	var) not hybrids (indicated with an "x") these have the notential t	o he a cross														
with a non-native s		val., not hybras (indicated with an x) these have the potential t	0 00 0 0 0 0 0 0 0 0 0 0														
bold botanical nam	nes indicate commo	n availibility in the landsane trade							c	FASONAL	INTER	FST					
						1				LAJONAL						1	
													orange	/ red/			
Amelanchier		multi stem large shrub apperance; single stem availible; very							red pu	rple			vellow	fall			
arborea	shadbush	popular landscape plant with seasonal intrest and edible fruit	Sun to Pt. Sun	15-35'			white	flowers	edible	berries			color				5.5 - 7.5
			sun to part														
Asimina triloba	paw paw	slow growing tree with edible fruit	sun .	15-40'			maroc	on flowers									5.2-7.2
							flower	rs /		•	<u> </u>		•				
							berrie	s in									
							spring	; white									
		single and multi stems availibe; good commerical plant with					and pi	ink	cultiva	rs can hav	e greer	n, golde	n, or	yellov	w fall		
Cercis canadensis	eastern redbud	many cultivars with varying sesonal attributes; FACU	Sun to Pt. Sun	20-30'			cultiva	ars	purple	foliage				color			>7.5
Magnolia tripetala	umbrella magnolia	PA is northern most range; moist well drained soils	Sun to Pt. Sun	20-30'			white	flowers									5-7.5



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Historic Arboretum | Shrubs

			1	1	1	1	1	1	1	r	—	<u> </u>	—
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Se
Conoral Notoe: the horticultural tra	ido providos numerous variations (the plants specified. Choose sultivers or				•			•				
verieties (indicated with quotations	ar yer) not hybrids (indicated with	the plants specified. Choose cultivals of											
varieties (indicated with quotations	or var.) not hybrids (indicated wi	in an x) these have the potential to be a cross	5										
with a non-native species.	- 1 1 -	bold botanical names indicate							6546		TEDE	CT.	
common availibility in the landsape	e trade		_			1			SEAS	UNAL II	ILEKE:	51	
Clethra alnifolia	Summersweet	FAC+; white fragrant flowers summer; can handle wet soils and moist woodlands; commerical cultivars readily availble ; not salt tolerant	sun to part sun	3-6'						fragra	nt wh	ile blc	on
													Т
Cornus stolonifera or sericea	red twig dogwood	attractive red twigs in winter several cultivars availble commerically; new growth produces brightest red; FACW+ good for stream bank restoration	sun to part sun	6-10'									
													or
		PA is on its northernmost border: low											lar
Fotherailla aardenii	fotherailla	manintenance: spreads by suckers	sun	3-6'									fo
Hydrangeg arborescens	Smooth Hydrangeg	Annabelle' is widely available cultivar.	part sun	3-6'						white	flower	rs	
			sun to part	00				_		winite	10 ** 01	5	+
Hydrangea quercifolia	oak leaf hydrangea	several commerical cultivars	sun	4-6'						white	flower	rs	b
			sun to part										
Hypericum kalmianum	St. John's Wort		sun	3'						vellow	flowe	ers	
		FACW; several commerically avilible		Ŭ						yonow	T		╈
		cultivars, even dwarf ones; can be semi	sun to part										
llex glabra	inkberry	evergreen	sun	3-6'									
		must include at least one male per 5-6											T
		females: Use 'Jim Dandy' as male			red b	oerries							
llex verticillata	Winterberry	cultivar; yellow berry cultivars availible	part sun	6-10'	in wi	nter							
		OBL: very widely used commerically and				1							
		can tolerate varying conditions: fragrant	sun to part					white					
Itea virginica	sweetspire	flowers	sun	3-6'				flowe	rs				b
		prefers wooded, sandy, acidic conditions;											
Kalmia latifolia	Mountain Laurel	commerically availible	part shade	10-20'									
Rhododendron catawbiense		evergreen foliage with pale pink flowers	S										
[maximum]	Catawba rhododendron	early summer	part sun	15-20'									
		moderate salt tolerance; varying											
Sambucus canadensis	Common Elderberry	cultivars availible	sun	6-8'					white	flowers	5		
		UPL found with Linderg and											T
		Hammamelis: widely used commercial											
		native plant; pretty foliage, good fall	sun to										
Viburnum acerifolium	Mapleleaf Viburnum	color and bright blue berries	shade	4-6'	1	1							
		FAC; good fall color and bright blue											
		berries; several culitvars avaible	sun to										
Viburnum dentatum	arrow wood viburnum	commercially	part sun	10-12'									



Historic Arboretum | Herbs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	luly	Aug
Conoral Notae: the horticultural	trada providas pumorous vari	ations on the plants specified. Choose sultivars or	9					1.161	,,	, conto	Joly	Aug
variatios (indicated with quotation	trade provides numerous van	ations on the plants specified. Choose cultivals of										
with a non-native species		area with all x j these have the potential to be a cross							5			DECT
with a non-native species.		comptimes called Canda anomono it is native to BA:	cup to part						3	LASUNA		NEST
		foot enough a second anemone it is native to PA;	sun to part									
Anemone candensis	anemone	Tast growing ground cover	sun	1-1.5								
		unusual flower, spreads rapidly from seed:	part sup									
Arisaema triphyllum	lack-in-the-pulpit	woodland native	shade	1-3'								
		dark green semi-evergreen attractive leaves: good										
Asarum canadense	Wild Ginger	groundcover for shaded areas	shade	4-8''								
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'								
		very tough easy to grow fern in part sun locations;	1									
Athyrium filix-femina	Lady Fern	found in swamps and thickets	part sun	1-2'								
		blue flowers in spring; intresting seed pods for dried										
Baptisia australis	Indigo	arrangements	sun	2-3'								
		vellow flowers in spring: intresting seed pods for										
Baptisia tinctoria	Yellow Wild Indiao	dried arrangements	sun	2-3'								
				2.0								
		warm season ornamental grass; good wildlife shelte	r									
Bouteloua curtipendula	Side-Oats Gramma	in winter; strong fall foliage and unique seed heads	sun	2-3'								
		slow spreader; blue green foliage; drought tolerant	part sun									
Carex flaccosperma	blue wood sedge	once established	shade	6-10"								
		native forest ground speceis, commonly found under										
Carex pensylvanica	Pennsylvania sedge	oaks	shade	8-10"								
		softer blue foliage than other species; benefits from										
		pruning in late winter; once established can tolerate	part shade									
Carex playphylla	Silver Sedge	dry shade	to shade	8-12"					_	ļ		
Chalana alabra	White Turtlebeed	OPI white flowers in fall	sun to	1 41								
			panson	1-4								
		large white flowers: best planted at the edge of a	part sun to									
Cimicifuaa racemosa	black snakeroot	woodland for light shade	part shade	4-7'								
					1							
Claytonia virginica	spring beguty	deicate small but showy flower: good in massing	shade	6-12"								
Dicentra eximia	Wild Bleeding Heart	repeat bloomer; prefers moist well drained soils	Shade	12-18"								
		showy pink flowers in summer; unique seed heads	sun to part									
Echinacea purpurea	purple coneflower	in fall	sun	18-24"								
		evergreen groundcover with fragrant flowers: hard										
Enigeg repens	trailing arbutus	to establish and needs mycorrhizal fungi association	shade	6"								
		dainty woodland flower with spotted foliage: can	Shuuc	5								-
		handle dry woodlands once established; a common										
		spring ephemral that is disappearing due to invasive	part sun									
Erythronium americanum	trout lily	trees shading too much	shade	6"								
		many cultivars availible; native to open fields and	sun part									
Eupatorium purpurea	joe pye weed	woods; can tolerate varying conditions	sun	2-6'		1						

Sept	Oct	Nov	Dec
<u> </u>			

Historic Arboretum | Herbs

		many cultivars availible; will drop foliage early in full							
		sun; pink flowers and light fragrant foliage; can							
Geranium maculatum	Wild Geranium	handle dry soils; low maintenance	part shade	6-12"					
		hardy perrennial plant adaptable to varying	sun to part						
Helianthus divaricatus	woodland sunflower	conditions	sun	3-5'					
		semi evergreen foliage; drought tolerant; foliage							
Heuchera americana	American alumroot	remains low; good ground cover	shade	1-2'					
		found along edges; do not bury rhizomes; white to							
Iris cristata	Dwarf Crested Iris	blue flowers	part shade	4-16"					
		OBL; great flowering perennial for wet areas;							
Iris versicolor	Blue Flag	moderate salt tolerance		2-3'					
		FACW; low salt tolerance; clump forming grass with							
		strong upright habit; brown seed heads in late							
Juncus effusus	soft rush	summer stand out against foliage	sun	4'					
		FAC; low growing clump forming grass; does will							
		with light foot traffic and can tolerate compacted							
luncus tenuis	path rush	soils: cannot bandlo short mowing	nort cun	2'					
2011/203 1611013	pairrosir		part sun	2			<u> </u>	<u> </u>	
		adaptable to varying conditions; purple flower							
		spikes in summer; feathery foliage and upright habit							
Liatris spicata	blazing star	adds texture to the landscape	sun	24-36"					
		found along stream edges; prefers moist part	sun part						
Lobelia cardinalis	cardinal flower	shaded woodland conditions; no salt tolerance	shade	2-4'					
		spring ephemeral with bright blue flowers; very			1				
		attractive in massing; prefers moderately moist							
		woodland locations; companion plant to provide							
Mertensia virginica	virginia blue bells	seasonal interest	part sun	1-2'					
		great plant for butterflies and hummingbirds; can							
		tolerate varving conditions: reseeds regularly: bright							
Monarda didyma	beebalm	rod flowers in summer	cu n	2'					
	beebaim	drought tolerant low growing plant; vellow	Sull	2					
		flowers in early summer: touch plant for bot dry							
Conothers fruitieees	Sundrana	sites		15 10"					
	sundrops	51165	3011	10-10					
		rhizomatus fern that spreads easily in wet areas;	shade to						
Onoclea sensiblis	sensitive fern	good groundcover in moist woodlands	part shade	12-18"					
		clump forming fern:: native to moist woodland							
		conditions: looks nice in an ornamental horder:	shade to						
Osmunda cinnamomea	cinnamon fern	conditions, looks nice in an ornamental border,	part chada	2 51					
Osmoniaa cinnamornea	CITINGITION TEIT		part snaue	3-5			<u> </u>		
		similar conditions to the sinnamon forn but	shuue io						
		similar conditions to the circulation term but		0.41					
Osmunda regalis	Royal Fern	without spore ironas and sofiel tollage	snade	2-4					
			shade to						
			part						
Pachysandra procumbens	Allegheny spurge	semi evergreen groundcover; moist woodlands	shade	12-18"					
		tail clump forming native grass folerant of							
		varying conditions; used ornamentally for its							
Panicum virgatum 'Shenandoah'	Red Switchgrass	strong fall color and structure in winter; FAC	sun	3-4'					



Historic Arboretum | Herbs

		dry fields and roadsides; drought tolerant; nice							
		perennial border plant; lavender flowers in late May	sun to part						
Penstemon hirsutus	Hairy Beardtongue	to early July	shade	16-24"					
		creeping evergreen groundcover with white or	part shade						
Phlox stolonifera	Creeping Phlox	pinkish blue blooms in spring; moist soils	to shade	8-10"					
		evergreen groundcover with white or white flowers;							
Phlox subulata	Moss Phlox	best in rock or alpine garden; drought tolerant	sun	4-6''					
		woodland perennial with delicate white							
		hanging bell shaped flowers in the spring; red							
		berries follow flowers in late summer; prefers	part						
Polygonatum biflorum var. biflorur	r Solomon's Seal	moist dappled shade	shade	2-3'					
		FACU; evergreen clumping ferm; strong habit shows	part shade						
Polystichum acrostichoides	Christmas fern	well as a speciment fern; dry woodlands	to shade	2'					
		FAC; large decorative yellow daisy like flowers in	sun to part						
Rudbeckia fulgida	coneflower	summer; adabtable to traditional garden conditions	sun	18-24"					
		FACU; drought tolerant grass for poor soil areas;							
		good in massing; native to early successional							
Schizachyrium scoparium	Little Bluestem	meadows	sun	2-4'					
		yellow daisy flowers in early spring; evergreen in							
		wet areas; can handle a wide range of							
		conditions but native to woodland edges; thick	part						
Senecio aureus	golden ragwort	tolerant groundcover	shade	1-2'					
		deep pink flowers in late spring; low growing	part						
Silene caroliniana	Wild Pink	plant for ornamental borders; well drained soils	shade	6-8''					
		a short ornamental grass with good structure and	sun to part						
Sporobolus heterolepis	Prarie Dropseed	fine foliage; moderate drough tolerance	sun	2-3'					
		one of the most sun tolerant fern species; yellow							
		green fronds; natualizes producing thick ground							
		cover: prefers moist woodland conditions but will	part sun to						
Thelypteris noveborgcensis	new vork fern	tolerate varving conditions	shade	1-2'					
		white flowers in spring, agod groundcover.	Shaue	1 2	+				
		native to decidious woodlands: average to							
Tigrella cordifolia	foomflower	mainte le déclares récolarias, average le							
		Inative woodland spring enhemeral: does not do well			+				
		with disturbance: best in rich well drained garden							
Trillium sp	Trillium	soils							
		Inative to most of the eastern US: found in wet			-				
		meadows: tall thin spikes of violet flowers: not salt							
Verbena hastata	blue vervain	tolerant	sun	4-6'					
		IFAC; purple flowers in Aua; bright showy flowers		1.0	-				
		in late season: good for wet meadow: not salt	sun to						
Vernonia noveboracensis	New York ironweed	tolerant	part sun	4-6'					
		Itight spacing; feathery foliage: attractive purple	part sun		+				
		flower in spring; may drop foliage in heavy sun:	to part						
Viola pedata	Birdfoot Violet	moist to average garden soil	shade	4-10"					
		pansy-like miniture plant: used in dry meadows for		10	+				
Viola spp.		spring color: reseeds	sun	6-10"					
	1		1.001	0-10					

Historic Arboretum | Seeds

Botanical Name	Common Name
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass
No-Mow Seed Mix- Prarie Nursery For no-mow	Red Fescue, Sheen Fescue

min. size at planting	Light
	sun part
5 lb/1000 sq. ft.	sun
	sun part
5 lb/1000 sq. ft.	sun

Special Garden or Plaza | Trees

				Avg height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	Julv	Aug	Sept	Oct	Nov	Dec	рH
							1 -	1 1						1	1		<u>r</u>
General Notes: the	e horticultural trade	e provides numerous variations on the plants specified. Choose															
cultivars or varieti	es (indicated with q	uotations or var.) not hybrids (indicated with an "x") these have the															
potential to be a c	ross with a non-nat	ive species.															
bold botanical na	mes indicate comm	on availibility in the landsape trade								SEASONA	AL INTER	EST					
		beautiful red, orange, yellow, fall color; can be slow growing;	sun to														
Acer saccharum	sugar maple	moderate drought tolerance; no salt tolerance;FACU	shade	60-75'													3.7 - 7.3
Fraxinus		FACW; fast growing with attractive form; tolerant of pH, salt, and	sun to part														
pennsylvanica	green ash	poor soils; susceptable to emerald ash borer; fall color is marginal	sun	60-80'													7.5 - 8.0
		poplar urban tree as its small leaves allow for filtered light															
		underneath and grass grows easily; tolerant of varying conditions;															
Gleditsia	Shademaster	some species have thorns; fruit can be considered a nuisance;	sun to part														
triacanthos	Honey Locust	yellow fall color; web worms can be a problem	sun	60-80'													adaptable
		FACU; prefers deep moist well drained soils; moderate shade,															
		drought, and salt tolerance; a very stately tree; slower growing then															
Quercus alba	white oak	red oaks but live longer; mild fall color	Sun	50-60'													6.8 - 7.2
		FACU; low salt tolerance but does well in poor soil sites; spreads															
Robinia		from root sprouts and masses in floodplains, thickets, and															
pseudoacacia	Black Locust	reclamation sites; large white flowers and yellow fall color	sun	30-70'													4.6 - 8.2
		adapts to wet and dry sites; tolerant of urban conditions; decorative															
		fruit; very used landscape tree;some cultivars susceptable to dutch															
Ulmus americana	elm	elm disease	sun	60-80'													5.5 - 8.0

Special Garden or Plaza | Evergreen Trees

				Average height at						_							
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the horticu	ltural trade provides nu	merous variations on the plants specified. Choose cultivars															
or varieties (indicated with	quotations or var.) not	hybrids (indicated with an "x") these have the potential to															
be a cross with a non-nativ	e species.																
bold botanical names indi	cate common availibilit	y in the landsape trade							5	EASONA	L INTER	EST					
		readily colonises abandoned fields, can handle variable															
Juniperus virginiana	Eastern red cedar	conditions; FACU	Sun	30-50'											blue be	erries	4.7 - 7.8
		PA is the northernmost state of habitat; can be difficult to															
Pinus pungens	table mountain pine	find commercially; it is a threaten species in NJ	Sun	25-50'					<u> </u>				ļ				6.8 - 7.2
Pinus rigida	pitch pine	dry sites; native habitat is in fire dependent ecoysystems	Sun	40-60'													4.5 - 8.3
Pinus virginiana	Virginia pine	grows best on clay or loam sites; UPL	Full Sun	30-40'													4.6 - 7.9
		a convient evergreen for small areas however there are multiple cultivars that have been crossed with non-native															
Thuja occidentalis	eastern arborvitae	species and it can be difficult to purchase a true species	Sun	30-75'													6.8 - 7.2

Special Garden or Plaza | Small Trees

				Average height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the hor	ticultural trade provid	les numerous variations on the plants specified. Cho	ose cultivars or varieties														
(indicated with quotation	ons or var.) not hybrid	ls (indicated with an "x") these have the potential to	be a cross with a non-														
native species.																	
bold botanical names in	ndicate common avai	libility in the landsape trade	-						5	SEASONAL	INTER	EST				1	
		multi stem large shrub apperance; single stem											orange	/ red/			
		availible; very popular landscape plant with							red pu	rple			yellow	fall			
Amelanchier arborea	shadbush	seasonal intrest and edible fruit	Sun to Pt. Sun	15-35'			white	flowers	edible	berries			color				5.5 - 7.5
Asimina triloba	paw paw	slow growing tree with edible fruit	sun to part sun	15-40'			maro	on flowers	5								5.2 - 7.2
							flowe	rs /									
							berrie	es in									
		single and multi stems availibe; good commerical					spring	g; white									
		plant with many cultivars with varying sesonal					and p	ink	cultiva	rs can hav	ve greer	n, golde	n, or	yellow	ı fall		
Cercis canadensis	eastern redbud	attributes; FACU	Sun to Pt. Sun	20-30'			cultiv	ars	purple	foliage	-			color			> 7.5
		PA is at its northern range; native to Missouri;														red	
Crataegus	Washington	cultivars can have thorns; good wildlife food								white				red pu	irple	berries	
phaenopyrum	hawthorn	source; tolerant of air pollution	Sun to Pt. Sun	25-30'		1				flowers				tall fo	liage	in winter	6.8 - 7.2
Magnolia tripetala	umbrella magnolia	PA is northern most range; moist well drained soils	Sun to Pt. Sun	20-30'			white	flowers									5 - 7.5

Special Garden or Plaza | Shrubs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Νον	Dec
General Notes: the horticultural tr	ade provides numerou	is variations on the plants specified. Choose cultivars or varieties (indicated with														
quotations or var.) not hybrids (ind	dicated with an "x") th	ese have the potential to be a cross with a non-native species.										_				
bold botanical names indicate con	nmon availibility in the	e landsape trade		(10)		-			SEAS		ITERES	Т				. <u> </u>
Cephalanthus occidentalis	Buttondush	OBL; moderate salt tolerance; fun globe white flowers in summer		6-10						white t	lowers	S			'	
Clethra alnifolia	Summersweet	FAC+; white fragrant flowers summer; can handle wet soils and moist woodlands; commerical cultivars readily available; not salt tolerant	sun to part sun	3-6'						fragrai	nt whil	e blo	oms			
			sun to part								white)				
Cornus amomum	silky dogwood	FACW; no salt tolerance; attractive flowers and berries	sun	6-10'							flowe	ers				
	and the star															
Corpus stoloniford or soricod	rea twig	attractive red twigs in winter several cultivars available commerically; new	sun to	6 10'										bright	t red s	stems
	uoywoou	growin produces blightest red, r ACW+ good for sheart bank residration	punson	0-10		1									iter	
	fether weiller			2 6									bright	t shade	es of	
Fornergilla garaenii	fornergilla	PA is on its northernmost border; low manintenance; spreads by suckers	sun	3-6'									fall fo	liage		
Hydrangeg grborescens	Hydranaea	Annahelle' is widely availible cultivar	nart sun	3-6'						white f		-				
	loak leaf		sun to part	00						winei	1000613	5	<u> </u>		<u> </u>	<u> </u>
Hydrangea quercifolia	hydranaea	several commerical cultivars	sun	4-6'						white f		s	briah	t fall c	color	
												-	i i i gri			
			sun to part													
Hypericum kalmianum	St. John's Wort		sun	3'						yellow	flowe	rs				
		FACW; several commerically avilible cultivars, even dwarf ones; can be semi	sun to part													
llex glabra	inkberry	evergreen	sun	3-6'		<u> </u>							 			<u> </u>
llox vorticillata	Winterborn	must include at least one male per 5-6 temales; use Jim Danay as male	part sup	4 10'	redk											
	winierbeity		panson	0-10	in wi	nter										<u> </u>
		OBL; very widely used commerically and can tolerate varying conditions; fragrant	sun to part					white								
Itea virginica	sweetspire	flowers	sun	3-6'				flowe	rs				brigh	t fall c	:olor	L
Kalmia latifolia	Mountain Laurel	prefers wooded, sandy, acidic conditions; commerically availible	part shade	10-20'												
Rhododendron catawbiense	Catawba															
[maximum]	rhododendron	evergreen foliage with pale pink flowers early summer	part sun	15-20'												
															red	
			sun to										brigh	t fall	berri	es in
Rhus aromatica	fragrant sumac	spreading / naturalizing habit; dwarf culticars availible	part sun	2-6'									color		winte	ər
	Common	FACW; fast growing shrub with moderate salt tolerance; varying cultivars														
Sambucus canadensis	Elderberry	availible	sun	6-8'					white	flowers					Ľ'	
	nignbush	EACM(s pative environments are acidies adible fruits strong fall color	sun to					small	pale				1			
	υισερεπλ	r ACvv, native environments are actaic; ealble truits; strong fall color	pan sun					pink f	lowers				orign	I TAILC	color	
	Mapleleaf	UPL found with Linderg and Hammamelis: widely used commercial native	sun to		1											1
Viburnum acerifolium	Viburnum	plant; pretty foliage, good fall color and briaht blue berries	shade	4-6'												1
	arrow wood	FAC; good fall color and bright blue berries; several culitvars avaible	sun to	1		1										<u> </u>
Viburnum dentatum	viburnum	commercially	part sun	10-12'												1

Special Garden or Plaza | Herbs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
General Notes : the horticultural tra- with quotations or var.) not hybrids	de provides numerous varia ; (indicated with an "x") the	ations on the plants specified. Choose cultivars or varieties (indicated se have the potential to be a cross with a non-native species.							SI	EASONA	L INTEI	REST				
Anemone candensis	anemone	sometimes called Canda anemone it is native to PA; fast growing ground cover	sun to part	1-1 5'												
Arisaema triphyllum	Jack-in-the-pulpit	red berry clusters appear late summer to fall; unusual flower, spreads rapidly from seed; woodland native	part sun shade	1-3'												
Asarum canadense	Wild Ginger	dark green semi-evergreen attractive leaves; good groundcover for shaded areas	shade	4-8''												
Asclepias verticillata	Whorled milkweed	very drought tolerant; good for difficult locations	sun	1-3'												
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'												
Aster oblongifolius/ Symphyotrichum oblongifolium	Aromatic Aster	native to alcareous cliffs; fragrant leaves; longest blooming native aster; violet flowers; several commerical cultivars	sun	12-18"												
Athyrium filix-femina	Lady Fern	very tough easy to grow fern in part sun locations; found in swamps and thickets	part sun	1-2'												
Baptisia australis	Indigo	blue flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Baptisia tinctoria	Yellow Wild Indigo	yellow flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Bouteloua curtipendula	Side-Oats Gramma	strong fall foliage and unique seed heads	sun	2-3'												
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10"												
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'												
Cimicifuga racemosa	black snakeroot	large white flowers; best planted at the edge of a woodland for light shade	part sun to part shade	4-7'												
Coreopsis verticillata	Threadleaf Coreopsis	commerical perennial	sun	1-2'												
Deschampsia flexuosa	Wavy Hairgrass	good alternative to C.pennsylvanica in dry areas; semi- evergreen; tidy clumping habit	shade	6-18"												
Dryopteris marginalis	eastern wood fern	clumping fern; evergreen fern preferring shady edge conditions	shade	12-18"												
Echinacea purpurea	purple coneflower	showy pink flowers in summer; unique seed heads in fall	sun to part sun	18-24"												
Epigea repens	trailing arbutus	evergreen groundcover with fragrant flowers; hard to establish and needs mycorrhizal fungi association	shade	6"												
Erythronium americanum	trout lily	dainty woodland flower with spotted foliage; can handle dry woodlands once established; a common spring ephemral that is disappearing due to invasive trees shading too much	part sun shade	6"												
Geranium maculatum	Wild Geranium	many cultivars availible; will drop foliage early in full sun; pink flowers and light fragrant foliage; can handle dry soils; low maintenance	part shade	6-12"												
Helianthus divaricatus	woodland sunflower	hardy perrennial plant adaptable to varying conditions	sun to part	3-5'												

Special Garden or Plaza | Herbs

Heuchera americana	American alumroot	semi evergreen foliage; drought tolerant; foliage remains low; good ground cover	shade	1-2'					
Iris cristata	Dwarf Crested Iris	found along edges; do not bury rhizomes; white to blue flowers	part shade	4-16"					
		OBL; great flowering perennial for wet areas; moderate salt							
Iris versicolor	Blue Flag	tolerance		2-3'					
		adaptable to varying conditions; purple flower spikes in summer;							
Liatris spicata	blazing star	feathery foliage and upright habit adds texture to the landscape	sun	24-36"					
		FACW; large flowers on tall upright stems; good hummingbird							
		attractant; best to interplant with other perennials as flower heads							
Lilium superbum	turk's cap lily	can get heavy and weigh foliage down	sun	4-6'					
		spring ephemeral with bright blue flowers; very attractive in massing;							
	, in statistics to be a the setter	prefers moderately moist woodland locations; companion plant to		1.01					
Mertensia Virginica	virginia biue belis	provide seasonal interest	part sun	1-Z				<u> </u>	
		great plant for butterflies and hummingbirds; can tolerate varying							
Monarda didyma	beebalm	conditions; reseeds regularly; bright red flowers in summer	su n	2'					
h to a smaller fight days a		pale pink - lilac flowers in late summer; self seeds and tolerate		1.01					
Monaraa tistulosa	wild Bergamot	Varying conditions	sun	1-3					
Opporthered fruitioner	Sundrana	arought tolerant low growing plant, yellow nowers in early		15 10"					
Cenomera indicosa	Sundiops	summer, rough plant for hot ary sites	sun	10-10			<u> </u>	<u> </u>	
		clump forming fern;; native to moist woodland conditions; looks	shade to						
Osmunda cinnamomea	cinnamon fern	nice in an ornamental border; cinnamon color spikes in fall	part shade	3-5'					
			shade to						
		similar conditions to the cinnamon tern but without spore	parr	0.4					
Osmunaa regalis	Royal Fern	tronas ana sotter tollage	shade to	2-4			 	<u> </u>	
			shuue io						
Pachygandra procumbong		somi overgreen greundeever; meist weedlands	pun	10 10"					
		dry fields and roadsides: drought tolerant: nice perennial border	sun to part	12-10			<u> </u>	<u> </u>	
Penstemon hirsutus	Hairy Beardtonaue	plant: lavender flowers in late May to early July	shade	16-24"					
		leverareen groundcover with white or white flowers: best in rock or	Chiado	10 2 1				<u> </u>	
Phlox subulata	Moss Phlox	alpine garden; drought tolerant	sun	4-6"					
		FACU; evergreen clumping ferm; strong habit shows well as a	part shade						
Polystichum acrostichoides	Christmas fern	speciment fern; dry woodlands	to shade	2'					
		FAC; large decorative yellow daisy like flowers in summer; adabtable	sun to part						
Rudbeckia fulgida	coneflower	to traditional garden conditions	sun	18-24"					
		yellow daisy flowers in early spring; evergreen in wet areas;							
		can handle a wide range of conditions but native to	part	1.01					
Senecio aureus	golden ragworf	woodland edges; thick tolerant groundcover	shade	1-2'					
		deep pink flowers in late spring; low growing plant for	part	(0)					
Silene caroliniana	Wild Pink	ornamental borders; well drained soils	shade	6-8	_				
Sporabolus botorolopis	Braria Dransad	a short ornamental grass with good structure and fine foliage;	sun to part	0.2'					
		white flowers in spring: good groundcover: native to decidious	SUII	2-0	_				
Tiarella cordifolia	foamflower	woodlands: average to moist soils							
		IFAC: purple flowers in Aug. bright showy flowers in late season.	sun to						
Vernonia noveboracensis	New York ironweed	and for wet meadow: not salt tolerant	nart sun	4-6'					
		Itight spacing; feathery foligge: attractive purple flower in	part sun				<u> </u>		
		spring; may drop foliage in heavy sun: moist to average	to part						
Viola pedata	Birdfoot Violet	aarden soil	shade	4-10"					
			1.1.0.010	1					



Special Garden or Plaza | Vines

General Notes : the horticultural tr cultivars or varieties (indicated wit the notential to be a cross with a n	ade provides numerous vari h quotations or var.) not hy	ations on the plants specified. Choose brids (indicated with an "x") these have							SF	Δ5ΟΝΔ	I INTE	REST			
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
		vigerous vine with large unique	Sun to Pt.												
ristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer;													
		strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
· ·	· ·	native to southern states, not PA													
		but is found in DE and NY; in													
Decumaria barbara	Woodvamp	warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry													
		summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.												
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											



Special Garden or Plaza | Seed

Rotanical Name	Common Name]		min.
Boldnica Name	Common Name			Ipiun
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass			5 lb/:
No-Mow Seed Mix- Prarie Nursery For no-mow				
turf appearance	Red Fescue, Sheep Fescue			5 lb/2
Native Detention Area Mix- ERNMX-183 For Areas where mowing is not anticipated				0.50
Woodland Mix- FRNMX-140 Partially Shaded	25% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype) 5% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype)	47% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga') 2% Ticklegrass (Rough Bentgrass), PA Ecotype (Agrostis scabra, PA Ecotype)	20% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype) 1% Path Rush, PA Ecotype (Juncus tenuis, PA Ecotype)	L
Area Roadside Mix				0.50
	25% Little Bluestem, 'Camper' (Schizachyrium scoparium, 'Camper')	20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype)	18% Deertongue, 'Tioga' (Panicum clandestinum (Dichanthelium c.), 'Tioga') 3% Zigzag Aster, PA Ecotype (Aster	
	5% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype)	4% Blackeyed Susan (Rudbeckia hirta)	prenanthoides (Symphyotrichum p.), PA Ecotype) 3% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA	
	3% Tall White Beardtongue (Penstemon digitalis) 3% Golden Alexanders, PA Ecotype (Zizia aurea, PA Ecotype) 2% Autumn Bentgrass, Albany Pine Bush-NY	3% Purple Coneflower (Echinacea purpurea) 2% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype)	Ecotype) 2% Thimbleweed, PA Ecotype (Anemone virginiana, PA Ecotype)	
	Ecotype (Agrostis perennans, Albany Pine Bush-NY Ecotype)	2% Mistflower, VA Ecotype (Eupatorium coelestinum (Conoclinium c.), VA Ecotype)	1% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype)	
	1% Wild Bergamot, PA Ecotype (Monarda fistulosa, PA Ecotype) 1% White (Silver Rod) Goldenrod, PA Ecotype (Solidago bicolor, PA Ecotype)	1% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype)	1% Slender Lespedeza, VA Ecotype (Lespedeza virginica, VA Ecotype)	

size at	
iting	Light
	sun part
1000 sq. ft.	sun
	sun part
1000 sq. ft.	sun

0.50 lb/ 1000 sq.ft. sun

0.50 lb/ 1000 sq.ft. part shade

Borough Residential Landscape | Trees

				Average height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the he	orticultural trade pro	ovides numerous variations on the plants specified. Choose															
cultivars or varieties (indicated with quota	ations or var.) not hybrids (indicated with an "x") these have															
the potential to be a o	cross with a non-nat	ive species.															
bold botanical names	indicate common a	vailibility in the landsape trade					-			SEASONA	AL INTER	REST		_			
		beautiful red, orange, yellow, fall color; can be slow growing;	sun to														
Acer saccharum	sugar maple	moderate drought tolerance; ho salt tolerance;FACU	snade	60-75 [°]			-									ļ	3.7-7.3
	native species	very snowy white blooms be aware the red flowering species															
	Include: flava and	is a non-native cross and should not be used; can tolerate	sun to														6 9 7 3
Aeculus spp.	parvinora	Water edges; moderate salt tolerance	part sun	50-75		-											0.8-7.2
Eravinus nigra	black ach	PACW, of all the ashes it is the most tolerant of varied and	sull to	60.90'													1100
		EACW: fast growing with attractive form: tolerant of pH salt	part suit	00-00													4.4-0.2
Fravinus		and poor soils: suscentable to emerald ach horer: fall color is	sun to														
nennsvlvanica	green ash	marginal	nart sun	60-80'													7 5-8 0
pennsylvanica			part sun	00 00													7.5 0.0
		poplar urban tree as its small leaves allow for filtered light															
		underneath and grass grows easily: tolerant of varying															
	Shademaster	conditions: some species have thorns: fruit can be considered	sun to														
Gleditsia triacanthos	Honey Locust	a nuisance: vellow fall color: web worms can be a problem	part sun	60-80'													adaptable
	,																
		FACU; prefers deep moist well drained soils; moderate shade,															
		drought, and salt tolerance; a very stately tree; slower															
Quercus alba	white oak	growing then red oaks but live longer; mild fall color	Sun	50-60'													6.8-7.2
		fragrant white blooms; bees attracted to blooms; large															
	American	stately tree with heart shaped leaves and good canopy;	sun to														
Tilia americana	basswood	moderate soil conditions; not salt tolerant	part sun	50-70'													4.5-7.5
	American Elm:																
	Liberty, Princeton,																
	Jefferson, New	adapts to wet and dry sites; tolerant of urban conditions;															
	Harmony, or Valley	decorative fruit; very used landscape tree;some cultivars															
Ulmus americana	Forge	susceptable to dutch elm disease	sun	60-80'	1												5.5-8.0

Borough Residential Landscape | Evergreen Trees

				Average													
	Common			height at													
Botanical Name	Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the horticultu	ral trade provide	es numerous variations on the plants specified. Choose cultivars or															
varieties (indicated with quot	ies (indicated with quotations or var.) not hybrids (indicated with an "x") these have the potential to be with a non-native species. • otanical names indicate common availibility in the landsape trade																
cross with a non-native specie	vith a non-native species. ptanical names indicate common availibility in the landsape trade																
bold botanical names indicat	vith a non-native species. otanical names indicate common availibility in the landsape trade								e e	SEASONA	L INTER	EST					
	with a non-native species. botanical names indicate common availibility in the landsape trade Eastern red readily colonises abandoned fields, can handle variable																
Juniperus virginiana	cedar	conditions; FACU	Sun	30-50'											blue be	erries	4.7-7.8
		a convient evergreen for small areas however there are multiple															
	eastern	cultivars that have been crossed with non-native species and it															
Thuja occidentalis	arborvitae	can be difficult to purchase a true species	Sun	30-75'													6.8-7.2

Borough Residential Landscape | Small Trees

					1	Ι			1								
				Average													
	Common			Average													
Botanical Name	Name	Comments	Light	maturity	lan	Eeb	Mar	Apr	May	luno	luby	Aug	Sont	Oct	Nov	Doc	nLl
	Name	comments	Light	maturity	Jan		IVIAI	יאר	Iviay	Julie	July	Aug	Jehr	000	NUV	Dec	рп
General Notes: the	horticultural tra	de provides numerous variations on the plants specified. Choose cu	ultivars or														
varieties (indicated	with quotations	or var.) not hybrids (indicated with an "x") these have the potentia	l to be a														
cross with a non-na	tive species.																
bold botanical nam	es indicate com	mon availibility in the landsape trade								SEASO	NAL INTI	EREST					
Amelanchier		multi stem large shrub apperance; single stem availible; very	Sun to Pt.						red pur	ple edible			orange/	red/			
arborea	shadbush	popular landscape plant with seasonal intrest and edible fruit	Sun	15-35'			white f	lowers	berries				yellow fa	all color			5.5-7.5
			sun to				maroor	ו									
Asimina triloba	paw paw	slow growing tree with edible fruit	part sun	15-40'			flowers	;									5.2-7.2
							flowers	5/									
							berries	in 									
			с				spring;	white									
	eastern	single and multi stems availibe; good commerical plant with	Sun to Pt.				and pin	IK	cultivar	s can have	green, go	olden, ol	r purple		c		
Cercis canadensis	redbud	many cultivars with varying sesonal attributes; FACU	Sun	20-30'			cultivar	S	foliage					yellow 1	tall color		>7.5
										1.11							
Crataegus	vvasnington	PA is at its northern range; native to ivissouri; cultivars can have	Sun to Pt.	25 201						white				red pur	pie fail	red berries in	6 0 7 0
phaenopyrum	hawthorn	thorns; good wildlife food source; tolerant of air pollution	Sun	25-30						flowers				foliage		winter	6.8-7.2

Borough Residential Landscape | Shrubs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
													<u> </u>	- L	4	L
Concred Notes: the herticultural trac	la providas pumaraus var	vistions on the plants specified. Choose sultivers or variatios (indicated with														
guetations or var) not hybrids (indi	cated with an "x") those h	Tations of the plants specified. Choose cultivals of varieties (indicated with														
hold botanical names indicate com	non availibility in the lan	dsane trade							SFAS		ITERES	sт				
																1
		FAC+; white fragrant flowers summer; can handle wet soils and moist	sun to part													
Clethra alnifolia	Summersweet	woodlands; commerical cultivars readily availble ; not salt tolerant	sun	3-6'						fragra	<u>nt whi</u>	le blo	oms			
	silky dogwood	EACW: no salt tolerance: attractive flowers and herries	sun to part	6 10'							white	erc				
			Jun .	0-10							nowe	512		-	L	
	rad turia de avread	new growth produces brightest red; FACW+ good for stream bank	sun to	0.40										brigh	nt red	stems
Cornus stolonitera or sericea		PA is on its northernmost border: a tough plant that will naturalize if not	panson	6-10		1				vellow		<u> </u>	<u> </u>	in wi	nter	
Diervilla sessilifolia	bush honeysuckle	maintained; suckering habit	sun	3-5'						flowers	5					
		PA is on its northernmost border; low manintenance; spreads by											brigh	t shac	les of	
Fothergilla gardenii	fothergilla	suckers	sun	3-6'									foliag	ge		
Hydrangea arborescens	Smooth Hydrangea	Annabelle' is widely availible cultivar.	part sun	3-6'						white t	lower	'S				
Hydrangeg guercifolig	oak leaf hydranaea	several commerical cultivars	sun	4-6'						white	lower	27	briat	nt fall	color	
			sun to part	10							101101		brigi			
Hypericum kalmianum	St. John's Wort		sun	3'				<u> </u>		yellow	flowe	rs		<u> </u>	4	
		FACW; several commerically avilible cultivars, even dwarf ones; can be semi	sun to part													
llex glabra	inkberry	evergreen	sun	3-6'									 			<u> </u>
		must include at least one male per 5-6 females; Use 'Jim Dandy' as		(10)	red b	perries										
llex verticiliata	winterberry	male cultivar; yellow berry cultivars availible	part sun	6-10'	in wir	nter		h.1.1					<u> </u>			<u> </u>
Itog virgining	sweetspire	OBL; very widely used commerically and can tolerate varying conditions;	sun to part	2.01				white	***				brigh	t fall	aalar	
	sweetspile		Sull	3-0				nowe					ngna			
Kalmia latifolia	Mountain Laurel	prefers wooded, sandy, acidic conditions; commerically availible	part shade	10-20'												
Khododendron catawbiense	Catawba	evergreen foligge with pale pink flowers early summer	part sup	15 201												
Phododendron periclymanoides	ninxterbloom	can handle moist soils	part sun	15-20 4 12'									<u> </u>	┼──	──	
kilododendion penciymenoides				0-12									<u> </u>	<u> </u>		<u> </u>
			sun to										brigh	it fall	red	
Rhus aromatica	fragrant sumac	spreading / naturalizing habit; dwarf culticars availible	part sun	2-6'									color		berri	es
		FACW; fast growing shrub with moderate salt tolerance; varying		(0)												
Sambucus canadensis	Common Elderbeiry		sun to	6-8				small	white	flowers		—				<u> </u>
Vaccinium corymbosum	hiahbush blueberry	FACW; native environments are acidic; edible fruits; strong fall color	part sun					pink f	lowers				briał	nt fall	color	
			ľ					1								
		UPL found with Lindera and Hammamelis: widely used commercial	sun to													
Viburnum acerifolium	Mapleleaf Viburnum	native plant; pretty foliage, good fall color and bright blue berries	shade	4-6'												
				1		1										
	arrow wood	FAC; good fall color and bright blue berries; several culitvars avaible	sun to													
Viburnum dentatum	VIDURNUM	commercially	part sun	10-12'												

Borough Residential Landscape | Herbs

				Average height at												
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Νον	Dec
General Notes: the horticultural trade	e provides numerous variat	ions on the plants specified. Choose cultivars or varieties (indicated with														
quotations or var.) not hybrids (indic	ated with an "x") these hav	e the potential to be a cross with a non-native species.				1			SE	EASONAI	. INTER	REST				
Anemone candensis	anemone	sometimes called Canda anemone it is native to PA; fast growing ground	sun to part	1_1 5'												
	anemone	no cultivars: EAC: one of the first flowers to bloom in the spring:	nart	1-1.5											<u> </u>	<u> </u>
Aquelgia canadensis	Wild Columbine	leafminers usually present on leafs	shade	12-18"												
		red berry clusters appear late summer to fall; unusual flower,	part sun													
Arisaema triphyllum	Jack-in-the-pulpit	spreads rapidly from seed; woodland native	shade	1-3'												
Asarum canadense	Wild Ginger	dark green semi-evergreen attractive leaves; good groundcover for shaded areas	shade	4-8"												
Asclepias verticillata	Whorled milkweed	very drought tolerant; good for difficult locations	sun	1-3'												
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'												
Aster divaricatus (Eurybia	White Wood Astor	rocky woods, drought tolorant; rhizomatus habit	part shado													
			part shaue	2												
Aster oblongifolius/ Symphyotrichu	Aromatic Aster	aster: violet flowers: several commerical cultivars	sun	12-18"												
		very tough easy to grow fern in part sun locations; found in swamps and		12.10												
Athyrium filix-femina	Lady Fern	thickets	part sun	1-2'												
Baptisia australis	Indigo	blue flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Baptisia tinctoria	Yellow Wild Indigo	yellow flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'												
Carex flaccosperma	blue wood sedge	slow spreader; blue green foliage; drought tolerant once established	part sun shade	6-10"												
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10''												
Carex plantaginea	Seersucker Sedge	ribbed blade adds texture to this species; semi-evergreen; habitat is moist woods	part shade to shade	8-10"												
		softer blue foliage than other species; benefits from pruning in late	part shade													
Carex playphylla	Silver Sedge	winter; once established can tolerate dry shade	to shade	8-12"												
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'												
		semi evergreen groundcover found on slopes and in alpine areas;														
Charagonum virgingnum	Croop and Cold	yellow daisy flowers in May and then occassionally through	sun to													
	Green and Gold		parison	6-8											<u> </u>	
		large white flowers; best planted at the edge of a woodland for light	part sun to													
Cimicifuga racemosa	black snakeroot	shade	part shade	4-7'					<u> </u>						<u> </u>	
Coreopsis verticillata	Threadleaf Coreopsis	perennial	sun	1-2'											L	
		native woodland habit, moist to average soils; vigorous spreader and														
Dennstaedtia punctilobula	hay-scented tern	makes a good shaded groundcover; orange fall color to fronds;	shade	15-24"												

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Borough Residential Landscape | Herbs

		good alternative to C.pennsylvanica in dry areas; semi-evergreen;					ſ
Deschampsia flexuosa	Wavy Hairgrass	tidy clumping habit	shade	6-18"		—	4
Dicentra eximia	Wild Bleeding Heart	repeat bloomer; prefers moist well drained soils	Shade	12-18"			
Dryopteris marginalis	eastern wood fern	clumping fern; evergreen fern preferring shady edge conditions	shade	12-18"			
Echinacea purpurea	purple coneflower	showy pink flowers in summer; unique seed heads in fall	sun to part sun	18-24"			
Eragrostis spectabilis	Purple Lovegrass	low maintenace clumping grass; drought tolerant and air pollution tolerant; used in dried flower arrangements; a good tough plant	sun	2-3'			
Eupatorium purpurea	joe pye weed	many cultivars available; native to open fields and woods; can tolerate varying conditions	sun part sun	2-6'			
Geranium maculatum	Wild Geranium	many cultivars availible; will drop foliage early in full sun; pink flowers and light fragrant foliage; can handle dry soils; low maintenance	part shade	6-12"			
Helianthus divaricatus	woodland sunflower	hardy perrennial plant adaptable to varying conditions	sun to part sun	3-5'			
Heuchera americana	American alumroot	semi evergreen follage; drought tolerant; follage remains low; good ground cover	shade	1-2'			
Iris cristata	Dwarf Crested Iris	found along edges; do not bury rhizomes; white to blue flowers	part shade	4-16''			
Iris versicolor	Blue Flag	OBL; great flowering perennial for wet areas; moderate salt tolerance		2-3'			
Juncus tenuis	path rush	FAC; low growing clump forming grass; does will with light foot traffic and can tolerate compacted soils; cannot handle short mowing	part sun	2'			
		adaptable to varying conditions; purple flower spikes in summer;					
Liatris spicata	blazing star	feathery foliage and upright habit adds texture to the landscape	sun	24-36"			Ļ
Lilium superbum	turk's cap lilv	FACW; large flowers on tall upright stems; good hummingbird attractant; best to interplant with other perennials as flower heads can get heavy and weigh foliage down	sun	4-6'			
		found along stream edges; prefers moist part shaded woodland	sun part	+ 0			t
Lobelia cardinalis	cardinal flower	spring ephemeral with bright blue flowers; very attractive in massing;	shade	2-4'			 ┞
Mertensia virginica	virginia blue bells	prefers moderately moist woodland locations; companion plant to provide seasonal interest	part sun	1-2'			
Monarda didyma	beebalm	great plant for butterflies and hummingbirds; can tolerate varying conditions; reseeds regularly; bright red flowers in summer	su n	2'			
Monarda fistulosa	Wild Bergamot	pale pink - lilac flowers in late summer; self seeds and tolerate varying conditions	sun	1-3'			
Oenothera fruticosa	Sundrops	drought tolerant low growing plant; yellow flowers in early summer; tough plant for hot dry sites	sun	15-18''			
Osmunda cinnamomea	cinnamon fern	clump forming fern;; native to moist woodland conditions; looks nice in an ornamental border; cinnamon color spikes in fall	shade to part shade	3-5'			
Osmunda regalis	Royal Fern	similar conditions to the cinnamon fern but without spore fronds and softer foliage	part shade	2-4'			
Pachysandra procumbens	Allegheny spurge	semi evergreen groundcover; moist woodlands	part shade	12-18"			

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Borough Residential Landscape | Herbs

		tall clump forming native grass tolerant of varying conditions; used					
Panicum virgatum 'Shenandoah'	Red Switchgrass	ornamentally for its strong fall color and structure in winter; FAC	sun	3-4'			
Phlox stolonifera	Creeping Phlox	creeping evergreen groundcover with white or pinkish blue blooms in spring; moist soils	part shade to shade	8-10"			
Phlox subulata	Moss Phlox	evergreen groundcover with white or white flowers; best in rock or alpine garden; drought tolerant	sun	4-6''			
Polygonatum biflorum var. biflorur	r Solomon's Seal	woodland perennial with delicate white hanging bell shaped flowers in the spring; red berries follow flowers in late summer; prefers moist dappled shade	part shade	2-3'			
Polystichum acrostichoides	Christmas fern	FACU; evergreen clumping ferm; strong habit shows well as a speciment fern; dry woodlands	part shade to shade	2'			
Pteridium aquilinum	Braken Fern	FACU; found throughout most of the US; naturalizes along woodland edges and ditches; rhizomatous root growth creates natural massing effect	part sun to part shade	3-6'			
Rudbeckia fulgida	coneflower	FAC; large decorative yellow daisy like flowers in summer; adabtable to traditional garden conditions	sun to part sun	18-24"			
Senecio aureus	golden ragwort	yellow daisy flowers in early spring; evergreen in wet areas; can handle a wide range of conditions but native to woodland edges; thick tolerant groundcover	part shade	1-2'			
Silene virginica	fire pink	red flowers in late spring; low growing plant for ornamental borders; well drained soils	part shade	12-18"			
Silene caroliniana	Wild Pink	deep pink flowers in late spring; low growing plant for ornamental borders; well drained soils	part shade	6-8''			
Smilacina racemosa	false solomon's seal	woodland perennial with delicate white hanging bell shaped flowers at leaf tips in the spring; red berries follow flowers in late summer; prefers moist dappled shade	part shade	2-3'			
Sporobolus heterolepis	Prarie Dropseed	a short ornamental grass with good structure and fine foliage; moderate drough tolerance	sun to part sun	2-3'			
Talinum teretifolium or calycinum	Fameflower	treatened speceis in PA; drought tolerant; good on rock outcroppings or alpine garden; self seeds; small pink flowers summer to fall	sun	6"			
Thelypteris noveboracensis	new york fern	one of the most sun tolerant fern species; yellow green fronds; natualizes producing thick ground cover; prefers moist woodland conditions but will tolerate varying conditions	part sun to shade	1-2'			
Tiarella cordifolia	foamflower	white flowers in spring; good groundcover; native to decidious woodlands; average to moist soils					
Uvularia grandiflora	large flowered bellwort	native to southeaster US, PA is at norhthermost border; drought tolerant shade perennial; yellow flowers in spring; low maintenance plant that will naturalize	shade to part shade	1-2'			
Vernonia noveboracensis	New York ironweed	FAC; purple flowers in Aug; bright showy flowers in late season; good for wet meadow; not salt tolerant	sun to part sun	4-6'			
Viola pedata	Birdfoot Violet	tight spacing; feathery foliage; attractive purple flower in spring; may drop foliage in heavy sun; moist to average garden soil	to part shade	4-10"			
Viola spp.		pansy-like miniture plant; used in dry meadows for spring color; reseeds	sun	6-10"			



Borough Residential Landscape | Seed

Botanical Name	Common Name	min. size at planting	Light
			sun part
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass	5 lb/1000 sq. ft.	sun
No-Mow Seed Mix- Prarie Nursery For no-mow			sun part
turf appearance	Red Fescue, Sheep Fescue	5 lb/1000 sq. ft.	sun

Borough Residential Landscape | Vines

General Notes: the horticultural tr	ade provides numerous vari	ations on the plants specified. Choose													
cultivars or varieties (indicated wit	h quotations or var.) not hy	brids (indicated with an "x") these have													
the potential to be a cross with a r	non-native species.								SE	ASONA		REST			
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov
		vigerous vine with large unique	Sun to Pt.										-		
Aristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer;													
		strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
		native to southern states, not PA													
		but is found in DE and NY; in													
Decumaria barbara	Woodvamp	warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry													
		summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.												
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											



Streetscape and Green Corridor | Trees

	Common			Avg height													
Botanical Name	Name	Comments	Light	at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the hort	icultural trade pr	ovides numerous variations on the plants specified. Choose cultivars or															
varieties (indicated with	quotations or va	ar.) not hybrids (indicated with an "x") these have the potential to be a															
cross with a non-native	species.																
bold botanical names in	ndicate common	availibility in the landsape trade					-		S	EASONA	LINTE	REST				_	
		beautiful red, orange, yellow, fall color; can be slow growing; moderate	sun to														
Acer saccharum	sugar maple	drought tolerance; no salt tolerance;FACU	shade	60-75'													рН 3.7 - 7.3
																	4.2–7.9;
																	seedlings do
		moist loam soils are best; longevity is poor in areas where temperature															poorly
Betula papyrifera	Paper Birch	exceeds 75 F		50-70'													above 6.5
		nice park - campus tree; white showy flowers; low maintenance;															
Cladrastis kentuckea	Yellowwood	yellow fall foliage	sun	30-50'													adaptable
		FACW; fast growing with attractive form; tolerant of pH, salt, and poor	sun to part														
Fraxinus pennsylvanica	green ash	soils; susceptable to emerald ash borer; fall color is marginal	sun	60-80'													7.5 - 8.0
. ,	5	poplar urban tree as its small leaves allow for filtered light underneath															
		and grass grows easily; tolerant of varying conditions; some species															
	Shademaster	have thorns; fruit can be considered a nuisance; yellow fall color; web	sun to part														
Gleditsia triacanthos	Honey Locust	worms can be a problem	sun	60-80'													adaptable
	,	adapts to wet and dry sites; tolerant of urban conditions; decorative															
	American	fruit; very used landscape tree; some cultivars susceptable to dutch elm															
Tilia americana	basswood	disease	sun	60-80'													4.5 - 7.5
		fast growing tree with straigh upright habit; unique flowers in spring	sun part														
Liriodendron tulipifera	tulip poplar	and seed pods in fall; FACU; no salt tolerance	sun	85'+													4.5-7.5
	American Elm:																
	Liberty,																
	Princeton,																
	Jefferson, New	adapts to wet and dry sites; tolerant of urban conditions; decorative															
	Harmony, or	fruit; very used landscape tree; some cultivars susceptable to dutch elm															
Ulmus americana	Valley Forge	disease	sun	60-80'													5.5 to 8.0

Streetscape and Green Corridor | Evergreen Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	Мау	June	July	Aug	Sept	Oct	Nov	Dec
General Notes: the horticultura cultivars or varieties (indicated v potential to be a cross with a no bold botanical names indicate of	eral Notes: the horticultural trade provides numerous variations on the plants specified. Choose vars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have th ential to be a cross with a non-native species. I botanical names indicate common availibility in the landsape trade a convient evergreen for small areas								S	EASONA	LINTER	EST				
Thuja occidentalis	eastern arborvitae	a convient evergreen for small areas however there are multiple cultivars that have been crossed with non-native species and it can be difficult to purchase a true species pH 6.8-7.2	Sun	30-75'												

Streetscape and Green Corridor | Small Trees

				Average													
Botanical Name	Common Name	Comments	Light	height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes : the (indicated with quo	horticultural trade tations or var.) not	provides numerous variations on the plants specified. Choose cultivars or van hybrids (indicated with an "x") these have the potential to be a cross with a	arieties non-native														
species. bold botanical nam	es indicate commo	n availibility in the landsape trade							9	SEASONA	L INTER	EST					
Amelanchier arborea	shadbush	multi stem large shrub apperance; single stem availible; very popular landscape plant with seasonal intrest and edible fruit	Sun to Pt. Sun	15-35'			white	flowers	red pu edible	irple berries			yellow color	/ red/ fall			5.5 -7.5
Amelanchier laevis	shadbush	low maintenance tree tolerant of air pollution; tree has a wide range and	Sun to Pt.	15-35'			white	flowers	red pu	irple berries			orange yellow	/ red/ fall			6.6 - 7.5
Asimina triloba	paw paw	slow growing tree with edible fruit	sun to part sun	15-40'			maroo	on flowers	culoic								5.2 - 7.2
		single and multi stems availibe; good commerical plant with many	Sun to Pt.				flower in sprin and pi	rs, berries ng; white nk	cultiva	irs can ha	ve greei	n, golde	n, or	yellov	w fall		
Cercis canadensis	eastern redbud	cultivars with varying sesonal attributes; FACU	Sun	20-30		<u> </u>	cultiva	ars	purple	toliage				color		red	> 7.5
Crataegus phaenopyrum	Washington hawthorn	PA is at its northern range; native to Missouri; cultivars can have thorns; good wildlife food source; tolerant of air pollution	Sun to Pt. Sun	25-30'						white flowers				red p fall fo	urple bliage	berries in winter	6.8 -7.2

Streetscape and Green Corridor | Shrubs

						-							_
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Se
General Notes: the horticul	ltural trade provides nu	umerous variations on the plants specified. Choose cultivars or											
varieties (indicated with ou	intations or var) not h	vbrids (indicated with an "x") these have the potential to be a cross											
with a non-native species		hold botanical names indicate	, 										
common availability in the	landsana trada	bold botalical names indicate							SEVE			ст	
		1	+	+		Ι							
		FAC+; white fragrant flowers summer; can handle wet soils and											
		moist woodlands; commerical cultivars readily availble ; not salt	sun to part										
Clethra alnifolia	Summersweet	tolerant	sun	3-6'						fragra	nt whi	le blc	on
			sun to part								white	Э	
Cornus amomum	silky dogwood	FACW; no salt tolerance; attractive flowers and berries	sun	6-10'							flowe	ərs	
		attractive red twigs in winter several cultivars available											
Cornus stolonifera or		commerically; new growth produces brightest red; FACW+	sun to										
sericea	red twig dogwood	good for stream bank restoration	part sun	6-10'									
Fothergilla gardenii	fothergilla	PA is on its northernmost border; low manintenance; spreads by suckers	sun	3-6'									br or ar fo
Hydrangea arborescens	Smooth Hydrangea	Annabelle' is widely availible cultivar.	part sun	3-6'						white f	ilower	S	
	oak leaf		sun to part										
Hydrangea quercifolia	hydrangea	several commerical cultivars	sun	4-6'						white f	ilower	S	br
Hypericum kalmianum	St. John's Wort		sun to part sun	3'						yellow	flowe	ers	
		FACW; several commerically avilible cultivars, even dwarf ones;	sun to part										
llex glabra	inkberry	can be semi evergreen	sun	3-6'									
llox vorticillata	Winterborn	must include at least one male per 5-6 females; Use 'Jim	part sup	4 10'	red k	oerries							
	winierbeny	Danay as male convar, yellow berry convars avallible	parison	0-10	In wi	nier		-		┣───		 	4
Itea virginica	sweetspire	OBL; very widely used commerically and can tolerate varying conditions; fragrant flowers	sun to part sun	3-6'				white flowe	rs				br
	Maralalacif	or Liouna with Lindera and Hammamells; Widely Used	aun ta										
		commercial native plant; pretty tollage, good fall color and	sun to	4.71									
muliotitos muniudiv	munuaiv	Unigni blue berries	snade	4-6						<u> </u>			
		rAC; good tail color and bright blue berries; several culitvars	sun io	10.10									
viburnum dentatum	MUNUQIV	Javaible commercially	part sun	10-12	1	1							



Streetscape and Green Corridor | Herbs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
General Notes : the horticultural trad quotations or var.) not hybrids (indic	e provides numerous varia cated with an "x") these ha	ations on the plants specified. Choose cultivars or varieties (indicated with ve the potential to be a cross with a non-native species.							S	EASONAL	. INTE	REST				
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'												1
Aster divaricatus (Eurybia divaricata)	White Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2'												
Athyrium filix-femina	Lady Fern	thickets	part sun	1-2'												
Baptisia australis	Indigo	blue flowers in spring: intresting seed pods for dried arrangements	sun	2-3'										<u> </u>	<u> </u>	<u> </u>
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'												
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10"												
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'												
Coreopsis verticillata	Threadleaf Coreopsis	bright yellow flowers in summer; very tolerant widely planted commerical perennial	sun	1-2'												
Dennstaedtia punctilobula	hay-scented fern	native woodland habit, moist to average soils; vigorous spreader and makes a good shaded groundcover; orange fall color to fronds;	shade	15-24"												
Echinacea purpurea	purple coneflower	showy pink flowers in summer; unique seed heads in fall	sun to part sun	18-24"												
Eragrostis spectabilis	Purple Lovegrass	low maintenace clumping grass; drought tolerant and air pollution tolerant; used in dried flower arrangements; a good tough plant	sun	2-3'												
Eupatorium purpurea	joe pye weed	many cultivars availible; native to open fields and woods; can tolerate varying conditions	sun part sun	2-6'												
Geranium maculatum	Wild Geranium	many cultivars availible; will drop foliage early in full sun; pink flowers and light fragrant foliage; can handle dry soils; low maintenance	part shade	6-12"												
Iris cristata	Dwarf Crested Iris	found along edges; do not bury rhizomes; white to blue flowers	part shade	4-16"												
Iris versicolor	Blue Flag	OBL; great flowering perennial for wet areas; moderate salt tolerance		2-3'												
Juncus effusus	soft rush	FACW; low salt tolerance; clump forming grass with strong upright habit; brown seed heads in late summer stand out against foliage	sun	4'												
Juncus tenuis	path rush	FAC; low growing clump forming grass; does will with light foot traffic and can tolerate compacted soils; cannot handle short mowing	part sun	2'												
Muhlenbergia mexicana	Satin Grass	fine blue green foliage with clouds of pink seed heads in fall; requires good drainage	sun to part sun	2-3'												
Pachysandra procumbens	Allegheny spurge	semi evergreen groundcover; moist woodlands	shade to part shade	12-18"												
Panicum virgatum 'Shenandoah'	Red Switchgrass	tall clump forming native grass tolerant of varying conditions; used ornamentally for its strong fall color and structure in winter; FAC	sun	3-4'												
Penstemon hirsutus	Hairy Beardtongue	dry fields and roadsides; drought tolerant; nice perennial border plant; lavender flowers in late May to early July	sun to part shade	16-24''												

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Streetscape and Green Corridor | Herbs

		evergreen groundcover with white or white flowers; best in rock or								
Phlox subulata	Moss Phlox	alpine garden; drought tolerant	sun	4-6''						
		FACU; evergreen clumping ferm; strong habit shows well as a	part shade							
Polystichum acrostichoides	Christmas fern	speciment fern; dry woodlands	to shade	2'						
		FAC; large decorative yellow daisy like flowers in summer; adabtable to	sun to part							
Rudbeckia fulgida	coneflower	traditional garden conditions	sun	18-24"						
		FACU; drought tolerant grass for poor soil areas; good in massing;								
Schizachyrium scoparium	Little Bluestem	native to early successional meadows	sun	2-4'						
		yellow daisy flowers in early spring; evergreen in wet areas; can								
		handle a wide range of conditions but native to woodland	part							
Senecio aureus	golden ragwort	edges; thick tolerant groundcover	shade	1-2'						
		a short ornamental grass with good structure and fine foliage; moderate	sun to part							
Sporobolus heterolepis	Prarie Dropseed	drough tolerance	sun	2-3'						
		white flowers in spring; good groundcover; native to decidious								
Tiarella cordifolia	foamflower	woodlands; average to moist soils								
Viola spp.		pansy-like miniture plant; used in dry meadows for spring color; reseeds	sun	6-10"						

Streetscape and Green Corridor | Seed

Botanical Name	Common Name	min. size at planting	Light
			sun part
Turf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass	5 lb/1000 sq. ft.	sun
No-Mow Seed Mix- Prarie Nursery For no-mow			sun part
turf appearance	Red Fescue, Sheep Fescue	5 lb/1000 sq. ft.	sun

•			
		min. size at	
tanical Name	Common Name	planting	Light
			sun part
rf Seed- Pennington Summer Stress Mix	90% Tall Fescue, 10% Kentucky Bluegrass	5 lb/1000 sq. ft.	sun
-Mow Seed Mix- Prarie Nursery For no-mow		2	sun part
fappearance	Red Fescue, Sheep Fescue	5 lb/1000 sq. ft.	sun

Streetscape and Green Corridor | Vines

General Notes : the horticultural tr cultivars or varieties (indicated wit the potential to be a cross with a r	neral Notes: the horticultural trade provides numerous variations on the plants specified. Choose tivars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have potential to be a cross with a non-native species.								SE	ASONA	L INTER	REST			
Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	Мау	June	July	Aug	Sept	Oct	Nov
		vigerous vine with large unique	Sun to Pt.												
Aristolochia macrophylla	Pipevine	flowers	Shade	30' +											
		orange tubular flowers in summer;		1											
		strong woody vine, it will need a													
Campsis radicans 'Flava'	Trumpet Vine	strong support	Sun	30' +											
		native to southern states, not PA													
		but is found in DE and NY; in													
Decumaria barbara	Woodvamp	warmer climates it is evergreen	Pt. Shade	20' +											
		tubular flowers late spring/ ealry													
		summer; good hummingird	Sun to Pt.												
Lonicera sempervirens	Coral Honeysuckle	attractant	Shade	20' +											
		striking fall color in sunnier	Sun to Pt.												Î
Parthenocissus quinquefolia	Virginia Creeper	locations; can handle shade	Shade	30-50' +											



Building Threshold or Educational Landscape | Trees

				Average													
Determined Marrie	Common	Community	1.5-64	height at		E.h							Cant				
General Notes: the	horticultural tra	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рн
varieties (indicated	with quotations	or var.) not hybrids (indicated with an "x") these have the potential to be a															
cross with a non-na	ative species.																
bold botanical nan	nes indicate com	mon availibility in the landsape trade								SEASON/	AL INTER	REST					
Acer saccharum	sugar manle	beautiful red, orange, yellow, fall color; can be slow growing; moderate	sun to	60-75'													3 7-7 3
			Shute	0075		1											5.7 7.5
	include: flava	cross and should not be used: can tolerate water edges: moderate salt	sun to														
Aeculus spp.	and parviflora	tolerance	sun	50-75'													6.8-7.2
			sun to														
Fraxinus		FACW; fast growing with attractive form; tolerant of pH, salt, and poor soils;	part														
pennsylvanica	green ash	susceptable to emerald ash borer; fall color is marginal	sun	60-80'													7.5-8.0
		poplar urban tree as its small leaves allow for filtered light underneath and															
		grass grows easily; tolerant of varying conditions; some species have thorns;	sun to														
Gleditsia	Snademaster Honey Locust	fruit can be considered a nuisance; yellow fall color; web worms can be a	part	60-80'													adantable
			Jun			1										<u> </u>	
		FACU; prefers deep moist well drained soils; moderate shade, drought, and															
		salt tolerance; a very stately tree; slower growing then red oaks but live															
Quercus alba	white oak	longer; mild fall color	Sun	50-60'				_								_	6.8-7.2
		fragrant white blooms; bees attracted to blooms; large stately tree with	sun to														
Tilia amoricana	American	heart shaped leaves and good canopy; moderate soil conditions; not salt	part	50 70'													4575
	basswood		Sull	50-70		-									-	<u> </u>	4.5-7.5
	American Elm:																
	Liberty,																
	Princeton,																
	Harmonv. or	adapts to wet and dry sites; tolerant of urban conditions: decorative fruit:															
Ulmus americana	Valley Forge	very used landscape tree; some cultivars susceptable to dutch elm disease	sun	60-80'													5.5-8.0

Building Threshold or Educational Landscape | Evergreen Trees

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	Mav	June	vlut	Aug	Sept	Oct	Nov	Dec
General Notes : the horticultural trade provides numerous variations on the plants specified. Choose cultivars or varieties (indicated with quotations or var.) not hybrids (indicated with an "x") these have the potential to be a cross with a non- native species.						1	<u></u>	<u> </u>								
bold botanical names indic	ate common availibi	lity in the landsape trade							9	SEASONA	L INTERE	ST				
Thuja occidentalis	eastern arborvitae	a convient evergreen for small areas however there are multiple cultivars that have been crossed with non-native species and it can be difficult to purchase a true species pH 6.8-7.2	Sun	30-75'												

Building Threshold or Educational Landscape | Small Trees

				Average height at													
Botanical Name	Common Name	Comments	Light	maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	рН
General Notes: the ho	rticultural trade prov	vides numerous variations on the plants specified. Choose cul	tivars or														
varieties (indicated wi	th quotations or var.) not hybrids (indicated with an "x") these have the potential \cdot	to be a														
cross with a non-nativ	e species.																
bold botanical names	indicate common av	vailibility in the landsape trade	1			. <u> </u>				SEASONA	L INTER	EST			_	1	
		multi stem large shrub apperance; single stem availible; very popular landscape plant with seasonal intrest and	Sun to Pt.						red pur	ple			orange/ yellow f	′ red/ ^F all			
Amelanchier arborea	shadbush	edible fruit	Sun	15-35'			white	flowers	edible	perries			color				5.5-7.5
			sun to part					_									
Asimina triloba	paw paw	slow growing tree with edible fruit	sun	15-40'			maroc	on flowers									5.2-7.2
							berrie	s in									
							spring	; white									
		single and multi stems availibe; good commerical plant with	Sun to Pt.				and pi	nk	cultiva	s can have	e green,	golden,	, or	yellow	fall		
Cercis canadensis	eastern redbud	many cultivars with varying sesonal attributes; FACU	Sun	20-30'			cultiva	ars	purple	foliage				color			>7.5
		PA is at its northern range; native to Missouri; cultivars can														red	
Crataegus	Washington	have thorns; good wildlife food source; tolerant of air	Sun to Pt.							white				red pu	rple fall	berries	
phaenopyrum	hawthorn	pollution	Sun	25-30'						flowers				foliage	2	in winter	6.8-7.2
Magnolia tripetala	umbrella magnolia	PA is northern most range; moist well drained soils	Sun to Pt. Sun	20-30'			white	flowers									5-7.5

Building Threshold or Educational Landscape | Shrubs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
General Notes: the horticultural trad quotations or var.) not hybrids (indic bold botanical names indicate comm	e provides numerous variations o cated with an "x") these have the p non availibility in the landsape tra	n the plants specified. Choose cultivars or varieties (indicated with potential to be a cross with a non-native species. Inde					-	_	SEAS	SONAL IN	ITERES	ST				
Clethra alnifolia	Summersweet	FAC+; white fragrant flowers summer; can handle wet soils and moist woodlands; commerical cultivars readily availble ; not salt tolerant	sun to part sun	3-6'						fragra	nt whi	le blo	oms			
Cornus stolonifera or sericea	red twig dogwood	attractive red twigs in winter several cultivars availble commerically; new growth produces brightest red; FACW+ good for stream bank restoration	sun to part sun	6-10'										brigh in wi	nt red : inter	stems
Fothergilla gardenii	fothergilla	PA is on its northernmost border; low manintenance; spreads by suckers	sun	3-6'									brigh orang and r foliag	t shad ge, yel ed fal ge	les of low l	
Hydrangea arborescens	Smooth Hydrangea	Annabelle' is widely availible cultivar.	part sun	3-6'						white	flower	'S				
Hydrangea quercifolia	oak leaf hydrangea	several commerical cultivars	sun to part	4-6'						white	flower	S	brigh	nt fall	color	
Hypericum kalmianum	St. John's Wort		sun to part sun	3'						yellow	flowe	ers				
llex glabra	inkberry	FACW; several commerically avilible cultivars, even dwarf ones; can be semi evergreen	sun to part sun	3-6'												
llex verticillata	Winterberry	must include at least one male per 5-6 females; Use 'Jim Dandy' as male cultivar; yellow berry cultivars availible	part sun	6-10'	red b in wir	berries hter										
ltea virginica	sweetspire	OBL; very widely used commerically and can tolerate varying conditions; fragrant flowers	sun to part sun	3-6'				white flowe	rs				brigh	nt fall	color	
Kalmia latifolia	Mountain Laurel	prefers wooded, sandy, acidic conditions; commerically availible	part shade	10-20'												
	Catawba rhododendron	evergreen foligge with pale pink flowers early summer	part sun	15-20'												
Rhododendron periclymenoides	pinxterbloom	can handle moist soils	part sun	6-12'												
			sun to										briat	t fall	red berri	es in
Rhus aromatica	fragrant sumac	spreading / naturalizing habit; dwarf culticars availible	part sun	2-6'									color	ſ	winte	ər
Vaccinium corymbosum	highbush blueberry	FACW; native environments are acidic; edible fruits; strong fal color	l sun to part sun					small pink f	pale lowers				brigh	nt fall	color	
Viburnum acerifolium	Mapleleaf Viburnum	UPL found with Lindera and Hammamelis; widely used commercial native plant; pretty foliage, good fall color and bright blue berries	sun to shade	4-6'												
Viburnum dentatum	arrow wood viburnum	FAC; good fall color and bright blue berries; several culitvars avaible commercially	sun to part sun	10-12'												

Building Threshold or Educational Landscape | Herbs

Botanical Name	Common Name	Comments	Light	Average height at maturity	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
General Notes : the hort with quotations or var.)	icultural trade provides not hybrids (indicated	numerous variations on the plants specified. Choose cultivars or varieties (indicated with an "x") these have the potential to be a cross with a non-native species.							SI	ASONA	L INTEF	REST				
			sun to part													
Anemone candensis	anemone	sometimes called Canda anemone it is native to PA; fast growing ground cover Ired berry clusters appear late summer to fall: unusual flower, spreads rapidly	sun part sun	1-1.5'											 '	
Arisaema triphyllum	Jack-in-the-pulpit	from seed; woodland native	shade	1-3'												
Asarum canadense	Wild Ginger	dark green semi-evergreen attractive leaves; good groundcover for shaded areas	shade	4-8''												
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'												
Baptisia australis	Indigo	blue flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Baptisia tinctoria	Yellow Wild Indigo	yellow flowers in spring; intresting seed pods for dried arrangements	sun	2-3'												
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'												
Carex flaccosperma	blue wood sedge	slow spreader; blue green foliage; drought tolerant once established	part sun shade	6-10"												
Carex pensylvanica	Pennsylvania sedge	native forest ground speceis, commonly found under oaks	shade	8-10"												
Carex plantaginea	Seersucker Sedge	ribbed blade adds texture to this species; semi-evergreen; habitat is moist woods	part shade to shade	8-10"												
Carex playphylla	Silver Sedge	softer blue foliage than other species; benefits from pruning in late winter; once established can tolerate dry shade	part shade to shade	8-12''												
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun to part sun	1-4'												
Cimicifuga racemosa	black snakeroot	large white flowers; best planted at the edge of a woodland for light shade	part sun to part shade	4-7'												
Coreopsis verticillata	Threadleaf Coreopsis	bright yellow flowers in summer; very tolerant widely planted commerical perennial	sun	1-2'												
Dryopteris marginalis	eastern wood fern	clumping fern; evergreen fern preferring shady edge conditions	shade	12-18"												
Echinacea purpurea	purple coneflower	showy pink flowers in summer; unique seed heads in fall	sun to part sun	18-24"												
Epigea repens	trailing arbutus	evergreen groundcover with fragrant flowers; hard to establish and needs mycorrhizal fungi association	shade	6"												
Eragrostis spectabilis	Purple Lovegrass	low maintenace clumping grass; drought tolerant and air pollution tolerant; used in dried flower arrangements; a good tough plant	sun	2-3'												
Geranium maculatum	Wild Geranium	many cultivars availible; will drop foliage early in full sun; pink flowers and light fragrant foliage; can handle dry soils; low maintenance	part shade	6-12"												
Heuchera americana	American alumroot	semi evergreen foliage; drought tolerant; foliage remains low; good ground cover	shade	1-2'												
Iris cristata	Dwarf Crested Iris	found along edges; do not bury rhizomes; white to blue flowers	part shade	4-16"												
Iris versicolor	Blue Flag	OBL; great flowering perennial for wet areas; moderate salt tolerance		2-3'												
Building Threshold or Educational Landscape | Herbs

Liatris spicata	blazing star	adaptable to varying conditions; purple flower spikes in summer; feathery foliage and	sun	24-36"			
Lilium superbum	turk's cap lily	FACW; large flowers on tall upright stems; good hummingbird attractant; best to interplant with other perennials as flower heads can get heavy and weigh foliage down	sun	4-6'			
Monarda didyma	beebalm	great plant for butterflies and hummingbirds; can tolerate varying conditions; reseeds regularly; bright red flowers in summer	su n	2'			
Muhlenbergia mexicana	Satin Grass	fine blue green foliage with clouds of pink seed heads in fall; requires good drainage	sun to part sun	2-3'			
Osmunda cinnamomea	cinnamon fern	clump forming fern;; native to moist woodland conditions; looks nice in an ornamental border; cinnamon color spikes in fall	shade to part shade	3-5'			
Osmunda regalis	Royal Fern	similar conditions to the cinnamon fern but without spore fronds and softer foliage	part shade	2-4'			
Pachysandra procumbens	Allegheny spurge	semi evergreen groundcover; moist woodlands	part shade	12-18"			
Panicum virgatum 'Shenandoah'	Red Switchgrass	fall clump forming native grass folerant of varying conditions; used ornamentally for its strong fall color and structure in winter; FAC	sun	3-4'			
Penstemon hirsutus	Hairy Beardtongue	dry fields and roadsides; drought tolerant; nice perennial border plant; lavender flowers in late May to early July	sun to part shade	16-24''			
Phlox stolonifera	Creeping Phlox	creeping evergreen groundcover with white or pinkish blue blooms in spring; moist soils	part shade to shade	8-10"			
Phlox subulata	Moss Phlox	drought tolerant	sun	4-6''			
Polygonatum biflorum var. biflorum	Solomon's Seal	woodland perennial with delicate white hanging bell shaped flowers in the spring; red berries follow flowers in late summer; prefers moist dappled shade	part shade	2-3'			
Polystichum acrostichoides	Christmas fern	FACU; evergreen clumping ferm; strong habit shows well as a speciment fern; dry woodlands	part shade to shade	2'			
Rudbeckia fulgida	coneflower	FAC; large decorative yellow daisy like flowers in summer; adabtable to traditional garden conditions	sun to part sun	18-24"			
Senecio aureus	golden ragwort	yellow daisy flowers in early spring; evergreen in wet areas; can handle a wide range of conditions but native to woodland edges; thick tolerant groundcover	part shade	1-2'			
Silene caroliniana	Wild Pink	deep pink flowers in late spring; low growing plant for ornamental borders; well drained soils	part shade	6-8''			
heterolepis	Prarie Dropseed	a snort ornamental grass with good structure and fine follage; moderate drougn tolerance	sun to part sun	2-3'			
Talinum teretifolium or calycinum	Fameflower	treatened speceis in PA; drought tolerant; good on rock outcroppings or alpine garden; self seeds; small pink flowers summer to fall	sun	6"			
Tiarella cordifolia	foamflower	white flowers in spring; good groundcover; native to decidious woodlands; average to moist soils					
Trillium sp.	Trillium	drained garden soils					
Viola pedata	Birdfoot Violet	tight spacing; feathery foliage; attractive purple flower in spring; may drop foliage in heavy sun; moist to average garden soil	to part shade	4-10''			



Green Roofs | Acidic

Green Roof- Acidic										
Aster oblongifolius/ Symphyotrichum oblongifolium	Aromatic Aster	native to alcareous cliffs; fragrant leaves; longest blooming native aster; violet flowers; several commerical cultivars	sun	12-18"						
Baptisia tinctoria	Yellow Wild Indigo	yellow flowers in spring; intresting seed pods for dried arrangements	sun	2-3'						
Coreopsis verticillata	Threadleaf Coreopsis	bright yellow flowers in summer; very tolerant widely planted commerical perennial	sun	1-2'						
Danthonia spicata	Poverty Oatgrass	Upl grass for dry mesic conditions; easily grown from seed	sun	6''						
		low maintenace clumping grass; drought tolerant and air pollution tolerant; used in dried flower arrangements; a good								
Eragrostis spectabilis	Purple Lovegrass	tough plant	sun	2-3'						
Oenothera fruticosa	Sundrops	drought tolerant low growing plant; yellow flowers in early summer; tough plant for hot dry sites	sun	15-18''						
Opuntia humifusa	Eastern Prickly Pear	rocky dry conditions; can be found on rock ledges; yellow flowers in spring; clump forming cactus	sun	8''						
		yellow daisy flowers in early spring; evergreen in wet areas; can handle a wide range of conditions but native to woodland edges: thick tolerant aroundcover	part	1.0						
	golden ragwori	deep pink flowers in late spring: low growing plant for ornamental	nart	1-2						
Silene caroliniana	Wild Pink	borders; well drained soils	shade	6-8''						
Silene virginica	fire pink	red flowers in late spring; low growing plant for ornamental borders; well drained soils	part shade	12-18"						

Green Roofs | Basic

Deterrie el Nerre e		Commonte	Links	Average height at		rh				luna						
boranical Name		Commenis	Light	maturity	Jan	гер	Mar	Apr	may	Jone	JUIY	AUg	зерт	Oct	NOV	Dec
General Notes: the horticultural trac	de provides numerous variatior	s on the plants specified. Choose cultivars or varieties (indicated with														
quotations or var.) not hybrids (indi	cated with an "x") these have t	he potential to be a cross with a non-native species.				_		_	SE	ASON/	AL INTE	REST				
Green Roof- Basic			aun to nort													
Allium cernuum	Nodding Onion	drought tolerant; white to light pink globe flowers	sun to part	1-3'												
Antennaria virginica	Shale Barren Pussytoes	a rare plant in PA; small groundcover found in alpine conditions	part shade	4-8''												
Aquelgia canadensis	Wild Columbine	no cultivars; FAC; one of the first flowers to bloom in the spring; leafminers usually present on leafs	part shade	12-18"												
Asclepias verticillata	Whorled milkweed	very drought tolerant; good for difficult locations	sun	1-3'												
Bouteloua curtipendula	Side-Oats Gramma	warm season ornamental grass; good wildlife shelter in winter; strong fall foliage and unique seed heads	sun	2-3'												
Cunila origanoides	Dittany	a member of the mint family native to Missouri but naturlized throughtout the the Eastern US. Low maintenance plant adaptable to a variety of conditions	sun to part shade	12"												
Monarda fistulosa	Wild Bergamot	pale pink - lilac flowers in late summer; self seeds and tolerate varying conditions	sun	1-3'												
Penstemon hirsutus	Hairy Beardtongue	dry fields and roadsides; drought tolerant; nice perennial border plant; lavender flowers in late May to early July	sun to part shade	16-24"												
Phlox subulata	Moss Phlox	evergreen groundcover with white or white flowers; best in rock or alpine garden; drought tolerant	sun	4-6''												
Schizachyrium scoparium	Little Bluestem	FACU; drought tolerant grass for poor soil areas; good in massing; native to early successional meadows	sun	2-4'												
Sedum mat				<6''												
Solidago bicolor	Silver-rod	silvery-white flowers in late summer; grows best in infertile soils; dry; wooded edges or road sides	part sun	1-3'												
		yellow flowers in late summer; grows best in infertile soils; rhizomatous														
Solidago nemoralis	Gray Goldenrod	habit forms massings	sun	1-2'												
Sorghastrum nutans	Indian Grass	UPL; tolerant of varying conditions	sun	3-8'												
Sporobolus heterolepis	Prarie Dropseed	a short ornamental grass with good structure and fine foliage; moderate drough tolerance	sun to part	2-3'												
Talinum teretifolium or calycinum	Fameflower	treatened speceis in PA; drought tolerant; good on rock outcroppings or alpine garden; self seeds; small pink flowers summer to fall	sun	6"												

Rain Gardens | Sun

				Average													
Potonical Nama	Common Nomo	Comments	Light	height at	lan	Lab	Mar	A	May	luna	1	A	Cont	Oct	Nov	Dec	
Doldnical Name	common Name	comments	Ligni	maturity	Jan	reb	IVIdi	Арг	Ividy	June	July	Aug	Sept	000	NOV	Dec	рп
SUN																	
		a great park plant adaptable to most conditions; specimens in multi	sun to														
Acer rubrum	red maple	stem form are availible; FAC; not salt tolerant; strong red fall color	shade	40-60'													6.0-7.0
		very adaptable tree with great fall color and small leaflets; can be															
Nucce suluction	blackgum	found natively in varying conditions of wet or dry; FAC; salt tolerant;	sun to part														
Nyssa sylvatica	ріаскдит	Strong fall color or purples and reds	sun	30-50													5.5-6.5
Quercus bicolor	swamn white oak	with large arching canony: no fall color	Sun	50-60'													4 0-6 8
Quercus coccinea	scarlet oak	UPL: found on dry rocky sites: drought tolerant: nice fall color:	Sun	70-75'													4.5-6.5
	American Elm: Liberty,																
	Princeton, Jefferson,	adapts to wet and dry sites; tolerant of urban conditions; decorative															
	New Harmony, or	fruit; very used landscape tree;some cultivars susceptable to dutch															
Ulmus americana	Valley Forge	elm disease	sun	60-80'													5.5-8.0
EVERGREEN TREES			Current a Dt		1	1				1.11		1					1
Magnolia virginiana	sweethay magnelia	comi overgreen: henefits from acidis soils: wind suscentable: EACW	Sun to Pt.	15 25'					large w	nite t flowors				rod bo	rrioc		ЕЛСО
	Sweetbay magnona	semi-evergreen, benefits from actuic soils, wind susceptable, FACW	Shaue	12-22					Inagran	it nowers				reu be	mes		5.4-0.8
UNDERSTORY TREES																	
		multi stem large shrub; single stem availible; strong fall color; good	Sun to Pt.											orange	e red		
Sassafras albidium	sassafras	wildlife food source	Sun	30-50'										fall fol	iage		6.0-7.0
SHRUBS					1	1										r	
Ceanothus			pt. sun to							white / r	ourple						
americanus	New Jersey Tea	Dry shade; slow growing	shade	1-3'						blooms							
Cephalanthus																	
occidentalis	Buttonbush	OBL; moderate salt tolerance; fun globe white flowers in summer		6-10'						white flo	owers						
Clathra albifalia	Cummorqueat	FAC+; white fragrant flowers summer; can handle wet soils and moist	sun to part	2.61						fragrant	while h	loomo					
	Summersweet	woodiands; commerical cultivars readily available ; not salt tolerant	sun to part	3-0						Iragrani	a sinw	nooms	r –				
Cornus amomum	silky dogwood	FACW: no salt tolerance: attractive flowers and berries	sun to part	6-10'							white	flowers					
	,	attractive red twigs in winter several cultivars availble commerically:				1										L	
Cornus stolonifera or		new growth produces brightest red; FACW+ good for stream bank	sun to part											bright	red stei	ms in	
sericea	red twig dogwood	restoration	sun	6-10'										winter			

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Rain Gardens | Sun

			multi stem large shruh form: FACU: unique flowers in late winter:	Sun to Pt			yellow	in				
	Hamamelis virginiana	common witchhazel	several non native commercial varieties	Sun to Ft.	15-30'		winter	,				
	Hydrangea	Smooth Hydrangea	Annabelle' is widely availible cultivar	part sun	3-6'		WITTEET				white flo	wers
	i i yuuungeu	omooth nyarangea	FACW: several commercially avilible cultivars, even dwarf ones: can	sun to part	5 0							
	llex glabra	inkberry	be semi evergreen	sun	3-6'							
			must include at least one male, per 5-6 females: Use 'lim Dandy' as			red be	rries in					
	llex verticillata	Winterberry	male cultivar: vellow berry cultivars availible	part sun	6-10'	winter	ines in					
				sun to part	0 10							
	Lindera benzoin	Spicebush	deer tolerant species found in woodlands: FACW	sun	6-12'							
	Rhododendron											
	periclymenoides	pinxterbloom	can handle moist soils	part sun	6-12'							
	Rhododendron	P		sun to part								<u> </u>
	viscosum	swamp azalea	fragrant flowers in early summer: wide native range: OBL	sun	4-8'						white flo	wers
		F									· · · · · · · · · · · · · · · · · · ·	
				sun to nart								
	Rhus aromatica	fragrant sumac	spreading / paturalizing babit: dwarf culticars available	sun	2-6'							
			FACW: fast growing shrub with moderate salt tolerance: varving	3011	20						L	
	Sambucus canadensis	Common Elderherry	cultivars availible	sun	6-8'					white f	lowers	
	Vaccinium			3011	00				small		Owers	
	angustifolium	Lowbush Blueberry	EACU: edible fruit: can be difficult to establish: strong fall color	sup	1_2'				nink fl	owers		
	angustrionann	Lowbash blacberry		3011	1 2				рики	000013		
	HERBACEOUS											
	TERDACEOUS			sun to part								
	Allium cernuum	Nodding Onion	drought tolerant: white to light nink globe flowers:UPI	sun	1-3'							
			no cultivars: EAC: one of the first flowers to bloom in the spring:	5411	1 3							
	Aquelgia canadensis	Wild Columbine	leafminers usually present on leafs	nart shade	12-18"							
				sun to nart	12 10							
	Asclenias incarnata	Swamn Milkweed	OBL	sun	3-5'							
			very tough easy to grow fern in part sun locations: found in swamps	5411	5.5							
	Athyrium filix-femina	Lady Fern	and thickets	nart sun	1-2'							
				pare san								
	Caltha palustris	Yellow Marsh Marigold	OBL		8-12"							
			a great native alternative to liriope, good clumping habit with wider	sun to part								
	Carex amphibola	Creek Sedge	distinctive blade than most carex sp.	sun	12"							
			emergent aquatic plant found in wetlands: OBL: forms clumps with	sun to part								
	Carex sticta	Tussock Sedge	growth: no salt tolerance: spreads by rhizomes	sun	3'							
				sun to part	-							
	Chelone glabra	White Turtlehead	OBL: white flowers in fall	sun	1-4'							
	0.0000 8.0000		bright vellow flowers in summer: very tolerant widely planted									
	Coreopsis verticillata	Threadleaf Coreopsis	commerical perennial	sun	1-2'							
	Elvmus virginicus	Virginia Wildrve	EACW									
ļ	,	0										
ļ			low maintenace clumping grass; drought tolerant and air pollution									
ļ	Eragrostis spectabilis	Purple Lovegrass	tolerant; used in dried flower arrangements: a good tough plant	sun	2-3'							
ļ	0 9	1 0	many cultivars availible; native to open fields and woods: can	sun part	-							
ļ	Eupatorium purpurea	joe pye weed	tolerate varying conditions	sun	2-6'							
1		<u>r i /</u>	, , , , , , , , , , , , , , , , , , , ,		I						4	

	yellow fa foliage	all			
1					
	bright fa	ll color	red ber winter	ries in	
	0				
	bright fa	ll color			
•					

Rain Gardens | Sun

			sun to part								
Helianthus divaricatus	woodland sunflower	hardy perrennial plant adaptable to varying conditions	sun	3-5'							
		OBL; great flowering perennial for wet areas; moderate salt	<u> </u>								
Iris versicolor	Blue Flag	tolerance		2-3'							
		FACW; low salt tolerance; clump forming grass with strong upright									
Juncus effusus	soft rush	habit; brown seed heads in late summer stand out against foliage	sun	4'							
		FAC; low growing clump forming grass; does will with light foot traffic									
Juncus tenuis	path rush	and can tolerate compacted soils; cannot handle short mowing	part sun	2'							
		adaptable to varying conditions; purple flower spikes in summer;									
Liatris spicata	blazing star	feathery foliage and upright habit adds texture to the landscape	sun	24-36"							
		found along stream edges; prefers moist part shaded woodland	sun part								
Lobelia cardinalis	cardinal flower	conditions; no salt tolerance	shade	2-4'							
		great plant for butterflies and hummingbirds; can tolerate varying									
Monarda didyma	beebalm	conditions; reseeds regularly; bright red flowers in summer	su n	2'							
		pale pink - lilac flowers in late summer; self seeds and tolerate									
Monarda fistulosa	Wild Bergamot	varying conditions	sun	1-3'							
		drought tolerant low growing plant; yellow flowers in early summer;									
Oenothera fruticosa	Sundrops	tough plant for hot dry sites	sun	15-18"						 	
Panicum virgatum		tall clump forming native grass tolerant of varying conditions; used									
'Shenandoah'	Red Switchgrass	ornamentally for its strong fall color and structure in winter; FAC	sun	3-4'							
		FAC; large decorative yellow daisy like flowers in summer; adabtable	sun to part								
Rudbeckia fulgida	coneflower	to traditional garden conditions	sun	18-24"							
Schizachyrium		FACU; drought tolerant grass for poor soil areas; good in massing;									
scoparium	Little Bluestem	native to early successional meadows	sun	2-4'							
		yellow daisy flowers in early spring; evergreen in wet areas; can									
		handle a wide range of conditions but native to woodland edges;									
Senecio aureus	golden ragwort	thick tolerant groundcover	part shade	1-2'							
Solidago speciosa	Showy Goldenrod		<u> </u>	1-3'							
Sporobolus		a short ornamental grass with good structure and fine foliage;	sun to part								
heterolepis	Prarie Dropseed	moderate drough tolerance	sun	2-3'	 						
		OBL; large leaved attractive foliage in wet areas; found in shaded									
Symplocarpus		swamps and along roadsides; moderate salt tolerance; difficult to	shade to	L							
foetidus	Shkunk Cabbage	obtain commercially	part shade	2-3'							
		and of the most our televent form energies, vellow groon frances									
Thelymteric		note of the most sun tolerant tern species; yellow green fronds;	port our to								
i neiypteris	a ann an le fann	natualizes producing thick ground cover; prefers moist woodland	part sun to	1 21							
noveporacensis	new york tern	conditions but will tolerate varying conditions	snade	1-2							
		telerent chade nerenniel vellev flevers in enrice berenist service	chada ±-								
		Interant shade perennial; yellow flowers in spring; low maintenance	shade to	1 21							
ovularia grandifiora	large nowered bellwort	plant that will naturalize	part shade	1-2							
Varbana bastata		native to most of the eastern US; found in wet meadows; tail thin		4.01							
verbena nastata	blue vervain	spikes of violet flowers; not salt tolerant	sun	4-0							

Rain Gardens | Sun

Vernonia		FAC; purple flowers in Aug; bright showy flowers in late season; good	sun to part								
noveboracensis	New York ironweed	for wet meadow; not salt tolerant	sun	4-6'							
		tight spacing; feathery foliage; attractive purple flower in spring; may	part sun to								
Viola pedata	Birdfoot Violet	drop foliage in heavy sun; moist to average garden soil	part shade	4-10"							
		pansy-like miniture plant; used in dry meadows for spring color;									
Viola spp.		reseeds	sun	6-10"							
		tolerates clay soils and varying conditions; naturalized to most of the									
Waldsteinia	Appalachian Barren	easter US; low maintenance and will spread forming a thick	full sun to								
fragarioides	Strawberry	groundcover	part shade	6"							
			sun to part								
Zizia aurea	Golden Alexanders	FAC; moist meadows and floodplains; great plant for wildlife	shade	1-3'							

SHADE												
HERBACEOUS												
		dark green semi-evergreen attractive leaves; good groundcover for										
Asarum canadense	Wild Ginger	shaded areas	shade	4-8"								
Aster cordifolus	Blue Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2-3'								
Aster divaricatus												
(Eurybia divaricata)	White Wood Aster	rocky woods, drought tolerant; rhizomatus habit	part shade	2'								
		very tough easy to grow fern in part sun locations; found in swamps										
Athyrium filix-femina	Lady Fern	and thickets	part sun	1-2'								
		a great native alternative to liriope, good clumping habit with wider	sun to part									
Carex amphibola	Creek Sedge	distinctive blade than most carex sp.	sun	12"								
Carex eburnea	Bristleleaf Sedge	soft thread like foliage; small habit; good naturalizer	part sun	6-8"								
		ribbed blade adds texture to this species; semi-evergreen; habitat is	part shade									
Carex plantaginea	Seersucker Sedge	moist woods	to shade	8-10"								
		softer blue foliage than other species; benefits from pruning in late	part shade									
Carex playphylla	Silver Sedge	winter; once established can tolerate dry shade	to shade	8-12"								
		emergent aquatic plant found in wetlands; OBL; forms clumps with	sun to part									
Carex sticta	Tussock Sedge	growth; no salt tolerance; spreads by rhizomes	sun	3'	_	ļ						
			sun to part									
Chelone glabra	White Turtlehead	OBL; white flowers in fall	sun	1-4'								
		semi evergreen groundcover found on slopes and in alpine areas;										
Chrysogonum		yellow daisy flowers in May and then occassionally through summer;	sun to part									
virginanum	Green and Gold	can tolerate drought	sun	6-8"								
Dennstaedtia		native woodland habit, moist to average soils; vigorous spreader and										
punctilobula	hay-scented fern	makes a good shaded groundcover; orange fall color to fronds;	shade	15-24"	_			 	 ļ			
				4.0.4.0.1								
Dryopteris marginalis	eastern wood fern	clumping fern; evergreen fern preferring shady edge conditions	shade	12-18"					<u> </u>			
		good alternative to C.pennsylvanica in dry areas; semi-evergreen;		6.40								
Deschampsia flexuosa	Wavy Hairgrass	tidy clumping habit	shade	6-18"					<u> </u>			
		many cultivars availible; will drop foliage early in full sun; pink										
		flowers and light fragrant foliage; can handle dry soils; low		6.40								
Geranium maculatum	wild Geranium	maintenance	part shade	6-12"							 	
	Appaiachian Barren											
Geum tragaroides	Strawberry			<u> </u>								
U	A	serni evergreen tollage; drought tolerant; tollage remains low; good	 -	1.21								
Heuchera americana	American alumroot	grouna cover	snade	1-2								

Rain Gardens | Shade

		spring ephemeral with bright blue flowers; very attractive in massing prefers moderately moist woodland locations; companion plant to	;					
Mertensia virginica	virginia blue bells	provide seasonal interest	part sun	1-2'				
Onoclea sensiblis	sensitive fern	rhizomatus fern that spreads easily in wet areas; good groundcover in moist woodlands	shade to part shade	12-18"				
Osmunda cinnamomea	cinnamon fern	clump forming fern;; native to moist woodland conditions; looks nice in an ornamental border; cinnamon color spikes in fall	shade to part shade	3-5'				
Osmunda regalis	Royal Fern	similar conditions to the cinnamon fern but without spore fronds and softer foliage	shade to part shade	2-4'				
Pachysandra procumbens	Allegheny spurge	semi evergreen groundcover; moist woodlands	shade to part shade	12-18"				
Phlox stolonifera	Creeping Phlox	creeping evergreen groundcover with white or pinkish blue blooms in spring; moist soils	part shade to shade	8-10"				
Phlox divaricata	Wild Blue Phlox	fragrant pale blue flowers	part shade to shade	6-24"				
Podophyllum pelatum	Mayapple	spring ephemeral with large maple shaped leaves; found in average to moist woodlands in light canopies; large green fruit forms in May	part shade	6-8"				
Polystichum acrostichoides	Christmas fern	FACU; evergreen clumping ferm; strong habit shows well as a speciment fern; dry woodlands	part shade to shade	2'				
Thelypteris noveboracensis	new york fern	one of the most sun tolerant fern species; yellow green fronds; natualizes producing thick ground cover; prefers moist woodland conditions but will tolerate varying conditions	part sun to shade	1-2'				
Viola labradorica	Alpine Violet	low maintenacne groundcover that will spread by self seeding and creeping stems to form a thick cover; can be aggressive	shade to part shade	6"				
Woodwardia areolata	netted chain fern	native throughout the most of the US; medium to wet soils; will naturalize and form a dense ground cover; low maintenance	part to full shade	18-24"				
Zizia aurea	Golden Alexanders	FAC; moist meadows and floodplains; great plant for wildlife	sun to part shade	1-3'				
SHRUBS					 	 		
Aronia arbutifolia	red chokeberry	FACW; tolerant of wet and moderate salt locations	sun	5-10'	I	white	flowers	
Asimina triloba	paw paw	slow growing tree with edible fruit	part sun	15-40'				



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Ceanothus			pt. sun to							white /	purple						
americanus	New Jersey Tea	Dry shade; slow growing	' shade	1-3'						blooms							
Cephalanthus																	i
occidentalis	Buttonbush	OBL; moderate salt tolerance; fun globe white flowers in summer		6-10'						white flo	owers						
																	i
		FAC+; white fragrant flowers summer; can handle wet soils and moist	sun to part														
Clethra alnifolia	Summersweet	woodlands; commerical cultivars readily availble ; not salt tolerant	sun	3-6'						fragrant	while bl	ooms					
			sun to part	1													
Cornus amomum	silky dogwood	FACW; no salt tolerance; attractive flowers and berries	sun	6-10'							white fl	owers					
	, , ,	attractive red twigs in winter several cultivars availble commerically;															
Cornus stolonifera or		new growth produces brightest red; FACW+ good for stream bank	sun to part											bright	red ster	ns in	
sericea	red twig dogwood	restoration	sun	6-10'										winter	-		
						yellow											
		multi stem large shrub form; FACU; unique flowers in late winter;	Sun to Pt.			flowers	in						yellow f	all			
Hamamelis virginiana	common witchhazel	several non native commerical varieties	Sun	15-30'		winter							foliage			<u> </u>	ļ
		FACW; several commerically avilible cultivars, even dwarf ones; can	sun to part														
Ilex glabra	inkberry	be semi evergreen	sun	3-6'													
		must include at least one male per 5-6 females; Use 'Jim Dandy' as			red be	rries in											
llex verticillata	Winterberry	male cultivar; yellow berry cultivars availible	part sun	6-10'	winter												
		OBL; very widely used commerically and can tolerate varying	sun to part														
ltea virginica	sweetspire	conditions; fragrant flowers	sun	3-6'				white	flowers				bright fa	all color			L
Kalmia latifolia	Mountain Laurel	prefers wooded, sandy, acidic conditions; commerically availible	part shade	10-20'													
		less commercially availible than K. latifolia; found in pastures,															
Kalmia angustifolia	sheep laurel	barrens, slow wooded streams, swamp borders, bogs, thickets	part shade	2-3'													
			sun to part														
Lindera benzoin	Spicebush	deer tolerant species found in woodlands; FACW	sun	6-12'												 '	
Rhododendron																	
periclymenoides	pinxterbloom	can handle moist soils	part sun	6-12'												 '	
Rhododendron			sun to part														
viscosum	swamp azalea	fragrant flowers in early summer; wide native range; OBL	sun	4-8'					ļ	white flo	owers					<u> </u>	
Rhododendron																	
catawbiense																	
[[maximum]	Catawba rhododendron	evergreen foliage with pale pink flowers early summer	part sun	15-20'													
		FACW; wet meadows, moist fields, riparian buffers; no salt tolerance;	sun to part													1	
Spirea tomentosa	steeplebush	rhizomatous shrub that naturalizes	sun	3'	<u> </u>										<u> </u>	 '	ļ
		FACW; fast growing shrub with moderate salt tolerance; varying	sun to part													1	1
Sambucus canadensis	Common Elderberry	cultivars availible	sun	6-8'					white f	lowers						1	1

CANOPY TREES															
		a great park plant adaptable to most conditions; specimens in multi	sun to												
Acer rubrum	red maple	stem form are availible; FAC; not salt tolerant; strong red fall color	shade	40-60'											6.0-7.0
															1
															1
											orange/	red/			
Amelanchier		similar to A. laevis and A. arborea but the habit is more upright with	Sun to Pt.					red pui	ple		yellow fa	all			l
candensis	serviceberry	suckering multi stem form. Native to bogs and swamps.	Sun	10-12'	_	white f	lowers	edible	berries		color				5.5-6.0
															l
		plant has several common names; FAC; low drought tolerance and	Sun to Pt.								red purp	le fall			l
Carpinus caroliniana	American hornbeam	no salt tolerance; good fall color; trunks are often crooked a bit	Sun	20-40'							foliage		grey ba	irk	6.8-7.2
	species include: ovata,	several native species of this plant exist however they are difficult to													1
	laciniosa, cordiformis,	obtain commerically as they are difficlut to propogate; yellow orange	sun to part												1
Carya spp.	glabra, tomentosa	fall color; nuts are edible	sun	50-75'											6.4-7.5
Liriodendron		fast growing tree with straigh upright habit; unique flowers in spring	sun part												1
tulipifera	tulip poplar	and seed pods in fall; FACU; no salt tolerance	sun	85'+											4.5-7.5
		very adaptable tree with great fall color and small leaflets; can be													l
		found natively in varying conditions of wet or dry; FAC; salt tolerant;	sun to part												l
Nyssa sylvatica	blackgum	strong fall color or purples and reds	sun	30-50'											5.5-6.5
		native understory tree; can tolerate varying conditions of clay,													l
		drought, salt, smooth grey bark is slightly attractive; trunk can grow	part sun to												1
Ostrya virginiana	hop-hornbeam	askew	shade	25-40'											4.2-7.6
		FACW; rapid growing tree in wet areas; no salt tolerance; single stem													1
Quercus bicolor	swamp white oak	with large arching canopy; no fall color	Sun	50-60'											4.3-6.5
Quercus coccinea	scarlet oak	UPL; found on dry rocky sites; drought tolerant; nice fall color;	Sun	70-75'											4.5-6.5
		large canopy tree; can tolerate dry to wet; found naturally in	Sun to part	:											1
Quercus macrocarpa	Bur Oak	floodplains; native to fire prone systems; no salt tolerance	sun	40-60'											5.3-7.4
		FACU; moderate drought tolerance; no salt tolerance; widely used													
		landscape plant with many cultivars; good form; cultivars vary in fall													1
Quercus rubra	red oak	color	Sun	60-75'											4.3-6.5
		with heart shaped leaves and good canopy: moderate soil conditions:	sun to part												
Tilia americana	American basswood	not salt tolerant	sun	50-70'											4 5-7 5
			5411	5070											
	American Elm: Liberty														1
	Princeton lefferson	adapts to wet and dry sites: tolerant of urban conditions: decorative													1
	New Harmony or	fruit: very used landscape tree:some cultivars suscentable to dutch													
I llmus americana	Valley Forge	alm disease	sun	60-80'											5 5-8 0
	Valley Forge		3011	00 00											5.5 0.0
EVERGREEN TREES															
llex opaca (ID the			Sun to Pt.												
cultivar)	American holly cultivar	slow growing; FACW+; wind susceptable	Shade	40-50'		white f	flws						red bei	ries	5.0-6.5
,		readily colonises abandoned fields, can bandlo variable conditions:													
luninerus virginiana	Fastern red cedar	$F\Delta C II$	Sun	30-50'									hlue be	arrias	17.78
			Jun	30-30									blue be	ines	т./-/.0

llex opaca (ID the			Sun to Pt.					
cultivar)	American holly cultivar	slow growing; FACW+; wind susceptable	Shade	40-50'		white flws		
		readily colonises abandoned fields, can handle variable conditions;						
Juniperus virginiana	Eastern red cedar	FACU	Sun	30-50'				

·	1			1	T I							
			Sun to Pt.					large white				
Magnolia virginiana	sweetbay magnolia	semi-evergreen; benefits from acidic soils; wind susceptable; FACW	Shade	15-35'				fragrant flowers	5		red berries	5.0-6.0
Pinus virginiana	Virginia pine	grows best on clay or loam sites; UPL	Full Sun	30-40'								4.5-7.5
UNDERSTORY TREES												
						wht.	or pink	k				
						flowe	ers /					
		single and multi stems availibe; good commerical plant with many	Sun to Pt.			berrie	es in	cultivars can have green, golden, or			yellow fall	
Cercis canadensis	eastern redbud	cultivars with varying sesonal attributes; FACU	Sun	20-30'		sprin	g.	purple foliage			color	>7.5
Chionanthus			Sun to Pt.								yellow fall	
virginicus	white fringetree	low branched multi stem habit; tolerant of clay soils and pollution	Sun	15-20'			white	ite flowers			color	4.5-6.5
		single stem shade tolerant tree; nativley found in moist shaded	1								red purple	1
Cornus florida	dogwood	woodlands	Pt. Sun	15-30'			white flowers			fall foliage	6.0-7.0	
		multi stem large shrub; single stem availible; strong fall color; good	Sun to Pt.								orange red	
Sassafras albidium	sassafras	wildlife food source	Sun	30-50'							fall foliage	6.0-7.0