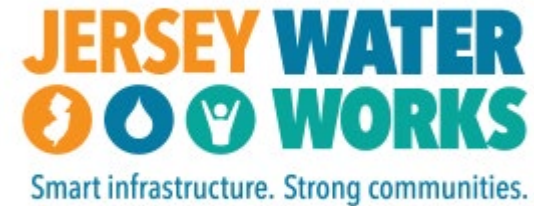


Green Infrastructure Champions Program

This program is partially funded by the Rutgers New Jersey Agricultural Experiment Station, Geraldine R. Dodge Foundation, NJ Sea Grant Consortium, and William Penn Foundation and is a collaboration of the Rutgers Cooperative Extension Water Resources Program and the Green Infrastructure Subcommittee of Jersey Water Works.



Please enter your full name and affiliation in the chat. This is how will take attendance.



Green Infrastructure Champion Training: Part 9

“Developing Green Infrastructure Masterplans for Entire Sites, Neighborhoods, and Townships”

Virtual Class
May 5, 2023



What is a Master Plan?

- Provides a framework for future growth
- Looks at the bigger picture
 - Interactive
 - Showcase collaboration
- Supports the value of an engineering, planning, and landscape architecture partnership
 - Multidisciplinary
 - Environmentally focused



Typical Master Plan Elements

- Public participation/visioning
- Land use/zoning
- Circulation/Transportation
- Environmental planning
- Economic development planning
- Historic preservation
- Infrastructure planning
- Parks, recreation and open space
- Community facilities
- Urban design
- Regional planning
- Sustainability/resiliency
- Redevelopment



Landscape Master Plan

Integrates the landscape elements of a site master plan

- Transportation/Circulation
- Vegetation
- Environmental Resources
- Recreational Spaces
- Cultural/Historic Resources
- Scenic Viewpoints
- Points of Interest / Attractions
- Stormwater Management
- Green Infrastructure



Stormwater Management / Green Infrastructure Master Plan

Highlights stormwater management elements of a site master plan

- Retrofitting existing sites for green infrastructure
- Reducing impervious cover
- Recommended locations for the maximum possible green infrastructure opportunities



Expanding the Focus of Green Infrastructure Master Planning

Integrating multiple master plan elements

- Stormwater Management/Green Infrastructure
- Landscape Elements
- Sustainability Element
- Placemaking



Why expand the focus?

- Enhance people/environment interaction
 - Accessibility
 - Education
 - Stewardship
- Collaborate across professional disciplines and community interests
- Align existing planning efforts to promote efficiency
- Provide a framework for future growth



Master Plan Scales

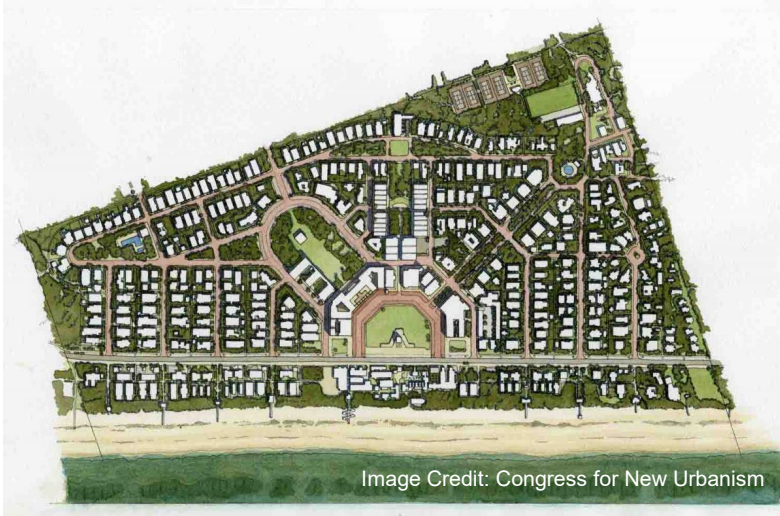
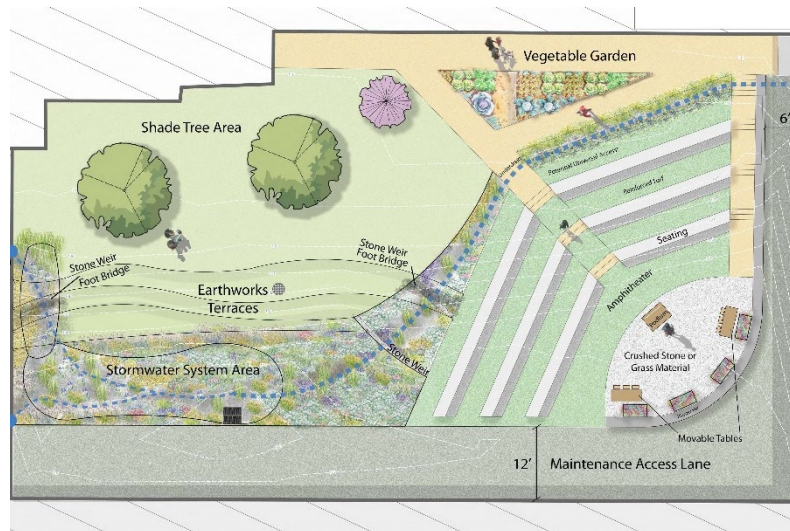


Image Credit: Congress for New Urbanism

Town



Neighborhood



Site

Components

Places – Home - Destinations – “Nodes”

Small

- residences
- playgrounds
- pocket parks,
- urban sites
- vacant lots to be reused
- schools w/out land
- small historic sites
- detention basins
- lakes/ponds

Large

- Neighborhoods
- parks
- school campuses
- municipal complexes
- historic sites
- cemeteries
- corporate parks
- business parks
- shopping areas, etc.

Components

Connections - Streets – Paths – Streams – “Corridors”

- Streets (especially wide streets)
- rails to trails
- linear parks
- river/floodplain parks
- stream corridors
- linear parks (e.g. D & R Canal)
- aggregated vacant lands
- infrastructure corridors (wide highway ROWs, rail line ROWs, powerline/ pipeline ROWs)
- historical corridors/trails
- waterfronts

Project Example: Hillsborough

Draft

**Impervious Cover Reduction Action Plan
for
Hillsborough Township, Somerset County, New Jersey**

*Prepared for Hillsborough Township by the
Rutgers Cooperative Extension Water Resources Program*

September 5, 2015



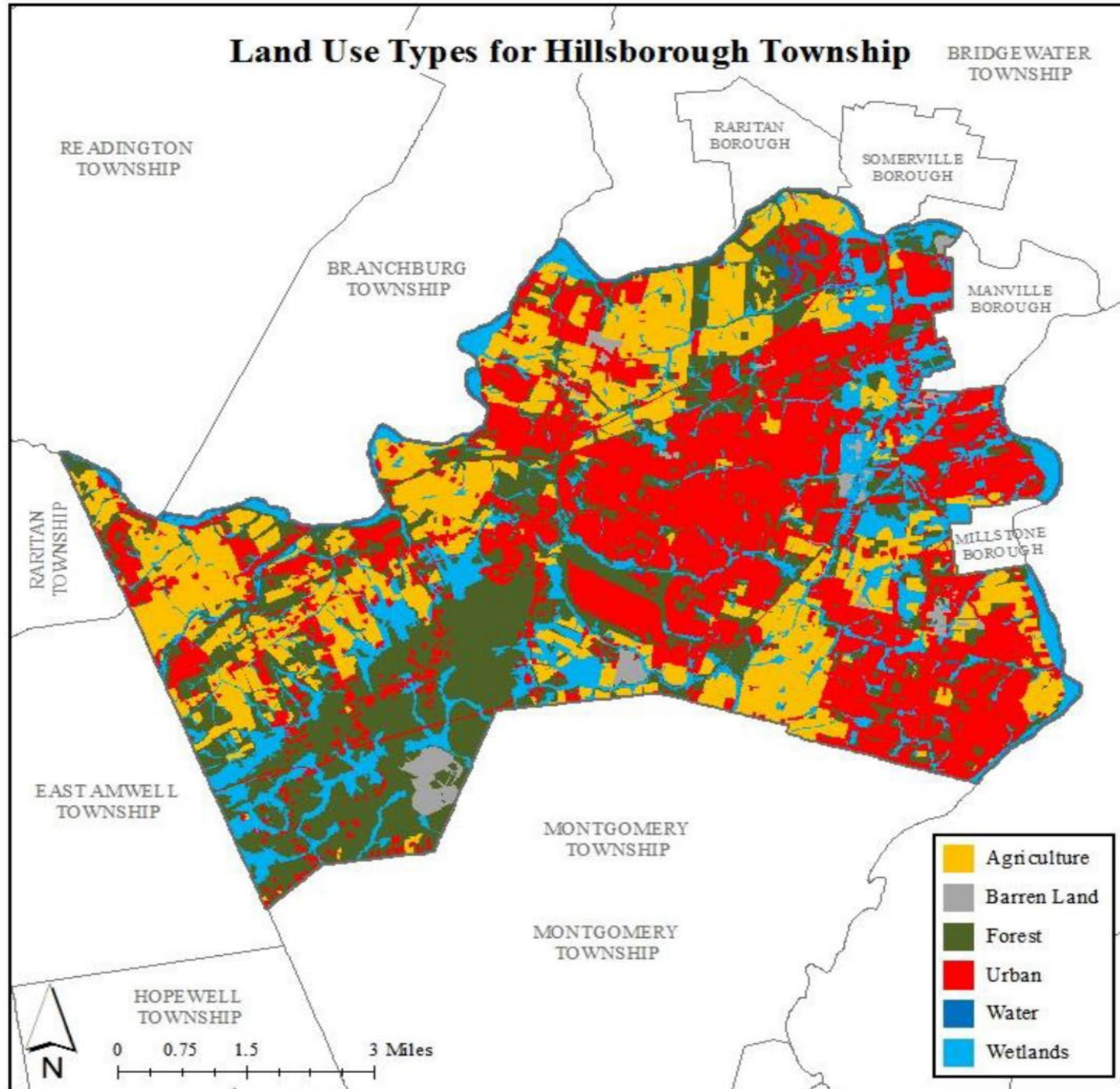


Figure 1: Map illustrating the land use in Hillsborough Township

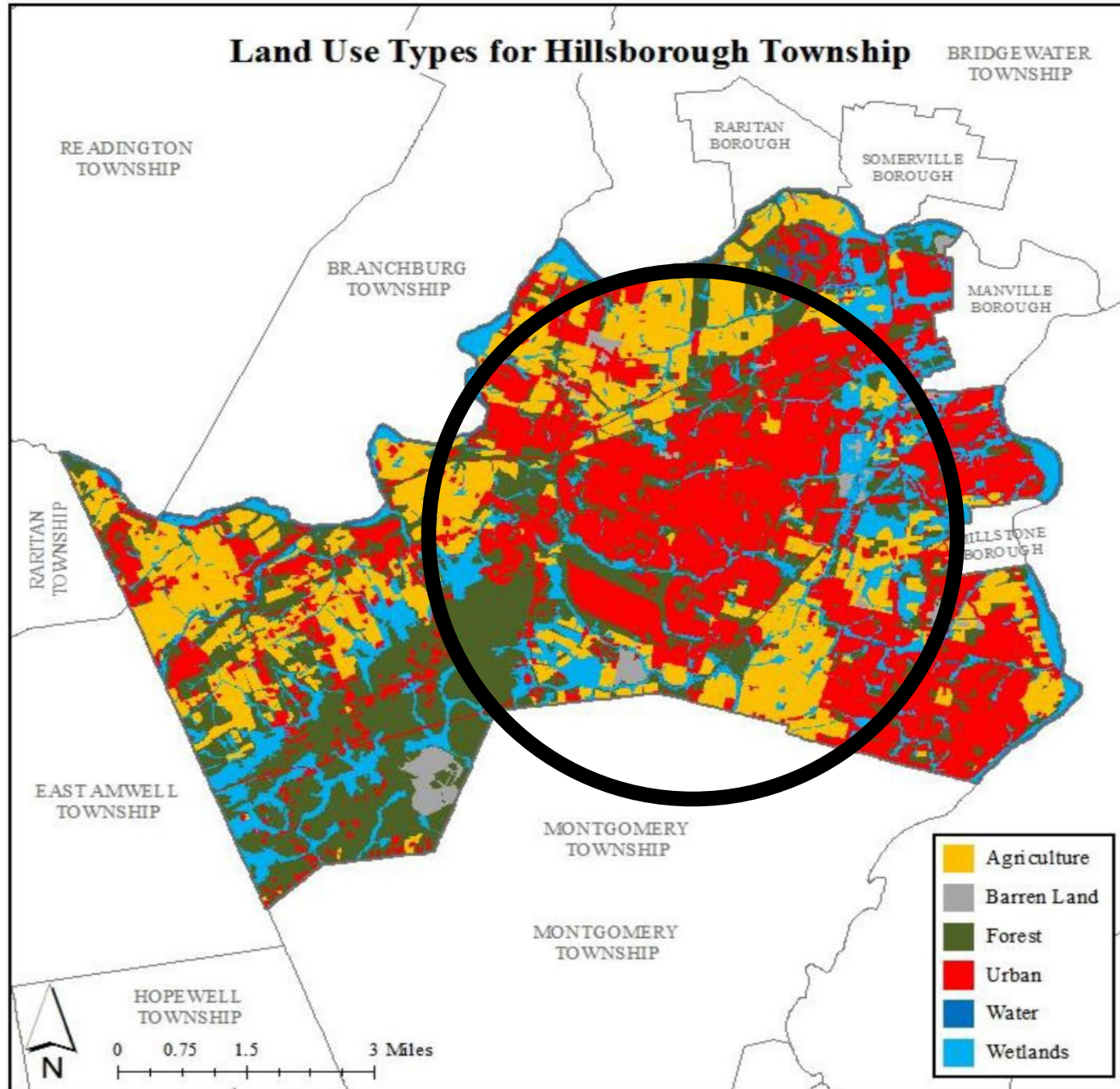
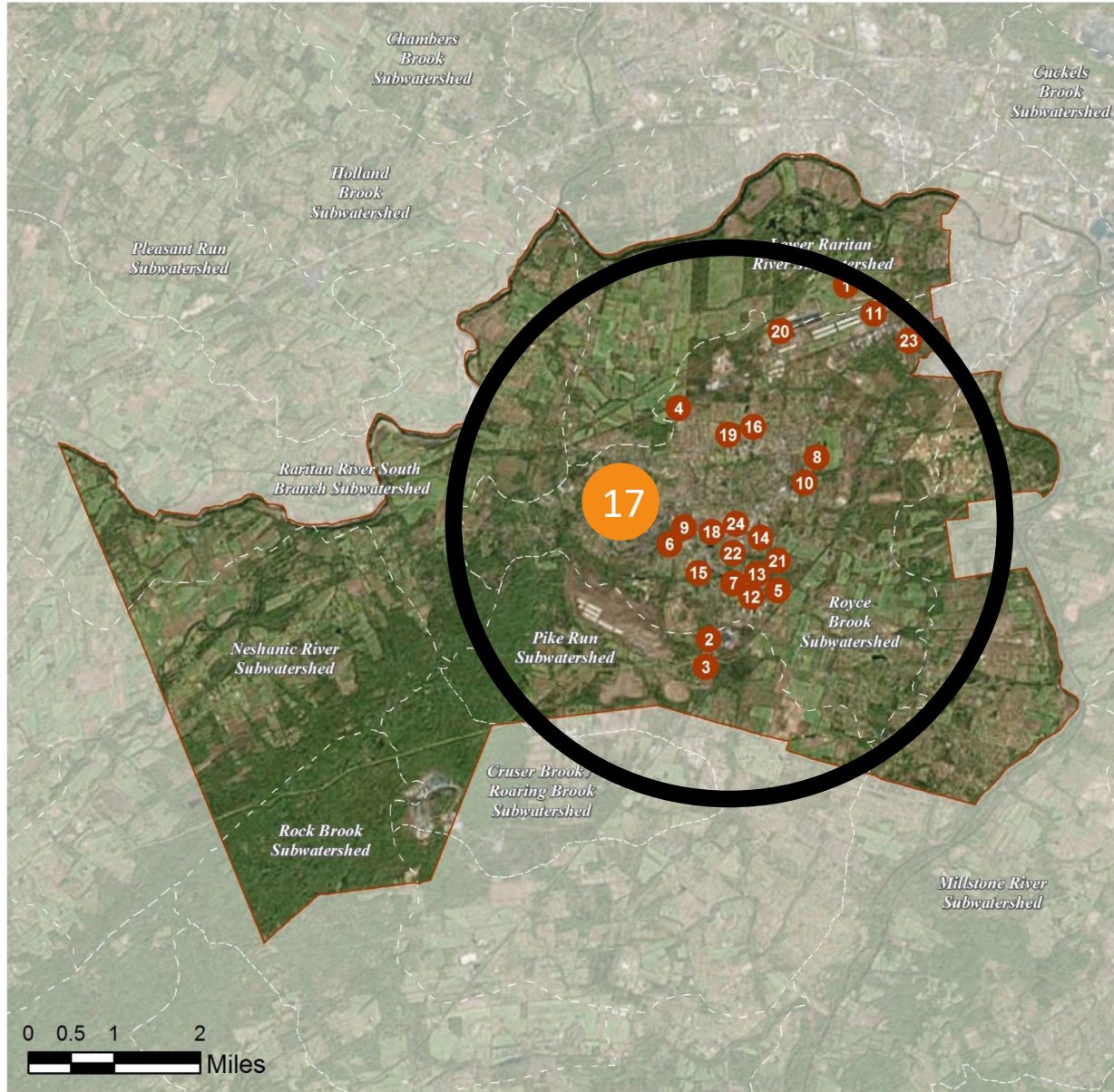


Figure 1: Map illustrating the land use in Hillsborough Township

HILLSBOROUGH: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE LOWER RARITAN RIVER SUBWATERSHED:

1. Duke Farms: Cottages

SITES WITHIN THE PIKE RUN SUBWATERSHED:

2. Hillsborough Star Diner
3. Mountain View Plaza

SITES WITHIN THE ROYCE BROOK SUBWATERSHED:

4. Auten Road School
5. Boro Kid Zone
6. Claremont Towers
7. Corporate Building
8. Doctors Way Offices
9. Eves Drive
10. Fire Department and Radiology
11. Harold Docherty Memorial Park
12. Hillsborough Business Center: Building 29
13. Hillsborough Business Center: Building 30
14. Hillsborough Center
15. Hillsborough High School
16. Hillsborough Middle School and Triangle Elementary School
17. Hillsborough Municipal Building and Library
18. JK Design
19. Mary Mother of God Church
20. Paramount Gymnastics
21. R C Fine Foods Inc.
22. Shopping Complex of Amwell
23. Sunnymead Elementary
24. US Post Office

HILLSBOROUGH MUNICIPAL BUILDING AND LIBRARY



Subwatershed: Royce Brook
Site Area: 1,397,452 sq. ft.
Address: 379 South Branch Road
Hillsborough, NJ 08844
Block and Lot: Block 149, Lot 1.02



Rain gardens can capture, treat, and infiltrate runoff from the parking lots. Additional stormwater can be infiltrated with pervious pavement. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

Impervious Cover		Existing Loads from Impervious Cover (lbs/yr)			Runoff Volume from Impervious Cover (Mgal)	
%	sq. ft.	TP	TN	TSS	For the 1.25" Water Quality Storm	For an Annual Rainfall of 44"
22	304,677	14.7	153.9	1,398.9	0.237	8.36

Recommended Green Infrastructure Practices	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Maximum Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cu. ft./second)	Estimated Size (sq. ft.)	Estimated Cost
Bioretention systems	0.610	102	45,217	1.70	5,920	\$29,600
Pervious pavements	0.998	167	73,902	2.78	6,950	\$173,750

GREEN INFRASTRUCTURE RECOMMENDATIONS

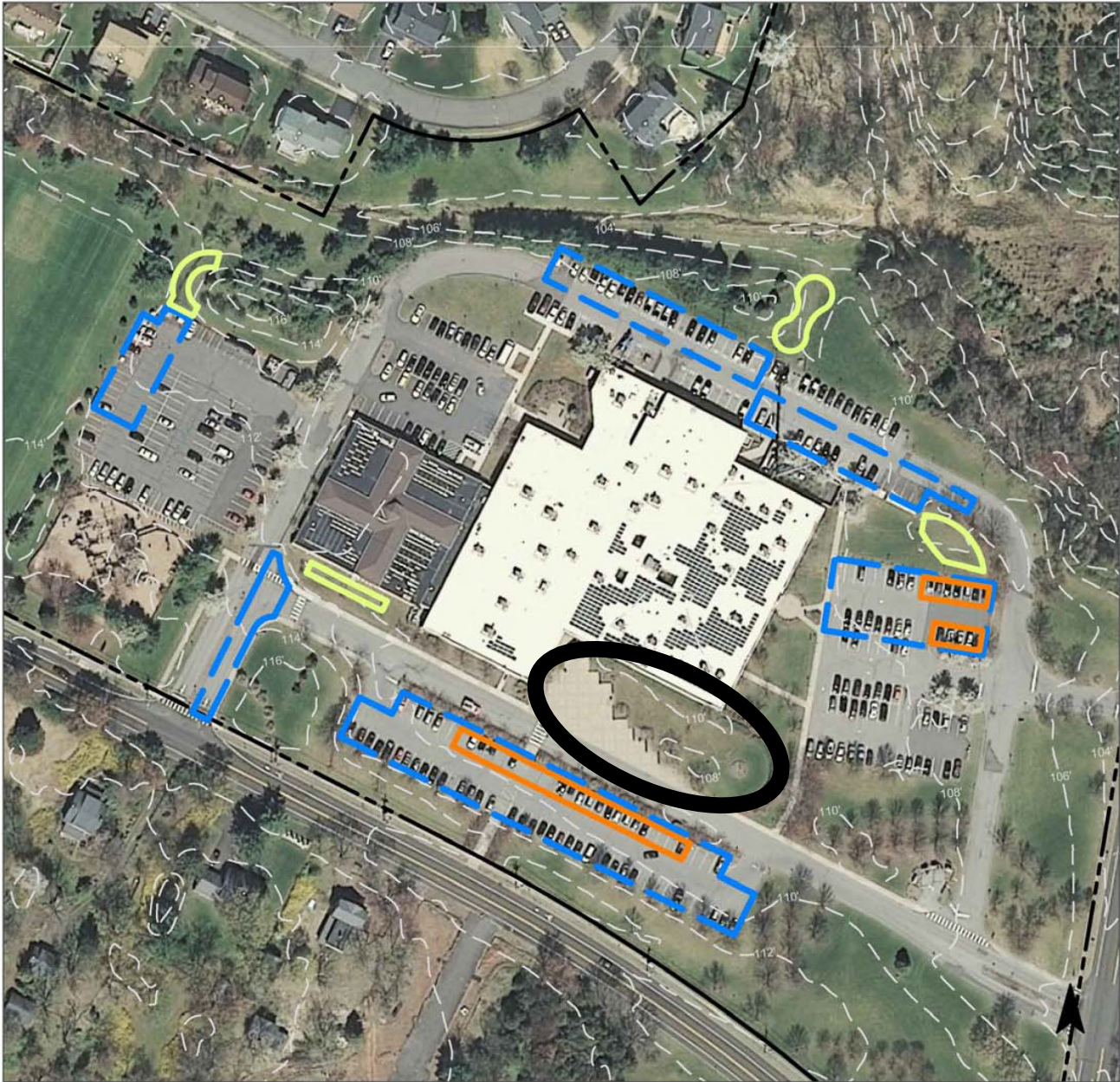


Hillsborough Municipal Building and Library

-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



GREEN INFRASTRUCTURE RECOMMENDATIONS












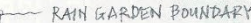



Hillsborough Municipal Building and Library

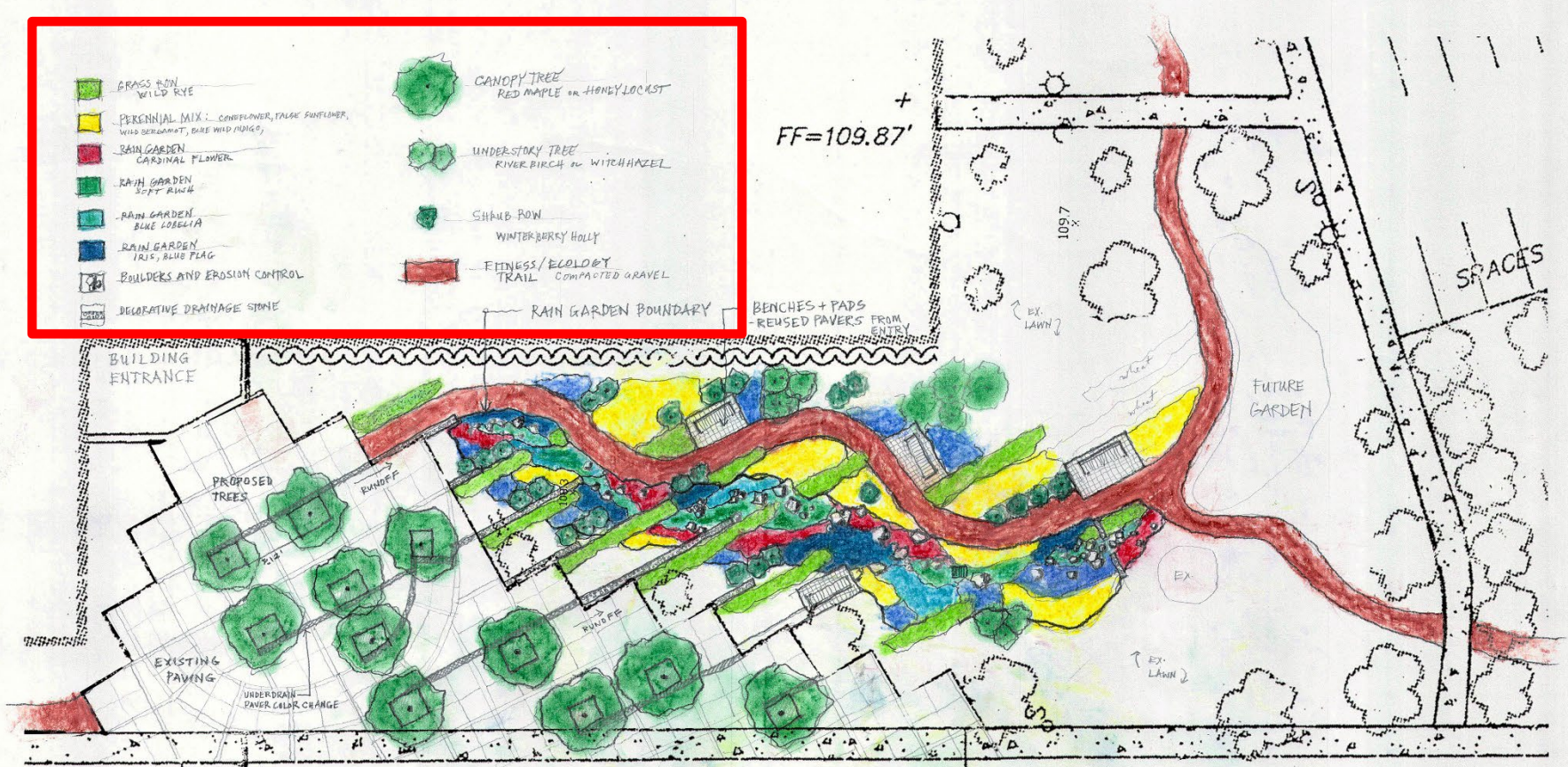
-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS





Hillsborough Municipal Complex Rain Garden Concept Plan

	GRASS MIX WILD RYE		CANOPY TREE RED MAPLE OR HONEYLOCUST
	PERENNIAL MIX: CONIFLOWER, TALL SUNFLOWER, WILD BERGAMOT, BLUE WILD THING		UNDERSTORY TREE RIVER BIRCH OR WITCH HAZEL
	RAIN GARDEN CARDINAL FLOWER		SHAUB POW WINTER BERRY HOLLY
	RAIN GARDEN SOFT RING		FITNESS/ECOLOGY TRAIL COMPACTED GRAVEL
	RAIN GARDEN BLUE LOBELIA		RAIN GARDEN BOUNDARY
	RAIN GARDEN IRIS, BLUE FLAG		
	BUILDERS AND EROSION CONTROL		
	DECORATIVE DRAINAGE STONE		



HILLSBOROUGH MUNICIPAL BUILDING
RAIN GARDEN CONCEPT PLAN

1" = 10'
RUTGERS
COOPERATIVE EXTENSION
APRIL 2016

Rain Garden Concept Plan Legend



GRASS ROW
WILD RYE



PERENNIAL MIX: CONEFLOWER, FALSE SUNFLOWER,
WILD BERGAMOT, BLUE WILD INDIGO,



RAIN GARDEN
CARDINAL FLOWER



RAIN GARDEN
SOFT RUSH



RAIN GARDEN
BLUE LOBELIA



RAIN GARDEN
IRIS, BLUE FLAG



BOULDERS AND EROSION CONTROL



DECORATIVE DRAINAGE STONE



CANOPY TREE
RED MAPLE OR HONEYLOCUST



UNDERSTORY TREE
RIVER BIRCH or WITCHHAZEL



SHRUB ROW
WINTERBERRY HOLLY



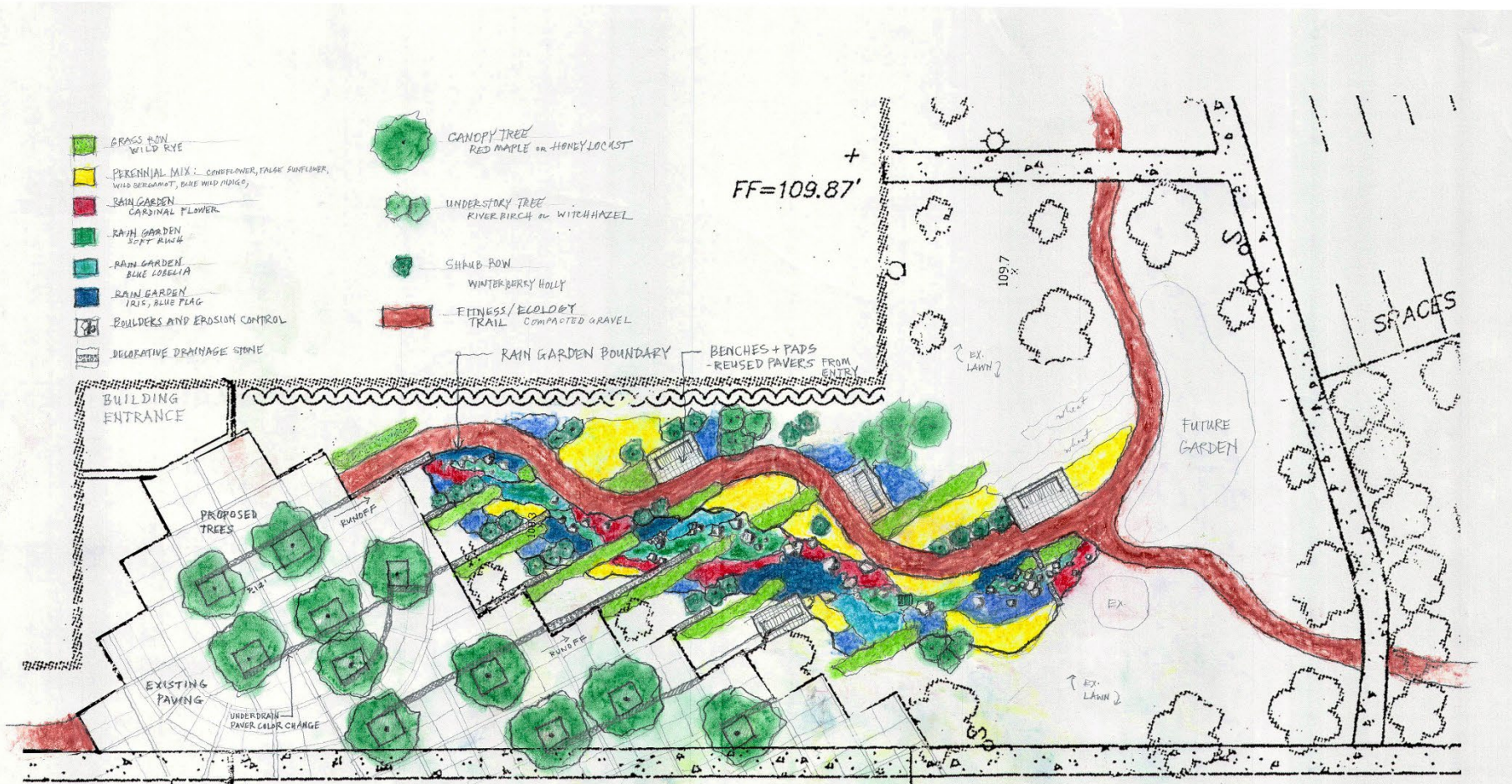
FITNESS/ECOLOGY
TRAIL COMPACTED GRAVEL

RAIN GARDEN BOUNDARY

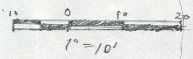


BUILDING

Hillsborough Municipal Complex Rain Garden Plan



HILLSBOROUGH MUNICIPAL BUILDING
RAIN GARDEN CONCEPT PLAN



RUTGERS
COOPERATIVE EXTENSION
APRIL 2016

Hillsborough Municipal Complex Sustainability Master Plan

Expanding the Scope

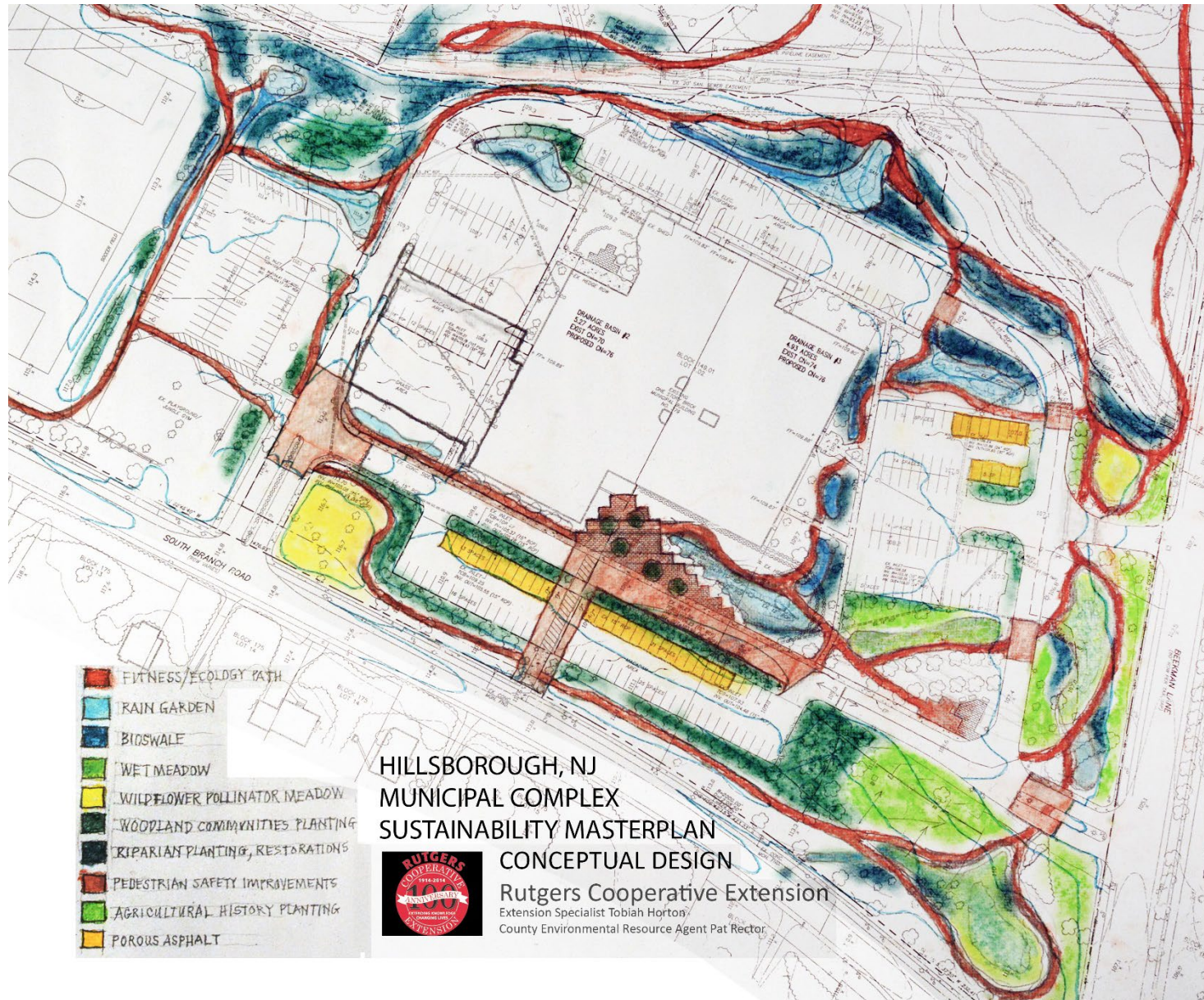


Master Plan Legend



Hillsborough Municipal Complex Sustainability Master Plan

Expanding the Scope



Conceptual Rendering



Construction



Season 1



Season 2








10/12/2018

GREEN INFRASTRUCTURE RECOMMENDATIONS

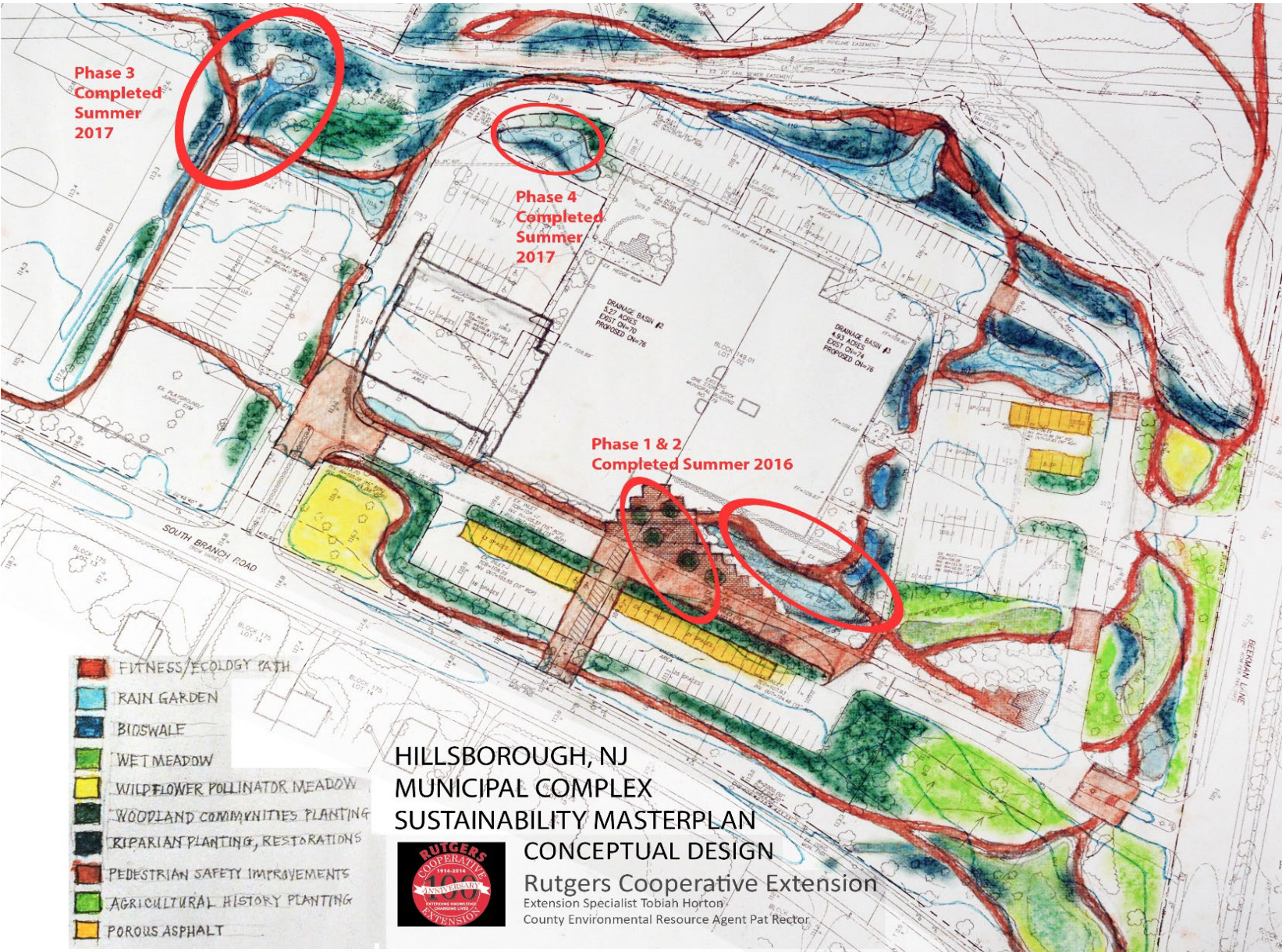


Hillsborough Municipal Building and Library

-  pervious pavements
-  bioretention / rain gardens
-  drainage areas
-  property line
-  2012 Aerial: NJOIT, OGIS



Hillsborough Municipal Complex Sustainability Master Plan Phasing Plan



Phase 2 of the Hillsborough Municipal Complex Landscape Sustainability Master Plan



Phase 2 of the Hillsborough Municipal Complex Landscape Sustainability Master Plan

Paths to nowhere?



On to the next project...



Hillsborough Municipal Complex Landscape Sustainability Master Plan Eagle Scout Project



Hillsborough Municipal Complex Sustainability Master Plan

Phase 3

- Bioswale
- Rain garden
- Walking path





Existing Conditions

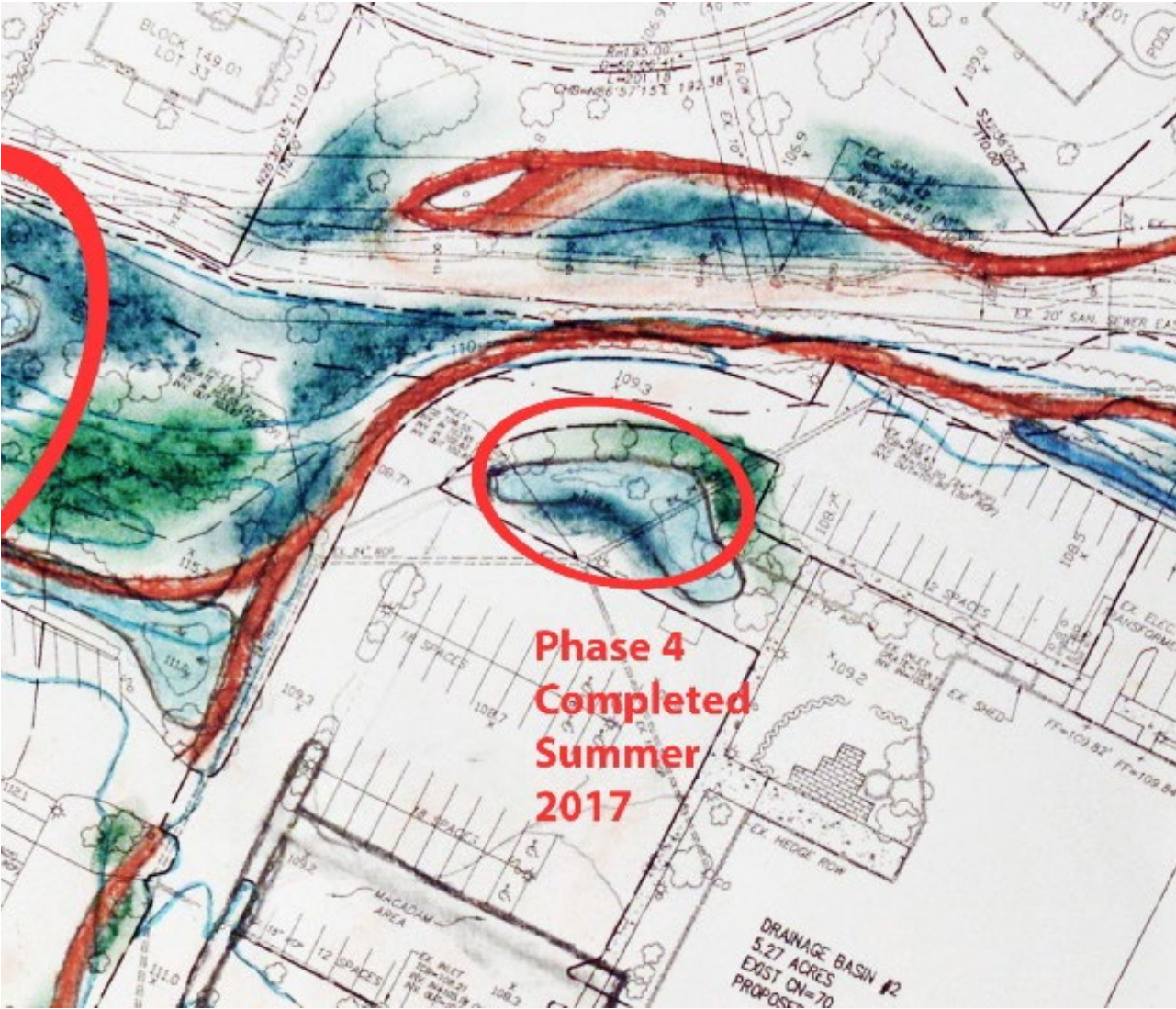


Conceptual Rendering



Post-installation

Phase 4 of the Hillsborough Municipal Complex Landscape Sustainability Master Plan



Hillsborough Municipal Complex Landscape Sustainability Master Plan Pollinator Garden, Girl Scout Gold Award Project



Hillsborough Municipal Complex Landscape Sustainability Master Plan

Pollinator Garden, Girl Scout Gold Award Project



Pollinators

Their importance to our world

What is a Pollinator?

Pollinators are vital to most of our food production in America. Pollinators can be bees, butterflies, and even birds. These animals are solely responsible for the reproduction of many of our favorite foods and recently, they have been on rapid decline. In order to stop this decline and evidence an upward trend in their population, gardens like these can be made to provide another breeding and pollination stop for these crucial creatures. Making a difference towards this movement is not hard, just one plant could be enough to help hundreds of bees and butterflies!

What is in this Garden?

This assortment of flowers are just some of the many that attract and accommodate pollinators. The major plants you see here include: Butterfly Bush, Babes, Geranium, Catnip, Lavender, Marigold, Aster, Thyme, Yarrow, and Coneflower. You also see a collection of rocks in the middle which serve as a sort of "bee cave" where they can be in a shaded area; bees also enjoy the moisture that collects on bare dirt which surrounds the rocks. The hummingbird feeder is to attract some flighted friends as well!

How can YOU Help?

Installing just one of these plants into your yard at home is enough to make a difference to pollinators in our community. Local garden centers are just as invested in this cause and are more than happy to help you pick the perfect plant for your pollinator project!

This pollinator garden was donated to Hillsborough Township as the Girl Scout Gold Award Project of Brynne Briegs. Thank you to these sponsors for making this project possible!



Pollinators

Their importance to our world

What is a Pollinator?
 Bees, butterflies, birds, and other animals are important to the world because they help plants to reproduce. Without them, many of the plants that we eat and use would disappear. They are also important to the environment because they help to keep the balance of nature.

What is in this Garden?
 This garden is full of plants that attract pollinators. Some of the plants are native to the area, and some are from other parts of the world. The plants are chosen because they are easy to grow and they provide a lot of food for pollinators.

How can YOU Help?
 You can help pollinators by planting flowers in your garden. You can also help by avoiding pesticides and by providing a safe place for them to live. You can also help by educating others about the importance of pollinators.







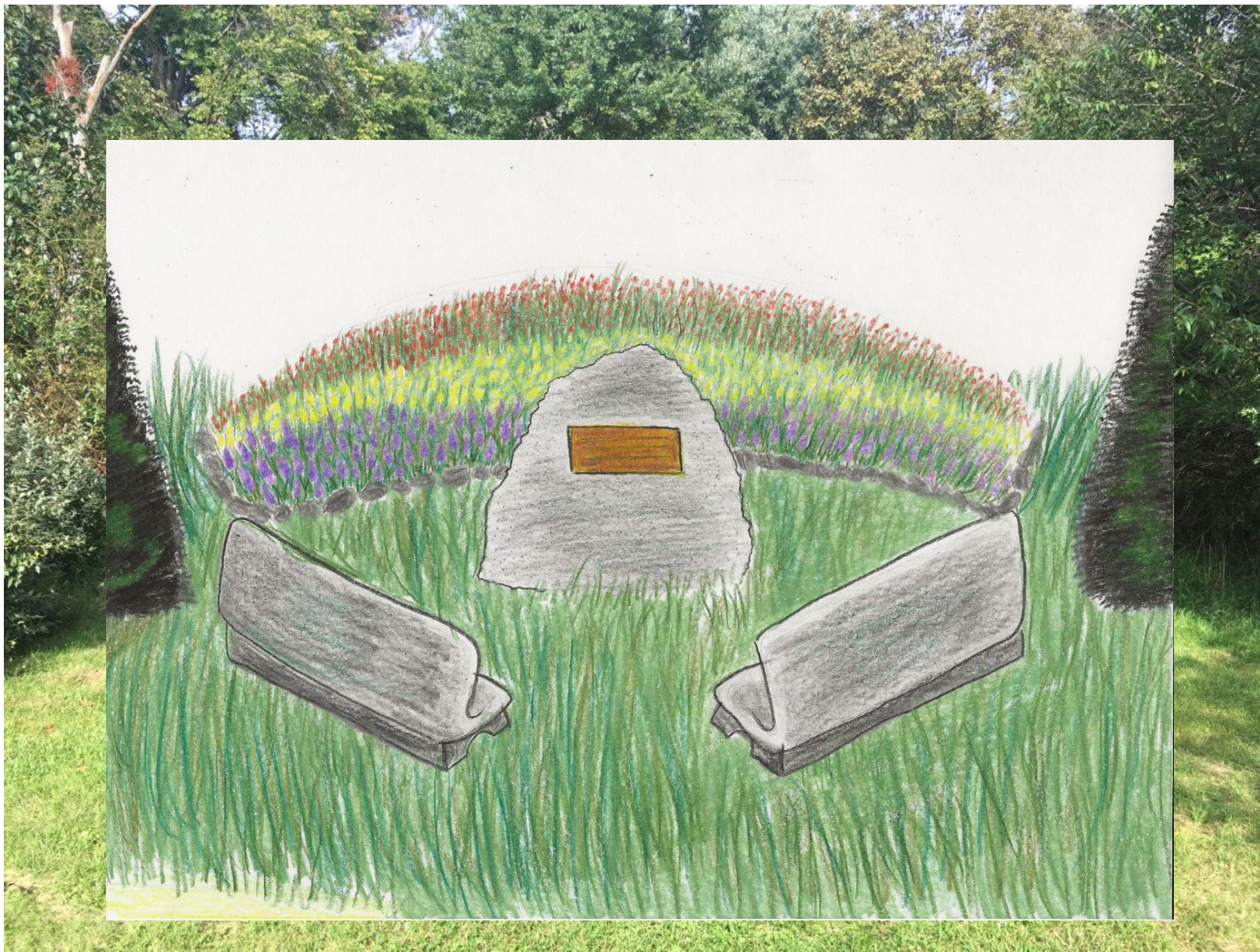



Hillsborough Municipal Complex Landscape Sustainability Master Plan Future Police Memorial Native Plant Garden



Hillsborough Municipal Complex Landscape Sustainability Master Plan

Future Police Memorial Native Plant Garden



Placed in the meadow for
what he did for the citizens of
the city of
to serve the way and honor in Law Enforcement
to honor the way and honor in Law Enforcement
to honor the way and honor in Law Enforcement
to honor the way and honor in Law Enforcement

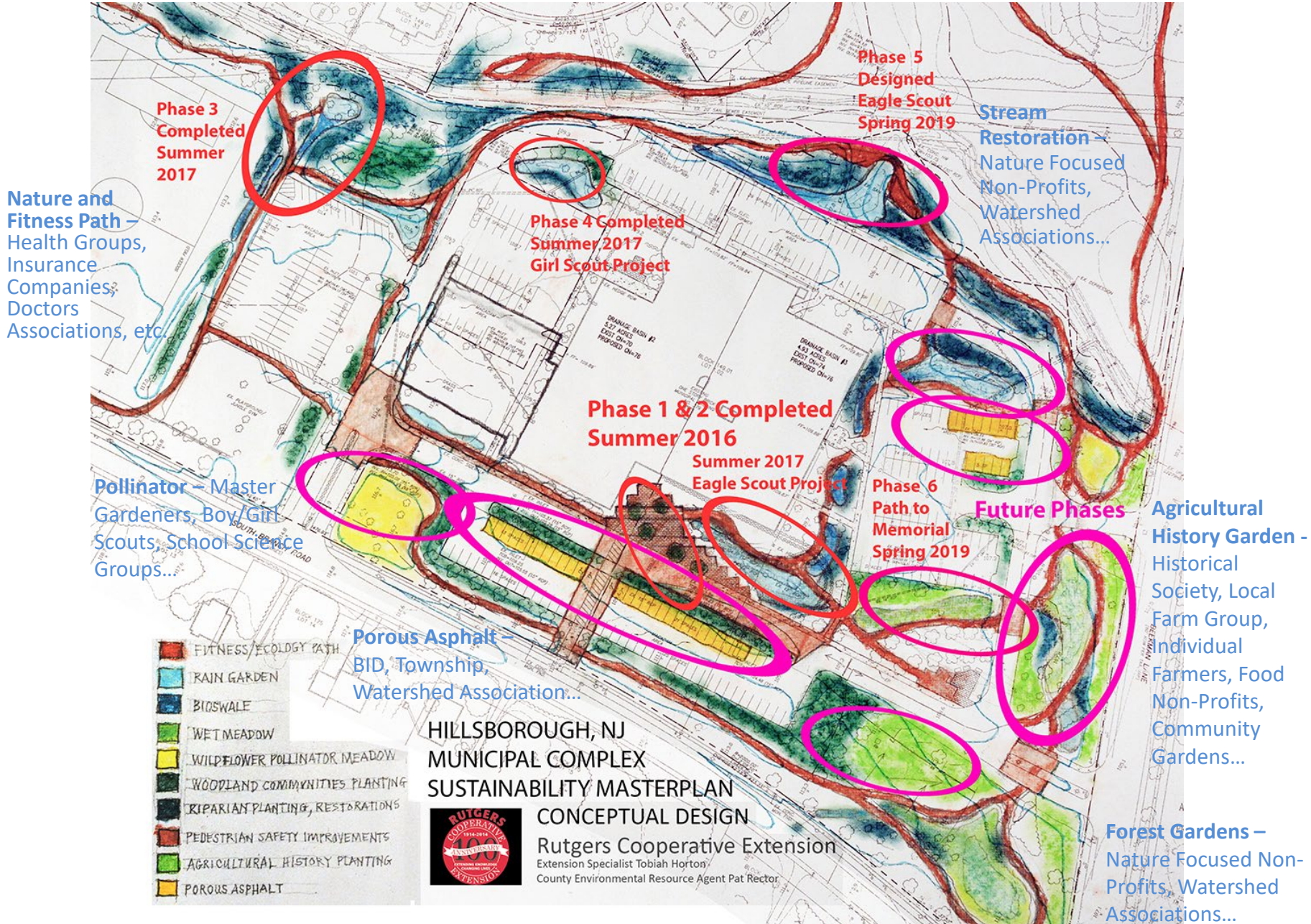


Williamsburg, New Jersey 0710

TO PROTECT AND SERVE

INTEGRITY, PROFESSIONALISM, FAIRNESS

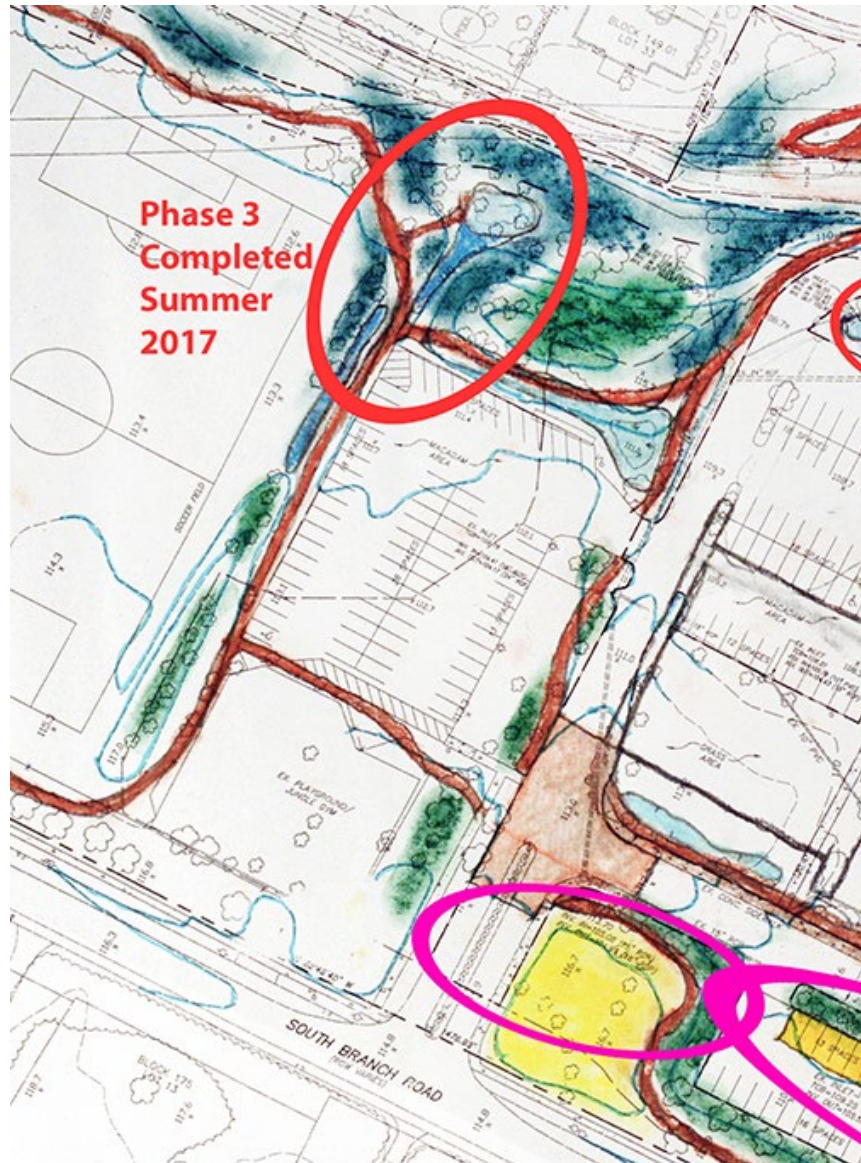
Demonstration Gardens to Full Site Sustainability Master Plans



Demonstration Gardens to Full Site Sustainability Master Plans

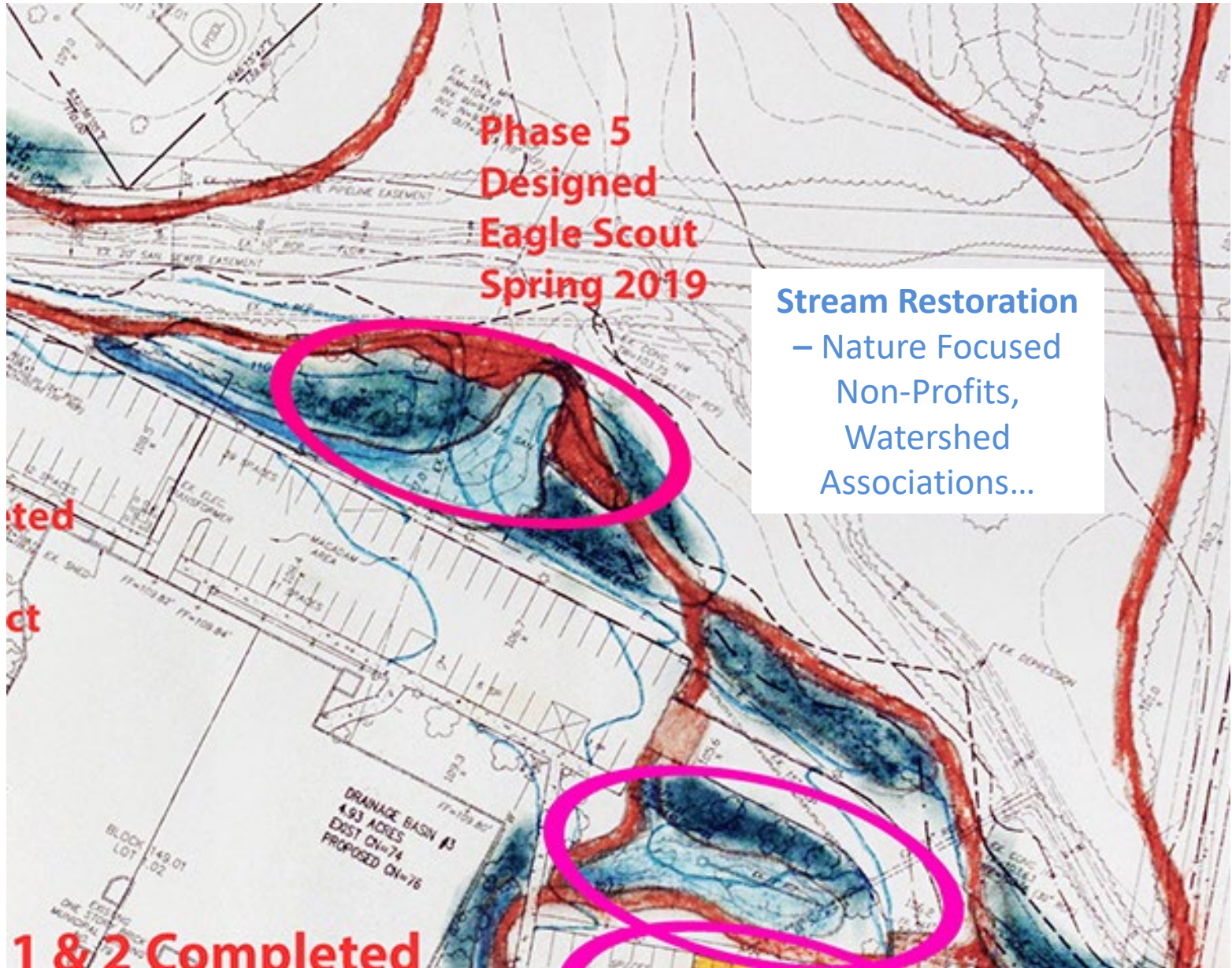
Nature and Fitness Path

– Health Groups, Insurance Companies, Doctors Associations, etc.



Pollinator –
Master Gardeners, Boy/Girl Scouts, School Science Groups...

Demonstration Gardens to Full Site Sustainability Master Plans

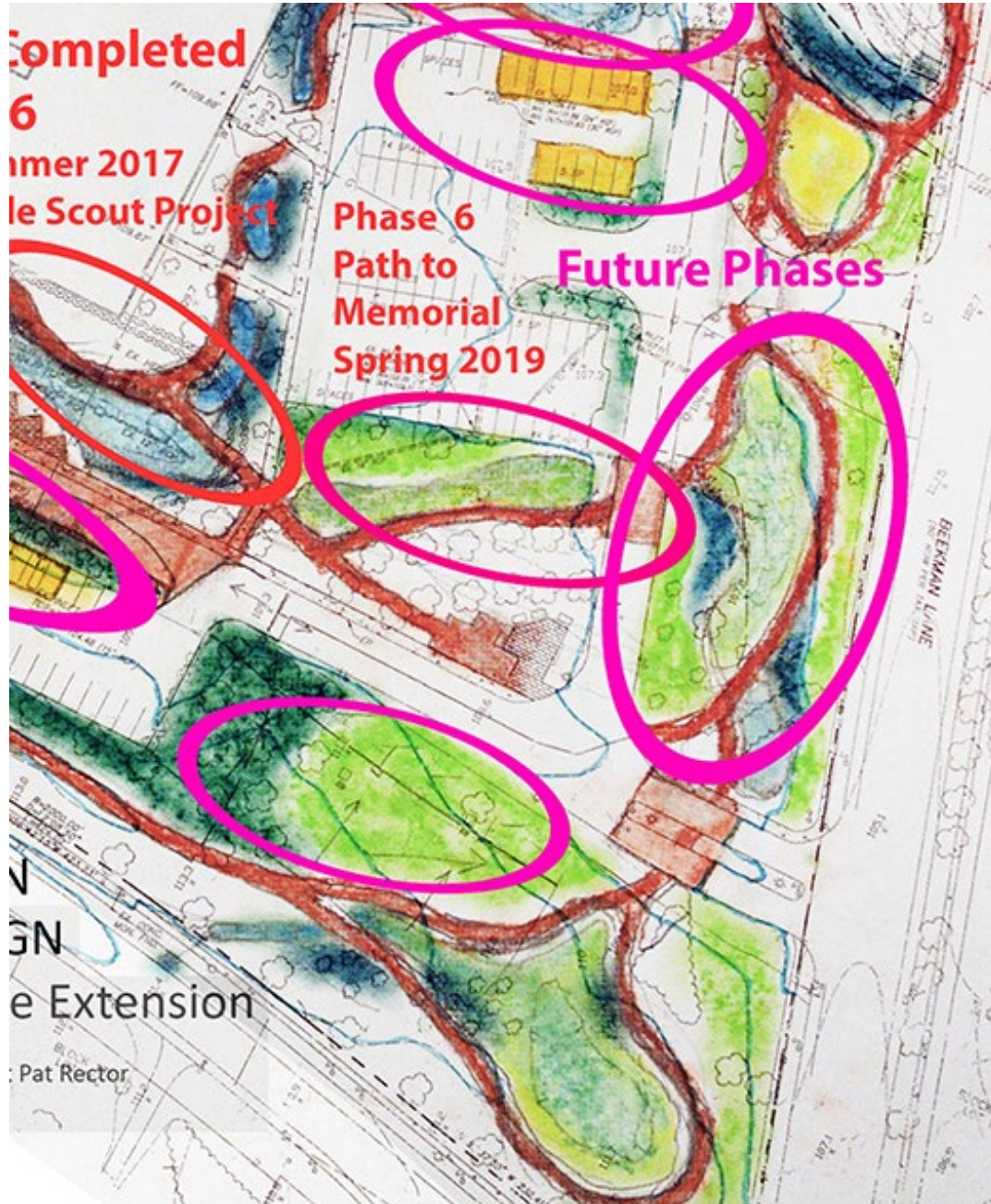


**Phase 5
Designed
Eagle Scout
Spring 2019**

Stream Restoration
– Nature Focused
Non-Profits,
Watershed
Associations...

1 & 2 Completed

Demonstration Gardens to Full Site Sustainability Master Plans



Agricultural History Garden - Historical Society, Local Farm Group, Individual Farmers, Food Non-Profits, Community Gardens...

Forest Gardens – Nature Focused Non-Profits, Watershed Associations...

Demonstration Gardens to Full Site Sustainability Master Plans





Hillsborough Township
Somerset County, New Jersey

2018 MASTER PLAN REEXAMINATION REPORT

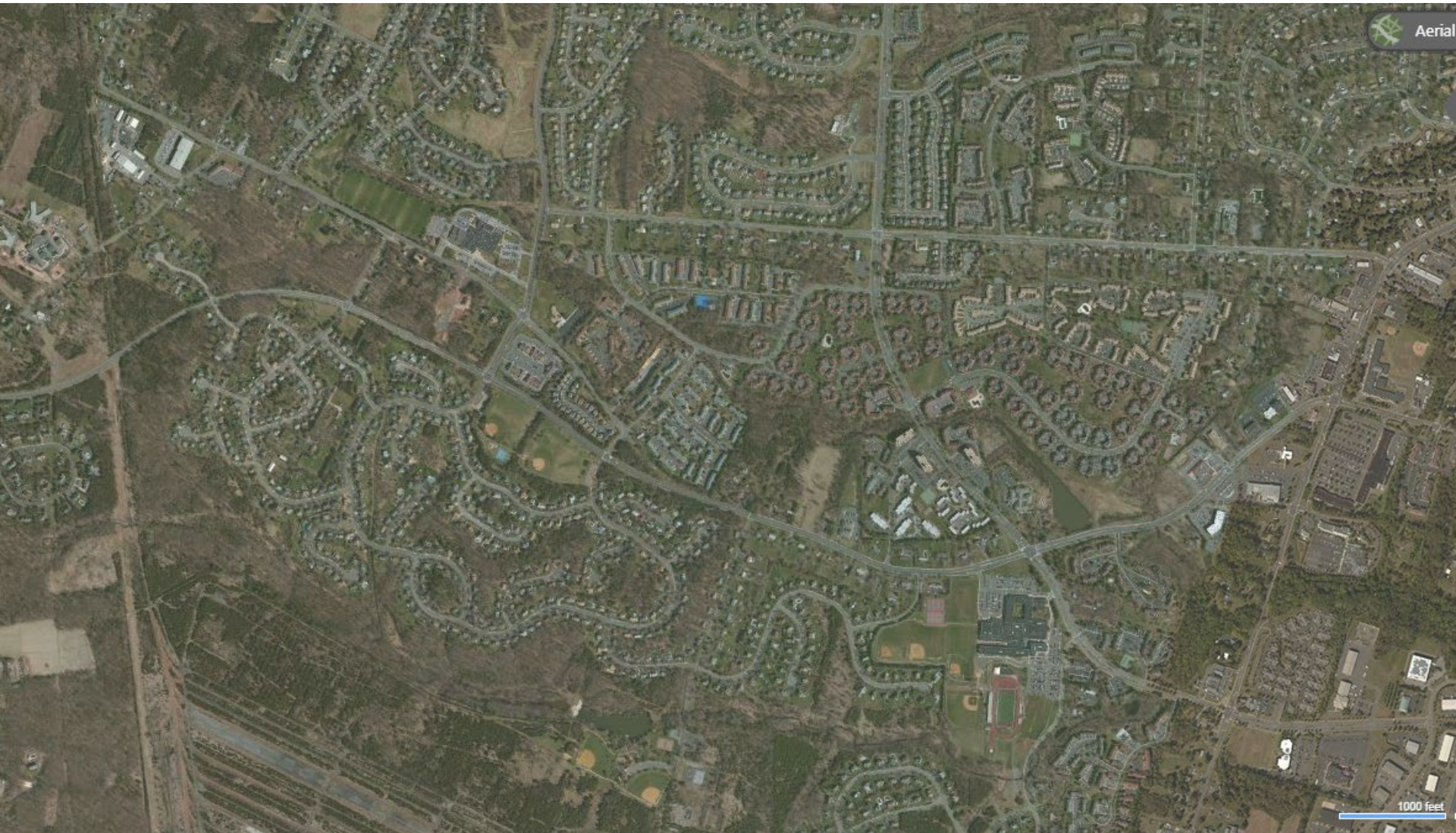
*Adopted by the Hillsborough Township Planning Board
November 29, 2018*

*7. Green Buildings and Environmental Sustainability Plan Element **

Prepare a Green Buildings and Environmental Sustainability Plan Element. This new element would serve as the basis for incorporating green building and sustainability practices into the Land Use and Development Ordinance.

Break

Town/Municipal Scale Green Infrastructure Master Plans



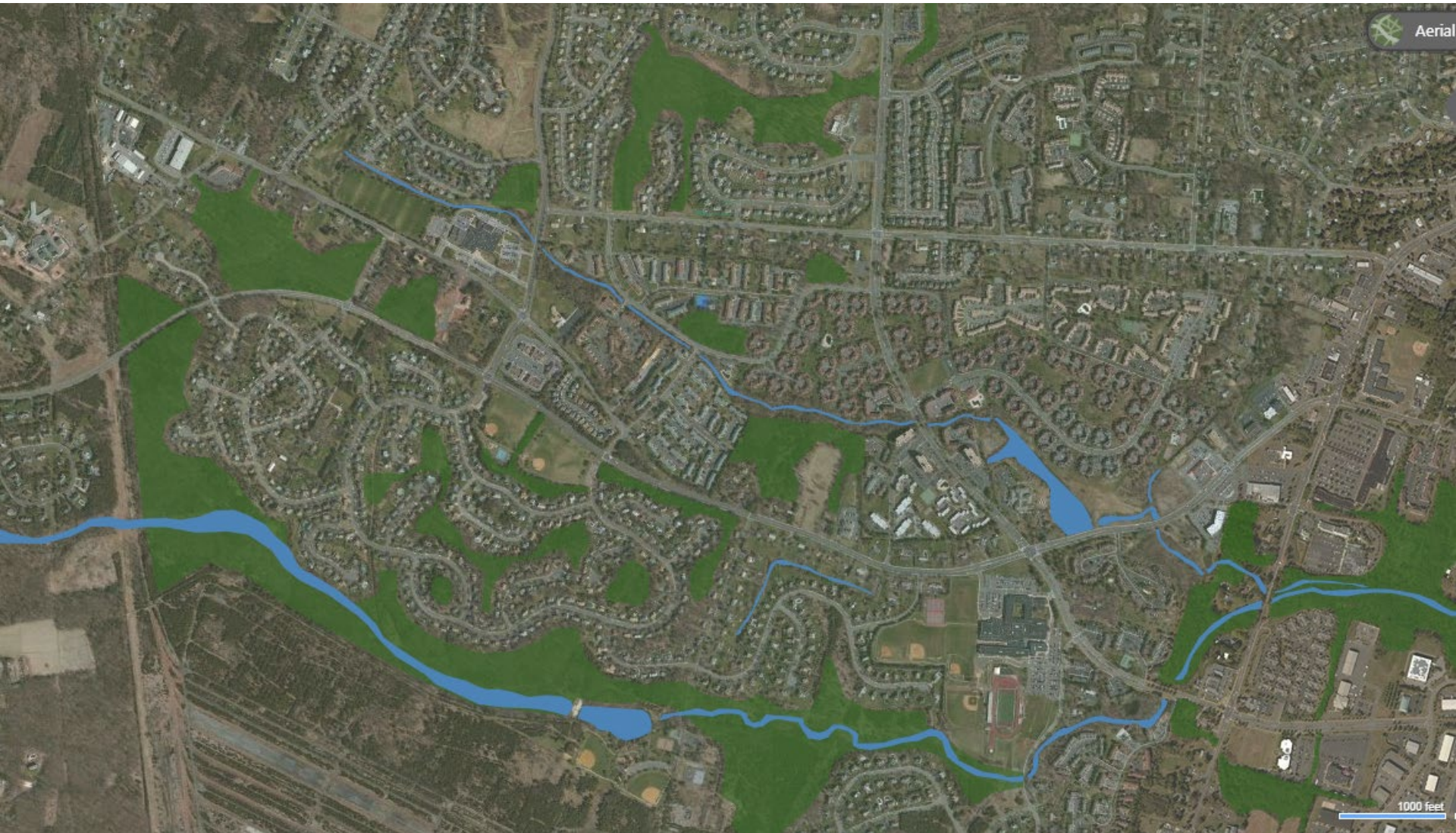
Hillsborough, New Jersey

Town/Municipal Scale Green Infrastructure Master Plans



Dense Tree Cover

Town/Municipal Scale Green Infrastructure Master Plans



Streams

Town/Municipal Scale Green Infrastructure Master Plans



Floodplains

Town/Municipal Scale Green Infrastructure Master Plans



Detention Basins

Town/Municipal Scale Green Infrastructure Master Plans



Destinations

Town/Municipal Scale Green Infrastructure Master Plans



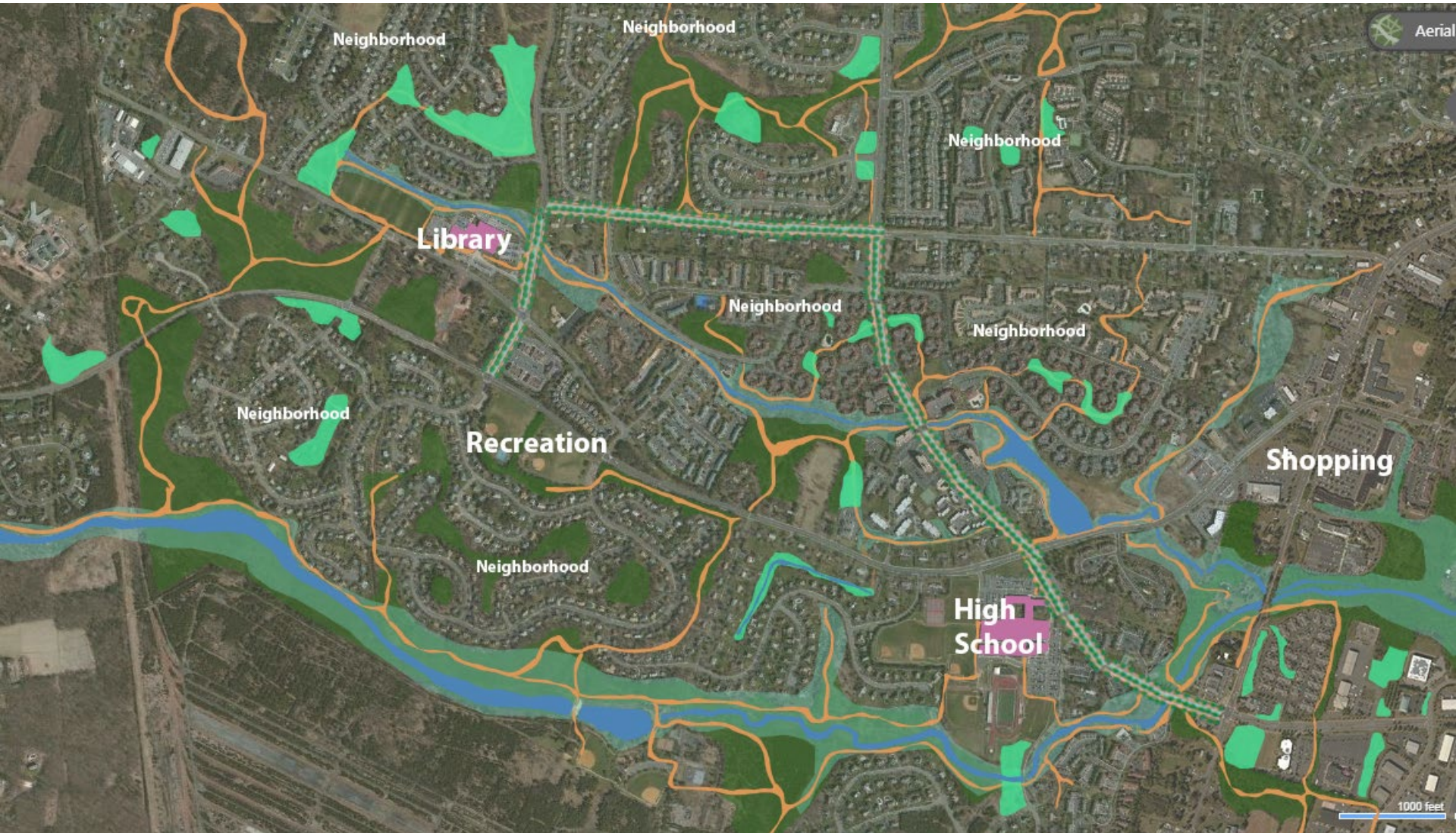
Destinations and Origins

Town/Municipal Scale Green Infrastructure Master Plans



Bike and Pedestrian Paths

Town/Municipal Scale Green Infrastructure Master Plans



Complete Streets

Town/Municipal Scale Green Infrastructure Master Plans



Safe Thoroughfares and Intersections

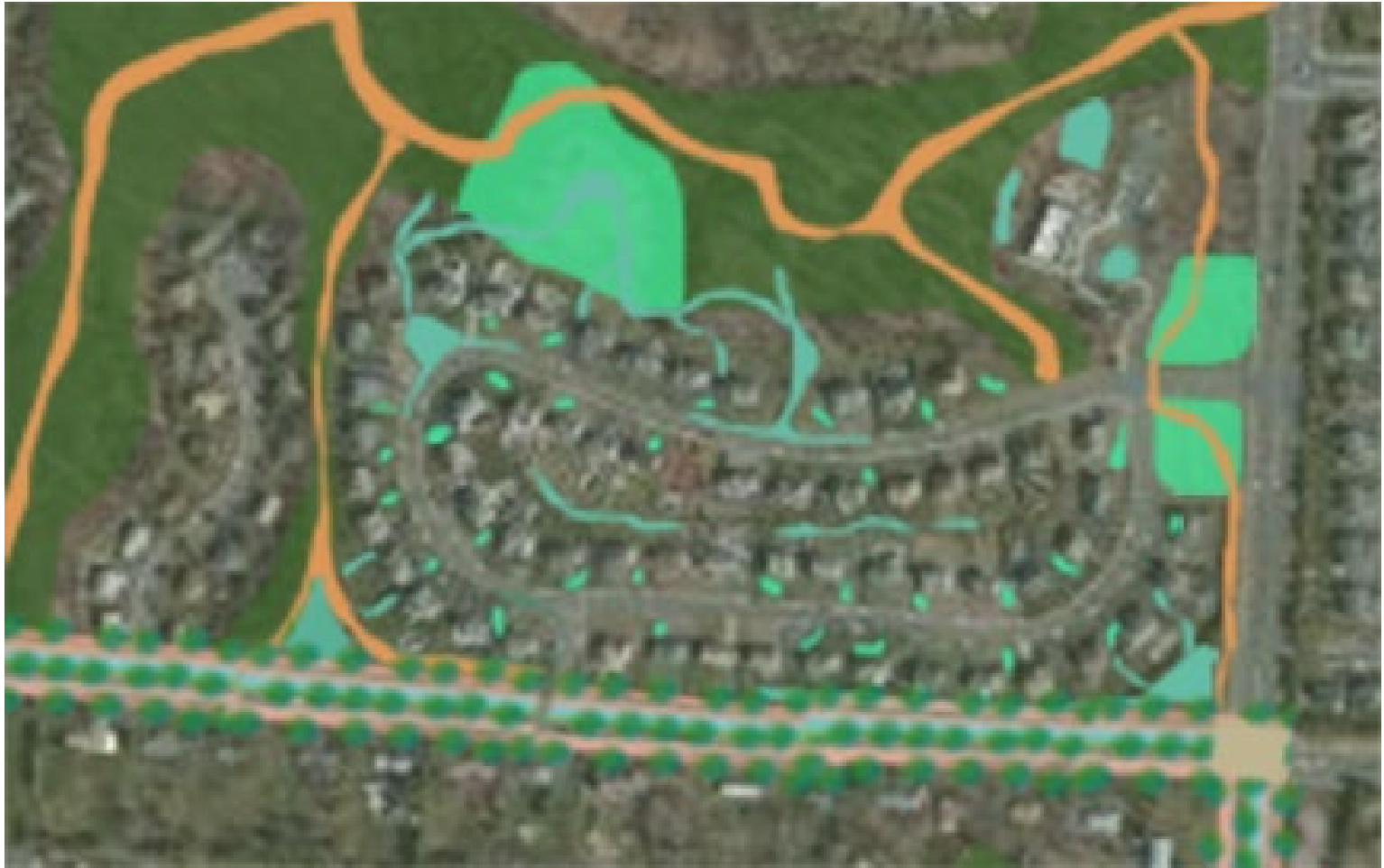
What Would a Neighborhood Look Like?



What Would a Neighborhood Look Like?



What Would a Neighborhood Look Like?



What Would a Neighborhood Look Like?



What Would a Neighborhood Look Like?



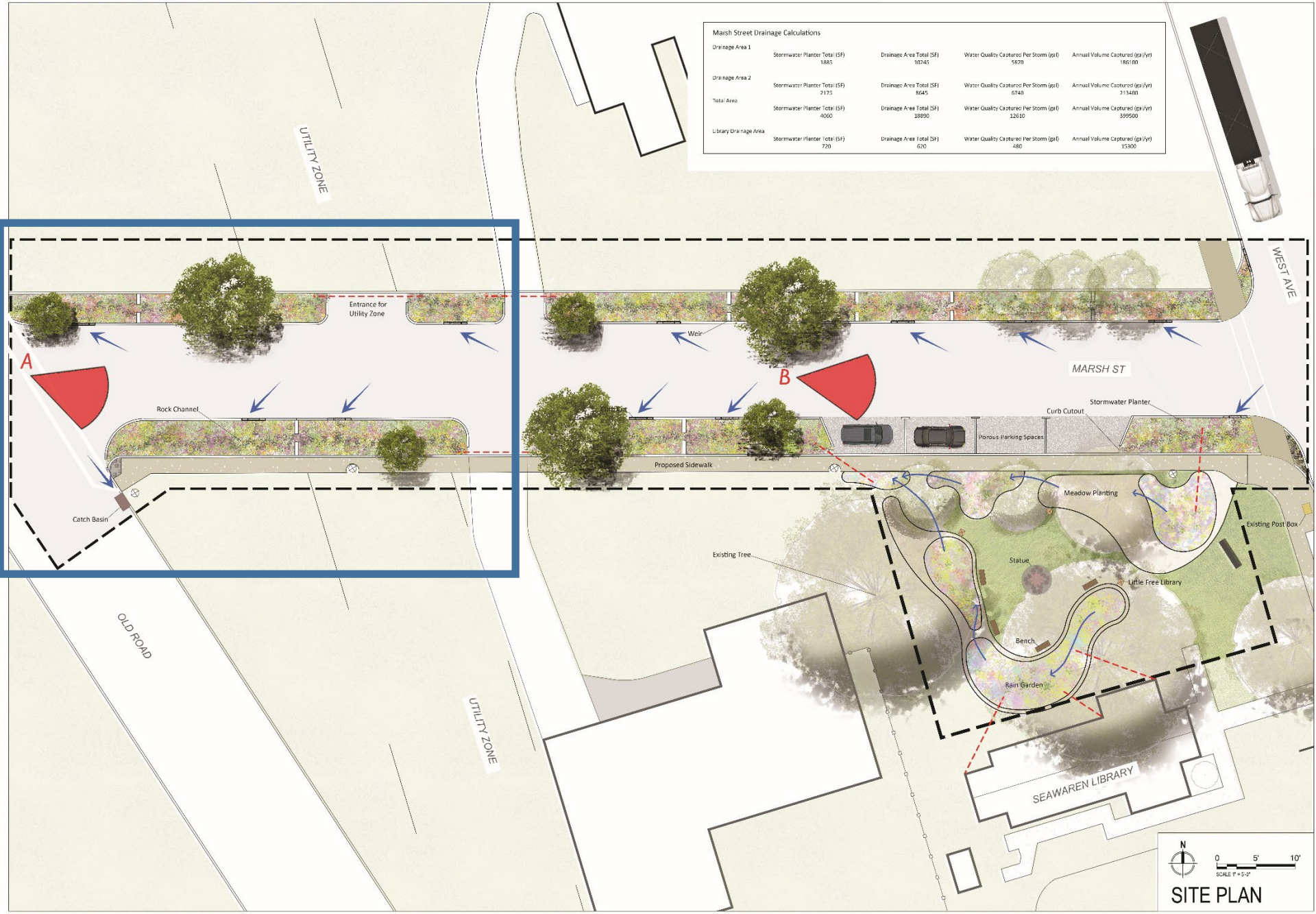
- **Green / Complete streets**
- **Rain Gardens**
- **Bioswales**

Project Examples

Conceptual Plan – Marsh Street, Woodbridge

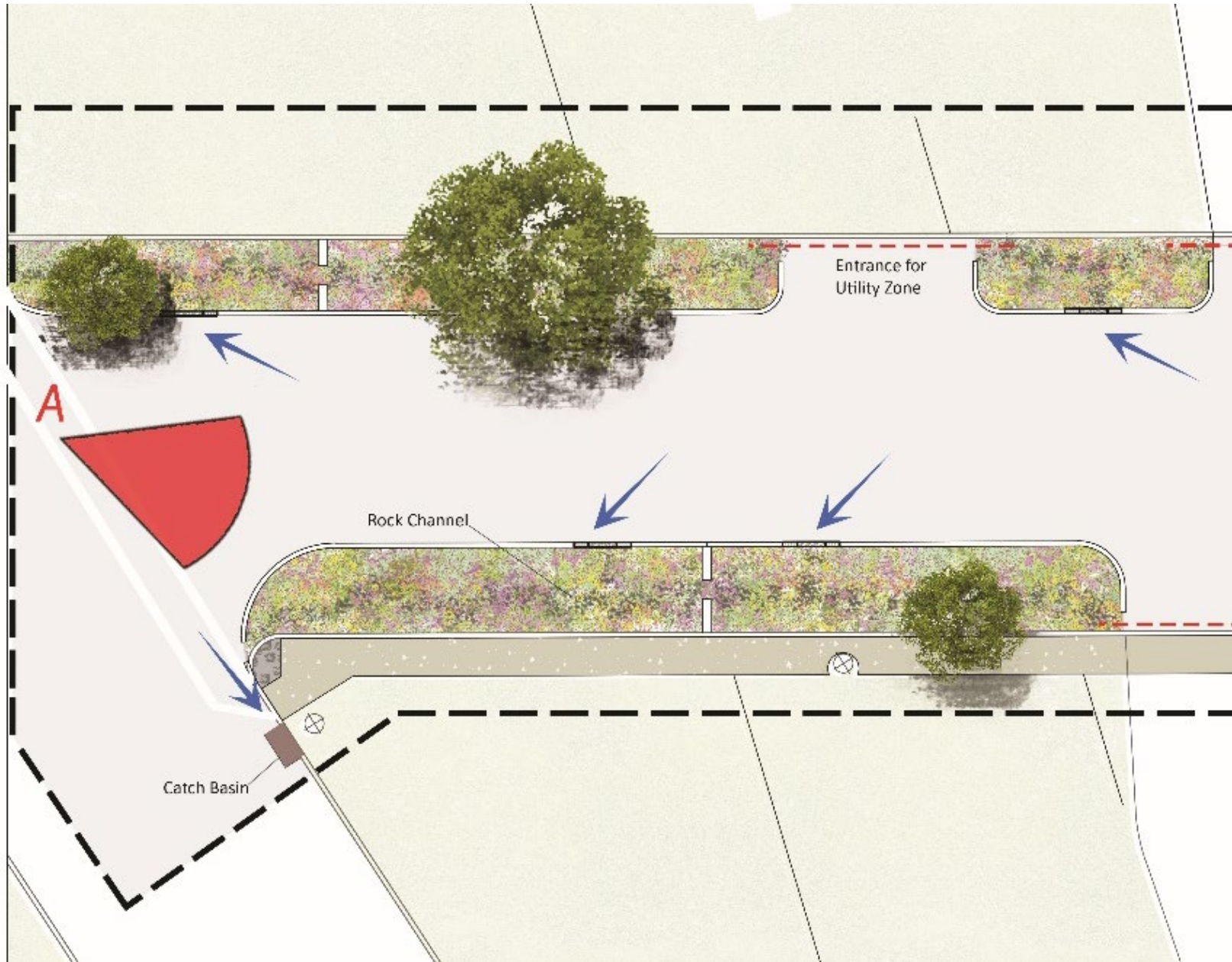
Marsh Street Drainage Calculations

Drainage Area 1	Stormwater Planter Total (SF)	Drainage Area Total (SF)	Water Quality Capture Per Storm (gal)	Annual Volume Captured (gal/yr)
	1885	10745	5670	186100
Drainage Area 2	Stormwater Planter Total (SF)	Drainage Area Total (SF)	Water Quality Capture Per Storm (gal)	Annual Volume Captured (gal/yr)
	2135	8645	6740	213400
Total Area	Stormwater Planter Total (SF)	Drainage Area Total (SF)	Water Quality Capture Per Storm (gal)	Annual Volume Captured (gal/yr)
	4000	18890	12610	399500
Library Drainage Area	Stormwater Planter Total (SF)	Drainage Area Total (SF)	Water Quality Capture Per Storm (gal)	Annual Volume Captured (gal/yr)
	720	620	480	15300

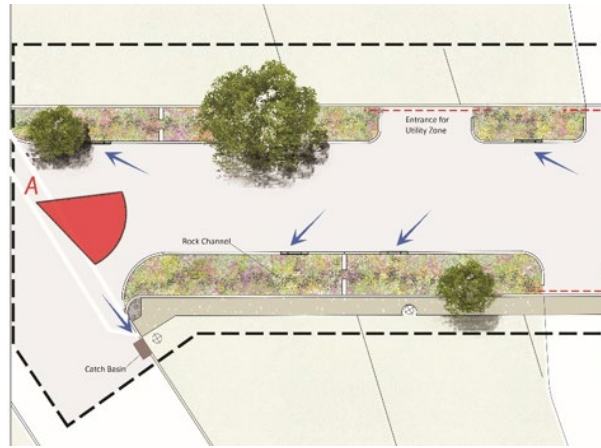


SITE PLAN

Conceptual Plan



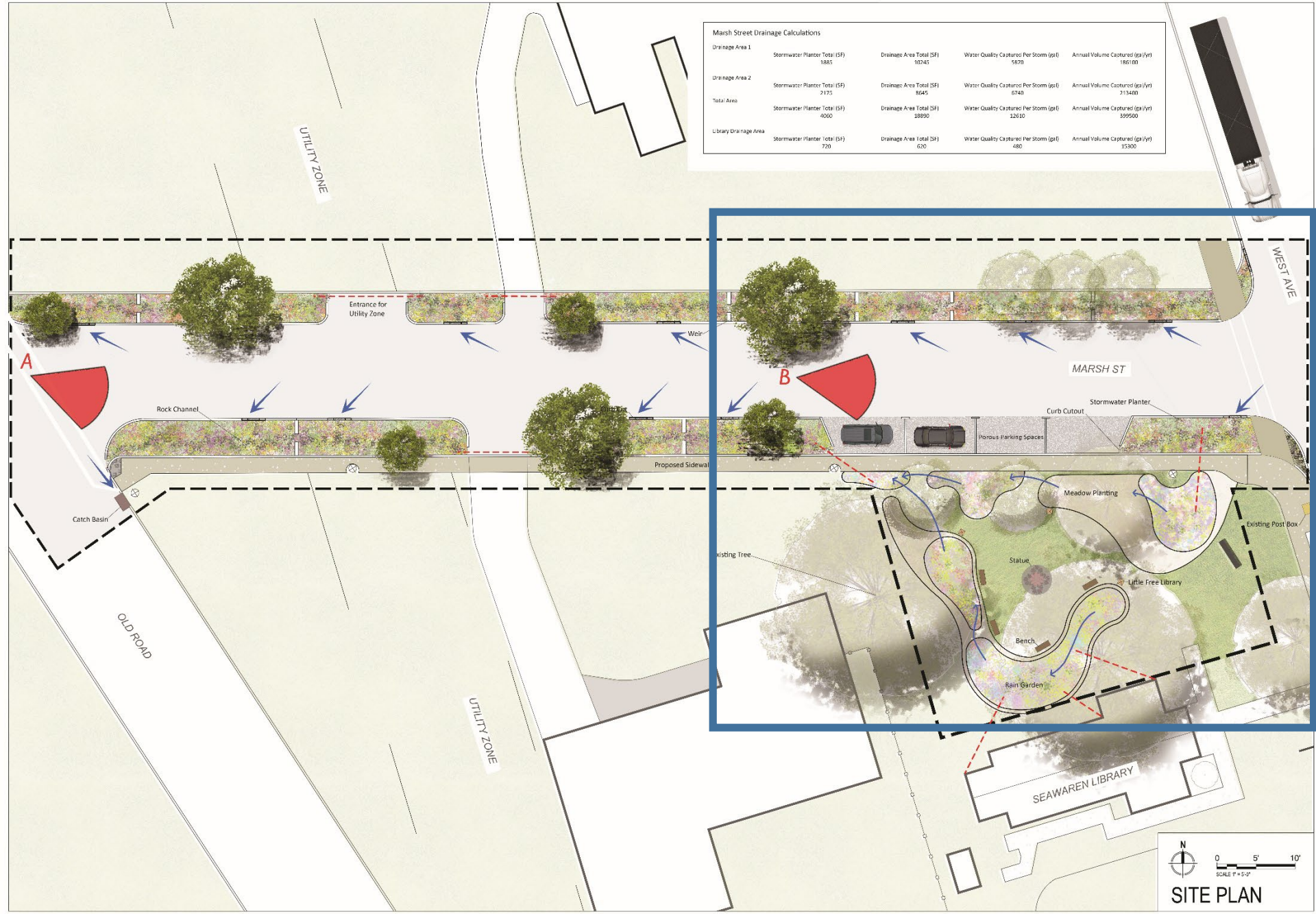
Rendering View A



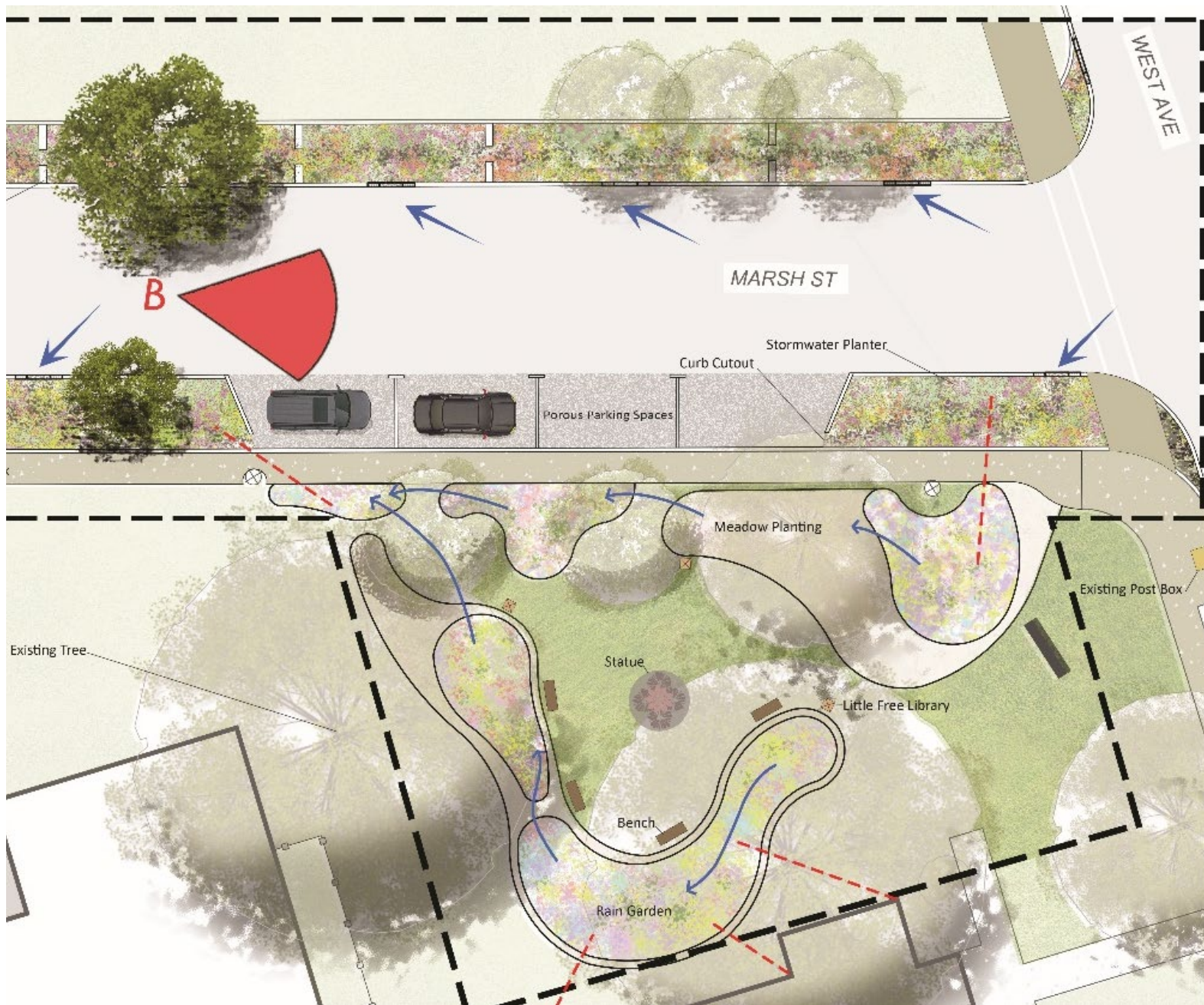
Conceptual Plan

Marsh Street Drainage Calculations

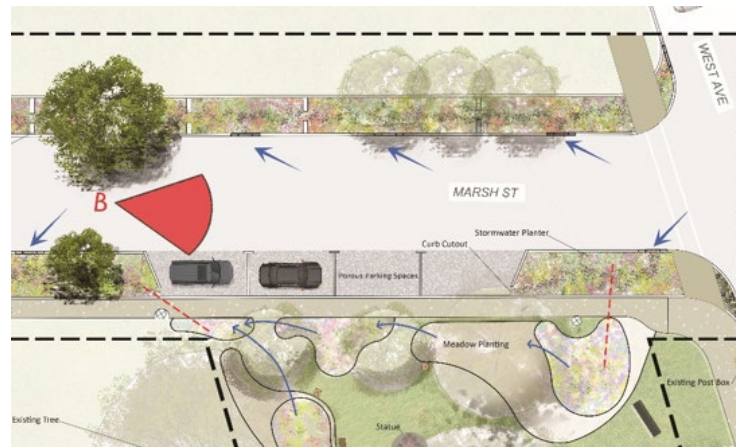
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Drainage Area 1	1885	10745	5670	186100
Drainage Area 2	2135	8645	6740	213400
Total Area	4000	18890	12610	399500
Library Drainage Area	720	620	480	15300



Conceptual Plan



Rendering View B



Final Engineering Plans

TO BE CONSTRUCTED: STORMWATER PLANTER

PAY ITEM NUMBER	ITEM DESCRIPTION	QUANTITY
1	36" EXCAVATION W/ DRAINING	2,835 SF (310 CY)
3	COMPACTED AGGREGATE BASE (#47 STONE)	25 CY
4	3" CURB WALL W/ FOOTING	693 LF
5	12" BACKFILL LINO-COMPACTED AGGREGATE (#47 STONE)	80 CY
6	12" BACKFILL OF BIORETENTION SOIL	92 CY
7	3" HARDWOOD MULCH	23 CY
8	CONCRETE FLOW PAD	2 LIN
9	LANDSCAPE FABRIC	170 SF
10	3/4" RIVER STONE	4.5 TON
11	PLANTINGS	622 LIN

TO BE CONSTRUCTED: ROADWORK

PAY ITEM NUMBER	ITEM DESCRIPTION	QUANTITY
1	HMA MILLING, 2"	9,850 SF (1,142 SY)
2	2" HOT MIX ASPHALT 3.5MB4 SURFACE AND LEVELER COURSE	9,850 SF (115 TONS)
3	CONCRETE SIDEWALK, 4" THICK	1,165 SF (129 SY)
4	CONCRETE LANDING PADS	338 SF (37.5 SY)
5	DETECTABLE WALKING SURFACE	32 SF (3.5 SY)
6	9' X 20' CONCRETE VERTICAL CURB	117 LF
7	RECONSTRUCT INLET, TYPE B	2 LIN
8	FERTILIZING	129 SF (14 SY)
9	SODDING	129 SF (14 SY)

TO BE CONSTRUCTED: RAIN GARDEN

PAY ITEM NUMBER	ITEM DESCRIPTION	QUANTITY
1	21" EXCAVATION	330 SF (10 CY)
2	12" BACKFILL BIORETENTION SOIL	9 CY
3	3" HARDWOOD MULCH	4 CY
4	4" PVC 50#-35 LEADER DRAIN EXTENSION OR RECONSTRUCTION	129 LF
5	LANDSCAPE FABRIC	15 SF
6	3/4" RIVER STONE	0.5 TON
7	RAIN GARDEN PLANTINGS	67 LIN
8	LIBRARY PLANTINGS	452 LIN

REFER TO DT-1 FOR FULL NOTES THAT SHOULD BE READ PRIOR TO MOBILIZATION

- PLANTING:**
- CONTRACTOR SHALL SCHEDULE MEETING WITH ENGINEER AND PROPERTY OWNER PRIOR TO MOBILIZATION AND CONSTRUCTION.
 - CONTRACTOR SHALL VERIFY ALL INFORMATION INCLUDING ELEVATIONS AND UTILITIES PRIOR TO CONSTRUCTION.
 - CONTRACTOR SHALL VERIFY ALL PROPOSED MATERIALS WITH PROPERTY OWNER AND ENGINEER PRIOR TO CONSTRUCTION.
 - CONTRACTOR SHALL STAKE OUT LOCATIONS OF PROPOSED BMPs AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO INSTALLATION.
 - CONTRACTOR SHALL GRADE SITE AS SHOWN ON PLAN. CUT SOIL SHALL BE REUSED ON SITE FOR FILL LOCATIONS.
 - CONTRACTOR SHALL HALL EXCESS SOIL OFF SITE UNLESS OTHERWISE NOTED BY PROPERTY OWNER.
 - ALL FINISHED ELEVATIONS SHALL MATCH ADJACENT PAVEMENT ENSURING SMOOTH TRANSITIONS AND NO TRIPPING HAZARDS.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL AREAS DISTURBED DURING CONSTRUCTION TO ORIGINAL CONDITIONS.

NOTE 1: STONE SHALL BE COMPOSED OF 3/4" DIAMETER CLEAN, WASHED RIVER STONE. ALL AREAS OF EROSION PROTECTION STONE SHALL BE UNDERLAIN WITH GEOTEXTILE FABRIC (#200X 80) BY PROPX OR APPROVED EQUIVALENT.

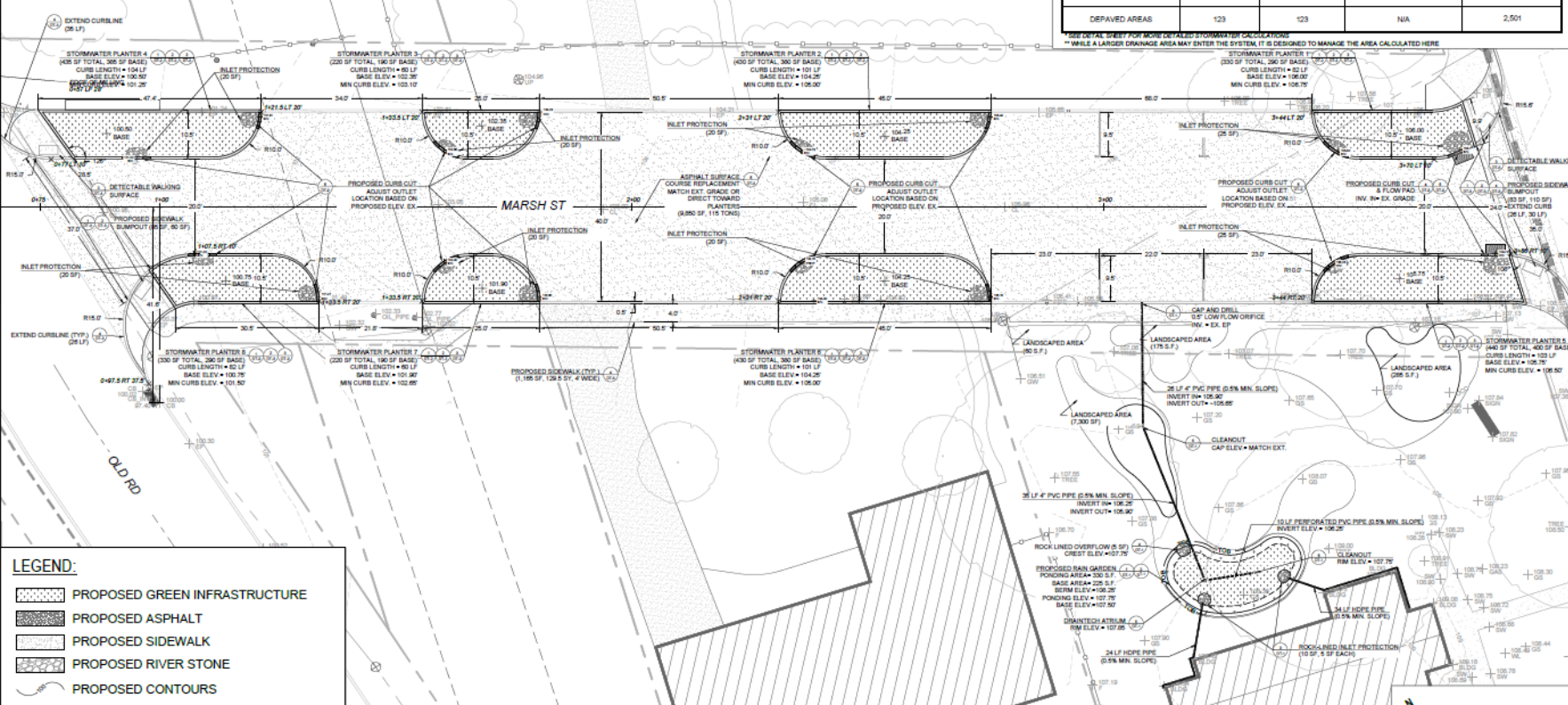
NOTE 2: UNDERDRAIN MAY BE OMITTED BY ENGINEER'S DISCRETION IF THE TESTED INFILTRATION RATE EXCEEDS 1 INCH PER HOUR PER BMP MANUFACTURER.

STORMWATER CALCULATIONS*

GREEN INFRASTRUCTURE PROJECT	PROJECT SIZE (SF)	TOTAL IMPERVIOUS DRAINAGE AREA (SF)	DRAINAGE AREA MANAGED** (WATER QUALITY STORM) (SF)	ANNUAL RUNOFF VOLUME MANAGED (GAL.)
RAIN GARDEN	330	660	660	10258
STORM WATER PLANTER 1-4	1,145	7,095	7,095	183,096
STORM WATER PLANTER 5-8	1,260	6,955	6,955	159,083
LANDSCAPED AREAS	7,820	N/A	N/A	18,260
DEPAVED AREAS	123	123	N/A	2,501

*SEE DETAIL SHEET FOR MORE DETAILED STORMWATER CALCULATIONS

**WHILE A LARGER DRAINAGE AREA MAY ENTER THE SYSTEM, IT IS DESIGNED TO MANAGE THE AREA CALCULATED HERE



LEGEND:

- PROPOSED GREEN INFRASTRUCTURE
- PROPOSED ASPHALT
- PROPOSED SIDEWALK
- PROPOSED RIVER STONE
- PROPOSED CONTOURS
- PROPOSED SPOT ELEVATIONS

SPOT ELEVATION CODES:
 INV. - BOTTOM OF CURB CUT
 BASE - FINISHED GRADE OF PLANTER CELL

Navigation controls: arrow, hand, zoom in (+), zoom out (-), 37.7% scale, print icon, and a redacted area.

Scale: 0 10' 20'
 SCALE 1"=10'

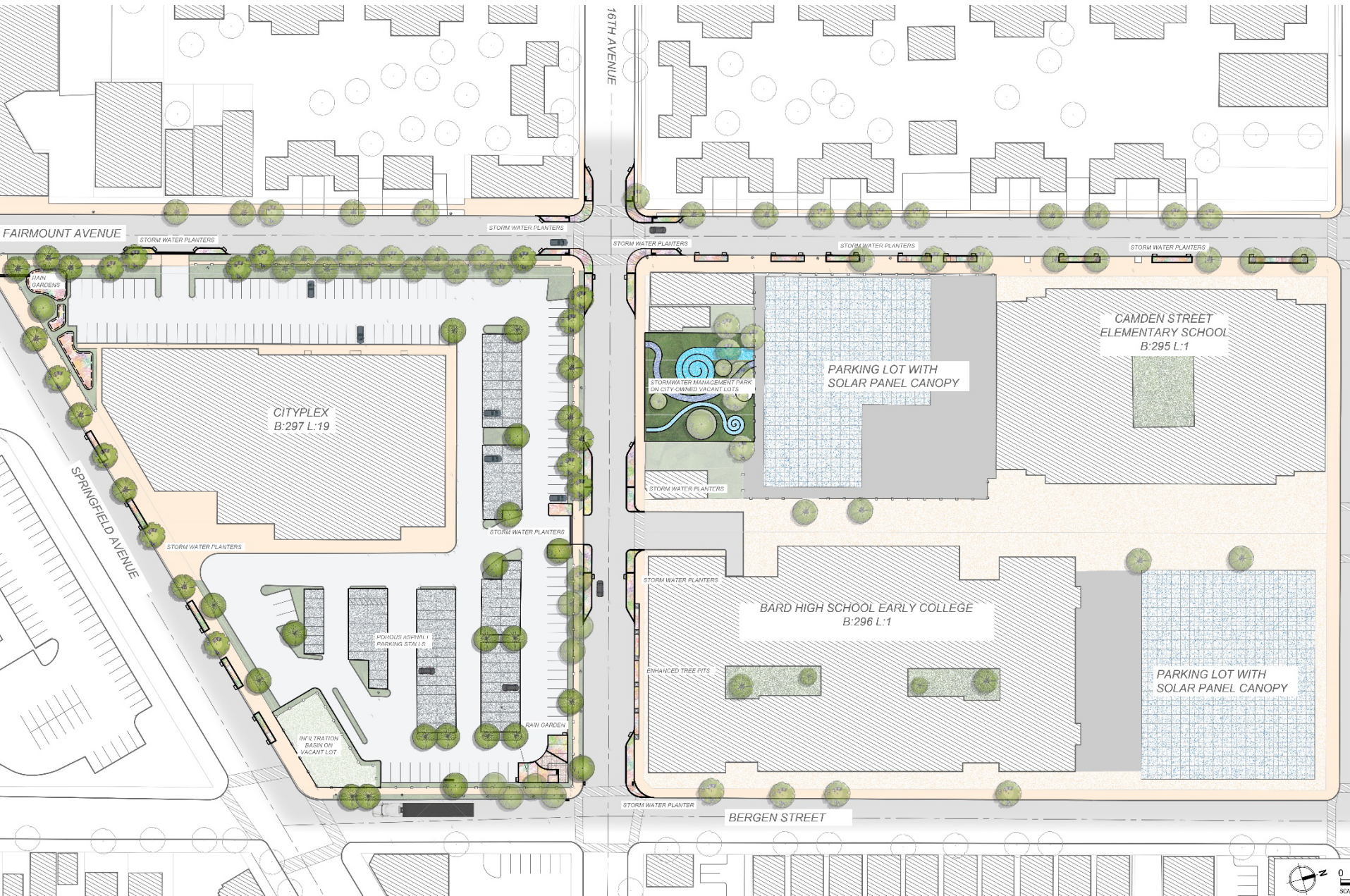
SITE PLAN

PROJECT INFORMATION:
 PROJECT: GREEN STREET IMPLEMENTATION PROJECT
 LOCATION: WOODBRIDGE TOWNSHIP, MIDDLESEX COUNTY, NJ
 SHEET NAME: PROPOSED SITE PLAN
 SHEET NUMBER: P-2

DESIGNER: CHRISTOPHER C. ORSHY & ASSOCIATES, P.A., P.E.
 PROFESSIONAL ENGINEER LICENSE # 35102
 DATE: 11/13/2024

APPROVED: [Signature]

Conceptual Plan – Cityplex, Newark





PLANTERS

STORM WATER PLANTERS

PERVIOUS ASPHALT
PARKING STALLS

INFILTRATION
BASIN ON
VACANT LOT

RAIN GARDEN

STORM WATER PLANTERS

BARD

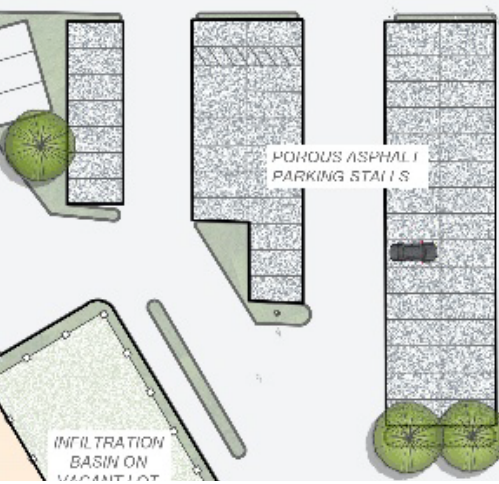
ENHANCED TREE PITS

STORM WATER PLANTER

BERGEN ST



CITYPLEX
B:297 L:19



STORM WATER PLANTERS

RAIN GARDEN

STORMWATER MANAGEMENT PARK
ON CITY-OWNED VACANT LOTS

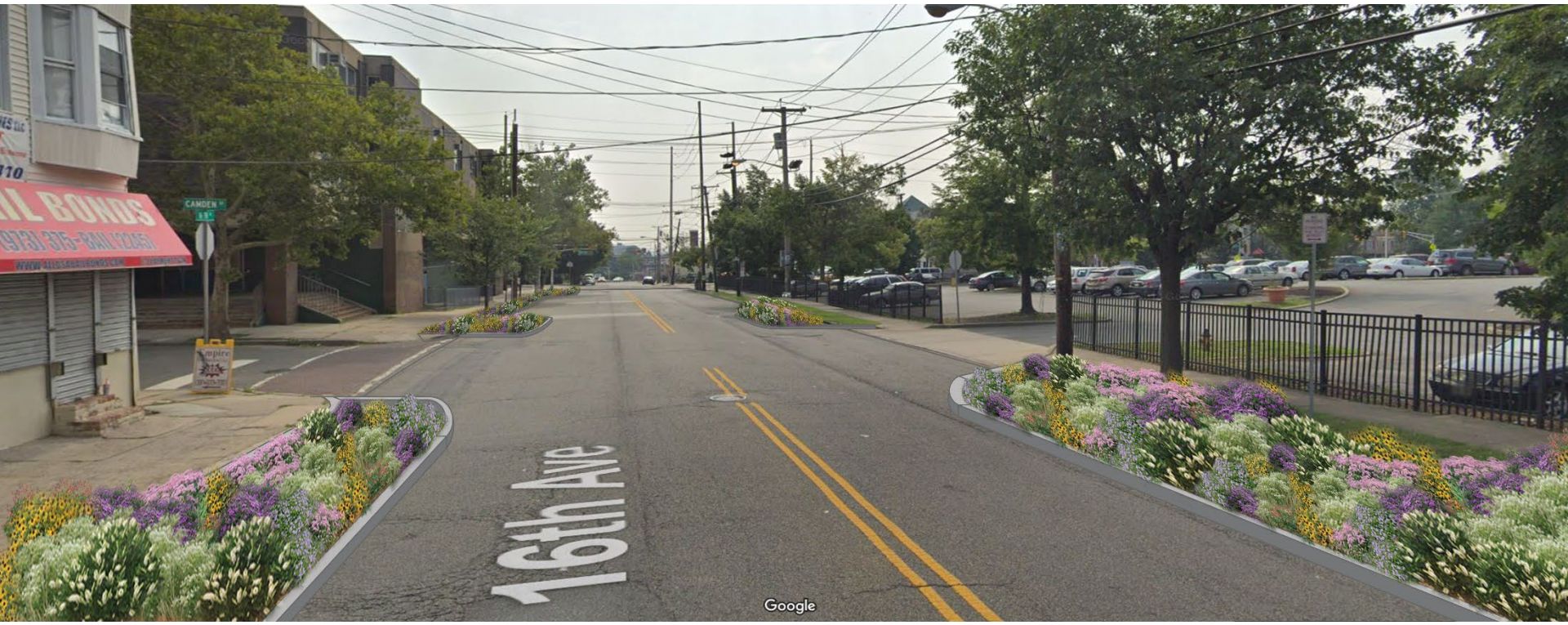
STORM WATER PLANTERS

STORM WATER PLANTERS

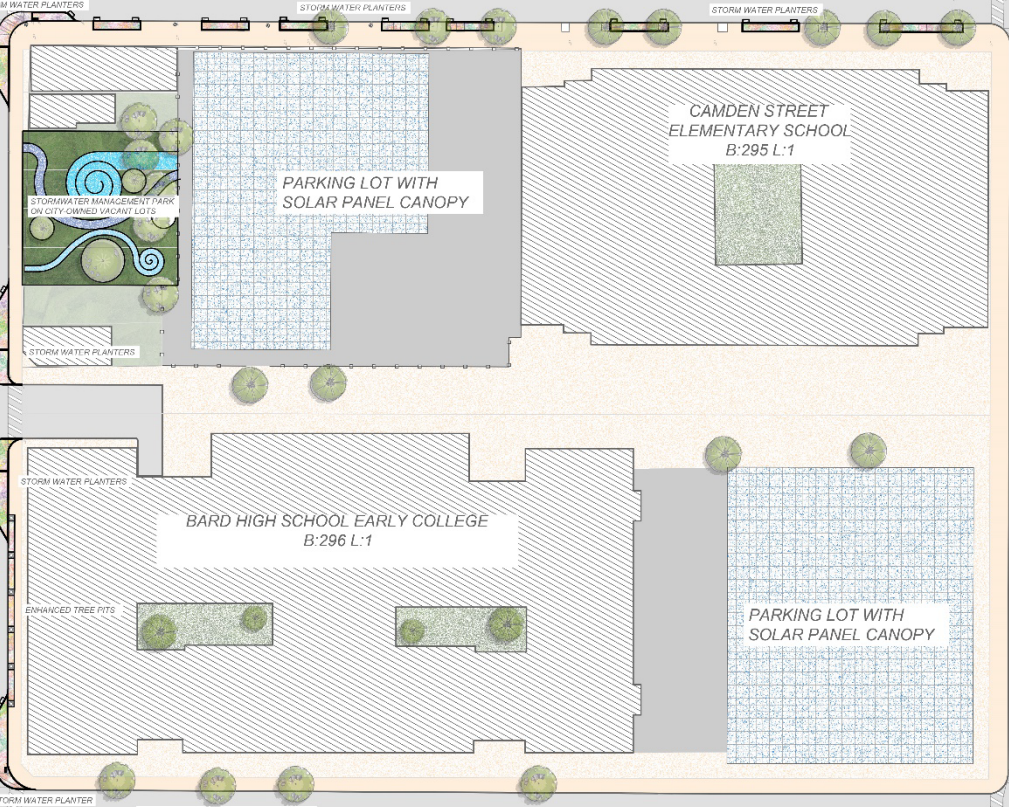
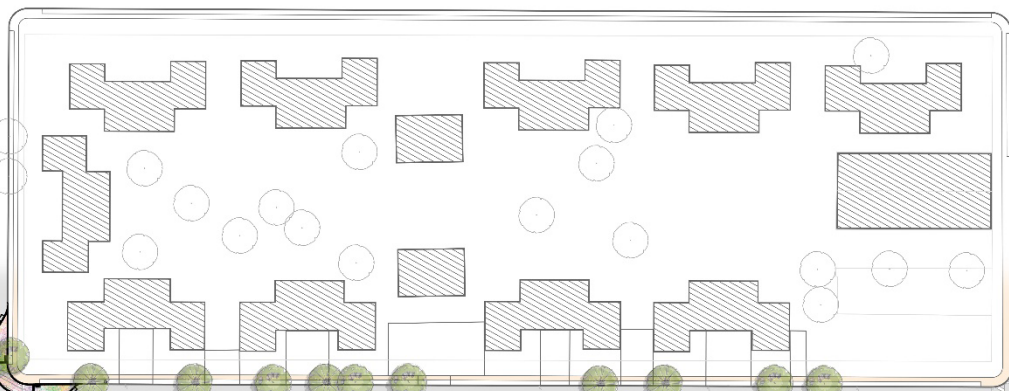
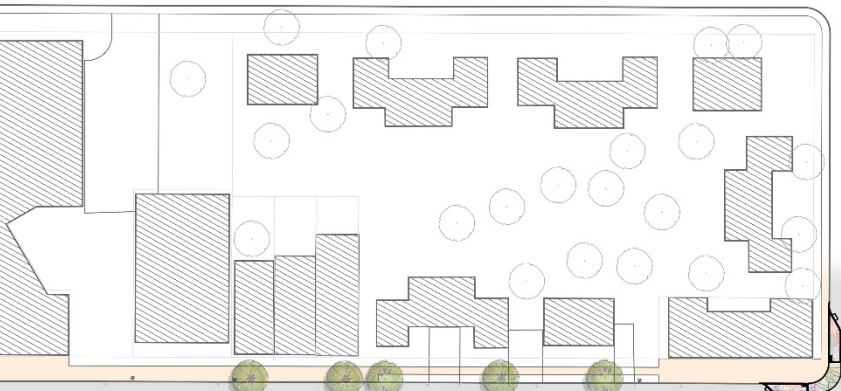
ENHANCED TREE PITS

PARKING LOT WITH
SOLAR PANEL CANOPY

BARD HIGH SCHOOL EARLY COLLEGE
B:296 L:1



Google





- LEGEND:**
- RAIN GARDEN
 - BIOSWALE
 - CISTERN
 - PERMEABLE PAVERS
 - PLANTER BOXES
 - MEADOW AREAS
 - ADA - PARKING
 - APPLE ORCHARD

CHRISTOPHER C. OBROPTA, PH.D., P.E.
 PROFESSIONAL ENGINEER - LICENSE # 37028

NO.	DESCRIPTION	DATE	BY	DATE	BY
1	ISSUED FOR PERMITS TO MAINTAIN TRAILS				










APPEL FARM ARTS AND MUSIC CENTER
 GREEN INFRASTRUCTURE IMPLEMENTATION PROJECT
 457 SHIRLEY ROAD, ELMER
 SALEM COUNTY, NJ



SHEET NAME
P-1



MASTER PLAN

- LEGEND:**
-  RAIN GARDENS
 -  BIOSWALES
 -  CISTERNS
 -  PERMEABLE PAVERS
Any emergency or maintenance road can be converted to permeable pavers
 -  POROUS PAVEMENT
 -  EXISTING TREES
 -  EXISTING LIGHTPOLES
 -  PROPOSED TREES
 -  PROPOSED PATH



NO.	DATE	DESCRIPTION
1	4/20/2021	PHASE 1 PLAN SET
2	1/10/2021	EDITED TO PHASE 2 AS BUILT

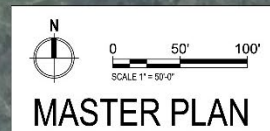
DESIGNED	CHECKED	APPROVED	DATE

**SALEM HIGH SCHOOL
RAIN GARDEN IMPLEMENTATION PROJECT**
219 WALNUT STREET, SALEM
SALEM COUNTY, NJ

MASTER PLAN



CHRISTOPHER C. OBROPTA, Ph.D., P.E.
PROFESSIONAL ENGINEER - IN LICENSE # 11332



PLAN REVISIONS		DESCRIPTION
No.	DATE	

FAIRFIELD MUNICIPAL BUILDING / SENIOR CENTER
 [70 FAIRTON GOULD TOWN ROAD, BRIDGETON]
 CUMBERLAND COUNTY, NJ



SHEET NAME
P-1

MASTER PLAN



- LEGEND:**
-  EXISTING TREES
 -  EXISTING LIGHTPOLES
 -  RAIN GARDENS
 -  BIOSWALES
 -  CISTERNS
 -  TURFSTONE PAVERS
 -  POROUS PAVEMENT
 -  PLANTER BOX
 -  TREE FILTER BOXES
 -  PROPOSED TREES
 -  PROPOSED PATH



SHEET NUMBER	DATE	DESCRIPTION	DESIGNED	CHECKED	APPROVED	DATE

MEMORIAL PARK BLUE BARN
 PERMEABLE PAVEMENT IMPLEMENTATION PROJECT
 1004 TUCKERTON ROAD, WARLTON
 BURLINGTON COUNTY, NJ

CHRISTOPHER C. OBROPTA, Ph.D., P.E.
 PROFESSIONAL LANDSCAPE ARCHITECT # 21052



MASTER PLAN

PLAN REVISIONS	
No.	DATE

CHRISTIC
PROFESSION

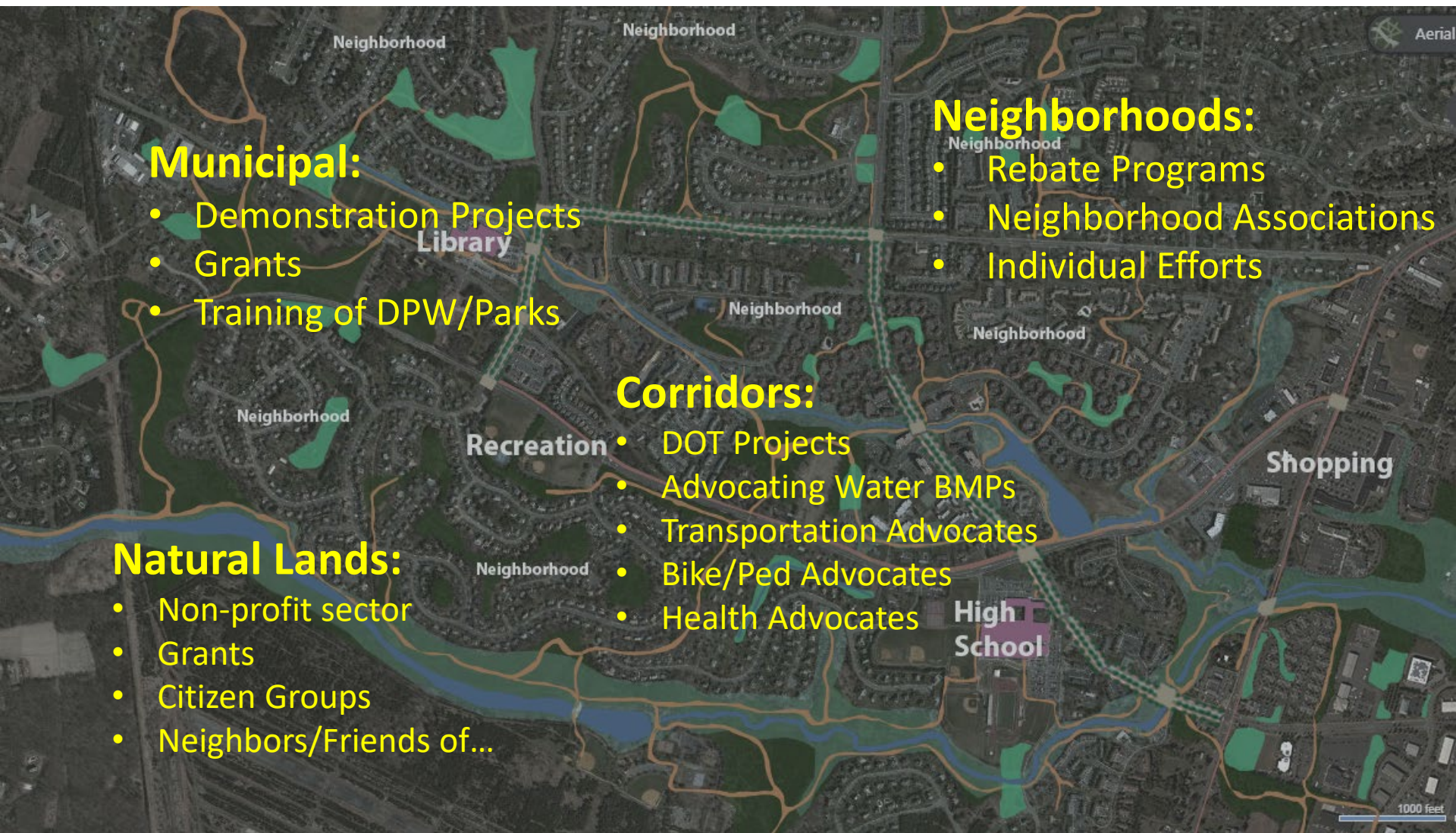
FAITH BIBLE CHURCH
3139 E CHESTNUT AVENUE, VINELAND
CUMBERLAND COUNTY, NJ

MASTER PLAN

RUTGERS
New Jersey Agricultural
Experiment Station

SHEET NAME
P-1

Steps Towards Achieving this Type of Plan



Local Champions make it all happen!

Steps Towards Achieving this Type of Plan



Local Champions make it all happen!



QUESTIONS?