Draft

Impervious Cover Reduction Action Plan for Berkeley Heights Township, Union County, New Jersey

Prepared for Berkeley Heights Township by the Rutgers Cooperative Extension Water Resources Program

November 16, 2015

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Introduction

Located in Union County in central New Jersey, Berkeley Heights Township covers approximately 6.3 square miles. Figures 1 and 2 illustrate that Berkeley Heights Township is dominated by urban land uses. A total of 69.2% of the municipality's land use is classified as urban. Of the urban land in Berkeley Heights Township, medium density residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection's (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Berkeley Heights Township into many unique land use areas, assigning a percent impervious cover for each delineated area. These impervious cover values were used to estimate the impervious coverage for Berkeley Heights Township. Based upon the 2007 NJDEP land use/land cover data, approximately 25.3% of Berkeley Heights Township has impervious cover. This level of impervious cover suggests that the streams in Berkeley Heights Township are likely non-supporting streams.[1]

Methodology

Berkeley Heights Township contains portions of two subwatersheds (Figure 4). For this impervious cover reduction action plan, projects have been identified in each of these watersheds. Initially, aerial imagery was used to identify potential project sites that contain extensive impervious cover. Field visits were then conducted at each of these potential project sites to determine if a viable option exists to reduce impervious cover or to disconnect impervious surfaces from draining directly to the local waterway or storm sewer system. During the site visit, appropriate green infrastructure practices for the site were determined. Sites that already had stormwater management practices in place were not considered.

[1] Caraco, D., R. Claytor, P. Hinkle, H. Kwon, T. Schueler, C. Swann, S. Vysotsky, and J. Zielinski. 1998. Rapid Watershed Planning Handbook. A Comprehensive Guide for Managing Urbanizing Watersheds. Prepared by Center For Watershed Protection, Ellicott City, MD. Prepared for U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds and Region V. October 1998

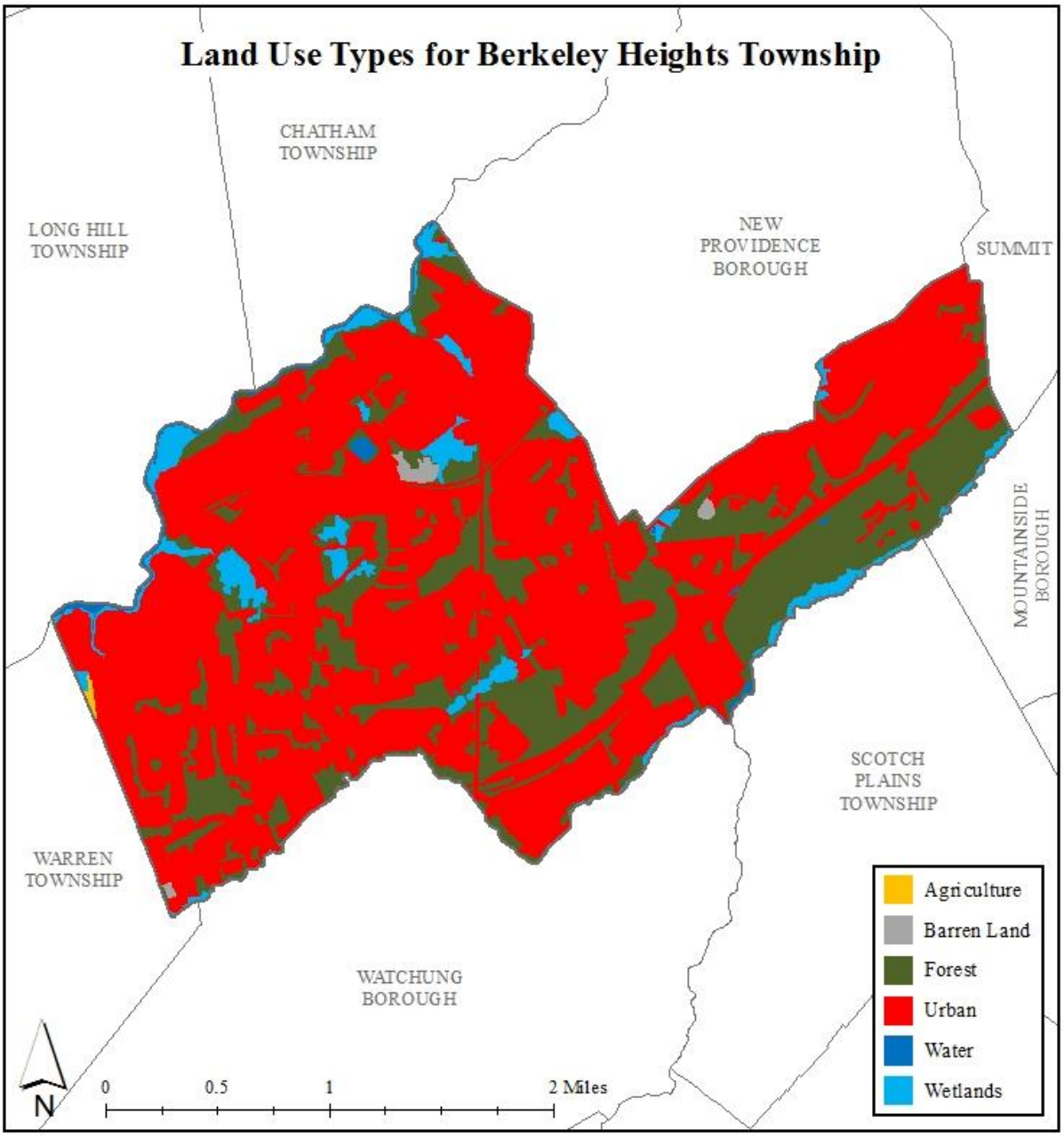


Figure 1: Map illustrating the land use in Berkeley Heights Township

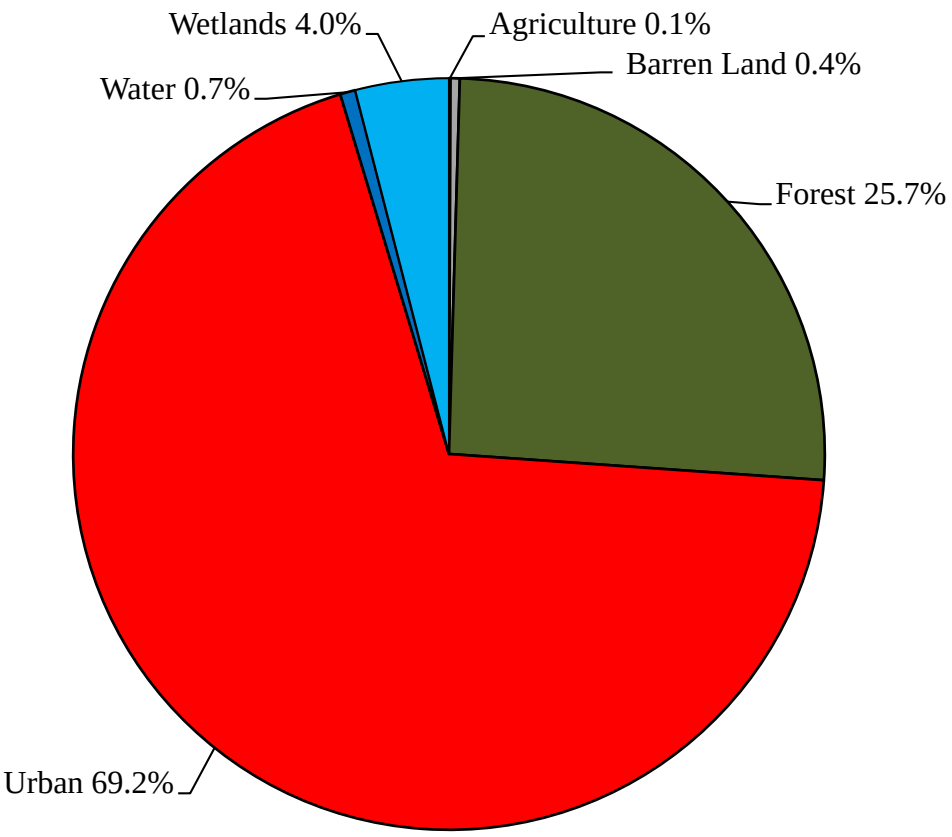


Figure 2: Pie chart illustrating the land use in Berkeley Heights Township

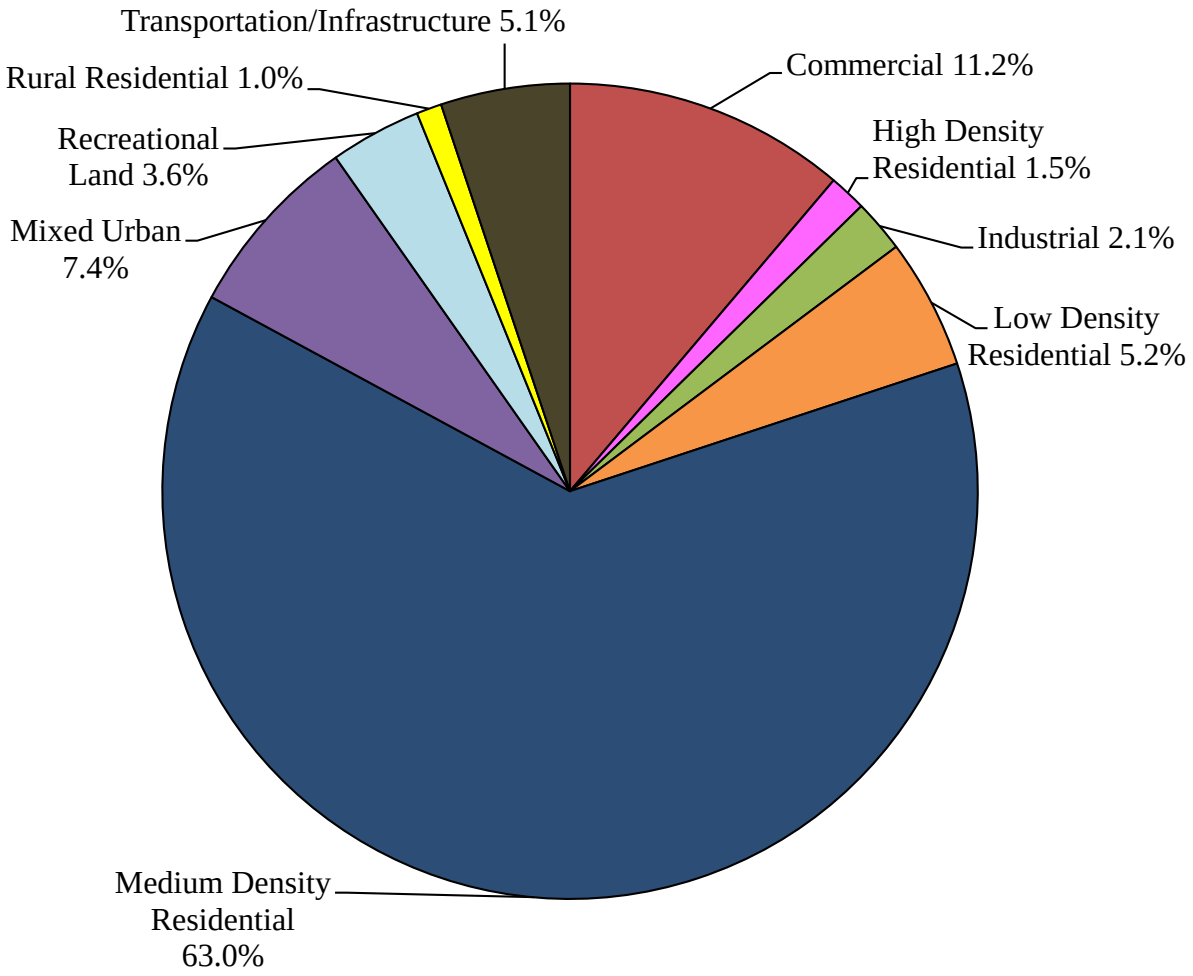


Figure 3: Pie chart illustrating the various types of urban land use in Berkeley Heights Township

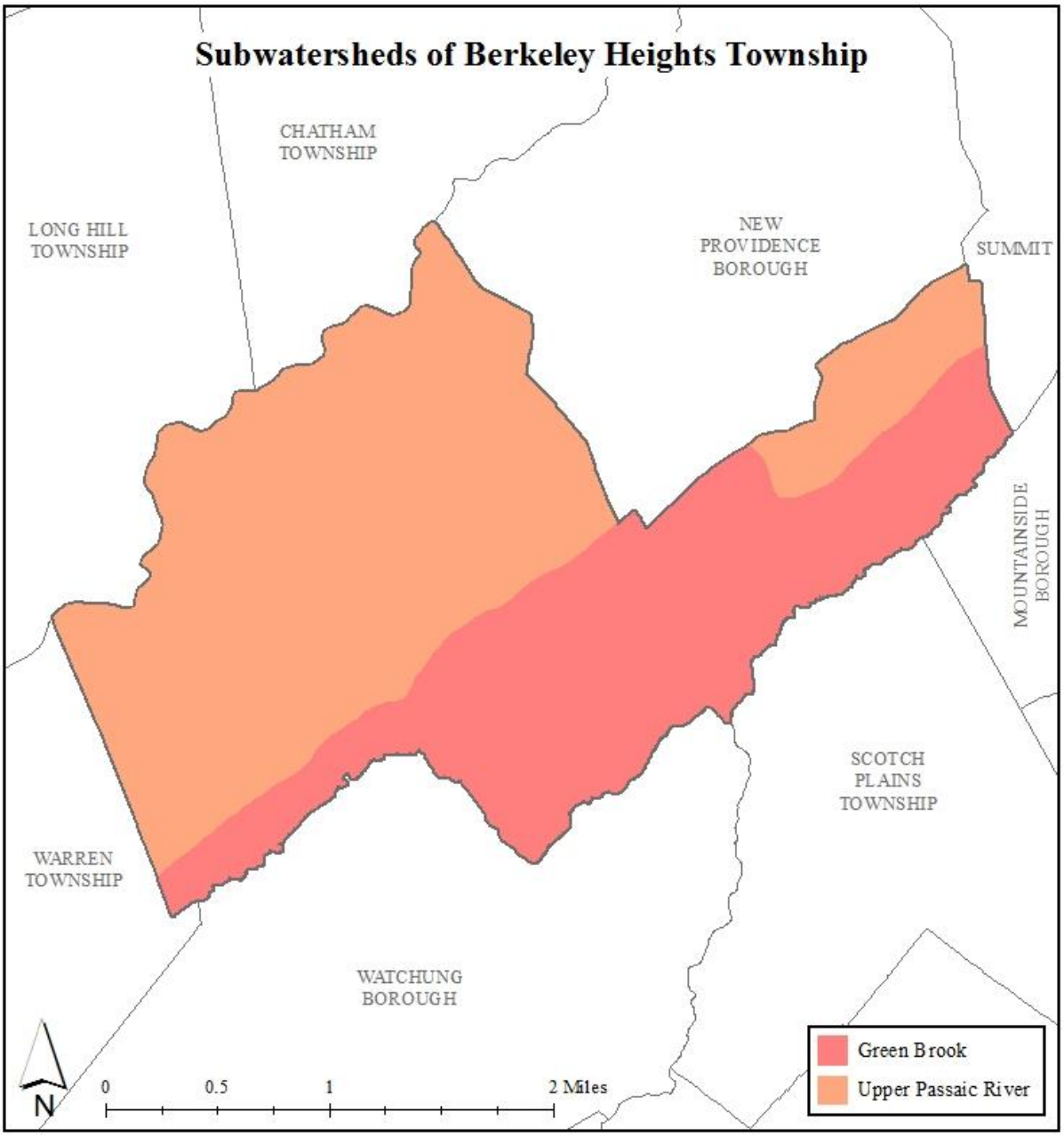


Figure 4: Map of the subwatersheds in Berkeley Heights Township

For each potential project site, specific aerial loading coefficients for commercial land use were used to determine the annual runoff loads for total phosphorus (TP), total nitrogen (TN), and total suspended solids (TSS) from impervious surfaces (Table 1). These are the same aerial loading coefficients that NJDEP uses in developing total maximum daily loads (TMDLs) for impaired waterways of the state. The percentage of impervious cover for each site was extracted from the 2007 NJDEP land use/land cover database. For impervious areas, runoff volumes were determined for the water quality design storm (1.25 inches of rain over two-hours) and for the annual rainfall total of 44 inches.

Preliminary soil assessments were conducted for each potential project site identified in Berkeley Heights Township using the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, which utilizes regional and statewide soil data to predict soil types in an area. Several key soil parameters were examined (e.g., natural drainage class, saturated hydraulic conductivity of the most limiting soil layer (K_{sat}), depth to water table, and hydrologic soil group) to evaluate the suitability of each site's soil for green infrastructure practices. In cases where multiple soil types were encountered, the key soil parameters were examined for each soil type expected at a site.

For each potential project site, drainage areas were determined for each of the green infrastructure practices proposed at the site. These green infrastructure practices were designed to manage the 2-year design storm, enabling these practices to capture 95% of the annual rainfall. Runoff volumes were calculated for each proposed green infrastructure practice. The reduction in TSS loading was calculated for each drainage area for each proposed green infrastructure practice using the aerial loading coefficients in Table 1. The maximum volume reduction in stormwater runoff for each green infrastructure practice for a storm was determined by calculating the volume of runoff captured from the 2-year design storm. For each green infrastructure practice, peak discharge reduction potential was determined through hydrologic modeling in HydroCAD. For each green infrastructure practice, a cost estimate is provided. These costs are based upon the square footage of the green infrastructure practice and the real cost of green infrastructure practice implementation in New Jersey.

Table 1: Aerial Loading Coefficients[2]

Land Cover	TP load (lbs/acre/yr)	TN load (lbs/acre/yr)	TSS load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agriculture	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

[2] New Jersey Department of Environmental Protection (NJDEP), Stormwater Best Management Practice Manual, 2004.

Green Infrastructure Practices

Green infrastructure is an approach to stormwater management that is cost-effective, sustainable, and environmentally friendly. Green infrastructure projects capture, filter, absorb, and reuse stormwater to maintain or mimic natural systems and to treat runoff as a resource. As a general principal, green infrastructure practices use soil and vegetation to recycle stormwater runoff through infiltration and evapotranspiration. When used as components of a stormwater management system, green infrastructure practices such as bioretention, green roofs, porous pavement, rain gardens, and vegetated swales can produce a variety of environmental benefits. In addition to effectively retaining and infiltrating rainfall, these practices can simultaneously help filter air pollutants, reduce energy demands, mitigate urban heat islands, and sequester carbon while also providing communities with aesthetic and natural resource benefits[3]. A wide range of green infrastructure practices have been evaluated for the potential project sites in Berkeley Heights Township. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, and prevented from draining directly to the roadway or storm sewer system, and directed to discharge water to a pervious area (i.e., lawn).

Pervious pavements

There are several types of permeable pavement systems including porous asphalt, pervious concrete, permeable pavers, and grass pavers. These surfaces are hard and support vehicle traffic but also allow water to infiltrate through the surface. They have an underlying stone layer to store stormwater runoff and allow it to slowly seep into the ground.




[3] United States Environmental Protection Agency (USEPA), 2013. Watershed Assessment, Tracking, and Environmental Results, New Jersey Water Quality Assessment Report. http://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ

Bioretention systems/rain gardens

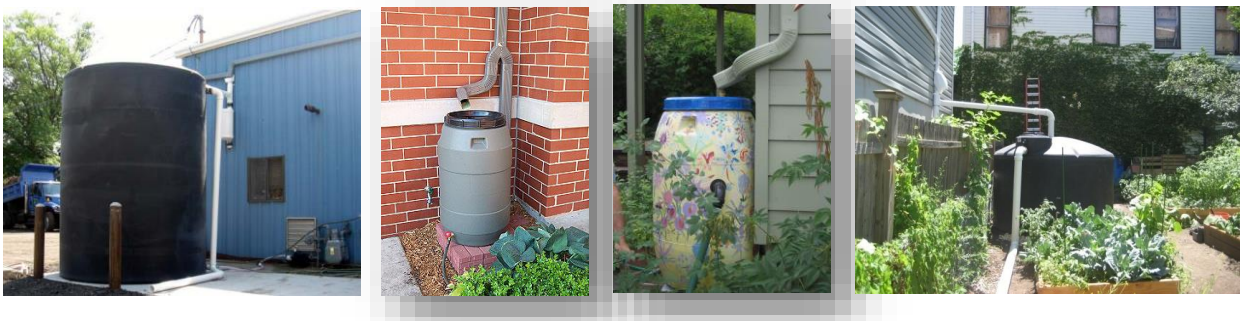
These are landscaped features that are designed to capture, treat, and infiltrate stormwater runoff. These systems can easily be incorporated into existing landscapes, improving aesthetics and creating a wildlife habitat while managing stormwater runoff. Bioretention systems also can be used in soils that do not quickly infiltrate by incorporating an underdrain into the system.

Downspout planter boxes

These are wooden boxes with plants installed at the base of a downspout that provide an opportunity to beneficially reuse rooftop runoff.

Rainwater harvesting systems (cistern or rain barrel)

These systems capture rainwater, mainly from rooftops, in cisterns or rain barrels. The water can then be used for watering gardens, washing vehicles, or for other non-potable uses.



Bioswale

Bioswales are landscape features that convey stormwater from one location to another while removing pollutants and providing water an opportunity to infiltrate.

Stormwater planters

Stormwater planters are vegetated structures that are built into the sidewalk to intercept stormwater runoff from the roadway or sidewalk. Many of these planters are designed to allow the water to infiltrate into the ground while others are designed simply to filter the water and convey it back into the stormwater sewer system.

Tree filter boxes

These are pre-manufactured concrete boxes that contain a special soil mix and are planted with a tree or shrub. They filter stormwater runoff but provide little storage capacity. They are typically designed to quickly filter stormwater and then discharge it to the local sewer system.

Potential Project Sites

Attachment 1 contains information on potential project sites where green infrastructure practices could be installed. The recommended green infrastructure practice and the drainage area that the green infrastructure practice can treat are identified for each potential project site. For each practice, the recharge potential, TSS removal potential, maximum volume reduction potential per storm, and the peak reduction potential are provided. This information is also provided so that proposed development projects that cannot satisfy the New Jersey stormwater management requirements for major development can use one of the identified projects to offset a stormwater management deficit. [4]

[4] New Jersey Administrative Code, N.J.A.C. 7:8, Stormwater Management, Statutory Authority: N.J.S.A. 12:5-3, 13:1D-1 et seq., 13:9A-1 et seq., 13:19-1 et seq., 40:55D-93 to 99, 58:4-1 et seq., 58:10A-1 et seq., 58:11A-1 et seq. and 58:16A-50 et seq., *Date last amended: April 19, 2010*.

Conclusion

This impervious cover reduction action plan is meant to provide the municipality with a blueprint for implementing green infrastructure practices that will reduce the impact of stormwater runoff from impervious surfaces. These projects can be implemented by a wide variety of people such as boy scouts, girl scouts, school groups, faith-based groups, social groups, watershed groups, and other community groups.

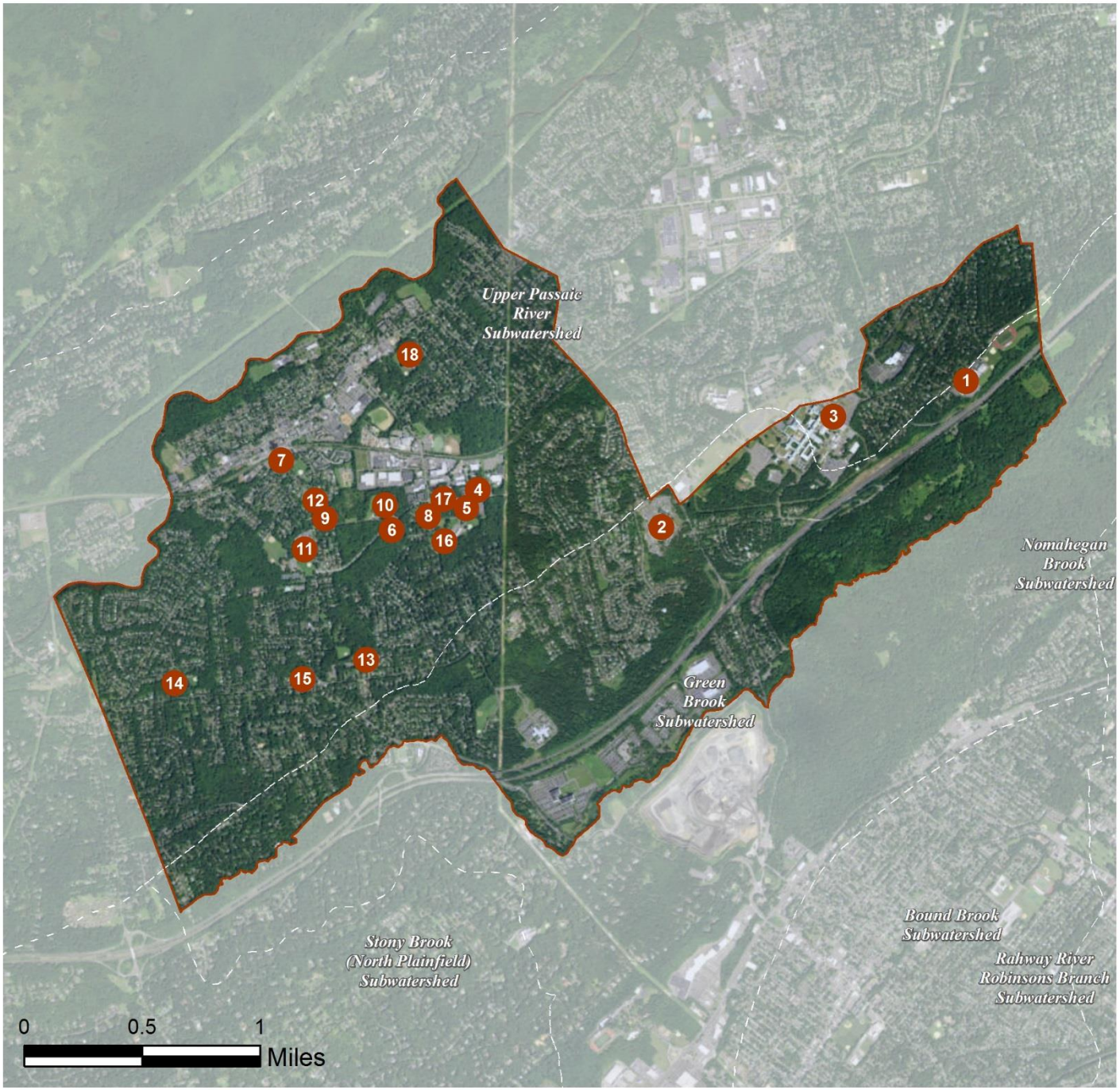
Additionally, development projects that are in need of providing off-site compensation for stormwater impacts can use the projects in this plan as a starting point. The municipality can quickly convert this impervious cover reduction action plan into a stormwater mitigation plan and incorporate it into the municipal stormwater control ordinance.

a. Overview Map of the Project

BERKELEY HEIGHTS: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN

b. Green Infrastructure Sites

BERKELEY HEIGHTS: GREEN INFRASTRUCTURE SITES



SITES WITHIN THE GREEN BROOK SUBWATERSHED:

1. Governor Livingston High School
2. Summit Medical Group

SITES WITHIN THE UPPER PASSAIC RIVER SUBWATERSHED:

3. Alcatel Lucent
4. ANCO Environmental Services Inc.
5. Berkeley Heights Community Pool
6. Berkeley Heights Fire Department
7. Berkeley Heights Town Hall and Recreation
8. Berkeley Heights Volunteer Rescue Squad
9. Church of the Little Flower
10. Church of the Little Flower: Parish Center
11. Columbia Middle School
12. Free Public Library
13. Mary Kay McMillin Early Childhood Center
14. Mountain Park Elementary School
15. Mountain Ridge Bible Chapel
16. Thomas P. Hughes Elementary School
17. Veterans of Foreign Wars
18. William Woodruff Elementary School

c. Proposed Green Infrastructure Concepts

GOVERNOR LIVINGSTON HIGH SCHOOL

Subwatershed: Green Brook

Site Area: 1,647,312 sq. ft.

Address: 175 Watchung Boulevard
New Providence, NJ 07974

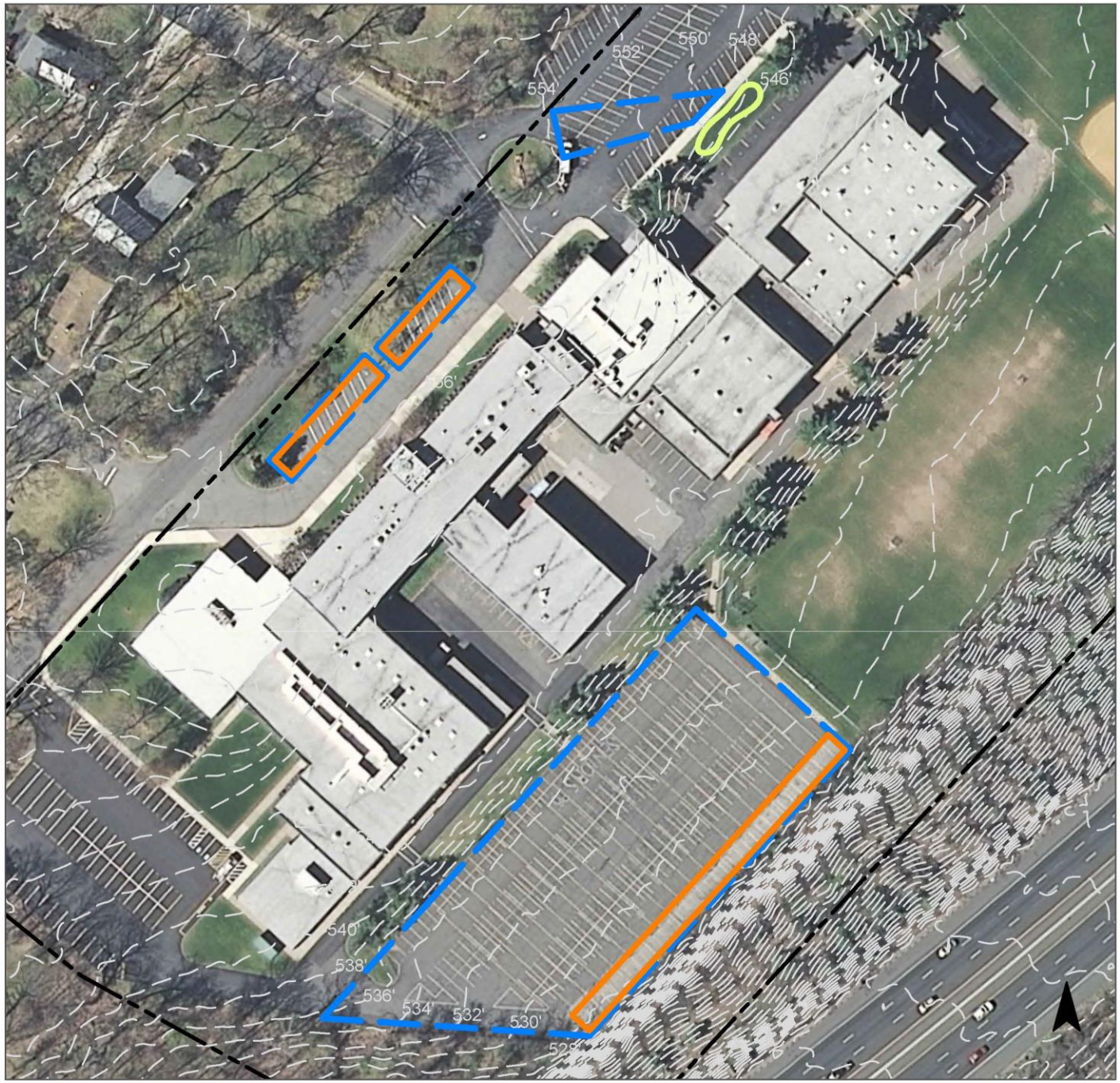
Block and Lot: Block 4903, Lot 36

Parking spots to the east and west of the building can be replaced with porous asphalt to capture and infiltrate stormwater. Installing a rain garden adjacent to the building can capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics 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"
34	553,818	26.7	279.7	2,542.8	0.432	15.19

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	0.089	15	6,710	0.25	850	$4,250
Pervious pavements	1.709	286	128,304	4.82	870	$215,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Governor Livingston High School

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

0 60' 120'

SUMMIT MEDICAL GROUP

Subwatershed: Green Brook

Site Area: 1,862,181 sq. ft.

Address: 1 Diamond Hill Road
Berkeley Heights, NJ 07922

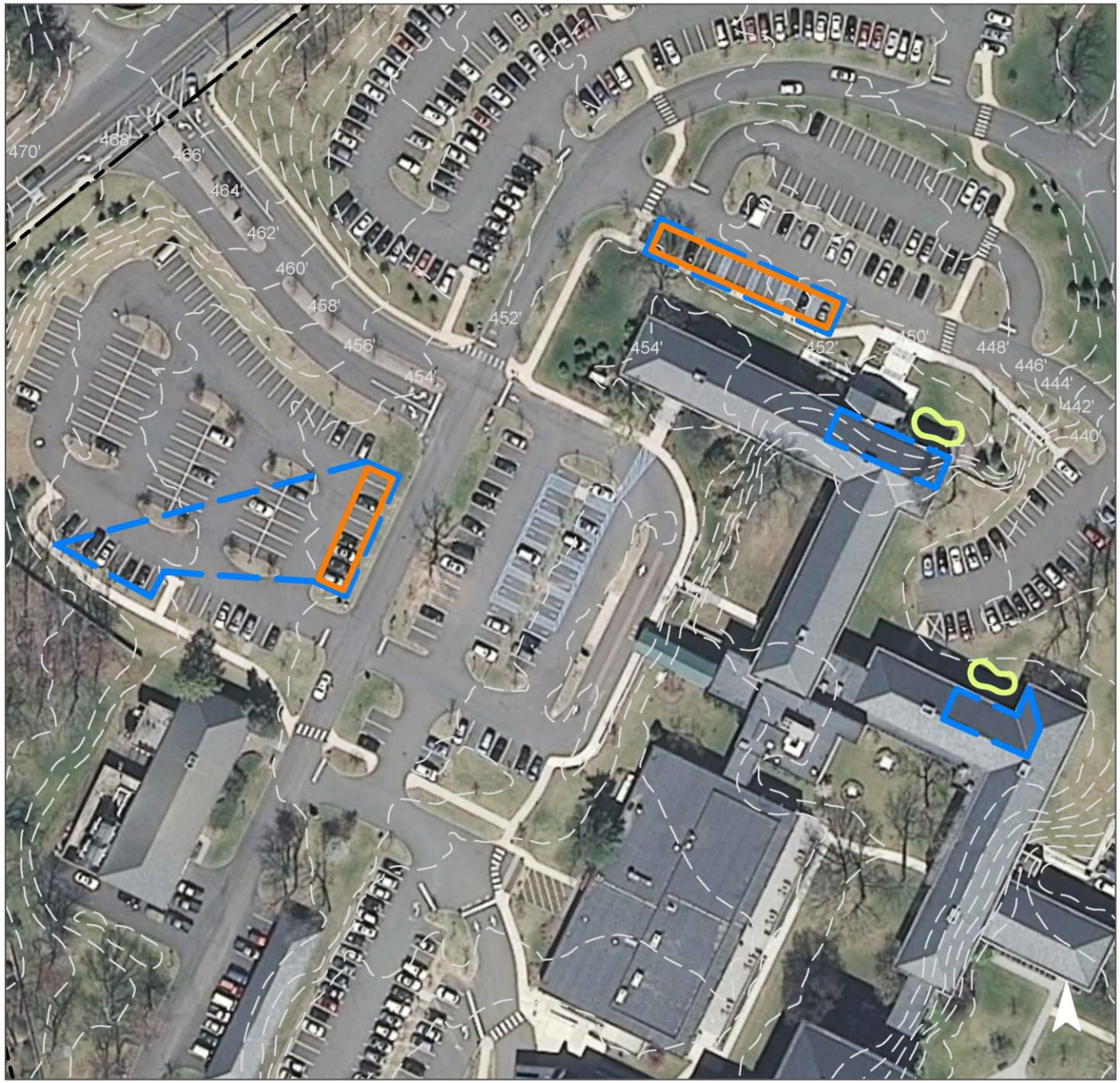
Block and Lot: Block 3601, Lot 6

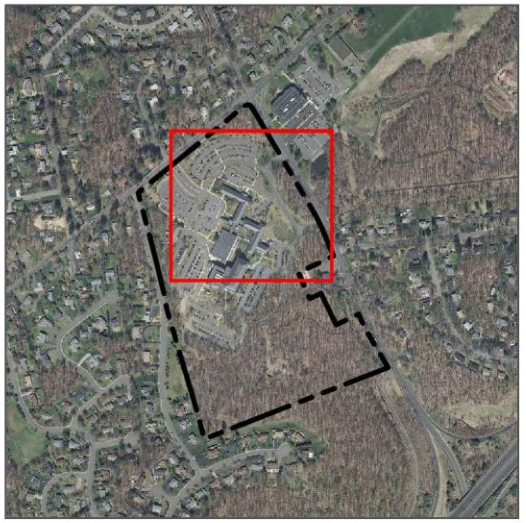
Parking spots can be replaced with porous asphalt to capture and infiltrate stormwater. The installation of rain gardens adjacent to the buildings can capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's 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"
31	580,739	28.0	293.3	2,666.4	0.452	15.93

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	0.082	14	6,216	0.23	800	$4,000
Pervious pavements	0.352	59	26,651	1.00	3,700	$92,500

GREEN INFRASTRUCTURE RECOMMENDATIONS





Summit Medical Group

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

0 50' 100'

ALCATEL LUCENT

Subwatershed: Upper Passaic River

Site Area: 6,625,382 sq. ft.

Address: 600 Mountain Avenue
Berkeley Heights, NJ 07922

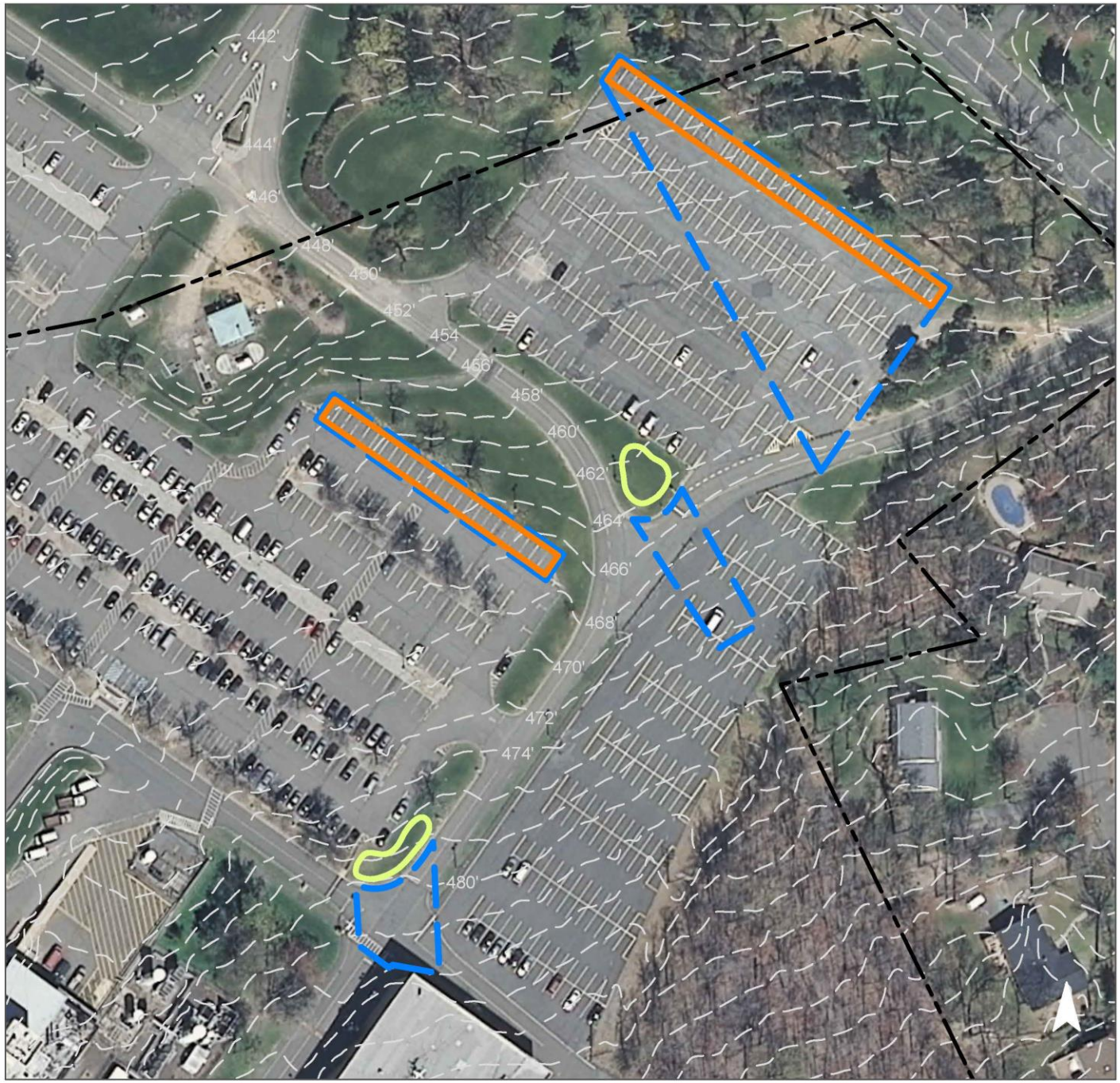
Block and Lot: Block 3701, Lot 1

Parking spots north of the building can be replaced with porous asphalt to capture and infiltrate stormwater. Installing rain gardens adjacent to the parking lots can capture, treat, and infiltrate runoff. 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"
34	2,232,381	107.6	1,127.5	10,249.7	1.739	61.23

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	0.234	39	17,765	0.67	2,300	$11,500
Pervious pavements	0.967	162	73,237	2.75	9,500	$237,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Alcatel Lucent

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

0 60' 120'

ANCO ENVIRONMENTAL SERVICES INC.

Subwatershed: Upper Passaic River

Site Area: 83,267 sq. ft.

Address: 1 Russo Place
Berkeley Heights, NJ 07922

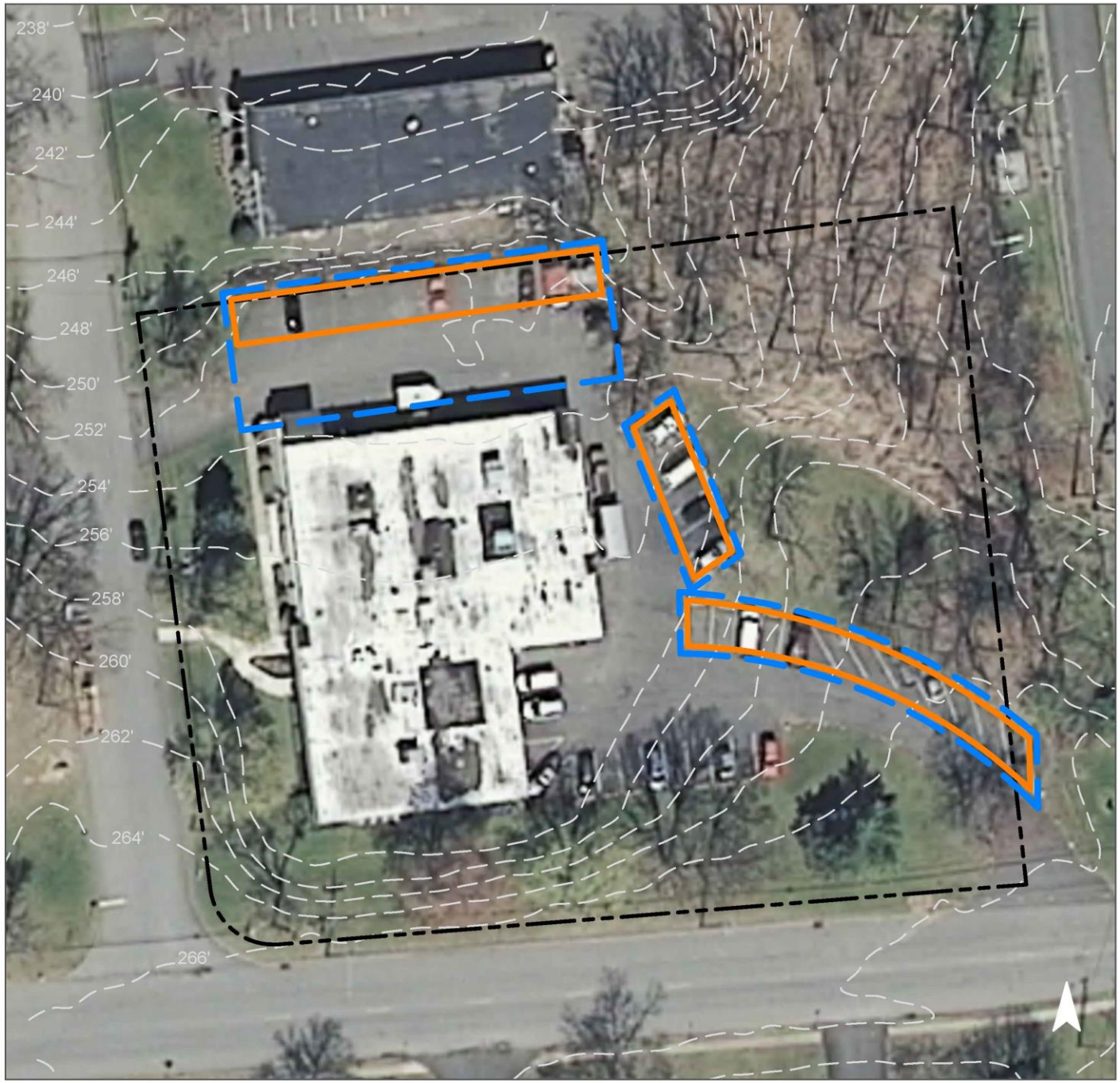
Block and Lot: Block 1901, Lot 36

Parking spaces can be replaced with porous asphalt to capture and infiltrate stormwater runoff. 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"
59	49,289	2.4	24.9	226.3	0.038	1.35

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
Pervious pavements	0.344	58	26,503	0.98	6,000	$150,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



ANCO Environmental Services Inc.

- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

BERKELEY HEIGHTS COMMUNITY POOL

Subwatershed: Upper Passaic River

Site Area: 740,588 sq. ft.

Address: 59 Locust Avenue
Berkeley Heights, NJ 07922

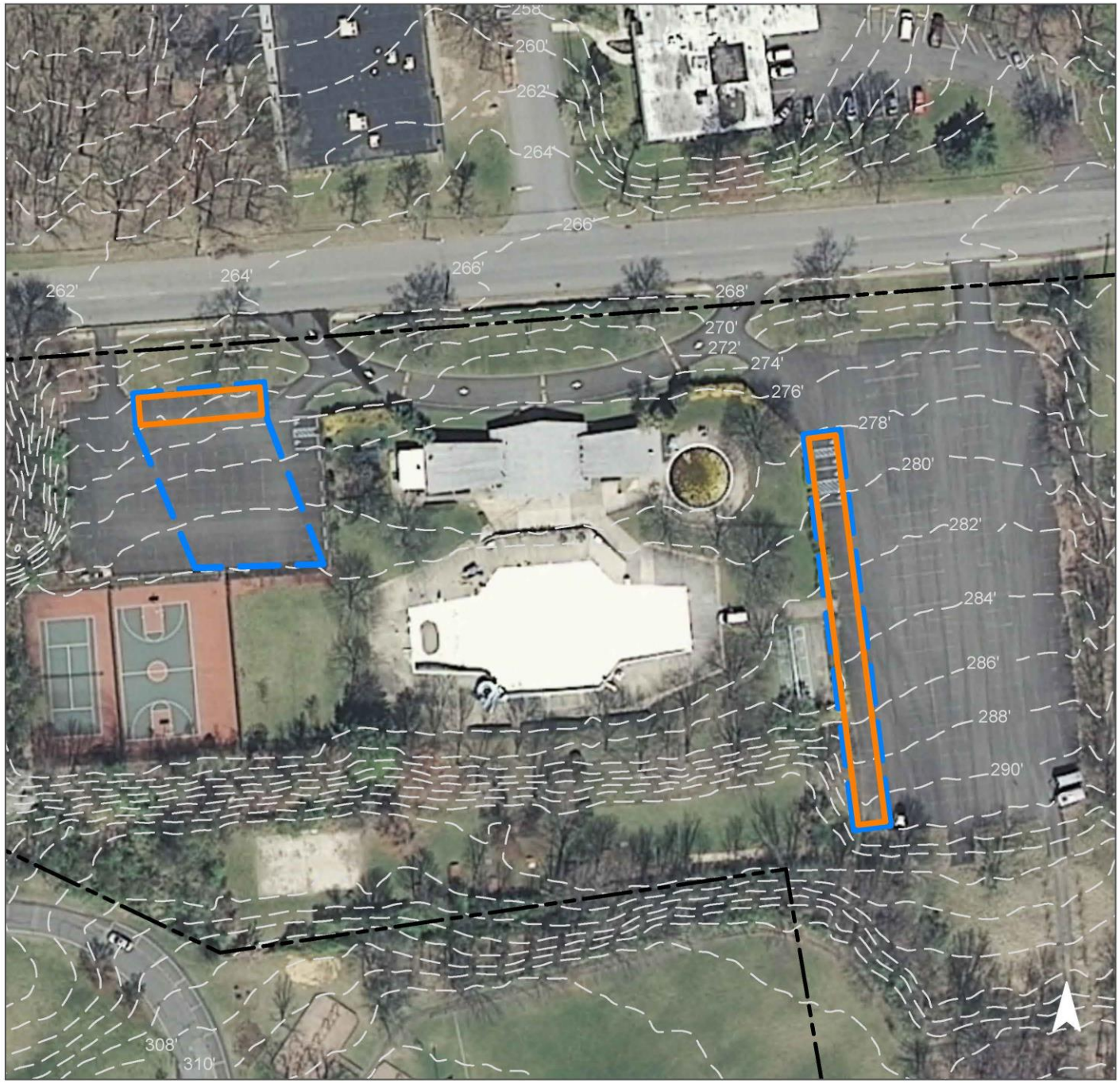
Block and Lot: Block 2201, Lot 19

Two rows of parking spots can be replaced with porous asphalt to capture and infiltrate stormwater. 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"
25	184,150	8.9	93.0	845.5	0.143	5.05

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
Pervious pavements	0.427	72	32,373	1.22	6,000	$150,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Berkeley Heights Community Pool

- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 50' 100'

BERKELEY HEIGHTS FIRE DEPARTMENT

Subwatershed: Upper Passaic River

Site Area: 718,904 sq. ft.

Address: 411 Hamilton Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 1815, Lot 6

A rain garden can be installed adjacent to the building to capture, treat, and infiltrate roof runoff. 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"
9	63,000	3.0	31.8	289.3	0.049	1.73

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	0.025	4	1,892	0.07	250	$1,250

GREEN INFRASTRUCTURE RECOMMENDATIONS

Berkeley Heights Fire Department

- disconnected downspouts
- bioretention / rain gardens
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

BERKELEY HEIGHTS TOWN HALL AND RECREATION

Subwatershed: Upper Passaic River

Site Area: 95,444 sq. ft.

Address: 29 Park Avenue
Berkeley Heights, NJ 07922

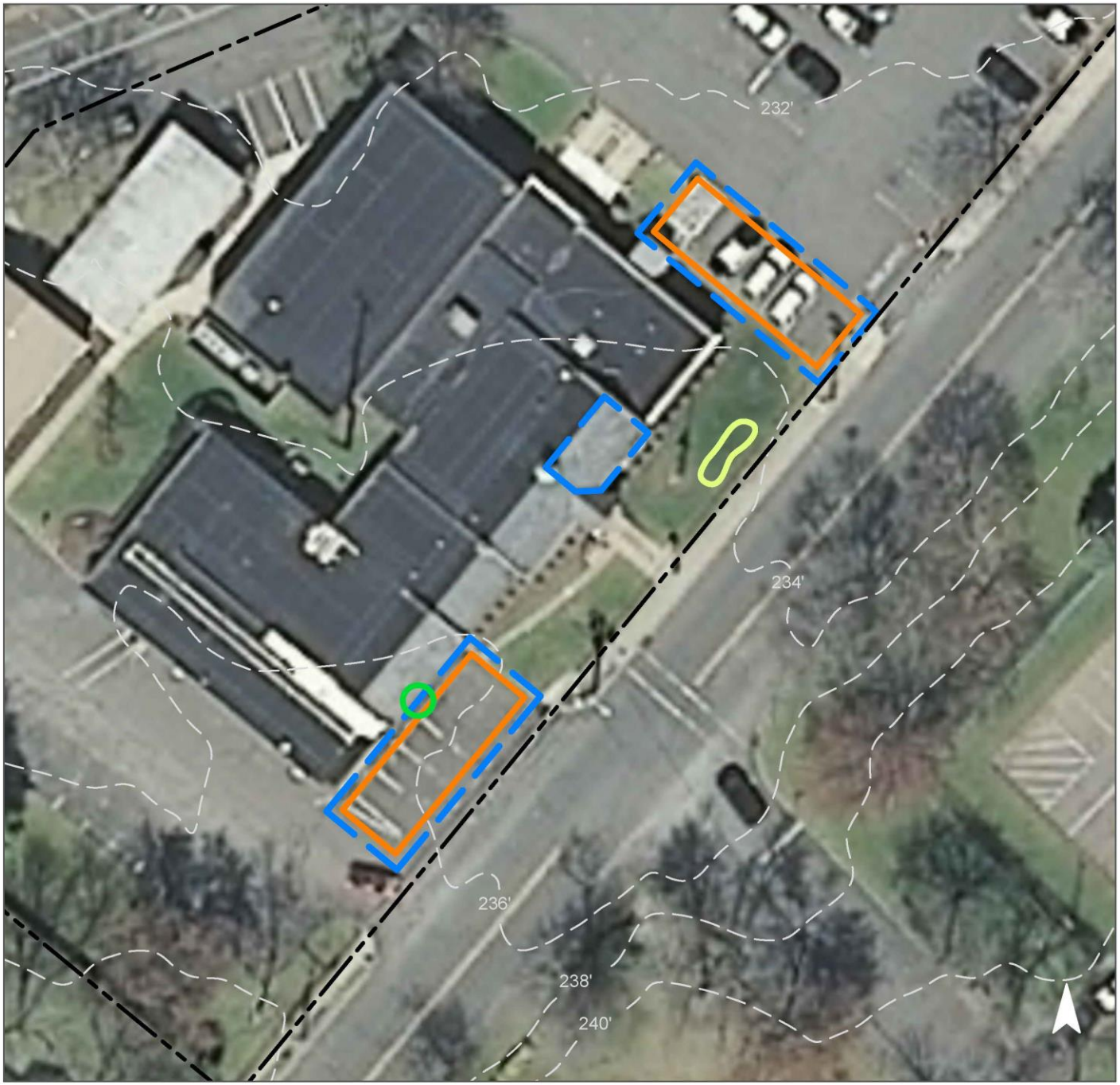
Block and Lot: Block 608, Lot 4

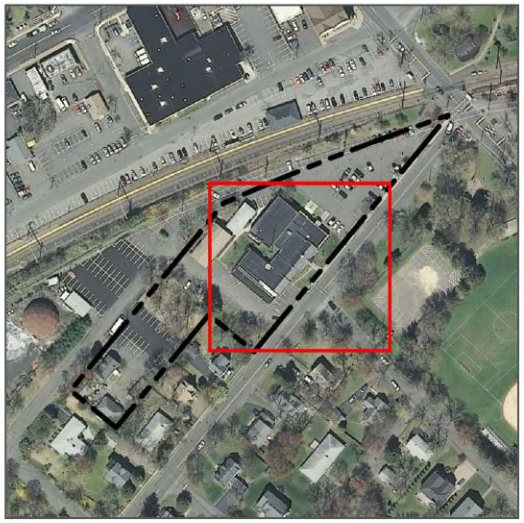
Parking spots adjacent to the building can be replaced with porous asphalt to capture and infiltrate stormwater. Also a downspout by the southern parking lot can be directed into the porous asphalt parking spaces in order to decrease stormwater runoff. A rain garden can be built to capture, treat, and infiltrate roof runoff. 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"
88	83,575	4.0	42.2	383.7	0.065	2.29

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	0.009	2	688	0.03	100	$500
Pervious pavements	0.051	9	3,852	0.14	1,950	$48,750

GREEN INFRASTRUCTURE RECOMMENDATIONS





Berkeley Heights Town Hall and Recreation

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

0 20' 40'

BERKELEY HEIGHTS VOLUNTEER RESCUE SQUAD

Subwatershed: Upper Passaic River

Site Area: 48,350 sq. ft.

Address: 378 Snyder Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 2201, Lot 16

Parking spots adjacent to the building can be replaced with porous asphalt to capture and infiltrate stormwater. Downspouts along the building can be disconnected and directed into porous asphalt parking spaces in order to decrease runoff. 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"
60	28,975	1.4	14.6	133.0	0.023	0.79

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
Pervious pavements	0.221	37	16,778	0.63	2,700	$67,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Berkeley Heights Volunteer Rescue Squad

- disconnected downspouts
- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 25' 50'

CHURCH OF THE LITTLE FLOWER

Subwatershed: Upper Passaic River

Site Area: 423,078 sq. ft.

Address: 310 Plainfield Avenue
Berkeley Heights, NJ 07922

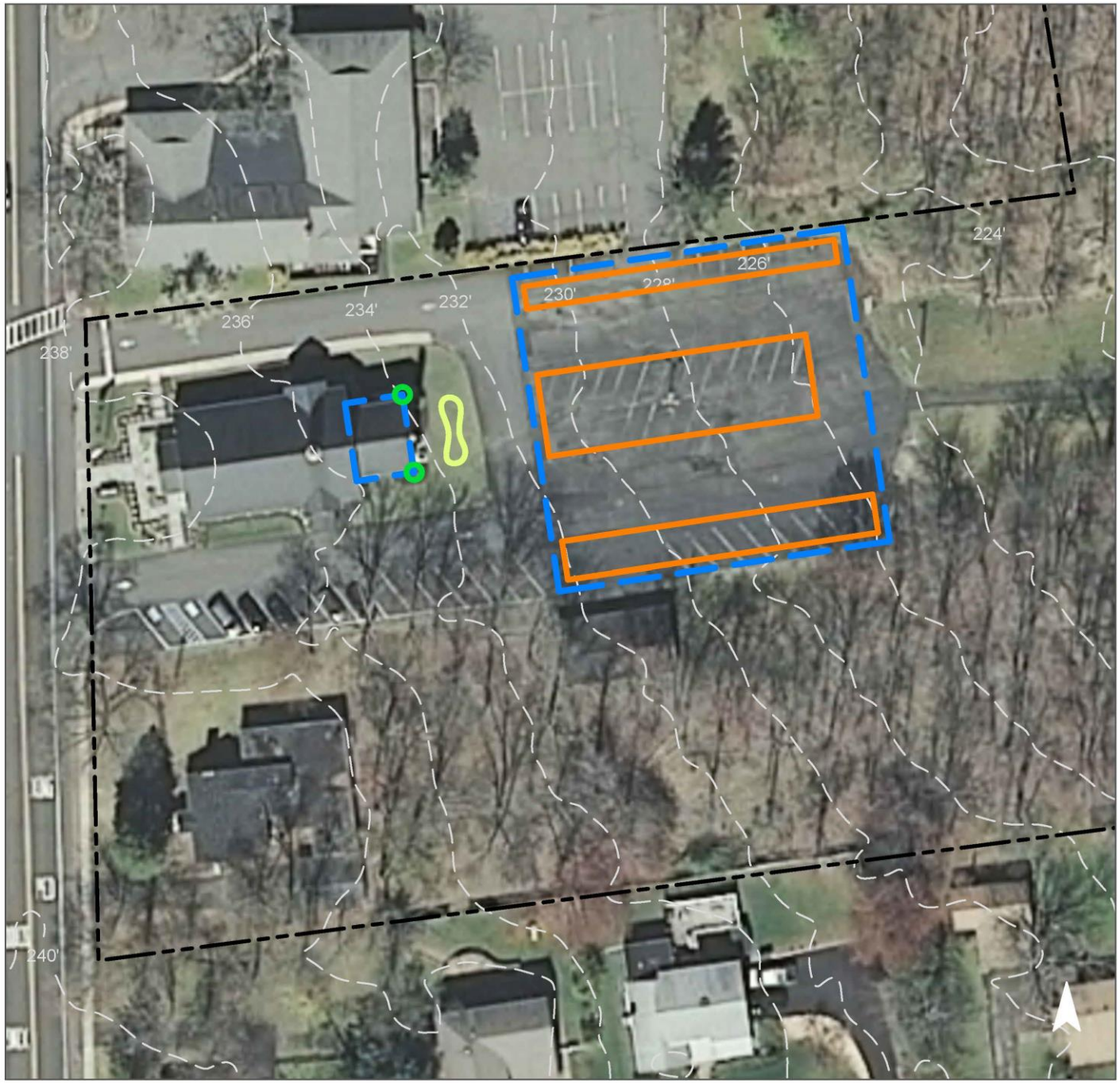
Block and Lot: Block 1301, Lot 21

Parking spots east of the building can be replaced with porous asphalt to capture and infiltrate stormwater. A rain garden can be installed adjacent to the building to capture, treat, and infiltrate roof runoff by disconnecting and redirecting two downspouts. 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"
16	66,326	3.2	33.5	304.5	0.052	1.82

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	0.018	3	1,384	0.05	150	$750
Pervious pavements	0.427	72	32,373	1.22	6,400	$160,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Church of the Little Flower

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

0 30' 60'

CHURCH OF THE LITTLE FLOWER: PARISH CENTER

Subwatershed: Upper Passaic River

Site Area: 688,837 sq. ft.

Address: 110 Roosevelt Avenue
Berkeley Heights, NJ 07922

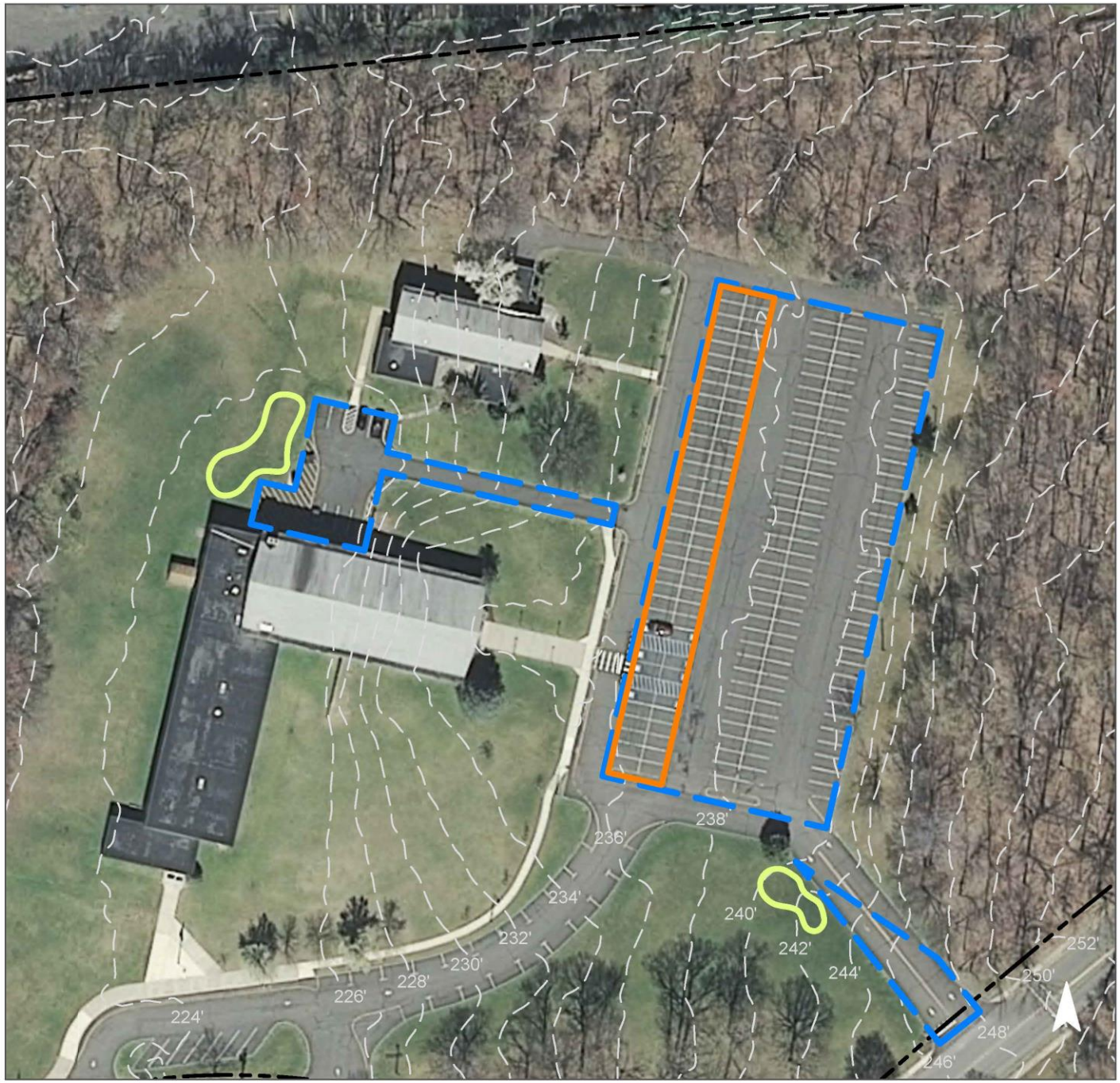
Block and Lot: Block 1301, Lot 19

A row of parking can be replaced with porous asphalt to capture and infiltrate stormwater. Installing a rain garden adjacent to the building and at the parking lot entrance can capture, treat, and infiltrate runoff. 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"
23	157,253	7.6	79.4	722.0	0.123	4.31

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	0.279	47	21,124	0.79	2,600	$13,000
Pervious pavements	1.308	219	99,095	3.72	11,800	$295,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Church of the Little Flower: Parish Center

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

0 50' 100'

COLUMBIA MIDDLE SCHOOL

Subwatershed: Upper Passaic River

Site Area: 1,117,263 sq. ft.

Address: 345 Plainfield Avenue
Berkeley Heights, NJ 07922

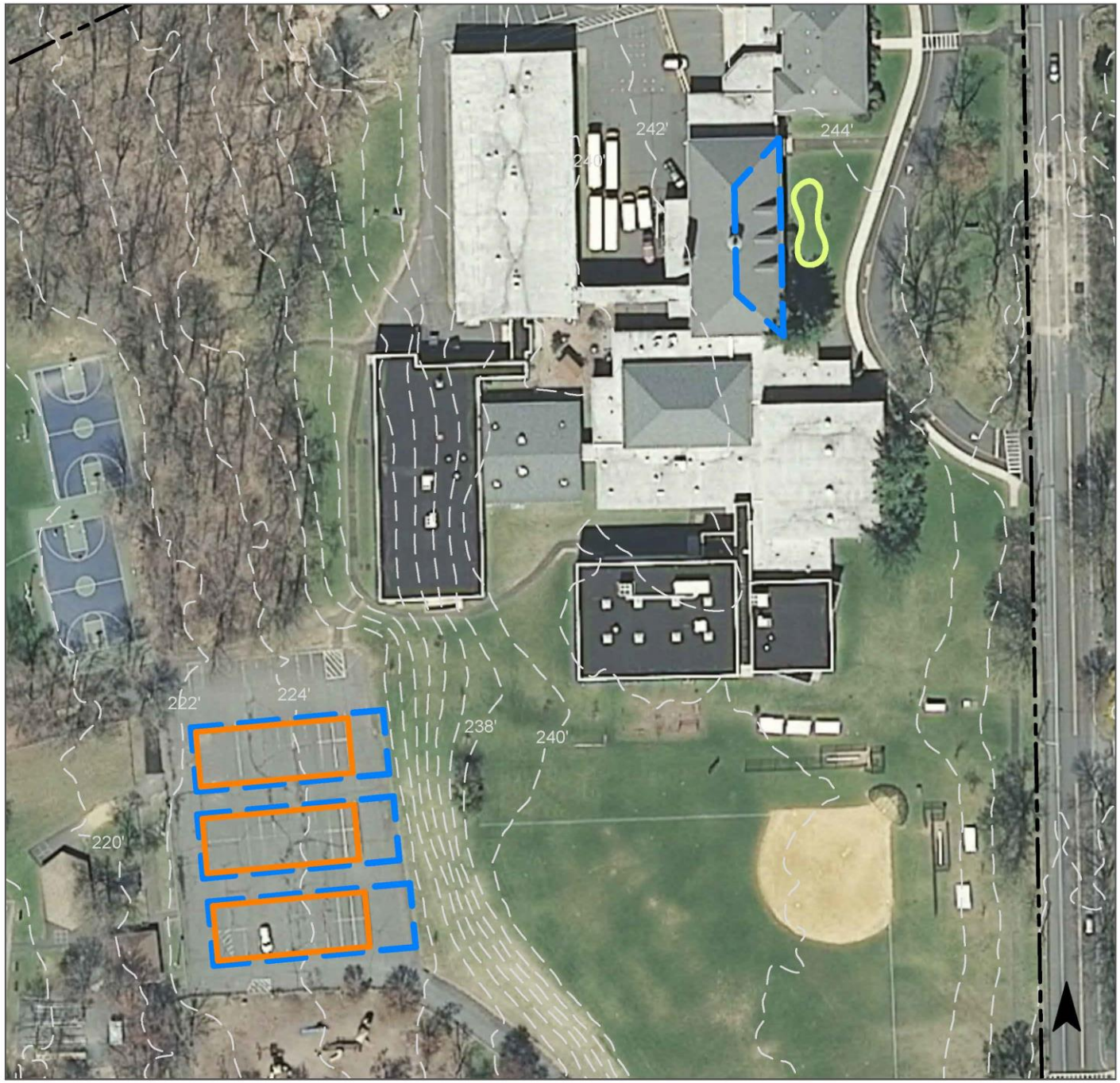
Block and Lot: Block 1204, Lot 17

Parking spots south of the school can be replaced with porous asphalt to capture and infiltrate stormwater. 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"
33	1,010,791	18.1	189.6	1,724.0	0.293	10.30

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	0.078	13	5,924	0.22	790	$3,950
Pervious pavements	0.425	71	32,179	1.21	10,800	$270,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Columbia Middle School

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

0 50' 100'

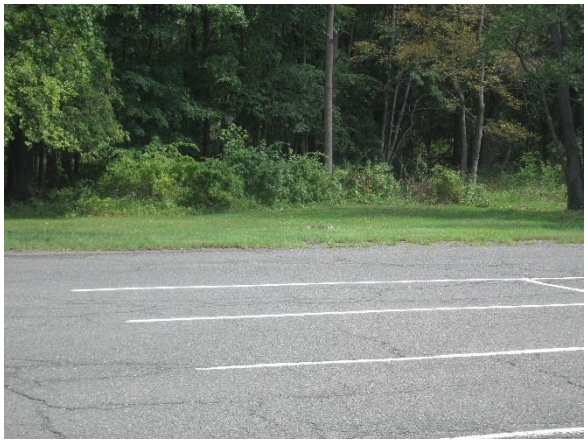
FREE PUBLIC LIBRARY

Subwatershed: Upper Passaic River

Site Area: 64,878 sq. ft.

Address: 290 Plainfield Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 1301, Lot 26

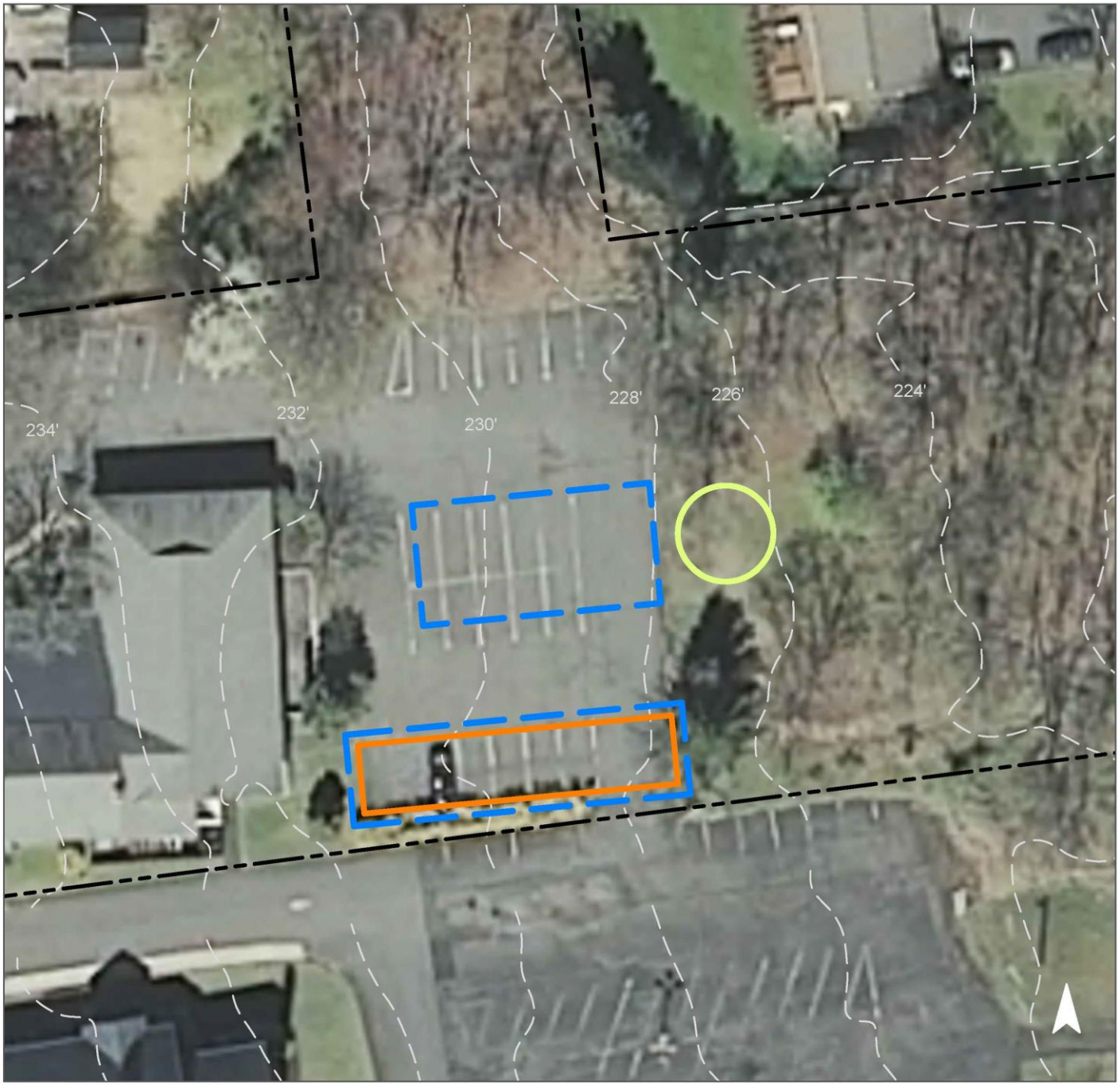


Parking spots east of the building can be replaced with porous asphalt to capture and infiltrate stormwater. A rain garden can be built adjacent to the parking lot to capture, treat, and infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining 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"
48	31,256	1.5	15.8	143.5	0.024	0.86

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	0.052	9	3,949	0.15	500	$2,500
Pervious pavements	0.055	9	4,144	0.16	1,500	$37,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Free Public Library

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

0 20' 40'

MARY KAY MCMILLIN EARLY CHILDHOOD CENTER

Subwatershed: Upper Passaic River

Site Area: 668,627 sq. ft.

Address: 651 Mountain Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 2006, Lot 26

Multiple rows of parking spaces west of the school can be replaced with porous asphalt to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable drainage characteristics 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"
20	135,914	6.6	68.6	624.0	0.106	3.73

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
Pervious pavements	0.254	43	19,246	0.72	5,900	$147,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Mary Kay McMillin Early Childhood Center

- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

MOUNTAIN PARK ELEMENTARY SCHOOL

Subwatershed: Upper Passaic River

Site Area: 479,976 sq. ft.

Address: 55 Fairfax Drive
Berkeley Heights, NJ 07922

Block and Lot: Block 1607, Lot 30

Two rows of parking spots can be replaced with porous asphalt to capture and infiltrate stormwater. Bioretention systems can be installed to capture, treat, and infiltrate runoff. 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"
28	136,232	6.6	68.8	625.5	0.106	3.74

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	0.089	15	6,710	0.25	800	$4,000
Pervious pavements	0.469	79	35,530	1.33	5,900	$147,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Mountain Park Elementary School

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

0 50' 100'

MOUNTAIN RIDGE BIBLE CHAPEL

Subwatershed: Upper Passaic River

Site Area: 8,109 sq. ft.

Address: 763 Mountain Avenue
Berkeley Heights, NJ 07922

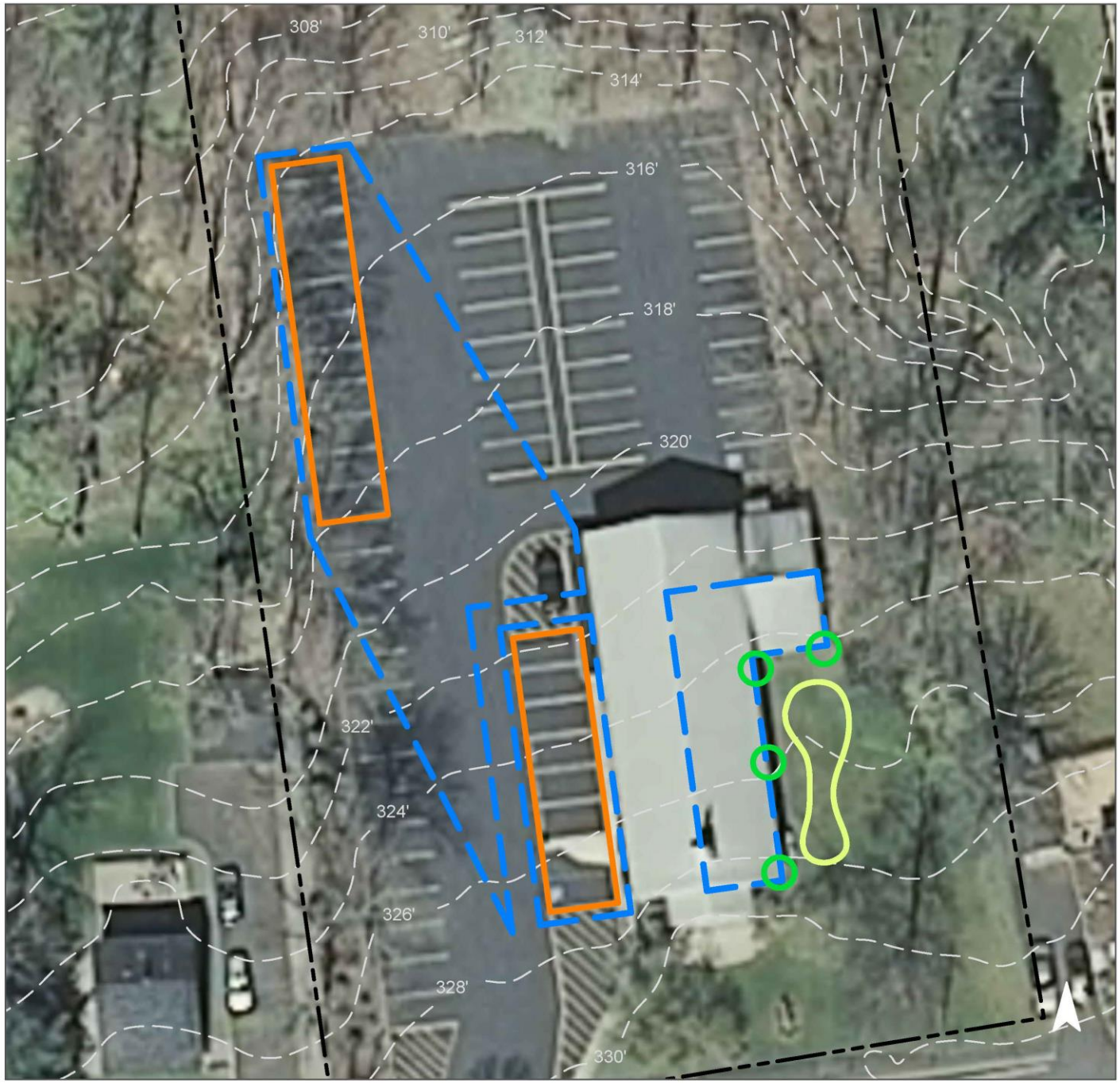
Block and Lot: Block 1715, Lot 23

Parking spots adjacent to the building and in the northwest section of the parking lot can be replaced with porous asphalt to capture and infiltrate stormwater. Downspouts on the east side of the building can be disconnected and redirected into a rain garden to capture, treat, and infiltrate roof runoff. 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"
41	33,524	1.6	16.9	153.9	0.026	0.92

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	0.051	9	3,890	0.15	500	$2,500
Pervious pavements	0.241	40	18,236	0.68	3,000	$75,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mountain Ridge Bible Chapel

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

0 20' 40'

THOMAS P. HUGHES ELEMENTARY SCHOOL

Subwatershed: Upper Passaic River

Site Area: 979,454 sq. ft.

Address: 446 Snyder Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 2201, Lot 15

Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A bioretention system can be installed adjacent to the school to capture, treat, and infiltrate rooftop runoff by disconnecting and redirecting downspouts. 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"
18	173,881	8.4	87.8	798.4	0.135	4.77

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	0.083	14	6,313	0.24	800	$4,000
Pervious pavements	0.328	55	24,871	0.93	6,700	$167,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Thomas P. Hughes Elementary School

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

0 50' 100'

VETERANS OF FOREIGN WARS

Subwatershed: Upper Passaic River

Site Area: 30,045 sq. ft.

Address: 15 Locust Avenue
Berkeley Heights, NJ 07922

Block and Lot: Block 2201, Lot 17

Parking spots south of the building can be replaced with porous asphalt to capture and infiltrate stormwater. Downspouts along the building can be disconnected and directed into porous asphalt parking spaces in order to decrease runoff. 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"
70	21,038	1.0	10.6	96.6	0.016	0.58

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
Pervious pavements	0.154	26	11,646	0.44	1,500	$37,500

GREEN INFRASTRUCTURE RECOMMENDATIONS

Veterans of Foreign Wars

- disconnected downspouts
- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 20' 40'

WILLIAM WOODRUFF ELEMENTARY SCHOOL

Subwatershed: Upper Passaic River

Site Area: 616,374 sq. ft.

Address: 55 Briarwood Drive
Berkeley Heights, NJ 07922

Block and Lot: Block 801, Lot 16

Parking spots east and west of the building as well as a basketball court can be replaced with porous asphalt to capture and infiltrate stormwater. 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"
21	127,775	6.2	64.5	586.7	0.100	3.50

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
Pervious pavements	0.771	129	58,426	2.19	14,600	$365,000

GREEN INFRASTRUCTURE RECOMMENDATIONS

William Woodruff Elementary School

- pervious pavements
- drainage areas
- property line
- 2012 Aerial: NJOIT, OGIS

0 30' 60'

d. Summary of Existing Conditions

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
GREEN BROOK SUBWATERSHED	**80.57**	**3,509,493**			**54.7**	**573.0**	**5,209.2**		**26.05**	**1,134,558**	**0.884**	**31.12**
Governor Livingston High School												
Total Site Info	37.82	1,647,312	4903	36	26.7	279.7	2,542.8	34	12.71	553,818	0.432	15.19
Summit Medical Group												
Total Site Info	42.75	1,862,181	3601	6	28.0	293.3	2,666.4	31	13.33	580,739	0.452	15.93
UPPER PASSAIC RIVER SUBWATERSHED	**309.04**	**13,461,577**			**188.0**	**1,969.7**	**17,906.7**		**89.53**	**3,900,069**	**3.039**	**106.97**
Alcatel Lucent												
Total Site Info	152.10	6,625,382	3701	1	107.6	1,127.5	10,249.7	34	51.25	2,232,381	1.739	61.23
ANCO Environmental Services Inc.												
Total Site Info	1.91	83,267	1901	36	2.4	24.9	226.3	59	1.13	49,289	0.038	1.35
Berkeley Heights Community Pool												
Total Site Info	17.00	740,588	2201	19	8.9	93.0	845.5	25	4.23	184,150	0.143	5.05
Berkeley Heights Fire Department												
Total Site Info	16.50	718,904	1815	6	3.0	31.8	289.3	9	1.45	63,000	0.049	1.73
Berkeley Heights Town Hall and Recreation												
Total Site Info	2.19	95,444	608	4	4.0	42.2	383.7	88	1.92	83,575	0.065	2.29
Berkeyley Heights Volunteer Rescue Squad												
Total Site Info	1.11	48,350	2201	16	1.4	14.6	133.0	60	0.67	28,975	0.023	0.79
Church of the Little Flower												
Total Site Info	9.71	423,078	1301	21	3.2	33.5	304.5	16	1.52	66,326	0.052	1.82
Church of the Little Flower: Parish Center												
Total Site Info	15.81	688,837	1301	19	7.6	79.4	722.0	23	3.61	157,253	0.123	4.31
Columbia Middle School												
Total Site Info	25.65	1,117,263	1204	17	18.1	189.6	1,724.0	34	8.62	375,498	0.293	10.30

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads TP (lb/yr)	Existing Annual Loads TN (lb/yr)	Existing Annual Loads TSS (lb/yr)	I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C. Water Quality Storm (1.25" over 2-hours) (Mgal)	Runoff Volumes from I.C. Annual (Mgal)
Free Public Library												
Total Site Info	1.49	64,878	1301	26	1.5	15.8	143.5	48	0.72	31,256	0.024	0.86
Mary Kay McMillin Early Childhood Center												
Total Site Info	15.35	668,627	2006	26	6.6	68.6	624.0	20	3.12	135,914	0.106	3.73
Mountain Park Elementary School												
Total Site Info	11.02	479,976	1607	30	6.6	68.8	625.5	28	3.13	136,232	0.106	3.74
Mountain Ridge Bible Chapel												
Total Site Info	1.86	81,109	1715	23	1.6	16.9	153.9	41	0.77	33,524	0.026	0.92
Thomas P. Huges Elementary School												
Total Site Info	22.49	979,454	2201	15	8.4	87.8	798.4	18	3.99	173,881	0.135	4.77
Veterans of Foreign Wars												
Total Site Info	0.69	30,045	2201	17	1.0	10.6	96.6	70	0.48	21,038	0.016	0.58
William Woodruff Elementary School												
Total Site Info	14.15	616,374	801	16	6.2	64.5	586.7	21	2.93	127,775	0.100	3.50

e. Summary of Proposed Green Infrastructure Practices

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
	GREEN BROOK SUBWATERSHED	**85,050**	**1.97**	**2.232**	**374**	**167,881**	**6.30**	**14,050**			**$470,750**	**7.5%**
1	**Governor Livingston High School**											
	Bioretention systems/rain gardens	3,400	0.08	0.089	15	6,710	0.25	850	5	SF	$4,250	0.6%
	Pervious pavements	65,000	1.51	1.709	286	128,304	4.82	8,700	25	SF	$217,500	11.7%
	Total Site Info	**68,400**	**1.58**	**1.798**	**301**	**135,014**	**5.07**	**9,550**			**$221,750**	**12.4%**
2	**Summit Medical Group**											
	Bioretention systems/rain gardens	3,150	0.07	0.082	14	6,216	0.23	800	5	SF	$4,000	0.5%
	Pervious pavements	13,500	0.31	0.352	59	26,651	1.00	3,700	25	SF	$92,500	2.3%
	Total Site Info	**16,650**	**0.38**	**0.434**	**73**	**32,867**	**1.23**	**4,500**			**$96,500**	**2.9%**
	UPPER PASSAIC RIVER SUBWATERSHED	**282,520**	**6.49**	**7.361**	**1,232**	**557,679**	**20.94**	**103,040**			**$2,247,700**	**7.2%**
3	**Alcatel Lucent**											
	Bioretention systems/rain gardens	9,000	0.21	0.234	39	17,765	0.67	2,300	5	SF	$11,500	0.4%
	Pervious pavements	37,100	0.85	0.967	162	73,237	2.75	9,500	25	SF	$237,500	1.7%
	Total Site Info	**46,100**	**1.06**	**1.201**	**201**	**91,002**	**3.42**	**11,800**			**$249,000**	**2.1%**
4	**ANCO Environmental Services Inc.**											
	Pervious pavements	13,200	0.30	0.344	58	26,053	0.98	6,000	25	SF	$150,000	26.8%
	Total Site Info	**13,200**	**0.30**	**0.344**	**58**	**26,053**	**0.98**	**6,000**			**$150,000**	**26.8%**
5	**Berkeley Heights Community Pool**											
	Pervious pavements	16,400	0.38	0.427	72	32,373	1.22	6,000	25	SF	$150,000	8.9%
	Total Site Info	**16,400**	**0.38**	**0.427**	**72**	**32,373**	**1.22**	**6,000**			**$150,000**	**8.9%**
6	**Berkeley Heights Fire Department**											
	Bioretention systems/rain gardens	960	0.02	0.025	4	1,892	0.07	250	5	SF	$1,250	1.5%
	Total Site Info	**960**	**0.02**	**0.025**	**4**	**1,892**	**0.07**	**250**			**$1,250**	**1.5%**
7	**Berkeley Heights Town Hall and Recreation**											
	Bioretention systems/rain gardens	350	0.01	0.009	2	688	0.03	100	5	SF	$500	0.4%
	Pervious pavements	1,950	0.04	0.051	9	3,852	0.14	1,950	25	SF	$48,750	2.3%
	Total Site Info	**2,300**	**0.05**	**0.060**	**10**	**4,540**	**0.17**	**2,050**			**$49,250**	**2.8%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area Area (SF)	Potential Management Area Area (ac)	Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
8	**Berkeyley Heights Volunteer Rescue Squad**											
	Pervious pavements	8,500	0.20	0.221	37	16,778	0.63	2,700	25	SF	$67,500	29.3%
	Total Site Info	**8,500**	**0.20**	**0.221**	**37**	**16,778**	**0.63**	**2,700**			**$67,500**	**29.3%**
9	**Church of the Little Flower**											
	Bioretention systems/rain gardens	700	0.02	0.018	3	1,384	0.05	150	5	SF	$750	1.1%
	Pervious pavements	16,400	0.38	0.427	72	32,373	1.22	6,400	25	SF	$160,000	24.7%
	Total Site Info	**17,100**	**0.39**	**0.446**	**75**	**33,757**	**1.27**	**6,550**			**$160,750**	**25.8%**
10	**Church of the Little Flower: Parish Center**											
	Bioretention systems/rain gardens	10,700	0.25	0.279	47	21,124	0.79	2,600	5	SF	$13,000	6.8%
	Pervious pavements	50,200	1.15	1.308	219	99,095	3.72	11,800	25	SF	$295,000	31.9%
	Total Site Info	**60,900**	**1.40**	**1.587**	**266**	**120,219**	**4.51**	**14,400**			**$308,000**	**38.7%**
11	**Columbia Middle School**											
	Bioretention systems/rain gardens	3,000	0.07	0.078	13	5,924	0.22	790	5	SF	$3,950	0.8%
	Pervious pavements	16,300	0.37	0.425	71	32,179	1.21	10,800	25	SF	$270,000	4.3%
	Total Site Info	**19,300**	**0.44**	**0.503**	**84**	**38,103**	**1.43**	**11,590**			**$273,950**	**5.1%**
12	**Free Public Library**											
	Bioretention systems/rain gardens	2,000	0.05	0.052	9	3,949	0.15	500	5	SF	$2,500	6.4%
	Pervious pavements	2,100	0.05	0.055	9	4,144	0.16	1,500	25	SF	$37,500	6.7%
	Total Site Info	**4,100**	**0.09**	**0.107**	**18**	**8,093**	**0.31**	**2,000**	**30**	**0**	**$40,000**	**13.1%**
13	**Mary Kay McMillin Early Childhood Center**											
	Pervious pavements	9,750	0.22	0.254	43	19,246	0.72	5,900	25	SF	$147,500	7.2%
	Total Site Info	**9,750**	**0.22**	**0.254**	**43**	**19,246**	**0.72**	**5,900**			**$147,500**	**7.2%**
14	**Mountain Park Elementary School**											
	Bioretention systems/rain gardens	3,400	0.08	0.089	15	6,710	0.25	800	5	SF	$4,000	2.5%
	Pervious pavements	18,000	0.41	0.469	79	35,530	1.33	5,900	25	SF	$147,500	13.2%
	Total Site Info	**21,400**	**0.49**	**0.558**	**93**	**42,240**	**1.58**	**6,700**			**$151,500**	**15.7%**
15	**Mountain Ridge Bible Chapel**											
	Bioretention systems/rain gardens	1,970	0.05	0.051	9	3,890	0.15	500	5	SF	$2,500	5.9%
	Pervious pavements	9,240	0.21	0.241	40	18,236	0.68	3,000	25	SF	$75,000	27.6%
	Total Site Info	**11,210**	**0.26**	**0.292**	**49**	**22,126**	**0.83**	**3,500**			**$77,500**	**33.4%**

Summary of Proposed Green Infrastructure Practices

	Subwatershed/Site Name/Total Site Info/GI Practice	Potential Management Area		Recharge Potential (Mgal/yr)	TSS Removal Potential (lbs/yr)	Max Volume Reduction Potential (gal/storm)	Peak Discharge Reduction Potential (cfs)	Size of BMP (SF)	Unit Cost ($)	Unit	Total Cost ($)	I.C. Treated %
		Area (SF)	Area (ac)									
16	**Thomas P. Huges Elementary School**											
	Bioretention systems/rain gardens	3,200	0.07	0.083	14	6,313	0.24	800	5	SF	$4,000	1.8%
	Pervious pavements	12,600	0.29	0.328	55	24,871	0.93	6,700	25	SF	$167,500	7.2%
	Total Site Info	**15,800**	**0.36**	**0.412**	**69**	**31,184**	**1.17**	**7,500**			**$171,500**	**9.1%**
17	**Veterans of Foreign Wars**											
	Pervious pavements	5,900	0.14	0.154	26	11,646	0.44	1,500	25	SF	$37,500	28.0%
	Total Site Info	**5,900**	**0.14**	**0.154**	**26**	**11,646**	**0.44**	**1,500**			**$37,500**	**28.0%**
18	**William Woodruff Elementary School**											
	Pervious pavements	29,600	0.68	0.771	129	58,426	2.19	14,600	25	SF	$365,000	23.2%
	Total Site Info	**29,600**	**0.68**	**0.771**	**129**	**58,426**	**2.19**	**14,600**			**$365,000**	**23.2%**