



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



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Introduction

Located in Somerset County in central New Jersey, Hillsborough Township is approximately 55 square miles in size. Figures 1 and 2 illustrate that Hillsborough Township is dominated by urban land use. A total of 34.5% of the municipality's land use is classified as urban. Of the urban land use in Hillsborough Township, rural residential is the dominant land use (Figure 3).

The New Jersey Department of Environmental Protection (NJDEP) 2007 land use/land cover geographical information system (GIS) data layer categorizes Hillsborough 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 Hillsborough Township. Based upon the NJDEP 2007 land use/land cover data, approximately 8.0% of Hillsborough Township has impervious cover. This level of impervious cover suggests that the streams in Hillsborough Township are likely sensitive streams.¹

Methodology

Hillsborough Township contains portions of eight 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

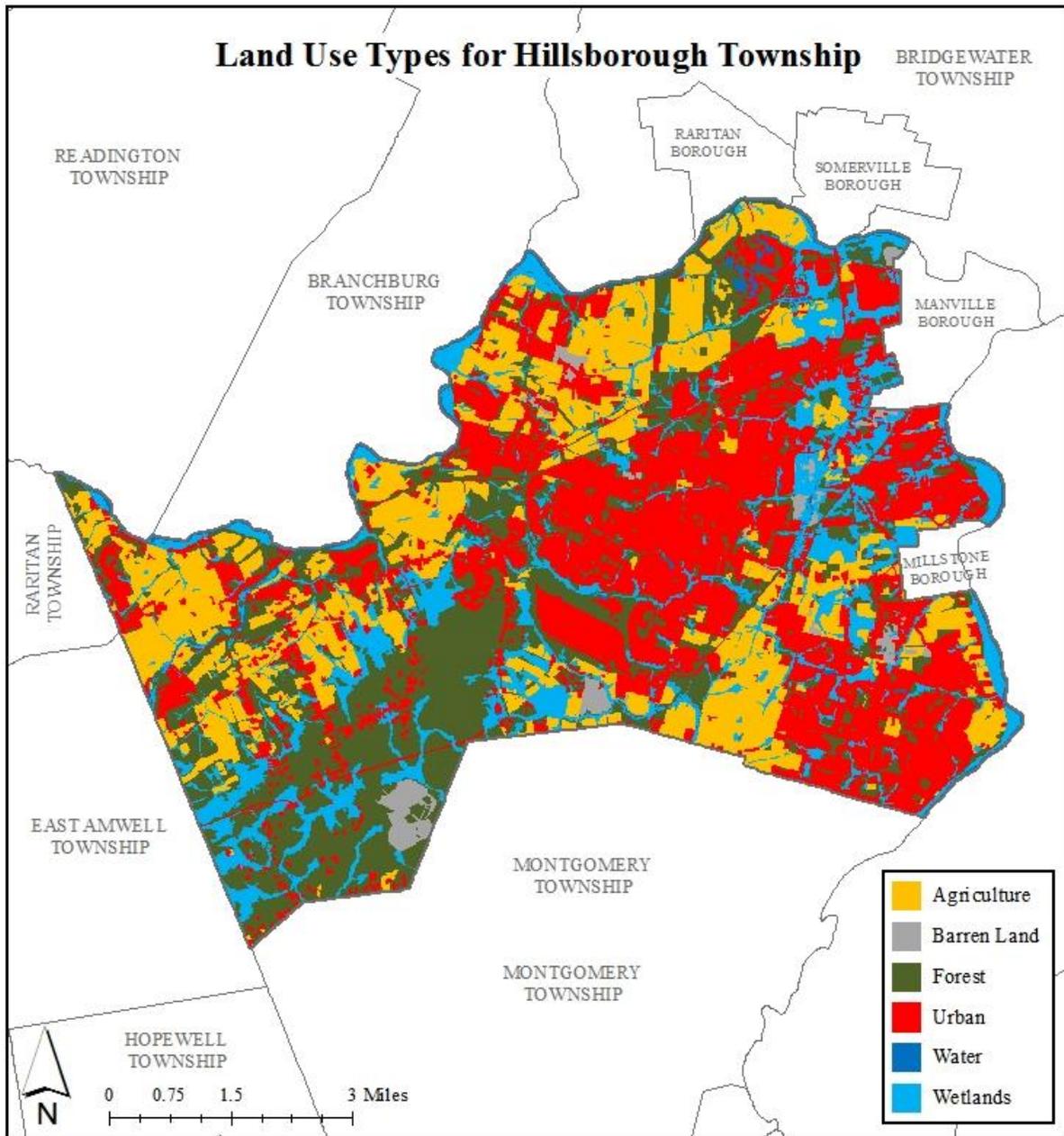


Figure 1: Map illustrating the land use in Hillsborough Township

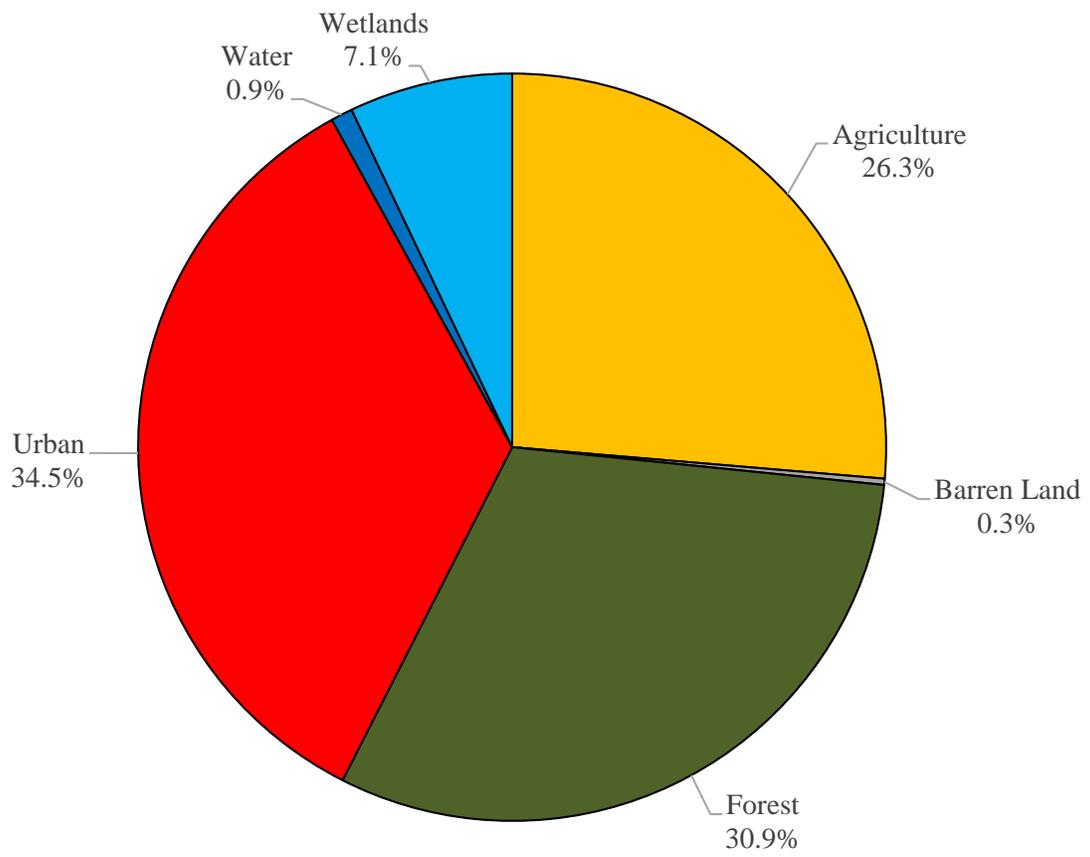


Figure 2: Pie chart illustrating the land use in Hillsborough Township

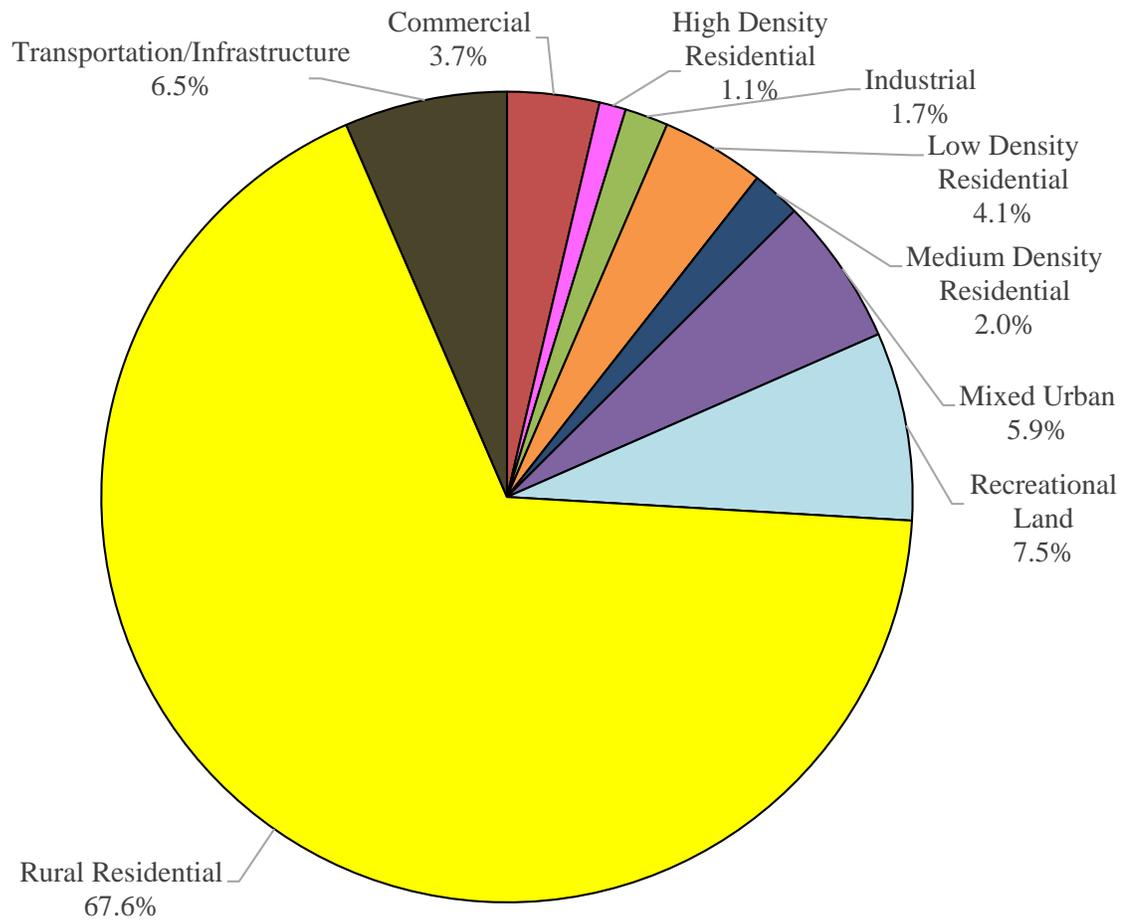


Figure 3: Pie chart illustrating the various types of urban land use in Hillsborough Township

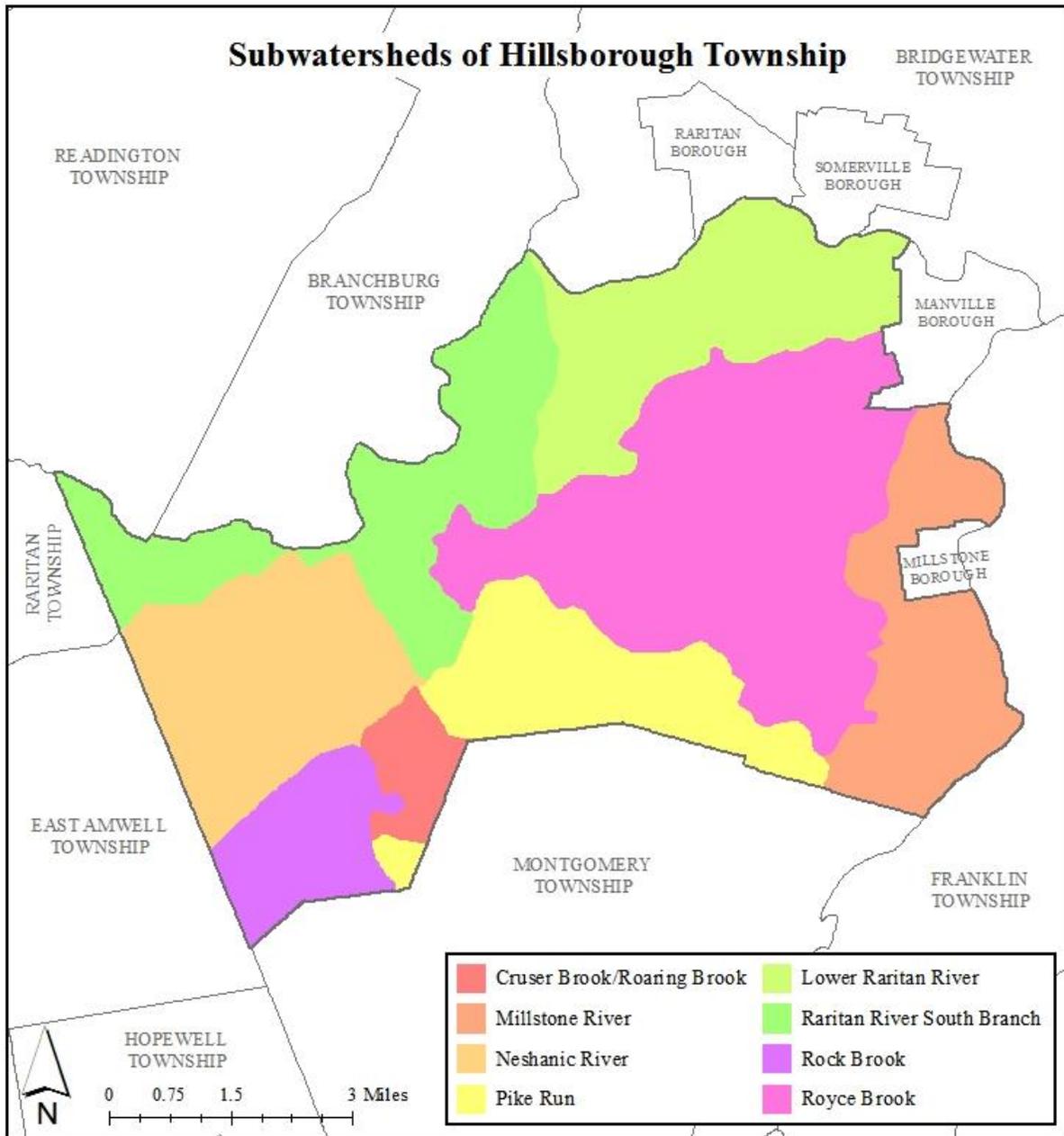


Figure 4: Map of the subwatersheds in Hillsborough Township

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 Hillsborough 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 Coefficients²

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 benefits³. A wide range of green infrastructure practices have been evaluated for the potential project sites in Hillsborough Township. Each practice is discussed below.

Disconnected downspouts

This is often referred to as simple disconnection. A downspout is simply disconnected, 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.*

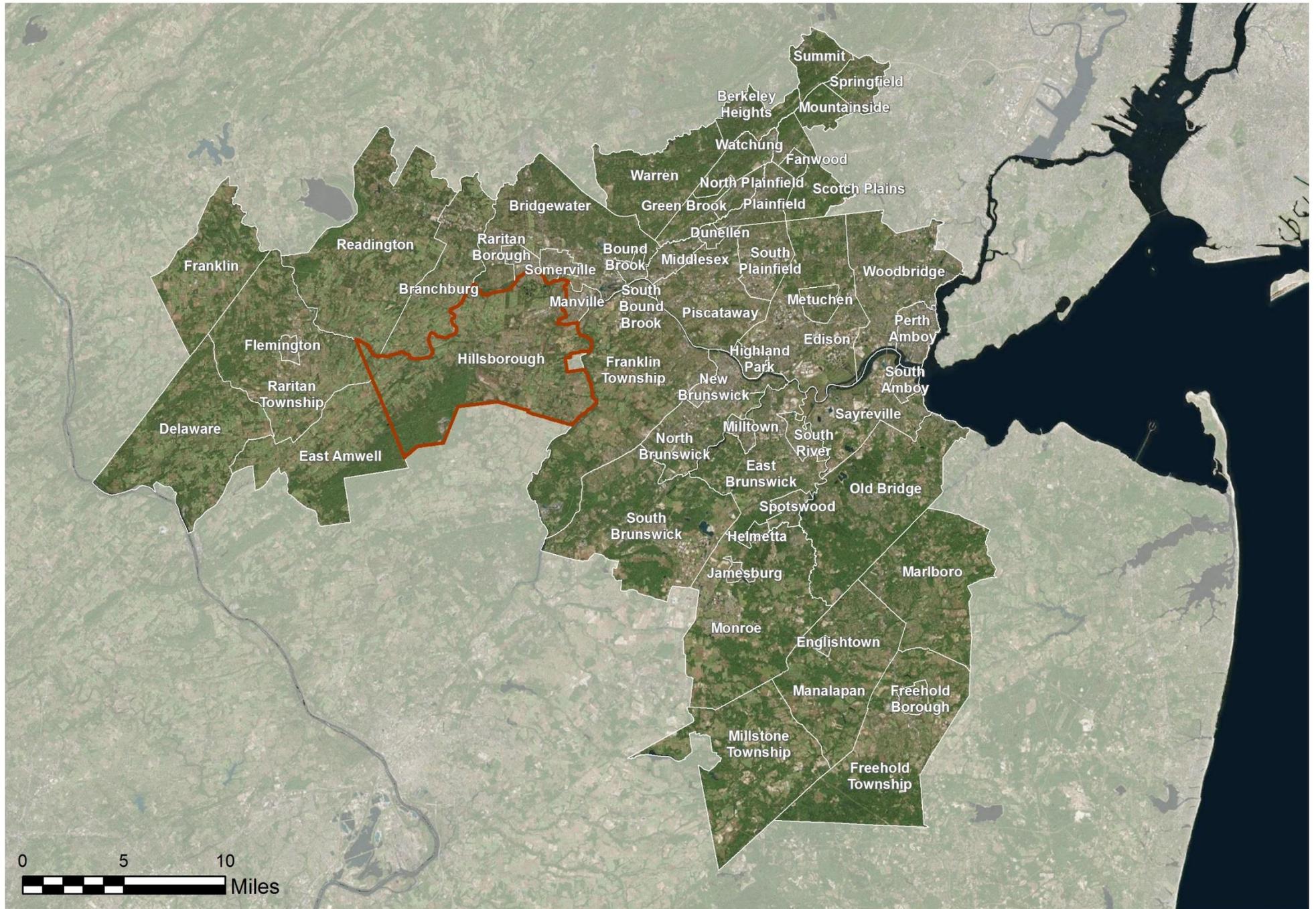
Conclusion

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.

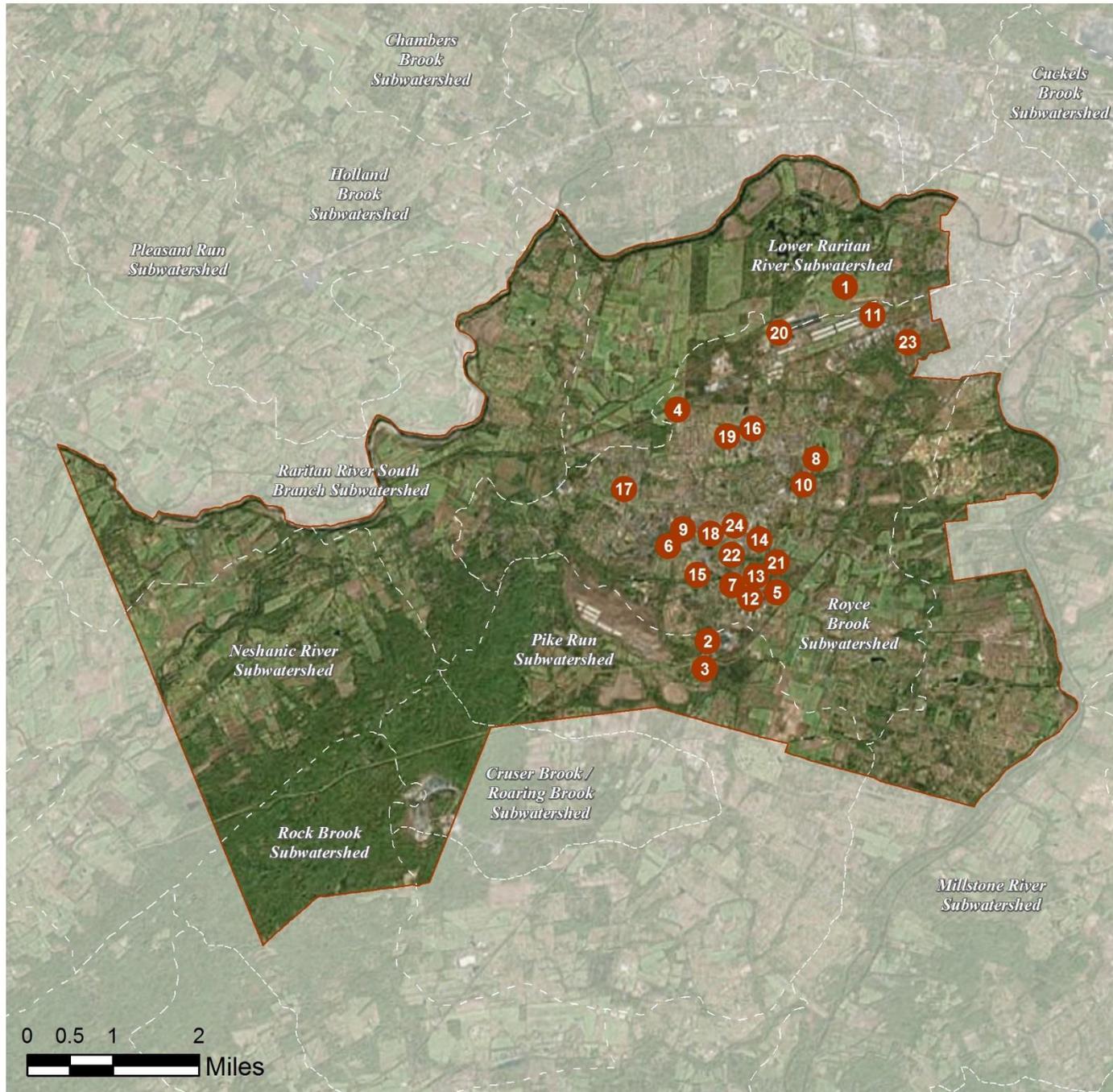
a. Overview Map of the Project

HILLSBOROUGH TOWNSHIP: CLIMATE RESILIENT GREEN INFRASTRUCTURE FOR THE RARITAN BASIN



b. Green Infrastructure Sites

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

c. Proposed Green Infrastructure Concepts

DUKE FARMS: COTTAGES



Subwatershed: Royce Brook

Site Area: 12,771,159 sq. ft.

Address: 1112 Dukes Parkway West
Hillsborough, NJ 08844

Block and Lot: Block 142, Lot 9



Rain gardens around the cottages can capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that the soils have suitable 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"
1	133,809	6.5	67.6	614.4	0.104	3.67

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	0.038	6	2,805	0.11	3,500	\$17,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Duke Farms: Cottages

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



HILLSBOROUGH STAR DINER



Subwatershed: Pike Run

Site Area: 64,863 sq. ft.

Address: 842 US Highway 206
Hillsborough, NJ 08844

Block and Lot: Block 177, Lot 22.01

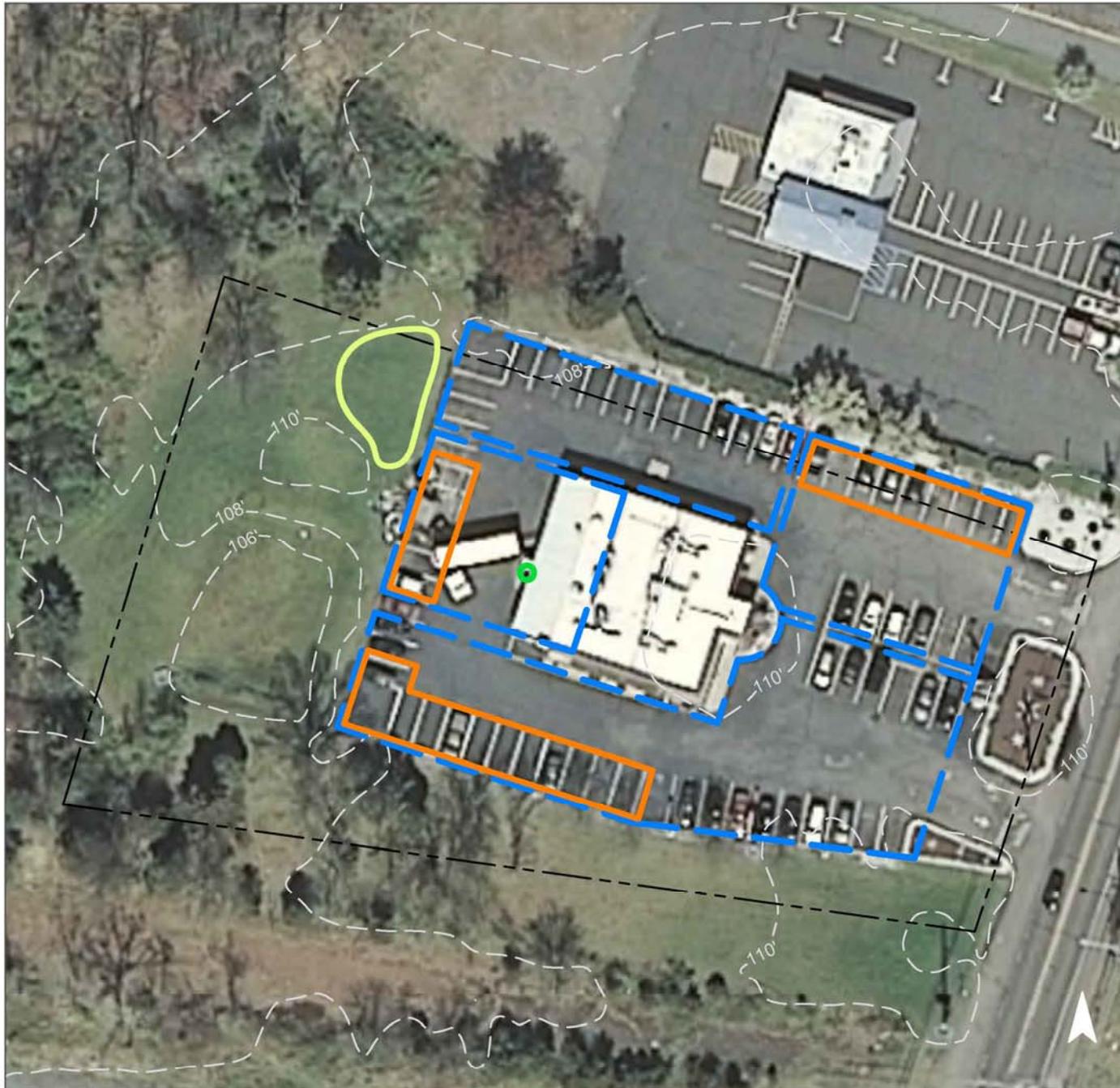


A rain garden behind the diner can capture, treat, and infiltrate runoff from the parking lot. Parking spaces can be converted into pervious pavement to infiltrate additional stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability 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"
55	35,811	1.7	18.1	164.4	0.028	0.98

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	0.143	24	10,547	0.40	1,420	\$7,100
Pervious pavements	0.640	107	47,386	1.78	5,115	\$127,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough Star Diner

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



MOUNTAIN VIEW PLAZA



Subwatershed: Pike Run

Site Area: 503,957 sq. ft.

Address: 856 US Highway 206
Hillsborough, NJ 08844

Block and Lot: Block 177, Lot 24.02

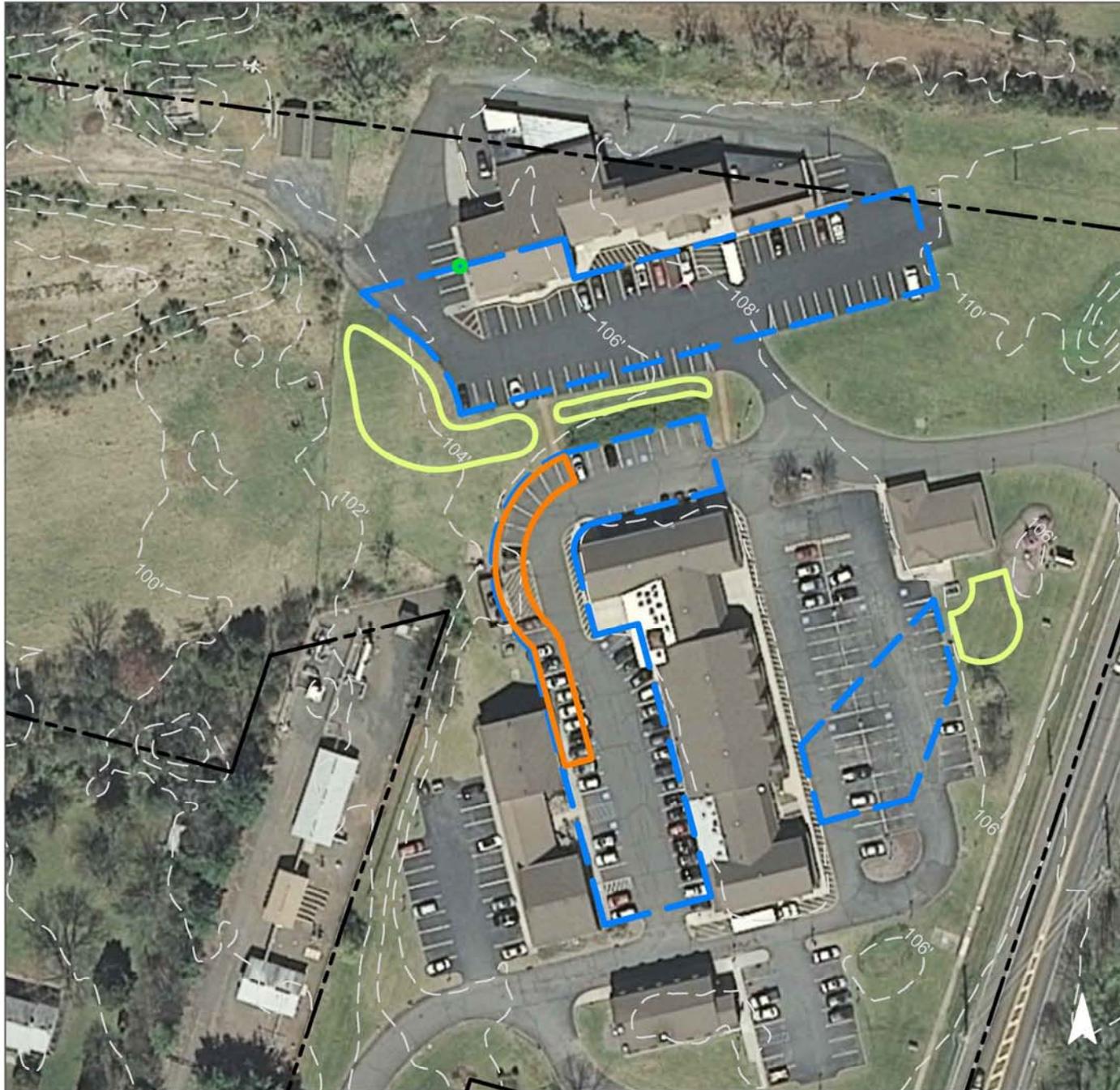


Several rain gardens can capture, treat, and infiltrate stormwater. Pervious pavement can infiltrate additional runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
38	190,333	9.2	96.1	873.9	0.148	5.22

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	0.845	141	62,570	2.35	8,065	\$40,325
Pervious pavements	0.605	101	44,805	1.68	3,860	\$96,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mountain View Plaza

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



AUTEN ROAD SCHOOL



Subwatershed: Royce Brook

Site Area: 2,128,895 sq. ft.

Address: 281 Auten Road
Hillsborough, NJ 08844

Block and Lot: Block 150, Lot 10

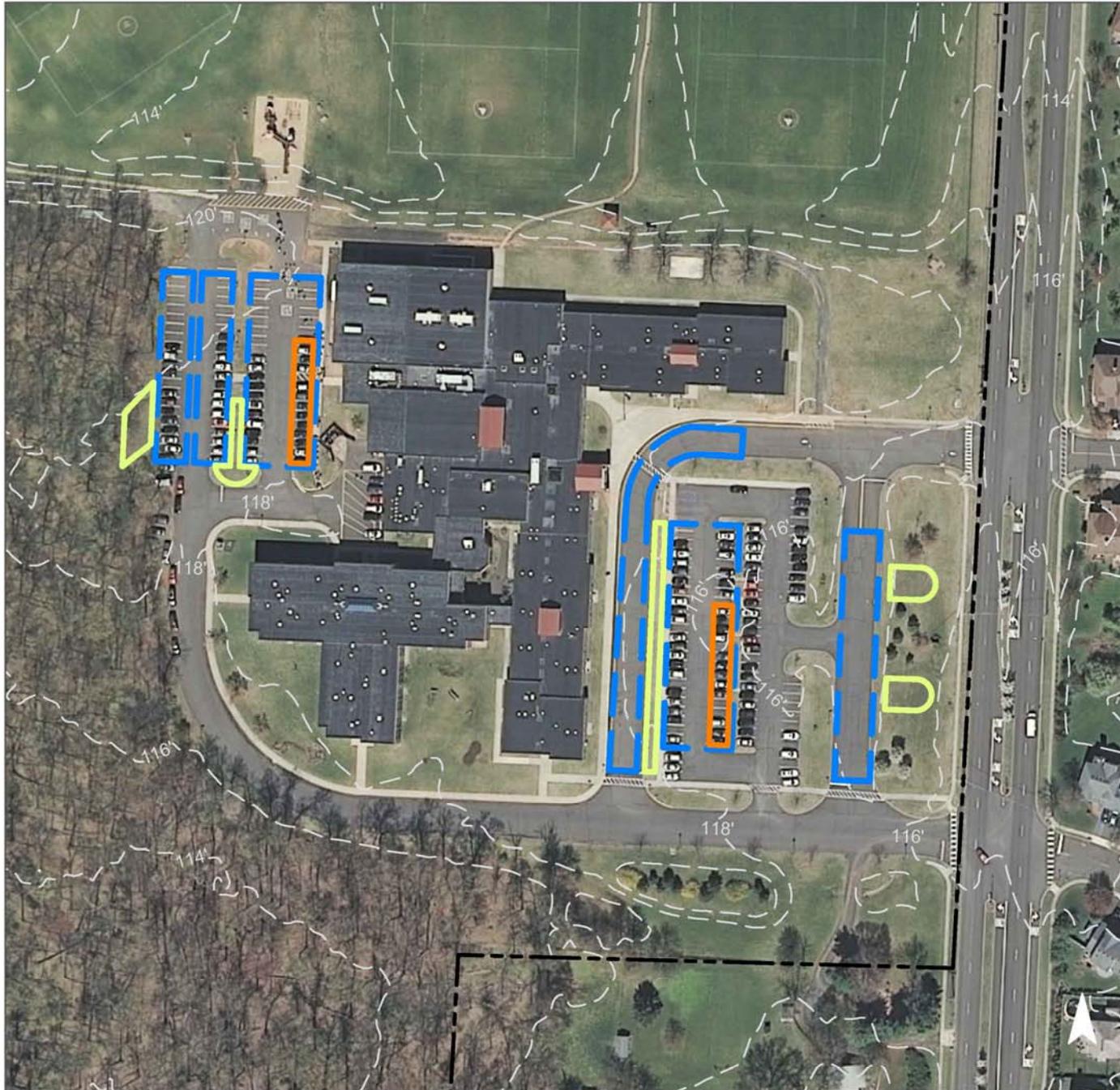


Runoff from the parking lot can be managed with several rain gardens. Additional stormwater can be infiltrated with pervious pavement. A preliminary soil assessment suggests that the soils have suitable characteristics for green infrastructure.

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"
14	295,524	14.2	149.3	1,356.9	0.230	8.11

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	0.751	126	55,576	2.09	7,500	\$37,500
Pervious pavements	0.701	117	51,911	1.95	4,615	\$115,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



Auten Road School

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



BORO KID ZONE



Subwatershed: Royce Brook
Site Area: 88,617 sq. ft.
Address: 126 Stryker Lane
Hillsborough, NJ 08844
Block and Lot: Block 200.05, Lot 6

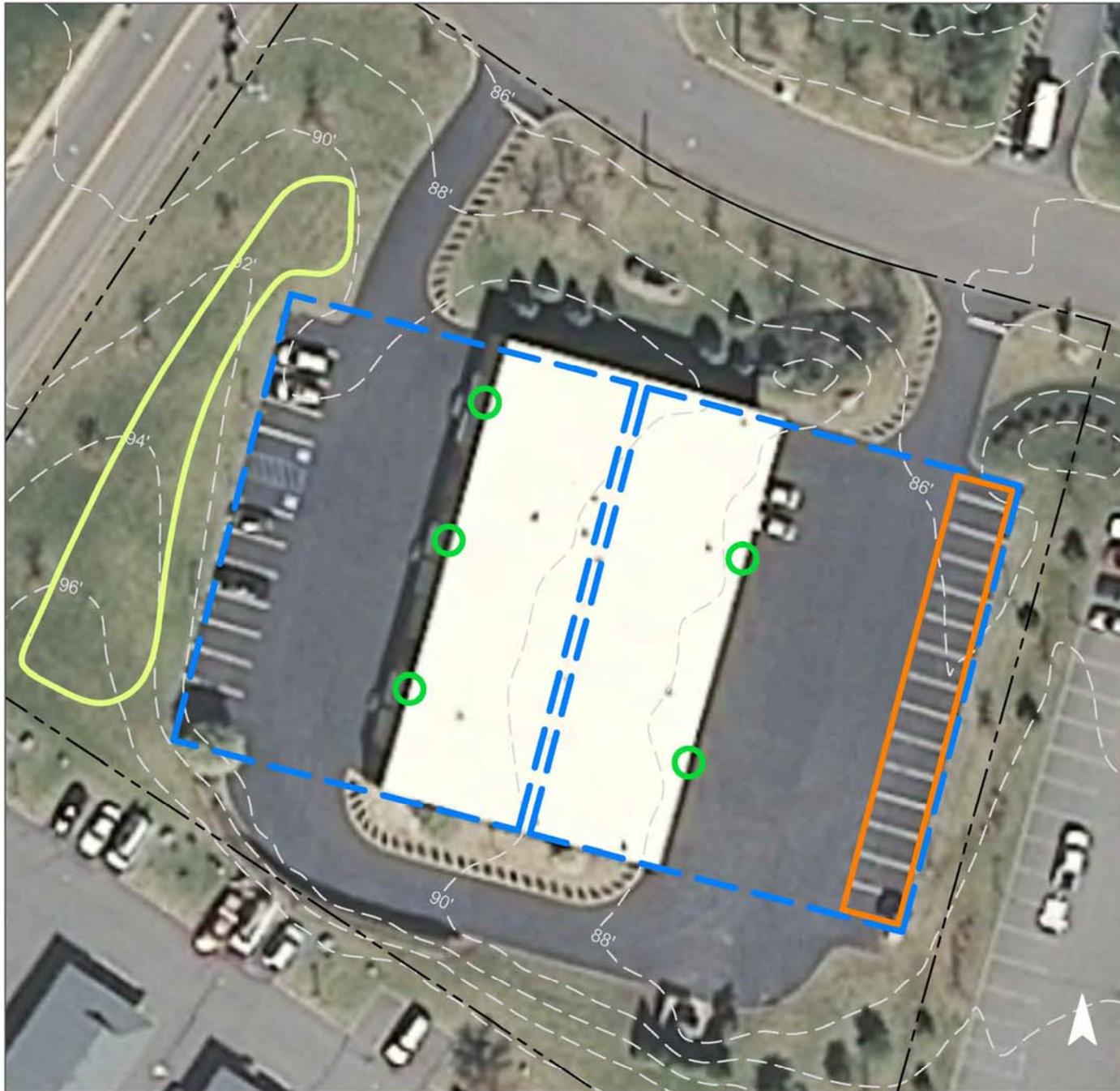


A rain garden and row of pervious pavement could infiltrate roof and parking lot runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
64	56,801	2.7	28.7	260.8	0.044	1.56

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	0.447	75	33,062	1.24	4,600	\$23,000
Pervious pavements	0.483	81	35,754	1.34	2,680	\$67,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Boro Kid Zone

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



CLAREMONT TOWERS



Subwatershed: Royce Brook
Site Area: 206,854 sq. ft.
Address: 779 Eves Drive
Hillsborough, NJ 08844
Block and Lot: Block 163.05, Lot 1.02



Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. Installing a rain garden at the north entrance can capture, treat, 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"
75	154,795	7.5	78.2	710.7	0.121	4.25

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	0.037	6	2,768	0.10	350	\$1,750
Pervious pavements	1.108	185	82,018	3.08	6,700	\$167,500

CORPORATE BUILDING



Subwatershed: Royce Brook
Site Area: 439,945 sq. ft.
Address: Raider Boulevard
Hillsborough, NJ 08844
Block and Lot: Block 200.02, Lot 1

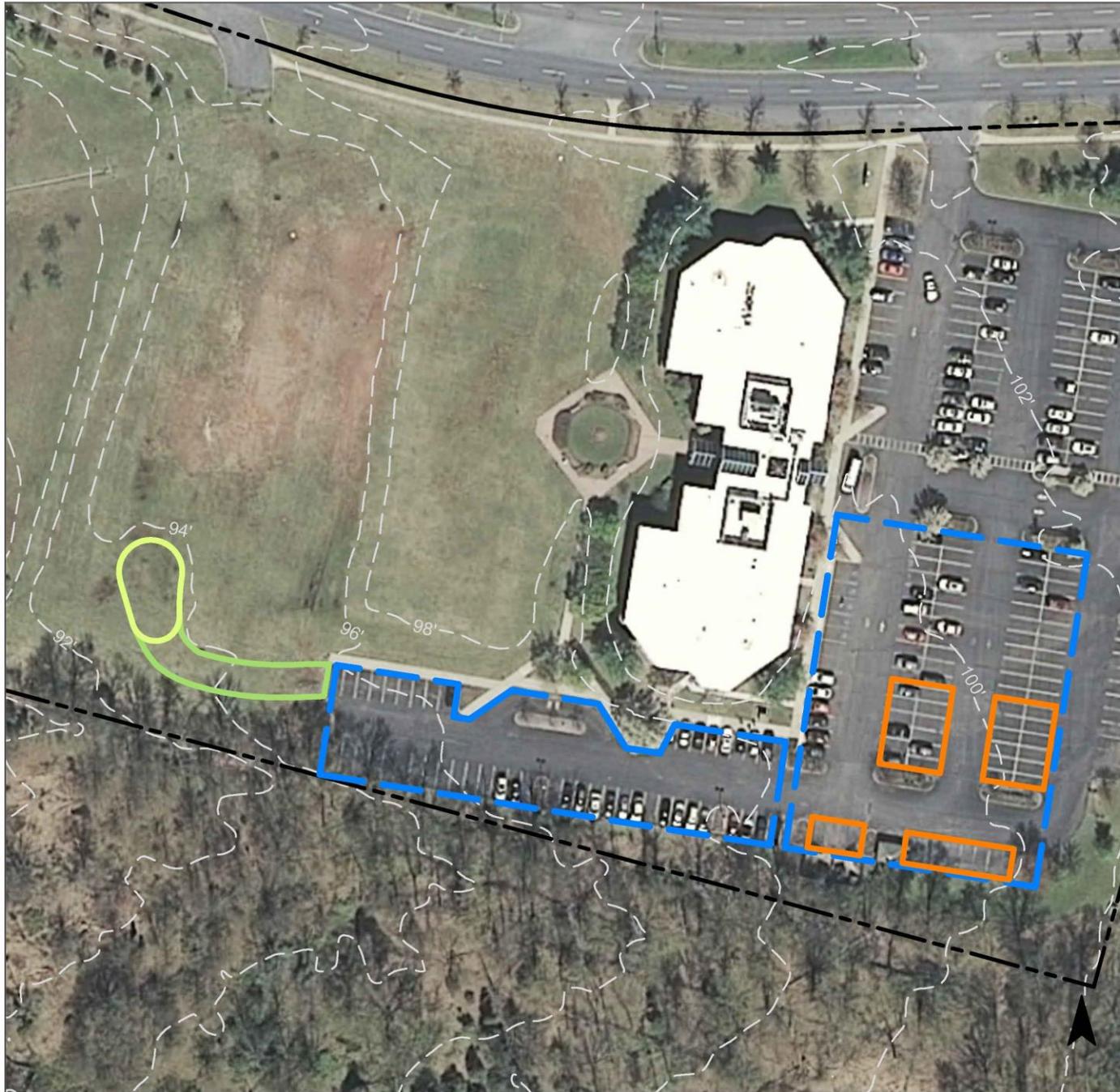


A bioswale and rain garden can capture, treat, and infiltrate parking lot runoff. Parking spaces can be replaced with pervious pavement to capture and infiltrate additional stormwater. A preliminary soil assessment suggests that the soils have suitable characteristics for green infrastructure.

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"
38	168,631	8.1	85.2	774.2	0.131	4.62

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	17,324	0.65	2,090	\$10,450
Bioswales	0.275	46	20,338	0.76	2,510	\$12,550
Pervious pavements	0.926	155	68,592	2.58	6,475	\$161,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Corporate Building

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



DOCTORS WAY OFFICE



Subwatershed: Royce Brook

Site Area: 86,343 sq. ft.

Address: 349 US Highway 206
Hillsborough, NJ 08844

Block and Lot: Block 182, Lot 38.01

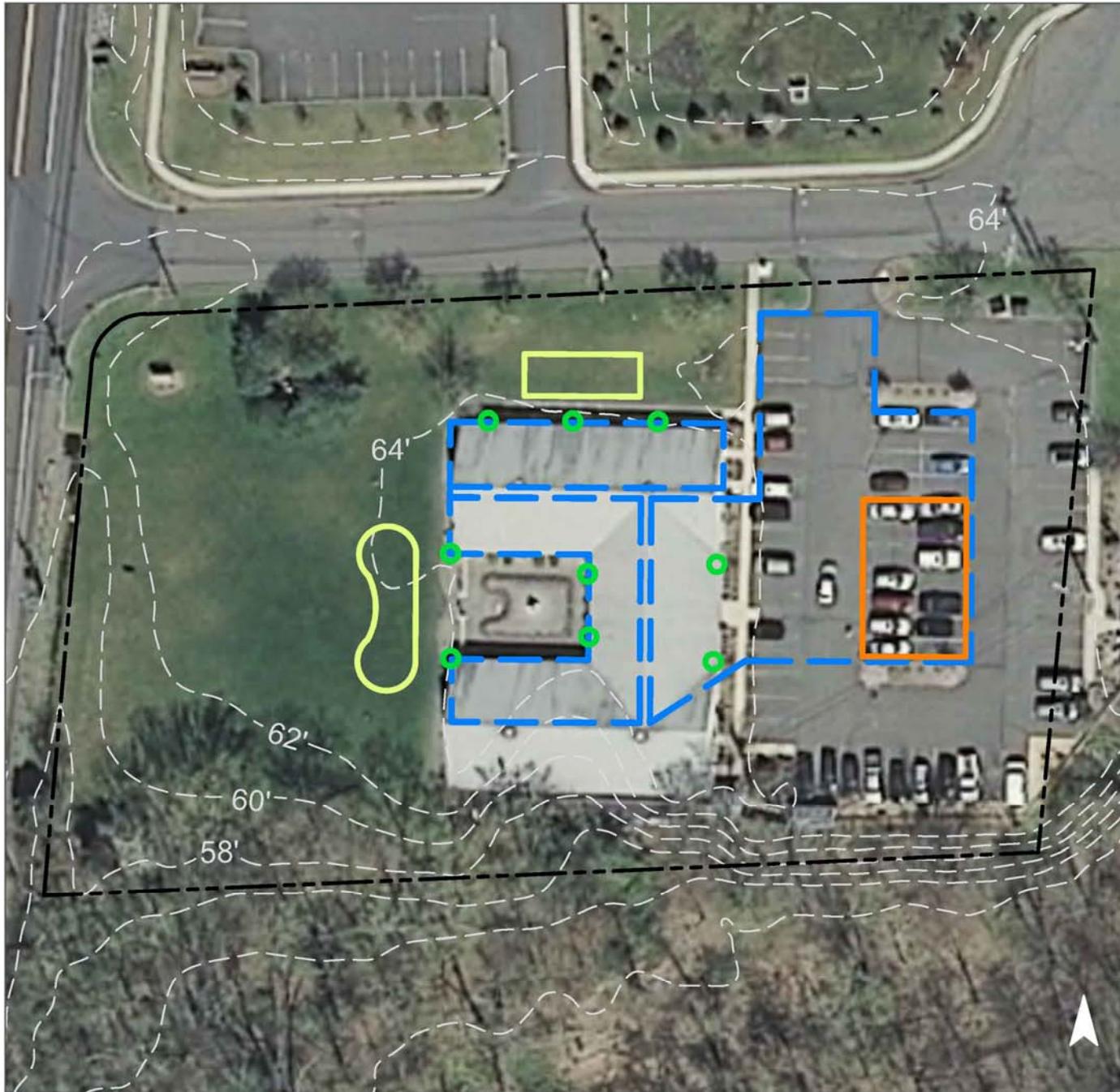


Runoff from the roof can be managed by disconnecting several downspouts and directing stormwater into rain gardens. Additional runoff could be infiltrated by replacing existing parking spaces with pervious pavement. A preliminary soil assessment suggests that the soils have suitable drainage characteristics 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"
47	40,617	2.0	20.5	186.5	0.032	1.11

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	0.179	30	13,240	0.50	1,890	\$9,450
Pervious pavements	0.331	55	24,497	0.92	2,430	\$60,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Doctors Way Offices

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



EVES DRIVE



Subwatershed: Royce Brook
Site Area: 819,986 sq. ft.
Address: Hillsborough, NJ
08844
Block and Lot: Block 163.05, Lot 1.01

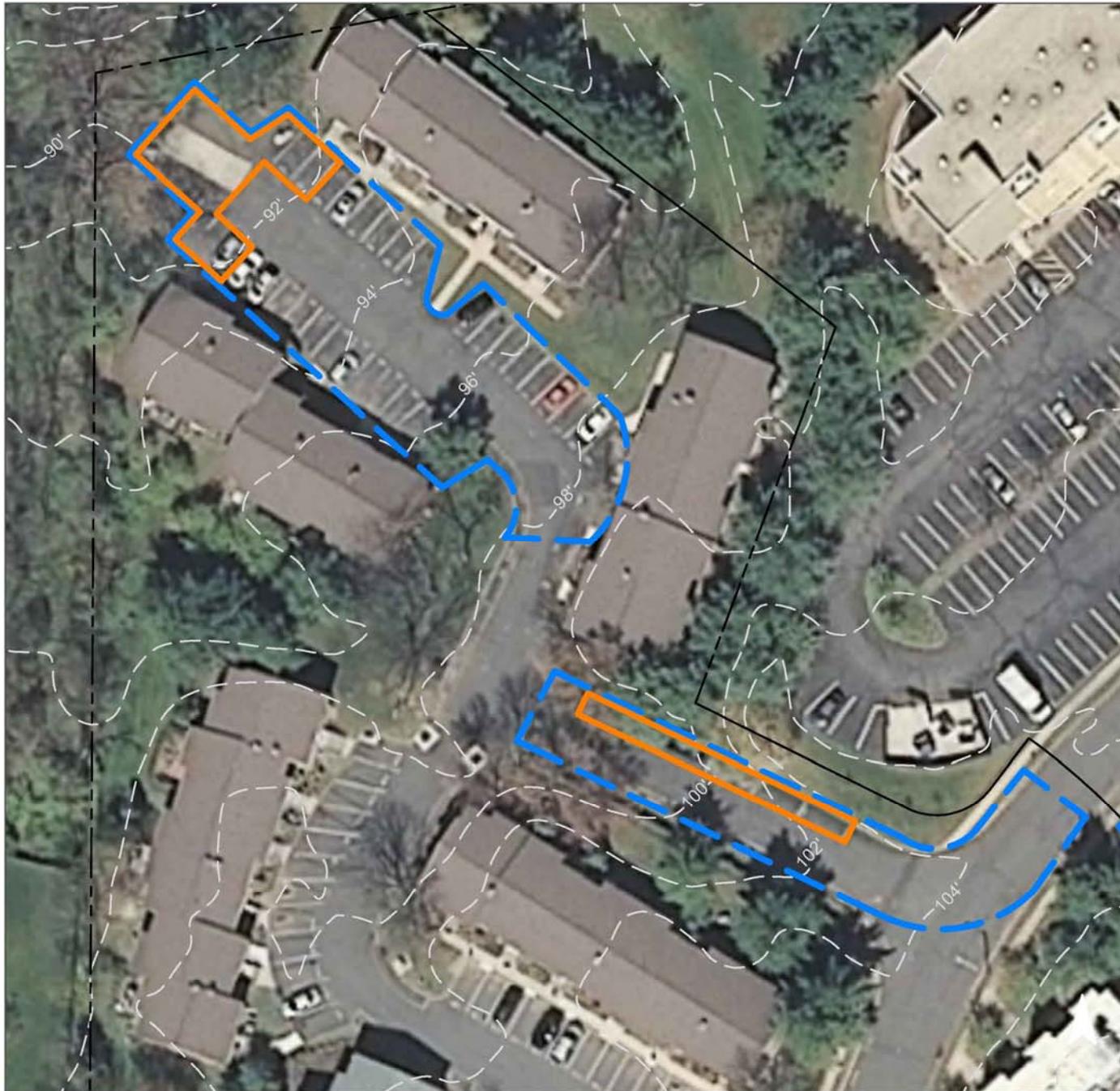


Rows of parking spaces could be replaced with porous asphalt to capture and infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
58	477,575	23.0	241.2	2,192.7	0.372	13.10

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	0.542	91	40,168	1.51	3,330	\$83,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Eves Drive

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



FIRE DEPARTMENT AND RADIOLOGY OFFICE



Subwatershed: Royce Brook
Site Area: 426,889 sq. ft.
Address: 381 US Highway 206
Hillsborough, NJ 08844
Block and Lot: Block 181, Lot 3

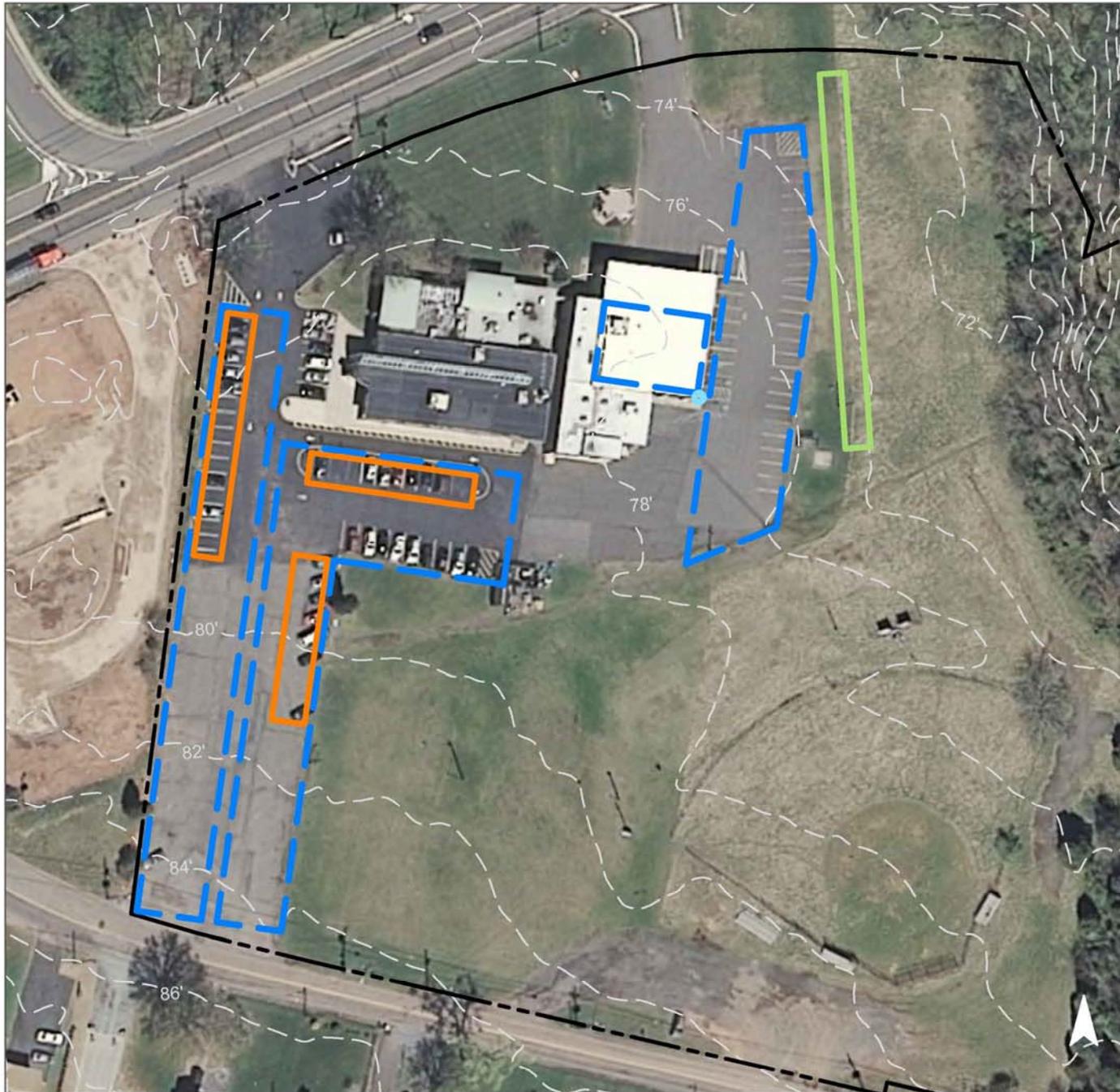


A bioswale could capture, treat, and infiltrate runoff from the east parking lot. Pervious pavement could infiltrate additional stormwater by using it to replace existing parking spaces. A cistern adjacent to the fire station could harvest stormwater from the roof and be used to wash service vehicles. 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	118,740	5.7	60.0	545.2	0.093	3.26

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
Bioswales	0.365	61	27,040	1.02	3,950	\$19,750
Pervious pavements	0.979	164	72,519	2.73	7,275	\$181,875
Rainwater harvesting systems	0.088	15	4,000	0.24	4,000 (gal)	\$8,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Fire Department and Radiology Office

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



HAROLD DOCHERTY MEMORIAL PARK



Subwatershed: Royce Brook
Site Area: 674,117 sq. ft.
Address: 158 US Highway 206
Hillsborough, NJ 08844
Block and Lot: Block 142, Lot 23.03



Stormwater from the pavilion roof could be managed by a rain garden. Pervious pavement could also infiltrate parking lot runoff. A preliminary soil assessment suggests that the soils have suitable 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"
10	65,983	3.2	33.3	303.0	0.051	1.81

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	0.014	2	1,047	0.04	130	\$650
Pervious pavements	0.444	74	32,875	1.24	2,915	\$72,875

GREEN INFRASTRUCTURE RECOMMENDATIONS



Harold Docherty Memorial Park

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



HILLSBOROUGH BUSINESS CENTER: BUILDING 29



Subwatershed: Royce Brook

Site Area: 99,120 sq. ft.

Address: 125 Stryker Lane
Hillsborough, NJ 08844

Block and Lot: Block 200.02, Lot 5



Pervious pavement could infiltrate runoff from the roof and parking lots. A preliminary soil assessment suggests that more soil testing would be required before determining the soils 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"
84	83,001	4.0	41.9	381.1	0.065	2.28

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	1.250	209	63,131	2.37	8,780	\$219,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough Business Center: Building 29

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



HILLSBOROUGH BUSINESS CENTER: BUILDING 30



Subwatershed: Royce Brook

Site Area: 74,485 sq. ft.

Address: 121 Stryker Lane
Hillsborough, NJ 08844

Block and Lot: Block 200.02, Lot 6

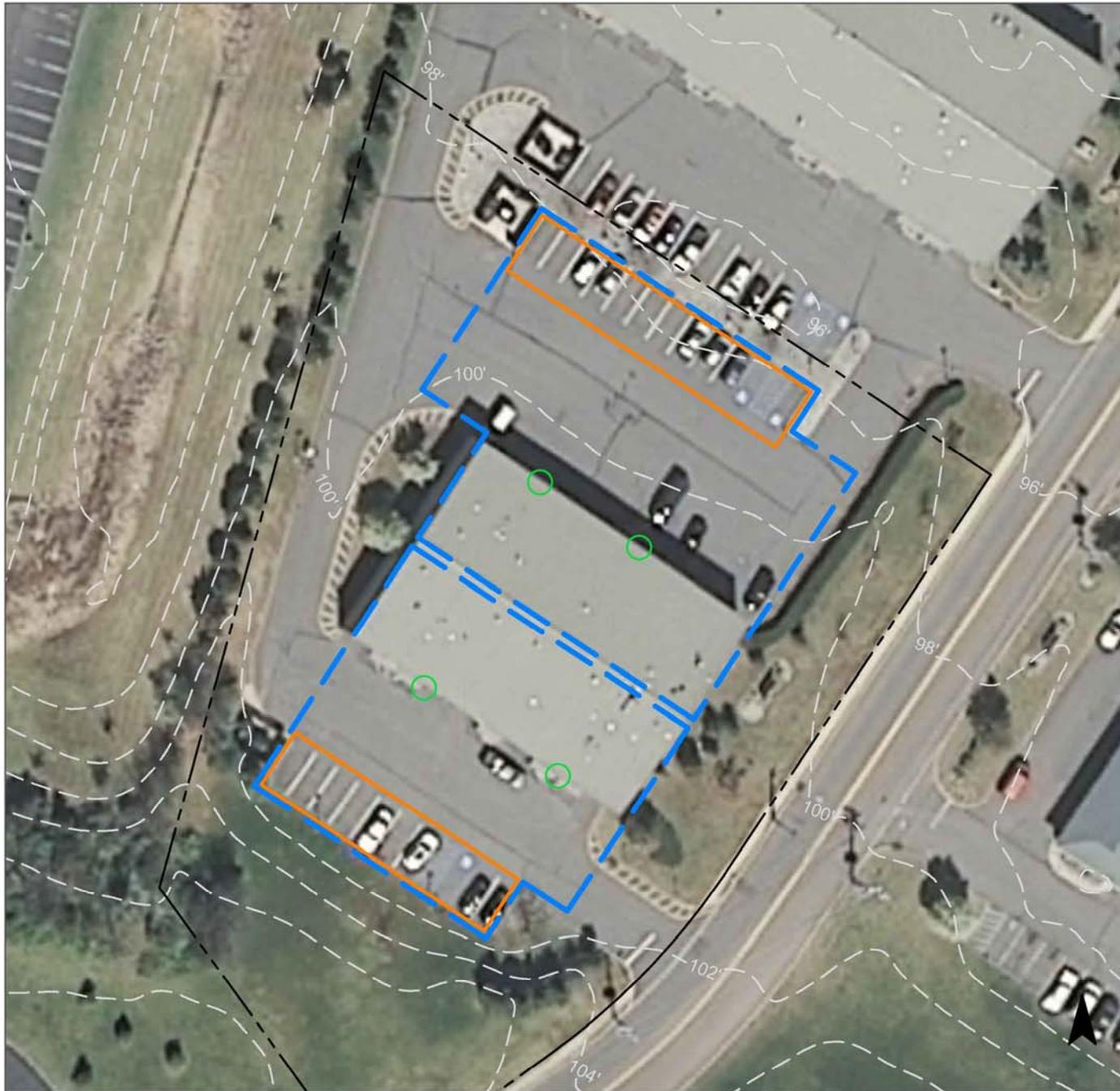


Pervious pavement could infiltrate runoff from the roof and parking lots. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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	52,191	2.5	26.4	239.6	0.041	1.43

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	0.853	143	63,131	2.37	5,655	\$141,375

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough Business Center: Building 30

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



HILLSBOROUGH CENTER



Subwatershed: Royce Brook
Site Area: 753,916 sq. ft.
Address: 649 US Highway 206
Hillsborough, NJ 08844
Block and Lot: Block 200.10, Lot 5.02

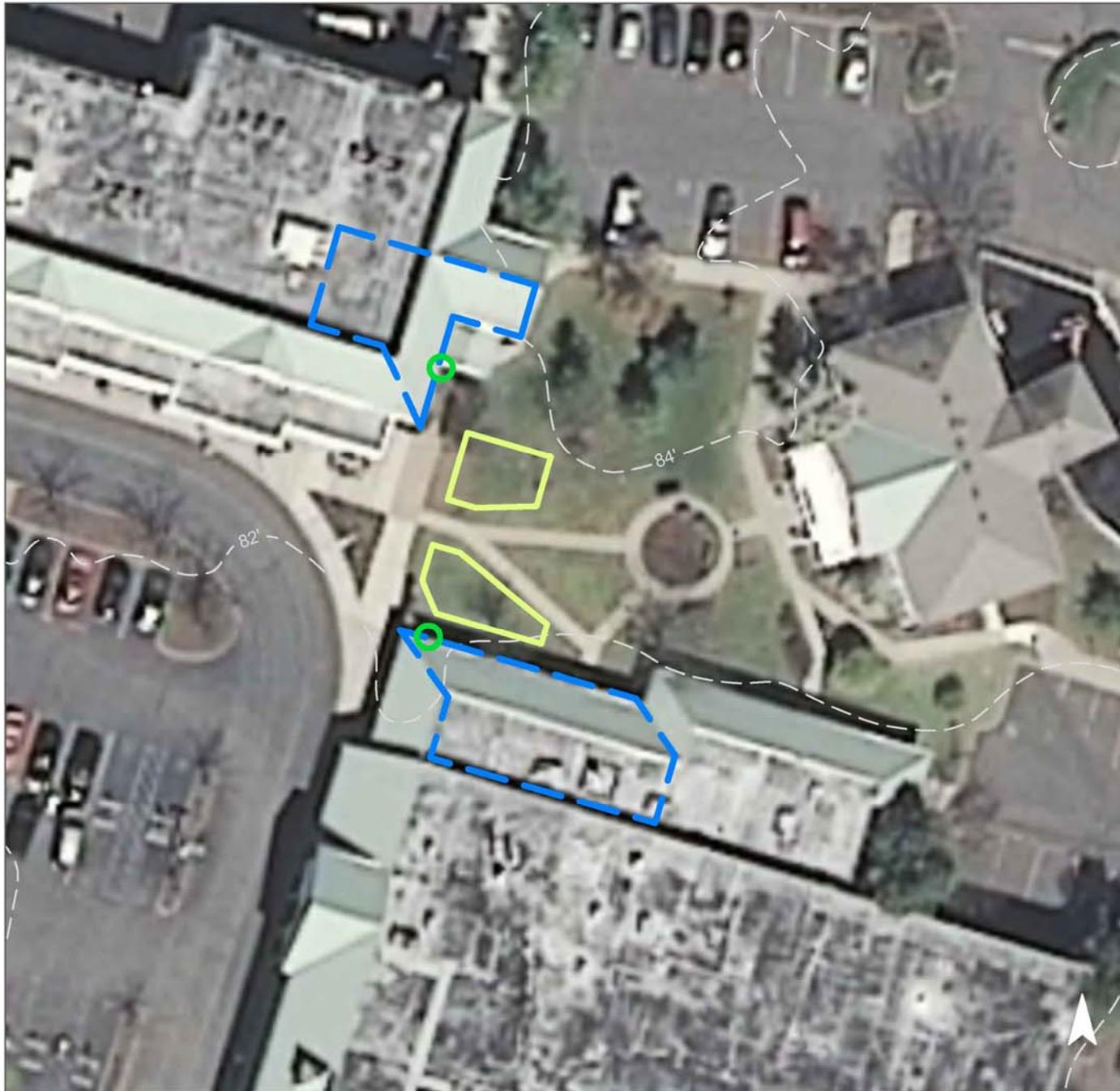


Rain gardens in the courtyard could capture, treat, and infiltrate roof runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
50	379,304	18.3	191.6	1,741.5	0.296	10.40

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	0.081	14	6,021	0.23	765	\$3,825

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough Center

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



HILLSBOROUGH HIGH SCHOOL



Subwatershed: Royce Brook

Site Area: 2,034,108 sq. ft.

Address: 466 Raider Boulevard
Hillsborough, NJ 08844

Block and Lot: Block 177.02, Lot 1.01

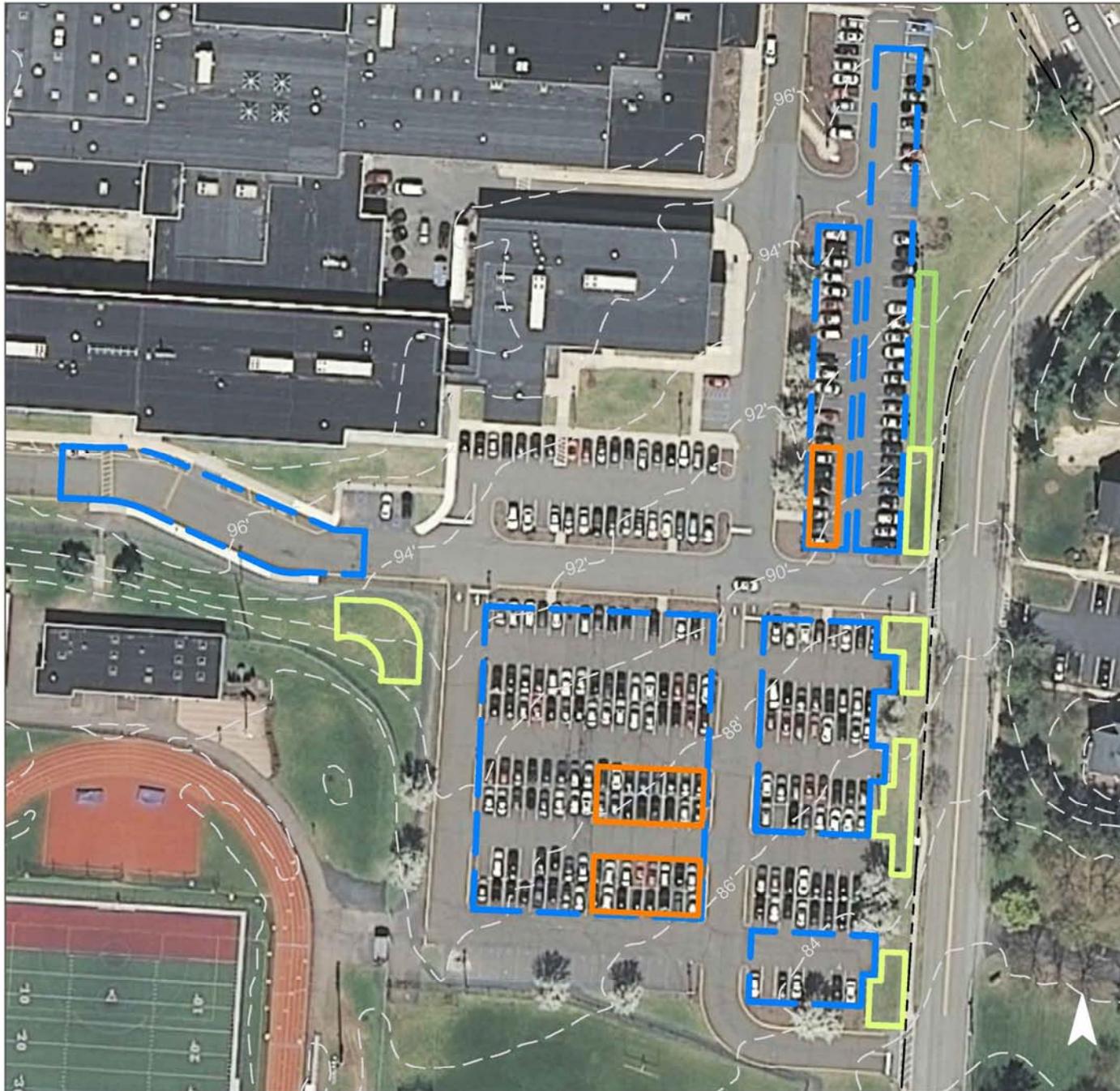


Several rain gardens and a bioswale could capture, treat, and infiltrate stormwater. Pervious pavement could also infiltrate additional runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

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"
40	815,061	39.3	411.6	3,742.2	0.635	22.35

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
Bioretention systems	0.674	113	49,929	1.88	5,925	\$29,625
Bioswales	0.119	20	8,864	0.33	1,210	\$6,050
Pervious pavements	0.900	151	66,647	2.51	6,100	\$152,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough High School

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



HILLSBOROUGH MIDDLE SCHOOL



Subwatershed: Royce Brook
Site Area: 1,758,653 sq. ft.
Address: 260 Triangle Road
Hillsborough, NJ 08844
Block and Lot: Block 155, Lot 42,43,44



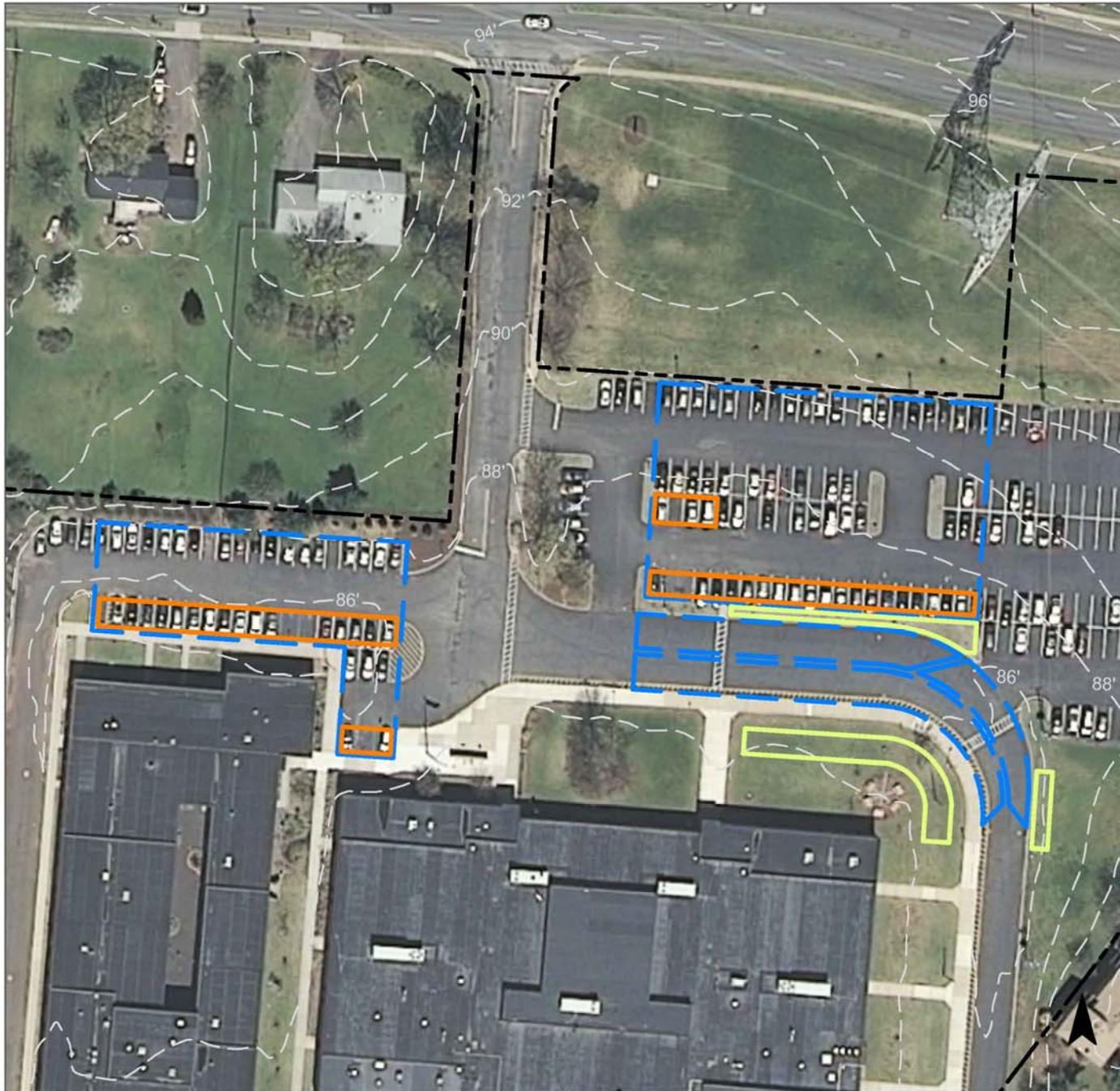
Parking spaces could be converted into pervious pavement to infiltrate runoff. Rain gardens could capture, infiltrate, and treat additional runoff. A preliminary soil assessment suggests that the soils have suitable drainage characteristics for green infrastructure.

Existing conditions are for both the Hillsborough Middle School and the Triangle Elementary School due to shared parcels.

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"
29	503,027	24.3	254.1	2,309.6	0.392	13.80

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	0.319	53	23,637	0.89	4,410	\$22,050
Pervious pavements	1.196	200	88,563	3.33	7,100	\$177,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Hillsborough Middle School

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



TRIANGLE ELEMENTARY SCHOOL



Subwatershed: Royce Brook

Site Area: 1,758,653 sq. ft.

Address: 156 S. Triangle Road
Hillsborough, NJ 08844

Block and Lot: Block 155, Lot 42,43,44



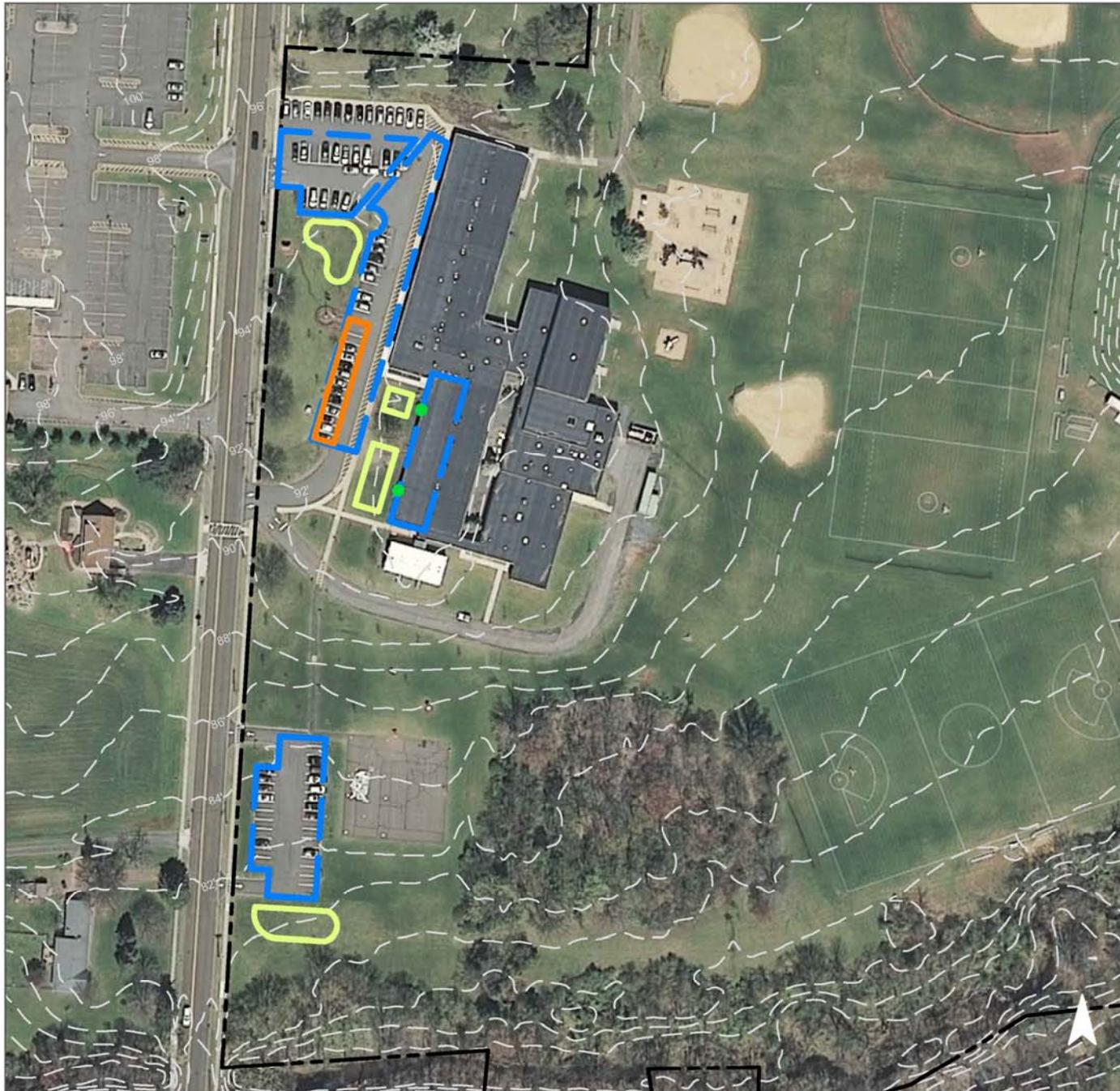
Several rain gardens could capture, treat, and infiltrate runoff from the roof and parking lots. Parking spaces can be converted into pervious pavement to infiltrate additional runoff. A preliminary soil assessment suggests that the soils have suitable characteristics for green infrastructure.

Existing conditions are for both the Hillsborough Middle School and the Triangle Elementary School.

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"
29	503,027	24.3	254.1	2,309.6	0.392	13.80

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	0.561	94	41,551	1.56	6,050	\$30,250
Pervious pavements	0.345	58	25,544	0.96	2,400	\$60,000

GREEN INFRASTRUCTURE RECOMMENDATIONS



Triangle Elementary School

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



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



JK DESIGN



Subwatershed: Royce Brook
Site Area: 104,713 sq. ft.
Address: 465 Amwell Road
Hillsborough, NJ 08844
Block and Lot: Block 163.22, Lot 41



Solar panels and a new green roof have already been installed on site. Downspouts can also be disconnected and redirected into a rain garden to 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"
23	24,350	1.2	12.3	111.8	0.019	0.67

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	0.027	5	2,020	0.09	300	\$1,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



JK Design

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



MARY MOTHER OF GOD CHURCH



Subwatershed: Royce Brook
Site Area: 413,984 sq. ft.
Address: 157 South Triangle
Hillsborough, NJ 08844
Block and Lot: Block 151, Lot 12.01

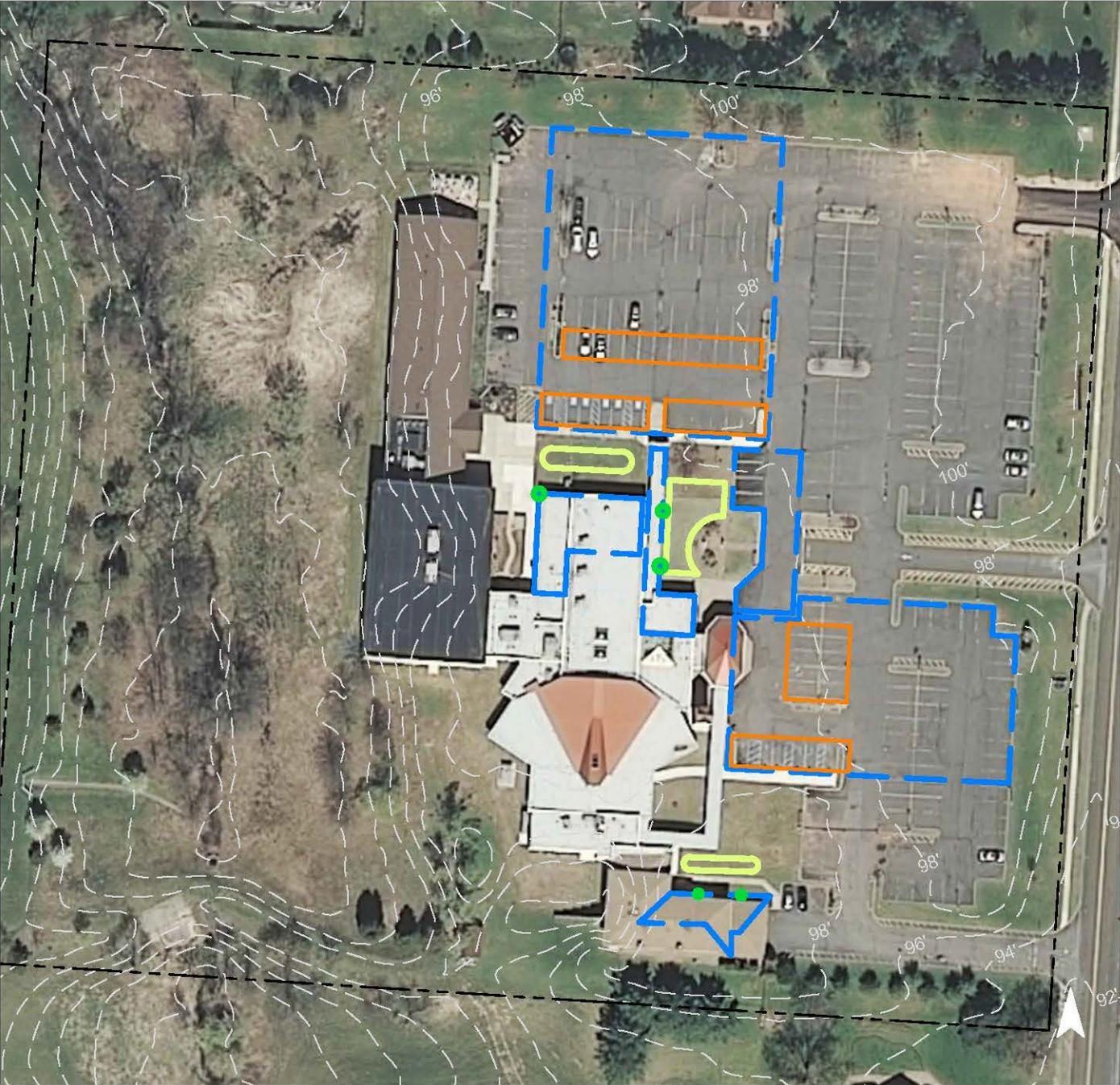


The installation of several rain gardens can capture, treat, and infiltrate roof runoff. Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability 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"
46	191,884	9.3	96.9	881.0	0.150	5.26

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	0.252	42	18,700	0.82	2,550	\$12,750
Pervious pavements	1.279	214	94,772	4.17	8,580	\$214,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Mary Mother of God Church

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



PARAMOUNT GYMNASTICS



Subwatershed: Royce Brook
Site Area: 109,039 sq. ft.
Address: 330 Roycefield Road
Hillsborough, NJ 08844
Block and Lot: Block 142, Lot 23.2

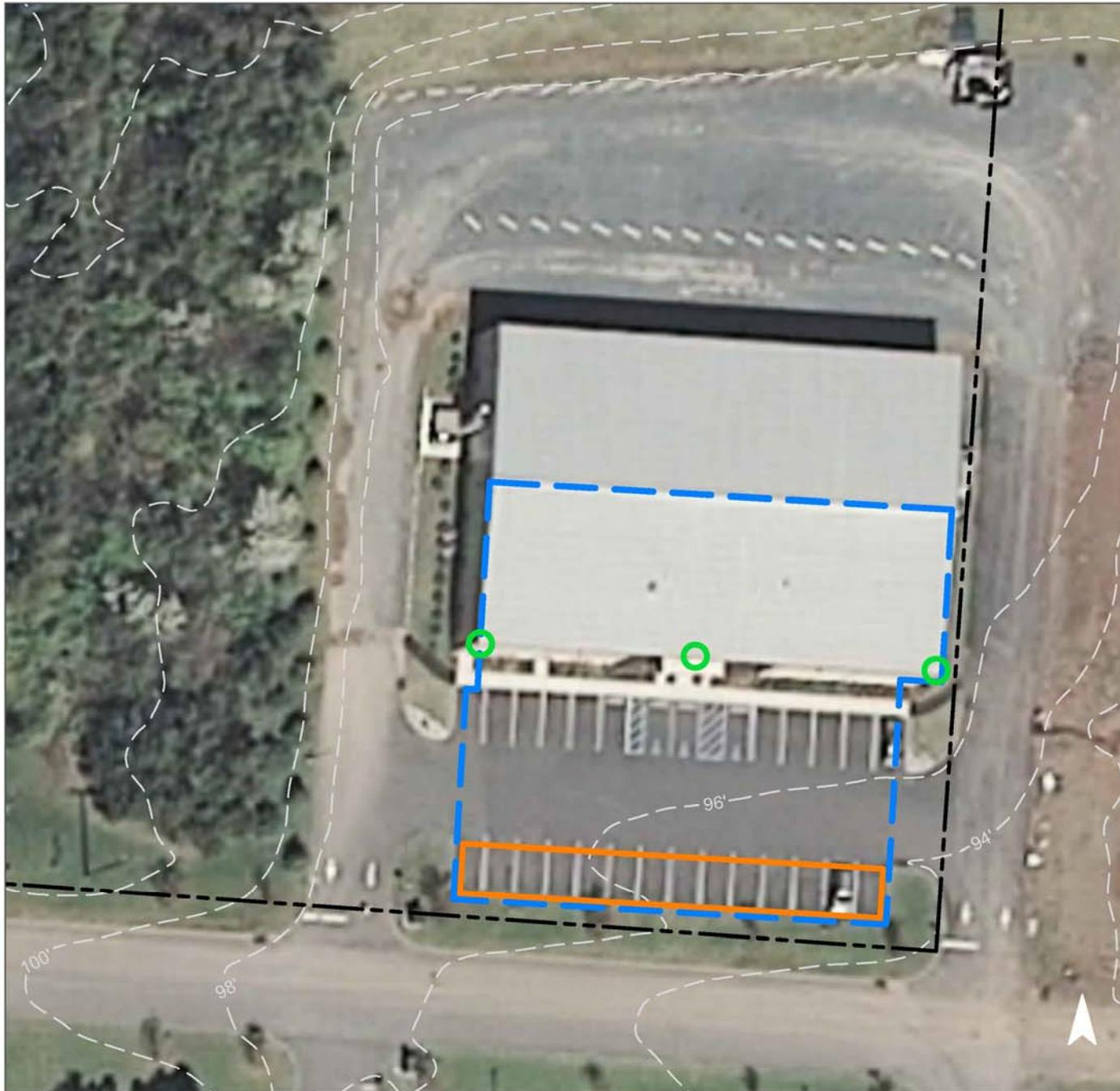


Runoff from the roof and the parking lot could be infiltrated with pervious pavement. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
28	30,538	1.5	15.4	140.2	0.024	0.84

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	0.506	85	37,475	1.41	2,180	\$54,500

GREEN INFRASTRUCTURE RECOMMENDATIONS



Paramount Gymnastics

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



RC FINE FOODS INC.



Subwatershed: Royce Brook

Site Area: 262,729 sq. ft.

Address: 139 Stryker Lane
Hillsborough, NJ 08844

Block and Lot: Block 200.06, Lot 17

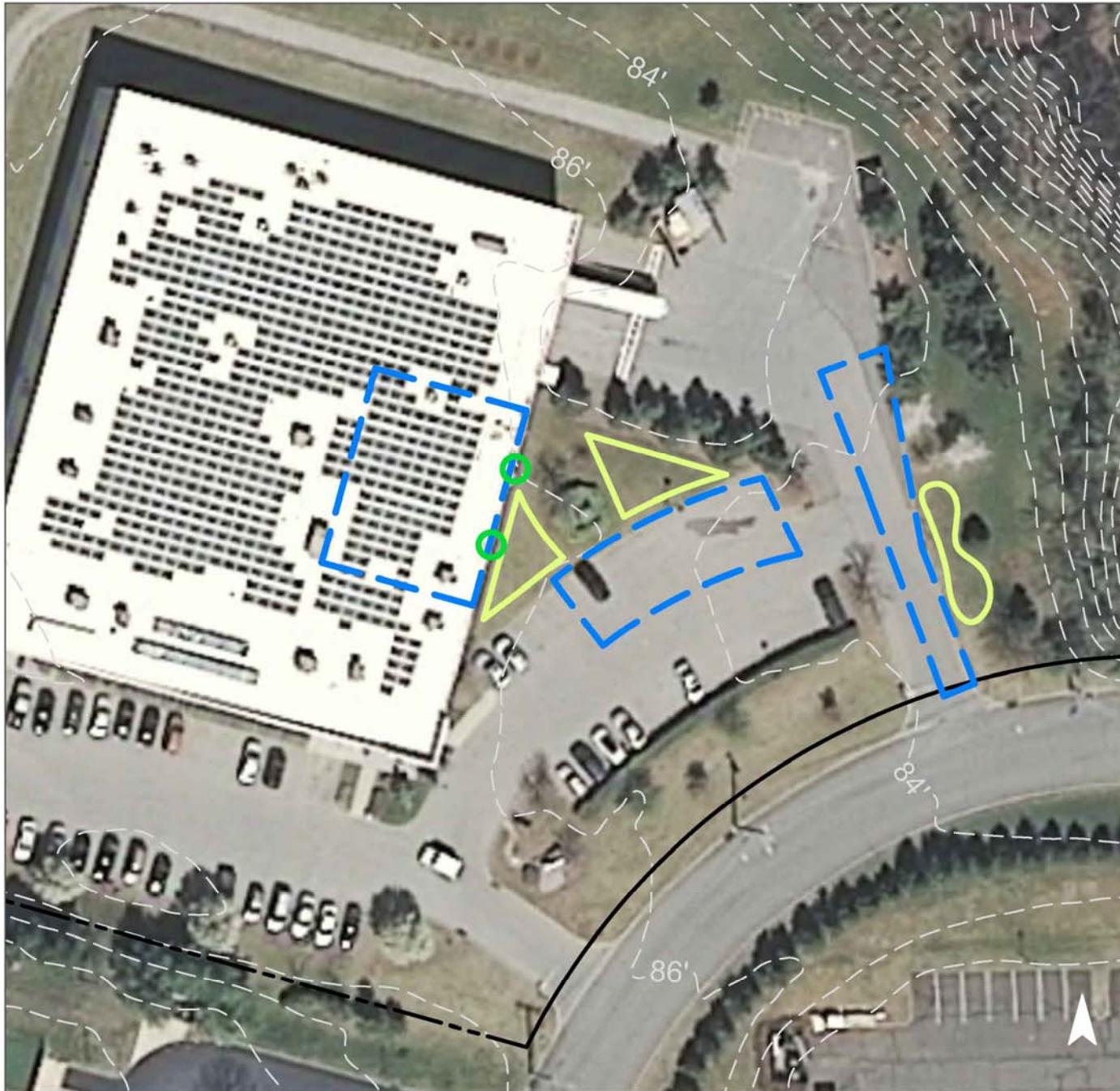


Several rain gardens could capture, treat, and infiltrate runoff. A preliminary soil assessment suggests that more soil testing would be required before determining the soil's suitability for green infrastructure.

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"
44	116,673	5.6	58.9	535.7	0.091	3.20

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	0.254	43	18,850	0.71	1,870	\$9,350

GREEN INFRASTRUCTURE RECOMMENDATIONS



RC Fine Foods Inc.

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



SHOPPING COMPLEX OF AMWELL



Subwatershed: Royce Brook
Site Area: 183,956 sq. ft.
Address: 450 Amwell Road
Hillsborough, NJ 08844
Block and Lot: Block 178, Lot 12.01



Pervious pavement could infiltrate stormwater runoff from the parking lots. 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"
69	126,308	6.1	63.8	579.9	0.098	3.46

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	1.315	220	97,390	3.66	8,050	\$201,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



Shopping Complex of Amwell

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



SUNNYMEAD ELEMENTARY SCHOOL



Subwatershed: Royce Brook

Site Area: 1,383,391 sq. ft.

Address: 55 Sunnymead Road
Hillsborough, NJ 08844

Block and Lot: Block 129, Lot 1.01

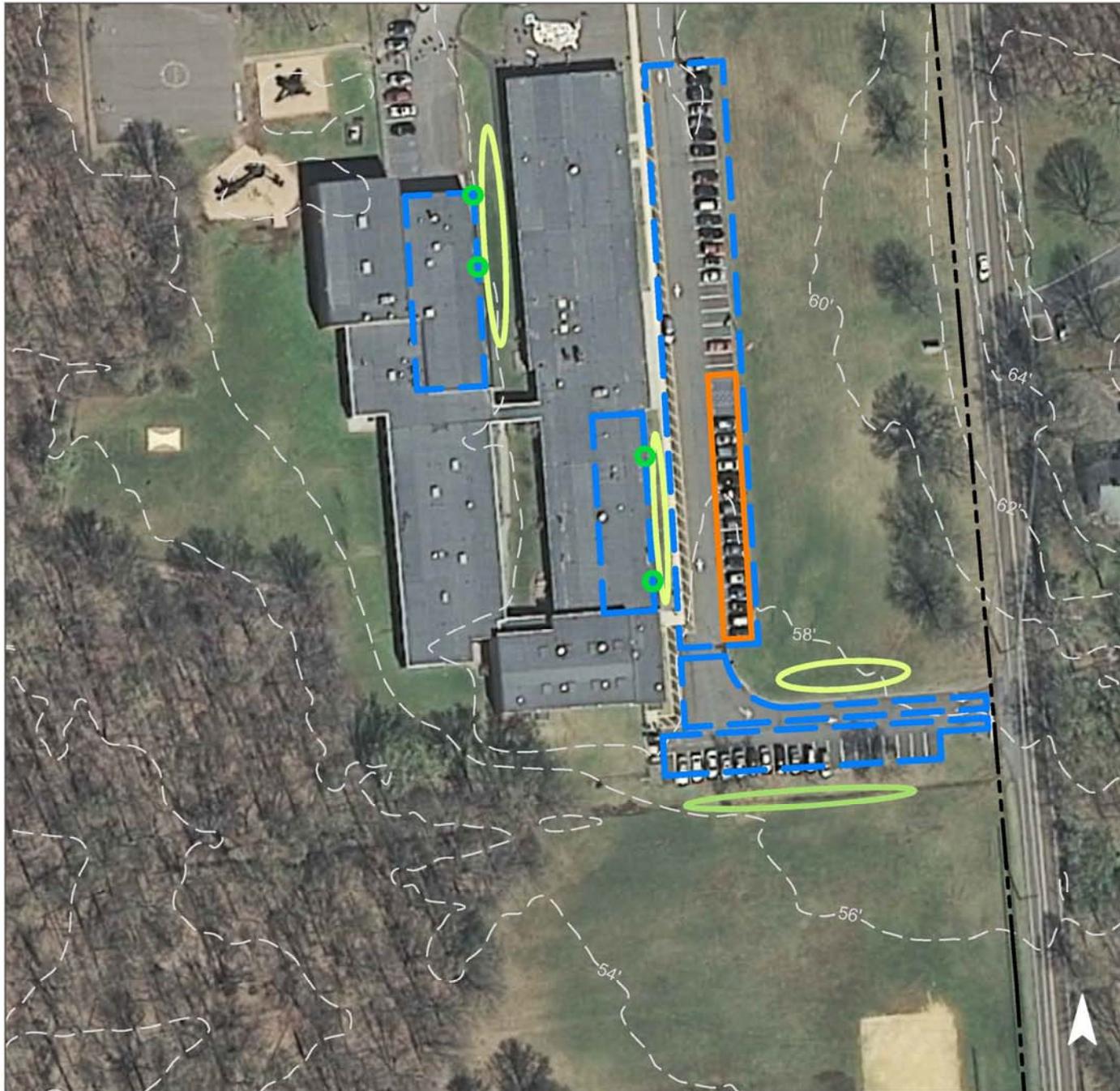


The installation of rain gardens and a bioswale can capture, treat, and infiltrate stormwater. Parking spaces can be replaced with pervious pavement to capture and infiltrate stormwater. A preliminary soil assessment suggests that the soils have suitable characteristics for green infrastructure.

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"
9	121,741	5.9	61.5	559.0	0.095	3.34

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	0.332	56	24,609	0.92	3,250	\$16,250
Bioswales	0.122	20	9,051	0.34	1,240	\$6,200
Pervious pavements	0.498	83	36,839	1.39	3,070	\$76,750

GREEN INFRASTRUCTURE RECOMMENDATIONS



Sunnymead Elementary School

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



US POST OFFICE



Subwatershed: Royce Brook
Site Area: 182,827 sq. ft.
Address: 437 Amwell Road
Hillsborough, NJ 08844
Block and Lot: Block 163.22, Lot 39



Pervious pavement could infiltrate runoff from the parking lots. A rain garden could capture, treat, and infiltrate additional 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"
71	130,614	6.3	66.0	599.7	0.102	3.58

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
Bioretention systems	0.097	16	7,218	0.27	840	\$4,200
Pervious pavements	1.446	242	107,076	4.03	9,850	\$246,250

GREEN INFRASTRUCTURE RECOMMENDATIONS



US Post Office

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



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			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
					LOWER RARITAN RIVER SUBWATERSHED	293.19	12,771,159					
Duke Farms: Cottages Total Site Info	293.19	12,771,159			6.5	67.6	614.4	1	3.07	133,809	0.104	3.67
PIKE RUN SUBWATERSHED	13.06	568,820			10.9	114.2	1,038.3		5.19	226,144	0.176	6.20
Hillsborough Star Diner Total Site Info	1.49	64,863	177.00	22.01	1.7	18.1	164.4	55	0.82	35,811	0.028	0.98
Mountain View Plaza Total Site Info	11.57	503,957	177.00	24.02	9.2	96.1	873.9	38	4.37	190,333	0.148	5.22
ROYCE BROOK SUBWATERSHED	312.90	13,630,019			205.3	2,150.5	19,550.2		97.75	4,258,035	3.318	116.78
Auten Road School Total Site Info	48.87	2,128,895	150.00	10.00	14.2	149.3	1,356.9	14	6.78	295,524	0.230	8.11
Boro Kid Zone Total Site Info	2.03	88,617	200.05	6.00	2.7	28.7	260.8	64	1.30	56,801	0.044	1.56
Claremont Towers Total Site Info	4.75	206,854	163.05	1.02	7.5	78.2	710.7	75	3.55	154,795	0.121	4.25
Corporate Building Total Site Info	10.10	439,945	200.02	1.00	8.1	85.2	774.2	38	3.87	168,631	0.131	4.62
Doctors Way Offices Total Site Info	1.98	86,343	182.00	38.01	2.0	20.5	186.5	47	0.93	40,617	0.032	1.11
Eves Drive Total Site Info	18.82	819,986	163.05	1.01	23.0	241.2	2,192.7	58	10.96	477,575	0.372	13.10
Fire Department and Radiology Office Total Site Info	9.80	426,889	181.00	3.00	5.7	60.0	545.2	28	2.73	118,740	0.093	3.26

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Block	Lot	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
Harold Docherty Memorial Park												
Total Site Info	15.48	674,117	142.00	23.03	3.2	33.3	303.0	10	1.51	65,983	0.051	1.81
Hillsborough Business Center: Building 29												
Total Site Info	2.28	99,120	200.02	5.00	4.0	41.9	381.1	84	1.91	83,001	0.065	2.28
Hillsborough Business Center: Building 30												
Total Site Info	1.71	74,485	200.02	6.00	2.5	26.4	239.6	70	1.20	52,191	0.041	1.43
Hillsborough Center												
Total Site Info	17.31	753,916	200.10	5.02	18.3	191.6	1,741.5	50	8.71	379,304	0.296	10.40
Hillsborough High School												
Total Site Info	46.70	2,034,108	177.02	1.01	39.3	411.6	3,742.2	40	18.71	815,061	0.635	22.35
Hillsborough Middle School & Triangle Elementary												
Total Site Info	40.37	1,758,653	155.00	42.00	24.3	254.1	2,309.6	29	11.55	503,027	0.392	13.80
Hillsborough Municipal Building and Library												
Total Site Info	32.08	1,397,452	149.01	1.02	14.7	153.9	1,398.9	22	6.99	304,677	0.237	8.36
JK Design												
Total Site Info	2.40	104,713	163.22	41.00	1.2	12.3	111.8	23	0.56	24,350	0.019	0.67
Mary Mother of God Church												
Total Site Info	9.50	413,984	151.00	12.01	9.3	96.9	881.0	46	4.41	191,884	0.150	5.26
Paramount Gymnastics												
Total Site Info	2.50	109,039	142.00	23.20	1.5	15.4	140.2	28	0.70	30,538	0.024	0.84
RC Fine Foods Inc.												
Total Site Info	6.03	262,729	200.06	17.00	5.6	58.9	535.7	44	2.68	116,673	0.091	3.20
Shopping Complex of Amwell												
Total Site Info	4.22	183,956	178.00	12.01	6.1	63.8	579.9	69	2.90	126,308	0.098	3.46

Summary of Existing Site Conditions

Subwatershed/Site Name/Total Site Info/GI Practice	Area (ac)	Area (SF)	Lot	Block	Existing Annual Loads			I.C. %	I.C. Area (ac)	I.C. Area (SF)	Runoff Volumes from I.C.	
					TP (lb/yr)	TN (lb/yr)	TSS (lb/yr)				Water Quality Storm (1.25" over 2-hours) (Mgal)	Annual (Mgal)
					Sunnymead Elementary School							
Total Site Info	31.76	1,383,391	1.01	129.00	5.9	61.5	559.0	9	2.79	121,741	0.095	3.34
US Post Office												
Total Site Info	4.20	182,827	39.00	163.22	6.3	66.0	599.7	71	3.00	130,614	0.102	3.58

e. Summary of Proposed Green Infrastructure Practices

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)									
LOWER RARITAN RIVER SUBWATERSHED	1,455	0.03	0.038	6	2,805	0.11	3,500			\$17,500	1.1%
1 Duke Farms: Cottages											
Bioretention systems/rain gardens	1,455	0.03	0.038	6	2,805	0.11	3,500	5	SF	\$17,500	1.1%
Total Site Info	1,455	0.03	0.038	6	2,805	0.11	3,500			\$17,500	1.1%
PIKE RUN SUBWATERSHED	85,675	1.97	2.232	374	165,308	6.21	18,460			\$271,800	37.9%
2 Hillsborough Star Diner											
Bioretention systems/rain gardens	5,475	0.13	0.143	24	10,547	0.40	1,420	5	SF	\$7,100	15.3%
Pervious pavements	24,555	0.56	0.640	107	47,386	1.78	5,115	25	SF	\$127,875	68.6%
Total Site Info	30,030	0.69	0.782	131	57,933	2.18	6,535			\$134,975	83.9%
3 Mountain View Plaza											
Bioretention systems/rain gardens	32,430	0.74	0.845	141	62,570	2.35	8,065	5	SF	\$40,325	17.0%
Pervious pavements	23,215	0.53	0.605	101	44,805	1.68	3,860	25	SF	\$96,500	12.2%
Total Site Info	55,645	1.28	1.450	243	107,375	4.03	11,925			\$136,825	29.2%
ROYCE BROOK SUBWATERSHED	842,040	19.33	21.940	3,673	1,592,864	60.71	166,485			\$2,923,125	19.8%
4 Auten Road School											
Bioretention systems/rain gardens	28,815	0.66	0.751	126	55,576	2.09	7,500	5	SF	\$37,500	9.8%
Pervious pavements	26,895	0.62	0.701	117	51,911	1.95	4,615	25	SF	\$115,375	9.1%
Total Site Info	55,710	1.28	1.452	243	107,488	4.04	12,115			\$152,875	18.9%
5 Boro Kid Zone											
Bioretention systems/rain gardens	17,140	0.39	0.447	75	33,062	1.24	4,600	5	SF	\$23,000	30.2%
Pervious pavements	18,520	0.43	0.483	81	35,754	1.34	2,680	25	SF	\$67,000	32.6%
Total Site Info	35,660	0.82	0.929	156	68,816	2.58	7,280			\$90,000	62.8%
6 Claremont Towers											
Bioretention systems/rain gardens	1,425	0.03	0.037	6	2,768	0.10	350	5	SF	\$1,750	0.9%
Pervious pavements	42,510	0.98	1.108	185	82,018	3.08	6,700	25	SF	\$167,500	27.5%
Total Site Info	43,935	1.01	1.145	192	84,786	3.18	7,050			\$169,250	28.4%

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)									
7 Corporate Building											
Bioretention systems/rain gardens	8,980	0.21	0.234	39	17,324	0.65	2,090	5	SF	\$10,450	5.3%
Bioswales	10,540	0.24	0.275	46	20,338	0.76	2,510	5	SF	\$12,550	6.3%
Pervious pavements	35,550	0.82	0.926	155	68,592	2.58	6,475	25	SF	\$161,875	21.1%
Total Site Info	55,070	1.26	1.435	240	106,254	3.99	11,075			\$184,875	32.7%
8 Doctors Way Offices											
Bioretention systems/rain gardens	6,870	0.16	0.179	30	13,240	0.50	1,890	5	SF	\$9,450	16.9%
Pervious pavements	12,700	0.29	0.331	55	24,497	0.92	2,430	25	SF	\$60,750	31.3%
Total Site Info	19,570	0.45	0.510	85	37,737	1.42	4,320			\$70,200	48.2%
9 Eves Drive											
Pervious pavements	20,820	0.48	0.542	91	40,168	1.51	3,330	25	SF	\$83,250	4.4%
Total Site Info	20,820	0.48	0.542	91	40,168	1.51	3,330			\$83,250	4.4%
10 Fire Department and Radiology Office											
Bioswales	14,010	0.32	0.365	61	27,040	1.02	3,950	5	SF	\$19,750	11.8%
Pervious pavements	37,590	0.86	0.979	164	72,519	2.73	7,275	25	SF	\$181,875	31.7%
Rainwater harvesting systems	3,360	0.08	0.088	15	4,000	0.24	4,000	2	gal	\$8,000	2.8%
Total Site Info	54,960	1.26	1.432	240	103,559	3.99	15,225			\$209,625	46.3%
11 Harold Docherty Memorial Park											
Bioretention systems/rain gardens	550	0.01	0.014	2	1,047	0.04	130	5	SF	\$650	0.8%
Pervious pavements	17,040	0.39	0.444	74	32,875	1.24	2,915	25	SF	\$72,875	25.8%
Total Site Info	17,590	0.40	0.458	77	33,922	1.28	3,045			\$73,525	26.7%
12 Hillsborough Business Center: Building 29											
Pervious pavements	47,980	1.10	1.250	209	63,131	2.37	8,780	25	SF	\$219,500	57.8%
Total Site Info	47,980	1.10	1.250	209	63,131	2.37	8,780			\$219,500	57.8%
13 Hillsborough Business Center: Building 30											
Pervious pavements	32,720	0.75	0.853	143	63,131	2.37	5,655	25	SF	\$141,375	62.7%
Total Site Info	32,720	0.75	0.853	143	63,131	2.37	5,655			\$141,375	62.7%
14 Hillsborough Center											
Bioretention systems/rain gardens	3,120	0.07	0.081	14	6,021	0.23	765	5	SF	\$3,825	0.8%
Total Site Info	3,120	0.07	0.081	14	6,021	0.23	765			\$3,825	0.8%

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)									
15 Hillsborough High School											
Bioretention systems/rain gardens	25,875	0.59	0.674	113	49,929	1.88	5,925	5	SF	\$29,625	3.2%
Bioswales	4,585	0.11	0.119	20	8,864	0.33	1,210	5	SF	\$6,050	0.6%
Pervious pavements	34,550	0.79	0.900	151	66,647	2.51	6,100	25	SF	\$152,500	4.2%
Total Site Info	65,010	1.49	1.694	284	125,440	4.72	13,235			\$188,175	8.0%
16 Hillsborough Middle School											
Bioretention systems/rain gardens	12,240	0.28	0.319	53	23,637	0.89	4,410	5	SF	\$22,050	2.4%
Pervious pavements	45,910	1.05	1.196	200	88,563	3.33	7,100	25	SF	\$177,500	9.1%
Total Site Info	58,150	1.33	1.515	254	112,200	4.22	11,510			\$199,550	11.6%
17 Triangle Elementary School											
Bioretention systems/rain gardens	21,530	0.49	0.561	94	41,551	1.56	6,050	5	SF	\$30,250	4.3%
Pervious pavements	13,240	0.30	0.345	58	25,544	0.96	2,400	25	SF	\$60,000	2.6%
Total Site Info	34,770	0.80	0.906	152	67,096	2.52	8,450			\$90,250	6.9%
18 Hillsborough Municipal Building and Library											
Bioretention systems/rain gardens	23,430	0.54	0.610	102	45,217	1.70	5,920	5	SF	\$29,600	7.7%
Pervious pavements	38,300	0.88	0.998	167	73,902	2.78	6,950	25	SF	\$173,750	12.6%
Total Site Info	61,730	1.42	1.608	269	119,119	4.48	12,870			\$203,350	20.3%
19 JK Design											
Bioretention systems/rain gardens	1,050	0.02	0.027	5	2,020	0.09	300	5	SF	\$1,500	4.3%
Total Site Info	1,050	0.02	0.027	5	2,020	0.09	300			\$1,500	4.3%
20 Mary Mother of God Church											
Bioretention systems/rain gardens	9,690	0.22	0.252	42	18,700	0.82	2,550	5	SF	\$12,750	5.0%
Pervious pavements	49,095	1.13	1.279	214	94,772	4.17	8,580	25	SF	\$214,500	25.6%
Total Site Info	58,785	1.35	1.532	256	113,472	4.99	11,130			\$227,250	30.6%
21 Paramount Gymnastics											
Pervious pavements	19,410	0.45	0.506	85	37,475	1.41	2,180	25	SF	\$54,500	63.6%
Total Site Info	19,410	0.45	0.506	85	37,475	1.41	2,180			\$54,500	63.6%
22 RC Fine Foods Inc.											
Bioretention systems/rain gardens	9,765	0.22	0.254	43	18,850	0.71	1,870	5	SF	\$9,350	8.4%
Total Site Info	9,765	0.22	0.254	43	18,850	0.71	1,870			\$9,350	8.4%

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)									
23 Shopping Complex of Amwell											
Pervious pavements	50,475	1.16	1.315	220	97,390	3.66	8,050	25	SF	\$201,250	40.0%
Total Site Info	50,475	1.16	1.315	220	97,390	3.66	8,050			\$201,250	40.0%
24 Sunnymead Elementary School											
Bioretention systems/rain gardens	12,745	0.29	0.332	56	24,609	0.92	3,250	5	SF	\$16,250	10.5%
Bioswales	4,685	0.11	0.122	20	9,051	0.34	1,240	5	SF	\$6,200	3.8%
Pervious pavements	19,100	0.44	0.498	83	36,839	1.39	3,070	25	SF	\$76,750	15.7%
Total Site Info	36,530	0.84	0.952	159	70,499	2.65	7,560			\$99,200	30.0%
25 US Post Office											
Bioretention systems/rain gardens	3,740	0.09	0.097	16	7,218	0.27	840	5	SF	\$4,200	2.9%
Pervious pavements	55,490	1.27	1.446	242	107,076	4.03	9,850	25	SF	\$246,250	42.5%
Total Site Info	59,230	1.36	1.543	258	114,294	4.30	10,690			\$250,450	45.3%